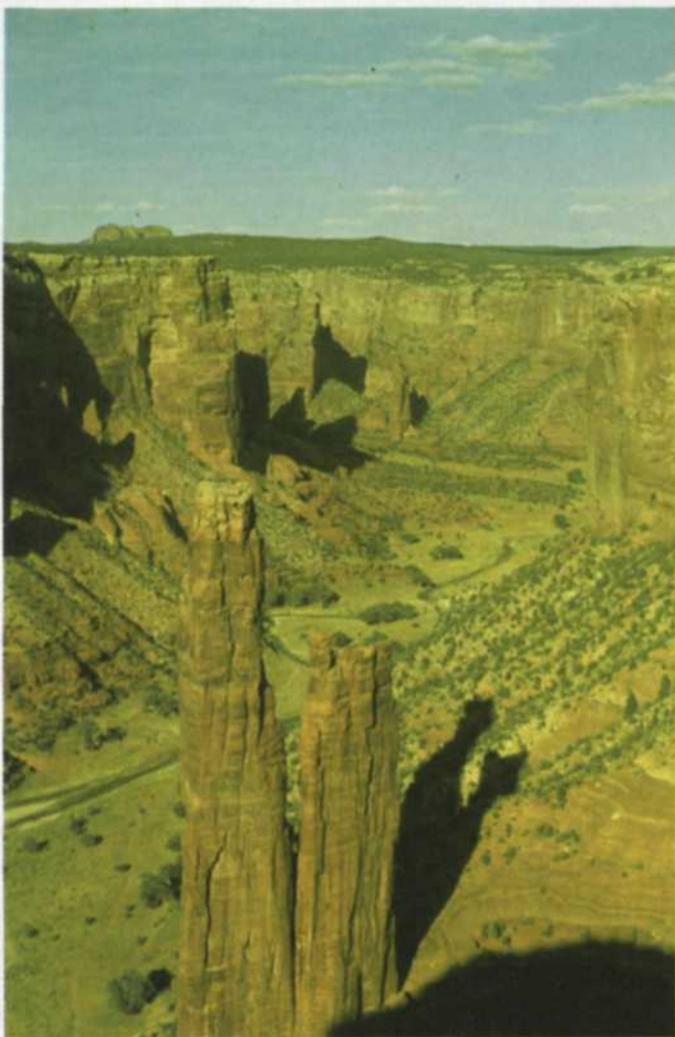# Digital Photo Restoration

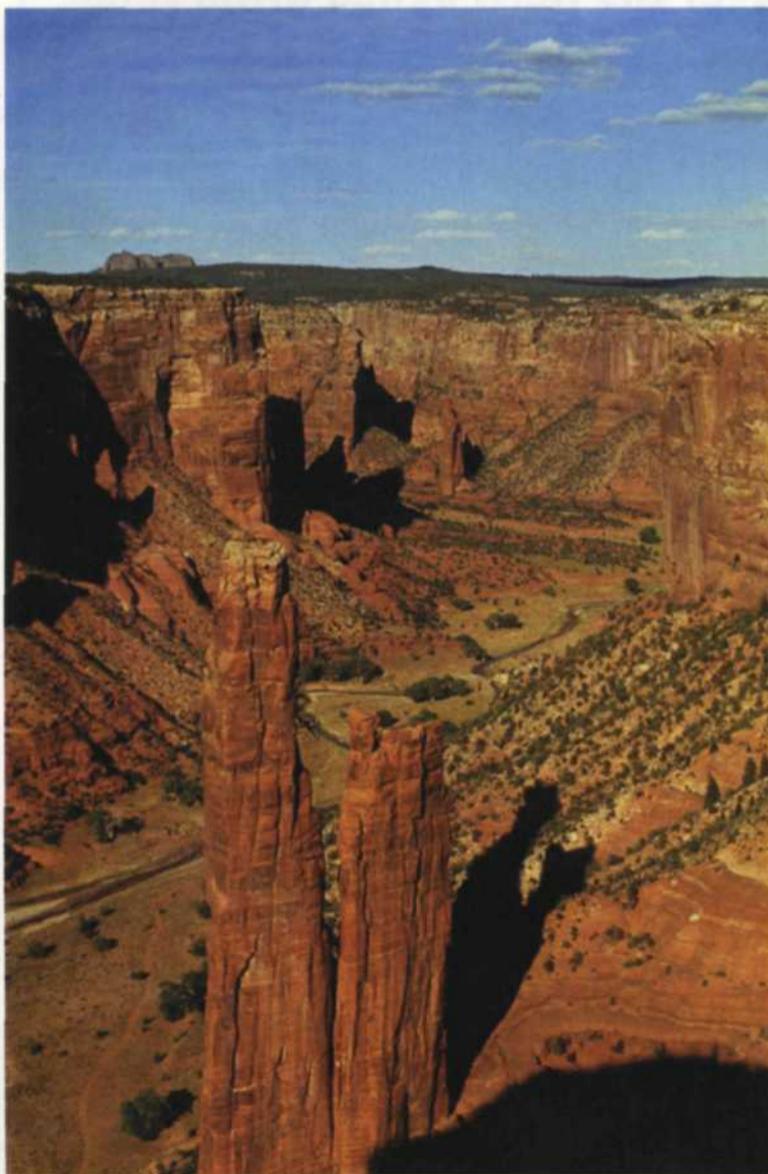## Understanding the Edit Tools

Jack & Sue Drafahl

25-year old Faded Ektachrome slide.

Color balanced image using Variations in Photoshop.

Increased color saturation in Photoshop.

WHEN WE FIRST STARTED our traditional photography business, we incorporated a stock photo agency as part of it. As years passed, our stock files increased, and we accumulated images that had been damaged and could not be sent out for sales. Many of these images were just round-filed, but those with important image content were filed in a folder we labeled "Salvage." We had expectations that eventually technological advancements would allow us to fix these images.

Along came digital technology to provide us the necessary tools to fix these important images. At first it was slow going, but as computers gained speed and editing programs became more efficient, we expanded our use of digital. Thanks to versatile digital editing tools, what took hours and many dollars to fix now takes minutes and a few million byes of computer data. The main problem facing photographers today is knowing what can be done digitally and learning how to do it.

Most Commonly Used Tools

Let's open up our digital toolbox and explain how these tools work. Then we'll show you a few examples of how they can be used to repair images. Note that the toolbox applies to all programs, and uses the same basic controls found in almost every image-edit program; i.e., eyedropper, magnifier, clone, select, paint bucket, foreground, background, etc. All manufacturers seem to use the same basic tools, but just give them various names. But when learning a program, they are the first buttons you try to learn how to use. Then one normally works the pull-down menus.

