

SilverFast Ai and HDR

Grain Reduction Tutorial

by Ian Lyons © 2001

Recently I have begun to receive queries about the very obvious "grain like" appearance of images scanned from both colour and B&W negatives. Grainy looking scans are not new but the increased occurrence of grainy scans appears to have arisen around the same time as 4000ppi film scanners have become more common - why and how do we overcome the problem?

The problem discussed in the introduction is not actually grain, as we know it but "grain aliasing", and as indicated above has been around for quite some time. Grain aliasing isn't real grain but an interference pattern between film grain (dye clusters in colour film) and the CCD pixel size. I don't propose to explain any further what the problem is or why it occurs, others can do that much better than me (see <http://www.photoscientia.co.uk/Grain.htm> for a very useful explanation). However I will explain a method that I use to help reduce (not eliminate) the problem.

Not all scanner models appear to be effected to equally badly and Nikon in particular with their GEM technology seem to have been reasonably successful at minimising the problem. However, even with GEM soft tradeoffs take place.

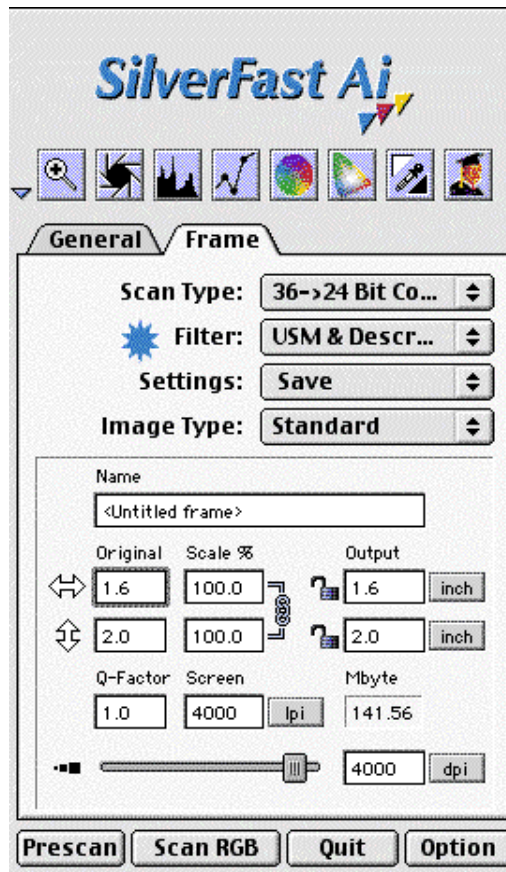
I tend not to use much colour negative type film but B&W is something I do use. I also tend to be quite conservative in terms of film stock and speed - read no faster than 200 ISO for colour and for B&W Ilford FP4 Plus or Agfa APX100 and very occasionally Ilford HP5 Plus. I have not used Kodak B&W films in many years and have little intention of changing this 20 year habit. It's funny that the new generation film stocks seem to be the ones causing the greatest problem.

Enough waffle - how do I overcome "grain aliasing"? In truth, I don't, I simply try to work round the problem using a rarely used filter provided within the SilverFast filter menu. "Grain aliasing" produces a broadly similar effect to "moiré" a patterning and lucky for users of SilverFast the Descreen filter is designed to reduce the effects of moiré. The following shows typical settings used when scanning Colour and B&W negative stock with my Polaroid SprintScan 4000 and 120, both of which have a maximum optical resolution of 4000ppi.

Step 1

The following steps are not cast in concrete. As with all SilverFast tools it's wise to experiment. Experimentation is how you will learn.

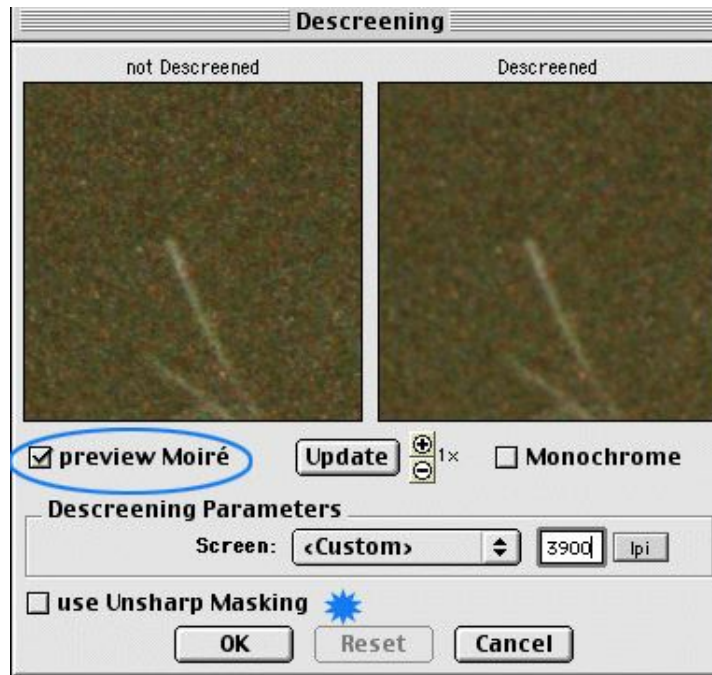
- Prescan and colour/tone edit the image in the normal way.
- Choose "USM or USM &Descreen" in the filter menu (note: USM denotes Unsharp Mask).



