USER GUIDE

Boris™

CONTINUUM COMPLETE AVX

for Avid Systems

Boris Continuum Complete for AVX Version 4.0

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Introduction

Boris Continuum Complete for AVX is a package of over 170 filters that work directly within the native Avid effects interface. Each filter in some way alters a source image or video clip, and some can even create new media. A filter can create something as simple as a color adjustment or as complex as shattering an image in three dimensions. All filters offer a range of parameters which can be animated using keyframes, providing precise control. Some filters allow you to use other media as input to particular elements of the effect.

Understanding Plug-ins

Boris Continuum Complete AVX is a plug-in. Plug-ins are software products which are added to your Avid to enhance its functionality. A plug-in can be a small and simple addition or a complex piece of software.

Plug-in files must reside in a specific folder on your computer so that the Avid can find them. If a plug-in is misplaced or moved, the host application may lose track of it. When your Avid starts, it examines the plug-in folder for the available plug-ins. All recognized plug-ins become available to the user.

Plug-ins become an integral part of the host program, sharing all of its resources including memory. Plug-ins are not separate applications; they do not have to run in the background and do not require additional memory.

Installing and Starting Boris Continuum Complete AVX

Installation instructions vary depending on your operating system. For instructions on installing Boris Continuum Complete AVX into your Avid system, see the Installation Guide PDF located on the Boris Continuum Complete CD-ROM.

Computer Experience

This guide assumes that you understand your computer's operating system at a fundamental level and are familiar with basic computer functions such as clicking, dragging, scrolling, and choosing commands from menus. You should also know how to create, open, and save documents and folders. Consult the documentation provided with your computer if you are not familiar with these terms and functions.

Avid Experience

This guide assumes that you have installed the Avid editing software on your system and are proficient enough to perform basic editing techniques. You must also know how to apply effects to the Avid timeline, edit effects, and render effects to use Boris Continuum Complete AVX. If you are unfamiliar with these operations, consult the documentation provided with your Avid.

Working with the User's Guide

This guide is designed to help you understand the many options offered by Boris Continuum Complete AVX so that you use this complex program to its fullest potential.

The illustrations in this printed User Guide are grayscale.However, the illustrations in the online pdf found on your CD include illustrations in color. This may be helpful when working with Color filters.

Overview of User's Guide

The guide is divided into the following sections:

- Chapter 1 describes how to use the Continuum Complete user interface to create effects. in your Avid.
- Chapter 2 provides information on the Color & Blur filters. This category includes a number of color correction and effects, compositing filters, blur filters, and an unsharp mask.
- Chapter 3 provides information on the Distortion & Perspective filters. This category includes particles, distortion and shape filters.
- Chapter 4 provides information on the Effects filters. This category includes noise and as well as film effects.
- Chapter 5 provides information on the Generators. This category includes filters that generate media, including a number of natural effects, a particle system and several bump maps.
- Chapter 6 provides information on the Key & Matte filters. This category includes al keying filters and a number of matte adjustment and clean up filters.
- Chapter 7 provides information on the Lights filters.
- Chapter 8 provides information on the Time filters.
- Chapter 9 provides information on the Wipe Transitions.
- Chapter 10 provides information on the PixelChooser.
- The Appendix provides information on the available Apply Modes.

Release Notes

The Release Notes contain valuable, up-to-date information on new features, supported host applications and operating systems, and known limitations. The Release Notes are located on the Boris Continuum Complete AVX CD-ROM.

Tutorials

The Tutorials will help you to start working with BCC AVX. The Tutorials are located on the Boris Continuum Complete AVX CD-ROM.

Conventions and Symbols

Several formatting conventions and symbols are used throughout this guide to convey important information.

- The first time a parameter name or other important term is mentioned in the text, the name appears in bold print. Menu choices that appear in the control panels are written in italics. For example, "Set **Make Matte From** to ***Luminance***" means to choose the "Luminance" option in the "Make Matte From" menu.
- The chevron symbol (>) indicates choosing a command from a menu. For example, "Choose File > Save" means to choose the Save command from the File menu.

The following icons are used to denote sections of special interest:

Indicates warnings about procedures that might produce unwanted effects, are very memory-intensive, or cannot be easily undone.

Accompanies useful notes about a parameter, filter, or procedure. These notes can help you better understand how to use Boris Continuum Complete.

Denotes a reference to another part of the manual in the text. Check the indicated sections for further information.

Accompanies creative ideas and techniques for using Boris Continuum Complete to produce specific effects.

Technical Support

If you encounter questions or difficulties that are not covered in this manual visit the Boris FX Technical Forum at http://www.borisfx.com/support, and look for the link for your host application and operating system. You can also contact Boris FX Technical Support by calling (617) 451-9900 or e-mailing techsupport@artelsoft.com.

Chapter 1
The User Interface

Overview

This section provides information on installing and applying Boris Continuum Complete AVX inside Avid systems,

Installing Boris Continuum Complete AVX in Avid Systems

For the latest installation information, as well as a list of supported hosts and operating systems, see the Release Notes PDF document on your installation CD.

Working with 8-bit and 16-bit Color Processing

Boris Continuum Complete AVX can work with Avid set to 8-bit-per-channel and 16-bit-per-channel color processing; 16-bit-per-channel mode makes a larger range of colors available. To render BCC filters in 16-bit, set this preference in the Render tab of Avid's Media Creation Settings window. See your Avid documentation for details on the color depth options.

When you work with high-resolution images that use a narrow range of colors, such as gradients for film effects or HDTV output, 16-bit-per-channel mode means that transitions between colors display less banding, and more detail is preserved.

You can choose to work in 8-bit-per-channel or 16-bit-per-channel mode for each project. BCC automatically uses the color depth that was set in your Avid preferences. Some filters do not support 16-bit color, for example Star Matte. If an effect supports only 8 bits, and your project is set to 16 bits, the Avid displays a warning. Using an 8-bit effect in a 16-bit project will result in a loss of detail.

To optimize performance, you may want to create effects in 8-bit, then render a 16-bit file for maximum quality. However, you should preview the final effect to make sure that it appears correct. Even if you work with 8-bit media, in some instances your images may look better in 16 bit. For example, when you use multiple filters or a complex filter with multiple inputs.

The OpenGL filters (BCC Glare, BCC Glint, BCC Glitter, BCC Lens Flare, BCC Lens Flare Advanced and 3D Extruded Image Shatter) are 8-bit only. They will still render if your system is set to 16 bit. However, they will render as 8-bit.

Working with Both AVX 1.5 and AVX 2.0

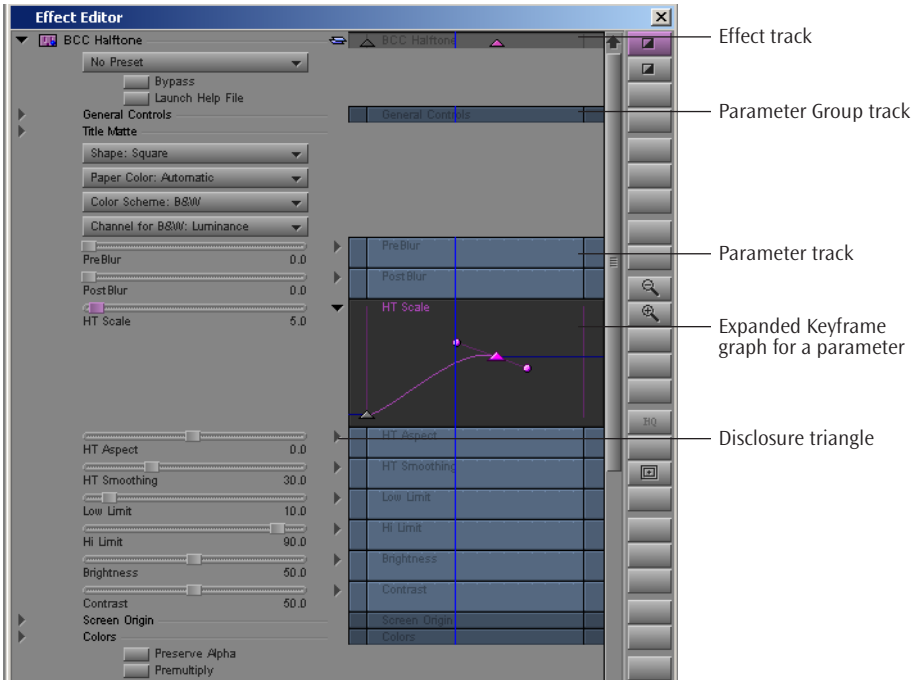
You can keep both AVX 1.5 and AVX 2.0 versions on your system. This allows you to promote existing BCC AVX 1.5 effects to AVX 2.0. However, if you do this, the AVX 1.5 filters appear in categories named ***BCC3Category Name***. The new filters appear in a category named ***BCCCategoryName***. Only the new filters will appear in this category.

For example, the AVX 1.5 Color & Blurs filters appear in the ***BCC3Colors&Blurs*** category, while ***BCCColors&Blurs*** only includes the new BCC Color Match and BCC Median filters.

For details on promoting effects, see your Avid documentation. You must have both the AVX 1.5 and AVX 2.0 versions on your system to promote effects.

Working with Avid's Advanced Keyframing Model

The AVX 2.0 architecture allows plug-in effects to take advantage of Avid's advanced keyframe model. One of the main benefits of using the advanced keyframe model is that you can set keyframes for individual parameters in the Effect Editor window. Instead of being limited to Linear interpolation, you can set whether a keyframe uses ***Shelf, Linear, Spline*** or ***Bézier*** interpolation.



When you use advanced keyframes, separate keyframe tracks appear in the Effect Editor. You can manipulate the keyframes in a parameter group or open a separate keyframe graph for each individual parameter.

The advanced keyframe model can be manipulated in a variety of ways:

- To open a keyframe graph, click the **disclosure triangle** for that parameter.
- To create a new keyframe, Right-click the keyframe graph for a parameter or parameter group and choose ***Add Keyframe*** from the menu that appears. You can also click the **Add Keyframe button** at the bottom of the Effect Editor window.
- To delete a keyframe, Right-click the keyframe graph and choose ***Delete Keyframe*** from the menu that appears. You can also select the keyframe then press the **Delete key**.

For details on Avid's advanced keyframe model, consult your Avid documentation.

Applying Boris Continuum Complete AVX Filters

Once Boris Continuum Complete AVX is installed, the effects automatically appear in the Effects Palette. The Boris Continuum Complete AVX filters are arranged alphabetically, by category in the Effects Palette.

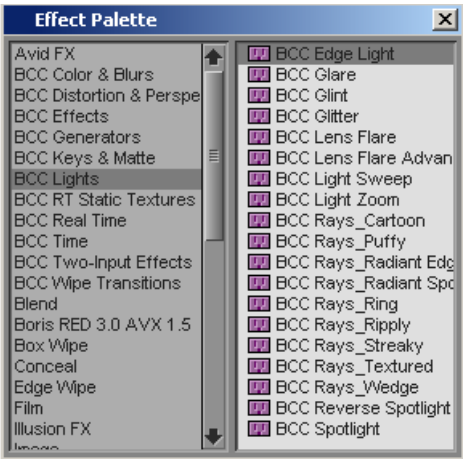
Some effects can be applied as either a transition or a filter. If an effect can be applied as a transition, it appears in the BCC Two-Input Effects category. For example, to apply a Blur as a filter, choose BCC Blur from the BCC Color & Blurs category. However, to apply a Blur as a transition, you would choose BCC TR Blur from the BCC Two-Input Effects category. For more information on transitions, see "Applying BCC Effects as Transitions" on page 12.

Some effects can also playback in realtime. See "Applying BCC AVX Real-Time Effects to Titles" on page 19 for details.

You can also apply BCC effects to titles created in the Avid Title tool. For more information, see "Applying BCC Effects to Titles and Mattes" on page 15.

1. Choose ***Effect Palette*** from the **Tools menu**.
2. Click to select the appropriate Boris Continuum Complete effect category on the left.
3. Choose the appropriate effect on the right.
4. Drag the icon for the desired effect onto a clip or transition.
5. Enter Effects mode and adjust the effect parameters. See "Working in Boris Continuum Complete" on page 20 for more information.

   Continuum Complete effects render exactly the same as Avid effects. For more information, consult your Avid documentation.



Applying BCC Effects as Transitions

BCC provides two methods to use effects as transitions. The first method is to apply a BCC Two-Input effect to the transition between two clips. The second method is to overlap two clips and apply a BCC filter effect to each layer. Each method offers advantages.

To use the first method, simply drag a BCC Two-Input effect onto the transition between two clips. When you do this, the BCC Two-Input effect applies the same static default values as the filter versions. Since many effects do not auto animate, you must keyframe parameter values to transition from the unfiltered outgoing shot to the unfiltered incoming shot. Once you animate transitions, you can save the effect template to a bin and use the saved effect as a default. For more information, see "Saving Effect Templates in a Bin" on page 40.

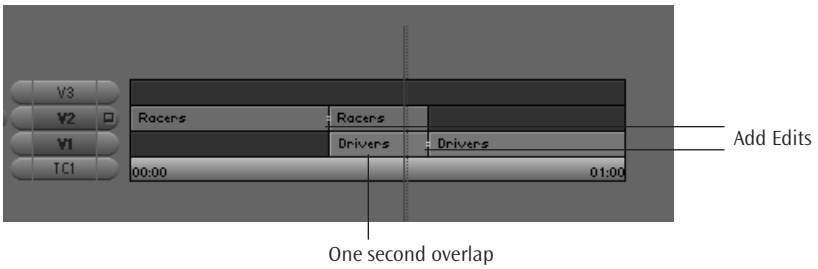
When you use BCC Two-Input effects, parameters only apply to the outgoing clip. However, you can animate the Layer Opacity to reveal the incoming shot. For example, filters that include a foreground and background like Page Turn can be animated so that the Page peels away to reveal the incoming shot. For effects that do not include a foreground and background, for example a Ripple, you can animate the effect from no ripple to a rippled image on the outgoing shot. Animating the Effect Layer Opacity will then fade out the rippling clip to reveal the incoming shot. When you work with BCC Two-Input effects, any Layer menus let you choose ***Incoming*** or ***Outgoing***.

The BCC Two-Input effects offer the convenience of an Avid transition. For example trimming and duration changes are easily made and you only have to render a single effect. However, to create a wider range of transition effects, you can use the second method: overlap two clips and apply a filter to each layer. This method provides greater control over effect parameters. The following steps outline this method.

1. Place the outgoing shot on V2 and the incoming shot on V1. Overlap the clips for the duration that you want your transition.

The outgoing shot must be on a track higher in the timeline than the incoming shot to properly reveal the incoming shot.

2. Create Add Edits around the section that you want to transition. In the following example, a one second section will be used as a transition between the Racers and Drivers clips.



3. Apply the appropriate BCC effect to the top track and enter Effects Mode. In this example, a BCC Ripple will be added to the Racers clip.
4. For effects that include a **Background menu**, choose ***1st Below***.
5. Move the position indicator to the midpoint between the two clips, in this example 15 frames into the effect. Create a keyframe at this point.

   In this example, you want the Racers clip to start unrippled, then gradually ripple as it dissolves out. In most instances, you will want the clip to start unfiltered at the Add Edit and then gradually animate into the filter.
6. Select the first keyframe and set the effect parameters so that there is no effect. This prevents the effect from jumping in at the Add Edit. In this example, the Ripple **Height, Perpendicular Height** and **Wave Width** parameters were all set to ***0***.
7. Select the last keyframe and set the **Effect Layer Opacity** parameter in the General Controls parameter group to ***0***. The effect now animates from fully opaque at the middle keyframe to fully transparent at the last keyframe.
8. Drag the Effect icon from the Effect Editor to the V1 track. This copies the effect on V2 to the V1 track. When you finish, your timeline should look like the following example.

9. Select the middle keyframe and set the **Effect Layer Opacity** parameter in the General Controls parameter group to ***50***.
10. Select the last keyframe and set the **Effect Layer Opacity** parameter in the General Controls parameter group to ***100***.
11. Set the effect parameters at the last keyframe so that no effect is visible. This prevents the effect from jumping at the Add Edit.

    In this example, the Ripple **Height, Perpendicular Height** and **Wave Width** parameters were all set to ***0***.
12. Render the two effects just as you would any Avid effects.

    The following examples illustrate the difference between applying an effect as a transition and transitioning between two filters.

Time 00:00:00:00

Time 00:00:00:10

Time 00:00:00:20

Time 00:00:01:00

In the following examples, the ripple was applied to a transition instead of as a filter on two clips. Notice that only the outgoing Racers clip ripples, but the incoming Drivers clip simply dissolves in.

Time 00:00:00:00

Time 00:00:00:10

Time 00:00:00:20

Time 00:00:01:00

Applying BCC Effects to Titles and Mattes

To apply a BCC effect to a title or matte, drag the effect onto the title. If you Option-drag to the effect, the effect is applied to the title as well as to any tracks beneath the title in the timeline. For example, to apply a blur to a title, drag the BCC Blur effect onto the title. To apply a blur to a title and the background video, Option-drag the BCC Blur effect to the title.

Applying a BCC filter to an Avid title is a destructive process that replaces the Avid title in the timeline. To edit the title as text (for example to change text characters or font), you need to reopen the original title saved in a bin. However, you can reposition the title, using the Geometrics parameter group. For details, see "Working with the Geometrics Parameter Group" on page 24.

When applying a BCC filter to an Avid title or matte key, the **Background menu** in the General Controls parameter group defaults to ***1st Below*** which results in the title effect keying over the track that was the original background in the timeline. However, ***2nd Below*** (not 1st Below) in an alternate Layer menu is actually the video background. For example, to displace a title using the video background as a Displacement Map, you set the **Map Layer menu** to ***2nd Below*** (rather than 1st Below). The effect references the nested Graphic fill as the 1st Below layer.

Not all BCC effects apply to titles. If you try to apply a BCC effect to a title and it does not apply, an "Effect does not apply" error message displays.

Some presets do not create the intended effect when applied to a title. Presets whose name includes the prefix "***title-***" were designed to apply to titles and will have the Apply to Title-Matte checkbox already selected.

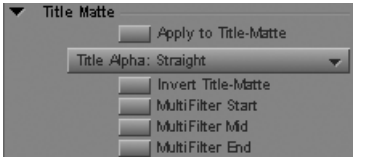
1. Drag the appropriate effect onto a title and select the **Apply to Title-Matte checkbox** in the Title Matte parameter group. When the Apply to Title-Matte checkbox is selected, it turns pink.
2. Set the **Title Alpha menu** to the appropriate option. This menu determines how the image's alpha information is used.
   - Choose ***Straight*** if you are applying a filter to a title created in the Avid Title tool.
   - Choose ***Premultiplied Black*** or ***Premultiplied White*** for images whose alpha channels are premultiplied with a solid black or white color respectively. This choice is appropriate for imported images. When you choose ***Premultiplied Black*** or ***Premultiplied White,*** you must select ***601/709, non-square*** in the Image Settings window.
3. If you are working with an imported image, you may need to select the **Invert Title Matte checkbox** to invert any matte created by your effect.

Applying BCC effects to a title or matte key is a destructive process; removing a BCC effect also removes the title's nested alpha channel. To remove a BCC effect and preserve the title, use the Undo command instead of the **Remove Effect button**.

Applying Multiple Filters to Avid Titles and Mattes

BCC AVX allows you to apply two or more effects to an Avid title or matte without affecting the background. For example, you could apply a BCC Emboss to a title then blur it. The MultiFilter controls can also be used to combine multiple keying filters, such as chroma keys. For details, see "Using the MultiFilter Controls to Combine Keying Filters" on page 17.

Applying Multiple Filters to Titles and Mattes



1. To apply an effect to a title created in Avid's Title tool or an imported matte, drag the effect onto the title (do not Option or Alt-drag).
2. Select the **Apply to Title-Matte checkbox** in the Title Matte parameter group.
3. Set the **Title Alpha menu** to the appropriate option. This menu determines how the image's alpha information is used. See "Working with the Title Matte Parameter Group" on page 23 for details.
4. Adjust the filter parameters.
5. Select the **MultiFilter Start checkbox** in the Title Matte parameter group before you apply more than one filter to the Avid title or matte. This checkbox must be enabled in the first filter before you add additional filters to the effect.

Once you enable the **MultiFilter Start checkbox**, the composited background no longer displays with the effect. You should enable this checkbox as the last step when you finish adjusting the first filter.

6. To apply an additional filter, Option (Macintosh) or Alt (Windows) drag the filter to the Avid timeline. You do not need to select the **Apply to Title-Matte checkbox** for the additional filters; only the first filter needs this checkbox selected.
7. If you select the **MultiFilter Mid checkbox**, the image no longer displays composited over the background. For this reason, while you adjust parameters for middle filter(s), select the **MultiFilter End checkbox**.
8. When you finish adjusting the middle filter's parameters, select the **MultiFilter Mid checkbox** before adding the next filter.

When you work with multiple filters, you can expand the effect at any time by double-clicking the effect icon in the timeline with the Effect Editor open. This allows you to adjust the first filter while viewing the output of all filters. To close the filter, double-click the effect again. If you want to adjust a filter while only viewing the output of that filter, use the **Step In** and **Step Out buttons**.

9. Repeat Steps Six, Seven and Eight for any additional filters.
10. Select **MultiFilter End** for the last filter in a MultiFilter effect.

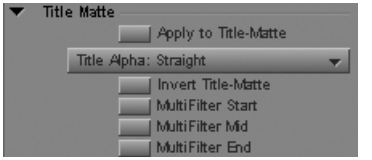
Using the MultiFilter Controls to Combine Keying Filters

The Title Matte parameter group's MultiFilter controls can be used to combine multiple keying effects, such as chroma keys, without applying them to the entire image. In this case, the output of the first keying filter is used as the input to the second keying filter. For example, you might want to apply the BCC Chroma Key then choke the output of the key using the BCC Matte Choker filter.

BCC AVX includes several filters to create precise keys. Combining multiple keying filters can solve some complex (but common) keying issues. For example, you might want to combine a BCC Chroma Key, BCC Matte Choker, and BCC Light Wrap, to quickly create an accurate key. This is true even with difficult-to-key DV footage.

For a tutorial on applying multiple keying filters, see the ***Tutorials.pdf*** on your installation cd.

Applying Multiple Keying Filters



1. Drag the first keying effect onto your clip and adjust the filter parameters.
2. Select the **MultiFilter Start checkbox** in the Title Matte parameter group before you apply the next filter. This checkbox must be enabled in the first filter before you add additional filters to the effect.

Once you enable the **MultiFilter Start checkbox**, the composited background no longer displays with the effect. You should enable this checkbox as the last step when you finish adjusting the first filter.

3. To apply an additional filter, Option (Macintosh) or Alt (Windows) drag the filter to the Avid timeline.
4. If you select the **MultiFilter Mid checkbox**, the image no longer displays composited over the background. For this reason, while you adjust parameters for middle filter(s), select the **MultiFilter End checkbox**.
5. When you finish adjusting the middle filter's parameters, select the **MultiFilter Mid checkbox** before adding the next filter.

When you work with multiple filters, you can expand the effect at any time by double-clicking the effect icon in the timeline with the Effect Editor open. This allows you to adjust the first filter while viewing the output of all filters. To close the filter, double-click the effect again. If you want to adjust a filter while only viewing the output of that filter, use the **Step In** and **Step Out buttons**.

6. Repeat Steps Three, Four and Five for any additional filters.
7. Select **MultiFilter End** for the last filter in a MultiFilter effect.

Working with the BCC AVX Real-time Filters

The filters in the BCC AVX RT category play back in real-time on certain Avid systems. This category is a subset of the existing filters. BCC AVX RT includes the following filters:

BCC Real-time Filters

3D Image Shatter	Composite	Make Alpha Key	Rectangular Wipe
Alpha Spotlight	Criss-Cross Wipe	Mosaic	Reverse Spotlight
Artist's Poster	Fast Flipper	Multi-Stretch Wipe	Safe Colors
Boost Blend	Gaussian Blur	Multi-Stripe Wipe	Spotlight
Brightness-Contrast	Invert-Solarize	MultiTone	Textured Wipe
Color Balance	Levels-Gamma	PixelChooser	Tritone
Color Correction	Light Sweep	Posterize	Two Way Key
Colorize	Linear Luma Key	RGB Blend	Unsharp Mask
	Linear Wipe	Radial Wipe	Wire Remover

Important Notes on the BCC Real-time Effects

The real-time effect playback is largely determined by the speed of the system hardware. Supported systems include Xpress DV, Xpress Pro and systems with Mojo or Adrenaline hardware. For system requirements, see the Release Notes PDF on your Boris CD.

When you work with the real-time filters, the Render menu only applies if you choose to render the effect. It does not affect previews and playback. For details, see "Working with the General Controls Parameter Group" on page 22.

Although some real-time filters may include the Motion Tracker parameter groups, you should not use the real-time version of a filter to motion track. Use the non-real-time version. For details, see "Working with the Motion Tracker Parameter Groups" on page 29.

To achieve real-time playback of BCC AVX RT plug-ins without dropped frames, make sure that your system meets the following requirements.

- Set your Avid to real-time Playback mode (green dot in the Timeline, not blue dot).
- Open your project's Video Display settings and set Real-time Effect Quality to High Performance (more simultaneous effects). This increases the system's ability to process effects at the expense of reducing image quality.
- Use the Expert Render command on parts of the sequence where the system has difficulties during playback.The system marks these sections of the sequence in the Timeline. For more information, see your Avid documentation.
- If possible, start playback earlier in the sequence, before the effects that cause difficulties. This allows the system to process some of the effect frames before displaying them, decreasing the chance of playback difficulties.

- If you still experience dropped frames, open your project's Video Display settings and set a Video Pre-Fill amount of a few seconds. This preloads the specified amount of video and can help if the system has trouble maintaining real-time playback.
- Some BCC AVX RT effects can play in real time with Real-time Effect Quality set to High Quality in the Video Display Settings. Experiment with the Real-time Effect Quality and Pre-Filled Frames to find the setting that best suit your project.
- Some aspects of BCC AVX RT effects appear a bit different during real-time preview than in non-real-time preview and render to disk. This is particularly true of effects using geometric distortions (Scale, Tumble, Spin, Rotate) and effects that blur and choke edges. While finetuning these parameters, toggle to non-real-time mode to check the quality of the final render. To do this, click the green dot in the Timeline and step to another frame or change a parameter to force the Composer window to update. In non-real-time mode you can also check the output on an external (NTSC or PAL) monitor.

Applying BCC AVX Real-Time Effects to Titles

BCC AVX Real-Time filters are not fast enough to apply to Avid titles and still playback in real time. Therefore the RT version of BCC AVX filters do not include a Title Matte parameter group. Use the non-RT version of the BCC AVX filter to apply it to a title or matte.

Working with the RT Static Textures Category

BCC includes a **RT Static Textures category**. This category contains filters that you may want to use as a static background. When you apply these filters, they do not animate, but they will play in real time. BCC includes the following static textures.

Brick	Emboss	Noise Map	Veined Marble
Bump Map	Fractal Noise	Reptilian	Weave
Cloth	Granite	Rock	Wood Grain
Clouds	Mixed Colors	Steel Plate	Wooden Planks

You can also apply these filters to use clips in the timeline as textures. For example, apply BCC Emboss RT to a clip to create a static backdrop. The first frame of the clip is used as the static texture; the clip no longer plays back. If you apply a RT Static Textures filter to a clip, make sure you are on the first frame of the clip when you adjust the parameters.

Animating Continuum Effects

You animate Continuum parameters exactly the same as native Avid effects parameters. You can use the Advanced Keyframing model in the Avid Effect Editor window. For more information, consult your Avid documentation.

Rendering Boris Continuum Complete Effects

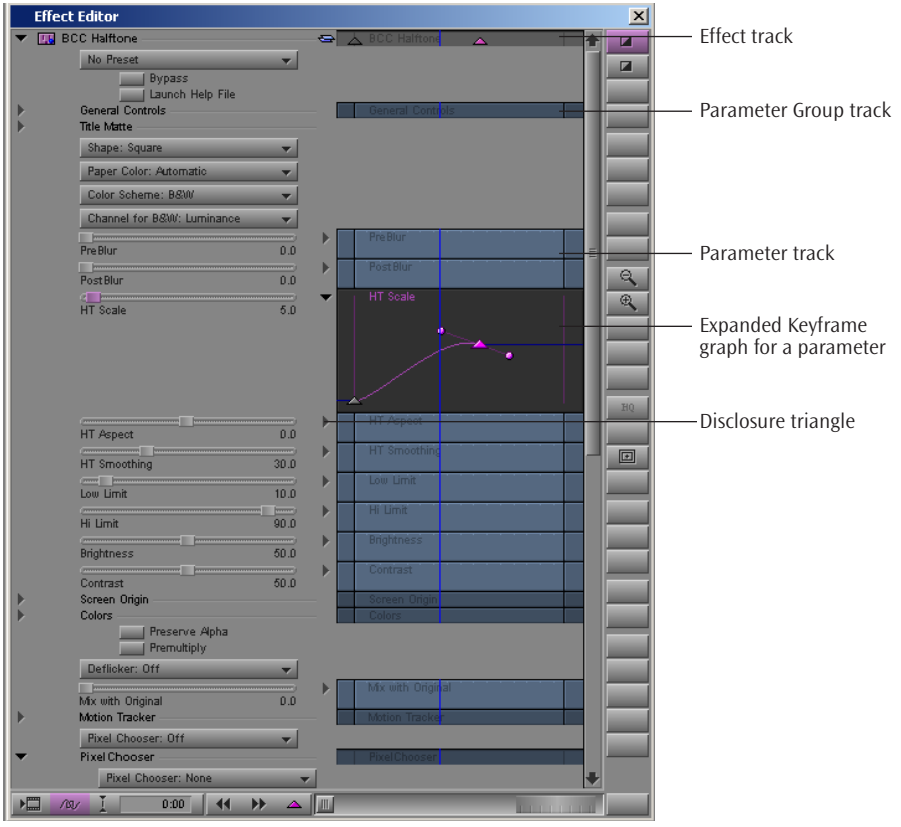
Boris effects render exactly the same as native Avid effects. Render effects individually or render in to out. In addition, if you redigitize material, you simply rerender any effects; all parameters are preserved. For more information, consult your Avid documentation.

Working in Boris Continuum Complete

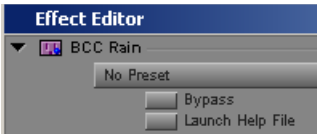
This section provides information on using the Avid user interface with Boris Continuum Complete.

The AVX 2.0 architecture allows plug-ins to take advantage of Avid's advanced keyframe model. The advanced keyframe model lets you set keyframes for individual parameters in the Effect Editor window. Instead of being limited to Linear interpolation, you can now set a keyframe's interpolation to ***Shelf, Linear, Spline*** or ***Bézier***.

For details on Avid's advanced keyframe model, see your Avid documentation.



Bypassing Effects



At times, you may want to view your unfiltered clip. The **Bypass checkbox** lets you view the source clip without the applied effect. When the Bypass checkbox is selected, it turns pink. When you apply a BCC effect to an Avid title or matte, enabling the **Bypass checkbox** does not display the original title unfiltered, but rather displays the nested Graphic Fill of the matte key.

Bypass is a parameter change. Selecting the Bypass checkbox will unrender a rendered effect. To bypass a rendered effect without unrendering, step into the effect in the Avid timeline to see the unaffected video.

Viewing Onscreen Help Information

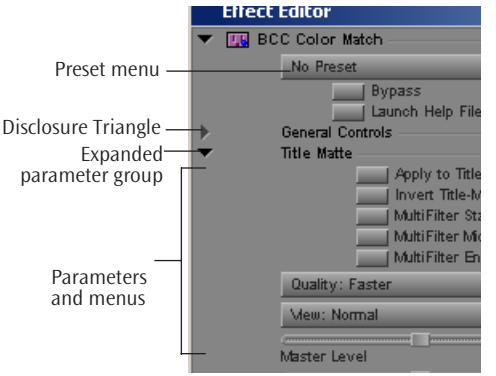
Boris Continuum Complete includes onscreen Help for each filter. Help is available by clicking the **Launch Help File checkbox** at the top of the Effect Editor window. When you click this button, PDF documentation for the current filter opens.

Each Help file also includes links to separate Help files on the General Controls, Title Matte, Geometrics, Drop Shadow, Motion Tracker and PixelChooser parameter groups.

Working with Parameter Groups

Each Continuum Complete filter has parameter controls which are categorized into groups. Groups of parameters appear under a text header next to a disclosure triangle. All filters contain a Bypass checkbox. Most filters include a General Controls and a Title Matte parameter group. Many filters also include a Geometrics and a Drop Shadow parameter group, which appear at the bottom of the filter controls. These parameters are explained in the following sections.

The example at right includes two parameter groups—General Controls and Title Matte. The Title Matte group is expanded, revealing the parameters.



Clicking the disclosure triangle to the left of a text header expands the parameter group, revealing its contents. Click the triangle a second time to close the group.

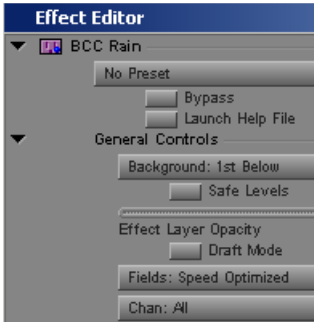
Option (Macintosh) or Alt (Windows) clicking a triangle opens all parameter groups. Option- or Alt-clicking again, closes all parameter groups.

Working with the Preset Menu

Each filter's **Preset menu** allows you to save filter settings independently of the media or project. This allows you to save favorite filter settings and apply them to multiple projects. Presets are static. All parameter values in the first keyframe are applied. Each effect also includes a default preset that you can use to reset the effect to the default values. You can return to the factory default settings or to a custom default that you create yourself.

For details on presets, see "Working with Presets" on page 38. For details on saving effects to a bin, see "Saving Effect Templates in a Bin" on page 40.

Working with the General Controls Parameter Group



Most filters contain a General Controls parameter group. This parameter group includes a **Background menu**, **Safe Levels checkbox, Draft Mode checkbox**, **Effect Layer Opacity**, an **OpenGL Prefs checkbox**, a **Fields menu,** and a **Channels menu**. Not all filters include all parameters. The parameters are described below.

Many filters include a **Background Menu** which lets you use information from other tracks to control some aspect of the filter. The Background menu includes choices corresponding to each track in the effect, including the track to which it is applied (***Filter Layer***) and a ***None*** setting. When None is chosen, the menu has no affect on the filter.

For example, you apply a Boost Blend filter to the V3 track in your timeline. To composite the V3 clip with the clip on V2, you would choose ***1st Below***. To composite V3 with the clip on V1, choose ***2nd Below***. Choosing ***Filter Layer*** composites the V3 clip with itself.

Selecting the **Safe Levels checkbox** enables an NTSC/PAL color-safe filter that allows only levels that are safe for broadcast. BCC allows RGB values across the full 0-255 range. When this checkbox is selected, the RGB values are limited to the NTSC/PAL safe range of 16-235.

The **Draft Mode checkbox** lets you work in a Draft Mode to speed previews. This is especially useful for effects with multiple track inputs. Deselect this option before rendering.

Effect Layer Opacity sets the opacity of the filter layer, which allows you to fade effects. When the **Apply to Title-Matte checkbox** in the Title Matte parameter group is selected, Effect Layer Opacity affects the graphic fill layer, which allows you to fade titles.

The **Fields menu** sets the rendering optimization. Not all filters include this option.

- For most filters, you can use the default of ***Speed Optimized***. Some filters default to Quality Optimized; in this case you should not use Speed Optimized.
- For effects that include edging or DVE moves, you may want to use ***Quality Optimized***. Quality Optimized takes more time to render, but will generally correct any problems with jitter or rough edges on effects.
- ***Motion Detect*** is a still better quality field rendering that motion detects the image before processing to better distinguish artifacts from noise.
- ***Progressive Input*** is useful when you work with progressive media at the project frame rate. This option applies the Quality Optimized algorithm to a frame based source such as a still image, video shot by a camera that does 30p or 15p, or video shot at 1/30 second or slower shutter speeds. When working with this type of material, you can choose to save rendering time by choosing Speed Optimized.

The **Channels menu** determines which image channels display in the Avid Record monitor. You can display ***All*** channels, or the individual ***Red, Green, Blue*** or ***Alpha*** channels.

The **OpenGL Prefs checkbox** opens a dialog box where you can run the OpenGL hardware test and manually enable the OpenGL acceleration, if appropriate. Boris Continuum Complete includes several filters, including BCC Glare, BCC Glint, BCC Glitter and BCC Lens Flare, and BCC Lens Flare Advanced, that require OpenGL hardware. For more information, see "Working with OpenGL" on page 37.

Working with the Title Matte Parameter Group

Most filters contain a Title Matte parameter group that allow you to apply filters to Avid titles or mattes without affecting the background.

The **Apply to Title-Matte checkbox** allows you to apply BCC filters to titles created in Avid's Title tool or mattes without affecting the background. To apply an effect to a title or matte, drag the effect onto the title or matte (you do not have to Option-drag) and select the **Apply to Title-Matte checkbox**.

For more information on applying BCC effects to Avid titles or matte keys, see "Applying BCC Effects to Titles and Mattes" on page 15.

The **Invert Title-Matte checkbox** allows you to invert any matte created by your effect. This is useful when you work with imported images.

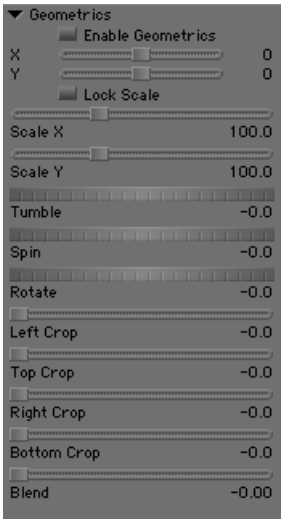
BCC AVX allows you to apply two or more effects to an Avid title or matte without affecting the background. For example, you could apply a BCC Emboss to a title and then blur it. The Title Matte Parameter group includes three checkboxes, **MultiFilter Start, MultiFilter Mid** and **MultiFilter End**. that enable this function. For details, see "Applying Multiple Filters to Avid Titles and Mattes" on page 16.

The **Title Alpha menu** determines how the image's alpha information is used.

- Choose ***Straight*** if you are applying a filter to a title created in the Avid Title tool. Straight displays the area defined by the alpha channel. The area where the alpha channel is black (a value of 0) is transparent. The area where the alpha channel is white (a value of 255) is opaque. Portions of the image with alpha channel levels between white and black (gray) are displayed with intermediate levels of transparency.
- Choose ***Premultiplied Black*** or ***Premultiplied White*** for images whose alpha channels are premultiplied with a solid black or white color respectively. This choice is appropriate for imported images.

When you set the **Title Alpha menu** to ***Premultiplied Black*** or ***Premultiplied White,*** you must import the image with the Image Settings window set to ***601/709, non-square***. You can access this window by clicking the **Options button** in the Import dialog box.

Working with the Geometrics Parameter Group



Most filters include a Geometrics parameter group that allows you to add basic DVE moves to any filter. For example, apply a BCC Blur filter to a clip and then use the Geometrics parameters to spin the blurred clip. This parameter group appears near the bottom of the Effect Editor window.

Parameters in the Geometrics parameter group are not saved when you save effects as presets.To save Geometric parameters with your presets, save the effect to a bin.

For details on presets, see "Working with the Preset Menu" on page 22. For details on saving to a bin, see "Saving Effect Templates in a Bin" on page 40.

The Geometrics parameter group includes the following controls.

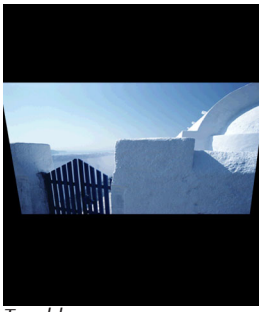
Selecting the **Reset Geometrics checkbox** allows you to reset all the Geometrics parameters to the default values.

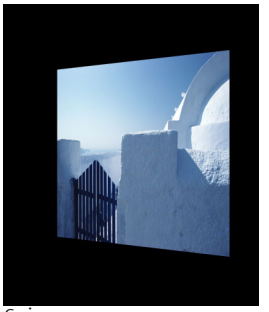
Selecting the **Enable Geometrics checkbox** allows you to use the parameters to reposition a track. When this checkbox is deselected, the other parameters have no affect.

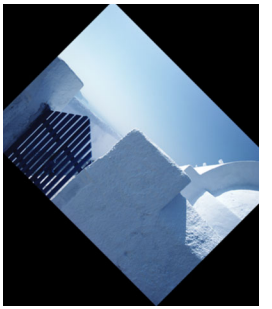
Position X and **Position Y** adjust the horizontal and vertical location of the track.

Scale X and **Scale Y** set the size of the image along the X and Y axis, respectively. These parameters scale as percentages of the image's original width and height. Thus, a Scale X value of 200 produces an image twice as wide as the original. Select the **Lock Scale checkbox** to keep the Scale X and Y values in proportion.

Tumble, **Spin**, and **Rotate** change the image's perspective along the X, Y, and Z axes respectively. Tumble, Spin, and Rotate can animate over values greater than 360° in order to make the shape complete more than one full revolution.


Tumble


Spin

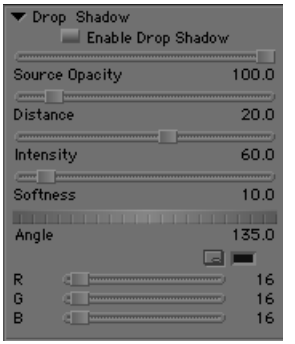

Rotate

The Crop controls crop the edges of the image. **Left Crop**, **Top Crop**, **Right Crop**, and **Bottom Crop** determine the width, in pixels, of the cropped area on each edge of the image.

The Crop controls refer to the sides of the original image before it is transformed. For example, if you tumble an image 180° so that it appears upside-down, cropping the Top affects the top of the original image, which is actually the bottom of the tumbled image.

The **Blend** control soften the edges of the image by reducing their opacity. The **Blend** parameter determines the width, in pixels, of the transparent band on each edge of the image. These values are unaffected by the Crop values, allowing you to soften the edges of an uncropped image.

Working with the Drop Shadow Parameter Group



Most filters include a Drop Shadow parameter group that allows you to add an animatable drop shadow to an effect. BCC AVX also includes a standalone Drop Shadow filter. For more information, see "Working with the BCC Drop Shadow Filter" on page 237. This parameter group appears near the bottom of the Effect Editor window.

Drop Shadow parameters are not saved when you save effects as presets. To save Drop Shadow parameters with your presets, save the effect to a bin.

For more information on presets, see "Working with the Preset Menu" on page 22. For details on saving effects to a bin, see "Saving Effect Templates in a Bin" on page 40.

The Drop Shadow parameter group includes the following controls.

Selecting the **Reset Drop Shadow checkbox** allows you to reset all the Drop Shadow parameters to the default values.

The **Enable Drop Shadow checkbox** turns the shadow on and off. If this checkbox is not selected, the other parameters have no affect.

Source Opacity sets the opacity of the source. You can use this parameter to fade in a title or other source, without fading in the shadow.

Distance sets the distance (in pixels) between the shadow and the image.

Intensity sets the opacity of the drop shadow, and is scaled as a percentage. At a value of 100, the shadow is completely opaque. Lower Intensity values allow the background image to be seen through the shadow. At a value of 0, the shadow is completely invisible.

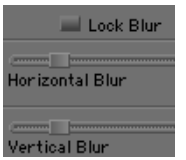
Softness controls the softness of the edges of the shadows. A setting of 0 produces a sharply defined shadow with hard edges. Increasing Softness produces shadows with softer edges.

Angle sets the direction of the drop shadow. A setting of 0° places the shadow to the right of the image; a setting of 90° places it directly below the image.

Shadow Color sets the color of the shadow. For information on working with color controls, see "Working with Color Controls" on page 27.

Working with Locks

Some parameters' values can be locked together to keep their values equal when one parameter is adjusted. For example, Scale X and Scale Y controls are locked by default to preserve the image's aspect ratio. A lock option appears before each set of parameters that can be locked together.



When the **Lock checkbox** is selected, adjusting any locked parameter also adjusts all additional locked parameters. For example, selecting the **Lock Blur checkbox**, locks ***Horizontal Blur*** and ***Vertical Blur*** together. When Lock Blur is selected and you adjust either Blur, the other Blur also adjusts. When Lock Blur is deselected, you can adjust each parameter independently.

Working with Angle Parameter Controls

Angle Parameter controls are used to manipulate an effect's angle or direction by dragging a treadmill representation to alter the angle or direction value. Values can be positive or negative and are not limited to a single 360 degree rotation. Shift-clicking allows you to move in increments of 1.

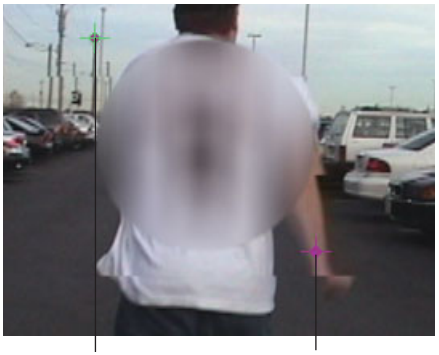
Working with Point Controls

Point controls specify locations along the X and Y axis in the source image. If the effect is selected in Effect mode, the Effect Preview monitor includes a position point icon for each point control parameter. An active Point Control is pink; an inactive control is green.

You can use several different methods to enter point control values:

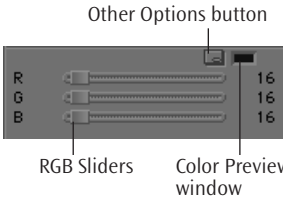
- Drag the cross-hair in the Effect Preview monitor. The selected cross-hair is pink. As you drag, the slider updates.
- Drag the slider corresponding to the point control that you want to adjust. As you drag the slider, the cross-hair updates.

The **Outline/Path button** must be selected in the Effect Editor or onscreen controls do not appear in the Effect Preview monitor.



Working with Color Controls

Color controls set a color for a parameter, such as a light source or border. You can use one of three methods to adjust color parameters. Click the **Other Options button** to access the system color picker. You can also position the cursor over the Color Preview window then use the eyedropper to choose a color from the screen. You can also use the R, G, B sliders to set the value in the corresponding color channel.



Understanding Contextual Controls

The AVX architecture does not support contextual controls, so parameters that do not apply are not dimmed in the Effect Editor window. This means that a parameter that appears in the Effect Editor may not apply unless other parameters are met. For example, **Reverse Range** in the PixelChooser Region parameter group does not have any affect unless specific shapes are chosen in the PixelChooser Shape menu. Whenever possible, parameters that are inactive unless certain conditions are met have been noted in the documentation.

Resetting Effects

To reset all parameters in an effect to the default values, simply reapply the effect from the Effect Palette. The Preset menu also lets you return to the default settings or to a custom default that you create yourself. See “Working with Presets” on page 38 for details.

Understanding the PixelChooser

Many filters in Boris Continuum Complete include PixelChooser parameter groups. The PixelChooser provides several methods to selectively filter an image. You can use the PixelChooser to create a matte between filtered and unfiltered pixels, either by specifying a geometric region or by using the image's luma or color information. For example, use the PixelChooser to apply a filter to only the brightest or darkest areas of an image, depending on the luma values you set. You can also select another image to use as a Matte Layer, and use that image's color or luma information to selectively filter the source image.

The PixelChooser also provides region controls to specify which region in the source image is filtered. You can apply a filter to any rectangular or oval-shaped region and animate the size of the region to create wipes between the source and filtered images. The PixelChooser is described in detail in "The PixelChooser" on page 603.

In this example, the PixelChooser selects pixels based on the image's Red channel. Therefore, the Noise filter is applied only to pixels whose Red value is highest.

In this example, the PixelChooser's region controls are used to specify a rectangular area in which to apply the Noise filter.

In this example, both the matte controls and region controls are used to select pixels. When the PixelChooser is selecting pixels based on both their channel values and their location on the screen, pixels are chosen only if they are fully meet both of the selection criteria.

Working with the Motion Tracker Parameter Groups

Two Motion Tracker parameter groups allow you to track the motion of an object in a media file. You can then use the motion path data to control another aspect of the effect. The parameters that can be affected depend upon the filter. For example, apply a Pyramid Blur filter and use the Motion Tracker parameters to track a logo on a t-shirt. Use the PixelChooser parameters to apply the Pyramid Blur to obscure the logo.

The Motion Tracker is included in many filters that include the PixelChooser parameter group. This allows you to apply the filter to an area using a shape choice in the PC Region parameter group's Shape menu.

Although some real-time filters may include the Motion Tracker parameter groups, you should not use the real-time version of a filter to motion track. Use the non-real-time version. For details, see "Working with the BCC AVX Real-time Filters" on page 18.

In general, Avid's **Video Quality menu** should be set to ***Full Quality*** when you use the Motion Tracker. However, if you work with large imagery, such as HD, you can probably track accurately with a lower image quality.

Working with the Motion Tracker Preprocess Parameter Group

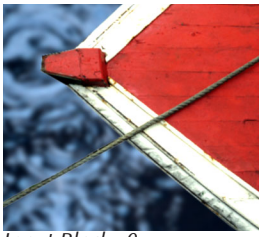
A good target region contains a high-contrast object with good vertical and horizontal edge definition. Ideally, you should find a pattern that is visible in every frame. If your image does not contain a high-contrast object to track, you can adjust the Preprocess parameters to make your source image easier to track. For example, you could increase the contrast for better results.

The **View Preprocessed Source checkbox** lets you view the preprocessed source image as you adjust it. When you select this checkbox, the chosen effect does not display in the Effect Preview window. Once you finish adjusting the Preprocess parameters, deselect this checkbox to view the applied effect.

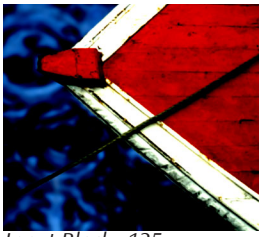
You should deselect the **View Preprocessed Source checkbox** before you select the **Track On-the-Fly checkbox** and begin tracking.

The Input Black, Input White, Gamma and Blur-Sharpen parameters adjust contrast and eliminate noise. Video shot at night or in poorly lit settings often contains noise in the dark areas which can interfere with accurate tracking. Increasing Input Black removes this noise by treating all areas darker than the Input Black setting as black. Washed out or overexposed images do not contain the full range of levels. Increasing Input Black and/or decreasing Input White can also boost the contrast of the image.

Input Black sets the channel values of the input image that are treated as pure black by the filter. For example, if Input Black is set to 50, all pixels with a value of 50 or less are output to a value of 0. The remaining values (50-255) are remapped to produce a smooth gradient from black to white.


Input Black=0


Input Black=75


Input Black=125

Input White sets the channel values of the input image that are treated as pure white by the filter. For example, if Input White is set to 200, all pixels with a value of 200 or more are output to a value of 255. The remaining values (0-200) are remapped to produce a smooth gradient from black to white.


Input White=255


Input White=175


Input White=125

Gamma controls the slope of the curve used to convert from the input color values to output values in pixels brighter than Input Black and darker than Input White. Increasing Gamma from the default of 100 lightens the image and decreases contrast, while decreasing Gamma darkens the image and increases contrast.


Gamma=50


Gamma=100


Gamma=150

Blur-Sharpen blurs or sharpens your image. Decreasing negative values blur the image, which is useful to smooth noise that might interfere with tracking; increasing positive values sharpen the image, which can enhance objects that might be too blurry to track.

Working with the Motion Tracker Parameter Group

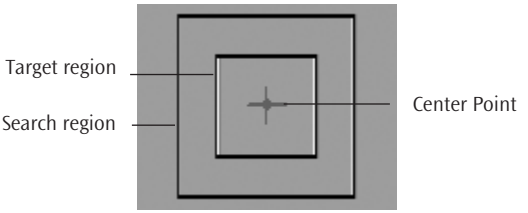
The Motion Tracker parameter group includes the following controls.

Selecting the **Reset Tracker checkbox** resets all Motion Tracker parameters.

The **Tracking Source Layer menu** sets the layer to track, which may be different from the source of the filter.

When the **Track On-the-Fly checkbox** is selected and you press **Play**, the filter calculates the tracking data. When you select this checkbox, the chosen effect does not display in the Effect Preview window. Instead the Search/Target outline appears. Once you finish tracking, deselect this checkbox to play the applied effect.

The **Tracker Center KF** position controls set up the area to track. However, in general it is easier to drag the onscreen Center Point control. Then use the X and Y position controls for finetuning. You need to select the **Track On-the-Fly checkbox** to display these controls in the Effect Preview window.



It's a good idea to create a keyframe for the Tracker Center KF parameter at the first frame in your effect. This is useful in case you need to adjust the tracker later in your effect.

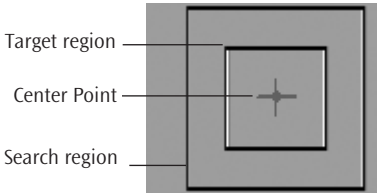
The **Input Channel menu** determines which channel in the filtered track is used to calculate the tracking data. Choose ***Luminance***, ***Saturation***, ***Red***, ***Green***, or ***Blue***. Experiment to see which channel produces the best result. Saturation is useful if the lighting in the effect changes over time.

The Motion Tracker estimates motion to an accuracy of a fraction of a pixel. The **Sub-Pixel Accuracy menu** allows you to select the accuracy you need from up to ***1/256*** of a pixel. Smaller fractions provide higher accuracy but may take longer to estimate.

The **Start Tracking Frame** and **End Tracking Frame** parameters allow you to limit the tracking range to portion of a clip. This is useful if the object moves offscreen. Start Tracking Frame sets the first frame of the effect for which tracking occurs; End Tracking Frame sets the last frame of the effect for which tracking occurs. If you limit the range of your tracking effect, the range is indicated by black marks at the bottom of the Effect Preview window.

To track the entire filtered clip, simply leave Start Tracking Frame and End Tracking Frame at their default values.You can also limit tracking to a portion of a clip by creating Add Edits and applying the filter between the Add Edits.

Target Width sets the size of the area to track. Increasing this value increases preview time but can increase the accuracy of the tracking. To view the target area, select the **Track On-the-Fly checkbox.** The inner rectangular outline indicates the target area that will be tracked.



Search Width sets the size of the search area. The search area should be large enough to accommodate the movement of the target in the subsequent frame. Increasing this value increases preview time but can increase the tracking accuracy. To view the area, select the **Track On-the-Fly checkbox.** The outside rectangular outline indicates the search area.

The **Apply menu** determines the parameter that the Motion Tracker data affects. The choices depend on the filter.

- When ***None*** is chosen, the Motion Tracker data has no affect.
- In the Lens Flare, Lens Flare Advanced, Light Zoom and the Rays Light suite filters, choosing ***Light Source*** tracks the source of the light.
- In the Twirl, Spiral Blur, and Radial Blur, choosing ***Center*** tracks the center point.
- Choosing ***PixelChooser*** allows you to use a choice in the PixelChooser Region's Shape menu to track the filter within the specified area. You must explicitly set the **Shape menu** to one of the following choices: ***Inside Rectangle, Outside Rectangle, Inside Oval, Outside Oval, Distance to Point, Clock Wipe, Linear Gradient,*** or ***Custom***. The Motion Tracker does not work with ***Distance to Edge***. The point specified by the top X and Y Position Point controls is tracked.
- In the Motion Key, choosing ***Area Offset*** tracks the area to remove.
- In the Rays_Radiant Spotlight, choosing ***Spotlight Target*** tracks the spotlight target.
- In the Wire Remover filter, choosing ***End Point 1*** or ***End Point 2*** tracks the corresponding end point. Alternatively, you can choose ***PixelChooser***.

Offset X and **Offset Y** allow you to offset the effect on the X and Y axis. This is useful if you want to track one area, then apply the effect to a different area. For example, you want to blur an athlete's name on a t-shirt but don't want to blur the player's number. However, the player's number offers more contrast and is therefore easier to track. You would track the number, then offset the effect to obscure the name.

The **Extrapolate Motion menu** determines what happens when the tracking range is limited by **Start Tracking Frame** or **End Tracking Frame**. If the parameters are at the default values (so the entire clip is tracked), this menu has no affect.

- When ***Off*** is chosen, the effect holds when it is outside the tracker range. For example, you might track a light then have it hold a stationary position when it reaches the end of the tracking range.
- When ***Start*** is chosen, before the effect reaches the beginning of the tracking range, it will move at the same speed that it moves at the beginning of the tracking range.

- When ***End*** is chosen, once the effect reaches the end of the tracking range it continues moving at the same speed.
- When ***Start and End*** is chosen, the effect continues moving at the same speed both before and after the tracking range.

Tracker Time Offset lets you create an effect that is offset in time from the object that it is tracking. Positive values cause the effect to lead the tracked object and negative values cause it to trail the tracked object. The Extrapolation Motion menu is taken into account when the corrected time goes outside the tracking range.

The **Use Offset Only checkbox** allows you to treat the generated tracker data as a motion path and animate the effect along the path by animating **Tracker Time Offset**.

Tracker Auto-Man lets you animate between the tracker data value and manual user keyframing The most obvious use is to manually correct tracking errors. At a value of 100, the generated tracking data is used. At a value of 0, the tracking data is ignored and any user input values are used.

Overview of Using the Motion Tracker

The steps below provide an overview of the tracking process. The sections that follow provide detailed information on each step.

1. Apply the appropriate filter directly to a clip in the timeline containing the moving area that you want to track and move the position indicator to the first frame of the clip.
2. If necessary, select the **View Preprocessed Source checkbox** and adjust the Motion Tracker Preprocess parameters to make your image easier to track. For details, see page 29. Deselect the **View Preprocessed Source checkbox** when you finish.
3. Create a keyframe at the first frame and set up the area the track by positioning the **Tracker Center KF** parameter. It is easiest to drag the onscreen center point control, then use the X and Y position controls for finetuning. You need to select the **Track On-the-Fly checkbox** to display these controls.

Place the Tracker Center KF on the center of the object to track

4. Generate the tracker data using the parameters in the Motion Tracker parameter group. With the **Track On-the-Fly checkbox** still selected, press **Play.**

   The filter calculates the tracking data.
5. If necessary, correct any tracking errors. See page 35 for details.
6. Once you finish tracking, deselect the **Track On-the-Fly checkbox** to view the effect.
7. Set the **Apply menu** to determine which parameter the Motion Tracker affects. For example, with the Lens Flare filter, you would set this to ***Light Source***.

Understanding the Onscreen Tracking Marks

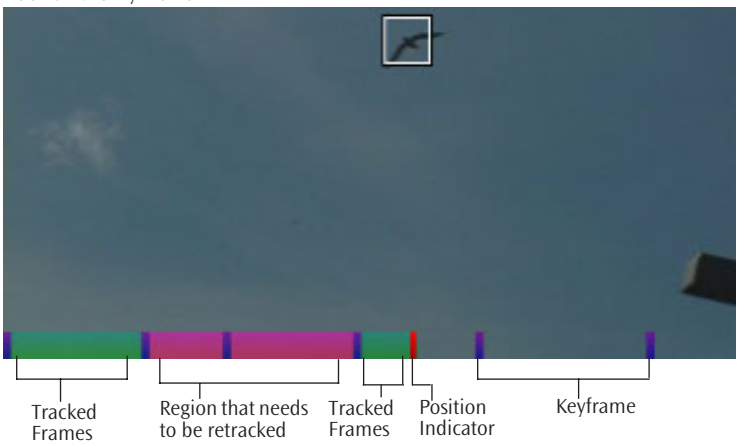
When Track on the Fly is enabled, a line along the bottom of the Effect Preview window indicating the location of tracked frames. The line references the length of the original source clip. It is important to note that this line is actually rendered onto the image when you are in Track on the Fly mode. Make sure to turn off Track on the Fly before you render your effect.

- A Red mark indicates the current location of the Position Indicator.
- Blue marks indicate keyframe locations. A keyframe location is any frame whose position differs from that of the previous frame. A frame where the center position differs from the previous frame is also considered a keyframe.

The blue onscreen marks are internal to the Motion Tracker. While the Motion Tracker considers these frames to be "keyframes," these are different than the keyframes that are visible in your Avid timeline or Keyframe graph.

- Green marks indicate the frames that have been tracked and are current (i.e. the location of the tracker center has not changed since the tracking data was generated).
- Magenta marks indicate frames that were tracked, but for which the tracker point has changed. This usually indicates a region that needs retracking (unless you are manually positioning the Tracker Center KF without making keyframes).
- Black marks indicate the start and end of the tracking region. If you are tracking the entire clip, black marks will not appear.

Track On the Fly marks



Understanding Error Messages when Tracking on the Fly

The most common error message you will see during tracking is a "Please Move the Position Indicator..." error message.

Several things you can do while tracking that cause this error message to appear.

- If you move the Position Indicator forward in the effect past the end of the tracked region.
- If you play, but don't play every frame.
- If you partly track an effect, disable Track on the Fly, and move the Position Indicator past the tracked region before re-enabling Track on the Fly.
- This message will sometimes appear when you press the space bar to stop playback. When this happens, the tracker render for the current frame is interrupted. Move the Position Indicator back one frame to continue.

Correcting Motion Tracker Errors

It is sometimes necessary to "help the tracker" when it loses the object by keyframing the **Tracker Center KF** control. The motion tracker treats any frame as keyframed if the Tracker Center position at that frame is different from the track center at the previous frame. Keyframes appear in blue along the bottom of the preview when Track On The Fly is on.

The onscreen marks are internal to the Motion Tracker. While the Motion Tracker considers the frames represented by the blue marks to be "keyframes," these are different than the keyframes that are visible in your timeline or Effect Editor.

Adjusting Tracking During the Effect

It may be necessary to adjust the tracking during an effect, as the tracking can become inaccurate when the tracked object changes orientation or is obscured by another object. The best way to deal with this is by keyframing the **Track Center KF** control. Note that the onscreen Tracker Center KF crosshair control does not follow the tracked object, but you can reset it to the location of the tracked object at any point in the effect.

Adjusting Tracking with Shelf Keyframes

At a frame where the effect loses tracking, put a new Shelf keyframe at the location of the object and continue tracking. If the object goes behind another object for several frames, you can put a Shelf keyframe at each frame where the object is obscured.

Adjusting Tracking with Linear or Bézier Keyframes

Create a keyframe one frame before the tracker loses tracking and another keyframe at the point where the tracker loses tracking. ***It is essential that the two keyframes be exactly one frame apart.*** Otherwise, the tracker assumes keyframes are between them, and interpolates between the keyframe where the object was at the start of the effect, and the second keyframe, where the object is when tracking was lost. This causes the render to jump between these keyframes. To make a second adjustment you need two more keyframes.

For example, you set a tracker point at the beginning of your effect, make an adjustment at frame 30 and another at frame 60. With Hold keyframes you can put the first keyframe anywhere between the beginning and frame 29, the second keyframe at frame 30 and the third at frame 60. With Linear keyframes, you need to put the first keyframe at frame 29, and the second at frame 30. You need another keyframe with same value as the one at frame 30 at frame 59, and then the final keyframe at frame 60.

The onscreen marks are internal to the Motion Tracker. While the Motion Tracker considers the frames represented by the blue marks to be "keyframes," these are different than the keyframes that are visible in your timeline.

Adjusting Tracking without Keyframes

You can also adjust tracking without using keyframes. However you should be careful working this way because if you make a mistake your effect could jump.

Move the Position Indicator to the point where you lost tracking, adjust the **Tracker Center KF**, and continue tracking, You will notice that the tracked frame markers turn from green to magenta when you do this. This indicates that the Tracker Center KF is different from the current value.

This method works unless you go back to an earlier frame with the **Track On The Fly checkbox** selected. If you go back, the tracker retracks that frame using the new (incorrect for that frame) value of **Tracker Center KF**, and the final render will jump. Since you haven't saved the Tracker Center KF value for the start of the effect, you will have to re-enter it and retrack.

If you use this method, we recommend that you close the Motion Tracker group as soon as you finish tracking, so you don't inadvertently change the tracker data.

Adjusting Tracking Manually

In extreme cases (or certain creative effects), you may need to adjust the tracker manually using the **Tracker Auto-Man** parameter. This parameter lets you animate between the tracker data value and manual user keyframing. The most obvious use is to manually correct tracking errors. At a value of 100, the generated tracking data is used. At a value of 0, the tracking data is ignored and any user input values are used.

Move the Position Indicator to the point where you lost tracking, create a keyframe and set the **Tracker Auto-Man** parameter to ***0***. Then adjust the **Tracker Center KF** using the onscreen controls. You will notice that the tracked frame markers turn from green to magenta when you do this. This indicates that the Tracker Center KF is different from the current value.

Working with OpenGL

Boris Continuum Complete's OpenGL hardware acceleration speeds previews for certain filters in the Lights category. OpenGL is a cross-platform standard that dramatically improves interactivity and rendering. "GL" stands for graphics library."Open" refers to the ongoing, industry-wide contributions to its evolution. OpenGL has been common in graphics workstations since 1992, and is built into both the Windows and Macintosh operating systems as well as a wide variety of display cards.

The technology behind OpenGL grew out of the desire to display high-quality 3D images as quickly as possible. Specific instructions for drawing geometry, textures, lighting, and special effects are coded into the chips powering many graphics applications. More details about OpenGL are available from www.opengl.org.

Currently Boris Continuum Complete includes several filters that are OpenGL-dependent. These include the BCC 3D Extruded Image Shatter, BCC Glare, BCC Glint, BCC Glitter, BCC Lens Flare and BCC Lens Flare Advanced filters. OpenGL is required to use these filters. See the Understanding OpenGL PDF on your Boris CD for any additions to this list.

OpenGL Acceleration Requirements

The first time you apply any of the Open GL filters, Boris Continuum Complete performs a fast, automatic test to look for the specific OpenGL capabilities. If your configuration passes this internal test, the filter opens with OpenGL enabled. If your configuration does not pass, an error message displays in the Composer window and OpenGL is disabled. However, depending on the error message, you may elect to enable OpenGL manually. See the next section for information on working with unsupported systems.

For the most recent list of supported hardware, please see the Understanding OpenGL PDF on your Boris CD or visit www.Borisfx.com.

Working with Unsupported Configurations

If your system does not pass the OpenGL test, the Composer window displays an error message. Clicking the **OpenGL Prefs checkbox** in the General Controls parameter group displays a dialog box. Click **Yes** to view the results of the internal OpenGL test. This is the recommended method for examining your system's configuration.

A window displays information about your system, including the graphics card, OpenGL version, driver, texture memory and OS version. Two types of error messages can display in this window. The first type of message indicates an unsupported configuration. In this case, you can try manually enabling OpenGL by selecting the **Enable OpenGL Filters checkbox** in the OpenGL dialog box. In many instances, unsupported hardware can correctly render the OpenGL filters. If you enable this option and your system displays distorted frames, you will not be able to use the OpenGL filters. The second type of error is a critical error. In this case, you cannot manually enable OpenGL and you will not be able to use the OpenGL filters. When you finish with the OpenGL dialog box, click **OK** to dismiss the window.

Working with Presets

After you apply a Boris filter and adjust the filter parameters, you can save the parameter settings by pressing the **Preset menu** and choosing ***Save***. A dialog box allows you to name and save the file. Presets are only compatible with the filter in which they were created. For example, if you attempt to load a Cartooner preset into a Blur filter, the preset is ignored. However, you can also save PixelChooser parameters as presets. PixelChooser presets allow you to move parameters between different filters. For information on PixelChooser presets, see "Working with PixelChooser Presets" on page 605.

Note for Macintosh users only: The presets folder contains a file with the extension ".rsrc." This file is dimmed when you Load or Save presets using the Presets folder and should not be removed.

Each filter has its own settings files folder created when you install BCC AVX. It is strongly recommended that you save the files in the default location. Otherwise, the filter may not be able to locate them when you try to load a settings file.

You can also save parameter settings in a bin as an Effect template, just as you save other Avid effects. Saving Effect templates in a bin lets you save animated settings. See "Saving Effect Templates in a Bin" on page 40 for more information.

Resetting Effects

The Preset menu allows you to save filter settings independently of the media or project. Each effect also includes a default preset that you can use to reset the effect to the default values. You can return to the default settings or to a custom default that you create yourself.

To reset a filter, press the **Preset menu** and choose the appropriate command from the menu.

- To return to the BCC default settings, choose ***Reset to Factory Defaults***.
- To return to your custom default settings, choose ***Reset to Custom Default Preset***. See the next section for details on creating custom default settings.

Creating Custom Default Settings

In addition to resetting a filter to the Boris Continuum Complete default settings, you can create your own custom default for each filter.

1. Create the appropriate filter.
2. Press the **Preset menu** and choose ***Save***.
3. A dialog box opens that allows you to save the file. Name the effect ***default*** and click **Save** or press Return (Macintosh) or Enter (Windows).

Loading Preset Effects

Each BCC AVX filter includes a collection of presets. To load a previously saved filter settings file, you must first apply the same filter to your media. A list of existing presets also appears in the menu.

Presets are static. All parameter values in the first keyframe are applied globally including, parameters in the General Controls, Geometrics and Drop Shadow parameter groups. Motion Tracking parameters are not saved with the preset. To save effects with parameters set at multiple keyframes, see "Saving Effect Templates in a Bin" on page 40.

1. Apply the appropriate filter to your media.
2. Press the **Preset menu** and choose ***Load***.

3. A dialog box lets you choose the file to load. Choose the appropriate effect and click **Save** or press Return (Macintosh) or Enter (Windows). The saved parameter settings are applied to your clip.

Working with the Provided Presets

Boris Continuum Complete AVX includes a selection of preset effects for each filter. These presets are an excellent way to learn the capabilities of a filter. Follow the instructions in "Loading Preset Effects" to apply these presets.

On Windows, the presets are installed in the following directory:
C:\Program Files\Boris FX, Inc\BCC Presets 4 AVX\Filter Name folder

Note: Inside the BCC Presets folder, each filter has its own folder. Place the preset inside the folder of the appropriate filter.

Saving Effects as Presets

You can save favorite filter settings as presets and apply them to multiple projects. Presets are static; all parameter values in the first keyframe are applied. To save effects with parameters set at multiple keyframes, see "Saving Effect Templates in a Bin" on page 40.

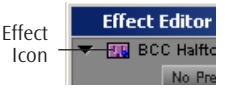
Saving a preset is a parameter change. This means that choosing Save from the Preset menu will unrender a rendered effect. To prevent unrendering, you should save your presets before unrendering.

1. Create the appropriate filter.
2. Press the **Preset menu** and choose ***Save***.
3. A dialog box opens that allows you to save the file. Name the effect and click **Save** or press Return (Macintosh) or Enter (Windows).

Saving Effect Templates in a Bin

You can save parameter settings in a bin as an Effect template, just as you save other Avid effects. Effect templates allow you to use effect parameters again to create or modify other effects. While parameter settings saved in the Preset menu are static, effect templates save parameters set at multiple keyframes.

To save an Effect template, drag the **Effect icon** from the Effect Editor window to a bin. An Effect template is saved in the bin. To rename the template, click the template name and type a new name.



The Effect Palette allows you to view and access effect templates that are stored in open bins. The names of open bins containing effect templates appear in a list below the effect categories. To view the effect templates in the bin, click the bin name. The list appears in the right side of the Effect Palette. When you open or close a bin or add an effect to a bin, the list automatically updates.

Applying Effect Templates from a Bin

To apply all the values from the template, drag the Effect template from the bin to either the Timeline or the Effect Preview monitor in the Effect Editor window.

Saving BCC Effects as Custom Transitions

You can also save custom transitions to the **Avid Quick Transition menu** for easy access. The following steps outline how to make custom BCC AVX transitions appear in the Quick Transitions dialog box.

This feature is not included in your Avid documentation.

1. Create a bin called ***Quick Transitions***. The naming, capitalization and spacing must match exactly for the custom transitions to appear in the Quick Transition dialog box.

   The Quick Transitions bin can be used in any project and can be updated at any time. Within a new project, choose **File > Open Bin**. Navigate to the location of your Quick Transitions bin and choose **Open**. The Quick Transitions bin will appear in a folder within the Project window labeled ***Other Bins***.

2. Create a BCC transition. Custom keyframes and animated parameters can be applied.

3. Drag the **Effect icon** from the Effect Editor to the ***Quick Transitions*** bin to save the custom parameters.

4. Rename the custom transition for easy recognition and save the bin by choosing **File > Save all Bins**.

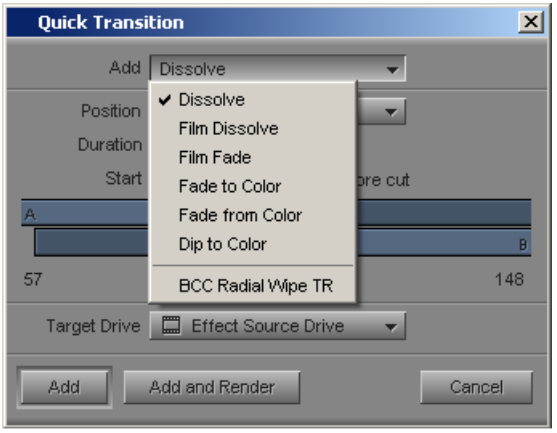
Applying Custom BCC Transitions

The Quick Transitions bin does not need to be open to access the Custom Transitions.

1. Move the Position Indicator to the transition where you want to apply a custom BCC transition. You can also apply custom transitions to all transitions in a selected area by marking In and Out in the timeline.
2. Click the **Quick Transition button**.

   The Quick Transition dialog box appears.



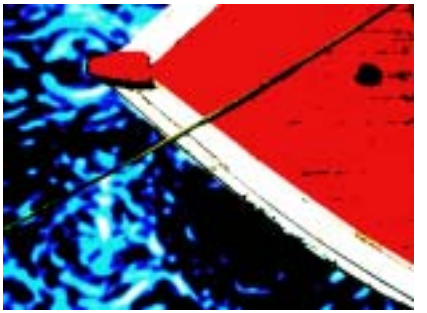
3. Press the **Add menu** at the top of the screen to view the custom transitions that were saved to the Quick Transitions bin. In the above example, the ***BCC Radial Wipe TR*** has been added to the Quick Transitions bin.
4. Choose the appropriate transition from the **Add menu.**
5. Choose the appropriate position from the **Position menu.** The choices are S***tarting on Cut, Ending on Cut, Centered on Cut*** or ***Custom***.
6. Set the **Duration** for the transition and click **Add** or **Add and Render**.

Chapter 2
Color & Blurs Filters

Working with the BCC Artist's Poster Filter

Artist's Poster creates a posterized effect by reducing the image to eight "pure" colors (Red, Green, Blue, Cyan, Magenta, Yellow, Black, and White) and processing each color separately. At its default settings, the filter outputs the NTSC-safe color that is closest to each of these eight colors.

Source image



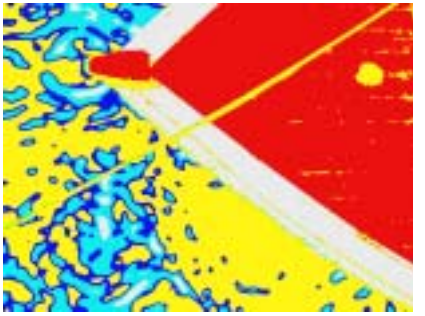
Filtered image

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

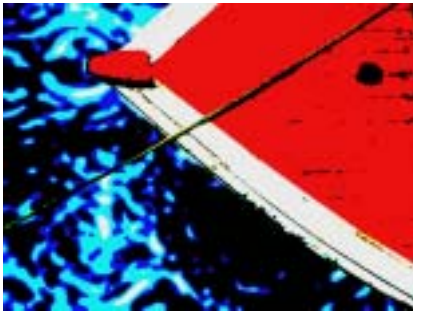
The **Mix Layer menu** chooses any layer to blend with the source layer (the clip to which the Artist's Poster filter is applied.)

The **Black Mode menu** determines how the black pixels in the source image are output.

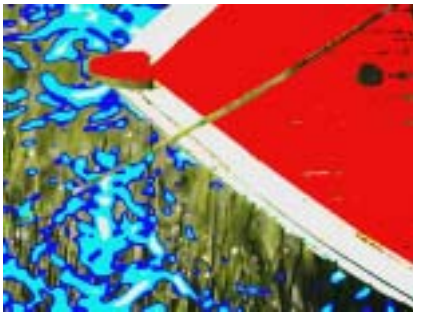
- ***Color*** replaces the black pixels in the source image with the specified **Black Color**. In this example, the Black Color is yellow, thus all black pixels from the posterized output are replaced with yellow pixels.



- ***Transparent*** makes the black pixels in the source transparent.



- ***Mix Layer*** replaces the black pixels in the source with the corresponding pixels from the layer selected in the **Mix Layer menu**. In this example, the Mix Layer is a movie file, thus the black pixels from the posterized output are replaced by the movie file.

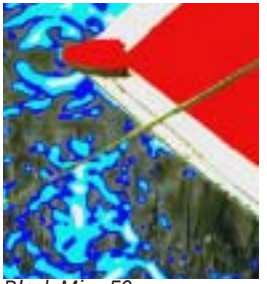


Black Color Parameter Group

Black Color sets the color that replaces the original black pixels in the source image when Black Mode is set to Color. When the Black Mode menu is not set to Color, this parameter has no affect.

Black Mix mixes the original black pixels with the new black pixels. If Black Mix is 100, the black pixels output in their original colors. If Black Mix is 0, the black pixels output according to the Black Mode setting. In the examples below, Black Mode is set to Mix Layer.

Black Mix=0



Black Mix=50

Black Mix=100

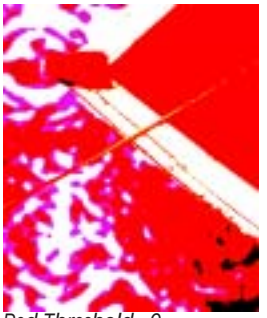
The other colors' Mode, Color and Mix controls work in the same way. The other colors include Red, Green, Blue, Magenta, Yellow, Cyan and White.

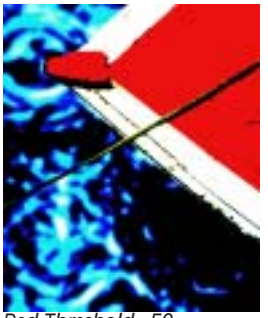
Threshold Parameter Group

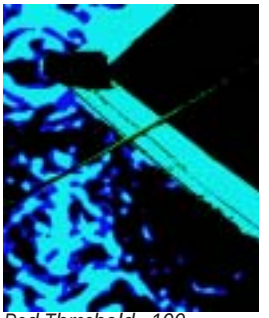
The Threshold parameter group adjust the division of pixels into color channels.

Red Threshold, **Green Threshold**, and **Blue Threshold** affect how the filter divides the image into the eight colors. The default setting for each of these controls is 50%. Pixels whose red, green and blue channels are less than 50% become black pixels. Pixels whose red channel is more than 50% and whose green and blue channels are less than 50% become red pixels. Pixels whose red and green channels are more than 50% become yellow pixels, and so on.

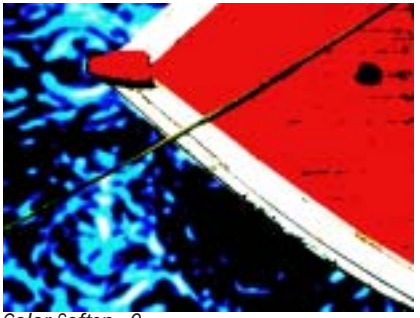
Adjusting the Thresholds changes this division into colors. Reducing Red Threshold makes some black pixels red, some blue pixels magenta, and so on. If you reduce Red Threshold to 0, only pixels whose red channel value is 0 can be black, green, blue, or cyan.


Red Threshold=0


Red Threshold=50


Red Threshold=100

Color Soften softens color transitions on a pixel-by-pixel basis. Artist's Poster works by creating a "color map" which transforms the pixels in the source image into output pixels. Color Soften softens this color map. This does not reduce the sharpness of details in the original image; rather it reduces harsh color contrasts, making even extreme posterizations more natural-looking.

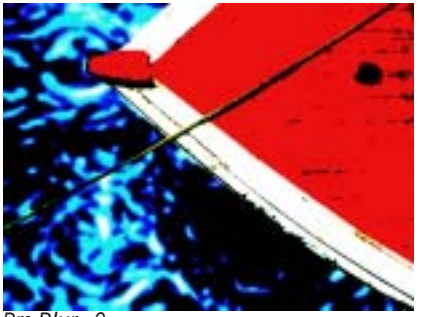

Color Soften=0


Color Soften=60

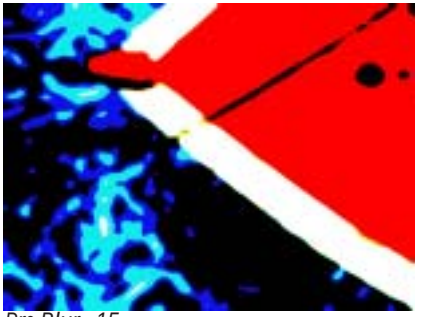
Blurs Parameter Group

The Blurs parameter group provides three options to blur the image.

Pre Blur blurs the source image before the posterization is applied. This softens the edges of the posterized image without increasing the number of output colors.

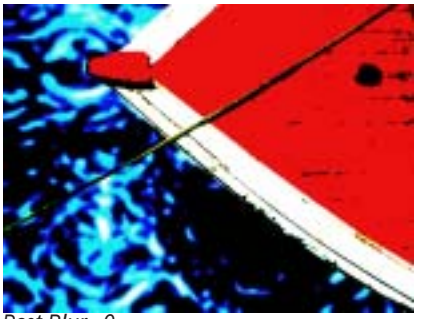


Pre Blur=0

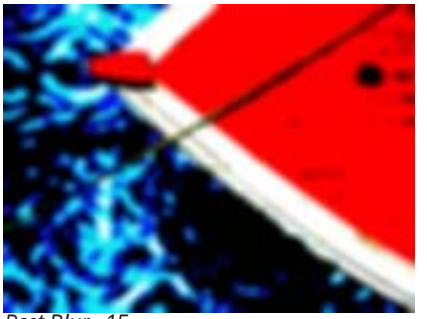


Pre Blur=15

Post Blur blurs the posterized image, creating softer edges where the colors blend. This means that the number of output colors is increased again after the posterization is applied.



Post Blur=0



Post Blur=15

Blur Transparency blurs the alpha channel. This parameter can be useful if you created an alpha channel by setting one or more of the Color Modes to Transparent.

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 PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Boost Blend Filter

Boost Blend is a compositing filter that blends two independent layers and adjusts contrast in the blended pixels. Unlike most transfer modes, Boost Blend adjusts the mix only where the source and blend layers are different. Boost Blend is especially useful when you composite an image over itself and do not want the transfer mode to affect areas where the blended pixels are identical to the source pixels. The PixelChooser provides additional control over the selection of pixels to adjust.

The BCC Boost Blend filter can also be used as a transition. To create a transition, use the BCC Boost Blend TR in the BCC Two-Input Effects or apply the filter to two layers. For details, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, and “Working with the Geometrics Parameter Group” on page 24.

The **Blend menu** chooses a clip in the timeline to blend with the source layer (the layer to which Boost Blend is applied). The illustrations below show the source layer and the blend layer used in the examples in this section. The Boost Blend filter was applied to a clip on V2. The Blend layer appears on V1.

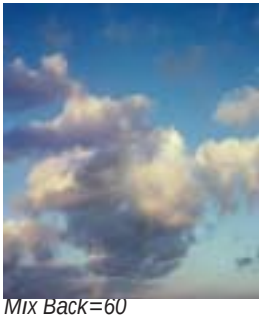
Source layer (V2)

Blend layer (V1)

Mix Back controls the opacity of the source and blend layers in the composite image. Increasing the Mix Back value increases the opacity of the blend layer. At a Mix Back value of 100, the blend layer is completely opaque and the source layer is completely transparent. Decreasing the Mix Back value decreases the opacity of the blend layer. At a value of –100, the blend layer is completely transparent and the source layer is completely opaque. Mix Back is not affected by the PixelChooser.


Mix Back= –60


Mix Back=0


Mix Back=60

The **Mode menu** controls how the layers blend together. Each option uses a slightly different algorithm to adjust the contrast in the output; some algorithms use **Bias Exponent Offset** and **Bias Exponent Weight** to adjust the output. The differences can be subtle or quite pronounced, depending on your footage and these settings. Try each Mode setting to see which works best.

- ***Exponential*** blends the layers by subtracting an offset value from each pixel's color channels, exponentiating the value, adding the results, and then adding back the offset. When you use this mode, **Bias/Exponent Offset** controls the exponent that is used in the calculations, and **Bias/Exponent Min. Weight** sets the offset value that is subtracted. Adjusting Bias / Exponent Offset and Bias / Exponent Weight using the Exponential mode can produce extreme posterization effects, as shown in the example at right.

- ***Equal Power Pos.*** is an algorithm modeled on the audio concept of an equal power crossfade. This algorithm emphasizes the light pixels in the blend, which can be useful when blending dark images. Bias / Exponent Offset and Bias / Exponent Weight have no affect when Equal Power Pos. is chosen.

- ***Equal Power Neg.*** is similar to Equal Power Pos., but it uses the difference between the pixels' channel values and 255 in computing the output contrast. This algorithm emphasizes the dark pixels in the blend, which can be useful when blending lighter images. Bias / Exponent Offset and Bias / Exponent Weight have no affect when Equal Power Neg. is chosen.

- ***Bias*** increases the contrast of pixels whose color channel values are furthest from the Bias / Exponent Weight value. The output is left unchanged if Bias Exponent Offset is 0.

- ***Off*** blends the two images equally by making them both 50% opaque, and does not affect the contrast of the blended output. This mode is useful for comparing the results of the other algorithms to an effect in which the contrast is unchanged.

Boost Mix mixes the chosen Mode with the ***Off*** Mode. When Boost Mix is 100, the chosen Mode is used. Setting Boost Mix to 0 produces an equal blend of the source and blend layers with no contrast adjustments. Intermediate values produce varying degrees of contrast adjustment in the blended output.

The PixelChooser controls are described in detail in "The PixelChooser" on page 603.

Working with the BCC Brightness-Contrast Filter

Brightness-Contrast adjusts the brightness and contrast in your image. This filter also has a PixelChooser, so you can select which pixels to adjust.

For information on common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24, “Working with the Drop Shadow Parameter Group” on page 25 and “The PixelChooser” on page 603.

Brightness adjusts the brightness of the image. Increasing the Brightness setting pushes colors toward white, and decreasing the setting pushes colors toward black.

Brightness=–40

Brightness=0

Brightness=40

Contrast adjusts the contrast of the image. Increasing the Contrast setting pushes colors toward pure colors, and decreasing the setting pushes colors toward 50% gray.

Contrast=–60

Contrast=0

Contrast=60

The **Channels menu** sets which channels to adjust. The choices are ***RGB***, ***Red***, ***Green***, ***Blue***, ***Red and Green***, ***Red and Blue***, ***Green and Blue***, ***Difference***, and ***Alpha***. Difference uses the difference between each filtered channel and the corresponding source channel.

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

Working with the BCC Color Balance Filter

Color Balance performs a true photographic RGB color correction, allowing you to make independent adjustments to the red, green, and blue channels of the image.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Type menu** sets the method used to make the RGB balance adjustments.

- ***Photo Positive*** simulates a color correction effect on a device that produces a positive image, such as a video camera. Brighter pixels are affected more than darker ones, and pixels for which the channel is completely off (0) are not affected at all. Use Photo Positive to correct colors in the lighter sections of the image.
- ***Photo Negative*** simulates a color correction effect on a device that produces a negative image, such as an enlarger. Darker pixels are affected more than brighter ones, and pixels for which the channel is completely on (255) are not affected at all. Use Photo Negative to correct colors in the darker sections of the image.
- ***Linear*** mode adds the corrections equally to all pixels in the image.

This example shows the original image before any color adjustments are applied.

Red Balance, Green Balance, and **Blue Balance** adjust the relative intensity of each corresponding RGB channel.

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 affect of the filter by mixing it with the source image.

Increasing the Blue and Green values in this image using the Linear mode adds cyan uniformly throughout the image, giving the shadows a cyan cast.

The Photo Positive mode corrects the image selectively using luminance information, which allows you to adjust the light areas of the image without affecting the dark areas.

In this example, the Red value of the image is decreased using the Linear mode, which gives the light areas a cyan cast.

Using the Photo Negative mode adjusts the color selectively, allowing you to correct the dark areas without affecting the light areas.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Color Correction Filter

Use Color Correction to improve the color of video images, or to create dramatic color effects.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Brightness adjusts the brightness of the image. Increasing the Brightness setting pushes colors toward white, and decreasing the setting pushes colors toward black.

Contrast adjusts the contrast of the image. Increasing the Contrast setting pushes colors toward pure colors, and decreasing the setting pushes colors toward 50% gray.

Hue cycles the colors in the image around the color wheel in the HSL color space. Most color corrections require very small changes in the Hue setting; adjustments of 10° or less usually suffice. Adjustments larger than 10° usually produce very dramatic color changes.

Hue Fine Control allows you to finetune the Hue parameter in increments of 1.


Hue= –20


Hue=0


Hue=20

Saturation adjusts the intensity of each color’s hue in the image. Negative values remove color from the image, and positive values add color to the image.


Saturation= –20


Saturation=0


Saturation=20

Output Black adjusts the luminance level of black pixels. Increasing Output Black from its default value of 0 makes black pixels brighter and pushes the RGB color space toward white.

Output White adjusts the luminance level of white pixels. Decreasing Output White from its default value of 255 makes white pixels darker and pushes the RGB color space toward black.

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 PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Color Match Filter

BCC Color Match simplifies the process of matching the color or luma values of two clips in the timeline. For instance, if two clips with different lighting conditions are spliced together, the color and luma values will differ between the clips. Match Color automates the process of removing or balancing the difference between the two clips by setting color or luma values for the quarter, mid and three-quarter areas of the image.

Original image

Filtered image (and matched target clip)

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24, and “Working with the Drop Shadow Parameter Group” on page 25.

Ideally, you want to view both the Source and Target clips so that you can sample colors. Because Avid only lets you sample colors from the Effect Preview window, the easiest method is to edit the filtered track on V2 above the track that you want to match on V1. Then use the Crop controls in the Geometric parameter group to crop the filtered track as shown in the example above. When you finish sampling colors, deselect the **Enable Geometrics checkbox** to view the uncropped image. For details, see “Working with the Geometrics Parameter Group” on page 24.

The **Quality menu** sets the quality of the effect. The choices are ***Faster*** or ***Smoother***. Smoother uses an algorithm which produces a better result but takes twice as long to render.

The **View menu** is a preview control that determines what type of output is displayed.

- ***Normal*** displays the filtered source image. Choose this option before rendering.
- ***Highlight*** displays the source image’s highlights as a black and white mask. White areas indicate pixels that are highlights. Black areas indicate pixels that are not in the highlight zone; gray areas indicate pixels that are partially in the highlight zone.
- ***Midtone*** displays the source image’s midtones as a black and white mask. White areas indicate midtones. Black areas indicate pixels that are not in the midtone zone; gray areas indicate pixels that are partially in the midtone zone.

- ***Shadow*** displays the source image's shadows as a black and white mask. White areas indicate pixels that are shadows. Black areas indicate pixels that are not in the shadow zone; gray areas indicate pixels that are partially in the shadow zone.
- ***HMS Colorized*** displays the three zones using three colors, so you can quickly tell which areas of the image are in which zone. Red indicates highlights, blue indicates shadows and green indicates midtones.

The **Master Level** parameter allows you to adjust all three Level parameters with a single control after you adjust individual Highlight, Midtone and Shadow Levels. The Level controls affect how much the source luminance is changed to match the target luminance.

The **Master Color** parameter allows you to adjust all three Color parameters with a single control after you adjust individual Highlight, Midtone and Shadow Colors. The Color controls affect how much the source colors are changed to match the target colors

Highlight Source, Midtone Source and **Shadow Source** select the source color for the highlight, midtones and shadows that you want to match between the source and the target. The source is the filtered clip.

Highlight Target, Midtone Target and **Shadow Target** select the target color for the highlight, midtones and shadows that you want to match between the source and the target. The target is the clip whose color you are sampling.

The **Highlight Level, Midtone Level** and **Shadow Level** controls affect how much the source luminance is changed to match the target luminance. At a value of 0, the image is unaffected by the filter. If the luminance of the two samples (source and target) is the same, this parameter has no affect.

The **Highlight Color, Midtone Color** and **Shadow Color** parameters affect how much the source colors are changed to match the target colors. At a value of 0, the image is unaffected by the filter.

The **Highlight/Midtone Bias** and **Midtone/Shadow Bias** parameters control the crossover points between the three zones. In other words, the level that distinguishes highlight from midtone, or midtone from shadow.

Mix with Original blends the source and filtered images. Use this parameter to animate from the unfiltered to the filtered image without adjusting other settings, or to reduce the affect by mixing with the source image. At a value of 0, the image is unaffected by the filter.

Motion Tracker Parameter Groups

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion path data to control another aspect of the effect. For more information, see "Working with the Motion Tracker Parameter Groups" on page 29.

PixelChooser Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. For details, see "The PixelChooser" on page 603.

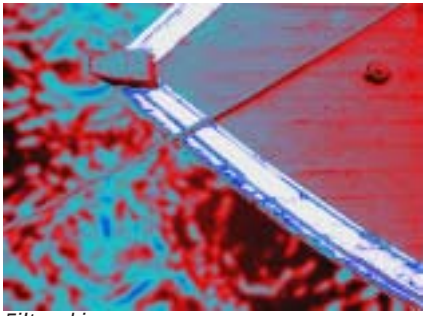
Working with the BCC Colorize Filter

Colorize uses a gradient of up to six colors to tone the image. All of the parameters in this filter can be animated and linked to other parameters.

The BCC Colorize filter can also be used as a transition. To create a transition, use the BCC Colorize TR in the BCC Two-Input Effects category or apply the filter to two layers. For details, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Source image

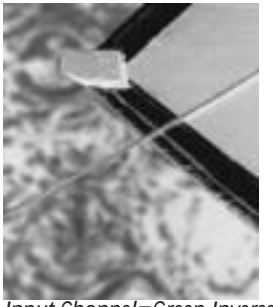


Filtered image

The **Input menu** determines which color channel in the image is used as the source for the toned image. The choices are ***Luma, Red, Green, Blur, Luma Inverse, Red Inverse, Green Inverse*** and ***Blue Inverse***.

Input Channel=Luma

Input Channel=Red



Input Channel=Green Inverse

The **Color Preset menu** allows you to choose a Colorize preset (a gradient of up to six colors to tone the effect). To open a preset, choose ***Load***. To save a gradient as a preset, choose ***Save***.

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.

Color 1-6 Parameter Groups

The **Color 1**, **Color 2**, **Color 3**, **Color 4**, **Color 5**, and **Color 6** controls choose six different colors to add to the gradient. The Color 1 and Color 6 colors 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 that the Black Point value are mapped to the Color 1. 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 examples show the affect of adjusting the Black Point in with a simple two-color gradient from black (Color 1) to white (Color 6).

Black Point= –75

Black Point=0

Black Point=75

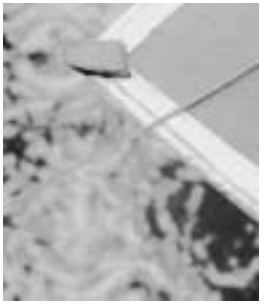
White Point adjusts the value in the Input Channel which is mapped to the pure Color 6 in the output. Decreasing White Point causes more pixels to be purely Color 6 in the output. The following illustrations show the affect of adjusting the White Point with a simple two-color gradient from black (Color 1) to white (Color 6).

White Point=100

White Point=50

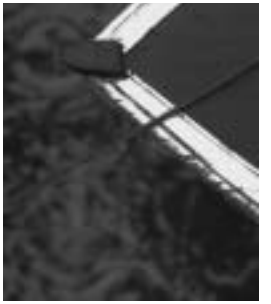
White Point=25

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.



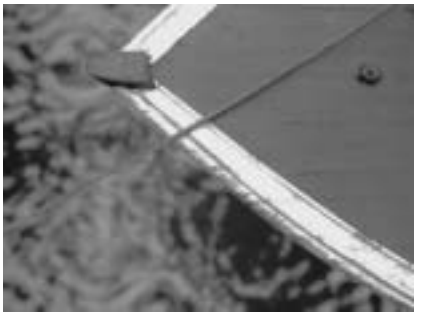
Squeeze= –75

Squeeze=0



Squeeze=75

Color Ease adjusts the softness of the transitions between pure colors in the gradient. Increasing positive values cause the transitions to be more abrupt. Decreasing negative values soften the transitions.



Color Ease= –100

Color Ease=100

Advanced Controls Parameter Group

The **Loop Mode 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.

Color Ease adjusts the softness of the transitions between pure colors in the gradient. Increasing positive values make the transitions more abrupt. Decreasing negative values soften the transitions.

Gradient HSL Parameter Group

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.

Lightness controls the brightness of the colors in the gradient. Higher values lighten the colors, while lower values darken the colors.

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.

Motion Tracker Parameter Groups

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion path data to control another aspect of the effect. The parameters that can be affected depend upon the filter. For example, apply the Colorize filter and use the Motion Tracker parameters to track a logo on a t-shirt. Apply the Colorize effect to the logo in an oval area using the PixelChooser's Distance to Point choice. For more information, see "Working with the Motion Tracker Parameter Groups" on page 29.

PixelChooser Region and Matte Parameter Groups

The PixelChooser controls are described in detail in "The PixelChooser" on page 603.

However, the Colorize filter has an additional PixelChooser parameter, **PixelChooser Intensity**, which controls the intensity of the PixelChooser. At the default of 100, the control is ignored. Reducing Intensity from 100 increases the pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

Working with the BCC Composite Filter

The Composite filter offers a variety of options for compositing one layer over another. This filter also offers a PixelChooser for greater creative control.

BCC Composite can also be used as a transition. To create a transition, use the BCC Composite TR in the BCC Two-Input Effects category or apply the filter to two layers. For details, see “Applying BCC Effects as Transitions” on page 12.

For details on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, and “Working with the Geometrics Parameter Group” on page 24.

The **Mix menu** chooses a clip in the timeline to composite with the source layer. Below are the source layer and the Mix layer used in the examples in this section.


Source Layer


Mix Layer

The **Apply Mode menu** controls how the source and Mix Layers are composited. This filter is most useful with Apply Modes other than ***Normal***.


Normal


Scale Screen


Lightness

For descriptions of all the Apply Modes, see “Apply Modes” on page 625.

Apply Mix blends the Apply Mode setting with the **Mix From menu** setting. The resulting mixed mode is used to composite the Mix layer over the original source media. For example, if Apply Mode is set to ***Lighten*** and Mix From is set to ***Normal***, then Apply Mix blends the Lighten and Normal apply modes. In this case, an Apply Mix setting of 0 uses the Normal apply mode, and an Apply Mix setting of 100 uses the Lighten apply mode. An Apply Mix setting of 50 blends the two apply modes equally.

You can use Apply Mix to soften the effect of a given apply mode, or to animate from one apply mode to another over time.

When the **Enable Bright/Contrast checkbox** is selected, the Brightness and Contrast settings are used. When Enable Bright / Contrast is deselected, these parameters have no affect.

Brightness adjusts the brightness of the composite image. Increasing positive values lighten the composite, while decreasing negative values darken the composite.

Brightness= –25

Brightness=0

Brightness=25

Contrast adjusts the contrast in the composite image. Increasing this value increases contrast, while decreasing this value decreases contrast.

Contrast= –25

Contrast=0

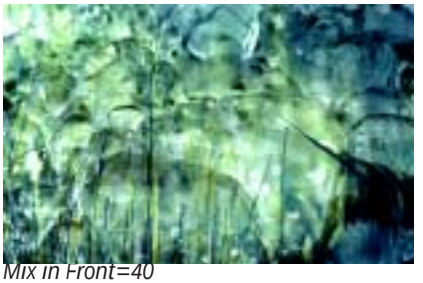
Contrast=25

When the **Enable Levels/Gamma checkbox** is selected, the Levels / Gamma parameter group settings are used. When Enable Levels / Gamma is deselected, these parameters have no affect.

The parameters in the Levels / Gamma parameter group are identical to the corresponding controls in the BCC Levels / Gamma filter. See "Working with the BCC Levels-Gamma Filter" on page 78 for more information.

Mix in Front mixes the Mix layer in front of the source layer. Increasing this value increases the opacity of the Mix layer.

If both Mix Behind and Mix in Front are used, the Mix Layer is composited behind the source. The Apply Mode, Apply Mix and Apply Mix From settings are then used to composite the Mix Layer over the initial composite of the source and the Mix Layer.



Mix in Front=40

Mix in Front=60

Mix Behind mixes the Mix layer behind the source layer. Increasing this value increases the opacity of the Mix layer.

The **Alpha Channel menu** determines which information is used to create the output alpha.

- ***Original*** uses the source layer's alpha as the output alpha.
- ***Composite*** creates a composite alpha channel in which pixels that are opaque in either the source or the Mix layer are opaque.
- ***Mix Layer*** uses the Mix layer's alpha as the output alpha.

The Mix Back parameters allow you to quickly create transitions between the source layer, composite image, and Mix layer without having to adjust multiple parameters.

When the **Enable Mix Back checkbox** is selected, the Mix Back settings are used. When Enable Mix Back is deselected, the Mix Back parameters have no affect.

The **Mix Back menu** determines which pixels are mixed.

- When ***Slider*** is chosen, all pixels are affected, and **Mix Back/Mix Back Min** determines how the pixels in the source and Mix layers are composited. If Mix Back is –100, the source layer is completely opaque. As Mix Back approaches 0, the composite image

becomes increasingly opaque. At 0, the composite image is completely opaque. Increasing Mix Back above 0 makes the Mix layer increasingly opaque; at a value of 100, the Mix layer is completely opaque.


Mix Back= –100


Mix Back=0


Mix Back=100

- When ***PixelChooser*** is chosen, pixels are mixed according to the PixelChooser. Pixel that are fully selected in the PixelChooser are mixed according to the **Mix Back Max** setting. Pixels that are fully unselected in the PixelChooser are mixed according to the **Mix Back/Mix Back Min** setting. Pixels that are partially selected are mixed to intermediate values between the Mix Back Min and Mix Back Max settings. Mix Back Min and Mix Back Max each work in the same way as the Mix Back parameter used when the Mix Back menu is set to Slider. If the Mix Back Min and Mix Back Max settings are the same, then the PixelChooser selection has no affect.

  In the following examples, the PixelChooser selects pixels inside an oval-shaped region, and Mix Back Min is –100.


Mix Back Max= –100


Mix Back Max=0


Mix Back Max=100

- When ***Original Alpha*** is chosen, the alpha channel in the source determines which pixels are selected. The source's alpha channel is not used for compositing–the source behaves like a fully opaque layer. Pixels that are fully opaque in the source alpha mix according to the **Mix Back Max** setting. Pixels that are fully transparent in the source alpha are mixed according the **Mix Back Min** setting. Pixels that are partially transparent in the source alpha mix to an intermediate value. Original Alpha lets you create mattes for the Mix Back parameters by altering the source's alpha channel.


Mix Back Max= –100


Mix Back Max=0


Mix Back Max=100

The Mix Back, Mix Back Min, and Mix Back Max values are scaled by the Mix in Front value. Therefore, if Mix in Front is at a value less than 100, the Mix layer never reaches full opacity, even if Mix Back or Mix Back Max is at 100. The range of opacities also varies according to the Apply Mode settings.

The Mix Back parameters provide the Composite filter with a great deal of creative potential.

- The PixelChooser setting in the Mix Back menu offers greater control over the appearance of a composite of two opaque layers. You can use the PixelChooser parameters to choose pixels in the source layer to control the mix of pixels.
- Try using apply modes and brightness and contrast adjustments to further enhance a Composite effect.
- You can animate Mix Back Min and Mix Back Max to create a transition from the source layer, to a composite effect, and then to the Mix Layer.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Correct Selected Filter

This filter allows you to adjust a specified range of colors in the source image, leaving colors outside the range unaffected.

Source image

Filtered image

To correct two or more separate colors within an image, apply the Correct Selected filter as many times as needed.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **View menu** sets the effect display. Choose ***Output*** to view the entire effect. Choose ***Matte*** to view the matte created by the effect. Choose ***Source*** to view the unfiltered clip.

The **Color Matching menu** determines how the filter matches colors.

- ***RGB*** matches colors in RGB space.
- ***HSL*** matches colors in HSL (Hue, Saturation, and Lightness) space.
- ***Chroma*** matches colors based on Hue and Saturation only.
- ***Hue*** matches colors based on Hue alone.

Color sets the color of the pixels to correct. For best results, use the eyedropper to select the color from your source image.

Color Range controls the extent of the range of colors to correct. A setting of 0 applies corrections only to pixels that exactly match the Selected Color. Increase the Color Range value to apply corrections to a wider range of colors.

Blend creates a blend between the selected and unselected regions in the filtered image. Use this parameter to soften discontinuities between the two regions.

Blur Matte blurs the matte created by the filter between the selected and unselected regions.

Choke applies a choke to the image. Positive values tighten the matte around the selected regions, while negative values pull the matte away from the edges of the selected regions.

Selecting the **Reverse Color Range checkbox** reverses the range of colors to correct.

Brightness adjusts the brightness of the image. Increasing the Brightness setting pushes colors toward white, and decreasing the setting pushes colors toward black.

Contrast adjusts the contrast of the image. Increasing the Contrast setting pushes colors toward pure colors, and decreasing the setting pushes colors toward 50% gray.

Hue cycles the colors in the image around the color wheel in the HSL color space. Most color corrections require very small changes in the Hue setting; adjustments of 10° or less usually suffice. Adjustments larger than 10° usually produce very dramatic color changes.

Hue Fine Control allows you to finetune the Hue parameter in increments of 1.

Saturation adjusts the intensity of each color's hue in the image. Negative values remove color from the image, and positive values add color to the image.

Output Black adjusts the luminance level of black pixels. Increasing Output Black from its default value of 0 makes black pixels brighter and pushes the RGB color space toward white.

Output White sets the luminance of white pixels. Decreasing Output White from its default value of 255 makes white pixels darker and pushes the RGB color space toward black.

Blur Amount sets the amount of blur that is applied to the color corrected image.

The **Blur menu** determines when the blur is applied to the color corrected image.

- Choose ***Post Correct*** to blur the matte created by the filter after color adjustments are made. If Blur Amount is 0, this parameter has no affect.
- Choose ***Pre Correct*** to blur the matte created by the filter before color adjustments are made. If Blur Amount is 0, this parameter has no affect.
- ***Off*** turns the blur off.

The **Blur Quality menu** controls the quality of the blur. ***Box*** produces a rough blur. ***Low*** produces a blur that is similar in quality to that of the Basic Blur filter. ***Medium*** is adequate for most applications, and ***High*** produces even smoother blurs. The ***Highest*** setting is much slower than High; only choose Highest if you see pixilation when using lower settings.

If the source image is opaque, selecting the **Opaque Source checkbox** can speed rendering and preview times. If your source is partially transparent, deselect this option for best results. You must deselect this checkbox to apply the filter to a title.

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 PixelChooser controls are described in detail in "The PixelChooser" on page 603.

Working with the BCC Directional Blur Filter

Directional Blur blurs the image by displacing it in one direction. The effect is similar to a photograph of a speeding object taken with a slower shutter speed.

Source image

Filtered image

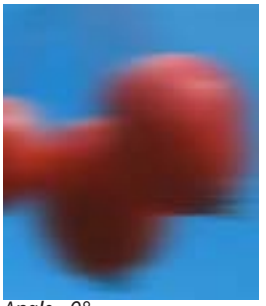
BCC Directional Blur can also be used as a transition. To create a transition, use the BCC Directional Blur TR in the BCC Two-Input Effects category or apply the filter to two layers. For details, see “Applying BCC Effects as Transitions” on page 12.

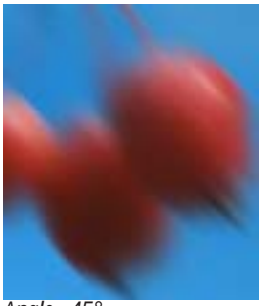
For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

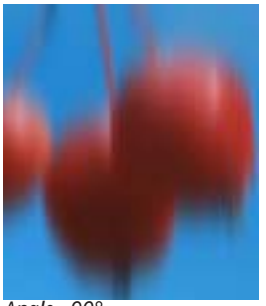
If the source image is opaque, selecting the **Opaque Source checkbox** can speed rendering and preview times. If your source is partially transparent, deselect this option for best results. You must deselect this checkbox if you are applying to a title. For details on applying to titles, see “Applying BCC Effects to Titles and Mattes” on page 15.

Blur Amount controls the amount of blur applied to the image. Increasing Blur Amount displaces pixels farther in the chosen direction and creates more blur.

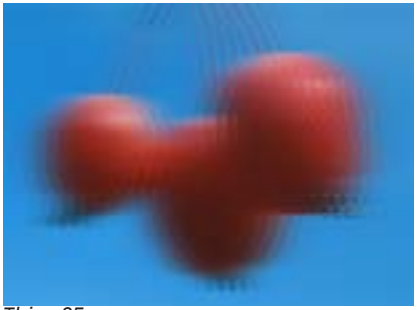
Angle sets the direction in which pixels are displaced to create the blur.


Angle=0°


Angle=45°

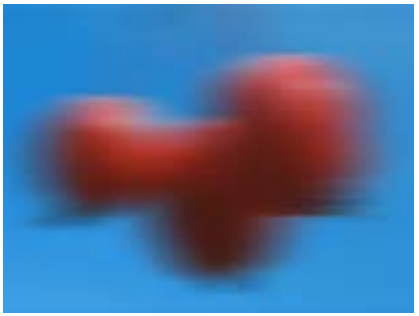

Angle=90°

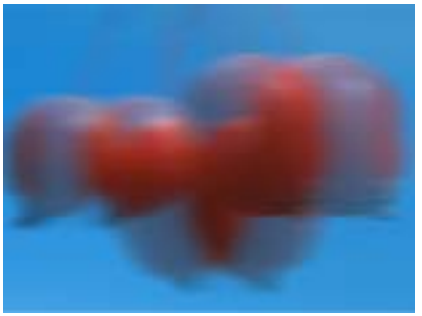
Thin reduces the number of pixels used to compute each point in the blur. Increasing Thin decreases the smoothness of the blur but reduces render time. Higher Thin values produce a "double vision" effect.


Thin=25


Thin=75

Increasing **Spread** causes each point in the rendered output to be affected more by points farther away from it in the blur, producing a blurred "double vision" effect.

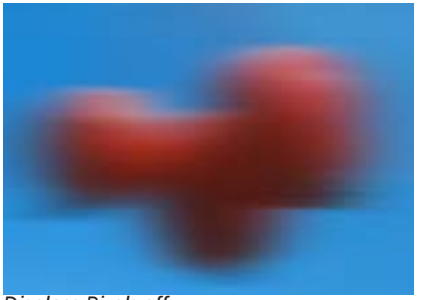

Spread=25


Spread=75

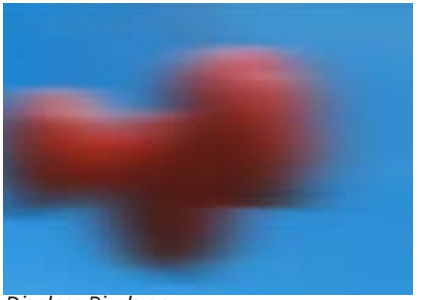
Blur Threshold reduces the amount of color change to each pixel by the threshold amount. Increasing Blur Threshold causes the parts of the image with abrupt changes in color to blur, while areas with subtle details remain unchanged.

Maximum Deviation sets the maximum deviation (based on 8 bit color) allowed for any channel. Reducing this value limits the amount any color can change. This control becomes more noticeable at values below 30. Very small values of Maximum Deviation can be useful (especially combined with the PixelChooser) to reduce noise in video and digital stills that contain noise in their dark areas.

The **Displace Pixels checkbox** displaces each pixel in the direction it blurs. For example, if Blur Amount is 20 and Displace Pixels is on, the image displaces 20 pixels in the specified Angle and blurs 20 pixels. An Angle value of 0 displaces the image to the right; a value of 180 displaces the image to the left. If Displace Pixels is off, pixels blur 20 pixels but are not displaced. In the following examples, the image blurs with a Angle setting of 180°. When Displace Pixels is selected, the image displaces to the left.



Displace Pixels off



Displace Pixels on

The **Apply Mode menu** controls how the filtered image is composited with the source image. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

The **Channels menu** specifies the channels to blur. You can blur all channels (***RGBA***), just the ***RGB*** channels, just the ***Alpha*** channel, or any combination of the ***Red***, ***Green***, and ***Blue*** channels.

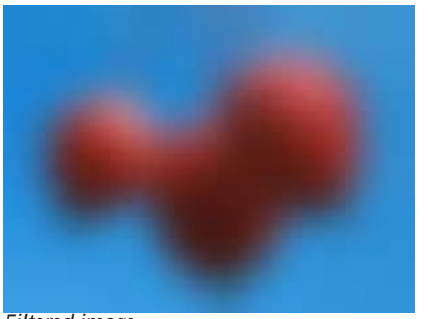
Mix with Original blends the source and filtered images. Use this parameter to animate the effect from unfiltered to filtered without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Gaussian Blur Filter

The Gaussian Blur filter implements a popular blur algorithm that produces smoother blurs but takes more time to render than the Basic Blur filter. Gaussian Blur softens the image by averaging each pixel with its neighboring pixels. The word "Gaussian" refers to the bell-shaped curve commonly used in statistical analysis. The shape of this curve determines how much each averaged pixel contributes to the output.

Source image



Filtered image

The BCC Gaussian Blur can also be used as a transition. To create a transition, use the BCC Gaussian Blur TR in the BCC Two-Input Effects or apply the filter to two layers. For details, see "Applying BCC Effects as Transitions" on page 12.

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

If the source image is opaque, selecting the **Opaque Source checkbox** can speed rendering and previews. If your source is partially transparent, deselect this option for best results. You must deselect this checkbox to apply the Gaussian Blur to a title. For information on applying effects to titles, see "Applying BCC Effects to Titles and Mattes" on page 15.

Horizontal Blur and **Vertical Blur** control the amount of blur in each direction. If **Lock Blur** is selected, Horizontal Blur sets the blur amount in both directions.

Spread adjusts the blur computation to create multiple image effects. At the default setting of 0, the input image at each pixel contributes the most "weight" to the output for that pixel. Increasing Spread modifies the computation to give more weight to points away from the center and less weight to points close to the center. This produces a double vision effect.

Spread=50

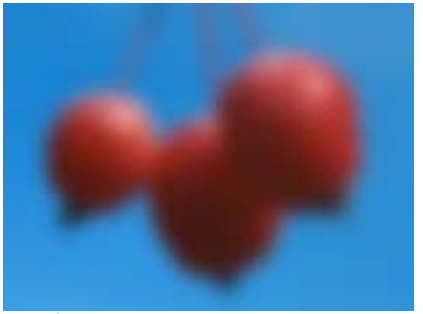
Spread=100

Blur Threshold reduces the amount of color change to each pixel by the threshold amount. Increasing Blur Threshold causes the parts of the image with abrupt changes in color to blur, while areas with subtle details remain unchanged.

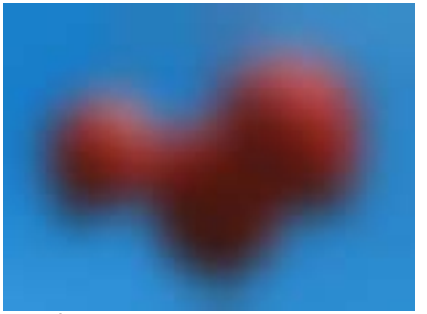
The **Maximum Deviation** parameter sets the maximum deviation (based on 8-bit color) allowed for any channel. Reducing this value limits the amount any color can change. This control becomes more noticeable at values below 30. Very small amounts of Max. Deviation can be useful (especially combines with the PixelChooser) to reduce noise in video and digital stills that contain noise in their dark areas.

The **Blur Quality menu** controls the quality of the blur. ***Low*** produces a blur that is similar in quality to that of the Basic Blur filter. ***Medium*** is adequate for most applications, and ***High*** produces even smoother blurs. Be aware that the ***Highest*** setting is much slower than High; you should only choose Highest if you see pixilation when using lower settings.

Iterations determines the number of times the blur is applied to the image. Increasing Iterations produces smoother blurs but increases render and preview time.



Iterations=2



Iterations=10

The **Apply Mode menu** controls how the filtered image is composited with the source image. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

The **Channels menu** sets which channels blur. You can blur all four channels (***RGBA***), just the ***RGB*** channels, the ***Alpha*** channel, or any combination of the ***Red***, ***Green***, and ***Blue*** channels.

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.

PixelChooser Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC HSL (Hue-Saturation-Lightness) Filter

BCC HSL (Hue-Saturation-Lightness) converts the image to the Hue / Saturation / Lightness color space, makes corrections to the image, and converts it back to RGB.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Hue cycles the colors in the image around the color wheel in the HSL color space. Most color corrections require very small changes in the Hue setting; adjustments of 10° or less usually suffice. Adjustments larger than 10° usually produce very dramatic color changes.

Hue Fine Control allows you to finetune the Hue parameter in increments of 1.

Saturation adjusts the intensity of each color’s hue in the image. Negative values remove color from the image, and positive values add color to the image.

Lightness adjusts the lightness of the image.

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.

PixelChooser Region and Matte Parameter Groups

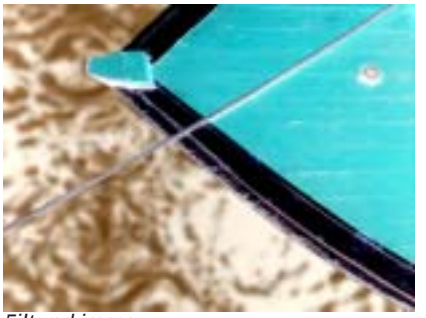
The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Invert-Solarize Filter

BCC Invert-Solarize inverts one or more channels in the source image.

Source image



Filtered image

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25. *

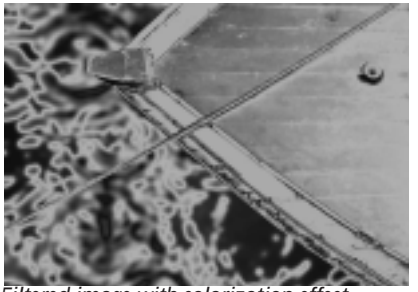
The **Channels menu** sets which channels invert. You can choose ***RGB***; ***RGBA*** (RGB and Alpha); ***Alpha***; any combination of ***Red, Green,*** and ***Blue***; ***Luminance***; ***Hue***; ***Saturation***; or ***Lightness***.

