In Which Ways do the New Printing Techniques Change the Layout of Orienteering maps?

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It was barely noticed that the printing technique for orienteering maps had changed in Switzerland. The maps for WOC 2003 in Rapperswil were printed using only 5 colours: yellow, green, blue, brown and black. 9 years later, the sponsor logos on the orienteering maps for WOC 2012 are shining in all different colours. Those maps, however, were printed using only 4 base colours. How is that possible?

Up to only a few years ago, most orienteering maps in Switzerland were printed using the offset spot-colour method. This means that for each of the 5 base colours, yellow, green, blue, brown and black, the corresponding colour was filled into the printing machine and one colour after the other was then printed onto the map paper. The advantage of the spot-colours is that they cover a wide spectrum and that it is possible to create overprinting effects. An example would be that contour lines in thickets appear somewhat darker than on white paper. In combination with the offset printing method one achieves a very high resolution so that map objects can be printed with razor-sharp clarity (see Fig. 1).

Figure 1: Orienteering map section printed with the True-colour offset printing method

The disadvantage of the spot-colour method is that for each colour the same paper has to be printed upon again. Considering the numerous logos of the federations and sponsors on the WOC 2012 maps in Lausanne, it would have been a very costly affair. It would be even almost unthinkable to print a picture with more than 16 million colours!

CMYK Offset printing has taken over from Spot-colour Offset printing in Switzerland

For decades, a printing method using the 4 base colours **C**yan, **M**agenta, **Y**ellow and **K**ey-Black which mixes millions of different colours has been used for magazine and accidental printing such as for brochures, leaflets and flyers. This is called the four-colour or CMYK offset printing method. It allows printing logos and map headings in more than the usual 5 orienteering map colours. Since this printing method has existed for a long time and is widely known, it has been greatly standardised and is thus reasonably priced.

Figure 2: Orienteering map section printed CMYK offset printing method, not optimised

Despite those advantages one ought to consider some points that are important for the printing of orienteering maps: as the colours are no longer printed sequentially. The four tiny colour dots, out of which the desired colour is mixed, are printed next to one another. Subsequently, the map objects do not appear razor-sharp any longer as is the case with spot-colour printing (see Fig. 2).

Additionally, the overprinting effect of contour lines in thickets does not exist anymore. The low resolution can be simulated to a certain point through accidental

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(stochastic) arrangement of the colour dots (see Fig. 3) and the missing overprinting effect can be simulated up to a certain degree.

The map commission of Swiss Orienteering has been following printing specialists when doing their tests to achieve the best possible printing result of the CMYK offset printing method as compared to spot-colour printing. As a result the break-through for the CMYK offset printing method for orienteering maps has definitely been achieved.

Figure 3: Orienteering map section printed with the CMYK offset printing method, optimised with a stochastic raster

The new map layout layer from OCAD 11

For quite some time, OCAD has been able to release printing databases using the CMYK offset printing method for the map content. However, one needed additional means in order to print federation or sponsor logos in their raster formats (e.g. TIFF, JPG, GIF, PNG), so they were vectorised or placed as a background map; both methods were very time-consuming.

To make it possible for the OCAD user to utilise the advantages of the CMYK offset printing method to its fullest extent, the software developers have introduced a map layout layer for the newest version of OCAD. On this layer it is possible to place headings, legends or pictures in raster data formats (e.g. logos) over the actual map content. This way, those elements can be moved, grouped, hidden or saved independently. In order to alleviate further the placement and exact alignment of the map layout elements, additional rulers and ruler guides were added.

As a new feature, map legends can be automatically generated based upon the symbols used on the map. Also, previously defined North arrows and scale bars can be placed. The positioning of trim marks for printing, round out the new map layout menu.

Lots of map layouts will appear more colourful thanks to the CMYK offset printing method. The new map lay-out layer from OCAD 11 with its functions (see box) is simplifying the design significantly. Thanks to this improved efficiency, a lot more time can be invested in the actual map that is still considered the essential part of an orienteering map and requires fullest attention.

Specific functions of the map layout layer in OCAD 11

- editing map layout layer
- saving map layout layer
- importing map layout layer
- hiding map layout
- importing North arrows
- Importing scale bars
- adding map legend
- adding trim and bleed marks