GBDeflicker3
Adobe Plug-in
For CC 2014, CC & C6
User’s Guide

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A guide to installation and operation of GBDeflicker Adobe Plug-in on Windows and Macintosh computers
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Introduction

Flickering is a common problem in time-lapse or stop motion footage captured using a digital still camera. Frame by frame variations in lighting or in exposure lead to perceptible brightness fluctuations, or flicker. GBDeflicker is an Adobe Plug-in for After Effects and Adobe Premiere that removes time-lapse flicker.

There are three versions of the GBDeflicker Plugin:

- **GBDeflicker3** – for Adobe CC 2014, CC and CS6 – Compatible with After Effects and Premiere Pro
- **GBDeflicker2** – for Adobe CS6, CS5.5 and CS5 – Compatible with After Effects and Premiere Pro
- **GBDeflicker1** – for Adobe CS4 - Compatible with After Effects CS4 and Premiere Pro.

*GBDeflicker for Adobe CS4 is also compatible with earlier versions of Adobe products, although we no longer support these obsolete Adobe products. Earlier compatible version are: After Effects CS3, 7.0, 6.5 and 6.0; Premiere CS3, 2.0, 2.5 and 1.0; and Premiere Elements 8, 7, and 4.*

Some amount of flicker is almost unavoidable. Thankfully it can usually be removed from the image sequence with a tool like GBDeflicker. The algorithm behind GBDeflicker is powerful and technically complex. The software creates a luminance histogram for each video frame, and then adjusts the image histogram, frame by frame, to minimize flicker. GBDeflicker can usually eliminate any flicker as long as there is no significant clipping.
Installation
This User’s Guide is for GBDeflicker3, for Adobe CC and CS6

**MAC Installation**

1) Download the GBDeflicker3Installx_x_x.pkg.zip
2) Unzip it and then double-click GBDeflicker3Installx_x_x.pkg to run the installer.
3) The installer copies GBDeflicker3 and its supporting files to the folder /Applications/GBDeflicker3 on your hard disk.

4) The installer also copies the plug-in to the proper shared location for 64-bit CS plug-ins: “/Library/Application Support/Adobe/Common/Plug-ins/CS6/MediaCore” and “/Library/Application Support/Adobe/Common/Plug-ins/7.0/MediaCore”
**MAC Uninstall**

1) If you have activated a Product license, follow the instructions to release the license
2) Run the AppleScript named /Applications/GBDeflicker3/GBDeflicker3Uninstall.scpt
   To remove the plugin from the Adobe Media Core folders
3) Remove the folder /Applications/GBDeflicker3
4) Remove the GBDeflicker license file (GBDeflicker3X.Ticket) from the /Users/Public/Ticket folder. This folder and files will only be present after you have run GBDeflicker.
Windows Installation

1) Download and run GBDeflicker3InstallX_X_X.exe.
2) The installer copies GBDeflicker3 and its supporting files to the folder c:/Program Files/Granite Bay Software/GBDeflicker3 on your hard disk.

3) The installer also copies the plug-in to the proper shared location for 64-bit CS plug-ins – “C:/Program Files/Adobe/Common/Plug-ins/Common/CS6/MediaCore”, and “C:/Program Files/Adobe/Common/Plug-ins/Common/7.0/MediaCore”.

Windows Uninstall

1) If you have activated a Product license, follow the instructions to release the license
2) Use Windows control panel to remove GBDeflicker3
3) Remove the GBDeflicker license file (GBDeflicker3X.Ticket) from the /Users/Shared/Ticket folder. This folder and files will only be present after you have run GBDeflicker.
Getting Started

Deflickering is a complex process that requires a great deal of computer time. GBDeflicker must compute and analyze the histogram of all frames in a video clip. To render the output, it must process each pixel in every frame individually.

