7 steps
to colour
heaven

www.colourmanagement.net

 Solution Expert

1 your window on the digital world

Use the best quality Display Screen you can get, it's your window on the digital world. LCD's can be great now that the technology has matured enough for serious colour use - just be sure to buy a good make, I'd suggest an Eizo Display, preferably from the ColorEdge range, if budget permits.

Size: since users tend to accept/use a lower resolution on CRT's than LCD's, I feel that the "desk space" should be measured in pixels, not in inches. I found that I got an equally *usable* screen area on my first 17 inch LCD as I had on my 21 inch CRT since the pixels were finer, application dialogue boxes were smaller leaving more working room. However, now that I have tried the 21 inch and 24 inch Eizo ColorEdge screens, I certainly do appreciate the additional "desk space".

Although really a thing of the past, CRT screens can still be used as long as they are not worn out. A CRT (CRT=Cathode ray Tube, like a TV) produces it's image by bombarding phosphors, so the imaging area does eventually fade - this means that luminance falls & also a decent black eventually becomes impossible to achieve.

With any screen, accurate hardware pre-adjustment significantly aids calibration of the screen and makes for better tonal capabilities since, with a well calibrated display, the video card Look Up Table and the ICC profile have less work to do. With a CRT, the RGB gain controls were important, with LCD's the best way is with automatic hardware calibration - as with Eizo's ColorEdge series.

Calibrate / profile your "Display System" with good software and you'll be guided by the manual.

If you're still using a good CRT under 3 years old, fine, maybe don't move up for the sake of it, but there's definitely an LCD in your future. Take it from me, sitting editing images or making pages in front of an LCD all day has to be a LOT more pleasant.

2 calibration and profiling

Set the Display System up accurately - to internationally accepted standards.

Tonal Reproduction? Basically, I start with L* gradation, or, if that's not available, Gamma 2.2.

Yes - if not L then Gamma 2.2 even on a Mac, Gamma 1.8 really is a thing of the past.*

White Point? (meaning white colour temperature) should be ideally selected to match your print viewing environment (properly that will be D50 artificial daylight), however we normally find that because of the way humans "see", a D65 calibrated Display System tends to match a printed proof in a D50 lightbox far better than a D50 calibrated Display System, I suggest D65 as a starting point, maybe moving down a little (to around 6000K, perhaps) to match the proof. If you have specific viewing requirements, gallery lighting etc. then your screen's white-point can be adjusted to give a good preview of the illuminated print.

White Luminance? Again this is adjusted relative to your working environment, many users find that 110 to 120 candelas/metre is about right.

Black Luminance? Start with "min." and check that the screen is not hiding printable shadow detail, by observing a properly illuminated accurate print (perhaps a certified proof).

You really must calibrate and profile using a Hardware Colorimeter or spectrophotometer, with good software (i.e. a software utility which provides the luminance, gamma and white point options you need as-well as giving good feedback). Again, note that comparison to a printed "Verification Test Image" or Certified Proof can be a very useful aid to confidence.

3 main imaging applications and settings

Use Industry Standard Adobe Photoshop, preferably Photoshop CS for your imaging work. Avoid Photoshop pre v 6.

Select Adobe Photoshop's Colour Settings properly to suit your own workflow.

In Adobe Photoshop's *Colour Settings*, "European Prepress 2" default is a good place to start for European readers working towards printed output, since the options are generally safe, respecting embedded profiles and using basically suitable ICC profiles for RGB workingspace and CMYK output. The ISO / FOGRA based profiles in Photoshop CS 2 and 3 are suitable for Sheet-Fed print. Do be aware though that CMYK conversion profiles should be discussed with the repro department or a colour specialist since colour ink recipes (the amounts of each ink needed to make, say a mid. grey) differ considerably for different press types. Read up on ISO standard printing at www.eci.org.

For US based readers working towards print - get started with "North America Prepress 2", although, do be aware that this defaults to a Web CMYK which is unsuitable for Sheet-Fed print work. Again, be aware that CMYK conversion profiles should be discussed with the repro department or a colour specialist since colour ink recipes differ considerably for different press types. Read up on GraCol.

You may want to explore more suitable (larger) RGB workingspaces if you are in a Fine Art or other High Gamut workflow, especially if you scan originals. Ask a Specialist.

For layout work, I prefer Adobe InDesign to Quark since Quark can make colour management complex and expensive. With some versions it can be done though.

4 other applications and settings

Where possible, set up any other imaging applications (e.g. your Scanner interface software or Digital Camera Capture / file processing utility) to properly fit into your colour managed workflow - and, rather importantly, to ensure data integrity and continuity of appearance between applications. Generally avoid making Jpegs in the camera since it is said by experts in the field that this can discard over 80% of the original raw capture data.

