

2022-02-05 / GENERAL , IMAGE EDITING , DARKTABLE , NEW

Darktable 3.8.0, Fuji Provia, Velvia and Filmic RGB



It has been possible for some time to imitate the popular film simulations of Fuji cameras using Darktable tools. With the new versions of Darktable and the scene-based workflow, that's kind of gone. There are presets for the *color lookup table* module in the standard system, but these alone are not enough to adjust the appearance of the images. Then I found a few places on the Internet where you can download the appropriate styles. But even these don't work with version 3.8.0 so easily. But you can adapt it to version 3.8.0. *However, the Filmic RGB* module works not with this styles together. Or to put it another way, if you use it in addition, the colors no longer match. To make this work, I created my own styles that work with *Filmic RGB*. There is a download link at the end of the article.

But one after another.

Why all this?

Beautiful colors

Fuji cameras are famous for their different film simulations. However, if you use Darktable for RAW editing, you won't see much of that anymore. Because ultimately it is the camera's JPG engine that uses these film styles. There are even people who do without RAW because of this and only use JPG images.

I think the film styles are also very good, but I don't want to do without RAW processing with Darktable, because you would like to adapt one or the other. This is also possible with a JPG, but here the limits are already narrower. I also find it very difficult to decide on a film style and make adjustments while shooting. That's why I prefer to make such decisions at home on the PC.

Of course, you could also take photos in RAW and then use the camera to create the JPG files in the various styles. Anyone who has done this before knows that, in contrast to working with a mouse and monitor, it is quite a torture.

The finished picture

Beautiful colors are one aspect. But there is another. When the RAW is first loaded into the darkroom in the scene-aware workflow and the *Filmic RGB module* has done its work, then I have the impression that I still have to change something about many of the pictures. Changing the default exposure value from 0.5EV to 1EV for Fuji cameras alleviates the problem somewhat. Nevertheless, I have the impression that the JPG is a "finished image" and that the first time the RAW is loaded into Darktable it is more of a good starting point. However, if the appearance of the film simulations is reproduced in Darktable, then after the first load I have a "finished picture". Now the question arises again, why not simply use the JPG, because it is already finished. This is because while this is often the case, it is not always the case. So it's not necessarily about the finished image, it's about having an image to base my decision on:

- That's done - I don't have to do anything else here.
- small adjustments are necessary here.
- major adjustments are needed here.
- this image is suitable (for example) for a black and white conversion.

- etc...

Fuji film simulations with Darktable

There are different approaches to this

- Another ICC profile can be used as input profile.
- A HaldClut can be used for the 3D-LUT module.
- A style is created using the Color Lookup Table module and a color curve.

Although the first two approaches change the colors in the right direction, they do not lead to the goal because the deviations are large.

A darktable style with the appropriate values for the *color lookup table* and *color curve* modules can be created using the *darktable-chart* tool. These modules also offer the option of subsequently adjusting the implementation of individual colors.

On the internet I found two sources where you can download the finished styles:

- Once the XTrans III styles from darktable.fr.
- and the styles from a blog post on darktable.org itself.

These styles no longer work out of the box with Darktable 3.8.0. There are a few things to consider here. It was also unclear to me how the styles would behave with the new scene-related workflow and *Filmic RGB*. When they were published, it didn't exist yet.

Since I got myself a new color target, I had the idea to create my own set of styles using *darktable-chart*. How to use them - and this is also important for the other styles of darktable.fr and darktable.org - I explain in the following sections.

Styles from darktable.fr and darktable.org

For the styles from darktable.fr and darktable.org, a download link can be found in the corresponding article:

- darktable.fr
- darktable.org

The darktable.org article also describes the procedure for creating the style using *darktable-chart* and the theory behind it.

