Eboni-1800
100% Carbon Pigment Printing
For the Epson R1800

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[No longer recommended unless 100% sponge-free carts or CIS is used. CIS should be agitated weekly. What follows is from the last draft. -- Paul]

Eboni-1800 combines the 1800 "3-MK" approach (MIS "UTBO" inkset) with Eboni-6 to make a very flexible, "K8," 100% carbon pigment printing platform.

For detailed information on the 3-MK inkset, see http://www.paulroark.com/BW-Info/R1800.htm; for more information on the Eboni-6 inkset in general, go to http://www.paulroark.com/BW-Info/Eboni-6.pdf .

Eboni-1800 retains the advantages of superior image stability (see http://www.paulroark.com/BW-Info/R1800-Lightfastness.pdf) and lack of color artifacts, with more flexibility in workflows, including "color managed" and "plug & play" Epson driver printing.

Using ICCs, a high, 16-bit grayscale file can be printed and maintain its high bit depth straight through the driver to the print. That is, unlike the Epson ABW workflow, which limits the print to 8 bits or 256 gray levels, the ICC workflow in the PS/Elements Print Preview can deliver many more gray levels via its 24-bit file output that goes to the Epson driver.

Matte paper only inks like Eboni that have very low levels of binder, also experience very little clogging.

Print Structure -- Comparison 1600 DPI Scans
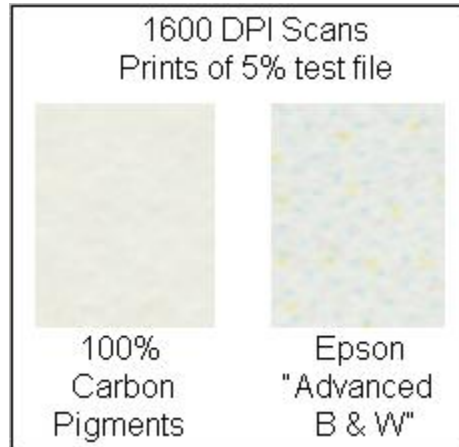
With no color pigments and many more carbon channels and levels, the 100% Carbon pigment Eboni-1800 prints have a significantly different image structure than the Epson "Advanced Black and White" mode prints. See the high resolution (1600 DPI Epson flatbed) scans of prints made with the 2 different approaches. When the dilute Eboni-6 inks are used, the image is exceptionally smooth, as seen above.

In contrast, the 3-MK approach, which uses the QTR rip, has a fine grain but still color-less image structure, as shown below.
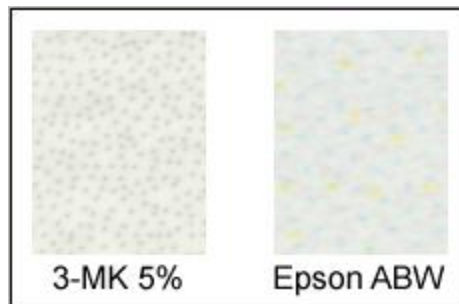

Ink Order

Eboni-1800 uses a different ink order than Eboni-6, which is made for hextone printers. While the MIS UTBO (3-MK) inks are loaded as usual in the MK, PK and GO positions, the Eboni-6 dilute, color-position inks are loaded as follows:

With the 1800, load the **dilute (color-position) inks** from lightest (Eb6-Y) to darkest (Eb6-C) in the order of the color wheel, working from Yellow and going clockwise to Cyan. The Eboni-6 ink order from lightest to darkest is: Y, LM, LC, M, C, (K). Thus the equivalent positions of Eboni-1800 and Eboni-6 are as follows:

Eboni-1800 Yellow = Eb6-Y
Eboni-1800 Red = Eb6-LM
Eboni-1800 Magenta = Eb6-LC
Eboni-1800 Blue = Eb6-M
Eboni-1800 Cyan = Eb6-C
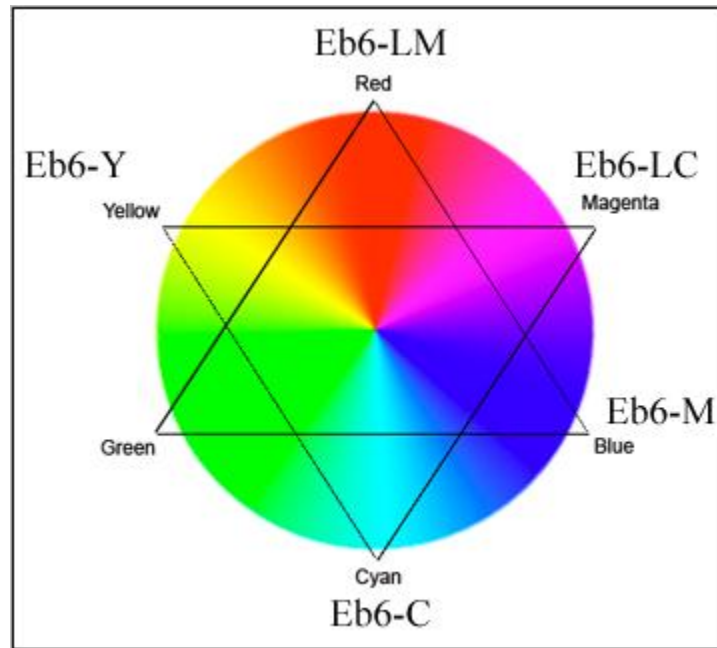
By being in the order of the color wheel, RGB curves, embedded in B&W ICCs, can be made to start the inks in their density order.

To obtain the 3-MK/UTBO inkset, go to http://www.inksupply.com/r1800_bo.cfm; for the Eboni-6 inkset, go to http://www.inksupply.com/eb6.cfm.

Printing Workflows

Epson Driver Printing – No ICC or profile

With Eboni-1800, the Epson driver prints in the normal manner with no special procedures. Nonetheless, for the best prints it is best to check the printer driver settings. After clicking on File>Print, go to the printer driver "Properties" dialog box. Then go to the "Advanced" dialog box by clicking that button.

In the Advanced Properties box, the driver settings to start with are shown below:
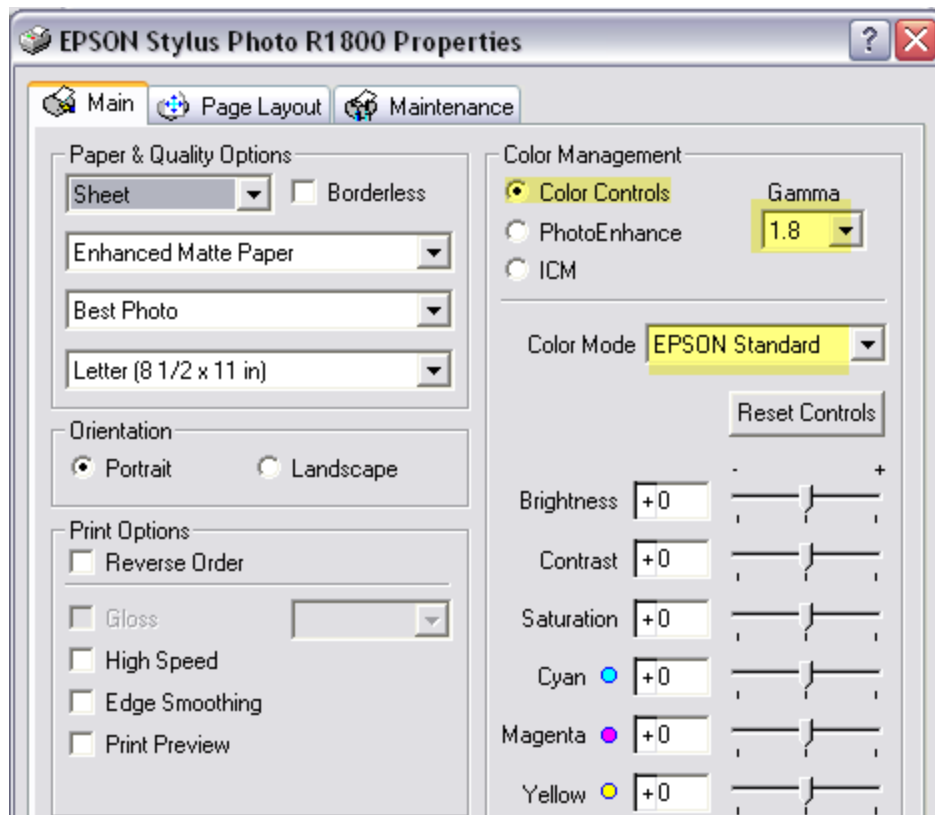

