

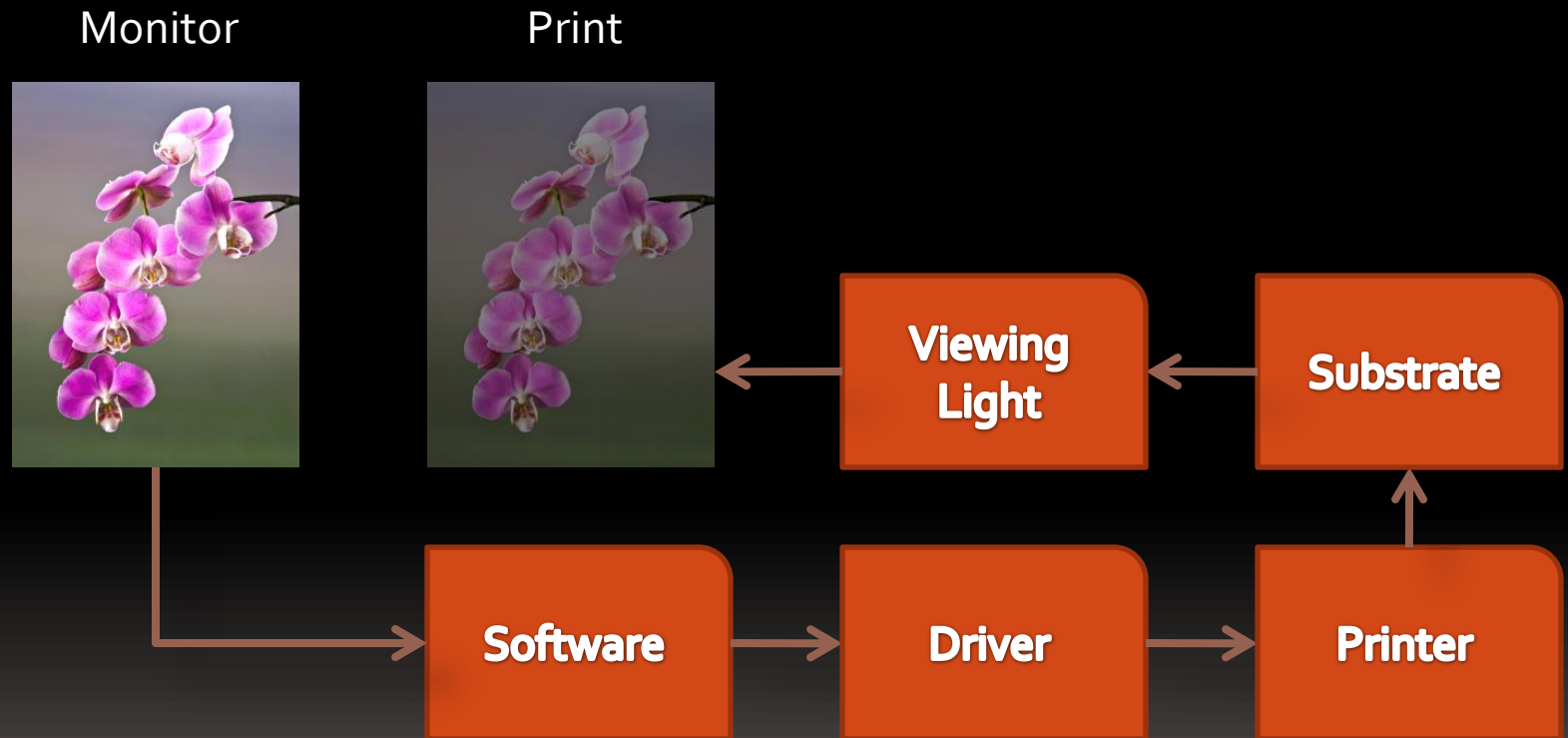
PHOTOGRAPHIC PRINTING WORKFLOW

A. Cemal Ekin, PhD

February 23, 2010

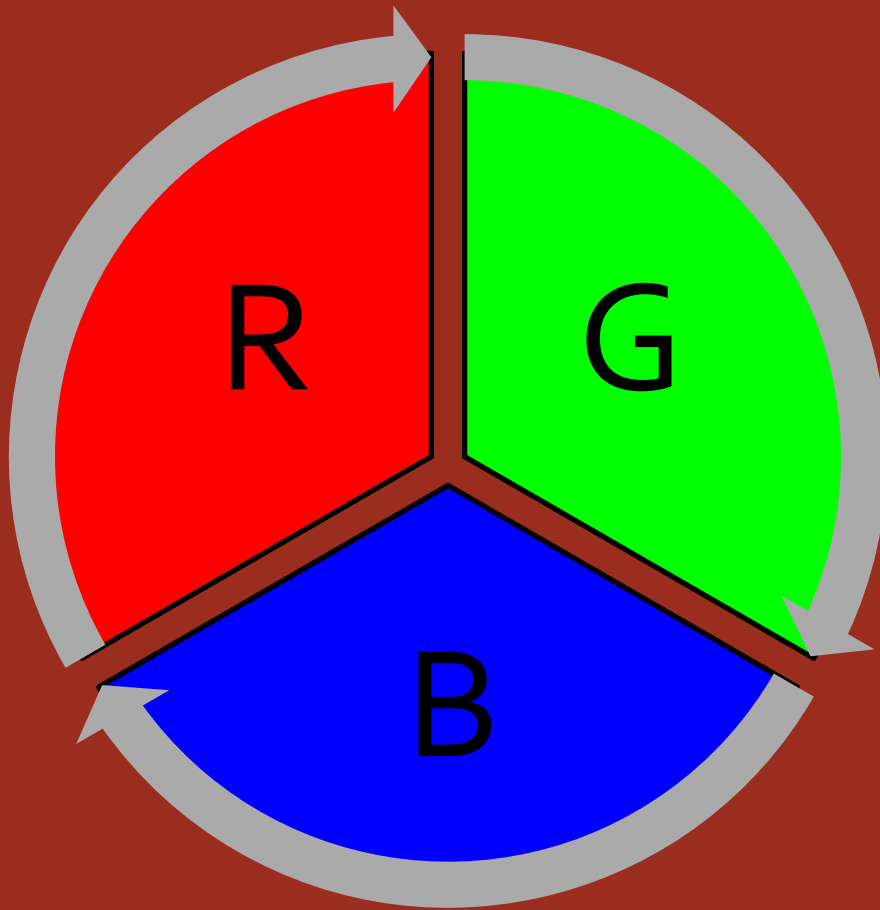
PSRI, Warwick

Why is printing so confusing



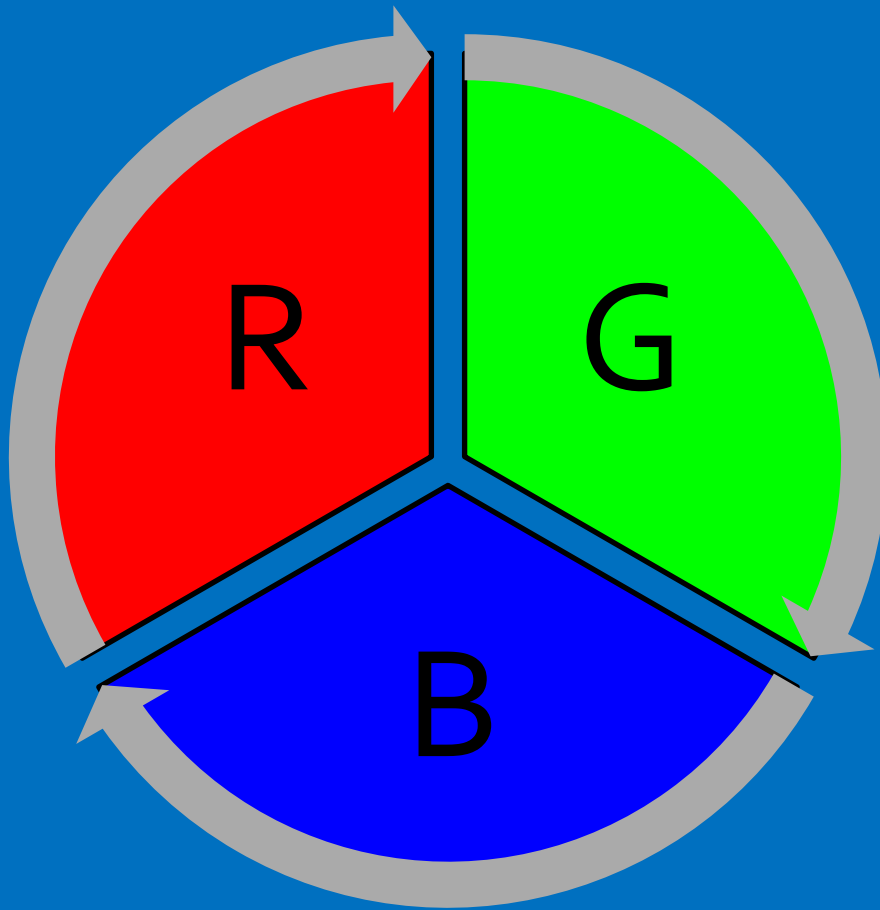