Clone Tool: The clone tool is a miniature copy and paste tool all wrapped into one. The first part selects the area to copy and the second drops it on the main image. This is all accomplished with a single click of the mouse button. The size of the area to be copied can be increased, reduced or feathered so the pasted image blends in well. You can drag the clone tool along a path or drop in one selection at a time. If you want to minimize the effect, you can also set a transparency option to less than 100%, so that not all of the image is copied. The key to using this tool is correctly matching the size of the clone tool to the area to be fixed. If it is too big it will spill into other areas, and if it is too small is will leave an uneven pattern in the editing path.

Select Tools: The mouse is used to choose the select tools that vary from a rectangular shape to freeform. Once areas are selected, they can be copied to the clipboard and pasted back into another part of the image. They can even be saved as "loadable" selections.

The *magic wand* is a special tool that selects pixels similar to the one you touch. You can expand or limit the scope of the selection by allowing the wand to select similar values. For example, a setting of seven allows the wand to select any pixels within seven points of the original selection. This tool is great for selecting the sky.

A new tool in PhotoShop 5.0 is the *magnetic lasso* selection tool. With this tool you can drag your mouse point along an edge and the selection tool grabs everything up to the edge of the subject. With this tool you can adjust the range to be wide or very narrow. It is great for tracing around difficult subjects that cross a multitude of tonal values.