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.

In this filter, Mix with Original is rarely useful at the mid-range values; a value of 50 mixes the original and inverted images equally, producing a gray image when the Invert Channel menu is set to RGB.

You can use Invert-Solarize to emulate the classic photographic solarization technique achieved by exposing a partially developed print to light, which exposes and darkens the lighter parts image. Create a similar look by selectively inverting the light parts of your image.

Source image



Filtered image with solarization effect

To achieve a solarized look, set the Channel menu in the PC Matte parameter group to Luminance or one of the color channels. Set the Type menu to Range. Adjust From and To until you achieve the desired effect. Use Blur Soften to control the transition between the inverted and non-inverted colors. You can also try inverting some of the RGB channels and not others.

PixelChooser Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Levels-Gamma Filter

Levels-Gamma provides options for adjusting contrast and eliminating noise in your image. Video shot at night or in poorly lit settings often contains noise in the dark areas. Increasing Input Black removes this noise by treating all areas darker than the Input Black setting as black. Washed out or overexposed images do not contain the full range of levels. Increasing Input Black and / or decreasing Input White can boost the contrast of the image.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Input Black sets the channel values of the input image that are treated as pure black by the filter. All pixels whose value is lower than the Input Black value become the Output Black color. For example, if Input Black is set to 50, all pixels with a value of 50 or less are output to a value of 0. The remaining values (50-255) are remapped to produce a smooth gradient from black to white.

Input Black=0

Input Black=75

Input Black=125

Input White sets the channel values of the input image that are treated as pure white by the filter. All pixels whose value is higher than the Input White value become the Output White color. For example, if Input White is set to 200, all pixels with a value of 200 or more are output to a value of 255. The remaining values (0-200) are remapped to produce a smooth gradient from black to white.

Input White=255

Input White=175

Input White=125

You can create dramatic posterization effects by adjusting the input levels so that only a small range of input values are used, and / or by processing chosen channels of the image.

The posterization effect below was created by increasing Input Black and decreasing Input White to create a steeper gradient between the luminance values in the image.

Source image

Filtered image

Gamma controls the slope of the curve used to convert from the input color values to output values in pixels brighter than Input Black and darker than Input White. Increasing Gamma from the default of 100 lightens the image and decreases contrast, while decreasing Gamma darkens the image and increases contrast.

Gamma=50

Gamma=100

Gamma=150

Output Black sets the channel value at which black source pixels are output. For example, if Output Black is set to 15, all pixels whose values are 0-15 are output to a value of 15. If you are working with broadcast material, you may need to raise the Output Black value in order to avoid NTSC-illegal black levels.


Output Black=0

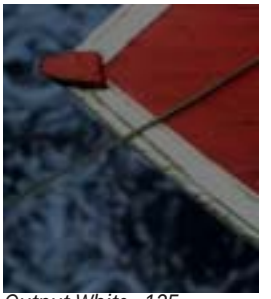

Output Black=75


Output Black=125

Output White sets the channel value at which white source pixels are output. For example, if Output White is set to 240, all pixels whose values are 240-255 are output to a value of 240. If you are working with broadcast material, you may need to decrease the Output White value to avoid NTSC-illegal white levels.


Output White=255


Output White=175


Output White=125

The **Channels menu** determines which channels the filter affects. The choices are ***RGB***, ***Red***, ***Green***, ***Blue***, ***Red and Green***, ***Red and Blue***, ***Green and Blue***, ***Difference***, and ***Alpha***. Difference uses the difference between each filtered channel and the corresponding source channel.

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 PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Median Filter

The BCC Median filter makes each pixel look like the majority of its neighboring pixels. It produces a smeary painterly look, but with sharp edges (at neighborhood boundaries). The Median filter also reduces noise by eliminating "spikes," or pixels that are very different from their neighbors (also referred to as "salt and pepper noise").

Original image

Filtered image

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

The **Mode menu** determines how similarity is determined between a pixel and neighboring pixels. The area is chosen by the Median Length, Median Width, and Median Angle controls, which form a rectangle that can rotate. The default setting produces a line (a very thin rectangle).

- When ***Pixel Selected by Channel*** is chosen, the median is calculated for the chosen channel, then the neighboring pixel(s) that have the median channel value are averaged and replace the current pixel. For example, if the Channel menu is set to Red, then the median Red value is calculated. All neighbor pixels with that same median Red channel value are averaged.
- When ***Selected Channel Only*** is chosen, each pixel is altered so that its chosen channel is the median value. The other aspects of the pixel remain unchanged. For example, if the Channel menu is set to Red, the Green and Blue channels are unaffected, but the Red channel is set to the median value.
- When ***RGBA Separately*** is chosen, each pixel is replaced by a new pixel. The four (or three, if Preserve Alpha is enabled) channels are the median values of those channels, calculated separately.
- When ***Most Common Pixel*** is chosen, each pixel is replaced by the neighboring pixel that is least different than the other neighbors.

Use the **Channel menu** to specify which channel to blur. The choices are ***Luminance, Lightness, Brightness, Hue, Saturation, Alpha, Red***, ***Green***, or ***Blue***.

The **Preserve Alpha checkbox** determines whether the blur uses alpha channel information. With Preserve Alpha selected, the blur does not appear in areas governed by the alpha channel (in other words the effect has zero opacity in alpha areas), with Preserve Alpha deselected, the effect is 100% opaque over the alpha channel.

Median Length and **Median Width** set the width of the median blur on the X-axis and the Y-axis, respectively. **Median Angle** sets the angle of the median blur.

The **Enable Fractional checkbox** allows you to smoothly animate Median Length and Median Width by blending two passes of the effect. The fractional parts of the length and width control the blend.

Median Level controls the amount of blur applied to the chosen pixels. At a value of 0, no blur is applied. Higher values produce more blur.

Softness controls the softness of the edges between affected and unaffected pixels. Increasing Softness produces a blur with softer edges.

The **Compositing menu** sets how the blur is applied to the image, using the available Apply Modes. The Apply Modes are described in detail in Appendix A in your User Guide. However, this menu includes three additional Apply Modes, ***None***, ***Under*** and ***Over***.

- ***None*** simply renders the blur and ignores the underlying image.
- ***Under*** renders the blur under the underlying image. The blur is only visible in areas where the image is transparent. This is most useful for images with an alpha channel.
- ***Over*** renders the blur over the underlying image.

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 affect of the filter by mixing it with the source image. At a value of 0, the image is unaffected by the filter.

Motion Tracker Parameter Groups

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion path data to control another aspect of the effect. The parameters that can be affected depend upon the filter. For example, track a logo on a t-shirt and apply a Glow to the logo.For more information, see “Working with the Motion Tracker Parameter Groups” on page 29.

PixelChooser Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Motion Blur Filter

The BCC Motion Blur filter creates a realistic blur on the motion in an image, simulating the effect of shooting a moving object on film. The blur is based on the motion of the pixels in the image. For example, you could apply the Motion Blur filter to a clip of a speeding car and the car's motion would blur while the background would not. The blur is most pronounced when the object moves quickly and more subtle when it moves slowly. Motion blur is not visible if the image is static. The following example shows BCC Motion Blur applied to a boy running toward a ball.


Source image


Source image


Filtered image

Based upon optical flow technology, this filter examines past and future frames to determine the motion of the pixels in the image. Depending upon the selected settings, a blur or a smear is applied to the pixels that move from one frame to the next. You can use an image in the timeline as a source for motion and then apply the motion from the chosen image to the filtered track. Motion Blur is especially memory-intensive.

For information on common parameters, see "Working with the General Controls Parameter Group" on page 22 and "Working with the Title Matte Parameter Group" on page 23.

The **Source Layer menu** sets the media to blur with the source layer (the clip or track to which BCC Motion Blur is applied). You must assign the media that you want to use to the Source Layer menu. The choices are ***None, Filtered Layer, 1st Below*** or ***2nd Below***. When the Source Layer menu is set to None, the other parameters have no affect.

The **Blur Type menu** sets the type of motion blur that is created. The choices are ***Blur*** or ***Smear***. Smear blurs the pixels in one direction. Blur blurs the pixels symmetrically.

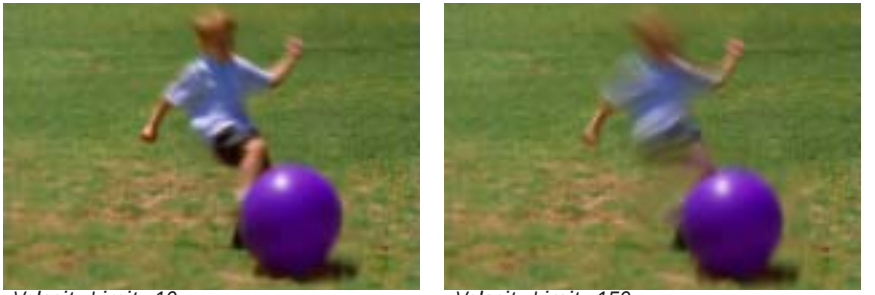
Original Image *Smear* *Blur*

Motion Blur Amount sets the amount of blur or smear that is applied to moving pixels. Positive values apply the blur or smear; negative values sharpen these pixels. The following example shows Blur as the Blur Type.

Motion Blur Amount=-9 *Motion Blur Amount=5* *Motion Blur Amount=10*

Smear Falloff determines the falloff when the Blur Type menu is set to Smear. Falloff is the transition between the smeared and unsmeared areas. At a value of 0, the Smear is fully applied; at a value of 100, the smear has no affect. This is ideal for animating the smear.

Velocity Limit determines the range of moving pixels that are filtered. At a value of 0, the filter will not find any moving pixels in the image; at a value of 1000 (maximum), the filter uses the full range of motion in the image.



Velocity Limit=10 *Velocity Limit=150*

The **FG Mask Layer menu** sets the media to use as a foreground mask to constrain the pixel movement. The choices are ***None, Filtered Layer, 1st Below*** or ***2nd Below***. When this menu is set to ***None***, the media that is assigned to the FG Mask Layer has no affect.

The **FG Mask Channel menu** determines which channel is used to create the foreground mask. The choices are ***Red, Green, Blue, Luma*** or ***Alpha.*** This setting has no affect if you have assigned the FG Mask Layer menu set to None.

The **FG Blur Type menu** sets the type of motion blur that is created on the foreground mask. The choices are ***Blur*** or ***Smear.*** Smear blurs the pixels in one direction; Blur blurs the pixels symmetrically. This option is applied to the foreground calculation; the background image is controlled by the Blur Type menu. This setting has no affect if the FG Mask Layer menu is set to None.

FG Blur Amount sets the amount of blur or smear applied to moving pixels in the foreground image. Positive values apply the blur or smear; negative values sharpen pixels.

FG Smear Falloff determines the falloff when the FG Blur Type menu is set to Smear. Falloff is the transition between the smeared and unsmeared areas.At a value of 0, the Smear is fully applied; at a value of 100, the smear has no affect on the image. This is ideal for animating the smear.

FG Velocity Limit determines the range of moving pixels in the foreground image that are filtered. At a value of 0, the filter will not find any moving pixels in the image; at a value of 2000 (maximum), the filter uses the full range of motion in the image.

Blur Threshold reduces the amount of color changes to each pixel by the threshold amount. Increasing Blur Threshold causes the parts of the image with abrupt changes in color to blur, while areas with subtle details remain unchanged.

The **Maximum Deviation** parameter sets the maximum deviation (based on 8-bit color) allowed for any channel. Reducing this value limits the amount any color can change. This control becomes more noticeable at values below 30. Very small amounts of Max. Deviation can be useful (especially combines with the PixelChooser) to reduce noise in video and digital stills that contain noise in their dark areas.

The **Apply Mode menu** controls how the filtered image is composited with the source image. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect and the parameter does not appear. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

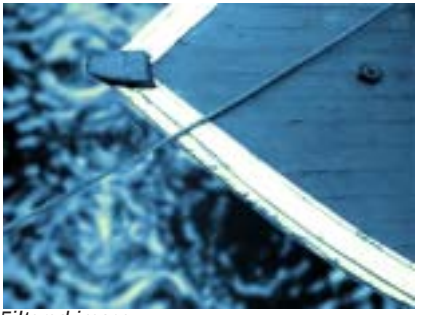
Mix with Original blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the affect of the filter by mixing it with the source image.

PixelChooser Intensity controls the intensity of the PixelChooser. At the default setting of 100, the control is ignored. Reducing the value from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser. The remaining PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Multitone Filter

The Multitone filter uses the source image's color, luma, or alpha information to create a toned image that uses up to five independent colors. MultiTone works by creating a color map based on a specific channel in the source image, then replacing each color range in the map with a new color.

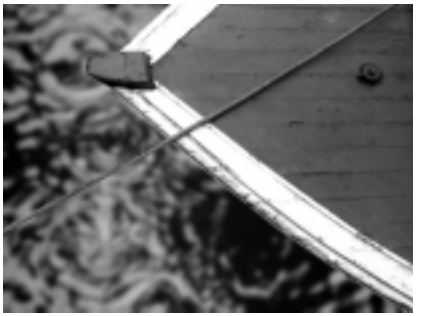
Source image



Filtered image

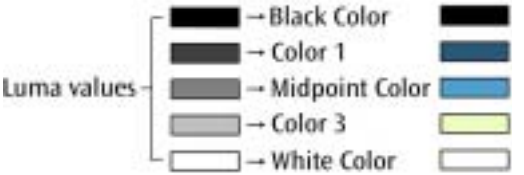
For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

MultiTone processes an image using the following steps:

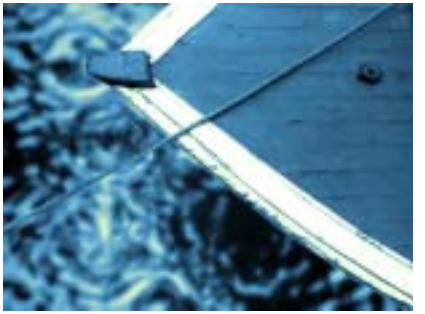


1. MultiTone examines the channel from the source image that is chosen as the Input Channel. In this example, the image's Luma channel is used as the Input Channel.

2. Where the value of the Input Channel is 0, the Black Color is substituted. Where the value of the Input Channel is 255, the White Color is substituted. Three additional points on the value range are replaced with the pure Color 1, Midpoint, and Color 3 colors.



3. Pixels whose Input Channel value falls between the specified points are replaced with a mix of two contiguous colors. For example, if a pixel's value falls between the Color 1 and Midpoint levels, it is replaced with a blend of the Color 1 and Midpoint colors.



The **Black Source menu** determines the media used to replace black pixels in the Input Channel.

Black Color, Color 1, Midpoint Color, Color 3 and White Color Parameter Groups

Black Color sets the color output for pixels whose Input Channel value is 0.

The **Color 1**, **Midpoint Color**, and **Color 3** determine the colors output for pixels at intermediate values on the input value range. You can adjust the values that are output to each color with the Level parameters (see below).

The Black Color, White Color, Color 1, Midpoint Color, and Color 3 colors are used in the output only if the corresponding Source menu is set to Color.

White Color sets the color output for pixels whose Input Channel value is 255.

The **Source 1**, **Midpoint Source**, and **Source 3** menus set the sources used to replace intermediate pixels whose input channel values equal the corresponding color level.

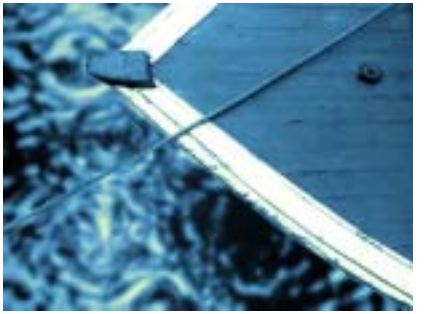
The **White Source menu** is the source that is used to replace white pixels in the Input Channel.

For each of these menus, you can choose from the following options:

- ***Color*** uses the corresponding color chosen with the Black Color, Color 1, Midpoint Color, Color 3, or White Color parameters (see below).
- ***Layer 1*** and ***Layer 2*** use the color information from the corresponding layers selected in the Source Layer 1 and Source Layer 2 menus (see page 89).
- ***Off*** eliminates the corresponding input level from the composite image, ignoring the corresponding color chosen with the Black Color, Color 1, Midpoint Color, Color 3, or White Color parameters (see below). This option is not available in the Black Color or White Color menus.

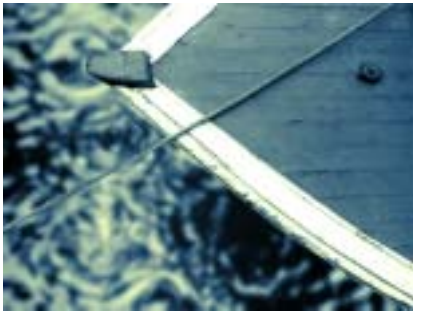
For example, if you set Color 1, Midpoint Color, and Color 3 to Off and Black and White to Color, the filter is a simple toner, mapping the image from the black color to the white color.

In this example, all of the Source menus are set to Color. The source image pixels are toned according to the chosen Black Color, Color 1, Midpoint Color, Color 3, and White Colors.



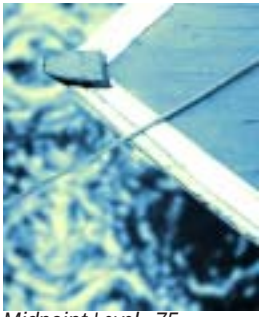
In this example, the Source 1 menu has been set to Layer 1, and the Source Layer 1 menu is set to the original source image. The dark grey pixels in the source image retain their original color. The Black Source, Midpoint Source, Source 3, and White Source menus are still set to Color, so that the other pixels in the source image are toned according to the chosen Black Color, Color 1, Midpoint Color, Color 3, and White Colors.

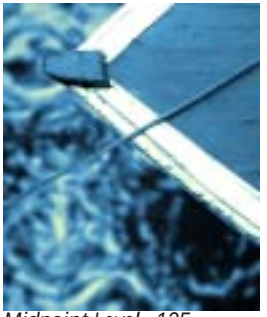
In this example, the Color 1 menu has been set to Off, so the dark gray level is eliminated from the range. The dark gray pixels in the source image have been toned a mixture of the Black Color (purple) and the Midpoint Color (yellow) according to their luminance values.

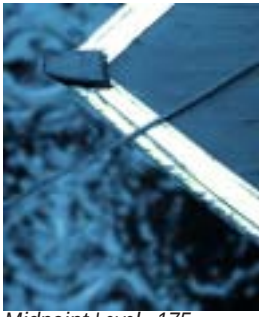


The Level parameters control the levels at which the output is taken directly from each source.

- **Source 1 Level** is the input channel value for which the output is the pure Color 1 color. A value of 0 sets this level to the Black Level, and a value of 100 sets it to the Midpoint Level.
- **Midpoint Level** is the input channel value (between 0 and 255) for which the output is the pure Midpoint color. Decreasing the Midpoint Level gives more prominence to the Color 3 and White Colors because it widens the input value range for these colors. Conversely, increasing the Midpoint Level gives more prominence to the Color 1 and Black Colors.


Midpoint Level=75


Midpoint Level=125


Midpoint Level=175

- **Source 3 Level** is the input channel value for which the output is the pure Color 3 color. A value of 0 sets this level to the Midpoint Level, and a value of 100 sets it to the White Level.

The **Source Layer 1 menu** sets the source layer used for any source(s) set to Layer 1. If Source Layer 1 is set to ***None***, the input layer is used with previous filters applied. If it is set to another layer, the corresponding layer is used with no filters are applied.

The **Source Layer 2 menu** sets the source layer used for any source(s) set to Layer 2. If Source Layer 2 is set to ***None***, the input layer is used with previous filters applied. If it is set to another layer, the corresponding layer is used with no filters are applied.

The **Input Channel menu** specifies the channel in the source image used to create the color map for the toned image.

The **Output Channels menu** specifies the channels in the image to be processed and output by the filter. The choices are ***RGB***, ***Red***, ***Green***, ***Blue***, ***Red and Green***, ***Red and Blue***, ***Green and Blue***, ***Difference***, and ***Alpha***. Difference uses the difference between each filtered channel and the corresponding source channel.

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 affect of the filter by mixing it with the source image.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

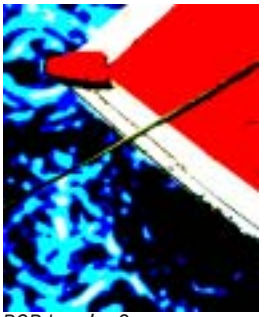
Working with the BCC Posterize Filter

Posterize reduces the number of colors in the image by independently reducing the number of discrete levels in each color channel. The resulting output image has a few distinct values of red, green, and blue, instead of having each value spread over the full range of 0 to 255. The filter also allows you to scramble the output values for additional creative control.

Posterization effects can produce hard edges that give the output image a rough appearance, which can be exacerbated by image compression and by the bandwidth limitations of analog video equipment. The Posterize filter provides several controls that deal with such problems by blurring and softening the posterized image.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

If the **Lock Level Count checkbox** is selected, adjusting Red Levels sets all **Levels** parameters. The **Levels** controls determine the number of distinct levels present in the **Red**, **Green**, and **Blue** channels in the filter’s output. For example, if Red Levels is 5, the red channel has only five distinct values. If Level Bias is at its default setting, these values are 0, 64, 127, 191, and 255. The red channel in each pixel changes to the Red Level value that is closest to its original value.



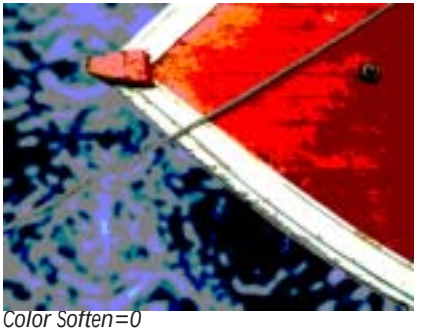
RGB Levels=2

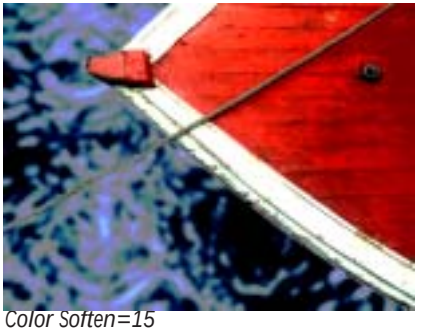
RGB Levels=3

RGB Levels=5

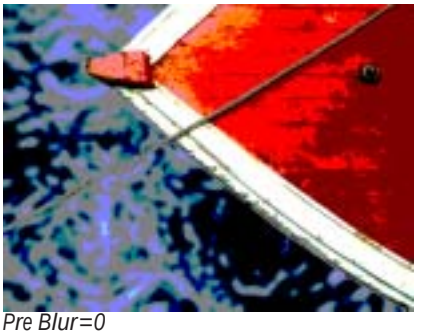
Level Bias adds bias to the set of discrete levels for each channel, and is useful for adjusting the look of the posterized output. Positive values push the levels toward white, and negative values push them toward black. In other words, if Level Bias is positive, there are more distinct output levels above 127 than there are below 127.

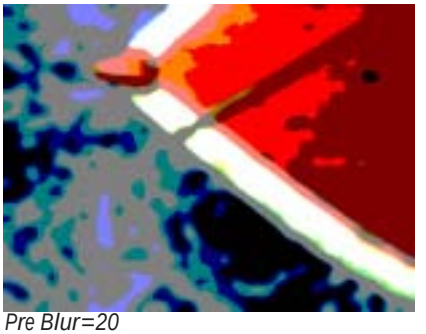
Color Soften softens the color transitions on a pixel-by-pixel basis. Posterize creates a “color map” that transforms the pixels in the source image into output pixels. Color Soften softens this color map. This parameter does not reduce the sharpness of details in the original image; rather it reduces harsh color contrasts, making even extreme posterizations more natural-looking.


Color Soften=0

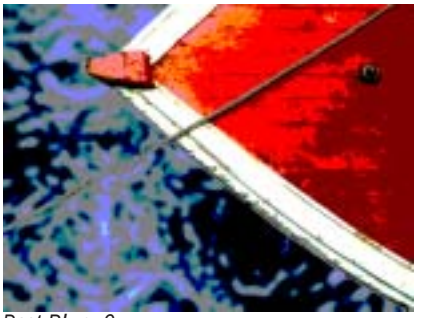

Color Soften=15

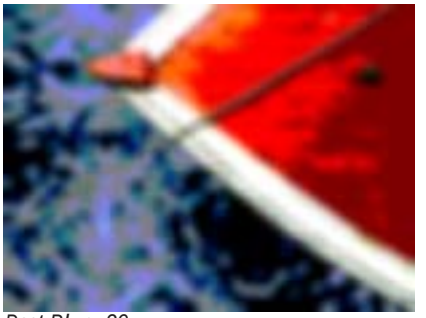
Pre Blur blurs the source image before the posterization is applied. This operation softens the edges of the posterized image, without increasing the number of output colors.


Pre Blur=0


Pre Blur=20

Post Blur blurs the image after posterization takes place, creating softer edges where the colors blend. Increasing Post Blur increases the number of output colors.


Post Blur=0

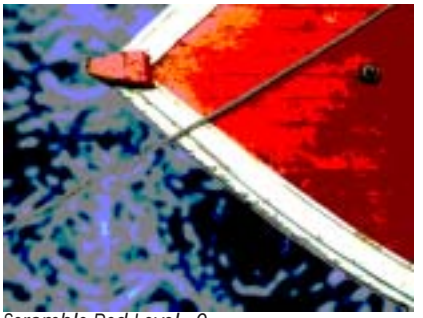

Post Blur=20

Scramble Parameter Group

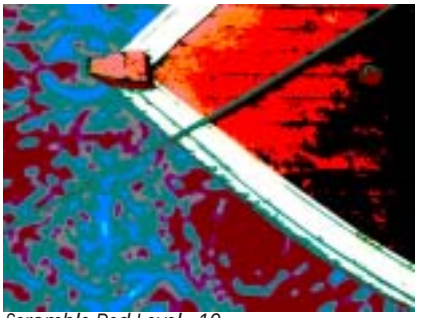
Use the Scramble controls to change the order of appearance of the levels in each of the RGB channels.

The **Red Scramble**, **Green Scramble**, and **Blue Scramble** controls scramble the output levels in their respective color channels. Each unit of Scramble applied to a channel switches two of the color levels in the output.

These settings create unusual effects. For example, a Scramble setting of 1 might change the list of values from 0, 64, 127, 191, 255 to 0, 255, 127, 191, 64. Pixels whose red channel was closest to 64 now have a red channel of 255, and pixels whose red channel was closest to 255 have a red channel of 64. In the illustrations below, the image's green channel is posterized to 10 levels of green. The number of distinct red and blue levels is reduced to the minimum number of 2.



Scramble Red Level=0



Scramble Red Level=10

Maximum Scramble controls the maximum distance in color space between the scrambled levels. At low Maximum Scramble values, only levels close to each other in color space are scrambled. At high values, very disparate levels such as pure black and pure white can be scrambled.

Random Seed controls the value used to seed the random number generator used by the Scramble controls. Adjust this value to get different random arrangements of the scrambled levels.

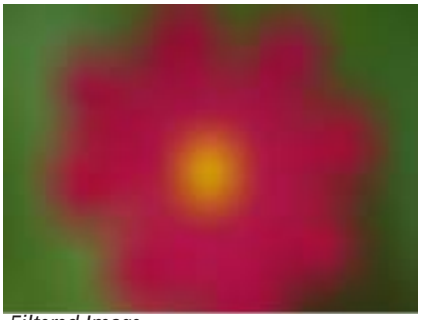
Mix with Original blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

The PixelChooser controls are described in detail in "The PixelChooser" on page 603.

Working with the BCC Pyramid Blur Filter

The BCC Pyramid Blur filter emulates the look of shooting in soft focus or with lens diffusion. This filter allows you to blur the horizontal and vertical components of the image separately. The functionality is similar to the BCC Blur filter that appeared in older versions of BCC. However, BCC Pyramid Blur uses a refined algorithm that speeds rendering approximately 20 - 40 percent.

Original Image

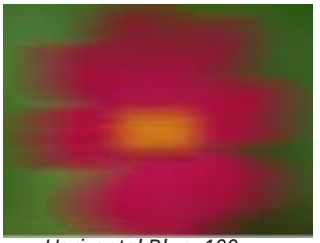


Filtered Image

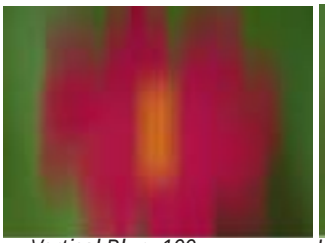
For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Blur Quality menu** sets the quality of the blur. The choices are ***Fastest, Balanced*** or ***Smoothest***. Image quality and render speed will vary according to this choice. Smoothest provides the best image quality while Fastest provides the fastest render times.

Horizontal Blur and **Vertical Blur** control the amount of blur in each direction. Increasing these values increases the amount of blur that is applied to the image. If the **Lock Blur checkbox** is selected, Blur sets the blur in both directions.



Horizontal Blur=100



Vertical Blur=100

Horiz and Vert Blur=100

When the **Blur Alpha checkbox** is selected (the default), the blur applies to the RGBA channels. When this checkbox is deselected, the alpha channel is not affected by the blur. If the image you are blurring does not include an alpha channel, this checkbox has no effect.

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 affect of the filter by mixing it with the source image.

PixelChooser Intensity controls the intensity of the PixelChooser (below). At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

Motion Tracker Parameter Group

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion path data to control another aspect of the effect. The parameters that can be affected depend upon the filter. For example, apply the Pyramid Blur filter to a clip and use the Motion Tracker parameters to track a logo on a t-shirt. Use the PixelChooser parameters to apply the blur to obscure the logo.

For more information on the Motion tracker parameter group, see “Working with the Motion Tracker Parameter Groups” on page 29.

PixelChooser Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Radial Blur Filter

The BCC Radial Blur filter creates a blur around a specific point, simulating the affect of a zooming or rotating camera. The Amount option specifies the amount of blur, depending on the selection for Type. For a Spin blur, which applies blurs in circles around the center point, the Amount value indicates the degree of rotation. For a Zoom blur, which applies blur that radiates out from the center point, the Amount value specifies the degree of radial blurring.

Original Image

Filtered Image

The BCC Radial Blur filter can also be used as a transition. To create a transition, use the BCC Radial Blur TR in the BCC Two-Input Effects or apply the filter to two layers. For details, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Blur Type menu** sets the type of motion blur that is created. The choices are ***Blur*** or ***Smear***. Smear blurs the pixels in one direction. Blur blurs the pixels symmetrically.

Center X and **Center Y** set the center of the radial blur, along the X and Y axis, respectively.

Center X=360, Center Y =243

Center X=775, Center Y=100

Blur Amount sets the amount of blur or smear that is applied to any moving pixels in the image. Positive values apply the blur or smear; negative values sharpen these pixels. The following example uses a Smear Blur Type.


Blur Amount=-50


Blur Amount=25


Blur Amount=75

When the Blur Type menu is set to Smear, **Smear Falloff** determines the falloff. Falloff is the transition between the smeared and unsmeared areas. At a value of 0, the Smear is fully applied; at a value of 100, the smear has no affect on the image. This is ideal for animating the smear. Smear Falloff is dimmed unless Smear is chosen as the Blur Type.


Smear Falloff=5


Smear Falloff=75

Blur Threshold reduces the amount of color changes to each pixel by the threshold amount. Increasing Blur Threshold causes the parts of the image with abrupt changes in color to blur, while areas with subtle details remain unchanged.

Maximum Deviation sets the maximum deviation (based on 8-bit color) allowed for any channel. Reducing this value limits the amount any color can change. This control becomes more noticeable at values below 30. Very small amounts of Max. Deviation can be useful (especially combines with the PixelChooser) to reduce noise in video and digital stills that contain noise in their dark areas.

The **Apply Mode menu** controls how the filtered image is composited with the source image. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect and the parameter does not appear. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode

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 affect of the filter by mixing it with the source image.

Motion Tracker Parameter Group

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion path data to control another aspect of the effect. The parameters that can be affected depend upon the filter. For example, apply the Radial Blur filter to a clip and use the Motion Tracker parameters to track a logo on a t-shirt. Use the PixelChooser parameters to apply the blur to obscure the logo.

For more information on the Motion tracker parameter group, see “Working with the Motion Tracker Parameter Groups” on page 29.

PixelChooser, Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. The Radial Blur includes one additional parameter.

PixelChooser Intensity controls the intensity of the PixelChooser (below). At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

The remaining PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC RGB Blend Filter

RGB Blend provides independent compositing of the source image's RGB channels with the Mix Layer's RGB Channels. The brightness and contrast of the composite can be adjusted independently for each channel.

The BCC RGB Blend filter can also be used as a transition. To create a transition, use the BCC RGB Blend TR in the BCC Two-Input Effects or apply the filter to two layers. For details, see "Applying BCC Effects as Transitions" on page 12.

For details on the common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, and "Working with the Geometrics Parameter Group" on page 24.

The **Mix menu** sets the layer that is composited with the original image. This layer is used without any filters.

Source image

Mix Layer

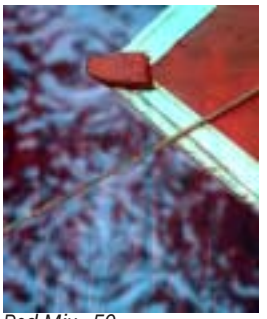
The **Order menu** determines the order of the two layers in the composite. ***Mix on Top*** composites the Mix layer over the filtered layer. ***Original on Top*** composites the original image over the Mix layer image.

If the **Lock Mix checkbox** is selected, adjusting Red Mix sets all the **Mix** parameters. Deselect this checkbox to adjust levels individually.

Red Mix, **Green Mix**, and **Blue Mix** adjust the mix of the source and Mix layer in each color channel. For example, if Red Mix is set to 0 and the Order menu is set to Mix on Top, the composited pixels use the values in the corresponding source pixels as their red values. If Red Mix is set to 50, the composited pixels use an average of the values in the corresponding source and Mix layer pixels as their red values. If Red Mix is 100, the composited pixels use the values in the corresponding Mix layer pixels as their red values. When Lock Mix is selected, the Red Mix value also sets the Green and Blue Mix values.

In the following examples, the Order menu is Mix on Top and the Green Mix and Blue Mix are set to 0.

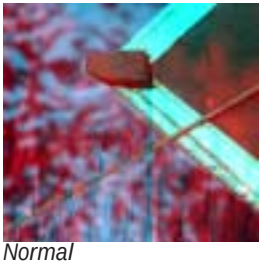

Red Mix=0

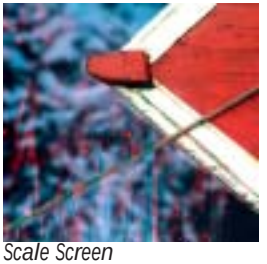

Red Mix=50


Red Mix=100

Alpha Mix determines how the source and Mix layer's alpha channels are mixed to produce a composite alpha channel. For example, if the Order menu is Mix on Top and Alpha Mix is 0, the source's alpha channel is used as the composite alpha. As the Alpha Mix value increases, the Mix layer's alpha channel is mixed with the source alpha to produce the composite alpha. At an Alpha Mix value of 50, the composite alpha is an equal mix of the source and Mix layer alpha channels. When Alpha Mix is 100, the Mix layer's alpha channel is used as the composite alpha.

The **Apply Mode menu** controls how the source and Mix Layers are composited. For descriptions of all the possible Apply Modes, see "Apply Modes" on page 625.


Normal


Scale Screen


Lightness

Apply Mix blends the Apply Mode setting with the **Mix From** setting. The resulting mixed mode is used to composite the Mix layer over the original source media. For example, if Apply Mode is set to ***Lighten*** and the Mix From menu is set to ***Normal***, then Apply Mix blends the Lighten and Normal apply modes. In this case, an Apply Mix setting of 0 uses the Normal apply mode, and an Apply Mix setting of 100 uses the Lighten apply mode. An Apply Mix setting of 50 blends the two apply modes equally.

You can use Apply Mix to soften the effect of a given apply mode, or to animate from one apply mode to another over time.

If the **Lock Brightness checkbox** is selected, the Red Brightness value is used for the Green and Blue Brightness values.

Red Brightness, Green Brightness, and **Blue Brightness** adjust the brightness of the corresponding output channels.

If the **Lock Contrast checkbox** is selected, the Red Contrast value is used for the Green and Blue Contrast values.

Red Contrast, Green Contrast, and **Blue Contrast** adjust the contrast of the corresponding output channels.

The **Mix Back** parameters allow you to quickly create transitions between the source layer, composite image, and Mix layer without having to adjust multiple parameters. When the **Enable Mix Back checkbox** is selected, the Mix Back settings are used. When Enable Mix Back is deselected, the Mix Back parameters have no affect.

The **Mix Back menu** determines which pixels are mixed.

- When ***Slider*** is chosen, all pixels are affected, and **Mix Back/Mix Back Min** determines how the pixels in the source and Mix layers are composited. If Mix Back is –100, the source layer is completely opaque. As Mix Back approaches 0, the composite image becomes increasingly opaque. At 0, the composite image is completely opaque. Increasing Mix Back above 0 makes the Mix layer increasingly opaque; at a value of 100, the Mix layer is completely opaque.
- When ***PixelChooser*** is chosen, pixels are mixed according to the PixelChooser. Pixel that are fully selected in the PixelChooser are mixed according to the **Mix Back Max** setting. Pixels that are fully unselected in the PixelChooser are mixed according to the **Mix Back/Mix Back Min** setting. Pixels that are partially selected are mixed to intermediate values between the Mix Back Min and Mix Back Max settings. Mix Back Min and Mix Back Max each work in the same way as the Mix Back parameter used when the Mix Back menu is set to Slider. If the Mix Back Min and Mix Back Max settings are the same, then the PixelChooser selection has no affect.
- When ***Original Alpha*** is chosen, the alpha channel in the source determines which pixels are selected. The source's alpha channel is not used for compositing–the source behaves like a fully opaque layer. Pixels that are fully opaque in the source alpha mix according to the **Mix Back Max** setting. Pixels that are fully transparent in the source alpha are mixed according the **Mix Back Min** setting. Pixels that are partially transparent in the source alpha mix to an intermediate value. Original Alpha lets you create mattes for the Mix Back parameters by altering the source's alpha channel.

The Mix Back, Mix Back Min, and Mix Back Max values are scaled by the Mix in Front value. Therefore, if Mix in Front is at a value less than 100, the Mix layer never reaches full opacity, even if Mix Back or Mix Back Max is at 100. The range of opacities also varies according to the Apply Mode settings.

The PixelChooser controls are described in detail in "The PixelChooser" on page 603.

Working with the BCC Safe Colors Filter

The BCC Safe Colors filter prevents clips from having saturation values that exceed the legal limits of broadcast standards. Use this filter to limit the values that are present in the image.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **View Mode menu** lets you view the pixels in the image that are affected by the filter.

- **Final Output** displays the final rendered effect.
- **Zebra Pattern** displays the image with a cross-hatch zebra pattern overlay where pixel values are outside of the legal broadcast limits (as determined by the filter parameters.) Note that the zebra pattern animates only when playing the timeline.
- **Clipped Pixels** displays the image with red values superimposed over areas that are not within the legal broadcast limit (as determined by the filter parameters.) The blue/green pixels are unaffected by the filter. If you view only the red channel, the affected pixels display as a mask. To view only the red channel, set the **Channels menu** in the General Controls parameter group to ***Red***.

Saturation Rolloff Limit sets the starting value of the saturation values that are outside of the legal broadcast limit as determined by the filter parameters. This parameter sets the lower limit of pixels that are affected.

Saturation Limit sets the absolute ceiling for color saturation. Reducing this parameter reduces the saturation in the final output. Only the pixels that exceed the Saturation Rolloff Limit are affected. Saturation values are mapped linearly into the range between the Saturation Rolloff Limit and the Saturation Limit (the upper limit). If the two limits are the same value, it just hard-clips the saturation. As the lower limit is reduced, the filter starts soft-clipping the saturation.

If you choose Clipped Pixels in the View Mode menu, the red channel indicates how much the pixel's saturation is scaled. A nonzero value indicates how much the pixel's saturation is reduced. For example, a red channel value of 64 would correspond to reducing the saturation by 1/4 (multiplying it by .75), while a value of 128 indicates that the saturation was reduced by 1/2. 255 would indicate that the saturation was completely removed (reduced by 1), producing a monochrome image.

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 affect of the filter by mixing it with the source image.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Spiral Blur Filter

The BCC Spiral Blur filter creates a blur or smear that appears as though it is spiraling toward the center of the image.

Original Image

Filtered Image

The BCC Spiral Blur filter can also be used as a transition. To create a transition, use the BCC Spiral Blur TR in the BCC Two-Input Effects or apply the filter to two layers. For details, see "Applying BCC Effects as Transitions" on page 12.

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24, "Working with the Drop Shadow Parameter Group" on page 25 and "Working with the Motion Tracker Parameter Groups" on page 29.

The **Blur Type menu** sets the type of motion blur that is created. The choices are ***Blur*** or ***Smear***. Smear blurs the pixels in one direction. Blur blurs the pixels symmetrically.

Center X and **Center Y** set the center of the spiral effect, along the X and Y axis. The following example shows a Zoom Amount of 25 applied as a Smear, with no Spin Angle.

Center X=440, Center Y=110

Center X=59, Center Y=97

Spin Angle sets the angle of the spiral effect. When Spin Angle is set to 0, no spiral is applied. The following examples show the first image above with Spin Angle applied.


Spin Angle=-5


Spin Angle=10


Spin Angle=20

Zoom Amount sets the direction of the zoom. Negative values zoom the pixels away from the viewer while positive values move the pixels towards the viewer. Animate this control to create a zooming in or out effect.

When Smear is chosen as the Blur Type, **Spin Smear Falloff** sets the degree of falloff for the spin. Falloff is the transition between the smeared and unsmeared areas. A value of 0 creates an effect where the smearing is visible over the entire image; at a value of 100 no spiral is applied. Spin Smear Falloff is dimmed unless Smear is chosen from the Blur Type menu.


Spin Smear Falloff=1


Spin Smear Falloff=100

When Smear is chosen as the Blur Type, **Zoom Smear Falloff** sets the degree of falloff for the zoom. Falloff is the transition between the smeared and unsmeared areas. A value of 0 creates an effect where the smearing is visible over the entire image; at a value of 100 no spiral is applied. Spin Smear Falloff is dimmed unless Smear is chosen from the Blur Type menu.

Blur Threshold reduces the amount of color changes to each pixel by the threshold amount. Increasing Blur Threshold causes the parts of the image with abrupt changes in color to blur, while areas with subtle details remain unchanged.

The **Maximum Deviation** parameter sets the maximum deviation (based on 8-bit color) allowed for any channel. Reducing this value limits the amount any color can change. This control becomes more noticeable at values below 30. Very small amounts of Max. Deviation can be useful (especially combines with the PixelChooser) to reduce noise in video and digital stills that contain noise in their dark areas.

The **Apply Mode menu** controls how the filtered image is composited with the source image.

For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect and the parameter does not appear. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode

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 affect of the filter by mixing it with the source image.

Motion Tracker Parameter Group

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion path data to control another aspect of the effect. The parameters that can be affected depend upon the filter. For example, apply the Spiral Blur filter to a clip and use the Motion Tracker parameters to track a logo on a t-shirt. Use the PixelChooser parameters to apply the blur to obscure the logo.

For more information on the Motion tracker parameter group, see “Working with the Motion Tracker Parameter Groups” on page 29.

PixelChooser Region and Matte Parameter Groups

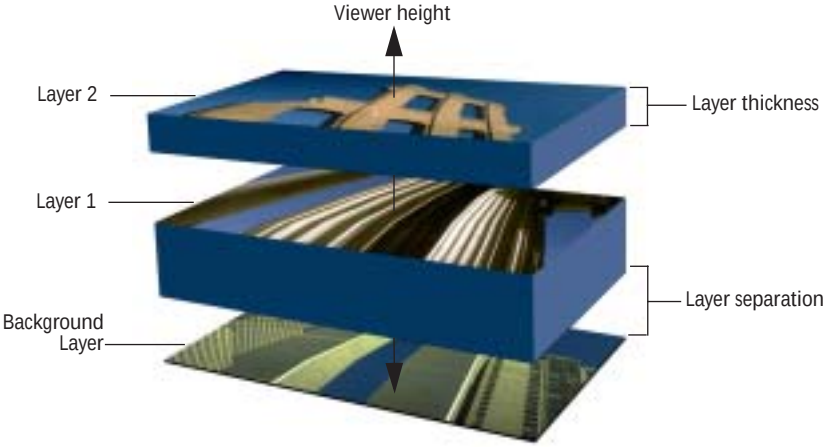
The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. The Spiral Blur includes one additional PixelChooser parameter.

PixelChooser Intensity controls the intensity of the PixelChooser. At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

The remaining PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Super Blend Filter

Super Blend is a compositing filter that allows you to superimpose up to five layers, then adjust and animate the view through each layer. If you imagine the effect as a series of layers of paint applied to a background layer, Super Blend lets you move in and out of the effect by adjusting the distance between the viewer's eye and the background, the thickness of the layers, and the distance separating each layer. This filter also offers a PixelChooser for greater creative control.



The BCC Super Blend can also be used as a transition. To apply create a transition, use the BCC Super Blend TR in the BCC Two-Input Effects or apply the filter to two layers. For details, see "Applying BCC Effects as Transitions" on page 12.

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

Viewer Height sets the distance between the viewer's eye and the background. At the default value of 0, the viewer is placed just above the background layer and below all other layers. Thus only the background layer is visible. As Viewer Height increases, the viewer's eye moves through each successive layer. At a value of 100, only the top layer is visible.

Selecting the **Normalize Height checkbox** scales the Viewer Height by the sum of the Layer Separation and Layer Thickness (see "Layer 1-5 Parameter Groups" below) values for all active layers so that the total height of the effect equals 100 units. If Normalize Height is deselected, then the Viewer Height is measured in the same absolute units as Layer Separation and Layer Thickness, and the total height of the effect may be taller or shorter than 100 units.

For example, when Normalize Height is selected, a Viewer Height of 100 always places the viewer immediately above the top layer. When Normalize Height is deselected, a Viewer Height value of 100 does not necessarily place the viewer above the top layer. Instead, the location of the viewer in relation to the layers depends on the number of layers, the distance between the individual layers, and the thickness of each layer.

The **Background menu** controls the appearance of the background layer. ***Source Layer*** uses the layer to which Super Blend is applied. ***Transparent*** makes a transparent background.

Layer 1-5 Parameter Groups

Select the **Layer On checkbox** to include the corresponding layer in the effect. Leave this option deselected to exclude the layer from the effect.

The **Source menu** allows you to select any layer in your timeline to use as the corresponding Layer.

Separation Layer sets the vertical distance between Layer and the layer below. For example, if Separation Layer 1 is 10, when Viewer Height is 10 or less, the Background Layer is visible. When Viewer Height is greater than 10, Layer 1 is visible.

Opacity Layer scales the opacity of the layer. At an Opacity Layer value of 100, the layer is completely opaque. At a value of 0, the Layer is completely transparent.

Thickness Layer determines the thickness of the corresponding Layer. For example, if Thickness Layer 1 is 5 and Separation Layer 1 is 10, when Viewer Height is 10 or less the background is visible. When Viewer Height is between 10 and 15, the viewer is “inside” Layer 1. The opacity of the layer increases as the Viewer Height approaches 15. When Viewer Height is greater than 15, Layer 1 is fully visible and its opacity is determined solely by the Opacity Layer 1 setting.

Apply Mode menu controls how the Layer is composited with the layers below. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix Layer controls the mix of the specified Apply Mode Layer with the ***Normal*** apply mode. If the Apply Mode Layer is Normal, Apply Mix Layer has no affect. If Apply Mix Layer is 0, Apply Mode Layer 1 has no affect. Increase Apply Mix Layer 1 to blend the Apply Mode Layer 1 setting with the Normal apply mode.

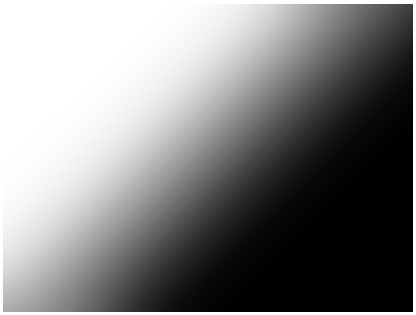
The Layer 2-5 Parameters function in the same manner as the Layer 1 parameters, but apply to the additional layers in the effect.

Height Maps Parameter Group

The Height Maps parameters allow you to apply up to three independent height maps to vary the viewer’s height from point to point in the image. You can choose a different source layer for each height map. The filter uses the source map layer’s alpha, luma, or color channels to determine the viewer height for each pixel in the composite.

For example, this image shows the relative height of each source layer before height maps are applied.

This gradient is applied as a Height Map Layer, and its luma channel used as the Map Channel.



Higher luma channel values (white areas) in the Map Layer place the viewer's eye higher in the composite. Lower luma values (black areas) place the viewer's eye lower in the composite.

The Height Maps control only the relative viewer height across the image, meaning you can still move Viewer Height up and down to adjust how much of each layer is visible in the composite. For example, increasing Viewer Height displays more of the topmost image (Layer 3) and none of the bottom-most image (Layer 1).

Select the **Use Height Maps checkbox** to turn the height maps on and enable the height map controls.

Select the **Mask with Height Maps checkbox** to mask the output of the filter with a composite of the alpha channels in all three height maps.

The **Source 1 menu** sets which layer is used to generate Map 1. If ***None*** is chosen, the map is not used, and the other Map 1 parameters have no affect.

The **Channel 1 menu** chooses which channel in the Source 1 Map is used to create Map 1.

If Luma or one of the RGB color channels is chosen, the height offsets in the map are scaled by the alpha values in the Source 1 Map layer.

The height map is created by comparing each pixel's Channel 1 menu value and the **Reference menu** value. The difference between the values in each pixel scales the Viewer Height at that pixel.

- When Reference is ***Black***, each pixel's channel value is compared to a value of 0. In this case, the channel values directly scale the Viewer Height.
- When Reference is ***Gray***, 128 is subtracted from each pixel's channel value, and the Viewer Height is scaled by the result.
- When Reference is ***White***, each pixel's channel value is subtracted from 255, and the Viewer Height is scaled by the result.

Amount Map 1 determines the direction and amount of displacement applied equally to all height values in the map. Positive values increase the Viewer Height, while negative values decrease the Viewer Height.

The remaining controls in this section adjust **Map 2** and **Map 3**. These parameters function identically to the corresponding Map 1 controls described above.

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 PixelChooser controls are described in detail in "The PixelChooser" on page 603.

Working with the BCC Tritone Filter

Tritone creates a toned image from the source image's luma channel or any of its RGB channels. The Input Channel maps to a color range that goes from the Black Color to the Middle Color to the White Color. The default Tritone uses the source's luma channel as the Input Channel to produce an image that is black where the source is black, white where the source is white, and blue-toned in the gray regions.

Source image

Filtered image

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

Black Color, Midpoint Color and White Color Parameter Groups

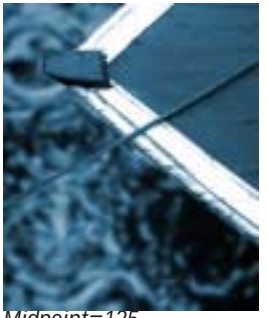
Black Color sets the output color for pixels whose Input Channel value is 0.

Midpoint Color sets the output color for pixels whose Input Channel value is equal to the Midpoint value. When the **Use Midpoint Color checkbox** is selected, the Midpoint Color is used, creating a tritone effect. When this option is deselected, a tint is created.

White Color sets the output color for pixels whose Input Channel value is 255.

Midpoint sets the Input Channel value for which the chosen Middle Color is output. The output color for pixels whose Input Channel value is less than Midpoint value is between the Black and Midpoint Colors. The output color for pixels whose Input Channel value is greater than Midpoint value is between the Midpoint and White Colors.


Midpoint=50


Midpoint=125

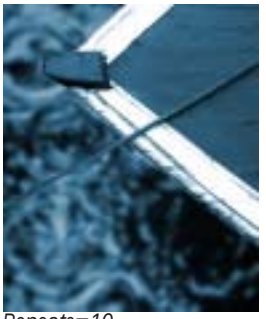

Midpoint=200

The **Input Channel menu** sets which channel is used as the source for the toned image.

The **Output Channels menu** sets the channels in the image that are processed by the filter. Use ***RGB*** for a normal toning effect, or experiment with other settings for more extreme color effects.

Repeats changes the mapping from input to output. You can use Loops to create effects that combine toning with a solarized look.

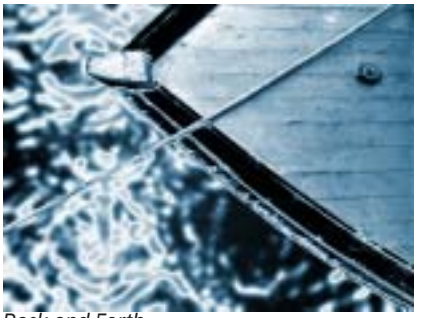
The default Repeats value of 10 produces a normal toned image: black pixels are output as the Black Color, Midpoint pixels as the Middle Color, and white pixels as the White Color. Increasing the Repeats value causes the map to repeat. The output color for black input pixels is still the Black Color, but the color reaches white faster and then repeats. Increase this value to 20 to produce a solarized and toned effect, and increase it further to produce more extreme effects. Decrease it to fade the output toward the Black Color.


Repeats=10


Repeats=20


Repeats=40

The **Repeat Mode menu** controls the type of map loop. ***Back and Forth*** causes the map to go from black to white to black to white. ***Jump*** causes the map to go from black to white and jump back to black. Jump almost always produces a very chaotic image.



Back and Forth

Jump

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 PixelChooser control**s** are described in detail in “The PixelChooser” on page 603.

Working with the BCC Unsharp Mask Filter

The Unsharp Mask filter uses a classic image sharpening technique similar to the method used to sharpen film images. The source image is blurred, and the blurred image is then subtracted from the source. The resulting image is sharper and has more contrast. Unsharp Mask sharpens areas in an image with significant color changes by adjusting the contrast of edge details to create the illusion of image sharpness. This filter is useful for refocusing an image that appears blurry due to scanning, poor lighting, or other factors.

Source image

Filtered image

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Radius sets the radius of the intermediate blur that is subtracted in order to produce the sharpened image. Increasing the Radius of the blur sharpens the image to a greater degree and creates more contrast. Extreme settings can create artificial halos around image details.

Radius=50

Radius=100

Amount controls the amount of blur applied to the image in the sharpening process. Increasing the Amount value increases sharpness.

Amount=25

Amount=100

Threshold reduces the change in each pixel by a set value between 0 and 255. Pixels whose value would change by less than the threshold setting are not changed at all.

The **Output Channels menu** specifies which channels are processed by the filter. You can blur all four channels (***RGBA***), just the ***RGB*** channels, just the ***Alpha*** channel, or any combination of the ***Red***, ***Green***, and ***Blue*** channels.

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

Unsharp Mask's PixelChooser has one additional parameter, the **Controls menu**. This menu determines whether the PixelChooser scales back the effect by reducing ***Amount***, increasing ***Threshold***, or both ***Amount & Threshold***. For more information on the PixelChooser, see"The PixelChooser" on page 603.

Working with the BCC Z-Blur Filter

Use the BCC Z-Blur filter with a Z-map image to emulate a rack focus effect. Move the focal plane through the source image, using the Z-map to control the focus. Adjust the focal point, depth of field and blur parameters to finetune the area of the image to blur.

You can also set a channel from the image clip, then use that channel to control the z-blur effect. This type of effect is most noticeable in real life with a long focal lens, such as a 105mm or greater zoom lens.

Use a Z-map image that has bright pixels where the image pixels are close, and dark pixels where the image pixels are far away, or vice versa. You can invert the Z-Map using the Invert Z Channel checkbox.

The following source image and Z-map are used in the examples in this section.

Source image

Z-map image

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **View menu** lets you display either the final render or the mask that defines the focus field.

- Choose ***Normal*** to view the final render.
- ***Focus*** displays only the areas of the image that are in focus. Focus is determined by the Depth of Field and Focal Point parameters.

Normal View

Focus View

Use the **Blur Type menu** to choose the type of blur to apply. The choices are ***Faster*** or ***Smoother***. Smoother uses a different blur algorithm which produces a better looking result but takes twice as long to render.

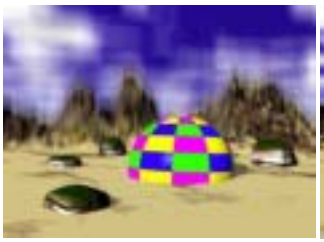
Use the **Z Layer menu** to assign the media that is used to create the depth map. The choices are ***None, Filtered Layer, 1st Below*** or ***2nd Below***.

You must assign media to the **Use Z Layer menu** to see any result from the filter. The default media assigned to the Z Layer track in the timeline is ***None***, not the filtered track.

The **Z Channel menu** sets the channel to use for the depth map. Choose ***R***, ***G***, ***B***, ***A***, ***Luminance*** or ***Brightness***. ***Luminance*** adjusts the tonal values in the image without affecting the hues. It can also be useful in retaining sharpness in the image which Brightness can reduce. ***Brightness*** adjusts the tonal values in the image, but it also affects the hues.

Max Blur sets the maximum amount of blur to apply to the image. When Max Blur is set to 0, no blur is applied to the image.

Blur Aspect Ratio controls the aspect ratio of the blur. Positive values produce a horizontal blur and negative values create a vertical blur. In the example below the clouds are blurred.



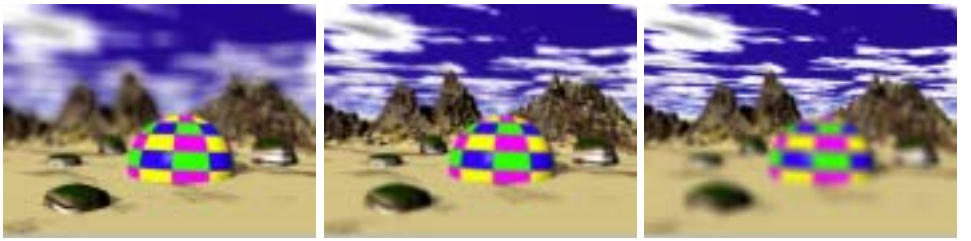
Blur Aspect Ratio=-1

Blur Aspect Ratio=0

Blur Aspect Ratio=1

Focal Point determines the center point of focus along the focal plane. Animate the Focal Point parameter to shift the positioning of the focal mask. The examples below show the same Z-Blur effect, but the second set of images shows the focus view, and indicates that the focus shifts from the foreground (ball) to the sky (background).

Normal View



Focal Point=1 *Focal Point=60* *Focal Point=100*

Focus View

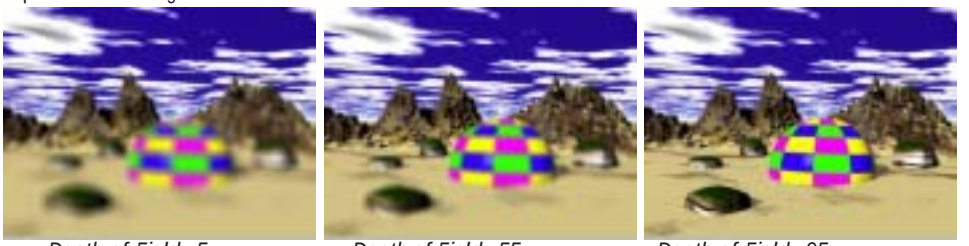
Focal Point=3 *Focal Point=60* *Focal Point=100*

Depth of Field determines the areas of the image that blur. Increasing Depth of Field decreases the amount of the image that blurs. The examples below show the same Z-Blur effect. The first set of images shows the difference in Depth of Field with a Focal Point of 5, and the second set of images shows the difference in Depth of Field with a Focal Point of 5. As the depth of field increases, the entire image becomes more in focus.

Depth of Field change with Narrow Focal Point

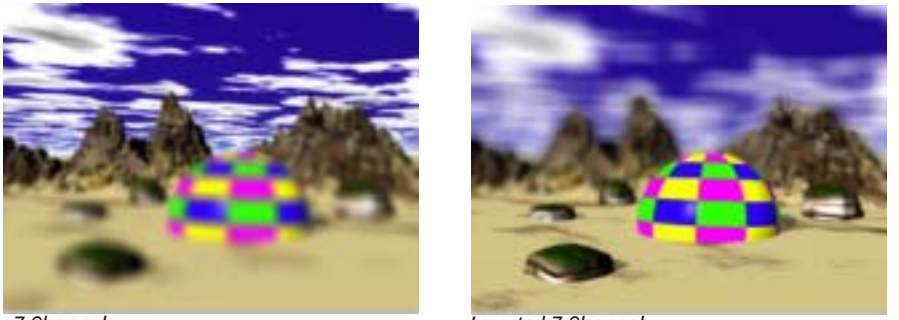
Depth of Field=5 *Depth of Field=35* *Depth of Field=95*

Depth of Field change with Wide Focal Point



Depth of Field=5 *Depth of Field=55* *Depth of Field=95*

The **Invert Z Channel checkbox** inverts the mask you assigned to the Z Layer track in the timeline. The following example shows Luminance as the Z Channel.



Z Channel *Inverted Z Channel*

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 affect of the filter by mixing it with the source image.

PixelChooser Intensity controls the intensity of the PixelChooser (below). At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

PixelChooser Region and Matte Parameter Groups

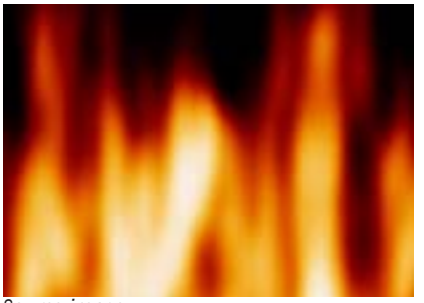
The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Chapter 3
Distortion & Perspective Filters

Working with the BCC 2D Particles Filter

2D Particles breaks the source image into particles and disperses them in 2D space. This filter also provides a variety of explosion, velocity, and gravity controls to adjust the particles movement. You can also control the size, shape, density, and opacity of the particles, and create custom particle shapes and scatter wipes. Use the auto-animation feature to easily generate explosion effects, or animate the filter manually for precise control.



Source image

Filtered image

The BCC 2D Particles can also be used as a transition. To create a transition, use the BCC 2D Particles TR in the BCC Two-Input Effects category or apply the filter to two layers. For information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, and “Working with the Drop Shadow Parameter Group” on page 25.

Scatter (initial) determines the initial position of the scattered image. At the default of 0, the image appears as if it is not initially scattered, which is ideal for creating transitions from one image to another. Negative Scatter values do not scatter the image, but are useful if you animate Scatter and want the image unaffected for a longer period of time. This parameter only applies when the Automate menu is set to Manual.

Scatter=0

Scatter=50

Scatter=200

The **Automate menu** controls the speed and direction in which the filter auto-animates. The choices are ***Manual***; ***Fast***, ***Medium***, or ***Slow Forward***; and ***Fast***, ***Medium***, or ***Slow Reverse***. The Forward options create an effect that shatters the initial image and disperses it, revealing a new image; whereas the Reverse options cause pieces to fly onto the screen to form the transition image. For more precise control over the animation of the effect, choose Manual. This allows you to use the Scatter setting as your time value directly, and animate it forwards, backwards, or both using keyframes.

The **Particle X menu** provides a multiplication factor for Grid Spacing (see page 126) that determines the order of magnitude of the grid spacing. For example, if Grid Spacing is set to 15 and Particle X is set to ***100***, the image breaks into 1500 particles. As the number of particles increases, the size of each individual particle decreases.


Particle X=1


Particle X=10


Particle X=100

Rendering time is directly proportional to the number of particles. If you use a high Particle X value, select the **Draft Mode checkbox** in the General Controls parameter group to speed your previews. Deselect this checkbox before rendering.

The **Explosion menu** controls the animation style of the explosion.

- ***Burst*** creates a fast initial burst, then particles slow down.
- ***Soft Burst*** creates a slower initial burst, then particles slow down.
- ***Constant*** causes particles to disperse at a constant speed.
- ***Soft Acceleration*** causes particles to move slowly at first, then gradually accelerate.
- ***Acceleration*** causes particles to move slowly at first, then quickly accelerate.

Speed determines the velocity of the particles.

Custom Shape Parameter Group

The controls in this group allow you to choose a particle shape by using the alpha or color information from another layer in your timeline to create a custom shape.

The **Shape Image menu** chooses the layer in the timeline used to create the custom shape.

The **Shape Use menu** determines how the Shape Image layer is used to create the shape. Choose ***Alpha***, ***Inverted Alpha***, ***Color***, or ***Inverted Color***. Alpha and Inverted Alpha use the alpha channel information to determine the particle shape. Color and Inverted Color use the color information to determine the particle shape.

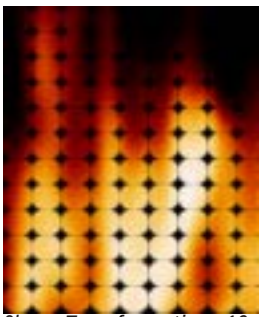

Shape Use=Alpha

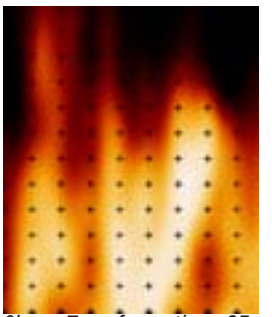

Shape Use=Inverted Alpha

The **Shape Size menu** determines how the Shape Image media is scaled in creating the particles. ***Larger*** means that the custom shape size is greater than or equal to the original particle size, ***Smaller*** means that it is less than or equal to the original particle size, and ***Conform to Particle*** means it is scaled to the size of the original Shape Image media from which the particles are made.

Shape Transformation is a manually animatable choking control that transforms each particle into a rectangle. At a Shape Transformation value of 0, the particles are unaffected and conform to the custom shape. At a value of 100, the particles are completely rectangular. This parameter is useful for creating smooth transitions in which the original image splits into rectangles which then transform into the custom shape. In the examples below, the custom shape is a circle, and the image is unscattered.


Shape Transformation=0


Shape Transformation=10


Shape Transformation=25

When the **Save Unscattered checkbox** is selected, unscattered particles do not break up the image when using custom shapes.

The **Type menu** sets how the animation of the Shape Image affects the particle shape.

- When ***Animate Shapes*** is chosen, the custom shape animates along with the source Shape Image layer.
- ***Random Frames*** chooses the first few frames of the custom shape image and randomly distributes those shapes among the particles. When Random Frames is chosen, **Shape Frame Count** determines the number of frames selected from the Shape Image layer. **Shape Random Seed** sets which value is input to the random number generator used by the filter to determine which Shape Image layer frame is used for each output frame.

Adjust **Resample Quality** to maximize the quality and/or minimize the render time and memory requirement of custom shape effects. Resample Quality places a limit on how large the particles become before losing quality. A setting of 10 means particles can become as large as the original custom shape image, and 5 means they can become half as large.

If your particles are relatively small, you can use a fairly low Resample Quality value without a noticeable loss of image quality while significantly decreasing rendering time.

If you select the **Optimize Resample checkbox**, the filter automatically performs Resample Quality adjustments for you.

Scatter Wipe Parameter Group

The Scatter Wipe parameters allow you to shatter images in a wipe-like fashion, and to control the rate and direction in which particles break off and disperse. You can either wipe the particles in a single direction or use a custom gradient to determine how the image breaks into particles.

In the **Wipe menu**, choose between ***Off, On, Pass Through*** and ***Random***.

- With ***Off*** chosen, no wipe takes place (unless you set up a Custom Gradient).
- With ***On*** chosen, the particles wipe across in the pattern designated by the Wipe Custom Gradient (see below).
- ***Pass Through*** is similar to On, except that the particles begin at a negative Scatter value rather than a value of 0. Particles come together along the edge of the wipe, then fall apart again as the wipe passes across the screen. This creates an effect which looks like a line that forms and dissipates the image as the line moves across the screen.
- With ***Random Wipe*** chosen, the particles break off randomly across the screen.

The **Custom Gradient menu** allows you to choose a layer in your timeline to use as the wipe gradient. Regions in the image corresponding to the darkest areas in the gradient break up first, followed by increasingly lighter areas. If ***None*** is chosen, the wipe moves across the screen in a straight line. The direction of the line is determined by **Wipe Angle**.

The **Invert Gradient checkbox** inverts the luma or alpha values in the custom wipe gradient, thereby reversing the scatter wipe pattern.

Wipe Speed adjusts the speed of the wipe by determining the Scatter value at which the whole image is broken in particles. For a faster wipe, decrease Wipe Speed. For a more gradual wipe, increase Wipe Speed.

Regardless of the particles' Speed setting, a low Wipe Speed value wipes the image quickly, and a high Wipe Speed value wipes the image slowly. With high-speed particles and a low-speed wipe, the image unravels slowly, but each particle flies away from the image extremely quickly. With slow particles and a fast wipe, the image breaks up quickly, but the particles then slowly drift off the screen.

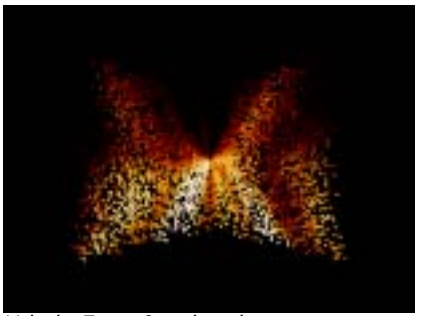
Move Parameter Group

The Move parameters adjust the particles' movement.

The **Velocity menu** determines which movement pattern the particles follow.

- ***Random*** moves the particles in random directions as they disperse.
- ***Straight*** moves the particles in a straight line. Use the **Velocity Angle** control to set the angle between this line and the horizontal axis.
- ***Centripetal*** moves the particles toward the center point. Use the **Center of Velocity** position controls to set the center point.
- ***Centrifugal*** moves the particles away from the center point. Use the **Center of Velocity** position controls to set the center point.
- ***Spiral CW*** moves the particles in a clockwise spiral around the center point. Use the **Center of Velocity** position controls to set the center point.
- ***Spiral CCW*** moves the particles in a counter-clockwise spiral around the center point. Use the **Center of Velocity** position controls to set the center point.

Velocity Type=Spiral CW



Velocity Type=Centripetal

Variance sets the range of different particle speeds that can appear in the effect. A Variance of 0 synchronizes the particles. A larger Variance value increasingly randomizes particle speeds.

Adjustment behaves differently depending on which Velocity you are using.

- In Random and Straight modes, Adjustment works as a variance control on the particle direction. By animating Adjustment, you can make the particles swerve or change course.
- In Spiral CW and Spiral CCW modes, Adjustment determines the strength of the spiral. Increasing this value makes the particles spiral much faster, while decreasing this value makes them spiral more slowly.
- In Centripetal and Centrifugal modes, Adjustment has no affect.

Center of Velocity sets the horizontal and vertical coordinates of the center point from, toward, or around which the particles move when Velocity Type is set to Centripetal, Centrifugal, Spiral CW, or Spiral CCW.

Velocity Radius sets the radius of the particle system when Velocity Type is set to Centripetal, Centrifugal, Spiral CW, or Spiral CCW.

When Velocity is set to Centripetal, the **Stop at Center checkbox** determines what happens when particles reach the center point. If Stop at Center is selected, particles move into the center of the image and disappear when they reach the center point. If this option is deselected, the particles pass through the center and continue through to the back side, creating an implosion effect.

Gravity Parameter Group

The Gravity controls apply a simulated gravitational force to the velocity of the particles.

Gravity applies a secondary force to the particles' movement in addition to their normal velocities. A small amount of Gravity can often help make an effect look more natural by creating more parabolic movement.

The **Gravity menu is** similar to Velocity except that Gravity is applied as acceleration rather than as direct movement.

- ***Random*** applies a random gravitational pull to the particles.
- ***Straight*** is the most "natural" type of gravity because it exerts a straight downward pull on the particles. You can pull the gravity in any direction by adjusting the **Gravity Angle** control, which can be used to simulate wind.
- ***Centripetal*** applies gravity that pulls particles away from the point defined by the **Center of Gravity** position controls.
- ***Centrifugal*** pulls particles away from the point defined by **Center of Gravity** position controls.

Options Parameter Group

The Options parameters affect particle density, position, size and behavior.

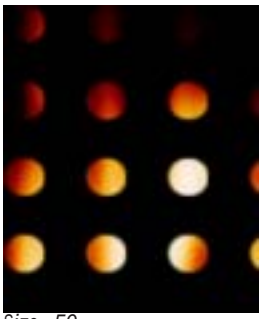
Grid Spacing works in conjunction with Particle X (see page 121) to determine the number of particles created from the image. Higher values make the grid resolution greater, generating a larger number of smaller particles; while lower values generate a smaller number of larger particles. The Grid Spacing value is multiplied by the Particle X value to determine the total number of particles.

Density controls the density of the particles in relation to each other. Low Density values spread the particles farther apart; high values pack the particles more closely together.

Position Variance varies the positions of each particle. Increase this setting to create a more random particle arrangement.

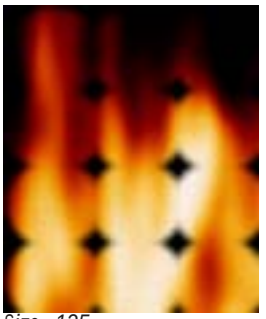
At any Position Variance value greater than 0, the unscattered image has some scattered particles, creating holes in the source image. Animate Position Variance along with Scatter to avoid this problem.

Size adjusts the size of the particles without affecting the grid spacing or the number of particles. At the default setting of 100, the image splits into the number of particles determined by the Particle X and Grid Spacing settings. If you increase Size, each particle maintains its original position in the grid but increases in size, so that the image fragments overlap in the unscattered image. Conversely, if you decrease Size, the unscattered particles maintain their positions but do not fill the screen.



Size=50

Size=100



Size=125

Size Variance varies the size of the particles by scaling them to 100% of their original size plus the Size Variance value. For example, the default setting of 0 creates particles that are 100% of their original size (that is, the particle size does not change). A Size Variance of 50 produces particles that range up to 150% of their original size, and a value of –50 creates particles that range down to 50% of their original size.

XY Ratio determines the aspect ratio of the particle grid. Setting this parameter to a positive value creates tall thin particles, while negative values create wide flat particles.


XY Ratio=10,000

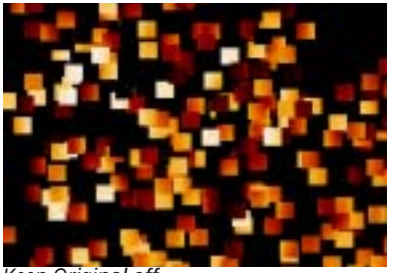

XY Ratio= –10,000

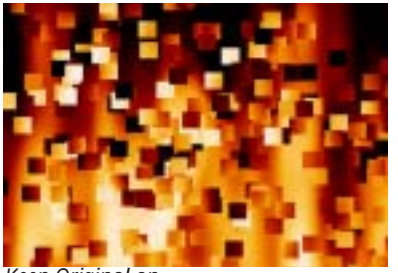
Opacity scales the transparency level of all the particles.

Opacity Variance varies the opacity of the particles. If you want the particles to change from completely opaque to completely transparent as the effect progresses, animate Opacity from 100 to 0, and set Opacity Variance to 0. If Opacity Variance is set to any value other than 0, some visible particles are at an Opacity value of 0, and some particles are transparent at an Opacity value of 100.

The **Process menu** determines which channels in the source image are processed. The default setting, ***All***, processes all four channels. You can also choose to process ***Alpha Only***, ***Red Only***, ***Green Only***, or ***Blue Only***.

When the **Keep Original checkbox** is selected, the original image appears behind the particles so that they reveal the image behind them, rather than creating an alpha channel.

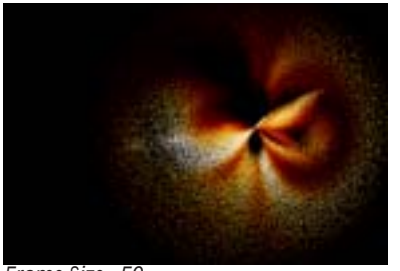

Keep Original off


Keep Original on

Random Seed determines which value is input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to alter the random configuration of the particles.

Frame Size scales the entire effect toward or away from the velocity center point. This is useful for making sure that all the particles are visible within a given frame.

Frame Size=100



Frame Size=50

The **Z-Order menu** determines where in space the particles fall away.

- ***Normal*** causes particles that break up first to fall in front of the rest of the image.
- ***Reversed*** causes these particles to fall behind the rest of the image.
- ***Random*** creates effects in which the particles randomly fall in front of or behind the other particles.

Select the **Wall Bounce checkbox** to prevent particles from leaving the frame. Particles that approach the edges of the frame "bounce" and continue to drift.

Parameters such as Size and Position Variance affect the initial (unscattered) image. **Parameter Suppression** allows you to animate all these parameters at once. To animate from an unscattered image to a scattered image that uses these parameters, set a keyframe with a Parameter Suppression value of 100 at the start of the effect, and animate the value to 0. This suppresses the parameters that affect the unscattered image at the start of the effect.

Working with the BCC 3D Extruded Image Shatter Filter

3D Extruded Image Shatter shatters the image in 3D space and disperses the image fragments. Unlike the 3D Image Shatter filter, this filter allows you to create three-dimensional particles with adjustable extrusions.

The filter provides a variety of explosion, velocity, and gravity parameters to control particle movement. In addition, 3D Extruded Image Shatter allows you to control the particle size, rotation, opacity, lighting, and explosion style. This filter auto-animates by default, but you can manually animate it for more precise control over the movement of the particles.

3D Extruded Image Shatter effect

Original image

Filtered image

You must have a supported OpenGL card and driver to use the BCC 3D Extruded Image Shatter filter. For information on supported configurations, see the ***Understanding OpenGL PDF*** on your Boris CD.

The BCC 3D Extruded Image Shatter can also be used as a transition. To create a transition, use the BCC 3D Extruded Image ShatterTR in the BCC Two-Input Effects category or apply the filter to two layers. For information, see "Applying BCC Effects as Transitions" on page 12.

For details on the common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, and "Working with the Drop Shadow Parameter Group" on page 25.

The **Particle X menu** provides a multiplication factor for Grid Spacing (see "Shatter Parameter Group" on page 133) that determines the number of particles. For example, if Grid Spacing is ***15*** and Particle X is ***100***, the image breaks into 1500 particles. As the number of particles increases, the size of each individual particle decreases.

Rendering time is directly proportional to the number of particles. If you use a high Particle X value, you might want to work in Draft Mode to speed your previews.

The **Automate Scatter menu** controls the speed and direction in which the filter auto-animates. The choices are ***Manual***, ***Fast Forward***, ***Medium Forward***, ***Slow Forward***, ***Fast Reverse***, ***Medium Reverse***, or ***Slow Reverse***. The Forward options create an effect that shatters the initial image and disperses it, revealing a new image; whereas the Reverse

options cause pieces to fly onto the screen to form the transition image. For more precise control over the animation of the effect, choose Manual. This allows you to use the Scatter Adjust setting directly, and animate it forwards, backwards, or both using keyframes.

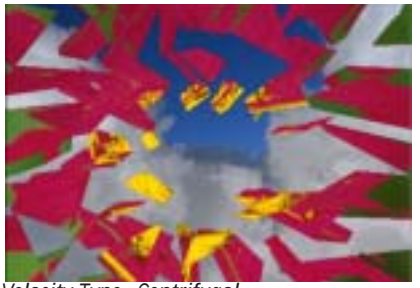
Scatter Adjust determines the initial position of the scattered image. At the default of 0, the image appears as if it is not scattered, which is ideal for creating transitions from one complete image to another. Negative Scatter values do not scatter the image, but are useful if you animate Scatter and want the image to appear unaffected for a longer period of time. This parameter only applies when the Automate Scatter menu is set to Manual.

Movement Parameter Group

These parameters adjust the particles' movement.

The **Velocity Direction menu** controls the pattern of movement the particles follow.

- ***Random*** moves the particles in random directions as they disperse.
- ***Straight*** moves the particles in a straight line along **Gravity** angle.
- ***Centripetal*** moves the particles toward the center point determined by **Position XY** in the System parameter group.
- ***Centrifugal*** moves the particles away from the center point.
- ***Spiral CW*** moves the particles in a clockwise spiral around the center point.
- ***Spiral CCW*** moves the particles in a counter-clockwise spiral around the center point.
- ***No Movement*** makes the particles rotate but not change position.



Velocity Type=Centrifugal

Velocity Type=Straight

Init. Velocity determines the initial speed of the particles. A high Initial Velocity gives particles more momentum as they leave the source, meaning that they travel farther in the initial direction before they decay or are affected by factors such as Gravity or Chaos Wind. At the default values, the particles leave a point and move up until gravity pulls them down. Increasing Initial Velocity allows the particles to achieve more height before falling. Decreasing Initial Velocity gives the particles less momentum, so they fall more quickly.

Velocity Radius sets the radius of the particle system when the Velocity Direction menu is set to Centripetal, Centrifugal, Spiral CW, or Spiral CCW.

Velocity Adjustment behaves differently depending on the Velocity Direction menu setting.

- In Random and Straight modes, Adjustment works as a variance control on the particle direction. Animating Adjustment, makes the particles swerve or change course.
- In Spiral CW and Spiral CCW modes, Adjustment determines the strength of the spiral. Increasing this value makes the particles spiral much faster, while decreasing this value makes them spiral more slowly.
- In Centripetal, Centrifugal and No Movement modes, Adjustment has no affect.

Velocity Z-Factor determines how fast the particles move in the Z direction in relation to the X and Y directions. A high value makes the particles appear to jump at you or recede into the screen, and a lower value keeps their depth relatively stable.

Velocity Variance sets the range of different particle speeds in the effect. A Velocity Variance of 0 synchronizes all particles. A higher value increasingly randomizes particle speeds.

Gravity applies a secondary force to the particles' movement in addition to their normal velocities. A small amount of Gravity can often help an effect appear more natural by creating more parabolic movement. You can pull the particles in any direction by adjusting **Gravity Angle**, which can be used to simulate wind.

Chaos Wind adds an element of chaos to the particles' movement, blowing the particles randomly as they move. Increasing Chaos Wind varies particle movement, which can create a more natural effect.

Objects Parameter Group

Shard Size adjusts the size of the particles without affecting the grid spacing or the number of particles. At the default setting of 100, the image splits into the number of particles determined by the Particle X and Grid Spacing settings. If you increase Size, each particle maintains its original position in the grid but increases in size, so that the image fragments overlap in the unscattered image. Conversely, if you decrease Size, the unscattered particles maintain their positions but do not fill the screen.

Extrusion sets the thickness of the extruded sides. At the default value of 0, the particles are two dimensional.

Extrusion=0

Extrusion=25

The **Extrusion Mode menu** determines how the image is mapped to the extruded sides of the shards.

- ***Shard*** maps the face of the particle onto each extrusion, without caring that it is a shard-piece mapped onto a rectangle.
- ***Stretch*** stretches the image to fit the width of the extruded edges of the shard. This option can look stretched or distorted on the extrusion.
- ***Crop*** maps the rectangle containing the shard onto the extrusions.
- ***Solid Color*** maps a solid color to the extruded edges of the shard. When you choose this option, use the **Color Adjust** parameter to set the color.
- ***MultiColor*** maps multiple colors to the extruded edges of the shard. When you choose this option, use the **Color Adjust** parameter to set the color.


Shard


Stretch


Crop

Tumble Speed, **Spin Speed** and **Rotate Speed** set the velocity of the particle flow around the X-, Y- and Z-axis, respectively.

Spin Variance determines the range of different Tumble, Spin and Rotate Speeds that can appear in the effect. A Spin Variance of 0 synchronizes all of the particles. A higher value increasingly randomizes particle flow.

System Parameter Group

The **Master Scale** parameter allows you to adjust all three Scale parameters with a single control.

Scale X, Scale Y and **Scale Z** adjust the size of the particles along the X, Y and Z axis respectively, scaled as a percentage.

The **Position XY** controls set the X and Y coordinates of the center point of the particles.

Position Z adjusts the apparent depth of the particles. Decreasing negative values move the particles closer to the viewer, while increasing positive values move the particles away.

Tumble, **Spin**, and **Rotate** move the entire system around the X, Y, and Z axis, respectively. Tumble, Spin, and Rotate can be animated over values greater than 360° in order to make the particle system complete more than one full revolution.

Field of View controls the camera perspective. Decreasing values move the camera closer to the image, exaggerating the perspective on portions that are closest to the camera. Increasing values move the camera away from the image, elongating the extrusions.

The **Alpha Mode menu** set how the particles intersect when they include an alpha channel.

- If you choose ***GL*** the particles can intersect, but if the image contains a large amount of alpha, then it may not appear correct.
- If you choose ***Sorting,*** the alpha appears correctly, but the particles won't intersect.
- ***Best Guess*** determines if the image contains large alpha areas and then uses the appropriate mode.

Lights Parameter Group

You can apply up to two lights to the particles. You must select the **Enable Light checkbox** to apply the light. If this checkbox is deselected, the other parameters have no affect.

The **L1** and **L2 Position XY** controls position the light source in space by moving the light parallel to the image plane along the X and Y axes.

L1 and **L2 Color** controls adjust the color of the directional light.

L1 and **L2 Ambient** adjust the total amount of ambient light on the particles. The default setting of 100 does not add or subtract ambient light. Decreasing this setting makes the particles darker before the other lights are applied. Ambient light illuminates or darkens the particles evenly, and is unaffected by any other lighting parameters.

L1 and **L2 Directional** sets the amount of directional diffuse light applied to the particles.

The **Double Side Lighting checkbox** enables or disable's OpenGL's backside lighting which lights the back sides of the particles.

Shatter Parameter Group

Grid Spacing works in conjunction with Particle X to set the number of particles. Higher values make the grid resolution greater, generating a larger number of smaller particles; lower values generate a smaller number of larger particles. The Grid Spacing value is multiplied by the Particle X value to set the total number of particles.

Shatter Control sets how the image breaks into pieces or how the cracks form. For example, if the image breaks into a Spiral pattern, Shatter Control determines how tight the spiral is.

Wipe Effect Parameter Group

Parameters in the Wipe Effect group shatter images in a wipe-like fashion, and control the rate and direction in which shards break off and disperse.

The **Scatter Wipe menu** allows you to set the type of wipe effect that is created.

- With ***None*** chosen, no wipe takes place.
- With ***Straight*** chosen, the particles wipe across the screen in a straight line. The direction of the line is determined by **Angle**.
- ***Pass Through*** is similar to Straight, except that the particles begin at a negative Scatter value rather than a value of 0. Particles come together along the edge of the wipe, then fall apart again as the wipe passes across the screen. This creates an effect which looks like a line that forms and dissipates the image as the line moves across the screen.

- With ***Random*** chosen, the particles break off randomly across the screen.


Scatter Wipe=Straight


Scatter Wipe=Random

Speed sets the speed of the wipe by determining the Scatter value at which the whole image is broken in particles. To wipe faster, decrease Speed. To wipe gradually, increase Speed.

Regardless of the particles' Speed setting, a low Speed value wipes the image quickly, and a high Speed value wipes the image slowly. With high-speed particles and a low-speed wipe, the image unravels slowly, but each particle flies away extremely quickly. With slow particles and a fast wipe, the image breaks up quickly, but the particles then slowly drift off.

Angle and Speed have no affect if the Scatter Wipe menu is set to None.

Animation Extras Parameter Group

The Animation Extras parameters affect particle density, position, size and behavior.

The **Explosion Type menu** controls the animation style of the explosion.

- ***Burst*** creates a fast initial burst, then particles slow down.
- ***Soft Burst*** creates a slower initial burst, then particles slow down.
- ***Constant*** disperses the particles at a constant speed.
- ***Soft Acceleration*** causes particles to move slowly at first, then gradually accelerate.
- ***Acceleration*** causes particles to move slowly at first, then quickly accelerate.

The **Z Movement menu** determines which way the particles move in the Z direction. Choose ***Forward***, ***Backward***, or ***Both***.

The **Rotate Direction menu** determines whether the particles rotate forwards, backwards, or in both directions. The Rotate Direction menu defaults to ***Both***, but if you want to synchronize the particles, set it to ***Forward*** or ***Backward***.

Random Seed determines which value is input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to alter the random configuration of the particles.

Working with the BCC 3D Image Shatter Filter

3D Image Shatter shatters the image in 3D space and disperses the image fragments. The filter provides a variety of explosion, velocity, and gravity parameters to control particle movement. In addition, 3D Image Shatter has a number of parameters that allow you to control the particle size and shape, rotation, opacity, lighting, and explosion style. This filter is auto-animated by default, but you can manually animate it for more precise control over the movement and dispersion of the particles.

3D Image Shatter effect


Time 00:00:00:00


Time 00:00:00:15


Time 00:00:01:00

The BCC 3D Image Shatter filter can also be used as a transition. To create a transition, use the BCC 3D Image Shatter TR in the BCC Two-Input Effects category or apply the filter to two layers. For details, see “Applying BCC Effects as Transitions” on page 12.

For details on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, and “Working with the Drop Shadow Parameter Group” on page 25.

Scatter (initial) determines the initial position of the scattered image. At the default of 0, the image appears as if it is not scattered, which is ideal for creating transitions from one complete image to another. Negative Scatter values do not scatter the image, but are useful if you animate Scatter and want the image to appear unaffected for a longer period of time. This parameter only applies when the Automate menu is set to Manual.

The **Automate menu** controls the speed and direction in which the filter auto-animates. The choices are ***Manual***; ***Fast***, ***Medium***, or ***Slow Forward***; and ***Fast***, ***Medium***, or ***Slow Reverse***. The Forward options create an effect that shatters the initial image and disperses it, revealing a new image; whereas the Reverse options cause pieces to fly onto the screen to form the transition image. For more precise control over the animation of the effect, choose Manual. This allows you to use the Scatter setting as your time value directly, and animate it forwards, backwards, or both using keyframes.

The **Particle X menu** provides a multiplication factor for Grid Spacing (see page 126) that determines the order of magnitude of the grid spacing. For example, if Grid Spacing is set to 15 and Particle X is set to ***100***, the image breaks into 1500 particles. As the number of particles increases, the size of each individual particle decreases.

Rendering time is directly proportional to the number of particles in the effect. If you use a high Particle X value, you might want to select the **Draft Mode checkbox** in the General Controls parameter group to speed your previews. Remember to deselect this checkbox before rendering.

The **Shatter menu** determines the general shard shape. The choices are ***Rectangles***, ***Triangles***, ***Shredded***, ***Random Cut*** (a mix of all of the shapes), and ***Spiral Cut***.

Spiral Cut

Shredded

Triangles

Using a custom shape overrides the Shatter menu setting. For more information on using custom shapes, see “Custom Shape Parameter Group” on page 137.

Shatter Extra allows you to adjust how the shards are cut from the source image. Adjust this setting when you like the general effect but want the shards to take on a slightly different random arrangement. This parameter affects only Spiral Cut and Shredded modes.

The **Explosion menu** controls the animation style of the explosion.

- ***Burst*** creates a fast initial burst, then particles slow down.
- ***Soft Burst*** creates a slower initial burst, then particles slow down.
- ***Constant*** causes particles to disperse at a constant speed.
- ***Soft Acceleration*** causes particles to move slowly at first, then gradually accelerate.
- ***Acceleration*** causes particles to move slowly at first, then quickly accelerate.

Movement Speed determines the velocity of the shards.

Light controls the intensity of the directional light on the moving shards. At a value of 0, all shards are evenly lit, as if by an ambient light source. Increasing values increase the intensity of the directional light. Particles that rotate toward the light source are more brightly lit, whereas particles that rotate away from the light source appear more deeply in shadow.


Light=0


Light=50


Light=100

Light Angle controls the direction of the light beam.

Light Color controls the color of the directional light.

Custom Shape Parameter Group

These controls allow you to use a clip's alpha or color information to create a custom shape.

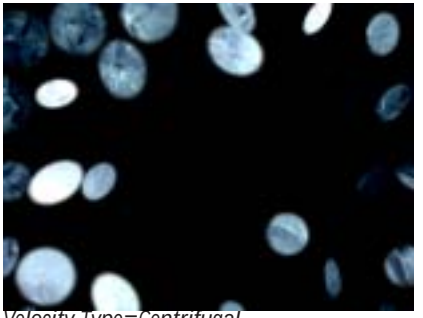
The parameters in this group are identical to the corresponding controls in 2D Particles. See "Custom Shape Parameter Group" on page 121 for more information.

Move Parameter Group

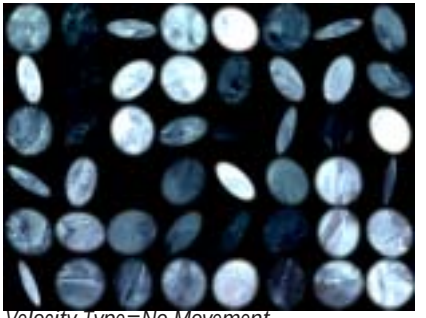
These parameters adjust the particles' movement.

The **Velocity menu** controls the pattern of movement the particles follow.

- ***Random*** moves the particles in random directions as they disperse.
- ***Straight*** moves the particles in a straight line along **Direction** angle.
- ***Centripetal*** moves the particles toward the center point determined by **Center X** and **Center Y** position controls.
- ***Centrifugal*** moves the particles away from the center point.
- ***Spiral CW*** moves the particles in a clockwise spiral around the center point.
- ***Spiral CCW*** moves the particles in a counter-clockwise spiral around the center point.
- ***No Movement*** makes the particles rotate but not change position.



Velocity Type=Centrifugal



Velocity Type=No Movement

Speed Z Factor determines how fast the particles move in the Z direction in relation to the X and Y directions. A high Speed Z Factor makes the particles appear to jump out at you or recede into the screen, and a lower Z Factor keeps their depth relatively stable.

The remaining parameters in this group are identical to the corresponding controls in 2D Particles. See “Move Parameter Group” on page 124 for more information.

Rotate Parameters

The Rotate parameters allow you to precisely control, synchronize, or desynchronize the 3D rotation of the particles. These parameters determine the speed, direction, and chaos in the shatter effect.

The **Rotate Mode menu** determines whether the particles rotate forwards, backwards, or in both directions. Rotate Mode defaults to ***Both***, but if you want to synchronize the particles, set it to ***Forward*** or ***Backward***.

X Rotate Speed, **Y Rotate Speed**, and **Z Rotate Speed** determine the speed at which the particles rotate around the X, Y, and Z axes respectively.

Rotate Variance determines the range of different particle rotation speeds that appear in the image. A Rotate Variance of 0 synchronizes the particles, whereas a high Rotate Variance makes some of the particles spin quickly while others rotate more slowly or not at all.

Chaos Wind adds an element of chaos to the particles’ movement, blowing the particles about randomly as they move. Increasing Chaos Wind varies particle movement, which can create a more natural effect.


Chaos Wind=0


Chaos Wind=25

Scatter Wipe Parameter Group

Parameters in the Scatter Wipe group shatter images in a wipe-like fashion, and control the rate and direction in which shards break off and disperse. You can wipe the shards in a single direction or use a custom gradient to determine how the image breaks into shards.

The parameters in this group are identical to the corresponding controls in 2D Particles. See “Scatter Wipe Parameter Group” on page 123 for more information.

Gravity Parameter Group

The Gravity controls apply a simulated gravitational force to the velocity of the shards.

The parameters in this group are identical to the corresponding controls in 2D Particles. See “Gravity Parameter Group” on page 125 for more information.

Options Parameter Group

The Options parameters affect particle density, position, size and behavior.

The **3D Velocity menu** determines which way the particles move in the Z direction. Choose ***Forward***, ***Backward***, or ***Both***.

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 affect of the filter by mixing it with the source image.

The remaining parameters are identical to the corresponding controls in 2D Particles Advanced. See “Options Parameter Group” on page 126 for more information.

Working with the BCC Bulge Filter

Bulge makes the source image appear as if it is stretched over a surface with a bulge or a depression.

The BCC Bulge filter can also be used as a transition. To create a transition, use the BCC Bulge TR in the BCC Two-Input Effects category or apply the filter to two layers. For information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25. The PixelChooser is described in “The PixelChooser” on page 603.

The Pinning parameters are described in “Working with the Pinning Controls” on page 210.

If the **Correct Non-Square Pixels checkbox** is selected and the filter is applied to media with non-square pixels, the filter converts the pixels to square pixels (maintaining the height), applies the bulge, and then converts the pixels back to their original format. This helps prevent distortion.

Selecting the **Process Alpha Only checkbox** allows you to distort the alpha channel without changing the underlying colors.

Center Point sets the X and Y coordinates of the center of the bulge or depression.

Height controls the height of the bulge above the surface. Negative Height values create a depression in the surface of the image.

Height=50

Height=–50

Perspective controls the distance from the viewer to the top of the bulge. Positive Perspective values move the viewer farther away from the surface, making the bulge appear less pronounced. Negative Perspective values place the viewer under the surface of the bulge, which can produce some unusual effects.


Perspective=0


Perspective=50

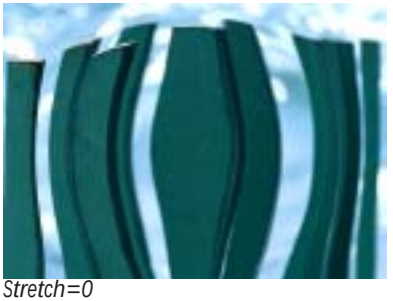
Radius sets the radius of the bulge. This value is expressed as the distance, in pixels, between the center point and the edge of the bulge.

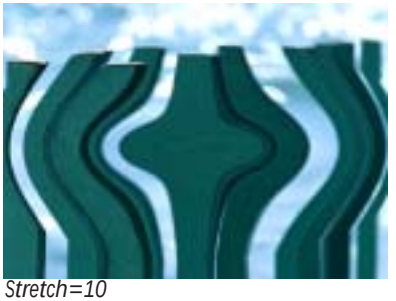

Radius=300


Radius=600

Taper controls the shape of the bulge. An untapered bulge maps the source track onto a surface with a roughly spherical bump. Increasing Taper makes the surface more like a tapered candle, proportionally much higher in the middle than at the edges.

Stretch stretches or squeezes the bulge in the direction of the Stretch Angle. Positive Stretch values pull the bulge apart, whereas negative values squeeze it together.


Stretch=0


Stretch=10

Stretch Angle sets the direction in which the bulge is stretched or squeezed.

Working with the BCC Corner Pin Filter

The BCC Corner Pin filter allows you to map media to a specific area on a moving object in a media file. For example, suppose your movie includes a moving bus with an advertisement on its side. You could use Corner Pin to track and replace the advertisement with a logo.


Original image

Corner Pin Image

Filtered image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, and “Working with the Drop Shadow Parameter Group” on page 25.

The **Corner Pin Source menu** sets the track that you want to corner pin onto the filtered track. The choices are ***None, Filter Layer, 1st Below*** or ***2nd Below***. In general, the easiest method is to place the filtered track on V2 and the corner pin image on V1.

If the source image is opaque, selecting the **Opaque Source checkbox** can speed rendering and preview times. If your source is partially transparent, deselect this option for best results. You must deselect this checkbox to apply the filter to a matte.

Corner 1, Corner 2, Corner 3 and Corner 4 Parameter Groups

The **Corner 1, Corner 2, Corner 3** and **Corner 4** position controls define the four corner pin trackers. However, in general it is easier to position the onscreen controls and use the sliders for finetuning. However, in general it is easier to position the onscreen controls and use the sliders for finetuning by selecting the **Track on the Fly checkbox**. The onscreen controls are color coded: Corner 1 is red, Corner 2 is green, Corner 3 is yellow, and Corner 4 is blue.

Crop Parameter Group

The Crop controls allow you to crop the edges of the media in the Corner Pin Source track. The **Crop Left**, **Crop Top**, **Crop Right**, and **Crop Bottom** settings determine the width, in pixels, of the cropped area on each edge of the image.

Crop Left = 29

Crop Left = 29, Crop Right = 18

Scale and Offset Parameter Group

Scale X and **Scale Y** scale the rendered image after tracker data is applied on the X and Y axis respectively. When the **Lock Scale to X checkbox** is selected, Scale X sets the scale amount in both directions.

Master Offset X and **Master Offset Y** allow you to change the Offset X or Offset Y parameters for each of the four corners with one control.

The numbered **Corner Offset X** and **Corner Offset Y** parameters, allow you to offset the applied image on the X and Y axis for each of the four corners. This is useful if you want to track one area, then apply the effect to a different area. For example, you want to add a new advertisement next to an existing ad on the side of a moving bus. You would track the current ad, then offset the four corners to pin the new advertisement to the right of the existing advertisement.

The **Render menu** is a display control that includes the following options.

- ***Pin Over Source*** displays the corner pin image composited over the filtered track.
- ***Corner Pin Only*** displays the corner pin image composited over the full size corner pin image.
- ***Punch Hole*** displays the filtered track with an alpha channel where the corner pin image will be placed. Tracks lower in the timeline are visible through the resulting "hole."
- ***Show Corner Region*** displays the full size corner pin track inside the corner pin region with an alpha channel outside where the corner pin image will be placed. Tracks lower in the timeline are visible through the resulting alpha channel.

Composite menu=Pin Over Source

Composite menu=Corner Pin Only

Composite menu=Punch Hole

Composite menu=Show Corner Region

Edge Width controls the width of the edge that is generated by choking the alpha channel of the corner pin image. Higher numbers result in a larger border. If Edge Width is set to a value of 0, Edge Softness and Edge Smoothness have no affect.

Edge Softness softens the edge of the corner pin image. A value of 0 creates a hard edge; increasing this value increasingly softens the edge of the image. If Edge Softness is set to a value of 0, Edge Smoothness has no affect.

Edge Smoothness controls the gradation of the edge.

Light Wrap Parameter Group

The Light Wrap parameters reflects the background image around the edges of the corner pin image to form a border. This creates the illusion that light from the background is reflected onto the foreground. This creates a more convincing composite by making it appear as if the images were shot in the same environment.

Wrap Lightness sets the lightness value of the reflected image. Negative values make the reflection darker and positive values make the reflection lighter

The **Wrap Softness** parameter softens the edges of the border that is reflected or wrapped.

Wrap Width controls the width of the reflection or wrap that is generated. Higher numbers result in a larger border.

The **Wrap Apply Mode menu** determines the method that is used to composite the border. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Composite Parameter Group

Opacity scales the opacity of the corner pin image. At an Opacity value of 100, the image is completely opaque. At a value of 0, the image is completely transparent.

The **Apply Mode menu** controls how the source and corner pin images are composited. This filter is most useful with Apply Modes other than ***Normal***. For descriptions of all the Apply Modes, see "Apply Modes" on page 625.

Apply Mix blends the Apply Mode setting with the **Normal** apply mode. The resulting mixed mode is used to composite the Corner Pin media over the filtered layer. For example, if Apply Mode is set to ***Lighten***, then an Apply Mix value of 0 uses the Normal apply mode; an Apply Mix value of 100 uses the Lighten apply mode. An Apply Mix value of 50 blends the two apply modes equally.

You can use Apply Mix to soften the affect of a given apply mode.

Deselecting the **Use Motion Trackers checkbox** allows you to override the corner pin trackers and use the onscreen controls to manually place your corner pin image.

Motion Tracker Parameter Groups

The Motion Tracker parameter groups allows you to track the motion of an object, then use the motion path data to control another aspect of the effect. For example, track a detergent bottle and pin a new label to the bottle. Because the Corner Pin Tracker includes four trackers, it includes the following additional parameters. Because the Corner Pin Tracker includes four trackers, the following parameters appear in the **Tracker 1, Tracker 2, Tracker 3 and Tracker 4** parameter groups. In other filters, these parameters appear in the Motion Tracker parameter group. The parameters are **Start Tracking Frame, End Tracking Frame**, **Target Width, Search Width** and **Tracker Auto-Man.**

The **Track menu** determines which corner pin trackers are analyzed when you select the **Track on the Fly checkbox** and click **Play**. The options are ***All, Corner 1, Corner 2, Corner 3*** and ***Corner 4***. Data is created for all currently selected trackers.

Selecting a **Lock Tracker checkbox** locks the specified Tracker. Tracking data is not generated for a locked Tracker, even if you track again. For example, set the **Track menu** to ***All***, select the **Track on the Fly checkbox** and click **Play**. Trackers 1, 2 and 3 track correctly, but Tracker 4 has some issues. You could lock Trackers 1, 2 and 3, adjust Tracker 4 then track again. Even if you click the **Reset Tracker checkbox**, locked Trackers are not affected.

When the **Use Start -End 1 for All checkbox** is selected, the **Start Tracking Frame** and **End Tracking Frame** parameter values set in Tracker 1 apply to all trackers. Deselect this checkbox to set separate values for individual trackers.

When the **Use Width 1 for All checkbox** is selected, the **Target Width** and **Search Width** parameter values set in Tracker 1 apply to all trackers. Deselect this checkbox to set separate values for each tracker.

Overview of Using the Corner Pin Tracker

The steps below provide an overview of the Corner Pin Tracker process. The sections that follow provide detailed information on each step.

1. Apply the Corner Pin Tracker filter directly to a clip in the timeline containing the moving area that you want to replace.
2. Choose the track that you want to replace the moving area from the **Corner Pin Source menu**. The easiest method is to place the filtered track on V2 and the corner pin image on V1.
3. If necessary, select the **View Preprocessed Source checkbox** and adjust the Motion Tracker Preprocess parameters to make your source image easier to track. For example, you could increase the contrast for better results. For details, see "Working with the Motion Tracker Preprocess Parameter Group" on page 29. Make sure to deselect the **View Preprocessed Source checkbox** before you select the **Track On-the-Fly checkbox** and begin tracking.
4. Select the **Track On-the-Fly checkbox** and use the onscreen controls to position a motion tracker on each of the four corners of the region to replace.
5. Generate the tracker data using the parameters in the Motion Tracker parameter group. With the **Track On-the-Fly checkbox** still selected, press **Play.** The filter calculates the tracking data. When you select this checkbox, the chosen effect does not display in the Effect Preview window. Once you finish tracking, deselect this checkbox to view the applied effect.

   The media in the Corner Pin Source track is automatically positioned in the region defined by the four corner trackers. The media distorts as necessary to fit the region as it moves and changes shape.

Correcting Corner Pinning Errors

If the Corner Pin Tracker cannot locate the Target region during analysis, errors can occur. You can use one of the following methods to finetune your results. Before finetuning, you should select the **Lock Tracker checkbox** for any Tracker that generated accurate data.

- Adjust the parameters in the Preprocess parameter group and track again. For details, see "Working with the Motion Tracker Preprocess Parameter Group" on page 29.
- If this still doesn't correct the error, you can manually correct the tracker position by keyframing the **Tracker Center KF.** See "Correcting Motion Tracker Errors" on page 35 for more information.
- Alternatively, you can manually position the Corner Pin image in problem areas by using the **Tracker Auto-Man** parameter. See "Adjusting Tracking Manually" on page 36 for details.

Working with the BCC Cube Filter

The Cube filter models the source image onto one or more faces of a cube. You can use a separate media source for each of the six faces.

The BCC Cube filter can also be used as a transition. To create a transition, use the BCC Cube in the BCC Two-Input Effects category or apply the filter to two layers. For more information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22.

Position XY Parameter Group

Position X and **Position Y** set the X and Y coordinates of the center point of the layer.

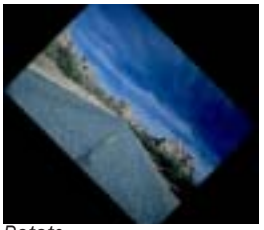
Position Z adjusts the apparent depth. Decreasing negative values move the layer closer to the viewer, while increasing positive values move the layer farther away from the viewer. Very low Position Z values move the plane behind the viewer, making it invisible.

Scale X, **Scale Y,** and **Scale Z** change the size of the image along the X, Y, and Z axis, respectively. These parameters are scaled as percentages of the original width and height. Thus, a Scale X value of 200 produces an image twice as wide as the original. Select the **Lock to Scale X checkbox** to keep the Scale values in proportion.

Tumble, **Spin**, and **Rotate** move the image around the X, Y, and Z axis respectively. Tumble, Spin, and Rotate can animate over values greater than 360° to make the image complete more than one full revolution.

Tumble

Spin



Rotate

When the **Lock Pivot checkbox** is selected, the image tumbles, spins, and rotates around its own center. If this option is deselected, you can set an external pivot point around which to tumble, spin, or rotate.

Pivot XY Parameter Group

Pivot X and **Pivot Y** set the X and Y coordinates of the pivot point. If Lock Pivot is selected, moving the pivot point has no affect. **Pivot Z** sets the Z coordinate of the pivot point. If Lock Pivot is selected, moving the Pivot Z point has no affect.

Cube Displacement detaches the faces of the cube from each other. You can animate this setting to create an effect in which all six faces move toward or away from each other to form or disperse the cube. A setting of 0 keeps the faces in contact. A setting of 1.0 moves each face apart by the dimension of the attached faces. In other words, a Cube Displacement of 1.0 moves the top and bottom by the height of the source image, and the other faces by the width.

Cube Displacement=0.1

Cube Displacement=0.3

Opacity sets the opacity of the image, and is scaled as a percentage. A setting of 0% makes the image completely transparent; a setting of 100% makes the image completely opaque. You can easily fade objects in or out by animating this parameter.

Front Opacity sets the opacity of the portion of the cube closest to the viewer. Use this parameter to make the front of the cube partially or fully transparent to reveal an image on the back side. A setting of 100 makes the cube completely opaque; a setting of 0 makes the front of the cube completely transparent.

Shadows Parameter Group

The Shadow parameters allow you to add a drop shadow to the cube effect. The **Shadows On checkbox** turns on the shadows. If this checkbox is not selected, the other parameters have no affect.

Shadow Distance sets the distance (in pixels) between the shadow and the image.

Shadow Intensity sets the opacity of the drop shadow, scaled as a percentage. At a value of 100, the shadow is completely opaque. Lower Shadow Intensity values make the background image visible through the shadow. At a value of 0, the shadow is invisible.

Shadow Softness controls the softness of the edges of the shadows. A setting of 0 produces a sharply defined shadow with hard edges. Increasing Shadow Softness produces shadows with softer edges.

Shadow Angle sets the direction of the drop shadow. A setting of 0° places the shadow to the right of the image; a setting of 90° places it directly below the image.

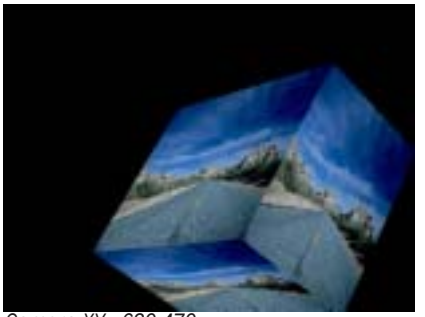
Shadow Color sets the color of the shadow.

Camera & Lights Parameter Group

Select the **Lights On checkbox** to turn on the applied light. If this checkbox is not selected, the other parameters have no affect.

Camera X and **Y** sets the horizontal and vertical position of the focal point of the camera (the point on the image plane at which the camera is pointed).

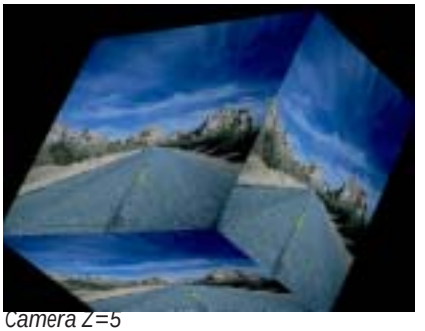
Camera XY=10,10



Camera XY=630,470

Camera Z sets the model camera's distance from the layer. Decreasing this setting places the camera closer to the layer, exaggerating the perspective on portions of the layer that are closest to the camera.

Camera Z=0.5



Camera Z=5

Light X and **Y** positions the light source in space by moving the light parallel to the image plane along the X and Y axes.

Light Z positions the depth of the light source relative to the image plane. A Light Z value of 100 places the light one source width above the image plane. Light Z can be negative, which places the light behind the image plane. If Light Z is negative, the light is seen only if the object is rotated or displaced so that all or part of it is behind the light source (that is, the light source always points in toward the object, never out at the viewer).

Ambient Light adjusts the total amount of diffuse light on the image. The default setting of 100 does not add or subtract ambient light from the source image. Decreasing this setting makes the image darker before the other lights are applied. Ambient Light illuminates or darkens the image evenly, and is unaffected by any other lighting parameters.

Diffuse Light determines the amount of non-directional diffuse light applied to the object. Increasing Diffuse Light brightens the object uniformly.

Specular Light simulates lighting a glossy surface from a point source, creating a small spot of intense light whose falloff can vary. Increasing this value adds reflected light.

Light Falloff controls the rate at which the Specular Light falls off from the center of the lit region. A higher value creates a more concentrated highlight, simulating a shiny, highly reflective surface. A lower value spreads light more evenly throughout the lit region, simulating a rougher, less reflective surface. Only Specular Light is affected by Light Falloff.

Light Color controls the color of the applied light (which includes the Specular and Diffuse Lights, but not Ambient Light).

Faces Parameter Group

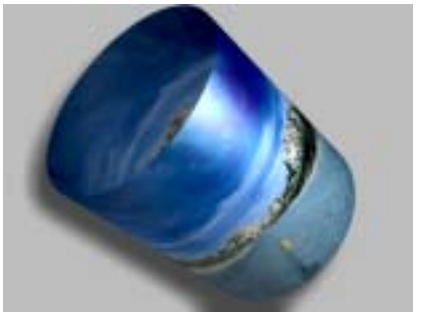
The **Faces menu** and the **Front**, **Back**, **Left**, **Top**, **Right**, and **Bottom menus** allow you to map different media on all six faces of the cube.

- ***Input Layer*** uses the filtered layer, including any other effects applied to the layer above the Cube filter, on all six sides of the cube.
- ***Use Front*** applies the chosen Front layer to all six faces of the cube. This setting allows you to quickly change the layer mapped to the cube without individually specifying a layer for each face.
- ***Independent*** allows you to chose any layer in the timeline for each face of the cube using the corresponding Front, Back, Left, Top, Right, and Bottom menus. You can create a transparent face by choosing ***None*** in the corresponding face menu.

If one or more faces of the cube are never visible in your effect, you can save rendering time by making those faces transparent. Set the **Faces menu** to ***Independent***, and then set the appropriate **Face menus** to ***None***.

Working with the BCC Cylinder Filter

The Cylinder shape maps the source media onto a cylinder.



The BCC Cylinder filter can also be used as a transition. To create a transition, use the BCC Cylinder TR in the BCC Two-Input Effects category or apply the filter to two layers. For information, see "Applying BCC Effects as Transitions" on page 12.

For details on the common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, and "Working with the Drop Shadow Parameter Group" on page 25.

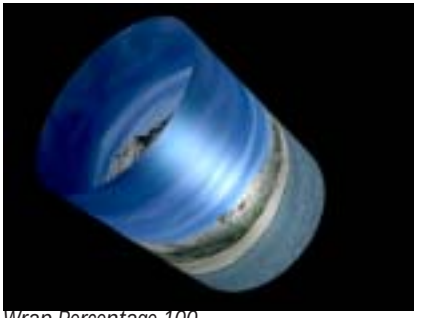
If the **Correct Non-Square Pixels checkbox** is selected and the filter is applied to media with non-square pixels, the filter converts the pixels to square pixels (maintaining the height), applies the filter, then converts the pixels back to their original format. This helps to prevent distortion.

Position Parameter Group

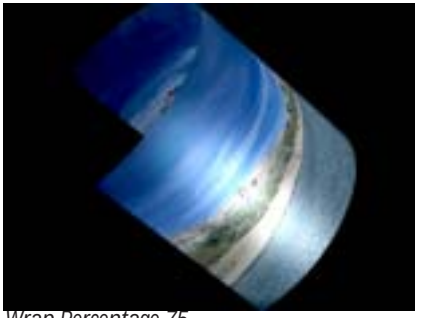
Position X and **Position Y** set the X and Y coordinates of the center point of the cylinder.

Wrap Percentage controls the extent to which the image wraps around the shape. As the value approaches 0, the shape becomes less cylindrical and closer to the original flat image.

A Wrap Percentage of 100 wraps the source image completely around the cylinder. As the value is reduced, four things happen to the physical model: the radius gets larger, the image is mapped on a smaller section of the 3D shape, the viewer's eye moves further away, and the aspect ratio is adjusted toward the original aspect ratio of the source. The overall effect is a gradual flattening of the image as the cylinder unwraps.



Wrap Percentage 100

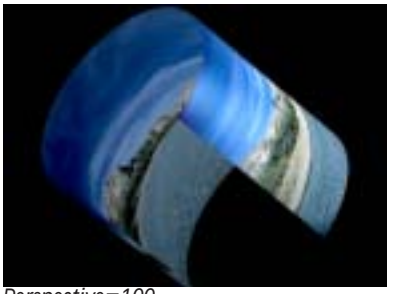


Wrap Percentage 75

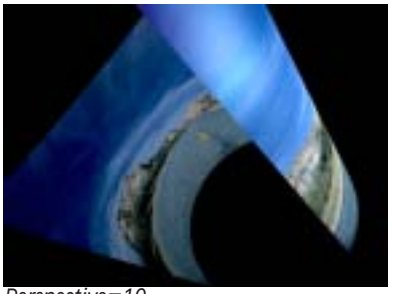
If you spin, tumble, or rotate a cylinder and then unwrap it, the object returns to its original position in 3D space as it unwraps. To spin the cylinder through one full revolution and unwrap it as it spins, animate Spin from –360 to 0 (or 360 to 0 to go the other direction). Otherwise, the image's motion counteracts the Spin as it moves to the original, unrotated position.

When the **Unwrap as Transition checkbox** is selected (the default), unwrapping the shape modifies the scale and rotation controls so the fully unwrapped image is the original source. When it is unchecked, unwrapping the image does not affect the scale or rotation.

Perspective determines the distance between the viewer's eye and the surface of the object. The maximum value places the viewer far away from the shape, and the minimum value puts the viewer just above the surface. Increasing Perspective increases the apparent size of the object and emphasizes the part of the object that is directly in front of the viewer. A Perspective setting of 100 makes the image appear almost flat; only the foreshortening near the curved edges of the cylinder show the curvature of the shape. A Perspective of 1 emphasizes the curvature, but shows only a small part of the source. The default setting of 80 shows both the entire surface and creates a more curved appearance.



