Overprint effect
when printing orienteering maps
- some technical observations

Finn Arildsen, 2016

Finn Arildsen

- Orienteer since 1975, running (slow) M55
- Author of Condes – course planning software, since 1985, first Windows version in 1997
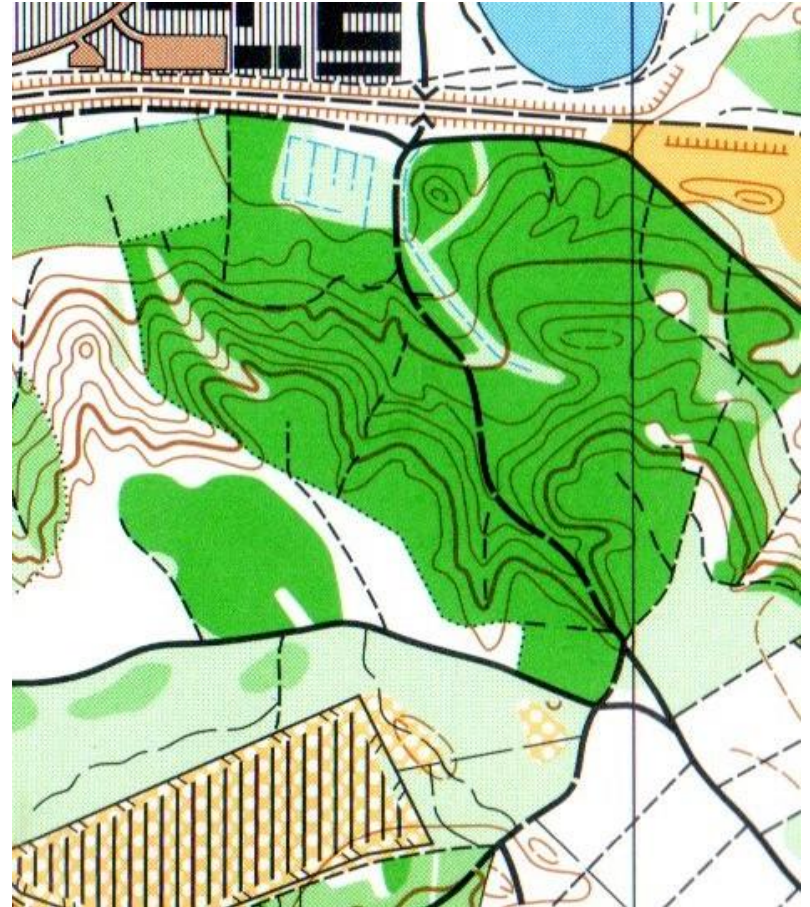- Member of the IOF IT Commission

What is overprint effect?

Real overprint

- Overprint effect is the effect seen when using traditional offset printing with spot colors

- Color tints "blend" to form darker colors where objects overlap

5 color offset print (1998)
(Spot colors: Black, Brown, Green, Blue, Yellow)
Brown and green blend to form a darker color

DISCLAIMER

- Overprint effect on orienteering maps is recommended/mandated by the ISOM/ISSOM – so "Is Overprint Effect needed?" is outside the scope
- Focus is on the basics
- Quality of different printer technologies is outside the scope

Why is it necessary to "simulate" overprint effect?

- Printing devices use process colors (CMYK), not spot colors
- Most digital printing is done with CMYK colors
- Print devices also do not support color "blending"; they knock out underlying colors
- Overprint effect can be simulated, but sometimes this does not happen

