



AP guide to...

Professional printing

Professional-quality prints can be difficult to achieve. **Tim Coleman** outlines the key factors to get what you see on-screen, on paper

YOUR image has been retouched and is ready to print, but how can you ensure that you achieve a print you would be happy to display? There are many factors that contribute to a professional-looking print from a correctly exposed digital image. Along with advice from printing professionals, I will take you through how to prepare your image and your inkjet printer for the best possible results.

WORK SPACE

David May, production manager at The Printspace in East London, stresses the importance of a good working area. 'Making minor adjustments to image detail and colour rendition will be tricky with glare from bright sunlight' 



A neutral environment with consistent light helps your eyes when checking for colour accuracy

THE PRINTSPACE

GETTING THE IMAGE READY



STEP ONE RESOLUTION

An inkjet printer uses nozzles to spray ink onto the paper, typically at a resolution of 360dpi. As a general rule, therefore, 360ppi is the ideal resolution for image files because the quality cannot be improved with a higher output. Straight out of the camera, the resolution of digital files is usually 72ppi, so this needs to be altered before printing. Although 360dpi is the ideal resolution for image files, you can use 240ppi or 180ppi for cameras with lower resolutions. When altering the ppi resolution, uncheck the Resample Image box first, alter the ppi resolution and then recheck it. The document size will change, but the pixel dimensions will remain the same. Do not increase the pixel dimensions drastically as you cannot create data from nothing, while if you make huge reductions in the pixel dimensions the quality will be reduced.



STEP TWO IMAGE SIZE

Most DSLRs shoot in a 3:2 format, which may not match the format you wish to print. Use the Crop tool to adjust the format by typing in the correct ratio or dimensions in the Crop tool's settings.

Borders are best added to the file rather than centring the print through output. This can be achieved in Photoshop by increasing the size of the canvas to the desired dimensions.

It is good practice to print the digital file at 100%. A 240ppi file is 150% larger than 360ppi. If you want to print larger, then compromising resolution is fine because it is difficult to spot any difference between 240ppi and 360ppi. This maintains the pixel dimensions to the output of the camera sensor, which in a 12.1-million-pixel camera in 4:3 format has an output of 4000x3000 pixels. For larger changes, resampling the image can be a better option. To do this, check the Resample Image box, and use Bicubic Sharper for reducing the size and Bicubic Smoother for enlarging.

STEP THREE COLOUR CHECK

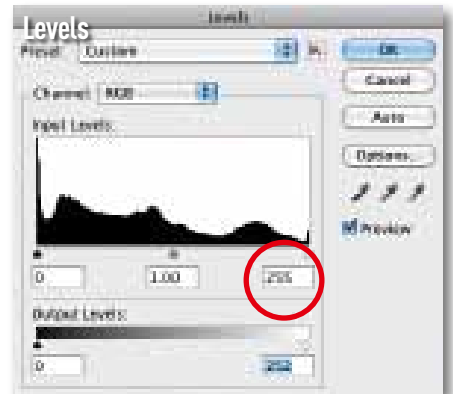
Poor colour rendition is most obvious in shadow areas. Look at the blacks in the image to check for a colour cast and at the highlights as these are also good indicators. If you are unsure about the colour balance, look for known colours in the scene, such as the colour of a wall, and then use that as a guide. If this becomes tricky, then balance the colour for the most important aspect of the image. In a portrait, for example, this would typically be the skin tone.

STEP FOUR LEVELS

Images with blown-out highlights, which are seen as areas of white, can cause a problem when printing. Because there is no data in this part of the image, the printer will not output any ink on this area, essentially leaving patches on the paper with no ink at all. Adjusting the Levels helps to avoid this problem. If you adjust the highlight to 252 on the output slider this should add enough data for the printer to distribute ink in these areas without affecting the image quality too much. Alternatively, dull down the area by pulling down the highlights via Curves. Both of these options will mean that the image has a little less contrast, but the print will have total ink coverage.

