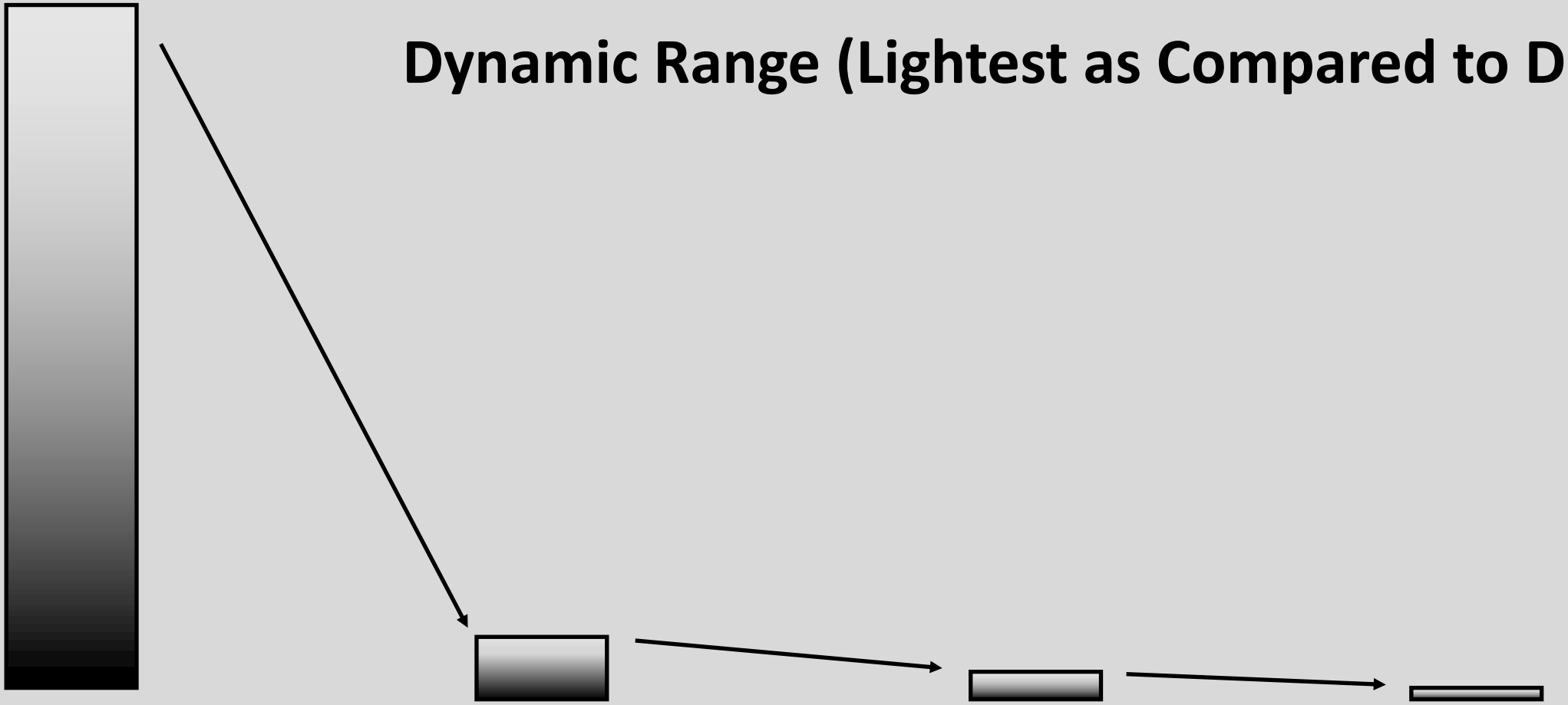
How to Improve Your Printing

Pip Shepley

Dynamic Range (Lightest as Compared to Darkest)



Human eye
1,000,000:1
20 *f* stops

Digital Camera
2,000:1
10-12 *f* stops

Monitor
500:1
8 *f* stops

Print
100:1
6.5 *f* stops

“You don't take a photograph, you make it.”

“The negative is comparable to the composer's score and the print to its performance. Each performance differs in subtle ways.”

