

Introduction

Welcome to SpotMatrix – a Windows 11 (and MacOS and Linux) utility for previewing and managing multilayer print jobs. The application is designed to be compatible with Alps MD series thermal ink printers.

The applications shows a representation of an entire print job, including white underlay, CMYK colour, spot colours and metallic inks allowing the user to preview a print job before sending to the printer.

The application includes a low-level USB driver which communicates directly with a compatible Alps printer either via a USB to parallel adaptor or the native USB port on the MD-5500 so no Windows Printer Driver is required.

While printing, the user is prompted to insert ribbon cassettes as they are required simplifying the process of printing complex multilayer print jobs.

PNG, SVG and PDF images can be loaded directly into the application. PNG images should be 600dpi, and ideally, include an Alpha Channel and be a compatible paper size.

If used with a virtual PDF printer driver, images can be spooled to the application using File->Print from any windows application. This allows a job to be built up in layers before committing any ink to paper. The application acts as a preview bridge between your drawing application and the printer.

Spot colour layers can be generated from colour artwork or a ribbon colour can be specified when a layer is loaded.

Aftermarket ribbons are supported and care has been taken to match the displayed behaviour (overprint, double printing etc) as closely as possible to the physical ink's behaviour.

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SpotMatrix is an independent software product and is not affiliated with, endorsed by, or sponsored by Alps Alpine Co., Ltd.

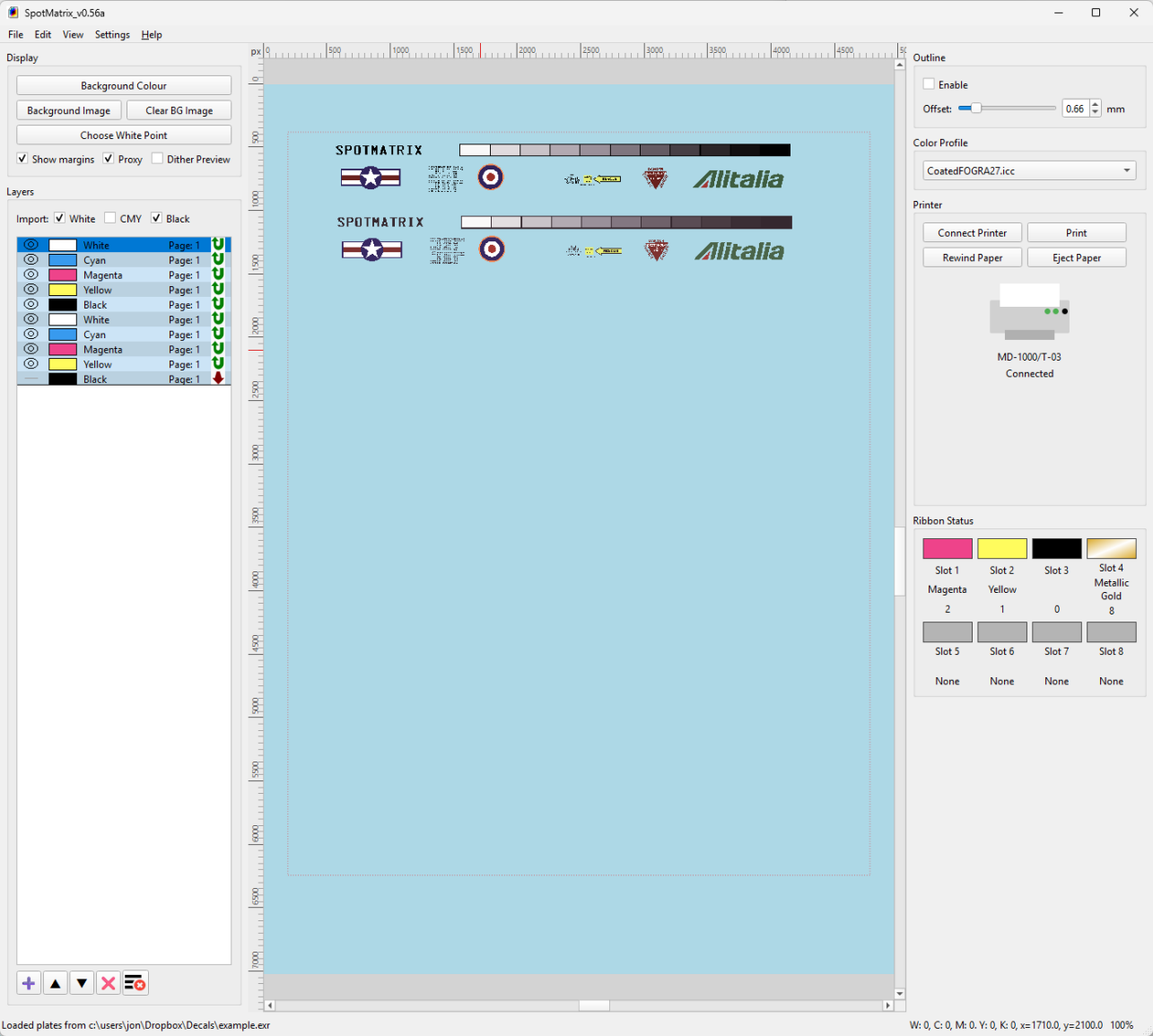
Elephant's Rocket Inc. and the Elephant's Rocket spot colour ribbon range are trademarks or trade names of Elephant's Rocket Inc, Fukuoka, Japan. SpotMatrix is not affiliated with, endorsed by, or sponsored by Elephant's Rocket Inc. Ribbon colour data is included for compatibility purposes only.

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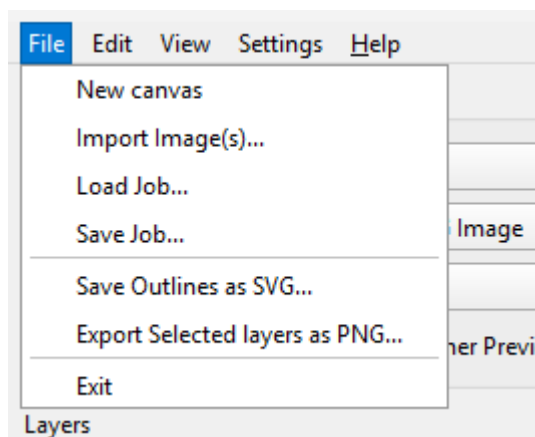
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Main Window



File Menu



New Canvas clears the layers and displays a blank page. See **Global Settings->General Tab** for page size options.

Import Image(s)

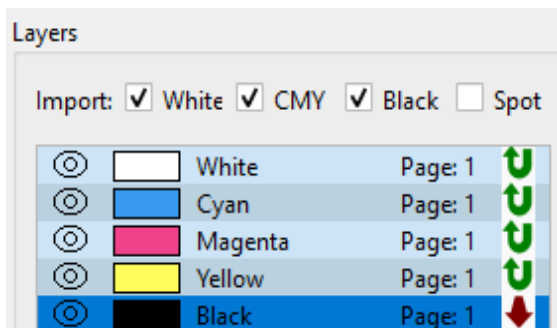
The application's native import format is PNG. However SVG and PDF files can be imported if the user has inkscape (SVG) or a command-line PDF rasterizer installed (see *Installing Utility Applications*)

PNG files should be RGBA at 600dpi and A4 or US Letter sized. If your image is smaller than the page, it will be loaded at the top left of the canvas inside the margins.

Exr files can be loaded here which will add the included layers to the layer stack.

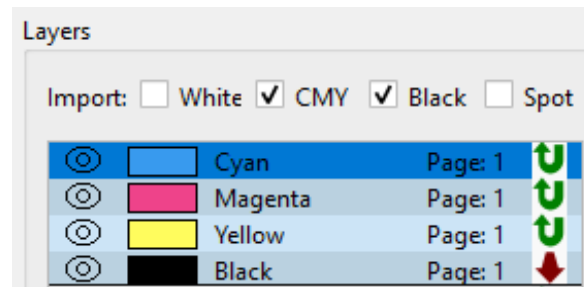
Color Images

If full color PNG images are imported they will be converted to CMYK and use the image's alpha channel for white. The last plate in the converted layers (usually black) will have its rewind flag set to false. This indicates the page will be ejected after printing that pass. If you want to keep the paper loaded – right click on the layer and click **Toggle Rewind/Eject**. Rewind is indicated by a green u-turn icon. Eject is indicated by a red arrow:

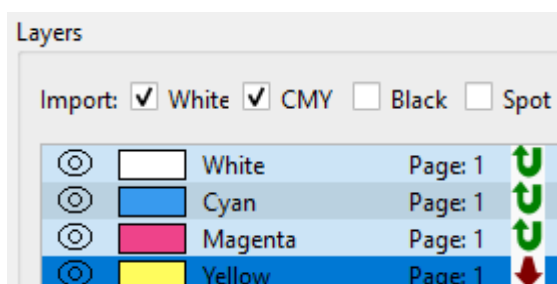


To control the layers created from **File → Import Image** use the **Import** checkboxes.

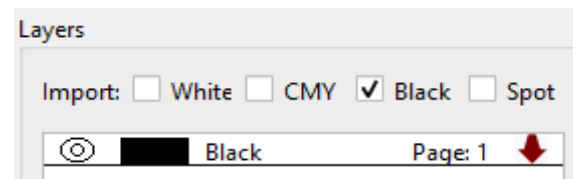
If a white underlay is not required deseelct the **White** checkbox:



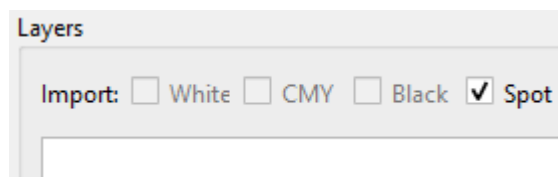
If **Black** is deselected – the K component will be merged into the CMY layers. This means you can print full colour with white underlay without ribbon changes on a printer with only 4 ribbon slots.

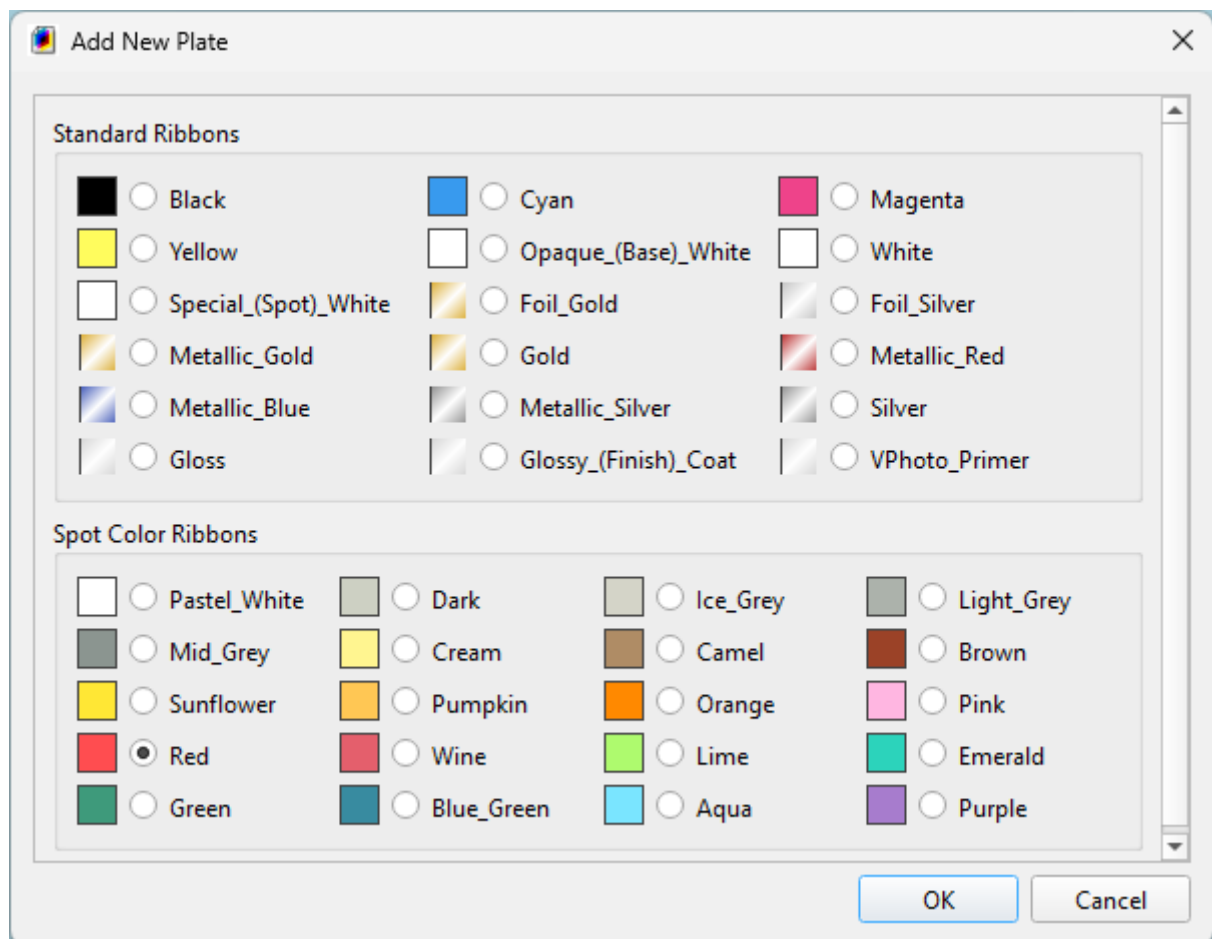


If only **Black** is selected – the luminance of the imcoming image will be used.