Real overprint
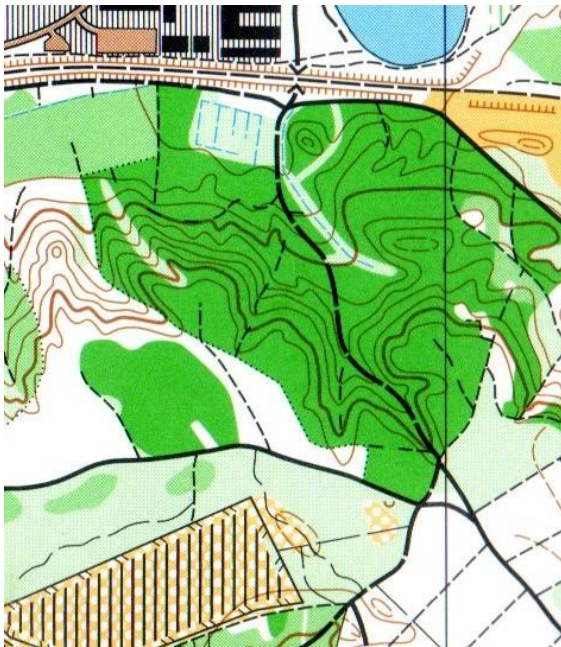
No overprint
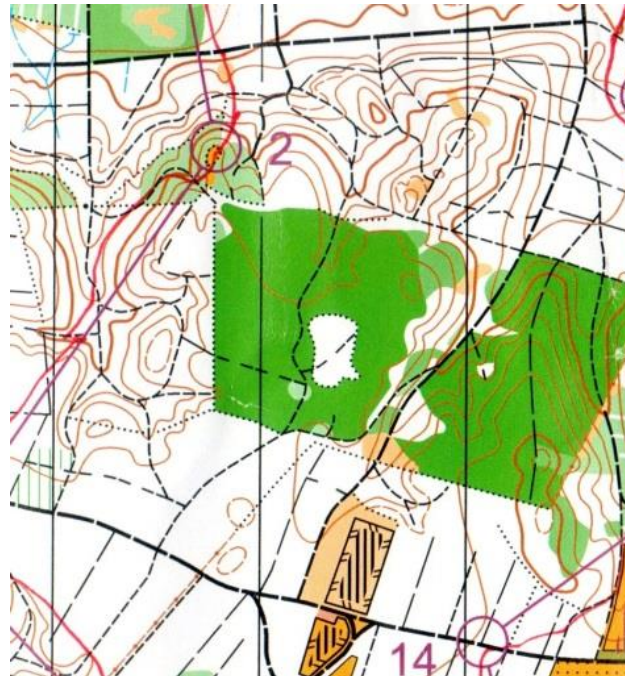
Brown "knocks out" green

4 color digital Print

Process colors: cyan, magenta, yellow, black (2006)

How to simulate overprint effect?

- To achieve simulated overprint effect, software needs to process the map and calculate the "blending" before printing.

- Overlapping objects are decomposed into smaller pieces.
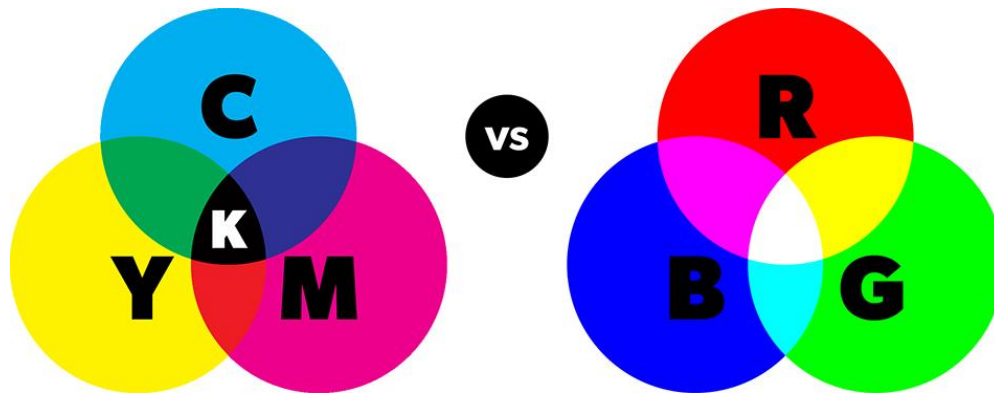
- This is often called "flattening".
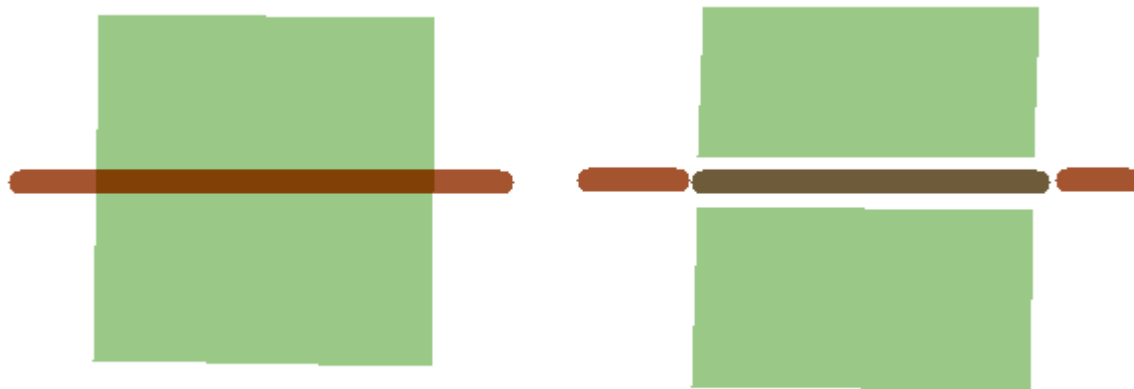
Adobe Reader support for flattening

- Adobe software packages, for example "Adobe Reader" supports flattening in the CMYK color domain.