Fine-tuning photos is easiest when the computer monitor closely matches the print. Different papers print somewhat differently, however. The sliders in the Epson driver may be all that one needs to correct for minor differences.

Epson Driver Printing with ICCs

To get a near perfect match between the monitor and the print automatically, the use of an ICC is recommended. The grayscale ICCs utilize the "color management" systems of the computer and printer, even though we are using grayscale files to print B&W images. Note, however, that while Adobe Photoshop and Elements can use these grayscale ICCs, most image editors are geared to RGB files and do not recognize these ICCs. Photoshop and Elements are highly recommended as the image editors of choice.

The ICC is selected in the Photoshop or Elements Print Preview.

The important **Print Preview settings** are shown below.
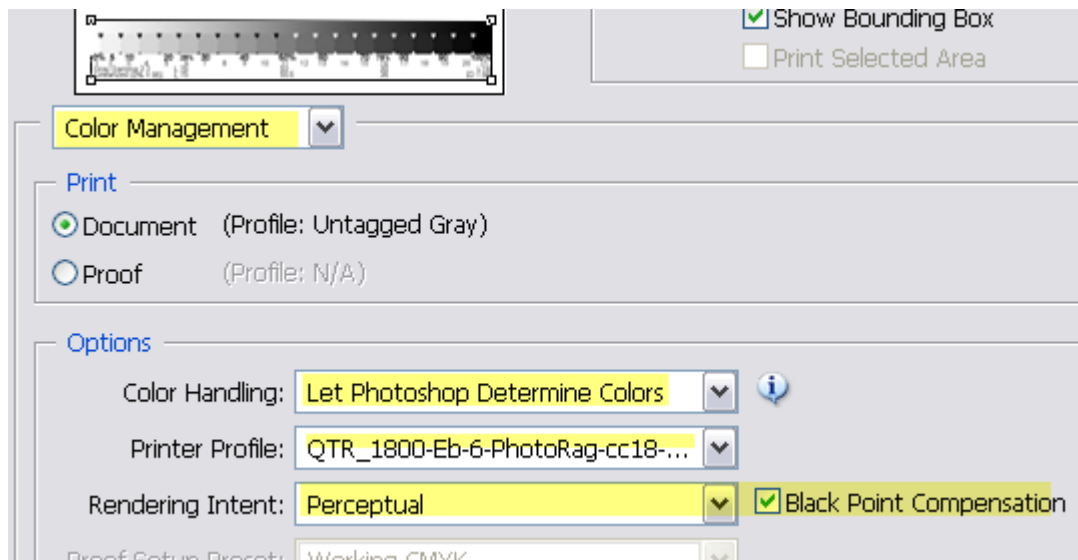
If the Print Preview does not show the bottom portion of this screen grab, check "Show More Options." (The screen grabs are from a Windows XP computer running CS2.)

The **"Printer Profile" box** will show the list of ICCs when the down arrow is clicked.

The ICCs are made with programs called "Create ICC" or "Create ICC-RGB" from QuadToneRip ("QTR") (http://www.quadtonerip.com/html/QTRoverview.html). The ICC names will all start with "QTR."

To **download ICCs** go to http://www.paulroark.com/BW-Info/1800-Eb6.zip

Save the Zip file to and/or open it in the folder shown below.