Ansel Adams

High Quality Source File (Image Capture)

- Shoot in RAW
- Set camera to highest bits (12 or 14 bit)
- Set camera to Adobe RGB (not sRGB)
- Use 16 bit files when processing

High Quality Source File (Image Capture)

- Use tripod when possible
- Use low ISO
- Expose to the Right – just shy of clipping and blinkies
- When processing do not save as JPEG except as a final output – JPEG compresses and loses quality at each saving

Calibrate your monitor

- Does your monitor match your prints? If so, maybe you are OK, unless...

    - Do you ever print on another printing device?
    - Do you ever send your pictures electronically to another device?

Source: John Paul Caponigro “Quick Start Printing Guide” (free download)

2 Environment

Control Your Environment

Control your environment and you'll control the color you see. It's one critical aspect of color management that has nothing to do with either hardware or software. Computer desktop, walls, decorations, fashion, viewing light, secondary light sources, ambient light – it all matters.

Keep It Neutral

Color influences color. This is sometimes physical, when filtered or reflected color alters the appearance of another color. This is always perceptual, when one color surrounds another color you'll experience them differently. You can't measure this perceptual change in the physical world because it takes place in your brain. While simultaneous contrast is a perceptual adaptation that you can't turn off, you can be aware that it's happening, understand how it's influencing you, and minimize it's effects. How? Surround yourself with neutral colors; they influence our experience of other colors least. Neutral colors produce the least contamination and the least adaptation. And, medium gray values produce the least brightness compensations of all neutral colors.

Computer Desktop

You may be tempted to make the appearance of your computer desktop colorful and lively. That's fine for many non-color-critical tasks. However, when you're adjusting color, make your desktop neutral. You won't be able to see the color you're adjusting accurately unless you do.

Walls

Make walls and decorations in your immediate field of view neutral. Any neutral color is better than a saturated color. Choose white, gray, or black. Don't choose designer whites, grays, or blacks, which contain trace amounts of color that can still influence your perception enough to be significant.

Fashion

Wear neutral colors for color critical tasks. If you wear bright colors, they'll influence your perception too, especially if light reflects off of them and onto your surroundings or images.

Light

The most important thing to control in your environment is light; viewing light, secondary light sources, and ambient light First, you'll want to consider the amount of light – measured lux. It's better to have too much light than too little light; colors will appear dull if you don't use enough light; just don't produce glare or make viewers squint. (A CRI of 90 or higher is recommended.)

Source: John Paul Caponigro "Quick Start Printing Guide" (free download)

Desktop image – all good - gray

Desktop image – something wrong!

Desktop image – something wrong!

6 Lightroom

Printing With Lightroom

To get great prints you have to navigate printer software successfully. Even if you get everything else right in color management, if you take a wrong turn here, you still won't get the results you're looking for.

Successfully managing color for digital printing requires that the color in an image file be converted from its device neutral color space (like Pro Photo RGB) to a device specific color space (as defined by an ICC profile characterizing a specific printing situation –printer, ink, paper, and driver.)

You can let the imaging software make this color conversion or you can let the printer make this color conversion. For most color printing applications, let Photoshop manage the color; this is the only way you can use a custom profile, which is necessary when using other manufacturer's papers.

Take these steps using Lightroom and the Epson driver.

1. In Lightroom's Print module click Page Setup.
2. Set Paper Size and paper feed method.
3. Click on one of the two Orientation icons – portrait or landscape.
4. Click OK.
5. Click Print Settings to activate the printer software.
6. Under Printer choose your printer
7. Change the Layout drop down menu to Printer Settings.
8. Choose Media Type.
9. Set Output Resolution. Choose SuperFine -1440 dpi for media using Ink : Matte Black or SuperPhoto – 2880 dpi for media using Ink : Photo Black.
10. Uncheck High Speed only if printer banding occurs.
11. Click Save.
12. Optionally, use Lightroom's Layout panel to adjust margins.
13. Open Lightroom's Print Job panel.
14. If the file's resolution (seen as an overlay on the print preview) is 240 ppi or higher leave Print Resolution unchecked. If the file's resolution is lower than 240 ppi, check Print Resolution and set it to 240 ppi.
15. Check Print Sharpening and select your desired level of output sharpening – Low, Standard, or High.
16. Set Media Type to Matte or Glossy.
17. Check 16 Bit Output.
18. Under Profile select the ICC profile that characterizes your choice of printer and paper.
19. Under Intent, click on either Perceptual or Relative. (See Soft Proofing.)
20. Click Print.