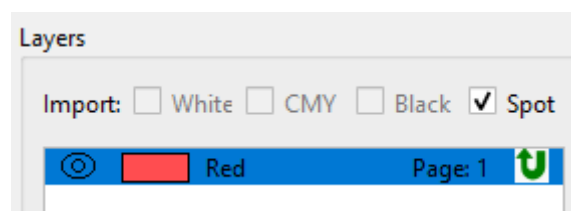


If **Spot** is selected the subsequent file import operations will prompt for a ribbon colour and be loaded as a single spot colour layer.





If the image is colour the luminance will be used – ensure spot layers regions are fully black in the source image



Spot Colors

black and white (greyscale) images are automatically detected as spot colours and will be imported as a spot layer. If any part of the filename contains a known ribbon colour then SpotMatrix will automatically assign the correct ribbon. If only one file is imported, and it has no ribbon name hint in the filename, then SpotMatrix will prompt for a ribbon assignment.

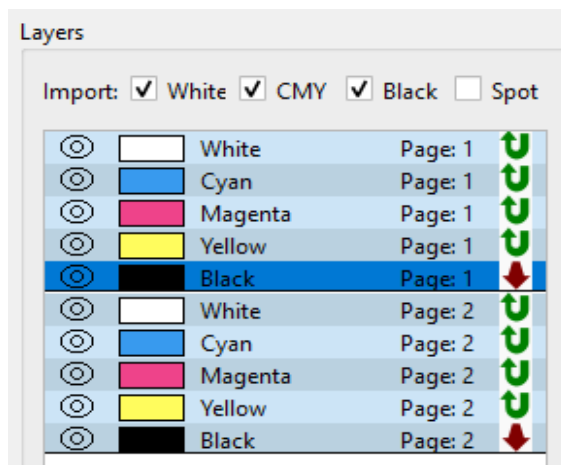
If the user has saved PNG files from Inkscape using the spot colour exporter extension (see **Exporting From Inkscape**). Selecting the base file name will automatically import and assign any associated spot layers.

Multiple Image import

If multiple files are selected, conversion to CMYK or spot colour layers are carried out in the same manner – however multiple unknown spot layers will be imported without a ribbon assignment. The user can easily assign ribbons to each layer in the UI.

Multiple Pages

Imported files are added to the end of the plate stack. If the last plate of a page is set to Eject – this marks a page boundary. The plate list shows a line delimiting page boundaries and the page number for each plate. Plates from one page will be displayed at any time. To change the displayed page, click any plate in the plate list. Page boundaries are calculated dynamically so changing the Eject/Rewind behaviour of a plate will create/delete page breaks.



Clicking on a layer will switch the main view to display the page selected.

Saving/Loading Print Jobs

Print jobs can be saved as a single file. The format is .exr which is an industry standard format that can store multiple images with metadata. All visibility, layer order, pages and plate settings are maintained in the saved file – as well as the background colour. This allows an entire job to be reloaded. Loading a Job from the file menu will remove any existing images. Use **Import Image(s)** to add to an existing file

Save Outlines as SVG If outlines have been generated they can be saved as SVG files for importing into die cutting software.

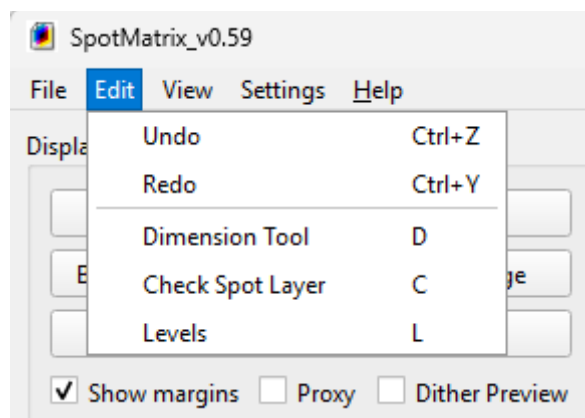
Export Selected Layers as PNG

Export each layer as a separate file. The file format is

prefix.png_0001_White.png.

If multiple files named like this are selected for importing they will import with ribbons assigned.

Edit Menu



Undo/Redo

Most destructive operations are undoable. The number of undo levels defaults to 10. This can be changed in *Global Settings* → *General Tab*

Dimension Tool

HotKey 'D' toggles a crosshair on/off. Clicking and dragging will draw a dimension object with it's length displayed in the current units. This allows verification of the size of decals before printing. Click near a dimension to delete.

See [Rulers and Dimensions](#) for more information

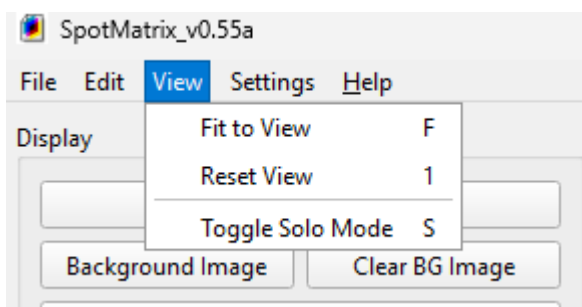
Check Spot Layer

Displays a diagnostic, red-tinted overlay showing all pixels in the selected layer(s) that are not 100% white or black. See [Working with Scanned Images](#) for more information.

Levels

Displays a histogram with low and high slider for adjusting contrast. See [Working with Scanned Images](#) for more information.

View Menu



Fit to View

hotkey: 'F' scales the canvas to fit in the display window

Reset View

hotkey '1' scales so that one image pixel is 1 displayed pixel

Toggle Solo Mode

hotkey 'S' This temporarily disables all but the selected layers – useful for seeing where layers are. Solo mode is automatically turned off on the next selection in the Layer list.

Preferences menu

see Global Settings section. Note that macOS version places the preferences menu in the application's menu to the left of the file menu per macOS default behaviour.

Help menu

About

displays the splash screen

Printer Status

displays a status panel. The printer's ID string plus all known status bits are exposed and ribbon inventory is shown. If the printer is ready to print – all status bits should be off.

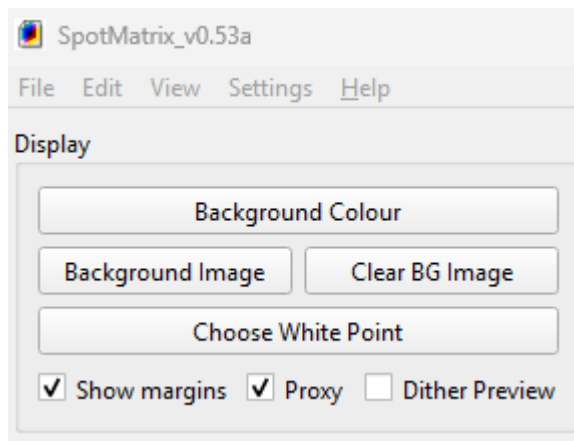
Printer Status

{'MANUFACTURER': 'ALPS', 'COMMAND SET': 'RGL', 'MODEL': 'MD-1000/T-03', 'CLASS': 'PRINTER', 'COMMENT': 'TH,CC,S,240,600/A,0', 'ACTIVE COMMAND SET': 'RGL-V130'}

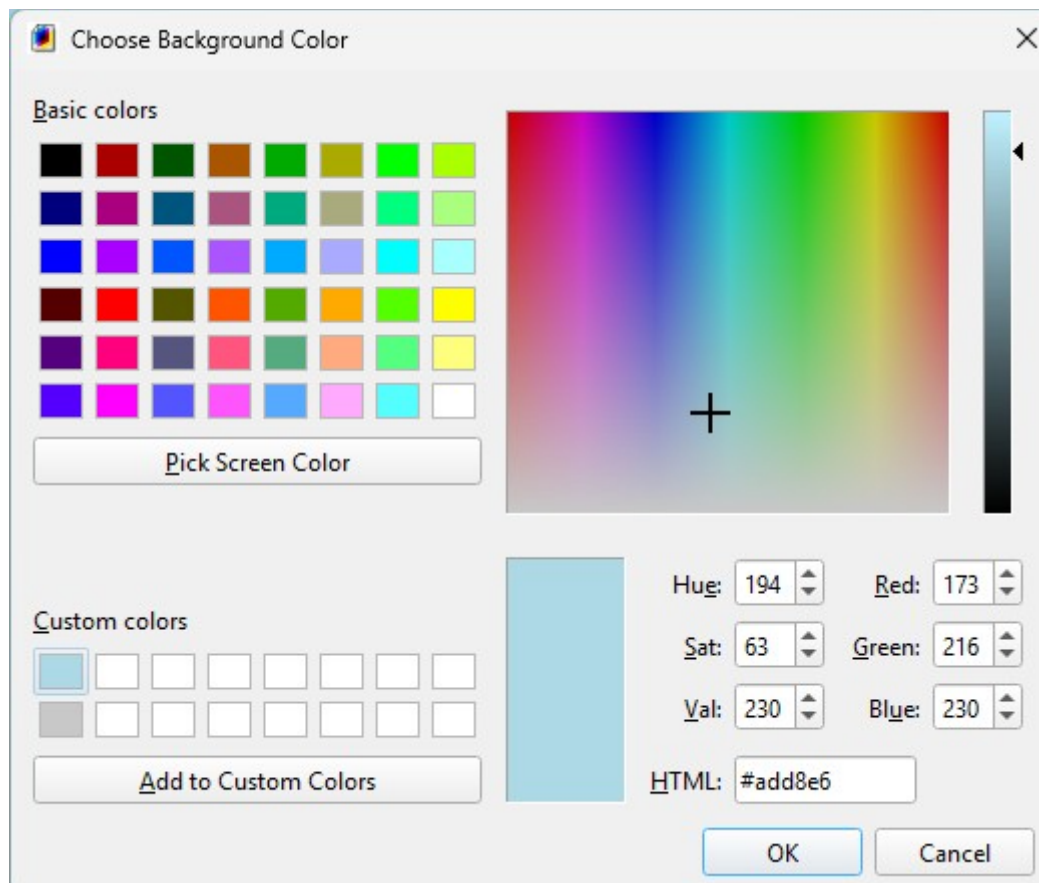
MagentaYellowBlackCyan

Col 0	Col 1	Col 2	Col 3	Col 4	Col 5
Byte: 0 Printer state	Byte: 6 Error 1	Byte: 7 Error 2	Byte: 8 Paper Errors	Byte: 9 Ribbon Errors	Byte: 10 Motor Errors
7 ● Not Ready	7 ● Motor Error	7 ● Paper Out	7 ● Size mismatch	7 ● Byte 4 bit 7	7 ● Cassette Change
6 ● Off-line	6 ● Cover Open	6 ● Paper Jam	6 ● Manual Paper Out	6 ● Byte 4 bit 6	6 ● CR Motor
5 ● manual/auto	5 ● Byte 1 bit 5	5 ● Ribbon Empty	5 ● Byte 3 bit 5	5 ● Byte 4 bit 5	5 ● Ball Arm Motor
4 ● Byte 0 bit 4	4 ● Byte 1 bit 4	4 ● Cassette Error	4 ● Paper Jam Source	4 ● Byte 4 bit 4	4 ● LF Motor
3 ● Printing	3 ● Byte 1 bit 3	3 ● Mem Overflow	3 ● Byte 3 bit 3	3 ● Byte 4 bit 3	3 ● Sheet Feeder Motor
2 ● Mode 2	2 ● Byte 1 bit 2	2 ● Byte 2 bit 2	2 ● Byte 3 bit 2	2 ● Cassette Error 1	2 ● Anti Curl Error
1 ● Mode 3	1 ● Byte 1 bit 1	1 ● Byte 2 bit 1	1 ● Byte 3 bit 1	1 ● Cassette Error 2	1 ● Byte 5 bit 1
0 ● Data	0 ● EEPROM Error	0 ● Byte 2 bit 0	0 ● Byte 3 bit 0	0 ● Byte 4 bit 0	0 ● Byte 5 bit 0

Display Settings



The background can be set to a solid colour by clicking the **Background Colour** button.