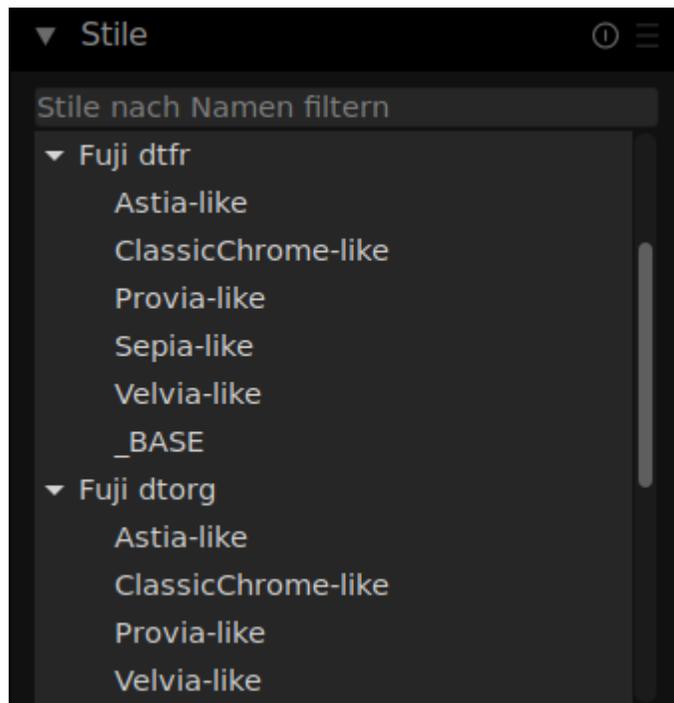
If you unpack the styles from the download archive and then import them into Darktable 3.8.0, nothing happens at first. No error message, no style.

There are two possibilities here: Either the style is imported using an older darktable version (I used 3.6.0) and then exported again. Or, using an editor, all line breaks and white space between the angle brackets are removed from the style's file. With Linux (sorry - Windows is simply out here) this can also be automated via

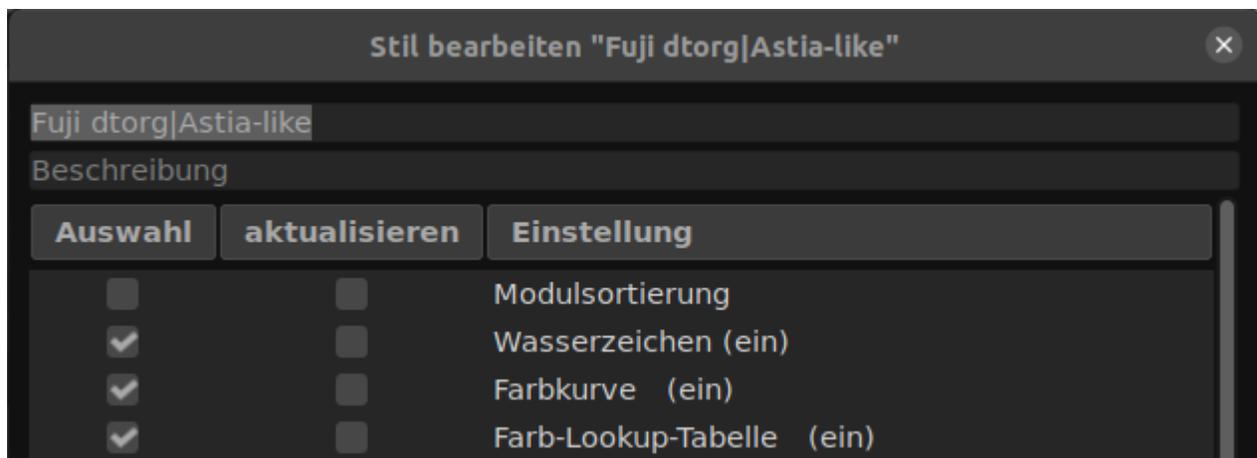
```
cat stylename.dtstyle | tr "\n" " "|sed -e 's/> *</></g' > stylename-38.dtstyle
```

The second problem is that an older version of the *Color Lookup Table* and *Color Curve modules* is being used. Actually, that's not a big deal, because Darktable 3.8.0 also supports this older version. But it can happen that suddenly two instances of a module are in play, because the modules of the styles instead of overwriting the values of the existing instance simply create a new second one. As a result, it looks completely different than it should.