Perspective=100



Perspective=10

Scale X and **Scale Y** change the size of the image along the X and Y axis, respectively. These parameters scale as percentages of the image's original width and height. Thus, a Scale X value of 200 produces an image twice as wide as the original. Select **Lock to Scale X checkbox** to keep the X and Y Scale values in proportion.

Axial Displacement displaces the modeled cylinder along its own axis.


Axial Displacement=0


Axial Displacement=125

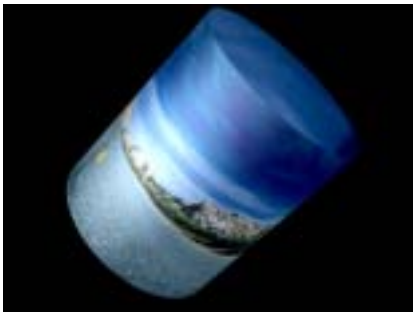

Axial Displacement= –125

Tumble, **Spin**, and **Rotate** move the image around the X, Y, and Z axis respectively. Tumble, Spin, and Rotate can be animated over values greater than 360° in order to make the image complete more than one full revolution.

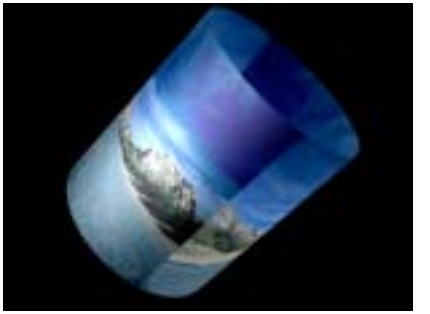
Faces Parameter Group

The **Wrap menu** determines how the image wraps around the cylinder.

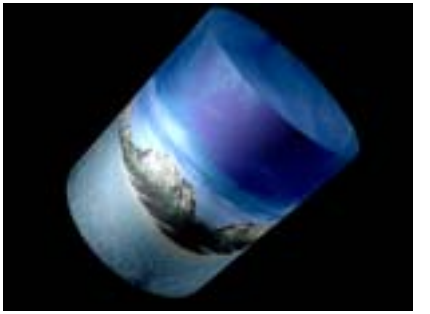
Around wraps the image completely around the shape. If the Wrap Percentage is 100, wrapping Around only shows half the source at any given time. Therefore, this is not always the best choice if you do not spin or tumble your cylinder. As you unwrap the cylinder, the source covers a smaller part of the modeled shape, and the uncovered area becomes transparent.



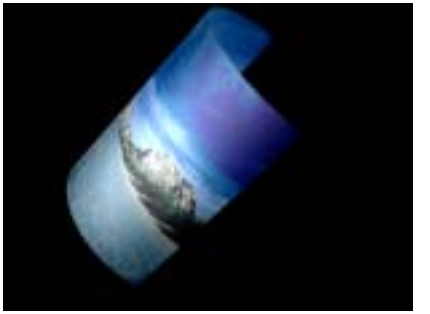
One Way Repeat renders two copies of the source image, one on the front and one on the back. You can see the seam between the two images if you spin the cylinder 90° or 270°. Unwrapping the cylinder using One Way Repeat causes multiple copies of the source (as many as required to fill the shape) to wrap horizontally around the shape.



Back & Forth Repeat also renders two copies of the source, but the back copy is a mirror image. This causes the corresponding sides to line up and mirror each other at the seams. This setting unwraps in the same manner as One Way Repeat.



Front maps the image onto the front of the cylinder and leaves the back transparent. This creates a semi-cylinder, visible if you spin or tumble the object, as shown in this example.



The **Faces menu** determines which faces of the cylinder are visible and allows you to map a separate image to the inside of the cylinder.

- ***Front*** maps the filtered layer to the front, or outside, of the cylinder. The back remains transparent regardless of how you transform the cylinder.
- ***Back*** maps the filtered layer to the back (the side furthest from the viewer) of the cylinder. The front remains transparent regardless of how you transform the cylinder.
- ***Both*** maps media to both the front and back of the shape, allowing you to create a full cylinder. When Both is chosen, you can map another clip from the timeline to the inside of the cylinder using the **Alternate Back menu**.

Front Opacity sets the opacity of the portion of the cylinder closest to the viewer. Use this parameter to make the front of the cylinder partially or fully transparent to reveal an image on the inside. A setting of 100 makes the cylinder completely opaque; a setting of 0 makes the front of the cylinder completely transparent.

The **Alternate Back menu** allows you to choose any layer in the timeline to apply to the back of the cylinder. ***None*** applies the source layer to both sides of the page.

Crop Top-Left and Crop Bot-Right Parameter Groups

The Crop controls crop the edges of the image. The **Crop Top-Left** and **Crop Bot-Right** set the upper left and lower right corners of a rectangle that defines the borders of the cropped image. Select the **Symmetrical Crop checkbox** to use the Crop Top-Left setting to crop opposite corners equally.

Lights Parameter Group

Specular Apply Mode controls how the Specular Light light is composited with the source image. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

The remaining parameters in this section are identical to the corresponding controls in the Cube filter. See “Camera & Lights Parameter Group” on page 149 for more information.

Working with the BCC Displacement Map Filter

The Displacement Map filter uses the luminance or color information from an alternate video or still image track (the Map Layer) to displace the pixels in the source image horizontally and vertically. This filter creates a distorted version of the source whose distorted regions correspond to the luma or color channel of the Map Layer's media.

BCC Displacement Map can also be used as a transition. To create a transition, use the BCC Displacement Map in the BCC Two-Input Effects category or apply the filter to two layers. For details, see "Applying BCC Effects as Transitions" on page 12.

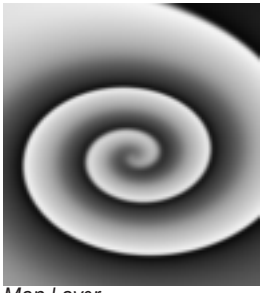
For information on the common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

Selecting the **Process Alpha Only checkbox** allows you to distort the alpha channel without changing the underlying colors.

The **Map menu** determines which clip layer in the timeline is used to create the distortions in the source image.

If the Map layer is partly transparent, the displacement amount is scaled by its alpha values. Pixels whose map alpha is 0 are not displaced.


Source image


Map Layer

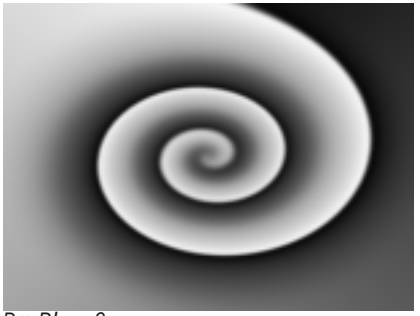

Filtered image

You can use the Noise Map filter to create auto-animated noise patterns that create a continuously flowing displacement effect. Luma gradients also make good Map layers. You can also try using a title or logo to create a displacement as shown in the example at right.

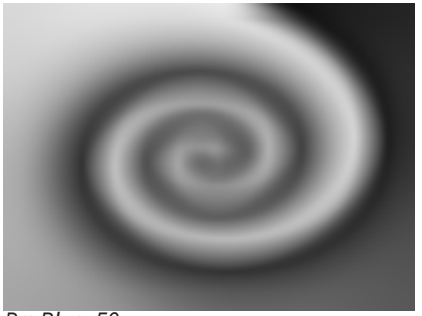
Map Parameter Group

The Map parameters control the appearance of the map used to distort the source image.

Pre Blur applies a blur to the Map Layer. Increasing Pre Blur can help eliminate sharp edges in the map to create a smoother effect.



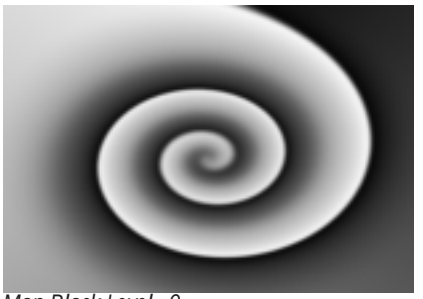
Pre Blur=0



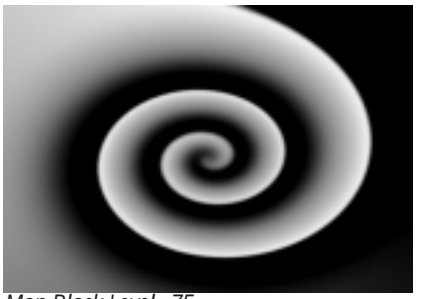
Pre Blur=50

Displacement filters often look rough if the Map Layer is high-contrast or has sharp edges. **Blur Threshold** softens the Map Layer before computing the displacements. After the Map Layer is blurred, the blurred track is compared to the original Map Layer, and the color change for each channel is reduced by a relative amount. Increasing Blur Threshold blurs parts of the image with rapid changes in color without blurring subtle details. This is particularly appropriate for a displacement map, which can severely distort areas of the image where the Map Layer changes rapidly.

Map Black Level sets the channel values of the map that are output as pure black. All pixels whose value is lower than the Map Black Level value become pure black. For example, if Map Black Level is set to 50, all pixels with a value of 50 or less output to a value of 0. The remaining values (50-255) are remapped to produce a smooth gradient from black to white.

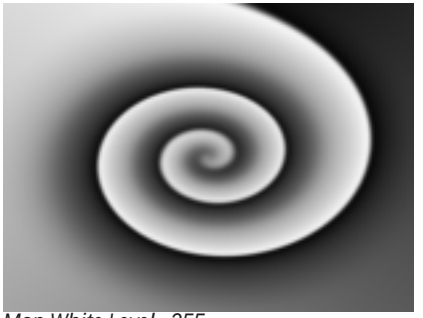


Map Black Level=0



Map Black Level=75

Map White Level sets the channel values of the input image that are treated as pure white by the filter. All pixels whose value is higher than the Map White Level value become to pure white. For example, if Map White Level is set to 200, all pixels with a value of 200 or more are output to a value of 255. The remaining values (0-200) are remapped to produce a smooth gradient from black to white.



Map White Level=255

Map White Level=175

Map Gamma adjusts the midlevel gray values of the input image by adjusting the gamma. Increasing Map Gamma lightens the shadows and reduces contrast. Decreasing Gamma darkens the shadows and increases contrast.

The **View Map checkbox** allows you to view the Map Layer as you adjust it. Deselect this option before rendering.

The **Master Displacement** control defaults to 100 and scales all of the displacement amounts. Animating this controls allows you to animate the total displacement.

The **Horizontal Channel menu** is the channel in the Map Layer used to compute horizontal displacement. The choices are ***Red***, ***Green***, ***Blue***, ***Luma, White***, ***Gray***, and ***Black***. White treats all of the pixels as if they were white (i. e. fully displaces each pixel to the Max. Horizontal value). Gray treats all pixels as if they were 50% gray (resulting in no displacement). Black treats all pixels as if they were black, thereby displacing all pixels to the negative of the Max. Horizontal Displacement value.

Max. Horizontal Displacement sets the amount of horizontal displacement for pixels in the Map layer. Positive values move points that correspond to white pixels in the Map layer to the right; points that correspond to black pixels displace to the left. Negative values displace pixels in the opposite direction (white pixels move to the left and black pixels to the right). The displacement of gray pixels is interpolated between these values. 50% gray pixels undergo no displacement, because they "pull" equally in both directions.


Max. Horizontal=25


Max. Horizontal=75


Max. Horizontal=175

The **Vertical Channel menu** sets the channel in the Map Layer used to compute vertical displacement. The choices are ***Red***, ***Green***, ***Blue***, ***Luma, White***, ***Gray***, and ***Black***. White treats all pixels as if they were white (fully displaces each pixel to the Max. Vertical Displacement value). Gray treats all pixels as if they were 50% gray (resulting in no displacement). Black treats all pixels as if they were black, thereby displacing all pixels to the negative of the Max. Vertical Displacement value.

The reference level is the channel value where no displacement occurs. If you want all of the displacement in the horizontal channel, set **Horizontal Reference Level** to 255. To have all the displacement occur vertically, set **Horizontal Reference Level** to **0.**

Max. Vertical Displacement sets the vertical displacement for pixels. White pixels are displaced up by this amount, and black pixels are displaced down by this amount. The displacement of gray pixels is interpolated between these values. 50% gray pixels undergo no displacement, because they "pull" equally in both directions.

The reference level is the channel value where no displacement occurs. If you want all of the displacement in the vertical channel, set **Vertical Reference Level** to 255. To have all the displacement occur horizontally, set **Vertical Reference Level** to **0.**


The Pinning parameters are described in "Working with the Pinning Controls" on page 210.

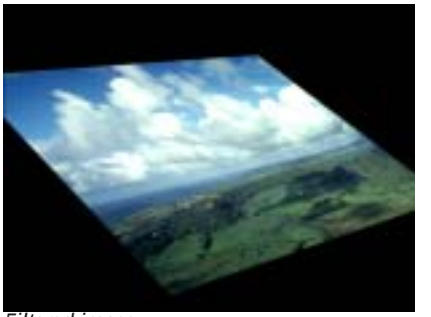

The PixelChooser is described in "The PixelChooser" on page 603.

Working with the BCC DVE and DVE Basic Filters

DVE models the source image on a two-dimensional plane which can rotate around the X, Y, and Z axis and positioned in 3D space. DVE also provides options for adding motion blur, adjusting camera perspective, and adding up to three independent lights to the effect.

Boris Continuum Complete includes both a BCC DVE and BCC DVE Basic. The two filters are very similar except that BCC DVE Basic does not include all the parameters; BCC DVE provides more options for controlling the effect; while BCC DVE Basic is streamlined for when you want to create a simple DVE move.

Source image



Filtered image

The BCC DVE filters can also be used as transitions. To apply create a transition, use the BCC DVE in the BCC Two-Input Effects category or apply the filter to two layers. For information, see “Applying BCC Effects as Transitions” on page 12.

For details on common parameters, see “Working with the General Controls Parameter Group” on page 22 and “Working with the Title Matte Parameter Group” on page 23.

The **Source menu** sets the clip layer in the timeline used to create the effect.

If the source is opaque, selecting the **Source Opaque checkbox** can improve render times by rendering only the RGB color channels and not the alpha channel. Leave this option deselected if the source is partially or fully transparent.

Geometry Parameter Group

Scale X and **Scale Y** change the size of the layer along the X and Y axis, respectively. These parameters are scaled as percentages of the layer’s original width and height. Thus, an X Scale value of 200 produces an layer twice as wide as the original layer. Select **Lock to Scale X checkbox** to keep the X and Y Scale values in proportion.

Position X and **Position Y** set the X and Y coordinates of the center point of the layer.

Position Z adjusts the apparent depth of the layer. Decreasing negative values move the layer closer to the viewer, while increasing positive values move the layer farther away. Very low Position Z values move the plane behind the viewer, making it invisible.

Tumble, **Spin**, and **Rotate** move the image around the X, Y, and Z axis respectively. Tumble, Spin, and Rotate can animate over values greater than 360° to make the image complete more than one full revolution.


Tumble


Spin


Rotate

Camera/Pivot Parameter Group

When the **Lock Pivot checkbox** is selected, the image tumbles, spins, and rotates around its own center. If this option is deselected, you can set an external pivot point around which to tumble, spin, or rotate.

Pivot X, Pivot Y and **Pivot Z** set the X, Y, and Z coordinates of the pivot point. If the Lock Pivot checkbox is selected, moving the pivot point has no affect.

Camera X and **Camera Y** sets the horizontal and vertical position of the focal point of the camera (the point on the image plane at which the camera is pointed).


Camera XY=10,10


Camera XY=630,470

Camera Z sets the model camera's distance from the image. Decreasing this setting places the camera closer to the image, exaggerating the perspective on portions of the image that are closest to the camera.


Camera Z=0.5


Camera Z=5

Motion Blur Parameter Group

Select the **Motion Blur On checkbox** to turn Motion Blur on.

Motion Blur is a very processor-intensive feature. You might want to turn motion blur off while you work, then enable it just before rendering. You can select the **Draft Mode checkbox** in the General Controls parameter group to speed your previews. Remember to deselect this checkbox before rendering.

The **Blur Quality menu** determines how many times the effect samples between the time the "shutter" opens and the time it closes. Increasing the number of samples creates a smoother blur but increases render and preview time proportionately. Choose ***Rough***, ***Medium***, ***Smooth***, or ***Smoothest***. Rough uses the fewest samples, while Smoothest uses the most.

Shutter Angle refers to the workings of a conventional film camera. Normally the shutter is open to 180°, meaning that the shutter is open for half of each frame. Increasing the angle opens the shutter longer, creating a wider blur. Decreasing the angle produces a thinner blur.


Shutter Angle=45


Shutter Angle=225

Selecting the **Adaptive Motion Blur checkbox** causes the effect to take fewer samples when the source moves slowly. Selecting this checkbox usually does not visibly affect the output, but improves rendering speed.

Crop & Blend Parameter Group

The **Crop X** and **Y** position controls crop the edges of the image. **Left**, **Top**, **Right**, and **Bottom** determine the width, in pixels, of the cropped area on each edge of the image.

The **Blend Corner Shape menu** sets the corners of the cropped image. When ***Square*** is chosen, the corners form right angles. When ***Round*** is chosen, the corners are rounded. If all of the Blend parameters are 0, this menu has no affect.

The **Blend** controls soften the edges of the image by reducing their opacity. The **Blend Left**, **Blend Top**, **Blend Right**, and **Blend Bottom** parameters determine the width, in pixels, of the transparent band on each edge of the image. These values are unaffected by the Crop values, allowing you to soften the edges of an uncropped image. Select **Lock Blend checkbox** to keep the Blend values in proportion.

For both the Crop and Blend controls, Top, Left, Bottom, and Right refer to the sides of the original image before it is transformed in 3D space. For example, if you tumble an image 180° so that it appears upside-down, blending the Top affects the top of the original image, which is actually the bottom of the tumbled image.

Border & Shadow Parameter Group

When the **Drop Shadow On checkbox** is selected, the shadow is visible. When this parameter is not selected, the shadow is not visible, and the other shadow parameters have no affect.

The **Border Corners menu** sets the corners of the border. When ***Square*** is chosen, the corners form right angles. When ***Round*** is chosen, the corners are rounded.

Border Width controls the width of the border. Width values are measured in pixels and are based on an image scale of 100%. If you scale the image, the border scales with it.

Border Opacity sets the opacity of the border and is scaled as a percentage. When Opacity is 100, the border is completely opaque. Lower Opacity values allow the background to appear through the border. When Opacity is 0, the border is completely transparent.

Border Softness adjusts the softness at the edges of the border. The amount of softness depends on the width of the border—wider borders can accommodate more softness.

Border Color sets the color of the border.

Shadow Distance sets the distance (in pixels) between the shadow and the image.

Shadow Intensity sets the opacity of the drop shadow, scaled as a percentage. At a value of 100, the shadow is completely opaque. Lower values allow the background image to be seen through the shadow. At a value of 0, the shadow is completely invisible.

Shadow Softness sets the softness of the shadows. A setting of 0 produces a sharply defined shadow with hard edges. Increasing Shadow Softness produces shadows with softer edges.

Shadow Angle sets the direction of the shadow. A setting of 0° places the shadow to the right of the image; a setting of 90° places it directly below the image. You can animate the shadow using Angle values greater than 360° to make it undergo one or more full revolutions.

Shadow Color sets the color of the shadow.

Ambient Light adjusts the brightness of the image. The default setting of 100 does not add or subtract ambient light from the source image. Decreasing this value darkens the image before other light is applied. Ambient light illuminates or darkens the image evenly, and is unaffected by any other lighting parameters.

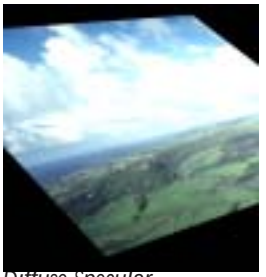
Select the **Light On checkbox** to turn on the corresponding light source. Deselect this option to turn off the light.

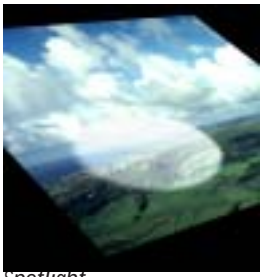
Light 1, Light 2, and Light 3 Parameter Groups

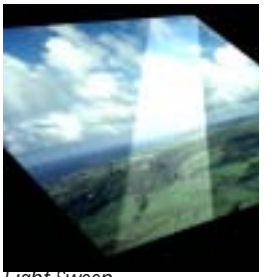
You can apply up to three different lights. Each section contains parameters which control the corresponding light source. These parameters function identically for each source.

The **Light Type menu** sets the light type.

- ***Diffuse-Specular*** combines both focused (specular) and diffuse light. You can use this Light Type to create the appearance of a shiny surface lit by a point light source.
- ***Spotlight*** simulates the look of a traditional theatrical spotlight.
- ***Light Sweep*** creates a linear band of light that sweeps across the layer.


Diffuse-Specular


Spotlight


Light Sweep

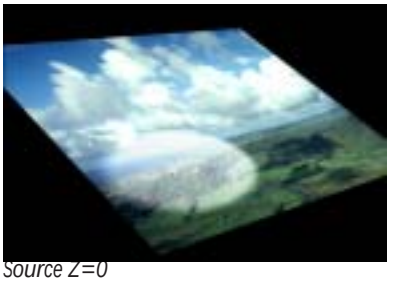
Each of the three light types is controlled by a slightly different group of parameters. The following chart indicates which parameters are used by each light type.

Parameter Name	Diffuse-Specular	Spotlight	Light Sweep
Source XY	X	X	X
Source Z	X	X	X
Target XY	X	X	X
Width	———	X	X
Intensity	X	X	X

Parameter Name	Diffuse-Specular	Spotlight	Light Sweep
Specular	X	———	———
Color	X	X	X
Falloff	———	X	X
Sweep Angle	———	———	X
Point at Source	———	X	X
Apply Mode	X	X	X
Apply Mix	X	X	X

Source X and **Y** sets the location of the light source on the horizontal and vertical axis.

Source Z sets the distance between the light source and the image plane. Decreasing this value moves the light source farther from the image; increasing this value moves the light closer. Adjusting Source Z allows you to focus the light or to spread it over a larger area.



Source Z=0

Source Z=3

Target X and **Y** sets the X and Y coordinates for the point at which the light is aimed.

Width controls the width of the light beam.

Intensity sets the intensity of the light source. Increasing this value creates a brighter light.

When using the Diffuse-Specular Light Type, Intensity controls the intensity of the diffuse light on the image and has no affect on the intensity of the specular light. Increasing the Intensity value increases the size of the lit region and makes the center of the lit area look increasingly bright.

Specular determines the amount of specular light applied to the image. Increasing this value increases the amount of light at the center of the lit region. The following illustrations demonstrate the effect of adjusting Intensity and Specular.

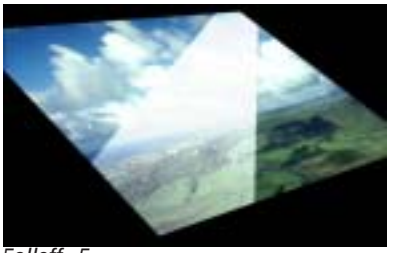
Intensity=50, Specular=0

Intensity=0, Specular=400

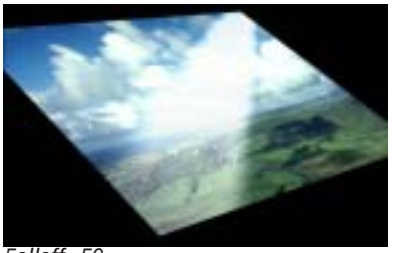
Intensity=50, Specular=400

Color controls the color of the Light source.

Falloff adjusts the amount of falloff on the edges of the lit region. Increasing this value adds more falloff, softening the edges of the lit region. Decreasing this value reduces the amount of falloff, creating harder edges on the lit region.



Falloff=5



Falloff=50

Sweep Angle sets the angle between the beam of light and the horizontal axis.

If you select the **Point at Source checkbox**, the Target point coordinates are set relative to the undistorted source, so that the light follows the source as it animates.

The **Apply Mode menu** controls how the light is composited with the source image. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

Working with the BCC Fast Flipper Filter

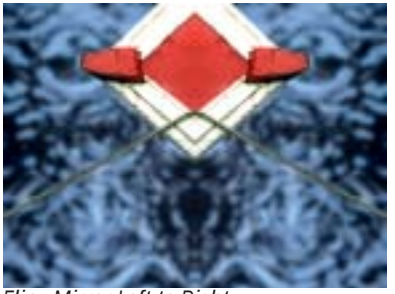
Fast Flipper flips or mirrors your image. You can flip your image vertically or horizontally, or define an invisible mirror line that mirrors your image in various directions. You can also blend the mirror line to produce a smoother transition between the original and mirrored images. Resampling is on a pixel-for-pixel basis, so the filter is fast and no quality is lost.

Source image

Filtered image (flipped horizontally)

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

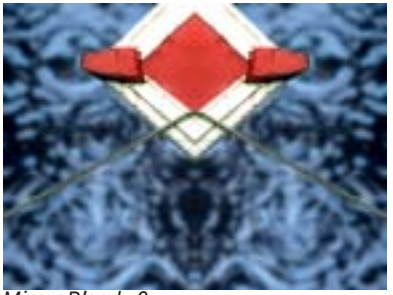
The **Flip menu** setting determines the type of flip or mirror operation the filter performs. The choices are ***Horizontal, Vertical, Both;*** or ***Mirror Left to Right, Mirror Right to Left, Mirror Top to Bottom,*** or ***Mirror Bottom to Top***.

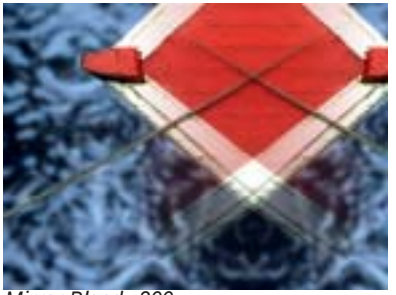


Flip=Mirror Left to Right

Flip=Mirror Right to Left

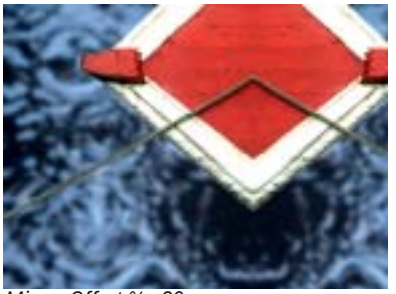
Mirror Blend is active if one of the mirror options is chosen under Flip. It softens the mirror edge by blending the image near the mirror line.


Mirror Blend=0


Mirror Blend=200

Mirror Offset % moves the mirror line in the direction of the mirror. For example, if Mirror Right to Left is chosen, increasing Mirror Offset % moves the mirror line to the left. If Mirror Left to Right is chosen, increasing Mirror Offset % moves the mirror line to the right.


Mirror Offset %=0


Mirror Offset %=30

Working with the BCC Page Turn Filter

Page Turn creates a 3D model of a page turning in a book or magazine, and allows you to place media on both sides of the page.

BCC Page Turn can also be used as a transition. To apply create a transition, use the BCC Page Turn in the BCC Two-Input Effects category or apply the filter to two layers. For information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

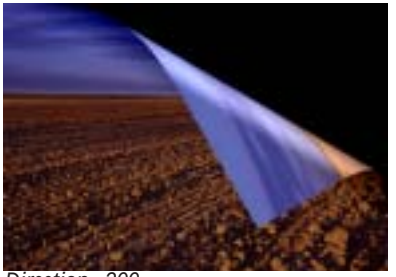
Offset controls the amount of the page that peels off over the duration of the effect. An Offset of 0 leaves the source image undistorted, whereas an Offset of 100 peels the page off completely, revealing the track below.

Offset=40

Offset=60

Direction sets the angle between the fold in the page and the horizontal axis.

Direction=70



Direction=300

Flap Radius sets the radius of the 3D-modeled flap as the page turns. Reducing Flap Radius makes the flap sharper and more like a crease, and increasing it makes the flap more cylindrical.

Flap Radius=10

Flap Radius=40

Flap Opacity adjusts the transparency of the flap. A setting of 100 makes the flap completely invisible, whereas a setting of 0 leaves the flap completely opaque.

Light adds a basic white light that illuminates the curve of the flap as it peels back. Increasing this value increases the intensity of the highlight.

Shadow causes the flap to cast a shadow on the turning page. Increasing this value increases the intensity of the shadow.

The **Alternate Back menu** allows you to choose a layer in the timeline to apply to the back of the page turn. ***None*** applies the source layer to both sides of the page.

Working with the BCC Polar Displacement Filter

The Polar Displacement filter uses a Map Layer to displace pixels radially outward from the Center Point and angularly along an arc of a circle centered at the Center Point.

Polar Displacement can also be used as a transition. To apply create a transition, use the BCC Polar Displacement TR in the BCC Two-Input Effects category or apply the filter to two layers. For information, see “Applying BCC Effects as Transitions” on page 12.

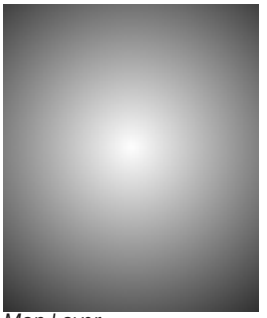
For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Selecting the **Process Alpha Only checkbox** allows you to distort the alpha channel without changing the underlying colors.

The **Map menu** determines which clip layer in the timeline is used to create the distortions in the source image.

If the Map layer is partly transparent, the displacement amount is scaled by its alpha values. Pixels whose map alpha is 0 are not displaced.

Source image



Map Layer

Filtered image

The **View Map checkbox** allows you to view the Map Layer as you adjust it. Be sure to deselect this option before rendering.

The Map parameters are identical to the corresponding controls in the Displacement Map filter. See “Map Parameter Group” on page 157 for more information.

Center Point Parameter Group

Center Point sets the center point for the radial and angular displacements on the X and Y axis.

The **Radial Channel menu** sets which channel in the Map Layer controls radial displacement. The choices are ***Red***, ***Green***, ***Blue***, ***Luma***, ***White***, ***Gray***, and ***Black***. White treats all pixels as if they were white (i. e. fully displaces each pixel to the Max. Radial Displacement value). Gray treats all pixels as if they were 50% gray (resulting in no displacement). Black treats all pixels as if they were black, thereby displacing all pixels to the negative of the Max. Radial Displacement value.

Max. Radial Displacement sets the amount of radial displacement (in pixels) applied to pixels in the source image that correspond to white pixels in the Map Layer. The displacement for black pixels is the negative of this value.


Max. Radial Disp.=50


Max. Radial Disp.=100


Max. Radial Disp.=150

Radial Reference Level allows you to control the channel where the displacement occurs. If you want all of the displacement in the angular channel, set **Radial Reference Level** to ***255***. To have all the displacement occur Radially, set **Radial Reference Level** to ***0***.

Angular Channel menu sets which channel in the Map layer controls angular displacement. The choices are ***Red***, ***Green***, ***Blue***, ***Luma***, ***White***, ***Gray***, and ***Black***. White treats all pixels as if they were white (i. e. fully displaces each pixel to the White Angular Displacement value). Gray treats all pixels as if they were 50% gray (resulting in no displacement). Black treats all pixels as if they were black, thereby displacing all pixels to the negative of the White Angular Displacement value.

Max. Angular Displacement sets the number of degrees of angular displacement applied to pixels in the source image that correspond to white pixels in the Map layer. The displacement for black pixels is the negative of this value.


Max. Angular Disp.=50


Max. Angular Disp.=100


Max. Angular Disp.=150

Angular Reference Level allows you to control the channel where the displacement occurs. If you want all of the displacement in the radial channel, set **Angular Reference Level** to ***255***. To have all the displacement occur angularly, set **Angular Reference Level** to ***0***.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

The Pinning parameters are identical to the corresponding controls in the Displacement Map filter. See “Working with the Pinning Controls” on page 210 for more information.

Working with the BCC Ripple Filter

The Ripple filter simulates ripples spreading out from a point of origin in a pool of water, similar to what you see after tossing a pebble into a pond. This filter automatically creates animated ripples and allows you to choose from a range of wave shapes.

Source image

Filtered image

The BCC Ripple filter can also be used as a transition. To create a transition, use the BCC Ripple in the BCC Two-Input Effects category or apply the filter to two layers. For more information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24, “Working with the Drop Shadow Parameter Group” on page 25 and “Working with the Motion Tracker Parameter Groups” on page 29.

If the **Correct Non-Square Pixels checkbox** is selected and the filter is applied to media with non-square pixels, the filter converts the pixels to square pixels (maintaining the height), applies the ripple, and then converts the pixels back to their original format. This helps to prevent distortion.

Selecting the **Process Alpha Only checkbox** allows you to distort the alpha channel without changing the underlying colors.

Radius determines the radius of the full-strength ripple. Points within the range set by the Radius value will be fully displaced by the ripple. The ripple waves decay as they move beyond the range of the radius, and points more than two times the radius from the center are not affected by the ripple (when Falloff is at 0).

For example, if you set Radius to 50, all pixels within 50 units of the Center Point are fully distorted by the ripple. Points between 50 and 100 units are affected less as the value approaches 100. Pixels beyond this range remain unaffected.


Radius=160


Radius=80

Center Point sets the coordinates of the center point of the ripple on the X and Y axis. Note that the center point must be placed within the source image.

Height determines the amount of displacement in the direction of wave motion.


Height=50


Height=100

Perpendicular Height determines the amount of displacement perpendicular to the direction of wave motion.


Perpendicular Height=0


Perpendicular Height=50

Wave Width determines the distance between the peaks of the ripple waves. The 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 in the effect, because as the waves become wider, fewer fit on screen.

Wave Width=40

Wave Width=20

Speed and **Phase** control the motion of the ripple waves as they move from the center of the ripple. Speed controls the rate at which the waves move, and Phase controls the position of the waves.

The default Speed setting is 1.0 moves the ripple out by one wave width per second. A negative Speed value moves the ripples in toward the center. When Speed is set to 0, the ripple is stationary (unless Phase is animated).

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

- Leave Phase at its default setting and adjust Speed. Try this technique if you care about the overall motion of the effect but not about the exact number of waves created.
- If you want to precisely control the point in the waveform at which the Ripple begins (for example, whether it begins at a peak or a trough), move the position indicator to the first frame of the effect and adjust the Phase control until the wave is at the desired point. If you want to control the number of waves that move out over the duration of the clip, set Speed to 0 and animate Phase to create movement. For example, suppose you want exactly five waves to form and disperse during the clip. At the first keyframe of the clip, set Phase to 0. Set the keyframe at the last frame in the clip to 1800° (5 x 360°). Exactly five full waves form over the duration of the clip.
- If you want a static (not animated) distortion, set Speed to 0 and do not animate Phase.

Inside Radius sets the radius of a circle at the center of the ripple within which no distortion takes place. You can animate this parameter to produce a ripple that does not continuously flow outward from the center, but instead produces a few concentric ripples that move outward and disappear.


Inside Radius=0


Inside Radius=80

Falloff controls the rate at which the wave height drops off beyond the edges of the radius. Increasing Falloff causes the wave height to decrease more slowly (thereby creating a wider falloff area), and decreasing this value makes the wave height decrease more abruptly.

Chaos Parameter Group

The Chaos parameters provide more options for controlling the appearance of the ripple, which can be useful for creating more realistic effects.

The **Twirl menu** affects the behavior of the angular portion of the wave. The Twirl settings have no affect if Perpendicular Height is set to 0.

- When Twirl is set to ***Off***, Perpendicular Height creates the same amount of displacement in the center of the ripple as it does at the edges.
- When Twirl is set to ***On***, the displacement caused by the Perpendicular Height increases farther from the center.
- ***Super Twirl*** and ***Hyper Twirl*** further exaggerate the angular motion as the wave moves away from the center of the ripple.


Twirl On


Twirl Hyper

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 page 191.

The Chaos Wave's waveform is determined by the **Chaos Wave** value, which relates to the fourteen Spectrum waveforms listed in the WaveForm menu. A Chaos Wave value of 10 uses the Spectrum 1 waveform, 20 uses the Spectrum 2 waveform, and so on. Values between two multiples of 10 create a mix of the two adjacent Spectrum waves.

Chaos Blend controls the mix of the specified Waveform (determined by the WaveForm menu) with the Chaos Wave setting.

If Chaos Blend is set to 0, the resulting wave conforms to the WaveForm setting. At a Chaos Blend value of 100, the filter uses only the Chaos Wave setting. Intermediate values blend between the two. You can change the Chaos Blend value to adjust the amount of chaos added to the basic waveform.

Wave Distortion distorts the shape of the wave, changing the displacement of pixels that are not at zero points (for positive values) or peaks (for negative values) in the wave. A zero point is a point in a wave which is not displaced; if you image a waveform drawn on a graph, the zero points are the points at which the wave crosses the horizontal axis.

The **Intensity menu** adjusts the affect of the Height and Perpendicular Height settings on the ripple.

- ***Normal*** has no affect on the Height and Perpendicular Height settings and is suitable in most circumstances.
- ***Low*** scales down the Height and Perpendicular Height values by a factor of 10, which can be useful if you are working with small ripples and want fine control over the parameters.
- ***High*** multiplies the Height and Perpendicular Height values by a factor of 10 and can produce very exaggerated and unnatural-looking ripple effects.

You can stretch or squeeze the area affected by the ripple in any direction by using **Stretch** and **Stretch Angle**. Positive Stretch values stretch the ripple, while negative values squeeze it. The Stretch Angle is the angle between the stretch direction and the horizontal axis.

Stretch is useful for adjusting the perspective of the ripple. For example, you can create the appearance of a ripple in water viewed from the shore rather than from above. To achieve this effect, adjust the Stretch slider to a high value (between 75 and 100), and leave Stretch Angle at the default of 0. This effect generally looks best if Wave Width is decreased, which adds to the illusion of perspective by making the waves look closer together. In the following examples, the PixelChooser is used to apply the filter to a rectangular area ending at the horizon.

Source image

Filtered image with Stretch

If you see holes or tearing in the ripple after you stretch it, scale down the Stretch and Height parameters or adjust the Pinning controls to compensate.

Light Parameter Group

The Light parameters adjusts the lighting of the ripple in the filtered image.

Light Level controls the amount of light applied to the image. At a value of 0, no light is applied. As the value increases, the light becomes more intense.

Light Color sets the color of the applied light.

Light Width affects the size of the lit area on the wave crest. Increasing this parameter value causes a wider part of the crest to be lit; decreasing it diminishes the lit portion of the wave.

Light Width=20

Light Width=80

Light Focus adjusts the shape of the light over each wave. Increasing Light Focus makes the light wider and more diffuse; decreasing Light Focus makes the light sharper and narrower.

Light Focus= –80

Light Focus=80

Light Angle sets the angle at which the light hits the surface of the waves.

Light Elevation determines the distance between the light source and the image plane. As Light Elevation increase, the light hits a larger portion of the ripple.

Light Elevation=20

Light Elevation=80

Ambient Light adjusts the diffuse light on the image. The default of 100 does not add or subtract ambient light from the source image. Decreasing this setting makes the image darker before the other light is applied. Ambient Light illuminates or darkens the image evenly, and is unaffected by any other lighting parameters.

The PixelChooser does not affect Ambient Light. Ambient Light is applied to all pixels. This ensures that the PixelChooser does not create discrepancies in the overall lighting of the image before Wave is applied. At the default Ambient Light value, the PixelChooser behaves exactly as in other filters; at other values, the PixelChooser filters every parameter except Ambient Light.

The **Apply Mode menu** controls how the filtered image is composited with the source image. For descriptions of all the Apply Modes, see “Apply Modes” on page 625.

The Pinning parameters are described in “Working with the Pinning Controls” on page 210. The PixelChooser is described in “The PixelChooser” on page 603.

Working with the BCC Sphere Filter

The Sphere shape maps the source image onto a 3D modeled sphere. A number of controls allow you to adjust the position, scale, size, and pivot point of the shape, crop and mask the sphere, adjust the camera perspective of the sphere, apply motion blur and lights, and control the compositing of the sphere with other objects.

The BCC Sphere can also be used as a transition. To apply a Sphere as a transition, see"Working with the BCC Sphere Transition" on page 185.

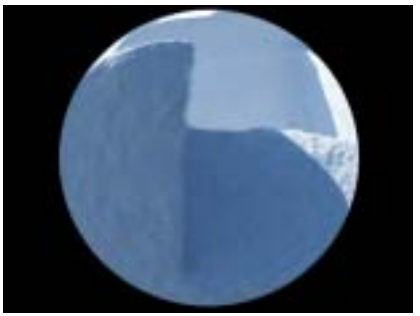
For details on the common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, and "Working with the Drop Shadow Parameter Group" on page 25.

Faces Parameter Group

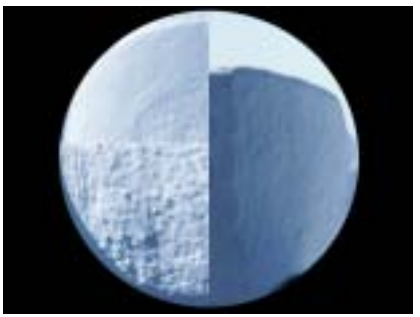
The **Source menu** allows you to choose any clip layer in the timeline to map to the surface of the sphere. If you choose ***None***, the filtered clip is used.

The **Wrap menu** determines how the source image wraps around the sphere.

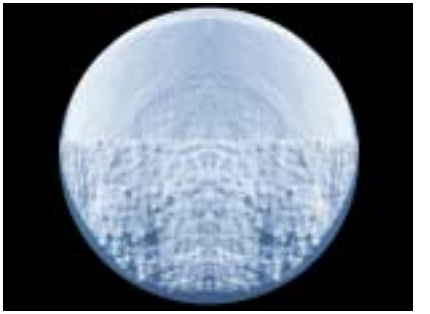
Around wraps the image completely around the shape. This is the most likely choice to use to place media on the shape and spin or tumble it. If the image is fully wrapped, wrapping Around only shows roughly half the source at any given time. This is not always the best choice if you do not spin or tumble your sphere. As you unwrap the sphere using the Around setting, the source covers a smaller part of the modeled shape, and the uncovered area becomes transparent.



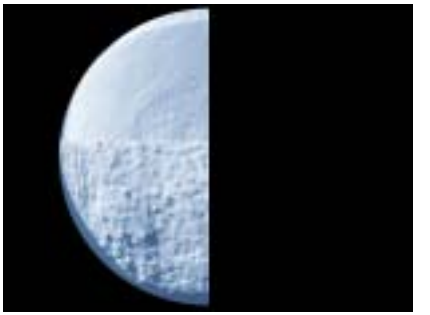
One Way Repeat renders two copies of the source image, one on the front and one on the back of the sphere. You can see the seam between the two images if you spin the sphere 90° or 270°. Unwrapping the sphere using One Way Repeat causes multiple copies of the source (as many as required to fill the shape) to wrap horizontally around the shape.



Back & Forth Repeat also renders two copies of the source, but the back copy is a mirror image. This causes the corresponding sides to line up and mirror each other at the seams. This setting unwraps in the same manner as the One Way Repeat setting.



Front maps the image onto the front of the sphere and leaves the back transparent. This creates a semi-sphere, visible if you spin or tumble the object. In this example, the sphere has been rotated 90° to show the transparent back half.



Tile is similar to One Way Repeat, but it also repeats the image vertically as it unwraps. You can create a tiled sphere by reducing Scale and Wrap Percentage.

The **Faces menu** determines which faces of the sphere are visible and allows you to map a separate image to the inside of the sphere.

- Choose ***Front*** to map the chosen Source Layer to the outside of the sphere.
- ***Back*** maps the Source Layer to the inside of the sphere.
- ***Both*** maps media to both the inside and outside of the shape. When Both is chosen, you can map another layer from the timeline to the inside of the sphere using the **Alternate Back menu**.

Front Opacity controls the opacity of the image on the outside of the sphere. You can use this setting to make the outside of the sphere partially or fully transparent to reveal an image on the inside. A setting of 100 makes the outside of the sphere completely opaque; a setting of 0 makes the outside completely transparent.

Geometry Parameter Group

Position XY sets the X and Y coordinates of the center point of the sphere.

Position Z adjusts the apparent depth of the sphere. Decreasing negative values move the sphere closer to the viewer, while increasing positive values move the sphere farther away from the viewer. Very low Position Z values move the sphere behind the viewer, making it invisible.

Wrap Percentage controls the extent to which the image wraps around the shape. As Wrap Percentage approaches 0, the shape is less spherical and closer to the original flat image.

A Wrap Percentage of 100 wraps the image completely around the sphere. As you reduce the value, four things happen to the physical model: the radius gets larger, the image is mapped on a smaller section of the 3D shape, the viewer's eye moves further away, and the aspect ratio is adjusted toward the original aspect ratio of the source. The overall effect is a gradual flattening of the image as the sphere unwraps.


Wrap Percentage=100


Wrap Percentage=80


Wrap Percentage=35

If you spin, tumble, or rotate a sphere and then unwrap it, the object moves back to its original position in 3D space as it unwraps.To animate the sphere so that it spins through one full revolution and unwraps, animate Spin from –360 to 0 (or 360 to 0 to go the other direction). Otherwise, the image's motion counteracts the Spin as it moves to the original, unrotated position.

Scale adjusts the size of the sphere.

Tumble, **Spin**, and **Rotate** move the sphere around the X, Y, and Z axis respectively. Tumble, Spin, and Rotate can be animated over values greater than 360° to make the sphere complete more than one full revolution.

The **Crop** controls crop the edges of the image. The **Crop Top-Left** and **Crop Bot-Right** set the upper left and lower right corners of a rectangle that define the borders of the crop.

Motion Blur Parameter Group

Select the **Motion Blur On checkbox** to turn Motion Blur on.

Motion Blur is a very processor-intensive feature. You might want to turn motion blur off while you work, then enable it just before rendering. You can also select the **Draft Mode checkbox** in the General Controls parameter group to speed your previews. Remember to deselect this checkbox before rendering.

The **Motion Blur menu** determines how many times the effect samples between the time the "shutter" opens and the time it closes. Increasing the number of samples creates a smoother blur but increases render and preview time proportionately. Choose ***Rough***, ***Medium***, ***Smooth***, or ***Smoothest***. Rough uses the fewest samples, while Smoothest uses the most.

Shutter Angle refers to the workings of a conventional film camera. Normally the shutter is open to 180°, meaning that the shutter is open for half of each frame. Increasing the angle opens the shutter longer, creating a wider blur. Decreasing the angle produces a thinner blur.

Camera/Pivot Parameter Group

The parameters in this section are identical to the corresponding controls in the DVE filter. See "Camera / Pivot Parameter Group" on page 161 for more information.

Light 1, Light 2, and Light 3 Parameter Groups

The parameters in this section are identical to the corresponding controls in the DVE filter. See "Light 1, Light 2, and Light 3 Parameter Groups" on page 164 for more information.

Drop Shadow Parameter Group

For information on these parameters, see "Working with the Drop Shadow Parameter Group" on page 25.

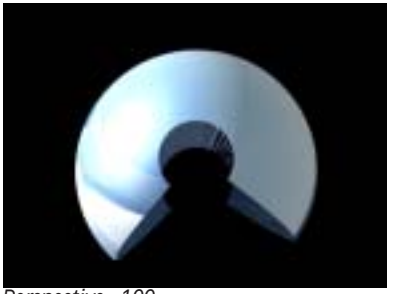
Working with the BCC Sphere Transition

The Sphere Transition shape models the source image onto a sphere. Unlike the Sphere filter, the Sphere Transition filter allows you to animate Perspective, which is useful in creating transitions.

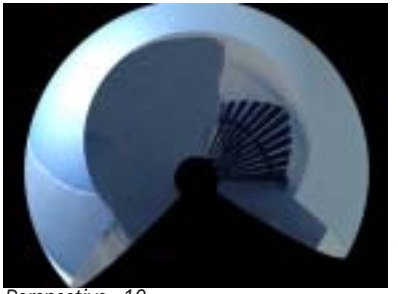
The remaining parameters are identical to the corresponding controls in the Sphere filter. See “Working with the BCC Sphere Filter” on page 181.

When the **Unwrap as Transition checkbox** is selected (the default), unwrapping the shape modifies the scale and rotation controls so the fully unwrapped image is the original source. When it is unchecked, unwrapping the image does not affect the scale or rotation.

Perspective sets the distance between the viewer’s eye and the surface of the object. The maximum value places the viewer far away from the sphere, and the minimum value puts the viewer just above the surface. Increasing Perspective increases the apparent size of the sphere, emphasizing the part that is directly in front of the viewer. A Perspective setting of 100 makes the image appear almost flat; only the foreshortening near the edges of the circular outline of the sphere show the curvature of the shape. A Perspective of 1 emphasizes the curvature, but shows only a small portion of the source media. The default setting of 80 shows the entire surface and creates a more curved appearance.



Perspective=100



Perspective=10

Working with the BCC Twirl Filter

The BCC Twirl filter spins the image around a center point, creating a spiral of distortion.

Source image

Filtered image

The BCC Twirl can also be used as a transition. To create a transition, use the BCC Twirl TR in the BCC Two-Input Effects category or apply the filter to two layers. For more information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Selecting the **Process Alpha Only checkbox** allows you to distort the alpha channel without changing the underlying colors.

Twirl Center sets the center of the twirl effect along the X and Y axis.

The **Twirl Style menu** adjusts the shape of the twirl effect. Each style uses the **Twirl Angle** and **Twirl Radius** parameters slightly differently.

- ***Linear*** displaces pixels to the specified Twirl Angle at the Twirl Center point. The displacement of the pixels decreases evenly as their distance from the center decreases, and pixels are not displaced at all beyond the Twirl Radius.
- ***Wide*** is similar to Linear, but applies more displacement to pixels near the Twirl Radius. This creates a wider twirl.
- ***Narrow*** is similar to Linear but applies more displacement to pixels near the Twirl Center point. This creates a narrower twirl.
- ***Two Way*** begins displacing pixels outside the Twirl Radius in the direction of the Twirl Angle. As the distance to the center of the effect decreases, the displacement increases until the Twirl Radius is reached. At the Twirl Radius, pixels are displaced fully in the Twirl Angle direction. Between the Twirl Radius and the Twirl Center, pixels are displaced increasingly in the direction opposite the Twirl Angle. At the Twirl Center point, pixels are displaced fully to the opposite of the Twirl Angle.

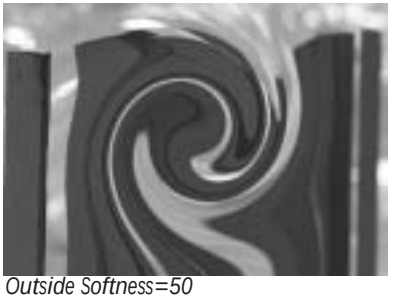

Twirl Style=Linear


Twirl Style=Narrow

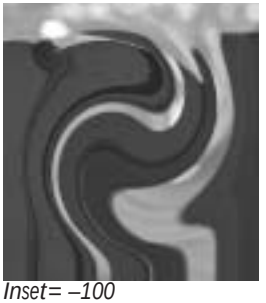

Twirl Style=Two Way

Outside Soften softens the transition between the twirl and the undistorted region.


Outside Softness=0


Outside Softness=50

Inset changes the radius value at which the twirl achieves its maximum displacement. Increasing positive values move the peak displacement area away from the center of the twirl, which can create an undistorted region in the center. Negative values create effects similar to those produced by reducing the Twirl Angle value.


Inset= –100


Inset=0


Inset=100

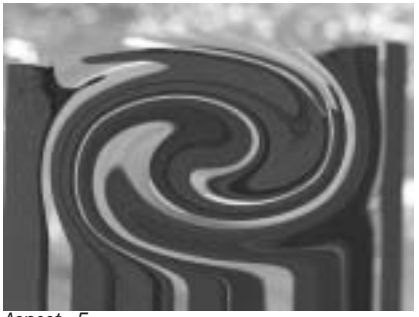
If Inset is greater than 0, **Inside Falloff** controls the length or the transition between fully displaced pixels in the twirl and the unaffected pixels. If the Inset value is greater than the Inside Falloff value, an undistorted region in the center of the effect is created. If Inset is 0 or a negative value, Inside Falloff has no affect.


Inside Falloff=0


Inside Falloff=25


Inside Falloff=50

Aspect stretches the Twirl. Positive values stretch the twirl horizontally, while negative values stretch the twirl vertically.


Aspect=5


Aspect= –5

The Motion Tracker parameter group allows you to track the motion of an object in a clip. You can then use the motion path data to control another aspect of the effect. See “Working with the Motion Tracker Parameter Groups” on page 29 for details.

The PixelChooser is described in “The PixelChooser” on page 603.

The Pinning parameters are described in “Working with the Pinning Controls” on page 210.

Working with the BCC Vector Displacement Filter

Vector Displacement uses the RGB channels in a Map layer to displace the image in three different directions.

This filter can also be used as a transition. To create a transition, use the BCC Vector Displacement TR in the BCC Two-Input Effects category or apply the filter to two layers. For information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Selecting the **Process Alpha Only checkbox** allows you to distort the alpha channel without changing the underlying colors.

Map Parameter Group

The **Map menu** sets which clip in the timeline is used to create the distortions.

If the Map layer is partly transparent, the displacement amount scales by its alpha values. Pixels whose map alpha is 0 are not displaced.

The remaining parameters are identical to the corresponding controls in the Displacement Map filter. See “Map Parameter Group” on page 157 and “Working with the Pinning Controls” on page 210.

Red Direction, **Green Direction**, and **Blue Direction** set the direction of the displacement controlled by the red, green and blue channels in the Map Layer.

Red Displacement, **Green Displacement**, and **Blue Displacement** set the amount of displacement, in pixels, that the filter applies to portions of the image corresponding to pixels in the Map Layer whose matching color channel is fully on. If a pixel in the Map Layer has a color channel that is fully off, then its corresponding image area is displaced in the amount determined by the matching Displacement value, but in the opposite direction.

The remaining Map parameters are identical to the corresponding controls in the Displacement Map filter. See “Map Parameter Group” on page 157 for more information.

Working with the BCC Wave Filter

The Wave and Ripple filters are very similar, except that Wave creates parallel waves instead of waves that radiate from a point.

Source image

Filtered image

The BCC Wave can also be used as a transition. To apply it as a transition, use the BCC TR Wave in the BCC Two-Input Effects category or apply the filter to two layers. For more information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Selecting the **Process Alpha Only checkbox** allows you to distort the alpha channel without changing the underlying colors.

Height and **Perpendicular Height** determine the strength of the wave. Height controls the amount of displacement in the direction of the wave, and Trans. (Transverse) Height sets the amount of displacement perpendicular to the direction of wave motion.

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

Speed and Phase control the motion of the waves as they move. If you look at any one peak in the wave, **Speed** controls the rate at which the peak moves, and **Phase** controls the position of the peak.

The default Speed setting of 10 moves the waves at a rate of one wave width per second. A negative Speed value moves the waves in the opposite direction. When Speed is 0, the waves are stationary (unless Phase is interpolating to a different value during the effect).

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

- Leave Phase at its default setting and adjust Speed. Try this technique if you care about the overall motion of the effect but not about the exact number of waves created.
- To precisely control the point at which the wave effect begins (for example, whether it begins at a peak or a trough), adjust the Phase control in the first frame of the effect until the wave is at the desired point. To control the number of waves that pass by over the duration of the clip, set Speed to 0 and animate Phase to create movement. For example, suppose you want exactly five waves to form and disperse. Set the first keyframe of the clip to a Phase of 0. Set a keyframe at the last frame in the clip to 1800° (5 x 360°). Exactly five full waves form over the duration of the clip.
- If you want a static (not animated) distortion, set Speed to 0 and do not animate Phase.

Wave Angle sets the angle between the direction of wave motion and the horizontal axis.

Chaos Parameter Group

The Chaos parameters control shape of the waves, change the look of the waves by adding distortion or chaos, or create the appearance of waves that dissipate as they move.

The **WaveForm menu** setting determines the shape of the wave. These 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.

Circle Waveform

Triangle Waveform

Semicircle Waveform

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 waveforms are all variations of the sine wave that can produce less regular, more realistic looking waves.


Spectrum 1 Waveform


Spectrum 4 Waveform


Spectrum 10 Waveform

The Chaos Wave's waveform is determined by the **Chaos Wave** value, which relates to the fourteen Spectrum waveforms listed in the Waveforms menu in the Basic tab. A Chaos Wave value of 10 uses the Spectrum 1 waveform as the Chaos Wave, 20 uses the Spectrum 2 waveform, and so on. Values between two multiples of 10 create a mix of the two adjacent Spectrum waves.

Chaos Blend controls the mix of the specified waveform (determined by the WaveForm menu) with the Chaos Wave setting. If Chaos Blend is set to 0, the resulting wave conforms to the WaveForm setting. At a Chaos Blend value of 100, the filter uses only the Chaos Wave. Intermediate values blend between the two. You can change the Chaos Blend value to adjust the amount of chaos added to the basic waveform.

Wave Distortion distorts the shape of the wave, changing the displacement of pixels that are not at zero points (for positive values) or peaks (for negative values) in the wave. A zero point is a point in a wave which is not displaced; if you image a waveform drawn on a graph, the zero points are the points at which the wave crosses the horizontal axis.

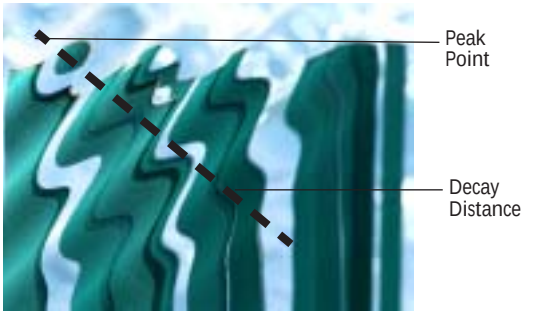
The **Intensity menu** includes three settings: Low, Normal, and High.

- ***Normal*** has no affect on the Height and Perpendicular Height settings and is suitable in most circumstances.
- ***Low*** scales down the Height and Perpendicular Height values by a factor of 10, which can be useful if you are working with small waves and want fine control over the parameters.
- ***High*** multiplies the Height and Perpendicular Height values by a factor of 10 and can produce very exaggerated and unnatural-looking wave effects.

Peak Point and Decay Parameter Groups

The Peak Point and Decay Distance interact to produce a wave that decays as it moves. As the wave advances, it stays at full strength until it reaches the **Peak Point**, beyond which it decays until it hits the **Decay Distance**, where it levels out.

The amount that the wave decays is controlled by **Decay**, which sets the ratio of the wave's strength at its lowest point (at the Decay Distance) to the wave's strength at its highest point (the Peak Point).



Light Parameter Group

The Light parameters adjusts the lighting of the wave in the filtered image.

Light Level controls the amount of light applied to the image. At a value of 0, no light is applied. As the value increases, the light becomes more intense.

Light Color sets the color of the applied light.

Light Width affects the size of the lit area on the wave crest. Increasing this value causes a wider part of the crest to be lit; decreasing it diminishes the lit portion of the wave.

Light Focus adjusts the shape of the light over each wave. Increasing Light Focus causes the light to look wider and more diffuse; decreasing Light Focus makes the light bands sharper and narrower.

Ambient Light adjusts the diffuse light on the image. The default setting of 100 does not add or subtract ambient light from the source image. Decreasing this setting makes the image darker before the other light is applied. Ambient Light illuminates or darkens the image evenly, and is unaffected by any other lighting parameters.

The PixelChooser does not affect the Ambient Light setting. Ambient Light is applied to all pixels. This ensures that the PixelChooser does not create discrepancies in the overall lighting of the image before Wave is applied. Thus, at the default Ambient Light value of 100 (where no ambient light is added or subtracted), the PixelChooser behaves exactly as in other filters; at other values PixelChooser filters every parameter except Ambient Light.

The **Apply Mode menu** controls how the filtered image is composited with the source image. For descriptions of all the possible Apply Modes, see "Apply Modes" on page 625.

The Pinning parameters are described in "Working with the Pinning Controls" on page 210.

The PixelChooser controls are described in detail in "The PixelChooser" on page 603.

Working with the BCC Z Space Filters

Normally, if you create an effect with multiple DVE layers, each layer is rendered separately. The layer that is topmost in the timeline overlaps all other layers, no matter how the layers move or rotate. The Z Space filters allow you to create effects using multiple DVE layers ("Z planes") and / or sphere layers which can interact and intersect in 3D space. In a Z Space effect, each plane or sphere's apparent depth, or position on the Z axis, determines how the plane interacts with other planes and spheres. The plane closest to the viewer in Z space covers planes and spheres that are farther away, regardless of the order in the timeline.

Normal DVE planes

DVE planes in Z Space

Boris Continuum Complete contains three Z space filters, **Z Space I**, **Z Space II**, and **Z Space III**. All three filters provide Z planes which can independently animate and / or transform. In addition, Z Space III offers two sphere layers. Each plane or sphere offers controls which allow you to scale, position, and rotate the shape. The Z planes and spheres can be nested within a container which allows you to globally scale, position, and rotate multiple planes. In addition, all three filters provide controls to add shadows and motion blur to the effect. Z Space I and II also allow you to add a background.

Working with the Z Space I, Z Space II, and Z Space III Features

The three Z Space filters differ only in the specific array of planes, spheres, and controls that each filter provides. The following table summarizes the differences between the filters.

Feature	Z Space I	Z Space II	Z Space III
Full Z Planes with Pivot controls	3	2	2
Modified Z Planes without Pivot controls	0	3	0
Spheres	0	0	2
Background Planes	1	1	0
Lighting Controls	2 Spotlights	none	1 Light

The sections that follow describe parameters that are used in one or more of the Z Space filters. Parameters common to one or more filters function in the same way in each filter.

For details on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Viewing Selected Planes

The **View menu** determines which portion of the effect displays in the Effect Preview monitor. Choose ***Effect*** to view the entire effect. The other View menu choices vary depending on the Z Space filter. Choose ***Plane 1***, ***Plane 2***, ***Plane 3***, ***Plane 4***, ***Plane 5***, ***Sphere 1***, ***Sphere 2***, or ***Background*** to view only the corresponding plane or sphere.

If the View menu is set to a Plane or Sphere which does not have a source layer assigned to it, the Effect Preview monitor displays a transparent layer.

Container Parameter Group

The Z Space filters use a **container** to group and arrange Z planes and spheres in 3D space. When you add planes and spheres to a container, you can animate each plane and sphere independently (using the Plane and Sphere parameters), then apply parameters and animations globally to all the planes and spheres within the container (using the Container parameters). The container preserves the spatial relationship between the objects within it as you reposition and rotate the container.

This is similar to nesting effects in the Avid timeline. The illustration at right shows three Z planes in a 3D container. Each plane is scaled and positioned independently.

When you scale or rotate the container, all three planes scale and rotate as well, yet the spatial relationship between the three tracks remains constant.

Container rotated

Container rotated and stretched

You can still adjust any individual Z plane and sphere by making changes to the corresponding group of Plane parameters (see “Plane 1, 2, and 3 Parameter Groups” on page 201). In the example at right, Plane 2 (the facade) is tumbled forward.

You control which planes and spheres are in the container using the Link menu in each Plane and Sphere parameter group. For details on the Link menu, see page 201. You can also choose whether the background plane is inside the container using the Link Background menu, described on page 203.

Scale X Container and **Scale Y Container** adjust the size of the container along the X and Y axis respectively. These parameters are scaled as percentages of the container’s original width and height. Thus, an Scale X setting of 200 produces a container twice as wide as the original. Select the **Lock Scale checkbox** to keep these values in proportion, or deselect this option to adjust the Scale X and Y independently.

Position X and **Position Y Container** sets the horizontal and vertical location of the container.

Position Z Container sets the apparent depth of the container. Decreasing negative values move the container closer to the viewer; increasing positive values move the container away. Very low Position Z values move the container behind the viewer, making it invisible.

Tumble Container, **Spin Container**, and **Rotate Container** move the container around the X, Y, and Z axis, respectively. Tumble, Spin, and Rotate can animate over values greater than 360° to make the container undergo more than one full revolution.

Container tumbled

Container spun

Container rotated

When the **Lock Pivot to Position checkbox** is selected, the container tumbles, spins, and rotates around its own center. If this option is deselected, you can set an external pivot point around which to tumble, spin, or rotate the container.

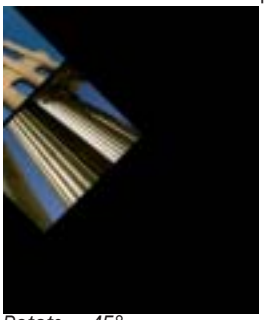
Container rotated around center

Rotate=–45°

Rotate=0°

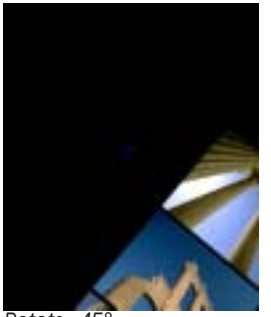
Rotate=45°

Container rotated around independent pivot point in lower left corner



Rotate=–45°

Rotate=0°



Rotate=45°

Pivot X Container, Pivot Y Container and **Pivot Z Container** set the X, Y, and Z coordinates of the pivot point. If Lock Pivot to Position is selected, moving the pivot point has no affect.

The **Motion Blur menu** turns motion blur on and off and controls the smoothness of the blur. ***Off*** turns motion blur off. The remaining options, ***Rough***, ***Medium***, ***Smooth***, and ***Smoothest***, produce motion blur of varying degrees of smoothness. Increasing smoothness produces a higher quality blur but increases rendering and preview times proportionately.

Motion Blur=Rough

Motion Blur=Smoothest

Motion Blur is a very processor-intensive feature. You might want to turn motion blur off while you work, then enable it just before rendering. You can also select the **Draft Mode checkbox** in the General Controls parameter group to speed your previews. Remember to deselect this checkbox before rendering.

Shutter Angle refers to the workings of a conventional film camera. Normally, the shutter is open to 180°, meaning that the shutter is open for half of each frame. Increasing the angle opens the shutter longer, creating a wider blur. Decreasing the angle produces a thinner blur.

Shutter Angle=180

Shutter Angle=300

Shadows Parameter Group

Shadows parameters let you to add true 3D cast shadows to the effect. These shadows are more realistic than simple drop shadows because the cast shadows change as the objects casting or receiving the shadows are transformed. In the following examples, notice that the shadow falls differently on the background plane as the plane is rotated in 3D space.

Each plane and sphere has a Shadows control that determines whether that plane casts and receives shadows. For example, if you want a sphere track to cast shadows on all other planes, but do not want the sphere shadowed by other planes, you can set the sphere track to cast but not receive shadows.

The **Shadows menu** turns shadows on and off and adjusts the quality of the shadows. ***Off*** turns off the shadows. The remaining three choices turn on shadows and provide three different rendering algorithms.

- ***Faster #1*** and ***Faster #2*** render shadows more quickly but a lower quality. Experiment with these two settings to find the algorithm that looks better for your effect.
- ***Better*** increases rendering time, but produces a better-looking shadow.

If Shadow Softness is 0, Faster #1, Faster #2, and Better all produce the same quality. For more information on Shadow Softness, see page 200.

Shadow Intensity controls the opacity of the shadows. A Shadow Intensity value of 100 creates completely opaque shadows, and a Shadow Intensity value of 0 makes the shadows completely transparent.

Shadow Color sets the color of the shadows.

Shadow Elevation sets the elevation of the synthetic light source used to produce shadows. A high elevation value produces a shadow that falls directly behind the plane casting the shadow. Decrease Shadow Elevation to offset the shadow farther from the plane casting the shadow. Negative Shadow Elevation values cause the plane to cast a shadow in front of itself in Z space so that the plane is partially covered by its own shadow.

Shadow Elevation=60

Shadow Elevation=25

Shadow Direction sets the angle between the beam of light and the horizontal axis. The plane casts a shadow in the direction opposite that of the of the light beam. For example, if the light hits the plane from the right, the plane casts a shadow to the left.

Shadow Direction=–135

Shadow Direction=–45

Shadow Softness controls the softness of the shadow edges. A setting of 0 produces a sharply defined shadow with hard edges. Increasing Shadow Softness produces shadows with softer edges.

Shadow Softness=15

Shadow Softness=50

When the **Lights Cast Shadows checkbox** is selected, the positioning of the Z planes affects how applied light hits the planes. For example, suppose there are two Z planes in an effect, one on top of the other. If Lights Cast Shadows is selected, a light source positioned above both planes lights the top plane and perhaps part of the bottom plane, but the top plane obstructs some of the light falling on the bottom plane. This creates a more natural lighting effect. If this option is deselected, the light falls on both planes, and the top plane does not act as an obstruction.


Lights Cast Shadows on


Lights Cast Shadows off

For more information on the lighting controls, see “Z Space I: Spotlight 1 and Spotlight 2 Parameter Groups” on page 205.

Plane 1, 2, and 3 Parameter Groups

These parameters apply geometric transformations to the corresponding Z plane.

The **Plane menu** sets which layer in the timeline is used as the source for the corresponding Z plane. Choose ***None*** to remove the plane from the effect.

The **Link menu** determines how the plane is grouped with the other elements of the effect.

- ***Free*** places the plane outside the container.
- ***In Container*** places the plane inside the container.
- ***In Layer 1*** links the plane to Plane 1. This link functions like a second container that can be also nested inside the main container. Thus, any changes made to Plane 1 also affect any Z planes whose Link menus are set to In Layer 1.

Scale X and **Scale Y** adjust the size of the plane along the X and Y axis respectively. These parameters are scaled as percentages of the plane’s original width and height. Thus, a Scale X setting of 200 produces a plane twice as wide as the original plane. Select the **Lock to Scale X checkbox** to keep the X and Y Scale values in proportion.

Opacity scales the opacity of the Z plane. When Opacity is 100, the plane is completely opaque. As Opacity decreases, the plane becomes increasingly transparent, and at value of 0, the plane is completely transparent.

Position X and **Position Y** sets the X and Y coordinates of the center point of the plane.

Position Z adjusts the apparent depth of the plane. Decreasing negative values move the plane closer to the viewer, while increasing positive values move the plane farther from the viewer. Very low Position Z values move the plane behind the viewer, making it invisible.

Tumble, **Spin**, and **Rotate** move the plane around the X, Y, and Z axis, respectively. Tumble, Spin, and Rotate can animate over values greater than 360° to make the plane complete more than one full revolution.

When the **Lock Pivot to Position checkbox** is selected, the plane tumbles, spins, and rotates around its own center. If this option is deselected, you can set an external pivot point around which to tumble, spin, or rotate the plane.

Pivot X, Pivot Y and **Pivot Z** set the X, Y, and Z coordinates of the pivot point. If the **Lock Pivot to Position checkbox** is selected, moving the pivot point has no affect.

The **Crop** controls crop the edges of the plane. The X and Y position controls set the upper left and lower right corners of a rectangle that defines the borders of the cropped area.

The **Shadows menu** determines whether the plane casts and/or receives shadows.

- ***Cast Only*** causes the plane to cast shadows on other objects but not to receive them.
- ***Receive Only*** causes the plane to receive shadows cast by other objects but not to cast any of its own.
- ***Cast and Receive*** causes the plane to both cast and receive shadows.
- ***Off*** causes the plane to neither cast nor receive shadows.

Z Space I has a **Lights menu** which determines which of the two spotlights light the plane. Choose ***Light 1 Only***, ***Light 2 Only***, ***Lights 1 and 2***, or ***Off***.

Z Space III contains a **Light On checkbox**. Select Light On to cause applied light to affect the object. Deselect this option to leave the object unlit.

Ambient Light adjusts the brightness of the plane. The default setting of 100 does not add or subtract ambient light from the image. Decreasing this setting darkens the plane before any other light is applied. Ambient light illuminates or darkens the plane evenly, and is unaffected by any other lighting parameters.Ambient Light is not available in Z Space II.

Sphere Parameters Group

These parameters apply geometric transformations to the corresponding sphere.

Many of the Sphere parameters are identical to the corresponding Plane controls. See “Plane 1, 2, and 3 Parameter Groups” on page 201 for more information.

Scale adjusts the size of the sphere. This parameters is scaled as percentages of the sphere’s original size. A Scale setting of 200 produces a sphere twice as big as the original sphere.

Wrap Percentage Sphere sets the extent to which the image wraps around the sphere. As this value approaches 0, the shape becomes less spherical and closer to the original flat image. A Wrap Percentage of 100 wraps the image completely around the sphere. As you reduce the value, four things happen to the physical model: the radius gets larger, the image is mapped on a smaller section of the 3D shape, the viewer’s eye moves further away, and the aspect ratio is adjusted toward the original aspect ratio of the source. The overall effect is a gradual flattening of the image as the sphere unwraps. For illustrative examples of the Wrap Percentage settings, see “Working with the BCC Sphere Filter” on page 181.

The **Wrapping menu** determines how the source image wraps around the sphere. See “Working with the BCC Sphere Filter” on page 181 for illustrations of the Wrapping modes.

- ***Around*** wraps the image completely around the shape. This is the most likely choice to place media on the shape and spin or tumble it. If the image is fully wrapped, wrapping Around only shows roughly half the source at any given time. This is not always the best choice if you do not spin or tumble your sphere. As you unwrap the sphere using the Around setting, the source covers a smaller part of the modeled shape, and the uncovered area becomes transparent.
- ***One Way Repeat*** renders two copies of the source image, one on the front and one on the back. You can see the seam between the two images if you spin the sphere 90° or 270°. Unwrapping the sphere using One Way Repeat causes multiple copies of the source (as many as required to fill the shape) to wrap horizontally around the shape.
- ***Back & Forth Repeat*** also renders two copies of the source, but the back copy is a mirror image. This causes the corresponding sides to line up and mirror each other at the seams. This setting unwraps in the same manner as the One Way Repeat setting.
- ***Front*** maps the image onto the front of the sphere and leaves the back transparent. This creates a semi-sphere, visible if you spin or tumble the object.
- ***Tile*** is similar to One Way Repeat, but it also repeats the image vertically as it unwraps. You can create a tiled sphere by reducing Scale and Wrap Percentage.

The **Faces menu** determines which faces of the sphere are visible.

- Choose ***Front*** to map the chosen Sphere Source to the outside of the sphere.
- ***Back*** maps the Sphere Source layer to the inside of the sphere.
- ***Front and Back*** maps the Sphere Source layer to the inside and outside of the sphere.

Select the **Casts Shadows checkbox** to have the sphere cast shadows on other objects.

Background Parameter Group

These parameters adjust the corresponding Background plane. Background planes are similar to Z planes but have fewer controls. Z Space III does not include this parameter group.

The **Background menu** determines which layer in the timeline is used as the background plane. Choose ***None*** to eliminate the background from the effect.

The **Link menu** controls how the background is grouped with other elements of the effect.

- ***Background*** places the background plane outside of the main container, and causes the background plane’s size to remain the same regardless of its depth. This allows you to position the background plane as far away in Z space as you need to without having to adjust the scale of the plane.
- ***Free*** places the background plane outside of the main container.
- ***In Container*** places the background plane inside the main container.

- ***In Layer 1*** links the background plane to Z Plane 1. This link functions like a second container that can be nested inside the main container. Any changes made to Plane 1 also affect any background planes whose Link Background menus are set to In Layer 1.

Scale Background scales the size of the background plane along the X and Y axis. This parameter is scaled as percentages of the plane's original width and height. Thus, a Scale Background setting of 200 produces a plane twice as wide as the original plane.

Opacity Background scales the opacity of the background plane. When Opacity Background is 100, the plane is completely opaque. As Opacity Background decreases, the plane is increasingly transparent, and at value of 0, the plane is completely transparent.

Position X and **Position Y** set the X and Y coordinates of the center point of the plane.

Position Z Background sets the apparent depth of the plane. Decreasing negative values move the plane closer to the viewer; increasing positive values move the plane away. Very low Position Z values move the plane behind the viewer, making it invisible.

The **Crop** controls crop the edges of the background. The X and Y position controls set the upper left and lower right corners of a rectangle that defines the borders of the cropped area.

The **Shadows menu** sets whether the background casts and/or receives shadows.

- ***Cast Only*** causes the plane to cast shadows on other planes but not to receive them.
- ***Receive Only*** causes the plane to receive shadows cast by other planes but not to cast any of its own.
- ***Cast and Receive*** causes the plane to both cast and receive shadows.
- ***Off*** causes the plane to neither cast nor receive shadows.

In Z Space I, the **Lights menu** determines which of the two spotlights affect the background. Choose ***Light 1 Only***, ***Light 2 Only***, ***Lights 1 and 2***, or ***Off***. You must select the appropriate **Spotlight On checkbox**. Deselect this option to leave the background unlit.

Z Space III contains a **Light On checkbox**. Deselect this option to leave the background unlit.

In Z Space I, **Ambient Light Background** adjusts the brightness of the background. The default of 100 does not add or subtract ambient light from the source image. Decreasing this setting makes the plane darker before the other light is applied. Ambient light illuminates or darkens the plane evenly, and is unaffected by any other lighting parameters.

Working with the Lighting Controls

In Z Space I, Spotlight 1 and Spotlight 2 Parameters allow you to add two independent spotlights to the effect. Z Space II does not provide any spotlight controls, while Z Space II has a different set of lighting controls.

Z Space I: Spotlight 1 and Spotlight 2 Parameter Groups

The Spotlight 1 Parameters control Light 1, and the Spotlight 2 Parameters control Light 2.

Select the **Spotlight On checkbox** to turn on the corresponding light source. Deselect this option to turn off the light.

Light Source X and **Light Source Y** set the horizontal and vertical location of the light source. **Light Source Z** sets the apparent depth of the light source. Decreasing negative values move the source closer to the viewer, while increasing positive values move the source farther away.

Light Target X and **Light Target Y** set the horizontal and vertical location of the point on the image plane at which the spotlight is aimed.

Width Spotlight controls the width (in degrees) of the beam of light. Changing Width Spotlight is analogous to altering the placement of a physical spotlight within its enclosure.

Intensity Spotlight sets the intensity of the light.

Light Color sets the color of the light.

Falloff Spotlight controls the softness of the edges of the lit region. Increase Falloff to soften the transition between the lit and unlit regions.

The **Apply Mode menu** controls how the light is composited with the effect.For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

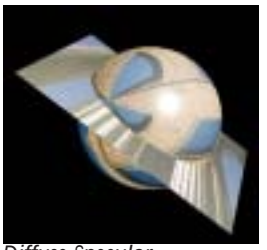
Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

Z Space III: Light Parameter Group

The **Light Type menu** sets the type of light that is applied.

- ***Diffuse-Specular*** combines both focused (specular) and diffuse light. You can use this Light Type to create the appearance of a shiny surface lit by a point light source.
- ***Spotlight*** simulates the look of a traditional theatrical spotlight.

- ***Light Sweep*** creates a linear band of light that sweeps across the layer.


Diffuse-Specular


Spotlight


Light Sweep

Each of the three light types is controlled by slightly different parameters. The shared parameters are described below. Descriptions of the other Light parameters, which vary according to the Light Type setting, begin on page 208.

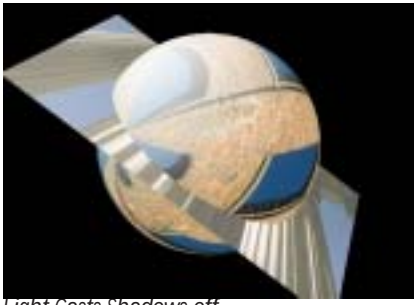
The **Source menu** chooses the method used to position the light source in space.

- ***XYZ*** allows you to position the light source by specifying X and Y coordinates and the distance between the light source and the image. When XYZ is chosen, **Light Source XY** sets the location of the light source on the horizontal and vertical axis. The **Light Distance** setting allows you to focus the light or to spread it over a larger area by adjusting the distance between the light source and the image. Decreasing the Light Distance moves the light closer to the image, while increasing this value moves the light further away.
- ***Directional*** moves the light around the shape along an arc. When Directional is chosen, **Light Distance** controls the distance between the light source and shape. **Light Elevation** and **Light Direction** control the position of the light source. If you imagine the light source is located on the surface of a sphere (whose radius is controlled by the Light Distance parameter) with the light pointing toward the object, Light Elevation sets the latitude of the light source point; Light Direction sets the longitude of the light source point.

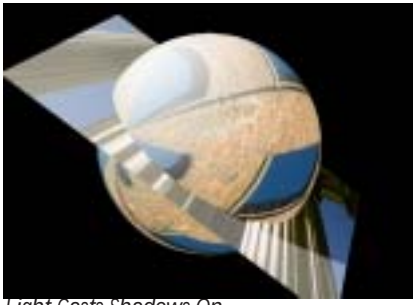
The **Apply Mode menu** controls how the light is composited with the source image. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the L 1 Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

Select the **Light Casts Shadows checkbox** if you want the applied light to create cast shadows on other objects.



Light Casts Shadows off

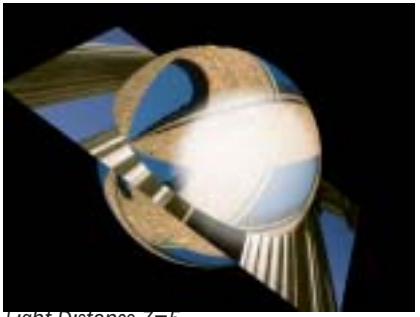


Light Casts Shadows On

Shadow Softness adjusts the softness of the cast shadows created by the applied light. This parameter has no affect if Light Casts Shadows is not selected.

Light Distance Z controls the distance between the light source and the image plane. Decreasing this value moves the light source farther from the image, while increasing this value moves the light closer to the image. Changing the Light Distance Z setting allows you to focus the light or to spread it out over a larger area.

Light Distance Z=2



Light Distance Z=5

Target sets the X and Y coordinates for the point at which the light is aimed.

The remaining parameters in this section vary according to the chosen Light Type. The following chart indicates which parameters are used by each light type.

Parameter Name	Diffuse-Specular	Spotlight	Light Sweep
Cone Width	———	X	———
Sweep Width	———	———	X
Sweep Angle	———	———	X
Intensity	———	X	X
Diffuse Light	X	———	———
Specular Light	X	———	———
Light Color	X	X	X
Falloff	———	X	X
Specular Falloff	X	———	———

Cone 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 Cone Width is analogous to altering the placement of a physical spotlight within its enclosure.

Sweep Width sets the width, in pixels, of the light beam.

Sweep Angle sets the angle between the beam of light and the horizontal axis.

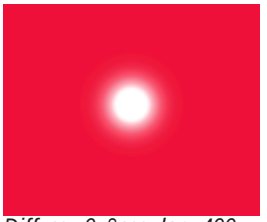
Intensity sets the intensity of the light source. Increasing this value creates a brighter light.

Diffuse Light determines the amount of non-directional diffuse light applied to the object. Increasing Diffuse Light brightens the object uniformly.

Specular Light determines the amount of specular light applied to the image. Increasing this value increases the amount of light at the center of the lit region.

The following examples show the affect of adjusting Diffuse Light and Specular Light.

Diffuse=50, Specular=0



Diffuse=0, Specular=400

Diffuse=50, Specular=400

Light Color sets the color of the applied light.

Falloff adjusts the amount of falloff on the edges of the lit region. Increasing this value adds more falloff, softening the edges of the lit region. Decreasing this value reduces the amount of falloff, creating harder edges on the lit region.

Falloff=0

Falloff=50

Specular Falloff adjusts the amount of falloff on the edges of the region lit by the specular light. Increasing this value adds more falloff, softening the edges of the lit region. Decreasing this value reduces the amount of falloff, creating harder edges on the lit region.

Working with the Pinning Controls

A displacement filter might distort the image in such a way that it creates holes at the edges of your image, or, at more extreme settings, tears holes in the center of your image. The pinning controls can counteract this effect by undistorting the image at specified edges, or in regions around up to two chosen points ("pin points") within the image.

No Pin

Pin All Edges

The most important control on this section is **Edge Pin**, which determines which edges are pinned. You can pin any or all of the edges, the center of the image, or only the horizontal or vertical edges.

The default setting pins all the edges, which prevents edge distortion at most parameter settings. However, pinning cannot always prevent tearing at extreme settings. Increasing **Edge Pin Width** can help by undistorting within a greater distance from the edges. For effects that involve less distortion, a smaller Edge Pin Width prevents the edges from tearing and looks more realistic.

Pin Point 1 and Pin Point 2 Parameter Groups

Pin Point 1 and **Pin Point 2** set the coordinates of a pin point. A pin point is a point at which the image is undistorted. The remaining Point 1 controls affect the distortion in a circular region (the pin region) centered around this point. The Pin Point 2 parameters apply a second pin point. These parameters function identically to the Pin Point 1 controls.

Point 1 Strength sets the amount of pinning applied to the image at the pin point. The default value of 100 completely undistorts the pin point. Decreasing values reduce the effect of the pin point, and at a value of 0, the point undergoes the full distorting effect of the filter. In other words, when Point 1 Strength is 0, the Pin Point 1 has no affect.

Point 1 Range sets the radius (in pixels) of the Pin Point 1 region.

Point 1 Center % sets the percentage of the pin region for which the pin is fully applied. For example, if you set Point 1 Range to 100, and Point 1 Center % to 50, then pixels within 50 pixels (50% of the Point 1 Range setting) are completely undistorted, and pixels within 50 to 100 pixels are partially undistorted.

Chapter 4
Effects Filters

Working with the BCC Alpha Pixel Noise Filter

Alpha Pixel Noise adds noise to an image's alpha channel. You can use this filter to create pixelated transitions between two images.

Alpha Pixel Noise transition


Time 00:00:01:00


Time 00:00:02:00


Time 00:00:03:00

For information on the common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

Percentage sets the percentage of pixels affected by the noise.

Alpha Offset adds or subtracts a fixed value to the alpha channel of each pixel that is affected by the noise. Use Alpha Offset when you want to make the same change to each affected pixel. Set Alpha Offset to –255 and Noise to 0 to make each affected pixel completely transparent, or Alpha Offset to 255 and Noise to 0 to make each affected pixel completely opaque. You can animate these settings to create noise transitions.

Noise sets the amount of noise applied to each affected pixel. When Alpha Offset is 0, a Noise value of 0 applies no noise to any pixel, leaving the image's alpha channel unchanged. A Noise value of 100 makes all affected pixels completely transparent.

The **Action menu** determines how the alpha channel is altered in each affected pixel.

- ***Transparency*** increases opacity in the affected pixels. Choose Transparency if the source image is completely opaque.
- ***Opacity*** increases opacity in the affected pixels. Choose Opacity if the source image is fully transparent.
- ***Both*** increases opacity in affected pixels that are transparent and decreases opacity in affected pixels that are opaque. Choose Both if the source image contains both transparent and opaque regions and you want to add noise to both regions.


Increase Transparency


Increase Opacity


Both

Random Seed determines which value is input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to adjust the random configuration of the noise pattern.

Animating the Random Seed setting creates noise that varies, because the noise affects a different randomly chosen group of pixels in each consecutive frame. Keeping this setting at a constant value creates static noise.

Perturbation and **Perturbation Seed** add a small amount of randomness to the numbers produced by Random Seed, allowing you to create noise patterns that differ from frame to frame by a controlled amount. The best way to do this is to animate Perturbation Seed. Make sure that it changes by at least one unit from one frame to the next, unless you want the noise pattern to be the same for some consecutive frames. Then adjust Perturbation until you get the desired amount of change.

The **PixelChooser Controls menu** determines which parameters are affected by the PixelChooser.

- ***Noise Amount & Percentage*** affects both the Noise and Percentage parameters.
- ***Noise Amount*** only affects the Noise parameter.
- ***Percentage*** only affects the Percentage parameter.

The remaining PixelChooser parameters are described in detail in “The PixelChooser” on page 603.

Working with the BCC Alpha Spotlight Filter

Alpha Spotlight uses a spotlight to create or add transparency to the source image. For example, use Alpha Spotlight to create an effect in which the lit areas become transparent while the background is left opaque, or vice versa.

Source image

Filtered image

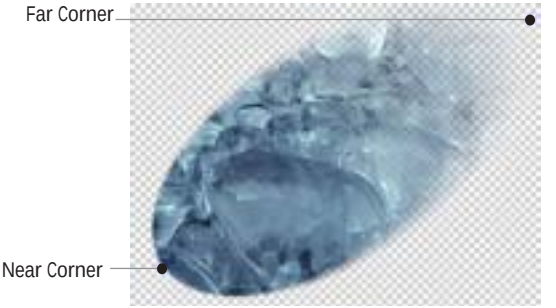
The BCC Alpha Spotlight filter can also be used as a transition. To apply an Alpha Spotlight as a transition, use the BCC TR Alpha Spotlight in the BCC Two-Input Effects category or apply the filter to two layers. For more information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, and “Working with the Drop Shadow Parameter Group” on page 25.

Near Corner and Far Corner Parameter Groups

The **Near Corner** parameter group’s point controls set the point in the lit region that is closest to the light source.

The **Far Corner** parameter group’s point controls set the point in the lit region that is farthest from the light source.



Displace Light Parameter Group

The **Displace Light** parameter group’s point controls displace the Near and Far Corners by the same amount. Use this control to animate the spotlight to sweep across the image without altering its shape or intensity.

Displace Light X=200

Displace Light X=500

Light Elevation sets the height of the light source above the image. The portion of the image that is lit is an ellipse or a hyperbola, depending on the angle at which the light strikes the image. The shape of the lit region is determined by the Light Elevation and the location of the Near and Far Corners. Reducing Elevation focuses the light on the Near Corner point. Increasing Elevation stretches the lit region towards the far corner. At a value of 100, the lit region forms an ellipse which reaches from the Near Corner to the Far Corner.

Light Elevation=0

Light Elevation=50

Light Elevation=100

Light Squeeze sets the shape of the lit region. A value of 100 creates a circular lit region (by putting the source directly above the center of the region). As Light Squeeze is reduced, the lit region narrows. Decreasing Light Squeeze moves the source away from the lit region, making the light weaker. You can compensate for the weaker light by increasing Intensity.

Light Squeeze=10

Light Squeeze=30

Light Squeeze=50

Intensity sets the intensity of the light.

Center Falloff controls the falloff in the center of the lit region. Increase Center Falloff from its default setting of 0 to create a light that is brighter in the center of the lit region

Edge Falloff controls the softness of the edges of the lit region. Increase Edge Falloff to soften the transition between the lit and unlit regions.

The **Apply Mode menu** setting determines how the filter uses the new alpha channel created by the filter to composite the image. For descriptions of all the possible Apply Modes, see the "Apply Modes" on page 625.

The **Gel-Matte Layer menu** allows you to choose a layer to use as a gel or a matte. You can use the ***Filter Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

The **Gel-Matte menu** determines how the Gel-Matte Layer is used.

- The ***Gel*** and ***Matte*** options use the Gel-Matte Track for color information in creating either a gel or matte, respectively.
- If the Gel-Matte menu is set to ***None***, no gel or matte is used.

Selecting the **Best Quality Gel checkbox** can improve the quality of the spotlight when using a gel, particularly if the spotlight moves, but increases render and preview time. Deselecting this option improves speed, and the resulting image quality is often adequate.

Using Gels and Mattes

Adding a gel is similar to placing a transparent gel over an actual spotlight. The image on the gel conforms to the size and shape of the light and is oriented in the same direction.

A matte is not a physically achievable lighting effect. A matte creates an alpha matte over the image which is only visible when the spotlight passes over it. Therefore the image on the matte maintains its orientation relative to the background, and does not change size or shape along with the light.

Spotlight with Gel

Spotlight with Matte

Working with the BCC Burnt Film Filter

Burnt Film simulates the look of holes burning through a layer of film to reveal another image. This filter provides control over the appearance of the burned edges and the burn rate, and allows you to use a custom alpha matte to set the shape of the burn holes.

Burnt Film transition

Time 00:00:01:00

Time 00:00:02:00

BCC Burnt Film can also be used as a transition. To apply Burnt Film as a transition, use the BCC TR Burnt Film in the BCC Transitions category or apply the filter to two layers. For more information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, and “Working with the Drop Shadow Parameter Group” on page 25.

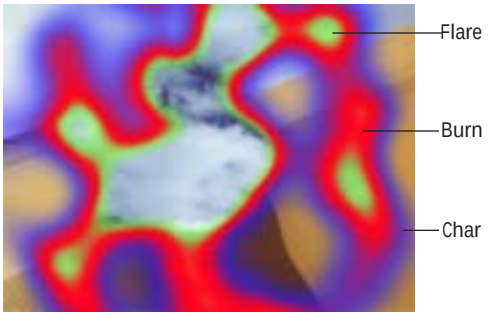
Burn Amount sets the amount of burn applied to the source image. A setting of 0 does not affect the source image. A setting of 1 burns out the source completely, revealing any tracks below it in the timeline. To create a burnt film transition, animate Burn Amount from 0 to 1.

Burn, Flare and Char Color Parameter Groups

Burn Color sets the color of the burnt edges.

Flare Color sets the color of the inside edges of the burn holes which are partially transparent.

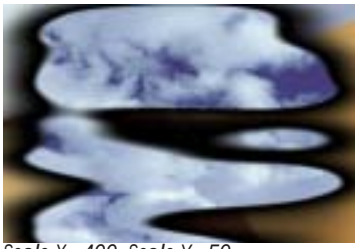
Char Color sets the color of the charred edges—that is, the outside edges of the burn holes. These edges have not yet burned through and are completely opaque.



Flare Amount sets the width of the inside edges of the burn holes. **Char Amount** sets the width of the "charred" edges.

The **Position** controls set the pattern of the burn holes at a given point by moving through the procedural noise from which the effect is generated. Navigate through the underlying noise pattern to find a pattern that you like.

Selecting the **Lock to Scale X checkbox** locks the Scale values and preserves the aspect ratio of the burn pattern; adjusting either parameter affects both Scale X and Scale Y. Deselect this option to adjust the Scale values independently. **Scale X** and **Scale Y** set the scale of the burn pattern along the horizontal and vertical axis.



Scale X=400, Scale Y=50

Scale X=50, Scale Y=400

The **Layer Function menu** determines how the effect uses the map layer. ***None*** ignores the map layer. ***Luma Gradient*** uses the map layer's luma values to determine when burning occurs. Light areas in the map layer burn first, followed by successively darker areas.

Map Layer chooses the layer to use as the map layer. You can use the ***Filtered Layer***, or use one of the clips below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

Swirl map

Swirl map used as Map Layer

Map Layer Level sets how much luma value in the map layer is used. At a value is 1.0, the filter uses only the luma values in the map layer to create the effect. Light areas in the map layer burn first, followed by successively darker areas. A value of 0 is the same as not using a map layer; burnt spots are created randomly.

Blend softens edges in the channel used as the map layer. A value of 0 produces very sharp edges. Increase this value to soften the edges and make the effect look more natural.

Choke expands or tightens the black areas in the map layer's luma channel. Positive values shrink the areas, making the burn holes larger. Negative values make the burn holes smaller.

Working with the BCC Cartooner Filter

The BCC Cartooner filter allows you to draw an outline around the edges in one of an image's color or alpha channels. You can also use the Cartooner filter to turn a video source into outline animation.

The filter compares a selected channel in the source with a threshold value to create an edge map. Cartooner then blurs the map and strokes the edges in the map.

The results obtained with the edge filters vary depending on the media to which the filter is applied and the exact settings used. Because they create edge effects by emphasizing differences between adjacent pixels, edge filters are very sensitive to parameter adjustments. Often a very small change in a parameter setting can have a dramatic result.

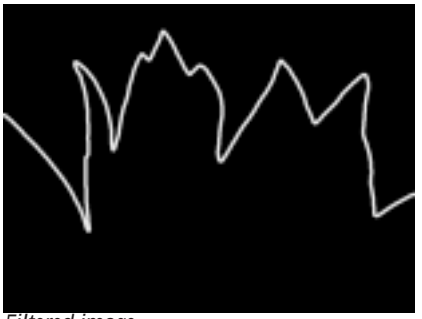
For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

For the best results when you work with the Cartooner filter, you should set the Fields menu in the General Controls parameter group to Quality Optimized. See page 23 for details.

Edges Parameter Group

The **Edge Source menu** allows you to choose any track in the timeline to use as the source for the edges. You can use the ***Filter Layer***, or use a track below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

Edge Source Layer



Filtered image

The **Edges From menu** determines which channel in the Edge Source is used to compute edges. You can create edges from the ***Alpha***, ***Luma***, ***Red***, ***Green*** or ***Blue*** channels.

If you are not using an image with an alpha channel, or you do not want to use the edges in the alpha channel, choose the color channel which contains the most contrast for best results.

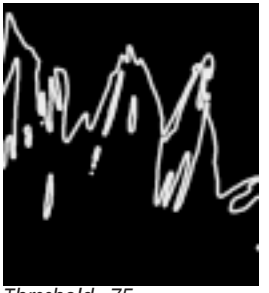

Edges From=Red


Edges From=Luma

Threshold determines the sensitivity to differences between pixels when finding edges in the Edge Source. The affect of this setting depends on the nature of the source.

Threshold is intended more for adjusting the look of the edges than for animation. Some images change dramatically when Threshold animates.


Threshold=50


Threshold=75


Threshold=125

Pre Blur blurs the source image before the edges are computed.

The **Width menu** determines how the filter sets the width of the outlines.

- When ***Constant*** is chosen, **Stroke Width** sets the thickness of the stroked edges.
- When ***PixelChooser*** is chosen, the PixelChooser parameters determine the stroke width instead of determining which pixels are filtered. Pixels that are fully selected in the PixelChooser use the specified Max Stroke Width. Pixels that are fully unselected use the specified Min Stroke Width. Partially selected pixels use intermediate widths.

When the Width menu is set to PixelChooser, if the difference between Min Stroke Width and Max Stroke Width is large, the filter can use a lot of memory. Make sure you have enough RAM assigned to your Avid.

- ***Min – PC Disabled, Average – PC Disabled,*** and ***Max – PC Disabled*** allow you to preview the specified **Min Stroke Width** and **Max Stroke Width** and ignore the PixelChooser selection. ***Min – PC Disabled*** uses the Min Stroke Width for all pixels.

Average – PC Disabled uses the average of the Min and Max Stroke Width for all pixels. ***Max – PC Disabled*** uses the Max Stroke Width. These options disable the PixelChooser, so you can see the affect the PixelChooser has on the outlines without having the PixelChooser revert to its default state.

Stroke Distance controls the location of the stroked edges. Increasing positive values expand the outlines away from the edges. Decreasing negative values contract the outlines around the edges.


Stroke Distance= –25


Stroke Distance=0


Stroke Distance=25

If the outline is complex, the effect of Stroke Distance is difficult to predict.

Post Blur control the amount of Gaussian blur the filter applies before the edges are composited on the source.

The **Post Blur Quality menu** adjusts the quality of the Post Blur. Choose ***Low***, ***Medium***, ***High***, or ***Highest***. There is a significant rendering cost to using High, and considerably more for using Highest. Low and Medium are adequate for simple matte smoothing, but to blur the edges of a high-contrast image or animate the blur, you may need to use Highest.

Intensity adjusts the intensity of the outlined edges.


Intensity=10


Intensity=200

Color sets the color of the outlines.

Ambient Light adjusts the total amount of diffuse light on the image. The default setting of 0 subtracts all ambient light from the source image, so only the outlines are visible. Increasing this setting illuminates the filtered layer so it is visible beneath the outlines.


Ambient Light=0


Ambient Light=50


Ambient Light=100

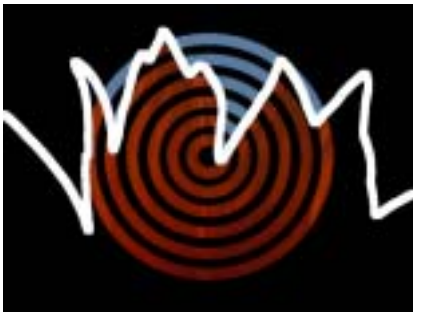
Increasing **Ambient Follow** causes the ambient light to fall off in the stroked regions of the image. Use Ambient Follow if you want the outline color to completely replace the background image. For example, suppose you have a blue source image and you are compositing red outlines over the source with the Screen apply mode. If Ambient Follow is 0, the outlines appear magenta (a mixture of red and blue). If Ambient Follow is 100, the outlines are red, because the ambient light which lights the blue object is reduced in the outline areas.

The **Alpha menu** determines how the Edge Source's input alpha channel and the outlined edges are composited to produce the output image.

- ***Source Alpha*** uses the source image's alpha channel to composite the image after outlines are applied.

- ***Edges Only*** composites only the outlines, ignoring the source alpha.

- ***Screen Alpha*** creates a new alpha channel from the stroked edges, in which the outlines form the opaque regions. This alpha channel is then screened with the source alpha channel. All areas that are opaque in at least one of alpha channels are opaque in the output.



- ***Multiply Alpha*** creates a new alpha channel from the stroked edges, in which the outlines form the opaque regions. This alpha channel is then multiplied with the source alpha channel. Only areas that are opaque in both alpha channels are opaque in the output.

- ***Composite Under*** draws the outlines and then uses the source alpha to composite the source image on top. When Composite Under is chosen, the Ambient Light setting has no affect.

- ***Mask*** is similar to Multiply Alpha but uses the source pixels to draw outlines, ignoring the outline Color setting. In addition, when Mask is chosen, the Ambient Light setting has no affect.

- ***Stencil*** is similar to Screen Alpha but uses the source pixels to draw outlines, ignoring the outline Color setting. In addition, when Stencil is chosen, the Ambient Light setting has no affect.

The **Apply Mode menu** controls how the outlines are composited with the filtered layer. For descriptions of all the Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

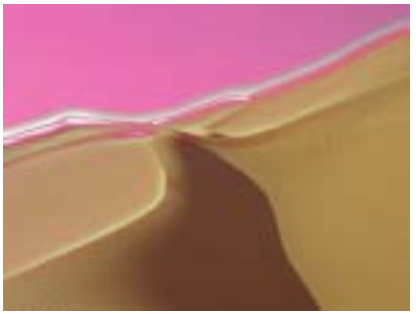
Mix with Original blends the source and filtered images. Use this parameter to animate the effect from the unfiltered to the filtered image without adjusting other settings, or to reduce the effect of the filter by mixing it with the source image.

For information on the PixelChooser parameter group controls, see “The PixelChooser” on page 603.

Working with the BCC Colorize Glow Filter

The BCC Colorize Glow filter is similar to the Glow filter but it generates the glow from a single channel and then applies a gradient to the glow. The Colorized Glow can be composited with the original image or viewed by itself.

Source image



Filtered image

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Glow Channel menu** sets the channel in the source image from which the glow is derived. Pixels with higher values in the chosen channel 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.
- ***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, the Source Edges parameters apply.
- ***Luma Edges*** and ***Alpha Edges*** find edges in the corresponding source channel and use the resulting image. When Luma Cartoon Edges or Alpha Cartoon Edges is chosen, the Source Edges parameters apply.

Source Edges Parameter Group

The Source Edges group provides additional control if ***Alpha Edges***, ***Luma Edges***, ***Alpha Cartoon Edge*** or ***Luma Cartoon Edges*** is chosen in the **Glow Channel menu**. If any of the other settings are chosen, the parameters in this section do not apply.

If the Glow Channel menu is set to Luma Edges or Alpha Edges, **Edge Intensity** adjusts the width of the outlined edges. If the Glow Channel menu is set to Luma Edges or Alpha Edges, **Edge Intensity** adjusts the intensity of the edges.

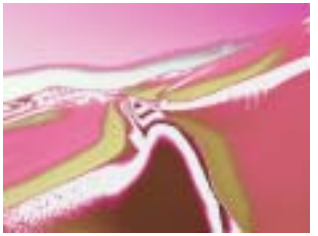
Edge Pre Blur blurs the source image before the filter searches for edges. This blur does not appear in the output; it is used only in edge detection.

Edge Post Blur blurs the edges before they are used to create the applied light.

If the Glow Channel menu is set to Luma Cartoon Edges or Alpha Cartoon Edges, **Cartoon Threshold** sets the value in the image above which pixels are considered fully on.

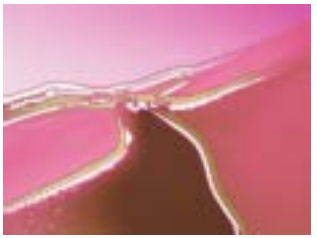
Blur Amount controls the amount of blur applied to the image to produce the glow effect. At a value of 0, no blur is applied, so no glow is visible. Higher values produce more blur and, therefore, more glow.


Blur Amount=5

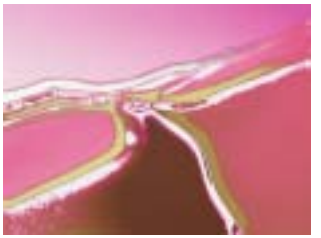

Blur Amount=25


Blur Amount=50

Increasing **Spread** causes each point in the rendered output to be affected more by points farther away in the blur. Animating Spread can cause visible jumps in the animated effect.


Spread=0

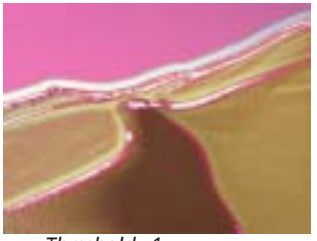

Spread=50

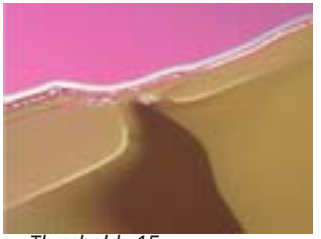

Spread=100

The **Blur Quality menu** controls the quality of the post blur applied to the glow. Choose ***Low***, ***Medium***, ***High***, ***Higher*** or ***Highest***. Low and Medium are adequate for simple matte smoothing, but to blur the edges of a high-contrast image or animate the blur, you may need to use Highest. There is a significant rendering cost to using High, and considerably more for using Highest.

Threshold adjusts the sensitivity of the filter to edges in the image. Increasing Threshold reduces the amount of glow created by weaker edges in the image, so less glow appears on smaller details in the source image.

Reducing this value to 0 tends to add noise to the image. For best results, use Threshold settings of 1 or above.

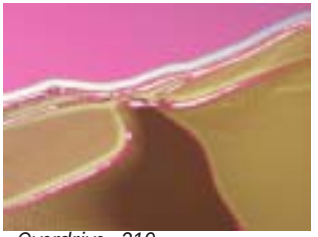

Threshold=1


Threshold=15


Threshold=30

Overdrive adjusts the overall intensity of the glow created by the blur. Lower values producing a softer glow, mixing the blurred image with the resulting glow. Higher values produce a harder, more dramatic glow effect.


Overdrive=10


Overdrive=210

The **Overdrive Soften** control softens the glow produced by the Overdrive parameter and pulls its edges in. Higher values of Overdrive Soften sharply reduce the edges of the glow. Negative values gently increase and soften the edges.

The **Overdrive Apply Mode menu** controls how the glow portion composites over the blurred portion of the effect. The resulting filtered image is then composited with the source image using the chosen Apply Mode. For information on the available apply modes, see Appendix A.

Softness controls a blur that is applied to the glow after the first blur and the overdrive mix.

Intensity scales the intensity of the glow.

The **Glow Offset** parameter offsets the glow. A positive Glow Offset value pushes some of the negative values positive and make them visible in the output. A negative value reduces all the glow values, causing only the most glowing pixels to appear in the output.

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

Colorize Parameter Group

The parameters in the Colorize Parameter group allow you to use a gradient of up to six colors to tone the lighting effect. All of the parameters in this section can be animated.

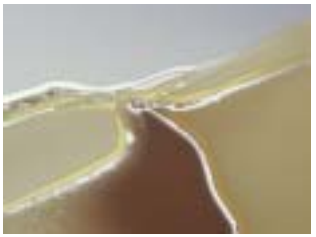
The **Color Space menu** determines whether the gradient is created in ***RGB, HSL,*** or ***HSV*** color space. Choose HSL or HSV if you want to animate the colors in the gradient while maintaining the level of saturation.

The Color 1 and Color 6 colors are always used. Each of the remaining colors includes 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.

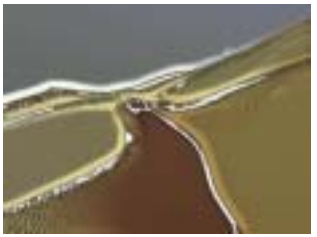
The **Color 1**, **Color 2**, **Color 3**, **Color 4**, **Color 5**, and **Color 6** controls choose six different colors to add to the gradient.

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 that the Black Point value are mapped to the Color 1. 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 in with a simple two-color gradient from black (Color 1) to white (Color 6).

Black Point= –75



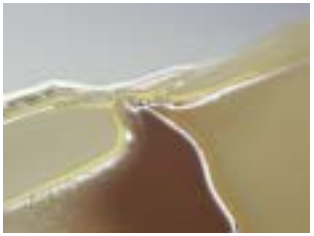
Black Point=0



Black Point=75

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

The following illustrations show the affect of adjusting the White Point with a simple two-color gradient from black (Color 1) to white (Color 6).

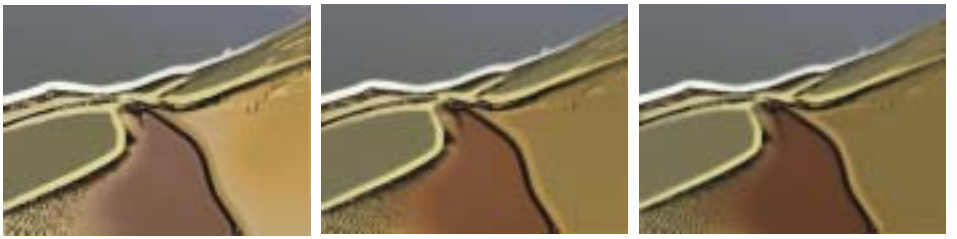


White Point=100

White Point=50

White Point=25

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.



Squeeze= –75 *Squeeze=0* *Squeeze=75*

The **Loop Mode 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.

Color Ease adjusts the softness of the transitions between pure colors in the gradient. Increasing positive values make the transitions more abrupt. Decreasing negative values soften the transitions.

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

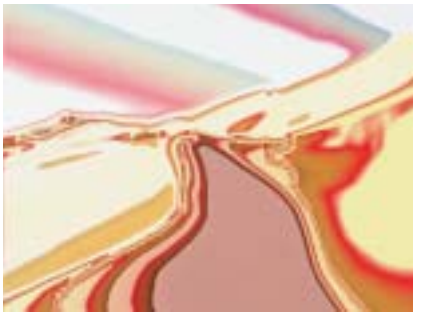
Saturation adjusts the intensity of each color's hue in the gradient. Negative values desaturate the gradient, while positive values increase the saturation of the gradient.

Lightness controls the brightness of the colors in the gradient. Higher values lighten the colors, while lower values darken the colors.

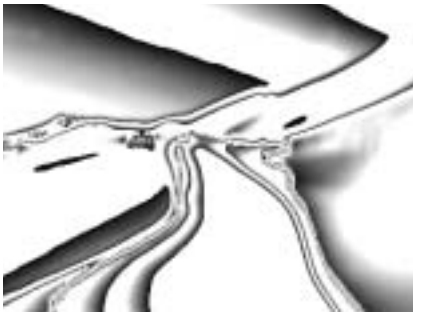
Composite Parameter Group

The **Output menu** sets the output of the effect.

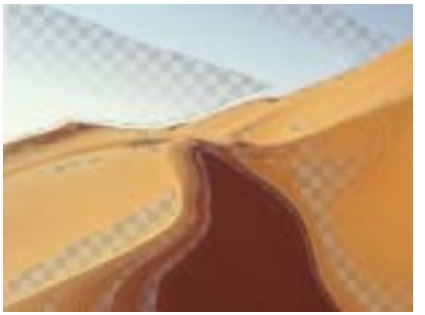
- The default is ***Colorized Glow,*** which displays the colorized glow effect composited with the source media.



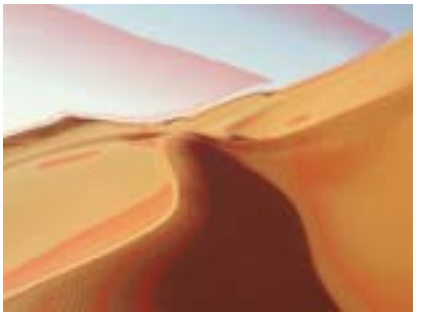
- ***Glow Map*** displays the glow map in black and white.



- When ***Matte with Glow*** is chosen, an alpha channel is created from the glow. Transparent and semi-transparent areas display a checkerboard image.



- ***Mask Outside Glow*** allows you to view the source with a ruby mask over the pixels that are not affected by the colorize glow effect.



- ***View Source*** views the channel from which the glow is derived. In other words, the Glow Channel applied to the source image.

When the **Opaque Glow checkbox** is deselected, the glow is composited with its own intensity before it is composited with the source. This makes colors at the left of the gradient more transparent. When this is enabled, the glow is opaque. Deselect Opaque Glow when the filter is applied to media with an alpha channel.

If Opaque Glow is deselected, **Glow Opacity** scales the opacity of the glow. Increasing Glow Opacity makes more of the glow opaque, and the colors at the left end of the gradient appears more prominently in the output.

The **Apply Mode menu** determines how the filter is composited over the source image.

For descriptions of all the apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, In Front, or Behind, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

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 affect of the filter by mixing it with the source image. At a value of 0, the image is unaffected by the filter.

Motion Tracker Parameter Group

The Motion Tracker parameter group allows you to track the motion of an object in a media file. You can then use the motion path data to control another aspect of the effect. See “Working with the Motion Tracker Parameter Groups” on page 29 for details.

PixelChooser Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image.

For information on the PixelChooser controls, see “The PixelChooser” on page 603.

Working with the BCC DeGrain Filter

BCC DeGrain removes grain-sized noise from an image by analyzing a sample of the grain, then filtering out image noise that has similar frequency (spectrum) and amplitude.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **View menu** sets the display. You must set this menu to Final Output before your final render.

- ***Final Output*** displays the final image, after the grain has been removed. You must set the View menu to Final Output before rendering.
- ***Sample Layer*** is used for selecting the area containing a grain sample. A suitable area should have no detail other than grain. Small samples should be used unless the grain is unusually large.
- ***Removed Grain*** shows the grain that is being removed from the image. Use this setting to ensure that no significant image details are removed.

Set the **View menu** to ***Final Output*** before rendering.

Adjusting **View Contrast** allows you to see the grain that is removed more clearly. The View Contrast parameter is available when the View menu is set to Removed Grain.

When the **Lock Sample checkbox** is deselected, the filter acquires and processes a grain sample each time it calculates a frame. Select the Lock Sample checkbox to retain the current grain sample. The sample determines the characteristics of the grain that is filtered out.

Sample Controls Parameter Group

Manually adjust the parameters in the Sample Controls Parameter Group to remove the grain in the image.

The DeGrain filter uses alternate frames received from the source image to smooth the noise artifacts. In order to read these frames from the source image, you must assign media to the **Sample Layer menu**. The choices are ***None, Filter Layer, 1st Below*** and ***2nd Below***.

Media must be assigned to this menu or the filter renders black. The default media assigned to the Sample Layer is ***None***.

Set **Sample Size** from a minimum of 16 (pixels) to a maximum of 64 (pixels). If your image has a large grain structures, setting a higher sample area may produce a better result although it can create low-frequency “ripples” in the image if the sample is not uniform (such as a sky with a large-scale variation in color or brightness).

The **Sample Center** position controls set the horizontal and vertical position of the center of the sample area.

Sample Frame # is the frame number of the video track used for sampling. Normally, this is left at 0, so that the sample is taken from the first frame of the track.

Filter Strength determines the amount of blurring used to remove the grain.

Use **HiPass Filter** to remove or reduce the amount of low frequency artifacts (which usually look like ripples) that are introduced as a result of removing the grain from the image.

Threshold is used to set the amplitude of the grain. Image detail with a higher amplitude is retained, and grain with a lower amplitude is suppressed.

Edge Padding is used to eliminate artifacting or distortions near the edges. Increase this value if streaks appear at the edges of the image.

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. At a value of 0, the image is unaffected by the filter.

PixelChooser Intensity controls the intensity of the PixelChooser (below). At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

PixelChooser Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image.

For information on the PixelChooser controls, see “The PixelChooser” on page 603.

Working with the BCC DeNoise Filter

The BCC DeNoise filter removes unwanted pixel noise from an image. DeNoise is especially useful when working with archival materials, as it lets you correct dark areas that show artifacts from film emulsion or video compression. You may also want to use the BCC DeNoise filter when resizing 4:3 images to 16:9 aspect ratio.

The BCC DeNoise filter distinguishes between moving areas and areas that are static. This allows the filter to selectively remove noise only from static areas. This preserves the full detail of areas that are in motion.

DeNoise uses temporal and spacial smoothing to eliminate the artifacts, based on alternate frames in the video. Since the smoothing algorithm is based on a sequence of frames, it is difficult to show the effects of this filter in a still image.

The PixelChooser is especially useful for this filter. If the DeNoise filter removes too much detail, you can selectively remove noise from a specific channel or area of your image.

For information on common parameter groups, see “Working with the General Controls Parameter Group” on page 22, and “Working with the Title Matte Parameter Group” on page 23.

Value Range determines how much noise is removed from the image. Higher values remove more detail from the image.

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 affect of the filter by mixing it with the source image. At a value of 0, the image is unaffected by the filter.

PixelChooser Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. The DeNoise filter includes one additional PixelChooser parameter.

PixelChooser Intensity controls the intensity of the PixelChooser. At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

For information on the remaining PixelChooser controls, see “The PixelChooser” on page 603.

Working with the BCC DeInterlace Filter

The BCC Deinterlace filter converts interlaced video clips into progressive-scan frames, such as footage shot on film. DeInterlace can render “simulated TeleCine” style by adding pulldown. This filter can also convert 29.97fps NTSC video into 24fps film-style frames.

If you are combining the BCC DeInterlace filter with other film filters (BCC Film Damage, BCC Film Grain, BCC Film Process or BCC Match Grain), you should apply BCC DeInterlace first. BCC Deinterlace works most effectively with the original, unprocessed pixels.

For information on common parameter groups, see “Working with the General Controls Parameter Group” on page 22 and “Working with the Title Matte Parameter Group” on page 23.

BCC DeInterlace Parameter Group

Deinterlacing leaves the first or earlier input field (the lower field for DV) unmodified. The second field is synthesized by interpolating the first field wherever the effect would otherwise show motion artifacts such as combing or teeth. A motion mask is used to determine where the second field is interpolated. You can use the Motion Sensitivity and Motion Filter Size parameters to finetune this mask.

The **Operation menu** determines which type of interpolation the filter performs.

- ***View Motion Mask*** displays the motion in the clip as a black and white mask. Moving areas in the image cause interlace artifacts, thus viewing the Motion Mask allows you to see where the interlace artifacts will be removed by interpolation. The unmasked areas in this view are unaffected by the filter. White indicates interpolation and black indicates that the original pixel is unchanged.
- ***Only DeInterlace*** converts interlaced video clips to progressive-scan frames without changing the frame rate. This option helps to remove video combing artifacts.