If custom colours are added to the colour picker these are saved with the application's preferences.

Alternatively a PNG bitmap can be loaded as a non-printable background layer.

This allows a preview of the ink over a background representing the base paint colour: e.g red stripes on a yellow background can be printed in just Magenta without a white undercoat. Similarly red areas of a logo could be left empty if the base colour of the model is red.

The **White Point** is a global multiplier of the displayed colour. This allows colour temp or brightness to be adjusted to match physical artwork without affecting the ink colour.

Show Margins displays a red rectangle representing the printable area. Note that the MD1000 has a larger bottom margin than the MD5500. Printing too close to the bottom of the page will result in the page being ejected – the application will crop any print data outside the margins to ensure rewinding is always possible

Proxy determines the resolution of the displayed image. Raw images are stored at 600dpi – for an A4 page that's about 35 million pixels. Clicking the proxy checkbox displays at 1/2 resolution which speeds up previews. Print resolution is not affected by this setting. Note that some operations require the full resolution image to be displayed – e.g flood fill.

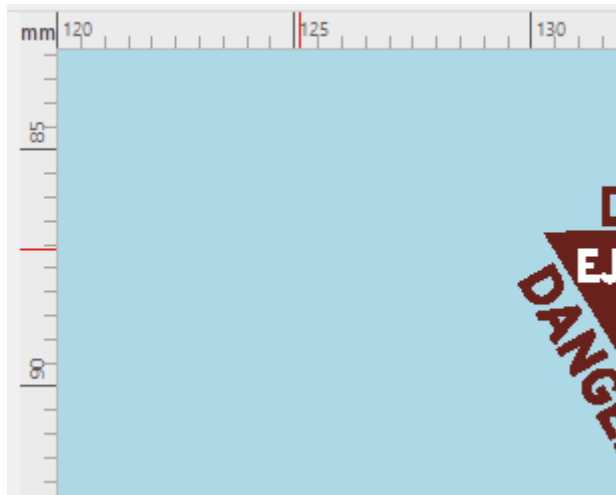
Dither Preview will show the exact data sent to the printer – for best results turn proxy off and press "1" to set the zoom level to 1 – which displays the pixels 1:1 with the monitor pixels. This allows comparison of dither types.

Navigation

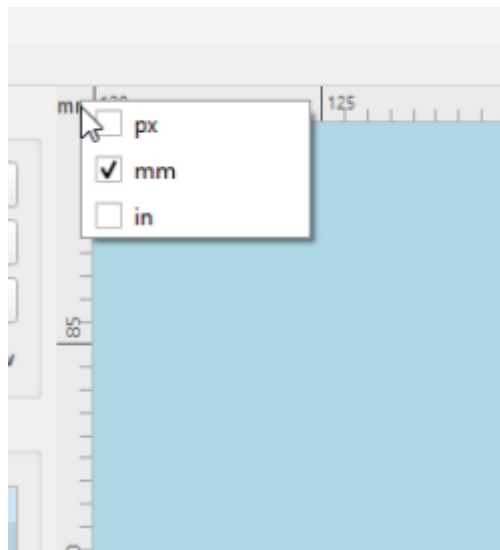
To zoom in out use the mouse wheel or the + or – keys. To pan the canvas middle click and drag or use the scrollbars on the right and bottom of the display. To fit the canvas to the window size press "F" or use the **View->Fit** menu. Selecting **View->Reset View** shows pixels unscaled – so 1 pixel in the artwork equals 1 pixel in the display.

Rulers and Dimensions

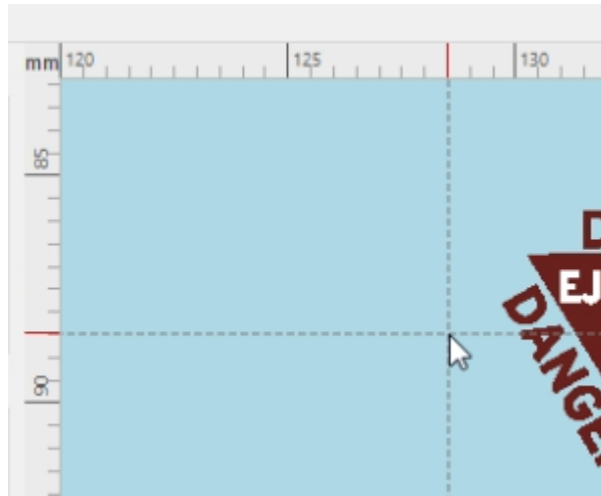
Rulers are shown along the top and left sides of the main window.



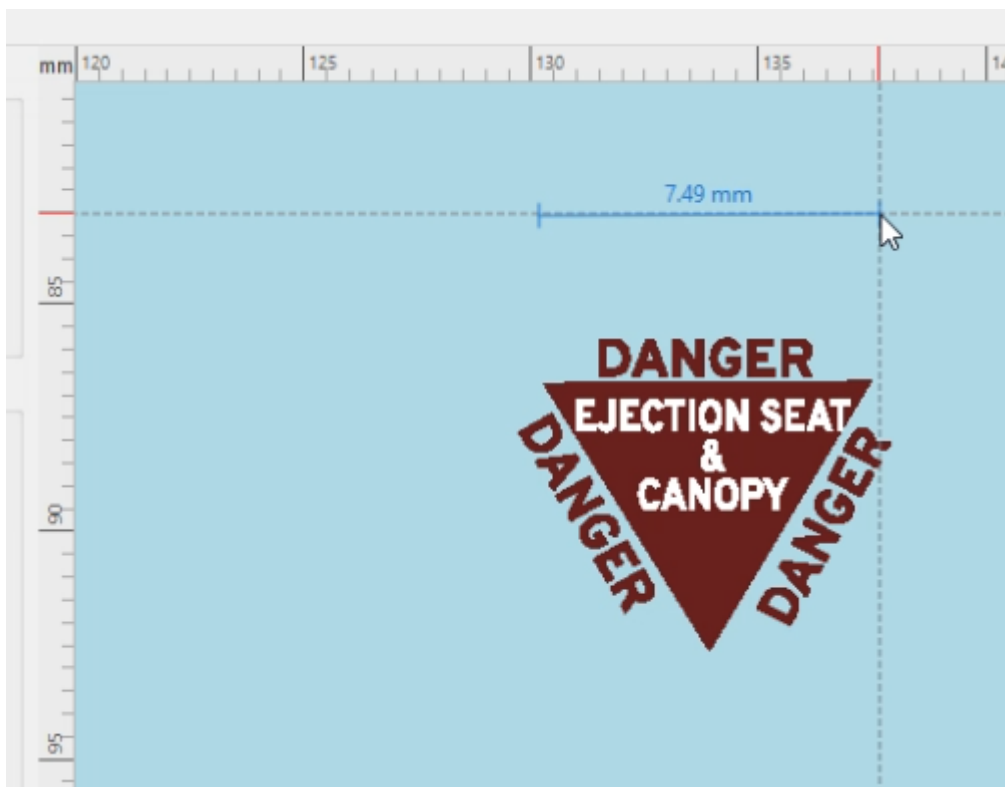
The default units are mm but can be changed to inches or pixels by clicking on the top right corner



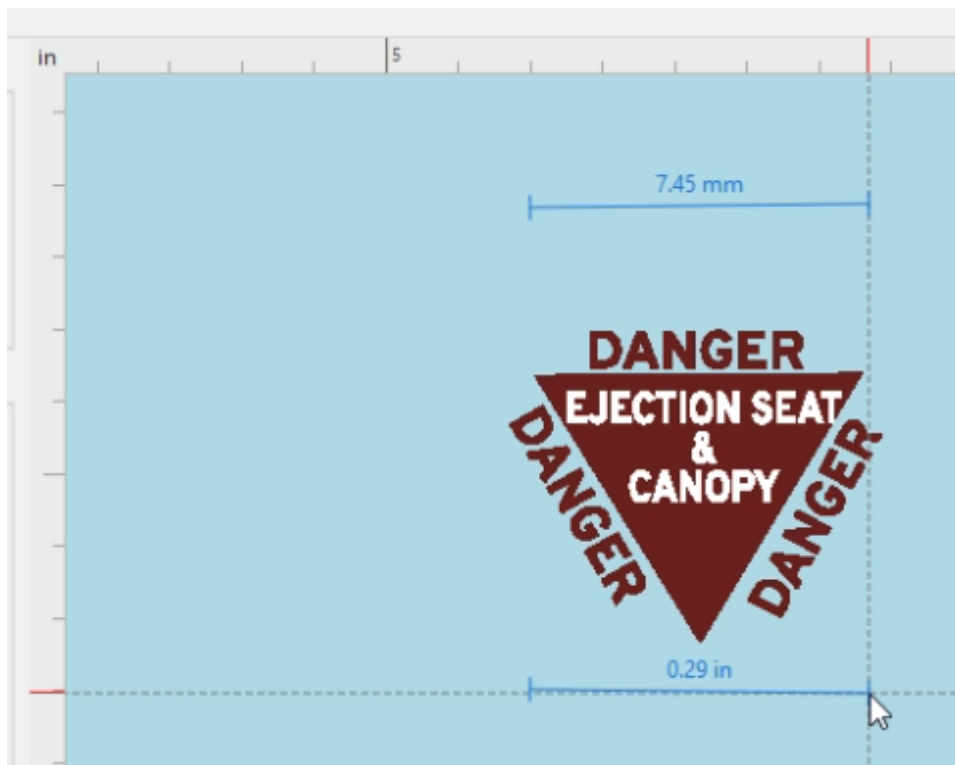
To verify accurate sizing of artwork, dimensions in the current units can be drawn. Select the **Edit->Dimension Tool** menu or press "D". This toggles dimension mode on/off. Crosshairs will be shown that follow the mouse cursor



Click and drag to draw a dimension in the current units.



Changing units allows mm and inches to be displayed if required.



To erase a dimension click near it. Dimensions are not saved with the file, do not print, and will be cleared if a new canvas is created

Plate Layer View

The Plate Layer View shows all the plates in the current job. Visibility of layers can be controlled with the eye icon in the left of the layer item. If the layer is not visible it will not show in the main viewport and it will be ignored during printing. The green and red arrows in the right show the rewind/eject behaviour at the end of the layer. Green u-turn arrow rewinds the paper between passes, Red arrow denotes Eject Page.

