sRGB v Adobe RGB – The Final Word!

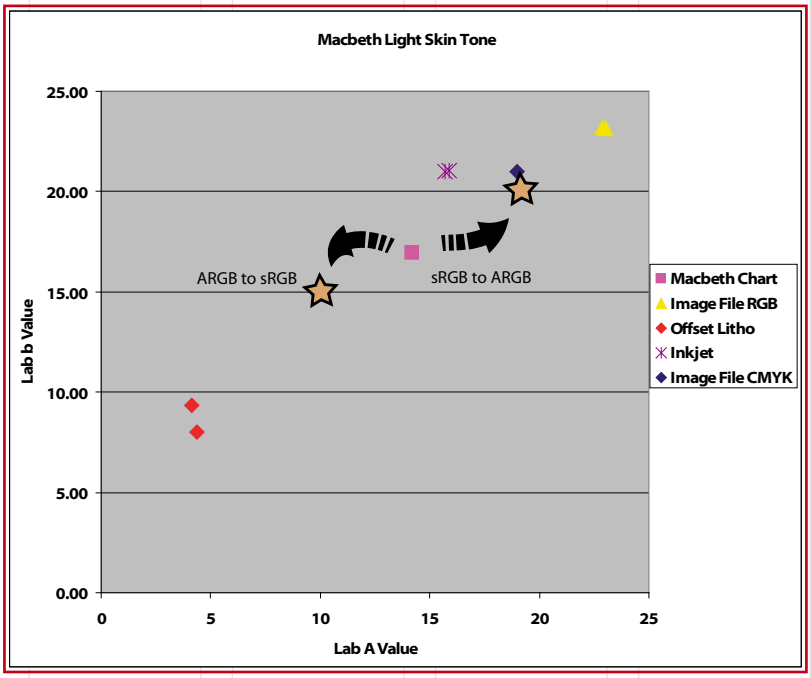
QUALITY MATTERS

One of the advantages of being both the editor and resident techie is that I get to do experiments using real magazine output. With that also comes responsibility for mistakes so we will get that out of the way first. The more observant of you will have noticed that the table on page 58 of the February issue was devoid of data despite the caption saying otherwise! This was due to your editor failing to purge the document of that typeface of Satan – Arial. This resulted in the proofer behaving impeccably but the plate-making RIP having a quiet fit and sneakily dropping all the text. The table is repeated here for completeness. To summarise its significance, the ACR-Calibrator performed the best overall of the camera calibration methods despite being free – 'not often you can say that! We make no apologies for presenting so much data – anybody who wants to argue that there is a large difference between sRGB and Adobe RGB can put up their own data (see below though, it can make a difference when not used correctly!). We do, of course, now have the ability to measure the actual output off the printed page and this is added as the final column. It shows very small differences between the two colour management routes.

Back to the sRGB versus Adobe RGB debate, which actually broke out again in Malta while we were speaking there. We can now go back and answer the question posed in the November-December issue – "can you see any dots?". As expected, the cyan is the only swatch where the difference between ARGB and sRGB is detectable. We rest our case therefore that there is no difference between the two profiles when correctly implemented in the workflow – differences in the profiles were swamped by differences in the move from chart to camera to RGB to CMYK to print, etc. We make no apologies for burdening you with more charts and tables; we are trying to put the matter to bed once and for all! The data show that for skin, the differences between sRGB and ARGB working spaces are 165 times smaller than the error in taking a RAW shot with a camera, 130 times smaller than the error going from chart to camera to ink-jet print, and 10 times smaller than going from chart to camera to offset litho print.

This leaves the matter raised by the Maltese photographers. They had been advised to change to an ARGB workflow but then found that the results were inferior to those obtained when following an sRGB workflow. Most have accordingly switched back to an sRGB workflow. The black arrows on the graph illustrate the most likely reason for their preference. It seems likely that they are working with a non-profile savvy application inside the printer itself (since confirmed by discussions on the colortheory web forum). They may thus be shifting in the direction of more saturated colour (sRGB assigned to ARGB) producing a more tanned look in their skin tones. This is exactly the same as changing from say Fuji NPS to Kodak Gold, the latter was intended to add a bit of fizz to a dull day. This is ideal for Caucasians who, in the main, prefer to be imaged more tanned – the opposite is true for Asians, who have a preference for a paler look – so be careful! The nightmare photographic scenario, related by the Maltese photographers, is of a Maltese builder marrying the Swedish au pair! Note that the assignment of the different profile shifts the colour by 5-6 ΔE in each direction so that there is a total of 11 ΔE difference between prints made on the two routes. This is significant and easily detectable, which explains why the confusion often arises. The moral of the story remains the same – the best print is the one that you prefer. However, try to be sure that you understand why you prefer one rendition over another or you will eventually get caught out! If you are currently happy with your non-colour managed lab but send your image to another, which has profile-savvy devices you, will see a saturation shift, possibly in a direction that is not to your liking.

In yet another postscript, since the original article was written, we have done a lot more testing of ACR-Calibrator in real situations. Typically, things have got more complex! When we tested using flash illumination, rather than the overcast daylight used before, all sorts of strange anomalies have popped up, principally with flesh tones being too red. First suspicion falls onto camera chip metamerism, we just hope that it does not lead to a discrediting of the workflows we have settled on – more of this as we test further, we will keep you up to date.