STEP FIVE THE FINAL EDIT

For a crisp and sharp print, add a bit of sharpening as a final touch. Set the view size somewhere between 33% and 50% (at 100% you risk sharpening too much) and increase the



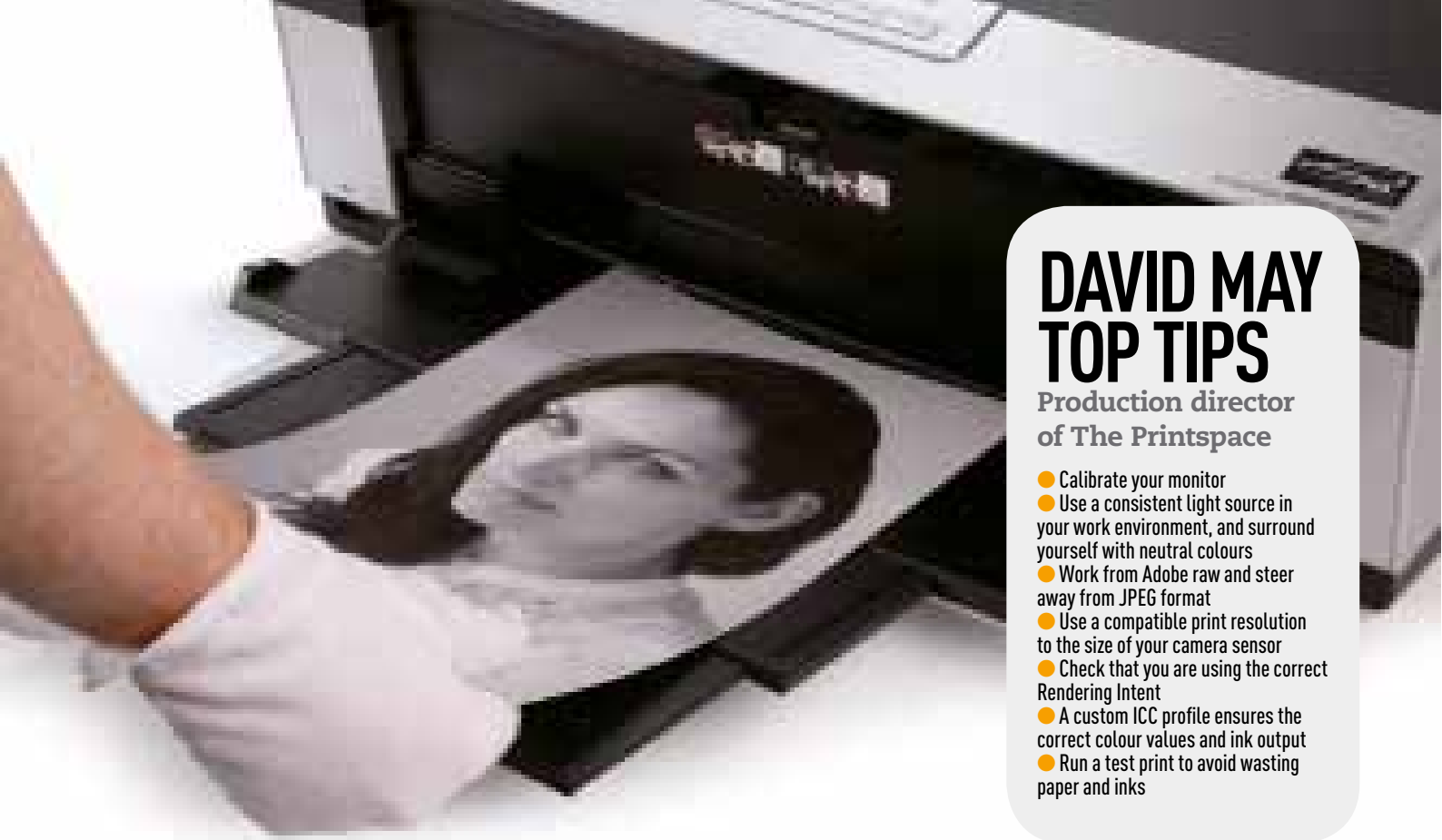
sharpening until you are happy with the print. Go to View>Print Size as a final check.

Because a monitor is effectively a lightbox, it is an ideal way to view and edit an image. However, what appears on screen is brighter than what will be produced on inkjet paper. To adjust for this, lighten the image by 10% before printing. A calibrated monitor has a more accurate output. Otherwise, you can darken the monitor by 10% and make final image adjustments.