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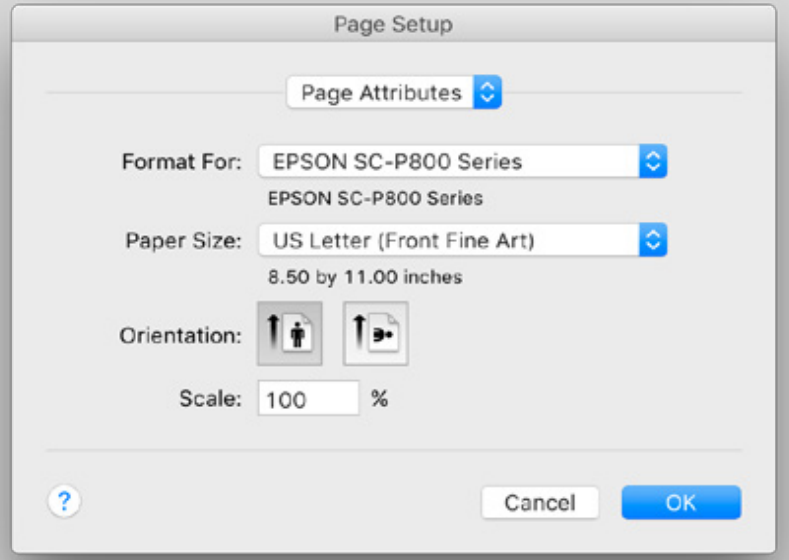
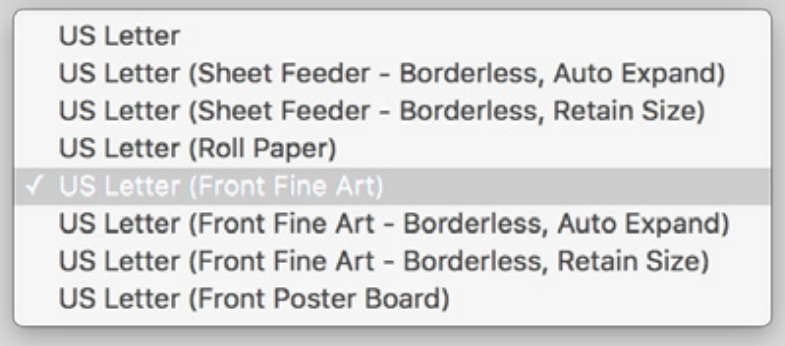
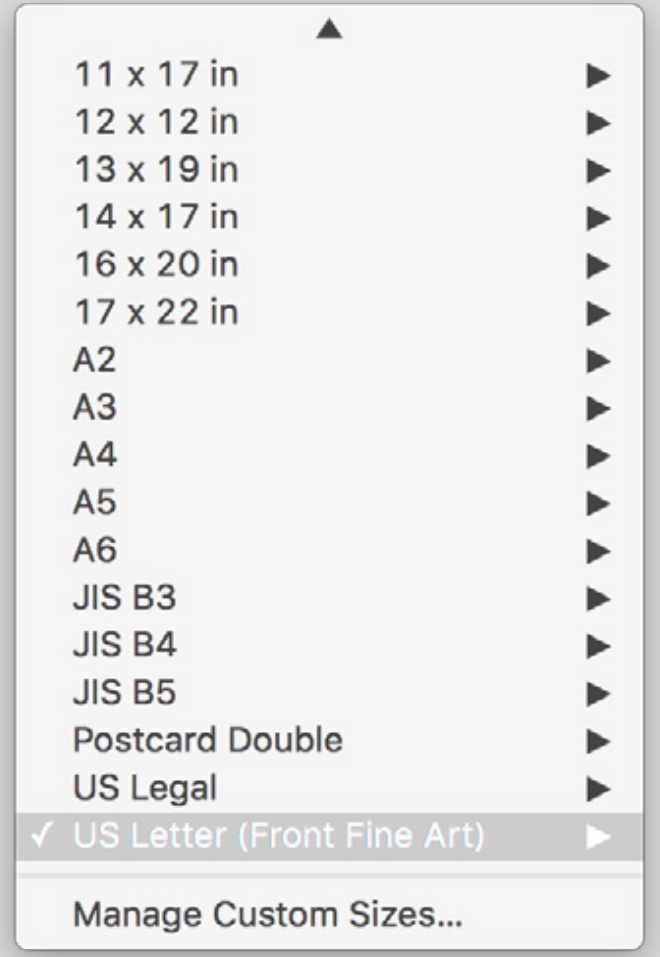
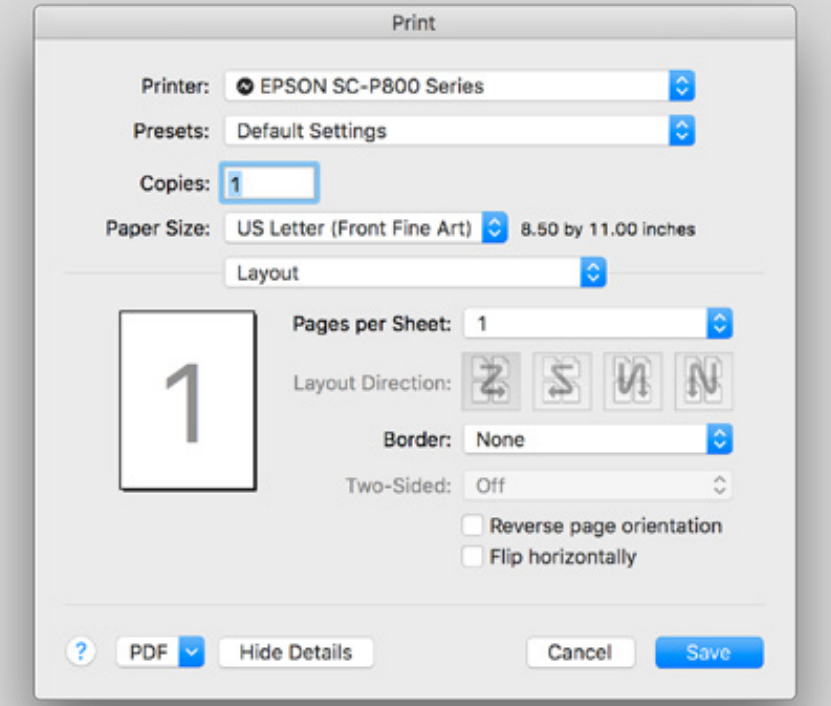