Different "languages" throughout

Image



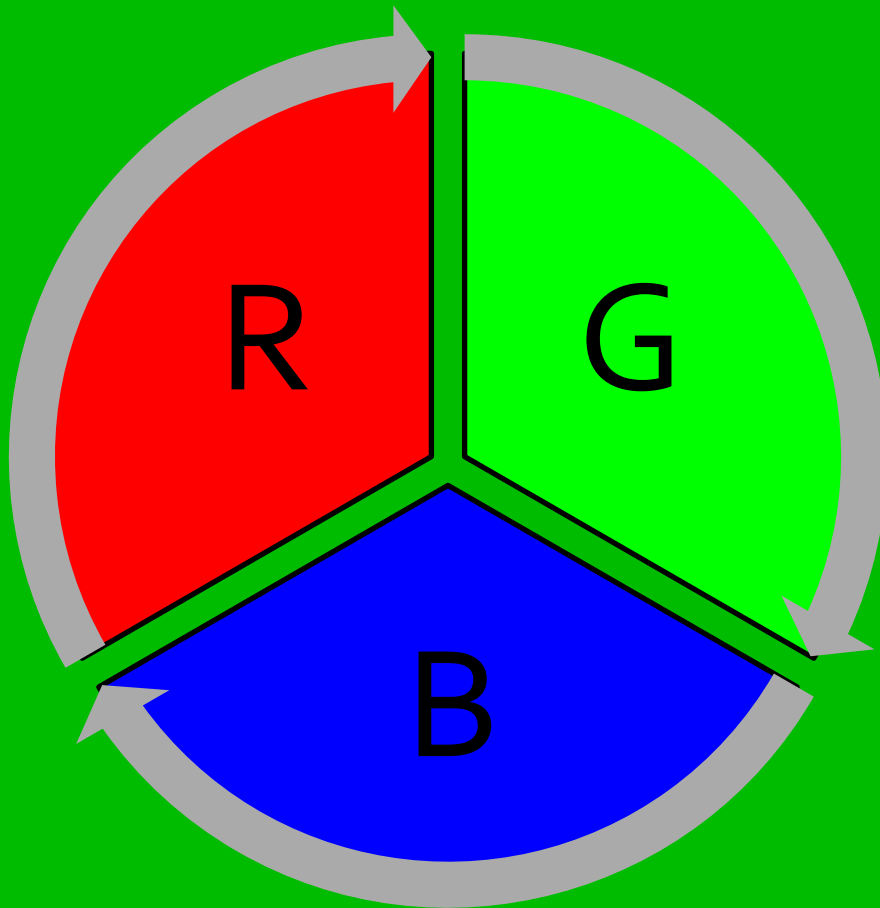
Eye sees the source of light
As the image forms on screen
Influenced by surroundings &
How monitor displays colors

Image



Do the colors look different?