Since I also like to switch back and forth between the styles and try out different ones one after the other, I made them a bit leaner so that the history stack doesn't become confusing so quickly due to the many modules. I immediately gave them a different name and put them in a submenu. For example, I put the styles from darktable.org in the submenu Fuji dtorg and those from darktable.fr in the submenu Fuji dtfr.



This is done by prepending the submenu name to the style name with a pipe character (|).



The style itself then contains only the *Color Lookup Table* and *Color Curve modules*, as well as a watermark that displays the style name on the image. With the help of the watermark you can see which style you used last. At some point you can remove it.

Each of the submenus contains a style named `__BASE`, in addition to the styles with the actual color definitions. It has the task of creating the conditions for the other styles.



The program *darktable-chart* creates a module in the style that *turns* off the base curve. However, if the scene-based workflow is used, this makes no sense. Therefore, *Filmic RGB* and *exposure* are switched off here instead. If you use the display-related workflow, you should switch off the base curve module *with* the style instead.

Also, the *Color Curve* and *Color Lookup Table* modules are switched off. These are the new versions of the modules. This prevents two different versions of these modules being active at the same time when the other styles in the group are applied. In fact, apart from these color styles, the *color lookup table* is rarely used. Still, it's necessary so that it doesn't conflict with the Fuji styles I've created myself that use the new version of the *color lookup table*.

So the workflow for use looks like this:

- Load Image - *Filmic RGB* and *Exposure* (or *Base Curve*) are active.
- Apply style `__BASE` - the prerequisites are created.
- Apply one of the styles in the group.
- If you don't like it, try the next one.
- At the end or in between, clean up the history (summarize).

- When you're done, remove the watermark.

My own styles for the Fuji film simulations

A description of how to create such styles can be found in the [Darktable 3.8](#) manual . There is a bit more detail in the already mentioned [darktable.org](#) blog article . Another article is available on [Pixls.us](#) .

Basically, I followed these instructions. But only in principle. At some points I did it completely differently.

The photo of the color target

Let's get straight to discrepancy number one. In the articles, a sunny day at midday is recommended for shooting. Yes, lunchtime would have been possible. But a sunny day? He just didn't want to come. Admittedly, it took me a few tries. In the end, the following structure led to the goal:

- Put the camera on a tripod and set ISO 200.
- Set up two (good) photo LED spotlights on the left and right at an angle of 45° , which illuminate the color target in the middle of the picture.
(I don't want to advertise, but I don't think you can get there with construction spotlights).
- Turn off all other light sources. No lunchtime. But late in the evening. Otherwise the rest of the daylight creates mixed lighting. This is not only disturbing for the white balance, but also leads to uneven illumination.
- Do not place the color target in the image so that it fills the frame so that only the middle (good) part of the lens is used.
- Then take a picture of a white piece of paper held in front of the color target.
- Check in Darktable with pipette (LAB mode) whether the brightness is the same in each area of the sheet.
- If not, reposition the radiators and repeat the process.

- Then take several shots of the color target with different exposure times ($\pm 1/3$ EV). Choose the best of them.
- Develop an in-camera JPG for each film style.



Generate source and target files

These files are generated using Darktable 3.8.0 by importing the RAW file and JPG files and then exporting them as PFM files in LAB color space.

The instructions state that almost all modules should be switched off. In this case specifically the *Base Curve* module .

But wait: I don't use that anymore because I switched to the scene-based workflow and now use *Filmic RGB*. So turn off *Filmic RGB* and then? Do you have to turn it back on later when using the style? And what about *exposure* to set the middle gray? Switch off first and switch on again later with the pictures?

So this is where deviation 2 arises: I want to use *Filmic RGB* along with the color styles.

