

## Working with colour images

In October, Consistent Software launched its revolutionary Wiselimage for AutoCAD, a true hybrid drawing editor and raster-to-vector converter for any type of scanned raster images including colour, greyscale and monochrome.

So now we have great tools to work on kinds of scanned images. While some simple editing operation can be applied straight to the original colour scanned image, other more complicated operations may require the conversion of the colour image to monochrome.

### Simple editing operations

After inserting colour image in AutoCAD, you can apply the simple editing operations, such as deskewing, cropping, mirroring and rotating. To do that, go to **rlmage** menu and choose the required procedure.

**Deskewing** is used to correct an image skew introduced during scanning. The whole image is rotated about its central point in order to eliminate either horizontal or vertical skew. The image automatically expands to fit the rotated image.

Using **Cropping**, you can reduce the size of an image to a specified rectangular image area size.

Using **Mirroring**, you can mirror an image about either the vertical or horizontal axis, crossing the image centre.

Using **Rotating**, an image can be rotated about its central point using three fixed rotation angles (90, 180 and 270 degrees) or an arbitrary angle.

Also, if you are dealing with a nice simple image, you can trace it using, for example, the tracing polyline mode.

### Colour Correction and Colour Filtration

To prepare image for more complicated operations, such as binarization, layering, raster editing and vectorization, you can use quite a few colour correction and colour filtration tools.

#### Modifying image brightness.

You can adjust brightness, contrast, hue and saturation for colour and grey images. From **rlmage** menu choose **Brightness/Contrast** and use the appropriate boxes or sliders (*figure one*) to modify the value of parameters, such as Brightness, Contrast, Hue and Saturation. The results are displayed in the Preview Window. When you are happy with changes, click Apply to run operation.

**Brightness** sets colour lightness or darkness. It is usually measured in percentage from 0% (black) to 100% (white). Modifying **contrast** allows you to increase or reduce the image brightness range. If the contrast value increases, it causes an increase of the brightness range, i.e. darkening dark colours and lightning light ones. Colour **hue** usually means colour, and **saturation** means colour purity.

#### Conversion to 8-bit indexed.

To facilitate colour management you can convert a colour image to 8-bit indexed colour. This tool allows you to reduce the size of an image through changing its colour depth from 24 bits per pixel to 8 bits per pixel. This is also the way to tune colours precisely.

When you apply this command to a RGB colour image, the number of colours is reducing to 256 (or less). You can further reduce this number by deleting selected colour or by merging several colours in one.

Choose **Convert to 8-bit indexed** operation from **rlmage** (*figure two*). By pressing the **Set Auto Palette** button, you force Wiselimage to reset colour palette automatically. Wiselimage determines the set of colours that most truly represent the image and places them into the colour sample table. In our case, the table contains 30 colours.

You can continue editing colour palette by merging the colour samples to mean group (select colours and press the **Merge** button), or deleting colour from the table (select the colours and press **Delete** button), or adding a new colour (press the **RGB** button and choose a new colour information).

To prepare an image for more complicated editing and vectorization operations, you will need to apply binarization or colour separation methods,

which allow you to create monochrome raster images.

Vectorization of a layered monochrome raster image is considerably more effective than vectorization of an original colour scan.

### Binarization methods

Binarization creates a new monochrome image of a specified colour, which is placed on the specified layer. Using the specific criteria, the program defines which pixel of the original colour image should become black (foreground pixels) and which one should become white (background pixel). The criterion for division of pixels into two sets is defined by the selected binarization method and its parameters (threshold values or a set of colour range). For example, from our image of a scanned map we want to extract roads (yellow) and rivers (blue) and place to separate monochrome layer (roads\_rivers). To do that, choose **Binarization** from the **rlmage** menu.

Now we need to tune the range method. From the Range tab in Binarization dialog box (*figure three*), choose, for example, **Range by HSV** (hue, saturation and brightness). Using the **Pick Smart Colour** eyedropper, click on the roads (yellow) and rivers (blue) on the original image. Adjust the saturation and brightness parameters using sliders.

The **Noise Reduction** slide sets the sensitivity of the binarization algorithms to small details in the image. If the maximum level of noise reduction is set, the quantity of raster noise and holes in the obtained monochrome raster objects is reduced. However, the high level of noise reduction decreases the binarization results of small and thin details, such as texts, thin lines, etc. since small details can be taken for noise.

The preview window dynamically displays the binarization results for part of an image. If you are happy with conversion results in the Preview Window press the **Apply** button and binarization method will be applied to the whole image.

You can save your customized binarization parameters in template.

If you want to do binarization using **Threshold** method, choose the **Threshold** tab in the Binarization dialog and from the **By** list choose an appropriate method (by **RGB** or **Grey**) and set the threshold parameters using the slides.

As I mentioned before, the binarization method is recommended for use when you need to extract different objects and place them on a same monochrome layer for further editing or vectorization.

### Colour Separation

Colour separation is another method of obtaining a monochrome image from a colour one. This method allows a colour image to be converted to a set of monochrome layers.

A black-and-white representation of each pixel of original image will be placed on particular layer. The procedure for this will be described in the next issue.

For more information, please visit the Rastertech web site: [www.rastertech.com.au](http://www.rastertech.com.au)

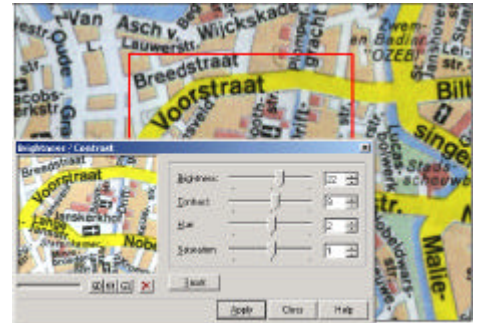


Figure one: brightness/contrast dialog box

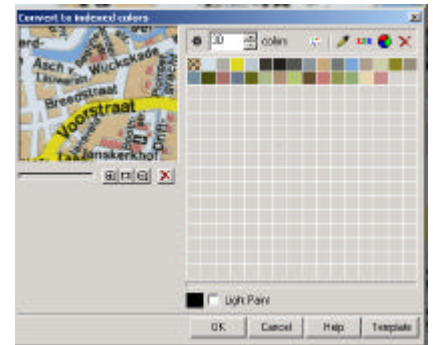


Figure two: convert to indexed colours dialog box

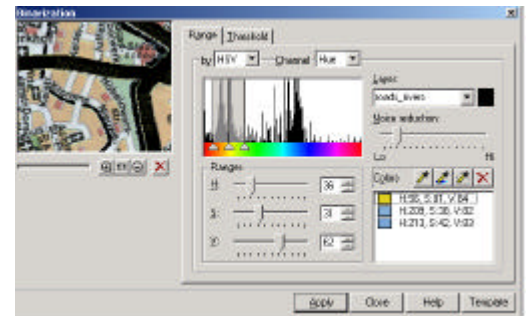


Figure three: binarization by Range

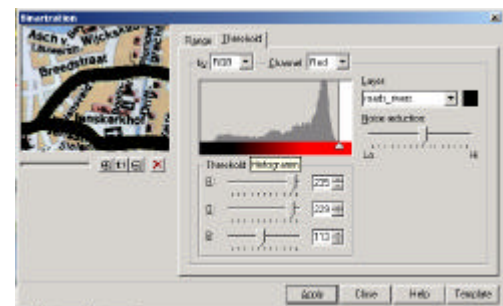


Figure four: binarization by Threshold