



**Digital Imaging** Special Interest Group  
Boeing Employees' Computing Society

# Scanning & Printing

(Rules of thumb)

## Scanning Resolution

- |            |              |  |
|------------|--------------|--|
| Archival { | • 72-150 ppi | E-mail or Web stuff, .pdf files for mail or Web download etc.  |
|            | • 300 ppi    | More than adequate if not cropping or enlarging  |
|            | • 600 ppi    | Adequate for most circumstances - <i>can stand minor cropping &amp; enlarging</i>                                |
|            | • 1200 ppi   | If you're patient, in most cases overkill unless working with very small original — however, if in doubt max out |

## 35mm Slide Scanning

- Don't use consumer flatbed scanners with 35mm film adaptors for printing anything over 4X6 inch prints
- Take advantage of the club's Nikon LS 2000 slide scanner much higher res. and dynamic range
- For large negative film sizes (120 film or 4X5") use the Epson 1600 Pro in Club Room

## Issues of file size

- Enlarging / cropping will require large resolutions
- Storage, is it an issue nowadays ?
- The future ?

## Printing Resolution

- 300 ppi more than adequate for consumer ink jet photo printers (Epson recommends 200-240 ppi)
- Learn to use Photoshop & Elements Image Size calculator

# Restoration Demo *Key Points*

Jerry Bates for the Digital Imaging SIG, February 26, 2007.

## **Images too dark too light**

Most “black and white” images that have darkened or lightened over the years can easily be corrected/improved by using the Levels Adjustment Layer.

Start by using the Auto button in the Levels window. The advantage being it gets you an instant adjustment, sometimes needing little if any tweaking. Plus, it automatically adjusts the white point taking away any colorcast in aged black & white photos.

Faded “color” images often do not improve much using the Levels Auto button. With faded color images use the Blending Mode “Multiply” in conjunction with the Levels Adjustment Layer, then duplicate the entire *Multiply* Levels Adjustment Layer until the color becomes saturated — use the Opacity Slider to back off an over saturated result.

## **Extreme Color Damage**

Sometimes old color images change chemically and color information can be completely lost. In this case Photoshop Pro versions must be used instead of Elements. CS and older Pro versions of Photoshop allow access the RGB color channels that must be manipulated to bring back these severely damaged color photos.

In the Channels pallet look and see what channel may be missing information and select one of the other channels that appears normal and copy paste it into the damaged channel. Return to the RGB “Layers” pallet and create a Levels Adjustment Layer, in the “Channel” drop down menu at the top of the Levels dialog box, select each color channel and adjust the Levels sliders to bring back as close to normal color appearance in the image window as possible, this may take extreme slider adjustment and repeated tries, just experiment, you can come back and readjust anytime later.

Some color areas may never come back to a normal or desired look, in this case use the Color Range tool under the Selection menu to select the areas that needs help. (I won't attempt to explain the use of this tool,

which would take an additional page of typing and not be as clear as the help support already in Photoshop).

Important: To add a desired color to a selected area of your image; while the area is still selected insert the “Color Fill” Adjustment layer and change the layer mode from “Normal” Blending Mode to “Color.” Then by double clicking the Color Fill icon any color can be generated. Using the “Color” Blending Mode retains the original dark/light values of color within the selected area. Remember to also use the Opacity Slider to adjust color intensity if need be. You can fine-tune the edge of the selected color area with the masking thumbnail on the Color Fill layer or using Quick Mask (Q).

Other adjustments using masking with the Hue and Saturation Adjustment layers can also be made.

### **Healing Brush and the Clone Stamp Tool**

These are the most critical tools to master when fixing physical damage to old photos (tears scratches and missing sections of an image). The Clone Stamp and Healing Brush tools differ more than you may realize. The Clone Stamp tool just copies the sampled area (Option or Alt clicking the area you wish to replicate).

The Healing Brush tool does more than this. This tool, as opposed to the Clone tool, “thinks.” Also, it only duplicates the light and dark values (texture for example) not color information as the Clone tool. Within the brush diameter it calculates from surrounding pixel information what value adjustment to make. No amount of words will make this entirely clear; you must play with it to fully understand.

Basically, use the Clone Stamp Tool for areas that have edges or tight areas within an image. The Healing brush tool is superior for large areas of colors that need spots or small aberrations removed quickly (great for facial blemishes). Also, play with the Aligned Non Aligned options to understand how they differ, again, no amount of words will replace just playing with these controls until it starts to sink in.

Important: Be sure to make Clone and Blemish tool adjustments using a separate layer. In the Clone or Healing Brush tool bar select “Use All Layers.” Then make a new layer to do your actual Cloning or Healing Brush work. With this process you are not permanently affecting the actual image area you are fixing. The cloning activity is on a separate layer, and the adjustments can be erased if you screw up.

## Putting the pieces back together

After scanning the image pieces as a single file, open the file in Elements or Photoshop. Quickly lasso the first piece leaving space around the image edges. Select the Magic Wand tool (tolerance around 10 or 20) and Alt /Option click inside the lasso selection to reduce the space between the image and your rough lasso selection. “Copy Paste” (Cmd/Ctrl “C” - Cmd/Ctrl “V”) this will give that piece its own layer. Duplicate this process for all remaining pieces.

Next manipulate/rotate each piece so they roughly join at the torn edges. This is easier to do in Elements if the “Show Bounding Box” button is highlighted (look on tool bar for this choice).

Important: To butt the pieces together as tightly as possible, make a clean edge on one of the pieces and join it to the other piece on a layer “under” the piece with the clean edge (clean edge = no residue beyond where the tear removed the image surface). This is done with the Eraser Tool in Elements or Layer Masking in Pro versions. Using a combination of the Clone Stamp Tool and the Healing Brush repair the visible tear mark. This is more art than specific steps, so just go for it. Remember, when using the Eraser Tool depend on the undo command Ctrl/Cmd “Z” to correct mistakes while making a clean join edge. If you are not using Layer Masking in the Pro versions, you can get multiple undos holding the Alt/Opt key after the first undo.

Large missing sections sometimes are best fixed by lassoing a similar area at another location in the image and copy pasting it into the area that needs to be rebuilt. Follow this with the eraser tool to remove overlapped areas. The Blemish Tool or the Clone tool work good to fine tune the patch edges.

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