The **location of ICCs** in different OS's is as follows:

Windows XP & Vista -- C:\Windows\System32\spool\drivers\color

Mac OS 9.x: -- Systems Folder/ColorSync Profiles

Mac OS X -- Library/ColorSync/Profiles

Windows 98/M --C: \Windows\System\Color

Windows NT/2000 or XP upgrade from NT/2000 -- \Winnt\system32\spool\drivers\color

(A shortcut can be made on the computer desktop that allows one to just drag and drop the folder of profiles into the correct location. To make a shortcut in Windows, right click on the desktop and click on New>Shortcut. The above location can be typed in.)

(Note that if Photoshop was already running when the ICCs were put into their correct location, PS's ICC list will need to be refreshed. Click on Edit>Color Settings in PS to refresh the ICC list.)

The **Epson driver settings** remain as indicated above, on page 4.

Making Custom ICCs

Many users will want to make their own custom ICCs. They are easily made with QTR's "Create ICC" or "Create ICC-RBG programs.   The QTR package can be downloaded from http://www.quadtonerip.com/html/QTRoverview.html   While a spectrophotometer is ideally used for measuring test strips, ICCs can also be made using a flatbed scanner. See http://www.paulroark.com/BW-Info/Making_B-W_ICCs-GrayCard.pdf

Printing with the QTR RIP

The QTR rip opens up yet more possibilities with Eboni-1800. By controlling each channel separately, one can fully utilize the 8 carbon channels in a variety of ways. By combining the characteristics of the "3-MK" and Eboni-6 dilute inks, further tone and image structure controls become possible.

For full information on the 3-MK approach, see http://www.paulroark.com/BW-Info/R1800.htm.

The 3-MK approach was recently reviewed by Shutterbug magazine. (See http://www.shutterbug.net/equipmentreviews/scanners_printers/0208winkjet/)

"3-MK" Workflow Settings

The screen grab below shows the settings I often use with Premier Art Smooth 325, an un-brightened paper that I use for the museum reproduction project.
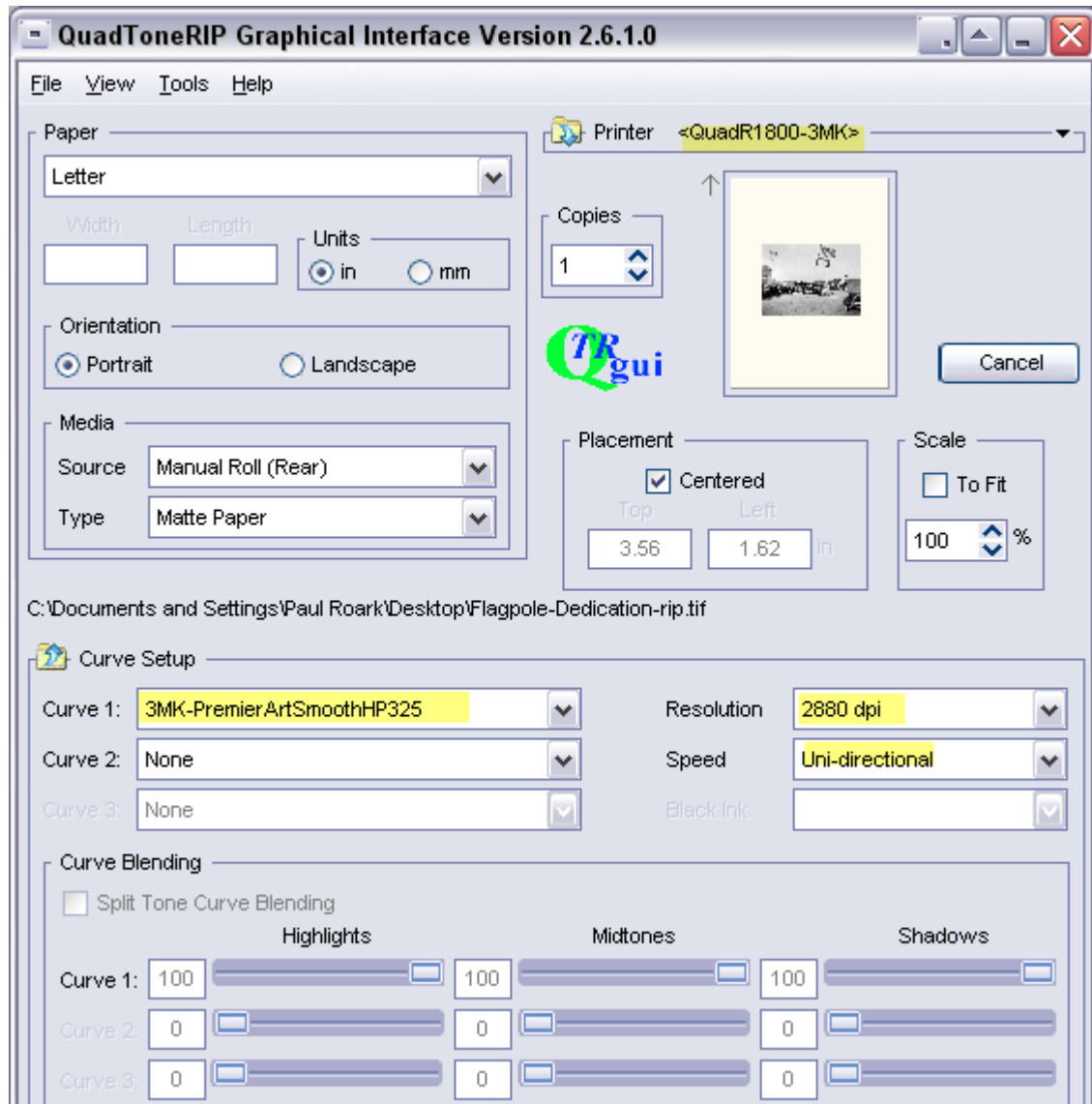
The 3-MK workflow makes quite neutral prints on un-brightened, "natural" (no OBAs) papers. It has a very fine grained image structure that also tends to impart a sense of finer detail than is actually in, for example, an old photo reproduction. Eboni carbon on un-brightened paper is probably the most stable print. Epson's "most archival" (and relative bargain) Premier Matte Scrapbook cotton paper and 100% Eboni carbon pigments may make the most stable image.