Copy and Paste Tools: These tools

For more information, circle 165

Photo of wrinkled print.

Photo flattened on Agfa DuoScan 1200 scanner.

Restored image using a variety of clone brush sizes.

Negative damaged in processing.

Image restored using Photoshop clone tool.

are an extension of the select tools. Once an area is selected, it can either be modified or copied to the clipboard, and then pasted to a different part of the image. This tool is useful if large areas of an image are missing and new sections need to be copied from a similar portion of the image.

Feathering: This function is usually used with the selection tools. After a selection is made, you can feather it so that the line between the selected and non-selected portions of the image blends and doesn't provide a jagged edge. The width of the feather can be adjusted according to the desired effect. The more the feather, the softer the blend between the selection and the image underneath.

Masking Tools: These tools are a little more difficult to use, but have excellent applications. When you select an area, some programs automatically make the mask, while others require an additional step. Once the mask is made, you can edit inside the mask without the worry of spilling onto the main image. The mask can also be saved to a file and recalled if further editing inside the mask is required later.

Fastbit or QuikEdit Menu: When you have to edit only one small portion of an image, you can use this menu to select only the area you need to edit. Since this area is small, it quickly loads into memory. If you had to edit using the entire file, it would take longer for loading and saving. After making the necessary edits, you can put the edited portion of the image back into the main file.

(Note: PhotoShop just dropped the QuikEdit menu from their newest version of PhotoShop 5. Corel Paint 9 does use a low-resolution open that allows you to edit in low res and then apply the editing to a higher resolution version. Micrographx Picture Publisher uses a Fastbit function where you can import sections of a photo and then save them out to the whole image. Looking at some of the others, none of them seem to agree on how to use this function. The best way for someone buying new software to find out if it exists in theirs is

to go to the help function and look for "low resolution edit," "QuickEdit" "Fastbits" or any term indicating a quick or fast method for editing images. The function is important for someone that is a little short on RAM. If you have more than 256MB, these functions are not necessary.)

Full Image Editing Tools: The curve editor, histogram, brightness control, saturation adjustment, and color balancing-tools are primarily used to make full image corrections. If necessary, they can also be used on selected portions as well.

Plug-ins: These specialized tools add special enhancements to the image such as sharpness, smoothness, edge enhancement, grain reduction, and dozens of other incredible tasks not possible in a traditional darkroom. Most software manuals have examples of each tool and how it can be used on an image.

Toolbox: Each software package will other tools for digital editing that can be found in the toolbox. You should learn how they all work, keeping in mind that practice makes perfect.

Common Problems

The following situations are some of the more common problems that can be fixed using the digital darkroom. In each case we will describe the problem, the tools used to fix the image, and a quick synopsis of the procedure used to repair the image.