  PAL input at 25i can be converted to progressive-frames by setting the **Operation menu** to ***Only Deinterlace*** and reinterpreting the results as 24 fps.

- Use ***Simulate Pulldown*** with NTSC video clips to simulate the effect of 3:2 pulldown when film is converted to NTSC video. The filter chooses the fields in the original video that are closest in time to where the 24fps frames would be, deinterlaces them, and then assembles them in the chosen pulldown pattern. The overall timing is not changed. The filter chooses the best 24 fields out of the 60 in each second of video and discards the rest. The pulldown pattern is set in the Pulldown menu.
- ***29.97i - 23.976p*** creates film-rate progressive-scan frames from interlaced NTSC video.

Motion Sensitivity sets the threshold between black and white on the motion detector or mask. White causes interpolation and black passes the original pixel through unchanged. Setting the Sensitivity to 100 interpolates all pixels. Increase the value until interlace (combing) artifacts disappear.

Motion Filter Size determines how many pixels are used to measure the strength of interlace "teeth" or "comb." Higher values allow the motion detector to better distinguish interlace artifacts from noise. However, higher values interpolate more pixels, reducing detail.

Interpolation Slant determines how many pixels to the side are examined for diagonal correlations. Setting Interpolation Slant to ***0*** creates vertical-only interpolation. Setting it to ***1*** also checks against lines at a 45-degree angle. Setting it to ***2*** examines one more pixel to the side, and preserves more slanted diagonal lines through interpolated pixels. However, increasing this value also increases rendering time and can introduce noise artifacts. In most instances, the default of ***1*** works very well, preserving slanted edges without slowing the filter or producing artifacts.

The **Pulldown menu** sets the pulldown pattern. Pulldown includes two "split" frames, composed of fields from different input frames. This filter can generate all five pulldown patterns. The result closely approximates the motion look of film that has been TeleCined. Choose ***A, B,C, D,*** or ***E***. This menu only applies when the Operation menu is set to Simulate Pulldown.

Mix with Original blends the source and filtered images. Use this parameter to animate from the unfiltered to the filtered image without adjusting other settings, or to reduce the affect of the filter by mixing it with the source image. At a value of 0, the image is unaffected by the filter.

PixelChooser Parameter Groups

PixelChooser Intensity controls the intensity of the PixelChooser. At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

For information on the remaining PixelChooser controls, see "The PixelChooser" on page 603.

Working with the BCC Drop Shadow Filter

The BCC Drop Shadow filter applies an animateable drop shadow to titles or clips in the timeline. To apply a BCC Drop Shadow to a title, drag the effect onto the title. If you Option- or Alt-drag, the shadow applies to the title as well as to any tracks beneath the title in the timeline. You must also select the **Apply to Title-Matte checkbox** in the Title / Matte Controls parameter group. For information on applying effects to titles, see "Applying BCC Effects to Titles and Mattes" on page 15.

Source image

Filtered image

For details on common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, and "Working with the Geometrics Parameter Group" on page 24.

Source Opacity sets the opacity of the source. For example, you can use this parameter to fade in a title, without fading in the shadow.

Shadow Distance sets the distance (in pixels) between the shadow and the image.

Shadow Intensity sets the opacity of the drop shadow, scaled as a percentage. At a value of 100, the shadow is completely opaque. Lower Shadow Intensity values allow the background image to be seen through the shadow. At a value of 0, the shadow is invisible.

Shadow Angle sets the direction of the drop shadow. A setting of 0° places the shadow to the right of the image; a setting of 90° places it directly below the image.

Shadow Color sets the color of the shadow.

Shadow Softness controls the softness of the edges of the shadows. A value of 0 creates a sharply defined shadow with hard edges. Increasing this value creates softer edges.

The **Blur Quality menu** sets the quality of the post blur applied to the shadow. Choose ***Low***, ***Medium***, ***High***, or ***Highest***. There is a significant rendering cost to using High, and considerably more for using Highest.

Increasing Gamma lightens the shadows and reduces contrast. Decreasing Gamma darkens the shadows and increases sharpness.

Working with the BCC Dust and Scratches Filter

The BCC Dust and Scratches filter removes unwanted dust and scratches from an image. The PixelChooser is especially useful to specify which areas the filter should affect.

Original Image

Filtered Image

For information on common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Radius determines the amount of pixels that are used in the evaluation. Higher values can result in an undesirable loss of detail.

Threshold sets the value of the image pixels that are used in the evaluation. Lower values affect a greater range of pixel values while higher values reduce the affect by limiting the density values to which the filter is applied. A value of 0 is equivalent to a range of 0-255; a value of 100 is the equivalent of setting a range of 230-255. Any pixel that falls below this parameter value is not affected by the filter.

Mix with Original blends the source and filtered images. Use this parameter to animate from the unfiltered to the filtered image without adjusting other settings, or to reduce the affect of the filter by mixing it with the source image. At a value of 0, the image is unaffected by the filter.

PixelChooser Intensity controls the intensity of the PixelChooser. At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

For information on the remaining PixelChooser controls, see “The PixelChooser” on page 603.

Working with the BCC Emboss Filter

Emboss simulates the appearance of an embossed or raised image by converting the source to a solid color and lighting the edges in the source's luma channel.

Source image

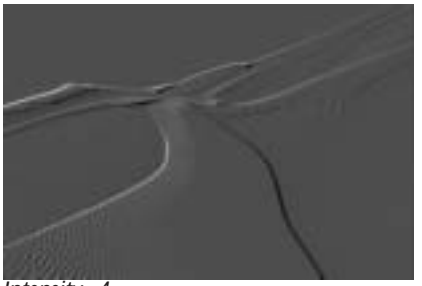
Filtered image

The BCC Emboss filter can also be used as a transition. To apply Emboss as a transition, use the BCC TR Emboss in the BCC Transitions category or apply the filter to two layers. For more information, see "Applying BCC Effects as Transitions" on page 12.

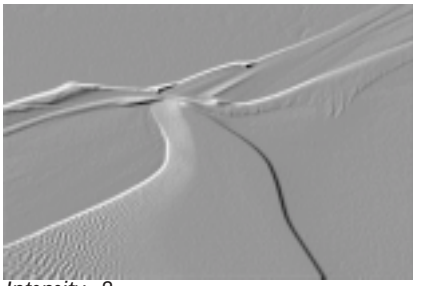
For information on common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

Direction sets the angle between the beam of light and the vertical axis.

Intensity controls the brightness of the effect. At a value of 0, the image is completely black. Higher values lighten the image.

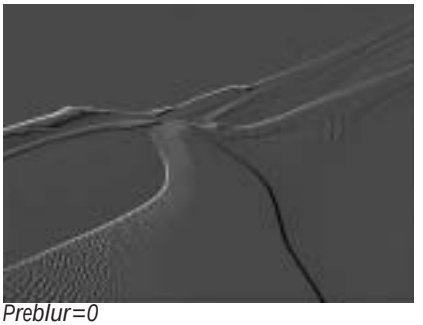


Intensity=4

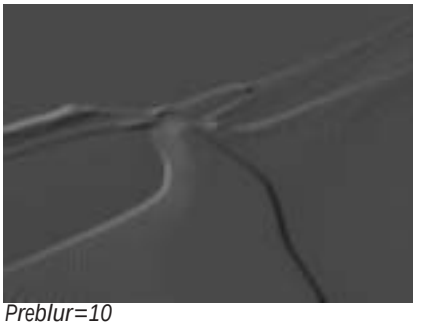


Intensity=8

Pre Blur adjusts the amount of blur applied to the image before edge detection is performed and the image is embossed. Higher values produce more blur, which tends to reduce the amount of detail and noise in the filtered image.



Preblur=0



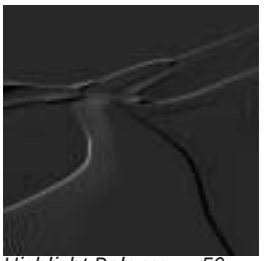
Preblur=10

Highlight Color and Shadow Color Parameter Groups

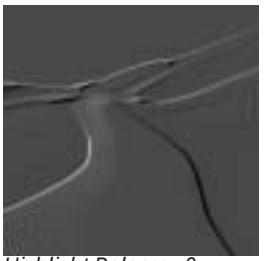
Highlight Color sets the color of the highlight areas.

Shadow Color sets the color of the shadow areas.

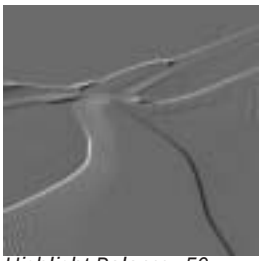
Highlight Balance adjusts the balance of highlight and shadow areas in the effect. Increasing positive values add more highlights and brighten the image. Decreasing negative values add more shadows and darken the effect.



Highlight Balance= –50



Highlight Balance=0



Highlight Balance=50

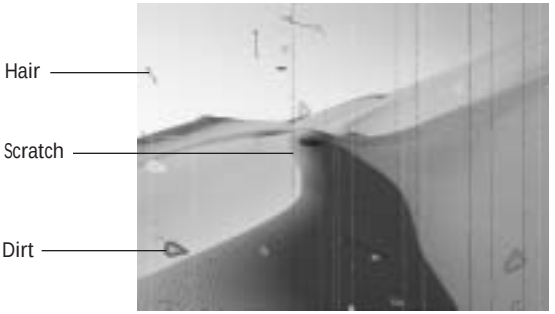
The **Apply Mode menu** determines how the filter is composited over the source image. For information on the available apply modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

Mix with Original blends the source and filtered images. Use this parameter to animate from the unfiltered to the filtered image without adjusting other settings, or to reduce the affect of the filter by mixing it with the source image. At a value of 0, the image is unaffected by the filter.

Working with the BCC Film Damage Filter

Film Damage simulates the appearance of old film stock. You can add scratches, grain particles, hair or fibers, and dirt, dust, or water spots. Film Damage also allows you to simulate camera shake and a flickering image.



For information on common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Select the **Color On checkbox** to add tint to the effect. Leave this option deselected to leave the image untinted. If this option is deselected, the other parameters in this section have no affect.

Brightness adjusts the brightness of the image. Increasing the Brightness setting pushes colors toward white, and decreasing the setting pushes colors toward black.

Contrast adjusts the contrast of the image. Increasing the Contrast setting pushes colors toward pure colors, and decreasing the setting pushes colors toward 50% gray.

Saturation adjusts the intensity of each color’s hue in the image. Negative values remove color from the image, and positive values add color to the image.

Tint Color sets the color that tints the image.

Tint Amount adjusts the amount of the Tint Color that is applied to the image. At a value of 0, the Tint Color has no affect. At a Tint Amount value of 100, the image is fully tinted with the selected color. Intermediate values produce a partially tinted image.


Tint Amount=0


Tint Amount=50


Tint Amount=100

Flicker Parameter Group

These controls allow you add a flicker to the effect, so the brightness of the image varies constantly from frame to frame.

Select the **Flicker On checkbox** to add flicker to the effect. Leave this option deselected to maintain the brightness of the image. If this option is deselected, the other parameters in this section have no affect.

Flicker Amount adjusts the amount of flicker applied to the effect. Higher values produce more pronounced variations in the brightness of the image.

Flicker Speed determines how quickly the brightness of the image changes. Higher values cause the brightness to change more quickly, producing rapid flickering.

The **Brightness Clamp checkbox** limits the amount of variation in brightness. When this option is selected, extreme variations in brightness are excluded, so the image is never solid black or solid white.

Shake Parameter Group

The Shake parameters move the image slightly from side to side and up and down, simulating a shaking camera.

Select the **Shake On checkbox** to add shake to the effect. If this option is deselected, the other parameters in this section have no affect.

Shake X and **Shake Y** control the amount that the image displaces along the X and Y axis as it shakes. Higher values move the image more.

Shake Speed sets how quickly the image shakes. Higher values produce faster movement.

The **Edge Type menu** determines how the filter produces new edges as the image shakes. For example, suppose the image shakes vertically. As the image moves up, the bottom of the image is raised above the bottom of the frame. This setting determines how the filter creates pixels to fill the this space.

- ***Mirror*** produces a mirror image copy of the pixels adjacent to the edge.
- ***Black*** produces a solid black bar on the edge of the image.

- ***Transparent*** leaves the space transparent, revealing the layers below.
- ***Smear*** repeats the pixels on the edge of the image, producing a smeared effect.


Edge Type=Mirror


Edge Type=Black


Edge Type=Smear

The **Position Clamp checkbox** limits the position variation so the image never moves fully offscreen.

Grain Parameter Group

Select the **Grain On checkbox** to create noise which simulates the appearance of grain particles in the emulsion of movie film. If this option is deselected, the other parameters in this section have no affect.

The remaining parameters in this section are identical to the corresponding controls in the Film Grain filter. See “Working with the BCC Film Grain Filter” on page 247 for more information.

Dirt Parameter Group

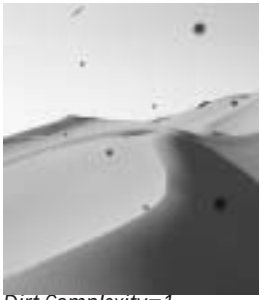
Select the **Dirt On checkbox** to create spots which simulate dust, dirt, and water spots on film. If this option is deselected, the other parameters in this section have no affect.

Dirt Density sets the number of dirt spots in the effect. Higher values add more spots.

Dirt Random Seed determines which value is input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to adjust the random configuration of the dirt spots.

Min Dirt Radius and **Max Dirt Radius** adjust the size of the dirt spots by setting a range of possible radius values for the spots. The spots created cannot be smaller than the Min Dirt Radius or larger than the Max Dirt Radius value.

Dirt Complexity adjusts the complexity of the dirt spots in the image. Lower values produce spots with smoother edges and simpler shapes. Higher values produce more complex shapes with irregular edges.


Dirt Complexity=1


Dirt Complexity=10


Dirt Complexity=20

Dirt Gradient adjusts the opacities of the centers of the dirt spots in relation to the edges of the spots. At a value of 0, the centers of the spots are transparent. Higher values increase the opacity of the centers. When Dirt Gradient is 20, the centers use the same opacity value as the edges.

The opacity of the edges of the spots is controlled by **Min Dirt Opacity** and **Max Dirt Opacity**. These parameters set a range of opacities which are used to create the spots.

Dirt Black Point and the **Dirt White Point** set the two colors used for the dirt spots.

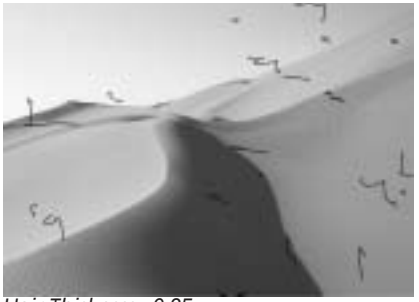
Hair Parameter Group

Select the **Hair On checkbox** to create lines which simulate hair or another fibrous material on the film. If this option is deselected, the other parameters in this section have no affect.

Hair Density determines the number of hairs in the effect. Higher values add more hairs.

Hair Random Seed sets the value input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to adjust the random configuration of the hairs.

Hair Thickness adjusts the thickness of the hair lines. Higher values produce thicker lines.


Hair Thickness=0.25

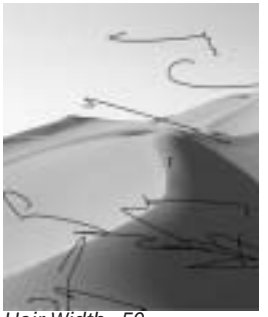

Hair Thickness=1.0

Hair Length adjusts the vertical length of the pieces of hair.

Hair Width adjusts the horizontal length of the pieces of hair. This value does not affect the thickness of the hair lines themselves.


Hair Width=10


Hair Width=25


Hair Width=50

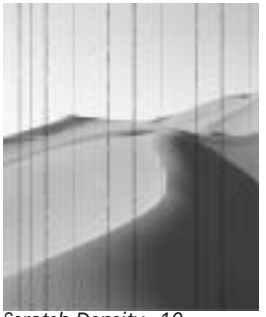
The opacity of the hair lines is controlled by **Min Hair Opacity** and **Max Hair Opacity**. These parameters set a range of opacities which are used to create the hair lines.

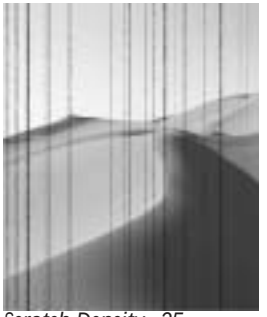
Scratches Parameter Group

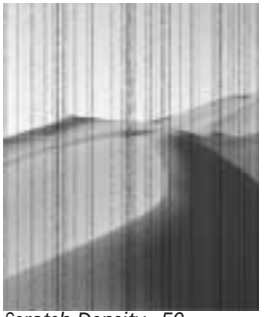
These parameters create vertical lines in the image which simulate scratches in the emulsion of film.

Select the **Scratches On checkbox** to add scratches to the effect. If this option is deselected, the other parameters in this section have no affect.

Scratch Density sets the number of scratches in the effect. Higher values add more scratches.


Scratch Density=10


Scratch Density=25


Scratch Density=50

As the effect progresses, each scratch line moves horizontally for a period of time, then disappears. **Min Lifetime** sets the minimum amount of time a scratch can remain onscreen, and **Max Lifetime** sets the maximum amount of time.

Scratch Random Seed determines which value is input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to adjust the random configuration of the scratch lines.

Scratch Width adjusts the thickness of the scratch lines. Higher values produce thicker lines.

The opacity of the scratch lines is controlled by **Min Scratch Opacity** and **Max Scratch Opacity**. These parameters set a range of opacities which are used to create the scratch lines.

Scratch Speed adjusts the rate at which scratches move horizontally. Increasing positive values move the scratches faster. Decreasing negative values slow the scratches.

Scratch Black Point and the **Scratch White Point** set the two colors used for the scratch spots.

PixelChooser Intensity controls the intensity of the PixelChooser. At the default setting of ***100***, the control is ignored. Reducing PixelChooser Intensity increases the number of pixels that are chosen. At ***0***, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

For information on the remaining PixelChooser controls, see “The PixelChooser” on page 603.

Working with the BCC Film Grain Filter

Film Grain creates an auto-animated noise effect designed to simulate the appearance of grain particles in the emulsion of movie or photo film.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

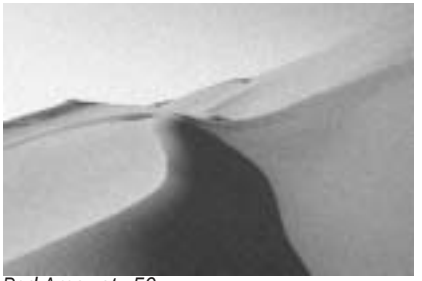
When the **Monochromatic checkbox** is selected, the **Red Amount**, **Green Amount**, and **Blue Amount** add luma noise to each color channel, creating a grayscale grain effect. When this checkbox is deselected, the Amount settings add colored noise to each color channel.

Monochrome on

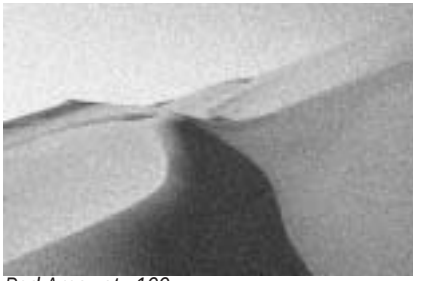
Monochrome off

For the most realistic film grain effects, select Monochromatic for grayscale images, and deselect this option when working with color images.

Red Amount, **Green Amount**, and **Blue Amount** adjust the amount of grain added to each respective color channel.



Red Amount=50



Red Amount=100

Red Grain Size, **Green Grain Size**, and **Blue Grain Size** set the size of the grains in each respective color channel.

The **Blur Quality menu** controls the quality of the post blur applied to the grain in all three channels. Choose ***Low***, ***Medium***, ***High***, or ***Highest***. There is a significant rendering cost to using High, and considerably more for using Highest.

Random Seed determines which value is input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to adjust the random configuration of the grain pattern.

Select the **Auto Animate checkbox** to create an animated effect in which the configuration of the grain pattern changes throughout the duration of the effect. Deselect this option to manually animate the effect, or to create a static effect.

Select the **Film Tint On checkbox** to use the chosen **Film Tint Color** to tint the image. Film Tint Color is in the Film Tint parameter group.

Tint Amount adjusts the amount of the Film Tint Color that is applied to the image. At a value of 0, the Film Tint Color has no affect. At a Tint Amount value of 100, the image is fully tinted with the chosen color. Intermediate values produce a partially tinted image.

Tint Amount=25

Tint Amount=100

PixelChooser Intensity controls the intensity of the PixelChooser. At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

For information on the remaining PixelChooser controls, see “The PixelChooser” on page 603.

Working with the BCC Film Process Filter

Film Process allows you to give video footage the appearance of having been shot on film. This filter allows you to integrate different types of media in a single project. For example, match computer-generated animations with archival film stock, make video appear like color-pushed film, infrared film, or color reversal film or make images appear warmer or cooler. You may want to combine this filter with the BCC DeInterlace, BCC Film Grain, BCC Film Damage and BCC Match Grain filters for the most realistic results.

Unfiltered video image

Filtered to look like Color Reversal Film

If you are combining the BCC Film Process filter with the BCC DeInterlace filter, you should apply BCC DeInterlace first. BCC DeInterlace works most effectively with the original, unprocessed pixels.

For information on common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Quality menu** sets the rendering optimization for the filter. For most applications, you can use the default of ***Faster***. ***Smoother*** takes more time to render, but will generally correct any problems with banding.

The **Operation menu** is a display control.

- ***Normal*** displays the output of the filter.
- ***Preprocess Only*** is useful if you want to view only the PreProcess parameters so that you can “normalize” or “linearize” the image with a preset applied.

Working with the PreProcess Parameter Group

Gamma Compensation is used to linearize the gamma of the clip. The BCC Film Process filter is most effective on clips with a gamma of 1.0. Set this to the current gamma of the clip, and it adjusts the gamma to 1.0. Increasing Gamma lightens the image and decreases contrast, while decreasing Gamma darkens the image and increases contrast.

Saturation adjusts the intensity of each color's hue in the image. Negative values remove color from the image, and positive values add color to the image.

Brightness adjusts the brightness of the output channels.

Contrast adjusts the contrast of the output channels.

Working with the Lens Misting Parameter Group

Shadow Mist applies a blur to dark areas. Video shot at night or in poorly lit settings often contains noise in these areas. Increasing this value applies the blur to more areas.

Increasing **Shadow Spread** causes each point in the rendered output to be affected more by points farther away from it in the blur. This adjusts the size of the applied blur.

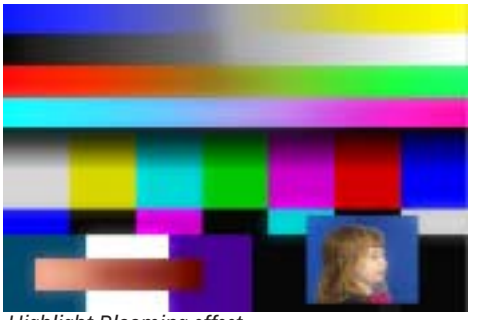
Shadow Threshold sets the threshold for defining which pixels in the image are affected by the Shadow Mist. The Shadow Mist is applied to pixels whose luminance value is below the Shadow Threshold. Increasing Shadow Threshold increases the amount the image that blurs.

Highlight Mist applies a blur to light areas. Increasing this value blurs more areas.

Increasing **Highlight Spread** causes each point in the rendered output to be affected more by points farther away from it in the blur. This adjusts the size of the applied blur.

Highlight Threshold sets the threshold for defining which pixels in the image are affected by the Highlight Mist. The Highlight Mist is applied to pixels whose luminance value is above the Highlight Threshold. Increasing Highlight Threshold reduces the amount of the image that blurs. The following example shows a highlight blooming effect achieved by adjusting the Highlight Mist, Highlight Spread and Highlight Threshold parameters.

Unfiltered image



Highlight Blooming effect

Working with the Film Tint Parameter Group

These parameters allow you to tint your clip. You can tint all pixels, the highlights or the shadows. When you adjust these parameters, the pixel's luminance is preserved.

Overall Tint, Highlight Tint and **Shadow Tint** set the strength of the tint that is applied to all pixels, only the highlights and only the shadows respectively.

The **Color** controls set the color of the Overall Tint, Highlight Tint and Shadow Tint respectively.

Highlight Threshold sets the threshold for defining which pixels in the image are affected by the Highlight Tint. The Highlight Tint is applied to pixels whose luminance value is above the Highlight Threshold. Decreasing Threshold increases the amount of the image that is tinted.

Shadow Threshold sets the threshold for defining which pixels in the image are affected by the Shadow Tint. The Shadow Tint is applied to pixels whose luminance value is below the Shadow Threshold. Increasing Shadow Threshold reduces the amount of tint that is applied.

Working with the Post Process Parameter Group

Warm/Cool Balance allows you to easily finetune the warm / cool (red / blue) balance in the clip. Unlike the tint parameters, this parameter does not preserve the pixel's luminance.

Unfiltered image

Cool Balance

Warm/Cool Hue allows you to adjust the hue of the warm / cool (red / blue) balance in the clip.

Post Saturation, Post Brightness and **Post Contrast** allow you to adjust the Saturation, Brightness and Contrast after the other parameters have been adjusted.

Output Gamma adjusts the image to have a given gamma. If the clip's gamma value was 1.0 inside the filter, this sets it to the given gamma. Increasing Gamma lightens the image and decreases contrast, while decreasing Gamma darkens the image and increases contrast.

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 affect of the filter by mixing it with the source image. At a value of 0, the image is unaffected by the filter.

PixelChooser Intensity controls the intensity of the PixelChooser. At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

PixelChooser Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image.

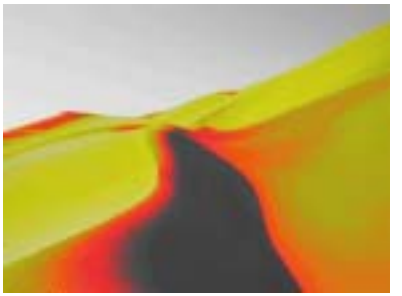
For information on the remaining PixelChooser controls, see “The PixelChooser” on page 603.

Working with the BCC Glow Filter

The Glow filter uses a blur to create a glowing effect, highlighting the edges in the chosen channel. This filter is different from the Glow filter included in earlier versions of BCC; that filter has been renamed BCC Rough Glow. If you are creating a new effect, you should use the BCC Glow filter.

The Glow finds the brighter parts of an image and then brightens those and surrounding pixels to create a diffuse, glowing halo. The Glow can also simulate overexposure of brightly lit objects. You can base the glow on either the original colors of the image or on a chosen channel. You can also use the Glow to create a gradient glow between two colors and to create multicolor effects with looping.

Source image



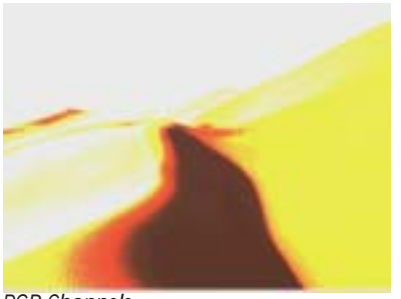
Filtered image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Glow is difficult to see at a grayscale print resolution. To view these illustrations in color, see the UserGuide.pdf, located on the Boris Continuum, Complete CD.

The **Glow Channels menu** determines which source channel is used to create the glow. Pixels with higher values in the chosen channel are considered to have higher intensities. The Glow filter treats pixels outside the layer as duplicates of the closest edge pixels, eliminating the dark border. The choices are ***RGB Channels, Luminance, Lightness, Brightness, Red***, ***Green***, ***Blue*** and ***Alpha***.

- When ***RGB Channels*** is chosen, the original colors in the image glow.
- When ***Luminance, Lightness, Brightness, Red***, ***Green***, or ***Blue*** is chosen, the chosen channel is colorized using the Color A and Color B parameters.
- When ***Alpha*** is chosen, the glow is applied to the edges between the opaque and transparent regions.



RGB Channels

Luminance

Lightness

Brightness

Glow Threshold adjusts the sensitivity of the filter to the chosen Glow Channels menu setting. Decreasing Glow Threshold increases the amount of glow created. At a value of 100, no glow is created.

Reducing this value to 0 tends to add noise to the image. For best results, use Glow Threshold settings of 1 or above.

Glow Radius sets the radius, in pixels, that the glow extends from the affected areas of the image. Higher values produce diffuse glows; lower values produce glows with sharp edges.

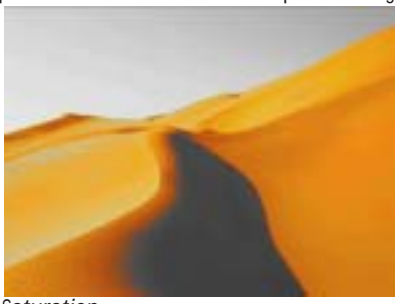
Glow Aspect Ratio stretches the glow. Decreasing negative values stretch the glow vertically. Increasing positive values stretch the glow horizontally.

Glow Intensity controls the amount of glow applied to the chosen channel(s). At a value of 0, no glow is applied, so no glow is visible. Higher values produce more glow.

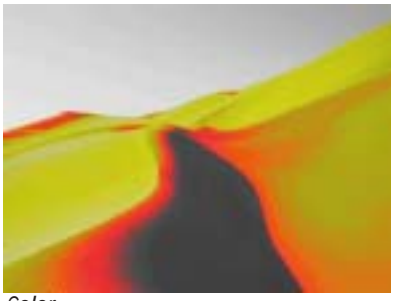
The **Glow Compositing menu** controls how the glow is applied, using the available Apply Modes. The Apply Modes are described in “Apply Modes” on page 625. However, the Glow Compositing menu includes three additional choices, ***None***, ***Under*** and ***Over***.

- ***None*** simply renders the glow and ignores the underlying image.
- ***Under*** renders the glow under the underlying image. The glow is only visible in transparent areas. This setting is useful with images with an alpha channel.
- ***Over*** renders the glow over the underlying image.

Examples of an RGB Channel Glow composited using Apply Modes

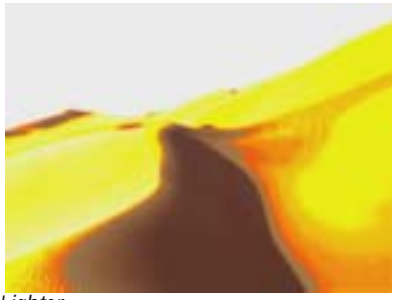


Saturation

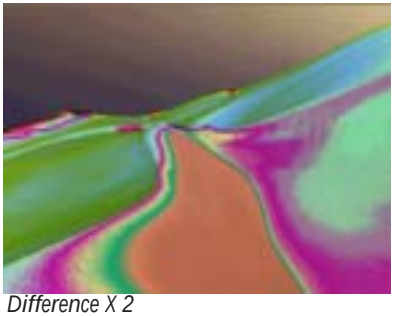


Color

Examples of an RGB Channel Glow composited using Apply Modes



Lighter



Difference X 2

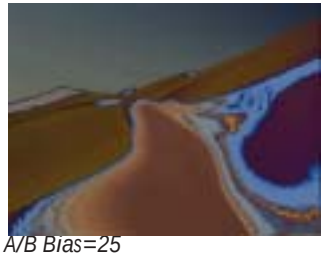
Color Loops lets you create multicolor glow effects that loop. At the default value of 1, only a single loop is created. The loop cycles through the gradient created between the Color A and Color B values. To create multicolor ringing in the glow, increase this value. This parameter has no affect when the Glow Channels menu is set to RGB Channels.

Color Phase lets you start the color loops at a specific point in the cycle. By default, color loops begin at the origin of the first loop (Color A). This parameter has no affect when the Glow Channels menu is set to RGB Channels.

Color Midpoint specifies the balance between the Color A and Color B used in the gradient. Lower values use less of Color A. Higher values use less of Color B. This parameter has no affect when the Glow Channels menu is set to RGB Channels.

A/B Bias determines how much of the color loop is spent on Color A and Color B. This lets you focus on either color by narrowing its influence. Decreasing values increase the focus on Color A; increasing values increase the focus on Color B.

In the following example, the **Glow Channels menu** is set to ***Luminance*** and the **Glow Compositing menu** is set to ***Difference***. **Color A** and **Color B** are set to ***Black***, and ***White*** respectively.

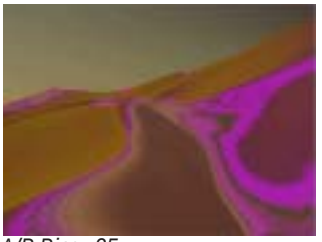

A/B Bias=25

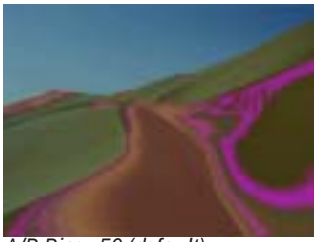

A/B Bias=50 (default)

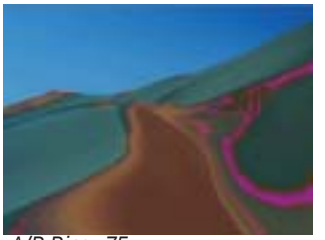

A/B Bias=75

Color A and **Color B** set the first and second colors used to create the color loop. These parameters have no affect when the Glow Channels menu is set to RGB Channels.

The parameters in the following example are the same as in the previous example except **Color A** and **Color B** have been set to ***Orange*** and ***Blue*** respectively.


A/B Bias=25


A/B Bias=50 (default)


A/B Bias=75

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 affect of the filter by mixing it with the source image. At a value of 0, the image is unaffected by the filter.

The Motion Tracker parameter group allows you to track the motion of an object in a media file. You can then use the motion path data to control another aspect of the effect. See “Working with the Motion Tracker Parameter Groups” on page 29 for details.

PixelChooser Intensity controls the intensity of the PixelChooser (below). At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

For information on the remaining PixelChooser controls, see “The PixelChooser” on page 603.

Working with the BCC Glow Alpha Edges Filter

The BCC Glow Alpha Edges filter applies a glow that adheres closely to the contours of the image clip's alpha channel or mask. This filter is designed for use with masks or images that have an alpha channel.

Original Image

Filtered Image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Width controls the width of the stroke or glow that is generated.

Softness sets the amount of generated glow that is soft. Higher values create softer edges.

Smoothness determines the amount of post blur that is applied to the generated glow. Increasing this value makes the glow appear more blurred.

The **Apply Mode menu** controls how the glow is applied to the image. The default is set to ***Under*** so that the glow does not obscure the image clip. The Apply Modes are described in detail in “Apply Modes” on page 625. However, the Glow Edges filter includes three additional Apply Mode parameters, ***None***, ***Under*** and ***Over***.

- ***None*** simply renders the glow and ignores the underlying image.
- ***Under*** renders the glow under the underlying image.
- ***Over*** renders the glow over the underlying image.

Apply Mode=None

Apply Mode=Under

Apply Mode=Over

Use **Color** to set the color of the glow. The default value is white.

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 affect of the filter by mixing it with the source image. At a value of 0, the image is unaffected by the filter.

PixelChooser Intensity controls the intensity of the PixelChooser (below). At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

PixelChooser Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image.

For information on the remaining PixelChooser controls, see “The PixelChooser” on page 603.

Working with the BCC Halftone Filter

The Halftone filter simulates the look of printed material by converting the image to simulated halftone dots. Print images are comprised of a rosette pattern of colored ink dots. To avoid moire or interference patterns, the dots are printed at different angles; this process is known as halftone screening. This is also used in the art world as a creative process such as the work produced by Lichtenstein.

Original image

Filtered image

To apply Halftone as a transition, use the BCC TR Halftone in the BCC Two-Input Effects category or apply the filter to two layers. For more information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

To apply the BCC Halftone filter to a title or matte, you must select the **Preserve Alpha checkbox**. For more information, see page 263.

The **Shape menu** sets the shape of the simulated ink dots to ***Square***, ***Round*** or ***Line***.

Square

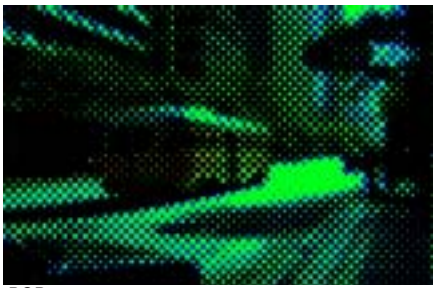
Round

The **Paper Color menu** sets the color of the paper on which the image is "printed."

- When ***Automatic*** is chosen, the paper color is set to black when the Color Scheme menu is set to RGB and white for other Color Scheme menu settings. The Paper Color parameter is ignored when Transparent is chosen.
- When ***Color*** is chosen, the **Paper Color** parameter in the Colors & Angles parameter group sets the color of the paper.
- When ***Transparent*** is chosen, the paper generates an alpha channel. This allows you to composite the Halftone effect over tracks lower in the timeline. The Paper Color parameter is ignored when Transparent is chosen.
- When ***Original Image*** is chosen, the paper is composited over the filtered image. The Paper Color parameter is ignored when Transparent is chosen.

The **Color Scheme menu** determines whether the effect is created in ***B&W***, ***RGB***, ***CMY***, or ***CMYK*** color space. The RGB mode simulates lights, while the other modes simulate ink. With lights, the color is additive, and should be set against a dark "paper color." Ink is subtractive, and should be set against a light "paper color."

B&W



RGB

CMY

CMYK

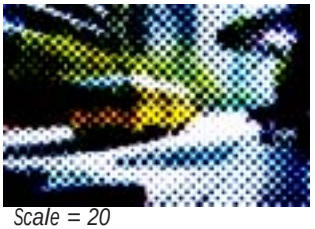
The **Channel for B&W menu** determines which channel creates the effect when the Color Scheme menu is set to B&W. The choices are ***Luminance, Lightness, Brightness, Hue, Saturation, Alpha, Red***, ***Green***, or ***Blue***.

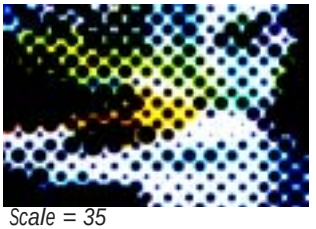
Pre Blur blurs the source image before the halftone is applied. This operation softens the edges of the image, without increasing the number of output colors.

Post Blur blurs the image after the halftone is applied, creating softer edges where the colors blend. Increasing Post Blur increases the number of output colors.

HT Scale sets the size of the simulated ink dots. Increasing values reduces the number of dots used to create the image. As the size of the dots increases, fewer dots are used.


Scale = 10


Scale = 20


Scale = 35

HT Aspect sets the aspect ratio of the dots. Decreasing negative values stretch the dots horizontally. Increasing positive values stretch the dots vertically.


Aspect = -5


Aspect = 0


Aspect = 5

HT Smoothing adjusts the amount of anti-aliasing applied to the halftone dot. Higher values produce more blur, which tends to reduce the detail and noise in the filtered image.

Low Limit and **High Limit** set the minimum and maximum dot sizes, respectively. These values are represented as a percentage of the dot size. The closer in value High Limit and Low Limit are, the less variation in size. When Low Limit is greater than or equal to High Limit, all dots are the same size.

Examples of different values in High Limit with Low Limit set to 0


High Limit= 100 (Default)

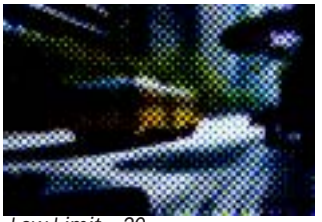

High Limit= 80


High Limit= 60

Examples of different values in Low Limit with High Limit set to 100


Low Limit= 0 (Default)


Low Limit= 15


Low Limit= 30

Brightness adjusts the brightness of the image. Increasing the Brightness setting pushes colors toward white, and decreasing the setting pushes colors toward black.

Contrast adjusts the contrast of the image. Increasing the Contrast setting pushes colors toward pure colors, and decreasing the setting pushes colors toward 50% gray.

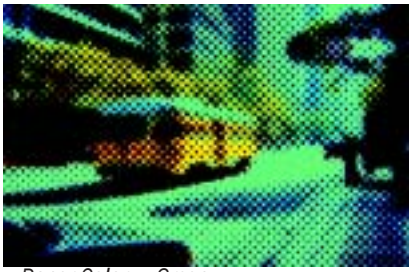
Screen Origin Parameter Group

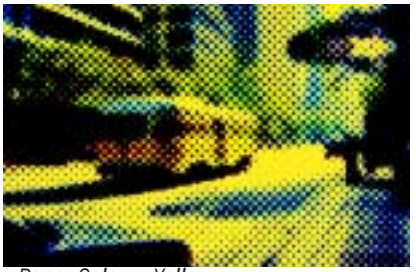
The **X** and **Y Point** controls set the location of the filter on the X and Y axis respectively.

Colors & Angles Parameter Group

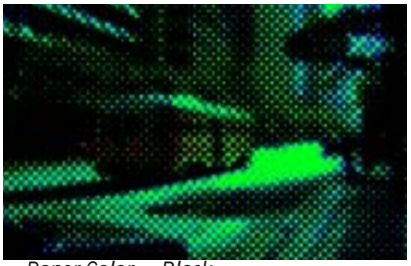
Paper Color sets the color of the paper on which the image is "printed."

CMYK Color Scheme


Paper Color = Green


Paper Color = Yellow

RGB Color Scheme


Paper Color = Black


Paper Color = White

The RGB Color Scheme mode simulates lights; the other Color Scheme modes simulate ink. With lights, the color is additive and should be set against a dark Paper Color. Ink is subtractive and should be set against a light Paper Color.

Red Color, **Green Color**, **Blue Color**, **Cyan Color**, **Magenta Color**, **Yellow Color**, and **Black Color** set the colors to use in the effect. The colors that apply depend on the Color Scheme menu. For example, if the Color Scheme menu is set to B&W, only Paper Color and Black Color apply. If the Color Scheme menu is set to RGB, only Paper Color, Red Color, Green Color, and Blue Color apply.

The **Red Angle**, **Green Angle**, **Blue Angle**, **Cyan Angle**, **Magenta Angle**, **Yellow Angle**, and **Black Angle** controls set the angle of the dot grid (or screen, in printing terminology).

The **Preserve Alpha checkbox** determines whether the effect uses alpha channel information. With Preserve Alpha selected, the original alpha is not affected (you will not see the effect in transparent areas).

You must select this checkbox if you are applying to a title. For details on applying to titles, see "Applying BCC Effects to Titles and Mattes" on page 15.

The **Premultiply checkbox** controls whether or not low-opacity pixels are considered "dark." This checkbox has no affect if the image is fully opaque.

Processing media one field at a time can cause flickering. The **Deflicker 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.

- ***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.
- ***2-3-2*** provides more softening than 1-2-1.
- ***1-1-1*** provides the most softening if effects still contain flicker with the above options.
- ***Off*** is the default. If Off is chosen, no deflickering occurs.

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 affect of the filter by mixing it with the source image. At a value of 0, the image is unaffected by the filter.

Motion Tracker Parameter Groups

The Motion Tracker parameter groups allow you to track the motion of an object, then use the motion path data to control another aspect of the effect. The parameters that can be affected depend upon the filter. See "Working with the Motion Tracker Parameter Groups" on page 29 for details.

PixelChooser Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. For details, see "The PixelChooser" on page 603.

Working with the BCC Match Grain Filter

The Match Grain filter copies the grain signature from a source clip and applies it to a destination clip. This helps to create a more realistic composite. The grain that is sampled from the source clip can be stored and reused with the separate Grain Preset options.

The example used for this filter is a synthesized sphere composited into a clip that has grain. BCC Match Grain was applied to the sphere to match the grain from the clip to make it appear that the sphere was part of the scene.

Unfiltered Image

Filtered Image

Grain is difficult to see at a grayscale print resolution. To view these illustrations in color, see the UserGuide.pdf, located on the Boris CD.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Grain Presets menu** allows you to load and save grain presets.

- Choose ***Load*** to load a previously saved grain preset.
- Choose ***Save*** to save the current grain signature.

The **View menu** allows you to set the display.

- ***Final Output*** displays the final render with grain applied to the image.
- ***Sample Layer*** displays the Sample Layer in the timeline. You must assign a clip in the **Sample Layer menu** or the Composer window displays black.
- ***Generated Grain*** displays the grain that the filter will apply to the image.


Final Output


Sample Layer


Generated Grain

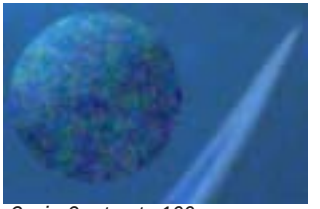
The **Grain menu** allows you to choose what type of grain is generated.

- Choose ***Monochrome*** to generated monochromatic grain.
- Choose ***RGB*** to generate red, green and blue grain.

The **Match Contrast checkbox** allows you to generate grain with the same contrast as the source image. When the Match Contrast checkbox is deselected, **Grain Contrast** allows you to adjust the contrast of the grain between 0 and 100%. If the Match Contrast checkbox is deselected, Grain Contrast has no affect.


Grain Contrast=5


Grain Contrast=35


Grain Contrast=100

Grain Size sets the size of the grain by adjusting the frequency spectrum of the grain. The default value of 100 is considered normal. This works in conjunction with the Grain Filter parameter. See the next section for details.

Adjusting Grain Size does not act as a zoom feature. This parameter modifies the grain texture size. Adjusting Grain Size compensates for samples taken from frames with a different scan resolution than the filtered layer. In most cases, you do not need to change this parameter from the default.

Grain Filter removes low frequencies from the grain sample. Lower numbers add a larger, more coarse grain structure (blotchy). Higher numbers produce a finer grain (smooth).

The Grain Filter setting is not stored when you load or save a sample Grain Preset file. You need to manually adjust Grain Filter when loading Grain Presets.

Grain filter=1

Grain Filter =100

If the **Lock Sample checkbox** is selected, the filter only uses the Sample Frame # to create the grain, creating static grain. If this option is deselected, the grain structure starts at the Sample Frame # and each successive frame is resampled from the clip, creating animating grain.

Sample Controls Parameter Group

The **Sample Layer menu** allows you to use a clip in the timeline as a sample for the generated grain. The choices are ***None, Filter Layer, 1st Below*** and ***2nd Below***.

You must place the media that you want to use in the timeline and assign that track in the Sample Layer menu. By default None is chosen.

Sample Frame # sets the frame from the Sample Layer that is used to create the grain.

Sample Size controls the size of the sample area from which the grain is sampled. The **Center Point** position controls set the center point for the sample area on the X and Y axis.

Random Seed sets the seed of the random number generator. Each frame is seeded with this value added to the frame time.

Random Seed should only be adjusted when multiple Match Grain filters are used to generate different grain; Random Seed ensures that the grain is different.

Mix with Original blends the source and filtered images. Use this parameter to animate from the unfiltered to the filtered image without adjusting other settings, or to reduce the filter's affect by mixing it with the source image. At a value of 0, the image is unaffected by the filter.

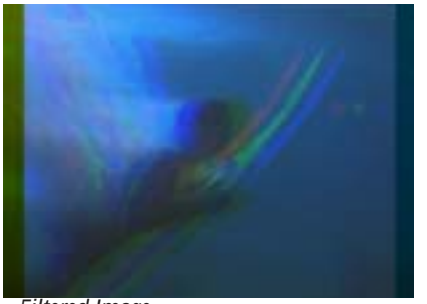
PixelChooser Intensity controls the intensity of the PixelChooser. At the default of 100, the control is ignored. Reducing PixelChooser Intensity increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

For information on the remaining PixelChooser parameter group controls, see "The PixelChooser" on page 603.

Working with the BCC Misalignment Filter

The Misalignment filter simulates the effect of misaligned RGB color channels.

Unfiltered Image



Filtered Image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Red Offset, Green Offset and Blue Offset Parameter Groups

The **Red Offset, Green Offset** and **Blue Offset** position controls offset the corresponding color channel on the X and Y axis.

The **Red Intensity, Green Intensity** and **Blue Intensity** determine the intensity of the corresponding color channel, expressed as a percentage. At the default values of 0, all channels are given equal weight.

The **Alpha menu** determines how the filter handles alpha channel information.

- When ***Single Channel*** is chosen, each color image is assigned 1/3 of the original alpha value. If the image does not include an alpha channel, a value of 255 is assumed. So, if the red, green and blue channels overlap on a pixel, then the alpha value for that pixel is the original alpha (1/3 + 1/3 + 1/3). If the red and green channels overlap, then the value is 2/3 of the original alpha (1/3 + 1/3).
- ***Composite*** uses the maximum alpha value among the three channels.

The **Apply Mode menu** controls how the filtered image is composited with the source image. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect and the parameter does not appear. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

Working with the BCC Mosaic Filter

Mosaic allows you to pixelate images to achieve a range of mosaic effects using a few simple parameters and a PixelChooser. The Mosaic effect is also part of the Witness Protection filter. For example, you could track a logo on a t-shirt and obscure it with a mosaic. For details, see “Working with the BCC Witness Protection Filter” on page 288.

Source image

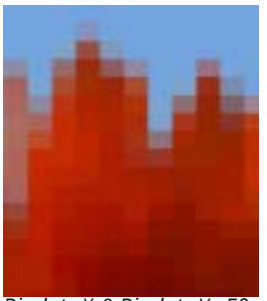
Filtered image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

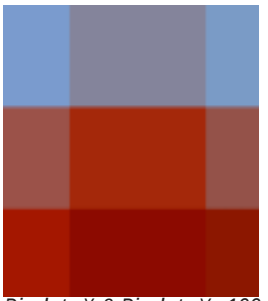
Pixelate X and **Pixelate Y** set the amount of pixelation along the horizontal and vertical axis, respectively. Increasing these values reduces the number of pixels used to create the image.

The **Lock Pixelation checkbox** locks the Pixelate Y value to the Pixelate X setting. When this option is selected, adjusting either Pixelate X or Y affects both parameters. Deselect this option to adjust the Pixelate X and Y values independently. When the Pixelate X and Y values are the same, the pixels forming the image have the same aspect ratio as the filtered media. Adjusting the Pixelate X and Y values independently distorts the pixels.

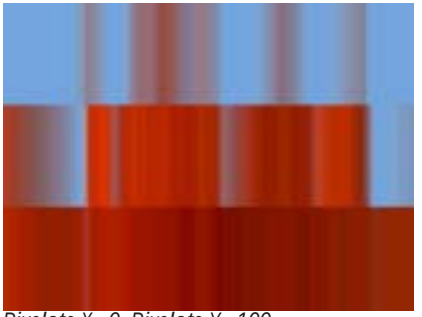
Pixelate X & Pixelate Y=0



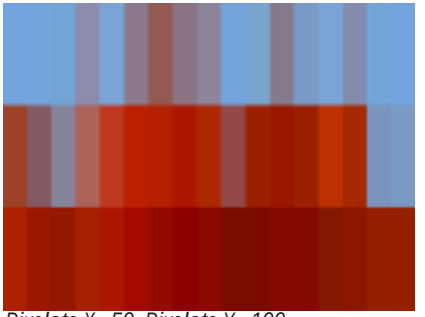
Pixelate X & Pixelate Y=50



Pixelate X & Pixelate Y=100



Pixelate X=0, Pixelate Y=100



Pixelate X=50, Pixelate Y=100

Scramble shuffles the pixels in the image. As Scramble increases, the arrangement of pixels becomes increasingly random.

Scramble=0

Scramble=10

Scramble=50

Scramble Seed determines which value is input to the random number generator used to scramble the pixels. Adjust this value when you like the overall effect but want to adjust the random configuration of the pixels.

The **Apply Mode menu** controls how the filtered image is composited with the source image.

For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect and the parameter does not appear. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

For information on the PixelChooser parameter group controls, see “The PixelChooser” on page 603.

Working with the BCC MultiShadow Filter

BCC Multi Shadow is a versatile filter which you can use to composite up to three independent drop shadows over a source image.

Source image

Filtered image

For information on common groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, and “Working with the Geometrics Parameter Group” on page 24.

The **Shadows From Channel menu** sets which source channel is used to create the shadows 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.
- ***Luma Inverse*** uses the inverted luma channel.
- ***Unmultiplied Luma*** and ***Alpha*** use the unmodified corresponding source channels.
- ***Luma Cartoon Edges*** and ***Alpha Cartoon Edges*** find edges in the chosen source channel, apply outlines to the edges, and use the resulting image. When Luma Cartoon Edges or Alpha Cartoon Edges is chosen, the **Source Edges** parameters apply.
- ***Luma Edges*** and ***Alpha Edges*** find edges in the corresponding source channel and use the resulting image. When Luma Cartoon Edges or Alpha Cartoon Edges is chosen, the parameters in the **Source Edges** group apply.

Alpha Edges

Alpha Cartoon Edges

Source Edges Parameter Group

When the **Shadows From Channel menu** is set to ***Alpha Edges***, ***Luma Edges***, ***Alpha Cartoon Edge*** or ***Luma Cartoon Edges*** the **Source Edges** parameters become active.

When the **Shadows From Channel menu** is set to ***Alpha Edge, Luma Edges, Alpha Cartoon Edge*** or ***Luma Cartoon Edges,*** **Thickness/Intensity** controls the intensity of the edges.

Edge Pre Blur 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. The following example shows Luma Cartoon Edges with a Cartoon Thickness of 20.


Pre Blur=0


Pre Blur=2.5


Pre Blur=4

Edge Post Blur blurs the edges before they are used to create the applied shadow.

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

The Master parameters allow you to change the corresponding parameter for each of the three shadows with one control.

Each Shadow has six parameters: ***Distance***, ***Intensity***, ***Angle***, ***Color***, ***Softness***, and ***Gamma***, which you can combine with the master parameters to control the shadows.

Master Distance sets the distance (in pixels) between the shadow and the image.


Master Distance=50


Master Distance=100


Master Distance=200

Master Intensity sets the opacity of the drop shadow, scaled as a percentage. At a value of 100, the shadow is completely opaque. Lower Shadow Intensity values make the background image visible through the shadow. At a value of 0, the shadow is completely transparent.

Master Angle sets the direction of the drop shadow. A setting of 0° places the shadow to the right of the image; a setting of 90° places it directly below the image. The angle you set for **Master Angle** is added to the angle for each shadow.

Master Softness controls the softness of the edges of the shadows. A setting of 0 produces a sharply defined shadow with hard edges. Increasing Master Softness produces shadows with softer edges.


Master Softness=0


Master Softness=150


Master Softness=300

The **Blur Quality menu** sets the quality of the Blur used to soften the shadow. ***Box*** is the fastest option and is generally adequate. It produces a blur similar in quality to the BCC Blur filter. The remaining choices, ***Low***, ***Medium***, ***High***, ***Higher*** and ***Highest*** produce soft shadows of increasing quality. These options increase rendering times proportionately.

The **Master Gamma** value is added to the gamma for each shadow with an offset of 1.0. For example, if Master Gamma and the Gamma value for an individual shadow are both 1.0, the gamma that is applied to the shadow is1.0.

The **Shadow Noise On checkbox** enables Shadow Noise on all three shadows and activates the parameters in the Shadow Noise Parameter group.

Shadow Noise Parameter Group

The Shadow Noise Parameters are master parameters that control all three shadows. These parameters have no affect unless the Shadow Noise On checkbox is selected.

Noise Master Intensity scales the noise for all three shadows. The following illustration is magnified and only shows one shadow, so that it is easier to see the noise.


Noise Intensity=0


Noise Intensity-1000

Noise Density sets the percentage of pixels the noise is applied to for all shadows.

Noise Blur controls the amount of blur applied to the noise. The fast (**Box Blur**) algorithm is used, so its best to keep this value fairly small.

Seed sets the random seed used at the first frame of the effect.

The **Auto Animate checkbox** creates noise that varies, because the noise affects a different randomly chosen group of pixels in each consecutive frame. Select this to create static noise that retains its appearance.

Source Opacity, **Source Apply Mode** and **Source Apply Mix** control how the source is composited with the shadow. **Source Apply Mix** controls the mix of the specified Source Apply Mode with the ***Behind*** and ***In Front*** apply modes. If the Apply Mode is Behind or In Front, Source Apply Mix has no affect. If Source Apply Mix is 0, Source Apply Mode has no affect. Increase Source Apply Mix to blend the Source Apply Mode setting with the Behind or In Front apply modes. You can make the source disappear completely or blend it with the shadows using these controls.

If the **Source Apply Mode menu** is set to ***In Front,*** an opaque source will cover its shadow (except for the parts outside the source region). For descriptions of the remaining Apply Modes, see "Apply Modes" on page 625.

Select the **Shadow 1 On, Shadow 2 On,** or **Shadow 3 On checkboxes** to turn each shadow on and use the parameters in each of the Shadow Parameter Groups.

The Shadow 1, Shadow 2 and Shadow 3 Parameter Groups

Each Shadow has six parameters: ***Distance***, ***Intensity***, ***Angle***, ***Color***, ***Softness***, ***Gamma*** and ***Noise*** which you can combine with the master parameters to control the shadows.

The **Shadow On checkbox** must be selected to turn each shadow on. If this checkbox is not selected, the other parameters have no affect.

Shadow Distance sets the distance (in pixels) between the shadow and the image.

Shadow Distance=20

Shadow Distance=1000

Shadow Intensity sets the opacity of the drop shadow, scaled as a percentage. At a value of 100, the shadow is completely opaque. Lower values make the background image visible through the shadow. At a value of 0, the shadow is completely transparent.

Shadow Angle sets the direction of the drop shadow. A setting of 0° places the shadow to the right of the image; a setting of 90° places it directly below the image. The following example shows a shadow applied using the Multiply Apply Mode.

Shadow Angle=-36 degrees

Shadow Angle=41 degrees

Shadow Angle=200 degrees

Shadow Color sets the color of the shadow.

Shadow Softness sets the softness of the edges. A setting of 0 produces a sharply defined shadow with hard edges. Increasing Shadow Softness produces shadows with softer edges.

Increasing Shadow Gamma from the default of 0 lightens the shadows and reduces contrast. Decreasing Gamma darkens the shadows and increases sharpness.

Shadow Gamma=0

Shadow Gamma=10

Shadow Noise controls the amount of noise applied to each shadow.

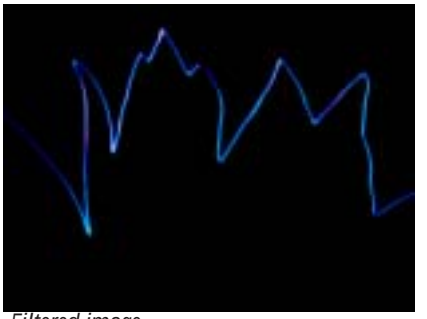
Shadow 1 and **Shadow 2** include additional ***Apply Mode*** controls which determine how they are composited with the shadow(s) below. **Shadow Apply Mode** and **Shadow Apply Mix** control how the source is composited with the shadow. **Shadow Apply Mix** controls the mix of the specified Shadow Apply Mode with the ***Behind*** and ***In Front*** apply modes. If the Shadow Apply Mode is Behind or In Front, Shadow Apply Mix has no affect. If Shadow Apply Mix is 0, Shadow Apply Mode has no affect. Increase Shadow Apply Mix to blend the Shadow Apply Mode with the Behind or In Front apply modes. You can make the source disappear completely or blend it with the shadows using these controls.

Working with the BCC RGB Edges Filter

RGB Edges finds edges in each RGB channel independently, creates a new RGB image from these edges, and applies the new image to the source using the chosen Apply Mode and Apply Mix.

The results obtained with edge filters depend on the media to which the filter is applied and the exact settings used. Because they create edge effects by emphasizing differences between adjacent pixels, edge filters are very sensitive to adjustments. Often a very small parameter change can have a dramatic affect on the result. You can set the location of the light source used to light the edges in the image, eliminate weak edges, soften the edges, choose which portion of the edges to enhance, and invert the edge output.

Source image



Filtered image

For information on the common groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Enhance menu** sets the portion of the edges that is enhanced. Choose ***Highlight***, ***Shadow***, or ***Both***.

The **Invert RGB checkbox** inverts the altered edges before they are applied to the source.

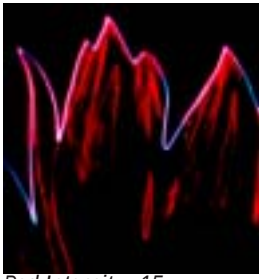
The Light Direction and Light Elevation controls set the location of the light source used to light the edges in the image. **Light Direction** controls the direction that the light comes from. **Light Elevation** controls the elevation of the light source above the image plane. Increasing Elevation makes edge detection less directional. At an Elevation of 100, the Light Direction setting has no affect.

The **Lock Intensity checkbox** locks the Green and Blue Intensity values to the Red Intensity setting. When this option is selected, adjusting Green and / or Blue Intensity has no affect. Deselect this option to adjust the three Intensity values independently.

Red Intensity, **Green Intensity**, and **Blue Intensity** control the intensity of the edges in each respective color channel.


Red Intensity=0


Red Intensity=10


Red Intensity=15

The **Lock Threshold checkbox** locks the Green and Blue Threshold values to the Red Threshold setting. When this option is selected, adjusting Green and / or Blue Threshold has no affect. Deselect this option to adjust the Threshold values independently.

Red Threshold, **Green Threshold**, and **Blue Threshold** determine how sensitive the filter is to differences between pixels when finding edges in the source image. The effect of these settings depends on the nature of the source image.

The Threshold parameters are intended to adjust the look of the edges not for animation. Some images change dramatically when the Thresholds are animated.

The filter eliminates edges whose intensity is lower than the **Edge Floor** value. Use the Edge Floor control to eliminate stray edges from the output if you want to process only the strongest edges in the image.

Pre Blur blurs the source image before the edges are computed, making the edges softer.

Use the Post Blur parameters to blur each of the output color channels before they are applied to the source.

The **Lock Post Blur checkbox** locks the Green and Blue Post Blur values to the Red Post Blur setting. When this option is selected, adjusting Green and / or Blue Post Blur has no affect. Deselect this option to adjust the three Post Blur values independently.

Red Post Blur, **Green Post Blur**, and **Blue Post Blur** control the amount of Gaussian blur the filter applies to each of the respective color channels before applying the edges to the source.

The **Post Blur Quality menu** controls the quality of the Post Blur in all three channels. Choose ***Low***, ***Medium***, ***High***, or ***Highest***. There is a significant rendering cost to using High, and considerably more for using Highest.

If you select the **Make Alpha From Edges checkbox,** the filter derives the image's alpha channel from the sum of the RGB channels in the edge output.

The **Apply Mode menu** controls how the filtered image is composited with the source image. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect and the parameter does not appear. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

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.

For information on the PixelChooser parameter group controls, see “The PixelChooser” on page 603.

Working with the BCC RGB Pixel Noise Filter

RGB Pixel noise applies noise to each of the RGB color channels independently. Alternately, you can use this filter to apply noise to the source image's luminance channel without changing the pixels' colors.

Source image

Filtered image

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

Percentage sets the percentage of pixels affected by the noise.

Select the **Luma Noise checkbox** to apply noise to the source image's luma channel without affect the source pixel colors. When this option is selected, **Red/Luma Noise** controls the amount of noise applied to the affected pixels. Leave this option deselected to apply noise to the RGB color channels.

If Luma Noise is not selected, **Red/Luma Noise**, **Green Noise**, and **Blue Noise** control the amount of noise applied to the affected pixels in each respective RGB color channel. For example, if you set Red/Luma Noise to 100 and Blue and Green noise to 0, each affected pixel's red channel is at the maximum, while the green and blue channels are left unchanged.

When the **Link Noise Ratio checkbox** is selected, the ratio between the amounts of noise in each channels is linked. If Red/Luma, Green, and Blue Noise are set to the same value, selecting Link Noise Ratio adds noise to the luminance channel. When the values are different, selecting this option adds bias, reducing the number of different colors appearing in affected pixels. If Luma Noise is selected, Link Noise Ratio has no affect.

When the **Clipping checkbox** is selected, the noise and luminance values clip between 0 and 255. If this option is deselected, overflow creates a wrap, so that a pixel with a value of 256 wraps to 0, –1 wraps to 255, and so on. This creates a more incoherent look.

Random Seed determines which value is input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to adjust the random configuration of the noise pattern.

Animating the Random Seed setting creates noise that varies from frame to frame, because the noise affects a different randomly chosen group of pixels in each consecutive frame. Keeping this setting at a constant value creates static noise that retains its appearance from frame to frame.

Perturbation and **Perturbation Seed** add a small amount of randomness to the numbers produced by Random Seed, allowing you to create noise patterns that differ from frame to frame by a controlled amount. The best way to do this is to animate Perturbation Seed. Make sure that it changes by at least one unit from one frame to the next, unless you want the noise pattern to be the same for some consecutive frames. Then adjust Perturbation until you get the desired amount of change.

The **PixelChooser Controls menu** determines which parameters are affected by the PixelChooser.

- ***Noise Amount & Percentage*** affects both the Noise and Percentage parameters.
- ***Noise Amount*** only affects the Noise parameter.
- ***Percentage*** only affects the Percentage parameter.

The remaining PixelChooser parameters are described in detail in “The PixelChooser” on page 603.

Working with the BCC Rough Glow Filter

The Rough Glow filter uses a blur to create a glowing effect, highlighting the edges in the image. In earlier versions of BCC, this filter was named BCC Glow. If you are creating a new effect, you should use the BCC Glow filter. This filter is included to provide compatibility with older settings.

Source image

Filtered image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

If the source image is opaque, selecting the **Opaque Source checkbox** can speed rendering and preview times. If your source is partially transparent, deselect this option for best results. You should deselect this checkbox if you are applying the Glow to a title.

Glow Scale adjusts the scale of the image. This value is expressed as a percentage of the image’s original size.

Glow Aspect stretches the image. Decreasing negative values stretch the image vertically. Increasing positive values stretch the image horizontally.

Glow Aspect= –15

Glow Aspect=15

Blur Amount controls the amount of blur applied to the image to produce the glow effect. At a value of 0, no blur is applied, so no glow is visible. Higher values produce more blur and, therefore, more glow.


Blur Amount=5


Blur Amount=25


Blur Amount=50

Increasing **Spread** causes each point in the rendered output to be affected more by points farther away in the blur. Animating Spread can cause visible jumps in the animated effect.


Spread=0


Spread=50


Spread=100

The **Quality menu** sets the quality of the blur used to generate the glow. ***Low*** produces a blur similar in quality to the Blur filter. ***Medium*** is adequate for most applications; ***High*** and ***Higher*** produces even smoother blurs. The ***Highest*** setting is much slower than High; only choose Highest if you see pixilation when using lower settings.

Threshold adjusts the sensitivity of the filter to edges in the image. Increasing Threshold reduces the amount of glow created by weaker edges in the image, so less glow appears on smaller details in the source image.

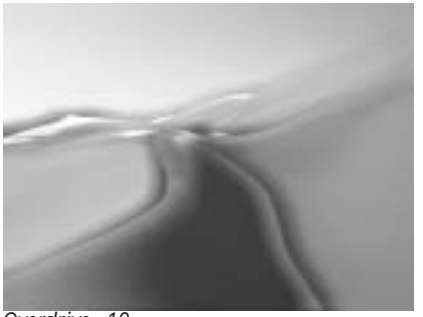
Reducing this value to 0 tends to add noise to the image. For best results, use Threshold settings of 1 or above.


Threshold=1


Threshold=15


Threshold=30

Overdrive adjusts the overall intensity of the glow created by the blur. Lower values producing a softer glow, mixing the blurred image with the resulting glow. Higher values produce a harder, more dramatic glow effect.


Overdrive=10


Overdrive=210

The **Overdrive Apply Mode menu** controls how the glow portion of the effect composites over the blurred portion of the effect. The resulting filtered image is then composited with the source image using the chosen global **Apply Mode**. For information on the available apply modes, see “Apply Modes” on page 625.

In the following illustrations, **Overdrive Apply Mode** is set to ***Difference X2***, so the glow composites with the blur using the Difference X2 apply mode. In the illustration on the left, **Apply Mode** is ***None***, so the filtered image completely replaces the source. In the image on the right, the filtered image is composited with the source using the ***Lighten*** apply mode.

Apply Mode=None

Apply Mode=Lighten

Softness blurs the overdriven glow output before it is composited with the source.

Selecting the **Scale Opacity From Luma checkbox** causes the glow image to have an alpha channel based on its luminance. This allows the original image to shine through the glow in places where the glow is dark.

The **Glow Opacity Scale** parameter scales the opacity of the glow image. This parameter can be overdriven, which means it will only have an affect if the image is not opaque or if Scale Opacity From Luma is enabled.

The **Apply Mode menu** controls how the filter is composited over the source image. The Apply Modes are described in "Apply Modes" on page 625. However, this filter includes two additional Apply Mode choices: **None** and **Behind:**

- ***None*** simply renders the light and ignores the underlying image.
- ***Behind*** renders the light behind the image that is lit, and is only useful for images that are not opaque.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode. This parameter has no affect on the Overdrive Apply Mode.

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 Motion Tracker parameter group allows you to track the motion of an object in a clip. You can use the motion path data to control another aspect of the effect. See "Working with the Motion Tracker Parameter Groups" on page 29 for details.

The PixelChooser Parameter Groups

The PixelChooser controls are described in detail in "The PixelChooser" on page 603.

Working with the BCC Scatterize Filter

Scatterize shuffles the pixels in the source image, creating a scattered effect.

To apply Scatterize as a transition, use the BCC TR Scatterize in the BCC Two-Input Effects category or apply the filter to two layers. For more information, see "Applying BCC Effects as Transitions" on page 12.

For information on the common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

Variance sets how scattered the image is and works in conjunction with the Scatter Percentage.


Variance=0


Variance=10


Variance=30

Scatter Percentage determines the percentage of the pixels in the image that scatter. Adjusting this parameter allows you to scatter an image while leaving its basic shape intact.


Scatter Percentage=20


Scatter Percentage=50


Scatter Percentage=80

The **Style menu** setting determines which type of scattering occurs in the effect.

- ***Uncontrolled*** scatters the pixels in random directions.

- ***Directional*** scatters the pixels along a straight line (in both directions). Use the **Direction Angle** control to set the angle between this line and the horizontal axis.
- ***Radial*** scatters pixels outward from a point set by the **Center Point** settings.


Uncontrolled


Directional


Radial

Center Point Parameter Group

The **Center Point** position controls set the center point for the effect on the X and Y axis.

The **Algorithm menu** specifies how the pixels scatter.

- ***No Bias*** scatters the entire image equally.
- ***Center Bias*** scatters the image more in the center than at the edges.
- ***Subtle Algorithm*** uses an algorithm which animates better but takes longer to render. This option also scales down Variance to some extent, so you should adjust Variance after choosing this option.

When the **Randomize checkbox** is selected, the effect auto-animates, producing a constantly shifting array of scattered pixels. Deselect this option to create a static effect, or to manually animate the effect.

Random Seed determines which value is input to the random number generator used by the filter. Adjust this setting when you like the overall effect, but want to change the random configuration of the pixels. Animating Random Seed produces a different random pattern of pixels in each consecutive frame. Keeping this setting at a constant value creates static noise that retains its appearance from frame to frame.

The **Apply Mode menu** controls how the filtered image is composited with the source image. For descriptions of all the available Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

The PixelChooser controls are described in detail in “The PixelChooser” on page 603.

Working with the BCC Spray Paint Noise Filter

Spray Paint Noise applies a flat spray paint color to the image.


Source image


Filtered image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Percentage sets the percentage of pixels affected by the noise.

Paint Color controls the color of the applied paint.

You can use the **Paint Layer menu** to paint any layer in the timeline. You can use the ***Filter Layer***, or use a clip below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.*** Choose ***None*** to use the chosen Paint Color.


“Flower.pct” layer


Paint Layer=None


Paint Layer =Flower.pct

Minimum Opacity sets the minimum opacity of the paint in each affected pixel. **Maximum Opacity** sets the maximum opacity of the paint in each affected pixel.

If the Minimum and Maximum Opacity values differ, a random number is used to choose opacity from the specified range. If the Minimum Opacity value is greater than the Maximum Opacity value, the Maximum Opacity value is used. If Pixel Percentage is 100, and Minimum and Maximum opacity are both 100, the entire image is covered by the paint color.

The **Apply Mode menu** controls how the filtered image is composited with the source image. For descriptions of all the possible Apply Modes, see "Apply Modes" on page 625.

Noise Seed determines which value is input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to adjust the random configuration of the noise pattern.

Animating Noise Seed creates noise that affects a different randomly chosen group of pixels in each consecutive frame. Keeping this setting at a constant value creates static noise that retains its appearance from frame to frame.

Perturbation and **Perturbation Seed** add a small amount of randomness to the numbers produced by Noise Seed, allowing you to create noise patterns that differ from frame to frame by a controlled amount. The best way to do this is to animate Perturbation Seed. Make sure that it changes by at least one unit from one frame to the next, unless you want the noise pattern to remain the same for some consecutive frames. Then adjust Perturbation until you get the desired amount of change.

The **PixelChooser Controls menu** sets which parameters are affected by the PixelChooser. For information on the other PixelChooser controls, see "The PixelChooser" on page 603.

- ***Paint Opacity & Percentage*** affects both the Minimum and Maximum Opacities as well as the Percentage parameter.
- ***Paint Opacity*** only affects the Minimum and Maximum Opacity parameters.
- ***Percentage*** only affects the Percentage parameter.

The PixelChooser Parameter Group

The remaining PixelChooser controls are described in detail in "The PixelChooser" on page 603.

Working with the BCC Witness Protection Filter

The Witness Protection filter allows you to track the motion of an object in a media file. You can then use the motion path data to control another aspect of the effect. For example, track a logo on a t-shirt and use a blur to obscure it. You can apply a mosaic, blur, tint or brightness / contrast effect to the specified area.

Unfiltered Image


Filtered Image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22 and “Working with the Title Matte Parameter Group” on page 23.

Overview of Using the Witness Protection Filter

The steps below provide an overview of the Witness Protection process.

1. Choose the appropriate effect from the **Effect Method menu** and use the parameters in the Effect parameter groups to set up your effect.
2. Use the parameters in the Mask parameter group to set up the region that you want to affect. **Region Radius** sets the size of the area while **Stretch/Direction** sets the shape. Setting the **View Mask menu** to ***Chosen Pixels*** or ***Mask Unchosen Pixels*** can help you to finetune the area.
3. Use the parameters in the Motion Tracker parameter group to setup the Target. The Target indicates the area in the media to track. You should manually set up both the first and last keyframe.

   A good tracking region contains a high-contrast object with good vertical and horizontal edge definition. Ideally, you should find a pattern that is visible in every frame.
4. Analyze the motion by selecting the **Track On-The-Fly checkbox** and clicking **Play**.

   The filter generates tracking data. While the filter is tracking, the effect is not displayed.
5. Manually correct any errors. See “Manually Correcting Errors” on page 291 for details.

Working with the Effect Parameter Group

The **Effect Method menu** determines what sort of effect is applied to the specified area. The controls in the Effect parameter group let you adjust the effect.

- When ***Blur*** is chosen, **Amount/Brightness** sets the amount of blur. **Contrast/Scramble**, **Seed** and the **Color** controls have no affect when Blur is chosen.
- When ***Mosaic*** is chosen, **Amount/Brightness** sets the amount of pixelation along the horizontal and vertical axis. Increasing these values reduces the number of pixels used to create the image. **Contrast/Scramble** shuffles the pixels in the image. As Scramble increases, the arrangement of pixels becomes increasingly random. **Seed** determines which value is input to the random number generator used to scramble the pixels. Adjust this value when you like the overall effect but want to adjust the random configuration of the pixels. See "Working with the BCC Mosaic Filter" on page 268 for illustrations of these parameters. The **Color** controls have no affect when Mosaic is chosen.
- When ***Brightness/Contrast*** is chosen, **Amount/Brightness** sets the amount of brightness. **Contrast/Scramble** sets the amount of Contrast in the image. **Seed** and the **Color** controls have no affect when Brightness / Contrast is chosen.
- When ***Tint*** is chosen, **Amount/Brightness** sets the amount of the chosen **Color** that is applied. **Contrast/Scramble** and **Seed** have no affect when Tint is chosen.

When the **Process Alpha checkbox** is selected, if the clip includes an alpha channel, the effect will apply to the alpha edges as well. This is useful if you are working with a title or matte or have applied multiple filters and some include an alpha channel.

The **Apply Mode menu** controls how the chosen effect is composited with the filtered layer. For descriptions of all the Apply Modes, see "Apply Modes" on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

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.

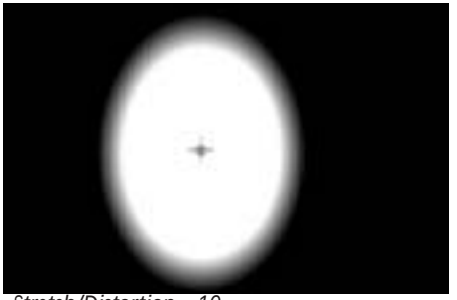
Working with the Mask Parameter Group

When setting up your mask, you may want to set the View Mask menu to View Chosen Pixels or Mask Unchosen Pixels so that you can easily see the masked area.

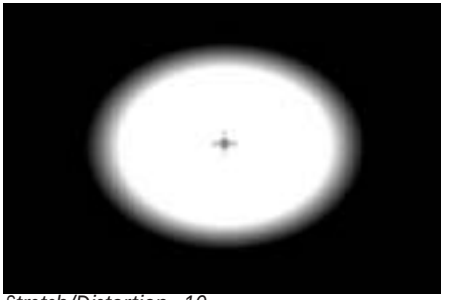
The **Offset X** and **Offset Y** parameters, allow you to offset the effect on the X and Y axis respectively. This is useful if you want to track one area, then apply the effect to a different area. For example, you want to blur out an athlete's name on a t-shirt but don't want to blur the player's number. However, the player's number offers more contrast and is therefor easier to track. You would track the number, then offset the effect to obscure the name.

Region Radius sets the size of the oval-shaped region where the effect is applied.

Stretch/Direction distorts the oval-shaped region by stretching it either horizontally (for positive values) or vertically (for negative values). The following examples show the View Mask menu set to View Chosen Pixels.



Stretch/Distortion=-10



Stretch/Distortion=10

Softness controls the softness of the edges of the mask created by the filter. A setting of 0 produces a sharply defined hard edge. Increasing Softness produces softer edges.

When the **Invert checkbox** is selected, the mask created by the filter is inverted. For example, you want to highlight a face in a crowd. You could track the face, apply a Brightness-Contrast filter then darken the crowd except for the specified area.

The **View Mask menu** offers several display options which help you to finetune your effect.

- ***Off*** displays the filtered effect.
- ***View Chosen Pixels*** displays the matte created between the filtered and unfiltered pixels in black and white. The black regions of the matte represent the unfiltered pixels, and the white regions of the matte represent the filtered pixels. Gray areas represent partially filtered pixels. This is useful for adjusting an area that is difficult to see, for example a subtle Blur filter applied to a region.
- ***Mask Unchosen Pixels*** displays a 50% red mask over the unfiltered pixels. This is also useful for adjusting an area that is difficult to see, for example a subtle Blur filter applied to a region.
- ***View Source Image*** shows the source of the matte.

Working with the Motion Tracker Parameter Group

Selecting the **Reset Tracker checkbox** resets the parameters in the Motion Tracker parameter group.

When the **Track On-the-Fly checkbox** is selected and you press **Play**, the filter calculates the tracking data. When you select this checkbox, the selected effect does not display in the Effect Preview window. Once you finish tracking, deselect this checkbox to play the applied effect.

The **X** and **Y Position** controls set up the area to track. However, in general it is easier to use the onscreen point controls to set this up, then use the position controls for finetuning.

To view the target area, you must select the **Track On-the-Fly checkbox.** If this checkbox is not selected, the applied effect displays instead of the target area. The white rectangular outline indicates the target area that will be tracked. In the example at right, the letters P and K are included in the target area.

Target Width sets the size of the area to track. Increasing this value increases preview time but can increase the accuracy of the tracking.

Tips for Setting Up the Target Area

- A good Target area contains a high-contrast object with good vertical and horizontal edge definition. Ideally, you should find a pattern that is visible in every frame.
- The Target Width should be large enough to accommodate a good target image. However, processing time increases as the size increases, so do not make the Target Width unnecessarily large.
- If your image does not contain a high-contrast object to track, apply the BCC Unsharp Mask or BCC Brightness Contrast filter to the Source track to increase the contrast for better results.
- You can work in Draft mode to preview. However, if the tracker fails repeatedly, deselect the Draft Mode checkbox in the General Controls parameter group.

Manually Correcting Errors

If the Witness Protection filter cannot locate the Target region during analysis, errors can occur. You can use one of these methods to finetune your results:

- Select the **Reset Tracker checkbox**. Refine your Target region. Deselect the **Reset Tracker checkbox**. Reanalyze the motion by selecting the **Track On-The-Fly checkbox** and clicking **Play**.
- You can manually correct the tracking by creating a new keyframe at the point where the tracking fails. Manually reposition the Target region at this keyframe. Then select the **Track On-The-Fly checkbox** and click **Play** to resume tracking from that point.

Chapter 5
Generators Filters

Working with the BCC Brick Generator

Brick is a versatile generator of tiled surfaces with realistic texture and lighting controls. The bricks can act as a filter on a layer or generate a brick surface

For information on common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Brick Parameter Group

The **X** and **Y** position parameters determine the position of the generated bricks.

Scale X and **Scale Y** determine the horizontal and vertical size of the brick image. These values scale both the bricks and the mortar. To scale only the bricks, use the Brick Width and Brick Height parameters. Select **Lock to Scale X checkbox** to lock the Scale Y value to the Scale X value, or deselect this option to adjust each parameter independently.

Rotation spins the brick pattern around the Z axis.

Bump Height determines the height of the bump map used to create the texture of the bricks.

Resolution determines the size of bump map. Increasing Resolution adds finer detail. However, increasing Resolution also increases rendering times.

The **Brick Color** controls set the color of the bricks.

The **Mortar Color** controls set the color of the mortar between the bricks.

Brick Color Hue Variation adjusts the amount of hue variance between brick colors. As this value increases, the bricks assume a wider variety of colors. Decreasing this value produces bricks that are more uniform in color.

Brick Color Sat. Variation adjusts the amount of saturation variance between brick colors. Decreasing this value produces bricks that are more uniform in saturation.

Brick Color Lightness Variation adjusts the amount of lightness variance between brick colors. Decreasing this value produces bricks that are more uniform in lighting.

Brick Color Pattern controls the Brick Color Variation at a given point by moving through the color map used to create the Brick Color Variation.

Brick Width determines the width of the bricks. Higher values create wider bricks. This parameter differs from Scale X in that increasing the value increases the width of the bricks but does not affect the mortar.

Brick Height determines the height of the bricks. Higher values create taller bricks. This parameter differs from Scale Y in that increasing the value increases the height of the bricks but does not affect the mortar.

Mortar Thickness determines the thickness of the mortar between the bricks. Higher values create wider bricks.

Brick Coarseness determines the amount of bumpy texture applied to the bricks.

Brick Wear adds wear to the mortar between the bricks. Higher values create more worn mortar.

Lighting Parameter Group

The **Light Type menu** determines the type of light source.

- ***Point*** combines both focused (specular) and diffuse light. You can use this Light Type to create the appearance of a shiny surface lit by a point light source.
- ***Distance*** creates a non-directional infinitely distant diffuse light, similar to sunlight.
- ***Spot*** creates the look of a traditional theatrical spotlight. Spot creates a small spot of intense light whose falloff can vary.

The **X** and **Y** Light controls position the light source in space by moving the light parallel to the image plane along the X and Y axes.

Light Z positions the depth of the light source relative to the image plane. A value of 100 places the light one source width above the image plane. Light Z can be negative, which places the light behind the image plane. If Light Z is negative, the light is seen only if the object is rotated or displaced so that all or part of it is behind the light source (that is, the light source always points in toward the object, never out at the viewer).

Light Intensity controls the intensity of the light.

The **Light Color** controls determine the color of the light.

The **X** and **Y** controls set the X and Y coordinates for the point at which the spotlight is aimed. Unlike the X and Y Light controls (under the Light Type menu), adjusting the Spot parameters does not change the shape of the light.

Spotlight Angle sets the angle of the light. This is analogous to focusing the light. Decreasing values create a smaller, more focused light.

Spotlight Falloff controls the relative softness of the edges of the lit region. The default setting creates a soft edge. Decrease this value to harden the edges of the lit region. Spotlight Falloff removes light from the edges of the lit region. To maintain the size of the region while softening the edges, you need to increase Spotlight Angle accordingly.

White in Specular increases the amount of white in the specular light. Increasing this value can create a more metallic surface effect. This parameter is only useful when Specular Intensity has a value greater than 0.

Ambient Intensity adjusts the total amount of diffuse light on the image. The default setting of 100 does not add or subtract ambient light from the source image. Decreasing this setting makes the image darker before the other lights are applied. Ambient light illuminates or darkens the image evenly, and is unaffected by any other lighting parameters.

Diffuse Intensity determines the amount of non-directional diffuse light applied to the object. Increasing Diffuse Intensity brightens the object uniformly.

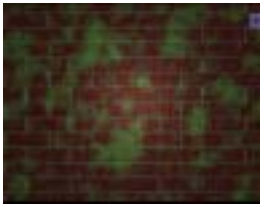
Specular Intensity simulates lighting a glossy surface from a point source, creating a small spot of intense light whose falloff can vary. Increasing this value adds reflected light to the surface.

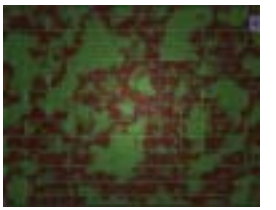
Shininess controls the rate at which the Specular light falls off from the center of the lit region. A higher Shininess value creates a more concentrated highlight, simulating a shiny, highly reflective surface. A lower Shininess value spreads light more evenly throughout the lit region, simulating a rougher, less reflective surface.

Stain Parameter Group

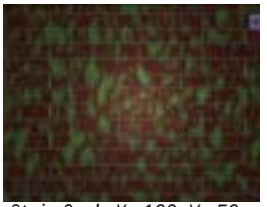
Stain Amount sets the amount of stain added to the brick surface. You can use this parameter to imitate dirt, moss, spray paint or water on the bricks. At a value of 0, no stain is visible.

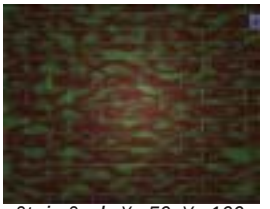

Stain=0

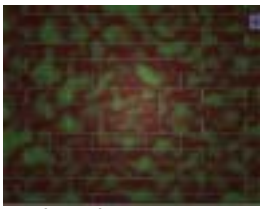

Stain=25


Stain=50

Stain Scale X and **Stain Scale Y** sets the scale of the stain on the X and Y axis respectively. Select the **Lock to Scale X checkbox** to lock the Stain Scale Y value to the Stain Scale X value, or deselect this option to adjust each parameter independently


Stain Scale X=100, Y=50

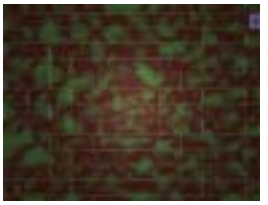

Stain Scale X=50, Y=100


Stain Scale X=100, Y=100

Stain Smoothness adjusts the amount of blur applied to the stain. Higher values produce more blur, which tends to reduce the amount of detail and noise in the filtered image.

Stain Detail sets the level of detail in the stain texture. At a value of 0, the stain is not visible. At a value of 1, the stain is a simple gradient with soft edges. As the value increases, the texture appears finer, with a rougher gradient.


Stain Detail=0


Stain Detail=50


Stain Detail=100

Stain Mutation controls the pattern of the stain at a given point by moving through the procedural noise from which the effect is generated along the Z axis.

The **Stain Color** controls set the color of the stain.

Surface Image Parameter Group

The **Image Layer menu** allows you to choose a layer to use as the background of the effect. You can use the ***Filter Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below.***The default setting, ***None***, creates an opaque bricks layer; the layers below the filtered layer in the timeline are not visible. When the Image Layer menu is set to None, the other parameters have no affect.

The **X** and **Y** position controls set the position of the layer specified in the Image Layer menu.

Scale X and **Scale Y** determine the horizontal and vertical scale of the layer specified in the Image Layer menu. Select **Lock to Scale X checkbox** to lock the Scale Y value to the Scale X value, or deselect this option to adjust each parameter independently.

Image Rotation spins the layer specified in the Image Layer menu around the Z axis.

Image Opacity sets the opacity of the layer specified in the Image Layer menu.

Apply Parameter Group

Select the **Source Alpha checkbox** to use the source alpha channel as a mask for the filter, so the texture appears only in the opaque regions of the source. If this option is deselected, the source image's alpha channel is ignored.

Opacity adjusts the opacity of the simulated texture.

The **Apply Mode menu** controls how the texture is composited over the source image.

For descriptions of all the possible Apply Modes, see "Apply Modes" on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

Working with the BCC Bump Map Generator

Bump mapping is used to create three dimensional detail on an image based on the luminance information in the image. The luminance value of each pixel of the image creates height, with brighter pixels creating more height.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Control Parameter Group

The **X** and **Y** position controls determine the position of the generated bump map.

Rotation spins the bump map around the Z axis.

Select the **Use Alpha checkbox** to use the source image’s alpha channel as a mask for the filter, so the texture appears only in the opaque regions of the source. If this option is deselected, the source image’s alpha channel is ignored.

Bump Height determines the height of the bump map used to create the texture of the bricks.

Bump Smoothness adjusts the amount of blur applied to the bump map. Higher values produce more blur, which tends to reduce the amount of detail and noise in the filtered image.

The **Tiling Style menu** lets you repeat the texture. This menu has no affect unless the Scale X and Scale Y values are less than 100.

- **Symmetric** tiles the images.
- **Repeating** mirrors the tiled images.

Scale X and **Scale Y** determine the horizontal and vertical size of the bricks. Select **Lock to Scale X** to lock the Scale Y value to the Scale X value, or deselect this option to adjust each parameter independently.

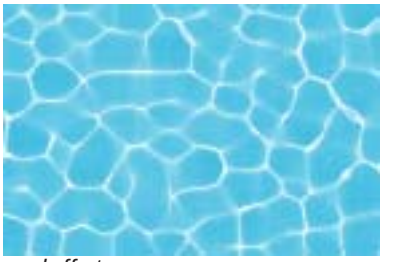
The remaining Bump Map parameters are identical to the corresponding Brick controls. See “Lighting Parameter Group” on page 295, “Surface Image Parameter Group” on page 297 and “Apply Parameter Group” on page 298 for details.

The Bump Map Filter’s Lighting Parameter Group has two additional controls not in the Brick filter. Select the **Use Texture Color checkbox** to use the color values from the underlying track to which the filter is applied. Deselect this checkbox to use the luminance values only. When this checkbox is deselected, the **Color controls** below set the color that is used with the luminance values.

Working with the BCC Caustics Generator

The BCC Caustics filter can be used to simulate the effect of light refracting through a surface of water and projected onto a surface (like moving water ripple reflections on a pool bottom). You can use this filter to create many types of effects where rays emanate from a point and are reflected or refracted by a curved surface. For example, you could use this filter to generate moving plasma fields, smoky particle effects, waves in a pool, or animating geometric patterns.

smoky effect



pool effect

This filter is very render intensive. You may want to select the **Draft Mode checkbox** in the General Controls parameter group while you set up the effect. Then deselect this checkbox off to finetune your effect.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **View menu** is a preview display. You can display the ***Final Output***, the pattern (or layer) used in the Wave Source menu to create the ***Waves*** or the ***Color*** used in the Color Source menu.

The **Compositing menu** controls how the texture is composited over the source image. Choosing ***None*** composites the filter over a color background and ignores the filtered clip. The remaining choices are Apply Modes. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

The **Wave Source menu** is used to set and view the input source for the waves generator.

- ***Filtered Layer*** uses a channel (luma / brightness / alpha / red / green / blue) from the layer to which the filter was applied as a source for the caustics wave generator.
- ***Aux Layer*** uses a user specified layer from the timeline as the source for the caustics wave generator. You set the Aux Layer in the Aux Layer menu.
- ***Fractals*** uses a built-in fractal generator algorithm as a source for the caustics wave generator.

The **Color Source menu** sets the color of the generated caustics.

- ***Color Control*** uses the specified **Color** parameter.
- ***Filtered Layer*** uses the color(s) from the layer to which the filter has been applied as the source for the color of the generated caustics.
- ***Aux Layer*** uses the color(s) from a user specified layer as the source for the color of the generated caustics. You set the Aux Layer in the Aux Layer menu.

The **Alpha Source menu** controls the alpha channel generated by the filter.

- ***Unmult Image*** uses the luminance of the caustics image as the alpha channel.
- ***Opaque*** ignores any alpha present in the layer to which the filter has been applied.
- ***Filtered Layer*** uses the alpha information available in the current layer, including the color used in the premultiply process.
- ***Aux Layer*** uses the alpha from a user specified layer from the timeline. You set the Aux Layer in the Aux Layer menu

The **Aux Layer menu** displays a list of all layers in the current timeline. The clip chosen in this menu is used wherever Aux Layer is set as a source. The choices are ***None, Filter Layer, 1st Below*** and ***2nd Below***.

The **Wave Channel menu** sets the source channel for the wave generator. The choices are ***Luminance, Brightness, Alpha, Red, Green,*** or ***Blue***. If the Wave Source menu is set to Fractals, this parameter has no affect.

Wave Smoothing controls the amount of blur that is applied to the wave map. Increasing values results in a more blurred wave map. This option enhances the caustics image as 8-bit image layers make very poor looking waves unless they are blurred.

Wave Height controls the height of the wave map, meaning the displacement of the generated caustics. both wave height and projection distance do similar things. Increasing values generate a deeper wave map, resulting in more caustic movement in the z dimension

Wave Area Scale sets the scale of the filtered layer so that the caustics completely cover the image output. If the scale is too small, the edges of the caustics image are visible in the output. Increasing values increase the scale of the layer.

Projection Distance moves the screen onto which the caustics are being projected closer or further from the camera. This essentially changes the focus of the generated caustics. As you move this control, the caustic image folds over itself and spreads. Increasing values make it appear as though the projection screen is further away, making the caustics appear smaller.

Color sets the color of the generated caustics when the Color Source menu is set to Color Control.

Brightness adjusts the brightness of the generated caustics.

Contrast adjusts the contrast of the generated caustics.

Wispiness adjusts the level of detail of the generated caustics. At a value of 0, the generated caustics use a fine gradient with soft edges. As the value increases, the texture appears coarser, with a rougher gradient and harder edges.

Adjusting **Softness** softens the output of the caustics image. If the Compositing menu is set to something other than None, the image is softened before it is composited.

Sampling Density is a smoothing control. Increase this parameter until the generated caustics appear smooth. If this parameter is too low, a fine dot pattern could appear in darker areas.

Fractal Wave Parameter Group

Fractal Frequency controls the size of the waves from the fractal generator.

Fractal Detail sets the visible level of detail in the generated caustics. Increasing values generate a more complex image.

X Position sets the horizontal center of the caustics. Animating this parameter makes the field drift across the output like flowing water.

Y Position sets the vertical center of the caustics. Animating this parameter makes the field drift across the output like flowing water.

Mutation Rate sets the speed of the caustics as they change over time. higher numeric values will cause the caustics to evolve more rapidly.

Random Seed determines which value is input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to adjust the random configuration of the caustics.If you have two applications of caustics, use different values so that their output images are different.

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.

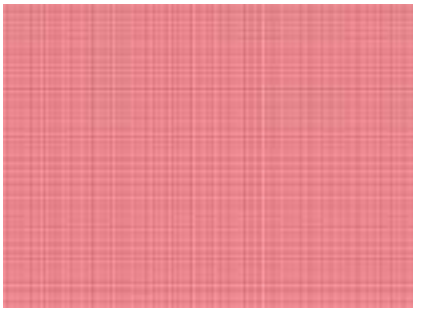
PixelChooser Region and Matte Parameter Groups

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image.

For information on the PixelChooser parameter group controls, see “The PixelChooser” on page 603.

Working with the BCC Cloth Generator

Cloth creates a texture resembling tightly-woven fabric.

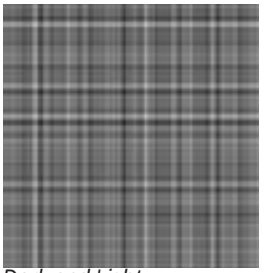


For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

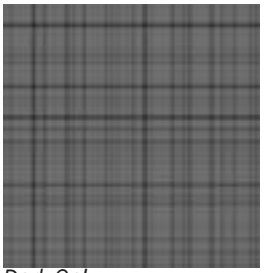
The **Offset X** and **Y** parameters control the appearance of the cloth pattern at a given point by moving through the procedural noise from which the effect is generated along the X and Y axis.

Scale X and **Scale Y** determine the scale of the threads that form the cloth along the X and Y axis respectively. Select **Lock to X Scale checkbox** to keep these values in proportion, or deselect this option to adjust Scale X and Y independently.

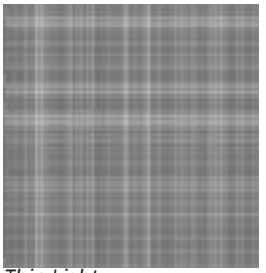
The **Type of Thread menu** sets the style of threads are used to create the cloth. Each type uses the selected Color, but varies the luminosity to achieve a range of thread colors. Choose ***Dark and Light***, ***Light Only***, ***Dark Only***, ***Thin Light,*** or ***Thin Dark***.



Dark and Light



Dark Only



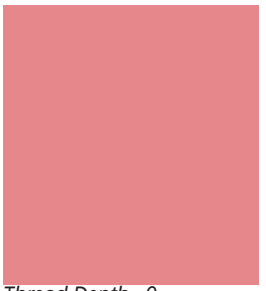
Thin Light

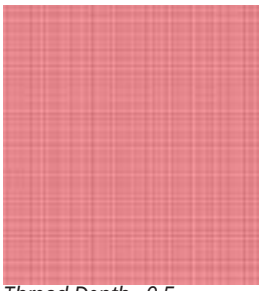
The **Color controls** set the color of the cloth pattern.

Color Alpha sets the alpha value of the color.

The **Thread Color** controls set the color of the thread.

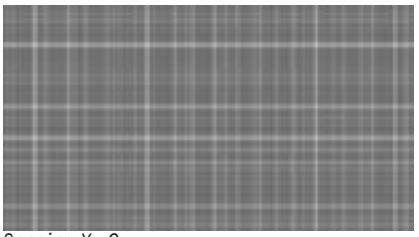
Thread Depth adjusts the contrast between the colors of the individual threads in the cloth. At a value of 0, all of the threads use the specified Color, and the pattern resembles a solid color. As the Thread Depth increases, a wider range of thread colors are used, and the individual threads are more pronounced in the pattern.

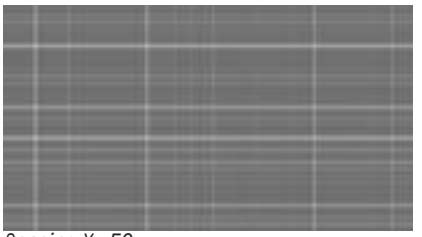

Thread Depth=0


Thread Depth=0.5


Thread Depth=1.0

Spacing X and **Spacing Y** adjusts the spacing of the threads along the X and Y axis. Increasing this value moves the threads farther apart.


Spacing X=0


Spacing X=50

Mutation controls the pattern of the threads at a given point by moving through the procedural noise from which the effect is generated along the Z axis.

Rotation spins the cloth pattern around the Z axis.

Opacity adjusts the opacity of the simulated texture.

Select the **Source Alpha checkbox** to use the source alpha channel as a mask for the filter, so the texture appears only in the opaque regions of the source. If this option is deselected, the source image's alpha channel is ignored.

The **Apply Mode menu** controls how the texture is composited over the source image. For descriptions of all the Apply Modes, see "Apply Modes" on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

Working with the BCC Clouds Generator

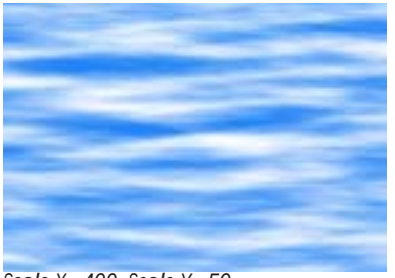
Clouds is a realistic clouds generator. The clouds can act as a filter on a layer or generate a sky with clouds and a horizon color. Three different types of clouds automatically animate using the Direction, Angle and Speed you set without using keyframes.

For information on common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

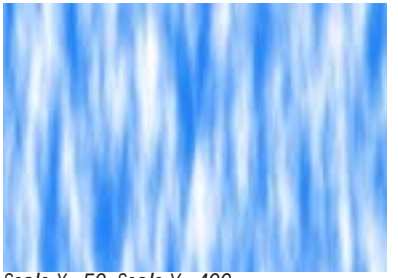
Cloud Direction sets the direction of cloud movement. This value represents the angle between the direction of motion and the horizontal axis.

Cloud Speed determines the speed at which the clouds move in the specified Cloud Direction. The clouds auto-animate at the chosen speed, but you can make a stationary cloud effect by setting Cloud Speed to 0.

Scale X and **Scale Y** determine the horizontal and vertical size of the clouds. Select the **Lock to Scale X checkbox** to lock the Scale Y value to the Scale X value, or deselect this option to adjust each parameter independently.



Scale X=400, Scale Y=50

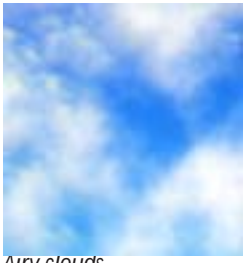


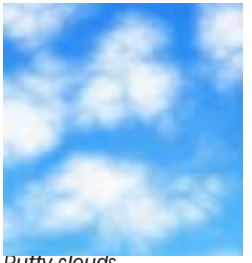
Scale X=50, Scale Y=400

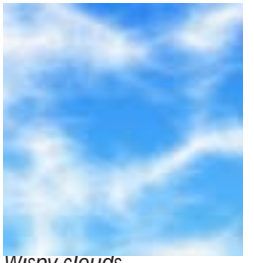
Billow Speed determines the rate at which the clouds surge or rotate inward on themselves.

Opacity controls the opacity of the clouds, or the overall image. If Sky Type (see below) is set to Color, Opacity affects the whole image. If Sky Type is set to Composite on Original or Alpha, this setting affects the opacity of the clouds only.

The **Cloud Type menu** sets the general appearance of the cloud patterns. The three different Cloud Types, ***Airy***, ***Puffy*** and ***Wispy,*** include some inherent shape and size differences. For this reason, you may want to adjust the Scale and Billow Speed settings slightly when switching between the various Cloud Types.


Airy clouds


Puffy clouds


Wispy clouds

The **Sky Type menu** setting determines how the filter applies the clouds.

- When Sky Type is set to ***Composite on Original***, the filter composites clouds over the source image, which remains visible through the clouds.
- ***Color*** composites clouds over the chosen **Sky Color**.
- ***Alpha*** composites the clouds over a transparent layer. This enables you to adjust the clouds without altering the background image.

Cloudiness controls the density of clouds in the sky. Cloudiness is scaled as a percentage between 0 and 100. A value of 0 produces a sky with no clouds. Increasing the Cloudiness value adds more clouds to the sky.

Cloud Color sets the color of the clouds. **Sky Color** sets the color of the sky. **Horizon Color** sets the color of the horizon. If **Use Horizon** is not selected, Horizon Color has no affect.

When the **Use Horizon checkbox** is selected, the resulting sky is a gradation from the Sky Color at the top of the screen to the Horizon Color at the bottom. The example at right shows the Use Horizon option.

Apply the Clouds filter twice to combine two types of clouds. Use the eyedropper to set the sky and horizon colors to the same values as the first Clouds filter, then set the second filter's Sky Type to Composite on Original and decrease the opacity about 50% to make both outputs visible. This technique mixes clouds of different sizes, colors, and shapes to achieve more natural, less regular clouds.

The **Map Layer menu** allows you to choose any layer in the timeline to use as matte for the clouds. The clouds conform to the opaque regions in the Map Layer's alpha channel. You can use the ***Filter Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

Boris matte

Clouds with Boris matte used as Map Layer

Blend blurs the alpha channel. You can use Blend to feather edges in the matte or to reduce pixilation caused by Choke.

Choke adjusts the size of the opaque regions in the matte. Increasing positive Choke values enlarge the opaque regions, while decreasing negative values shrink the opaque regions.

Working with the BCC Comet Generator

Comet creates an auto-animated comet that streaks across the screen. The comet is compromised of particles whose sizes, shapes, and colors can be adjusted. You can also set the length and speed of the effect, adjust the camera perspective, position the starting and ending points of the comet, and apply a gravitational force to adjust the comet's movement.

When you play the effect, the comet's position automatically animates from the source point to the destination point.

For information on common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

Source X and **Source Y** sets the comet's source point on the X and Y axis.

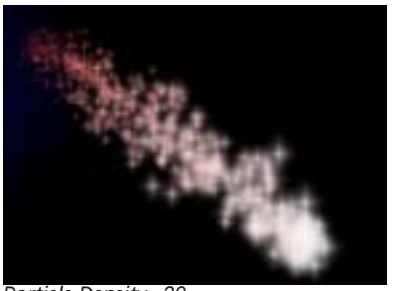
Source Z sets the comet's source point on the Z axis. Negative values move the source point closer to the viewer, while positive values move the source point farther away.

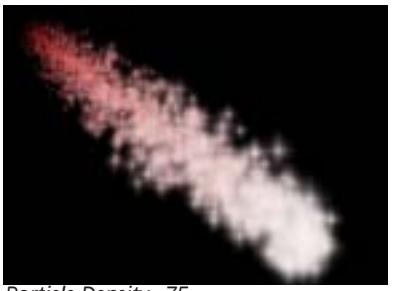
Destination X and **Destination Y** sets the comet's destination point on the X and Y axis.

Destination Z sets the comet's destination point on the Z axis. Negative values move the destination point closer to the viewer, while positive Source Z values move the destination point farther away.

Completion Time determines how long it takes for the head of the comet to move from the source to the destination points. This value is scaled as a percentage of the total effect duration. For example, suppose the effect duration is 60 frames. When Completion Time is 25, the comet travels from the source to the destination points in 15 frames, or 25% of 60 frames. When Completion Time is 50, the comet takes 30 frames to move from its source to its destination, and so on.

Particle Density controls the density of the individual particles which comprise the comet. Use low Particle Density values to create a less-distinct mass, or higher values to create a dense ball.


Particle Density=30


Particle Density=75

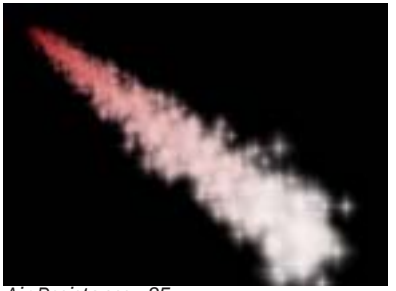
Select the **Composite on Alpha checkbox** to composite the comet over a transparent background. Deselect this option to use the filtered layer as the background for the effect.

Blur adds a slight blur to the comet, which is useful for softening the edges of the particles which comprise the comet. Increasing this value increases the amount of the blur, while decreasing this value reduces the amount of blur applied.

Gravity allows you to apply a second force to the movement of the comet. Increasing this value pulls the comet increasingly strongly in the direction of the **Gravity Angle** as it moves from its source to destination points.

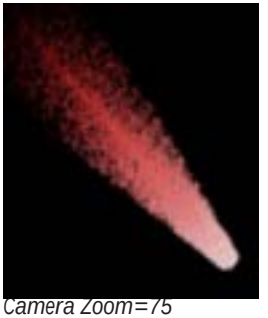
Air Resistance adjusts the amount of air resistance pushing against the comet. Increasing Air Resistance causes particles to push more closely toward the center of the comet.

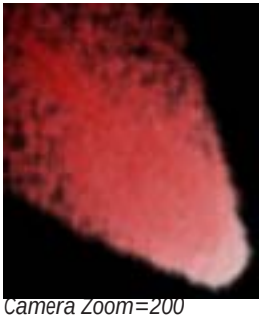

Air Resistance=65


Air Resistance=85

Camera Zoom moves the entire comet toward and away from the viewer. At a value of 0, the comet is infinitely far away and becomes invisible. Increasing this value moves the comet closer to the viewer.


Camera Zoom=25


Camera Zoom=75


Camera Zoom=200

Particles Parameter Group

The **Particle Shape menu** sets the shape of the generated particles that comprise the comet. The choices are ***Reference Boxes, Pixel Streaks***, ***Pixel Trails***, ***Antialiased Lines***, ***Blurs*** (blurred colored circles), ***Bubbles*** (open circles), ***Shaded Spheres***, ***Wide Sparkles***, ***Long Sparkles***, ***Round Noise***, and ***Pointers***.

For illustrative examples of some of the Particle Shape choices, see page 335.

Particle Character adjusts the look of the particles. The affect of this setting depends on which Particle Shape is chosen.

- With Reference Boxes, Wide Sparkles, and Pointers, increasing positive Particle Character values stretch the particles horizontally, while decreasing negative values stretch the particles vertically.
- With Pixel Streaks, Pixel Trails, and Antialiased lines, increasing positive Particle Character values lengthen particles, while decreasing negative values shorten them.
- With Blurs, increasing positive Particle Character values soften the edges of the particles, while decreasing negative values create harder edges.
- With Bubbles, increasing positive Particle Character values enlarge the transparent area in the center of the particles; decreasing negative values shrink the area.
- With Shaded Spheres, increasing positive Particle Character values increase the opacity of the shaded edges of the particles, while decreasing negative values decrease the opacity of the shading.
- With Long Sparkles, increasing positive Particle Character values lengthen the four points of the sparkles, while decreasing negative values shorten the points.
- With Round Noise, increasing positive Particle Character values increase the resolution of the noise, while decreasing negative values decrease the resolution.

Particle Lifespan determines how long each particle lasts before it decays. Increasing this value makes the particles last longer, while decreasing this value makes the particles last a shorter length of time.

The **Compositing menu** controls how the particles are composited on each other when they overlap. These choices all correspond to apply mode settings. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Opacity Boost affects the opacity levels of the entire comet, after individual Start, Midpoint and End opacity values are taken into account. This provides a means of adjusting and animating the opacity of the effect as a whole without changing individual parameters for each range.

Size Variance sets the range of particle sizes for the comet, after individual Start, Midpoint, and End size values are taken into account. A Size Variance value of 0 ensures that all particles conform to the chosen Size values for their ranges. Increasing Size Variance creates more disparity between the smallest and largest particles in each range.

Brightness Variance controls the range of brightness values among the particles. Increasing Brightness Variance creates a comet in which some particles are bright and others are dim, and increases the disparity between the brightest and dimmest particles. The default setting of ***0*** ensures that all particles will have the same brightness value.

Appearance Parameter Group

The controls in this section select the color and opacity of the generated particles and are divided into three groups. **Start** settings affect particles as they are produced at the source; **End** settings affect particles as they reach their final destinations, and **Midpoint** settings allow you to affect particles differently between the Start and End points. If all these options are used, the effect creates a gradient between Start, Midpoint, and End settings.

Each of the three groups contains the following parameters.

The **Color controls** select colors for the Start, Midpoint, and End ranges of the effect. These are arranged from top to bottom in the Effect Editor window.

The **Start Color Source menu** chooses whether to use the clip layer as a source for particle colors. If the midpoint and end colors are not set, then this is the only color source layer used. At the default setting, ***None***, black is used.

Particle Opacity sets the opacity of the particles. A value of 100 makes all particles in the range completely opaque, and a value of 0 makes all particles completely transparent. You can set different Particle Opacity values in the Start and End ranges to create effects in which particles stream from the source and disappear.

Particle Size controls the size of the particles. The Particle Size parameter has no affect on particles that are line shapes (Pixel Streaks, Pixel Trails, and Antialiased Lines), but does affect the size of all two-dimensional Particle Shapes (Blurs, Bubbles, Shaded Spheres, 2D Boxes, and Sparkles).

In addition to the Opacity and Size parameters, a **Use Midpoint checkbox** enables you to use Midpoint color and brightness settings that are different from Start and End settings. For example, suppose you have a stream of particles whose colors change from red at the source, to yellow, to blue at the end. You set Opacity to 75% at the start, and 25% opaque at

the end. With the Use Midpoint checkbox on, you have to adjust the Midpoint Opacity to 50% to create a smooth Opacity gradient. With this checkbox turned off, the effect interpolates between the Start and End Opacity settings to create a smooth gradient.

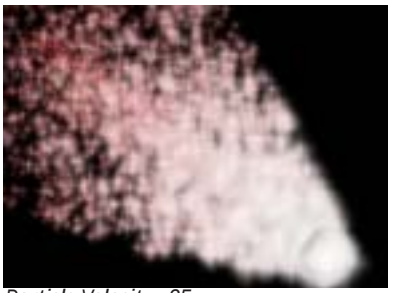
Midpoint Location moves the Midpoint along the gradient between the Start and End values. A value of 0 places the Midpoint close to the generation point, and particles reach the Midpoint color, size, and opacity values soon after birth. A value of 100 places the Midpoint nearer the End point, and particles reach the Midpoint Color, Size, and Opacity values toward the end of their life span.

Midpoint Variance increases the range of Midpoint Location values among the particles. With a Midpoint Variance setting of 0, all particles reach the Midpoint settings at the same location. As you increase the Midpoint Variance value, the Midpoint Location varies more from particle to particle. Therefore, at higher values, some particles reach the Midpoint settings early on, while others reach the Midpoint settings near the end of their life span.

Production Parameter Group

Particle Velocity determines the amount of force with which particles move away from the center of the comet as the comet moves.

Particle Velocity=10



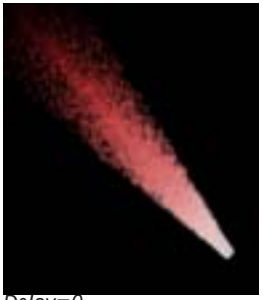
Particle Velocity=35

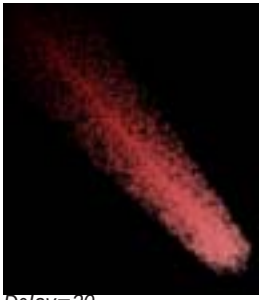
Particle Velocity Variance controls the range of possible Particle Velocity values among the particles in the comet. Leaving this parameter at the default setting of 0 ensures that all particles have the same Particle Velocity. Increasing this value creates a wider range of possible Particle Velocity values.

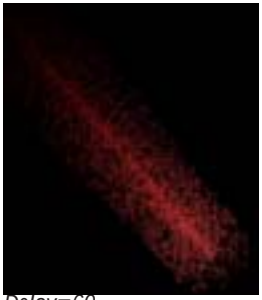
Tumble, **Spin** and **Rotate** move the comet around the X-, Y- and Z-axis, respectively.

Spread affects the overall tightness of the comet as it moves from the source to the destination point. Decreasing this value brings the particles closer to the source, while increasing it spreads the particles and causes them to flow farther from the source.

Increasing **Delay** from the default value of 0 causes particles within a certain distance of the comet's head to remain invisible. Delay can be used to create a comet with no visible production center, since particles do not appear until they disperse to some extent.


Delay=0


Delay=30


Delay=60

Options Parameter Group

Start on Frame allows you to start the auto-animated effect a number of frames past the first frame of the filtered layer. For example, setting Start on Frame to 20 starts the animation twenty frames past the beginning of the filtered layer.

Time Scale allows you to adjust the timing of the effect by stretching or speeding time. Decreasing Time Scale below the default of 100 stretches time. Thus, the effect appears to take place in slow motion, with particles taking more time to reach their destination or die. Time scale values greater than 100 speed time, moving the comet more quickly.

Increasing **Precision** increases the accuracy of particle movement, which can be helpful when creating complex effects. Higher values increase rendering times proportionately.

Selecting the **Optimize Algorithm checkbox** helps speed rendering times without affecting the apparent quality of the image. Deselect this option if the render jumps.

Random Seed determines which value is input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to adjust the random configuration of the particles.

Working with the BCC Fire Generator

Fire is an auto-animated procedural fire effect which offers control over flame width and height, color, and movement, and allows you to generate smoke. This filter can use the alpha channel in any other layer as a Map Layer, allowing you to create fire effects which conform to a pre-composed image or logo.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Fire Appearance menu** determines which portions of the fire effect are visible in the filtered image. ***Fire & Smoke*** displays both the fire and the smoke in the effect. ***Fire Only*** displays only the fire. ***Smoke Only*** displays only the smoke.

Fire & Smoke

Fire Only

Smoke Only

The **Fire Type menu** controls the general appearance of the fire effect. The different Fire Types, ***Regular***, ***Stringy***, and ***Bubbly***, include some inherent shape and size differences. You may want to compensate for these differences by adjusting the Scale, Texture Scale, Speed, and Fire Detail settings when switching between the various Fire Types.

Regular

Stringy

Bubbly

Fire Direction sets the angle between the horizontal axis and the direction of the flames.

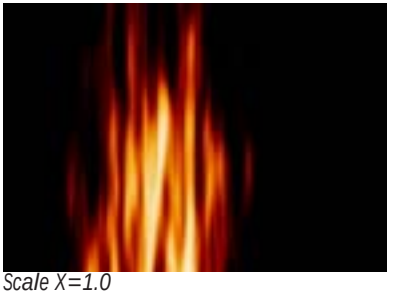
Fire Speed controls how fast the flames move in the selected Fire Direction.

Fire Texture Speed sets the billowing speed of the auto-animated flame. As Fire Texture Speed increases, the texture of the flames changes more quickly.

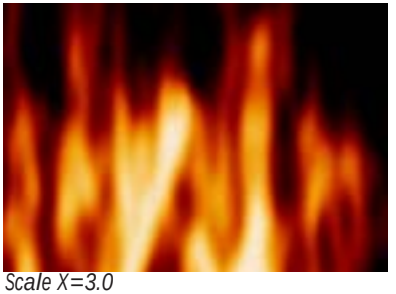
Fire Position sets the location of the center of the fire effect on the X and Y axis.

Texture Position controls the texture of the fire at a given point by moving through the procedural noise pattern from which the effect is generated.

Scale X and **Scale Y** stretch the flame along the X and Y axis, respectively. You can lock the Scale Y value to the Scale X value by selecting the **Lock to Scale X checkbox**.