Once you are ready to print, view a soft proof to see how the image will look in accordance with the printer and paper being used. Go to View>Proof Setup>Custom... Device to Simulate to see how the print will look. Under this heading you will see a list of ICC profiles already loaded into Photoshop (see ICC profiles on page 60). Choose your desired paper. There is a discernible difference between papers, particularly in bright blue and red areas of an image. C-type paper is less vivid, but the tonal range is good. Select the correct rendering intent (see Output, opposite page) and then click OK. Finally, make your final colour and Levels adjustments.

STEP SIX FILE FORMAT

Before printing, make sure the file is flattened of all adjustment layers. Using the TIFF format from a raw file is ideal for image editing, and Photoshop users will be equally pleased with PSD files. JPEG files compress information and are not ideal for editing, but once the final edit is complete, it is difficult to see the difference between any of those formats.



DAVID MAY TOP TIPS

Production director
of The Printspace

- Calibrate your monitor
- Use a consistent light source in your work environment, and surround yourself with neutral colours
- Work from Adobe raw and steer away from JPEG format
- Use a compatible print resolution to the size of your camera sensor
- Check that you are using the correct Rendering Intent
- A custom ICC profile ensures the correct colour values and ink output
- Run a test print to avoid wasting paper and inks

shining on your monitor,' he says. 'Try to work in an environment away from strong light and with a consistent level of light.' A monitor hood shields your screen from strong light and allows the monitor brightness to be turned down, which is energy efficient. Try the Colour Confidence PChOOD Monitor Hood Pro, which costs £71.44 from www.colourconfidence.com (see AP 23 October 2010). Use a neutral colour, such as grey, for your desktop background and restrict bright, distracting colours within your vision.

It is important to view prints in daylight conditions. Bright light is not helpful to see image detail, but neutral overcast light is good. There are plenty of options when it comes to daylight-balanced light sources, and some are very reasonable. For example, the Daylight Company sells portable lamps from £54.99 (www.daylightcompany.com).

Calibrating your monitor is a key part of your preparation. There is a software option to calibrate your monitor that relies on the human eye, but for best accuracy hardware calibration devices ensure the colour rendition and levels are correct.

The X-Rite i1 Display 2 is a popular choice for professionals (available for £150 from www.colourconfidence.com). Monitors should be calibrated every six months or so, but if you do a lot of printing this should be every two months. Some photo labs, including The Printspace (www.theprintspace.co.uk), offer a monitor-calibration service for free if you can take it to the store, which is useful for laptop users.

COLOUR SPACE

Colour space comprises all possible colours created from red, green and blue (RGB). The limit of these colours is defined by the colour gamut. For top-quality prints, using Adobe RGB in-camera and on computer is better than sRGB, because it has a larger colour gamut. This is particularly

Above: Even with instant dry paper, leave prints to dry completely and handle with gloves


noticeable in the green, blue and cyan areas, all of which are particularly important to landscape photographers. sRGB was designed for web use, so is ideal for online images. For black & white prints, work from Adobe RGB desaturated. It is best to match the working colour space that the image was recorded with, and this can be found through Edit>Color Setting in Photoshop.

OUTPUT

Once the image has been edited, the settings for output must be set correctly. As a default, most printers are set to use high-speed mode. This in turn affects image quality, so make sure this option is not selected. Also, uncheck the box for colour management, because this is being carried out manually, and make sure the image is the correct size for the print you require.

Rendering intent tells you how to deal with

the colours you cannot reproduce – those out of the colour gamut. As a default, this is set to Relative Colormetric. In this setting the white of the source colour space and that of the destination space (printer) are compared and colours are shifted accordingly. Out-of-gamut colours are shifted to the closest match, which means accurate colours are maintained. The tone is then flattened, so it is less able to render shadow detail and is therefore best for use for brighter images.

Perceptual is the alternative option, which shrinks the whole colour gamut down to fit within the smaller gamut of the printer. The relationship between colours is maintained, but this often means there will be a shift in colour values. This option holds shadow detail, making it best for images with dark areas and shadow detail. Check the correct option when viewing a soft proof to ensure accurate colour management. 