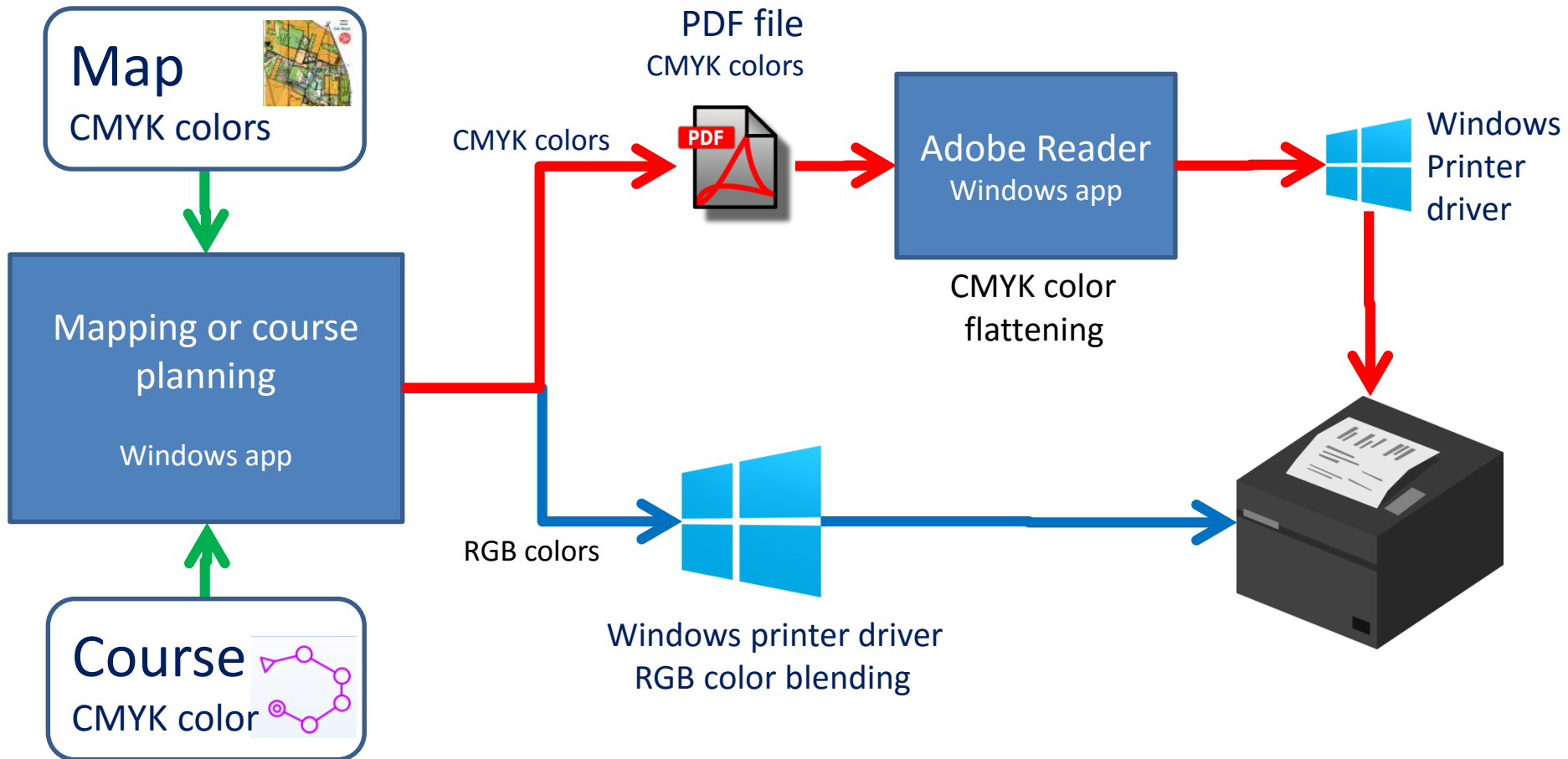- You may recognize this pop-up when printing from Adobe Reader:
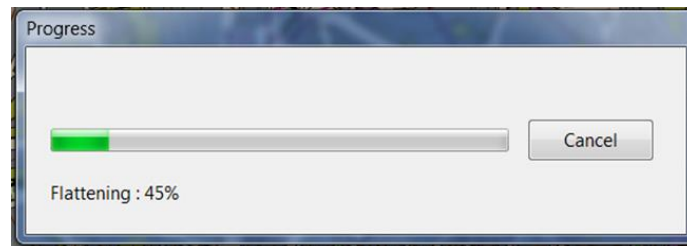
Application support for flattening