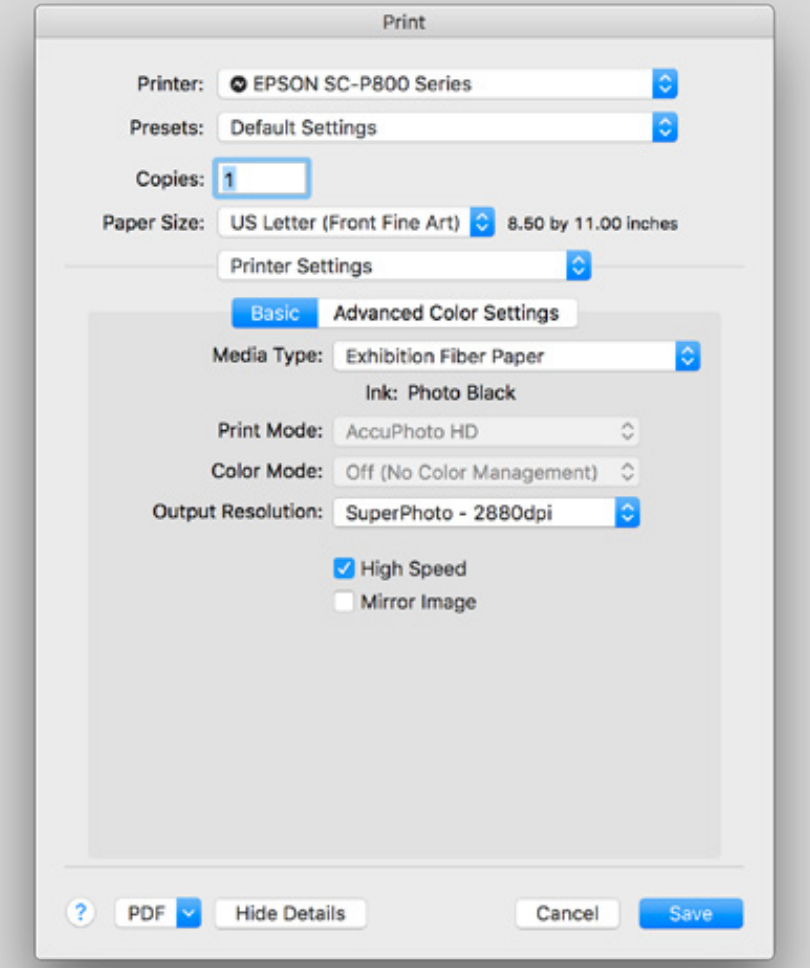


Epson Page Setup

Source: John Paul Caponigro “Quick Start Printing Guide” (free download)