Layers				
		White	Page: 1	
		Cyan	Page: 1	
		Magenta	Page: 1	
		Yellow	Page: 1	
		Black	Page: 1	
		White	Page: 2	
		Cyan	Page: 2	
		Magenta	Page: 2	
		Yellow	Page: 2	
		Black	Page: 2	
		White	Page: 3	
		Cyan	Page: 3	
		Magenta	Page: 3	

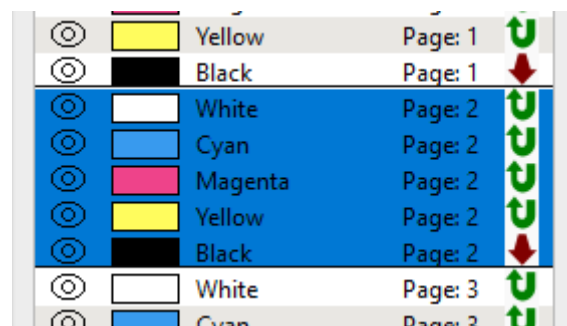
Clicking on a list item will highlight it and semi-highlight any layers related to the selected layer as well as change the main display to show the selected page

Layers				
		White	Page: 1	
		Cyan	Page: 1	
		Magenta	Page: 1	
		Yellow	Page: 1	
		Black	Page: 1	
		White	Page: 2	
		Cyan	Page: 2	
		Magenta	Page: 2	
		Yellow	Page: 2	
		Black	Page: 2	
		White	Page: 3	
		Cyan	Page: 3	
		Magenta	Page: 3	

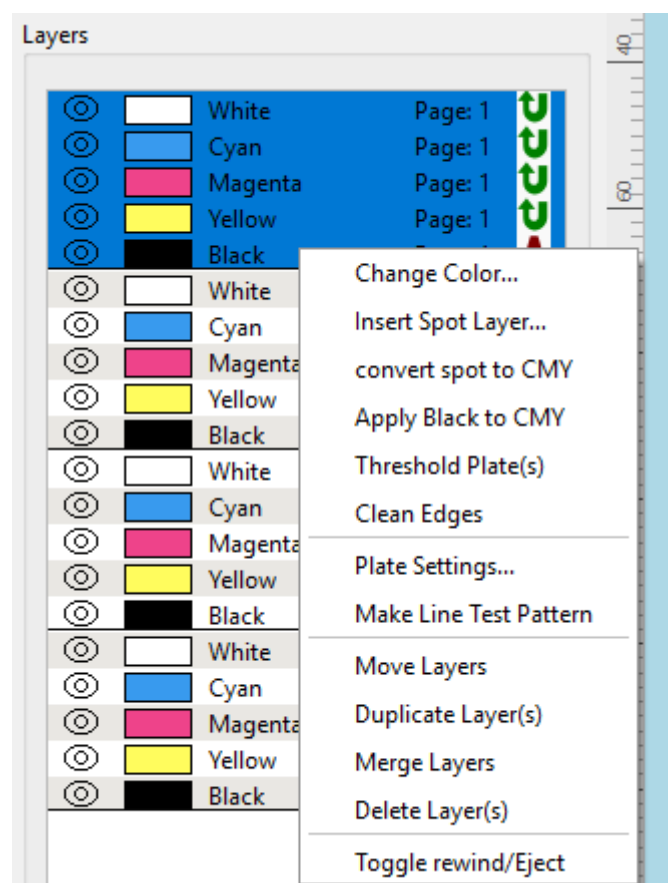
Pressing <shift> or <ctrl> while clicking allows multiple layer selection

		Magenta	Page: 1	
		Yellow	Page: 1	
		Black	Page: 1	
		White	Page: 2	
		Cyan	Page: 2	
		Magenta	Page: 2	
		Yellow	Page: 2	
		Black	Page: 2	
		White	Page: 3	
		Cyan	Page: 3	
		Magenta	Page: 3	

<shift><ctrl> Click will select all related layers



Right clicking on a layer will show this menu:

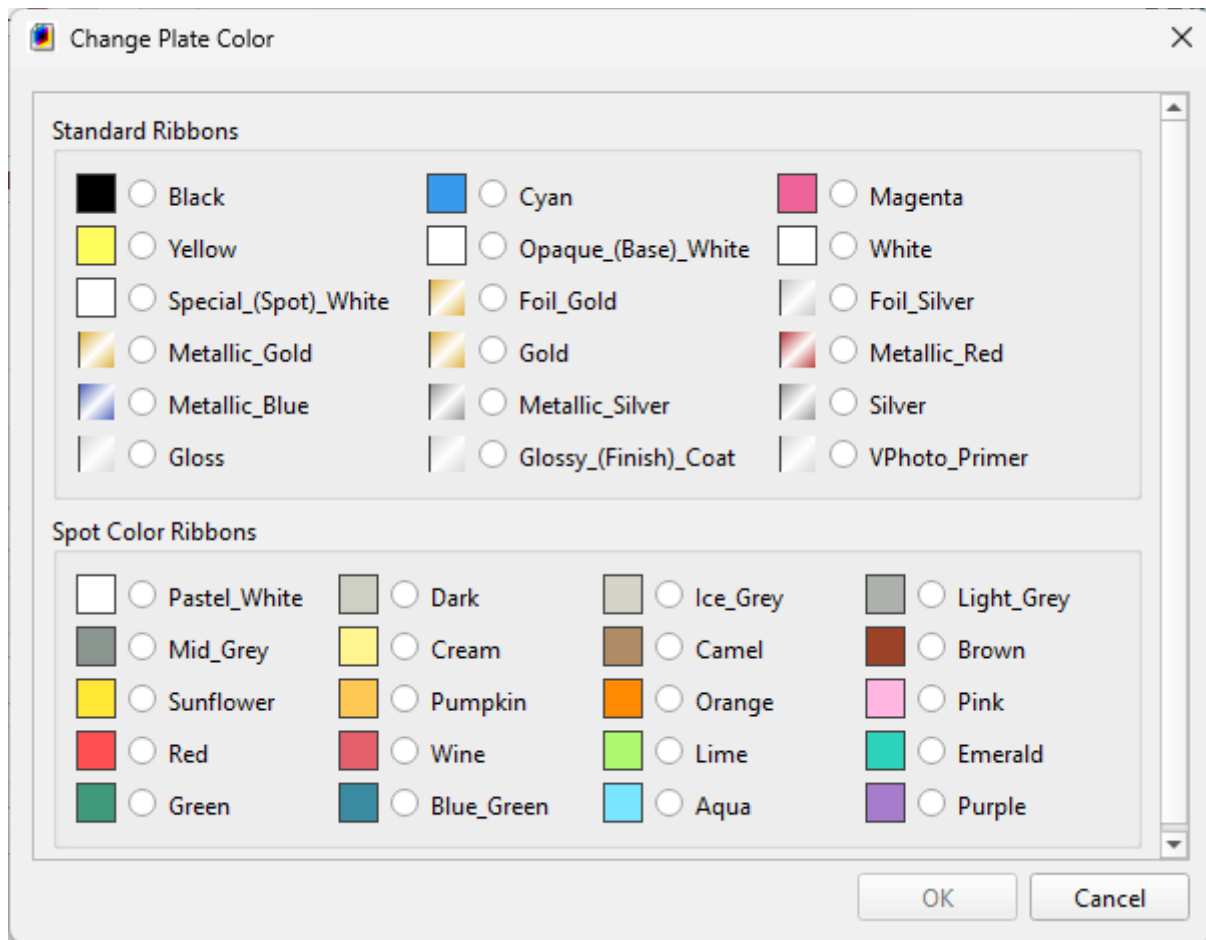


Change Color

will show a dialog box containing all know ribbons – selecting one will change ribbon colour for the selected layer.

Insert Spot Layer

will insert a blank layer – a ribbon select box will appear.



Convert Spot to CMY

will convert a spot colour ribbon to new CMY layers – this conversion is approximate as some spot colours lie outside the CMY gamut.

Apply Black to CMY

(only active for black plates) will apply the current Black layer to the previous CMY layers. This allows full colour + white underlay to print on MD1000 without changing ribbons. This is a tradeoff between convenience and cost – Printing multiple decal sheets requiring white underlay will be quicker – no ribbon changes, but, will consume more CMY ribbon. To see the effect, hide the black layer then select ***Apply Black to CMY***. You will see the black appear as ink in the CMY channels – leave the original black channel hidden to prevent it appearing in prints.

Threshold Plate(s)

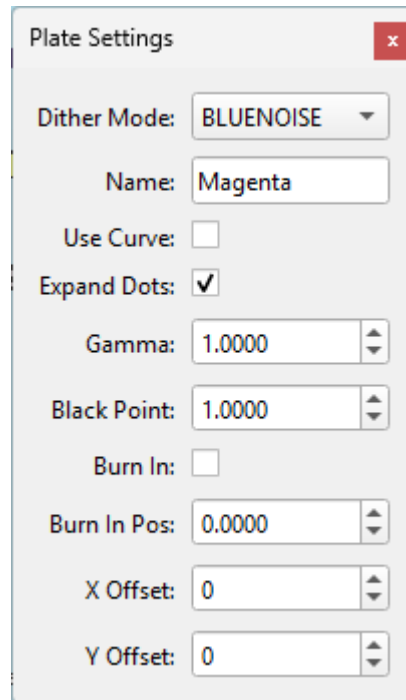
convert CMY channels into binary masks – useful for creating primary, undithered colours e.g Cyan Blue Magenta Red Yellow Green

Clean Edges

expands colour towards the edge of the white layer – useful if the source image has a lighter edge left over from creating a mask in a paint package – unlikely if the image originated in a vector drawing package

Plate Settings

allows the dither patterns and gamma to be set per plate.



Settings have been pre-tuned to provide the best results for the default dither type and plate gamma set to one. You can set the dither to use the OEM halftone pattern, change the display name of the plate (this will *_not_* change the ribbon colour).

Use Curve applies an S-curve correction which darkens light areas and lightens dark areas – this provided better results on plain paper during testing. Not required on glossy decal paper.

Gamma A global gamma of 1.5 is applied in addition to the specified plate gamma. The global gamma value can be set in the **Preferences** dialog. Increasing this value will lighten midtones.

Expand dots provides the best result for Blue Noise.

Black Point adjusts density of the ink – a lower value will make darker areas blacker. Only applied when **Use Curve** is active

Burn-in applies a small text field to the plate containing these values at a specified y position. This is useful for tuning settings with a gresyscale pattern so the effect of the Dither Settings can be compared.

X Offset and Y Offset are the transforms which are set during move or duplicate operations

Make line Test Patterns

will create a test pattern useful for determining dead thermal elements in the print head. A future version will have support for double printing to account for dead pixels.

Move Layer(s)

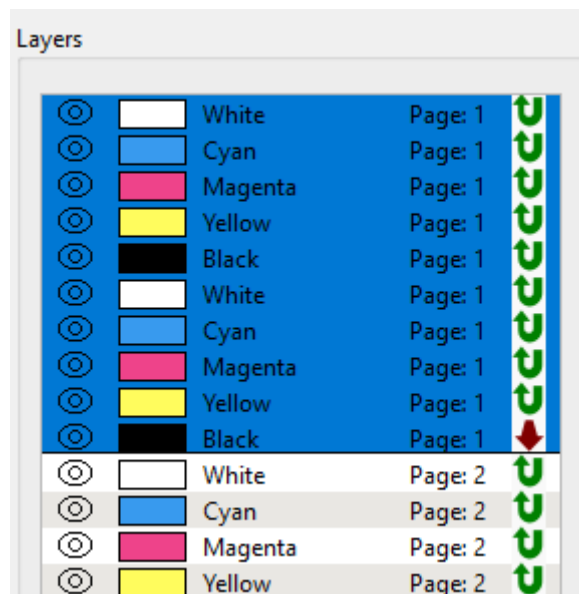
will allow interactive repositioning of the selected layers. Layers can be selected individually or with <Ctrl><Shift> Click to select linked layers. A temporary overlay will be rendered showing the layers to be moved. Click and drag to reposition. This adjusts the x and y offset of the selected layers so is non-destructive.

Duplicate layer(s)

makes a copy of the selected layer(s). To copy an entire image <Ctrl><Shift> Click on a layer to select all associated layers and select Duplicate Layers. This will render a temporary overlay showing the layers being duplicated. Click and drag to reposition the copy.