Quick Tutorial – After Effects

1. Launch Adobe After Effects
2. Load a series of images and make a composition
3. Press the spacebar to play the clip and observe the amount of flickering
4. Add a GBDeflicker3 effect by dragging onto the composition track
5. Until you have purchased a license and activate a serial number the output is watermarked with the faint words “GBDeflicker Free Trial”. In free trial mode the effect is fully functional.

A second notice advises you about how GBDeflicker works. It must first analyze the histogram of every frame in the composition. It does this by loading the composition source images while ignoring any masks or other effects you may have applied.

6. A blue band is overlaid on the image indicating the need to analyze the composition before it can be deflickered.

7. Select the Effect Controls, expand the GBDeflicker Options, and click the “Analyze” button.
8. A progress dialog appears showing you the Analyze progress. Long high-resolution images can take several minutes to analyze because each image is loaded in order to calculate its histogram. Analyze is faster if the composition has already been previewed in the After Effects window.
9. If the license has not been activated the “GBDeflicker Free Trial” watermark is overlain on the composition. To activate the license, see the “Activate a License” later in this Users Guide.

10. In the Deflicker Options the default settings should be “Deflicker method” set to “Smoothing” and the “Correction method” set to “Linear”.

11. Expand the **Luminance** option to see the Histogram and Luminance Graphs
12. Expand the “Luminance graph options”, check the box labeled “Zoom luminance scale”.

13. Now the input and desired luminance are shown on an expanded axis. The amount of flicker in the clip is indicated by the fluctuating yellow input luminance curve. The green desired luminance curve is much smoother, indicating that deflickering will make a significant improvement.
14. Preview the clip again and observe the degree of flickering. If the flickering has been reduced and you are satisfied; now that the clip has been previewed, the final output can be rendered.
15. If there is still some flickering try changing parameters, and preview again
   a. Try increase the “Number of smoothing frames”
   b. Try changing the correction method to “Shift”
   c. Try changing the correction method to “Gamma”
User Interface

The figures in this chapter show the After Effects user interface, but the Premiere Pro interface is nearly identical.

GBDeflicker controls are divided into seven groups: License, Analyze buttons, Analyze options, Deflicker Options, Luminance, Shift Spread and Luminance graph options.

License

To activate a license, click the Register button and enter your serial number and other information.

Analyze Buttons

Before deflickering the composition needs to be analyzed to compute histogram of every frame in the composition. Long high-resolution images can take several minutes to analyze because each image is loaded in order to calculate its histogram. Analyze is faster if the composition has already been previewed in the After Effects window.

Click the Analyze button to begin the analysis.

Analyze Progress

Progress while analyzing is shown by a pop-up dialog when running on a Mac computer. Analysis of long high-resolution sequences can take several minutes.
**Analyze Options**
Changing any analyze option will require re-analyze.

![GBDeflicker3 Analyze Progress]

**Speed**
Increasing the speed setting can speed up the analyze process. A setting of 1 is very accurate, but much slower. A setting of 10 is just a little less accurate but faster. We recommend a setting of between 5 and 10 for higher resolution images.

**Analyze Within Sub-rectangle**
Sometimes a clip has some normal (or wanted) fluctuations in luminance along with some unwanted flickering.

The sky in the sample below had some unwanted flickering, but the ground had some wanted brightness variation due to the shadows of the clouds on the tarmac.
The sub-rectangle option was selected and the corners were dragged to cover most of the sky. This caused GBDeflicker to analyze the sky flickering separate from the cloud shadows on the runway.

Changing this option requires the entire clip to be re-analyzed by GBDeflicker.

1st and 2nd Sub-rectangle
These two controls allow you to enter the coordinates of the sub-rectangle corners. You can enter values of just drag the corners on the preview screen.

Favor brighter pixels
When this is checked, the brighter part of the histogram is more heavily weighted. The unchecked value is generally better, but for darker scenes you may want to check this. Changing this option requires the entire clip to be re-analyzed by GBDeflicker.