Main SilverFast Control Panel

Step 2

- Ensure that "Preview Moiré" is engaged.
- Choose a "Screen" value at or just below the actual scan resolution. I show 3900ppi in the following example but quite often I simply choose 4000ppi.
- Press the "Prescan" (shown as "Update" on screenshot below) button and select an area of the image that you wish to preview close-up. The scanner will now perform a "full resolution" preview scan of the selected image area and present it in the "Descreen" preview panel (as shown below). Remember the area being previewed is full size (100%) and so gives a true indication of how the grain aliasing is really impacting upon the image.

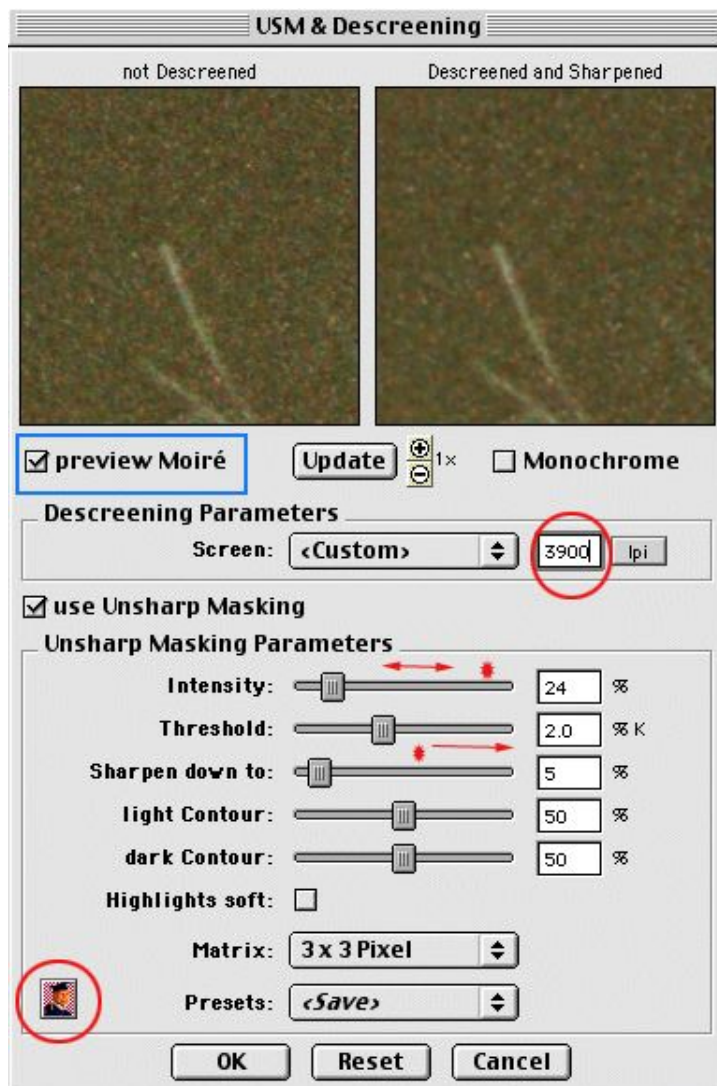


Basic Descreen Configuration

It should be pretty obvious from the screenshot that the grain effect has been reduced considerably, and whilst the fine detail of the hair strand has been softened it has not been totally obliterated.

From this we can conclude an obvious drawback of using the "Descreen" filter, i.e. - it will soften the image. The degree of softening varies and sometimes it will be acceptable. However with other images the softening effect of the "Descreen" filter will be unacceptable. The screenshot above is good example of "Descreen" filter softening at work.

So why trade grain for softening of the image, surely we can do the same in Photoshop? Not quite! The screenshot below demonstrates that there is more to the SilverFast Descreen filter than simply removing the moiré effect and softening. I usually engage the "use Unsharp Masking" filter to help bring back some sharpness to the image. In fact I now find that with some images very fine detail returns - notice the appearance of a hair strand on the bottom right of the "Descreen" preview window.



Descreen and Unsharp Mask Filter

So what are the sliders doing? With SilverFast USM takes place on-the-fly in Lab mode hence the % values and references to grey in the user manual.

- Intensity will determine the amount of sharpening that takes place. Typically we should set low values between 15 and 40%. Occasionally values above 50% can be used, but these are rare.
- Threshold determines where the sharpening will take place (i.e. contrast between two adjacent pixels). Values between 2 and 6 are normal. If high Intensity values are used it will be necessary to further increase the Threshold.
- "Sharpen down to" is a bit more complex to explain but basically determines how far into the shadows the image will be sharpened. Go too far down and shadow noise will become more pronounced than we would normally desire. It's probably better to experiment with different values.
- I tend to leave "Light and Dark Contour" at the default values. Modifying either will tend to cause black or white specks to become less or more pronounced. Increase "Light contour" value and white specs will jump off the screen at you, likewise increasing the "Dark contour" value will cause any dark specs to become even blacker.

Experimentation is the name of the game with these two sliders. If the image has lots of speckles it is certainly worth adjusting one or both sliders.

- Engage the "Highlights soft" option means that the sharpening effects will not be applied to highlights.

Each of the above adjustment sliders works in "real-time" so you can easily see the effect of a change in the high-resolution scan window. This window can be scaled up to 8x magnification, but I rarely find it useful above 2x magnification. Hopefully, through some experimentation you will get less grainy scans than appears to be the case at present