- When printing directly to a printer, a Windows app must convert CMYK colors to RGB (Red, green, blue) colors.

- Windows can "blend" overprinting colors in the RGB color domain

- This works well for most cases, but has certain limitations (see later slide)

Printing workflows

Map
CMYK colors

Mapping or course planning

Windows app

Course
CMYK color

CMYK colors

PDF file
CMYK colors

Adobe Reader
Windows app

CMYK color flattening

Windows Printer driver

RGB colors

Windows printer driver
RGB color blending
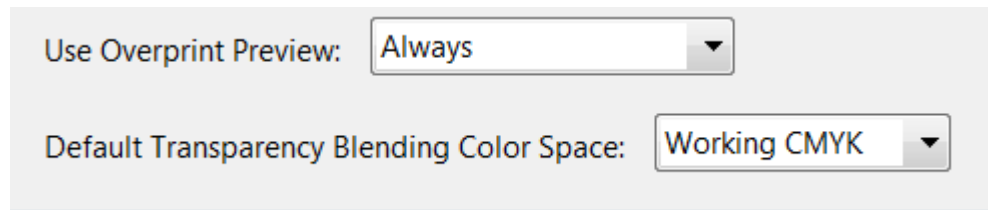
PDF workflow

1. Export a PDF file with overprint markings for relevant color layers (brown, blue)
2. Print PDF file from Adobe Reader

Make sure to configure Adobe Reader preference to use "Overprint Preview":

Use Overprint Preview:	Always
Default Transparency Blending Color Space:	Working CMYK

Or – preferably – use "Blend mode DARKEN" when exporting the PDF file, instead of overprint. This doesn't require any specific settings in Adobe Reader

Regular orienteering map

PDF printed with Adobe Reader
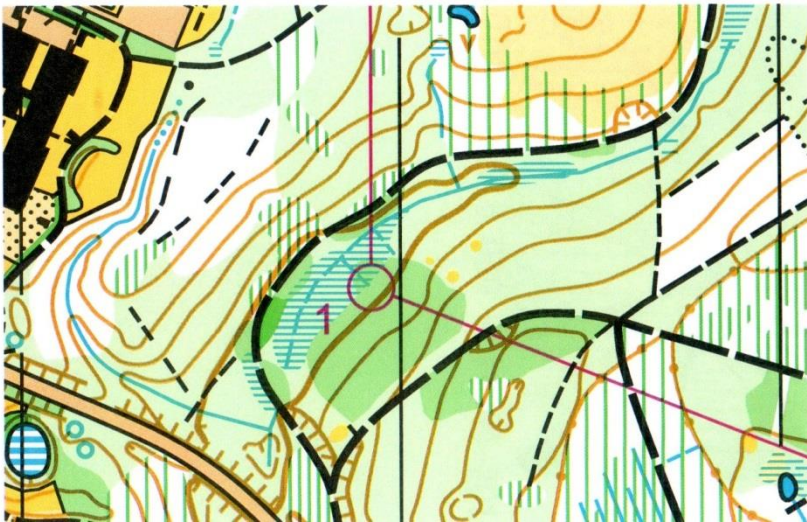
Direct print on non-PS-printer

With proper software handling the CMYK/RGB conversion, in most cases there is no significant difference between the results. The PDF flow produces slightly nicer output.

Sprint map
Issue: ISSOM vegetation

PDF

Adobe Reader ignores PDF overprint operator!!

Using PDF blend mode "DARKEN" overcomes the problem

Direct printing

Dark green vegetation blends poorly with brown contour

Conclusion

- When printing REGULAR orienteering maps, you can export PDF and print via Adobe Reader, or you can print directly from the application. There is no significant difference in the output.

- When printing SPRINT maps, there are some pitfalls, mainly related to the dark green vegetation color. Printing via PDF and using "blend mode DARKEN" seems to create the best result

Contact info

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