Don’t Deflicker
This is normally unchecked, but can be used to exclude portions of a clip from analysis and deflickering. If there is a segment with no noticeable flicker, you can set keyframes for this option to turn off deflickering and leave the input unchanged. This can greatly speed up the Analyze process by eliminating sections that don’t need to be analyzed.
Using Don’t Deflicker
If you have a long sequence, the Analyze function can take a long time. If only part of the sequence needs to be de-flickered, then use “Don’t deflicker” keyframes to limit analysis to only a part of the sequence.

Deflicker Options
There are several options to control how deflickering is performed.

Deflicker Method
Two deflickering methods are available: Smoothing and Keyframes. It is your decision which method is best for each case. If the input variance is fairly constant, it may be better to use the keyframe method.
**Smoothing Method**
The output luminance is set to the moving average of the input luminance. The number of values in the moving average is set by the “Number of smoothing frames”. The Smoothing method is generally best when the luminance graph varies.

The green desired luminance curve below shows the expected result of the smoothing method applied to a clip.

![Luminance Graph](image)

**Keyframes Method**
The output luminance is set to a fixed value as determined by the keyframe value. The Keyframes method is generally best when the luminance graph is flat (or piecewise linear).

The green desired luminance curve below shows the expected result of the keyframe method with two keyframes (one at the start of the clip and one at the end).

![Luminance Graph](image)

**Correction Method**
There are three correction methods: Linear, Shift and Gamma. Since the linear method is generally better, it is the default. However, in many cases a better result can be achieved with shift correction and in some rare cases gamma correction.

**Linear Correction**: The output histogram is adjusted to be proportional to the input histogram, using a linear brightness correction curve.

**Shift Correction**: The output histogram is adjusted by shifting the input histogram and also linearly adjusting the spread of the histogram.
**Gamma Correction:** The output histogram is adjusted by applying a gamma brightness correction curve to the input. GBDeflicker can use either a linear or a gamma (nonlinear) luminance correction algorithm.

**Number of smoothing frames**
This is the number of frames before and after the current frame in the clip used in the smoothing method’s moving average.

![Smoothing over 30 frames](image1)
![Smoothing over 10 frames](image2)

Typically 15 to 30 frames produces the best result, but the number of smoothing frames to use depends on your judgement and experience.

**Adjust for clipping**
Use this option only if your clip has significant clipping that is resistant to deflickering. Significant clipping can make it impossible to totally eliminate flicker, but it may be minimized using this option.

This option is only available when using the Shift or Gamma correction methods. When this is checked, clipped values are not changed by deflickering and nearly clipped values clipped are “feathered in”.

**Adjust for clipping at %**
Pixel values within this percentage of being clipped will be adjusted for clipping. Pixel values less than this percentage of full scale will be adjusted by the selected deflicker method.
GBDeflicker operates by adjusting each frames luminance value. The luminance value is calculated from a histogram by averaging the luminance of all pixels in the image. GBDeflicker calculates the luminance by the same method as Adobe Photoshop

\[
\text{luminance} = 0.30*R + 0.59*G + 0.11*B
\]

where R, G, and B are the values of the red, green and blue pixel.

When using the keyframe method, you need to specify the desired luminance of each keyframe. You can adjust the luminance two ways.

1) Click the yellow triangle in the histogram graph to set the keyframe luminance to match the luminance of the current frame.
2) Drag the green triangle in the histogram graph to set the keyframe luminance to any arbitrary value between 0 and 255.

**Histogram Graph**
The histogram graph shows the histogram for the current frame in the clip. Optionally, red, green and blue color channels are shown along with the overall luminance histogram in white.
The input (before filtering) mean luminance value is shown in yellow in the upper left corner of the graph. It is also shown as a yellow triangle on the graph.

GBDeflicker computes a desired luminance value based on the deflicker method (smoothing or keyframes). The deflicker algorithm adjusts the pixel values in order to achieve the desired luminance value. The desired luminance is shown in green and indicated by a green triangle below on the graph.