Merge Layers

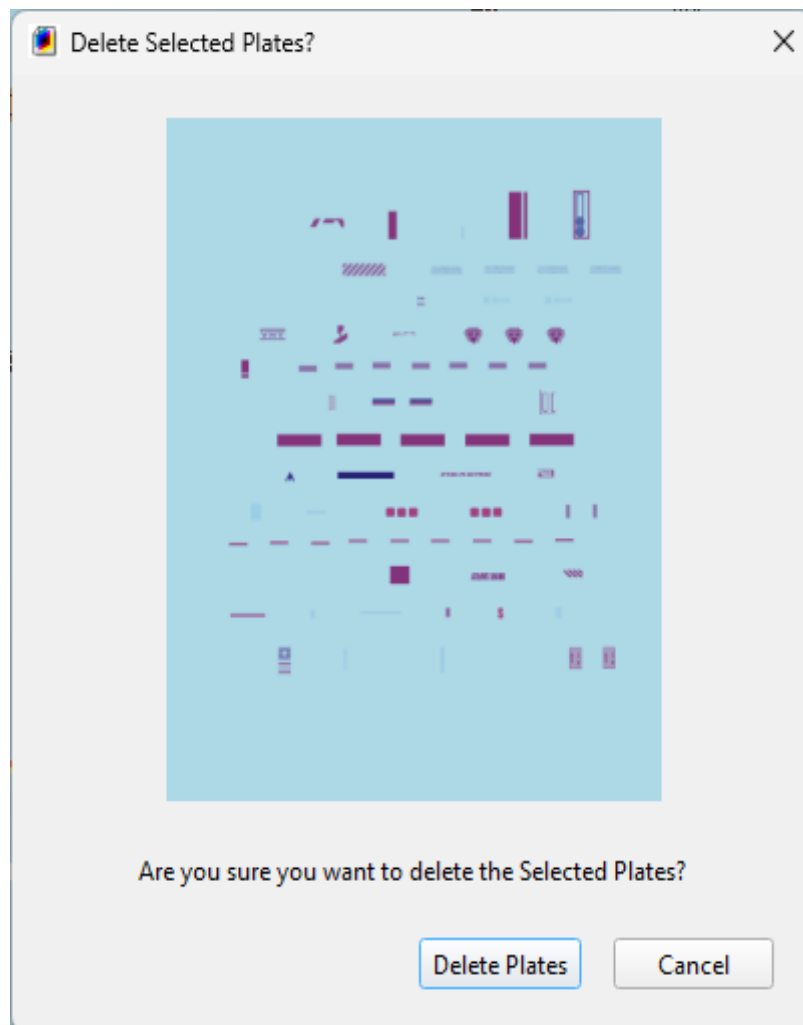
The duplicate operation makes copies of the original layers. Similarly importing another image generates new layers. This means you can end up with multiple layers using the same ink. To optimise printing the layers can be merged. Select the layers to be merged:



then click *Merge Layers*. This will flatten selected layers containing the same ink colour (not the layer name) creating a new layer for each ink colour. The original layers remain but will have their visibility turned off. This flattens all transforms and will crop the layers to the canvas size.

Delete layer(s)

will delete the selected layers - a confirmation box showing the layers to be deleted will be shown.



Toggle Rewind/Eject sets the paper feed behaviour after the current pass is printed. If a layer is set to Eject it will insert a page break after the layer and the paper will be ejected from the printer after that layer is printed.

The default for any new plate is to rewind. Page Eject is set automatically at the end of an imported full colour image. Imported spot colour layers default to rewind. A single page job can safely have all layers set to rewind. When finished the user can push the feed button on the printer – or the Eject Paper button in the application.

These buttons at the bottom of the layer view allow layers to be added, moved or deleted. The icon on the right will delete the entire job – a confirmation box will be shown.



In addition to the up/down arrows, plates can be reordered by dragging them in the layer view. The application tries to maintain page boundaries if plates are re-ordered.

Layout Adjustment

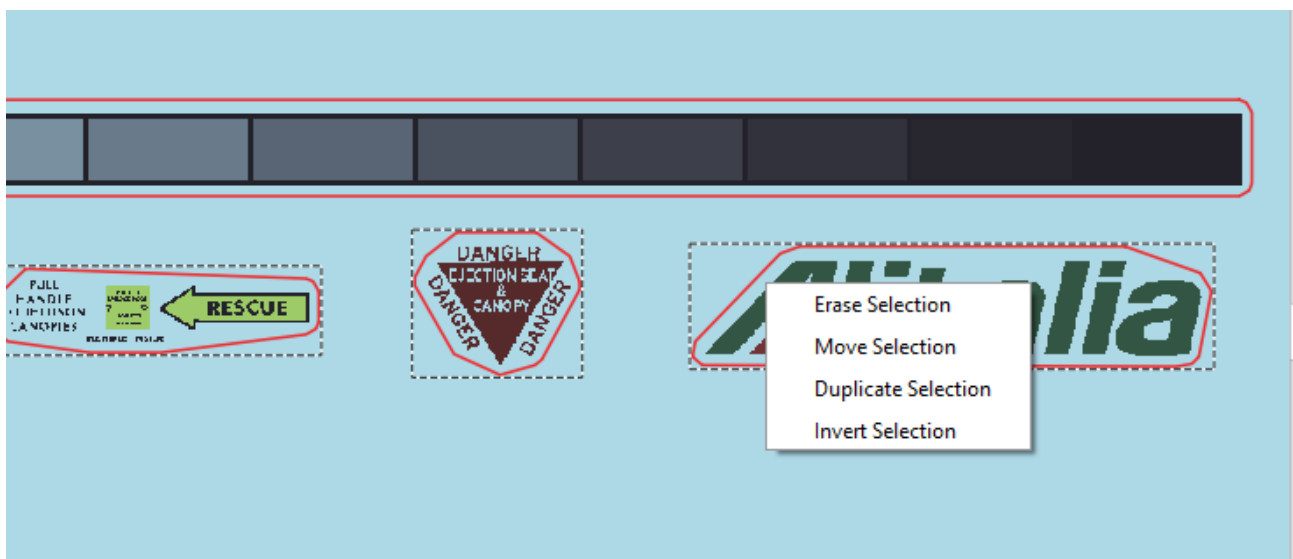
Adjusting decal layout without a round trip back to your design software is possible using the following tools.

Individual selections

Enabling outlines segments the image into selectable regions. Double-click the image or toggle the checkbox to enable/disable selectable regions. Adjust the offset to fine tune boundaries.



Click to select a region, Shift-click to add to selection. Ctrl-click to toggle selection. Right-click inside a selected outline to display a context menu.



The following operations operate on the layers data directly so care should be taken to ensure regions are not placed on top of other image data. Any erase, move or copy operations are undoable.

Erase Selection:

Clears all pixels inside the selected regions

Move Selection

Click and drag to reposition selected regions

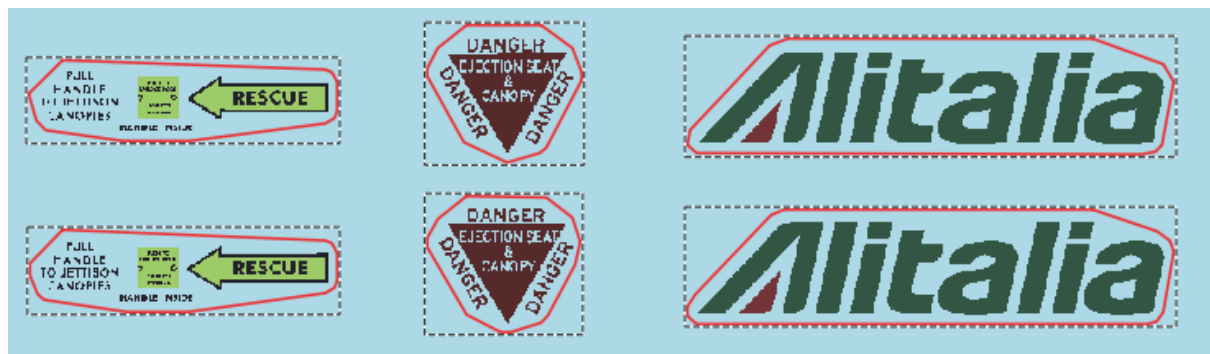
Duplicate Selection

Click and drag to copy selected regions

Invert Selection

Deselects current selection and selects everything else

Duplicated or moved pixel regions become selectable objects with their own outlines

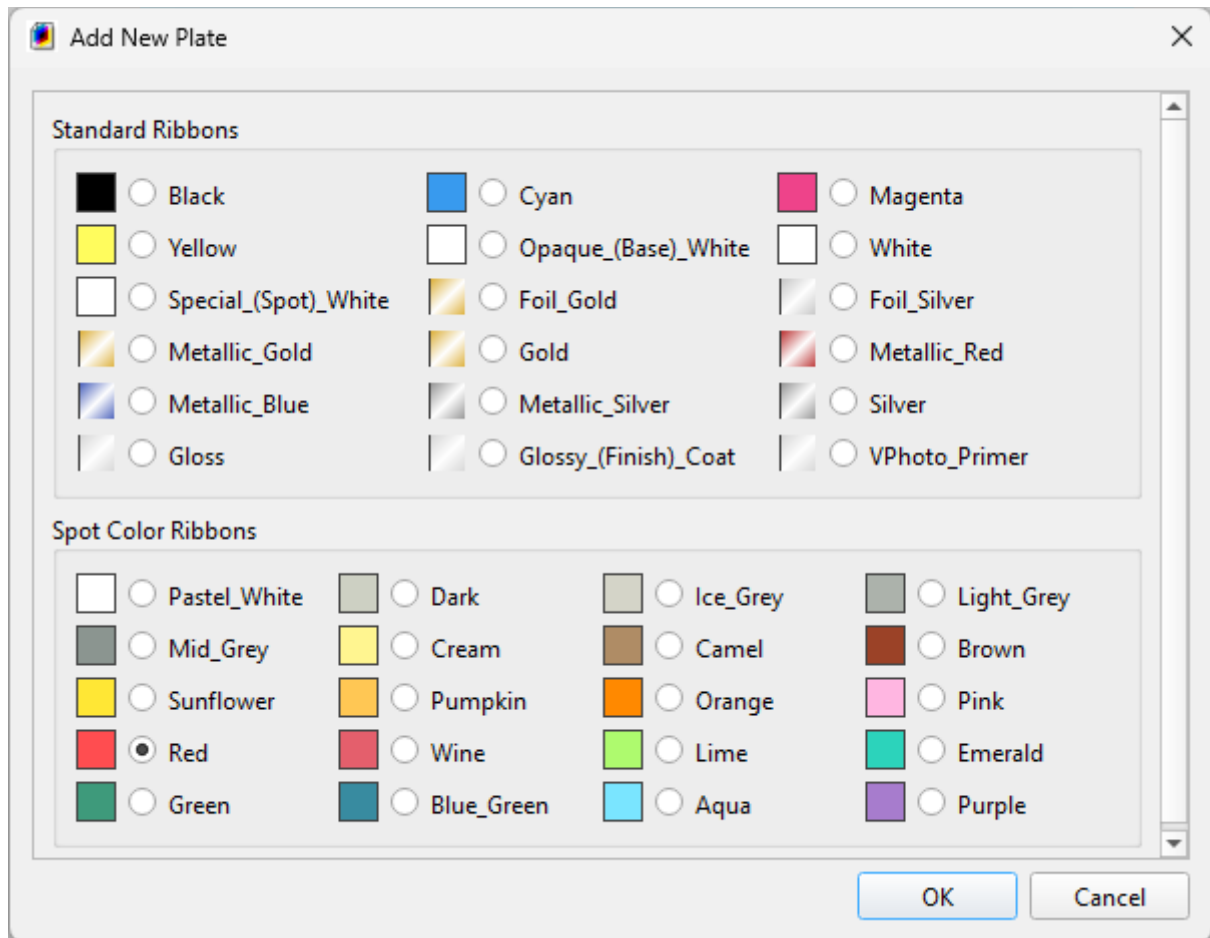


Layer Move or Duplicate

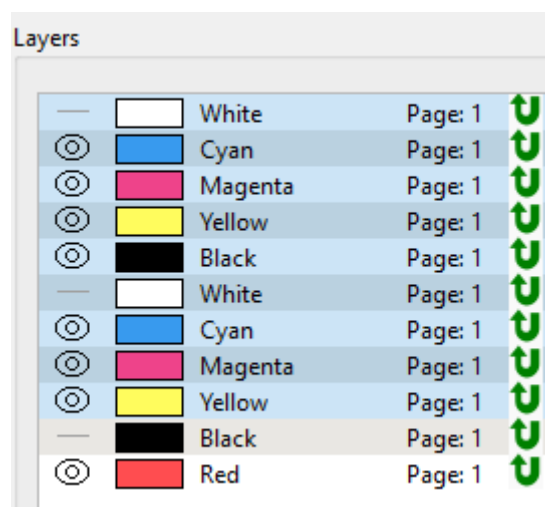
To reposition whole layers - see [Plate Layer View](#) -> [Move Layer\(s\)](#) and [Duplicate layer\(s\)](#) for more info and layer based layout adjustments.