For this I thought a bit about what *darktable-chart* actually does. The program gets two images as input. First the ACTUAL state created from the RAW file and then the TARGET state

created from the JPG. From this, *darktable-chart* creates a *color lookup table* and a color curve that turns the *ACTUAL* state into the *TARGET* state.

If these two modules with the calculated settings are applied to another RAW that has undergone the same processing as the RAW with the color target, then the same operations are applied and produce an image in the same color style. Or to put it another way, if I want to use *Filmic RGB* later with the images, then I also have to do it with the RAW with the color target, which *darktable-chart* serves as the *ACTUAL* state. In principle, this applies to every module. The only important thing is that it is used before the *Color Curve* and *Color Lookup Table* modules and that the same settings are used.

Since the Fuji images with the standard +0.5EV exposure are too dark for the middle gray, I set the exposure to 1EV. So, *exposure* with +1EV and *Filmic RGB* are already included.

Modules that do not change colors and tonal values are irrelevant. *This means that the rotation* module is not relevant and can remain in it.

Next would be the Sharpen module . I had the following thoughts on this: It's about the color fields of the color target, which should actually be even in color. However, not all pixels of a color field have the same value. It may be due to the cheap target or the camera, but there is also noise at ISO-200, which is also quite visible in the magnification. Sharpening would increase the noise and the calculation of the hue could come to a different result. I'm not sure if that's really the case, but I left out the *Sharpen module* . The impact, if any, is likely to be minimal.

The lens correction module is more critical because it eliminates vignetting and thus changes tonal values. With Fuji you can't turn it off in-camera and unfortunately I didn't use a manual lens to bypass the correction. This means that the JPGs include lens correction (that from the camera) but the RAW does not. Since I want to use it later with my pictures, I also switch it on with the RAW.

But here you can twist and turn it as you like: The lens correction will later lead to deviations in the tonal values, even if it is switched off in the camera by using a manual lens to generate the RAW with the color target. At the latest when you use other lenses for your pictures, more

or less deviations will occur. Turning on the lens correction in darktable will make the image lighter than the JPG produced by Fuji and turning it off will make it darker. This is simply because Fuji and Darktable use different values to correct vignetting. The lensfun profiles Darktable uses ensure that the vignetting is really gone, while Fuji tends to tone it down so that it's no longer noticeable.



The first image is the JPG that Fuji supplies. Slight obscurations can still be seen here. The second image is the RAW with no lens correction applied. The edge shadowing is very strong here. In the third image, Darktable's lens correction was used and corrected all shadowing at the edges.

All other modules that are essential remain in place. Ultimately, the pixel pipe of the RAW file looks like this:



Use Darktable chart

To create the style, start *darktable-chart*. But unfortunately there are still problems with the program in version 3.8.0. Therefore, only version 3.6.0 can help here. It can also load the pfm files generated with 3.8.0. But the styles created, like those downloaded from the web, cannot be imported immediately with Darktable 3.8.0. The same additional conversion step is then necessary here again. This results in the following workflow:

1. Generate pfm images with Darktable (3.8.0).
2. Use *darktable-chart* 3.6.0 and create style.
3. Import style into *darktable* 3.6.0 and then export again or adjust with editor.
4. In Darktable 3.8.0 import the style exported from Darktable 3.6.0.

It's a bit cumbersome, but I think the bug will be fixed in *darktable-chart* 3.8.0 soon.

I then created the styles myself as described in the instructions above.