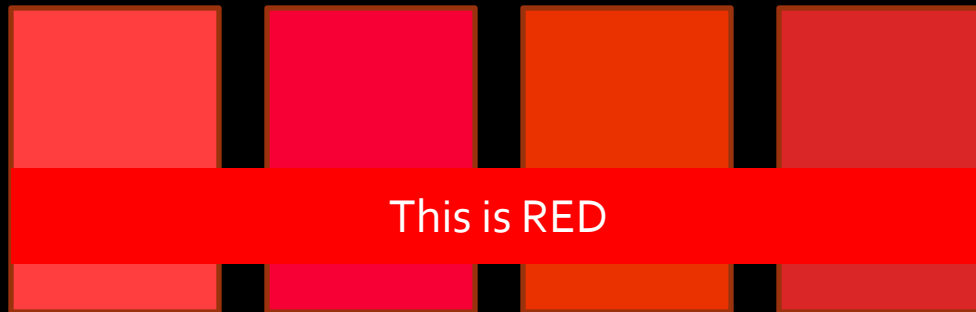
Image



How about now?

What is "red?"

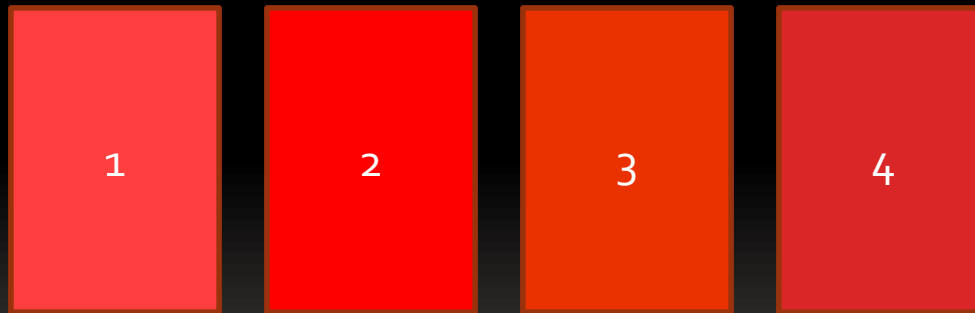
- Take a look at the following, which is red?



The answer is: None!

Imagine

- I give you the paint cans below and ask you to paint the wall “Red”
- The potential for error is obvious



Using numbers will eliminate the error
“Paint with #2”

Software

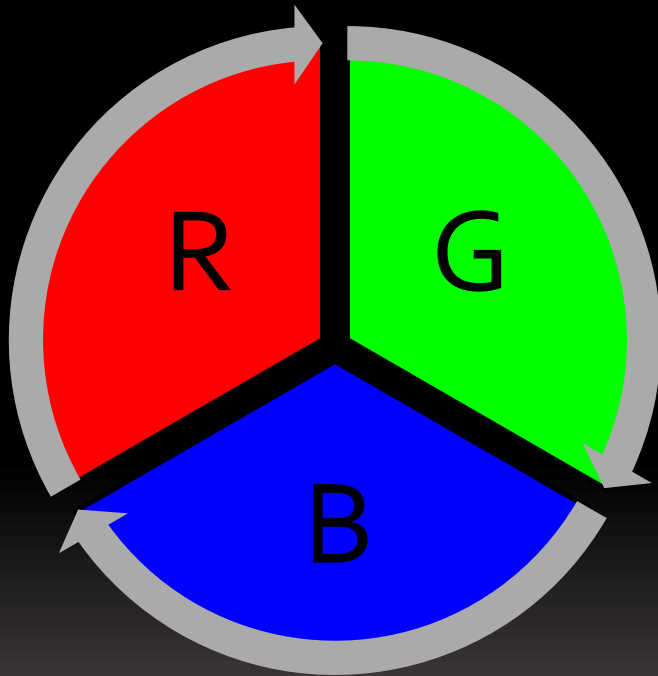
- Image is displayed and adjusted in a software
- How much color language does it know?
- How much color can it define and use?
- Surprise:
 - Photoshop works in grayscale!
 - For our convenience, it displays color

Printer

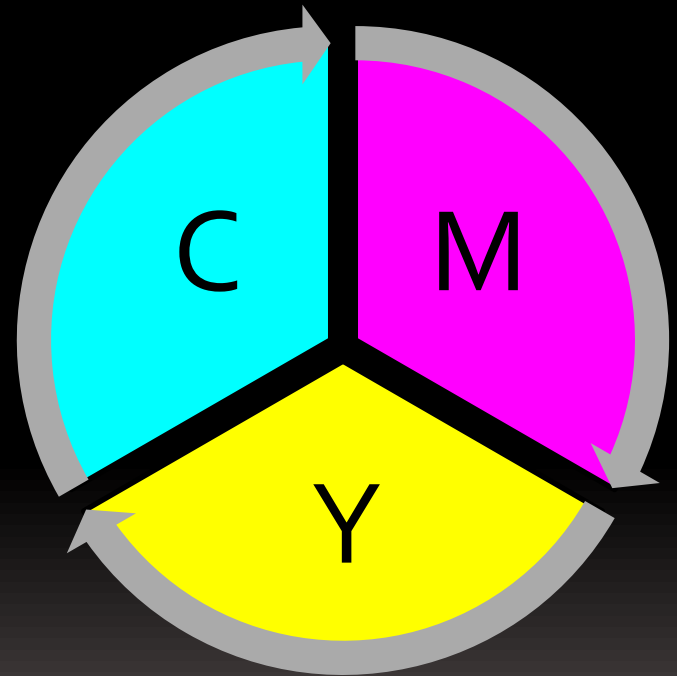
- Essentially a very precise spray can
- Uses “subtractive color” model and
- Secondary colors, Cyan, Magenta, Yellow
- To punch the blacks, it adds black to above
- Problem:
 - RGB needs to be converted to CMYK

Two color models (not spaces)