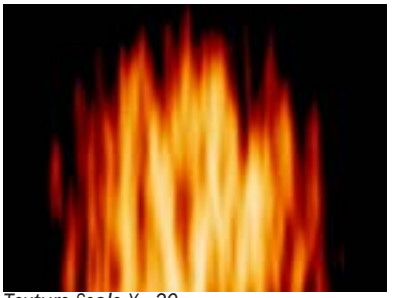


Scale X=1.0

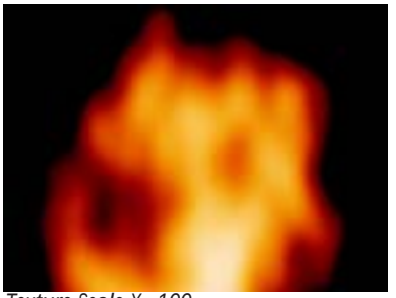


Scale X=3.0

Texture Scale X sets the scale of the flame texture along the horizontal axis. Increasing this value stretches individual wisps of fire out and creates fewer wisps. Decreasing this value makes each wisp thinner and creates more wisps. **Texture Scale Y** operates similarly but affects the flame texture along the vertical axis. You can lock the Texture Scale Y value to the Texture Scale X value by selecting **Lock to Scale X (Texture)**.

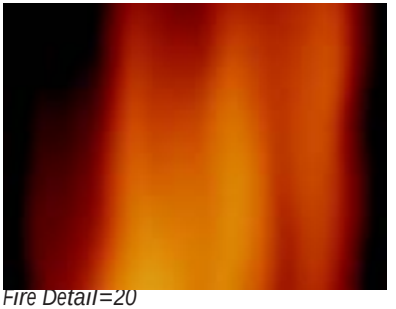


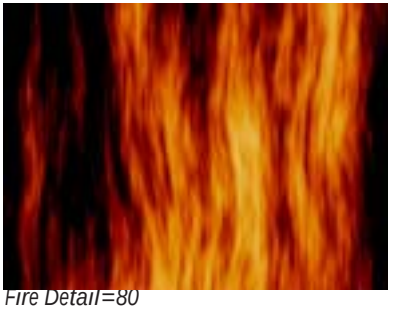
Texture Scale X=20



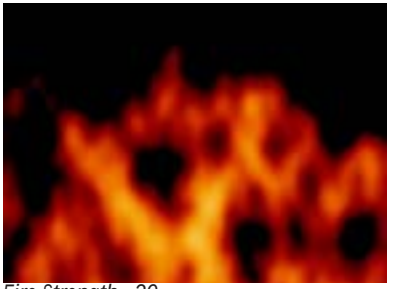
Texture Scale X=100

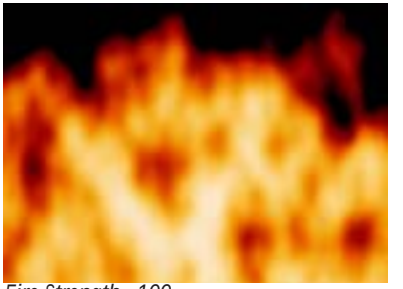
Fire Detail sets the level of detail in the texture. At a value of 0, the flame is a simple gradient with soft edges. As the value increases, the texture appears finer, with a rougher gradient, creating the illusion of increasing distance between the viewer and the fire.


Fire Detail=20


Fire Detail=80

Fire Strength determines the overall temperature and brightness of the fire. Increasing this parameter causes the High Fire Color to predominate.


Fire Strength=20


Fire Strength=100

For more information on the High Fire Color parameter, see “Color Parameter Group” on page 318.

Opacity determines the opacity of the flame. A value of 100 makes the flame completely opaque, and a value of 0 makes the flame completely transparent.

Selecting the **Composite on Source checkbox** composites the fire on the filtered layer. When this option is deselected, the effect is composited over an alpha channel.

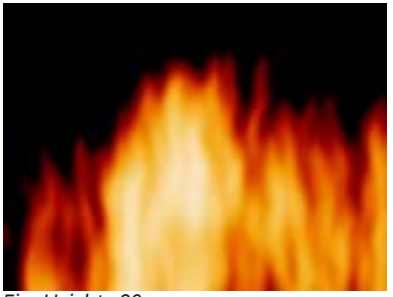

Composite on Original off


Composite on Original on

Shape Parameter Group

Fire Width adjusts the width of the fire effect in relation to the screen, without affecting the Scale or the Texture Scale. Increasing Fire Width extends the range of the effect to cover more of the screen.

Fire Height functions similarly to Fire Width but adjusts the vertical height of the flames above the Fire Position point.

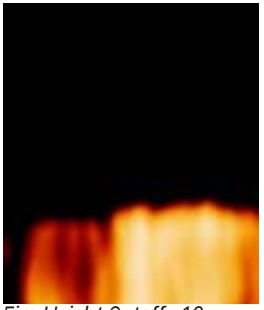


Fire Height=20

Fire Height=100

Fire Base adjusts the distance between the base of the flames and the Fire Position point. When Fire Base is 0, the base of the flames is located at the Fire Position point. Increasing Fire Base moves the flame base below the Fire Position.

Fire Height Cutoff affects the shape of the top of the fire. A setting of 0 cuts the top of the flame off in a straight line. As you increase this value, the top becomes more jagged.



Fire Height Cutoff=10

Fire Height Cutoff=50

Fire Height Cutoff=90

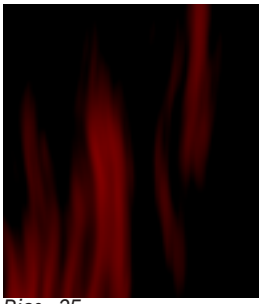
Fire Bottom Cutoff functions similarly to Fire Height Cutoff, except that it affects the shape of the base of the flames.

Edge Softness blends the edges of the flames with the background.

Color Parameter Group

A color map determines how to apply color to the texture map (the procedural noise) used to create the effect. The color map is a gradient which maps between the chosen Fire Colors.

Bias controls the overall position of the texture on the color map. Changing Bias moves the texture's high and low points through the color map.


Bias=25


Bias=50


Bias=75

Gain controls the sensitivity of the color map to changes in texture. As Gain increases, pixels similar in texture move further apart on the color map. As Gain decreases, pixels similar in texture move closer together on the color map.


Gain=25


Gain=50


Gain=75

The **Fire Color Type menu** determines which colors are used to generate the color map.

- When Fire Color Type is ***Regular***, the color map uses default colors that create flames that move from deep brown to red-orange to light yellow as the temperature increases.
- ***Gas*** uses default colors that create blue flames that look similar to those on a gas stove.
- ***Custom*** allows you to override the default color maps and create flame effects using up to three custom colors as described below.

The Color controls for **Low Fire Color**, **Medium Fire Color**, and **High Fire Color** select custom colors for the low, medium, and high flame temperatures, respectively. If Fire Color Type is set to Regular or Gas, changing the color parameters have no affect. These controls are arranged in the Effect Editor window from top to bottom.

Middle Color Position sets the relative position of the Middle Fire Color along the color gradient used to create the custom color map. Higher values move the Middle Fire Color closer to the High Fire Color, while lower values move the Middle Fire Color towards the Low Fire Color.

Smoke Parameter Group

Smokiness adjusts the amount of smoke produced by the flames.

Smoke Spreading Angle determines the width of the column of the smoke as it rises.


Smoke Spreading Angle=10

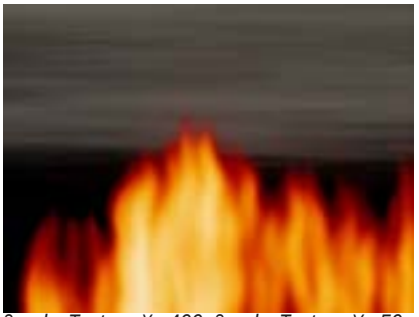

Smoke Spreading Angle=50

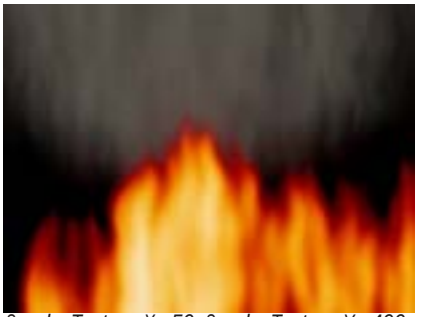

Smoke Spreading Angle=90

The **Smoke Color** controls set the smoke color.

Smoke Opacity adjusts the opacity of the smoke. A setting of 100 makes the smoke completely opaque, while a setting of 0 makes the smoke completely transparent.

Smoke Texture X Scale sets the scale of the smoke along the horizontal axis. Increasing this value stretches individual wisps of smoke out and creates fewer wisps. Decreasing this value makes each wisp thinner and creates more wisps. **Smoke Texture Y Scale** operates similarly but affects the smoke texture along the vertical axis. You can keep these two values in proportion by selecting the **Lock Smoke Texture Scale checkbox**.


Smoke Texture X=400, Smoke Texture Y=50


Smoke Texture X=50, Smoke Texture Y=400

Wind Parameter Group

Wind Speed deflects the flame either to the right (for positive values) or to the left (for negative values) in order to simulate the affect of wind on the flames. A value of 0 creates no wind. As the value moves away from 0 the amount of deflection increases.

Wind Speed= –80

Wind Speed=60

Wind Variance controls the range of Wind Speed values that are used in the effect. When Wind Variance is 0, the wind moves at the specified wind speed. Increasing Wind Variance causes the wind to move at an increasingly wider range of speeds.

Wiggle Amount adds a wave pattern to the flame motion. Increasing this value makes the wave distortion more pronounced.

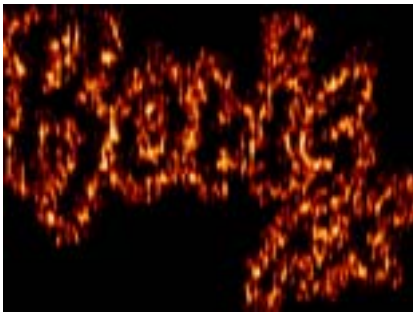
Wiggle Frequency determines the number of wiggle waves that can appear in the effect at any given time. High Wiggle Frequency values produces many small waves, while low values produce a few large waves.

Wiggle Frequency 25

Wiggle Frequency 75

Map Layer Parameter Group

The **Map Layer menu** allows you to choose a layer in the composition to use as matte for the fire. The flames conform to the opaque regions in the map layer's alpha channel.This is useful for creating effects in which an image or logo appears to be burning. The map layer can be a still or moving image or gradient—any media with an alpha channel can be used. The example at right shows the Boris FX logo used as a map layer.



When using a map layer, you may need to adjust the Fire Base and Fire Height so that the boundaries of the flames include the appropriate portions of the map layer.

The **Composite with Map Layer checkbox** allows you to composite the fire over the map layer. Select this option if you want to see the map layer image as it burns. Deselect this option if you want the flames to follow the outline of the map layer's alpha channel, but you want to see only fire and not the map layer media itself.

If you select the **Fire on Edge Only checkbox**, flames appear only around the edges of the opaque regions in the map layer. If this option is deselected, the entire opaque region contains flames.

If you select the **Map On Alpha checkbox**, the fire is mapped on the Alpha channel. If Map On Alpha is not selected, the fire maps on the Luma channel. This checkbox is useful when applying Fire to titles or mattes.

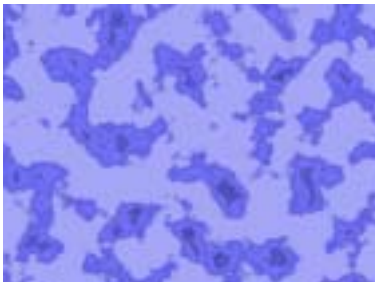
Blend blurs the edges in the map layer's alpha channel smooth the transitions between opaque and transparent areas.

Choke expands or contracts the alpha matte. Increasing positive Choke values make the opaque areas in the alpha matte larger, and decreasing negative Choke values make the opaque areas smaller.

For information on the PixelChooser parameter group controls, see "The PixelChooser" on page 603.

Working with the BCC Fractal Noise Generator

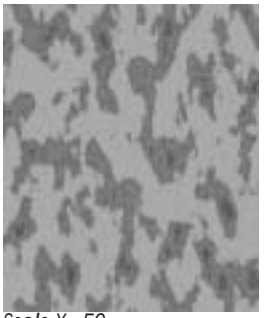
Fractal Noise creates a simulated marble texture.



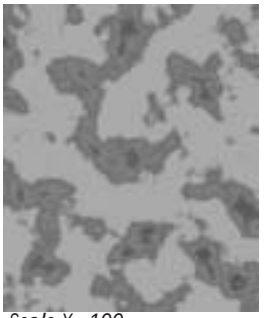
For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Offset XY controls the pattern of the marble at a given point by moving through the procedural noise from which the effect is generated.

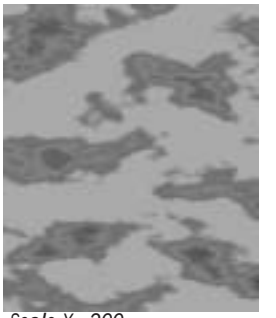
Scale X and **Scale Y** determine the scale of the marble pattern along the X and Y axis respectively. Select the **Lock to Scale X checkbox** to keep these values in proportion, or deselect this option to adjust Scale X and Y independently.



Scale X=50



Scale X=100



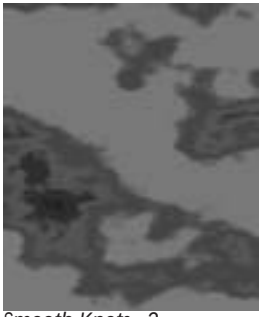
Scale X=200

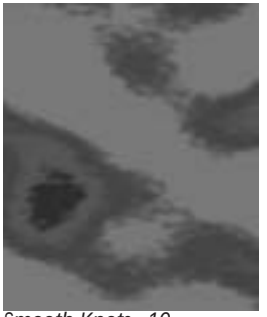
Rotation spins the pattern around the Z axis.

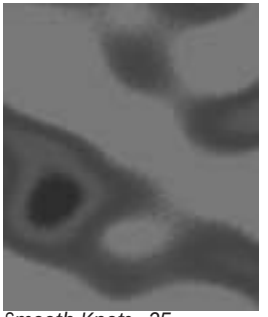
Noise Color sets the predominant color in the pattern.

Mutation controls the pattern of the texture at a given point by moving through the procedural noise from which the effect is generated along the Z axis.

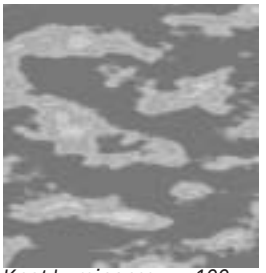
Smooth Knots reduces the complexity of the knots or veins in the texture, smoothing their edges and creating simpler shapes.

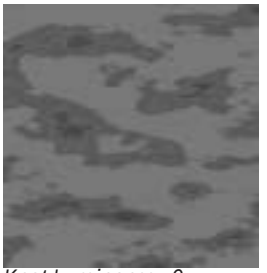

Smooth Knots=2

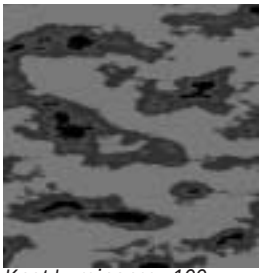

Smooth Knots=10


Smooth Knots=25

Knot Luminance adjusts the brightness of the knots in relation to the background color. Decreasing negative values lighten the knots. Increasing positive values darken the knots.

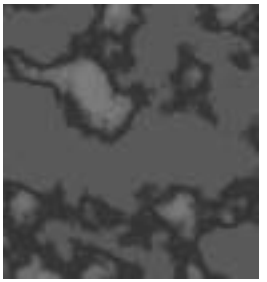

Knot Luminance = –100

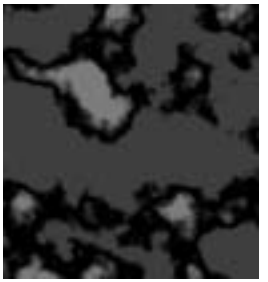

Knot Luminance=0


Knot Luminance=100

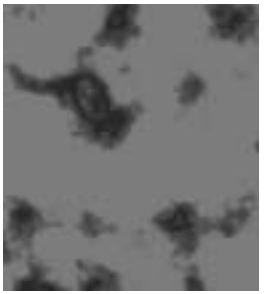
Lum Wave Amplitude affects the luminance of the background areas in relation to the luminance of the knots in the texture. This parameter varies the luminance values using a wave. Higher values produce more contrast in the texture.

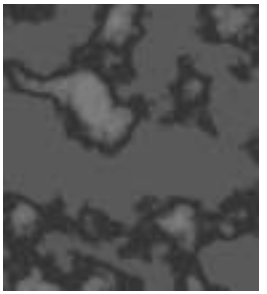

Amplitude=0


Amplitude=50


Amplitude=100

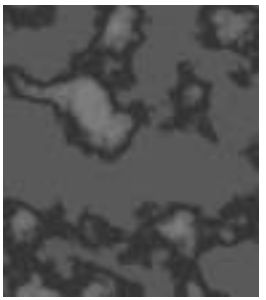
Lum Wave Offset changes the location of the luminance wave which varies luminosity. Changes to Luminance Wave Offset move the luminosity scale within the pattern. For example, bright areas become dark, and vice versa.

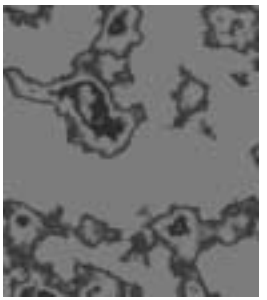

Offset=25

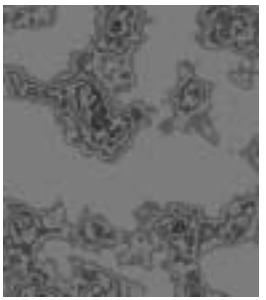

Offset=50


Offset=75

Lum Wave Frequency adjusts the frequency of the luminance wave which varies luminosity. Higher Luminance Wave Frequency values add more luminance levels to the texture. Lower values reduce the number of distinct luminance levels.


Frequency=1


Frequency=10


Frequency=20

Select the **Use Color 2 checkbox** to add a second color to the effect. If this option is not selected, the remaining Color 2 parameters are not available.

Color 2 sets the Color 2.

The **Color 2 Amplitude**, **Color 2 Offset**, and **Color 2 Frequency** parameters determine how the second color mixes with the background color in the texture. These parameters use a wave to vary the blending of Color 2 in the texture.

Color 2 Amplitude, Color 2 Offset, and Color 2 Frequency function similarly to the corresponding Luminance Wave parameters. For more information, see page 323.

Color 2 Alpha adjusts the opacity of Color 2. Lower values reduce the opacity.

Select the **Source Alpha checkbox** to use the source alpha channel as a mask for the filter, so the texture appears only in the opaque regions of the source. If this option is deselected, the source image's alpha channel is ignored.

Opacity adjusts the opacity of the simulated texture.

The **Apply Mode menu** controls how the texture is composited over the source image.For descriptions of all the possible Apply Modes, see "Apply Modes" on page 625.

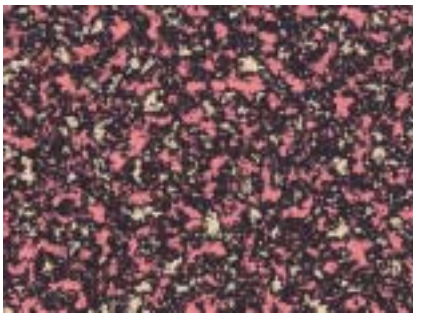
Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

3D Bump Mapping Parameter Group

3D Bump Mapping creates the appearance of three-dimensional detail on a surface. These parameters are identical to the corresponding Granite controls. See page 329 for details.

Working with the BCC Granite Generator

Granite simulates the appearance of granite or another type of mottled stone.

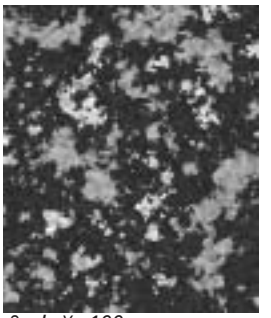


For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

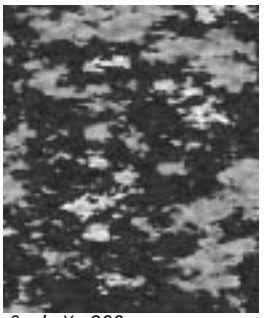
Offset XY controls the appearance of the granite pattern at a given point by moving through the procedural noise from which the effect is generated.

Scale X and **Scale Y** determine the scale of the pattern along the X and Y axis respectively. Select **Lock to Scale X** to keep these values in proportion, or deselect this option to adjust Scale X and Y independently.

Scale X=50



Scale X=100



Scale X=200

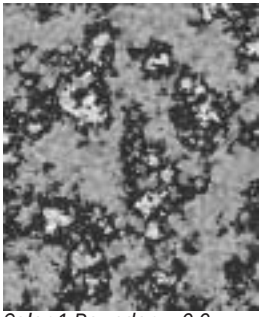
Rotation spins the granite pattern around the Z axis.

The **Color 1** and **Color 2** controls set the two colors that make up the marble pattern.

The **Background Color** controls set the background color in the marble pattern.

Color 1 Alpha, Color 2 Alpha and **Background Alpha** set the alpha value for the corresponding color.

The **Color 1 Boundary** and **Color 2 Boundary** settings adjust the relative sizes of the patches of the colors. Color 1 Boundary controls the area covered by Color 1 and 2. When Color 1 Boundary is at 0, the Color 1 display covers its maximum area. As Color 1 Boundary increases, Color 2 intrudes into Color 1, reducing the size of the Color 1 patches and increasing the size of the Color 2 patches. Color 2 Boundary controls the area covered by Color 2 and 3. As Color 2 Boundary increases, more of the Background Color patches intrude into the Color 2 patches. Adjust the Boundary settings to balance the pattern to get the look you want.


Color 1 Boundary=0.0

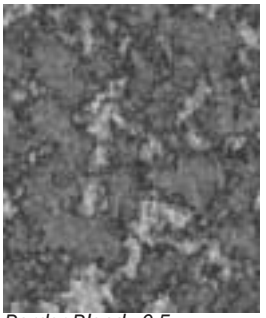

Color 1 Boundary=0.5


Color 1 Boundary=1.0

Border Blend softens the borders of the color patches. Higher values produce softer borders.

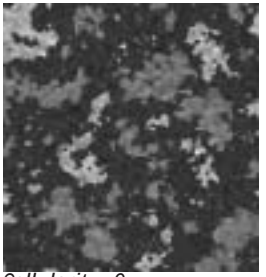

Border Blend=0.0

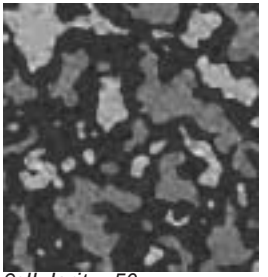

Border Blend=0.25

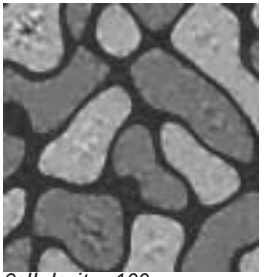

Border Blend=0.5

Mutation controls the appearance of the granite pattern at a given point by moving through the procedural noise from which the effect is generated along the Z axis.

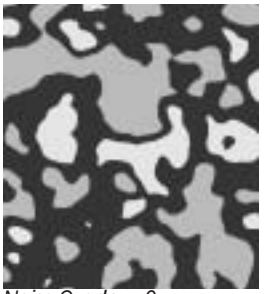
Cellularity reduces the complexity of the color patches in the texture, smoothing their edges and creating simpler shapes.

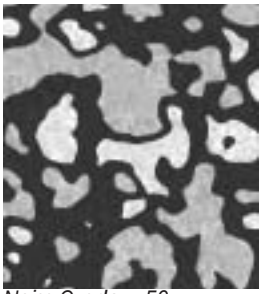

Cellularity=0

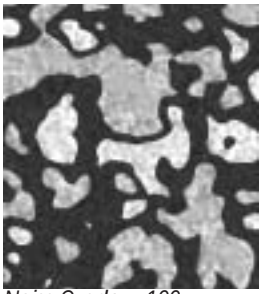

Cellularity=50


Cellularity=100

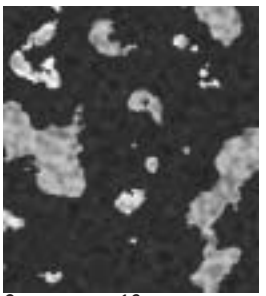
Noise Overlay adjusts the intensity of the mottled noise texture which is overlaid on the color pattern. Decreasing this value decreases the intensity of the noise.

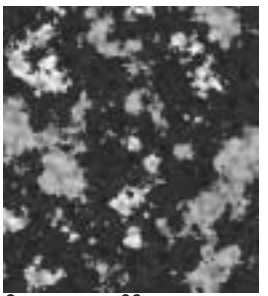

Noise Overlay=0

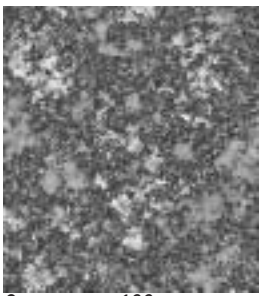

Noise Overlay=50


Noise Overlay=100

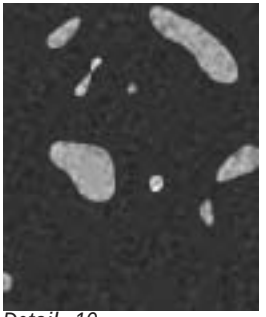
Coarseness controls the number of distinct color patches that appear in the granite pattern. Higher values create a greater number of smaller patches, while lower values create a fewer patches that are larger in size.

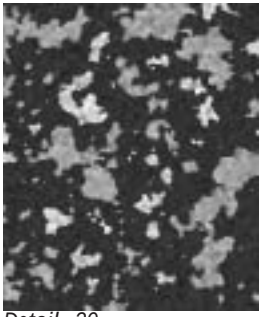

Coarseness=10

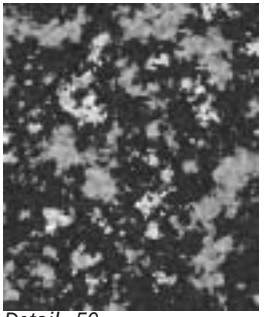

Coarseness=60


Coarseness=100

Detail determines how jagged the boundaries between the three colors in the pattern are. Low values produce smooth curvilinear boundaries. High values produce rougher, more intricate boundaries.


Detail=10


Detail=30


Detail=50

Select the **Source Alpha checkbox** to use the source alpha channel as a mask for the filter, so the texture appears only in the opaque regions of the source. If this option is deselected, the source image's alpha channel is ignored.

Opacity adjusts the opacity of the simulated texture.

The **Apply Mode menu** controls how the texture is composited over the source image.

For descriptions of all the Apply Modes, see "Apply Modes" on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

3D Bump Mapping Parameter Group

3D Bump Mapping is used to create the appearance of three-dimensional detail on a surface.

Select the **Use Bump Map checkbox** to turn on the Bump map. If this checkbox is not selected, the other parameters have no affect.

Light X and **Light Y** position the light source in space by moving the light parallel to the image plane along the X and Y axes.

Light Z positions the depth of the light source relative to the image plane. A value of 100 places the light one source width above the image plane. Light Z can be negative, which places the light behind the image plane. If Light Z is negative, the light is seen only if the object is rotated or displaced so that all or part of it is behind the light source (that is, the light source always points in toward the object, never out at the viewer).

Light Intensity controls the intensity of the light.

Light Color controls the color of the light.

White in Specular increases the amount of white in the specular light. Increasing this value can create a more metallic surface effect. This parameter is only useful when Specular Intensity has a value greater than 0.

Ambient Intensity adjusts the total amount of diffuse light on the image. The default setting of 100 does not add or subtract ambient light from the source image. Decreasing this setting makes the image darker before the other lights are applied. Ambient light illuminates or darkens the image evenly, and is unaffected by any other lighting parameters.

Diffuse Intensity determines the amount of non-directional diffuse light applied to the object. Increasing Diffuse Intensity brightens the object uniformly.

Specular Intensity simulates lighting a glossy surface from a point source, creating a small spot of intense light whose falloff can vary. Increasing this value adds reflected light to the surface.

Shininess controls the rate at which the Specular light falls off from the center of the lit region. A higher Shininess value creates a more concentrated highlight, simulating a shiny, highly reflective surface. A lower Shininess value spreads light more evenly throughout the lit region, simulating a rougher, less reflective surface.

Bump Height determines the height of the bump map used to create the texture of the bricks.

Resolution X and **Y** determine the size of bump map. Increasing Resolution adds finer detail. However, increasing Resolution also increases rendering times.

Bump Smoothness adjusts the amount of blur applied to the bump map. Higher values produce more blur, which tends to reduce the amount of detail and noise in the filtered image.

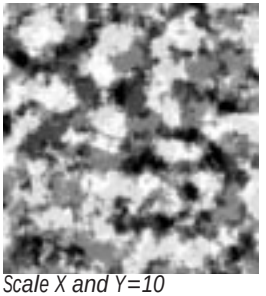
Working with the BCC Mixed Colors Generator

Mixed Colors produces a color noise map.

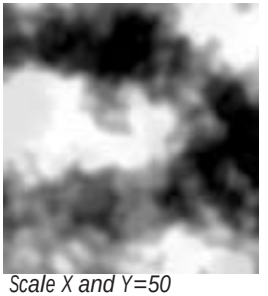
For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Offset XY controls the appearance of the pattern at a given point by moving through the procedural noise from which the effect is generated along the X and Y axis, respectively.

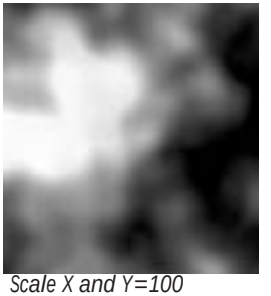
Scale X and **Scale Y** determine the scale of the pattern along the X and Y axis. Select **Lock to Scale X checkbox** to keep these values in proportion, or deselect this option to adjust Scale X and Y independently.



Scale X and Y=10



Scale X and Y=50



Scale X and Y=100

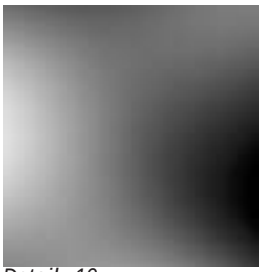
Rotation spins the pattern around the Z axis.

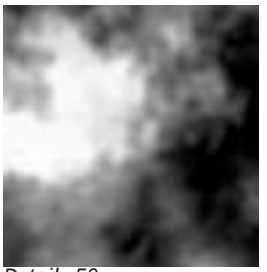
Brightness adjusts the brightness of the pattern. Increasing the Brightness setting pushes colors toward white, and decreasing the setting pushes colors toward black.

Contrast adjusts the contrast of the image. Increasing the Contrast setting pushes colors toward pure colors, and decreasing the setting pushes colors toward 50% gray.

Red Balance, **Green Balance**, and **Blue Balance** adjust the relative intensity of each respective color channel in the texture.

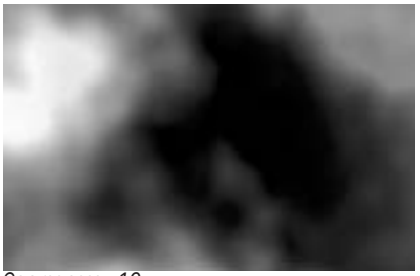
Detail determines how jagged the boundaries between the colors in the pattern are. Low values produce smooth curvilinear boundaries. High values produce rougher, more intricate boundaries.

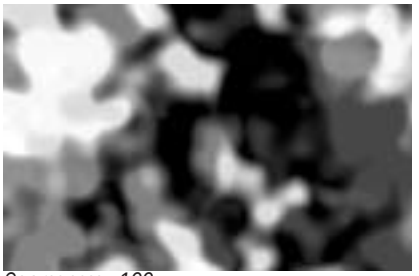

Detail=10


Detail=50


Detail=100

Coarseness controls the number of distinct color patches that appear in the random color pattern. Higher values create a greater number of smaller patches, while lower values create fewer patches that are larger in size.


Coarseness=10


Coarseness=100

Mutation controls the pattern of the colors at a given point by moving through the procedural noise from which the effect is generated along the Z axis.

Select the **Source Alpha checkbox** to use the source alpha channel as a mask; the texture appears only in opaque regions. When deselected, the source's alpha channel is ignored.

Opacity adjusts the opacity of the simulated texture.

The **Apply Mode menu** controls how the texture is composited over the source image. For descriptions of all the possible Apply Modes, see "Apply Modes" on page 625. **Apply Mix** controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

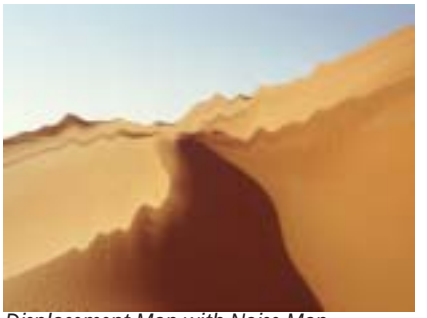
Working with the BCC Noise Map Generator

Noise Map is a procedural noise generator that produces a continuously flowing gradient which can be used to provide organic input to other filters. Because the noise is continuous, there is never a seam.

Noise Map

You can use Noise Map as a map in any filter that allows you to use luma information in a map layer. For example, you can apply the Noise Map filter to the clip to use as a map layer in any of the Displacement filters to create continuously flowing displacement effects (such as heat or water effects).The example below shows a heat effect created by applying Noise Map to the map layer used by the Displacement Map filter.

Source image



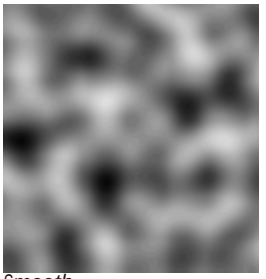
Displacement Map with Noise Map

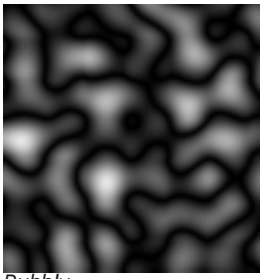
For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

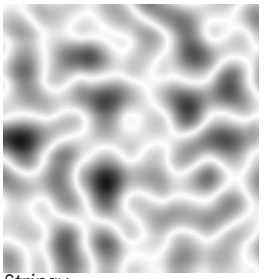
Flow Direction sets the direction of motion of the noise pattern.

Flow Speed controls the speed of motion of the noise pattern as it auto-animates.

The **Noise Type menu** sets the general appearance of the noise pattern. The three different Noise Types, ***Smooth***, ***Bubbly*** and ***Stringy***, include some inherent shape and size differences. You can compensate for these differences by adjusting the Scale, Morph Rate, and Turbulence settings slightly when changing Noise Types.


Smooth


Bubbly


Stringy

Scale X and **Scale Y** determine the horizontal and vertical scale of the noise pattern. Choose **Lock to Scale X checkbox** to lock the Scale Y value to the Scale X value, or deselect this option to adjust each parameter independently.

Morph Rate determines the rate at which the noise pattern surges and rotates inward as the filter auto-animates.

Turbulence Level controls the texture of the noise map. Increasing Turbulence Level creates a rougher noise pattern and increases rendering and preview time proportionately.

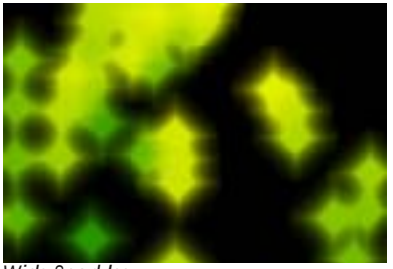
Working with the BCC Particle System Generator

BCC Particle System is an auto-animated particle generator that provides in-depth control over individual particles as well as the overall shape and movement of the system. This filter offers extensive options for adjustment, enabling you to create a wide variety of useful effects. You can control the size, shape, color, velocity, and movement properties of the particles; adjust the size and shape of the particle production area; set points which attract or repulse the particles as they move; control the camera perspective; adjust how particles interact with the edges of the effect; and customize the animation.

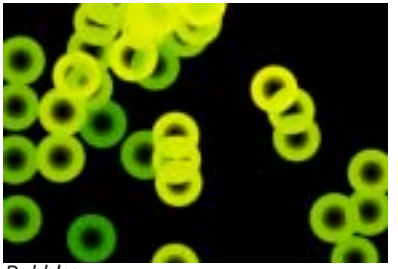
Particle System is especially memory-intensive. It is particularly useful to select the **Draft Mode checkbox** in the General Controls parameter group when creating a Particle System effect.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

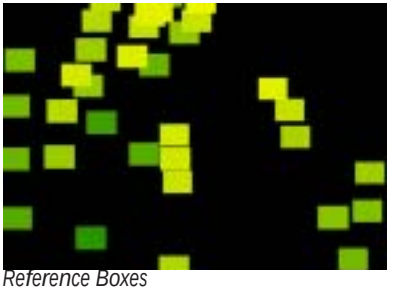
The **Particle Shape menu** sets the shape of the generated particles. The choices are ***Reference Boxes, Streaks, Pixel Streaks***, ***Lines***, ***Blurs*** (blurred solid circles), ***Bubbles*** (open circles), ***Shaded Spheres***, ***Wide Sparkles***, ***Long Sparkles***, ***Round Noise***, and ***Reference Pointers***.



Wide Sparkles



Bubbles



Reference Boxes

Round Noise

Shape Character adjusts the appearance of the particles. The affect of this setting depends on which Particle Shape is chosen.

- With Reference Boxes, Wide Sparkles, and Pointers, increasing positive Shape Character values stretch the particles horizontally, while decreasing negative values stretch the particles vertically.
- With Pixel Streaks, Pixel Trails, and Antialiased lines, increasing positive Shape Character values lengthen the particles, while decreasing negative values shorten them.
- With Blurs, increasing positive Shape Character values soften the edges of the particles, while decreasing negative values create harder edges.
- With Bubbles, increasing positive Shape Character values enlarge the size of the transparent area in the center of the particles, while decreasing negative values shrink this area.
- With Shaded Spheres, increasing positive Shape Character values increase the opacity of the shaded edges of the particles, while decreasing negative values decrease the opacity.
- With Long Sparkles, increasing positive Shape Character values lengthen the four points of the sparkles, while decreasing negative values shorten the points.
- With Round Noise, increasing positive Shape Character values increase the resolution of the noise, while decreasing negative values decrease the resolution.

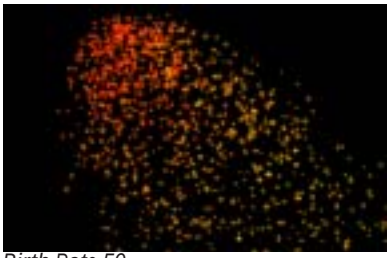
The **Composite with Layer menu** allows you to composite the particle system over a layer in the timeline, or to retain an alpha background by selecting the ***None*** option.

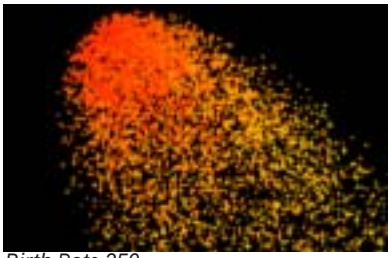
The **Show Reference menu** determines which onscreen position controls are visible. Choose ***Floor: Draft Only***, ***Floor and Attractors: Draft Only***, ***Attractors: Draft Only***, ***Floor: Render***, ***Floor and Attractors: Render, Attractors: Render*** or ***None***. When you use the ***Draft Only*** options, the curves are not visible in the rendered effect. However, you must preview in Draft mode in Avid for these options to display. When you use the ***Render*** options, the curves will appear in the rendered effect.

Set the Show Reference menu to None before rendering or the onscreen position controls will render with the effect.

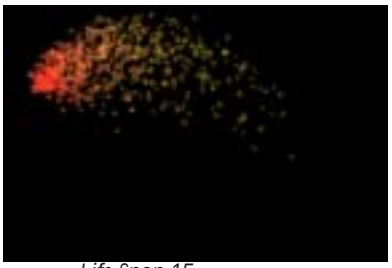
The Floor and Attractors are described in “Interaction Parameter Group” on page 346 and “Attractors Parameter Group” on page 345, respectively.

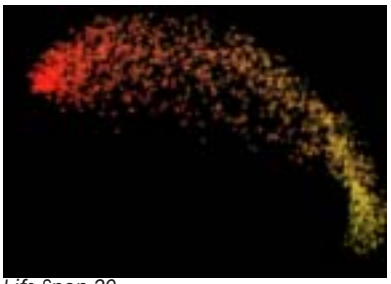
Birth Rate controls the number of particles produced over a constant time.

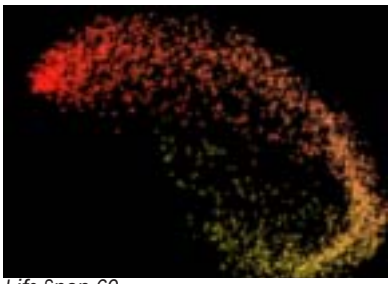

Birth Rate 50


Birth Rate 250

The **Life Span** parameter determines how long each particle lasts before it decays. You can use longer life spans to create trailing effects, as in the examples below.


Life Span 15


Life Span 30

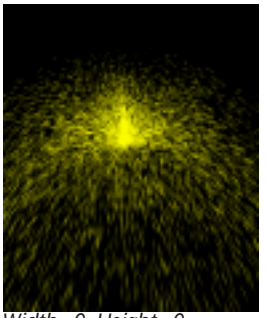

Life Span 60

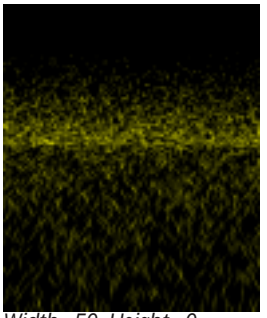
The **Production Boundary menu** allows you to set a boundary for the particle production area using the alpha channel from a layer in your timeline. Particles only generate within the region that corresponds to the opaque portion of the Production Boundary layer's alpha channel. If the chosen layer has no alpha, this setting has no affect.

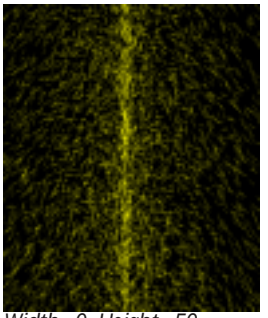
Center X and **Y** sets the coordinates of the particle source point.

Center Z controls the apparent depth of the particle system. Higher values move the system closer to the viewer, while lower values move the system farther away.

Width and **Height** stretch the particle source along the horizontal and vertical axis, respectively. Increasing one of these parameters stretches the source in one dimension and creates a particle source that is a straight line. Increasing both stretches the source in two dimensions and creates a particle source that is a plane. When the particle source is a plane, the particles appear to generate randomly within the space, rather than flowing from a specific point or line.


Width=0, Height=0


Width=50, Height=0


Width=0, Height=50

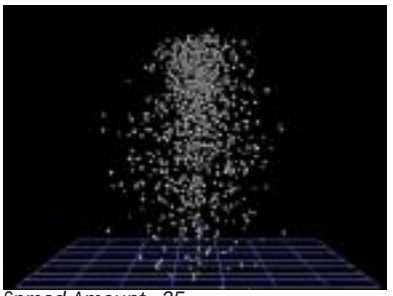
Depth controls the movement of the particles in Z-space. Decreasing Depth from the default value of 0 makes the particles appear to approach the viewer as they flow from the source. As a result, particles appear to grow in size as they approach the viewer. Increasing Depth makes the particles appear to move away from the viewer as they flow from the source. In this case, particles appear to shrink as they move away from the source.

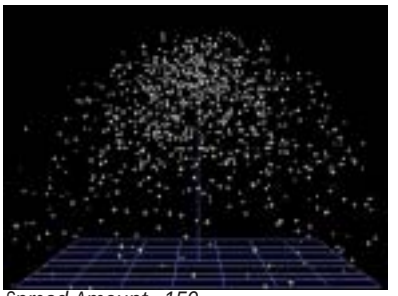
Position Randomness varies the positions of the particles. Higher values create a wider range of possible particle positions, while lower values create a narrower range of possible positions. Set Position Randomness to 0 creates a grid of particles.

Initial Velocity controls the velocity of the particles as they leave the source. A high Initial Velocity gives particles more momentum as they leave the source, meaning that they travel farther in the initial direction before they decay or are affected by factors such as gravity or attractors. At the default values, the particles leave a point and move upward until gravity pulls them down. Increasing Velocity allows the particles to achieve more height before falling. Decreasing Velocity gives the particles less momentum, so they fall more quickly.

Tumble, **Spin** and **Rotate** move the particle flow around the X-, Y- and Z-axis, respectively. These parameters only affect the direction of particles as they leave the source, but do not affect the particle system as a whole. Try adjusting these parameters while the Floor is displayed, then compare these parameters with Camera Tumble, Camera Spin, and Camera Rotate (see page 343) which move the entire system as they are adjusted.

Spread Amount affects the overall tightness of the particle pattern as the particles leave the source. Decreasing this value brings the particles closer to the source as they descend, while increasing it spreads the particles and causes them to flow farther from the source.


Spread Amount=35


Spread Amount=150

The **Spread Mode menu** controls for the overall shape of the particle system.

- The default choice, ***3D***, generates particles which flow out through a cone-shaped region in all directions.
- ***Fountain*** is similar to 3D, but adds more particles flowing straight upward in the manner of water droplets flowing from a fountain.
- ***Flat Fan*** sprays particles in a two-dimensional fan on two opposite sides of the source.
- ***Sine Cannon*** shoots particles from a generator swinging in a circle around the source.
- ***Circular*** sprays particles out from the edges of a circle.
- ***Spiral*** creates particles that spiral around a central source, much like hurricane winds spiralling around the eye of the storm.

Spread Character can be used to finetune the shape of the particle system created by the selected Spread Mode. The effect of this parameter depends on the selected Spread Mode.

- In the 3D and Fountain Spread Modes, Spread Character alters the shape of the cone through which the particles flow.
- In Flat Fan mode, Spread Character decreases the randomness of the particles and making them spray out from the source point in a more ordered manner.
- In Circular mode, Spread Character causes more particles to spread toward the center of the circle rather than only spraying out from the edges.
- In Sine Cannon mode, Spread Character affects the speed of the swinging generator.
- In Spiral mode, Spread Character makes the spiral pattern tighter or wider.

Movement Parameter Group

Gravity applies a secondary force to the particles' movement as they flow outward from the source. Gravity can either counteract or strengthen the particles' initial velocity. By default the **Gravity Angle** is set to 180° (straight down) in order to simulate the effect of gravity in nature, but the strength and direction of the Gravity can be adjusted to produce other effects (such as wind) as well.

Increasing the **Air Resistance** value adds resistance to the particles, and causes them to decelerate as they disperse.

Velocity Variance varies the speeds of individual particles. Increasing this value creates a wider range of possible particle velocities. Leaving this parameter at the default setting of 0 ensures that all particles will travel at exactly the same speed.

Amplitude controls the shape of the particle's paths as they leave the source point. At the default value of 0, the particles follow a straight line. Positive values cause the particles to follow a sinosoidal (sine wave) path. Negative values cause the particles to follow a negative sinosoidal path, meaning that the wave dips before it peaks. The amplitude, or height, of the wave increases as the Amplitude value moves away from zero. More extreme Amplitude values produce increasingly erratic particle paths which make the system appear more chaotic.

Amplitude Variance adjusts the range of possible Amplitude settings among individual particles in the system. A high Amplitude Variance value produces a wider range of wave heights among the individual particle paths, creating greater a disparity between the highest and lowest waves. An Amplitude Variance of 0 ensures that all particle paths have the same Amplitude setting.

Frequency adjusts the frequency of the sine wave, and therefore the number of waves that the particles create over the course of their life span. A Frequency value of 0 produces no wave motion, so particles travel in a straight line until affected by gravity or other factors. More extreme Frequency values produce very wavy particle paths which make the system appear more chaotic.

Frequency Variance adjusts the range of possible Frequency settings among individual particles in the system. A high Frequency Variance produces a larger range of wave frequencies among the particle paths, creating a greater disparity between the fastest and slowest waves. A Frequency Variance of 0 ensures that all particle paths have the same Frequency setting.

Appearance Parameter Group

The **Compositing menu** determines how the particles are composited on each other when they overlap. These choices all correspond to apply mode settings. For descriptions of all the possible Apply Modes, see "Apply Modes" on page 625.

The following controls determine the color and opacity of the generated particles, divided into three groups. The **Start** settings affect the particles as they are produced at the source, the **End** settings affect the particles as they reach their final destination or decay point, and the **Midpoint** settings allow you to affect particles differently between the Start and End points. If all the options are used, the effect creates a gradient between Start, Midpoint, and End settings.

Each of the three groups contains the following parameters.

The **Color Use menus** offer several means by which the particles' color is derived.

- ***Source Point*** causes each particle to use the color of the source layer at the point where the particle originates. If the effect's source coordinates correspond to a red region in the source layer, the particle is red.
- ***Source Update*** causes each particle to use the color of each point on the source image that the particle passes through. If the particle passes from a blue region in the source to a red region, the particle's color will change from blue to red.
- ***Source within System*** is similar to Source Point, except that Source within System picks colors from the source based on the particles' positions relative to the particle system instead of relative to the source layer.
- ***Random Source*** causes the particles use the color of a randomly chosen point in the source image.
- ***Random Source 2*** uses another randomly chosen color from the source image as the particle color.
- ***Custom Color*** sets the particle color to the color you have chosen with the Custom Color control.
- ***Source as Gradient: Left to Right*** creates a gradient from the Color Source Layer menu image that blends from left to right.
- ***Source as Gradient: Top to Bottom*** creates a gradient from the Color Source Layer menu image that blends from top to bottom.

Custom Color selects colors for the Start, Midpoint, and End ranges of the effect. You must set the Color menu (described above) to ***Custom Color*** to use this parameter.

The **Color Source Layer menus** chooses any layer in your timeline to use as a source for particle colors. At the default setting, ***None***, the source image is used.

Opacity sets the opacity level of the particles. A value of 100 makes all particles in the range completely opaque, and a value of 0 makes all particles completely transparent (invisible). You can set different Opacity values in the Start and End ranges to create effects in which particles stream outward from the source and disappear.

Size adjusts the size of the particles. Note that the Size parameter has no affect on Particle Shapes that are line shapes (Pixel Streaks, Pixel Trails, and Antialiased Lines), but does affect the size of all two-dimensional Particle Shapes (Blurs, Bubbles, Shaded Spheres, 2D Boxes, and Sparkles).

In addition to the Opacity and Size parameters, a **Use Midpoint checkbox** lets you use Midpoint color and brightness settings that are different from Start and End settings.

For example, suppose you have a stream of particles whose colors change from red at the source, to yellow, to blue at the end. You have also set Opacity to 75% at the start, and 25% opaque at the end. With the Use Midpoint checkbox on, you have to adjust the Midpoint Opacity to 50% to create a smooth Opacity gradient. With this checkbox turned off, the effect interpolates between the Start and End Opacity settings to create a smooth gradient.

Midpoint Location moves the Midpoint along the gradient between the Start and End values. A value of 0 places the Midpoint close to the generation point, and particles reach the Midpoint Color, Size, and Opacity values soon after birth. A value of 100 places the Midpoint nearer the End point, and particles reach the Midpoint Color, Size, and Opacity values toward the end of their life span.

Midpoint Variance increases the range of Midpoint Location values among the particles. With a Midpoint Variance setting of 0, all particles reach the Midpoint settings at the same location. As you increase the Midpoint Variance value, the Midpoint Location varies more from particle to particle. Therefore, at higher values, some particles reach the Midpoint settings early on, while others reach the Midpoint settings near the end of their life span.

When the **Sparkle Fade checkbox** is selected, the particles' opacities vary as the effect progresses, creating a sparkling particle effect. Leave this option deselected to maintain the opacity of the particles throughout the effect. If Sparkle Fade is selected, **Sparkle Fade Speed** determines the rate at which the particles' opacities change. When Sparkle Fade is deselected, Sparkle Fade Speed has no affect.

If the Sparkle Fade checkbox is selected, **Sparkle Fade Speed** determines the rate at which the particles' opacities change. When the Sparkle Fade checkbox is deselected, Sparkle Fade Speed has no affect.

System Opacity affects the opacity levels of the entire particle system, after individual Start, Midpoint and End opacity values are taken into account. This slider provides a means of adjusting and animating the opacity of the effect as a whole without changing individual parameters for each range.

System Size Variance sets the range of particle sizes for the entire particle system, after individual Start, Midpoint, and End size values are taken into account. A value of 0 ensures that all particles conform to the chosen Size values for their ranges. Increasing Size Variance creates more disparity between the smallest and largest particles in each range.

System Brightness Variance sets the range of possible brightness values among the particles. Increasing this value creates a system in which some particles are bright and others are dim, and increases the disparity between the brightest and dimmest particles. Leaving this parameter at the default of 0 ensures that all particles have the same brightness value.

Custom Shape Parameter Group

These parameters allow you to use another layer to create a custom particle shape. To use a custom shape, place the clip that you want to use on a track below the filtered layer. Then choose this layer from the **Custom Shape menu**.

The **Shape Mode menu** controls the orientation of the particles as they fall and the color of the particles. The choices fall into two groups, the Source modes and the Color modes. The ***Source*** modes use the colors in the Custom Shape layer for the particles colors. The ***Color*** modes use the settings specified by the Appearance parameters to color the particles. Each group has three options, Upright, Weighted, and Tilting.

- ***Upright*** applies the orientation of the Custom Shape layer to the particles.

- ***Weighted*** makes the custom shape "bottom-heavy" so that it falls bottom-first as it follows its path. This has an effect somewhere between Upright and Tilting.
- ***Tilting*** randomly rotates the shape slowly as it falls.

The **Shape Animation menu** determines how the layer information is used to create the custom particle shape when the Custom Shape layer changes or animates over time.

- ***Current Time*** uses the particle shape at the custom shape layer's current time regardless of the particle's birth time or life span. Therefore, the particles' animation is synchronized with the animation of the custom shape layer.
- ***Starting at Particle Birth*** causes each particle to begin its life using the first frame of the custom shape layer and then animate. The particles all animate in the same way, but the movement is staggered since some particles start later than others. This option takes more rendering time than the others.
- ***First 15 Random Frames*** creates particle shapes that are chosen randomly from the first 15 frames of the Custom Shape layer and remain constant throughout the particle's lifespan.

Camera Parameter Group

The **Camera View checkbox** turns on and off the virtual camera. It can be helpful to turn the camera off when adjusting the positioning controls.

Camera Zoom moves the entire particle system toward or away from the viewer. At a value of 0, the system is infinitely far away and becomes invisible. Increasing this value moves the system closer to the viewer. Unlike the Depth parameter (in the Movement section), Camera Zoom moves the whole system in Z space and does not affect the depth of particles as they flow from the source.

Field of View adjusts the angular width of the camera's lens. Higher values exaggerate the perspective, distorting the effect. Lower values reduce the perspective, creating a flatter effect.

Camera Tumble, **Camera Spin**, and **Camera Rotate** move the camera around the particle system (including the Floor) on the X, Y, and Z axis respectively. Adjusting these parameters creates the appearance of the entire system rotating in 3D space.

Increasing **Angle Subtlety** causes camera adjustments to have a less pronounced effect, allowing you to finetune camera movements.

The **Pivot Point menu** sets the point around which the camera tumbles, spins, or rotates.

- ***World Center*** uses the center of the entire system as the camera's pivot point.
- ***Camera*** uses the camera's own center as the camera's pivot point.

The **Floor Follows menu** sets how the floor moves in relation to the camera and the particles' point of origin.

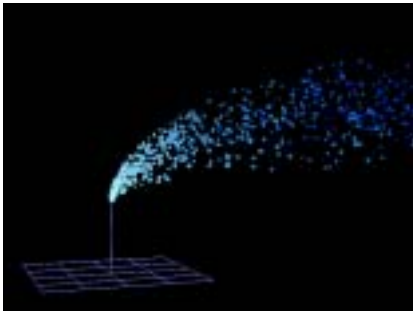
- ***Pivot Point*** positions the floor relative to the camera, enabling you to see the effect of pivoting the camera in space.
- ***Horizontally with Producer*** keeps the floor attached to the point of origin, but allows you to change the distance between the two by moving the point of origin up or down.
- ***Producer Point*** keeps the floor attached to the particles' point of origin.

The **Point Positioning checkbox** determines whether the point controls (including the source point and any attractor points) are affected by the movement of the camera. Selecting this option allows you to alter the perspective view of the particle system while retaining the locations of all position points. Deselecting this option causes the entire system, including the attractor and source position points, to move with the camera.

This example shows a particle system with no camera movement applied. Particles are drawn toward an attractor point in the upper right-hand corner.

In this example, the camera is spun with Point Positioning Ignore Camera deselected; therefore, the generation and attractor points spin along with the camera. Notice that the apparent position of the attractor point has changed and particles are drawn toward the upper left-hand corner.

Here, the camera is spun with Point Positioning Ignore Camera selected. In this case, the attractor acts on the particle system after the camera has moved. Thus, the apparent position of the attractor remains constant while the camera view spins.



Translate X, **Translate Y**, and **Translate Z** set the location of the virtual camera on the X, Y, and Z axis, respectively. Use these controls to make minor adjustments to the apparent position of the particle system. Translate X, Y, and Z can also move the viewer through the effect in 3D space.

The **Translation checkbox** determines whether the Translate X, Y, and Z adjustments are applied to the camera before or after Camera Tumble, Spin, and Rotate. When Translation is selected, Translate X, Y, and Z position the camera along the X, Y, and Z axis of the effect. When deselected, the Translate controls position the camera on its own X, Y, and Z axis. For example, suppose Camera Rotate is 90. If Translation is selected, increasing Translate X moves the camera toward the right of the screen. If this option is deselected, increasing Translate X moves the camera toward the top of the screen.

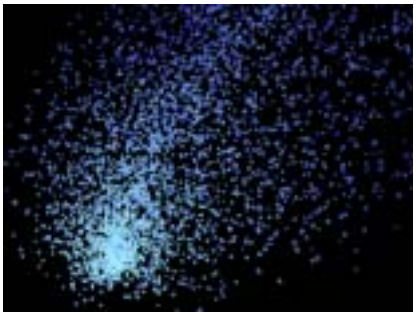
Attractors Parameter Group

These parameters allow you to add up to two points of attraction or repulsion to the particle system and to control the strength of these points.

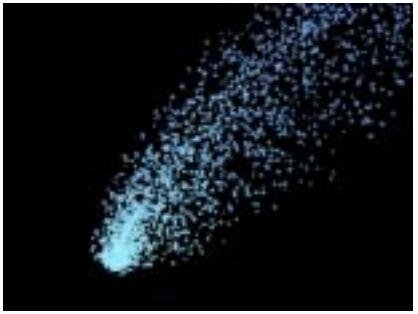
Each attractor has a **Power** control which sets the strength of the attractor on the particles. Positive values pull particles toward the attractor, while negative values push particles away, making the point a repulsor. The strength of the attraction or repulsion increases as Power value moves away from 0.

This example shows a particle effect in which the source point is placed near the bottom left corner, and an attractor point is place in the top right corner.

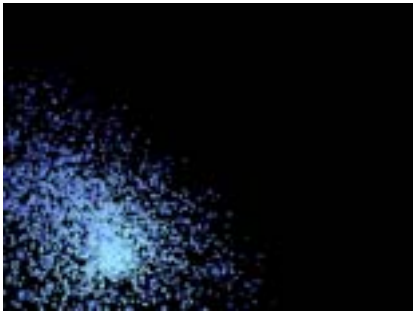
Gravity is 0 and Power is 25.



Here Power is increased to 100, so the attractor point exerts a stronger pull on the particles.



In this example, Power value is set to –15, making the attractor point a weak repulsor which pushes particles away.



The attractor affects particles in a circular- or ring-shaped region centered around the attractor point. **Radius** sets the radius of the outer edge of the region. **Falloff Radius** sets the radius of the inner edge. By setting Falloff Radius to a value lower than the Radius value you can create a ring shaped affected region around the attractor point.

Gradient controls the relative strength of the attractor throughout the affected region (whose size is determined by the Radius and Falloff Radius). When Gradient is 0, all points in the affected region are affected equally by the attractor. Increasing positive values concentrate the strength of attractor toward the center of the region. Decreasing negative values concentrate the strength of the attractor towards the outer edges of the region.

Attractor X, Attractor Y and **Attractor Z** set the location of the attractor point on the X, Y, and Z axis, respectively.

Selecting the **Attractor 2D Mode checkbox** ignores the depth and Z positioning of the attractors. When this option is selected, the attractors affect particles in only two dimensions.

Interaction Parameter Group

The **Floor Properties menu** determines how the particles interact with the floor as they hit it. Choose ***Ignore*** if you are using the floor purely as a visual reference, and do not want its presence to affect the particles' behavior at all. The remaining settings create effects in which the particles interact with the floor.

- ***Stick*** causes particles to stick to the floor and accumulate.
- ***Slide*** causes particles to slide outward across the floor as they hit.
- ***Bounce*** causes particles to bounce off the floor as they hit.

Floor Height adjusts the distance between the floor and the particles' generation point.

If the Floor Properties menu is set to Bounce, you can adjust the height of the bouncing particles with the **Bounce Friction** control. Reducing Bounce Friction allows particles to bounce higher. Increasing Bounce Friction slows the particles, so they bounce lower.

Bounce Friction also affects particles bouncing off the Interaction Layer (see below).

The **Render menu** chooses which particles in the system are displayed and rendered. You may opt to render the ***Complete System*** (all particles), ***Above Floor*** (only particles above the floor), or ***Below Floor*** (only particles that fall below the floor).

The **Interaction Layer menu** allows you to choose a layer in the timeline or the particles to interact with.

The **Layer Mode menu** controls how the particles interact with the chosen Interaction layer.

- ***Stick*** causes the particles to stick to areas corresponding to portions of the Interaction Layer with high values in the chosen Layer Use Channel.
- ***Fall*** causes the particles to briefly stick to areas corresponding to portions of the Interaction Layer with high values in the chosen Layer Use Channel, then slide off.
- ***Slide*** causes the particles to slide off of areas corresponding to portions of the Interaction Layer with high values in the chosen Layer Use Channel.
- ***Bounce*** causes the particles bounce off of areas corresponding to portions of the Interaction Layer with high values in the chosen Layer Use Channel. When this option is selected, Bounce Friction adjusts the height of the bouncing particles.

The **Layer Use Channel menu** sets the channel in the Interaction Layer used to interact with the particles according to the Layer Mode setting.

The **Layer Edges menu** sets how the edges of the Interaction Layer interact with the particles.

- ***None*** treats the edges of the interaction layer like transparent areas.
- ***Solid*** treats the edges of the interaction layer like opaque areas.

Floor Size adjusts the size of the floor.

Floor Grid Resolution sets the number of grid squares in the floor. A value of 5 creates a grid with 5x5 squares, or 25 squares. A value of 10 creates a grid with 10x10 squares, or 100 squares, and so on.

Floor Color sets the color of the floor.

Animation Parameter Group

The **Start on Frame** parameter has two functions, depending on whether the **Manual Animation checkbox** is selected or deselected.

- With the Manual Animation checkbox deselected, Start on Frame starts the beginning of the auto-animated effect a number of frames past the start of the clip to which it is applied. Setting Start on Frame to 20 starts the animation twenty frames past the beginning of the clip.
- With Manual Animation selected, Start on Frame allows you to manually animate the effect. In this case, a value of 0 represents zero frames into the effect, 15 represents 15 frames into the effect, and so on. Selecting the Manual Animation option locks the effect to the selected Start on Frame value. You can then animate the Start on Frame value to pause, slow down, or speed the effect, or to animate forward and backward in time.

The **Keyframe Animation menu** sets how keyframes are affected by changes to the timing of the effect.

- ***Follow Start Frame*** causes keyframes to apply to the effect based on their actual location in the timeline. When Current Time is chosen, the Start on Frame and Use Manual Animation settings do not affect the action of the keyframes.
- When ***Absolute Time*** is chosen, keyframes apply to the effect based on the timing of the effect (as determined by the Start on Frame and Use Manual Animation settings).

If the **Use Particle History checkbox** is selected, changes made to parameters such as Air Resistance or Gravity affect all particles throughout their life spans, regardless of when the particles are created or disappear. If this option is deselected, the particles are affected only by the current settings at their time of birth. Thus if Use Particle History is deselected, changing the Gravity value only affects particles created after the value is changed.

Time Limit sets the duration of the particle production period.A value of 10 causes particle production to occur for ten frames and then stop, and so on. This can be useful to create explosions, such as fireworks, in which particles are produced for only a short time and then disperse for the remainder of the effect.

Time Scale allows you to adjust the timing of the effect by stretching or speeding time. Decreasing Time Scale below the default value of 100 stretches time. Thus, the effect appears to take place in slow motion, with particles taking more time to reach their destination or die. Time scale values greater than 100 speed time, moving the comet more quickly.

Selecting the **Reverse Time checkbox** reverses the animation of the effect, whether it animates automatically or manually. With Reverse Time selected, particles move toward the generation point and disappear rather than emitting from the source point and dispersing.

Increasing **Delay** from the default value of 0 causes particles within a certain distance of the production area to remain invisible. Delay can be used to create effects with no visible production center, since particles do appear until they have dispersed to some extent.

Increasing **Precision** increases the accuracy of particle movement, which is helpful when creating effects with strong attractor points. Higher values increase rendering times.

Random Seed determines which value is input to the random number generator used by the effect. Adjust this setting if you like the general appearance of the effect but want to change the random arrangement of the particles.

You can animate Random Seed instead of animating particle movement to produce a randomly shifting particle effect. However, animating Random Seed while the particles are moving may create jumps in the effect, and is not recommended.

The **Partial Render checkbox** allows you to define a region in Z space in which particles are rendered. **Farthest Z** determines the location of the far end of the region, while **Closest Z** determines the location of the near end of the region.

The **Optimize Algorithm checkbox** helps speed rendering times without affecting the apparent quality of the image. Deselect this option if there are jumps in the render.

The **Animate Production Boundary checkbox** improves quality if the Production Boundary is animated.

The **Animate Interaction Layer checkbox** improves quality if the Interaction Layer animates.

Animate Production Boundary and Animate Interaction Layer checkbox are memory-intensive features. For this reason, you may want to use lower Lifespan values when either option is selected.

Working with the BCC Rain Generator

Rain is an auto-animated filter which generates realistic rain effects. You can composite the rain over any clip in your timeline. The filter allows you to determine the density, speed, direction, and color of the drops, and to control the apparent depth of the effect.


Source image


Filtered image

For information on common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, and “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Rain Amount determines the density of the drops in the effect. Increasing Rain Amount creates more drops, and decreasing Rain Amount creates fewer drops.


Rain Amount=10


Rain Amount=250

Rain Angle sets the angle between the drops' direction of motion and the vertical axis.


Rain Angle= –25


Rain Angle=0


Rain Angle=25

Rain Speed determines the speed of the drops as they move across the screen. Increasing this value moves the drops faster, while decreasing this value moves the drops slower.

Rain Depth controls the apparent depth of the effect. Increasing this value creates the illusion of greater depth by varying the lengths of the drops. Decreasing this value creates drops that are increasingly uniform in length, simulating a narrow band of rain.

Blur adjusts the amount of blur applied to each drop. Increase this value to increase the amount of blur.

Select the **Composite on Alpha checkbox** to composite the rain over a transparent background. Deselect this option to use the filtered layer as the background for the effect.

Pan XY adjusts the perspective view of the effect. Move this point to change the position of the viewer's eye in relation to the effect.

The **Composite Layer menu** allows you to choose a layer in your timeline to use as the background of the effect. You can use the ***Filter Layer*** or one of the layers below the filtered layer by choosing ***1st Below*** or ***2nd Below.*** The default setting, ***None***, composites the rain over a transparent background, revealing the layer below the filtered layer in the timeline.

Composite Depth controls the apparent depth of the chosen composite layer. Increasing values move the composite layer closer to the viewer, while decreasing values move the layer farther from the viewer. This setting has no affect if Composite Layer is set to None.


Composite Depth= –200


Composite Depth=200

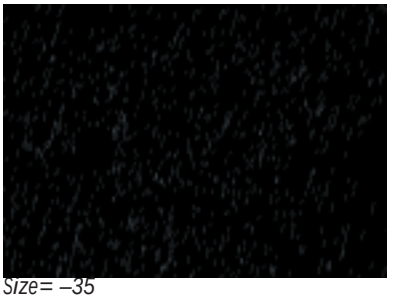
Random Seed determines which value is input to the random number generator used by the effect. Adjust this value when you like the overall effect but want to adjust the random configuration of the drops.

Raindrops Parameter Group

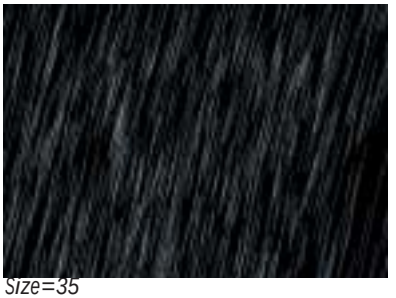
The **Color controls** set the color of the raindrops.

The **Color Source Layer menu** chooses a layer in your composition to use as a source for droplet colors. You can use the ***Filter Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

Size controls the size of the drops. Higher values create longer drops, while lower values create shorter drops.



Size= –35



Size=35

Opacity determines the opacity of the drops. Higher values create increasingly opaque drops, while lower values create increasingly transparent drops.

Brightness Variance varies the opacity of the raindrops. Increase this setting to create a wider range of droplet opacities.

The **Drop Shape menu** sets the shape for the raindrops. Choose ***Lines*** or ***Streaks***.

System Parameter Group

Particle Lifespan determines how long each droplet lasts before it disappears.

Particle Lifespan=20

Particle Lifespan=80

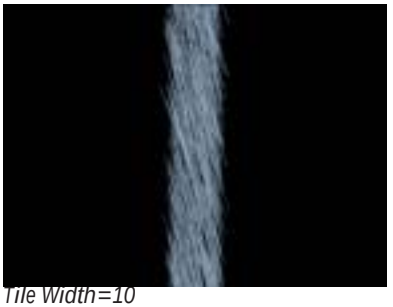
If the rain effect stops short of the bottom of the image in a frame, increase Particle Lifespan to extend the effect to the bottom of the screen.

Generation Width adjusts the width of the rain production region. Increasing this value spreads out the individual drops, reducing the density of the effect. Decreasing this value places the drops closer together, creating a denser effect.

Generation Width=10

Generation Width=500

The Rain filter creates an image by tiling a series of images. Changing the **Tile Width** value adjusts the width of each individual image, which can be useful if tiling becomes noticeable in the output. Increasing Tile Width creates wider tiles, while decreasing this value creates narrower tiles. At extreme Tile Width settings, the tiles may not fully overlap.



Tile Width=10

Tile Width=100

Speed Variance varies the speed of each drop. Increase this value to create a wider range of speeds.

Direction Variance varies the angle of motion of each droplet. Increase this setting to create a wider range of drop directions.

Direction Variance=0

Direction Variance=25

Interaction Parameter Group

The **Splash on Layer menu** chooses a layer in the timeline to use as an interaction track. When drops hit the edge of the interaction track, they bounce. You can use the ***Filter Layer***, or use one of the clips below the filtered layer by choosing ***1st Below*** or ***2nd Below.***

The **Layer Use Channel menu** chooses the channel of the reflection track that determines how the raindrops bounce. The choices are ***Title-Matte, Inv Title-Matte, Luma, Inv Luma, Red, Inv Red, Green, Inv Green, Blue*** and ***Inv Blue***. For example, if ***Title-Matte*** is chosen, the drops bounce off the boundaries of the title's alpha channel.

The **PixelChooser Interaction menu** uses the PixelChooser output as the interaction menu. You can use this to make the rain bounce off a simple circle (created by the PixelChooser). You can also adjust the PixelChooser's complex blending, choking or Apply mode options to work better with your Interaction Layer. The choices are:

- **None** does not apply an interaction layer.
- **Use PC Layer** uses the PixelChooser settings to create an interaction layer.
- **Use PC Layer Inverted** inverts the PixelChooser settings to create an interaction layer.
- **Use PC Layer and Pixel Choice** uses the PixelChooser settings to create an interaction layer and also uses the PixelChooser settings to create a matte.
- **Use PC Layer Inverted and Pixel Choice** inverts PixelChooser settings to create an interaction layer and also uses the PixelChooser settings to create a matte.

The **Layer Mode menu** determines how the filter uses intermediate values in the chosen channel in the Splash on Layer menu.

- ***Binary*** uses the chosen Layer Use Channel in the Splash on Layer but treats each pixel as if its chosen channel is either fully on or fully off. For example, suppose Layer Use Channel is Alpha. Pixels that are 50% to 100% opaque in the Splash on Layer are treated as 100% opaque, while pixels 0% to 49% opaque are treated as fully transparent.
- ***Gradient*** uses the channel in the Splash on Layer as it is, preserving the full range of channel values.

Splash Angle sets the angle at which the raindrops bounce off the reflection map.

Splash Height determines how high the raindrops bounce.

Fallthru Percent sets the probability that individual drops will pass through edges in the interaction layer. At the default value of 0, all drops bounce off the first edge in the layer that they strike. As Fallthru Percent increases, more drops fall beyond the first edge and bounce off edges below it.

Fallthru Maximum sets the maximum number of edges in the interaction layer a drop can fall past without bouncing. For example, if Fallthru Maximum is 1, drops can bounce off either the first or second edge. If Fallthru Maximum is 2, drops can bounce off the first, second, or third edges. If Fallthru Percent is 0, Fallthru Maximum has no affect.

If you select the **Splash on Ground checkbox**, the rain bounces when it reaches the chosen **Ground Height**. Increase Ground Height to move the ground down, or decrease this value to move the ground up. To see a grid representing the ground, select the **View Ground checkbox**.

Making Rain Splash on a Title

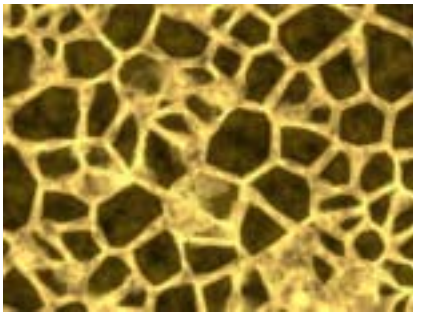
To make rain splash off a title, apply the Rain filter directly to the title. Select the **Apply to Title-Matte checkbox** in the Title / Matte parameter group. Choose ***Title-Matte*** in the **Layer Use Channel menu** in the Interaction parameter group. Set the **Splash On Layer menu** to ***Filter Layer.*** Now the rain splashes off the alpha channel from the title or matte.

The Rain filter includes an additional choices in the **Region Type menu** in the PixelChooser parameter group. ***Distance to Pan Point*** filters the image between two specified distances from the Pan X and Y point.

For information on the remaining PixelChooser controls, see “The PixelChooser” on page 603.

Working with the BCC Reptilian Generator

Reptilian produces a texture resembling a scaly or spotted animal skin.



For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Offset XY controls the pattern of the animal skin at a given point by moving through the procedural noise which generated the effect.

Scale X and **Scale Y** determine the scale of the pattern along the X and Y axis. Select **Lock to Scale X** to keep these values in proportion, or deselect this option to adjust Scale X and Y independently.

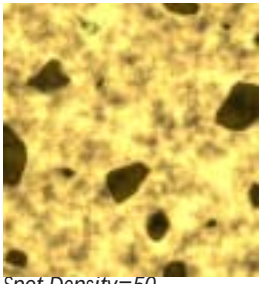
Rotation spins the animal skin pattern around the Z axis.

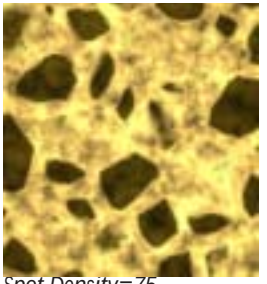
The **Base Color** controls set the color for the lines between the spots in the pattern.

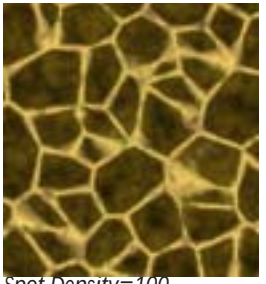
The **Spot Color** controls set the main color for the spots in the pattern.

The **Spot Boundary Color** controls set the color for the edges of the spots. This parameter has no affect if Spot Boundary is set to 0.

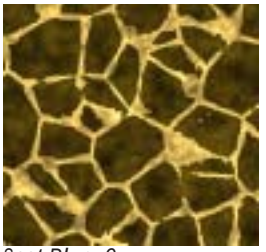
Spot Density adjusts the density of the spots in the pattern. Lower values produce patterns with fewer spots that are widely spaced. Higher values produce patterns with many spots placed close together.

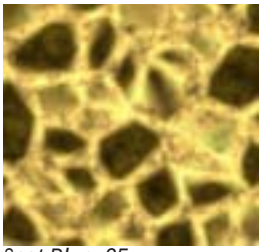

Spot Density=50

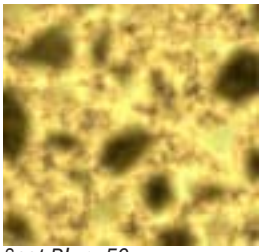

Spot Density=75


Spot Density=100

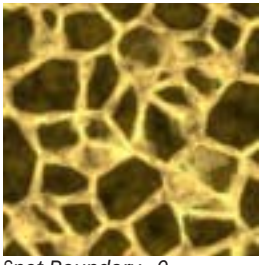
Spot Blur applies a blur to the spots in the pattern, softening the distinctions between the spots and the background in the pattern. Higher values produce more blur.

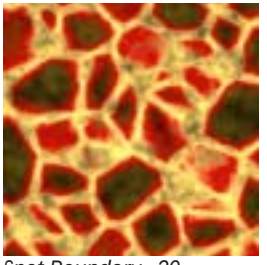

Spot Blur=0

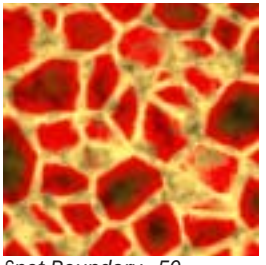

Spot Blur=25


Spot Blur=50

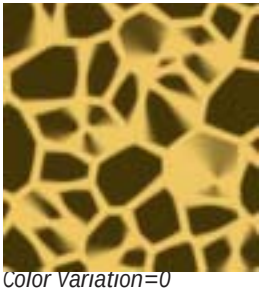
Spot Boundary adjusts the color of the spots. When Spot Boundary is 0, the color of the spots is determined by Spot Color, and the Spot Boundary Color is not used. As the Spot Boundary value increases, the color of the spots becomes a gradient between the Spot Color (the middle of each spot) and the Spot Boundary Color (the edges of each spot). When Spot Boundary is 100, the spots almost entirely fill with the Spot Boundary Color. In the following examples, the Spot Color is brown and the Spot Boundary Color is red.

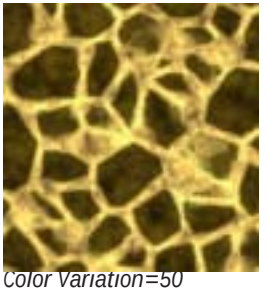

Spot Boundary=0

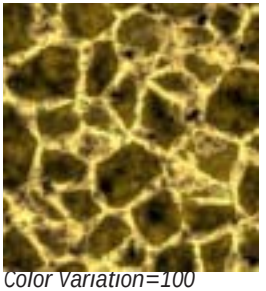

Spot Boundary=30


Spot Boundary=50

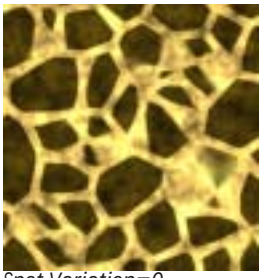
Color Variation varies the colors in the skin pattern. When Color Variation is 0, the Spot Color is used almost exclusively for the spots, and the background color for the background. As Color Variation increases, a wider range of colors produce a more mottled appearance.

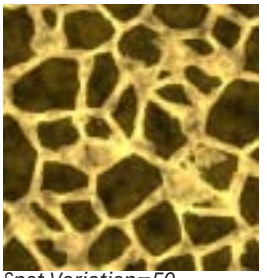

Color Variation=0

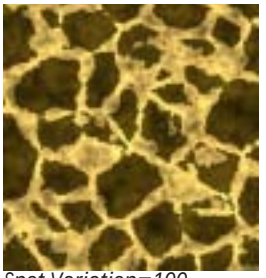

Color Variation=50


Color Variation=100

Spot Variation adjusts the shape of the edges of the spots. Lower values produce spots with smooth edges, while higher values produce spots with irregular, rippled edges.


Spot Variation=0


Spot Variation=50


Spot Variation=100

Select the **Source Alpha checkbox** to use the source alpha channel as a mask for the filter, the texture appears only in the opaque regions of the source. If this option is deselected, the source's alpha channel is ignored.

Opacity adjusts the opacity of the simulated texture.

The **Apply Mode menu** controls how the texture is composited over the source image. For descriptions of all the possible Apply Modes, see "Apply Modes" on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

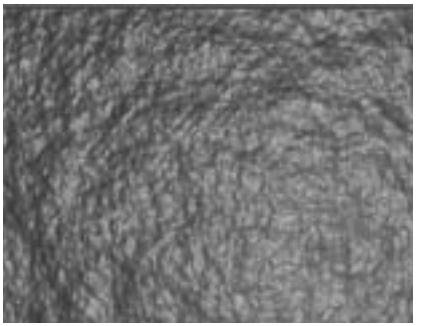
3D Bump Mapping Parameter Group

3D Bump Mapping is used to create the appearance of three-dimensional detail on a surface.

The 3D Bump Mapping parameters are identical to the corresponding Granite controls. See "3D Bump Mapping Parameter Group" on page 329 for details.

Working with the BCC Rock Generator

Rock is a realistic rock generator. The rock can act as a filter on a clip or layer or you can generate an opaque rock surface.



For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Rock Parameter Group

Bump Height determines the height of the bump map used to create the texture of the rock.

Bump Detail adds detail to the bump map, similar to adding a gravelly component onto the surface. Decreasing this value creates a smoother surface. Increasing this parameter creates a coarser rock surface.

Resolution determines the size of bump map. Increasing Resolution adds finer detail. However, increasing Resolution also increases rendering times.

The **Offset XY** position controls the pattern of the rock at a given point by moving through the procedural noise which generated the effect.

Rotation spins the rock bump map around the Z axis.

Scale X and **Scale Y** determine the horizontal and vertical size of the rock. Select the **Lock to Scale X checkbox** to lock the Scale Y value to the Scale X value, or deselect this option to adjust each parameter independently.

Lighting and Stain Parameter Groups

The Lighting and Stain parameter groups are identical to the corresponding Brick controls. See “Lighting Parameter Group” on page 295 and “Stain Parameter Group” on page 296 for details.

Surface Image Parameter Group

The **Image Layer menu** allows you to choose a clip to use as the background of the effect. You can use the filtered layer, or one of the clips below the filtered layer in the timeline.The default setting, ***None***, creates an opaque rock image; clips below the filtered layer in the timeline are not visible. When the Image Layer menu is set to None, the other parameters have no affect.

Position XY determines the position of the layer specified in the Image Layer menu.

Scale X and **Scale Y** determine the horizontal and vertical scale of the layer specified in the Image Layer menu. Select **Lock to Scale X checkbox** to lock the Scale Y value to the Scale X value, or deselect this option to adjust each parameter independently.

Image Rotation spins the image specified in the Image Layer menu around the Z axis.

Image Opacity sets the opacity of the image specified in the Image Layer menu.

Apply Parameter Group

The remaining Apply parameter group is identical to the corresponding Brick controls. See “Apply Parameter Group” on page 298 for details.

Working with the BCC Snow Generator

Snow is an auto-animated snow generator which can composite snow over a sky color or an image layer.The filter offers extensive options for customizing the effect and allows you to create drifts or make flakes pile up along the edges of an alpha channel.

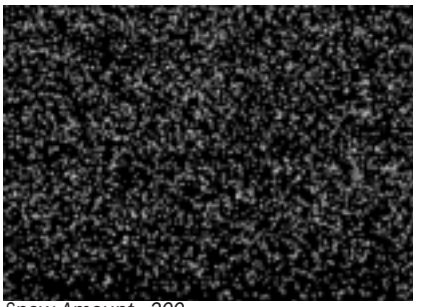
Source image

Filtered image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Snow Amount controls the density of the snow. Increasing this value creates more snowflakes, while decreasing this value creates fewer snowflakes.

Snow Amount=10

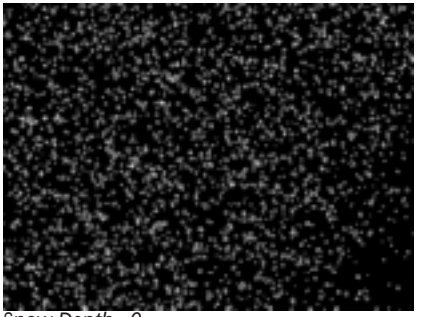


Snow Amount=200

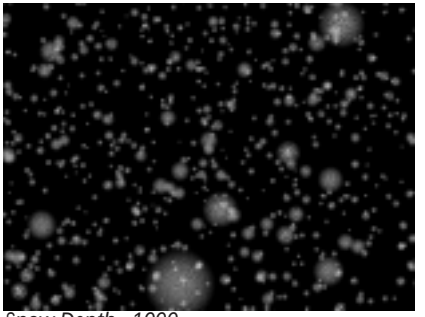
Snow Angle sets the angle between the snowflakes’ direction of motion and the vertical axis.

Snow Speed sets the speed of the snowflakes as they move across the screen. Increasing this value moves the snowflakes faster, while decreasing this value moves the snowflakes slower.

Snow Depth controls the apparent depth of the effect. Increasing this value creates the illusion of greater depth. Decreasing this value creates the illusion of shallower depth.



Snow Depth=0



Snow Depth=1000

Select the **Composite on Alpha checkbox** to composite the snow over a transparent background. Deselect this option to use the filtered layer as the background for the effect.

Pan X and **Pan Y** adjust the perspective view of the effect. Move this point to change the position of the viewer's eye in relation to the effect.

The **Composite Layer menu** sets the layer to use as the background of the effect. You can use the ***Filter Layer***, or use one of the clips below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.*** The default setting, ***None***, composites the snow over a transparent background, revealing the clip below the filtered layer in the timeline.

Composite Depth controls the apparent depth of the chosen composite layer. Increasing values move the composite layer closer to the viewer, while decreasing values move the layer farther from the viewer. This setting has no affect if Composite Layer is set to None.

Composite Depth= –200

Composite Depth=200

Random Seed determines which value is input to the random number generator used by the effect. Adjust this value when you like the overall effect but want to adjust the random configuration of the flakes.

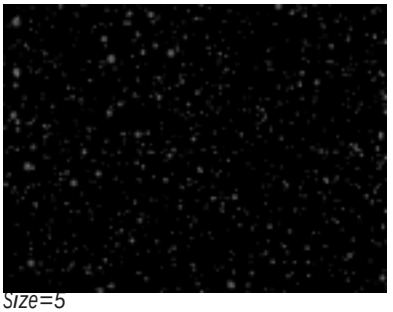
Snowflakes Parameter Group

Color sets the color of the snowflakes.

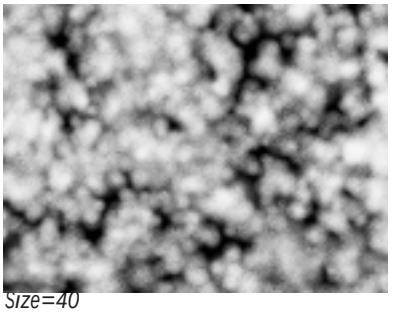
Select the **Use End Color checkbox** to add a second color to the effect. If this option is selected, the **End Color**, **End Color Source Layer**, and **End Opacity** settings control snowflakes near the end of their lifespan. This produces a gradient of colors among the snowflakes from the specified start Color in the newer particles to the End Color in the older particles.

The **Color Source Layer menu** chooses any layer in your timeline to use as a source for snowflake colors. You can use the ***Filter Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below***

Size controls the size of the snowflakes. Higher values create larger snowflakes, while lower values create smaller snowflakes.

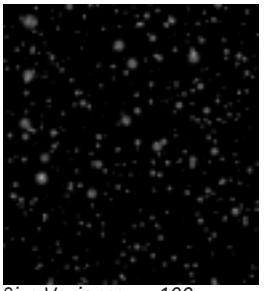


Size=5

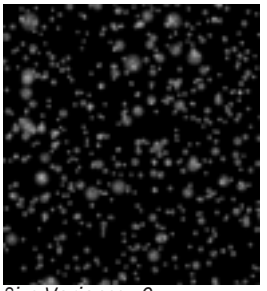


Size=40

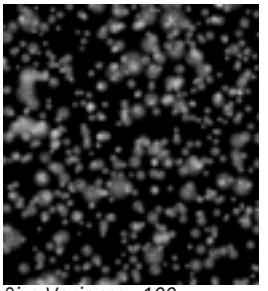
Size Variance varies the size of the snowflakes, creating a wider range of flake sizes in the effect. Positive values create snowflakes larger than or equal to the chosen snowflake Size. Negative values create snowflakes smaller than or equal to the chosen Size.



Size Variance= –100

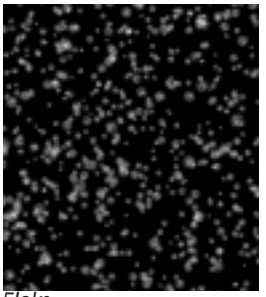


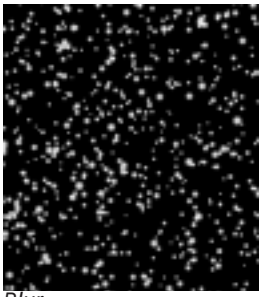
Size Variance=0

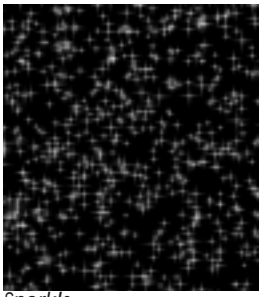


Size Variance=100

The **Shape menu** sets the shape of the snowflakes. Choose ***Flake***, ***Blur***, or ***Sparkle***.


Flake


Blur


Sparkle

Character adjusts the appearance of the snowflakes. The affect of this setting depends on the Shape menu setting.

- With Flakes, higher values produce more detailed snowflakes, while lower values produce more blurred snowflakes.
- With Blurs, increasing positive Character values soften the edges of the particles, while decreasing negative values create harder edges.
- With Sparkles, increasing positive Character values lengthen the four points of the sparkles, while decreasing negative values shorten the points.

Opacity determines the opacity of the snow. Higher values create more opaque snow, while lower values create more transparent flakes.

Brightness Variance controls the range of possible brightness values among the snowflakes. Increasing Brightness Variance creates a system in which some snowflakes are bright and others are dim, and increases the disparity between the brightest and dimmest snowflakes. Leaving this parameter at the default of 0 ensures that all snowflakes have the same brightness value.

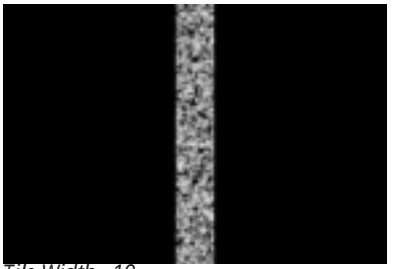
Midpoint Location moves the midpoint along the gradient between the start and end values. A value of 0 places the midpoint close to the beginning of the effect, and snowflakes begin changing to their End Color and End Opacity values soon after birth. A value of 100 places the Midpoint nearer the end of the effect, and snowflakes remain at the start Color, Size, and Opacity values until close to the end of their lifespan.

System Parameter Group

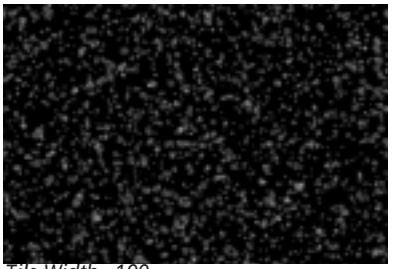
Particle Lifespan determines how long each snowflake lasts before it disappears.

Generation Width adjusts the width of the snow production region. Increasing this value spreads out the individual snowflakes, reducing the density of the effect. Decreasing this value places the flakes closer together, creating a more dense effect.

The Snow filter creates an image by tiling a series of images. Changing the **Tile Width** value adjusts the width of each individual image, which can be useful if tiling becomes noticeable in the output. Increasing Tile Width creates wider tiles, while decreasing this value creates narrower tiles. At extreme Tile Width settings, the tiles may not fully overlap.



Tile Width=10



Tile Width=100

Speed Variance varies the speed of the snowflakes. Increase this value to create a wider range of snowflake speeds.

Direction Variance varies the angle of motion of the snowflakes. Increase this setting to create a wider range of snowflake directions.

Chaos Parameter Group

The Chaos parameters create a more random pattern of falling snow, which can help produce a more natural effect.

Amplitude controls the shape of the snowflakes' paths as they leave the source point. At the default value of 0, the flakes follow a straight line. Positive values cause the flakes to follow a sinosoidal (sine wave) path. Negative values cause the flakes to follow a negative sinosoidal path, meaning that the wave dips before it peaks. The amplitude, or height, of the wave increases as the Amplitude value moves away from 0. More extreme Amplitude values produce increasingly erratic flake paths which make the effect appear more chaotic.

Amp Variance adjusts the range of possible Amplitude settings among individual snowflakes. A high Amplitude Variance value produces a wider range of wave heights among the individual flake paths, creating greater a disparity between the highest and lowest waves. An Amplitude Variance of 0 ensures that all flake paths have the same Amplitude setting.

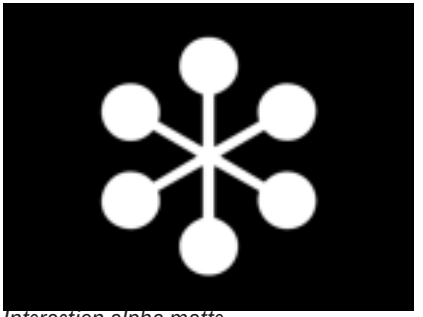
Frequency adjusts the frequency of the sine wave, and therefore the number of waves that the flakes create over the course of their life span. A Frequency value of 0 produces no wave motion, so flakes travel in a straight line. More extreme Frequency values produce very wavy flake paths which make the effect appear more chaotic.

Freq Variance adjusts the range of Frequency settings among individual flakes in the effect. A high Frequency Variance produces a larger range of wave frequencies among the flake paths, creating a greater disparity between the fastest and slowest waves. A Frequency Variance of 0 ensures that all snowflake paths have the same Frequency setting.

Interaction Parameter Group

The **Stick to Layer menu** allows you to choose any layer in your timeline to use as a map to determine where the snow accumulates. Use the ***Filtered Layer***, or use one of the clips below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

The **Layer Use Channel menu** sets which channel in the Stick to Layer is used to create the map. The choices are ***Title-Matte, Inv Title-Matte, Luma, Inv Luma, Red, Inv Red, Green, Inv Green, Blue*** and ***Inv Blue***. In the following examples, an alpha channel is used as an interaction layer.



Interaction alpha matte

Filtered image

Some snow always piles on the edges of the interaction layer, even in the first frame of the effect. To gradually build snow over the course of the effect, animate Snow Amount from 0 to the desired amount.

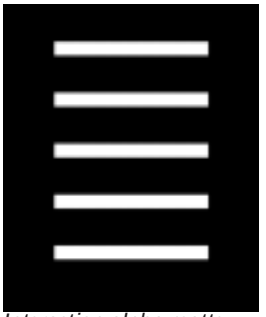
The **PixelChooser Interaction menu** uses the PixelChooser output as the interaction menu. You can use this to make the snow stick to a simple circle (created by the PixelChooser). You can also adjust the PixelChooser's complex blending, choking or Apply mode options to work better with your Interaction Layer. The choices are:

- **None** does not apply an interaction layer.
- **Use PC Layer** uses the PixelChooser settings to create an interaction layer.
- **Use PC Layer Inverted** inverts the PixelChooser settings to create an interaction layer.
- **Use PC Layer and Pixel Choice** uses the PixelChooser settings to create an interaction layer and also uses the PixelChooser settings to create a matte.
- **Use PC Layer Inverted and Pixel Choice** inverts PixelChooser settings to create an interaction layer and also uses the PixelChooser settings to create a matte.

The **Layer Mode menu** determines how the filter uses intermediate values in the chosen channel in the Stick to Layer.

- ***Binary*** uses the chosen Layer Use Channel in the Stick to Layer but treats each pixel as if its chosen channel is fully on or fully off. For example, suppose Layer Use Channel is Title / Matte. Pixels that are 50% to 100% opaque in the Stick to Layer are treated as 100% opaque, while pixels that are 0% to 49% opaque are treated as 0% opaque (fully transparent).
- ***Gradient*** uses the channel in the Stick to Layer as it is, preserving the full range of channel values.

Fallthru Percent sets the probability that individual flakes will pass through edges in the interaction layer. At the default value of 0, all snowflakes stick to first edge in the layer that they strike. As Fallthru Percent increases, more snowflakes fall beyond the first edge and stick to edges below it.


Interaction alpha matte

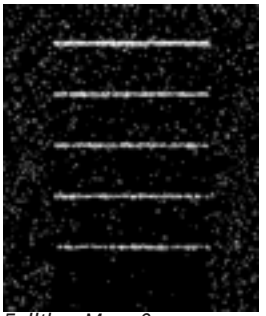

Fallthru Percent=0


Fallthru Percent=50

Fallthru Max determines the maximum number of edges in the interaction layer a snowflake call fall past without sticking. For example, if Fallthru Max is 1, snowflakes can stick to either the first edge or the second. If Fallthru Max is 2, snowflakes can stick to the first, second, or third edges. If Fallthru Percent is 0, Fallthru Max has no affect.

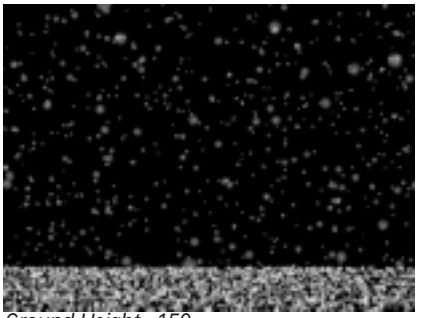

Fallthru Max=1


Fallthru Max=2


Fallthru Max=6

If you select the **Stick to Ground checkbox**, the snowflakes stop moving and begin accumulating when they reach the chosen **Ground Height**, creating the appearance of snow piling on the ground. Increase Ground Height to move the ground down, or decrease this value to move the ground level up. To view a grid representing the ground, select the **View Ground checkbox**.

Ground Height=50



Ground Height=150

Applying Snow to a Title

To make snow stick to a title, apply the Snow filter directly to the title. Select the **Apply to Title-Matte checkbox** in the Title / Matte parameter group. Choose ***Title-Matte*** in the **Layer Use Channel menu** in the Interaction parameter group. Set the **Stick to Layer menu** to ***Filter Layer.*** Now the snow sticks to the alpha channel from the title or matte.

Snow filter with no Interaction

Snow filter using Title Matte Layer

The Snow filter includes an additional choices in the **Region Type menu** in the PixelChooser parameter group. ***Distance to Pan Point*** filters the image between two specified distances from the Pan X and Y point.

For information on the remaining PixelChooser controls, see “The PixelChooser” on page 603.

Working with the BCC Sparks Generator

Sparks generates auto-animated sparks that shoot from a point and disperse. The sparks' sizes, shapes, and colors can be adjusted. You can also adjust the speed of the sparks, apply a gravitational force, and add an interaction layer.

For information on the common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

The **Spark Shape menu** chooses the shape of the sparks. Choose ***Streaks***, ***Trails***, or ***Lines***.

Streaks

Trails

Lines

Spark Velocity determines the speed with which the sparks emanate from the producer point. Increasing this value moves the sparks faster, while decreasing this value moves the sparks slower.

Amount controls the number of individual sparks in the effect. Increase this value to add more sparks to the effect; decrease this value to reduce the number of sparks in the effect.

Amount=20

Amount=100

Amount=300

The Producer **X** and **Y** controls set the location of the producer point on the X and Y axis.

Producer Z set the location of the producer point on the Z axis.

Select the **Composite on Alpha checkbox** to composite the sparks over a transparent background. Deselect this option to use the filtered layer as the background for the effect.

Spread affects the overall tightness of the spark pattern as the sparks leave the source. Decreasing this value brings the sparks closer to the source. Increasing this value spreads the sparks and causes them to flow farther from the source.


Spread=25


Spread=50


Spread=100

The **Spread Mode menu** controls the overall shape of the spark effect.

- The default selection, ***3D***, generates sparks which flow out through a cone-shaped region in all directions.
- ***Fountain*** is similar to 3D, but adds more sparks flowing straight upward in the manner of water droplets flowing from a fountain.
- ***Flat Fan*** sprays sparks in a two-dimensional fan shape on two opposite sides of the source.
- ***Sine Cannon*** shoots sparks from a generator swinging in a circle around the source point.
- ***Circular*** sprays sparks out from the edges of a circle.
- ***Spiral*** creates sparks that spiral around a central source, much like hurricane winds spiralling around the eye of the storm.

Spread Character can be used to finetune the shape of the spark system created by the selected Spread Mode. The affect of this parameter depends on the chosen Spread Mode.

- In the 3D and Fountain Spread Modes, Spread Character alters the shape of the cone through which the sparks flow.
- In Flat Fan mode, Spread Character decreases the randomness of the sparks and making them spray out from the source point in a more ordered manner.

- In Circular mode, Spread Character causes more sparks to spread toward the center of the circle rather than only spraying out from the edges.
- In Sine Cannon mode, Spread Character affects the speed of the swinging generator.
- In Spiral mode, Spread Character makes the spiral pattern tighter or wider.

Spark Size Adjustment adjusts the size of the sparks. Negative values produce shorter sparks, while positive values produce longer sparks.


Spark Size Adjustment=–90


Spark Size Adjustment=0


Spark Size Adjustment=25

The **Spark Lifespan** parameter determines how long each spark lasts before it decays.


Spark Lifespan=3


Spark Lifespan=4

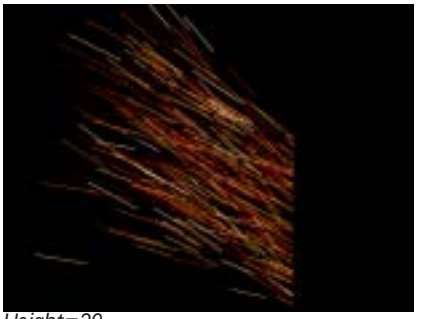

Spark Lifespan=5

Orientation Parameter Group

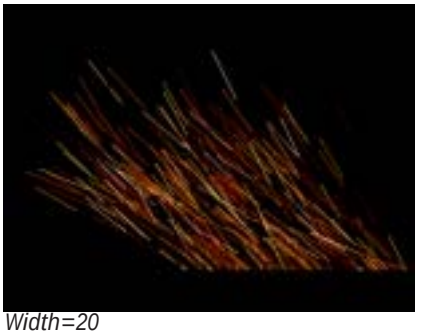
Tumble, **Spin** and **Rotate** rotate the producer point around the X, Y, and Z axis, respectively.

Production Area Parameter Group

Width and **Height** stretch the spark source along the horizontal and vertical axis. Increasing one of these parameters stretches the source in one dimension and creates a spark source that is a straight line. Increasing both stretches the source in two dimensions and creates a spark source that is a plane. When the spark source is a plane, the sparks appear to generate randomly within the space, rather than flowing from a specific point or line.



Height=20



Width=20

Depth controls the movement of the sparks in Z-space. Decreasing Depth from the default value of 0 makes the sparks appear to approach the viewer as they flow from the source. As a result, sparks appear to grow in size as they approach the viewer. Increasing Depth makes the sparks appear to move away from the viewer as they flow from the source. In this case, sparks appear to shrink as they move away from the source.

The **Generate From Alpha menu** allows you to set a boundary for the spark production area using the alpha channel from any clip or layer in your composition. Sparks are only generated within the region that corresponds to the opaque portion of the Generate from Alpha image's alpha channel. If the chosen image has no alpha, this setting has no affect.

Color Parameter Group

The controls in this section select the color and opacity of the generated sparks. The **Start** settings affect the sparks as they are produced at the source, and the **End** settings affect the sparks as they reach their final destination or decay point. The **Midpoint** controls control the how quickly the sparks move from the Start to the End settings. Each of the two groups contains the following parameters.

The **Color Mode menus** offer several means by which the sparks' colors are derived.

- ***Source Point*** causes each spark to use the color of the source layer at the point where the spark originates. If the effect's source coordinates correspond to a red region in the source layer, the spark is red.
- ***Source Update*** causes each spark to use the color of each point on the source image that the spark passes through. If the spark passes from a blue region in the source to a red region, the spark's color will change from blue to red.

- ***Source within System*** is similar to Source Point, except that Source within System picks colors from the source based on the sparks' positions relative to the spark system instead of relative to the source layer.
- ***Random Source*** causes the sparks to use the color of a randomly chosen point in the source image.
- ***Random Source 2*** uses another randomly chosen color from the source image as the spark color.
- ***Custom Color*** sets the spark color to the Custom Color parameter setting.

The **Color** controls set the colors for the Start, Midpoint, and End ranges of the effect. You must set the Color menu (described above) to Custom Color to use this parameter.

The **Color Reference Layer menu** chooses any layer in your composition to use as a source for spark colors. You can use the ***Filtered Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

Brightness Variance controls the range of brightness values among the sparks. Increasing Brightness Variance creates a system in which some sparks are bright and others are dim, and increases the disparity between the brightest and dimmest sparks. The default setting of ***0*** ensures that all sparks have the same brightness value.

Opacity sets the opacity level of the sparks. A value of ***100*** makes all sparks in the range completely opaque, and a value of ***0*** makes all sparks completely transparent. You can set different Opacity values in the Start and End ranges to create effects in which sparks stream outward from the source and disappear.

Midpoint Location moves the Midpoint along the gradient between the Start and End values. A value of ***0*** places the Midpoint close to the generation point, and sparks begin changing to their End Color and Opacity values soon after birth. A value of ***100*** places the Midpoint nearer the End point, and sparks remain at the Start Color, Size, and Opacity values until close to the end of their life span.

Midpoint Variance increases the range of Midpoint Location values among the sparks. As you increase the Midpoint Variance value, the Midpoint Location varies more from spark to spark.

Overall Opacity affects the opacity levels of the entire spark system, after individual Start, Midpoint and End opacity values are taken into account. This parameter provides a means of adjusting and animating the opacity of the effect as a whole without changing individual parameters for each range.

Reflection Parameter Group

The **Reflect Off Layer menu** chooses a layer in the composition to use as a reflection layer. When sparks hit an edge in the reflection layer, they bounce off. You can use the ***Filtered Layer***, or use one of the clips below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

The **Layer Use Channel menu** chooses the channel in the reflection layer that determines how the sparks bounce. For example, if ***Red*** is used, the sparks bounce off boundaries in the reflection layer's red channel.

The **Layer Edges menu** sets how the outer edges of the reflection layer interact with the sparks.

- ***None*** treats the edges of the reflection layer like transparent areas.
- ***Solid*** treats the edges of the reflection layer like opaque areas.

Bounce Friction sets the amount of friction applied to the sparks as they bounce off the reflection layer. Reducing Bounce Friction allows the sparks to bounce higher. Increasing Bounce Friction slows the sparks down, causing them to bounce lower.

Forces Parameter Group

Gravity allows you to apply a second force to the movement of the comet. Increasing this value pulls the sparks increasingly strongly in the direction of the **Gravity Angle** as they leave the source point.


Gravity=0


Gravity=400


Gravity=700

Air Resistance adds resistance to the effect, decreasing the sparks' velocities. Increase Air Resistance to slow down the sparks, or decrease Air Resistance to increase the sparks' speed.

Velocity Variance varies the speeds of individual sparks. Increasing this value creates a wider range of possible spark velocities. The default setting of 0 ensures that all sparks travel at exactly the same speed.

Options Parameter Group

The **Start on Frame** parameter has two functions, depending on whether the Manual Animation checkbox is selected or deselected.

- With the **Manual Animation checkbox** deselected, Start on Frame lets you start the beginning of the auto-animated effect a number of frames past the start of the layer to which it is applied. Setting Start on Frame to 20 starts the animation twenty frames past the beginning of the clip.

- With the **Manual Animation checkbox** selected, Start on Frame lets you manually animate the effect. In this case, a value of 0 represents zero frames into the effect, 15 represents 15 frames into the effect, and so on. Selecting the Manual Animation option locks the effect to the selected Start on Frame value. You may then animate the Start on Frame value to pause, slow down, or speed the effect, or to animate the effect forward and backward in time.

Time Scale allows you to adjust the timing of the effect by stretching or speeding time. Decreasing Time Scale below the default value of 100 stretches time. Thus, the effect appears to take place in slow motion, with sparks taking more time to reach their destination or die. Time scale values greater than 100 speed time, causing the comet to move more quickly.

Increasing **Delay** from the default value of 0 causes sparks to remain invisible until they reach a certain distance from the source point. This can be used to create effects with no visible production center, since sparks do not appear until they disperse to some extent.

Increasing **Precision** increases the accuracy of spark movement, which can be helpful when creating complex effects. Higher values increase rendering times proportionately.

The **Optimize Algorithm checkbox** helps speed rendering times without affecting the apparent quality of the image. Deselect this option if there are “jumps” in the render.

Random Seed determines which value is input to the random number generator used by the filter. Adjust this value when you like the overall effect but want to adjust the random configuration of the sparks.

Working with the BCC Stars Generator

Stars is an auto-animated star generator which can composite stars over a sky color or an image layer. This filter provides control over the size, density, movement and color of the stars, and allows you to add galaxies. Stars can also use the alpha channel in any other layer as a map layer, allowing you to create skies in which stars fill a pre-composed image or logo.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Selecting the **Multiple Layer checkbox** composites three layers of stars over one another. The star layers move at different speeds to create a sense of depth.

Pattern sets the position of the star map on the X and Y axis. Adjusting this parameter changes the random configuration of the stars.

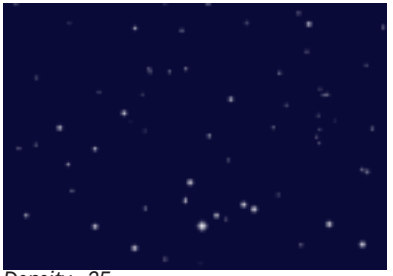
The **Move Type menu** determines how the stars move.

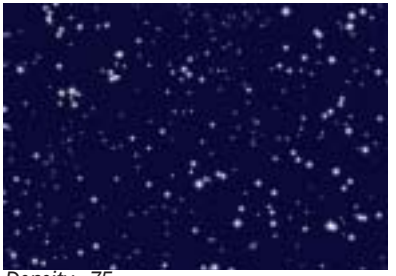
- ***Side*** moves the stars in the direction set by the Direction control.
- ***Forward*** moves the stars forward, approaching the viewer. Forward is only functional when Multiple Layer is selected.
- ***Backward*** moves the stars backward, away from the viewer. Backward is only functional when Multiple Layer is selected.

Speed sets the speed of the stars at which the stars move. Setting Speed to 0 creates a stationary effect. Increasing the Speed value makes the stars move more quickly.

Direction controls the stars’ direction of movement when Move Type is set to Side. The Direction setting represents the angle between the stars’ direction of motion and the vertical axis. Therefore, at a Direction value of 0, the stars move upward. At a Direction value of 90, the stars move to the right.

Density sets the density of the stars without affecting their size. Decreasing Density spaces the stars farther apart, whereas increasing Density packs stars closer together.


Density=35

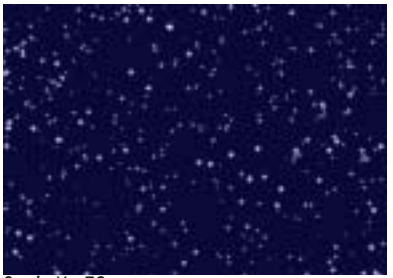

Density=75

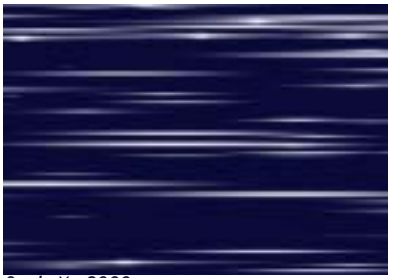
Maximum Size sets the maximum star size in the layer, and **Minimum Size** sets the minimum star size in the layer. The stars' sizes fall in the range set by the Minimum Size and Maximum Size values. Therefore, creating a large discrepancy between the Minimum and Maximum Size values produces a wide range of star sizes. Setting the Minimum and Maximum Size values closer together produces more uniform star sizes.

Twinkle determines the degree to which stars flicker off and on as they move. Increasing the Twinkle value causes the stars to flicker more, whereas decreasing Twinkle causes the stars to flicker less.

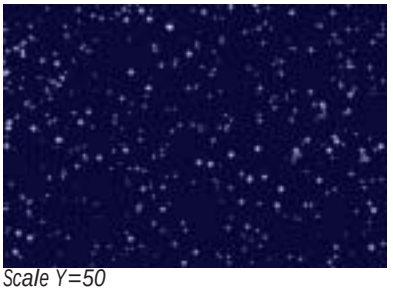
The **Lock to Scale X checkbox** locks the Scale Y value to the Scale X value in order to preserve the aspect ratio of the star pattern. Deselect this option if you want to adjust the Scale X and Scale Y values independently.

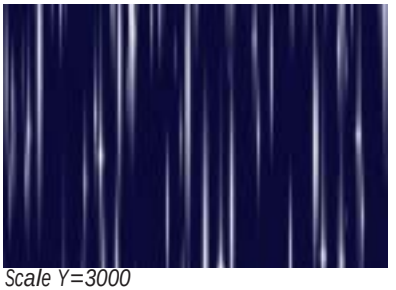
Scale X sets the horizontal scale of the star pattern. Increase Scale X to stretch the stars horizontally.


Scale X=50


Scale X=3000

Scale Y sets the vertical scale of the star pattern. Increase Scale Y to stretch the stars vertically.


Scale Y=50


Scale Y=3000

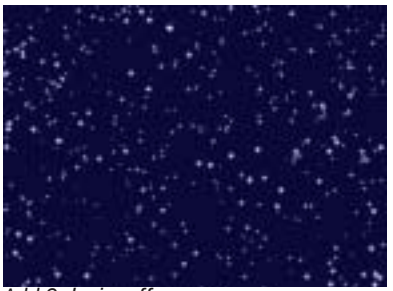
The **Sky Type menu** chooses how the stars are composited.

- ***Composite on Original*** composites the stars over the filtered layer.
- ***Color*** composites the stars over the chosen **Sky Color**.
- ***Alpha*** composites the stars over an alpha channel.

Star Color sets the color of the stars.

Sky Color sets the color of the sky background.

The **Add Galaxies checkbox** adds galaxies to the star pattern.


Add Galaxies off


Add Galaxies on

Galaxy Density determines how closely the galaxies are packed together. Increasing the Galaxy Density value places galaxies closer together and adds more galaxies to the sky. Decreasing Galaxy Density moves galaxies further apart and adds fewer galaxies to the sky.

Galaxy Density=15

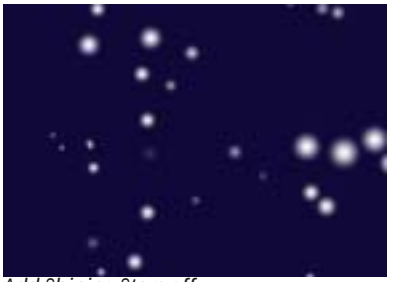
Galaxy Density=40

Galaxy Size determines the size of the galaxies. Increase the Galaxy Size value to create larger galaxies; decrease this value to create smaller galaxies.

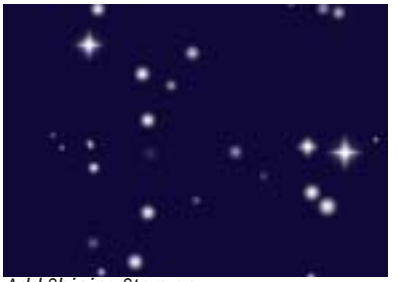
Galaxy Size=30

Galaxy Size=100

The **Add Shining Stars checkbox** changes some of the stars from round- to diamond-shaped.



Add Shining Stars off

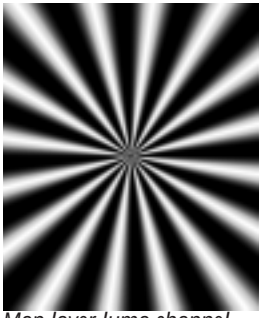


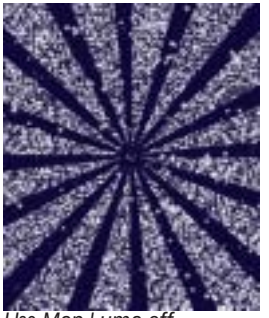
Add Shining Stars on

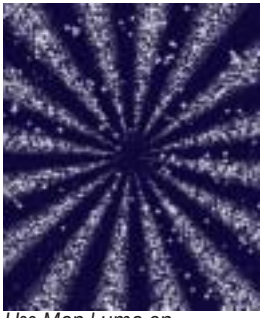
The **Map Layer menu** allows you to choose a layer in the timeline to use as mask for the effect. The stars conform to the opaque regions in the map layer's alpha channel. You can use the ***Filtered Layer***, or use one of the clips below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

The remaining parameters affect only the map layer. If no map layer is chosen, adjusting these parameters has no affect.

If you select the **Use Map Luma checkbox**, the filter uses the luma channel in the map layer as it is, preserving the full range of transparencies. If this option is not selected, the filter uses the luma channel in the map layer but treats each pixel as if it were either fully opaque or fully transparent. Pixels that are 50% to 100% opaque in the map layer luma channel are treated as 100% opaque (fully opaque), while pixels that are 0% to 49% opaque in the map layer luma channel are treated as 0% opaque (fully transparent).


Map layer luma channel


Use Map Luma off


Use Map Luma on

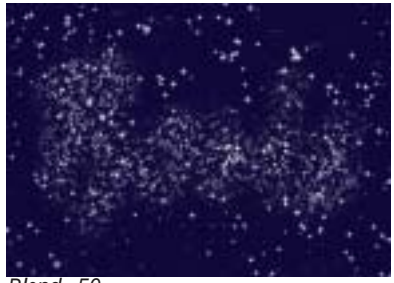
Density on Map Layer controls the density of the stars within the opaque regions of the map layer's luma channel. Increasing this value packs the more stars in the region, while decreasing this value creates fewer stars in the region.


