BIPC DIGITAL IMAGING STUDY GROUP
ASSIGNMENT 2003-02
SUBJECT: WORK FLOW

PROBLEM: You want to obtain a digital image that you can store on your computer. You want to correct colors and prepare the enhanced image for successful printing. What should your work flow be?

CONCEPT: Even after getting a great scan or digital camera image, you usually need to do some further color correction work. The process flow discussed below contains the process flow favored by the experienced. It is assumed that your monitor is calibrated and that profiles are available for the relevant input and output devices.

Two of the tools used in the following process flow are the Levels and Curves tools. They provide nonlinear transformations as they are applied. An alternate set of tools such as Brightness/Contrast, Color Balance, and Variations provide linear transformations (they do exactly the same thing to each pixel in the selection). These later tools throw away much more information than the nonlinear tools. In general the linear tools are "less precise" than the nonlinear tools and "they are more for color beginners and don't offer as much control as the[1] nonlinear tools." The linear tools should be avoided as we avoid the Auto Adjust features of all tools.

The Hue/Saturation tool is recommended over the Color Balance tool. The Hue/Saturation tool should be used when you want to change the color, saturation or lightness of a particular object or color range without changing its gamma or other characteristics.

PROCEDURE: The complete work flow is outlined in what follows. The basic process for color correction when starting with a scan or digital image will follow below.[2] For this process flow it is assumed that the image has a bit depth of more than 8 and hence the initial processing will be in 16 bit mode. The work flow and process:

Image Capture

1. Obtain image from digital camera using *.RAW format[3] at highest resolution practical (considerations - having sufficient storage media and time to store in camera); or,
2. Obtain image from reflective image scan using 16 bit depth, 300 to 260 ppi, and target set at 100% or from transparency scan using 16 bit depth, max scanner resolution (e.g. 2900 ppi) and target set at 100%; or,
3. Obtain image from CD-R (not covered further here)

Initial Steps in Photoshop

1. In Photoshop establish Color Settings. Edit/Color Settings/Settings/U.S. Prepress Defaults[4]
2. When opening image in Photoshop, assign scanner profile if you have not used color management in scanner and assign Adobe RGB (1998) working space
3. Crop image to final size using crop tool while leaving resolution alone (unless you are creating a Master Image which will be cropped, resolution set and sized for multiple uses from the Master Image). In Image Size window examine resultant resolution. If close to

[1] Haynes, B & Crumpler, W; Photoshop 6 Artistry; New Riders; 2001
[2] Ibid
[3] Nikon has capability to store in NEF (Nikon Electronic Format) raw
[4] Julieanne Kost - Adobe

300 to 360 ppi leave image alone. If much lower, set at 300 ppi leaving Resample Image (Bicubic) on. If much higher than 360 ppi decide if sending an image of this resolution to the printer is warranted. If not, reduce to 360 ppi. Bicubic interpolation is great; however, you want to avoid it if possible.

Overall Color Correction

1. Go into Levels (Ctrl-L) (more details found in Lesson 2002-05)
    a. Set the Highlights
    b. Set the Shadows
    c. Adjust the overall brightness of the image[5]
    d. Go into the Red, Green or Blue Level's channels and remove color casts, being especially careful that neutral colors stay neutral and don't have a cast
    e. Save your Levels or Curves adjustments in case you want to revert to the original, apply and tweak the above settings
    f. Make your OK for all the Level's adjustment only once
2. Perform a soft proof and check for gamut warnings using the Print Space (View/Proof Setup/Custom/Epson 1280 for example). Toggle Print Space and Gamut Warning On and Off (Ctrl-Y and Ctrl+Shift-Y). If problems exist revert to the original, apply and tweak the settings discussed in 1. above until Print Space view and Gamut Warning is satisfactory
3. If needed, use the RGB channel of Curves (Ctrl-M) to adjust the overall contrast of the image and the Red, Green or Blue channels to adjust color casts in particular color ranges within the entire image (more details found in Lesson 2002-06)
4. Use Hue/Saturation (Ctrl-U) to increase or decrease overall saturation. Make adjustments to the hue, saturation and lightness of specific colors
5. Again check perform a soft proof and gamut warning check and correct problems
6. At this point use Image/Mode/ to convert from 16 bit to 8 bit color depth

Color Correction of Specific Areas Using Masks, Spotting

1. Make a copy of the background layer and work with that copy after turning off the original background layer
2. Make color changes to specific image areas using Levels, Curves, Hue/Saturation and other adjustment layers and/or filters each with a mask to isolate its target correction area. There can be as many of these as needed to get the job done.
3. Remove spots and scratches from your Master Image and do any required retouching
4. Save and archive your Master Image

Final Processing

1. In the event that you have not cropped image to final size and resolution for a specific purpose do so now
2. Sharpen the image or selected image layers using the Unsharp Mask filter. A separate layer for this step may be appropriate
3. Perform final checks before printing such as viewing the Gamut Warning and performing a Soft Proof. Correct the Adjustment Layers as appropriate
4. Save image with proper notation

Print

1. Image to be printed has the proper size, resolution
2. Select Print with Preview to get the full Print window. Select show more options and then select Color Management. Your Document Source space should be Adobe RGB (1998). Now select Print Space Profile. For example Epson Stylus Photo 1280. If you have no significant Gamut Warnings then choose Relative Colorimetric (has best color

[5] Curves could be used here to adjust overall brightness as it is a more selective tool

saturation). If you do have warnings, select Perceptual (prohibits clipping). In either case check Black Point Compensation per the Epson Print Academy

3. Go to the printer driver. The Epson 1280 driver will be assumed. On Main tab pick paper and select Print Preview. Then Custom Mode and then Advanced. Then select Color Controls with the proper Gamma (2.2 - Win, 1.8 – Mac). Note that at the Epson Print Academy it was stated that when in Advanced select No Color Adjustment. I found that the results if this advice is followed are unsatisfactory. Then Print Quality in dpi: 720 is a good value[6]. Higher maybe appropriate, especially if using ColorFast paper. Turn off High Speed for best quality prints. Then Save and name settings for next time. In Paper/Printable Area select Maximum and Centered

ASSIGNMENT: Capture an image that has good detail in the shadows and highlights and perform the above steps. Print and be prepared to discuss.

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[6] DPI for Printing: 360 = Draft Mode; 720 = Min. Photo Quality; 1440 = Photo Quality; 2880 = Highest Quality