IMAGE



PRINT



Translation of color

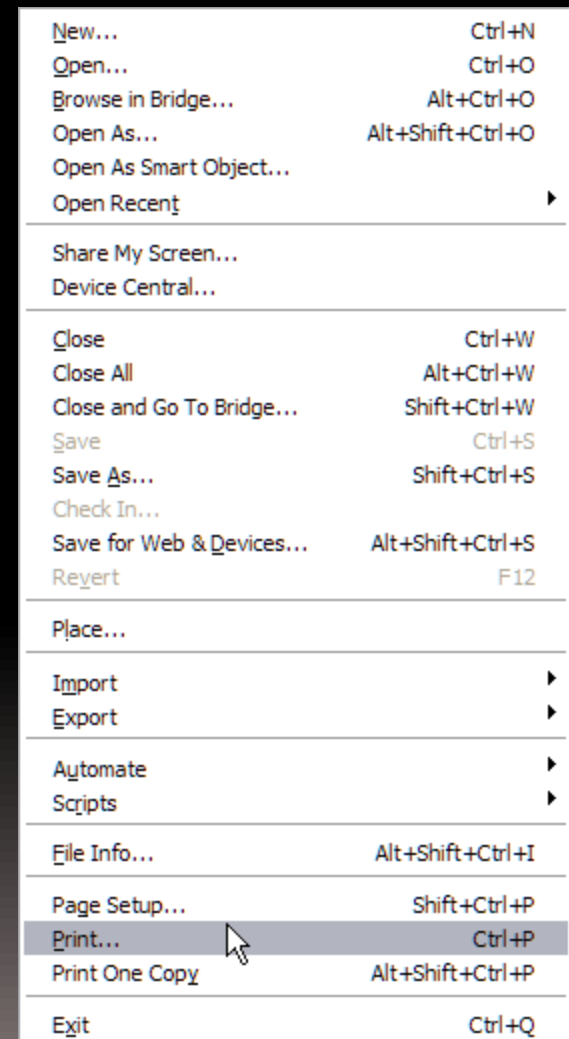
- One of the most critical steps to do right
- You may allow:
 - Photoshop do the translation, or
 - Printer do the translation, but
 - Not both at the same time

Environment

- Must do
 - Calibrate and profile your monitor
 - Have reasonably consistent illumination
 - No direct light on your monitor
- Should do
 - Do not work in a very colorful environment
 - Work in a large gamut color space ProPhoto
 - Work in 16 bit

Photoshop Nondestructive Editing

- Have an exit strategy in all your edits: layers
- Size and sharpen your image for print
- When ready to print, go to “File/Print”



Photoshop print dialog

The screenshot shows the Photoshop print dialog box with the following settings and callouts:

- 1** Printer: EPSON Stylus Photo 2200
- 2** Color Management: Document (Profile: ProPhoto RGB)
- 3** Color Handling: Photoshop Manages Colors
- 4** Printer Profile: SP2200 Premium Glossy_PK
- 5** Rendering Intent: Relative Colorimetric
- 6** Page Setup... button

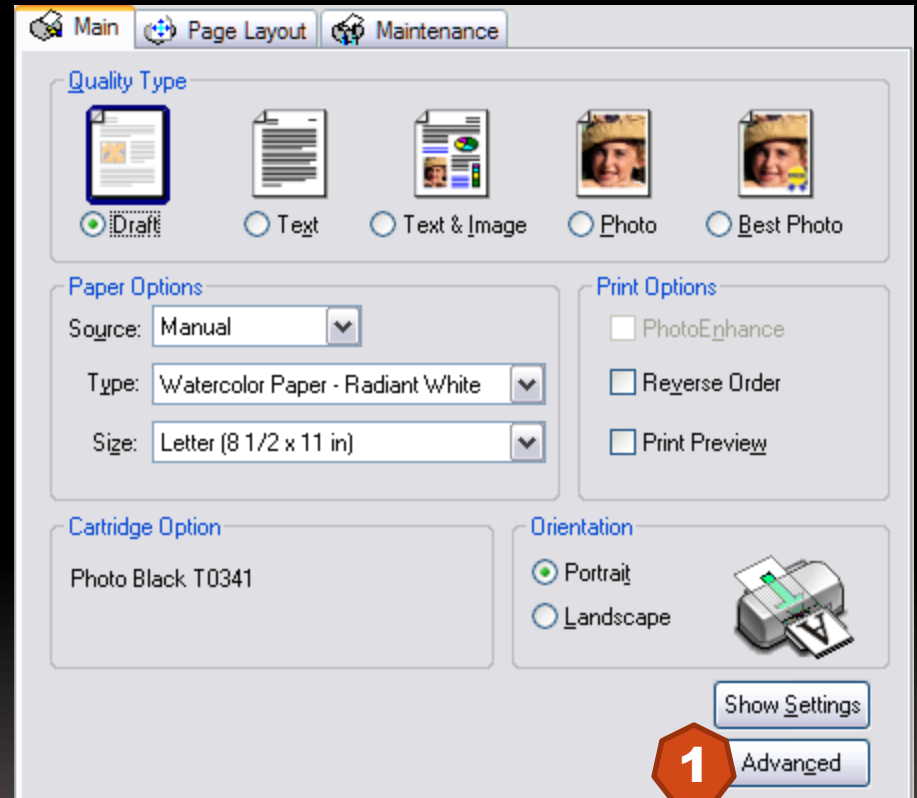
Other visible settings include: Copies: 1, Position (Center Image, Top: 1.018, Left: 0.493), Scaled Print Size (Scale to Fit Media, Scale: 50%, Height: 6.239, Width: 9.36, Print Resolution: 600 PPI), Match Print Colors, Gamut Warning, Show Paper White, Print Selected Area, Bounding Box, and Units: inches.

Buttons at the bottom: Cancel, Done, Print...