Density on Luma Layer=25


Density on Luma Layer=75

Blend adjusts the softness of the edges in the map layer's alpha channel. Increasing this value softens the edges of the opaque areas in the matte.


Blend=25


Blend=50

Choke contracts or expands the edges of the opaque regions in the alpha channel. Positive Choke values expand the opaque regions, while negative Choke values contract them.

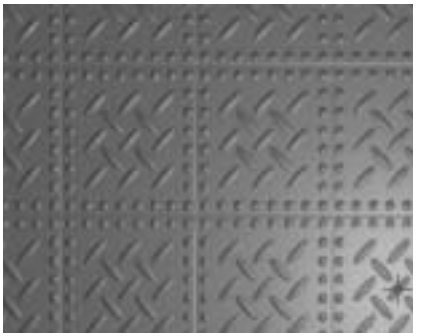

Choke= –100


Choke=0


Choke=100

Working with the BCC Steel Plate Generator

Steel Plate creates a textured plate of steel generator. The steel can act as a filter on a layer or generate a steel surface.



For information on common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Control Parameter Group

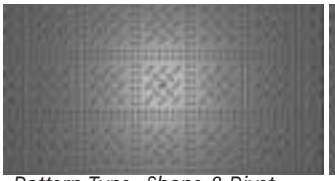
Position X and **Y** determines the position of the generated steel plate.

Scale X and **Scale Y** determine the horizontal and vertical size of the steel plate image. Select **Lock to Scale X checkbox** to lock the Scale Y value to the Scale X value, or deselect this option to adjust each parameter independently.

Rotation spins the steel pattern around the Z axis.

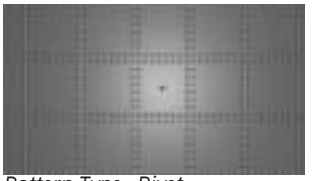
Bump Height determines the height of the bump map used to create the texture of the bricks. Higher values create a more textured surface.

The **Pattern Type menu** determines the texture of the Steel Plate, choose ***Shape&Rivet, Shape*** or ***Rivet*** which are illustrated below.



Pattern Type=Shape & Rivet

Pattern Type=Shape



Pattern Type=Rivet

The **Rivet Shape menu** determines the shape of the rivets, choose ***Round Bolt, Hexnut, Lugnut, Capped Lugnut*** and ***Star.***

The **Shape menu** determines the shape choose ***Round Bolt, Hexnut, Lugnut, Capped Lugnut, Star, Diamond*** and ***Crosshatch***.

Plate Gap determines the width of the gap between each steel plate. Higher values create wider gaps.

Plate Width Radius determines the aspect ratio of the steel plates. Higher values create wider plates. Lower values create taller plates. At the default of 1, the plates are square.

Rivet Size sets the size of the chosen Rivet. If the Pattern Type menu is set to Shape, this parameter has no affect.

Shape Size sets the size of the chosen Shape. If the Pattern Type menu is set to Rivet, this parameter has no affect.

Rivet Counts (Width) and **Rivet Count (Height)** set the number of Rivets on the X and Y axes respectively. If the Pattern Type menu is set to Shape, this parameter has no affect.

Shape Counts (Width) and **Shape Count (Height)** set the number of Shapes on the X and Y axes respectively. If the Pattern Type menu is set to Rivet, this parameter has no affect.

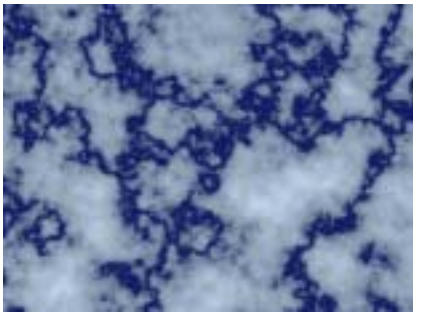
Rivet Offset sets the distance of the rivets from the edge of the plate. Higher values add more space between the rivets and the edge of the plate.

Shape Area Scale X and **Shape Area Scale Y** scale the shape on the X and Y axes respectively. This parameter differs from Scale X and Scale Y in that scaling the value scales the width and height of the plates but does not affect the plate gap.

The remaining Steel Plate parameters are identical to the corresponding Brick controls. See “Lighting Parameter Group” on page 295, “Surface Image Parameter Group” on page 297 and “Apply Parameter Group” on page 298 for details.

Working with the BCC Veined Marble Generator

Veined Marble is similar to the Marble Texture Type, but produces a texture with more pronounced “veins” and offers more controls for customizing the effect.



For information on common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Offset X and **Offset Y** control the pattern of the marble at a given point by moving through the procedural noise from which the effect is generated along the XY axis.

Scale X and **Scale Y** set the scale of the marble pattern along the X and Y axis respectively. Select the **Lock to Scale X checkbox** to keep these values in proportion, or deselect this option to adjust Scale X and Y independently.

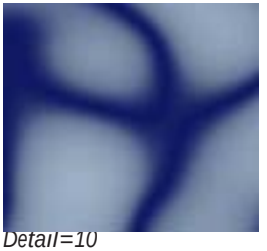
The **Vein Color** controls set the color of the veins in the pattern.

Vein Alpha sets the alpha value for the Vein Color.

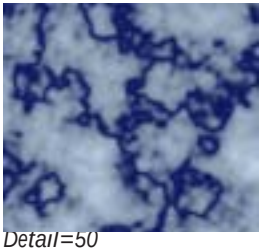
The **Background Color** controls set the color of the background of the marble pattern.

Background Alpha sets the alpha value for the Background Color.

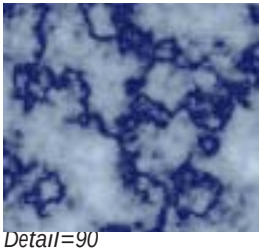
Detail sets the resolution of the vein pattern. Lower values produce marble patterns resembling soft gradients. As Detail increases, the pattern becomes more complex and detailed.



Detail=10

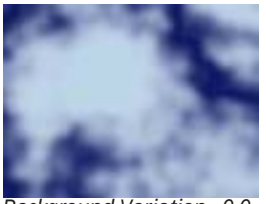


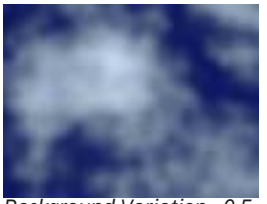
Detail=50

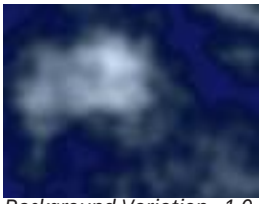


Detail=90

Background Variation varies the Background Color. At lower values, the background areas resemble flat patches of the Background Color. As the value increases, the background areas become more mottled as a wider variety of colors are used.


Background Variation=0.0


Background Variation=0.5


Background Variation=1.0

Vein Thickness adjusts the thickness of the veins in the marble pattern. Higher values produce thicker veins, while lower values produce narrower veins.

Vein Color Blend sets the contrast between the Vein and Background Colors. Increasing this value blends the Veins with the Background. Decreasing this value creates a narrower blended region.

Mutation controls the pattern of the marble at a given point by moving through the procedural noise from which the effect is generated along the Z axis.

Rotation spins the veined marble pattern around the Z axis.

Select the **Source Alpha checkbox** to use the source alpha channel as a mask for the filter, so the texture appears only in the opaque regions of the source. If this option is deselected, the source image's alpha channel is ignored.

Opacity adjusts the opacity of the simulated texture.

Apply Mode controls how the texture is composited over the source image. For descriptions of all the possible Apply Modes, see "Apply Modes" on page 625. **Apply Mix** controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

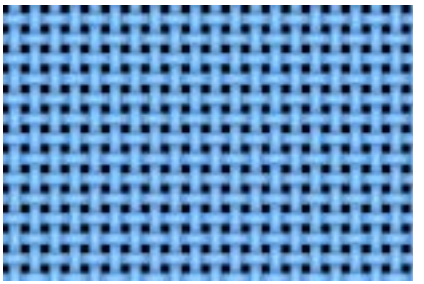
3D Bump Mapping Parameter Group

3D Bump Mapping creates the appearance of three-dimensional detail on a surface.

These parameters are identical to the corresponding Granite controls. See page 329 for details.

Working with the BCC Weave Generator

Weave is similar to the Cloth filter, but produces a texture resembling a much more loosely-woven fabric, such as burlap or gauze.



For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

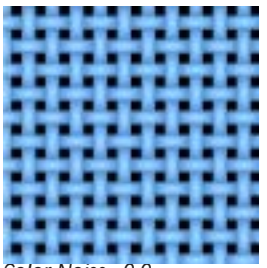
Offset X and **Offset Y** control the appearance of the weave by moving through the procedural noise from which the effect is generated.

Scale X and **Scale Y** determine the scale of the threads that form the cloth along the X and Y axis respectively. Select **Lock to Scale X checkbox** to keep these values in proportion, or deselect this option to adjust Scale X and Y independently.

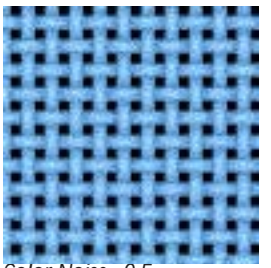
Rotation spins the cloth pattern around the Z axis.

The **Color** controls set the color of the weave pattern.

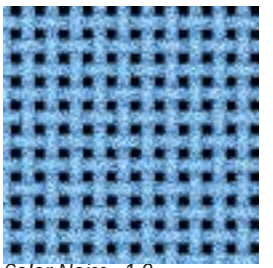
Color Noise varies the color of the threads in the weave pattern. As the Color Noise value increases, the threads appear more mottled, and the shading becomes more irregular.



Color Noise=0.0

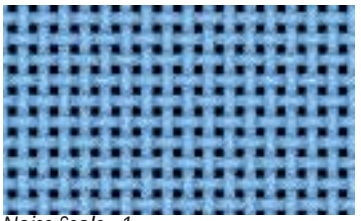


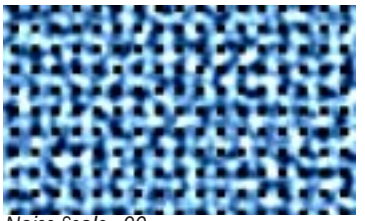
Color Noise=0.5



Color Noise=1.0

Noise Scale adjusts the scale of the color pattern on the threads. Adjustments to this value are most pronounced at higher Color Noise values.


Noise Scale=1


Noise Scale=90

Noise Mutation controls the pattern of the Color Noise at a given point by moving through the procedural noise from which the effect is generated along the Z axis.

Weave Thickness adjusts the thickness of the individual threads that form the weave.

Selecting the **Background Transparent checkbox** creates an alpha channel from the weave. Black areas are transparent. When this option is deselected, the weave is totally opaque.

Select the **Source Alpha checkbox** to use the source alpha channel as a mask for the filter, so the texture appears only in the opaque regions of the source. If this option is deselected, the image's alpha channel is ignored.

Opacity adjusts the opacity of the simulated texture.

The **Apply Mode menu** controls how the texture is composited over the source image. For descriptions of all the possible Apply Modes, see "Apply Modes" on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

3D Bump Mapping Parameter Group

3D Bump Mapping is used to create the appearance of three-dimensional detail on a surface.

The 3D Bump Mapping parameters are identical to the corresponding Granite controls. See "3D Bump Mapping Parameter Group" on page 329 for details.

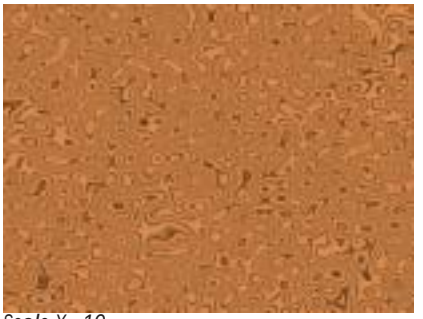
Working with the BCC Wood Grain Generator

Wood Grain creates the appearance of a solid piece of wood.

For information on common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Offset X and **Offset Y** control the pattern of the wood grain at a given point by moving through the procedural noise from which the effect is generated along the X and Y axis.

Scale X and **Scale Y** determine the scale of the grain pattern along the X and Y axis respectively. Select **Lock to Scale X checkbox** lock the Scale Y value to the Scale X, or deselect this option to adjust each parameter independently.



Scale X=10

Scale X=100

Wood Color Parameter Group

The **Wood Color** controls set the color of the lightest parts of the wood grain pattern.

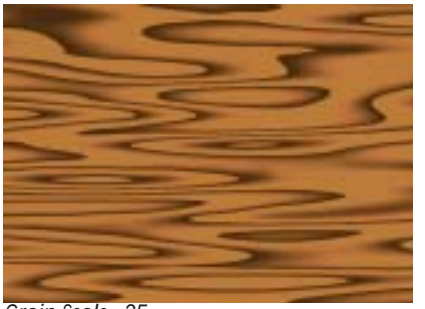
Wood Alpha sets the alpha value for the Grain Color.

Grain Color sets the color of the darkest parts of the wood grain pattern.

Grain Alpha sets the alpha value for the Grain Color.

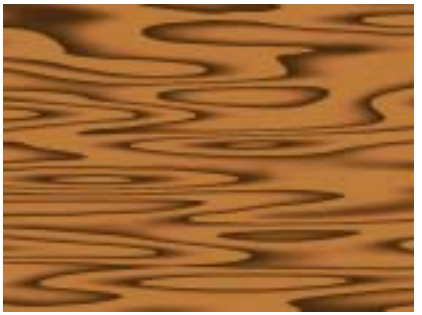
Grain Scale adjusts the scale of the rings in the grain pattern. Higher values create larger rings, while lower values create smaller rings.

Grain Scale=1



Grain Scale=25

Grain Noise adjusts the resolution of the grain pattern. Lower values create distinct, well-defined grain lines on the wood. As Grain noise increases, the pattern becomes less distinct as patches of the Wood Color begin overlapping the darker grain lines.



Grain Noise=0

Grain Noise=1.0

Mutation controls the pattern of the wood grain at a given point by moving through the procedural noise from which the effect is generated along the Z axis.

Rotation sets the angle between the grain of the wood texture and the horizontal axis.


Rotation=135


Rotation=90


Rotation=45

Select the **Source Alpha checkbox** to use the source alpha channel as a mask for the filter, so the wood texture appears only in the opaque regions of the source. If this option is deselected, the source image's alpha channel is ignored.

Opacity sets the opacity of the wood grain.

The **Apply Mode menu** controls how the texture is composited over the source image. For descriptions of all the possible Apply Modes, see "Apply Modes" on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

3D Bump Mapping Parameter Group

3D Bump Mapping is used to create the appearance of three-dimensional detail on a surface.

The 3D Bump Mapping parameters are identical to the corresponding Granite controls. See "3D Bump Mapping Parameter Group" on page 329 for details.

Working with the BCC Wooden Planks Generator

Wooden Planks simulates a surface covered in wooden boards, similar to a wood floor.

For information on common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Wood Color** controls set the color of the lightest parts of the wood grain pattern.

The **Grain Color** controls set the color of the darkest parts of the wood grain pattern.

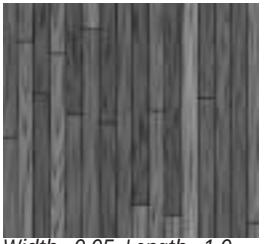
Color Variation adjusts the amount of variance between plank colors. As this value increases, the planks assume a wider variety of colors. Decreasing this value produces planks that are more uniform in color.

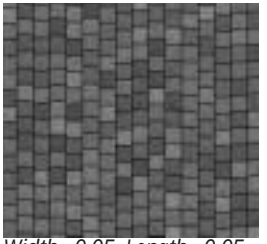
Color Variation=0

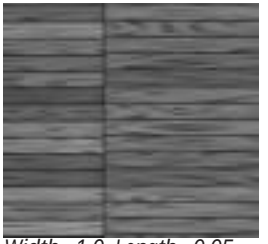
Color Variation=1.0

Color Variation=2.0

Plank Length and **Plank Width** adjust the size of the planks without altering the scale of the wood pattern.


Width=0.05, Length=1.0


Width=0.05, Length=0.05


Width=1.0, Length=0.05

Distance Apart determines the width of the grooves between the individual planks of wood. Higher values create wider grooves.

The **Background Color** controls set the color of the grooves between the planks. When Distance Apart is at a higher value, more of the Background Color is visible.

Background Opacity sets the opacity of the grooves between the planks.

Planks Parameter Group

Alignment adjusts the lateral alignment of the planks. If Align Randomness is 0, An Alignment value of 0 causes the ends of the planks to be even with the ends of adjacent planks. As the Alignment value moves away from 0, every other plank is increasingly offset.

Align Randomness adjusts the randomness of the locations of the ends of the planks in relation to the ends of the other planks. At a value of 0, the ends of the planks are aligned in a regular pattern. As this value increases, the location of the ends becomes more random.

Random Variance varies the random locations of the ends of the planks. This setting has no affect if Align Randomness is 0.

Position Mutation controls the pattern of the individual planks in the texture at a given point by moving through the procedural noise from which the effect is generated along the Z axis.

Opacity adjusts the opacity of the planks.

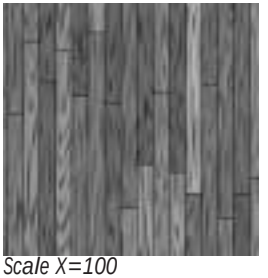
Opacity Variation varies the opacities of the individual planks. At a value of 0, all the planks are equally opaque. As this value increases, the planks appear in a wider range of opacities.

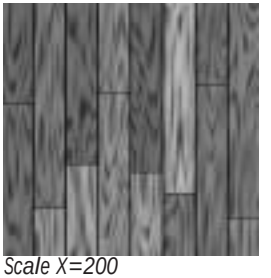
Geometry Parameter Group

The Offse**t X** and **Y** parameters control the pattern of the wood grain at a given point by moving through the procedural noise from which the effect is generated.

Scale X and **Scale Y** adjust the overall scale of the pattern along the X and Y axis respectively. Select **Lock to Scale X checkbox** to keep this values in proportion.


Scale X=50


Scale X=100

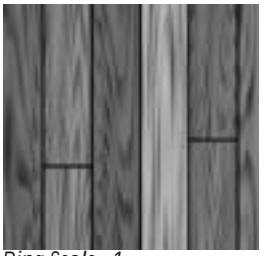

Scale X=200

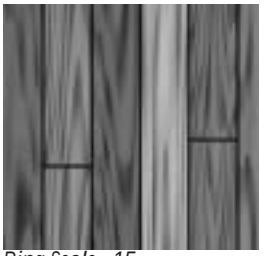
Rotation sets the angle between the grain of the wood texture and the horizontal axis.

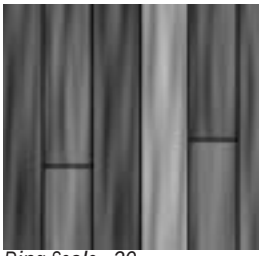
Texture Parameter Group

Texture Mutation smoothly randomizes the grain textures.

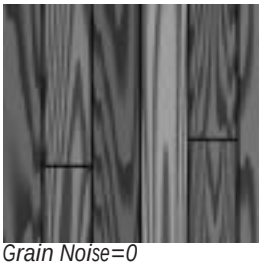
Grain Scale adjusts the scale of the rings in the grain pattern. Higher values create larger rings, while lower values create smaller rings.

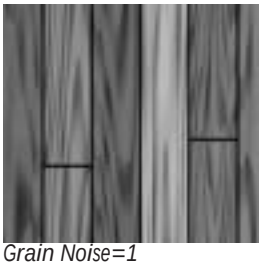

Ring Scale=1

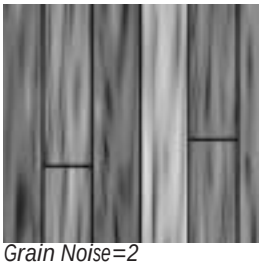

Ring Scale=15


Ring Scale=30

Grain Noise adjusts the resolution of the grain pattern. Lower values create distinct, well-defined grain lines on the wood. As Grain Noise increases, the pattern becomes less distinct as grain spots (patches of the Wood Color) appear and overlap the darker grain lines.


Grain Noise=0

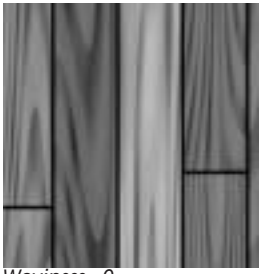

Grain Noise=1


Grain Noise=2

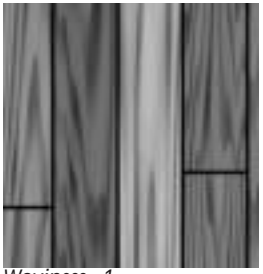
Noise Scale adjusts the size of the grain spots created by the Grain Noise control.

If Grain Noise is set to 0, Grain Scale has no affect.

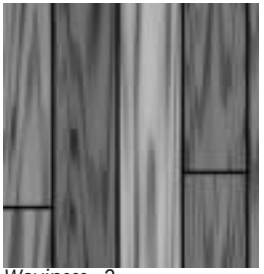
Waviness adjusts the shape of the grain lines in the wood. At a value of 0, the lines form smooth curves. As the Wave value increases, each line becomes more wavy, or jagged.



Waviness=0



Waviness=1



Waviness=2

3D Bump Mapping Parameter Group

3D Bump Mapping is used to create the appearance of three-dimensional detail on a surface.

The 3D Bump Mapping parameters are identical to the corresponding Granite controls. See “3D Bump Mapping Parameter Group” on page 329 for details.

Apply Parameter Group

Overall Opacity adjusts the opacity of the effect.

Select the **Source Alpha checkbox** to use the source alpha channel as a mask for the filter, so the texture appears only in the opaque regions of the source. If this option is deselected, the source image’s alpha channel is ignored.

The **Apply Mode menu** controls how the texture is composited over the source image.

For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

Chapter 6
Keys & Matte Filters

Types of Keys

Boris Continuum Complete includes a number of keying filters that use various techniques to create and adjust mattes. A ***matte*** is an image that uses transparency (alpha) information to determine which pixels in the image are visible. Some of the Boris Keying filters create mattes using the image's luma or color channel information, while others clean existing mattes by subtracting, adding, or blending pixels in the matte. You can use many types of keys to separate a foreground object from its background based on color or luminance. Boris includes two general types of keys: linear and chroma keys.

Understanding Linear Keys

A linear key creates mattes by a process known as color matching. First, you specify a color or range of colors to key out (make transparent). Each pixel in the source that fits the selection criteria is keyed out, while pixels that are not selected remain opaque. Most of the linear keys in Boris contain Softness and Blur controls that allow you to create partially transparent regions in the matte.

Linear keys also composite the alpha channel with any existing alpha channel in the image. Therefore, you can combine multiple linear keys to add or subtract transparency from the matte, which can help achieve a cleaner matte. For more information, see "Combining Linear Keys" on page 397.

Linear keys do not alter the colors of the source image, and therefore are not ideal for working with blue or green screen footage. A blue screen shot often has areas such as hair or smoke where the foreground is semi-transparent. In these areas, the linear key shows a blue fringe, because modifying the transparency does not alter the color values of the pixel. Chroma keys, described in the following section, are better options for creating mattes based on blue or green screen material.

Understanding Chroma Keys

A chroma key is used to composite images shot using a blue, green, or red screen as a backdrop. This technique involves shooting the foreground subject in front of a solid color background in a controlled studio environment, and then using software to replace the background with video or a still image from a separate file. Blue and green backgrounds are used for human foreground subjects because skin tones are predominantly red.

The Chroma Key filter examines the RGB channels of each pixel, then differentiates between foreground and background pixels based on the chosen key color. The filter creates transparency by examining the ratio of the key color to the other color channels, not to the color level alone. For example, pure green and pure white both contain a green level of 255, but the ratio of green to red and blue is much higher in the pure green pixel. Therefore, the green pixels in the background are the most transparent, a light green pixel is semi-transparent, and a white pixel is opaque. Chroma Key also deals with color spill, which occurs when regions of the foreground reflect the color of the background and take on an unwanted cast.

Combining Linear Keys

It is often necessary to combine one or more linear keys when working with footage that was not shot in a studio setting, or whose background and foreground both contain a wide range of lights and darks or contain similar colors. Each successive key can subtract or add pixels to the matte, helping to create a cleaner key.

It is not usually recommended to combine linear keys with the Chroma Key filter, because the Chroma Key filter actually alters the RGB channels of the image whereas the linear keys alter only the alpha channels. You can, however, use the Region of Interest controls in multiple linear keys to remove sections of a matte created with Chroma Key.

The following examples illustrate how you can combine multiple linear keys and use Region of Interest controls to create a clean matte from an image whose background contains a range of colors and has colors in common with the foreground image.

This image shows the original source image. By combining multiple linear keys, you can effectively isolate the light and dark areas of the facade and remove the full range of colors from the background.

In this example, a Two Way Key is applied in order to key out a large range of blues in the sky while preserving opacity in the dark regions of the foreground. The Similarity controls are adjusted to remove as large a part of the background as possible without subtracting pixels from the foreground.

Next, the Region of Interest controls are used to remove pixels outside the desired foreground from the matte. This leaves a smaller range of blue colors in the background, which can be easily keyed out by applying an additional key.

Finally, a Linear Color Key with a very small Similarity range is applied to key out the remaining blue pixels from the Background. The result is a fairly clean matte, which can be further refined using the Softness and Post Blur controls.

Post Blur blurs the complete matte, not just the part created by the current filter. If you want to blur only part of a complex matte, create that part in the first keying filter. If you want to blur the entire matte, you only need to use Post Blur in the last keying filter.

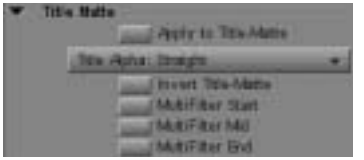
Using the MultiFilter Controls to Combine Keying Filters

The MultiFilter controls can be used to combine multiple keying effects, such as chroma keys, without applying them to the entire image. In this case, the output of the first keying filter is used as the input to the second keying filter. For example, you might want to apply the BCC Chroma Key then choke the output of the key using the BCC Matte Choker filter.

BCC AVX includes several filters to create precise keys. Combining multiple keying filters can solve some complex (but common) keying issues. For example, you might want to combine a BCC Chroma Key, BCC Matte Choker, and BCC Light Wrap, to quickly create an accurate key. This is true even with difficult-to-key DV footage.

For a tutorial on applying multiple keying filters, see the ***Tutorials.pdf*** on your installation cd.

Applying Multiple Keying Filters



1. Drag the first keying effect onto your clip and adjust the filter parameters.
2. Select the **MultiFilter Start checkbox** in the Title Matte parameter group before you apply the next filter. This checkbox must be enabled in the first filter before you add additional filters to the effect.

Once you enable the **MultiFilter Start checkbox**, the composited background no longer displays with the effect. You should enable this checkbox as the last step when you finish adjusting the first filter.

3. To apply an additional filter, Option (Macintosh) or Alt (Windows) drag the filter to the Avid timeline.
4. If you select the **MultiFilter Mid checkbox**, the image no longer displays composited over the background. For this reason, while you adjust parameters for middle filter(s), select the **MultiFilter End checkbox**.
5. When you finish adjusting the middle filter's parameters, select the **MultiFilter Mid checkbox** before adding the next filter.

When you work with multiple filters, you can expand the effect at any time by double-clicking the effect icon in the timeline with the Effect Editor open. This allows you to adjust the first filter while viewing the output of all filters. To close the filter, double-click the effect again. If you want to adjust a filter while only viewing the output of that filter, use the **Step In** and **Step Out buttons**.

6. Repeat Steps Three, Four and Five for any additional filters.
7. Select **MultiFilter End** for the last filter in a MultiFilter effect.

Working with the BCC Alpha Process Filter

The Alpha Process filter blurs the alpha channel of an image, performs levels and gamma correction on the output of the blur, and composites the output alpha with the initial alpha using the chosen apply mode. The filter also allows you to soften the matte by blurring the alpha channel after it is processed.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Horizontal Blur and **Vertical Blur** control the amount of blur applied to the alpha channel in each direction. Select the **Lock Blur checkbox** to lock the Vertical Blur value to the Horizontal Blur.

Black Level sets the alpha values in the matte that are treated as pure black (transparent) by the filter. All pixels whose alpha value is lower than the Black Level value are output as transparent. For example, if Black Level is set to 50, all pixels with a value of 50 or less are output to a value of 0. Increasing Black Level helps eliminate unwanted semi-transparent areas in the background.

White Level sets the alpha values in the matte that are treated as pure white (opaque) by the filter. All pixels whose alpha value is higher than the White Level value are output as opaque. For example, if White Level is 200, all pixels with a value of 200 or more are output to a value of 255. Lowering White Level helps eliminate unwanted semi-transparent areas from the foreground.

Source image

Alpha matte

White Level adjusted

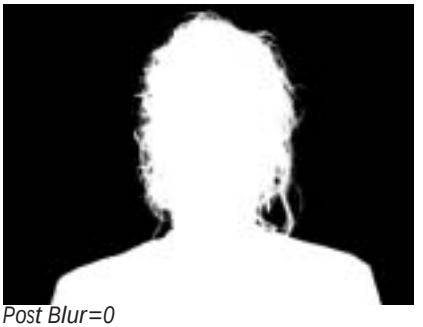
Gamma controls the slope of the curve used to convert input color values to output values in pixels brighter than Input Black and darker than Input White. Increasing Gamma from the default of 100 lightens the image and reduces contrast. Decreasing Gamma darkens the image and increases contrast.

The **Apply Mode menu** controls how the filtered image is composited with the source image.

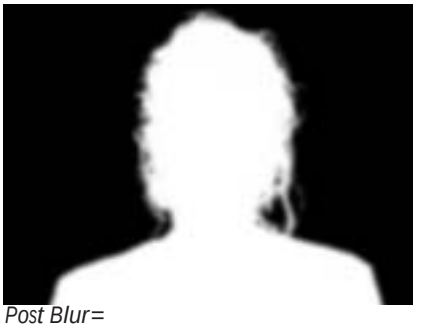
For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect and the parameter does not appear. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

Post Blur blurs the alpha channel after it has been processed. Use Post Blur to soften the edges of the matte for sources with high-contrast edges. Post Blur is also useful for eliminating artifacts produced when using an apply mode (in the Advanced tab) to create a complex alpha composite.



Post Blur=0



Post Blur=

The **Blur Quality menu** includes four settings: ***Low***, ***Medium***, ***High***, and ***Highest***. Blur Quality affects Post Blur as well as the initial Horizontal and Vertical Blur. Low and Medium are adequate for simple matte smoothing, but to blur the edges of a high-contrast image or animate the blur, you should use Highest. There is a significant rendering cost to using High, and considerably more for Highest.

The **View Matte checkbox** allows you to view the matte as you make adjustments. Deselect this option before rendering.

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 PixelChooser parameters are described in “The PixelChooser” on page 603.

Working with the BCC Chroma Key Filter

Chroma Key is used for compositing camera footage shot using a blue, green, or red screen as a backdrop over a new background video or a still image from a separate file.

Source image

Filtered image

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Output menu** determines whether the composite image or the matte displays in the Effect Preview monitor. ***Composite*** displays the composited effect. ***Show Matte*** allows you to view the matte as you adjust it. You must set Output to Composite before rendering.

Increasing **Density** makes transparent areas more transparent and opaque areas more opaque. Too much Density can degrade the matte.

Balance adjusts the balance between Density and Lightness. Adjusting balance can enhance semi-transparent foreground objects and shadows.

Increasing **Lightness** makes the entire matte more transparent. Boosting transparency might be necessary to ensure that the new background shows through in semi-transparent areas. However, too much Lightness can result in “print-through”–that is, the background image might show through the foreground subject.

Color Parameter Group

Use the eyedropper to choose a key **Color** from the image background. If you are working with a human subject, pick a color close to the subject’s hair line, but not in the hair itself.

If the default key Color pulls a matte which removes a lot of the source image, it can be difficult to use the eyedropper to select a different key Color. Use the **Bypass Effect checkbox** in the General Controls parameter group to temporarily hide the filter and pull the correct matte color from the unfiltered image.

Color Weight Parameter Group

Red, **Green**, and **Blue** adjust the weight of the corresponding color channel in creating the matte. Adjusting the weights of the color channels slightly changes the key Color and can help improve the matte.

Spill Suppression Parameter Group

After you are satisfied with the matte, check the image in the Effect Preview monitor for color spill–that is, the presence of the background color in the foreground. If a spill is present you can substantially reduce it by modifying the Spill Ratio, Tone Mix, and Tone Range. It is best to adjust the controls in the order described.

The first step in spill removal is to adjust **Spill Ratio** until most of the background color is gone from the foreground. Lowering Spill Ratio to 0 creates a magenta (if the key color is green) or yellow (if the key color is blue) tint in the foreground. Increasing this value to 200 leaves the original foreground color unchanged, with no adjustment for spill.

Tone Mix has the opposite effect of Spill Ratio; it adds background color to the foreground image. For example, if you work with a green screen image, you can increase Tone Mix to compensate for magenta tint created by lowering the Spill Ratio.

Increasing **Tone Range** increases the range of the foreground color mix, which can also help restore the original color to flesh areas.

Two sets of **X** and **Y** position sliders define the upper left and bottom right corners of a rectangle that contains the foreground image. All points outside of this rectangle become fully transparent. This area is called a garbage matte because it discards parts of the color channel information. Such a matte is useful for getting rid of unwanted foreground objects or shadows in the background color that prevent it from keying out.

Working with the BCC Composite Choker Filter

Composite Choker contracts or expands the edges of the matte to bring them closer to or farther from the foreground. Two Choke controls allow you to smoothly adjust the matte.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Choke 1 applies a choke to the image. Positive values tighten the matte around the foreground image, while negative values pull the matte away from the edges of the foreground image.

The **Output menu** determines how the filter uses the two Choke values to composite the filter, which enables you to adjust the matte more precisely.

- ***Choke 1*** uses the Choke 1 value and ignores the Choke 2 value.
- ***Mix*** blends the two Choke values to alter the alpha channel.
- ***Difference*** uses the difference between the two chokes, creating an outline effect.
- ***Subtract Difference*** uses the difference between the original alpha channel and the difference between the two Choke values.
- ***Choke 2*** uses the Choke 2 value and ignores the Choke 1 value.

Choke 2 applies a second choke to the image which you can mix with the first choke using the Output menu setting.

Post Blur blurs the alpha channel after the matte is processed. Use Post Blur to soften the edges of the matte for sources with high-contrast edges. You might also want to add Post Blur when using Difference or Subtract Difference Output modes.

The **Blur Quality menu** adjusts the quality of the Post Blur. Choose ***Low***, ***Medium***, ***High***, or ***Highest***. Low and Medium are adequate for simple matte smoothing, but to blur the edges of a high-contrast image or animate the blur, you may need to use Highest. There is a significant rendering cost to using High, and considerably more for using Highest.

The **View Matte checkbox** allows you to view the matte as you adjust it. Be sure to deselect this option before rendering.

Region Parameter Group

The Region parameters allow you to define a specific region of interest in which the filter is applied, leaving the rest of the image unchanged.

The **Region of Interest menu** sets the shape of the region. You can apply the filter inside or outside a rectangular or oval-shaped region, or choose ***All*** to filter all pixels in the image, regardless of their location. The remaining choices are ***Inside Rectangle***, ***Outside Rectangle***, ***Inside Oval,*** and ***Outside Oval.***

- ***All*** filters all pixels in the image, regardless of their location.
- ***Inside Rectangle*** filters the image inside a rectangle-shaped region.
- ***Outside Rectangle*** filters the image outside a rectangle-shaped region.
- ***Inside Oval*** filters the image inside an oval-shaped region.
- ***Outside Oval*** filters the image outside an oval-shaped region.

Two sets of **X** and **Y Position** point controls set the size and location of the region of interest. If Region of Interest is set to Inside or Outside Rectangle, the sliders define the upper left and bottom right corners of the rectangle. If Region of Interest is set to Inside or Outside Oval, the sliders define a rectangle in which the oval is inscribed.

Increasing **Region Blend** softens the edges of the region.

Working with the BCC Glow Matte Filter

The BCC Glow Matte filter uses a blur with a gradient to create a glowing effect, then outputs an alpha channel instead of colors. This filter is useful for making semi-abstract mattes based on a glow of any channel in the original image.


Source image


Filtered image

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Glow is difficult to see at a grayscale print resolution. To view these illustrations in color, see the UserGuide.pdf, located on the Boris Continuum Complete CD.

The **Matte Layer menu** lets you choose the media from which the matte is derived. The choices are ***None, Filtered Layer, 1st Below*** or ***2nd Below***.

The **Glow Channel menu** sets the channel in the source image from which the glow is derived. 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.
- ***Luma Inverse*** uses the inverse of the luminance channel and multiplies it by the source alpha channel.
- ***Luma***, ***Red***, ***Green***, and ***Blue*** use the corresponding color channel and multiply it by the source alpha channel.
- ***Unmultiplied Luma*** and ***Alpha*** use the unmodified corresponding source channels.
- ***Luma Edges***, ***Alpha Edges, 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 one of these options is chosen, the **Source Edges** parameters apply.

Source Edges Parameter Group

The Source Edges parameter group provides additional control if either ***Alpha Edges***, ***Luma Edges***, ***Alpha Cartoon Edge*** or ***Luma Cartoon Edges*** is chosen in the Glow Channel menu. If ***Red, Green, Blue, Luma, Unmultiplied Luma, Luma Inverse*** or ***Alpha*** is chosen, these parameters have no affect.

If the Glow Channel menu is set to Luma Edges or Alpha Edges, **Thickness/Intensity** adjusts the width of the outlined edges. If the Glow Channel menu is set to Luma Cartoon Edges or Alpha Cartoon Edges, **Thickness/Intensity** adjusts the intensity of the edges.

Edge Pre Blur 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.

Edge Post Blur blurs the edges before they are used to create the applied light.

Cartoon Threshold sets the value in the threshold above which pixels are considered fully on. This parameter only applies when Luma Cartoon Edges or Alpha Cartoon Edges is chosen in the Glow Channel menu.

Blur Amount controls the amount of blur applied to the image to produce the glow effect. At a value of 0, no blur is applied, so no glow is visible. Higher values produce more blur and, therefore, more glow.

Increasing **Spread** affects each point in the rendered output more by points farther away in the blur. Animating Spread can cause visible jumps in the animated effect.

The **Blur Quality menu** controls the quality of the post blur applied to the glow. Choose ***Low***, ***Medium***, ***High, Higher*** or ***Highest***. There is a significant rendering cost to using High or Higher, and considerably more for using Highest.

Threshold adjusts the sensitivity of the filter to edges in the image. Increasing Threshold reduces the amount of glow created by weaker edges in the image, so less glow appears on smaller details in the source image.

Reducing this value to 0 tends to add noise to the image. For best results, use Threshold settings of 1 or above.

Overdrive adjusts the overall intensity of the glow created by the blur. Lower values producing a softer glow, mixing the blurred image with the resulting glow. Higher values produce a harder, more dramatic glow effect.

Overdrive Soften softens the overdrive mix that creates the glow, and makes it nonlinear. The affect of increasing Overdrive Soften is similar to, but not identical to the effect of reducing Overdrive.

The **Overdrive Apply Mode menu** controls how the glow portion of the effect composites over the blurred portion of the effect. The settings all correspond to apply modes. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Softness controls a blur that is applied to the glow after the Pre Blur and the Overdrive Mix are applied.

Adjust **Thickness/ Intensity** to scale the intensity of the glow.

Gamma controls the value of the middle tones while leaving the white and black of the image unaltered. The **Gamma** adjustment is made to the derived alpha. Increasing gamma spreads the alpha so that the matte is more opaque.

Alpha Offset controls an offset that is added to the output alpha. Create a transition by animating this from –100 to 100. At a value of -100, the entire image keys out. At a value of 100, the entire image is opaque.

The **Output menu** controls the output of the filter. You can also use this menu to preview the matte, or preview the source channel used by the filter to create the effect.

- ***Replace Alpha*** replaces the source alpha with the matte created by the filter.
- ***Screen Alpha*** screens the alpha channel created by the filter with the source alpha channel. Areas that are opaque in either alpha channel are opaque in the output.
- ***Multiply Alpha*** multiplies the alpha channel created by the filter with the source alpha channel. Only areas that are opaque in both alpha channels are opaque in the output.
- ***Difference Alpha*** subtracts the alpha channel created by the filter from the source alpha.
- ***View Matte*** displays a grayscale preview of the alpha channel created by the filter. Opaque regions are white, and transparent regions are black.
- ***View Inverse Matte*** inverts the matte created by the filter and displays a grayscale preview of the result.
- ***View Source*** displays the chosen Glow Channel menu setting in the source image. See page 406 for more information on the Glow Channel menu.
- ***Mask Source*** shows the source of the Matte with a ruby (50% red) mask applied to pixels that are transparent in the output.

Choke is applied after the output stage and will affect the composited matte. Adjusting choke will not affect the image if the output is set to View Matte or Mask Source.

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 affect of the filter by mixing it with the source image.

See “The PixelChooser” on page 603 for information on the PixelChooser parameters.

Working with the BCC Light Matte Filter

Light Matte uses applied light to create or modify an alpha channel. Rays of light spread from the light source point in all directions. As the rays expand, their intensities are affected by the luminosities of the pixels that they cross. The farther from the source the rays extend, the less they are affected by the intensities of new pixels that they cross. This process is referred to as attenuation, since the affect of the pixels on the intensity of the rays attenuates, or lessens, over time.

The BCC Light Matte can also be used as a transition. To create a transition, use the BCC Light MatteTR in the BCC Transitions category or apply the filter to two layers. For information, see "Applying BCC Effects as Transitions" on page 12.

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

An easy way to familiarize yourself with this filter is to adjust the Attenuation menu and Ray Length. After you become more familiar, use the Noise controls or the PixelChooser to create unique textured lights and mattes.

Light Source Parameter Group

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

Intensity adjusts the intensity of the light source.

The **Attenuation menu** chooses the type of mathematical process used to determine how the influence of pixels affecting the intensity of the rays of light changes over time. The choices are ***Expon Distance SQ***, ***Expon Distance***, ***Expon Distance Sqrt***, ***Distance SQ***, ***Distance***, and ***Distance Sqrt***. Experiment with the various modes to see which works best with your effect.

The following examples show the affect of Attenuation on the matte created by the filter.


Expon Distance SQ


Expon Distance


Distance SQ

Ray Length adjusts the length of the rays of light that emanate from the source. The length of the rays is also affected their Attenuation type.


Ray Length=35


Ray Length=50


Ray Length=100

Minimum Influence sets the minimum amount of influence the pixels have on the length of the rays in the effect. Increasing this value is similar to decreasing the Ray Length value.


Minimum Influence=10


Minimum Influence=30


Minimum Influence=60

Aspect adjusts the shape of the light rays and the resulting matte. Positive values stretch the rays and matte horizontally, and negative values stretch them vertically.

Advanced Parameter Group

These controls further adjust how the attenuation affects the image and provide several additional controls for finetuning the effect.

The **Attenuation Bias menu** determines how differences between the intensity of the pixels passed over by the rays and the intensity of the rays themselves affects their attenuation.

- If ***Off*** is chosen, the difference in intensity between an individual pixel and the ray crossing it does not affect the amount of influence the pixel has on the ray's intensity.
- ***One Way*** uses **Bias Amount** to determine how a pixel's influence affects its intensity. Increasing positive values cause pixels that are more intense than the rays passing them to have more influence on the intensity of the rays. This lightens the output. Decreasing negative values cause pixels that are less intense than the rays passing them to have more influence on the intensity of the rays. This darkens the output.

- ***Two Way*** works similarly to One Way, but causes a more pronounced effect. For example, if the Bias Value is positive, Two Way increases the influence of pixels that are more intense than the rays while simultaneously decreasing the influence of pixels that are less intense than the rays.

Increasing positive **HV Bias** values cause the rays to travel predominantly on horizontal and vertical lines. Decreasing negative values cause the rays to travel on lines that form a 45 degree angle with the horizontal axis.

Ray Holdout Radius sets where the rays of light and / or the attenuation 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.


Ray Holdout Radius= –10


Ray Holdout Radius=10


Ray Holdout Radius=20

Directional Tuning smooths the angular behavior of the light. For most purposes, you should leave this control at the default value.

Source Threshold subtracts the threshold from each pixel value when computing the light. This allows you to set a threshold level below which light is not generated.

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 fades the light more rapidly as you move away from the source image.

The **Light From Channel 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 chosen channel are considered to have higher intensities.

- ***Luma***, ***Red***, ***Green***, and ***Blue*** use the corresponding color channel with the source alpha information.
- ***Unmultiplied Luma*** uses the source luma channel but ignores the source alpha information. All pixels in the source are treated as fully opaque.
- ***Alpha*** uses the corresponding source channel.

- ***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 either is chosen, **Thickness/Intensity** adjusts the width of the outlined edges, and **Cartoon Threshold** sets the value in the image 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.


Luma


Unmultiplied Luma


Alpha


Alpha Cartoon Edges


Luma Edges


Red

Edges Parameter Group

If the Light From Channel menu is set to Luma Edges or Alpha Edges, **Thickness/Intensity** adjusts the width of the outlined edges. If the Light From Channel menu is set to Luma Cartoon Edges or Alpha Cartoon Edges, **Thickness/Intensity** adjusts the 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. This parameter only applies if the Light From Channel menu is set to Luma Edges, Alpha Edges, Luma Cartoon Edges, or Alpha Cartoon Edges.

Edge Bloom blurs the edges before they are used to create the applied light.This parameter is only available if the Light From Channel menu is set to Luma Edges, Alpha Edges, Luma Cartoon Edges, or Alpha Cartoon Edges.

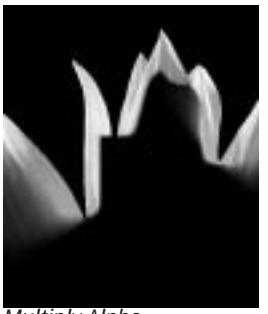
Cartoon Threshold sets the value in the threshold above which pixels are considered fully on. This parameter only applies when Luma Cartoon Edges or Alpha Cartoon Edges is chosen in the Light From Channel menu.

The **Apply Mode menu** determines how the alpha information created by the filter is composited with the source alpha (if any) to produce an output alpha channel. You can also use this menu to preview the matte or the source channel used by the filter.

- ***Replace Alpha*** replaces the source alpha with the matte created by the filter.
- ***Screen Alpha*** screens the alpha channel created by the filter with the source alpha channel. Areas that are opaque in either alpha channel are opaque in the output.
- ***Multiply Alpha*** multiplies the alpha channel created by the filter with the source alpha channel. Only areas that are opaque in both alpha channels are opaque in the output.
- ***Difference Alpha*** subtracts the alpha channel created by the filter from the source alpha.
- ***View Matte*** displays a grayscale preview of the alpha channel created by the filter. Opaque regions are white, and transparent regions are black.
- ***View Inverse Matte*** inverts the matte created by the filter and displays a grayscale preview of the result.
- ***View Source*** displays the chosen Light From Channel menu setting. In the examples below, this menu is set to Alpha Cartoon Edges.


Replace Alpha


Screen Alpha


Multiply Alpha


Difference Alpha


View Matte

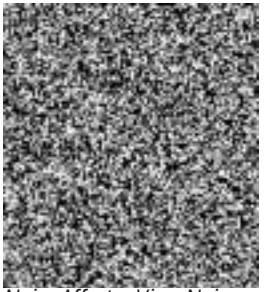

View Source

The **Noise Affects menu** determines which aspect of the effect is affected by the noise.

- When ***Off*** is chosen, the noise does not affect the output, and the remaining parameters in this section have no affect.
- ***Source Light*** causes the noise to affect the intensity of the source in the selected Light From Channel. See page 411 for more information on the Light From Channel menu.
- ***Attenuation*** causes the noise to affect the amount of attenuation the light rays experience as the emanate from the source and interact with the pixels they cross.
- ***Light*** causes the noise to affect the light output by the filter. This choice often creates somewhat grainy images.
- ***View Noise*** displays a grayscale preview of the noise.


Noise Affects=Attenuation


Noise Affects=Light


Noise Affects=View Noise

Noise Parameter Group

These controls add noise which can be used to randomly vary several aspects of the effect.

Noise Density sets the percentage of pixels that are affected by the noise.

Noise Intensity adjusts the intensity of the noise. Negative values cause the noise to have the opposite affect on the selected Noise Target as positive values.


Noise Intensity=50


Noise Intensity=100

Noise Blur applies a blur to the noise, creating a smoother, more organic, effect.

The **Noise Blur Quality menu** sets the quality of the Noise Blur. ***Box*** is the fastest option and is generally adequate unless Noise Affects is set to Light. It produces a blur similar in quality to the Blur filter. The remaining choices, ***Low***, ***Medium***, ***High***, and ***Highest*** produce gaussian blurs of increasing quality. These options increase rendering times proportionately.

When the **Bidirectional Noise checkbox** is selected, the noise affects the target both positively and negatively. For example, if the Noise Affects menu is set to Attenuation and Bidirectional Noise is selected, the attenuation both increases in some regions and decreases in other regions. If Bidirectional Noise is not selected, the attenuation increases in some areas, but does not decrease anywhere.


Bidirectional Noise=off


Bidirectional Noise=on

Seed determines which value is input to the random number generator used by the filter to create noise. Adjust this value when you like the overall effect but want to adjust the random configuration of the noise pattern. Animating Seed creates noise that varies from frame to frame, because the noise affects a different randomly chosen group of pixels in each frame. A constant value creates static noise that retains its appearance.

Perturbation and **Perturbation Seed** add a small amount of randomness to the numbers produced by Seed, creating noise patterns that differ from frame to frame by a controlled amount. The best way to do this is to make sure that Perturbation Seed changes by at least one unit from one frame to the next, unless you want the noise pattern to remain the same for some consecutive frames. Then adjust Perturbation to the desired amount of change.

Selecting the **Auto-Animate checkbox** auto-animates the noise by using a different random Seed for each frame. This can produce results that are quite chaotic and is best used with small amounts of noise.

Radial Matte Parameter Group

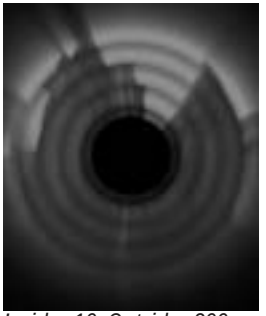
The Radial Matte controls allow you to selectively filter the image using a radial matte.

Select the **Radial Matte On checkbox** to turn on the radial matte. If this option is not selected, the Radial Matte parameters have no affect.

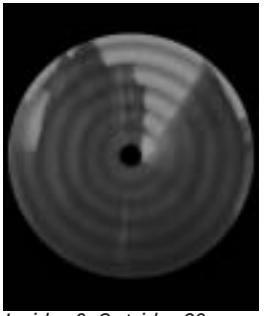
Inside Radius and **Outside Radius** set the radius of the inner and outer edges of the filtered region, respectively.

Inside Blend and **Outside Blend** soften the inner and outer edges of the filtered region, respectively. Higher values produce a softer edge.

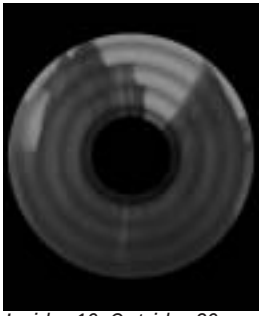
The following illustrations show adjustments to the Inside and Outside Radius values.



Inside=10, Outside=200



Inside=0, Outside=30



Inside=10, Outside=30

The Radial Matte controls provide an easy way to create a wipe. Try setting Inside Radius to 0 and animate Outside Radius from 0 to 200 to create a radial wipe.

The PixelChooser provides several methods to selectively filter an image. You can use the PixelChooser to create a matte between filtered and unfiltered pixels, either by specifying a geometric region or by using the image's luma or color information.

The Light Matte PixelChooser includes two additional PixelChooser parameters.

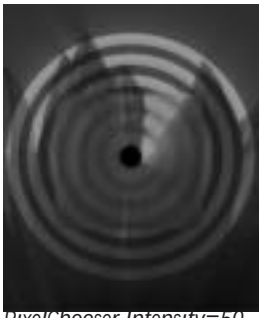
Pixel Chooser Intensity sets the intensity of the PixelChooser. At the default value of 100, this parameter has no affect. As the value decreases, the selectivity of the PixelChooser is reduced, so more pixels that would otherwise be excluded by the PixelChooser criteria are included in the selection. At a value of 0, all pixels are selected, so the other PixelChooser parameters have no affect. Decreasing negative values reverse the sensitivity of the PixelChooser, so more pixels that would otherwise be selected by the PixelChooser are

excluded from the selection. At a value of –100, the PixelChooser selection is completely inverted. Values below –100 or above 100 cause partially selected pixels to become less selected while leaving fully selected pixels unaffected.

If there are no partially selected pixels, PixelChooser Intensity values below –100 or above 100 have no affect.

In the following illustrations, the PixelChooser's Region controls are used to select pixels in a rectangular region at the center of the image.

PixelChooser Intensity=100

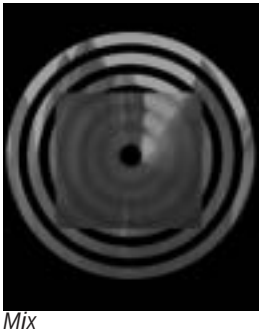


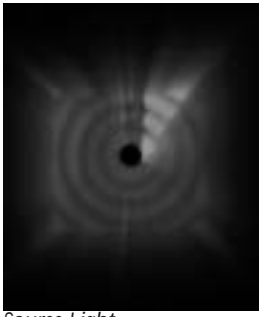
PixelChooser Intensity=50

PixelChooser= –50

The **PixelChooser Target menu** determines how the PixelChooser affects the output.

- ***Mix*** causes the PixelChooser to affect the output as it does in other filters, mixing the selected pixels, which are filtered, with the unselected, unfiltered source pixels.
- ***Light*** reduces the intensity of applied light in selected pixels. The reduction in intensity is scaled so that fully selected pixels are affected most, while partially selected pixels are affected less.
- ***Source Light*** reduces the intensity of the ambient light in the chosen Light From Channel light in selected pixels, darkening the image. The reduction in intensity is scaled so that fully selected pixels are affected most, while partially selected pixels are affected less. See page 411 for information on the Light From Channel.
- ***Attenuation*** reduces the attenuation of the rays of light in pixels that are partially selected. This tends to shorten the length of the light rays. In unselected regions, the light rays completely disappear.
- ***Attenuation Boost*** has the reverse effect of the Attenuation option.
- ***Off*** turns off the PixelChooser; the other PixelChooser parameters have no affect.


Mix


Source Light


Off

See “The PixelChooser” on page 603 for information on the remaining PixelChooser parameters.

Working with the BCC Light Wrap Filter

The BCC Light Wrap reflects a background image around the edges of a foreground image to form a border. This creates the illusion that light from the background image is reflected onto the foreground image. This creates a more convincing composite by making it appear as if the images were shot in the same environment.


Composited image


Composited using Light Wrap

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **View menu** lets you choose how to display the image.

- Choose ***Normal*** to view the composite of the background track wrapped around the edges of the source layer.
- Choose ***Wrap Only*** to view only the wrap (and not the source image) composited over the background track in the timeline.
- Choose ***Wrap on Black*** to view only the wrap (and not the source image) composited over a black background. This is useful when setting up the effect.


Normal


Wrap Only


Wrap on Black

The **Background menu** allows you to choose the media to use as the reflected source. You can use the ***Filter Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.*** Choosing ***None*** is the same as choosing the Filter Layer.

Lightness sets the lightness value of the reflected image. Negative values make the reflection darker and positive values make the reflection lighter


Lightness=-1


Lightness=.5


Lightness=1

The **Softness** parameter softens the edges of the border image that is reflected or wrapped.

Width controls the width of the reflection or wrap that is generated. Higher numbers result in a larger border. The following examples show the **View menu** set to ***Wrap On Black***.


Width=3


Width=20

The **Apply Mode menu** determines the method that is used to composite the border. For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

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 affect of the filter by mixing it with the source image.

The PixelChooser parameters are described in “The PixelChooser” on page 603. The BCC Light Wrap filter includes an additional PixelChooser parameter.

PixelChooser Intensity controls the intensity of the PixelChooser. At the default value of 100, this parameter has no affect. As the value decreases, the selectivity of the PixelChooser is reduced, so more pixels that would otherwise be excluded by the PixelChooser criteria are included in the selection. At a PixelChooser Intensity value of 0, all pixels are selected, so the other PixelChooser parameters have no affect. Decreasing negative values reverse the sensitivity of the PixelChooser, so more pixels that would otherwise be selected by the PixelChooser are excluded from the selection. At a value of –100, the PixelChooser selection is completely inverted. Values below –100 or above 100 cause partially selected pixels to become less selected while leaving fully selected pixels unaffected.

Working with the BCC Linear Color Key Filter

Linear Color Key creates a key based on the difference between the color of each pixel and the specified Key Color. The color comparison can be done in RGB or in HSL color space, and you can adjust the relative importance of each RGB channel with the RGB Weights parameters.

Linear Color Key also removes unwanted foreground objects or restores opacity to a transparent region in the foreground using Region of Interest controls. This is useful when the foreground has an isolated region that is similar in color to the background (for example, a person wearing a tie of the same color as the background).

Source image

Filtered image

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Output menu** determines how the filter output renders.

- ***Composite*** uses the new alpha channel, making portions of the image partially or completely transparent when composited over the new background.
- ***Composite - Inv Alpha*** inverts the new alpha channel.
- ***Show Matte*** displays the matte instead of the composite, allowing you to view the matte as you make adjustments.
- ***Show Invert Matte*** displays the inverted matte.
- ***Gel*** creates artistic gel effects using an alpha channel generated from the image. A Gel applies a transparent solid color, similar to a theatrical gel, to the source image. The alpha channel created by the filter is used to composite the chosen **Gel Color** over the background. See “Gel Color Parameter Group” on page 424 for more information.
- ***Gel - Inv Alpha*** inverts the new alpha channel and uses it to composite the Gel Color over the background. The Gel Color is set in the Gel Color Parameter Group. See “Gel Color Parameter Group” on page 424 for more information.
- ***Keep Color*** is useful only when the image already has an alpha channel. It is used to restore opacity to regions that were made transparent by a previous keying filter.

The **Color Matching menu** determines what type of color matching the filter uses to create the matte. At the default setting, ***RGB***, the filter performs color matching based on the RGB color values in each pixel. The other Color Matching options match colors in the HSL color space. They compute the Hue, Saturation, and Lightness of each pixel, and compare them with the HSL values of the Key Color. ***HSL*** matches Hue, Saturation, and Lightness; ***Chroma*** matches Hue and Saturation and ignores Lightness; and ***Hue*** matches only the Hue value.

HSL color matching takes considerably more time to render than RGB color matching. Chroma and Hue matching often key out pixels that appear quite different from the key color; in these modes the filter ignores one or two color channels in each pixel. The best approach to a difficult key is to try RGB color matching, and switch to HSL matching if the desired results are not achieved. You can also combine multiple linear keys and define a different Region of Interest around each area to key. For details, see "Combining Linear Keys" on page 397.

Key Color Parameter Group

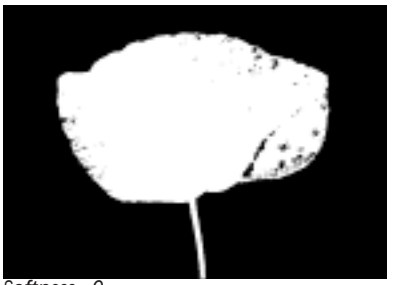
Key Color determine which portion of color space (the Key Color Region) is affected by the key. Key Color sets the color that keys out.

Similarity controls the range of values similar to the Key Color that are keyed. If Similarity is 0, the filter only keys out pixels that exactly match the key color. Increasing Similarity keys a wider range of colors.

Red Weight, **Green Weight**, and **Blue Weight** set the relative importance of each channel in RGB color matching. Increasing a channel's weight makes the filter more sensitive to differences between the corresponding channel value in each pixel and the key color and less sensitive to differences in the other channels. This narrows the range of colors that key out in the channel whose weight is increased, and widens the range in the other channels.

Softness and Post Blur create transitions between the transparent and opaque regions in the matte. A completely "hard" matte (with all pixels fully transparent or opaque) often looks sharp and unrealistic. Softness and Post Blur soften the matte by creating partially transparent pixels.

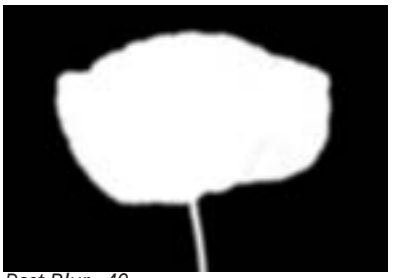
Softness softens the matte by increasing transparency in pixels that are close to the borders of the key color region. You can use Softness to soften the matte edges so the colors of the image change gradually from point to point, or to create artistic blended mattes in which the image gradually becomes transparent as you move into the Key Region.


Softness=0


Softness=40

Post Blur blurs the alpha channel after the matte is created. Use Post Blur to soften the edges in the matte for sources with high-contrast edges.


Post Blur=0


Post Blur=40

Softness does not increase rendering time, but Post Blur increases it substantially.

Gamma controls the value of the middle tones while leaving the white and black of the image unaltered. The **Gamma** adjustment is made to the derived alpha. Increasing gamma spreads the alpha so that the matte is more opaque.

Alpha Offset controls an offset that is added to the output alpha. Create a transition by animating this from –255 to 255. At a value of -255, the entire image keys out. At a value of 255, the entire image is opaque.

Choke adjusts the size of the opaque portion of the matte. Positive values expand the opaque areas, while negative values contract them.

Region Parameter Group

The linear keys allow you to define a Region of Interest. The key creates a matte only for pixels that lie within this region.

The **Region of Interest menu** determines the shape of the region in which the filter is applied. You can apply the filter inside or outside a rectangular or oval-shaped region, or choose ***All*** to filter all pixels in the image, regardless of their location. The remaining choices are ***Inside Rectangle***, ***Outside Rectangle***, ***Inside Oval,*** and ***Outside Oval.***

- ***All*** filters all pixels in the image, regardless of their location.
- ***Inside Rectangle*** filters the image inside a rectangle-shaped region.
- ***Outside Rectangle*** filters the image outside a rectangle-shaped region.
- ***Inside Oval*** filters the image inside an oval-shaped region.
- ***Outside Oval*** filters the image outside an oval-shaped region.

Two sets of **X** and **Y** position sliders control the size and location of the region of interest. If Region of Interest is set to Inside or Outside Rectangle, the sliders define the upper left and bottom right corners of the rectangle. If Region of Interest is set to Inside or Outside Oval, the sliders define a rectangle in which the oval is inscribed.

The **Outside Region menu** controls the processing of points outside the region. ***Make Transparent*** clears the alpha channel for these points. Use Make Transparent if you have chosen a region that includes all of the desired foreground (opaque) pixels. The ***Use Existing Alpha*** setting leaves these points unprocessed, and uses only the alpha information in the original image.

Gel Color Parameter Group

Gel Color allows you to set the color of the gel which is used to create artistic gel effects using an alpha channel generated from the image. A Gel effect applies a transparent solid color, similar to a theatrical gel, to the source image. The alpha channel created by the filter is used to composite the chosen **Gel Color** over the background.

Gel Color only has no affect unless the **Output menu** is set to ***Gel*** or ***Gel-Inv Alpha***.

Working with the BCC Linear Luma Key Filter

Linear Luma Key creates a key from a single channel in the source. This type of filter is called a luma key, because the key is usually created from the image luminance, but you can also use any single RGB channel. You might want to examine the individual channels of the source and use a channel that provides more contrast between the foreground and background than the luma channel.

Source image

Filtered image

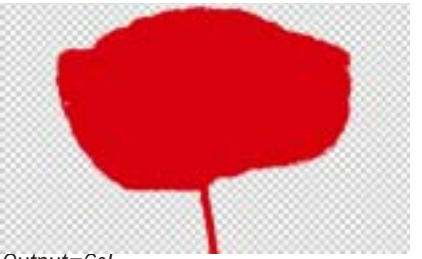
For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Make Key From menu** setting determines which channel (***Luma***, ***Red***, ***Green***, or ***Blue***) is used to construct the key.

The **Output menu** determines how the output of the filter is rendered.

- ***Composite*** uses the new alpha channel, making portions of the image partially or completely transparent when composited over the new background.
- ***Composite - Inv Alpha*** inverts the new alpha channel.
- ***Show Matte*** displays the matte instead of the composite, allowing you to view the matte as you make adjustments.
- ***Show Invert Matte*** displays the inverted matte.
- ***Gel*** allows you to create artistic gel effects using an alpha channel generated from the image. A Gel effect applies a transparent color, similar to a theatrical gel, to the source image. The alpha channel created by the filter is used to composite the chosen **Gel Color** over the background. Gel Color is set in the Gel Color parameter group. See “Gel Color Parameter Group” on page 427 for more information.
- ***Gel - Inv Alpha*** inverts the new alpha channel and uses it to composite the Gel Color over the background. The Gel Color is set in the Gel Color parameter group.

Output=Composite



Output=Gel

The **Key Type menu** determines how the key uses the Threshold value and the image's color or luminance information.

- ***Key Out Brighter*** keys out pixels whose value is higher than the Threshold value.
- ***Key Out Darker*** keys out pixels whose value is lower than the Threshold value.
- ***Key Out Similar*** keys out pixels whose value is close to the Threshold value, within the range set by Key Similarity.
- ***Key Out Dissimilar*** keys out pixels whose value is not close to the Threshold value, outside of the range set by Key Similarity.

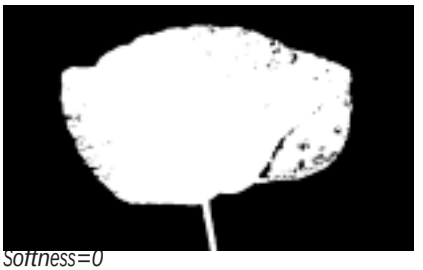
Key Type=Key Out Brighter

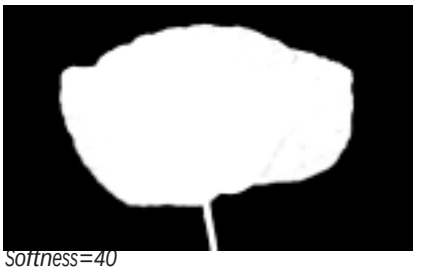
Key Type=Key Out Darker

Threshold controls the sensitivity of the key to changes in color or luminance. When Key Type is Brighter or Darker, pixels brighter or darker than the Threshold value key out, and the Key Similarity setting is ignored. When Key Type is Similar or Dissimilar, pixels whose brightness is close to the value of Threshold Level, and within (Similar) or outside of (Dissimilar), the range set by Key Similarity key out.

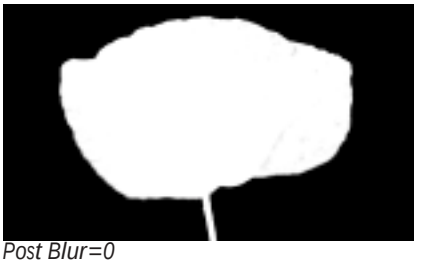
Similarity sets a range of luminance values for which pixels key out or are kept in, depending on whether Similar or Dissimilar is chosen as the Key Type. The Similarity value and the Key Type can create mattes that change from opaque to transparent as the luminance changes from black to white.

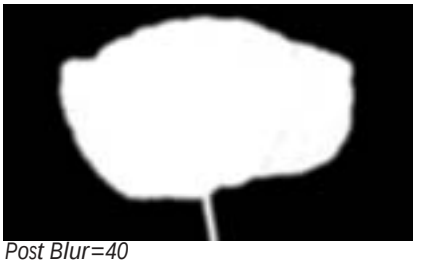
Softness softens the matte by increasing transparency in pixels that are close to the borders of the key color region. Use Softness to soften the matte edges so the colors of the image change gradually from point to point, or to create artistic blended mattes in which the image gradually becomes transparent as you move into the Key Region.


Softness=0


Softness=40

Post Blur blurs the alpha channel after the matte is created. Use Post Blur to soften the edges in the matte for sources with high-contrast edges.


Post Blur=0


Post Blur=40

Softness does not increase rendering time, but Post Blur increases it substantially.

Gamma controls the value of the middle tones while leaving the white and black of the image unaltered. The **Gamma** adjustment is made to the derived alpha. Increasing gamma spreads the alpha so that the matte is more opaque.

Alpha Offset controls an offset that is added to the output alpha. Create a transition by animating this from –255 to 255. At a value of -255, the entire image keys out. At a value of 255, the entire image is opaque.

Choke adjusts the size of the opaque portion of the matte. Positive values expand the opaque areas, while negative values contract them.

The Region parameters in Linear Luma Key are identical to the corresponding controls in Linear Color Key. See “Region Parameter Group” on page 423.

Gel Color Parameter Group

Gel Color sets the color of a gel which is used to create artistic gel effects using an alpha channel generated from the image. A Gel applies a transparent solid color, similar to a theatrical gel, to the source image. Gel Color only has no affect unless the **Output menu** is set to ***Gel*** or ***Gel-Inv Alpha***.

Working with the BCC Make Alpha Key Filter

Make Alpha Key creates a new alpha channel from one of the existing channels in the image and then applies levels and gamma corrections to the new alpha channel. Make Alpha Key also has a PixelChooser that determines which pixels are used to make the alpha channel. You can create many useful effects by making a Full On (completely opaque) alpha channel and using the PixelChooser to control which parts of the image key out.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Alpha Source Layer menu** chooses any layer in your timeline to use as the source layer. If you choose ***None***, the filtered layer is automatically used as the source.

The **Alpha From Channel menu** specifies the channel in the Alpha Source Layer used to create the output alpha channel.

- ***Luminance, Red***, ***Green***, and ***Blue*** create mattes that become more opaque as the pixels in the source channel become brighter. You can use such a matte to key out shadows in the source image. You might want to try all channels to see which produces the best matte for your purposes. The channel with the highest contrast is usually best to use.
- ***Alpha*** uses the alpha channel in the source. Use this mode if you are using alpha information from another layer that already has the desired matte.
- ***Full On*** and ***Full Off*** create a completely opaque or transparent matte. These settings can be useful when you use the PixelChooser with the filter.
- The Inverse settings (***Luma Inverse, Red Inverse***, ***Green Inverse***, and ***Blue Inverse***) create keys that become more opaque as the source channel becomes darker.
- The Folded settings (***Luma Folded, Red Folded***, ***Green Folded***, and ***Blue Folded***) create a solarized key that is opaque in the middle of the value range and transparent for the lowest and highest values in the source channel.

In this illustration, Alpha From Channel is set to Blue. The filter keys out portions of the image in which the blue channel value is closest to 0 and keys in the parts of the image in which the blue channel value is closest to 255. Thus the sky region is left opaque and the yellow flower is keyed out.

Setting the Alpha From Channel menu to Blue Inverse has the opposite effect. The filter keys out pixels whose blue channel value is highest and retains the pixels whose blue channel value is lowest.

If the Alpha From Channel menu is set to Blue Folded, the middle range of the blue channel becomes opaque and the highest and lowest blue values are both keyed out. This image does not contain many pixels with mid-range blue channels, so using the Blue Folded option makes the image almost entirely transparent.

The **Output menu** determines how the output of the filter is rendered.

- In ***Composite*** mode, the filter uses the new alpha channel, making portions of the image partially or completely transparent when composited over the new background.
- ***Composite Inv Alpha*** inverts the new alpha channel.
- ***Show Matte*** displays the matte instead of the composite, allowing you to view the matte as you make adjustments.
- ***Show Invert Matte*** displays the inverted matte.

Input Black and Input White determine which values in the alpha channel are purely transparent and purely opaque, respectively. All pixels more transparent than the **Input Black** level map to the Output Black transparency level, and all pixels more opaque than the **Input White** level map to the Output White transparency level. Increasing the Input Black value from the default setting of 0 increases the number of semi-transparent pixels that map to purely transparent (pure black in the matte). Decreasing the Input White value from the default setting of 255 increases the number of semi-transparent pixels that map to purely opaque (pure white in the matte).

You can increase Input Black to completely key out areas with low alpha values and decrease Input White to completely key in areas with high values. This is an effective way to create a matte that keys out shadows, keys in highlights, and leaves midtones partly transparent.

The following examples demonstrate the effect of Input Black and Input White adjustments on a matte.

This is the original image. Because the luminance in the sky and flower regions is about the same, it is better to make the alpha from a color channel. In this case, the blue channel provides the most contrast.

This is the initial matte made from Blue Inverse. Notice that the flower contains some gray areas that could cause the background image to show through, and the matte, in general, is rather low-contrast. You can remedy these problems using the Input controls.

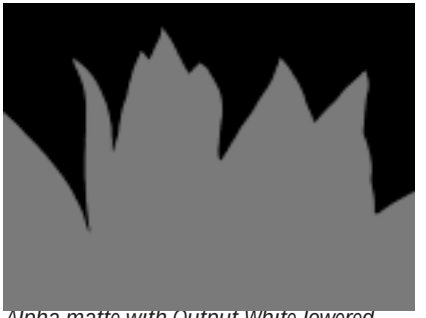
Decreasing Input White eliminates the light gray areas in the opaque part of the matte by increasing the number of gray values that map to white.

Increasing the Input Black value increases the number of gray values that map to black, increasing contrast in the matte.

Gamma controls the slope of the curve used to convert from the input color values to output values in pixels brighter than Input Black and darker than Input White. The **Gamma** adjustment is made to the derived alpha. Increasing gamma spreads the alpha so that the matte is more opaque.

The output levels control the range of transparency levels that can appear in the alpha channel. **Output Black** sets the minimum opacity of the image. Increasing Output Black lightens the black areas of the matte, increasing their opacity. **Output White** sets the maximum opacity of the channel. Decreasing Output White darkens the white areas of the matte, decreasing their opacity.

Alpha matte with Output Black raised



Alpha matte with Output White lowered

Post Blur is a blur that is applied to the alpha channel after the key is created. This parameter blurs the entire alpha channel, not just the part created by this filter. Use Post Blur to soften the edges of the matte for sources with high-contrast edges.

Alpha Offset controls an offset that is added to the output alpha. Create a transition by animating this from –255 to 255. At a value of -255, the entire image keys out. At a value of 255, the entire image is opaque.

Positive **Choke** values tighten the matte around the selected regions, while negative values pull the matte away from the edges of the selected regions.

The PixelChooser in this filter has one additional control. The **Input Alpha menu** sets how pixels not chosen by the PixelChooser are affected by the filter. Choose ***Alpha Off*** to make them opaque, ***Alpha On*** to make them transparent, or ***Layer Alpha*** to use the source alpha information for these pixels. See “The PixelChooser” on page 603 for information on the remaining controls.

Working with the BCC Matte Choker Filter

The BCC Matte Choker filter is a tool for the often frustrating task of adjusting mattes that are not quite right. A first-pass matte often includes unwanted holes in areas that should be opaque, and / or unwanted spots in areas that should be transparent. The Matte Choker filter can usually fix these problems.

Matte Choker uses an iterative technique to process the source alpha channel. In other words, the filter applies one stage of the process to the source image, then applies a second stage to the output of the first stage, and repeats the process using the output of each iteration as the input of the next.

This filter is particularly useful in conjunction with the BCC Chroma Key filter which does not include a built-in Choke parameter.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The first three controls affect Choke 1, whose output can then be passed through Choke 2 if needed.

Blur 1 softens the image’s alpha channel.

Positive **Choke 1** values push the tones in the matte toward transparent, tightening the edges of the matte around the foreground image. Negative values push the tones toward opaque, expanding the edges of the matte away from the foreground image.

Gray Soften 1 controls the amount of affect the Choke setting has. When Gray Soften is 100, the Choke value has no affect on the image. If Gray Soften is 0, the Choke acts as an alpha extract and produces a purely binary key.

To contract the matte to get rid of areas in the foreground, use a positive Choke value. Increase Blur to increase the softness of the transparent areas, and adjust Gray Soften to adjust the sharpness of the borders of the matte. To expand the matte, follow the same guidelines using a negative Choke value. You may also want to apply a choke in one direction and a second choke in the opposite direction to deal with problem areas created by the first choke. You can use the Iterations parameter to repeat adjustments a number of times.

Working with the Choker 2 Parameters

The second choke uses the Choke 1 output and applies the process again using **Blur 2**, **Choke 2**, and **Gray Soften 2**. These parameters are identical to Blur 1, Choke 1, and Gray Soften 1, except that they affect the output of the first choke rather than directly affecting the source.

Iterations determines the number of times the filter is applied. Some choking effects can only be achieved by repeatedly applying the same settings. Increasing Iterations increases rendering times proportionately.

Blur Quality controls the quality of the blur applied in the filter. Choose ***Low***, ***Medium***, ***High***, or ***Highest***. Low and Medium are adequate for simple matte smoothing, but to blur the edges of a high-contrast image or animate the blur, you probably need to use Highest. There is a significant rendering cost to using High, and considerably more for using Highest.

Iterations determines the number of times the filter is applied. Some choking effects can only be achieved by repeatedly applying the same settings. Increasing Iterations increases rendering times proportionately.

The **View Matte checkbox** allows you to view the matte as you make adjustments to it. Be sure to deselect this option before rendering.

Region Parameter Group

The Region parameters allow you to define a specific region of interest in which the filter is applied, leaving the rest of the image unchanged.

The **Region of Interest menu** sets the shape of the region. You can apply the filter inside or outside a rectangular or oval-shaped region, or choose ***All*** to filter all pixels in the image, regardless of their location. The remaining choices are ***Inside Rectangle***, ***Outside Rectangle***, ***Inside Oval,*** and ***Outside Oval.***

- ***All*** filters all pixels in the image, regardless of their location.
- ***Inside Rectangle*** filters the image inside a rectangle-shaped region.
- ***Outside Rectangle*** filters the image outside a rectangle-shaped region.
- ***Inside Oval*** filters the image inside an oval-shaped region.
- ***Outside Oval*** filters the image outside an oval-shaped region.

Two sets of **X** and **Y** position controls set the size and location of the region of interest. If Region of Interest is set to Inside or Outside Rectangle, the sliders define the upper left and bottom right corners of the rectangle. If Region of Interest is set to Inside or Outside Oval, the sliders define a rectangle in which the oval is inscribed.

Increasing **Region Blend** softens the edges of the region.

Working with the BCC Matte Cleanup Filter

Use Matte Cleanup to correct imperfect mattes and to make interesting matte effects.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Output menu** sets the display. ***Composite*** displays the composited effect. ***Show Matte*** allows you to view the matte as you adjust it. Set the Output menu to Composite before rendering.

Blend sets the amount of blur applied to the matte after level adjustments (see below) are made. You can use blend to feather matte edges or to create blurred title effects.

Choke adjusts the size of the opaque portion of the matte. Positive values expand the opaque areas, while negative values contract them.

Often a key can create an imperfect matte in which traces of the background color remain around the edge of the foreground subject, as in this image.

You can use the Choke parameter to shrink the opaque region and remove the green fringe around the subject’s head and shoulders. In this example, Choke has been over corrected, removing parts of the foreground.

In this image, Choke is correctly adjusted to remove remnants of the background color, while retaining all of the desired foreground pixels.

Black sets the alpha values in the matte that are treated as pure black (transparent) by the filter. All pixels whose alpha value is lower than the Black value are output as transparent. For example, if Black is 50, all pixels with a value of 50 or less are output to a value of 0. Increasing Black can help eliminate unwanted gray (semi-transparent) areas.

White sets the alpha values in the matte that are treated as pure white (opaque) by the filter. All pixels whose alpha value is higher than the White value are output as opaque. For example, if White is set to 200, all pixels with a value of 200 or more are output to a value of 255. Lowering White can help eliminate unwanted semi-transparent areas from the foreground.

Spread controls the width of the edge area used in making level adjustments.

Gain sets the maximum variance permitted within the edge area before the black and white thresholds are tested. Increasing Gain heightens the effect of changes to the Black and White parameters.

Processing is done in the following order: Level Adjustment, Blending, then Choking. To change the order, apply the filter several times adjusting one parameter each time.

Region of Interest Top-Left and **Region of Interest Bot-Right** define the upper left and bottom right corners of a rectangle within which the filter is applied. This is useful if you need to adjust the matte in a certain portion of the image. At the default Region of Interest settings, the entire image is included in the rectangle so that all pixels are affected by the filter.

Working with the BCC Motion Key Filter

The BCC Motion Key filter allows you to isolate and remove a moving foreground object based on motion estimation. For example, you have a static shot of some buildings and a car passes by on the street in front of the buildings. You could use this filter to remove the car and replace it with the buildings.

Original image

Filtered image

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Mode menu** is a preview control with the following options.

- Choose ***Remove Area*** to remove the selected area.
- ***Setup Region*** allows you to select the area to remove.
- ***Show Mask*** displays the image areas that were pieced together to replace the foreground object. The mask uses contrasting colors to distinguish the different areas. If the mask is empty or partly empty, there was an insufficient replacement area. This happens when the mask isn’t moving enough with respect to the background or the time range isn’t sufficient to uncover material for replacement.

The Motion Key filter is very render intensive. There can be a considerable delay when switching between the Mode menu settings.

The **Area Selection menu** determines the shape of the target area to replace. Before adjusting these controls, set the Mode menu to Setup Region. In general it is easier to use the onscreen point controls to set up your area. Then use the Area Corner position controls for finetuning.

- When ***Oval*** is chosen, the **Area Corner 1** position points determine the location of the upper left corner of a rectangle in which the oval is inscribed, while the **Area Corner 2** position points determine the location of the lower right corner. **Area Width** determines the width of the oval area.

- When ***Rectangle*** is chosen, the **Area Corner 1** position points determine the location of the left side of a rectangular area, while the **Area Corner 2** position points determine the location of the right side. **Area Width** determines the width of the rectangular area.
- When ***Spline*** is chosen, you can draw your own custom mask using onscreen controls. The shape you draw is animatable and can include up to 40 points. This is similar to the ***Custom*** option in the PixelChooser's **Shape menu**. For details, see "Creating an Animated Custom Mask" on page 619.

Spline Area Selection

Area to remove

Ideally the background outside your replacement area should include good contrast as well as vertical and horizontal edge definition. Repeating or uniform patterns such as grass or sky can be difficult to replace.

The Area Position / Offset, Area Scale and Area Rotate parameters are useful if you want to animate the position and scale of the area to replace to increase the accuracy of the results. **Area Position Offset** allows you to offset the area to replace on the X and Y axis. **Area Scale** allows you to scale the area to replace. **Area Rotate** allows you to rotate the area to replace.

First Replacement Frame and **Last Replacement Frame** set the first and last frame to be used as source material to fill the replacement area. This parameter can be used to limit the extent of a scene in a clip. The Motion Key filter will never search before the First Replacement Frame or after the Last Replacement Frame to find source material. These parameters use frame numbers, beginning at the start of the clip; they do not reference the clip's timecode.

Replacement Range limits the frames that can be used as source material relative to the current frame. For example, with a 30 fps project, if you set a value of **30**, the filter would not use source material that was more than 1 second away from the current frame. If the First or Last Replacement Frame is within this range, it uses the closer of the two.

Feathering softens the edges of the masked area.

Luma Compensation helps to compensate for luminance changes in the image. At a value of ***100***, this parameter alters the luminance of the areas taken from alternate frames to match the luminance of the current frame. This helps to correct small changes in lighting.

The **Tracking Mode menu** lets you choose how to calculate the tracker data. The tracking data is calculated for the area outside the selection area.

- ***Translation*** tracks the motion on the X and Y axis only.
- ***+Rotation*** takes motion and rotation into account when tracking the background.
- ***+Zoom*** takes motion, rotation and scaling into account when tracking the background.

Optical Flow Parameter Group

The Optical Flow parameters estimate the motion between adjacent frames of video and use that information to calculate the motion of the background. Optical Flow analyzes the frames before and after the current frame to determine which pixels need to be replaced. The tracking information is used to warp the images from the adjacent frames to cover the replacement area in the current frame.

Tracking Samples sets the number of samples that the filter takes. The filter breaks the images into a matrix; this parameter controls the number of cells in that matrix. Higher values produce more accurate analysis but increase rendering times.

Span sets the percent of the frame's pixels that are used to determine the frame's dominant motion. Increasing values can improve the tracking accuracy, but only to a point. This parameter is image-dependent. The default value works with a wide variety of images.

Edge Contrast sets a threshold for the minimum amount of detail in a region. Regions containing less detail than the threshold are treated as having no detail. If your image includes a lot of motion in areas that are very detailed or small objects, decrease this value. Min. Edge Contrast does not depend on the motion, only the texture and detail.

The **Resolution menu** adjusts the quality of the output. The choices are ***Full, Half, Quarter, Eighth, Sixteenth, 32nd*** or ***64th***.The optical flow estimation algorithm has sub-pixel accuracy, so ***Full*** may not be necessary to produce good results. In general, if the motion estimation appears incorrect, you may need to adjust the controls in the Velocity parameters, even if you increase the Optical Flow Quality.

- ***Full*** uses single pixel accuracy. Use this option if the motion of fine lines is blurred.
- ***Half*** uses half resolution accuracy, interpolated to full size.
- ***Quarter*** uses quarter resolution accuracy, interpolated to full size. This is the default.
- The remaining options use ***Eighth, Sixteenth, 32nd*** or ***64th*** resolution accuracy, respectively.

If the Optical Flow does not look correct at a particular frame, move to that frame and reduce the resolution. Adjust the Velocity parameters until you see a better output. Then increase the Resolution menu setting and finetune as necessary.

Velocity Limit constrains the magnitude of motion estimation. Decrease this value if the motion estimation appears incorrect. This value corresponds to a percentage of the size and resolution of the Source Layer. For example, when working with a D1 image, the value of 100 corresponds to approximately 100 pixels.

Low Velocity Correction sets a threshold for detecting motion in a region. If the Optical Flow moves an area that should not move, adjust the **Low Velocity Correction** value.

Mix with Original blends the source and filtered images. Use this parameter to animate from the unfiltered to the filtered image without adjusting other settings or to reduce the effect by mixing with the source image. At a value of 100, the image is unaffected by the filter.

Motion Tracker Parameter Groups

The Motion Tracker parameter groups allow you to track the motion of an object, then use the motion path data to control another aspect of the effect. The parameters that can be affected depend upon the filter.

In the Motion Key filter you can use the Motion Tracker to track the area to remove, by setting the **Apply menu** to ***Area Offset***. For details, see “Working with the Motion Tracker Parameter Groups” on page 29.

Working with the BCC PixelChooser Filter

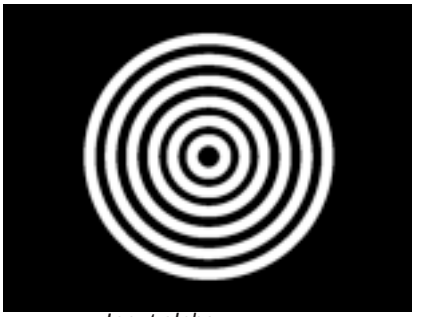
The PixelChooser filter is a standalone version of the PixelChooser parameter group used by many BCC filters. Like the PixelChooser in other filters, the standalone PixelChooser filter allows you to select pixels in the source based on their geometric positions or their luma or color information.

For more information on the PixelChooser see Chapter 10, “The PixelChooser” on page 603.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Output determines how the matte created by the filter is composited with the source alpha to produce the output. The illustrations below show the source image and the source’s input alpha channel used to create the examples that follow.

Source image



Input alpha

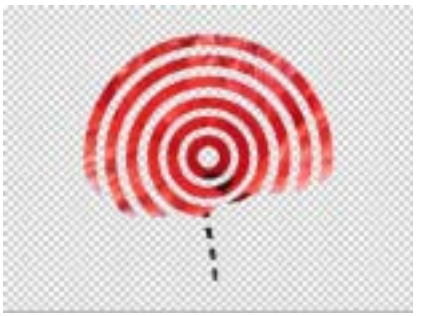
- ***B/W Matte*** ignores the source’s input alpha and displays a black and white matte in which fully selected pixels are black and fully unselected pixels are white.

- ***Alpha Channel*** ignores the source's input alpha and uses the PixelChooser selection to create a new alpha channel in which fully selected pixels are transparent, and fully unselected pixels are opaque.

- ***Multiply Alpha*** creates a new alpha channel from the PixelChooser selection in which fully selected pixels are transparent, and fully unselected pixels are opaque. This alpha channel is then multiplied with the source's input alpha channel. Only areas that are opaque in both alpha channels are opaque in the output.

- ***Screen Alpha*** creates a new alpha channel from the PixelChooser selection in which fully selected pixels are transparent, and fully unselected pixels are opaque. This alpha channel is then screened with the source's input alpha channel. All areas that are opaque in at least one of alpha channels are opaque in the output.

- ***Stencil Alpha*** creates a new alpha channel from the PixelChooser selection in which fully selected pixels are opaque, and fully unselected pixels are transparent. This alpha channel is then multiplied with the source's input alpha channel. Only areas that are opaque in both alpha channels are opaque in the output. Stencil is the opposite of Multiply Alpha.



  The remaining parameters in the filter are identical to the corresponding controls in the PixelChooser. See "The PixelChooser" on page 603 for more information.

Working with the BCC Star Matte Filter

Star Matte uses a ray burst effect to create or modify the source's alpha channel.

The BCC Star Matte filter can also be used as a transition. To apply a Star Matte as a transition, use the BCC TR Star Matte found in the BCC Transitions category.

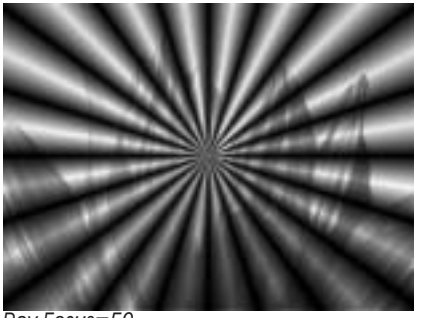
For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

Center Parameter Group

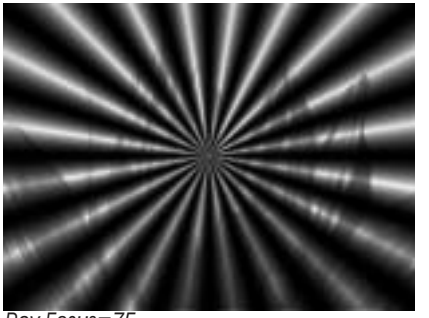
The **Center X** and **Y** position controls set the center point of the rays on the X and Y axis, respectively.

Intensity scales the alpha channel produced by this filter. This scales the intensity of the rays.

Ray Focus determines how much the rays are focused or narrowed. Higher values produce narrower rays.

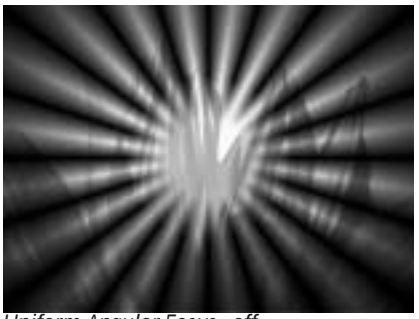


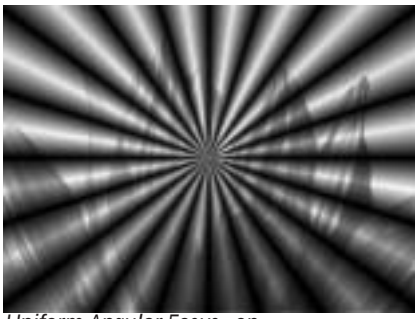
Ray Focus=50



Ray Focus=75

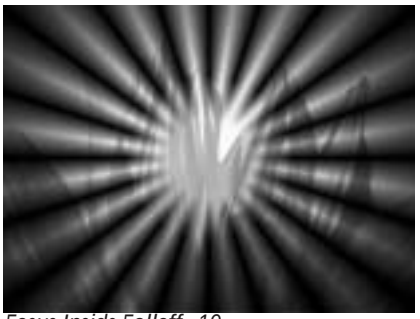
If the **Uniform Angular Focus checkbox** is selected, the rays focus uniformly from the center to the edges of the ray burst. If this option is not selected, you can create regions at the center of the ray burst and at the edges in which the rays are less focused.


Uniform Angular Focus=off

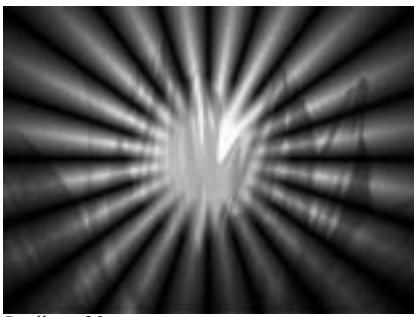

Uniform Angular Focus=on

Focus Inside Falloff softens the transition between the unfocused area at the center of the ray burst and the focused rays. Higher values produce a more gradual transition. This parameter has no affect if Uniform Angular Focus is selected.


Focus Inside Falloff=0

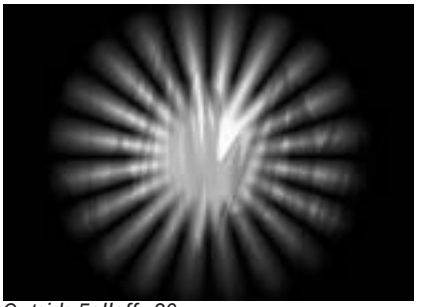

Focus Inside Falloff=10

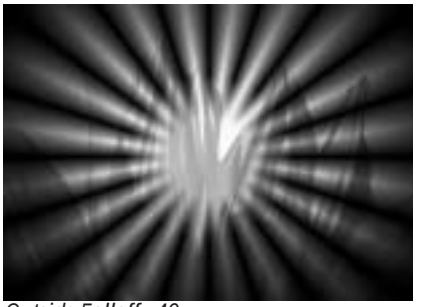
When Uniform Angular Focus is not selected, **Radius** sets the radius of the circle in the center of the ray burst in which the rays are less focused. Higher values produce a larger unfocused region.


Radius=20


Radius=60

As the rays extend outward beyond the Radius, they begin to fall off as their transparency increases. **Outside Falloff** adjusts the length of the rays beyond the Radius before they become transparent. Higher values produce longer rays.


Outside Falloff=20


Outside Falloff=40

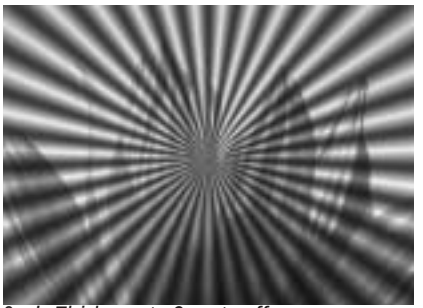
Aspect adjusts the shape of the ray burst. Positive values stretch the rays horizontally, and negative values stretch them vertically.

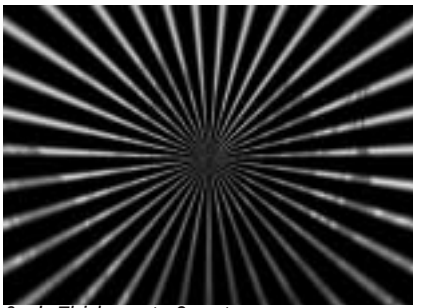
Rays Parameter Group

Count determines the number of rays in the effect.

Thickness sets the width of the rays. Higher values produce wider rays.

When the **Scale Thickness to Count checkbox** is selected, the Thickness value is scaled by the Count value. This causes the rays to become thinner as Count increases.


Scale Thickness to Count=off


Scale Thickness to Count=on

Rotation spins the rays around the point from which they emanate.

Angular Width determines the width of the angle in which the rays appear. At the default of 360, the rays emanate in a full circle. A setting of 90 produces a semicircle, and so on.

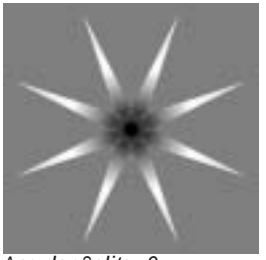
Increasing **Bunching** causes the distribution of rays within the Angular Width area to be less even, placing more rays closer to the specified Rotation angle.

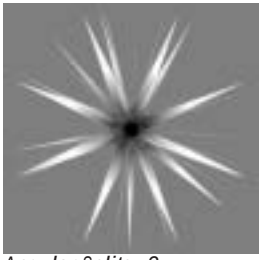
When the **Angular Splits On checkbox** is selected, the controls in the Angular Splits parameter group split each ray into multiple rays; a random number generator controls the pattern. When this checkbox is deselected, the Angular Splits parameters have no affect.

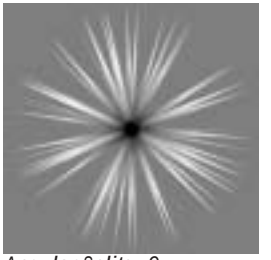
Angular Splits Parameter Group

The Angular Splits parameters can be used to split each ray into multiple rays.

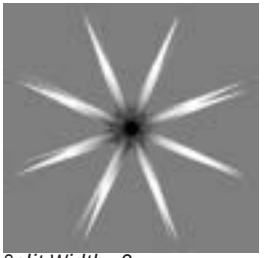
Angular Splits adjusts the number of splits created from each ray.

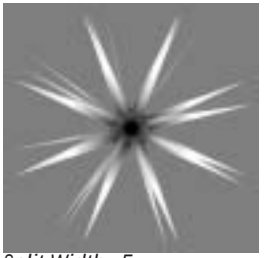

Angular Splits=0

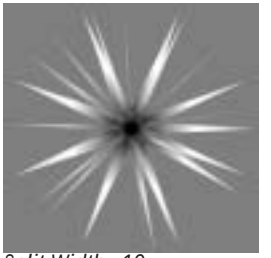

Angular Splits=3


Angular Splits=9

Split Width sets the angular distance between the split rays and the original rays.


Split Width=2


Split Width=5


Split Width=10

Split Fade Time controls how fast new rays reach their maximum intensity as the Angular Splits value is increased. Lower Split Fade Time values cause new rays to reach their maximum intensities more quickly.

The **Split Narrows Rays menu** determines how the Angular Splits value affects the thickness of the rays.

- ***Off*** leaves the thickness of the rays and angular splits unchanged regardless of the Angular Splits value.
- ***Low*** causes the rays and angular splits to narrow as the Angular Splits value increases.
- ***High*** works similarly to Low, but causes the Angular Splits value to have an even more pronounced affect on the widths of the rays and splits.

The **Split Variance Type menu** controls the type of number series used to position the angular splits.

- ***Noise*** uses a random number sequence. When Ray Variance Type is set to Noise, the **Seed** value is used as the input value by the random number generator.
- ***Fractal*** uses a sequence derived from fractal math. When Fractal is chosen, low **Multiplier** and **Start** values produce a regular series, and high values produce a more chaotic series.
- ***Constant*** offsets all of the angular splits' positions uniformly by the chosen **Amount**.
- The remaining choices correspond to waveforms. When one of the waveform options is chosen, **Frequency** sets the frequency of the wave, and **Phase** sets the starting phase.

Variance 1 and Variance 2 Parameter Groups

The two sets of Variance controls can vary almost any attribute of the ray effect. Each Variance group varies up to three attributes of the rays using a sequence of random or ordered numbers. Each Variance group uses the same controls, which are described below.

Select the **Variance On checkbox** to turn on the variance. Deselect this option to turn off the variance.

The **Variance Type menu** controls the type of number series used to vary the selected attributes of the effect.

- ***Noise*** uses a random number sequence. When Ray Variance Type is set to Noise, the **Seed** value is used as the input value by the random number generator.
- ***Fractal*** uses a sequence derived from fractal math. When Fractal is chosen, low **Multiplier** and **Start** values produce a regular series, and high values produce a more chaotic series.
- ***Constant*** varies the attributes uniformly by the specified **Amount**.
- The remaining choices correspond to waveforms. When one of the waveform options is chosen, **Frequency** sets the frequency of the wave, and **Phase** sets the starting phase.

Variance Destination 1, **Variance Destination 2**, and **Variance Destination 3** allow you to choose up to three different parameters to affect by the variance.

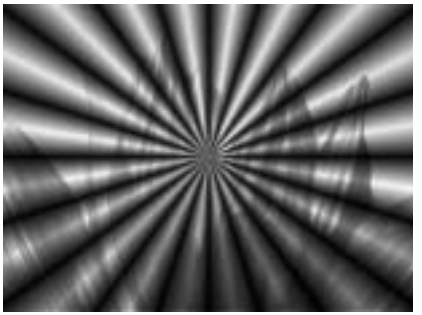
- ***Off*** turns off the Variance Destination, so it affects no parameter.
- ***Thickness*** varies the thickness of the rays. The Thickness parameter is set in the Rays parameter group.
- ***Angle*** varies the angular position of the rays, leaving them unevenly spaced.
- ***Focus Intensity*** varies the opacity of the Focus Matte making some rays fade away and others become more opaque for most of their thickness.
- ***Focus*** is a matte that focuses the rays, causing some rays to appear narrow and more focused and others to appear wider and less focused.

Each Variance Destination has an Amount and Skip control which appear when the destination is set to any choice other than Off. **Amount** determines the amount of variation applied to the chosen destination. **Skip** sets the number of elements in the sequence that are skipped before the numbers are used.

If Variance Type is Noise, you can use Skip to produce a completely different set of random numbers for each Variance Destination. If Variance Type is Fractal or one of the wave options, Skip allows you to manipulate the relationship of the patterns produced by each of the Variance Destinations.

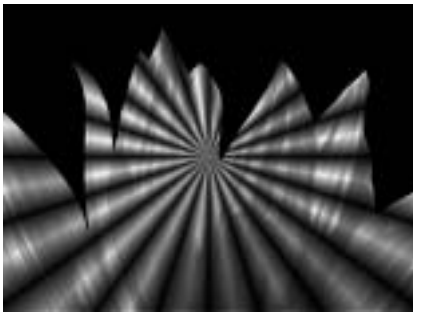
The **Apply Mode menu** determines how the alpha information created by the filter is composited with the source alpha to produce an output alpha channel. You can also use this menu to preview the matte.

- ***Replace Alpha*** replaces the source alpha with the matte created by the filter.

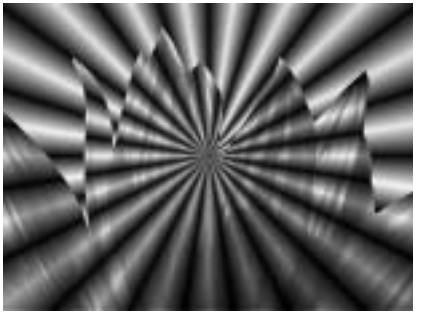


- ***Screen Alpha*** screens the alpha channel created by the filter with the source alpha channel. All areas that are opaque in at least one of alpha channels are opaque in the output.

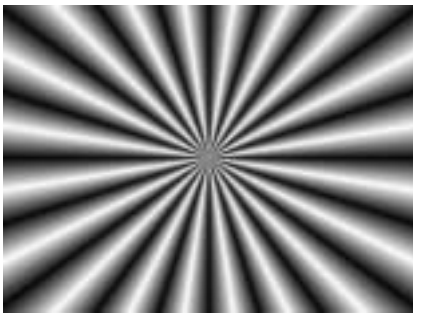
- ***Multiply Alpha*** multiplies the alpha channel created by the filter with the source alpha channel. Only areas that are opaque in both alpha channels are opaque in the output.



- ***Difference Alpha*** subtracts the alpha channel created by the filter from the source alpha.



- ***View Matte*** displays a grayscale preview of the alpha channel created by the filter. Opaque regions are white, and transparent regions are black.



- ***View Inverse Matte*** displays a grayscale preview of an inverted version of the matte created by the filter.

Gamma controls the value of the middle tones while leaving the white and black of the image unaltered. The **Gamma** adjustment is made to the derived alpha. Increasing gamma spreads the alpha so that the matte is more opaque.

Alpha Offset controls an offset that is added to the output alpha. Create a transition by animating this from –255 to 255. At a value of -255, the entire image keys out. At a value of 100, the entire image is opaque.

Choke applies a choke to the image. Positive Choke values tighten the matte around the selected regions, while negative values pull the matte away from the edges of the selected regions.

Working with the BCC Two Way Key Filter

Two Way Key is useful for keying out a range of colors while retaining one color in the range. Two Way Key works by using a Key Color to determine which color is keyed out, then using a Keep Color to restore opacity to selected colors in the range. You can also adjust the range of colors to key out and key in using the Similarity controls.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

This image shows the original source image, which contains a range of blue pixels to key out.

In this example, Two Way Key is applied and the Key Color is set to a medium blue. When Key Similarity is increased to key out the full range of blue pixels, some of the foreground pixels also key out, creating holes.

In this example, Keep Color is set to a light pink to match the light areas of the foreground image. When Keep Similarity is increased, opacity is restored to these regions.

The **Output menu** setting determines how the output of the filter is rendered.

- ***Composite*** uses the new alpha channel, making portions of the image partially or completely transparent when composited over the new background.
- ***Composite - Inv Alpha*** inverts the new alpha channel.

- ***Show Matte*** displays the matte instead of the composite, allowing you to view the matte as you make adjustments.
- ***Show Invert Matte*** displays the inverted matte.
- ***Gel*** allows you to create artistic gel effects using an alpha channel generated from the image. A Gel effect applies a transparent solid color, similar to a theatrical gel, to the source image. The alpha channel created by the filter is used to composite the chosen **Gel Color** over the background.
- ***Gel - Inv Alpha*** inverts the new alpha channel and uses it to composite the Gel Color over the background.

Key Color Parameter Group

Key Color and **Similarity** determine which portion of color space (the Key Color Region) is affected by the key. Key Color sets the color that keys out. Similarity controls a range of values similar to the Key Color that key out. If Similarity is 0, the filter only keys out pixels that exactly match the key color. Increasing Similarity keys a wider range of colors.

Keep Color Parameter Groups

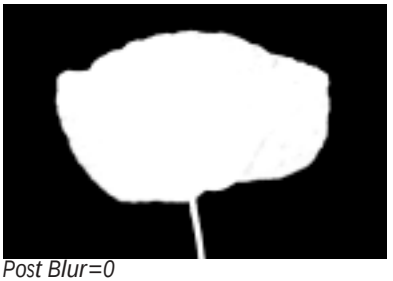
Keep Color and **Keep Similarity** determine which portion of color space is not affected by the filter. Keep Color sets the color that is retained in the image. Pixels whose channel values match the Keep Color remain opaque even if the they are within the Key Color region. Keep Similarity controls the range of values similar to the Keep Color that remain opaque. If Keep Similarity is 0, the filter only keeps in pixels that exactly match the Keep Color. Increasing Keep Similarity keeps in a wider range of colors.

Softness softens the matte by increasing transparency in pixels that are close to the borders of the key color region. You can use Softness to soften the matte edges so the colors of the image change gradually from point to point, or to create artistic blended mattes in which the image gradually becomes transparent as you move into the Key Region.

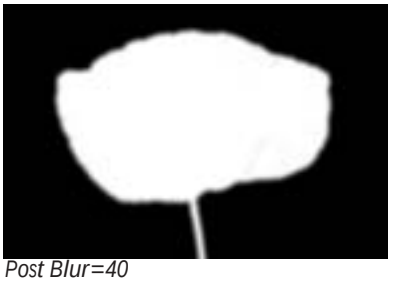
Softness=0

Softness=40

Post Blur blurs the alpha channel after the matte is created. Use Post Blur to soften the edges in the matte for sources with high-contrast edges. Softness does not increase rendering time, but Post Blur increases it substantially.



Post Blur=0



Post Blur=40

Gamma controls the value of the middle tones while leaving the white and black of the image unaltered. The **Gamma** adjustment is made to the derived alpha. Increasing gamma spreads the alpha so that the matte is more opaque.

Alpha Offset controls an offset that is added to the output alpha. Create a transition by animating this from –255 to 255. At a value of -255, the entire image keys out. At a value of 100, the entire image is opaque.

Choke applies a choke to the image. Positive Choke values tighten the matte around the selected regions, while negative values pull the matte away from the edges of the selected regions.

The Region parameters in Two Way Key are identical to the corresponding controls in Linear Color Key. See “Region Parameter Group” on page 423 for details.

The Gel Color parameters in Two Way Key are identical to the corresponding controls in Linear Color Key. See “Gel Color Parameter Group” on page 424 for details.

Working with the BCC Wire Remover Filter

BCC Wire Remover removes wires and unwanted objects from still or moving images by either cloning or blending pixels together from surrounding areas. This filter has several uses. When working with blue or green screen shots, use this filter to remove wires or eliminate unwanted rigs or objects prior to keying. You can also use this filter to blend replacement pixels over video dropouts or film scratches.

The Wire Remover filter includes two motion tracker parameter groups. This allows you to track the ends of the wire if the ends move.

Original Image

Filtered Image

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The BCC Wire Remover’s PixelChooser can be a powerful tool when removing wires or rigs from moving images.

Working with Multiple Wire Remover Filters

In many instances you will need to apply multiple Wire Remover filters. For example, you may need to remove several wires from an image. To do this, apply a second Wire Remover filter directly to the same clip.

The **Method menu** offers three methods of applying the effect to the image.

- ***Cover*** uses pixels from the sides of the area that is defined by the **End Point 1**, **End Point 2** and **Width** parameters. When you choose this option, **Noise** adds noise to the Cover. Adding Noise is useful if the background has detail such as grass. The example above shows the Cover method.

- ***Mask*** creates a mask between the area that is defined by the End Point and Width parameters. Underlying tracks in the timeline are visible through this area. This method is useful if you are keying the image with wires, or a portion of that image over another track. The example above shows the same result as if you masked it with a clear sky as the underlying track.
- ***Clone*** fills the area that is defined by the End Point and Width parameters with the image taken from underneath the specified Clone Center. When you choose this option, **Clone Center X** and **Clone Center Y** set the center point of the area that is used as the source for the clone and **Clone Time Offset** lets you clone from different frames in the timeline.

The **View menu** sets the display.

- ***Render*** displays the rendered effect. Be sure to set this menu to Render before rendering your effect.
- ***Preview Area*** displays a red mask over the area that is defined by the End Point and Width parameters. You should use this option to setup your effect. The following example shows two Wire Remover filters applied to an image, one for each wire.


Preview Area


Render

The **End Point 1** and **End Point 2** position controls set the start and end point of the line on the X and Y axis, respectively. This determines where the effect is positioned.

Width sets the width of the effect area (defined by the End Point parameters), in pixels. In the following example, two Wire Remover filters are used, one for each wire. The wire on the left is thinner; a Width of 4.5 was used. The Wire on the right is set to a Width of 8.

Feathering softens the edge of the defined effect area.

Noise adds noise when you choose Cover from the Method menu. Adding Noise is useful if the background has detail such as grass.

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 affect of the filter by mixing it with the source image.

The BCC Wire Remover PixelChooser includes an additional PixelChooser parameter.

Pixel Chooser Intensity controls the intensity of the PixelChooser. At the default value of 100, this parameter has no affect. As the value decreases, the selectivity of the PixelChooser is reduced, so more pixels that would otherwise be excluded by the PixelChooser selection criteria are included in the selection. At a PixelChooser Intensity value of 0, all pixels are selected, so the other PixelChooser parameters have no affect. Decreasing negative values reverse the sensitivity of the PixelChooser, so more pixels that would otherwise be selected by the PixelChooser are excluded from the selection. At a value of –100, the PixelChooser selection is completely inverted. Values below –100 or above 100 cause partially selected pixels to become less selected while leaving fully selected pixels unaffected.

If there are no partially selected pixels, PixelChooser Intensity values below –100 or above 100 have no affect.

See “The PixelChooser” on page 603 for information on the remaining PixelChooser parameters.

Working with Motion Tracker Parameter Groups

The Motion Tracker parameter groups allow you to track the affected area if it moves in the image. The two Motion Tracker parameter groups offers functionality that is similar to the standalone Witness Protection filter. See "Working with the BCC Witness Protection Filter" on page 288 for more information.

The following steps below provide an overview of the motion tracking process.

1. Use the parameters in the Motion Tracker parameter group to setup the Target. The Target indicates the area in the media to track. In general, you should manually set up both the first and last keyframe so that the Target points are positioned over the End Point 1. Set the **Apply menu** to ***End Point 1***.
2. Repeat the first step, using the parameters in the Motion Tracker 2 parameter group so that the Target points are positioned over the End Point 2 (assuming that both the End Point 1 and End Point 2 move). Set the **Apply menu** to ***End Point 2.***
3. Analyze the motion by selecting the **Track On-The-Fly checkbox** and clicking **Play**.

   The filter generates tracking data.
4. Manually correct any errors. See "Manually Correcting Errors" on page 291 for details.

Instead of tracking an End Point, you can choose ***PixelChooser*** to use a choice in the PixelChooser Region's Shape menu to track the filter within the specified area.

Selecting the **Reset Tracker checkbox** resets the parameters in the Motion Tracker parameter group.

The **Tracking Source Layer menu** allows you to choose a layer in the timeline to use as the source for the filter. You can use the ***Filter Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.*** Choosing ***None*** is the same as choosing the Filtered Layer. In general, you want to use the Filter Layer.

When the **Track On-the-Fly checkbox** is selected and you press **Play**, the filter calculates the tracking data. When you select this checkbox, the selected effect does not display in the Composer window.

The **X** and **Y Position** controls set up the area to track. However, in general it is easier to use the onscreen point controls to set this up. Then use the position control sliders for finetuning.

Target Width sets the size of the area to track. Increasing this value increases preview time but can increase the accuracy of the tracking.

The **Apply menu** determines which point the Motion Tracker data affects. The choices are ***None, End Point 1, End Point 2*** and ***Both***.

Offset X and **Offset Y** allow you to offset the effect on the X and Y axis respectively. This is useful if you want to track one area, then apply the effect to a different area.

Chapter 7
Lights Filters

Working with the BCC Edge Light Filter

The Edge Light filter finds edges based on pixel-to-pixel differences in any chosen channel in the source image or an Edge Source Track and applies light to these edges. Highlights and Shadows are independently computed and can be blurred and applied separately to the source.


Source image


Filtered image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Edge Layer menu** sets the layer used to generate edges. You can use the ***Filter Layer***, or one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

The **Edges From menu** determines which source channel is used to compute edges. You can create edges from the ***Alpha***, ***Luma***, ***Red***, ***Green*** or ***Blue*** channels.

Edge Light uses a synthetic light source to light the edges. The position of this light source is controlled by the Light Direction and Light Elevation.

Light Direction sets the direction that the light comes from; **Light Elevation** sets the elevation of the light source above the image plane. Increasing Light Elevation makes the edge lighting appear less directional. At a Light Elevation of 100, Light Direction has no affect.

Highlights Parameter Group

The Highlights parameters control the appearance of the highlights on the edges.

Highlight Intensity controls the intensity of the highlights.

Highlight Color sets the color of the highlights.

Highlight Post Blur blurs the highlights after they are applied to the source.

The **Highlight Apply Mode menu** controls how the highlights are composited with the source image. For descriptions of all the Apply Modes, see “Apply Modes” on page 625.

Highlight Apply Mix controls the mix of the specified Highlight Apply Mode with the ***Normal*** apply mode. If the Highlight Apply Mode is Normal, Highlight Apply Mix has no affect. If Highlight Apply Mix is 0, Highlight Apply Mode has no affect. Increase Highlight Apply Mix to blend the Highlight Apply Mode setting with the Normal apply mode.

Increasing **Background Follow** causes the ambient light and the shadows to fall off in regions of the image that are lit by highlights. Use Background Follow if you want the Highlight Color to replace the ambient light and shadows.

You can add highlights to 2D text to create a subtle 3D appearance. To create an effect similar to the following example, increase the Intensity of the highlights and shadows, then soften the edge lighting by slightly increasing Post Blur.

Original text

Text with Edge Light

Shadows Parameter Group

The Shadows parameters control the appearance of the shadows on the edges.

Shadow Intensity controls the intensity of the shadows.

Shadow Color sets the color of the shadows.

Shadow Post Blur blurs the shadows after they are applied to the source.

The **Shadow Apply Mode menu** controls how the shadows are composited with the source image. For descriptions of the Apply Modes, see “Apply Modes” on page 625.

Shadow Apply Mix controls the mix of the specified Shadow Apply Mode with the ***Normal*** apply mode. If the Shadow Apply Mode is Normal, Shadow Apply Mix has no affect. If Shadow Apply Mix is 0, Shadow Apply Mode has no affect. Increase Shadow Apply Mix to blend the Shadow Apply Mode setting with the Normal apply mode.

Common Parameter Group

The Common parameters offer a variety of options for adjusting the filter, allowing you to finetune the appearance of the effect.

Pre Blur blurs the source image before the edges are computed.

Threshold determines how sensitive the filter is to differences between pixels when finding edges in the source image. The affect of this setting depends on the nature of the source image. Changes to the Threshold value affect both Shadows and Highlights.

Threshold is intended more for adjusting the look of the edges than for animation. Some images change dramatically when Threshold is animated.

The filter eliminates edges whose intensity is lower than the **Edge Floor** value. Increase Edge Floor to eliminate stray edges from the output to enhance or light only the strongest edges in the image. Adjustments to the Edge Floor affect both Shadows and Highlights.

Ambient Light adjusts the total amount of diffuse light on the image. The default setting of 100 does not add or subtract ambient light from the source image. Decreasing this setting makes the image darker before the other light is applied. Ambient light illuminates or darkens the image evenly, and is unaffected by any other lighting parameters.

The **Post Blur Quality menu** adjusts the quality of the Post Blur. Choose ***Low***, ***Medium***, ***High***, ***Higher***, or ***Highest***. There is a significant rendering cost to using High, and considerably more for using Highest. Low and Medium are adequate for simple matte smoothing, but if you want to blur the edges of a high-contrast image or animate the blur, you may need to use Highest.

The **Alpha From menu** determines how the filter creates the output alpha channel. When Alpha From is set to ***Source***, the filter uses the input alpha channel. The other options allow you to use only the ***Highlight*** edges or a combination of both the ***Source and Highlight*** information or of the ***Highlight and Shadow*** edges. ***Full*** creates a completely opaque alpha channel, which is helpful if you want to use the PixelChooser with this filter.

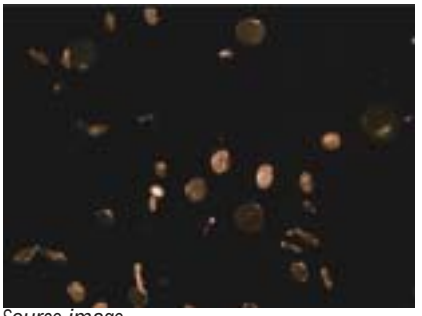
The **View menu** is a preview control. Choose ***Output*** to view the filter's output. Choose ***Highlights*** or ***Shadows*** to view either set of edges in black and white. Choose ***Both*** to see a preview of both the highlights and shadows. Switch to Output before rendering.