Continuity of appearance (which means that in each application, the image looks the same on screen as it does in Photoshop) is extremely important as it reduces the need for the potentially destructive re-editing of the colour and tone at each step. However, many scanner interfaces cannot provide a reliable preview, this can be circumvented by scanning RAW, assigning a well made scanner profile processing High Bit files in Photoshop where the preview is reliable and accurate.

Remember, repeated edits can be very damaging to an image file. Especially if it's 8 bits per channel. High Bit, usually 16 bit, sometimes called *48 bit image editing is far kinder to tone and colour in your images.

*48 bit, because with RGB there are 2 channels and 3 x 16 = 48. 16 bit CMYK = 72 bit.

5 image integrity - don't discard important data

Learn how to use Adobe Photoshop's tools, such as the Levels Adjustment dialogue, to judge an image file's quality and ensure that scans and capture files are being made correctly and without the destruction of detail in areas of heavy colour.

When these image files are moved, re-saved or edited, know how to be sure that the data stays intact.

We recommend users retain the full range of tone and colour of an original as long as possible in the process to respect the original art or scene. Since we all know that printing and image reproduction in other forms is improving in leaps and bounds, it's inadvisable to discard image data just because an image is destined for, say, a low quality publication or print process today - for example, by reducing saturation (reduces colour range) or perhaps making a JPeg (compresses data) or converting to a small colourspace, e.g. for Newsprint or Web print (which can "clip" out of gamut colours). Future re-purposing of archived imagery may enable the reproduction of more tone and detail - and if it was in the original scan or capture we might be kicking ourselves that it was discarded in editing. Save the original, you would not throw away a transparency or negative after scanning - would you?

# 6 printing or selling digital files - feel you're in the dark?

Perhaps you are a photographer, sending digital files out to clients or labs for printing? Perhaps you are receiving such files.

How about providing (or asking for) a print or proof to prove the image file's integrity or just to test your own colour work?

I suggest implementing a well profiled desktop ink-jet printer or even a desktop proofer to produce in house "proofs" or "Digital Validation Prints" - the printer should be set up properly to simulate (press) printed output.

This proof/print quality can be achieved at very low cost with good accuracy and high image quality.

Proof Certification to a recognised standard is possible and practical with a simple Epson + RIP setup and a low cost spectrophotometer to measure a control strip on each proof. Here is a sample MediaWedge from UGRA/FOGRA for proof checking.

Ugra/FOGRA-Medienkeil CMYK-TIFF V2.0a tif
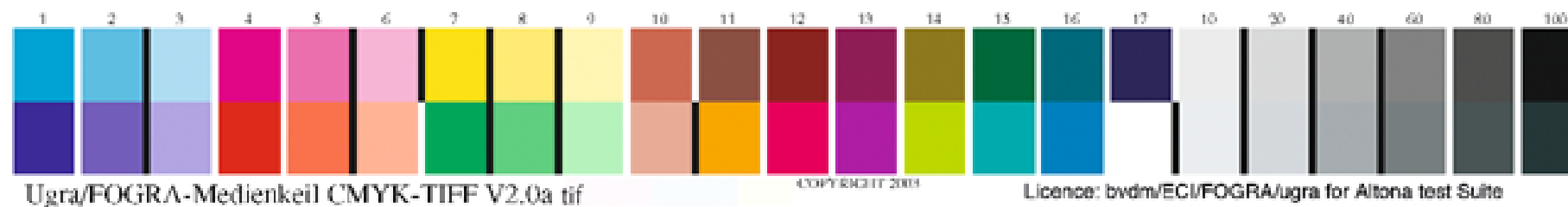
Even for users who simply produce final print in house, a well calibrated printer with a good accurate ICC profile can help immensely as it will often remove the need for constant test-strips and re-prints. Outputting an image becomes a pleasure and originator creativity is released, since compromises due to an inability to predict print are no longer needed. Of course a decent photo or perhaps a proofing RIP, with a compatible printer is the right way to do this. Great portfolio prints or prints for exhibition and sale AND reliable proofs or "Digital Validation Prints" can be achieved at an amazingly low cost nowadays.

colourmanagement.net ::: **NeilBarstow**

7 a 16 bit workflow

Where disc space and processor speed permit, I suggest you archive your high bit (16 bit) originals and also archive your full size 16 or 8 bit layered Photoshop .psd image files.

Next, working on a duplicate of the image, optimise your output files to suit the eventual print destination and, very important, work on your compatibility with the others in the image chain - be they photographers, designers, agencies or print houses. With everyone singing from the same song-sheet, all of a sudden harmony is possible. Normally it is best to send out a flattened file since Photoshop layers can cause issues down the line.

Colour Management – it really can work for you