1. Choose printer
2. Color management option
3. Photoshop manages color
4. Select paper profile on printer
5. Choose rendering intent
6. Go to Page Setup

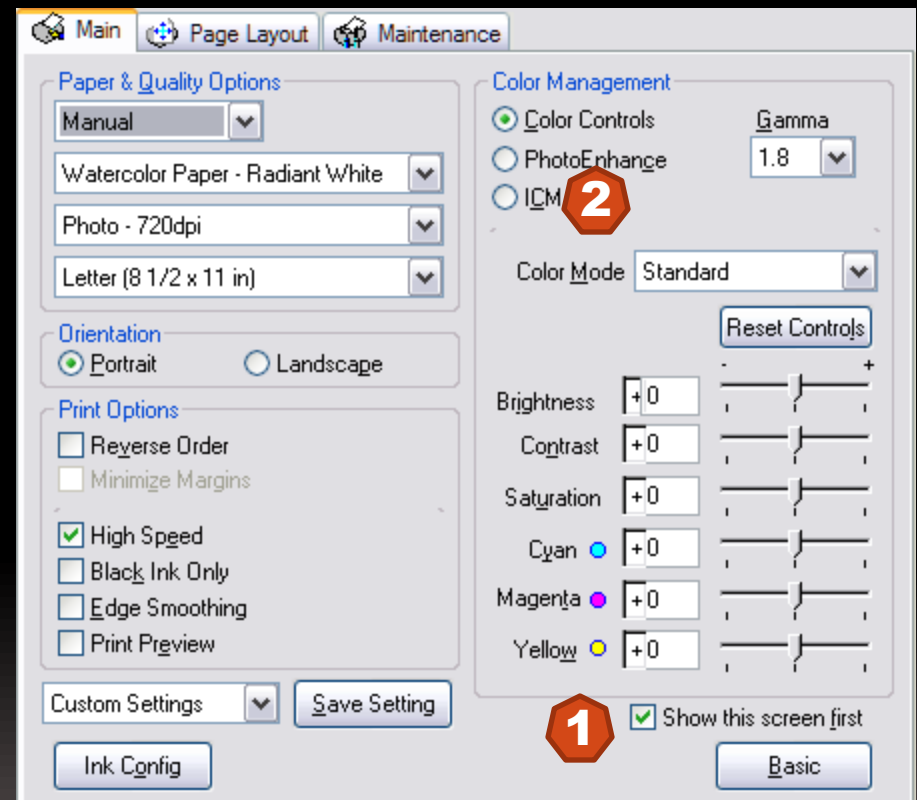
Forget “Basic” setup

- If you see this
 - Click on “Advanced”



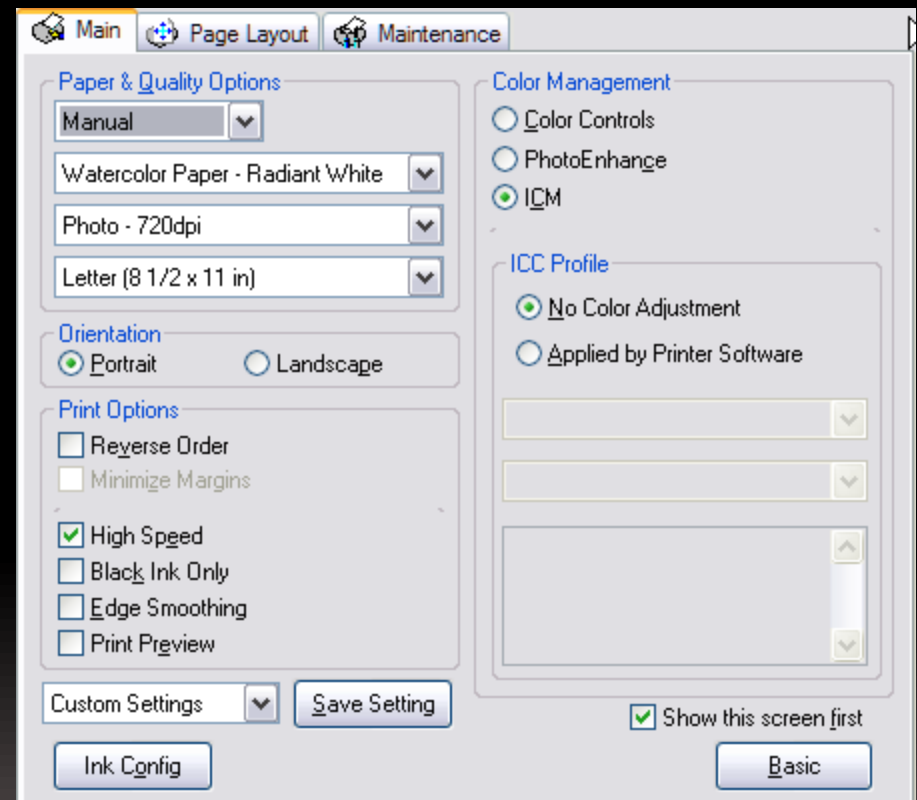
Use Advanced Printer Controls

- Put check mark to set as default
- Click on the radio button next to ICM to reveal options