Scratches: Scratches can be found on negatives, slides, and prints. If they are very large, they will be difficult to fix in a traditional darkroom, so digital is the answer. Once the image is scanned, the clone tool is selected. Set the size to at least twice the width of the scratch. As you move along the scratch, copy and paste adjoining information on top of the scratch. Make sure that as you move along the scratch, you are always selecting similar information to copy over the scratch. We recommend the use of the Undo function, until you feel extremely comfortable using this tool.
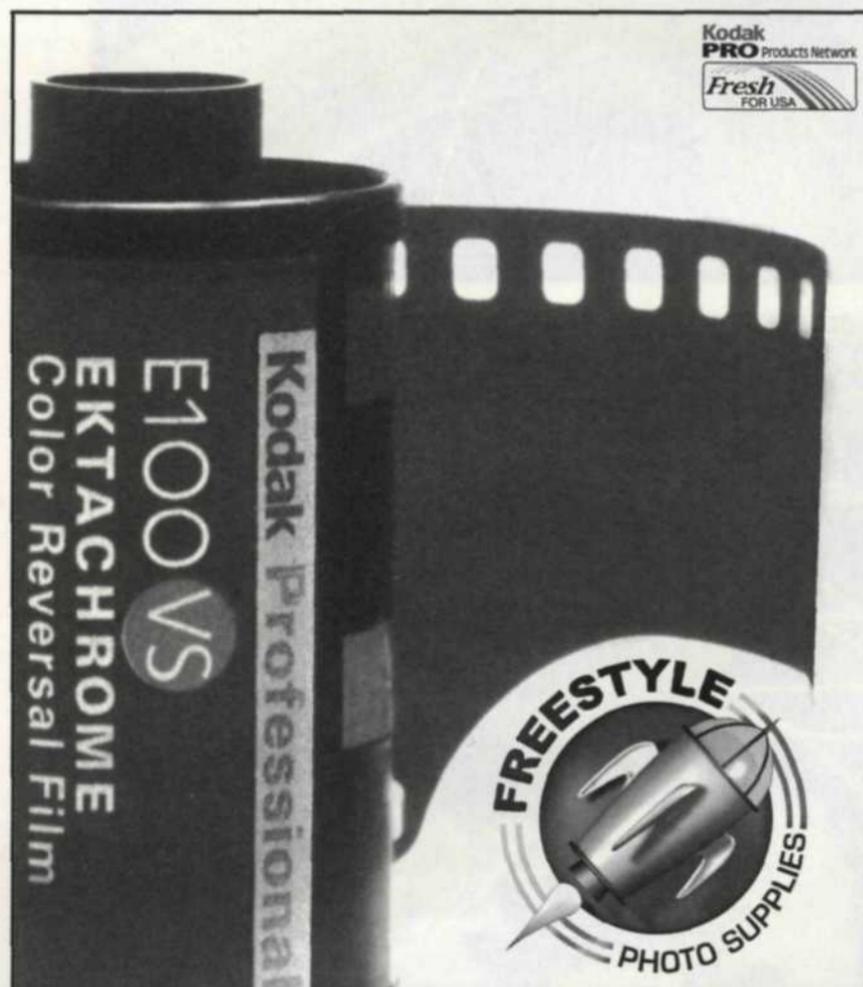
Cuts and Holes: This problem is very similar to a scratch except that the width of the problem is usually greater than a scratch. The problem can be solved using the clone tool. When the cut is

very large, you may have to use the selection tool to select a similar sized area near the problem and move it on top of the cut. This is accomplished with the copy and paste tools. It's also a good idea to feather the selection before it's pasted onto the problem area.

Wires and lines: Frequently, this subject can be treated as though it was a straight scratch. The clone tool is best for this task, and should be set to a feathered size about twice the width of the line. To insure that your editing does not bleed over into critical areas, you can use the select tool to make a mask slightly larger than the line. This way, if you do wander from the line too much, the mask will block the editing beyond the adjoining area.
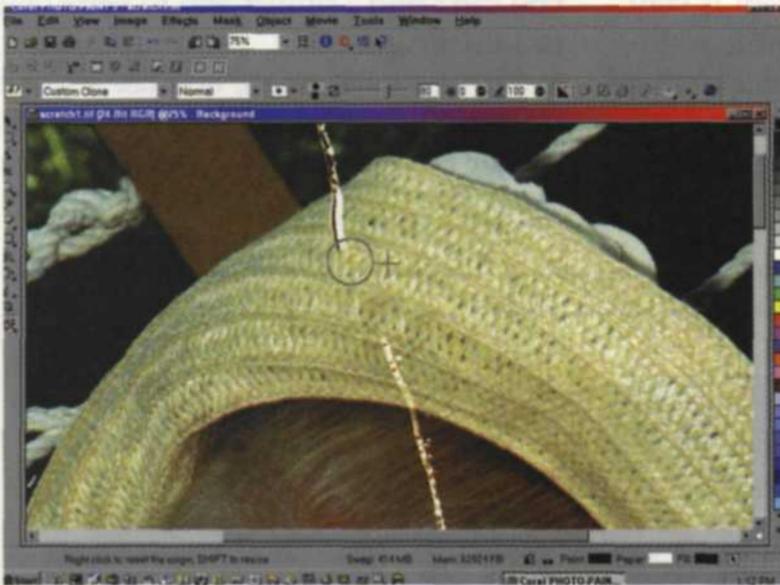
Burned photos: This image will probably have a combination of scratches, cuts, holes and missing parts. The large holes and missing areas will require the use of the copy and paste function. If you can't find a similar area to paste over the missing section, you may have to scan in a similar image and use selected parts as a filler. The smaller problems can usually be fixed using the clone tool.