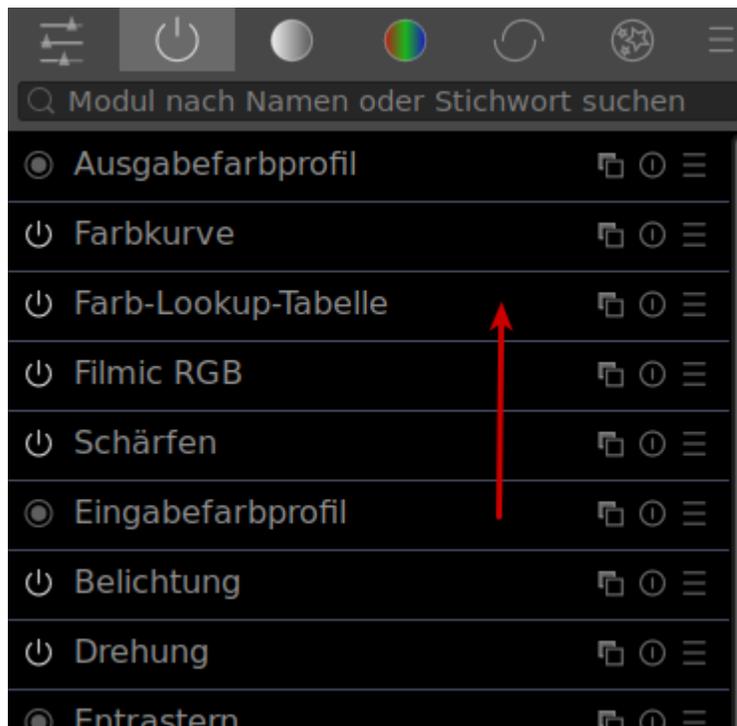
Customize styles

Next, the styles were adjusted a bit again. Basically the same changes were made that I made to the darktable.org and darktable.fr styles. This means

- the styles have again been split into submenus/groups and each style has a watermark with its name next to the color *curve* and *color lookup table* .
- The necessary preparations, which all styles have in common, are included in a style `__BASE`, which is then to be applied at the beginning.

As with the styles from darktable.org, I had my styles calculated for 24 and 49 color fields. Depending on the number of color patches, I classified the style into one of the two groups *Fuji F24* or *Fuji F49* . I included the `__BASE` style in both groups. A zip package is then available for download for each group, so that the `__BASE` style is always included, even if only one group is installed.

When the styles created by *darktable-chart* are used for the first time - and to make these adjustments you have to do that - then you notice that something is wrong. In the default *v3.0 RAW* module sorting, the *Color Lookup Curve* module comes before the *Filmic RGB* module . Correctly, however, it must come afterwards for these styles, since *Filmic RGB* is already activated in the ACTUAL state RAW. So the `__BASE` style specifies a different module order, where the *color lookup curve* module is pushed up.