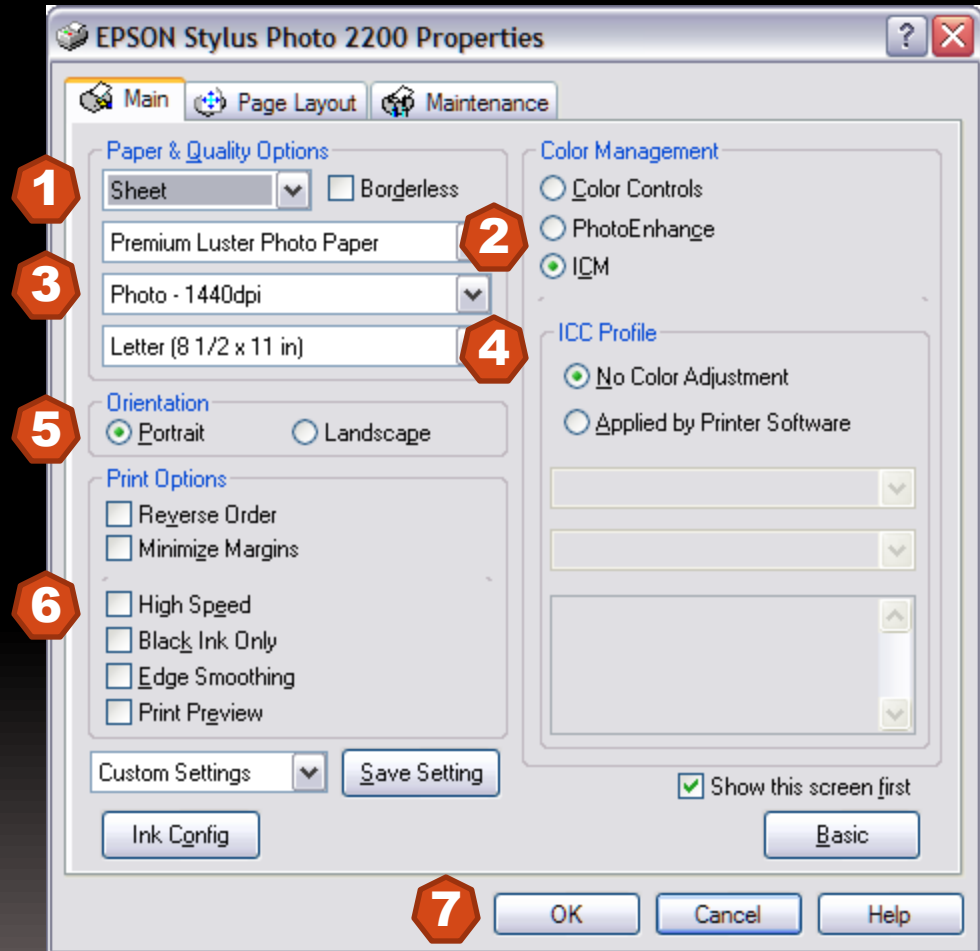
Turn off printer color management

- Click on the radio button next to “No Color Adjustment”, MUST do



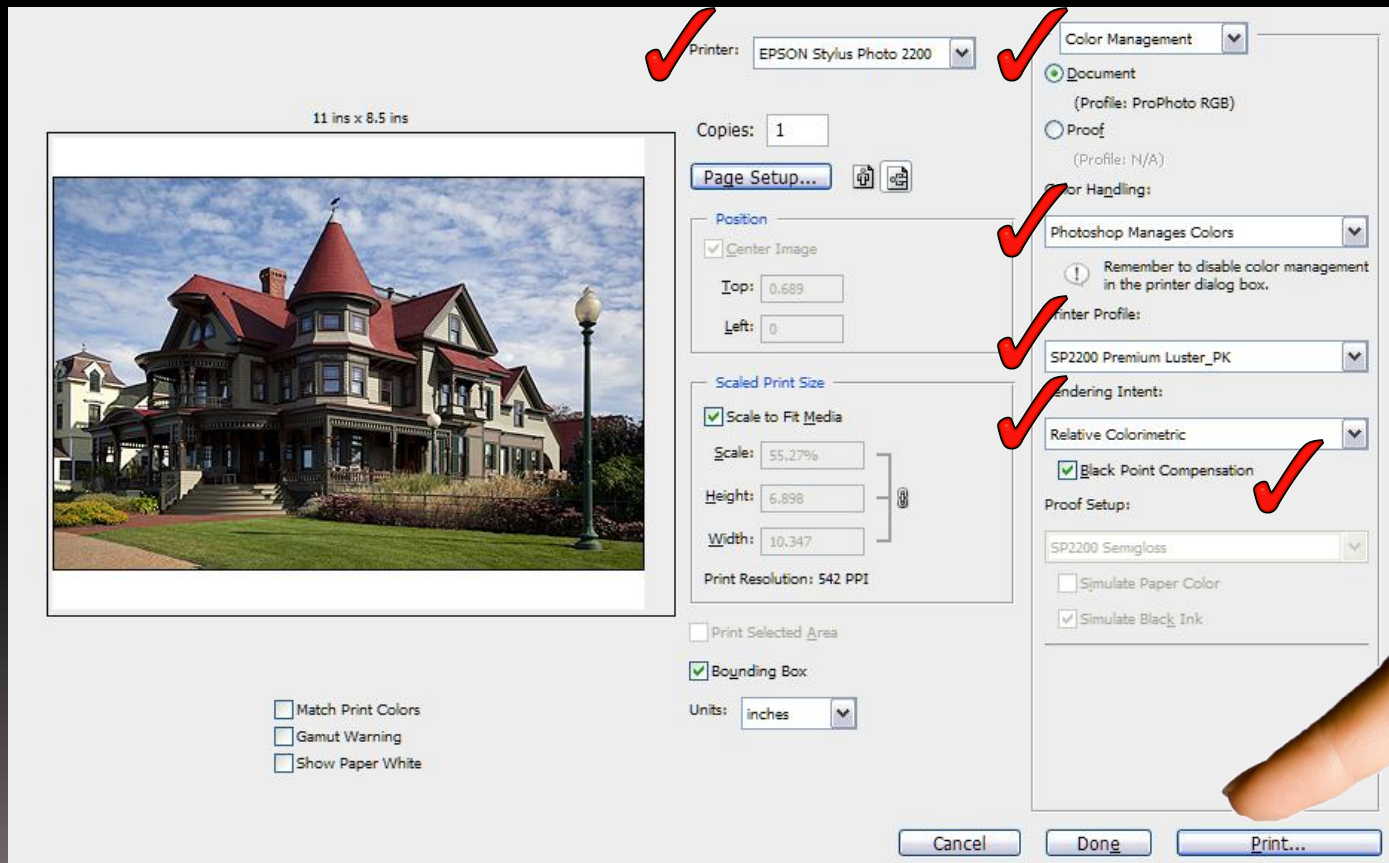
Settings

- Pay attention to
 - Paper feed
 - Paper type
 - Output resolution
 - Paper size
 - Paper orientation
 - High Speed
 - Optionally, save settings



Back in Photoshop

- Review settings, load your paper, click "Print"



Print Problems

- Banding:
 - Check high speed setting, turn off if on
 - Check nozzle, clean nozzles
- Ink beading:
 - Printed on wrong side of paper