Epson Print Dialog Box



Print Settings Dialog Box

Source: John Paul Caponigro “Quick Start Printing Guide” (free download)

John Paul Caponigro
“The Digital Printing Quick Start Guide”

Also details:

- Photoshop printing step by step
- Epson Advanced Black and White (ABW) printing step-by-step
- Overview of paper choices and reasoning
- Viewing light

Viewing light

3500 degrees Kelvin

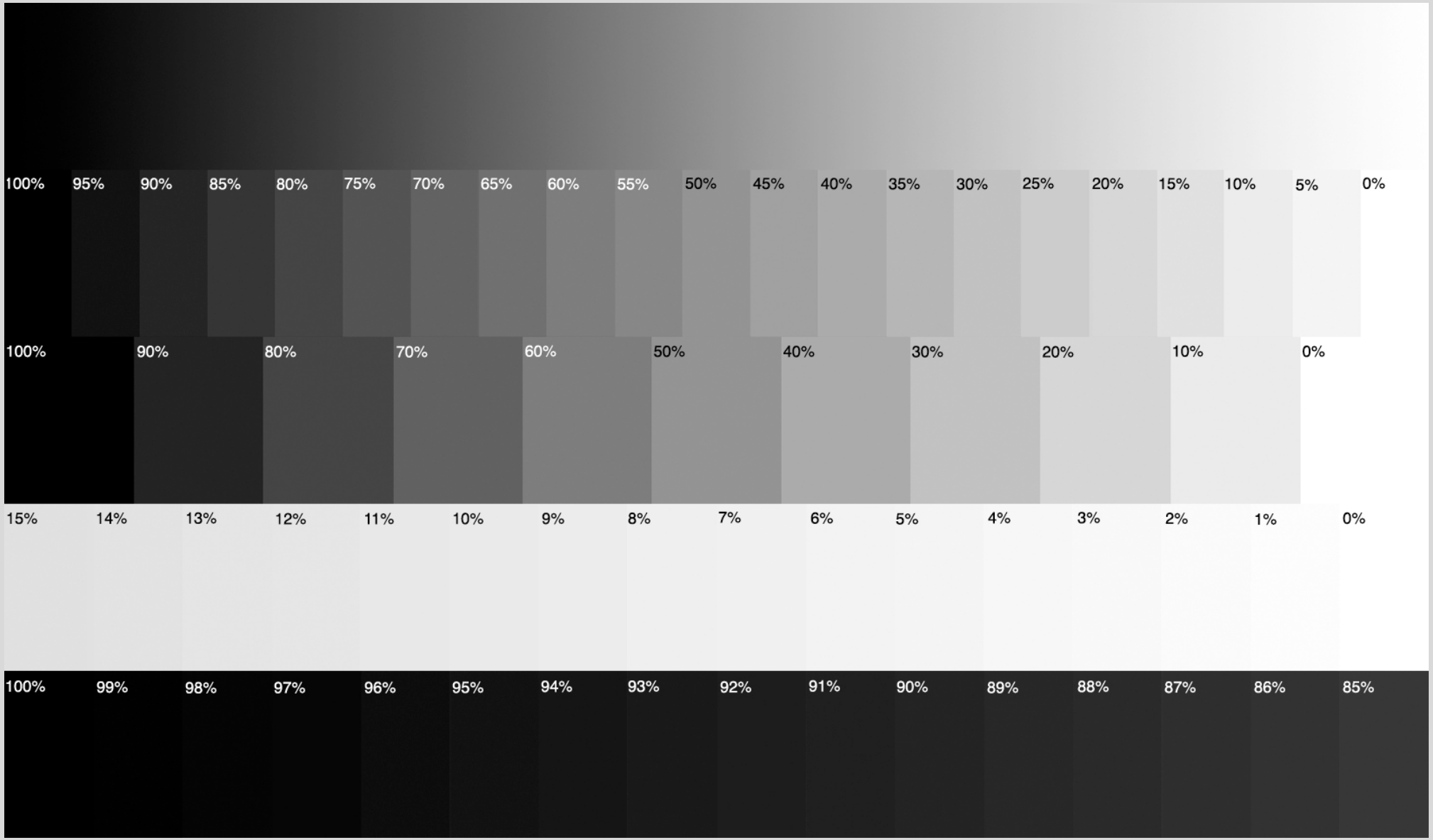
5000 degrees Kelvin

Evaluate the prints in lighting similar to the light where it will be displayed. Want CRI (Color Rendition Index) of 90 or higher.