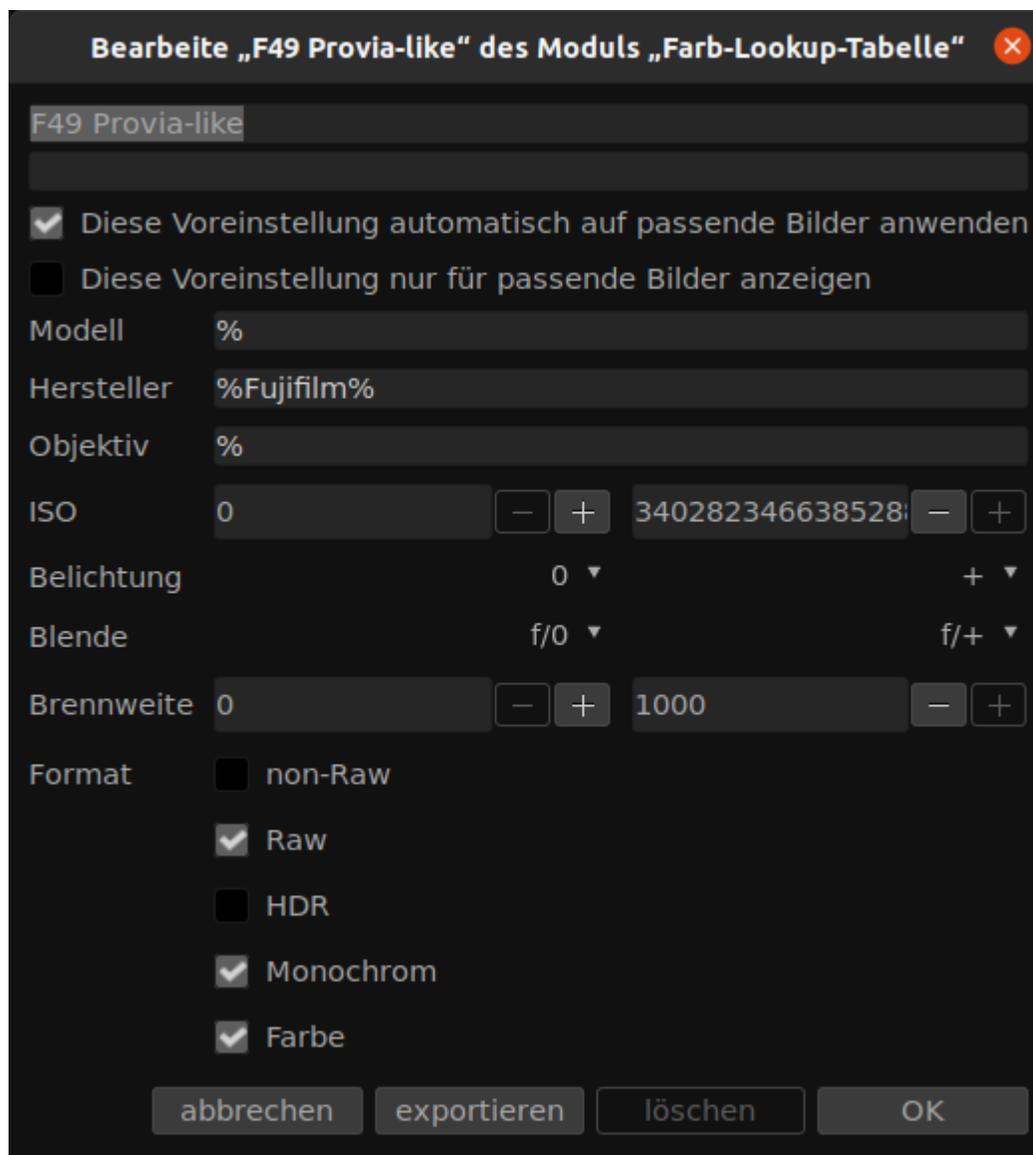


Since the *Exposure* with 1EV module and the *Filmic RGB* module were also present in the RAW used for the calculation in the default settings, these two modules are also part of the prerequisites and are contained in the `_BASE` module. Then the *input* color profile module is missing, which is generated by *darktable-chart* with the same settings in each style. Since I want to use the styles interchangeably with those from *darktable.org*, turning off the *color curve* and *color lookup table* (in the old versions this time) is also part of it. The `_BASE` style thus has the following structure:



Apply a style immediately after loading it

Unfortunately, this doesn't work like the presets that can be defined to have a style applied automatically. That's why you have to take the detour here and create presets for the individual modules that the style uses and then apply them automatically when you first load an image. *Here are the settings for the Color Lookup Table module :*



The screenshot shows a dialog box titled "Bearbeite „F49 Provia-like“ des Moduls „Farb-Lookup-Tabelle“". The dialog contains the following settings:

- Field: F49 Provia-like
- Diese Voreinstellung automatisch auf passende Bilder anwenden
- Diese Voreinstellung nur für passende Bilder anzeigen
- Modell: %
- Hersteller: %Fujifilm%
- Objektiv: %
- ISO: 0 (with - and + buttons) and 340282346638528 (with - and + buttons)
- Belichtung: 0 (with + and - buttons)
- Blende: f/0 (with + and - buttons)
- Brennweite: 0 (with - and + buttons) and 1000 (with - and + buttons)
- Format:
 - non-Raw
 - Raw
 - HDR
 - Monochrom
 - Farbe

Buttons at the bottom: abbrechen, exportieren, löschen, OK

Enter a name for the preset in the first field. *Selecting the Automatically apply this preset to matching images* checkbox enables automatic loading. The conditions can be entered in the fields that appear below. *Fujifilm* is specified as the manufacturer and *RAW* format in *monochrome* and *color*.