Original image of train station with wire in it.

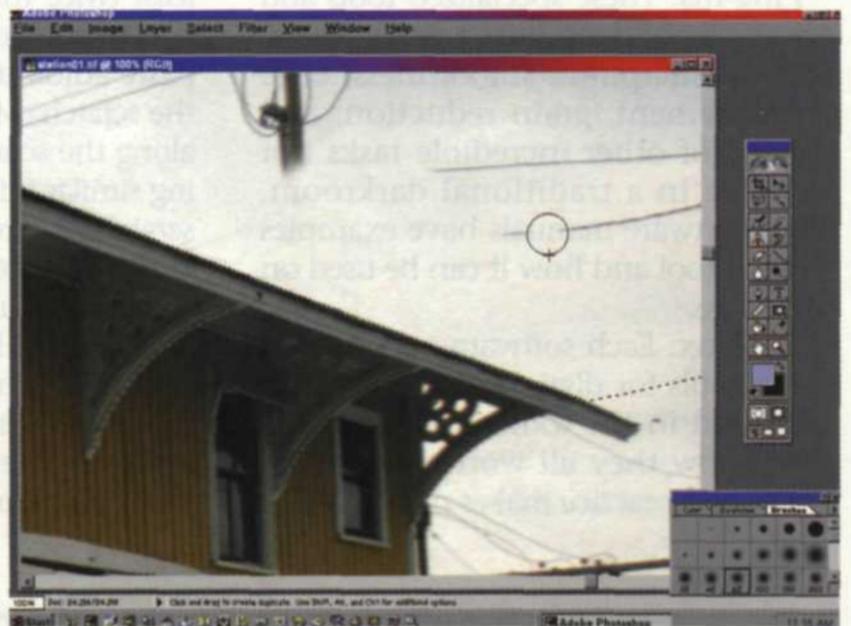Removing wires with Photoshop's clone tool.

Restored image.

Top left:
Color negative with large scratch.
Scanned with Nikon LS-2000 scanner.

Middle image:
Using clone tool in Photoshop to fill in
scratch with data adjacent to it.

Corrected image.

Pictures Cut into Pieces: This problem is a little more difficult to repair and may be beyond hope if it is cut into too many small pieces. For the sake of discussion, our example has less than a half dozen tears. The photo should be reassembled as close as possible on the scanner, making sure that no piece lays on top of another. Using one piece as a base, the other pieces are selected, copied, pasted, and moved into place. Continue this method until the entire image is reassembled. The clone tool can then be used to mend the area between each piece. Any missing pieces should be copied and pasted from similar parts of the image.

Processing Errors: If the processing error has an overall effect to the image, the tone curve editor will allow you to change color, density, and contrast to all parts of the image. The fastest way to correct this error is using the auto levels function. The program will look for the darkest tone and assign black, and do the opposite for the lightest tone. If the results don't meet your expectations, you can undo auto levels and manually adjust until you have corrected the problem.

If processing has caused streaks, stains or the film was touched in drying, you will need to use the clone and copy/paste tools. Select areas near the damaged area and paste them on top of the problem. You should mask the damaged area first, so that your editing does not spill into adjoining areas.

Faded Images: This problem eventually haunts most traditional photo images, and in the past, repair consisted of image duplication using color correction. With digital repair, you can color correct, change image density, and then realign the contrast curve with the tone editor.

You can now sort through your old photos and give them new life thanks to the digital darkroom. The key to success is practicing and developing a system for solving each problem one at a time. The more images you repair, the better you will be at deciding how to fix future images. Each time you repair an image, it should take less time and your techniques will improve over time. The trial and error of your first few images will become the building blocks that make you a proficient digital editor.

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