

## Making Digital Negatives with an Ink-jet Printer

### Prologue

What follows was born of necessity: my need for a stepwise sequence of explicit instructions for making monochrome digital photographic negatives on a personal computer, starting either from original small- and medium-format camera negatives or transparencies, or from digital picture files. The software applications used for this image manipulation are Photoshop CS™ (Version 8) and Epson Scan, using an iMac, running OS 10.4. No additional specialist software or 'latest upgrades' are required. The files are printed out onto special ceramic-coated transparency material (PermaJet or Pictorico Digital Transfer Film) using an Epson photo-quality ink-jet printer, to provide internegatives suitably matched in ultra-violet optical density for contact printing in any of the 'alternative' photographic processes. I am indebted to the several pioneers of digital negative-making and gratefully acknowledge the many borrowings I have made from their work. Their refined methods are well-known and widely practised, so it may be useful at the outset to summarise here how my digital negative workflow may differ significantly from the accepted practices:

- 1) For calibration, an inkjet 100-step tablet negative is printed from the file supplied, identical in all its parameters with the actual negatives to be printed.
- 2) The Standard Printing Exposure is found using only this step tablet negative (and not using additional silver-gelatin step tablets on different media).
- 3) The printer ink density range is tested first and adjusted to find the best printer driver settings to make a fully printable negative for a given process.
- 4) Deriving (or borrowing!) a "Curve" is unnecessary: the redistribution of image levels appropriate for analogue printing (approximate re-mapping from linear to logarithmic) is performed simply by the Gamma slider in the Levels window, which applies a suitable curve automatically.
- 5) Few, if any, of the 256 levels are wasted by truncating the tonal scale to fit the exposure range of the process, as happens with some "Curves".
- 6) Ink colour selection is *not* used for adjusting the optical density to match the UVA exposure range of the process; the printer's mix of all the ink colours, including black, provides a very smooth neutral grey with no risk of "spotting".
- 7) RGB files are usually monochromatised according to the visual response of the normal human eye.
- 8) The 'white point' can be 'fine-tuned' (it's not usually necessary) by employing the Layer Opacity Slider control, if the ink density range is too high.
- 9) Image files are economical in size, but high resolution: flattened, 16-bit greyscale, 360 ppi .tiff: an A3 (16.3"x11.4") image file occupies 46 MB.

To achieve the desired end result, I found the number of individual mouseclicks and keystrokes turns out to be far more (in the order of 100+) than I can retain in my ageing head in their correct order; hence the following ‘click by click’ *aide memoire*, to set beside my computer. This introduction explains some of the background reasoning to unusual features of this Workflow. From start to finish, I have identified a sequence of 22 ‘**things that may need to be done**’ to the original file or film. Each of these receives a numbered heading. But each of these ‘**things that may need to be done**’ can itself entail a whole series of keystrokes or clicks – many of them non-intuitive – in order to access features of the software that are not indelibly engraved upon the memory of an occasional user like me. [These instructions are not, of course, intended for Photoshop experts].

So each of the 22 ‘**things that may need to be done**’ comprises a box of instructions which tell explicitly ‘**how to do it**’ using shortcut keys and menus. If any of these boxes turns out to be superfluous, irrelevant, or otherwise *not* needed to be done, it can easily be omitted *in toto*, and the lucky operator can pass on to the next numbered ‘**how to do it**’ box in the sequence. There should be no vagueness in the instructions here, leaving the beginner stranded, although sometimes choices have to be made of parameters, and trial values are recommended. My aim is that someone who knows almost nothing of Photoshop should be able to carry through the entire procedure successfully with the aid of this workflow. There are four phases to the process, and the image workfile is saved at three of these stages, so that if, for any reason, it is desired to make a duplicate or modified negative, then this is easily accomplished without having to repeat the whole procedure:

#### Phase

- I Acquire the raw scan or original digital file
- II Prepare a ‘perfected’ positive image file
- III Prepare an ‘adjusted’ negative image file
- IV Print the negative image file onto transparency film

In order to keep the file sizes economic, I have minimised the use of layers in Photoshop, and do not employ templates. Users who are fortunate in the extent of their computer power may well prefer to employ more layers, with their benefit of reversibility, especially for adjusting the contrast and levels, and retouching flaws. Since this Workflow is essentially a “reminder to myself” it is inevitably personalised to a degree, and may need some small obvious adjustments to accommodate the working practices of those who use different formats or printers. The method put forward here for matching the density range of the resulting negative to the printing exposure range of the intended photographic process is not the only way to skin the cat, but I believe it to be a simple and economic way, which is technically sound, optimises the image quality, in both tonal and spatial resolution, and achieves the aim with a minimum of labour and complication. This document is not intended as an authoritative instruction manual, but rather as a discussion paper in an attempt to rationalise and facilitate digital methods of photographic negative-making. I welcome feedback and criticism: <mailto:mike@mikeware.co.uk>