Extracting Spot Layers

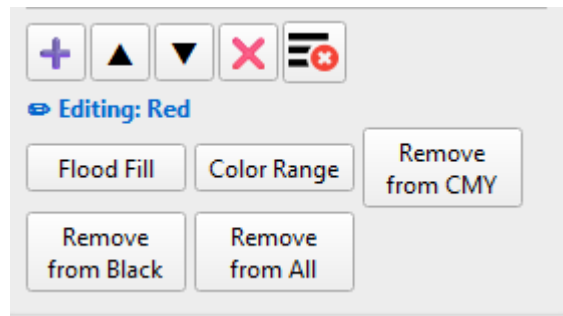
To create a new spot colour layer either click the Plus icon below the plate list or right click on a layer and select "Insert Spot Layer". This will open dialog with all known ribbon colours.



Select a colour and click OK. A new layer will be added to the plate list

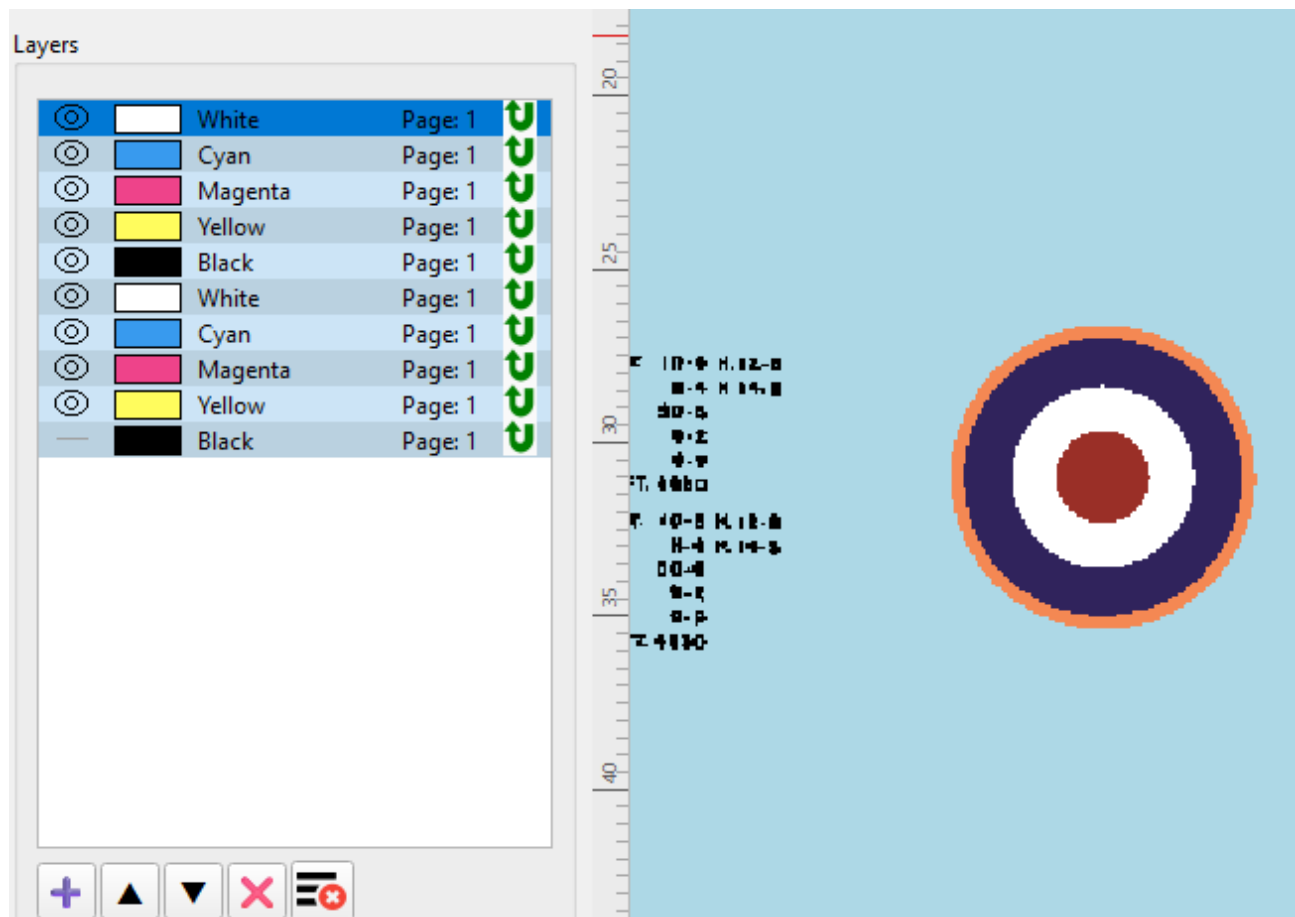


Adding a new layer will activate edit mode. Double clicking on an existing layer will also activate edit mode for that layer

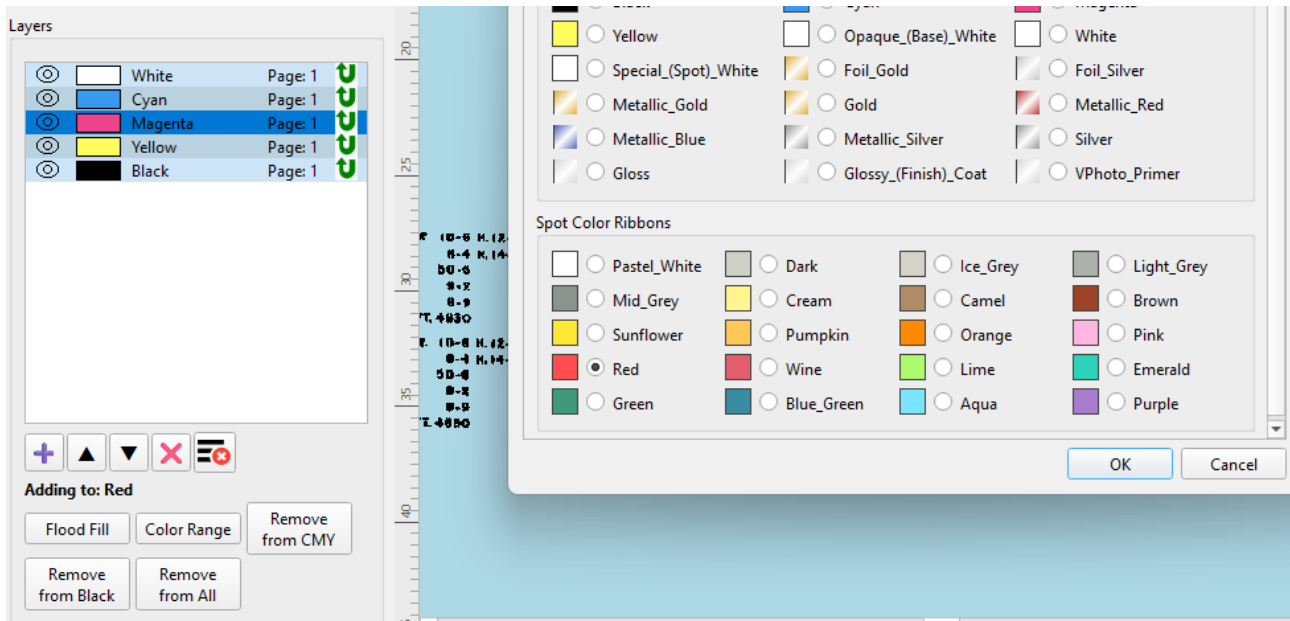


Regions from the image can be converted into spot colours by flood fill, by similar colours, or duplicating and thresholding existing layers.

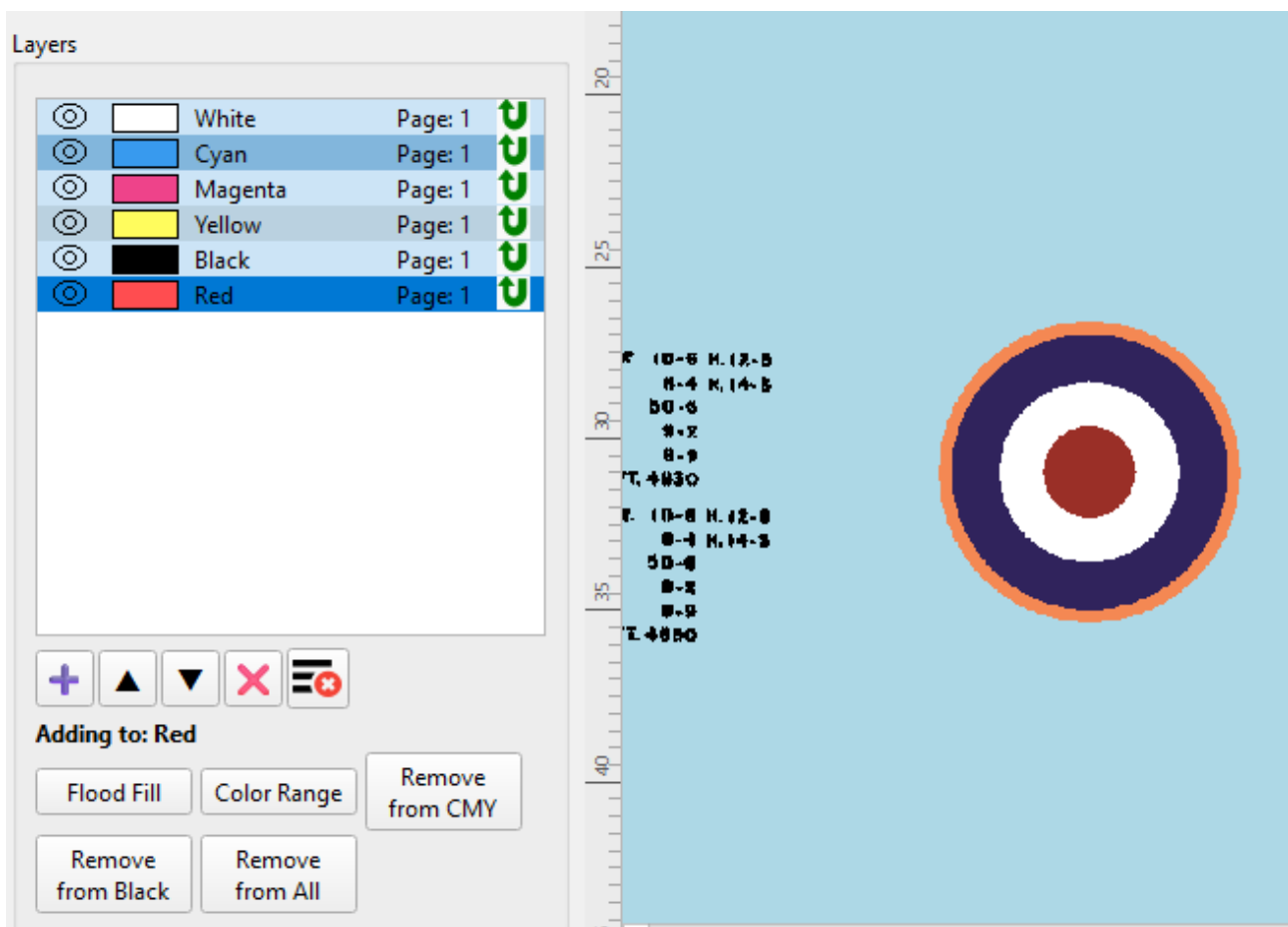
To convert the red and orange regions of this roundel to spot colours:



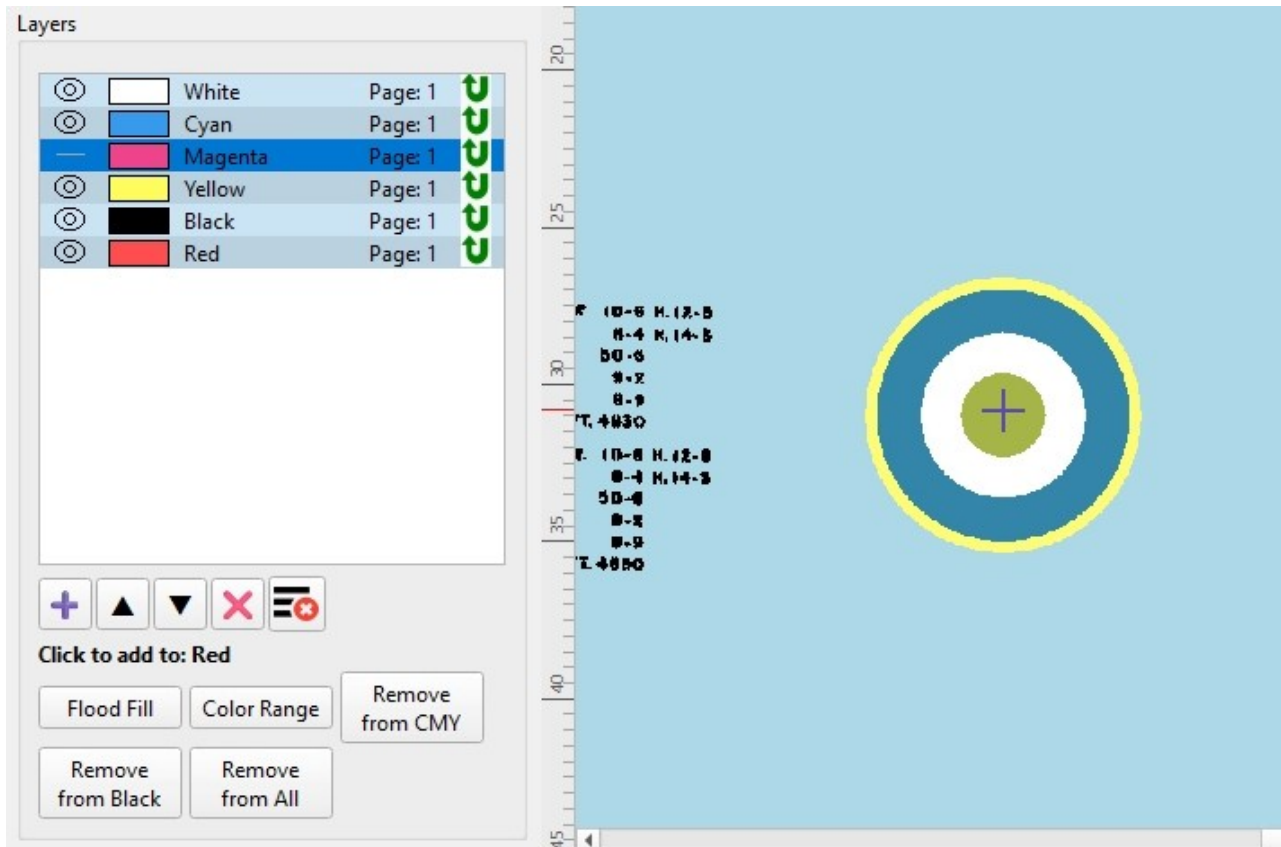
Click the + button to create a new red layer



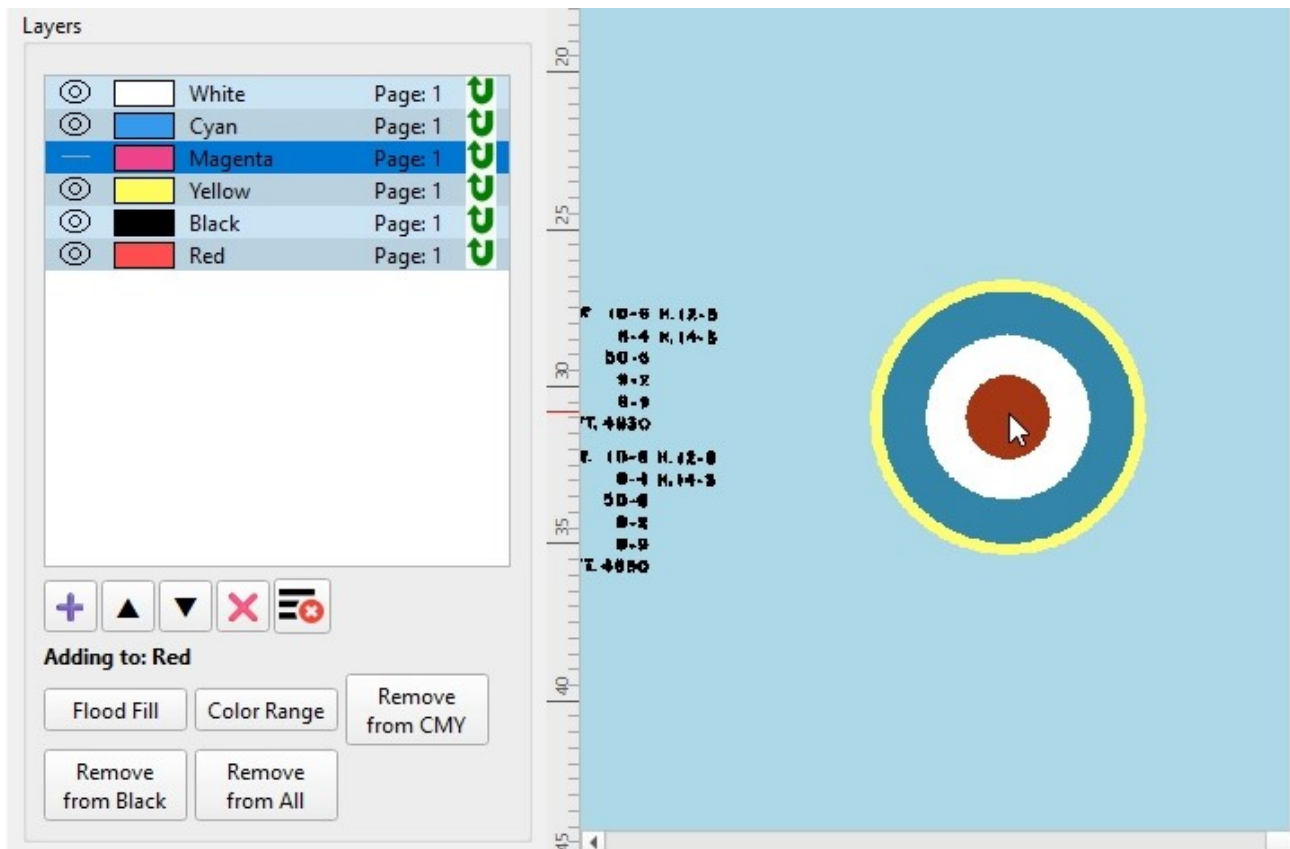
This activates the colour extraction tools



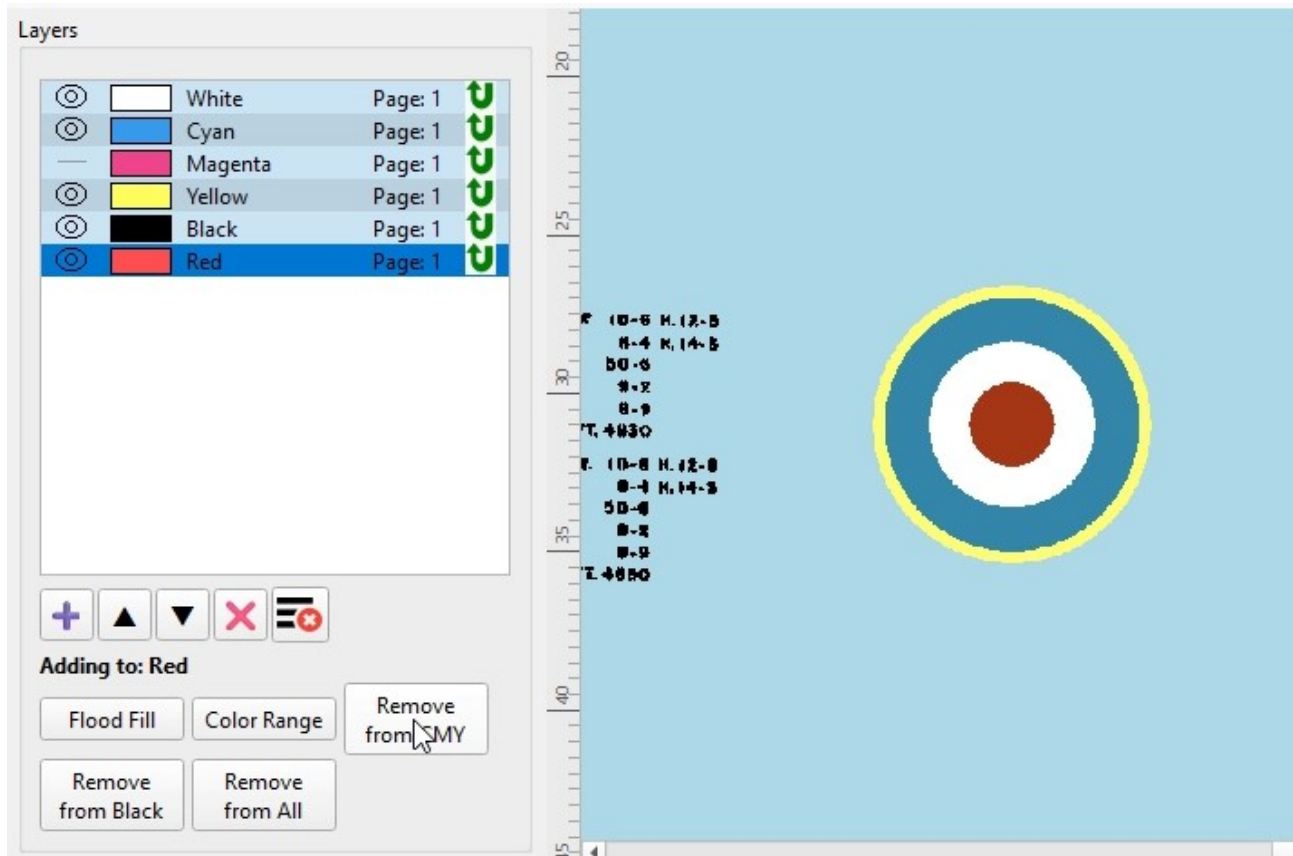
Hide the Magenta layer so the red you are about to add is easier to see and click **Flood Fill**.



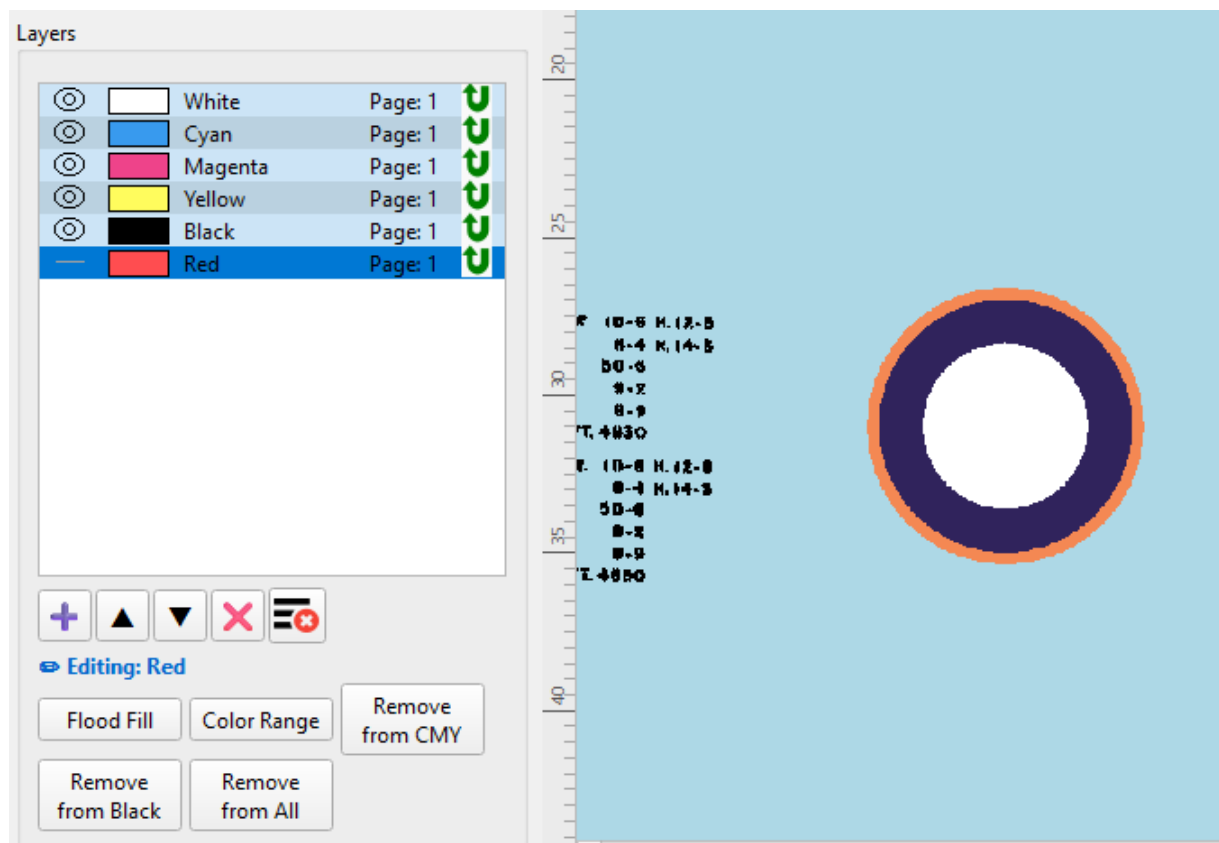
The cursor will change to a cross-hair. Click in the region you wish to become a spot colour.