Many thanks to **David May** from The Printspace, **Vij Solanki** from Permajet, **Dominic Fowler** from Epson and **Estelle Sexton** from Canon for their help with this article



GETTING THE PRINTER READY

ICC PROFILES

I spoke to Vij Solanki from Permajet to get his thoughts on the importance of ICC profiles. He said: 'An ICC profile holds information about the range of colours that a printer or monitor can utilise. To obtain accurate colour rendition, particularly in shadow areas, it is vital to use the correct ICC profile. The default information will be correct if you use, for example, an Epson printer, Epson ink and Epson paper. However, if any one of these variables is changed, then the default is incorrect. Your operating system is also a variable.'

It is fairly straightforward to download the correct generic ICC profile to match your printer, ink and paper combination through the website of the paper brand you are using. This will improve the accuracy of print, but it is a profile that has been created on another printer. Every printer is unique and performs slightly differently. The same profile and output may be fine on one printer, but could show a slight cyan tinge on another and even a variable such as humidity can influence the outcome of the print. So for the most accurate colour rendition it is worth investing in your own unique ICC profile that is specific to your printer.

Software to do this is available, such as Canon's Colour Management Tool Pro 2. Alternatively, Permajet provides give free advice when using its paper, but charges for other papers. This process includes downloading two generic colour patches, printing them off with no colour management or manipulation, and sending them off to the company. For more details visit www.permajet.com. There is online 'remote' ICC profiling, but for the best accuracy it is best to send off the colour patches.

PRINTER MAINTENANCE

It is possible to get all the output and printer profiling correct, but still have an unsatisfactory print. If you are not happy with the print you have produced, begin by running a nozzle check. This can be found through the printer setup and will indicate if there is any issue with the mechanics of the printer, such as head alignment, and if the heads are clean and clear. It takes just a



Using manufacturers' own inks ensures the best possible quality prints

paper-feeding issue to misalign the print heads. If it has been a while since the printer was last in use, the print heads may need cleaning. In the UK, long-term storage is less likely to be an issue in terms of clogged printer heads, whereas a hot, dry climate is more problematic. Give pigment ink cartridges a shake before use in this instance.

Cleaning a print head uses up ink, but it is cheaper than wasting a sheet of expensive photo paper. Complete a nozzle check first to avoid the unnecessary wasting of ink.

INK CHOICE

For professional-quality prints, using the printer manufacturer's own or top-quality third-party inks is important. Cheaper, poor-quality third-party inks have several downsides. For example, an ICC profile may not exist for the ink, and the longevity of third-party inks is much lower, leading to faded prints. The general density and saturation of the inks will produce poorer results, too.

Permajet's continuous-flow system is one example of good-quality third-party inks. A complete system costs £260, with each cartridge holding 125ml of ink. The company claims this produces an 80% saving on ink and that the ink quality is even more saturated and equal in longevity to the print manufacturer's own ink. Each cartridge is replaceable for £26.95. Manufacturers' inks are expensive. A complete set of inks for a printer such as the Epson Stylus Photo R2880 will cost just under £100. Each ink cartridge holds 11ml of ink, although this can produce less than 10ml of usable ink.

PAPER CHOICE

Depending on your image and the way you wish to present it, your choice of paper is key.

Typically, gloss paper is a popular choice because the high-contrast, bright and saturated colours make for bold prints. Paper with a baryta layer has many of these advantages, but with a greater choice of finishes and thicknesses. Matt and textured paper can give a nice arty feel, but often this results in more muted colour reproduction, limited contrast and loss of detail. Also, the base colour of the paper affects the warmth of a print.

Each paper has a different level of texture, so setting the correct paper type is important for an accurate level of ink output.

FEEDING

Sheets of paper that are dense and thick may not feed through the printer correctly. Typically, sheets over 300gsm will need to go through individually, or in some cases through another feeder on the printer, but read the manual of your printer to make sure. If the printer is stacked with several sheets, it may feed more than one through at a time and throw the printer head out of alignment, which will consequently need fixing.

HANDLING

Although most inkjet papers produce prints that are dry straight from the printer, it is worth handling them as little as possible to make sure they are thoroughly dry. When handling prints, particularly with a gloss finish, fingermarks can spoil the surface, so wear gloves to avoid any damage.

TEST PRINTS

To save money on ink and paper, run a test strip, much like in darkroom printing. It is advisable to do this for both sharpening and colour balance, set at incremental levels. Use the same section of the image with key points of interest. When you print, uncheck the centre image box and move the strip along the page setup from left to right so the strips do not overlap.



The different fibre base of these papers affects the warmth of tone