These settings are to be made for each module of the style.

The result

To get straight to the point: The styles from darktable.org and darktable.fr as well as my own do not produce 100% the appearance of the JPG from the camera. I think Fujifilm is doing a lot more here than just adjusting the colors according to a scheme. But 100% equality wasn't my goal either. I was more interested in the fact that when a JPG looks finished from the camera, the RAW also looks almost finished after the first load in Darktable.

While the styles from darktable.fr produce strong deviations and the images are consistently too dark, images created with the styles from darktable.org or my own are very usable. In the case of some images, the deviations from the JPG from the camera are only noticeable if you compare them using a snapshot. For others, the differences are more visible. But in contrast to the purely scene-related workflow, I would say that in many cases you get a finished picture.

In the following examples, one line is always the same image that was developed with the respective style from the three packages. The images are tagged with:

- <style> JPG - the JPG from the camera.
- <style> dtfr - created with a style from darktable.fr.
- <style> dtorg - made with a style from darktable.org.
- <style> F49 - made with my own style.

In the sequence, the JPG from the camera appears again and again, so that the differences can be seen better when leafing through.

As a first test, I use the color target from which I developed my styles.





This is where my own style clearly wins. But of course the “home advantage” has an effect here. After all, the styles were developed from this image and with this color target. darktable.org's style does a good job too. The biggest deviations are in the images developed with the darktable.fr style.

Second, a picture with natural colors in the Velvia-like style.



Here, too, my own style comes off best, although differences can already be seen. The darktable.org style overemphasizes the red tones a bit. That could be because the style wasn't developed with an H1. darktable.fr's style is completely different.

Next an example in Astia-like.



Since the draktable.fr style was too dark in the previous two examples, I increased the exposure a bit. But without success. The brightness is now correct, but the colors look too pale in contrast to the JPG from the camera. The other two styles manage to replicate the movie style quite well. The slight differences may be due to the lens correction.

Next then an example in ClassicChrome-like. Lens correction is mandatory for this motif. Since this increases the brightness compared to the JPG, the exposure was adjusted down a bit in my own style and that of darktable.org. Even with ClassicChrome, the darktable.fr style seems to be too dark, so the exposure had to be increased despite lens correction.



With these corrections, all three styles come relatively close to the JPG. Slight deviations can be seen in the blue of the sky. And it is noticeable that the lens correction works differently in Darktable. This also affects the distortion.

In order to be able to better assess the differences, in the next example the images are compared with the development immediately after the first loading into the darkroom. In addition to the standard Darktable processing, the exposure was set to the Fuji-typical 1EV instead of 0.5EV and the *lens* correction module was activated for the first image.



Here you can see what the styles achieve. With pure standard processing, the differences are much greater.

With this photo, however, the styles reach their limits.



The shades of red no longer fit at all – in any of the three styles. It's particularly strong in my own style. Here they almost turn purple.

