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Customizing PhotoShop

Adobe® Photoshop® 5.0

Version v5.0.2

for the Coldset Printing Process

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I n order to create a quality reproduction for newspaper printing using Adobe's PhotoShop (Ver. 5.x) the following settings can help match monitor viewing to the reproduction produced on Press.

The values suggested in this report will be from SNAP, which specifies values for the Coldset market. If one wishes, to customize the values to accurately predict what is coming off press, a digital test form such as the SNAP/NAA/GATF Digital Test Form can be run on press. This form needs to be run at standard ink densities for all of the values to be correct.

US Ink can supply a Print Quality Test package to help with this process. The Print Quality Package analyzes the total reproduction process from data input (digitally supplied from disk) to final output (printed sheets). Furthermore, it offers an opportunity to identify any problems along the way. Your film output from the disk is analyzed by a properly calibrated transmission densitometer to ensure that your **Imagesetter** is operating within normal tolerances. The **Plate Making Process** is evaluated next. Problems with drawdown and exposure can be easily identified by analyzing the amount of dot gain present from the film that you output, to the plates that you produce. Finally, sheets printed on your **Press**, are evaluated and compared to industry standard print quality characteristics, such as, dot gain, print contrast, hue error/grayness and apparent trap.

Running a test form is easy and can provide valuable information concerning print quality. As stated earlier the package provides an opportunity to look at every step of the reproduction process in an orderly step by step manner. Small problems in a certain area can be identified to improve quality even further. Additionally, utilizing the package allows you to **fingerprint your reproduction process**. This initial "fingerprint" can become the baseline for future evaluations to ensure that your process stays in control.

The default settings in PhotoShop are set up for commercial printing. In PhotoShop one will be adjusting photographs in both the RGB and CMYK color space. The first step to customize your settings is to adjust the RGB settings. Open the RGB set up window (Choose File>Color Settings>RGB Setup). RGB Setup controls the translation of RGB into the CIE Lab color space (theoretically, the space containing all the colors a human can perceive). There are several RGB working spaces in Photoshop 5.x. It's designed this way to allow users to share color with other systems regardless of the difference in monitors. The default space is sRGB, which is not acceptable for newspaper printing because it clips a chunk of the cyan corner of the print gamut (the range of colors within a specific color space or the range of colors a device can produce), so the reproduction of bright cyans, greens and blues are drastically compromised.
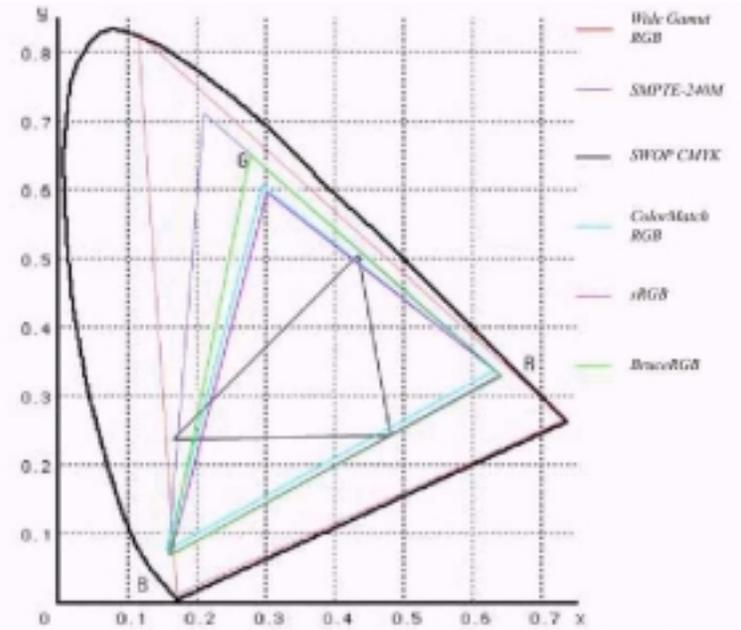
This figure shows the gamuts of several of Photoshop's working RGB spaces, and the gamut of SWOP CMYK, plotted in CIE xyY space. It illustrates the trade-off inherent in choosing an RGB space between clipping the gamut of CMYK and wasting bits on unprintable colors.

Recommended RGB Setup:

RGB: ColorMatch RGB is based on the Radius Pressview monitor and has a large gamut although it clips some of the cyan. SMPTE-240M comes close to encompassing the entire CMYK gamut. Either of these would be considered a safe choice.