QTR File Preparation

QTR is a non-color-managed driver that prints slightly lighter, particularly in the deep shadows, than the Gray Gamma 2.2 workspace often used for B&W images.

There are several different methods to either edit in the space QTR uses or adjust for the differences. I edit in Gray Gamma 2.2 and apply a Photoshop curve to the file for printing. This adjustment curve ("GG22-QTR.acv") is in the Zip download file: http://www.paulroark.com/BW-Info/1800-Eb6.zip

In my workflow, after the curve is applied to an image I want to print, I save this file to the desktop, with "rip" or the like in the name. On the Desktop, the image file icon can be dragged and dropped into the QTR icon for printing.

Print Tones

Print tones are primarily determined by the paper used, ranging from neutral/cool to medium warm. Additionally, with QTR one can use sliders to combine a smooth, dilute carbon workflow (like that used by the Epson driver) with the 3-MK workflow, with its different paper tones and image structure.

When the Epson driver is used, as examples, Premier Art Smooth Bright White prints relatively cool (similar papers are Moab Entrada BW and Hawk Mountain Condor); Hahnemuhle papers print medium warm, as do most matte papers.

The relative tones of papers are most objectively compared by looking at **Lab B** measures of 21-step test prints. Lab B (warm-yellow positive, cool-blue negative) is the primary variable.

The R-1800 tones when the Epson driver is used are similar to the Eboni-6 tones shown in the Lab B graph at page 3 of http://www.paulroark.com/BW-Info/C88-C13-5.pdf

The 1800 3-MK tones are shown in 2 PDF linked to main R1800 page at http://www.paulroark.com/BW-Info/R1800.htm

The 3-MK un-brightened paper tones are shown at http://www.paulroark.com/BW-Info/R1800-No-OBA-Paper.pdf

The 3-MK brightened paper tones are shown at http://www.paulroark.com/BW-Info/R1800-OBA-Papers.pdf

All donations to the cause of free inkset designs and profiles are appreciated.

Enjoy,

Paul
www.PaulRoark.com