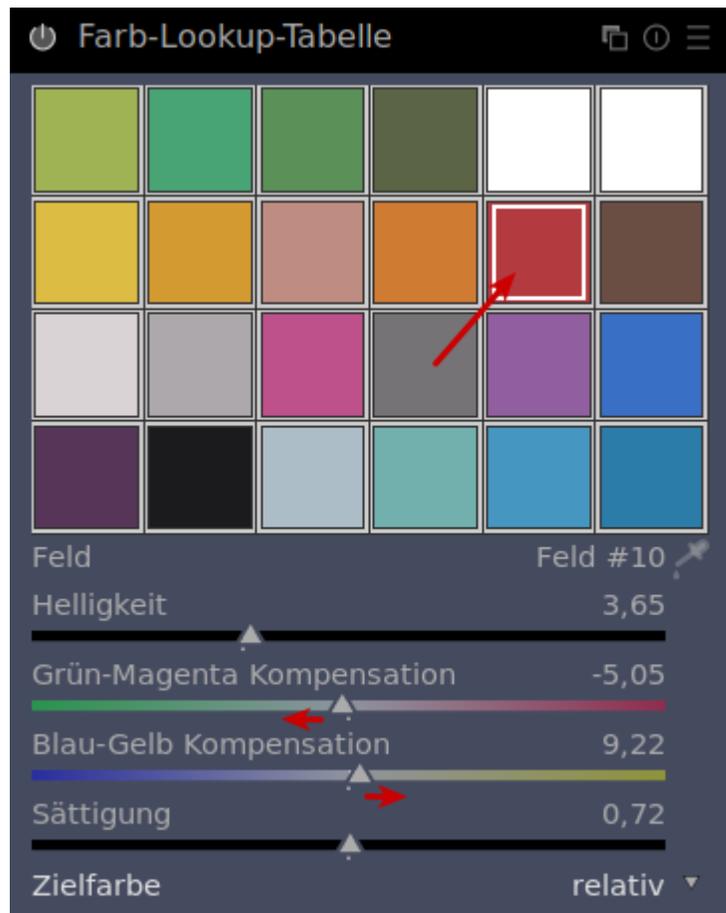
adjustments

In such a case, you can now take advantage of the *color lookup table* module , because the individual colors can be adjusted. This is easier to do in the 24 patch version because only one or two patches need to be adjusted. With the 49-field version, this can easily become confusing. It can also have the effect that a kind of noise is created because adjacent colors have been adjusted unevenly. But if you're careful, you can do it with 49 fields and the result is more accurate.

Nevertheless, for this example I decided to use the 24-field version and applied the *Fuji F24/Provia-like* style . I then adjusted the exposure down to 0.7EV to compensate for the increase in brightness from the lens correction.

Then in the *Color Lookup Table* module , click the eyedropper and select a red dot in the image area to adjust the red areas. The corresponding value is then marked in the palette in the module and the values are displayed. With the 24-color version this works relatively well, with the 49-color version it is sometimes better to click on the color in the module's palette. You can determine whether you got the right field by using the *Saturation slider* to -128. The corresponding areas then become gray in the image. The same goes for the other controls. It's all about changing something and recognizing the areas affected by the color from the change. Then you should go back to the original values. The best way to do this is to press Ctrl-Z.

In this case, however, the color is clear. So I just click the red box in the palette. So that the red tones don't go so much towards purple, I move the sliders slightly towards green and yellow.



This weakens the strong red tones.



If you want, you can save such an adjustment as a preset or apply it to the style.

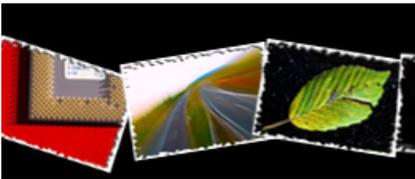
Download the styles

And the most important thing comes at the end. Here you can download my self-created styles:

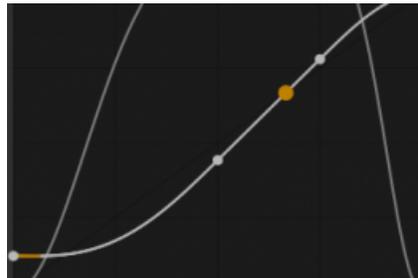
After unpacking the ZIP archives, the styles can be easily imported via the Styles panel on the right side of the light table. The *right-red-text.svg* file is a watermark used by the styles. Copy it to the watermarks subdirectory of *darktable*'s configuration directory (*<user directory>|AppData|Local|darktable* on Windows and *<home directory>/.config/darktable* on Linux). If the directory does not exist, simply create it.

Color lookup table Darktable Darktable 3.8.0 Color Lookup Table film simulation
Fuji film simulation

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