Source: John Paul Caponigro “Quick Start Printing Guide” (free download)

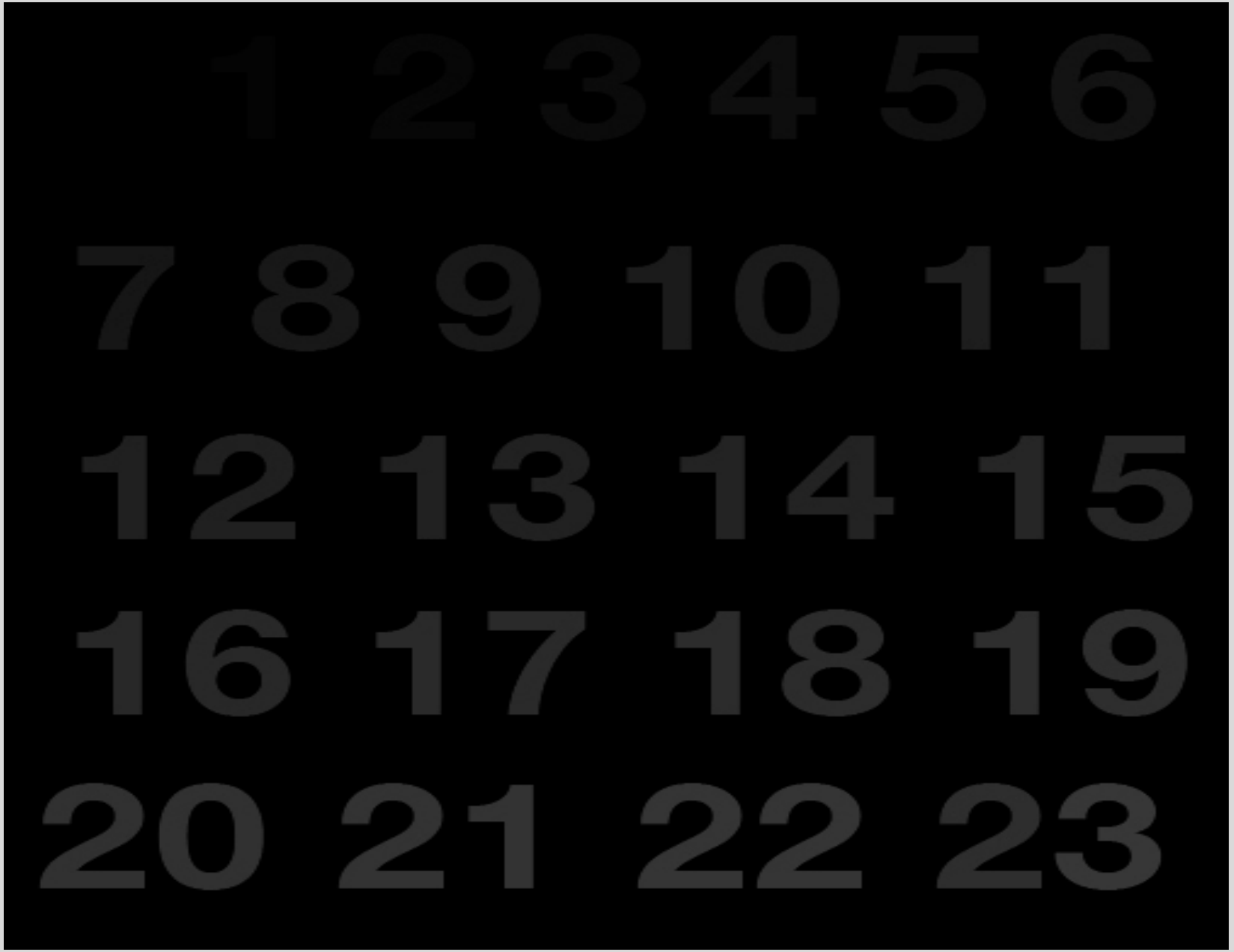
Paint by Numbers

Gray Scale (percent)