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.

For information on the PixelChooser parameter group controls, see "The PixelChooser" on page 603.

Working with the BCC Glare Filter

The Glare filter creates an effect producing a sharp reflection. A luminance map creates the glare based on bright areas in the image.

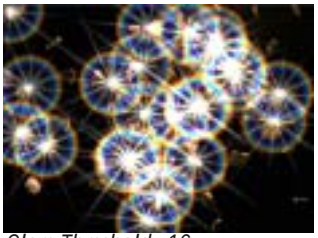

Source image

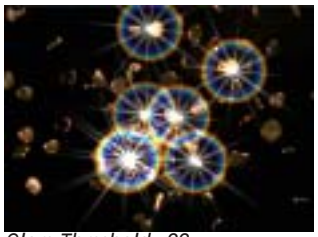

Filtered image

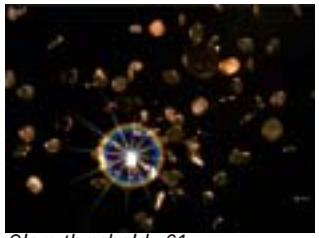
For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24, “Working with the Drop Shadow Parameter Group” on page 25 and “Working with the Motion Tracker Parameter Groups” on page 29.

You must have a supported OpenGL card and driver to use the BCC Glare filter. For information on supported configurations, see “Working with OpenGL” on page 37 or the Understanding OpenGL PDF on your Boris CD.

Glare Threshold uses a luminance map to create glare based on a bright area in the image. The effect is created on any area with a luminance value above the specified Threshold. If you decrease this value, more glare is created; if you increase it, less glare is created.


Glare Threshold=16


Glare Threshold=33


Glare threshold=61

Glare Brightness sets the brightness of the glare.

Glare Scale sets the scale of the glare.


Glare Scale=1

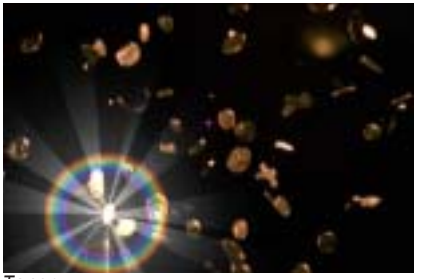

Glare Scale=2

Glare Scale Aspect adjusts the shape of the glare. Positive values stretch the glare horizontally, and negative values stretch it vertically.

Glare Angle sets the angle of the glare.

Glare Ray Color sets the color of the glare.

The **Glare Ray Shape menu** sets the shape of the glare.The choices are ***Taper*** and ***Straight***. When Taper is chosen, the rays spread outward in the shape of a fan.


Taper


Straight

Glare Ray Width and **Glare Ray Height** set the size of the rays on the X-axis and Y-axis.


Glare Ray Height=1


Glare Ray Height=2

Glare Ray Counts determines the number of rays in the effect.

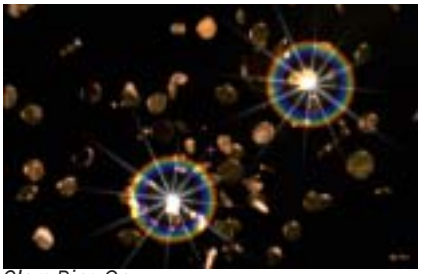
Glare Ray Scale Variance varies the size of the rays. Increasing Size Variance increases the variety of sizes in the effect. Leaving this parameter at the default setting of 0 ensures that each ray uses the assigned Scale value.

Glare Ray Scale Seed determines the value input to the random number used by the filter to change the size of the rays. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the sizes. If Glare Scale Variance is 0, this parameter has no affect.

Glare Ray Color Variance varies the color of the rays. Increasing Glare Color Variance increases the variety of colors in the effect. Leaving this parameter at the default setting of 0 ensures that each ray uses the assigned Color value.

Glare Ray Color Seed determines the value input to the random number used by the filter to change the color of the rays. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the colors. If Glare Color Variance is 0, this parameter has no affect.

Selecting the **Glare Ring On checkbox** creates a hollow donut-shaped ring of light around the glare. If this checkbox is not selected, the other Ring parameters have no affect.

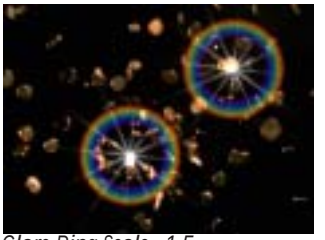


Glare Ring On

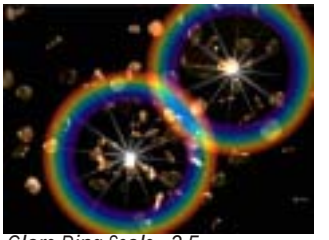
Glare Ring Off

Glare Ring Scale sets the scale of the ring.

Glare Ring Scale=.5



Glare Ring Scale=1.5

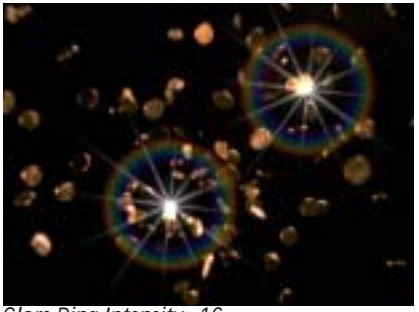


Glare Ring Scale=2.5

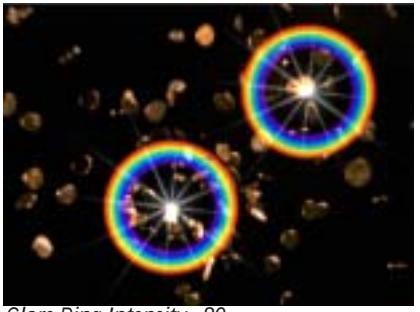
Glare Ring Saturation adjusts the intensity of each color's hue in the glare. Negative values desaturate the ring, while positive values increase the saturation of the ring.

When the **Glare Ring On checkbox** is selected, the **Glare Ring Red Amount**, **Glare Ring Green Amount**, and **Glare Ring Blue Amount** adjust the weight of the corresponding color channel in creating the glare ring.

Glare Ring Intensity controls the intensity or brightness of the ring.



Glare Ring Intensity=16



Glare Ring Intensity=80

The **Glare Alpha Map Layer menu** determines how the glare uses alpha channel information. The Alpha Map works in conjunction with the Glare Preserve Alpha parameter to determine how much glare to apply within the alpha channel area. You can use the ***Filter Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

Glare Preserve Alpha controls the amount of glitter in the areas covered by the alpha channel. With Glare Preserve Alpha set to 0, Glare does not appear in areas governed by the alpha channel (in other words the effect has zero opacity in alpha areas); with Glare Preserve Alpha set to 100, the Glare is opaque over the alpha channel.

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.

For information on the PixelChooser parameter group controls, see “The PixelChooser” on page 603.

Working with the BCC Glint Filter

The Glint filter creates a sparkle or ray burst effect. A luminance map creates the glints based on bright areas in the image.


Source image


Filtered image

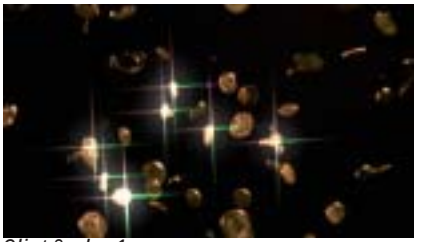
For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24, “Working with the Drop Shadow Parameter Group” on page 25 and “Working with the Motion Tracker Parameter Groups” on page 29.

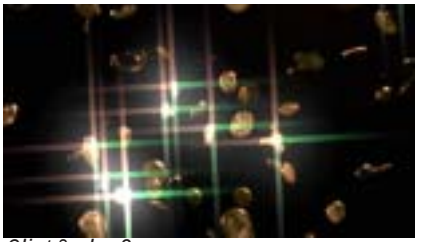
You must have a supported OpenGL card and driver to use the BCC Glint filter. For information on supported configurations, see “Working with OpenGL” on page 37 or the Understanding OpenGL PDF on your Boris CD.

Glint Threshold uses a luminance map to create glints based on a bright area in the image. A glint is created on any area with a luminance value above the specified Threshold. If you decrease this value, more glints are created; if you increase it, less glints are created.

Glint Brightness sets the brightness of the glints.

Glint Scale sets the scale of each glint.


Glint Scale=1


Glint Scale=2

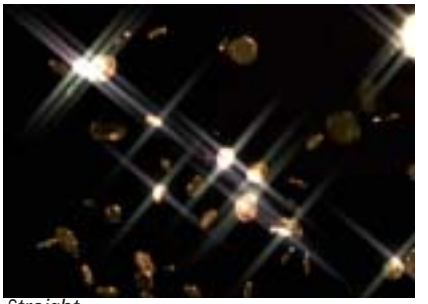
Glint Scale Aspect adjusts the shape of the glints. Positive values stretch the glints horizontally, and negative values stretch them vertically.

Glint Angle sets the angle of the glints.

Glint Color sets the color of the glints.

The **Glint Shape menu** sets the shape of the glints.The choices are ***Taper*** and ***Straight***. When Taper is chosen, the rays spread outward in the shape of a fan.


Taper


Straight

Glint Ray Width and **Glint Ray Height** set the size of the rays on the X-axis and Y-axis.

Glint Counts determines the number of rays in the glint effect.


Glint Counts=4


Glint Counts=15

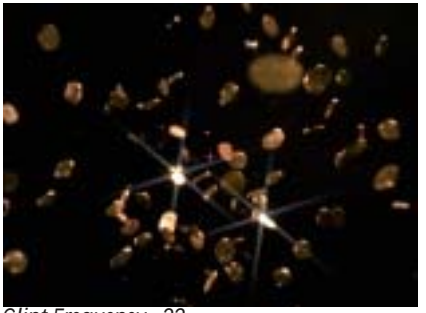
Glint Scale Variance varies the size of the rays. Increasing Size Variance increases the variety of sizes in the effect. Leaving this parameter at the default setting of 0 ensures that each ray uses the assigned Scale value.

Glint Scale Seed determines the value input to the random number used by the filter to change the size of the rays. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the sizes. If Glint Scale Variance is 0, this parameter has no affect.

Glint Color Variance varies the color of the rays. Increasing Glint Color Variance increases the variety of colors in the effect. Leaving this parameter at the default setting of 0 ensures that each ray uses the assigned Color value.

Glint Color Seed determines the value input to the random number used by the filter to change the color of the rays. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the colors. If Glint Color Variance is 0, this parameter has no affect.

Glint Frequency controls the amount of glints added in the effect. Increasing this value creates more glints.



Glint Frequcncy=23

Glint Frequcncy=80

The **Glint Alpha Map Layer menu** determines how the glints uses alpha channel information. The Alpha Map works in conjunction with the Glint Preserve Alpha parameter to determine how much glint to apply within the alpha channel area. You can use the ***Filter Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

Glint Preserve Alpha determines how the glints use alpha channel information. With Glint Preserve Alpha set to 0, Glints do not appear in areas governed by the alpha channel (in other words the Glint has zero opacity in alpha areas), with the Preserve Alpha parameter set to 100, the Glint is 100% opaque over the alpha channel.

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.

For information on the PixelChooser parameter group controls, see “The PixelChooser” on page 603.

Working with the BCC Glitter Filter

The Glitter filter creates a glittering or sparkling light effect. A luminance map creates the glitter based on bright areas in the image.


Source image


Filtered image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24, and “Working with the Drop Shadow Parameter Group” on page 25.

You must have a supported OpenGL card and driver to use the BCC Glint filter. For information on supported configurations, see “Working with OpenGL” on page 37 or the Understanding OpenGL PDF on your Boris CD.

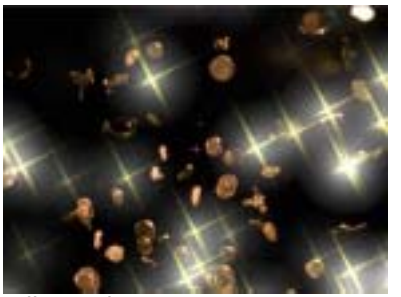
Glitter Frequency controls the amount of glitter added in the effect. Increasing this value creates more glitter.

Glitter Pattern Seed determines the value input to the random number used by the filter to change the pattern of the glitter. Adjust this value when you like the overall appearance of the effect but want to change the random configuration.

Glitter Brightness sets the brightness of the glitter.

Glitter Scale sets the scale of the glitter.


Glitter Scale=.75

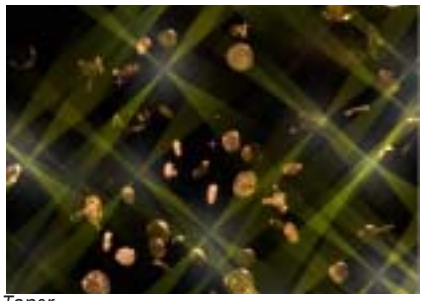

Glitter Scale=2

Glitter Scale Aspect adjusts the shape of the glitter. Positive values stretch the glitter horizontally, and negative values stretch it vertically.

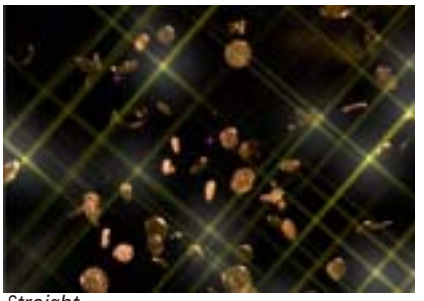
Glitter Angle sets the angle of the glitter.

Glitter Ray Color sets the color of the rays in the glitter.

The **Glitter Ray Shape menu** sets the shape of the rays in the effect.The choices are ***Taper*** and ***Straight***. When Taper is chosen, the rays spread outward in the shape of a fan.



Taper



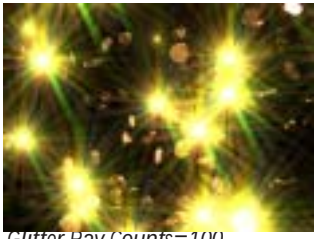
Straight

Glitter Ray Width and **Glitter Ray Height** set the size of the rays on the X-axis and Y-axis respectively.

Glitter Ray Counts determines the number of rays in the effect.

Glitter Ray Counts=6

Glitter Ray Counts=15



Glitter Ray Counts=100

Glitter Ray Scale Variance varies the size of the rays. Increasing Size Variance increases the variety of sizes in the effect. Leaving this parameter at the default setting of 0 ensures that each ray uses the assigned Scale value.

Glitter Ray Scale Seed determines the value input to the random number used by the filter to change the size of the rays. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the sizes. If Glitter Scale Variance is 0, this parameter has no affect.

Glitter Ray Color Variance varies the color of the rays. Increasing Glitter Color Variance increases the variety of colors in the effect. Leaving this parameter at the default setting of 0 ensures that each ray uses the assigned Glitter Ray Color value.

Glitter Ray Color Seed determines the value input to the random number used by the filter to change the color of the rays. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the colors. If Glitter Color Variance is 0, this parameter has no affect.

The **Glitter Offset** position controls offset the glitter on the X and Y axis.

Glitter Speed X and **Glitter Speed Y** adjust the rate at which glitter moves on the X-axis and Y-axis respectively. Increasing positive values move the glitter faster. Decreasing negative values slow the glitter.

Glittering Speed determines how quickly the brightness of the glitter changes. Higher values cause the brightness to change more quickly, producing rapid glittering.

The **Glitter Background Map Layer menu** determines the background to the effect when applying to an Avid title or matte key. ***2nd Below*** (not 1st Below) is actually the video background. The effect references the nested Graphic fill as the 1st Below layer. You can use the ***Filter Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

The **Glitter on Alpha Layer Only checkbox** determines how the glitter uses alpha channel information. This checkbox works in conjunction with the Glitter Preserve Alpha parameter to determine how much glitter to apply within the alpha channel area.

Glitter Preserve Alpha determines how the glitter uses alpha channel information. With Glitter Preserve Alpha set to 0, glitter does not appear in areas governed by the alpha channel (in other words the effect has zero opacity in alpha areas); with the Glitter Preserve Alpha parameter set to 100, the glitter is 100% opaque over the alpha channel.

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 BCC Lens Flare and BCC Lens Flare Advanced

The BCC Lens Flare filter simulates a lens flare–that is, streaks and spots of light on film caused by light bouncing inside of a camera lens. Lens flare is typically produced when you point a camera too close to the sun. You can also use this filter to produce a range of other creative effects. The flare can be composited over the source image or you can generate a completely synthetic image.

Boris Continuum Complete includes both a BCC Lens Flare and BCC Lens Flare Advanced. The two filters are very similar except that BCC Lens Flare does not include all the parameters. BCC Lens Flare Advanced provides more options for controlling the effect; while BCC Lens Flare is streamlined for when you want to create a simple effect.

Source image

Filtered image

You must have a supported OpenGL card and driver to use the BCC Lens Flare and BCC Lens Flare Advanced filters.For details on supported configurations, see “Working with OpenGL” on page 37 or the Understanding OpenGL PDF on your Boris CD.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24, “Working with the Drop Shadow Parameter Group” on page 25 and “Working with the Motion Tracker Parameter Groups” on page 29.

Motion Tracker Parameter Groups

The Motion Tracker parameter group allows you to track the motion of an object, then use the motion path data to control another aspect of the effect. For example, use the Motion Tracker parameters to track an object. Then apply that tracking data to the Lens Flare Basic’s Light Source parameter. Only the Lens Flare Basic includes the Motion Tracker parameter group.

For more information on the Motion tracker parameter group, see “Working with the Motion Tracker Parameter Groups” on page 29.

Common Parameters

The BCC Lens Flare includes the following parameters. All these parameters also appear in the BCC Lens Flare Advanced.

Global Intensity controls the brightness of all elements of the lens flare.

Global Scale controls the scale of all elements of the lens flare.

Light Source sets the location on the X and Y axis of the simulated light source which creates the flare. The glow section of the flare is always centered around the Light Source.

Pivot Point controls the location of the other elements of the flare. All of the elements of the flare appear centered on a line from the Light Source to the Pivot Point. The Light Source in the following examples stays the same while the Pivot Point changes.

Color sets the color of the lens flare effect. When you work with the BCC Lens Flare Advanced filter, each element of the flare effect includes its own color control.

The **Lens Type menu** sets the type of lens flare that is created, based on commonly used camera lens. The choices are ***50-300mm Zoom, 35mm Prime*** and ***105mm Prime.*** When you work with the BCC Lens Flare Advanced filter, each element of the flare effect includes its own controls, so this menu does not appear.

Source image *50-300mm Zoom*

35mm Prime

105mm Prime

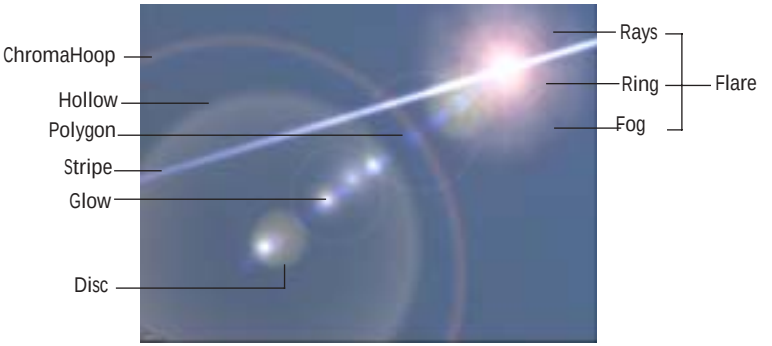
Preserve Alpha determines how the lens flare uses alpha channel information. With Preserve Alpha set to 0, a lens flare does not appear in areas governed by the alpha channel (in other words the effect has zero opacity in alpha areas), with the Preserve Alpha parameter set to 100, the effect is 100% opaque over the alpha channel.

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.

BCC Lens Flare Advanced Parameters

The BCC Lens Flare Advanced includes the following parameters. None of these parameters appear in the BCC Lens Flare filter.

The Lens Flare Advanced effect is comprised of ten discrete elements, ***Flare, Ring, Ray, Fog, Polygons, Discs, Hollows, Glows, ChromaHoop*** and ***Stripe***, as shown at in the following. The Lens Flare Advanced filter provides controls for adjusting each element individually.



Select the **16 x 9 checkbox** to work in a 16 x 9 Project. Leave this checkbox deselected when you work in a 4 x 3 Project.

Working with the Flare, Polygons, Discs, Hollows, Glows, ChromaHoop and Stripe Parameter Groups

Each of these parameter groups includes an **On checkbox.** When this checkbox is selected, that element is to added to the effect. Deselect this checkbox to remove that element. If this option is deselected, the other parameters have no affect. For example, if the **Flare On checkbox** is deselected, the flare does not appear in the effect.

The Flare Parameter Group includes controls for Ray, Ring and Fog, which are additional Flare elements that can be added with separate On checkboxes and adjusted. Use the following descriptions of the parameters for these elements.

Color sets the color of the corresponding element.

Intensity controls the brightness of the corresponding element.

Stripe Length sets the length of the stripes. Only the Stripes parameter group includes this parameter.

Scale controls the scale of the corresponding element.

Position controls the position of the corresponding element.

Stripe Angle sets the angle for the stripes. Only the Stripes parameter group includes this parameter.

Stripe Softness sets the amount of softness applied to the stripes. Only the Stripes parameter group includes this parameter.

Radius determines the radius of the corresponding element. Higher values produce a larger element.

Rotation spins the corresponding element.

The **Ray Shape menu** sets the shape of the rays.The choices are ***Taper*** and ***Straight***. Only the Flare parameter group includes this parameter. When Taper is chosen, the rays spread outward in the shape of a fan.


Taper


Straight

The **Polygon Shape menu** sets the shape of the polygons.The choices are ***Pentagon*** and ***Hexagon***. Only the Polygon parameter group includes this parameter.


Pentagon


Hexagon

Increasing **Spread** values spread the polygons out along the line of sight. Decreasing values tighten the polygons closer together.

Width sets the width of the corresponding element. Higher values produce wider element.

Counts determines the number of the corresponding element in the effect.

Scale Variance varies the size of the corresponding element. Increasing Size Variance increases the variety of sizes in the effect. Leaving this parameter at the default setting of 0 ensures that each element uses the assigned Scale value.

Scale Seed determines the value input to the random number used by the filter to change the size of the elements. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the sizes of the elements. If Scale Variance is 0, this parameter has no affect.

Color Variance varies the color of the corresponding element. Increasing Color Variance increases the variety of colors in the effect. Leaving this parameter at the default setting of 0 ensures that each element uses the assigned Color value.

Color Seed determines the value input to the random number used by the filter to change the color of the elements. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the colors of the elements. If Color Variance is 0, this parameter has no affect.

Increasing the **Spread** parameter adds space between the elements. Only the Polygons and ChromaHoop parameter group includes this parameter. The following example shows Spread adjusted to just the ChromaHoop elements.

ChromaHoop Spread=5

ChromaHoop Spread=25

Intensity Variance controls the range of possible intensity values. Increasing Intensity Variance creates an effect in which some elements are bright and others are dim, and increases the disparity between the brightest and dimmest elements. Leaving this parameter at the default setting of 0 ensures that each element uses the assigned Intensity value.

Intensity Seed determines the value input to the random number used by the filter to change the Intensity of the elements. Adjust this value when you like the overall appearance of the effect but want to change the random configuration of the intensities. If Intensity Variance is 0, this parameter has no affect.

Working with the BCC Light Sweep Filter

BCC Light Sweep creates a linear beam of light that sweeps across your image. The filter is physically modeled after a light that is infinitely far away. The light is infinitely wide in one direction, and falls off in the other. Light Sweep also has some very useful edge detection and edge lighting features.

Source image

Filtered image

The BCC Light Sweep can also be used as a transition. To apply Light Sweep as a transition, use the BCC TR Light Sweep in the BCC Transitions category or apply the filter to two layers. For more information, see “Applying BCC Effects as Transitions” on page 12.

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25. For information on the PixelChooser parameter group controls, see “The PixelChooser” on page 603.

The light center is set by the **Light Center** point controls. The light comes from infinitely far away to the Light Center, at which point it begins to fall off.

Direction sets the angle that the light beam makes with the horizontal axis.

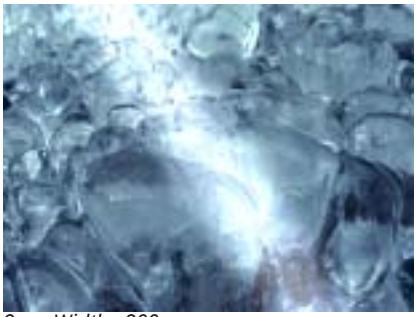
Falloff Distance controls the rate at which the light darkens or falls off, after it passes the Center point. If Falloff Distance is 0, the light falls off immediately. If Falloff Distance is 100, the light continues past the center to infinity, and displacing the Center along the Direction of the light does not change the effect.

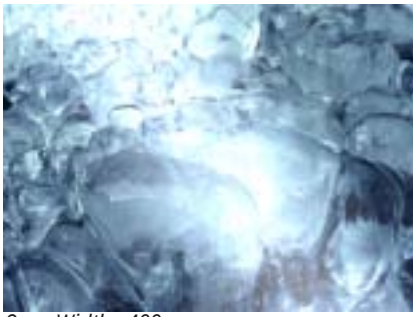

Falloff Distance=10


Falloff Distance=20


Falloff Distance=30

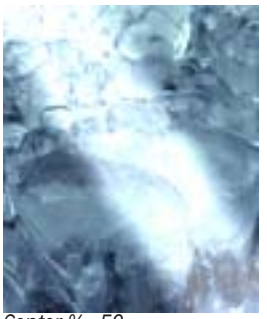
Cone Width sets the width, in pixels, of the light beam.


Cone Width=200


Cone Width=400

Center % sets the percentage of the cone width for which the light is fully applied. For example, if Center Percentage is 50, the center half of the lit region is fully lit, and the light in the quarters on each side of the center falls off as it approaches the edge of the lit region.


Center %=0


Center %=50


Center %=100

Shape controls how the light falls off from the center of the beam to the outside regions of the beam. At higher values, the light falls off rapidly outside the center of the light beam, creating a hard-edged light beam. At the lowest Shape values, the light falls off more gradually toward the outside of the light beam, creating a softer light beam.


Shape=10


Shape=50


Shape=100

Intensity adjusts the intensity of the light.

Light Color sets the color of the light.

Ambient Light adjusts the total amount of diffuse light on the image. The default setting of 100 does not add or subtract ambient light from the source image. Decreasing this setting makes the image darker before the other light is applied. Ambient light illuminates or darkens the image evenly, and is unaffected by any other lighting parameters.

Ambient Light overrides the PixelChooser in the Light Sweep filter. In other words, the Ambient Light setting is applied to all pixels, regardless of whether or not they are chosen by the PixelChooser. This ensures that the PixelChooser does not create discrepancies in the overall lighting of the image before Light Sweep is applied. At the default Ambient Light value of 100 (where no ambient light is added or subtracted), the PixelChooser behaves exactly as in other filters; at other values, the PixelChooser filters every parameter except Ambient Light.

Increasing **Ambient Follow** causes the ambient light to fall off in regions of the image that are lit by the applied light. Use Ambient Follow if you want the applied light's color to completely replace the ambient light.

The remaining Light Sweep parameters are identical to the corresponding Spotlight controls. See “Edges Parameter Group” on page 522 and “Common Parameter Group” on page 522 for details.

Working with the BCC Light Zoom Filter

The Light Zoom filter creates rays of light that spread out from the light source point in all directions. As the rays expand, their intensities are affected by the luminosities of the pixels that they cross. The farther from the source the ray extends, the less it is affected by the intensities of new pixels that it crosses. This process is referred to as attenuation, since the affect of the pixels on the intensity of the rays attenuates, or lessens, over time.

The BCC Light Zoom filter can also be used as a transition. To apply Light Zoom as a transition, use the BCC TR Light Zoom in the BCC Transitions category or apply the filter to two layers. For more information, see "Applying BCC Effects as Transitions" on page 12.

For information on the common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

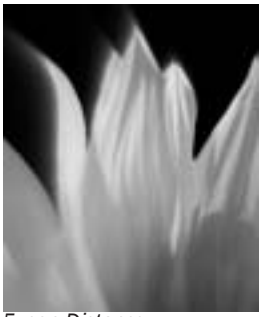
The **Light Source X** and **Y** position points set the location of the simulated light source on the X and Y axis.

Intensity adjusts the intensity of the light source.

The **Attenuation menu** chooses the type of mathematical process used to determine how the influence of pixels affecting the intensity of the rays of light changes over time. The choices ar***e Exp Distance SQ***, ***Exp Distance***, ***Expon Dist Sqrt***, ***Dist SQ***, ***Distance***, and ***Dist Sqrt***. Experiment with the various modes to see which works best with your effect.

The following illustrations below show the affect of various Attenuation Types on the matte created by the filter.


Expon Distance SQ


Expon Distance


Distance SQ

Ray Length adjusts the length of the rays of light that emanate from the source. The length of the rays is also affected by the attenuation.


Ray Length=35


Ray Length=50


Ray Length=100

Minimum Influence determines the minimum amount of influence the pixels have on the length of the rays. Increasing this value is similar to decreasing the Ray Length value.


Minimum Influence=10


Minimum Influence=30


Minimum Influence=60

Aspect adjusts the shape of the light rays and the resulting matte. Positive values stretch the rays and matte horizontally, and negative values stretch them vertically.

Advanced Parameter Group

The **Attenuation Bias menu** determines how difference between the intensity of the pixels being passed and the intensity of the rays affects the attenuation.

- If ***Off*** is chosen, the difference in intensity between an individual pixel and the ray crossing it does not affect the amount of influence the pixel has on the ray's intensity.
- ***One Way*** uses the **Bias Amount** value to determine how the influence of a pixel is affected by its intensity. Increasing positive values cause pixels that are more intense than the rays to have increasing influence on the intensity of the rays. This lightens the output. Decreasing negative cause pixels that are less intense that the rays to have increasing influence on the intensity of the rays. This darkens the output.

- ***Two Way*** is similar to One Way, but causes a more pronounced effect. For example, if the Bias Amount value is positive, Two Way increases the influence of pixels that are more intense than the rays while simultaneously decreasing the influence of pixels that are less intense than the rays.
- ***Contrast*** affects pixels that are closer to black or white over pixels that are closer to gray.

Increasing positive **HV Bias** values cause the rays to travel predominantly on horizontal and vertical lines. Decreasing negative values cause the rays to conform more to lines that form a 45 degree angle with the horizontal axis.

Ray Holdout Radius determines where the rays of light or the attenuation starts 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 start the attenuation closer to the light source point.


Rat Holdout Radius= –10


Ray Holdout Radius=10


Ray Holdout Radius=20

Directional Tuning smooths the angular behavior of the light. For most purposes, you should leave this control at the default value.

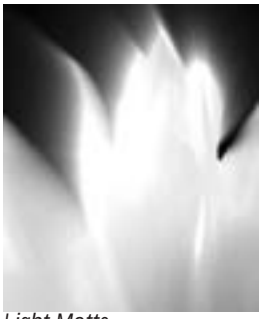
The **Color menu** determines how the applied light affects the source image. You can also use this menu to preview the source channel used by the filter to create the effect.

- ***Colorize*** uses the applied light to tone the image using controls similar to those in the Colorize filter.
- ***Image*** produces a colored lighting effect using color information from the chosen Image Layer (see page 483).
- ***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.

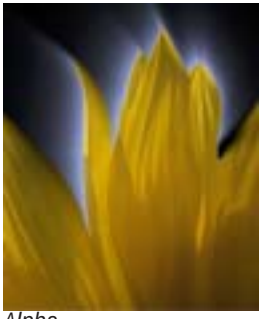
- ***View Source*** displays the chosen Light From channel. This can be especially useful if you are using edges in the image as the Light From channel. In the following examples, Light From is set to Luma. See the following section for more information on the Light From menu.


Colorize


Image


Light Matte


Inverse Light Matte


Alpha


View Source

The **Image Layer menu** sets the layer used when the Color menu is set to Image. You can use the ***Filter Layer***, or use one of the layers below the filtered layer in the timeline by choosing ***1st Below*** or ***2nd Below.***

Source Threshold subtracts the threshold from each pixel 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 will fade out the light more rapidly as you move away from 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 selected, **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 selected, **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.

The illustrations below were created with the **Color menu** set to ***Image***, so only the source channel used by the filter, and not the output, is visible. See "Advanced Parameter Group" on page 481 for more information on the Color menu.


Luma


Unmultiplied Luma


Alpha


Alpha Cartoon Edges


Luma Edges


Red

Edges Parameter Group

When Luma Edges or Alpha Edges is selected in the Light From Channel menu, **Thickness/Intensity** adjusts the intensity of the edges.

Edge Pre Blur 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 Channel menu is set to Luma Edges, Alpha Edges, Luma Cartoon Edges, or Alpha Cartoon Edges.

Edge Post Blur blurs the edges before they are used to create the applied light.This parameter only works if the Light From Channel menu is set to Luma Edges, Alpha Edges, Luma Cartoon Edges, or Alpha Cartoon 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 Channel menu is set to Luma Cartoon Edges or Alpha Cartoon Edges.

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

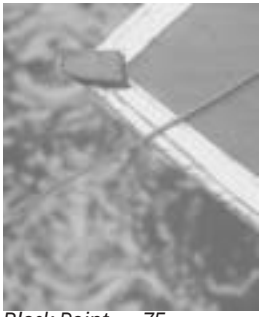
Colorize Parameter Group

When the Light Mode menu is set to Colorize, these parameters allow you to use a gradient of up to six colors to tone the lighting effect. All of the parameters in this section can be animated.

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 that the Black Point value are mapped to the Color 1. 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 in with a simple two-color gradient from black (Color 1) to white (Color 6).


Black Point= –75


Black Point=0


Black Point=75

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

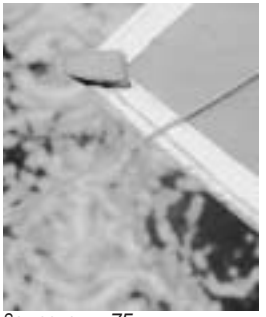
The following illustrations show the affect of adjusting the White Point in with a simple two-color gradient from black (Color 1) to white (Color 6).


White Point=100

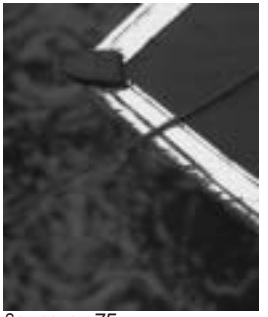

White Point=50


White Point=25

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.


Squeeze= –75


Squeeze=0


Squeeze=75

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.

Color Ease adjusts the softness of the transitions between pure colors in the gradient. Increasing positive values create more abrupt transitions. Decreasing negative values softens the transitions.

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.

Lightness controls the brightness of the colors in the gradient. Higher values lighten the colors, while lower values darken the colors.

The **Apply Mode menu** controls how the filter is composited over the source image. For information on the available apply modes, see "Apply Modes" on page 625.

Composite Parameter Group

These controls determine how the applied light is composited over the underlying image. When the **Opaque Light checkbox** is selected, the light created by the effect is opaque. Deselect this option to create light with a range of transparency.


Opaque Light=off


Opaque Light=on

Light Opacity controls the opacity of the light as it is composited over the source image.


Light Opacity=50


Light Opacity=150

Apply Mix controls the mix of the chosen Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

The **Noise menu** determines which aspect of the effect is affected by the noise.

- When ***Off*** is chosen, the noise does not affect the output, and the remaining parameters in this section have no affect.
- ***Source Light*** causes the noise to affect the intensity of the source in the chosen Light From channel. See page 483 for more information on the Light From menu.
- ***Attenuation*** causes the noise to affect the amount of attenuation the light rays experience as the emanate from the source and interact with the pixels they cross.
- ***Light*** causes the noise to affect the light output by the filter. This choice often creates somewhat grainy images.
- ***View Noise*** displays a grayscale preview of the noise. The illustrations throughout this section were created with Noise Target set to View Noise.

Setting Noise to Attenuation has a similar effect to that of ***Stringiness*** in the Light Rays filters.

Noise Parameter Group

Noise Density sets the percentage of pixels that are affected by the noise.

Noise Intensity adjusts the intensity of the noise. Negative values cause the noise to have the opposite effect on the selected Noise Target as positive values.

Noise Intensity=50

Noise Intensity=100

Noise Blur applies a blur to the noise, creating a smoother, more organic, effect.

Noise Blur Quality sets the quality of the Noise Blur. ***Box*** is the fastest option and is generally adequate unless Noise Target is Light. It produces a blur similar in quality to the basic Blur filter. The remaining choices, ***Low***, ***Medium***, ***High***, and ***Highest*** produce gaussian blurs of increasing quality. These options increase rendering times proportionately.

When the **Bidirectional Noise checkbox** is selected, the noise affects the target both positively and negatively. For example, in the Noise menu is set to Attenuation and Bidirectional Noise is selected, the attenuation both increases in some regions and decreases in others. If Bidirectional Noise is not selected, the attenuation increases in some areas, and never decreases by the noise.

Bidirectional Noise=off

Bidirectional Noise=on

Seed determines which value is input to the random number generator used by the filter to create noise. Adjust this value when you like the overall effect but want to adjust the random configuration of the noise pattern.

Animating Seed creates noise that varies from frame to frame, because the noise affects a different randomly chosen group of pixels in each consecutive frame. A constant value creates static noise that retains its appearance from frame to frame.

The **Auto Animate checkbox** causes the filter to use a different random number seed for each frame. This is best used with small amounts of noise because it can produce results that are chaotic.

Perturbation and **Perturbation Seed** add a small amount of randomness to the numbers produced by Seed, allowing you to create noise patterns that differ between frames by a controlled amount. The best way to do this is to animate Perturbation Seed by at least one unit from one frame to the next, unless you want the noise pattern the same for some consecutive frames. Then adjust Perturbation until you get the desired amount of change.

When the **Radial Matte On checkbox** is selected, the Light Zoom filter creates a matte over the light. Deselecting the Radial Matte On checkbox turns the matte off.

Radial Matte Parameter Group

If the Radial Matte On checkbox is not selected, the parameters in this section have no affect. The **Inside Radius** and **Outside Radius** position point controls set the range of the matte, and the **Inside Blend** and **Outside Blend** soften the matte.To create a wipe using this filter, animate Outside Radius from a negative value to a value that displays the entire image.

PixelChooser Parameter Groups

For information on the remaining PixelChooser controls, see page 603.

PixelChooser Intensity controls the intensity of the PixelChooser. At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the number of pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

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*** uses the pixel chooser to mask the image as the light is created. It does not affect the compositing of the light over the image.
- ***Attenuation*** scales down the attenuation at each point where pixels are not fully chosen. This tends to make the rays shorter. You can make the rays stop in an unchosen region and pick up again in the chosen region.
- ***Attenuation Boost*** reverses Attenuation; rays travel further in unchosen regions.
- ***Off*** turns off these options.

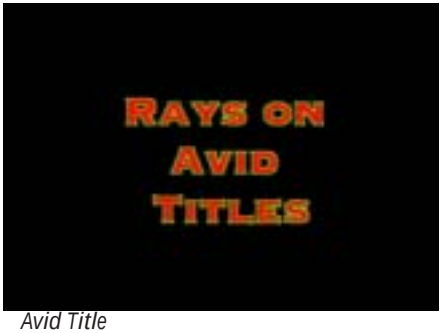
Understanding the Rays Light Suite

The Rays filters are a collection of lighting filters that offer similar functionality to produce varying lighting effects. The Rays filters produce light which spreads from a source point, and is generated from a selected channel in the source image.

The Rays filters are designed so that the most frequently used controls are at the top level. Other controls are in subgroups by category. All of these filters share a common set of controls; most also include some specialized controls.

Unlike most filters, you can load presets created in any Rays filter into another Rays filter. For example, you can create a preset in the BCC Rays_Wedge filter and open it in the BCC Rays_Streaky filter. However, the presets are stored in the filter's individual folder. For example, if you want to open a BCC Rays_Wedge preset in the BCC Rays_Streaky filter, you have to manually navigate to the BCC Rays_Wedge folder. For information on presets, see "Working with the Preset Menu" on page 22.

The examples in this section show Rays Filters applied to a title created in the Avid Title tool. You can also apply Rays to clips in the timeline.



Avid Title

Avid Title with Rays_Puffy applied

Common Rays Parameter Groups

Many new BCC Rays Light filters contain common parameter groups such as ***Light Source, Custom Look***, ***Edges***, ***Texture Controls***, ***Colorize Controls***, ***Composite*** and ***PixelChooser***. These groups are explained in the following sections.

Working with the Light Source Parameter Group

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

Working with the Intensity and Ray Length Parameters

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.

Working with the Ray Style Menu

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

Working with the Look Menu

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 “Working with the Custom Look Parameter Group” on page 493.

Default

Extended Bloom

Tight

Tight Bloom

Working with the 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 start the attenuation closer to the light source point.

Holdout Radius=0

Holdout Radius=50

Working with the Color Menu

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)

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.

Working with the 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 use a stored gradient by choosing a preset from the Color Preset menu.

All of the parameters in this section can be animated. If the Color menu is not set to Colorize, these parameters have no affect.

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.

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 following illustration shows Color 1 set to red and Color 6 set to white.

Squeeze= –75 *Squeeze=0* *Squeeze=75*

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.

Working with the Apply Mode menu

The **Apply Mode menu** controls how the filter composites the applied light with the image. For information on the available apply modes, see "Apply Modes" on page 625.

Working with the 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.

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 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.
- ***Luma Inverse*** uses the inverted luma channel to create 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.

The following illustrations show the Light Source choices on a red title with the **Color menu** set to ***View Source***.

Light From=Luma Edges

Light From=Alpha Edges

Light From=Alpha Cartoon Edges

Light From=Red

Working with the 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.

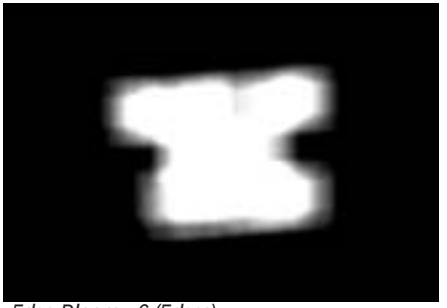
Smooth Details blurs the source image before the filter searches for edges. This blur does not appear in the output; it is used only in edge detection. This parameter only works if the **Light From menu** is set to ***Luma Edges, Alpha Edges, Luma Cartoon Edges*** or ***Alpha Cartoon Edges***.

Edge Bloom blurs the edges of the source image 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 the Light From menu set to Luma Cartoon Edges. The first image shows the blurred source edges only (Color menu is set to View Source), and the second image shows the final result (Color menu is set to Colorize) for the chosen Edge Bloom setting.

Edge Bloom=2 (Edges)

Edge Bloom=2 (Result)



Edge Bloom=6 (Edges)

Edge Bloom=6 (Result)

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***.

Working with the 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.

Strings

Shimmer

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.

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, see "The PixelChooser" on page 603. The Rays filters' PixelChooser includes two additional parameters.

PixelChooser Intensity controls the intensity of the PixelChooser. At the default setting of 100, the control is ignored. Reducing PixelChooser Intensity from 100 increases the pixels that are chosen. At 0, all pixels are chosen, which means the PixelChooser has no affect. At negative values, pixels that were partially chosen move towards an unchosen state; a value of –100 inverts the PixelChooser.

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.

Working with the 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 "Working with the Motion Tracker Parameter Groups" on page 29.

Working with the BCC Rays_Cartoon Filter

The BCC Rays_Cartoon filter creates 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

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

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.

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.

For information on the remaining, common Rays parameter groups such as ***Light Source, Custom Look***, ***Edges***, ***Texture Controls***, ***Colorize***, ***Composite*** and ***PixelChooser***, see “Common Rays Parameter Groups” on page 491.

Working with the BCC Rays_Puffy Filter

The BCC Rays_Puffy filter creates 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

For information on the common parameters, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23, "Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

Working with the Remaining Rays_Puffy Parameter Groups

The Rays_Puffy filter does not include any custom parameter groups. For information on the common Rays parameter groups such as ***Light Source, Custom Look***, ***Edges***, ***Texture Controls***, ***Colorize***, ***Composite*** and ***PixelChooser***, see "Common Rays Parameter Groups" on page 491.

Working with the 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

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

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.

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.

For information on the remaining, common Rays parameter groups such as ***Light Source, Custom Look***, ***Edges***, ***Texture Controls***, ***Colorize***, ***Composite*** and ***PixelChooser***, see “Common Rays Parameter Groups” on page 491.

Working with the BCC Rays_Radiant Spotlight Filter

The BCC 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

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

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.

Working with the Remaining Rays_Radiant Spotlight Parameter Groups

For information on the remaining, common Rays parameter groups such as ***Light Source, Custom Look***, ***Edges***, ***Texture Controls***, ***Colorize***, ***Composite*** and ***PixelChooser***, see “Common Rays Parameter Groups” on page 491.

Working with the BCC Rays_Ring Filter

The BCC Rays_Ring filter masks the light source with a ring. 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

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

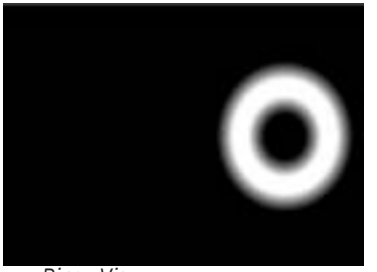
The **Ring menu** determines the type of ring light that is created.

- ***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 choose 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 the softness of the ring.

Working with the Remaining Rays_Ring Parameter Groups

For information on the remaining, common Rays parameter groups such as ***Light Source, Custom Look***, ***Edges***, ***Texture Controls***, ***Colorize***, ***Composite*** and ***PixelChooser***, see “Common Rays Parameter Groups” on page 491.

Working with the 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

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

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 **Te*xture 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 to setting the Ripple menu to Off.

Wave Width determines the distance between the peaks of the ripple waves. Wave Width does not affect the maximum displacement of each point in the image, but it does affect how fast the displacement changes from point to point in the image. Wave Width also affects the total 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 page 191.

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**.

Working with the Remaining Rays_Ripply Parameter Groups

For information on the remaining, common Rays parameter groups such as ***Light Source, Custom Look***, ***Edges***, ***Texture Controls***, ***Colorize***, ***Composite*** and ***PixelChooser***, see “Common Rays Parameter Groups” on page 491.

Working with the BCC Rays_Streaky Filter

The BCC Streaky Light 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

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, and “Working with the Drop Shadow Parameter Group” on page 25.

Working with the Remaining Rays_Streaky Parameter Groups

The Rays_Streaky filter does not include any custom parameter groups. For information on the common Rays parameter groups such as ***Light Source, Custom Look***, ***Edges***, ***Texture Controls***, ***Colorize***, ***Composite*** and ***PixelChooser***, see “Common Rays Parameter Groups” on page 491.

Working with the 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 selected channel in the source image, and spreads from a source point in all directions.

Source image

Filtered image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, and “Working with the Drop Shadow Parameter Group” on page 25.

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.

Working with the 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 patter. 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.


Texture Radius = 5


Texture Radius = 25


Texture Radius = 75

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 filter appear rougher, which is useful for some effects.

Working with the Remaining Rays_Textured Parameter Groups

For information on the remaining, common Rays parameter groups such as ***Light Source, Custom Look***, ***Edges***, ***Texture Controls***, ***Colorize***, ***Composite*** and ***PixelChooser***, see “Common Rays Parameter Groups” on page 491.

Working with the BCC Rays_Wedge Filter

The BCC Wedge Light 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

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

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 Type menu), or the start of the wedge angle (when ***From To*** is chosen in the 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

Working with the Remaining Rays_Wedge Parameter Groups

For information on the remaining, common Rays parameter groups such as ***Light Source, Custom Look***, ***Edges***, ***Texture Controls***, ***Colorize***, ***Composite*** and ***PixelChooser***, see “Common Rays Parameter Groups” on page 491.

Working with the BCC Reverse Spotlight Filter

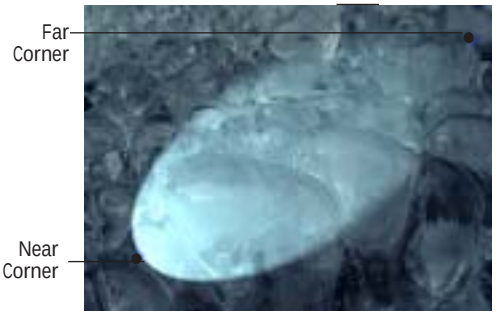
Using the Spotlight filter to precisely light a specific area in your image can sometimes be difficult. Reverse Spotlight allows you to define the lit region and computes the Light Source, Target, and Cone Width from this region. The Near Corner, Far Corner and Light Squeeze controls in Reverse Spotlight replace the Light Source, Target, and Cone Width controls in the Spotlight filter.

See “Working with the BCC Spotlight Filter” on page 519 for more information on the Spotlight filter.

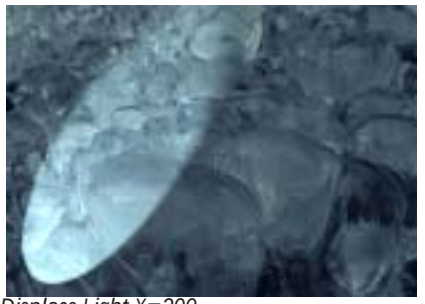
For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Near Corner sets the point in the lit region that is closest to the light source.

Far Corner sets the point in the lit region that is farthest from the light source.



The **Displace Light X** and **Y** point controls displaces the light source and target point by the same amount. Use this control if you want to animate the spotlight to sweep across the image without altering its shape or intensity.



Displace Light X=200

Displace Light X=500

Light 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 Light

Elevation and the distance between the Near and Far Corner points. Reducing Light Elevation produces a an increasingly stretched ellipse, or a hyperbola. Increasing Light Elevation produces an increasingly circular lit region.

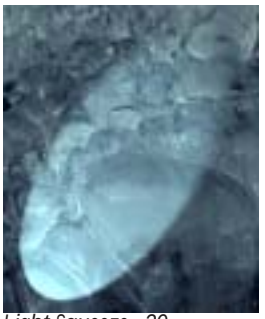

Light Elevation=50


Light Elevation=100


Light Elevation=200

Light Squeeze controls the shape of the lit region. A value of 100 creates a circular lit region (by putting the source directly above the center of the region). As Light Squeeze is reduced, the lit region narrows. Decreasing Light Squeeze moves the source further away from the lit region, making the light weaker. You can compensate for the weaker light by increasing the Intensity value.


Light Squeeze=10


Light Squeeze=30


Light Squeeze=50

Intensity sets the intensity of the light.

Light Color sets the color of the light.

Ambient Light adjusts the total amount of diffuse light on the image. The default setting of 100 does not add or subtract ambient light from the source image. Decreasing this setting makes the image darker before the other light is applied. Ambient light illuminates or darkens the image evenly, and is unaffected by any other lighting parameters.

Increasing **Ambient Follow** causes the ambient light to fall off in regions of the image that are lit by the applied light. Use Ambient Follow if you want the applied light's color to completely replace the ambient light.

Center Falloff controls the falloff in the center of the lit region. Increase Center Falloff from its default setting of 0 to create a light that is brighter in the center of the lit region than at the edges. Use a negative Center Falloff value to create a ring-shaped spotlight.

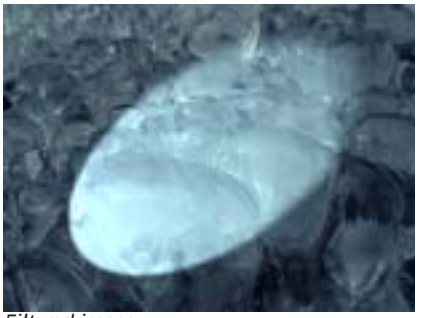
Edge Falloff controls the softness of the edges of the lit region. Increase Edge Falloff to soften the transition between the lit and unlit regions.

The remaining Reverse Spotlight parameters are identical to the corresponding Spotlight controls. See “Edges Parameter Group” on page 522 and “Common Parameter Group” on page 522 for more information.

Working with the BCC Spotlight Filter

Spotlight generates a realistic spotlight that can be placed and aimed at a target point on the image using on-screen position points. A range of parameters provide full control over the shape, width, color, and elevation of the light; offer edge lighting capabilities; and even allow you to place gels over the light source.

Source image



Filtered image

For information on the common parameters, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23, “Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Light Source sets the point coordinates of light source on the X and Y axis.

Light Source=10, 450

Light Source=610, 450

Target sets the point on the image plane at which the spotlight is aimed on the X and Y axis.

Target=0, 0

Target=640, 0

The **Displace Light** point controls displace the light source and target point by the same amount. Use these controls if you want to animate the spotlight to sweep across the image without altering its shape or intensity.

Displace Light X=200

Displace Light X=500

Light 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 Light Elevation and the distance between the Light Source and Target points. Reducing Light Elevation produces a an increasingly stretched ellipse, or a hyperbola, and moves the center of the lit region farther from the Target point. Increasing Light Elevation produces an increasingly circular lit region.


Light Elevation=50

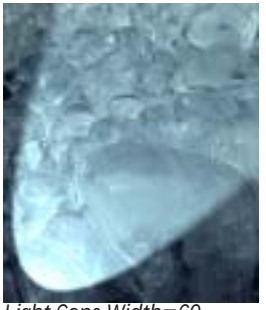

Light Elevation=100


Light Elevation=200

Light Cone 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 Light Cone Width is analogous to altering the placement of a physical spotlight within its enclosure.


Light Cone Width=30


Light Cone Width=40


Light Cone Width=60

Intensity sets the intensity of the light.

Light Color sets the color of the light.

Ambient Light adjusts the total amount of diffuse light on the image. The default setting of 100 does not add or subtract ambient light from the source image. Decreasing this setting makes the image darker before the other light is applied. Ambient light illuminates or darkens the image evenly, and is unaffected by any other lighting parameters.

Increasing **Ambient Follow** causes the ambient light to fall off in regions of the image that are lit by the applied light. Use Ambient Follow if you want the applied light's color to completely replace the ambient light.

Center Falloff controls the falloff in the center of the lit region. Increase Center Falloff from its default of 0 to create a light that is brighter in the center of the lit region than at the edges. Use a negative Center Falloff value to create a ring-shaped spotlight.

Edge Falloff controls the softness of the edges of the lit region. Increase Edge Falloff to soften the transition between the lit and unlit regions.

Edges Parameter Group

The Edges parameters control edge detection and edge lighting. Note that the edges referred to here are edges in the source image, not the edges of the spotlight.

The **Edges From menu** determines which channel in the source is used to compute edges. Choose ***Alpha*** to light text, or to light an image around the edges of its matte. Use ***Luma*** or an RGB channel to light the image based on the edges in the corresponding color channel.

Edge Intensity controls the intensity of the edge light. If Edge Intensity is any value other than 0, the filter completes a directional edge detection on the source image. Edge points are then given additional light, which is scaled by the geometric controls in the general parameters. You can also light only the edges by setting the spotlight Intensity (in the general parameters) to 0 and Edge Intensity to a value other than 0.

Edge Threshold determines how sensitive the filter is to differences between pixels when finding edges. The affect of this setting depends on the nature of the source image.

Edge Threshold is intended more for adjusting the look of the edges than for animation. Some images change dramatically when Edge Threshold is animated.

Edge Pre Blur blurs the source image before edge detection. This parameter softens the image's edges and reduces their intensity.

Edge Post Blur blurs the edge light after the edges are computed. You can use Edge Post Blur to create glowing edges and flare effects.

The **Post Blur Quality menu** determines the quality of the Post Blur. Choose ***Low***, ***Medium***, ***High***, ***Higher***, or ***Highest***. There is a significant rendering cost to using High, and considerably more for using Highest. Low and Medium are adequate for simple matte smoothing, but if to blur the edges of a high-contrast image or animate the blur, you may need to use Highest.

The **View Edges Only checkbox** allows you to view the edges created by the filter in black and white. When View Edges Only is on, the filter's output is determined only by the edge controls. This is useful if you are creating a complex effect involving edge lighting.

Edge Color sets the edge light color.

The **Edge Color menu** controls the interaction between the Edge Color and the Light Color. If ***Ignore*** is chosen, the Light Color overrides the Edge Color. If ***Mix*** is chosen, the Edge Color is mixed with the Light Color. If ***Prefer*** is chosen, the Light Color fades away where the Edge Color is intense.

Common Parameter Group

The Common parameters offer more options for adjusting the filter. Use these parameters to mix ambient and applied light and/or to create gel or matte effects.

The **Apply Mode menu** setting determines how the filter composites the applied light with the image. For descriptions of the available Apply Modes, see "Apply Modes" on page 625.

Apply Mix controls the mix of the specified Apply Mode with the ***Normal*** apply mode. If the Apply Mode is Normal, Apply Mix has no affect. If Apply Mix is 0, Apply Mode has no affect. Increase Apply Mix to blend the Apply Mode setting with the Normal apply mode.

If the **Shadow Transparent checkbox** is selected, unlit regions of the image are transparent.

The **Gel-Matte Layer menu** sets a layer in the timeline to use as either a gel or a matte. Use the ***Filter Layer***, or use a layer below the filter layer by choosing ***1st Below*** or ***2nd Below.***

The **Gel-Matte menu** determines how the Gel-Matte Layer is used.

- The ***Gel*** and ***Matte*** options use the chosen Gel-Matte Layer for color information in creating either a gel or matte, respectively.
- The ***Luma Gel*** and ***Luma Matte*** options scale down the applied light by the luminance values in the Gel-Matte Layer.
- If the **Gel-Matte menu** is set to ***None***, no gel or matte is used.

Selecting **Best Quality Gel** can improve the quality of the spotlight when using a gel, particularly if the spotlight is in motion, but increases render and preview time. Deselecting this option improves speed, and the resulting image quality is often adequate.

The **Light Apply Laye**r **menu** allows you choose a layer in the timeline to which the light is applied. You can use the ***Filter Layer***, or use one of the layers below the filtered layer by choosing ***1st Below*** or ***2nd Below.*** This lets you apply multiple lights to a clip with low ambient light.

Using Gels and Mattes

Adding a gel to a Spotlight filter is similar to placing a transparent gel over an actual spotlight. The text or image on the gel conforms to the size and shape of the light and is oriented in the same direction.

A matte is not a physically achievable lighting effect. A matte creates an alpha matte over the source image which is only visible when the spotlight passes over it. Therefore the text or image on the matte maintains its orientation relative to the background, and does not change size or shape along with the light.

Chapter 8
Time Filters

Working with the BCC Jitter and Jitter Basic Filters

Jitter allows you to vary one or more attributes of a source layer over time, such as size, position, opacity, brightness, or contrast. Additional controls choose the type of variance used for the jittering and allow you to view color-coded graphs of the jittered parameter values.

Boris Continuum Complete includes both a BCC Jitter and BCC Jitter Basic. The two filters are very similar except that BCC Jitter Basic does not include all the parameters; BCC Jitter provides more options for controlling the effect; while BCC Jitter Basic is streamlined for when you want to create a simple Jitter effect.

Creating a Jitter Effect

The Jitter filter has four basic groups of controls that are used to jitter attributes of the source layer. The following steps outline the recommended usage of this filter.

1. Apply the BCC Jitter or BCC Jitter Basic filter the clip you want to Jitter. Leave the **Source menu** set to ***Filter Layer***.
2. Use the **Geometry** parameters to adjust or animate basic geometric attributes of the source layer, and use the **Insert 1, 2,** and **3** parameters to apply up to three additional effects to the source.
3. Use the **Jitter 1, 2,** and **3** parameters to create up to three different jitter curves. The curves represent the variation of a parameter value over time. Select **View Jitter Curves** while you adjust the Jitter parameters to see the affects your adjustments have on the parameters.
4. Apply each Jitter curve to up to three parameters using the **Destination 1, 2,** and **3** controls. For example, you could use the same variance pattern to affect the source image's scale, opacity, and contrast.
5. Adjust the impact of each Jitter curve on the destination parameter using the **Amount 1, 2,** and **3** controls. Amount affects the intensity, rather than the shape, of the applied Jitter curve.

The Jitter filter includes extensive parameters for you to customize. You may want to start by using a preset to help you become familiar with the parameters.

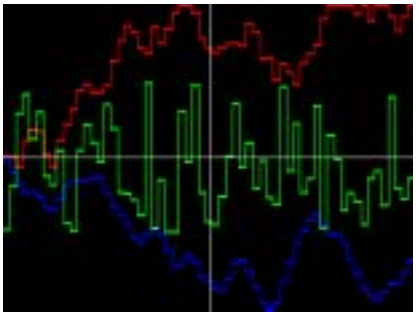
For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, "Working with the Title Matte Parameter Group" on page 23,"Working with the Geometrics Parameter Group" on page 24 and "Working with the Drop Shadow Parameter Group" on page 25.

Curves Parameter Group

The parameters in this section allow you to view the Jitter curves as you make adjustments to them. These curves plot the values of the jittered parameter over time.

The **Curve View menu** displays a graph of the effect of the jitter over time. If one of the Jitter Shape controls is Off, that jitter is inactive and its curve does not appear on the graph. This menu setting determines how the jitter curves are represented on the graph. When you use the ***Draft Only*** options, the curves are not visible in the rendered effect. However, you must preview in Draft mode by selecting the **Draft Mode checkbox** in the General Controls parameter group for these options to display. When you use the ***Render*** options, the curves appear in the rendered effect.

- ***Off*** does not display any jitter curves.
- ***Curves: Draft Only*** and ***Curves: Render*** display curves showing the amount of jitter at each frame or at selected frames of the effect.
- ***Curves Over Layer: Draft Only*** and ***Curves Over Layer: Render*** display the jitter curves over the rendered clip. This mode allows you to simultaneously preview the jitter curves and the rendered output, which can be useful for adjusting the effect.
- ***Curves Over Comp: Draft Only*** and ***Curves Over Comp: Render*** display the jitter curves over all other layers in the effect.



The vertical axis on the graph represents the current time in the effect. The horizontal axis represents the base parameter value (set by the Source or Insert parameter values) before it is jittered. The red curve represents Jitter 1, the green curve represents Jitter 2, and the blue curve represents Jitter 3.

The **Curve View menu** determines how the jitter curves are represented on the graph.

- ***Curves*** displays the amount of jitter at each frame or at selected frames of the effect.
- ***Curves Over Layer*** displays the jitter curves over the rendered clip layer. This mode allows you to simultaneously preview the jitter curves and the rendered output, which can be useful for making adjustments to the effect.
- ***Curves Over Comp*** displays the jitter curves over all other layers in the effect.

The **Time View menu** controls the time range shown on the graph. ***Full Effect*** displays the jitter curves from the start to the end of the effect. ***16***, ***8***, ***4***, and ***2*** display the curves for the given number of seconds after the frame specified by Scroll Curves.

Scroll Curves selects the first frame in the effect that is displayed when Time View is set to 16, 8, 4, or 2. This parameter has no affect if Time View is set to Full Effect.

The **Source menu** sets the layer in the timeline used to create the effect.

Geometry Parameter Group

The Geometry parameters adjust the source layer's position, size, rotation, and opacity.

Lock to Scale X checkbox locks the Scale Y to the Scale X value, preserving the aspect ratio of the source image as scale adjustments are made. Deselect Lock to Scale X to adjust Scale X and Y independently.

Scale X sets the horizontal scale of the source layer. The Scale X value is expressed as a percentage of the source layer's original width.

Scale Y sets the vertical scale of the source layer. The Scale Y value is expressed as a percentage of the source layer's original height.

Position X and **Y** sets the horizontal and vertical position of the source layer.

Position Z sets the apparent depth of the source layer. Increasing positive values move the source further away from the viewer, and decreasing negative values draw the source closer to the viewer.

Tumble, **Spin**, and **Rotate** move the source layer around the X, Y, and Z axis respectively. Tumble, Spin, and Rotate can be animated over values greater than 360° in order to make the layer complete more than one full revolution.

When the **Lock Pivot to Center checkbox** is selected, the layer tumbles, spins, and rotates around its ow n center. If this option is deselected, you can set an external pivot point around which to tumble, spin, and rotate the layer., using the Pivot X, Y and Z parameters. The BCC Jitter Basic filter does not include this parameter.

Pivot X, **Pivot Y** and **Pivot Z** set the X, Y, and Z coordinates of the pivot point. If the **Lock Pivot to Center checkbox** is selected, moving the pivot point parameters have no affect. The BCC Jitter Basic filter does not include this parameter.

Opacity scales the opacity of the source layer. When Opacity is 0, the layer is completely transparent. As the Opacity value increases, the layer becomes increasingly opaque, and at a value of 100, the layer is completely opaque.

Motion Blur Parameter Group

Select the **Motion Blur On checkbox** to turn on motion blur. If Motion Blur On is not selected, the other parameters have no affect.

Motion Blur is an especially memory-intensive feature. It is particularly useful to select the **Draft Mode checkbox** in the General Controls parameter group when creating an effect with motion blur.

The **Motion Blur menu** determines how many times the effect samples between the time the shutter opens and the time it closes. Increasing the number of samples creates a smoother blur but increases render and preview time proportionately. Choose ***Rough***, ***Medium***, ***Smooth***, or ***Smoothest***. Rough uses the fewest samples, while Smoothest uses the most.

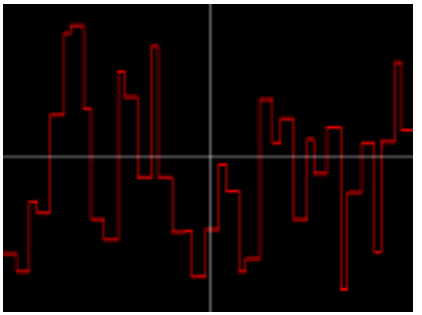
Shutter Angle refers to the workings of a conventional film camera. Normally the shutter is open to 180°, meaning that the shutter is open for half of each frame. Increasing the angle opens the shutter longer, creating a wider blur. Decreasing the angle produces a thinner blur.

Selecting the **Adaptive Motion Blur checkbox** causes the effect to take fewer samples when the source moves more slowly. Selecting this checkbox usually does not have a visible effect, but improves rendering speed.

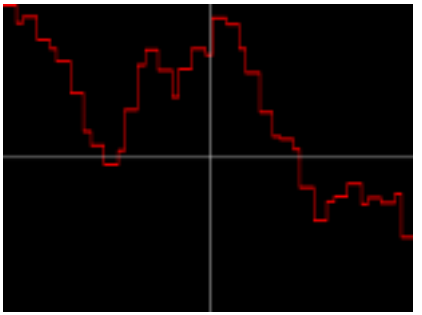
The **Shape Jitter 1 menu** sets the shape of the Jitter curve. The best way to understand how these shapes affect the jittered parameters is to select View Jitter Curves to see the shape of the curve over time. The curves can be modified using the **Timing Jitter 1** and / or **Master Jitter 1** settings.

- ***Off*** turns Jitter 1 off. If shape Jitter 1 is set to Off, the other Jitter 1 parameters have no effect.

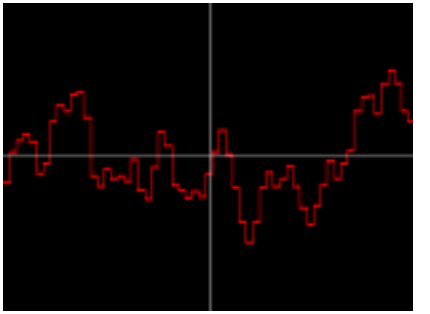
- ***Noise Jumps*** causes the noise to jump to a new value in increments set by the Timing Jitter 1 setting.



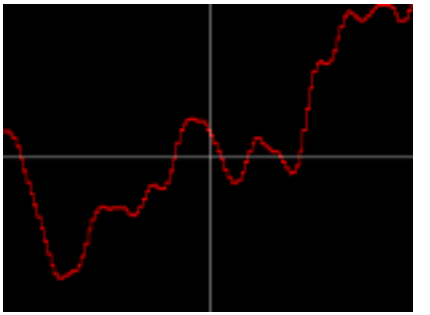
- ***Random Walk*** causes the noise to start at 0, then add a new random number in increments set by the Timing Jitter 1 setting.



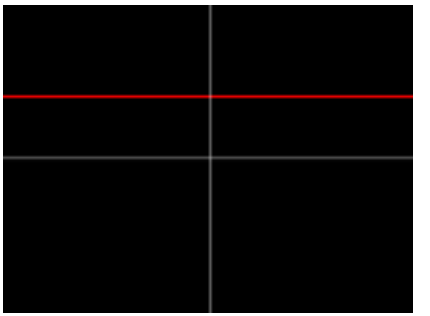
- ***Smooth Noise*** creates a new noise value every frame, then smooths the curve that is created. Timing Jitter 1 adjusts the width of the curve smoothness.



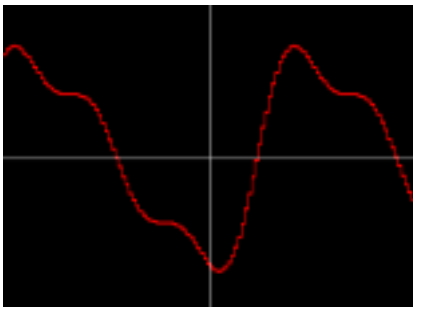
- ***Smooth Walk*** creates a Random Walk curve, then smooths the result. Timing Jitter 1 adjusts the width of the curve smoothness.



- ***Constant*** adds the Master Jitter 1 value to the base parameter value set by the Source and Insert settings, creating a static effect.



- The remaining choices all produce regular waves of varying shapes. Most of these choices have fairly descriptive names. The ***Spectrum*** choices are all variations on the sine wave (the curve at right is an example of a Spectrum wave). For each of these choices, Timing Jitter 1 adjusts the frequency of the wave, and Master Jitter 1 adjusts the amplitude (height) of the wave.



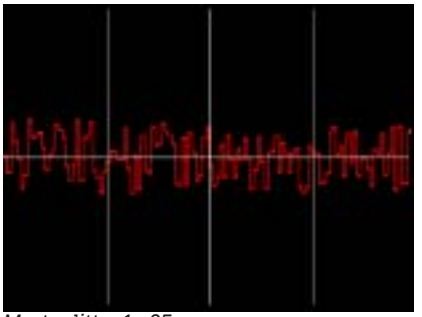
Jitter 1, 2, and 3 Parameter Groups

The Jitter 1, 2, and 3 parameter groups create three different jitter curves, each of which can apply to up to three parameters. Jitter 2 and Jitter 3 parameters function similarly to Jitter 1 parameters, which are described in this section.

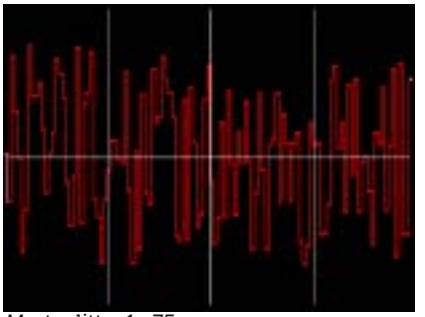
The only difference between the three Jitter parameters sections is that each Jitter can apply to Jitter parameters below it. That is, Jitter 3 can apply to Jitters 1 and 2, Jitter 2 can apply to Jitter 1, and Jitter 1 cannot be applied to other Jitters.

The BCC Jitter Basic filter only allows you to apply one Jitter curve.

Master Jitter 1 adjusts the intensity of the jitter by scaling all of the other jitter parameters. For this reason, each Shape Jitter 1 curve responds slightly differently to Master Jitter 1. When Master Jitter 1 is 0, no jitter is created.



Master Jitter 1=25



Master Jitter 1=75

The effect of **Timing Jitter 1** depends on which shape is selected in the Shape Jitter menu. See page 527 for details.

Random Seed Jitter 1 sets the value that is input to the random number generator used to generate noise. Adjust this value when you like the overall effect but want to adjust the random configuration of the jitter curve.

Frame Offset Jitter 1 offsets the position of the jitter curve by the specified number of frames. Adjusting this value controls which point on the curve corresponds to a given frame.

The **Destination 1 Jitter 1 menu** selects which parameter is affected by the jitter. **Destination 2 Jitter 1** and **Destination 3 Jitter 1** allow you to choose two more parameters to jitter.

- When Destination is set to ***Off***, no parameters are affected.
- ***Scale*** jitters both the X and Y Scale.
- ***Motion*** jitters the motion of the layer in the X, Y, and Z directions simultaneously. If Motion is selected, the Jitter Amount is proportionate to the layer's speed, so when the layer is still, no jitter is applied.

- ***XY Wobble*** jitters the layer in the direction perpendicular to the layer's direction of motion in the X and Y planes. For example, if the layer is moving horizontally, XY Wobble jitters the layer vertically. If XY Wobble is selected, the Jitter Amount is proportionate to the layer's speed, so when the layer is still, no jitter is applied.
- ***Angular Motion*** jitters Tumble, Spin, and Rotate in amounts proportionate to each parameters rate of change. When Tumble, Spin, or Rotate is constant, the parameter is not affected by the jitter.
- ***Insert 1 Red***, ***Insert 1 Green***, and ***Insert 1 Blue*** affect the respective color channel in the chosen Insert 1 Color. The ***Insert 2*** and ***Insert 3 Red***, ***Green***, and ***Blue*** choices function in the same way but affect the Insert 2 and Insert 3 Colors, respectively.
- The remaining choices affect the parameters of the same name.

Insert 1, 2, and 3 Parameter Groups

Each of these parameter groups can be used to apply a simple effect to the source image. The parameters function in the same way in each section. The **Effect Insert menu** determines which effect is applied. Effect are adjusted with the **Amount** and **Parameter** controls. Several effects use the **Color** parameter as well. The controls behave differently depending on the selected effect.

The BCC Jitter Basic filter does not include an Effect Insert menu and the associated controls.

- ***Off*** applies no additional effect to the source layer.
- ***Bright-Contrast*** adjusts the brightness and contrast of the source layer. When Bright-Contrast is chosen, Amount adjusts brightness, and Parameter adjusts contrast.
- ***Hue-Sat*** adjusts the hue and saturation of the source layer. Amount adjusts the hue angle, and Parameter adjusts the saturation.
- ***Black & White*** mixes the source image with a black and white copy of itself. Amount controls the mixture of the images. Increasing Amount values replace the colored image with the black and white copy, and at a value of 100, the image is completely black and white. Negative Amount values have no affect. Parameter has no affect when Black & White is chosen.
- ***Black & Color*** mixes the source image with a copy of itself that is tinted black and the chosen Color. Amount controls the mixture of the images. Increasing Amount values replace the original source image with the tinted copy, and at a value of 100, the source is completely tinted. Negative Amount values have no affect. Parameter has no affect when Black & Color is chosen.
- ***Color & White*** mixes the source image with a copy of itself that is tinted the chosen Color and white. Amount controls the mixture of the images. Increasing Amount values replace the original source image with the tinted copy, and at a value of 100, the source is completely tinted. Negative Amount values have no affect. Parameter has no affect when Color & White is chosen.

- ***Colorize*** mixes the source image with the chosen Color. Amount controls the mixture of the source and color. Increasing Amount values replace the original source image with the color; at a value of 100, the source is entirely replaced by the color. Negative Amount values have no affect. Parameter has no affect when Colorize is chosen.
- ***Blur*** applies a blur to the source image. Amount controls the amount of blur. Negative Amount values have no affect. Parameter controls the amount of blur in each direction. Increasing positive Parameter values increase the horizontal blur, while decreasing negative values increase the vertical blur. When Parameter is 0, the image blurs equally in both directions.
- ***Choke*** shrinks or expands the opaque areas in the source image's alpha channel. Increasing positive Amount values increase the size of the opaque regions, while decreasing negative values decrease the size of the opaque regions. When Choke is selected, Parameter has no affect.
- ***Radial Wipe*** creates a wipe effect which keys out a portion of the source image. The image keys outside of a circle whose diameter is controlled by the Amount. When Amount is 0, the image is unchanged. Increasing this value decreases the diameter of the circular opaque region, removing more of the image. At a value of 100, the entire source keys out. Negative Amount values have no affect. Parameter adjusts the softness of the edges of the opaque region. When Parameter is 0, the edges are completely hard. Increasing this value increasingly blends the edges with the background. Negative Parameter values have no affect.
- ***Key Out Dark*** keys out the darker pixels in the source image, making them transparent. Amount controls the value of the key threshold. Increasing this value raises the threshold, increasing the range of luminosities that key out. Increasing Parameter increases the softness of the edges of the opaque regions in the image. Negative Parameter values have no affect.
- ***Key Out Light*** keys out the lighter pixels in the source image, making them transparent. Amount controls the value of the key threshold. Increasing this value lowers the threshold, increasing the range of luminosities that key out. Increasing Parameter increases the softness of the edges of the opaque regions in the image. Negative Parameter values have no affect.
- ***Key Out Color*** keys out pixels whose channel values are similar to the chosen Color. Amount controls the width of the range of similar values that key out. As Amount increases, a wider range of colors similar to the Color key out. Increasing Parameter increases the softness of the edges of the opaque regions in the image. Negative Parameter values have no affect.
- ***Key In Color*** keys out pixels whose channel values are dissimilar to the chosen Color. Amount controls the width of the range of dissimilar values that key out. As Amount increases, a wider range of colors dissimilar to the Color key out. Increasing Parameter increases the softness of the edges of the opaque regions. Negative Parameter values have no affect.

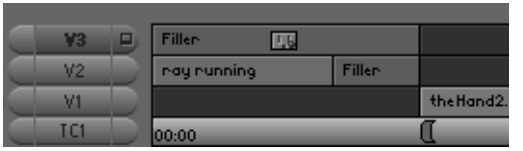
Working with the BCC Looper Filter

Looper allows you to quickly create looped effects. You can animate the number and duration of loops, offset the loops automatically, and create fades and dissolves between the looped clips.

Creating a Loop Effect

You can apply Looper directly to the clip that you want to loop; however, the duration of the looped effect is then limited to the duration of the filtered clip. To create a looped effect that is longer than the duration of the source media, follow the steps below.

1. Use Add Edits to create filler in the timeline track above the clip that you want to loop. Alternatively, you can edit a placeholder clip instead of filler.
2. Add filler after the clip that you want to loop so that it matches the duration of the filler clip.
3. Apply the BCC Looper filter to the filler. Your timeline should appear similar to the example below.



4. Choose the clip you want to loop in the **Loop Layer menu**.
5. Adjust the other parameters as needed.

   If you delete the source clip from the timeline, the effect becomes unrendered.

Animating BCC Looper Parameters

All Looper parameters can animate. However, animation behaves slightly different than in other filters because Looper renders loops, rather than frames, as its basic unit. Therefore, the properties of the first loop are set by the parameter settings at the start of the effect. Value changes that occur through animation are ignored until the start of the second loop, at which point the new parameter values take effect. Subsequent parameter changes are ignored until the start of the third loop, and so on. This pattern allows all parameters to produce predictable results when animated.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23,“Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Loop Layer menu** chooses the clip in the timeline to loop.

Start Frame sets the frame in the Loop Layer to use as the beginning of the looped clip. For example, if Start Frame to 10, the loop begins on the 10th frame of the Loop Layer clip.

Loop Length determines how many frames are in each loop. For example, if you set Loop Length to 30, each looped clip lasts exactly 30 frames.

Increment automatically offsets the start frame of the each loop. For example, if the Start Frame is 10 and Increment is 2, the effect begins on frame 10 in the first loop, on frame 12 in the second loop, on frame 14 in the third loop, and so on.

The **Loop Mode menu** determines how the filter plays successive loops.

- ***Normal*** plays each loop forwards only. For example, if Loop Length is 4, the filter plays frames 0, 1, 2, 3, 0, 1, 2, 3, and so on.
- ***Reset after N Cycles*** plays each loop in the same manner as Normal does, but resets the Increment value to 0 after the number of loops specified by **Reset Cycles**.
- ***Back & Forth*** plays the loop forward and then backwards, but only plays the end frames once. For example, if Loop Length is 4, the filter plays frames 0, 1, 2, 3, 2, 1, 0, 1, 2, 3, 2, and so on.
- ***BF Repeat Ends*** plays the loop forward and backwards, repeating the end frames. For example, if Loop Length is 4, the filter plays frames 0, 1, 2, 3, 3, 2, 1, 0, 0, 1, and so on.

If you apply Looper to a clip with an alpha channel, selecting the **Matte with Own Alpha checkbox** masks the Loop Layer with the source layer's alpha channel. Leave this option deselected if you do not want to mask the Loop Layer.

The source alpha channel is not looped when used as a mask.

Fade Parameter Group

When the **Loop Mode menu** is set to ***Normal***, the parameters in this section can be used to create dissolves and fades. If Loop Mode is not set to Normal, parameters in this section have no affect.

The **Fade menu** creates dissolves and fades by blending the transitions between each loop.

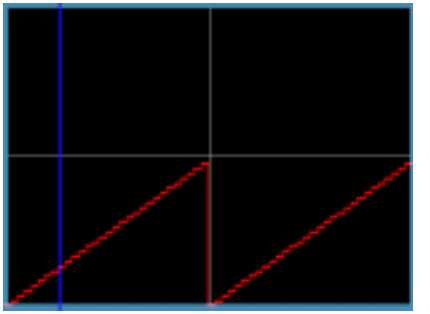
- ***Cross Fade*** fades out the end of each loop as the beginning of the next loop fades in, creating dissolves between each loop. When Cross Fade is chosen, **Overlap** sets the number of frames in which the outgoing and incoming loops overlap. Negative Overlap values create a gap between the outgoing and incoming loops.
- ***Fade In–Fade Out*** fades out the end of each loop before the succeeding loop begins to fade in. When Fade In–Fade Out is chosen, the **Fade In** and **Fade Out** values determine the duration (in frames) of each loop's fade in and fade out, respectively.
- When Fade is ***None***, the end of each loop cuts directly to the beginning of the next loop.

Frame Curve Parameter Group

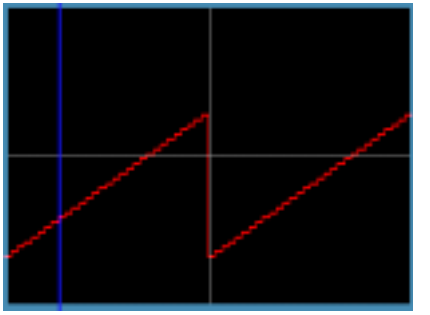
The Frame Curve Parameters are preview display controls which enable you to view a curve that graphs the frame in the Loop Layer used to render each frame in the loop effect.

Select the **View Curve checkbox** to display the time curve in the Effect Preview monitor. Deselect this option to view the effect.

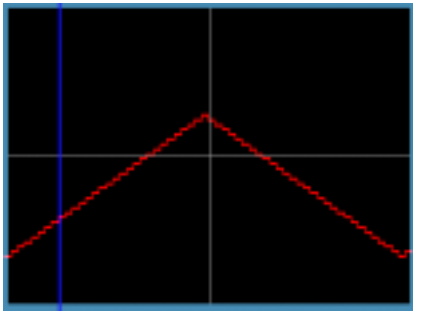
This example shows a frame curve for a loop effect. The vertical blue line represents the current time. The X axis represents time (measured in frames), and the Y axis represents the source frame number. In this effect, Start Frame is 0, Loop Length is 30, and Loop Mode is Normal. The first frame in the effect corresponds to frame 0 in the source. This point is represented by the far left point on the curve. As the effect progresses and the source frame increases, the curve climbs. When the effect reaches frame 30 in the source, it loops back to frame 0, and the curve drops precipitously.



In this example, Start Frame is increased to 10, moving the curve upwards. Since each loop begins on frame 10, the curve never reaches the bottom of the Y axis.



In this example, Loop Mode is set to Back & Forth. This creates a smoother curve pattern because the frame number does not drop to the Start Frame value each time the effect loops.



The **Composite Curve menu** allows you to composite the curve over the Loop Layer clip or the completed effect. If the **View Curve checkbox** is not selected, these menu choices have no affect.

- ***Curves*** composites the curve over a black background.
- ***Curves Over Layer*** composites the curve over the Loop Layer.
- ***Curves Over Comp*** composites the curve over the entire composition.

The **Input Time View menu** controls the scale of the X axis in the frame curve. ***Full Effect*** scales the X axis to the untrimmed length of the filtered layer. ***16 Seconds***, ***8 Seconds***, ***4 Seconds***, and ***2 Seconds*** scale the X axis to the corresponding number of seconds centered around the timeline indicator.

The **Output Time View menu** controls the scale of the Y axis in the frame curve. ***Full Effect*** scales the Y axis to the untrimmed length of the filtered layer. ***First 16 seconds***, ***First 8 seconds***, ***First 4 seconds***, and ***First 2 seconds*** scale the Y axis to the corresponding number of seconds starting from the frame specified by Scroll Curves.

Scroll Curves selects the first frame in the effect that is displayed when Output Time View is set to First 16 seconds, First 8 seconds, First 4 seconds, or First 2 seconds. This parameter has no effect if Output Time View is set to Full Effect.

Working with the BCC Optical Flow Filter

The Optical Flow filter estimates the motion between two frames of video and renders an intermediate frame that interpolates the motion. The synthesized frame contains a mixture of the previous and next frames, each distorted by an amount determined by the optical flow estimation. With this filter, you can smoothly slow down or speed footage. Optical Flow generally produces smoother animations than a velocity remap filter.

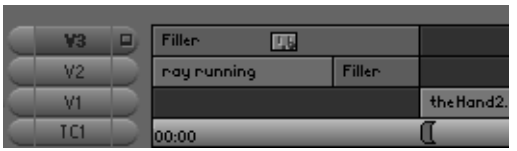
Optical Flow synthesizes frames needed to complete the effect instead of blending adjacent frames as most retiming applications do. In essence, Optical Flow manufactures entire frames. Optical Flow analyzes the frames before and after the current frame to determine which pixels are moving. Then, only the moving pixels are synthesized, repositioned and composited into the new frame. The intervening information is created by warping the two frames, estimating where each individual pixel should be at every new in-between point.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23,“Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

Creating an Optical Flow Effect

You can apply Optical Flow directly to the clip that you want to affect. However, the duration of the effect is then limited to the duration of the source media. To create an Optical Flow effect that is longer than the duration of the source clip, follow the steps below.

1. Create a placeholder clip that is the duration that you want for the final effect on the track above the clip that you want to affect.
2. Add filler after the clip that you want to affect so that it matches the duration of the filler clip.
3. Apply the BCC Optical Flow filter to the filler. Your timeline should appear similar to the example below.



4. Choose the desired clip or layer from the **Source Layer menu**.
5. Set **Velocity** to the desired speed. Values between 0 and 99 slow the clip, while values above100 speed the clip.

The **Source Layer menu** sets the clip that is affected by the filter. The choices are ***None, Filter Layer, 1st Below*** or ***2nd Below***.

Velocity adjusts the velocity of the Source Layer. This value is expressed as a percentage of the clip's frame rate. If Velocity is 100, the source moves at the normal frame rate—that is, at the clip's frame rate. If Velocity is 50, the source moves half as fast as the clip's frame rate. If Velocity is 0, the source is a static image.

When the **Offset Keyframe checkbox** is selected, you can specify which frame from the Source Layer to output at a specific frame in the composition. Velocity is automatically calculated, even if it is a fractional value. For example, you want to output frame 20 at frame 28. Select this checkbox, create a keyframe at frame 28 and set **Start/Offset Frame** to 20. When this checkbox is selected, the Velocity and Input Frame Rate parameters have no affect.

Start/Offset Frame determines which frame in the Source Layer is used as the output frame in the effect when the Offset Keyframe checkbox is selected and Velocity is adjusted. If the Offset Keyframe checkbox is not selected, this parameter sets which frame in the Source Layer is used as the first frame in the effect when Velocity is adjusted.

The **Optical Flow Quality menu** adjusts the quality of the output. The optical flow estimation algorithm has sub-pixel accuracy, so ***Best*** may not be necessary to produce good results. In general, if the motion estimation appears incorrect at ***Medium***, you may need to adjust the controls in the Motion Estimation parameters, even if you increase the Optical Flow Quality.

- ***Best*** uses single pixel accuracy. Use this option if the motion of fine lines is blurred.
- ***High*** uses half resolution accuracy, interpolated to full size.
- ***Medium*** uses quarter resolution accuracy, interpolated to full size. This is the default.

If the Optical Flow does not look correct at a particular frame, move to that frame and reduce the **Optical Flow Quality** to ***Medium***. Adjust the Motion Estimation parameters until you see a better output. Then increase Optical Flow Quality and finetune the Motion Estimation parameters as necessary. Displaying the Motion Vectors can help you to adjust the Optical Flow. See page 540 for details.

The **Blending menu** allows you to specify the mixture of normal frame blending and the optical flow frame synthesis in the output.

- ***Frame Blending Only*** does not include any optical flow frame synthesis in the output. This is similar to creating a Velocity Remap effect and can be useful to speed previews.
- ***Bi-Directional Mix*** uses a mixture of frame blending and optical flow frame synthesis in the output. The current frame is combined with both the previous and next frame.
- ***Nearest Mix*** uses a mixture of frame blending and optical flow frame synthesis in the output. The current frame is combined with either the previous or next frame, depending on which original source frame is closest in time.

Optical Flow Mix determines the percent of Optical Flow synthesized frames vs. frame blending. If Optical Flow Mix is set to 0, only the Optical Flow frames are used in the output. If the Blending menu is set to Frame Blending Only, this parameter has no affect.

Motion Estimation Parameter Group

The controls in this section offer options for improving the motion estimation.

Select the **Use Reverse Estimation checkbox** to reverse the motion estimation. This can be useful if the object moves to the right. Reverse Estimation treats the next frame as the first and the current frame as the second.

Min. Edge Contrast sets a threshold for the minimum amount of detail in a region. Regions containing less detail than the threshold are treated as having no detail. If your frame includes a lot of motion in areas that are very detailed or small objects, decrease this parameter. Min. Edge Contrast does not depend on the motion, only the texture and detail of the frames.

If your effect includes Optical Flow errors that are localized to small areas where the image moves together, increase Min. Edge Contrast to 200 or 400. If errors occur at motion boundaries, decrease Min. Edge Contrast to approximately 50.

The **Enable Low Velocity Correction checkbox** sets a threshold for detecting motion in a region. If the Optical Flow moves an area that should not move, select this checkbox and adjust the **Low Velocity Correction** value. If this checkbox is not selected, Low Velocity Correction has no affect.

Velocity Limit constrains the magnitude of motion estimation. Decrease this value if the motion estimation appears incorrect. This value corresponds to a percentage of the size and resolution of the Source Layer. For example, when working with a D1 image, the value of 100 corresponds to approximately 100 pixels.

If the estimated motion is larger than the actual motion, the image will distort and the motion vector display will show long motion vectors. If this occurs, try decreasing Velocity Limit to approximately 50.

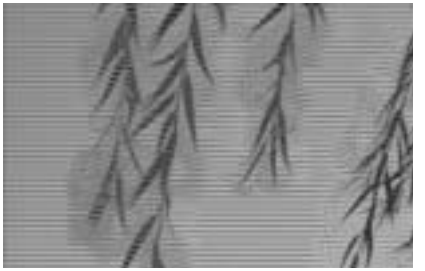
The **Composite Motion Vectors menu** displays onscreen motion vectors. The array of vector lines indicate the direction of motion of the pixels in the image in the current frame.

- ***Off*** does not display motion vectors.
- ***Draft Only*** displays motion vectors but does not include the motion vectors in the rendered effect. When you use the ***Draft Only*** option, you must preview in Draft mode. To preview in Draft mode, select the **Draft Mode checkbox** in the General Controls parameter group.
- ***Render*** displays motion vectors and includes the motion vectors in the rendered effect.

Motion Vectors Parameter Group

These parameters control onscreen motion vectors which indicate the direction of motion of the pixels in the current frame. If an area in the effect that doesn't look correct, turn on the vectors to view the estimation. For example, something in your image is not supposed to move. When you turn the vectors on, you see large motion vectors over the object. To correct this problem, add a keyframe and increase Low Velocity Correction or the Velocity Limit.

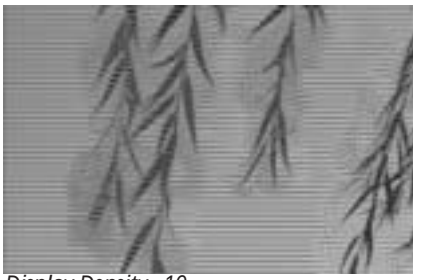
Motion Vectors=off



Motion Vectors=on

Display Density adjusts the number of vector lines which appear in the composite. Higher values produce more vectors. If the Composite Motion Vectors menu is set to Off, this parameter has no affect.

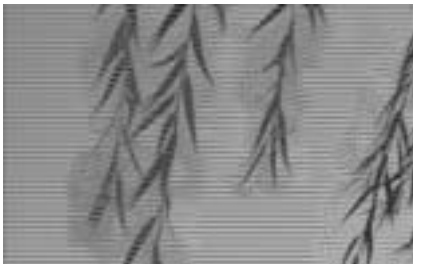
Display Density=2



Display Density=10

Drawing Scale controls the length of the individual vector lines. Higher values produce longer lines. If the Composite Motion Vectors menu is set to Off, this parameter has no affect.

Drawing Scale=10



Drawing Scale=10

Working with the BCC Optical Stabilizer Filter

The Optical Stabilizer filter allows you to stabilize shaky video footage. The Optical Stabilizer uses optical flow technology to analyze a specified region and then adjusts the track's position to compensate. Unlike many stabilizing tools, the BCC Optical Stabilizer does not require you to set user-defined tracking points. This is useful for images where tracking data is unreliable.

During playback, the motion appears smooth because the track moves incrementally to offset the unwanted motion. You can also stabilize just a portion of a track to correct isolated camera bumps.

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, and "Working with the Title Matte Parameter Group" on page 23.

Unlike Avid's Region Stabilize effect which only takes horizontal and vertical movement into consideration, the BCC Optical Stabilizer allows you to take motion, rotation and scaling into account when stabilizing. However, because it uses optical flow technology, the BCC Optical Stabilizer is more render intensive than the Region Stabilize effect and may not be appropriate for all clips. While the Region Stabilize effect provides an Auto Zoom option, the Optical Flow filter provides more options for producing new edges as the image is offset. You should consider these factors when deciding which effect to use.

For an overview of using the BCC Optical Stabilizer filter, see "Overview of Using the Optical Stabilizer" on page 546.

The **Mode menu** is a preview control with the following options.

- Choose ***Stabilize*** to stabilize the clip. Choose Stabilize when you want to lock all the frames to the reference frame, eliminating all motion.
- Choose ***Smooth*** to produce an image that averages the motion over the smoothing range. This option may be less render intensive than Stabilize because there may be fewer frames within the smoothing range than from the current frame to the reference frame. Choose Smooth when you want to smooth, but not eliminate motion, such as when panning a hand-held camera.
- Choose ***Setup Region*** to setup the target area. This region should be as large as possible while excluding large untrackable areas of uniform texture such as sky or water.
- Choose ***Show Vectors*** to display onscreen motion vectors. The array of vector lines indicate the direction of motion of the pixels in the image in the current frame. This can be helpful for finetuning. Be sure to return the menu to Smooth or Stabilize before rendering.

Reference Frame sets the frame that is used as a reference for the filter. When stabilizing, the other frames are transformed to match the reference frame. The Reference Frame is not used when the Mode menu is set to Smooth.

Smoothing Range sets the number of frames that are used to calculate the average position.

Corner 1 and **Corner 2 position controls** determine the target region. The target region indicates the area in the media to track. The points set the location of the upper left and lower right corners of a rectangular target region. However, in general it is easier to use the onscreen point controls to set this up. Then use the position controls for finetuning. Before adjusting these controls, set the Mode menu to Setup Region.

A good target region contains a high-contrast object with good vertical and horizontal edge definition as well as large areas of non-uniform detail, especially edges in various directions. Ideally, you should find a pattern that is visible in every frame. The area you define should contain an object that should be stationary in every frame.

For example, you want to stabilize some footage shot off the railing of a moving boat. The pier is visible from the boat. A high contrast mooring on the pier would make a good target.

Not all imagery is appropriate for optical stabilization. For example, images with large uniform textures, like fields of grain, sky, water, or blank walls will not work well with this filter. Images with lots of motion blur or low contrast images may also cause problems. In addition, perspective shifts (for example, a forward dolly shot) or moving foreground objects that dominate the image will not generate optimum results. For best results, your target region should include a fair amount of contrast with good vertical and horizontal edge definition as well as large areas of non-uniform detail, especially edges in various directions. The motion of the clip should only include panning, zooming and rotation. Large background areas with objects moving independent of the background are also suitable.

The **Stabilize menu** lets you choose how to calculate the tracker data.

- ***Translation*** tracks the motion on the X and Y axis only.
- ***+Rotation*** allows you to take motion and rotation into account when stabilizing.
- ***+Zoom*** allows you to take motion, rotation and scaling into account when stabilizing.

The **Clip Top, Clip Left, Clip Bottom** and **Clip Right** allow you to crop the edges of the clip after it has been stabilized. This allows you to finetune how the edges are handled. For example, if you set the Edge Handling menu to Repeat, you may want to adjust where the edge begins to repeat.

The **Edge Handling menu** determines how the filter produces new edges as the image is offset. For example, suppose the image shakes vertically. As the image moves up to offset the unwanted motion, the bottom of the image is raised above the bottom of the frame. This setting determines how the filter creates pixels to fill the this space.

- ***Color*** produces a solid color on the edge of the image. The ***Edge Color*** parameter determines the color that is used.

- ***Transparent*** leaves the space transparent, revealing any tracks that are lower in the timeline.
- ***Repeat*** repeats the pixels on the edge of the image, producing a smeared effect.
- ***Reflect*** produces a mirror image copy of the pixels adjacent to the edge.
- ***Tile*** produces an image copy of the pixels adjacent to the opposite edge of the image.


Edge Handling=Mirror


Edge Handling=Black


Edge Handling=Smear

X Translation and **Y Translation** position point controls allow you to move the center point of the clip on the X and Y axis respectively.

Rotation allows you to rotate the clip on the Z axis.

Scaling changes the size of the image along the X and Y axis. This parameters scales as a percentage of the image's original width and height. Thus, a Scaling value of 200 produces an image twice as large as the original.

Optical Flow Parameter Group

The Optical Flow parameters estimate the motion between frames of video and use that information to calculate the motion of the image. Optical Flow analyzes the frames before and after the current frame to determine which pixels are moving.

Vector View Spacing and **Vector View Scale** control onscreen motion vectors which indicate the direction of motion of the pixels in the current frame. If an area in the effect doesn't look correct, turn on the vectors to view the estimation. For example, if an area in your image is not supposed to move, check the display for that area.

You must set the **Mode menu** to ***Show Vectors*** to display the onscreen motion vectors. Be sure to return this menu to Stabilize or Smooth before rendering your effect.

Vector View Spacing adjusts the number of onscreen motion vector lines. The array of vector lines indicate the direction of motion of the pixels in the image in the current frame. Higher values produce more vectors. At a value of 0, no vectors display.

Display Density=2

Display Density=10

Vector View Scale controls the length of the individual vector lines. The array of vector lines indicate the direction of motion of the pixels in the image in the current frame. Higher values produce longer lines. At a value of 0, no vectors display.

Drawing Scale=10

Drawing Scale=10

Stabilization Samples sets the number of vector field samples that the filter takes. Higher values produce more accurate analysis but increase rendering times.

Span sets the percentage of samples that are considered to be representative of the background. If the image is nearly all background, increasing Span can increase the accuracy of the stabilization.

Edge Contrast sets a threshold for the minimum amount of detail in a region. Regions containing less detail than the threshold are treated as having no detail. If your frame includes a lot of motion in areas that are very detailed or small objects, decrease this parameter. Min. Edge Contrast does not depend on the motion, only the texture and detail of the frames.

The **Resolution menu** adjusts the quality of the analysis. The choices are ***Full, Half, Quarter, Eighth, Sixteenth, 32nd*** or ***64th***. The default Quarter resolution setting often produces good results. However some images may require Half or even Full to produce good results. Easily tracked images may be able to use lower resolutions. Higher resolutions take more time to process but can create more accurate results.

Velocity Limit constrains the magnitude of motion estimation. This value corresponds to a percentage of the size and resolution of the Source Layer. For example, when working with a D1 image, the value of 100 corresponds to approximately 100 pixels.

If the estimated motion is larger than the actual motion, the stabilization will be incorrect and the motion vector display will show long motion vectors. If this occurs, try decreasing Velocity Limit to approximately 50.

Low Velocity Correction sets a threshold for detecting motion in a region. If the Optical Flow shows vectors in an area that is not moving, adjust the **Low Velocity Correction** value.

Overview of Using the Optical Stabilizer

The following steps provide an overview of the optical stabilizing process.

1. Apply the BCC Optical Stabilizer filter directly to a clip that you want to stabilize.

Avid's **Video Quality menu** should be set to ***Full Quality*** when you use the Optical Stabilizer.

2. Set the **Mode Menu** to ***Setup Region*** and use the onscreen controls to set up the target region. This region should be as large as possible while excluding areas of uniform texture such as sky or water or other difficult to track areas such as motion blur or low contrast.

   A good target region contains large areas of non-uniform detail with high-contrast edge definition aligned in a variety of directions.

3. If you are stabilizing, set the **Reference Frame** to assign the frame that is used as a reference for the filter. When stabilizing, the other frames are transformed to match the reference frame.

4. If you will be smoothing instead of stabilizing, adjust **Smoothing Range** to set the number of frames that are used to calculate the average position of the image.

5. Set the **Stabilize menu** to the appropriate choice. For details, see page 543.

6. Set the **Edge Handling menu** to the appropriate choice. This setting determines how the filter creates pixels to fill the this space created when the image is offset to compensate for movement. For details, see page 543.

7. Make sure you are on the first frame in the effect. Set the **Mode Menu** to ***Stabilize*** or ***Smooth*** and click **Play.** The filter will stabilize or smooth the clip.

   Choose **Stabilize** when you want to lock all the frames to the reference frame, eliminating all motion. Choose **Smooth** when you want to smooth, but not eliminate all motion, such as when panning a hand-held camera.

If you are not on the first frame of the effect and choose Stabilize, the filter will calculate the stabilization of every frame up to the current frame before displaying the current frame. No onscreen displays indicate that the filter is calculating, so you could mistakenly believe that the BCC Optical Stabilizer filter is frozen. Conversely, if you are on the first frame and choose Smooth, the filter must calculate all frames in the Smoothing Range. This means that if the position indicator is on the first frame, Stabilize will be more interactive while if the position indicator were on frame 100, Smooth could be more interactive (depending on the Smoothing Range setting).

8. If necessary, correct any errors using the Optical Flow parameters. See page 544 for details.

9. If you want, you can adjust **X Translation** and **Y Translation, Rotation** and **Scaling** parameters to correct any mistakes made by the filter or to finetune the results.

10. Render the effect.

If you play through the entire effect before rendering the filter will calculate the stabilization of every frame. Otherwise, the filter will calculate during the render.

Working with the BCC Posterize Time Filter

Posterize Time can be used to create strobe effects by altering the frame rate of the source media and adjusting the length of time that each frame displays. You can also use apply modes and the PixelChooser to mix the time-posterized output with the original in various ways.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23,“Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

You can apply the Posterize Time filter directly to the clip that you want to strobe; however, the duration of the effect is then limited to the duration of the filtered clip. To create an effect that is longer than the duration of the source media, follow the steps described in “Creating a Loop Effect” on page 534.

Frame Separation sets which frames display and the duration each frame is held. For example, if Frame Separation is 10, every tenth frame (frame 0, 10, 20, and so on) displays for 10 frames for the duration of the clip. Increasing Frame Separation reduces the number of frames from the source media that display and increases the time that each frame stays on-screen. When Frame Separation is 1, the sequence plays at its normal frame rate.

Select the **Lock to Whole Numbers checkbox** to round Frame Separation values to the nearest whole number.

The **Time Mix Mode menu** affects what happens when Time Width is reduced from the default of 100. The Time Width sets the percentage of the time for which the output is the unmixed Poster Frame.

- ***Original*** is the default choice. Reducing Time Width from 100 replaces the posterized frame with the original image as you move away from the actual time of the frame. Reducing Time Width to 0 removes the posterization completely. Time Falloff determines the smoothness of this transition.
- ***Dissolve*** dissolves the output from one posterized frame to the next when Time Width is reduced. Time Falloff is ignored.
- ***Transparency*** mixes the posterized frame with transparency as Time Width is reduced. Time Falloff works as it does with Original.
- When the Time Mix menu is ***Off***, the Time Width and Falloff controls have no affect.

Time Width mixes the time-posterized output with the source image by alternately outputting some frames at their normal frame rate and outputting other frames at the time-posterized frame rate (determined by the Frame Separation value).The Time Width value is expressed as a percentage in which 0 represents the normal frame rate and 100 the time-

posterized rate. For example, if Frame Separation is 10 and Time Width is 50, the first five frames play at their normal frame rate, followed by 5 frames at the time-posterized frame rate. This creates the appearance of real-time motion alternating with strobe motion.

Time Falloff creates dissolves between the source frames and the time-posterized frames when Time Width is used. Increasing Time Falloff increases the number of frames in each dissolve, smoothing the transitions between real-time motion and strobe motion.

The **Apply Mode menu** sets the apply mode used to composite the time-posterized output over the original source media.

For descriptions of all the possible Apply Modes, see “Apply Modes” on page 625.

Apply Mix blends the Apply Mode setting with the **Apply Mix From menu** setting. The resulting mixed mode is used to composite the time-posterized output over the original source media. For example, if Apply Mode is set to ***Lighten*** and Apply Mix From is set to ***Normal***, then Apply Mix blends the Lighten and Normal apply modes. In this case, an Apply Mix setting of 0 uses the Normal apply mode, and an Apply Mix setting of 100 uses the Lighten apply mode. An Apply Mix setting of 50 blends the two apply modes equally.

You can use Apply Mix to soften the effect of a given apply mode, or to animate from one apply mode to another over time.

Mix with Original blends the filtered output with the original source image. Use this parameter to scale down or animate the effect of the filter without adjusting individual parameters.

For information on the PixelChooser parameter group controls, see “The PixelChooser” on page 603.

Working with the BCC Temporal Blur Filter

Temporal Blur blurs the image over time by averaging two or more source frames to produce each output frame. This filter includes a PixelChooser, which allows you to selectively blur only a portion of the source image.

In the following example, the willow leaves move from left to right across the screen. When Temporal Blur is added, several frames preceding and following the source frame are blended to create blurred movement.

Source image

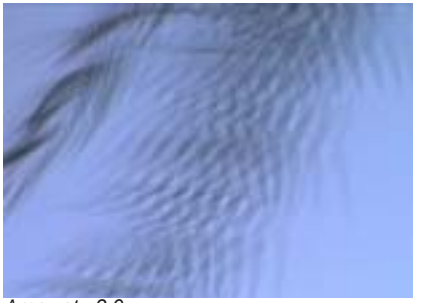
Filtered image

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23,“Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

You can apply the Temporal Blur filter directly to the clip that you want to filter; however, the duration of the effect is then limited to the duration of the filtered clip. To create an effect that is longer than the duration of the source media, follow the steps described in “Creating a Velocity Remap Effect” on page 573.

Amount (Frames sets the width of the blur in frames. For example, if Amount is set to 5, the current frame is averaged with the following five frames to produce the output frame.

Amount=1.0

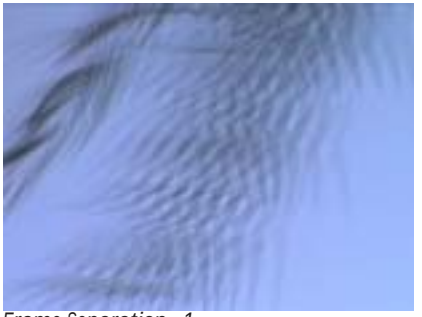


Amount=3.0

Selecting the **Lock to Whole Frames checkbox** locks the Amount value to a whole number of frames, which prevents partial frames from being averaged into the output. Selecting this option can improve render time and may produce a cleaner output if you want the blur to render only a few distinct frames.

If Amount is animated, Lock to Whole Frames will cause jumps in the animation.

Frame Separation sets the separation between the frames that are averaged in the blur computation. For example, if Frame Separation is set to 3, then the render for each frame uses the current frame averaged with every third frame thereafter (therefore, the render for frame 0 would average frames 0, 3, 6, and so on).



Frame Separation=1

Frame Separation=3

Frame Offset offsets the source image used to create the blur at the current time position. For example, if Frame Offset is 10, Frame 10 is used to compute the blur output at Frame 0.

Try using Mix with Original with Frame Offset to produce an effect in which the blur is offset from the source image. In the examples below, Frame Offset is set to –6, so the blurred image lags 6 frames behind the source.

Frame Offset=0

Frame Offset= –6

The **Blur Direction menu** chooses which frames are used to compute the blur for the source frame.

- ***Bidirectional*** blurs the source frame with both the preceding and following frames to produce the blurred output.

- ***Later Frames*** blurs the source frame with the following frames to produce the blurred output.

- ***Earlier Frames*** blurs the source frame with the preceding frames to produce the blurred output.

The **Blur Shape menu** sets the shape of the blur over time.

- ***Gaussian*** gives the most "weight" (prominence in the averaged output) to the source frame and less weight to frames further from the source in time to compute the blur.
- ***Flat*** gives an equal amount of weight to each frame used to compute the blur.

Blur Shape=Gaussian

Blur Shape=Flat

When Blur Shape is Gaussian, **Blur Falloff** determines the number of frames that are added to the Amount value in computing the Blur. When Blur Falloff is 0, the effect uses only the frames specified by the Amount value. Increasing Blur Falloff averages additional frames in the blur, creating a softer blur. This parameter has no affect if Blur Shape is set to Flat.

Blur Falloff=0

Blur Falloff=50

Increasing Blur Falloff increases rendering time. Also, animating Blur Falloff may produce jumps in the effect.

Spread determines how frames used in computing the blur are weighted when using the Gaussian Blur Shape. Increasing Spread weights frames that are farther away in time from the source frame, adding less weight to frames close to the source frame. This parameter has no affect if the Blur Shape menu is set to Flat.

Blur Threshold reduces the effect of the blur using the following method. First, the filter compares each blurred channel with the corresponding source channel. If the difference between the two is less than the Blur Threshold value, the source channel is used in the output and is not affected by the blur. If the difference is greater than the Blur Threshold value, the filter reduces the difference by the Blur Threshold value before outputting the channel.

Blur Threshold=0

Blur Threshold=25

The Bias parameters weights pixels based on their channel values or contrast level.

The **Bias Type menu** sets the type of bias used in weighting pixels.

- ***Channel*** weights pixels according to their channel values. If Bias Type is set to Channel, increasing positive **Bias Amount** values add more weight to pixels whose Bias Channel values are the highest. Decreasing negative values add more weight to pixels whose Bias Channel values are lowest.
- ***Contrast*** weights pixels based on the difference between their channel values and 128 (the midpoint between 0 and 255). If Bias Type is set to Contrast, increasing positive Bias Amount values add weight to pixels whose Bias Channel value are furthest from 128 (closest to 0 and 255). Decreasing negative values add more weight to pixels whose Bias Channel values are closest to 128.
- ***Off*** weights all pixels equally, so no bias is applied. When Bias Type is set to Off, Bias Channel and Bias Amount have no effect.

The **Bias Channel menu** sets the channel whose values are used in weighting pixels. The choices are ***Luma***, ***Alpha***, ***Red***, ***Green***, and ***Blue***.

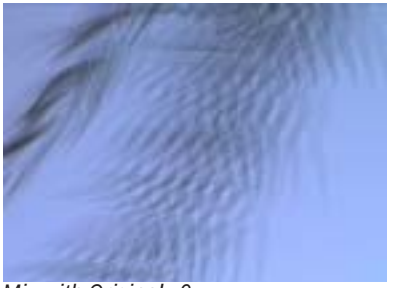
The **Apply Mode menu** sets the apply mode used to composite the blurred output over the original source media. For descriptions of all the Apply Modes, see “Apply Modes” on page 625.

Apply Mix blends the Apply Mode setting with the **Apply Mix From menu** setting. The resulting mixed mode is used to composite the output over the original source media. For example, if Apply Mode is set to ***Lighten*** and Apply Mix From is set to ***Normal***, then Apply Mix blends the Lighten and Normal apply modes. In this case, an Apply Mix setting of 0 uses the Normal apply mode, and an Apply Mix setting of 100 uses the Lighten apply mode. An Apply Mix setting of 50 blends the two apply modes equally.

You can use Apply Mix to soften the effect of a given apply mode, or to animate from one apply mode to another over time.

For information on the PixelChooser parameter group controls, see “The PixelChooser” on page 603.

Mix with Original blends the filtered output with the original source image. Use this parameter to scale or animate the effect of the filter without adjusting individual parameters.



Mix with Original=0

Mix with Original=30

Working with the BCC Time Displacement Filter

The Time Displacement filter is a displacement map that operates in time instead of in space. Pixels are displaced by mixing pixels from the source at the current frame with source pixels from previous or future frames. Basic frame blending is used to compute intermediate pixels and to produce anti-aliased result.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23,“Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

You can apply the Time Displacement filter directly to the clip that you want to filter; however, the duration of the effect is then limited to the duration of the filtered clip. To create an effect that is longer than the duration of the source media, follow the steps described in “Creating a Velocity Remap Effect” on page 573.

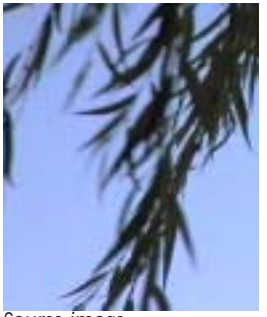
The **Source Layer menu** determines which layer in the timeline is used to create the distortions in the filtered image.

If the Source Layer is partly transparent, the displacement amount scales by its alpha values. Pixels whose map alpha is 0 are not displaced.

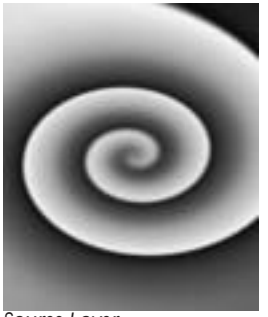
Working with the Map Parameter Group

The Map parameters control the appearance of the displacement map used to distort the source image.

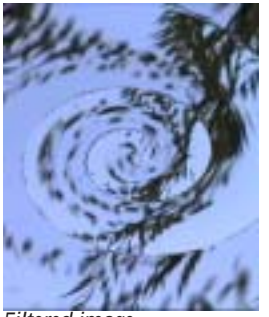
The parameters in this section are identical to the corresponding controls in the Displacement Map filter. See “Map Parameter Group” on page 157 for more information.



Source image



Source Layer

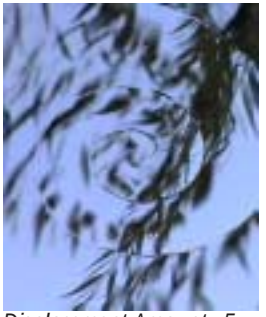


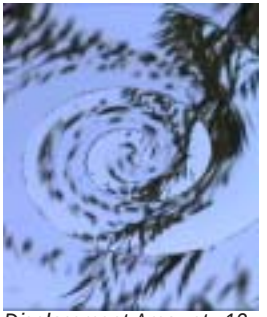
Filtered image

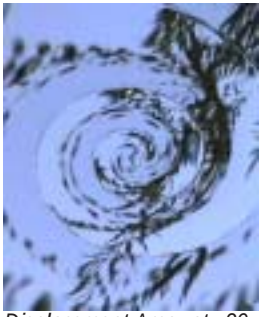
The **View Map checkbox** allows you to view the Source Layer as you make adjustments to it. Deselect this option before rendering.

The **Displacement Channel menu** sets the channel in the Source Layer used to compute displacement. The choices are ***Red***, ***Green***, ***Blue***, ***Luma, White***, ***Gray***, and ***Black***. White treats all of the pixels as if they were white (i. e. fully displaces each pixel Displacement Amount value). Gray treats all of the pixels as if they were 50% gray (resulting in no displacement). Black treats all of the pixels as if they were black, thereby displacing all pixels to the negative of the Displacement Amount value.

Displacement Amount sets the number of frames between the most forward-displaced pixel and the most backward-displaced. For example, if Displacement Amount is 2 and Map Reference Level is 127.5, pixels whose value in the selected Displacement Channel is 255 are displaced forward 1 frame, and those whose value is 0 are displaced backward 1 frame.


Displacement Amount=5


Displacement Amount=12


Displacement Amount=20

Map Reference Level determines the channel value for which pixels are not displaced. For example, if Map Reference Level is 0, pixels whose values in the selected Displacement Channel are 0 are not displaced. Pixels whose value is 255 are displaced 2 frames forward. If Map Reference Level is 255, pixels whose value is 0 are displaced backwards 2 frames, and pixels whose value is 255 are not displaced.

Select the **Frame Blending checkbox** to enable frame blending. It is recommended that you leave this option selected, as Frame Blending prevents an aliased appearance in the render.


Frame Blending off


Frame Blending on

If the **Deinterlace checkbox** is selected, the program creates an in-between frame to use for the field opposite to the one being rendered, and use the new frames in the displacement render. This produces a smoother render, but it can be somewhat softer because the in-between fields are averaged to make a frame. The filter renders more slowly when Deinterlace is selected. This option is only used when the effect is field rendered; you cannot see the effect of Deinterlace in a preview.

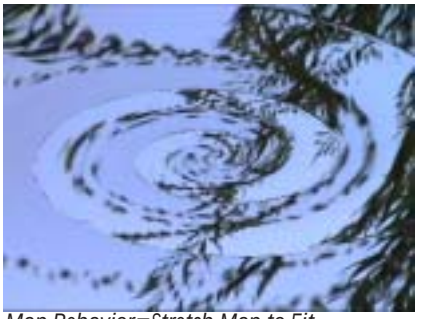
End Behavior determines the behavior of the displacement map when the frame being rendered is the close to the first or last frame in the source media and the previous or future frame does not exist. For example, at the default settings in frame 0 the filter tries to mix the current frame with a previous frame (frame –1) which does not exist.

- ***Squeeze Map in Time*** uses the specified Displacement Amount where possible and squeezes the displacement map so that all pixels are displaced.
- ***Expand Map in Time*** expands the map in the direction which has enough pixels (in the example above, this would be in the future frames direction) to keep the distance in time between the maximum and minimum displacement equal to the Displacement Amount.
- ***Clip Map*** does not alter the map. The filter substitutes the closest existing frame for every frame that does not exist. This choice produces a render in which the displacement does not start for some pixels until after the start of the effect.

The **Map Behavior** setting determines how the map is applied when the source image is a different size than the image in the Source Layer. If your map is the same size as the image to which you are applying the filter, the Map Behavior settings all produce the same result.