Light Skin		L	a	b		
	Macbeth Chart	**66.42**	**14.17**	**16.95**	**ΔE**	**Diff**
Image File RGB	sRGB	70.94	22.89	23.19	11.64	
	ARGB	70.88	23.04	23.16	11.71	0.07
Image File CMYK	Both	67.00	19.00	21.00	6.33	
Offset Litho	sRGB	62.57	4.35	8.00	13.83	
	ARGB	62.65	4.15	9.35	13.13	1.35
Inkjet	sRGB	69.29	15.69	21.00	5.19	
	ARGB	69.45	15.88	21.04	5.37	0.04
ARGB Assigned sRGB		64.00	10.00	15.00	5.20	
sRGB Assigned ARGB		68.00	19.00	20.00	5.93	

"…operation of the Huey could not be easier…"

"Highly recommended!"

COLOUR	Expodisc	Adobe RAW	ACR	CC24	CCSG	Difference in print
dark skin	3.7	5.4	3.5	3.8	3.1	1.4
light skin	5.1	8.4	4.7	4.9	3.4	0.8
blue sky	9.6	4.6	1.3	2.1	2.4	2.0
foliage	7.1	3.0	2.5	2.4	4.8	2.0
blue flower	6.8	3.0	2.8	3.7	0.6	2.0
bluish green	11.3	5.2	5.6	0.9	1.4	3.0
orange	3.4	10.2	4.2	5.6	5.5	2.5
purplish blue	11.4	8.0	5.0	6.9	1.5	1.2
moderate red	5.8	12.7	4.9	4.7	4.1	1.5
purple	5.4	5.2	4.2	0.5	4.7	1.4
yellow green	5.1	3.6	4.1	3.7	5.8	4.4
orange yellow	2.6	7.4	2.2	7.0	5.9	4.2
blue	11.4	9.9	8.3	7.3	5.1	1.1
green	7.9	2.4	4.8	5.7	4.1	2.5
red	5.6	13.7	5.0	8.0	7.9	2.3
yellow	6.3	7.0	5.0	7.5	6.4	4.2
magenta	2.2	9.9	3.4	4.1	2.3	2.1
cyan	14.4	9.7	4.9	4.9	2.0	4.8
white	7.7	2.3	4.3	6.3	0.9	0.9
neutral 8	5.8	2.7	0.5	1.0	0.7	0.5
neutral 6.5	6.5	2.8	0.9	2.1	0.4	1.9
neutral 5	6.8	1.4	1.0	1.6	1.0	2.1
neutral 3.5	7.9	2.5	1.0	0.8	2.2	1.9
black	6.6	2.8	1.6	0.9	7.6	1.7
Mean	**6.9**	**6.0**	**3.6**	**4.0**	**3.5**	**2.2**
Std Dev	3.0	3.6	1.9	2.4	2.3	1.2
Biggest	14.4	13.7	8.3	8.0	7.9	4.8
Smallest	2.2	1.4	0.5	0.5	0.4	0.5
MEAN ΔE2000	**4.6**	**3.8**	**2.2**	**2.5**	**1.8**	

RIGHT TOP: The Huey is smaller than your mouse and sits alongside your monitor (so you need one for each of your computers).

RIGHT: The software and operation of the Huey could not be easier, we did not even need to read the instructions, just followed the on-screen wizard.

PANTONE HUEY

This is a device that profiles your printer and then sits alongside it, periodically checking the ambient light level and compensating for it. As the light in the room increases the monitor luminance is increased and vice versa. This goes against the grain for hardened calibrationists, who would prefer a constant, and standard condition, but in the real world that is not always the most practical solution. The relevant ISO3664:2000 calls for room illumination at less than 64lux and preferably below 32lux. This is very bleak territory to work in and most people prefer a little more light on their world! An additional nonsense that we now have to put up with is that the standard calls for a monitor luminance of 75 to 100Cd/m2 whereas most LCDs can't be turned down below 150Cd/m2. In practice then the higher luminance of the LCD actually needs the brighter room conditions to get nearer to a match between print and screen. The Huey attempts to cut through all this by abandoning the standard and regulating the screen according to the light level in the surroundings.

The tactic seems to work quite well. We have no way of measuring screen output on other than Monaco-built profiles (using the Evaluation routine of Monaco Profiler which only works on Monaco profiles). However our calibrated La Cie was slightly off colour, as measured, and then changed by the Huey. Our guess is that it was improved. Prior to reprofiling the error had drifted up to around 3 DE, which we brought back to 0.98DE, so at best the Huey might have matched that shift. It was in the amount of shadow detail revealed that the Huey scored best. The Blacks Detector of our audit file allows the user to read the point at which the shadows block up on the screen. When profiled with the Monaco this is normally about 15 RGB points, lying on top of a 0 RGB point background. However a calibrated print normally blocks up at 25 RGB points, a difference which leads to the suggestion that there is more detail in the image than actually prints. The Huey showed blocking at about 20 points when the room illumination was 75lux, a slightly more favourable result.

The only disturbing feature of the software was that the profile made by the Huey was not installed as the default Windows profile automatically - we had to intervene manually and install as the default ourselves. Despite this it seemed to be working OK.

Overall then, if you want a very simple to use calibration device, the Huey does the job well and at a very competitive £59.53 on the web, from Colour Confidence, there is little in the way of competition. If you need to track how you are drifting or a measure of your errors, the more sophisticated Monaco Optix XRPro is still a better bet, but for ordinary mortals it does a great job. Highly recommended!

visit www.colourconfidence.com