Gray scale (bottom of 256 steps for Photoshop)

Gray scale (0-100% for Lightroom)



Monitor versus Print

- A glowing screen versus a reflective surface

- What will you print that you cannot see on the monitor?
- What will you see on the monitor that you cannot print?
- The monitor is often the weakest link in the chain for colors
- Printer is the weakest link for dynamic range
- But each link is different

Softproofing

Softproofing is a method to display the closest rendition of how a print would appear on the monitor. Major challenges:

- Loss of saturation
- Loss of contrast

Out of Gamut

When a color exceeds the ability of a device to reproduce that color

- Can be on one or more channels (RGB) – 3 histograms
- Each device has its own color reproduction capabilities (camera, monitor, printer)
- Monitor is generally the weakest link these days
- Rely on hard proof (print) if that is the final “product”

Out of Gamut

In Photoshop there are four Rendering Intents:

- You can forget two
- Only use Perceptual or Relative Colorimetric
- How to tell – click on each and see on screen which you prefer

Softproofing

John Paul Caponigro “Quick Start Printing Guide” (for both PS and LR on page 20) details what I am going to show you here – how to match the softproof to the original (side by side)

Source: John Paul Caponigro “Quick Start Printing Guide” (free download)

Noise reduction and Sharpening

- Do noise reduction and sharpening at 100% view
- For noise reduction I use Imagenomics Noiseware, almost always on the Default setting. LR, PS, Nik Dfine 2, and DXO can denoise too
- Do noise reduction before sharpening
- I sharpen using Filter/Unsharp Mask in PS for most sharpening
- Avoid oversharpening – creates haloes on edges, crunchiness
- Less is more

Keeping Track

- Post-It
- Write on the back of prints with pigment pen (Pigma Micron):
  - File name, post processing, paper, ink, printer, etc. (variables)
- On final prints add:
  - Image name
  - Your name
  - Copyright

PS vs LR

- Which is better?
- Both, in that they are different:
  - PS - controls actual pixels, but very manual
  - LR – much smoother and more automated, for photographers.
  - LR is non-destructive
  - Some adjustments can only be done in PS, possibly causing switching back and forth
  - Other software: Capture One, DXO

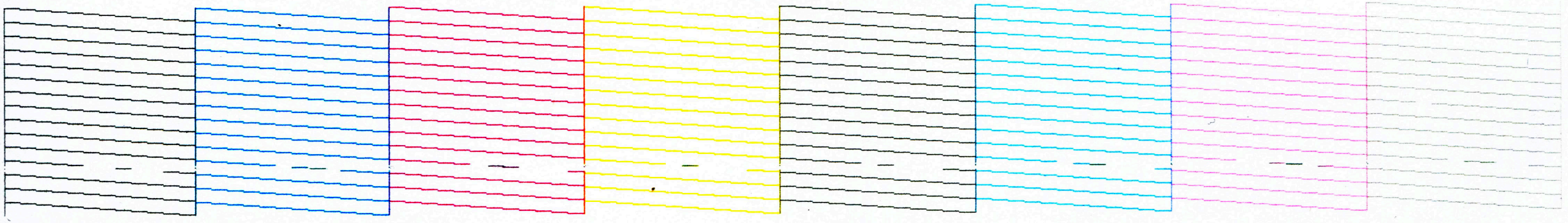
Other software

- Generally the best software is the software you know
- Plug-ins:
  - NIK Silver Efex Pro for B&W
  - Portrait Pro for touching up faces
  - Imagenomics Noiseware
  - Photomatix for HDR
  - Topaz
  - Many more

Printer Maintenance

- The good news – not much maintenance
- Use the printer – print weekly – at least a test pattern
- The ink has pigments that settle – shake larger cartridges or slosh the printer at least once a month. Ink life 6 months to 2 years
- Only do 3 head cleanings in a day – avoid overheating and burning up the head. Let it sit overnight and it will generally unclog
- Keep printer covered to avoid dust

Epson nozzle check



Version :A01868.800
MaintenanceTank: 2%
Cur.InkCount : 5106.2ml Pre.InkCount : 5105.4ml C-P: 0.8ml
Cur.PaperCount:103781.7cm Pre.PaperCount:103751.7cm C-P: 30.0cm