Gamma: 2.20
The Gamma of the editing space not the monitor. It controls the bit distribution over the tone curve. A gamma value of 2.2 is considered perceptually uniform and devotes more bits to the shadows.

White Point: 6500K

This is the white point for the editing space, not the monitor.

Primaries: Adobe RGB
This sets the boundaries of the working space and tells Photoshop exactly what Red, Green and Blue are supposed to look like.
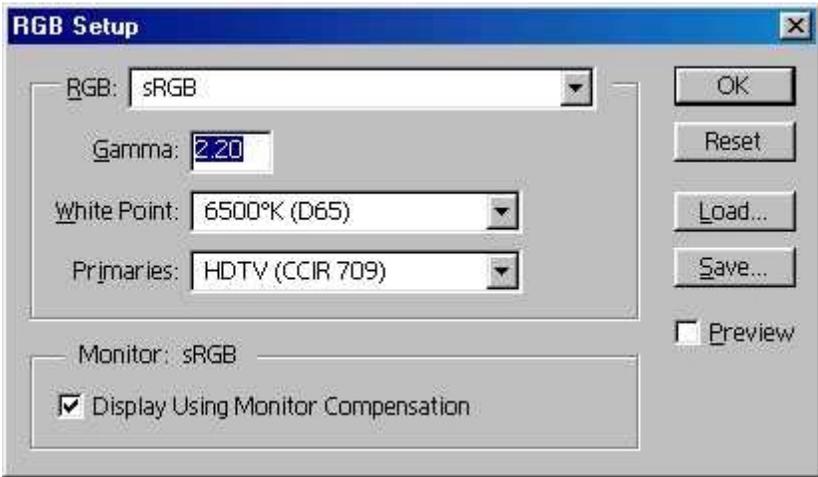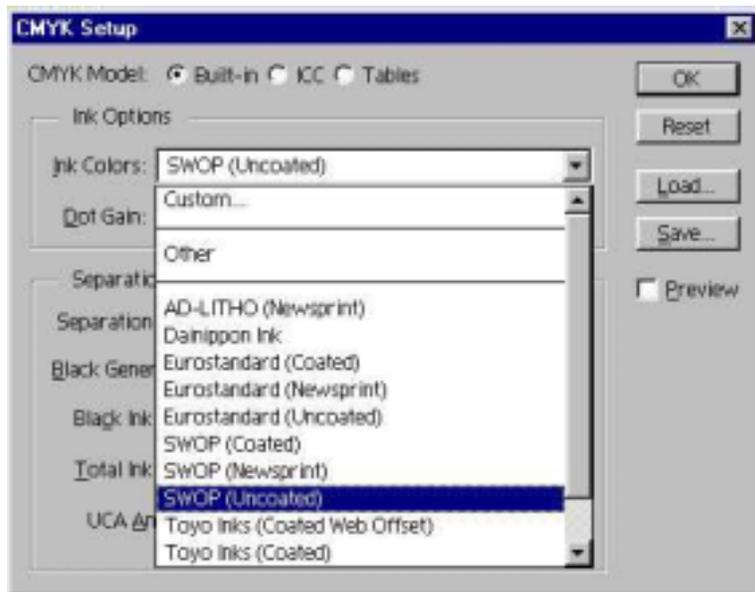
Monitor: Display Using Monitor Compensation
Transforms the data sent to the screen so that it displays accurately on everyone's monitor.

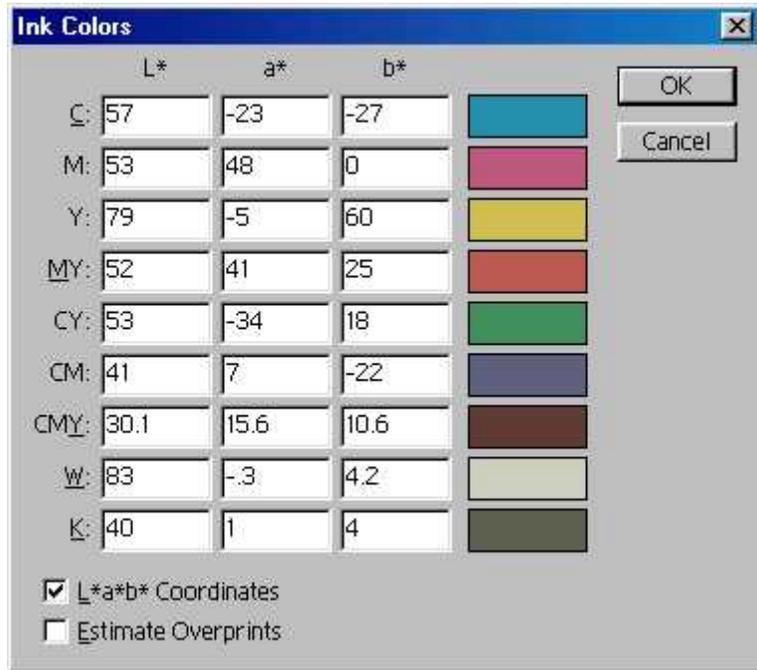Save these settings in the ColorSync Profiles folder in the System Folder.