Print Problems

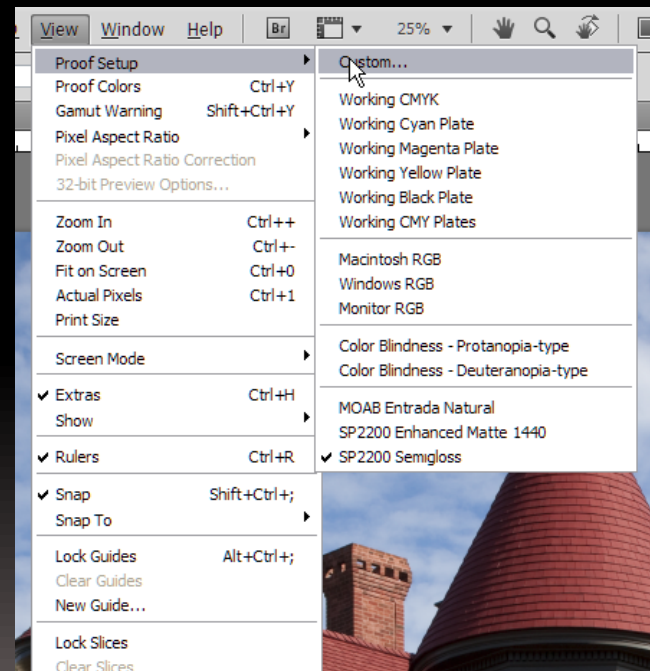
- Pale colors:
 - Wrong paper selection
 - Poor or no monitor calibration
- Wrong colors:
 - Double color managed
 - Clogged nozzle
- Partial image printed:
 - Wrong paper size

Proofing

- Ekin's rule #1: The ultimate print does not come on the first try
- Ekin's rule #2: Nobody can change rule #1
- Proofing is necessary
 - Soft proofing in Photoshop, an approximation
 - Hard proofing, printed on the actual printer
 - MUST DO: record keeping of settings
 - Add output adjustment layers as needed

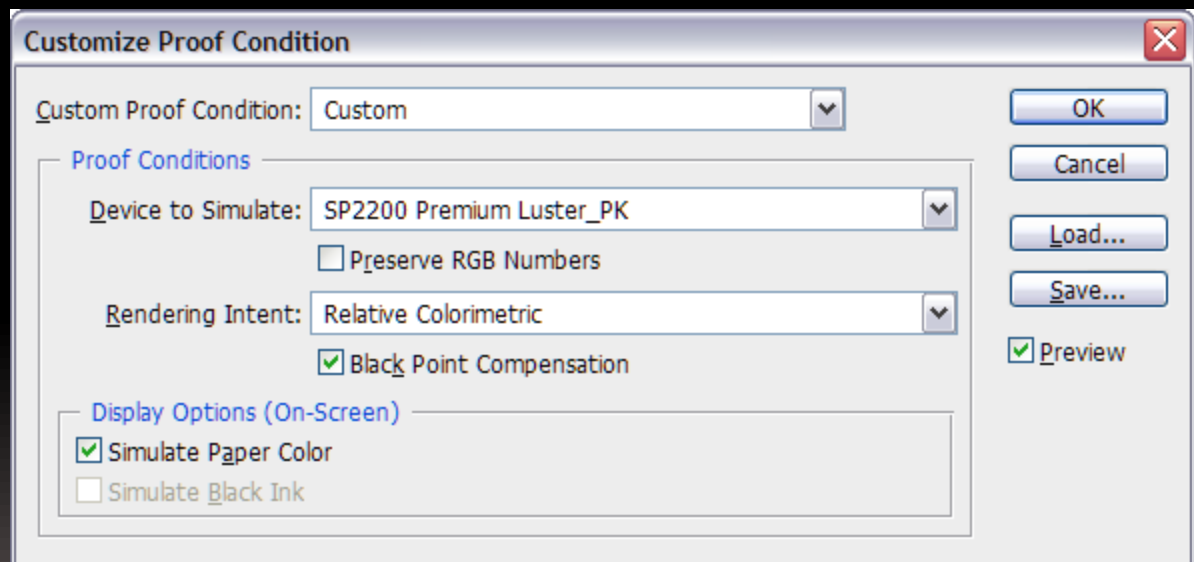
Soft Proofing

- An on-screen approximation of the output
- Useful to see out of gamut colors
- Process
 - Set up
 - View
 - Gamut Warning



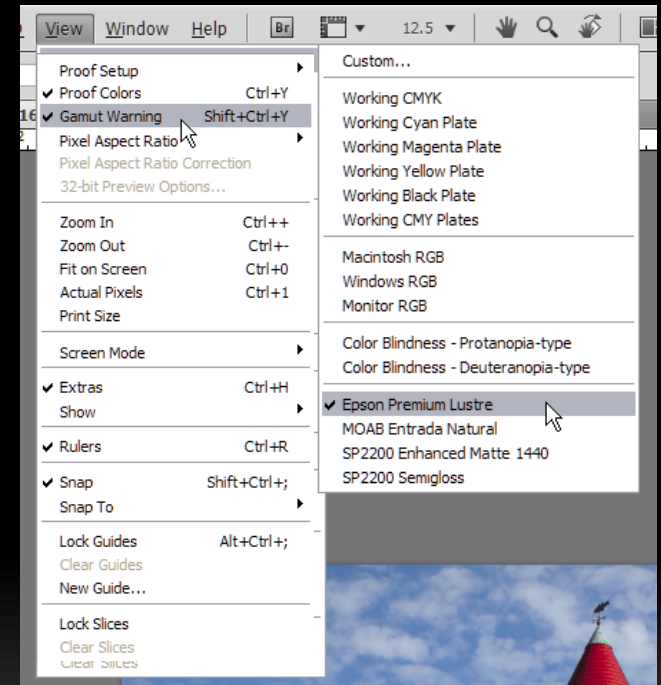
Soft Proof Setup

- Pick the printer/paper
- Save it with a name, use over again



Soft Proof Use

- Select (if not already) View/Proof Colors
- You will see a different color rendering
- Go back and turn on Gamut Warning



Gamut Warning

- Reds and greens go beyond the color gamut of Epson Premium Luster paper
- Fix them!