When the “deflicker method” is set to “keyframes”, clicking the yellow triangle sets the keyframe value to match the input value. When the “deflicker method” is set to “keyframes”, dragging the green triangle sets the keyframe value.

When using shift correction the luminance spread values are also displayed (see image below).

**Luminance Graph**

When GBDeflicker is first applied to a clip, this graph is blank. The luminance values are drawn as the clip is previewed. The yellow line shows the input luminance, the green line shows the desired luminance and the black line shows the output luminance.

**Shift Spread**

The spread is defined as the standard deviation of a frame’s luminance. It is a measure of a histogram’s width. The spread parameter is used only by the shift correction method and is enabled only when using keyframes with shift correction.
When using shift correction the output histogram is adjusted by shifting the input histogram and also linearly adjusting the spread of the histogram to match the desired spread value.

When using the keyframe method, GBDeflicker needs the desired spread of each keyframe, but you don’t normally need to set the spread value. It is set automatically when you set a luminance keyframe value by clicking the yellow triangle in the histogram graph.

You can adjust the spread two ways.
1) **RECOMMENDED**: Click the yellow triangle in the histogram graph to set the spread to match the spread of the current frame.
2) Drag the slider to set the spread to any arbitrary value between 0 and 255.

**Luminance graph options**
There are several Luminance graph options…

**Zoom luminance scale**
Checking this box expands the vertical scale so the luminance variation is more noticeable.

**Show input histogram**
Clicking “Show input histogram” draws the input histogram (before deflickering).

**Show red, green and blue histogram**
These three options control overlays of the red, green and blue histogram components.
Show output histogram
Clicking “Show output histogram” overlays the output histogram (after deflickering) on the input giving an indication of how GBDeflicker altered the image to remove the flicker. This must be checked in order to see the black output line in the luminance graph. It is useful only when checking the deflicker effectiveness. It should not normally be checked because it slows down the deflicker processing by adding another histogram calculation step.

The sub-rectangle option was selected and the corners were dragged to cover most of the sky. This caused GBDeflicker to analyze the sky flickering separate from the cloud shadows on the runway.

Changing this option requires the entire clip to be re-analyzed by GBDeflicker.

1st and 2nd Sub-rectangle
These two controls allow you to enter the coordinates of the sub-rectangle corners. You can enter values of just drag the corners on the preview screen.

Luminance Graph Options
Two options are available to control the luminance graph.
Usage Tips

Make a master clip
Because some clips take so much time to analyze and deflicker, it may be best to create a project to just do the deflickering. Use that project to output a master clip that is deflickered. Then use the master clip in another project to make your final composition.

You can also do any other cropping, scaling or rotation while making the master clip.

Interaction other effects
Avoid using any other color correction effects in the same project with GBDeflicker. It’s best to have GBDeflicker process the original material before any other color correction effects have been applied.

If you do use other color correction effects, make sure GBDeflicker performs its actions first. The example below shows the proper order - the Levels effect performs its action on the GBDeflicker output.

Don’t do time remapping
GBDeflicker does not work with time-remapping. If you need to do remapping, do it on a master clip that has already been deflickered.

Clipping - The bane of deflickering
GBDeflicker works very well as long as there isn’t any significant clipping of the image data. Clipping occurs when some image pixels are at the maximum possible value. This part of the image is likely overexposed resulting in loss of image information.

When pixels values are clipped, the histogram cannot be shifted correctly because there is no way to calculate the corrected value of an overexposed pixel.

Looking at the graph above, it’s not possible to know what the blue channel should look like if it were shifted to the left. The clipped information has been lost.
GBDeflicker License

A license is for use on one computer and is activated using a code (Request number) unique to that computer. As a convenience you are given a serial number that can be activated twice. This means you can use the software on two computers.