The next step is to set up the CMYK color space. To convert this setting for Coldset printing, open the CYMK set up window (Choose File>Color Settings>CMYK Setup). There is a drop down list for choosing ink colors. One of the choices is for AD-LITHO Newsprint. This set of ink values does not accurately reproduce on press due to incorrect gray ramps. Although one may be using NAA's standard AD-LITHO® set of inks. A better choice from the standard values would be to choose the SWOP (Uncoated) values.

You can also create your own custom set of ink values for a better match to your ink set and newsprint. After running a print quality assessment, the values for a custom ink set can be determined by reading the process colors and overprints with a spectrophotometer. (Note: Some test forms do not have a three color patch, if so ensure it is added to the test form.) These values can then be entered in the Ink Colors Table. This table is found by choosing the custom setting on the drop down list in the CMYK set up window.

Ink Colors

	L*	a*	b*
C:	57	-23	-27
M:	53	48	0
Y:	79	-5	60
MY:	52	41	25
CY:	53	-34	18
CM:	41	7	-22
CMY:	30.1	15.6	10.6
W:	83	-.3	4.2
K:	40	1	4

☑ L*a*b* Coordinates
☐ Estimate Overprints

Note: By default, the Ink Colors dialog box defines colors as Y (lightness), x, and y values. The default ink sets are calibrated for viewing conditions of 5000K (when viewed under D50 lighting), 2° observation.

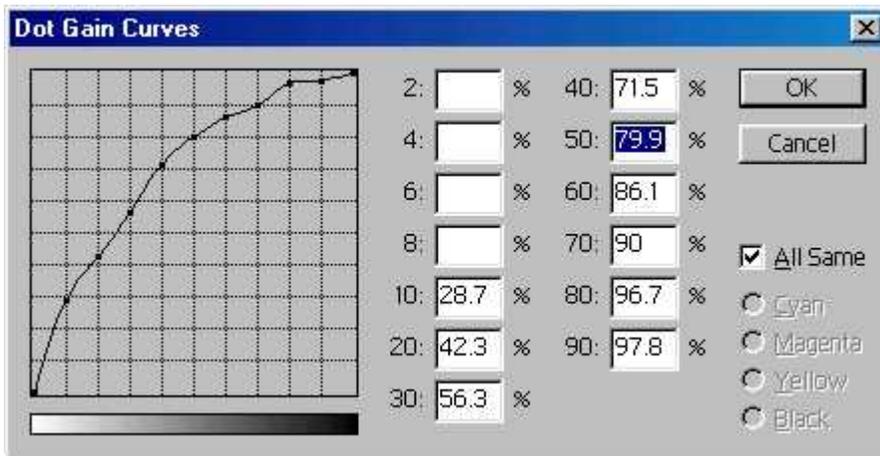**US Ink®** A Division of Sun Chemical Corporation

The next step would be to establish the dot gain curves for your particular press conditions. The standard SNAP values for dot gain are listed below.