More Serious Printer Maintenance

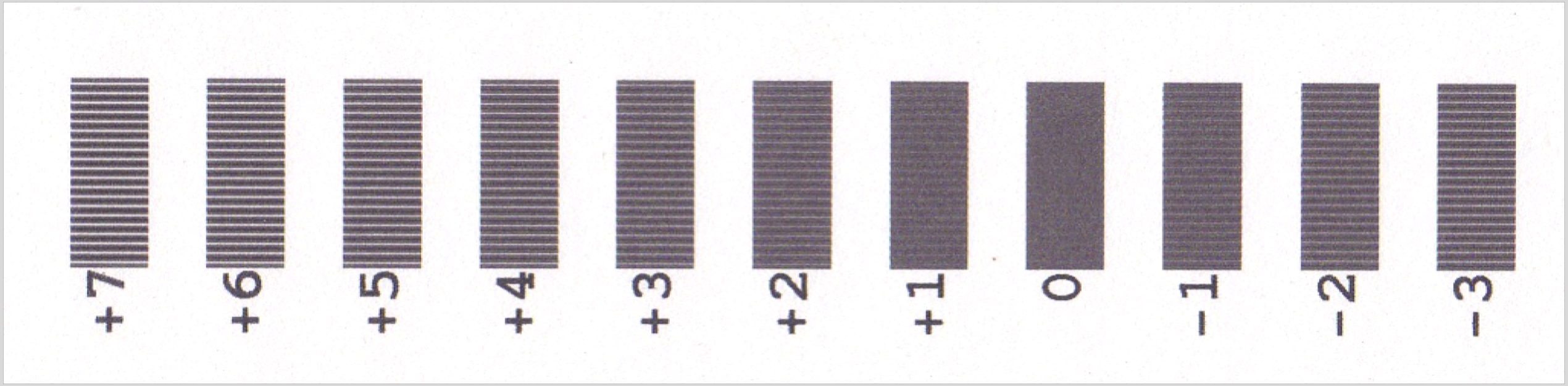
For Epson printers there are great YouTube videos on maintenance (Inkjetmall):

- Cleaning the bottom of the print head
- Cleaning the capping station
- Waste ink tanks (changing on large printers and adding on small printers)
- Note – always unplug printer before putting hands into it!

Speeding Up Printing

Uni-directional vs. bi-directional (bi-directional takes 1/2 the printing time)

- Test both and evaluate the difference. I use bi-directional
- If bi-directional worse, try manual head alignment



Speeding Up Printing

Print resolution

- Try 1440 dpi vs 2880 dpi.
- I prefer 1440 and it is faster
- When evaluating remember:
  - Prints dry “up” (lighter). Do not evaluate when wet
  - Use a hair dryer to accelerate the drying (20 to 45 seconds or so), matte paper gets wetter than glossy

Speeding Up Printing

- Always start with a nozzle check
- Have a standard process
- Consider a checklist
- Test the abilities of your equipment and softproof within those limits
- Prints show faults better than the monitor – examine monitor at 100%

Printing Problems

- Head strikes
- Erratic colors – if ink settled, shake tanks, print test patterns
- White spots – esp. on matter paper – dust with draftsman brush

Maximum Print Size

Longest side in pixels ÷ 360 pixels/inch (or 300) x 2 (possibly up to 4) = Maximum print size in inches.

Example:

- my camera is 8,256 x 5,505 pixels. (45.4 MP)
- 8,256 pixels on long side ÷ 360 pixels/inch = 22.93 inches
- 22.93 inches x 2 = 45.87” longest side max. print size (possibly up to double that depending on subject, viewing distance, paper, image quality, processing artifacts, etc.)

What's the Best Printer to Buy?

- Epson claims 88% market share
- Canon trying hard
- Ink cartridge size should last a year or so (otherwise replacements get expensive)
- Each "improvement" is very small – mostly marketing hype
- Learning gives far better return for money than a newer printer

Better Quality Printing

- For best print quality, either learn it yourself, or find an expert printer who you can sit next to while they print your image
- For better Black & White try Epson Advanced Black & White mode” (similar to Canon “Monochrome Photo”)
- For best B&W consider Piezography

Better Quality Printing

- Go see original photographs
- Live with your prints and reanalyze them
- Learn the capabilities of your equipment and print to it
- Seeing and technique are more important than fancier equipment and software
- Jim Mickelson's "Fine Art Inkjet Printing"
- Use the resources in your handout

Questions?