Print Proofing

- Soft proof is not sufficient
- Produce an actual print on the same paper
- Use small size for economy of paper and ink
- Try to fix with global adjustments

Print Evaluation

- Prints become visible from reflected light
- Less light – less brightness
- Use daylight balanced viewing light
- I use OttLite
- Solux is better

Proof strategy

- Blocked shadows?
- Too much or too little saturation?
- Too warm or too cool?
- Instead of multiple prints, a tip I learned from John Paul Caponigro works well

Bracket Proofing

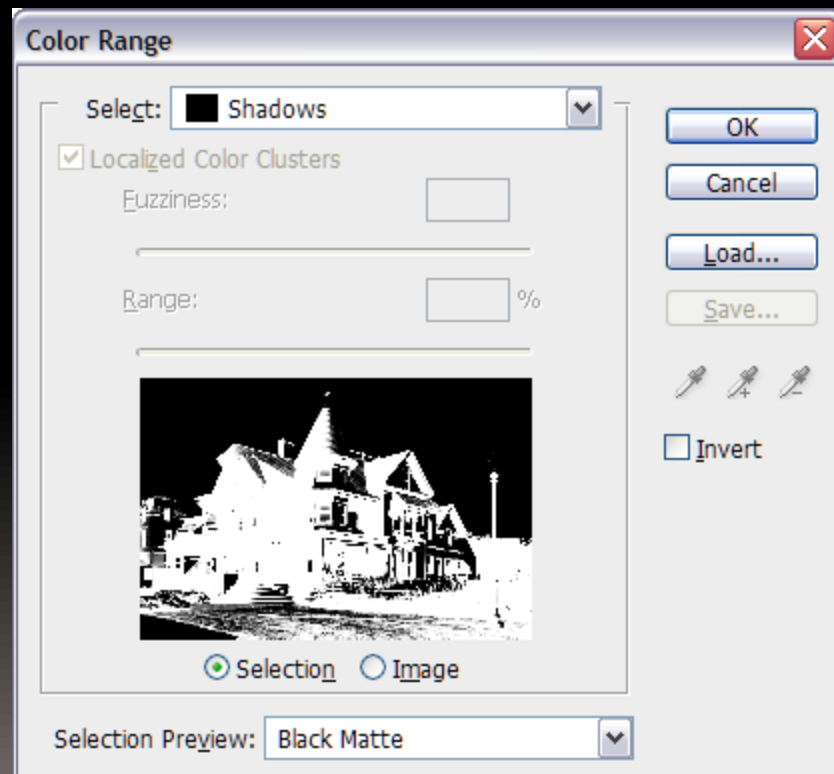
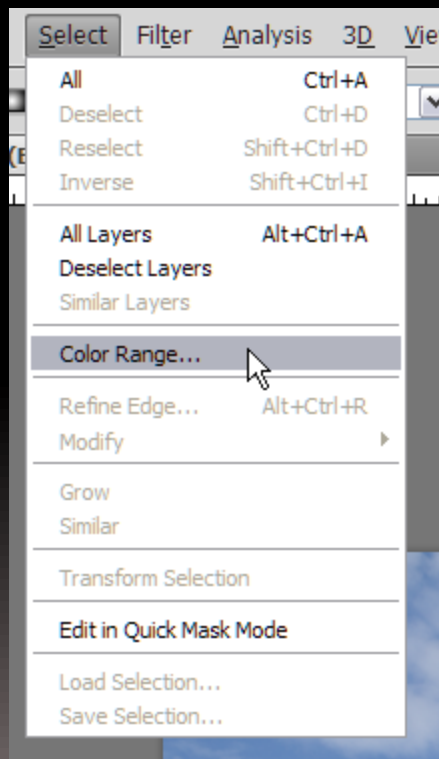
- Create the needed adjustment layer, say H&S
- Aggressively adjust, go overboard
- Add a layer mask
- Fill with gradient black to white
- Print a copy, choose the part you like
- Fill the entire mask with the gray shade of that spot
- Here is how to do it ...

Localized Adjustments

- Sometime we may need to open shadows or control highlights
- This involves using a mask for the adjustment layer
- Can we still create a multi strip proof?
- Of course we can!

Localized Adjustments

- Say I want to open the shadows, but how much?



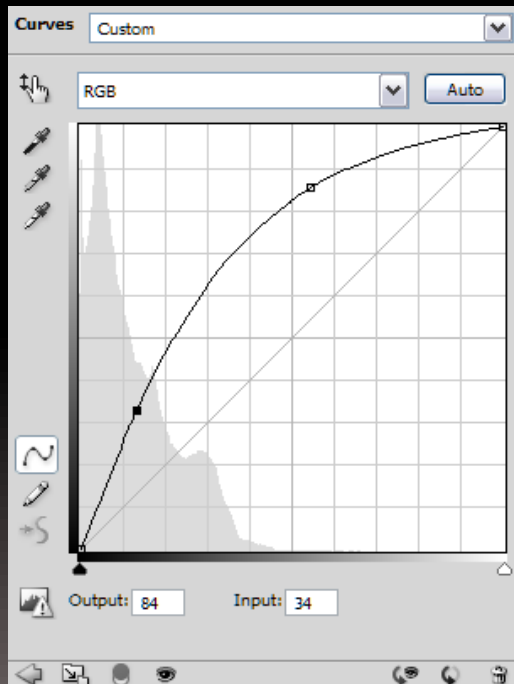
Shadows selected

- Adjustment layer will work on the selection



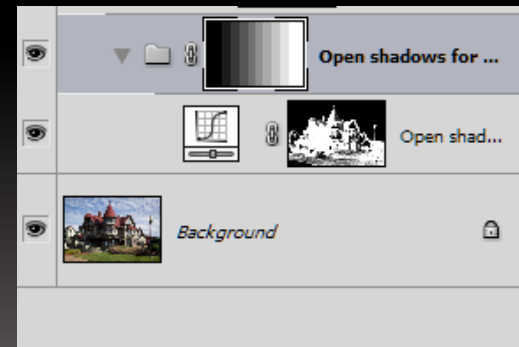
Add Adjustment Layer

- Add curves layer (levels will work too)
- Aggressively open the shadows



Add a Second Mask, Really?

- Yes really
- Target the new curves layer, press Ctrl-G
- A new group is created, name it properly
- Now add a layer mask to the group
- Fill with gradient B&W
- Posterize
- Print



Summary

- If you do not adjust your expectations you cannot adjust your output
 - It will not be right on the first try, that's OK
 - Calibrate your monitor, you must!
 - Adjust environment, light, color
 - Editing workflow, nondestructive, layers
 - Proofing, soft proof, hard proof
 - Proper viewing illumination, use right light

May your prints have the best gamut
And shine with the best D-max

Thank you