Dot Gain @ 25%	Offset (85 lpi)	Offset (100 lpi)	Flexography (85 lpi)	Letterpress (72-85 lpi)
Cyan	28%	32%	25%	15%
Magenta	28%	32%	25%	15%
Yellow	28%	32%	25%	15%
Black	28%	32%	25%	15%
SNAP Tolerances	+/- 3%	+/- 3%	+/- 3%	+/- 3%
Dot Gain @ 50%				
Cyan	30%	32%	25%	18%
Magenta	30%	32%	25%	18%
Yellow	30%	32%	25%	18%
Black	30%	32%	25%	18%
SNAP Tolerances	+/- 4%	+/- 4%	+/- 4%	+/- 4%
Dot Gain @ 75%				
Cyan	20%	20%	16%	16%
Magenta	20%	20%	16%	16%
Yellow	20%	20%	16%	16%
Black	20%	20%	16%	16%
SNAP Tolerances	+/- 3%	+/- 3%	+/- 3%	+/- 3%

Customized dot gain curves can also be established by using the data collected from the print quality assessment. It should be noted that the values from the assessment should be compared to the SNAP values. What this means is that the process should be reviewed to ensure that no problems were encountered during the assessment. If this occurs, the problems should be corrected and the print quality assessment should be redone to determine the new values. Once these values have been established, they can be entered into PhotoShop by the following steps. Select dot gain curves from the CMYK setup window in PhotoShop.

Dot Gain: Standard ▼ 20 %
• Standard
Curves...

The dot gain values for the four process colors can then be entered in the tables.

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The final steps in the setup would be to enter the separation values into the CMYK setup. You must decide if you want to use some type of under color removal.

Under Color Removal (UCR), Under Color Addition (UCA) and Gray Component Replacement (GCR) are the three most effective methods that are very critical in correcting for total ink coverage during color separation process.

UCR is a function of color separation that replaces specified amounts of cyan, magenta and yellow inks with black ink in neutral shadow areas. Inversely it is also possible to increase the three-color component in a variation of the UCR technique called UCA.
GCR is a similar concept applied to saturated color areas. The concept of GCR is to remove the gray caused by the three colors of ink and replace it with black.

Achieving the proper amount of ink coverage for process color reproduction has many advantages that include improvement of printability and quicker drying of ink, ink cost reduction, shadow colorcast correction and stability of gray neutrality. (See Technical Bulletin Volume XV for a more detailed description on UCR and GCR.)

SNAP recommends to use UCR or GCR only with proper testing on press.

In order to print good shadows the Total area coverage (TAC) of all four inks for process color material should be between 220% - 240%. This helps

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to allow maximum shadow detail with minimum shadow area ink set-off. TAC exceeding 240% may result in reduced shadow detail, set-off and build up problems.
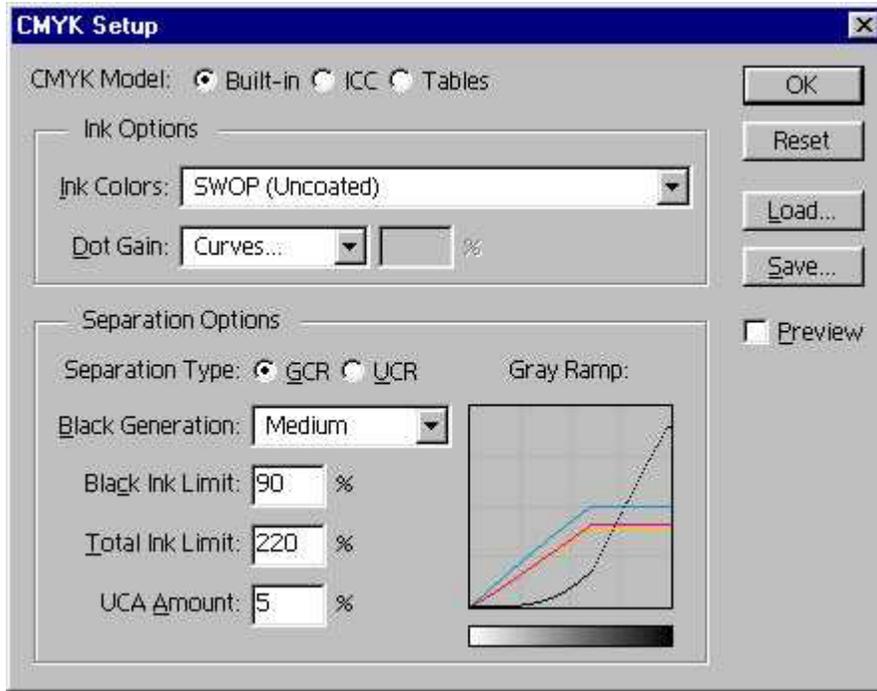
Once all of these values have been entered, save the file in the ColorSync folder on the system level. Then quit and restart PhotoShop. When using customized values, the process will be in control and the image created on screen can more accurately predict what the process is capable of while giving the optimized values for your production process.

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