If you want to use it on a third you need to either...
1) Buy another serial number
2) Release the license on one of your previously installed computers.

However, you can't move a license between two computers by repeatedly Releasing and Re-activating. Release can only be done a few times.

A GBDeflicker3 serial number can be used on Mac or Windows computers.

When first use GBDeflicker3 in an After Effects (or Premier Pro) session, it checks for a valid product license. If the product license has not been activated it will overlay the watermark.

Activate a License

1) After purchasing GBDeflicker, you will receive a serial number via email.
2) Select the Effect Controls, expand the GBDeflicker Options, and expand the License options
3) Then click the “Register” button.
4) If you have purchased GBDeflicker, go ahead and enter the serial number and other information and click **Activate Now**. Otherwise, to continue the free trial click on **Activate Later**.

The form information is sent to our server. If the serial number is valid and has not reached its activation limit, the license will be activated and the watermark will be removed.

**Move a License to a Different Computer**

Because a license is granted for use on one computer, it must be released from that computer before it can be activated on another computer. Follow the instructions for **Release License**

**Release License**

Use the Release button to deactivate the license on your computer. This function sends a request to our license server over an internet connection.

A license must be released before it can be moved to a different computer. Once released, the license will no longer be valid on the host computer. If it is accidentally released, it can be restored.

A license must be released before you make any major changes to your computer such as reinstalling the OS, changing the hard disk or adding memory. After you make the change, you can restore or re-activate the license.

1. While **holding down the Shift and OS keys** on the keyboard, click the **Register** button.
2) Select the “Release License” tab and click the OK button.

3) Your serial number is now blocked on this computer so it can now be activated on a different computer.
**Restore License**

Use the Restore button to restore a previously released license. Do not use Release/Restore to repeatedly move a license back and forth between computers – it can only be performed a limited number of times before the license is permanently deactivated.

1. While **holding down the Shift and OS keys** on the keyboard, click the **Register** button.

2) Select the “**Restore License**” tab and click the **OK** button.
Remote Reset
This option resets a license to its original un-activated state. **This can only be done with prior authorization from Granite Bay Software.** Only use this option if we ask you to. It won’t do anything without prior authorization.

1. While **holding down the Shift and OS keys** on the keyboard, click the **Register** button.

2) Select the “**Remote Reset**” tab and click the OK button.
Show Activation Data

This tab shows information about your license.

1. While **holding down the Shift and OS keys** on the keyboard, click the **Register** button.

2) Select the **“Show Activation Data”** tab.
**Block License**

Use this option to permanently block this software license on this computer. **Do this only if request by Granite Bay Software.**

1. While holding down the **Shift and OS keys** on the keyboard, click the **Register** button.

2) Select the “**Block License**” tab.
**Unblock License**

Use this option to unblock a previously blocked license. **This can only be done after contacting Granite Bay Software to get an unblock code unique to your computer.**

1. While **holding down the Shift and OS keys** on the keyboard, click the **Register** button.

2) Select the “**Unblock License**” tab and enter the Unblock code you have been given.
**Activation on a Computer with no Internet Connection**

If your computer has no internet connection, a dialog appears explaining the manual activation process. Or, if your computer is attached to a proxy server that is blocking the activation process, disconnect it from the internet and run GBDeflicker. You will see the "Select Activation Type" dialog.

![Manual Activation Dialog]

A URL and Request Number are displayed. On a computer with an internet connection go to the URL and enter the Request Number and other information.

The URL is [https://www.safeactivation.com/activate.php?x=21002028](https://www.safeactivation.com/activate.php?x=21002028)
Fill out the form and click send.

Then enter the display Activation Code along with your serial number to Activate your product license.
Release on a Computer with no Internet Connection
If your computer has no internet connection, hold down the Shift and OS keys while clicking the Activate button. Then choose the Block License tab to deactivate the license. Send us the Block code and we will deactivate the license on our server making it available for use on a different computer.