- ***Center Map*** centers the map on the source and does not displace the source image outside the boundaries of the centered Source Layer.
- ***Stretch Map to Fit*** resizes the Source Layer to the size of the source.

Map Behavior=Center Map



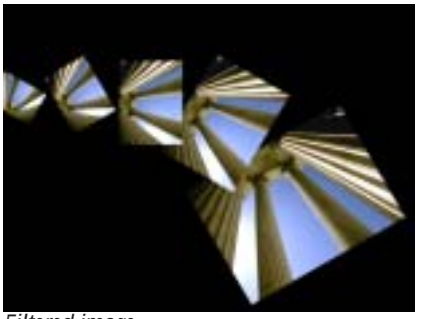
Map Behavior=Stretch Map to Fit

For information on the PixelChooser parameter group controls, see “The PixelChooser” on page 603.

Working with the BCC Trails Filter

BCC Trails creates motion trails, video echoes, and video feedback effects which can be combined in a variety of ways.

Source image



Filtered image

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23,“Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Source Layer menu** sets the clip used to create the effect.

Source Geometry Parameter Group

The Source Geometry parameters adjust the source’s size and position and rotate the source around the X, Y, and Z axis.

Scale X Source and **Scale Y Source** adjust the size of the source along the X and Y axis respectively. These parameters are scaled as percentages of the source’s original width or height. Thus, a Scale X setting of 200 produces a source twice as wide as the original source. Select the **Lock to Scale X checkbox** to keep the Scale X and Y values in proportion.

Position XY Source sets the X and Y coordinates of the center point of the source.

Position Z Source adjusts the apparent depth of the source. Decreasing negative values move the source closer to the viewer, while increasing positive values move the source farther away from the viewer.

Tumble Source, **Spin Source**, and **Rotate Source** move the source around the X, Y, and Z axis, respectively. Tumble, Spin, and Rotate can be animated over values greater than 360° in order to make the source complete more than one full revolution.

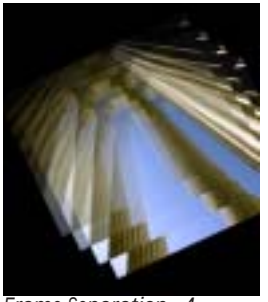
When the **Pivot Source checkbox** is selected, the source tumbles, spins, and rotates around its center. If this option is deselected, you can set an external pivot point around which to tumble, spin, and rotate. **Pivot XY Source** and **Pivot Z Source** set the X, Y, and Z coordinates of the pivot point. If the Pivot Source checkbox is selected, these parameters have no affect.

Trails Parameter Group

The Trails parameters add motion trails to the effect and provide a variety of options for adjusting the trails' behavior and appearance.

Frame Separation sets the distance between each motion trail and the adjacent trail and/or source image. This value measures the number of frames between each trail and the frame from which the trail is created. For example, if Frame Separation is 2, the current time is frame 10 (Time 00:00:00:10), and there are three trails in the effect, the first motion trail is created from frame 8, the second from frame 6, and the third from frame 4. Increasing this value spreads the trails apart, while decreasing this value moves them closer together.


Frame Separation=2


Frame Separation=4

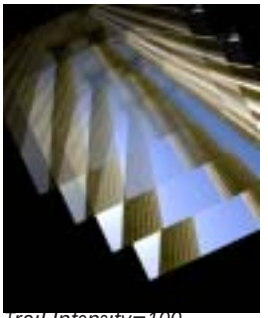

Frame Separation=8

Trail Count determines the number of trails that are visible in the effect.

The **Trails Before Start menu** determines whether or not the effect displays trail frames that are created before the first frame of the source layer. When ***Off*** is chosen, no trails display until after the first frame in the source layer. When ***On*** is chosen, the first frame in the source layer is used as the trail image for trails created before the first frame in the source layer.

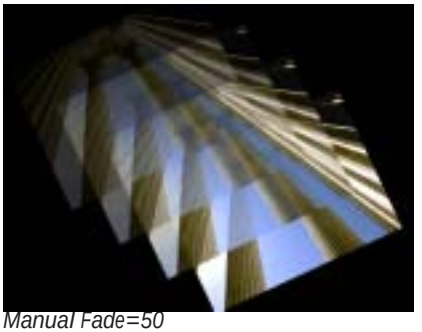
Trail Intensity adjusts the opacity of the trails. At a value of 100, the first trail is completely opaque. At a value of 0, the first trail is completely transparent. The first trail is always the most opaque, but you can increase the number of fully opaque trails by using Trail Intensity values greater than 100.


Trail Intensity=50

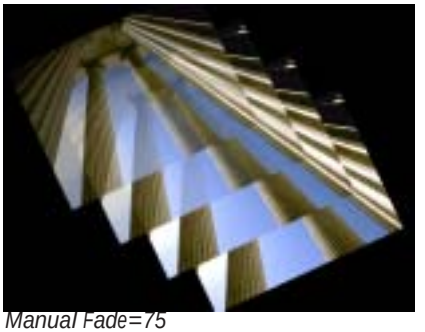

Trail Intensity=100


Trail Intensity=150

When the **Auto Fade checkbox** is selected, the trails automatically fade evenly so that the first trail is entirely opaque and the last trail is almost entirely transparent. When AutoFade is deselected, **Manual Fade** sets the ratio of the opacity of each trail to the opacity of the following trail.



Manual Fade=50



Manual Fade=75

The **Animation menu** sets how the trails animate in relation to the animation of the source.

- When ***Source Time*** is chosen, each trail animates according to its source frame.For example, suppose Frame Separation is 2 and the current time is 00:00:00:08 (frame 8). With Source Time chosen, the first trail in the effect corresponds to frame 6 in the source clip, the second trail to frame 4, and so on.
- When ***Current Time*** is chosen, each trail animates according to the parameter values at the current frame. For example, suppose Frame Separation is 2 and the current time is 00:00:00:08 (frame 8). If Animation is Current Time, all trails correspond to frame 8 in the source clip.

Trails Geometry Parameter Group

The Trails Geometry parameters allow you to manipulate the trails independently from the source layer. These parameters affect all of the trails equally. Each of the parameters in this section adjust the trails in relation to the source clip as manipulated by the controls in the Source parameter group, not in relation to the original source image. For example, if you decrease the Scale Source, the scale of all trails also decreases. Decreasing the Scale Trails value further reduces the size of the trails, but does not affect the scale of the source layer.

Scale Trails controls the size of the trails in relation to the size of the source layer.

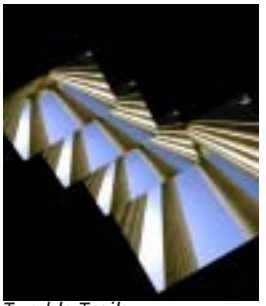

Scale Trails=25

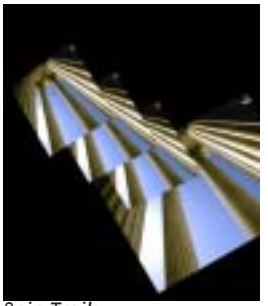

Scale Trails=50


Scale Trails=100

Position XY Trails and **Position Z Trails** sets the X, Y and Z position of the trails.

Tumble Trails, **Spin Trails**, and **Rotate Trails** rotate the trails around the X, Y, and Z axis respectively.


Tumble Trails


Spin Trails


Rotate Trails

When **Pivot X Offset Trails**, **Pivot Y Offset Trails**, and **Pivot Z Offset Trails** are all 0 (the default settings), the trails tumble, spin, and rotate around their own centers. Changing these values displaces the trails' centers of rotation along the X, Y, and Z axis, respectively.

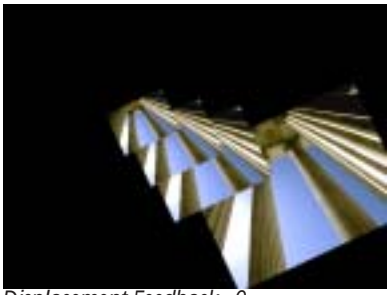
Trail Feedback Parameter Group

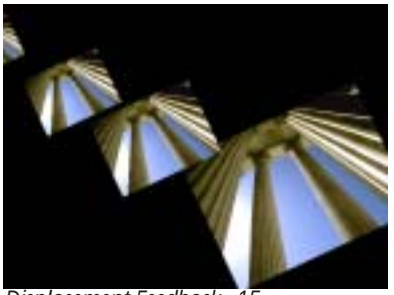
These controls produce feedback effects and are applied recursively to each successive trail—once to the first trail, twice to the second trail, three times to the third, and so on.

The Feedback, Geometry, and Source Parameters have a cumulative effect on the trails. For example, if Source Rotation is 5, Rotate Trails is 30, and Rotate Feedback is 10 degrees, the source rotates 5 degrees, the first trail rotates 45 degrees [5 + 30 + (1 x 10)], the second trail 50 degrees [5 + 30 + (2 x 10)] and so on.

Scale Feedback adjusts the sizes of the trails. Increasing this value creates successively larger trails, while decreasing this value creates successively smaller trails.

Displacement Feedback affects the XY position of the trails. Increasing this value moves the trails away from their original positions along the chosen **Displacement Angle Feedback**.


Displacement Feedback=0

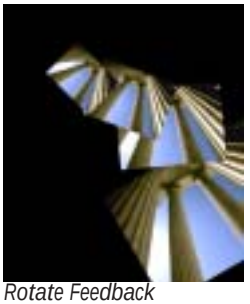

Displacement Feedback=15

Position Z Feedback displaces the trails along the Z axis. Increasing positive values move successive trails further away from the viewer. Decreasing negative values move successive trails closer to the viewer.

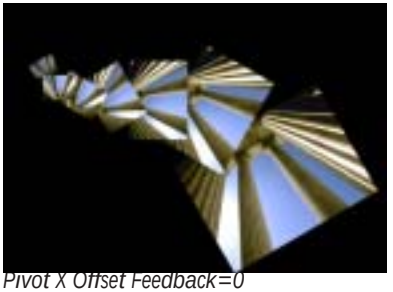
Tumble Feedback, **Spin Feedback**, and **Rotate Feedback** rotate the trails around the X, Y, and Z axis respectively.


Tumble Feedback

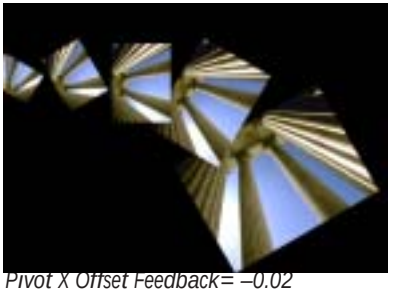

Spin Feedback


Rotate Feedback

When **Pivot X Offset Trails Feedback**, **Pivot Y Offset Trails Feedback**, and **Pivot Z Offset Trails Feedback** are all 0 (the default settings), the trails tumble, spin, and rotate around their own centers. Changing these values displaces the successive trails' centers of rotation along the X, Y, and Z axis, respectively.



Pivot X Offset Feedback=0



Pivot X Offset Feedback= –0.02

Acceleration Parameter Group

These controls produce acceleration effects and are applied increasingly to each successive trail according to an acceleration pattern. For example, if Source Rotation is 0, Rotate Trails is 0, Rotate Feedback is 0 degrees, and Rotate Acceleration is 10, the source clip rotates 0 degrees, the first trail rotates 0 degrees, the second trail 10 degrees [0 + (10 x 1)], the third trail 30 degrees [10 + (10 x 2)], the fourth trail 60 degrees [30 + (10 x 3)], the fifth trail 100 degrees [60 + (10 x 4)] and so on.

Like the Trails Feedback parameters, the Acceleration parameters have a cumulative effect on the trails.

The parameters in this section work in the same way as the corresponding Trail Feedback parameters, except for the way they affect successive trails. For descriptions of these controls, see the previous section.

Working with the Insert 1-3 Parameters

The parameters in these groups apply up to three of a variety of simple effects to one or more of the trails.

The **Effect Insert menu** sets which effect is inserted in the trail. Each effect is adjusted with the **Amount** and **Parameter** controls. Several effects use a **Color** parameter as well. These controls behave differently depending on this menu setting.

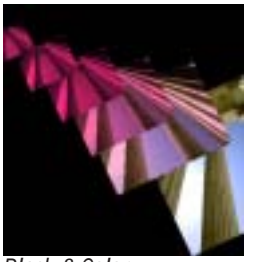
- When Effect is set to ***Off***, no affect is applied and none of the other parameters in this section have any affect.
- ***Brightness*** allows you to adjust the brightness and contrast of the trail. When Brightness is chosen, Amount adjusts brightness; Parameter adjusts contrast.
- ***Contrast*** allows you to adjust the contrast and brightness of the trail. When Contrast is selected, Amount adjusts contrast, and Parameter adjusts brightness.
- ***Hue*** changes the hue and saturation of the trail. Amount adjusts the hue angle, and Parameter adjusts the saturation.
- ***Saturation*** changes the saturation and hue of the trail. Amount controls the saturation, and Parameter adjusts the hue angle.

- ***Black & White*** mixes the trail image with a black and white copy of itself. Amount controls the mix of the images. Increasing Amount replaces the colored image with the black and white copy; at a value of 100, the trail is completely black and white. Negative Amount values have no affect. Parameter has no affect.
- ***Black & Color*** mixes the trail image with a copy of itself that is tinted black and the chosen Color. Amount controls the mix of the images. Increasing Amount replaces the original trail image with the tinted copy; at a value of 100, the trail is completely tinted. Negative Amount values have no affect. Parameter has no affect.
- ***Color & White*** mixes the trail image with a copy of itself that is tinted the chosen Color and white. Amount controls the mix of the trail images. Increasing Amount replaces the original trail image with the tinted copy; at a value of 100, the trail is completely tinted. Negative Amount values have no affect. Parameter has no affect.
- ***Colorize*** mixes the trail image with a solid of the chosen Color. Amount controls the mix of the trail and the colored solid. Increasing Amount replaces the original trail image with the colored solid; at a value of 100, the trail is entirely replaced by the solid. Negative Amount values have no affect. Parameter has no affect.
- ***Invert*** inverts the trail image. When Invert is chosen, neither Amount nor Parameter have an affect. If Status is Recursive (see the Status Insert menu description on page 566), only the odd-numbered trails invert.
- ***Blur*** applies a blur to the trail. Amount sets the amount of blur. Negative Amount values have no affect. Parameter controls the blur direction. Increasing positive Parameter values increase the horizontal blur, while decreasing negative values increase the vertical blur. When Parameter is 0, the image blurs equally in both directions.
- ***Choke*** shrinks or expands the opaque areas in the trail image's alpha channel. Increasing positive Amount values increase the size of the opaque regions, while decreasing negative values decrease the opaque regions. Parameter has no affect.
- ***Radial Wipe*** creates a wipe which keys out a portion of the trail image. The image keys outside a circle whose diameter is controlled by Amount. When Amount is 0, the image is unchanged. Increasing Amount decreases the diameter of the circular opaque region, removing more of the image. At a value of 100, the entire trail image keys out. Negative Amount values have no affect. Parameter softens the edges of the opaque region. When Parameter is 0, the edges are hard. Increasing Parameter increasingly blends the edges with the background. Negative values have no affect.
- ***Key Out Dark*** keys out the darker pixels in the trail image, making them transparent. Amount controls the key threshold. Increasing this value raises the threshold, increasing the range of luminosities that key out. Increasing Parameter softens the edges of the opaque regions in the image. Negative Parameter values have no affect.
- ***Key Out Light*** keys out the lighter pixels in the trail image, making them transparent. Amount controls the key threshold. Increasing this value lowers the threshold, increasing the range of luminosities that key out. Increasing Parameter softens the edges of the opaque regions in the image. Negative Parameter values have no affect.

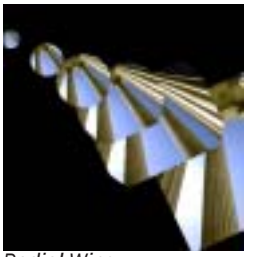
- ***Key Out Color*** keys out pixels whose channel values are similar to those of the chosen Color. Amount controls the width of the range of similar values that key out. As Amount increases, a wider range of colors similar to the Color key out. Increasing Parameter softens the edges of the opaque regions in the image. Negative Parameter values have no affect.
- ***Key In Color*** keys out pixels whose channel values are dissimilar to those of the chosen Color. Amount controls the width of the range of dissimilar values that key out. As Amount increases, a wider range of colors dissimilar to the Color key out. Increasing Insert 1 Parameter softens the edges of the opaque regions in the image. Negative Parameter values have no affect.


Brightness


Hue


Black & Color


Blur


Radial Wipe


Key Out Color

The **Start Insert menu** determines on which trail the Insert effect begins. Choose ***Source*** to begin the effect on the source or choose the appropriate ***Trail***.

The **End Insert menu** determines on which trail the Insert effect ends. Choose ***Never*** to apply the effect to the Start trail and all subsequent trails. Choose ***Source*** to end the effect on the source or choose the appropriate ***Trail***.

The **Status Insert menu** sets how the effect is applied to the trails in the specified range.

- When Status is ***Off***, the effect is not applied and the Insert parameters have no affect.
- ***Single*** applies the effect equally to each trail in the range.
- ***Recursive*** applies the effect to each trail in the range and increases the intensity of the effect on each successive trail by increasing the Amount value. The Parameter value is applied equally to all the trails and is not affected by the recursive progression.

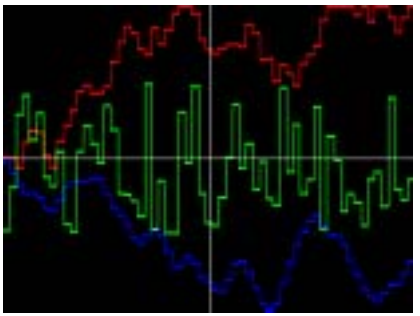
Jitter Curves Parameter Group

The Jitter parameters enable you to vary up to six different attributes of the Trails effect. Use the Jitter Curves parameters to view the jitter curves as you adjust them. These curves plot the values of the jittered parameters over time.

The **Curve View menu** determines how the jitter curves are represented on the graph. When you use the ***Draft Only*** options, the curves are not visible in the rendered effect. However, you must preview in Draft mode for these options to display. To preview in Draft mode, select the **Draft Mode checkbox** in the General Controls parameter group. When you use the ***Render*** options, the curves appear in the rendered effect.

- ***Off*** displays the effect without any curves.
- ***Curves: Draft Only*** and ***Curves: Render*** display curves showing the amount of jitter at each frame or at selected frames of the effect.
- ***Curves Over Layer: Draft Only*** and ***Curves Over Layer: Render*** display the jitter curves over the rendered layer. This allows you to simultaneously preview the jitter curves and the rendered output, which can be useful for adjusting the effect.
- ***Curves Over Comp: Draft Only*** and ***Curves Over Comp: Render*** display the jitter curves over all other layers in the composition.

You can use the Curve View menu options to displays a graph of the jitter over time. If one of the Jitter Shape controls is set to Off, that jitter is inactive and its curve does not appear on the graph.



The vertical axis on the graph represents the current time in the effect. The horizontal axis represents the base parameter value (set by the Source or Insert parameter values) before it is jittered. The red curve represents Jitter 1, the green curve represents Jitter 2, and the blue curve represents Jitter 3.

The **Time View menu** sets the time range shown on the graph. ***Full Effect*** displays the jitter curves from the start to the end of the effect. ***16 Seconds, 8 Seconds***, ***4 Seconds***, and ***2 Seconds*** display the curves for the given number of seconds after the frame specified by Scroll Curves.

Scroll Curves sets the first frame in the effect that displays when Time View is set to 16 Seconds, 8 Seconds, 4 Seconds, or 2 Seconds. This parameter has no affect if Time View is set to Full Effect.

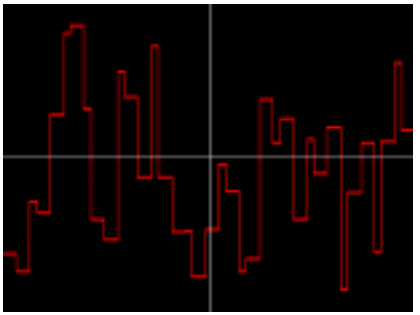
Jitter 1 and Jitter 2 Parameter Groups

The Jitter 1 and 2 parameters allow you to create two different jitter curves, each of which can be applied to up to three parameters. The Jitter 2 parameters function similarly to the Jitter 1 parameters, which are described in this section.

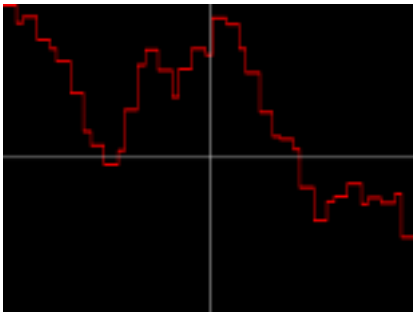
The only difference between the two Jitter parameter sections is that Jitter 2 can be applied to the Jitter 1 parameters.

The **Shape Jitter menu** sets the shape of the jitter curve. The best way to understand how these shapes affect the jittered parameters is to use the **Curve View menu** setting to see the shape of the curve over time. The curves can be modified in various ways using the **Timing Jitter** and / or **Master Jitter** settings.

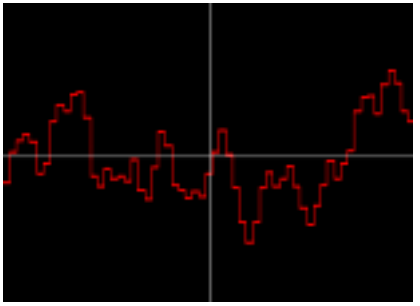
- ***Off*** turns off the jitter.
- ***Noise Jumps*** causes the noise to jump to a new value in increments set by the Timing Jitter setting.



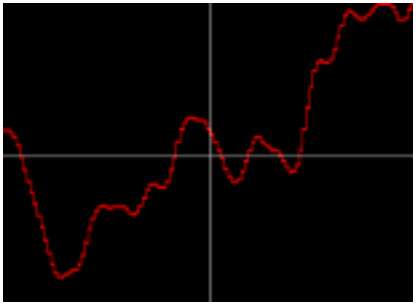
- ***Random Walk*** causes the noise to start at 0, then add a new random number in increments set by the Timing Jitter setting.



- ***Smooth Noise*** creates a new noise value every frame, then smooths the curve that is created. Timing Jitter adjusts the width of the curve smoothness.

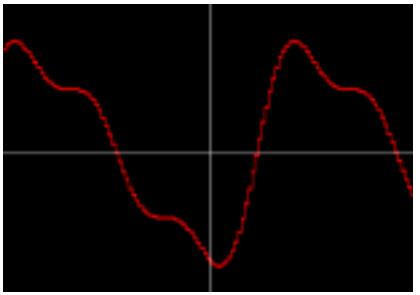


- ***Smooth Walk*** creates a Random Walk curve, then smooths the result. Timing Jitter adjusts the width of the curve smoothness.



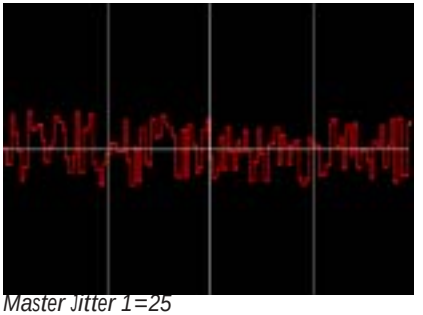
- ***Constant*** adds the Amount Jitter value to the base parameter value, creating a static effect.

- The remaining choices all produce regular waves of varying shapes. Most of these choices have fairly descriptive names. The ***Spectrum*** choices are all variations on the sine wave (the curve at right is an example of a Spectrum wave). For each of these choices, Timing Jitter adjusts the frequency of the wave, and Amount Jitter adjusts the amplitude (height) of the wave.

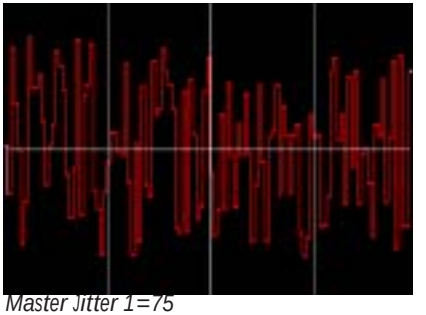


Try the Constant shape to manipulate a trail or sequence of trails without affecting the other trails. Constant will not jitter the parameter value for the trail, but allows you to adjust any parameter of the trail up or down.

Master Jitter adjusts the intensity of the jitter by scaling 0 the other jitter parameters. For this reason, each Shape Jitter curve responds slightly differently to Master Jitter. When Master Jitter is 0, no jitter is created.



Master Jitter 1=25



Master Jitter 1=75

Random Seed Jitter sets the value that is input to the random number generator used to generate noise. Adjust this value when you like the overall effect but want to adjust the random configuration of the jitter curve.

Frame Offset Jitter offsets the position of the jitter curve by the specified number of frames. This value allows you to control which point on the curve corresponds to a given frame.

The **Start Jitter menu** sets the trail where Jitter begins. Choose ***Source*** to begin the jitter on the source or choose the appropriate ***Trail***.

The **End Jitter menu** sets the trail where Jitter ends. Choose ***Never*** to apply the effect to the Start Jitter trail and each subsequent trail. Choose ***Source*** to end the jitter on the source or choose the appropriate ***Trail***.

The **Mode Jitter menu** sets how Jitter is applied to the trails in the range specified by Start Jitter and End Jitter.

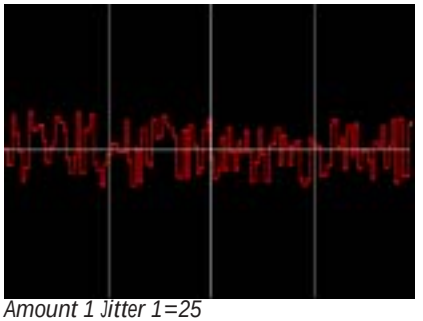
- When Mode Jitter is ***Off***, Jitter is not applied and the Jitter parameters have no affect.
- ***Constant*** applies Jitter equally to each trail in the range.
- ***Fade Up*** applies Jitter to each trail in the range and increases the intensity of the Jitter on each successive trail.
- ***Fade Down*** applies Jitter to each trail in the range and decreases the intensity of the Jitter on each successive trail.
- ***Fade Up-Down*** applies Jitter to each trail in the range and increases the intensity of the Jitter on each successive trail until the middle trail is reached, then decreases the intensity to the end of the range.

The **Destination 1 Jitter menu** sets which parameter is affected by Jitter 1. The **Destination 2 Jitter 1** and **Destination 3 Jitter 1** menus allow you to choose two more parameters to jitter.

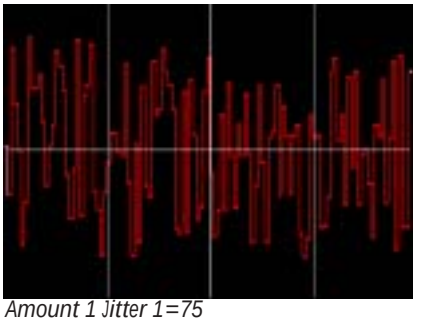
- When ***Off*** is selected, the corresponding destination is not used.
- ***Scale*** affects both the X and Y Scale values. ***Scale X*** only affects the Scale X; ***Scale Y*** only affects the Scale Y.
- ***Position X, Y, Z*** affect the X,Y and Z position, respectively.

- ***Insert 1 Red***, ***Insert 1 Green***, and ***Insert 1 Blue*** affect the corresponding color channel in the chosen Insert 1 Color. The ***Insert 2*** and ***Insert 3 Red***, ***Green***, and ***Blue*** choices function in the same way but affect the Insert 2 and Insert 3 Colors, respectively.
- The remaining choices affect the parameter of the same name.

Amount 1 Jitter 1, **Amount 2 Jitter 1**, and **Amount 3 Jitter 1** adjust the intensity of the three jitters by scaling all the other jitter parameters. For this reason, each Shape curve responds slightly differently to Amount. When Amount Jitter 1 is 0, no jitter is created for the Destination 1 Jitter 1.



Amount 1 Jitter 1=25



Amount 1 Jitter 1=75

Composite Parameters

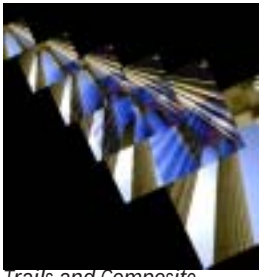
The **Apply Mode menu** setting determines how the trails and source layer are composited over objects below them in the timeline.For descriptions of all the Apply Modes, see “Apply Modes” on page 625.

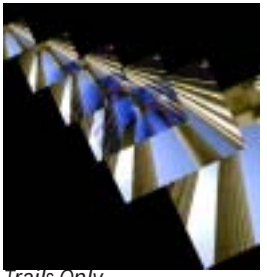
Apply Mix blends the Apply Mode setting with the **Apply Mix From** setting. The resulting mixed mode is used to composite the effect. For example, if Apply Mode is ***Lighten***, and Apply Mix From is ***Normal***, then Apply Mix blends the Lighten and Normal apply modes. In this case, an Apply Mix setting of 0 produces the Normal apply mode, and an Apply Mix setting of 100 produces the Lighten apply mode. An Apply Mix setting of 50 blends the two apply modes equally.

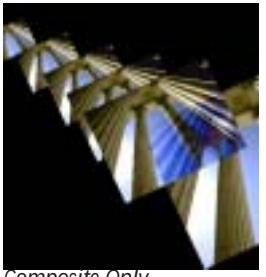
Use Apply Mix to soften the effect of a given apply mode, or animate Apply Mix to blend from one apply mode to another over time.

The **Use Apply Settings menu** sets which elements are affected by the Apply Mode and Apply Mix settings.

- ***Trails and Composite*** applies the settings to both the trails and the source layer.
- ***Trails Only*** applies the settings to the trails only, leaving the source layer unaffected.
- ***Composite Only*** applies the settings to the source layer only.
- ***Ignore*** disregards the settings and applies the effect normally to both the trails and the source layer.

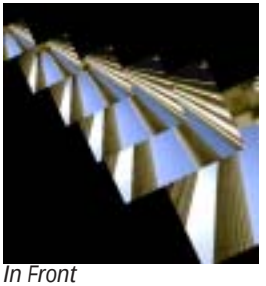

Trails and Composite


Trails Only


Composite Only

The **Composite Trails menu** setting controls how the trails overlap the source layer in the filtered output.

- ***In Front*** composites the trails in front of the source layer.
- ***Behind*** composites the trails behind the source layer.
- ***Trails Only*** composites the trails only, removing the source layer from the effect.

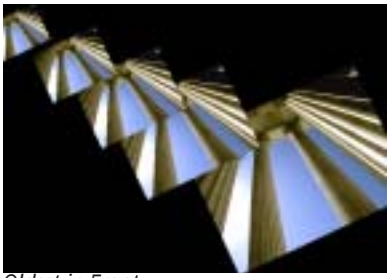

In Front

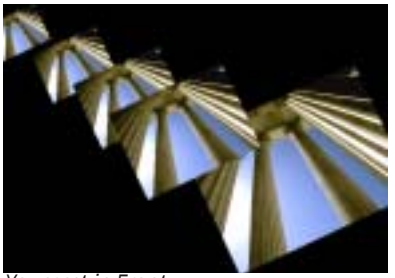

Behind


Trails Only

The **Render Order menu** determines how the trails overlap each other in the filtered output.

- Choose ***Oldest in Front*** to place each successive trail in front of the previous trail.
- Choose ***Youngest in Front*** to place each successive trail behind the previous trail.


Oldest in Front


Youngest in Front

Source Opacity sets the opacity of the source in the filtered output and does not affect the trails. A value of 100 leaves the image fully opaque; a value of 0 makes the fully transparent.

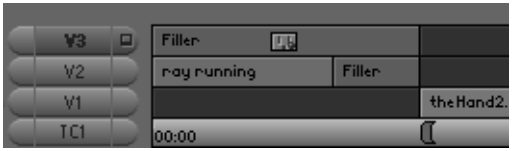
Working with the BCC Velocity Remap Filter

Velocity Remap allows you to adjust and animate the frame rate of a video image and to blend adjacent frames to create smoother motion effects.

Creating a Velocity Remap Effect

You can apply Velocity Remap directly to the clip that you want to affect, however, the duration of the effect is then limited to the duration of the source media. To create a Velocity Remap effect that is longer than the duration of the source media, follow the steps below.

1. Use Add Edits to create filler in the timeline track above the clip that you want to remap. Alternatively, you can edit a placeholder clip instead of filler.
2. Insert filler after the clip that you want to remap so that it matches the duration of the filler clip.
3. Apply the BCC Velocity Remap filter to the filler. Your timeline should appear similar to the example below.



4. Choose the clip you want to remap from the **Source Layer menu**.
5. Adjust the other parameters as needed.

If you delete the source clip from the timeline, the effect becomes unrendered.

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, “Working with the Title Matte Parameter Group” on page 23,“Working with the Geometrics Parameter Group” on page 24 and “Working with the Drop Shadow Parameter Group” on page 25.

The **Source Layer menu** sets which clip in the timeline is affected by the filter.

Velocity adjusts the velocity of the source layer, expressed as a percentage of the frame rate. If Velocity is 100, the source moves at the normal frame rate. If Velocity is 50, the source moves half as fast as the clip’s frame rate. If Velocity is 0, the source is a static image.

Source Start determines which frame in the Source Layer used as the first frame in the effect.

Select the **Frame Blending (Best Only) checkbox** to enable frame blending.

The **Frame Blending Mode menu** determines how adjacent frames are mixed when frame blending is performed. Several of the modes are adjusted by the **Boost Extra 1** and **Boost Extra 2** parameters, whose function depends on which mode is used. Frame Blending Mode, Blur Amount, and Boost Extra 1 and 2 have no effect when Frame Blending is off.

- When ***Fast*** is chosen, the first frame fades out as the second frame fades in simultaneously. All pixels are affected equally, regardless of their channel values. Boost Extra 1 and Boost Extra 2 have no effect when Fast is selected.
- ***Fast Opaque Source*** causes the second frame to fade over the first frame. All pixels are affected equally, regardless of their channel values. Boost Extra 1 and Boost Extra 2 have no effect when Fast Opaque Source is selected.
- ***Temporal Blur*** averages two or more source frames to produce each output frame. When this option is chosen, Blur Amount determines how much blur is applied.
- ***Boost Exponential*** blends the color channels in the adjacent frames by subtracting an offset value from each pixel, exponentiating the value, adding the results, and then adding back the offset. When you use this mode, Boost Extra 1 controls the exponent that is used in the calculations, and Boost Extra 2 sets the offset value that is subtracted.
- ***Boost Equal Power Pos.*** is modeled on the audio concept of an equal power crossfade. This algorithm emphasizes the light pixels in the blend, which is useful when working with darker images. Boost Extra 1 and Boost Extra 2 have no affect when Boost Equal Power Pos. is chosen.
- ***Boost Equal Power Neg.*** is similar to Boost Equal Power Pos., but emphasizes the dark pixels in the blend. This is useful when working with lighter images. Boost Extra 1 and Boost Extra 2 have no effect when Boost Equal Power Neg. is chosen.
- ***Boost Bias*** blends adjacent frames by increasing the contrast of pixels whose channel values are furthest from Boost Extra 2 value. The contrast is weighted by the Boost Extra 1 value, and therefore is left unchanged if Extra 1 is set to 0.

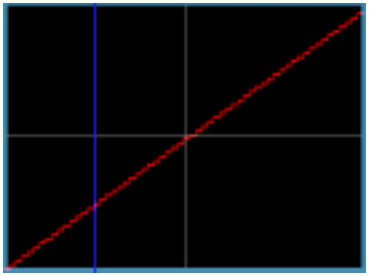
When Frame Blending is set to Temporal Blur, **Temporal Blur Amount** sets the width of the blur in frames. For example, if Blur Amount is set to 5, the current frame is averaged with the following five frames to produce the output frame. When Blur Amount is 0, no Frame Blending is performed.

Boost Mix mixes the chosen Frame Blending Mode with the Fast Frame Blending Mode. When Boost Mix is set to 100, the selected Frame Blending Mode (and the Extra 1 and Extra 2 settings where applicable) are used. When Boost Mix is set to 0, the Fast mode is used. Intermediate values mix the chosen mode with the Fast mode to varying degrees.

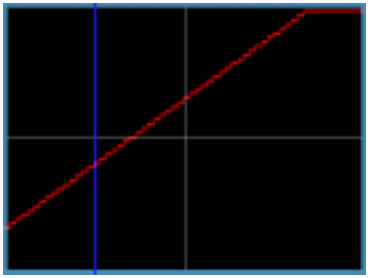
Frame Curve Parameter Group

The Frame Curve Parameters are preview displays which enable you to view a curve that graphs the frame in the Source Layer used to render each frame in the effect. Select the **View Curve checkbox** to display the time curve. Deselect this option to view the effect.

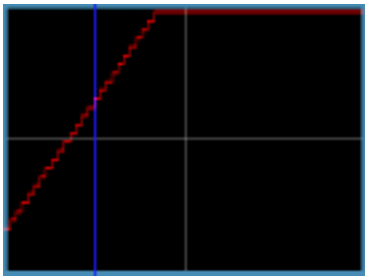
This illustration shows a frame curve for a Velocity Remap effect. The vertical blue line represents the current time. The X axis represents time (measured in frames), and the Y axis represents the source frame number. In this effect, Source Start is 0 and Velocity is 0. The first frame in the effect corresponds to frame 0 in the source. This point is represented by the far left point on the curve. As the effect progresses and the source frame increases, the curve climbs.



In this example, Source Start is increased to 10, moving the curve upwards along the Y axis. The curve is cut off on the far right side because the Y axis is not tall enough to show the last 10 frames of the effect. The scale of the Y axis can be changed using the Output Time View parameter.



In this example, Velocity is increased to 200, creating a steeper curve.



The **Composite Curves** menu allows you to composite the curve over the Source Layer or the entire composition.

- ***Curves*** composites the curve over a black background.
- ***Curves Over Layer*** composites the curve over the Source Layer.
- ***Curves Over Comp*** composites the curve over the entire composition.

If the source is opaque, Curves Over Layer and Curves Over Comp produce the same result.

Input Time View sets the scale of the X axis in the frame curve. ***Full Effect*** scales the X axis to the untrimmed length of the filtered layer. ***16 Seconds***, ***8 Seconds***, ***4 Seconds***, and ***2 Seconds*** scale the X axis to the corresponding number of seconds centered around the position indicator.

Output Time View sets the scale of the Y axis in the frame curve. ***Full Effect*** scales the Y axis to the untrimmed length of the filtered layer. ***First 16 seconds***, ***First 8 seconds***, ***First 4 seconds***, and ***First 2 seconds*** scale the Y axis to the corresponding number of seconds starting from the frame specified by Scroll Curves.

Scroll Curves sets the first frame that displays when Output Time View is First 16 seconds, First 8 seconds, First 4 seconds, or First 2 seconds. This parameter has no affect if Output Time View is set to Full Effect.

Chapter 9
Working with Wipe Transitions

Understanding the BCC Wipe Transitions

The BCC Wipe Transitions category is a collection of auto-animating wipes. While at their default values these wipes appear similar to those provided with your Avid system, they include extensive parameters for you to customize. You can add wipe patterns and textures to the edges. You can also assign an influence layer which pushes the wipe border in or out based on the value of pixels in a specified channel.

The BCC Wipe Transitions can also be used as filters. This allows you to create interesting picture-in-picture or composite effects. To apply as a wipe as a filter, use the corresponding BCC Wipe effect in the BCC Keys & Matte category.

Common Wipe Parameter Groups

The BCC Wipe Transitions contain common parameter groups. These groups are open by default when you apply a Wipe Transition and are explained in the following sections.

Working with the Animation Menu

The **Animation menu** is common to all the Wipe Transitions and controls whether the filter auto-animates as a wipe or is animated manually. Choose from the following options.

- ***Manual*** is the most flexible setting. Use Manual if you are applying the filter as a composite instead of a transition, or do not have enough control with the other settings. When Manual is chosen, you create the wipe by manually animating parameters such as Wipe Amount, Radius and Direction, depending on the wipe. When Manual is chosen, Percent Done has no affect.
- ***Auto*** animates the incoming clip from offscreen at the start of the transition, to fully onscreen at the end of the transition. Choosing Auto has the same affect as choosing Percent Done with a 0 value keyframe at the start of the effect and a 100 value keyframe at the end. This is the Default choice. When Auto is chosen, Percent Done has no affect.

In some instances Auto may result in the incoming clip reaching fully onscreen before the effect finishes. In this instance, choose Percent Done and animate the Percent Done parameter instead of using Auto.

- ***Pct. Done*** animates the incoming clip from transparent (at a value of 0) to opaque (at a value of 100). When Pct. Done is chosen, the **Percent Done** parameter allows you to adjust the animation.

If an option other than Manual is chosen, the filter automatically adjusts the animation parameters. If this does not produce the desired look at the ends of the effect, set Animation to Manual and manually adjust the effect instead.

When the **Invert Wipe Checkbox** is selected, the alpha channel created by the wipe is inverted.

Working with the Wipe Position Controls

The parameters in this group allow you to finetune the wipe's position.

When the Animation menu is set to Manual, each filter contains a parameter that lets you animate the wipe manually. When the Animation menu is set to Percent Done or Auto, these parameters have no affect.

- In the BCC Criss-Cross Wipe, Multi Stripe Wipe and BCC Rectangular Wipe, the **Width** parameter lets you manually animate the wipe.
- In the BCC Linear Wipe and BCC Textured Wipe, the **Wipe Amount** parameter lets you manually animate the wipe.
- In the BCC Multi Stretch and BCC Radial Wipe, the **Radius** parameter lets you manually animate the wipe**.**

Direction sets the direction of the wipe.

Rotation Rate sets the speed of the rotation.

Softness softens the edges of the wipe by increasing transparency in pixels that are close to the edges. You can use Softness to create artistic blended wipes in which the image gradually becomes transparent.

Radial Wipe

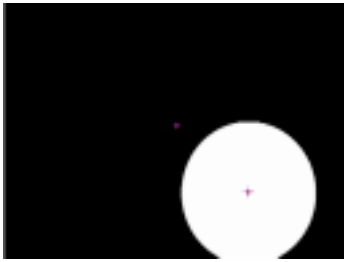
Softness=50

Softness=300

The **Output menu** controls the output of the wipe. You can also use this menu to preview the matte or the source channel used to create the effect. Not all options are relevant in all situations. Choose from the following options. The following examples show the BCC Radial Wipe.

- ***Mult. Alpha*** multiplies the alpha channel created by the filter with the source alpha channel. Only areas that are opaque in both alpha channels are opaque in the output. This results in an image whose opacity at each point is at most its input opacity. For an opaque input image, this is the same as ***Replace Alpha***.

- ***View Matte*** displays a grayscale preview of the alpha channel created by the filter, as shown at right. Opaque regions are white, and transparent regions are black.



- ***Replace Alpha*** replaces the source alpha with the matte created by the filter. For an opaque input image, this is the same as ***Mult. Alpha***
- ***Screen Alpha*** screens the alpha channel created by the filter with the source alpha channel. Areas that are opaque in either alpha channel are opaque in the output.
- ***Diff. Alpha*** subtracts the alpha channel created by the filter from the source alpha as shown at right.

- ***Zoom*** scales the input image to the size of the alpha channel created by the wipe. The image is positioned at the center of this alpha channel at its correct aspect. The scaling is based on the computed alpha channel. In some instances, adjusting parameters such as Influence and Texture can cause Zoom settings to appear jumpy.
- ***Zoom Independent*** is the same as Zoom, but each axis of the source scales independently.

Zoom Effect

- When ***Borders Only*** is chosen, the wipe renders only the borders.
- ***Borders w Source*** renders the borders over the source image. As shown in the example at right, the wipe's alpha channel is ignored.

Working with the Border Parameter Group

The parameters in the Border group adjust the first border you create. To create only a single border, use the parameters in this group. You can create up to three independent borders.

The **Border On checkbox** enables the first border. If this checkbox is disabled, no border is created and the remaining parameters have no affect.

Border Thickness sets the thickness of the first border, in pixels.

Border Opacity controls the opacity of the border, expressed as a percentage.

The **Color** controls set the color of the border.

The **Border Layer menu** generates the border from another timeline layer instead of the chosen Color. Choose ***Incoming***, ***Outgoing*** or ***None***. When None is chosen, the specified Color is used. When you apply a Wipe as a filter (by using the BCC Wipe effect in the BCC Keys & Matte category), the choices are ***Filter Layer, 1st Below*** or ***2nd Below***.

Radial Wipe

Border Layer menu set to Outgoing

You can create interesting composites by using moving video as your border.

Border Softness adjusts the softness of the border and is scaled to the width of the border. When Softness is 100, the border is fully opaque at its center.

Border Balance controls the balance of softness between the inside edge and outside edge of the border. Positive values increase the softness at the outside edge, and decrease softness at the inside edge.

Radial Wipe

Border Balance=-99 *Border Balance=0* *Border Balance=100*

Border Offset moves the border relative to the edge of the wipe. Negative values move the border to the left; positive values move the border to the right.

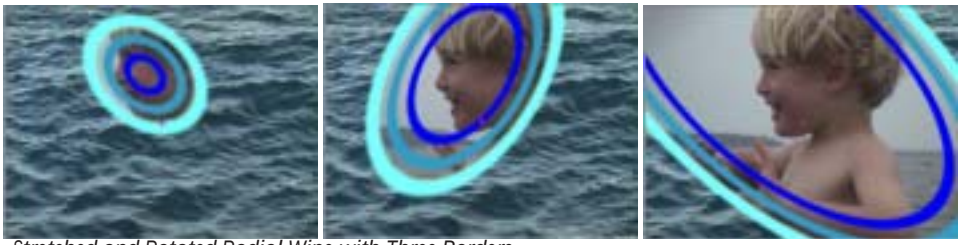
Radial Wipe

Border Offset=-5 *Border Offset=0* *Border Offset=10*

To apply a drop shadow to the edges of a wipe, apply a border and use the Border Offset parameter to make it appear like a drop shadow. When you apply a wipe as a filter effect, you can use the Drop Shadow parameters.

Working with the Additional Borders Parameter Group

Each Wipe effect can include up to three independent borders. The Additional Borders parameter group contains controls for two additional borders. To create only two borders, you can use only the controls in this group. To make three borders, create the first border using the parameters in the Border Parameter Group and use this group for the additional and master border controls. Borders are composited in order; if all three borders are used, Border 3 is composited over Border 2, which is composited over Border 1.



Stretched and Rotated Radial Wipe with Three Borders

The **Borders On checkbox** is an easy way to enables all the borders contained in this and the Border parameter group. If this checkbox is deselected, no borders are rendered, even if the Borders On checkbox from the previous Borders parameter group is enabled.

Master Thickness scales the thickness of all borders.

Master Opacity sets the opacity for all the borders, expressed as a percentage.

Master Offset offsets the position of all borders relative to the wipe progress.

The **Border 2 On** and **Border 3 On checkboxes** enable the second and third borders. These are ignored if the Master Borders On checkbox is deselected.

The remaining Border 2 and Border 3 individual border controls are identical to the corresponding Border 1 parameters.

Working with the Pattern Parameters

The Pattern parameters let you superimpose an angular pattern on the wipe to produce a more complex effect. The pattern distorts the edges of the wipe, making it less even. You set the Pattern type in the Pattern menu. When ***Off*** is chosen in the Pattern menu, the other Pattern parameters have no affect.

The BCC Criss-Cross Wipe, BCC Multi Stripe Wipe, the BCC Rectangular Wipe and BCC Textured Wipe do not include Pattern parameters.

Using a pattern has very little affect on render time.

The **Pattern menu** sets the type of pattern. The available patterns depend on the wipe shape that you use. Experiment with these options to find one that works for you.

- When ***Off*** is chosen, no pattern is applied and the parameters in the Pattern Settings parameter group have no affect.
- ***Noise*** creates a wavy noise pattern.
- ***Noise Symm 2, Noise Symm 3,Noise Symm 4, Noise Symm 6, Noise Symm 8, Noise Symm 12*** or ***Noise Symm 16*** create noise that is symmetric, with the number indicating the repetitions.
- ***Smooth Fractal Noise*** or ***Rough Fractal Noise*** create a noise pattern by directly using the Fractal Noise algorithm. Because the noise pattern wrap s, the noise is always symmetric; at some settings the noise will exhibit noticeable points at 0 and 180 degrees.
- ***Smooth Noise, Medium Noise, Rough Noise, Rougher Noise, Roughest Noise*** are variants of a wavy fractal noise pattern.
- ***Sine 1, Sine 2*** and ***Sine 3*** are variants of a sine wave pattern.

- ***Quadratic, Cubic, Sine, Triangle*** and ***Wave*** are shape patterns. Pattern Variation has no affect when you choose Sine or Triangle.
- ***Opposing Smooth Noise, Opposing Medium Noise, Opposing Rough Noise,*** and ***Opposing Mixed Noise*** superimpose two different noise patterns. Pattern Detail affects both patterns, while Pattern Variation affects the detail of the second pattern relative to the first.
- ***Opposing Waves*** superimposes two different sine waves.
- ***Sine Variable Noise*** superimposes a sine wave with noise.
- ***3 Sines*** superimposes three sine waves. At a Pattern Variation value of 0, all three use the same wavelength.
- ***3 Sines with Noise*** superimposes three sine waves with noise. At a Pattern Variation value of 0, all three use the same wavelength.
- ***3 Spectra*** superimposes three Spectral waves. At a Pattern Variation value of 0, all three use the same wavelength.
- ***3 Spectra with Noise*** superimposes three Spectral waves with noise. At a Pattern Variation value of 0, all three use the same wavelength.
- ***Variable Wave Bunch*** creates a group of waves of random amplitudes. Increasing Pattern Variation increases the number of different wavelengths, making the effect look more like noise.
- ***Narrow Wave Bunch, Medium Wave Bunch,*** or ***Wide Wave Bunch*** create a group of waves of varying number. Pattern Variation changes the shape of the waves by adjusting the starting point of the noise sequence.

Examples of Radial Wipe Patterns

Rough Fractal Noise *Sine 1* *3 Spectra with Noise*

Pattern Amount controls the amount of distortion created by the chosen pattern from the Wipe Pattern menu. At a value of 0, no pattern is created.

Large amounts of distortion, especially with the Noise patterns, can result in an aliased look or overly sharp points. These can be corrected using the Choke or Blur in the Post Process parameter group.

Pattern Detail controls the amount of detail in the pattern. Depending on the chosen pattern, this parameter controls the number of cycles of the wave or the amount of detail in the pattern.

Since waves must fit around the wipe shape, Pattern Detail cannot smoothly animate any of the wave patterns, and Pattern Variation cannot smoothly animate patterns that use multiple waves. All parameters can smoothly animate for the noise-based patterns.

Pattern Offset offsets the position of the pattern. This parameter is only available in the Linear Wipe.

Pattern Variation randomizes the pattern. The nature of the variation depends on the chosen pattern.

Pattern Motion auto-animates the position of the pattern. The nature of the animation depends on the chosen pattern.

Pattern Rotation adjust the amount of rotation for the chosen pattern. The affect increases as Pattern Detail increases, especially for the wave patterns. This parameters only affects the Multi Stretch Wipe and Radial Wipe.

Working with the Influence and Influence Map Parameters

The Influence and Influence Map parameters allow a channel in the incoming or outgoing clip to influence the wipe. The influence layer pushes the wipe border in or out based on the value of each pixel.

Using a moving video texture such as water as both an Influence layer and a border can produce a pleasing stylized effect. A custom gradient still image is also a useful source for the Influence.

Using the Influence controls slows the filter.

The following examples show a Linear Wipe with Influence used on different images.

Linear Wipe

Influence=Off

Influence=incoming fish

Influence=outgoing water

The **Influence menu** allows you to turn the Influence ***On*** or ***Off***. When Off is chosen, the other parameters have no affect. Choosing ***View*** lets you see the influence map after it is processed by controls in the Influence Map group.

Influence Intensity adjusts the intensity of the influence. Increasing values create more intensity.

The **Inf. Layer menu** lets you choose the clip that is used for the influence. Choose ***None***, ***Outgoing*** or ***Incoming***. When None is chosen, the other parameters have no affect. When you apply a wipe as a filter (by using the corresponding BCC Wipe effect in the BCC Keys & Matte category), the choices are ***None***, ***Filter Layer, 1st Below,*** or ***2nd Below***.

The **Channel menu** allows you to choose the channel that is used for the influence.

- ***Alpha, Luma, Red***, ***Green***, and ***Blue*** create influence based on the value of the corresponding channel. Higher values create more influence.
- Choose ***Luma Inverted*** or ***Alpha Inverted*** to create influence based on the inverse of the value of the corresponding channel. In this case, lower values create more influence.
- If ***Luma Difference, Luma Lightest,*** or ***Luma Darkest*** is chosen, the filtered layer (the outgoing clip when the effect is a transition) is combined with the chosen Influence Layer to create the channel.

Inf. Threshold works in conjunction with the Inf. Softness parameter to set the value in the Influence Layer above which pixels are considered fully on. Pixels whose channel values are above the Influence Threshold level are fully on; those with channel values below the level are off. For example, if the Channel menu is set to Red and Inf. Threshold is set to 100, then all pixels whose red channel value is higher than 100 create influence.

Inf. Softness softens the edges of the influence by softening pixels whose values are near the Inf. Threshold value. Set Inf. Softness to 0 for a harsh, high-contrast influence, or increase it to soften the edges of the filtered region.

Blur applies a blur to the edges of the Influence channel before creating the wipe.

Choke applies a choke to the wipe. Positive Choke values tighten the matte, while negative values expand the matte.

If the **Bidirectional Influences checkbox** is deselected, a positive influence value always reveals more image, and a negative value hides more. If this checkbox is selected, the influence can go in both directions.

Working with the Texture Parameters

The Texture controls are similar to the Influence controls. They allow the wipe to be influenced by a Fractal Noise Map, a White Noise map, or both. The Texture controls differ from the pattern controls in that they operate on a pixel-by-pixel basis. The Texture controls can create holes in the wipe, while the Pattern controls do not create holes.

Using the Texture controls slows down the filter.

The **Texture menu** controls which type(s) of texture map influences the wipe.

- When ***Off*** is chosen, no texture is used.
- ***Fractal Noise*** uses a simplified version of the algorithm used by the Noise Map filter to generate the texture.
- ***White Noise*** uses the algorithm used by the Pixel Noise filters combined with a high quality blur. The blur amount is set by the **Noise Softness** parameter.
- ***Fractal and White Noise*** combines both types of texture.

Multi Stretch Wipe

Texture=Off *Texture=Fractal* *Texture=White Noise*

Texture Intensity scales the intensity of both the Fractal and White Noise. Negative values reverse the effect, causing pixels that would become more transparent to become more opaque and vice versa.

Fractal Intensity adjusts the intensity of the Fractal Noise texture if ***Fractal Noise*** or ***Fractal and White Noise*** are chosen in the Texture menu.

Fractal Scale scales the size of the details in the Fractal Noise texture if ***Fractal Noise, White Noise*** or ***Fractal and White Noise*** are chosen in the Texture menu.

The choices in the **Fractal Type menu** set the general appearance of the Fractal Noise texture. Choose ***Smooth, Bubbly*** or ***Stringy.***

Smooth *Bubbly* *Stringy*

Fractal Flow Rate set the speed of the motion of the Fractal Noise texture pattern.

Fractal Flow Direction sets the direction of the motion of the Fractal Noise texture pattern.

Fractal Morph Start controls the look of the Fractal Noise texture at the first frame of the effect.

Fractal Morph Rate determines the rate at which the Fractal Noise texture surges and rotates inward as the filter auto-animates.

Setting the **Downsample menu** to ***2*** speeds rendering by creating a smaller (downsampled) Noise map. This can make the filter appear rougher, which is useful for some effects.

Noise Intensity controls the intensity of the noise texture.

Noise Softness controls the softness applied to the noise texture.

Noise Seed determines the value input to the random number used by the filter to create the noise. Adjust this value when you like the overall appearance of the noise but want to change the random configuration.

Noise Morph Rate controls the rate at which the noise texture evolves over time. This allows you to auto-animate the noise texture. You can also animate this parameter between a static and evolving noise texture by animating this parameter

If the **Bidirectional Textures checkbox** is deselected, a positive texture value always reveals more image, and a negative value hides more. If this checkbox is selected, the texture can go in both directions.

Working with the Post Process Parameter Group

Gamma controls the value of the middle tones while leaving the white and black of the image unaltered. The Gamma adjustment is made to the derived alpha. Increasing gamma spreads the alpha so that the matte created by the wipe is more opaque. The affect of Gamma is much more noticeable at high softness values.

Alpha Offset controls an offset that is added to the output alpha. You can create a transition by animating from -255 to 255. At a value of -255, the entire image keys out. At a value of 255, the entire image is opaque.

Post Blur blurs the alpha channel after the matte is created. Use Post Blur to soften the edge in the matte for sources with high contrast edges.

Choke applies a choke to the matte. Positive values tighten the matte around the foreground image, while negative values pull the matte away from the edges of the foreground image.

Post Blur and Choke are particularly useful if you used the texture, pattern, or influence controls to make a wipe with a nice shape but too many sharp details.

Borders are computed before Blur and Choke are applied, so using both borders and blur or choke on the same effect may create unexpected results.

Working with the Composite Parameter Group

The controls in this group let you composite an underlying clip with the source image, and allow brightness, contrast, and apply modes to be used in the blended region.

Composite controls only affect images without an alpha channel if you use some Softness value (for example, make the Wipe Edge soft). If the image has an alpha channel, these settings affect partly transparent pixels even without Softness.

The most common use of the Composite settings is to boost the brightness and contrast of the blended region when creating a soft wipe. You can also achieve unusual composites by using an Apply mode.

The **Background menu** allows you to choose the underlying clip to composite below the source image. Choose ***None, Outgoing*** or ***Incoming***.

The **Blend menu** lets you choose an apply mode to use in the blended region. The available Apply Modes are described in detail in “Apply Modes” on page 625.

Blend Brightness adjusts the brightness used in the blended region.

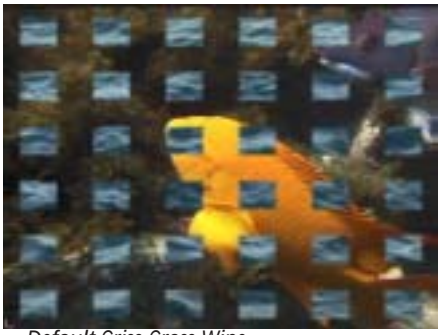
Blend Contrast sets the amount of contrast used in the blended region.

Mix w 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.

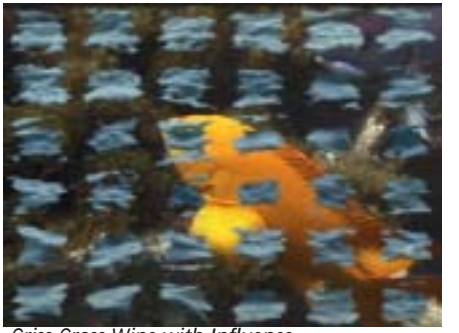
Working with the BCC Criss-Cross Wipe

The Criss-Cross Wipe combines two independent Multi-Stripe filters, to make wipes in a variety of patterns. At the default value, this wipe appears similar to the Avid Grid wipe (in the Matrix category).

The following example shows a Criss-Cross Wipe using Influence on the incoming (waves) media. For more information on using the Influence controls, see “Working with the Influence and Influence Map Parameters” on page 585.



Default Criss-Cross Wipe



Criss-Cross Wipe with Influence

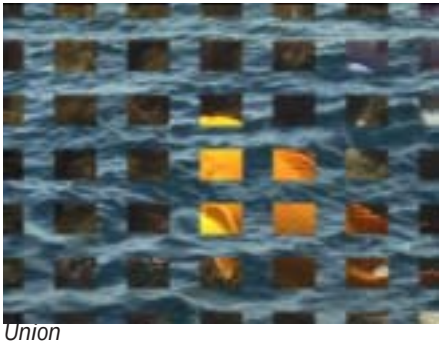
For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, and “Working with the Geometrics Parameter Group” on page 24.

The **Wipe Center X** and **Y** position controls set the center point of the wipe on the X and Y axis, respectively. Setting the Wipe Center controls also affects the thickness and aspect ratio of the stripes because the wipe recalculates their size to uniformly finish the effect.

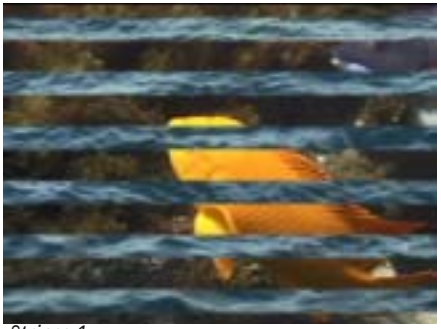
The **Combine menu** determines how the stripes are combined. The choices are:

- ***Union*** renders the opacity at each point as the higher of the opacities of the two separate wipes (the horizontal and vertical stripes). When Union is chosen, the wipe may reach full opacity at a Percent Done value below 100.
- ***Intersect*** renders the opacity as the lower of the opacities of the two separate wipes. When Intersect is chosen, the wipe may reach full transparency at a Percent Done value significantly above 0.
- ***Stripes 1*** creates only horizontal stripes.
- ***Stripes 2*** creates only vertical stripes.

Intersect



Union



Stripes 1

Stripes 2

Relative Angle sets the angle that the two sets of stripes make with each other. The default value is 90 degrees.

Relative Rotation Rate lets you auto-rotate the Relative Angle parameter.

Master Width scales the width controls found in each Stripe parameter group. This parameter has no affect if the Animation menu is set to Auto.

Master Separation scales the separation controls found in each Stripe parameter group. This parameter has no affect if the **Fit Stripes to Image checkbox** is selected.

If the **Fit Stripes to Image checkbox** is selected, the filter automatically determines the Separation Width for each group of stripes using the Angle and Stripe Count parameters. As a result, the stripes are centered in the image as long as the Wipe Center parameter remains at the image center. When this checkbox is selected, the Master Width and the Width parameters have no affect.

Stripe Count 1 and **Stripe Count 2** set the number of horizontal and vertical stripes that are created, respectively.

Working with the Stripes 1 and Stripes 2 Parameter Groups

When the Combine menu is set to Union or Intersected, both parameter groups apply. When the Combine menu is set to Stripes 1, only the Stripes 1 parameters apply. When the Combine menu is set to Stripes 2, only the Stripes 2 parameters apply.

Stripe Width sets the size of the corresponding stripes. This parameter has no affect if the Animation menu is set to Auto.

Stripe Offset offsets the position of the corresponding stripes, depending on the Direction value. At the default Direction value of 90, increasing positive values move the stripes up or to the right. Decreasing negative values move the stripes down or to the left.

Manual Separation allows you to manually set the space between the corresponding stripes. If the **Fit Stripes to Image checkbox** is selected, these parameters have no affect.

The **Randomize Stripes menu** lets you randomize wipe parameters.

- ***Off*** does not randomize any parameters.
- ***Width*** randomizes the Stripe Width parameter.
- ***Position*** randomizes the stripe's position.
- ***Coherent Position*** adds the randomization of the previous stripe to the randomization of each successive stripe.
- ***Position and Width*** randomizes the Stripe Width parameter and position.
- ***Coherent Pos and Width*** randomizes both the Stripe Width parameter and position then uses the Coherent algorithm for position randomization.

Amount sets the amount of randomization that is applied to the corresponding parameter.

Position sets the amount of randomization that is applied to the stripe's position.

Width sets the amount of randomization that is applied to the stripe's width.

Seed determines the value input to the random number used by the filter to create the randomization. Adjust this value when you like the overall appearance but want to change the random configuration.

Morph Rate auto-animates the randomization of the stripes, so the stripe pattern automatically evolves as the effect progresses.

Working with the Remaining Parameter Groups

The remaining parameter groups for this effect are described in "Common Wipe Parameter Groups" on page 578.

Working with the BCC Linear Wipe

BCC Linear Wipe is similar to the Avid Horizontal wipe (in the Edge Wipe category). However, it offers more parameters for you to customize. This filter is similar to the BCC Rectangular Wipe filter, but wipes in a straight line.

The following example shows a Linear Wipe using Influence on the incoming (fish) media. For more information on using the Influence controls, see "Working with the Influence and Influence Map Parameters" on page 585.

Default Linear Wipe

Linear Wipe with Influence

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, and "Working with the Geometrics Parameter Group" on page 24.

Wipe Start sets the starting point of the wipe if the Animation menu is set to Manual. The wipe proceeds along a line passing through this point in the specified direction.

If **Wipe Amount** is 0, the edge of the wipe passes through the Wipe Start point. Increasing Wipe Amount reveals more of the incoming image; decreasing this value hides more of the incoming image. This parameter only applies if the Animation menu is set to Manual.

Working with the Remaining Parameter Groups

The remaining parameter groups for this effect are described in "Common Wipe Parameter Groups" on page 578.

Working with the BCC Multi Stretch Wipe

The BCC Multi Stretch Wipe is a radial wipe with three additional stretch controls named **Taffy Stretch**. The Taffy Stretch parameters do not significantly impact render times.

The following example shows a Multi Stretch Wipe using Influence on the incoming (fish) media. For more information on using the Influence controls, see “Working with the Influence and Influence Map Parameters” on page 585.

Default Multi Stretch Wipe

Multi Stretch Wipe with Influence

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, and “Working with the Geometrics Parameter Group” on page 24.

The **Wipe Center X** and **Y** position controls set the center point of the wipe on the X and Y axis, respectively.

When the Animation menu is set to Manual, the **Radius** parameter determines the radius of the wipe. Higher values produce a larger wipe. For information on the Animation menu, see “Working with the Animation Menu” on page 578.

Softness softens the edges of the wipe by increasing transparency in pixels that are close to the edges. You can use Softness to create artistic blended wipes in which the image gradually becomes transparent.

Stretch Master scales the stretch amount of all the Elliptical Stretch and the Taffy Stretches parameters.

Master Rotation sets the angle of the Elliptical Stretch and the Taffy Stretches.

Master Rot. Rate scales the rotation rate for all the Elliptical Stretch and the Taffy Stretches.

Ellipse Stretch lets you stretch the shape of the wipe into an ellipse. Values greater than 100 stretch the shape in the direction determined by **Ellipse Stretch Angle.** Values less than 100 shrink the shape in the chosen Stretch Angle direction.

Ellipse Rotation Rate auto-animates the Ellipse Stretch Angle, rotating the Ellipse Stretch. Its units are measured in degrees per second.

Taffiness is a master control for the three Taffy Stretch controls which appear in the Taffy Stretch parameter group.t

Working with the Taffy Stretch Parameter Group

The Taffy Stretch parameters stretch the wipe into a shape that is similar to pulled taffy.

Taffy Stretch 1, 2, 3 control the amount of taffy stretch. Negative values can create really interesting results.

Taffy Angle 1, 2, 3 allow you to independently set the angle of the Taffy Stretch.

Taffy Rot. Rate 1, 2, 3 allows you to independently rotate each taffy stretch.

The taffy stretches can produces some hard edged wipes, which you may want to soften with the Post Blur or Choke parameters.

When the **Scale Controls to Radius checkbox** is selected, the Softness, Border Widths, Texture and Influence parameters are scaled to the Radius setting. This checkbox is ignored if the Animation menu is not set to Manual.

For information on the **Output menu**, see “Working with the Wipe Position Controls” on page 579.

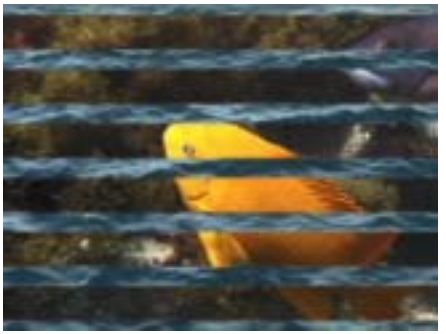
Working with the Remaining Parameter Groups

The remaining parameter groups for this effect are described in “Common Wipe Parameter Groups” on page 578.

Working with the BCC Multi Stripe Wipe

The BCC Multi Stripe Wipe is a similar to Avid's Horizontal or Vertical Blinds wipe. It offers extensive controls to randomize the stripes parameters.

The following example shows a Multi Stripe Wipe using Influence on the outgoing (fish) media. For more information on using the Influence controls, see "Working with the Influence and Influence Map Parameters" on page 585.



Default Multi Stripe Wipe

Multi Stripe Wipe with Influence

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, and "Working with the Geometrics Parameter Group" on page 24.

Stripe Width sets the size of the stripes. This parameter has no affect if the Animation menu is set to Auto.

The **Wipe Center X** and **Y** position controls set the center point of the wipe on the X and Y axis, respectively.

Stripe Count sets the number of stripes that are created.

Direction sets the direction of the stripes.

Rotation Rate lets you auto-rotate the corresponding Relative Angle parameter.

Softness controls the softness of the edges of the corresponding stripes.

Stripe Offset offsets the position of the stripes. Increasing positive values move the stripes up or to the right, depending on the chosen Direction angle. Decreasing negative values move the stripes down or to the left.

If the **Fit Stripes to Image checkbox** is selected, the filter automatically determines the Manual Separation for each group of stripes. As a result, the stripes are centered in the image as long as the Wipe Center parameter remains at the image center. This parameter may create undesirable results if you are rotating the stripes.

Manual Separation allows you to manually set the space between the stripes. If the **Fit Stripes to Image checkbox** is selected, this parameter has no affect.

For information on the **Output menu**, see “Working with the Wipe Position Controls” on page 579.

Working with the Randomize Stripes Parameter Group

The **Randomize Stripes menu** lets you randomize wipe parameters.

- ***Off*** does not randomize any parameters.
- ***Width*** randomizes the Stripe Width parameter.
- ***Position*** randomizes the stripe’s position.
- ***Coherent Position*** adds the randomization of the previous stripe to the randomization of each successive stripe.
- ***Position and Width*** randomizes the Stripe Width parameter and position.
- ***Coherent Position and Width*** randomizes both the Stripe Width parameter and position then uses the Coherent algorithm for position randomization.

Amount sets the amount of randomization that is applied to the corresponding parameter.

Position sets the amount of randomization that is applied to the stripe’s position.

Width sets the amount of randomization that is applied to the stripe’s width.

Seed determines the value input to the random number used by the filter to create the randomization. Adjust this value when you like the overall appearance but want to change the random configuration.

Morph Rate auto-animates the randomization of the stripes, so the stripe pattern automatically evolves as the effect progresses.

Working with the Remaining Parameter Groups

The remaining parameter groups for this effect are described in “Common Wipe Parameter Groups” on page 578.

Working with the BCC Radial Wipe

BCC Radial Wipe produces a radial wipe transition, and contains many controls for unlimited creativity, including Influence controls and preset edge patterns. At the default value, this wipe is similar to the Avid Circle wipe (in the Shape Wipe category).

The following example shows a Radial Wipe using Influence on the incoming (fish) media. For more information on using the Influence controls, see "Working with the Influence and Influence Map Parameters" on page 585.

Default Radial Wipe

Radial Wipe with Influence

For information on the common parameter groups, see "Working with the General Controls Parameter Group" on page 22, and "Working with the Geometrics Parameter Group" on page 24.

The **Center X** and **Y** position controls set the center point of the wipe on the X and Y axis, respectively.

Radius controls the radius of the wipe (a value of 100 is scaled to the image width) when Manual is chosen from the Animation menu. When Auto or Percent Done are chosen in the Animation menu, this parameter has no affect.

The **Scale Others to Radius checkbox** is only active when Manual is chosen in the Animation menu. If this checkbox is selected, most of the controls in the remaining parameter groups scale to the Radius setting. For example, the Border Thickness decreases as the Radius scales down to 0.

Softness controls the softness of the wipe.

Stretch Parameter Group

The parameters in this group contain three controls that stretch the shape of the wipe into an ellipse.

Stretch stretches the shape. Values greater than 100 stretch the shape in the direction determined by **Stretch Angle.** Values less than 100 shrink the shape in the chosen Stretch Angle direction.

The following example shows a wipe with Influence applied to the incoming (fish) media. and Stretch set to 155.

Stretch Angle=120

Stretch Angle=200

Rotation Rate auto-animates the Stretch Angle value, causing Stretch to rotate. The units are measured in degrees per second.

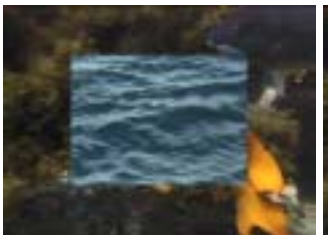
The remaining parameter groups for this effect are described in “Common Wipe Parameter Groups” on page 578.

Working with the BCC Rectangular Wipe

This filter produces rectangular wipes, using most of the controls from the BCC Radial Wipe filter. This filter does not include any pattern controls. At the default value, this wipe is similar to the Avid Box wipe.

The following example shows a default Rectangular Wipe using Influence on the incoming (fish) media. In this effect, the fish swims and cuts through the rectangle as the water wipes on. For more information on using the Influence controls, see “Working with the Influence and Influence Map Parameters” on page 585.


Original Image


Default Rectangular Wipe


Rectangular Wipe with Influence

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, and “Working with the Geometrics Parameter Group” on page 24.

The **Center X** and **Y** position controls set the center point of the wipe on the X and Y axis, respectively.

Width controls the width of the rectangle when Manual is chosen from the Animation menu. When Auto or Percent Done are chosen in the Animation menu, this parameter has no affect. A value of 100 creates a rectangle that is equal to the width of the image.

Softness controls the softness of the wipe.

Aspect sets the aspect ratio of the rectangle. Values greater than 100 stretch the rectangle horizontally**.** Values less than 100 stretch the rectangle vertically. If the Scale Aspect to Image checkbox is selected, this parameter has no affect.

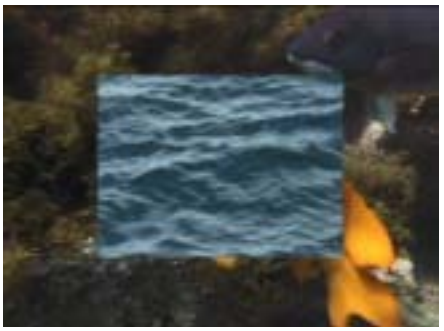
When the **Scale Aspect to Image checkbox** is selected, an aspect of 100 produces a rectangle with the same aspect ratio as the image being wiped. When this is selected, the Aspect parameter has no affect.

Rotation rotates the rectangle.

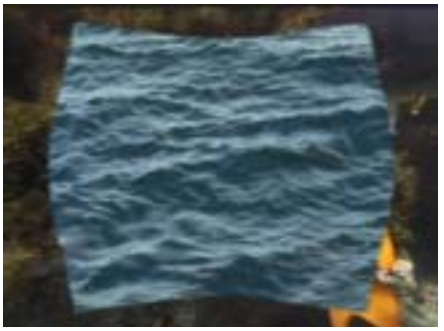
Rotation Rate auto-animates the Rotation value. The units are measured in degrees per second.

The **Distortion menu** sets the shape of the rectangles sides.

- Choosing ***None*** creates a rectangle whose sides form right angles.
- Choosing ***Semi-Elliptical*** creates a rectangle whose sides and corners are curved.



None



Semi-Elliptical

For information on the **Output menu**, see “Working with the Wipe Position Controls” on page 579.

Working with the Remaining Parameter Groups

The remaining parameter groups for this effect are described in “Common Wipe Parameter Groups” on page 578.

Working with the BCC Textured Wipe

The BCC Textured Wipe creates a non-geometric wipe using the Influence layer and the Texture settings. By default, the Influence is generated from the luminance of the outgoing clip when you apply the wipe as a transition and by the Filtered clip when you apply the wipe as a filter. For more information on using the Influence controls, see “Working with the Influence and Influence Map Parameters” on page 585

The following example shows a Textured Wipe using Influence on the both the incoming (water) and outgoing (fish) media.

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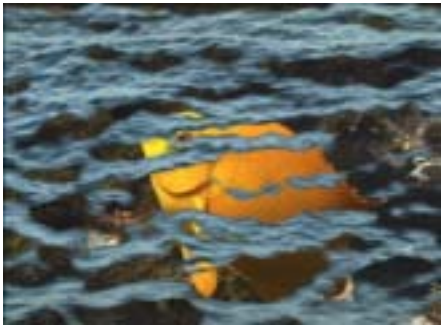


Textured Wipe (influence on incoming water)

Textured Wipe (Influence on Outgoing)

For information on the common parameter groups, see “Working with the General Controls Parameter Group” on page 22, and “Working with the Geometrics Parameter Group” on page 24.

When the Animation menu is set to Manual, **Wipe Amount** lets you create the wipe manually. When the Animation is set to Percent Done or Auto, this parameter has no affect.

Working with the Remaining Parameter Groups

The remaining parameter groups for this effect are described in “Common Wipe Parameter Groups” on page 578.

Chapter 10
The PixelChooser

Overview

The PixelChooser is included in many Boris filters and provides several methods to selectively filter an image. You can use the PixelChooser to create a matte between filtered and unfiltered pixels, either by specifying a geometric region or by using the image's luma or color information.

In this example, the PixelChooser selects pixels based on the image's Red channel. Therefore, the Spray Paint Noise filter is applied only to pixels whose Red value is highest.

In this example, the PixelChooser's region controls are used to specify a rectangular area in which to apply the filter.

In this example, both the matte controls and region controls are used to select pixels. When the PixelChooser is selecting pixels based on both their channel values and their location on the screen, pixels are chosen only if they are fully meet both of the selection criteria.

The PixelChooser performs the same basic operations in most filters:

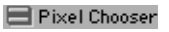
- The PixelChooser examines each pixel in the image and decides how to process each pixel based on its location and/or the channel values in that pixel.
- If the PixelChooser decides that a pixel not does meet the selection criteria, the source pixel is copied to the output and left unfiltered. Unfiltered pixels are black in the matte.
- If the PixelChooser decides that a pixel fully meets the selection criteria, the filtered pixel replaces the source pixel in the output. Filtered pixels are white in the matte.
- If the PixelChooser decides that a pixel partially meets the selection criteria, a mix of the source pixel and filtered pixel appears in the output. Partially filtered pixels are gray in the matte.

Working with PixelChooser Presets

After you adjust the PixelChooser parameters, you can save and load PixelChooser parameter settings using the **PixelChooser menu** in the PixelChooser parameter group. Unlike other BCC presets which are only compatible with the filter in which they were created, PixelChooser presets allow you to move parameters between filters. For example, you can load a PixelChooser preset created in the Cartooner filter into a Blur filter.

Loading PixelChooser Presets

Boris Continuum Complete includes a selection of PixelChooser presets. These presets are an excellent way to learn the capabilities of a filter. Presets are static. All parameter values in the first keyframe are applied globally.

1. Apply the appropriate filter to your media and adjust the PixelChooser parameters.
2. In the PixelChooser parameter group, press the **PixelChooser menu**. 

3. Use one of the following methods to open a preset.
   - To open a preset from the current filter, choose the preset from the list that appears.
   - To open a preset from another filter, choose ***Load.*** A dialog box lets you navigate to the setting. Click **Save** or press Return (Macintosh) or Enter (Windows).

Saving PixelChooser Parameters as Presets

You can save favorite PixelChooser settings as presets and apply them to multiple projects. Presets are static; all parameter values in the first keyframe are saved.

1. Apply the appropriate filter to your media and adjust the PixelChooser parameters.
2. In the PixelChooser parameter group, press the **PixelChooser menu**. 

3. A dialog box opens that allows you to select the file to load. Choose the appropriate effect and click **Save** or press Return (Macintosh) or Enter (Windows).

Using the PixelChooser Menu

The **PixelChooser menu** offers several display options for PixelChooser effects.

- ***Off*** displays the filtered effect without the PixelChooser settings.
- ***On*** displays the filtered effect with the PixelChooser settings.
- ***Chosen Pixels*** displays the matte created between the filtered and unfiltered pixels. Black regions represent the unfiltered pixels; white regions represent the filtered pixels. Gray areas represent partially filtered pixels. This is useful for adjusting an area that is difficult to see, for example a subtle Blur filter applied to an oval region.
- ***Mask Unchosen Pixels*** displays a 50% red mask over the unfiltered pixels.
- ***View Matte Source*** shows the source of the PixelChooser matte, which may be different from the source of the filter. This option was previously called ***Source Image.***

Working with the PixelChooser Region Parameter Group

The PixelChooser's Region parameters specify an area in which to apply a filter. You can use a region-based matte as a garbage matte, then combine it with a channel-based matte. For details on creating a channel-based matte, see "Working with the PixelChooser Matte Parameters" on page 621.

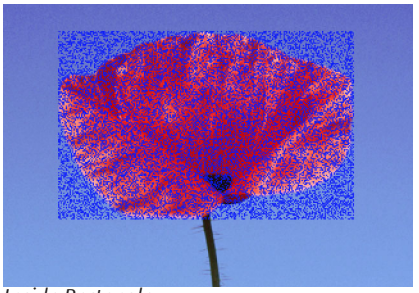
The **Shape menu** determines the shape of the region where the filter is applied. Each type has its own set of parameters which control the size and location of the region. These choices are described in the following sections.

- ***All*** filters all pixels in the image, regardless of their location.
- ***Inside Rectangle*** filters the image inside a rectangle-shaped region.
- ***Outside Rectangle*** filters the image outside a rectangle-shaped region.
- ***Inside Oval*** filters the image inside an oval-shaped region.
- ***Outside Oval*** filters the image outside an oval-shaped region.
- ***Distance to Point*** filters the image between two specified distances from a center point.
- ***Distance to Edge*** filters the image within two specified distances from the edge.
- ***Clock Wipe*** filters the image in a region between two radial lines emanating from a center point.
- ***Linear Gradient*** creates a linear gradient between the filtered and unfiltered regions in the image. When Linear Gradient is chosen, only the point controls and the Reverse Range checkbox in the region group are active.
- ***Distance to Line*** filters pixels based on the distance to the line between the two points.
- ***Distance to Key Point*** is similar to Distance to Point except it uses the Light Source instead of the Center Point control.
- ***Distance to Effect Center*** is similar to Distance to Point except it uses the Effect Center point instead of the Center Point control. This Region Type is available in the Bulge, Ripple, Polar Displacement, Ripple and Twirl filters.
- ***Distance to Light Source*** is similar to Distance to Point except it uses the Light Source instead of the Center Point control.
- ***Distance to Pan Point*** is similar to Distance to Point except it uses the Pan Point instead of the Center Point control.
- ***Distance to Peak Point*** is available in the Wave filter. It is similar to Distance to Point except it uses the Peak Point instead of the Center Point control.
- ***Distance to Position Point*** is available in the Fire filter. It is similar to Distance to Point except it uses the Position Point instead of the Center Point control.
- ***Custom*** lets you draw your own custom shape using onscreen controls.

The PixelChooser region does not scale when using the Geometrics parameters. If you want to use both a PixelChooser shape-based matte and scale the clip, you should apply a separate DVE (or DVE Basic) filter to scale the effect.

Inside Rectangle and Outside Rectangle

Inside Rectangle and ***Outside Rectangle*** filter the image inside or outside a rectangle-shaped region, respectively.



Inside Rectangle

Outside Rectangle

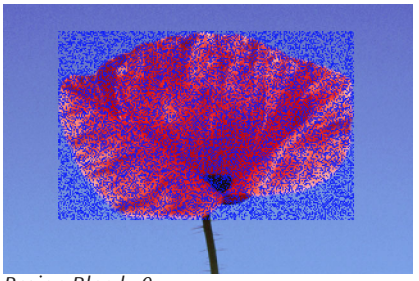
The **Point 1 X** and **Y Position** point controls determine the location of the upper left corner of the rectangle, while the **Point 2 X** and **Y Position** point controls determine the location of the lower right corner.

From and **To** have no affect when Inside Rectangle or Outside Rectangle is chosen.

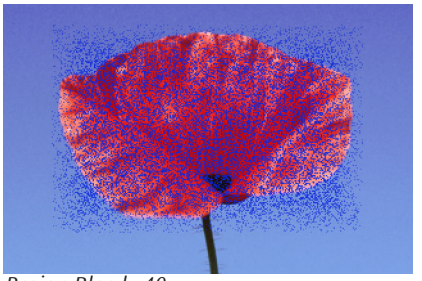
Scale allows you to scale the rectangle-shaped region.

Stretch/Direction distorts the rectangle-shaped region by stretching it either horizontally (for positive values) or vertically (for negative values).

Increasing **Region Blend** softens the edges of the region.



Region Blend=0

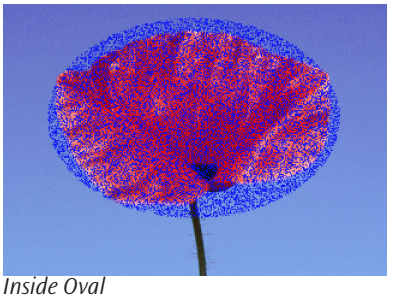


Region Blend=40

The **Reverse Range checkbox** is similar to an invert matte command, except that it does not invert pixels affected by Region Blend. Region Blend always subtracts pixels from the matte.

Inside Oval and Outside Oval

Inside Oval and ***Outside Oval*** filter the image inside or outside a oval-shaped region, respectively.



Inside Oval

Outside Oval

The **Point 1 X** and **Y Position** point controls determine the location of the upper left corner of a rectangle in which the oval is inscribed, while the **Point 2 X** and **Y Position** point controls determine the location of the lower right corner.

From and **To** have no affect when Inside Oval or Outside Oval is chosen.

Scale allows you to scale the oval-shaped region.

Stretch/Direction distorts the oval-shaped region by stretching it either horizontally (for positive values) or vertically (for negative values).

Increasing **Region Blend** softens the edges of the region.

The **Reverse Range checkbox** is similar to an invert matte command, except that it does not invert pixels affected by Region Blend. Region Blend always subtracts pixels from the matte.

Region Blend=0

Region Blend=40

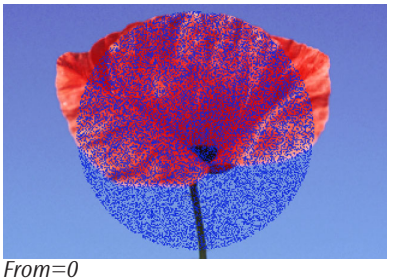
Distance to Point

Distance to Point filters the image between two specified distances from a center point. You can use Distance to Point to create a circular or donut-shaped region.

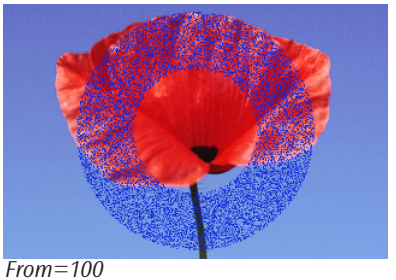
In filters that include the Motion Tracker parameter group, choosing ***PixelChooser*** in the **Apply menu** tracks the filter within the specified area. For example, track a face, then use Distance to Point to apply a light to the face. For details, see "Working with the Motion Tracker Parameter Groups" on page 29.

The **Point 1 X** and **Y Position** point controls determine the location of the center point of the inner circle. The **Point 2 X** and **Y Position** point controls have no affect.

From sets the radius of the circle which defines the inner edge of the region. Set From to 0 to produce a circular region, or increase this value to create a donut shape. Negative From values are the same as a value of 0 unless you are using Region Blend.



From=0



From=100

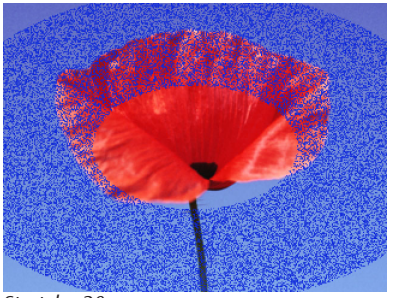
To sets the radius of a circle which forms the outer edge of the region. Increasing To can extend the radius beyond the edges of the screen, in which case the region encompasses all pixels outside the inner circle. If the From value is greater than the To value, no pixels are chosen.

To=200

To=350

Scale adjusts the size of the filtered region. This value is expressed as a percentage of the region's original size.

Stretch/Direction distorts the region by stretching it either horizontally (for positive values) or vertically (for negative values).


Stretch=20


Stretch= –20

Increasing **Region Blend** softens the edges of the region. Region Blend removes pixels from both the inside and the outside edges of the region defined by From and To. Therefore, even when From is 0, increasing Region Blend removes some pixels from the center of the region, creating a transparent or semi-transparent hole. If you want a solid inner region, decrease the From value to achieve the desired effect.

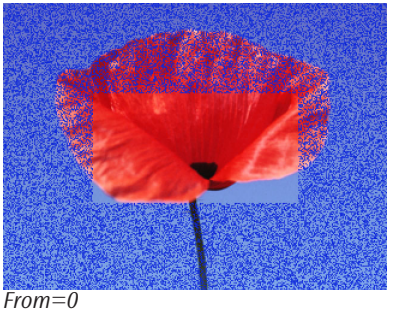
The **Reverse Range checkbox** is similar to an invert matte command, except that Reverse Range does not invert pixels affected by the Region Blend control. At a value greater than zero, Region Blend always subtracts pixels from the matte.

Distance to Edge

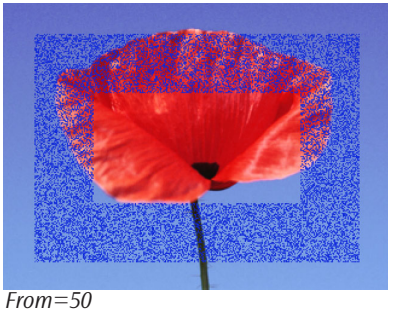
Distance to Edge filters the image within two specified distances from the edge of the frame. You can use Distance to Edge to produce a rectangular region with or without a rectangular hole in the center.

The **Point 1** and **Point 2 X** and **Y Position** point controls have no affect when Distance to Edge is chosen.

From determines the distance between the outer edge of the region and the edge of the image. Set From to 0 to include all of the pixels on the edge of the screen, or increase this value to move the edges of the region towards the center of the image.



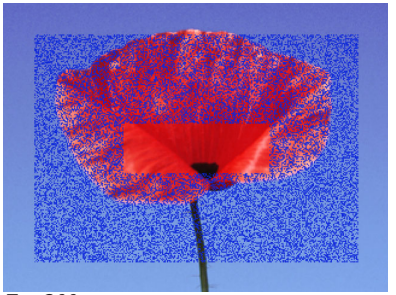
From=0



From=50

To determines the distance between the inner edge of the region and the edge of the image. Increase the value to include more pixels from the center of the image. If the From value is greater than the To value, no pixels are chosen.

To=100



To=200

Scale and **Stretch/Direction** have no affect when Distance to Edge is chosen.

Increasing **Region Blend** softens the edges of the region by removing pixels from both the inside and the outside edges of the region defined by From and To. Therefore, even when From is 0, increasing Region Blend removes some pixels from the outer edges of the region, creating a transparent or semi-transparent border. If you want the region to extend to the edges of the image, decrease the From value until you achieve the desired effect.

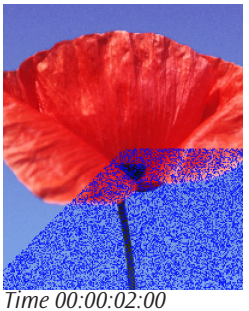
The **Reverse Range checkbox** is similar to an invert matte command, except that Reverse Range does not invert pixels affected by the Region Blend control. At a value greater than zero, Region Blend always subtracts pixels from the matte.

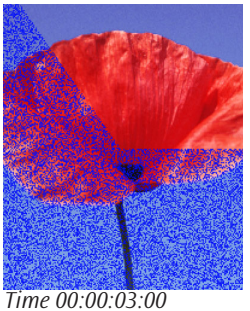
Clock Wipe

Clock Wipe filters the image in a region between two radial lines emanating from a center point. By animating the angles of these lines, you can create a clock wipe.

. Clock Wipe transition


Time 00:00:01:00


Time 00:00:02:00


Time 00:00:03:00

The **Point 1 X** and **Y Position** point controls determine the location of the center point of the clock wipe. The **Point 2 X** and **Y Position** point controls have no affect when Clock Wipe is chosen.

From and **To** control the angles between the edges of the region and the horizontal axis.

The default settings are set up to create a basic clock wipe that starts at 3:00 and moves clockwise similar to the wipe in the examples above. To achieve this effect, just animate the To setting from 0° to 360.

Scale and **Stretch/Direction** have no affect when Clock Wipe is chosen.

Increasing **Region Blend** softens the edges of the region.

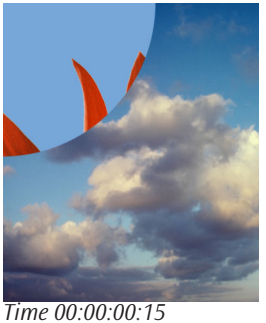
The **Reverse Range checkbox** is similar to an invert matte command, except that Reverse Range does not invert pixels affected by the Region Blend control. At a value greater than zero, Region Blend always subtracts pixels from the matte.

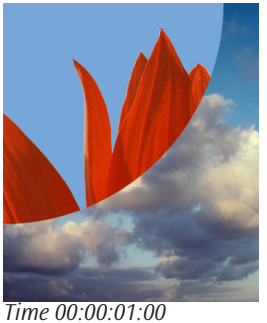
Creating Wipes with the PixelChooser

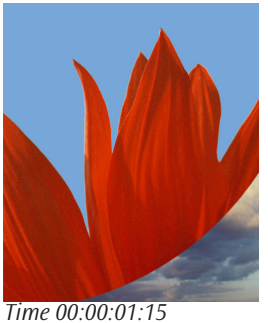
You can easily create wipes from one image to another using the PixelChooser's region controls and the BCC Make Alpha filter.

1. Create two tracks in the timeline and place the incoming image on the top track and the transition media (the outgoing image) on the bottom track.
2. Apply the BCC Make Alpha filter to the top track. Set the **Alpha From Channel menu** to ***Full On.***
3. Animate the PixelChooser's region controls to create a wipe between the source image and the transition image. To create a soft-edged wipe, adjust the Region Blend controls.

The following wipe was created using the Distance to Point region, setting the center point in the top left corner, and animating the To value until the flower fills the screen.


Time 00:00:00:15


Time 00:00:01:00


Time 00:00:01:15

Linear Gradient

Linear Gradient creates a linear gradient between the filtered and unfiltered regions in the image. When Linear Gradient is chosen, only the point controls and the Reverse Range checkbox in the region group are active.

The **Point 1 X** and **Y Position** point controls set the location of the transparent edge of the gradient along the X and Y axis, respectively.


X= –300, Y= –300


X=300, Y=300

The **Point 2 X** and **Y Position** have no affect when you work with the Linear Gradient.

To sets the location of the opaque edge of the gradient, taking into account the Stretch/Direction setting.

From, Scale and **Region Blend** have no affect when Linear Gradient is chosen.

Stretch/Direction sets the direction of the gradient.

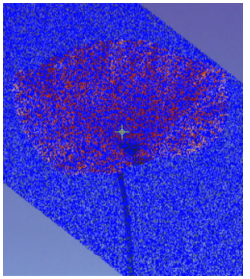
The **Reverse Range checkbox** inverts the matte created by the filter.

Distance to Line

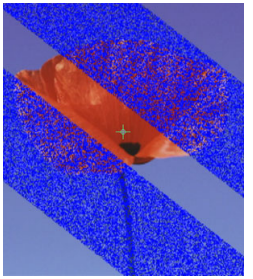
Distance to Line filters pixels based on their distance from a line between the two points.

The line extends between two points whose locations are determined by the **Point 1** and **Point 2 X** and **Y Position** point controls.

From sets the distance between the line and the inner edge(s) of the filtered region(s). Set to 0 to produce a single linear region centered on the line; increase this value to create two parallel regions, one on either side of the line. Negative values produce the same effect as a value of 0 unless you are using Region Blend.



From=0

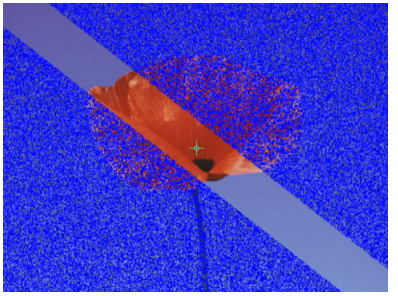


From=5

From=15

To sets the distance between the line and the outer edges of the filtered regions. Increasing To can extend the outer edges of the filtered regions beyond the edges of the screen. If the From value is greater than the To value, no pixels are chosen.

To=10



To=60

Scale adjusts the size of the filtered region. This value is expressed as a percentage of the region's original size.

Stretch/Direction sets the direction of the line.

Increasing **Region Blend** softens the edges of the region. Region Blend softens the edges by removing pixels from both the inside and the outside edges of the region(s) defined by From and To. Therefore, even when From is 0, increasing Region Blend removes some pixels from

the inner edges of the region(s), creating a transparent or semi-transparent area around the line. To make the region solid in the center, decrease the From value until you achieve the desired effect.

The **Reverse Range checkbox** is similar to an invert matte command, except that Reverse Range does not invert pixels affected by the Region Blend control. At a value greater than zero, Region Blend always subtracts pixels from the matte.

Distance to Effect Center

Distance to Effect Center is similar to Distance to Point except it uses the Effect Center point instead of the Center Point control. You can use Distance to Effect Center to create a circular or donut-shaped region.

The **Point 1 X** and **Y Position** point controls determine the location of the center point of the inner circle. The **Point 2 X** and **Y Position** point controls have no affect when Distance to Effect Center is chosen.

The Distance to Effect Center parameters work in the same way as the corresponding Distance to Point controls. For details, see “Distance to Point” on page 609.

Distance to Key Point

Distance to Key Point is similar to Distance to Point except it uses the Key Point instead of the Center Point control. You can use Distance to Key Point to create a circular or donut-shaped region.

The **Point 1 X** and **Y Position** point controls determine the location of the center point of the inner circle. The **Point 2 X** and **Y Position** point controls have no affect when Distance to Key Point is chosen.

The Distance to Key Point parameters work in the same way as the corresponding Distance to Point controls. For details, see “Distance to Point” on page 609.

Distance to Light

Distance to Light is available in some filters that use simulated light sources to affect the image. This option is similar to Distance to Point, except it uses the Light Source point instead of a center point control to define the center of the filtered region.

The **Point 1 X** and **Y Position** controls determine the location of the center point of the inner circle. The **Point 2 X** and **Y Position** point controls have no affect when Distance to Light is chosen.

The Distance to Light parameters work in the same way as the corresponding Distance to Point controls. For details, see “Distance to Point” on page 609.

Distance to Pan Point

Distance to Pan Point is similar to Distance to Point except it uses the Pan Point instead of the Center Point control. You can use Distance to Pan Point to create a circular or donut-shaped region.This Region Type is available in the Rain and Snow filters.

The **Point 1 X** and **Y Position** point controls determine the location of the center point of the inner circle. The **Point 2 X** and **Y Position** point controls have no affect when Distance to Pan Point is chosen.

The Distance to Pan Point parameters work in the same way as the corresponding Distance to Point controls. For more information, see “Distance to Point” on page 609.

Distance to Peak Point

Distance to Peak Point is available in the Wave filter which does not contain a center point. It is similar to Distance to Point except it uses the Peak Point instead of the Center Point. You can use Distance to Peak Point to create a circular or donut-shaped region.

The **Point 1 X** and **Y Position** point controls determine the location of the center point of the inner circle. The **Point 2 X** and **Y Position** point controls have no affect when Distance to Peak Point is chosen.

The Distance to Peak Point parameters work in the same way as the corresponding Distance to Point controls. For information, see “Distance to Point” on page 609.

Distance to Position Point

Distance to Position Point is available in the Fire filter. It is similar to Distance to Point except it uses the Position Point instead of the Center Point control. You can use Distance to Position Point to create a circular or donut-shaped region.

The **Point 1 X** and **Y Position** point controls determine the location of the center point of the inner circle. The **Point 2 X** and **Y Position** point controls have no affect when Distance to Position Point is chosen.

The Distance to Position Point parameters work in the same way as the corresponding Distance to Point controls. For more information, see “Distance to Point” on page 609.

Custom

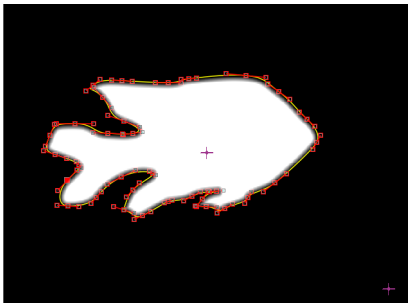
Custom lets you draw your own custom mask using onscreen controls. The shape includes bézier handles at each control point. Instead of simply creating a garbage mask, you can create animating masks with adjustable bézier handles.

The shape you draw is animatable and can include up to 40 points. You can also combine multiple shapes. You can drag points to reposition or animate them; Shift-select to reposition multiple points. The number of points is not animatable.

If you are working with a filter that obscures the image, for example BCC Mosaic, you may want to set the **PixelChooser menu** to ***View Matte Source*** while you draw your custom mask. See page 605 for details.

The Custom shape is especially useful for creating animating mattes. You can then combine the matte with a channel-based matte to finetune your effect. See "Working with the PixelChooser Matte Parameters" on page 621 for details.

As part of the Custom shape interface, a **Custom Spline Points parameter group** appears in the Effect Editor window below the PixelChooser parameter group. To animate your custom shape, you must add keyframes to the Custom Spline Points parameter group. See the next section for details.



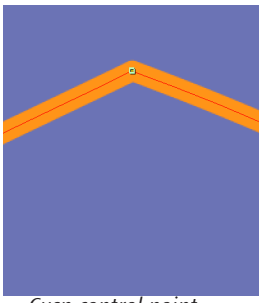
Custom mask

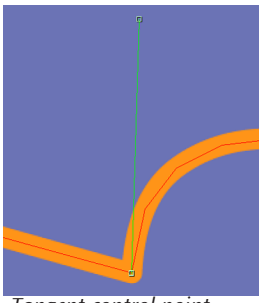
Filtered image

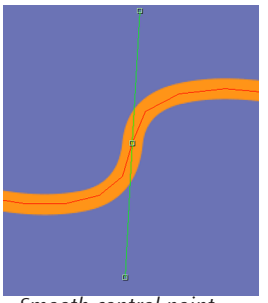
The **Outline/Path button** must be selected at the bottom of the Effect Editor or onscreen controls do not appear in the Effect Preview monitor. This button is pink when selected.

The Custom shape option can be manipulated in a variety of ways:

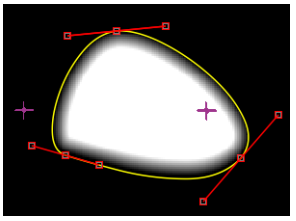
- To draw a shape, click onscreen to create points. You can create up to 40 control points. By keyframing and dragging shapes, you can create animating masks.
- To begin a new custom shape, click onscreen. A single click creates a **cusp point**–that is, a control point without bézier handles. To create a **smooth point**–a point with two bézier handles–drag away from the point before releasing the mouse. To create a **tangent point**–a point with one bézier handle–press the Option (Macintosh) or Alt (Windows) key as you drag.

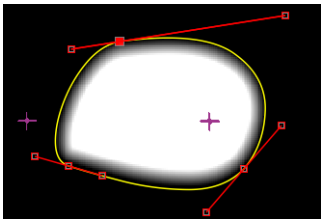

Cusp control point

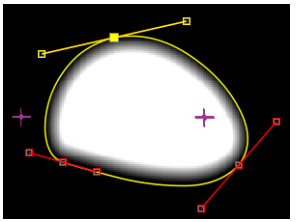

Tangent control point


Smooth control point

- To close a shape, click the original point.
- To add a new point between existing points, Option-click (Macintosh) or Alt-click (Windows) the outline. As the mouse moves over the outline, a tool tip displays ***Insert***.
- Each control point includes a center point with two bézier handles. To adjust a bézier handle individually, Alt-click the bézier handle. This allows you to change the curve before or after the center point without affecting the corresponding curve on the other side of the center point.
- Shift-dragging a bézier handle keeps the angle the same, but adjusts the length for that handle individually. Shift-dragging again, restores the symmetry to the handles as shown in the following examples.


Original Mask

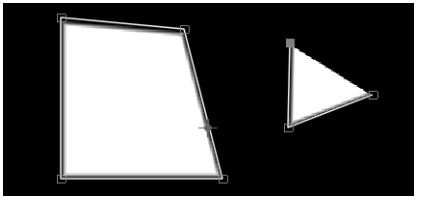

Right handle Shift-dragged


Shift-dragged again

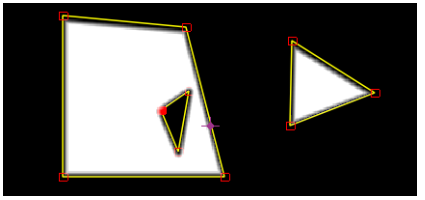
- To delete a point, Option-click (Macintosh) or Alt-click (Windows) the center point.
- To move individual points, drag the point. To move multiple points, Shift-select and drag the points. You can also drag a line to move multiple points.
- You can scale and rotate the shape(s) using the **Scale** and **Stretch/Direction** parameters.
- You can move the center point of the shape(s) using the sliders for the **Point 1 X** and **Y Position** point controls. However, you must lock the shape to use the onscreen crosshair point controls. To lock the shape, click the bottom **Overlay button** at the top of the Effect Editor window. The top button is the **Edit Custom Region button**. When this button is selected, mouse clicks allow you

to create and edit the Custom shape. When the bottom **Lock Custom Region button** is selected, mouse clicks affect the other point controls. The buttons turn purple when selected.

- You can create multiple shapes, as shown in the following example. When you work with multiple shapes, you reposition shapes by dragging them. With multiple shapes, adjusting the **top X** and **Y Position** point controls will move all shapes.
- You can combine multiple shapes into one object. In the right example, a hollow triangle shape was created inside the custom mask.



Mask Created with Two Custom shapes



Mask Created with Three Custom shapes

The **Point 1 X** and **Y Position** point controls determine the location of the center point of the custom shape. You can use this to animate the shapes position. The **Point 2 X** and **Y Position** point controls have no affect when Custom is chosen.

From and **To** have no affect when Custom is chosen.

Scale adjusts the size of the filtered region. This value is expressed as a percentage of the region's original size.

Stretch/Direction lets you rotate the custom shape around its center point.

The **Reverse Range checkbox** is similar to an invert matte command, except that Reverse Range does not invert pixels affected by the Region Blend control. At a value greater than zero, Region Blend always subtracts pixels from the matte.

Creating an Animated Custom Mask

1. Choose ***On*** from the **PixelChooser menu**.

   When you work with a filter that obscures the image, you may want to set the **PixelChooser menu** to ***View Matte Source*** while you draw your custom mask. Then set the PixelChooser menu to On after you finish drawing. See your User Guide for details.

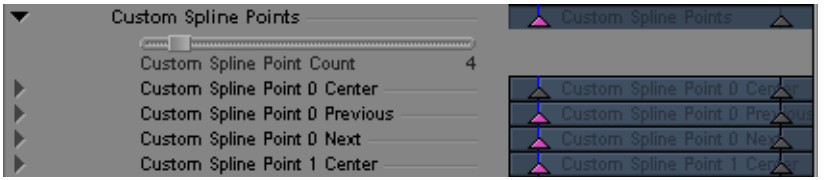
2. In the PixelChooser Region parameter group, choose ***Custom*** from the **Shape menu**.
3. The **Outline/Path button** must be selected at the bottom of the Effect Editor or onscreen controls do not appear in the Effect Preview monitor. This button is pink when selected.

4. Use the following controls to draw your custom shape.
   - Click onscreen to create points. You can create up to 40 points.

- To close a shape, click the original point.
- To add a point between existing points, Option (Macintosh) or Alt-click (Windows) the shape outline. As the mouse moves over the outline, a tool tip displays ***Insert***.

5. Create a keyframe at the first and last keyframe in the **Custom Spline Shape** parameter group. To create a new keyframe, Right-click the keyframe graph and choose ***Add Keyframe*** from the menu that appears or click the **Add Keyframe button**.

   In the following example, the disclosure triangle was clicked to reveal the nested parameters inside the Custom Spline Points parameter group. Keyframes are automatically added for every parameter inside the parameter group.



6. Use the following controls to animate your custom shape.

   - To move individual points, drag the point. To move multiple points, Shift-select and drag the points. You can also drag a line to move multiple points.
   - You can scale and rotate shapes using the **Scale** and **Stretch/Direction** parameters.
   - You can move the center point of shapes by adjusting the sliders for the **Point 1 X** and **Y Position** controls. However, you must lock the shape if you want to use the onscreen crosshair point controls. To lock the shape, click the bottom **Lock Custom Region button** in the Effect Editor window. When this button is selected, mouse clicks affect the point controls. The top button is the **Edit Custom Region button**. When this button is selected, mouse clicks create and edit the Custom shape. The selected button turns purple.

Working with the PixelChooser Matte Parameters

The Matte parameters allow you to filter an image based the values in one or more of its channels. These parameters also provide three different methods of creating a matte from these channels.

For even more precise control, you can use a region-based matte as a garbage matte, then combine it with a channel-based matte. For details on creating a region-based matte, see "Working with the PixelChooser Region Parameter Group" on page 606.

The **Channel menu** determines which channel is used to create a matte.

- ***None*** filters all pixels in the image, regardless of their channel values.
- ***Luma*** selects pixels according to their Luminance values.
- ***Red***, ***Green***, and ***Blue*** select pixels according to their corresponding RGB color channel values.
- ***Alpha*** selects pixels according to their Alpha channel values.
- ***Hue***, ***Saturation***, and ***Lightness*** select pixels according to their corresponding HSL color channel values.
- ***RGB Diff***, ***HSL Diff***, ***Hue Diff***, and ***Chroma Diff*** choose pixels based on the difference between their channel values and the channels values of the chosen **Color**. RGB Diff uses RGB values in calculating differences, HSL Diff uses HSL values, Hue Diff uses only the Hue values (in HSL color space), and Chroma Diff uses Hue and Saturation values (in HSL colorspace).

The **Layer menu** allows you to select any layer in the timeline to create the matte between unfiltered and filtered pixels. The choices are ***Filter Layer***, ***1st Below*** and ***2nd Below***.

The **Type menu** determines which type of adjustments can be made to improve the matte. The three types, ***Levels***, ***Threshold*** and ***Range***, each include a different set of controls which are described in the following sections.

Matte Softness softens the edges of the matte by creating gray areas for pixels whose values are near the Threshold value. Set Matte Softness to 0 for a harsh, high-contrast matte with no gray pixels, or increase it to soften the edges of the filtered region.

Blur Matte applies a basic blur to the matte created by the PixelChooser. This can help smooth edges in the matte.

Choke Matte applies a choke to the matte created by the PixelChooser. Positive Choke Matte values tighten the matte around the opaque regions, while negative values pull the matte away from the edges of the opaque regions.

The **Invert Matte checkbox** reverses the range of the matte.

Levels

When ***Levels*** is chosen from the **Type menu**, you can adjust the contrast in the matte by adjusting the input black and white levels.

Black/Threshold/From controls the number of pixels in the matte that are pure black. Increasing the black level pushes dark gray pixels to black.

Black Level=0

Black Level=100

White/To controls the number of pixels in the matte that are pure white. Decreasing the white level pushes light gray pixels to white.

White Level=255

White Level=200

Matte Softness has no affect when ***Levels*** is chosen from the **Type menu**,

Threshold

When ***Threshold*** is chosen from the **Type menu**, you adjust the balance of black and white pixels in the matte. You can then smooth the resulting matte by adding intermediate gray pixels.

Black/Threshold/From sets a level in the chosen color channel. Pixels whose channel values are above the Threshold level are pure white in the matte, and those with channel values below the level are pure black. For example, if the Channel menu is set to Red and Threshold is set to 100, then all pixels whose red channel value is higher than 100 are white in the matte. All pixels whose red channel value is lower than 100 become black in the matte.

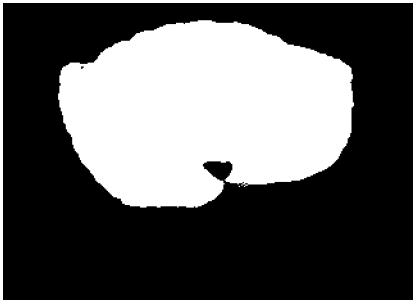
Threshold=120

Threshold=130

Threshold=140

White/To has no affect when ***Threshold*** is chosen from the **Type menu**,

Matte Softness softens the edges of the matte by creating gray areas for pixels whose values are near the Threshold value. Set Matte Softness to 0 for a harsh, high-contrast matte with no gray pixels, or increase it to soften the edges of the filtered region.



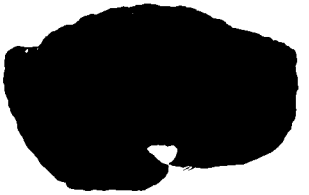
Matte Softness =0

Matte Softness=40

Range

When ***Range*** is chosen from the **Type menu**, you to can choose a range of channel values within which pixels are filtered. You can then soften the edges of the resulting matte.

Black/Threshold/From and **White/To** define the lower and upper limits of a range of values in the chosen color channel. Pixels whose appropriate color channel values fall within this range appear white in the matte, while the remaining pixels are left black.



From=0, To=140

From=140, To=255

If From is higher than To, no pixels are filtered. Decreasing From below 0 and/or increasing To above 255 only has an affect if you are using Region Blend.

Increasing **Matte Softness** softens the edges in the matte.

Matte Softness softens the edges of the matte by removing pixels from all of the edges of the matte defined by From and To. Therefore, even if From is 0 and To is 255, increasing Matte Softness removes some pixels from the matte, creating transparent or semi-transparent areas. You can use negative From values and/or To values higher than 255 to expand the matte to counteract this effect if necessary.

Appendix
Apply Modes

Many effects use Apply Modes to apply the filtered output (or light or some other aspect of the effect) to the source image. Apply Modes control the blending of the two images, giving the effects many additional creative possibilities. The Apply Mode menu may contain any or all of the apply modes described in the following table.

Apply Mode	Effect
Normal	Applies the light or filter directly to the source image, and the filtered pixels replace the source pixels.
Lighten	Compares the color channels values in the original pixels and in filtered pixels, and chooses the lighter (higher) value for each channel in each pixel. If a pure red pixel is applied to a pure blue pixel, the result is pure magenta.
Darken	Compares the color channels values in the original pixels and in filtered pixels, and chooses the darker (lower) value for each channel in each pixel. If a pure red pixel is applied to a pure blue pixel, the result is black.
Multiply	Applies the light or effect to the source as if it were a transparency placed over the source. The resulting image is darker than either. If a pure red pixel is applied to a pure blue pixel, the result is black. If a 50% gray pixel is applied to another 50% gray pixel, the result is 25% gray.
Screen	Applies the light or effect to the source as if a photographic double image was taken of the light or effect and the source. The resulting image is lighter than either the light or effect or the source. If a pure red pixel is applied to a pure blue pixel with Screen, the result is magenta. If a 50% gray pixel is applied to another 50% gray pixel with Screen, the result is 75% gray.
Difference	Outputs the difference between the light or filtered color and the source color for each channel. Difference modes can produce some very striking colors and create glow effects when used with Blurs. Difference modes can also exacerbate the noise in noisy video sources. Difference can generate non-Color Safe output.
Lighter	Uses the lighter of the source and filtered colors for each pixel for all channels. If a dark green pixel is composited with light red, the result is light red.

Apply Mode	Effect
Darker	Uses the darker of the source and light or filtered colors for each pixel for all channels. If a dark green pixel is applied to a light red pixel, the result is dark green.
Scale Multiply	A useful variation of Multiply that produces a brighter image than the standard Multiply. This is often the most realistic Apply mode for light effects.
Scale Screen	A useful variation of Screen that produces a darker and less washed-out image than the standard Screen.
Difference X 2	A variation of Difference that produces a more intense effect than the standard Difference. The enhanced difference modes can be particularly effective in creating glows with the Blur effects.
Difference X 4	A variation of Difference that produces an even more intense effect than Difference X 2. The enhanced difference modes can be particularly effective in creating glows with the Blur effects.
Add	Includes the light or filtered output with the source. The resulting color values are clipped at white.
Subtract	Removes the light or effect from the source. This can produce intense and unpredictable colors and make the image appear noisy.
Overlay	Puts the light or effect over the source. The result is brighter than the result of a Multiply and darker than the result of a Screen.
Soft Light	Simulates shining a diffuse light (whose color is the light color or filtered output) on the source image. Most of the detail in the final output comes from the source image.
Hard Light	Simulates shining a harsh light (whose color is the light color or filtered output) on the source image. The source image and the light or filtered output contribute roughly equal amounts of detail to the final output.
Hue	Creates a result color for each pixel that takes its Hue value from the light color or filtered output, and takes the Lightness and Saturation values from the source image.
Saturation	Takes the Saturation of each pixel from the light color or filtered output, and takes the Lightness and Hue from the source image.
Color	Takes the Color for each pixel from the light color or filtered output, and takes the Lightness from the source image.
Luminosity	Takes the Luminosity for each pixel from the light color or filtered output, and its Color from the source image.

Apply Mode	Effect
Transparency	Used in Light filters and other lighting effects. Increases transparency in lit regions.
Opacity	Used in Light filters and other lighting effects. Increases opacity in lit regions. If the image is fully opaque, Opacity has no affect.
Boost Expo 1	Blends the color channels in the source and filtered pixels by subtracting an offset value from each pixel, exponentiating the value, adding the results, and then adding back the offset.
Boost Expo 2	Similar to Boost Expo 1, except that this mode uses offset and exponent values different from those used by Boost Expo 1.
Boost Eq Power +	Uses an algorithm modeled on the audio concept of an equal power crossfade. This algorithm emphasizes the light pixels in the blend of the source and filtered pixels, which is useful when working with darker images.
Boost Eq Power –	Similar to Boost Eq Power +, but uses the difference between the channel value and 255 in computing the contrast. This algorithm emphasizes the dark pixels in the blend of the source and filtered pixels, which can be useful when working with lighter images.
Boost Bias	Bias increases the contrast of the pixels whose channel values are highest.
50–50 Mix	50–50 Mix reduces the opacity of the source and filtered pixels by 50% and the blends them equally. If the source and / or filtered pixels are partially transparent, their opacity is reduced proportionately.
Most Opaque	Compares the alpha channel values in the original pixels and in filtered pixels, and chooses the more opaque value for each channel in each pixel.
Most Transparent	Compares the alpha channel values in the original pixels and in filtered pixels, and chooses the more transparent value for each channel in each pixel.
Behind	Composites the light behind the image that is lit. This Apply mode is only useful for images that include some transparency.
In Front	Composites the light in front of the image that is lit. This Apply mode is only useful for images that include some transparency.

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