To remove the new red region from the CMY components click **Remove from CMY**.



You can verify the region is no longer present in the CMY layers by temporarily hiding the red layer. When printing the user will be prompted to insert a red spot colour ribbon.



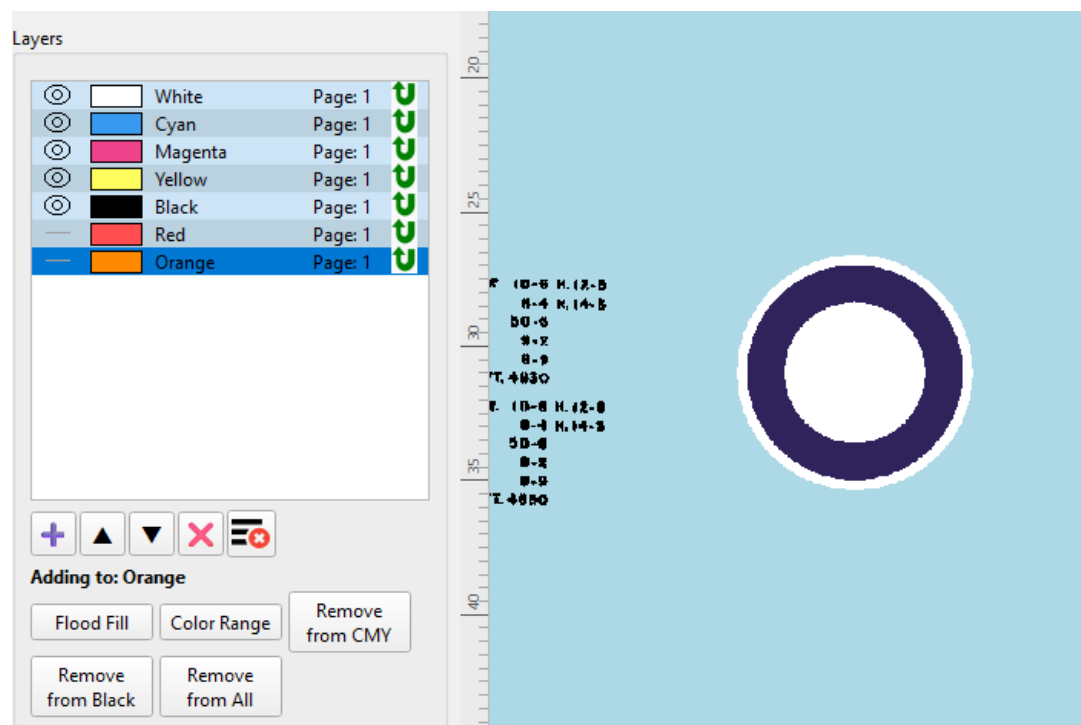
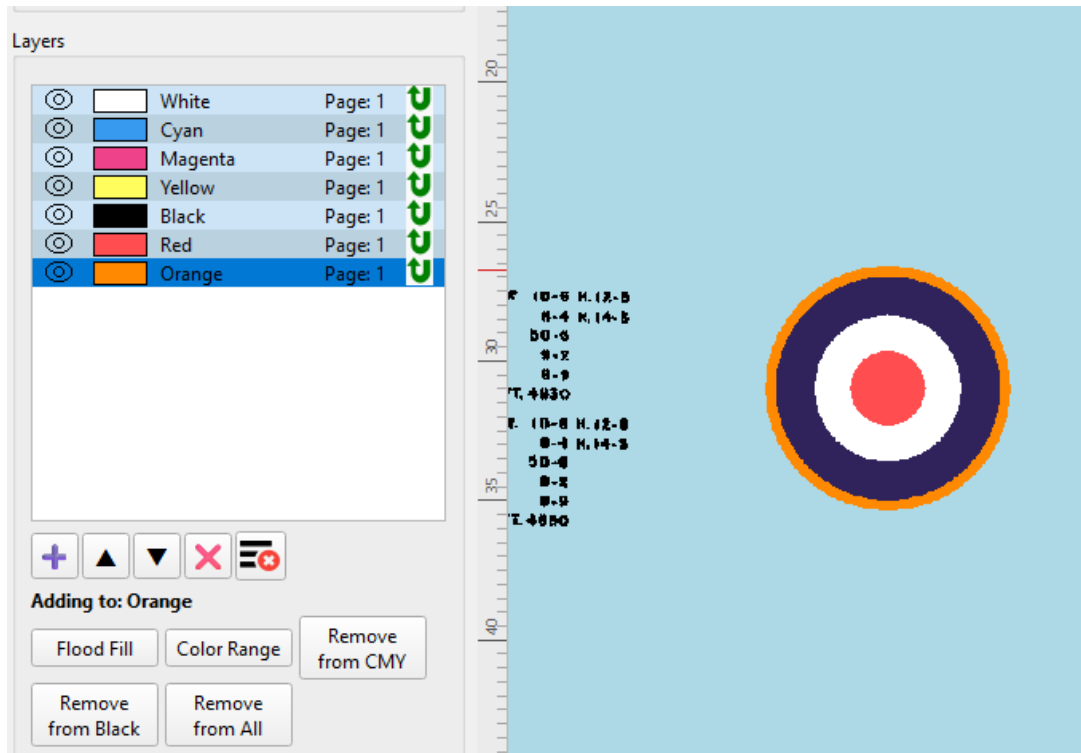
Follow the same steps for other regions :

Add New Spot Colour Layer

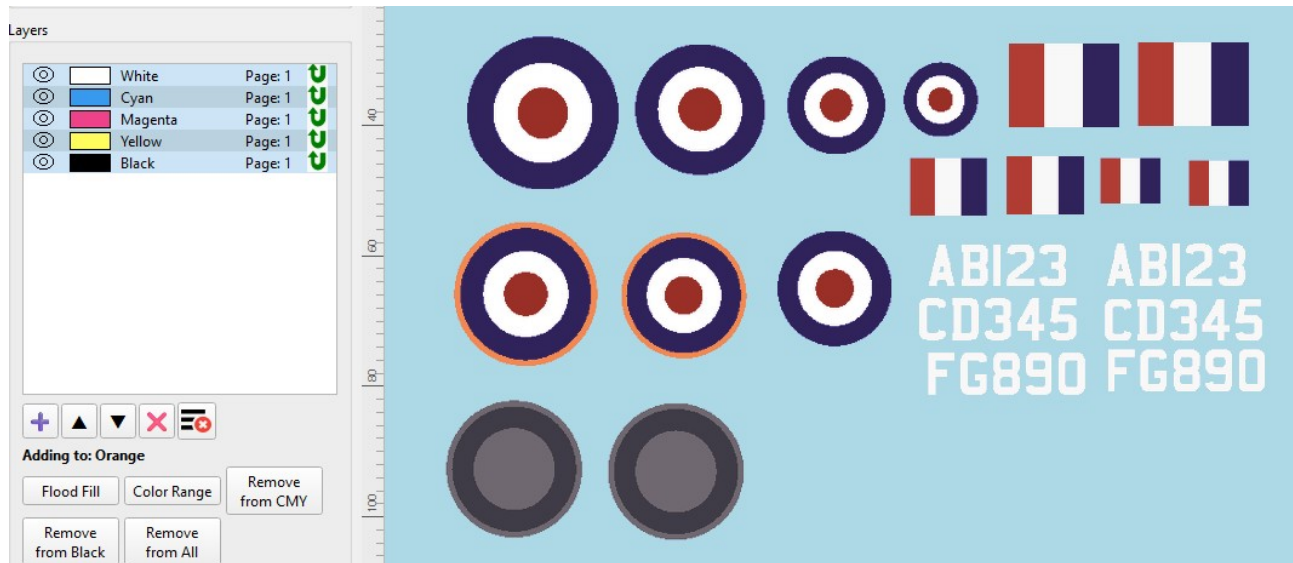
flood region with Spot Colour

Remove Spot Colour from CMY

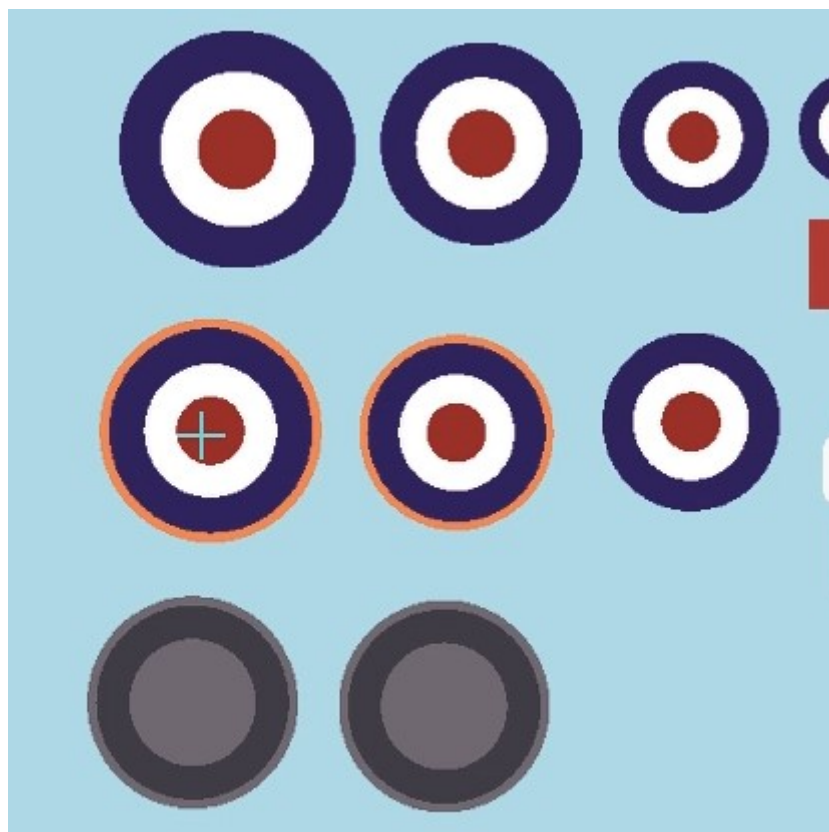
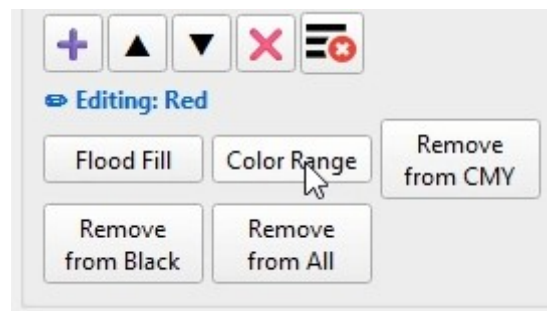
Here the Orange and red have been converted to Spot Colours and removed from the CMY layers -



To convert multiple regions the same colour to spot colours



The procedure is similar to the above but choose "Color Range" and click the colour to be replaced.



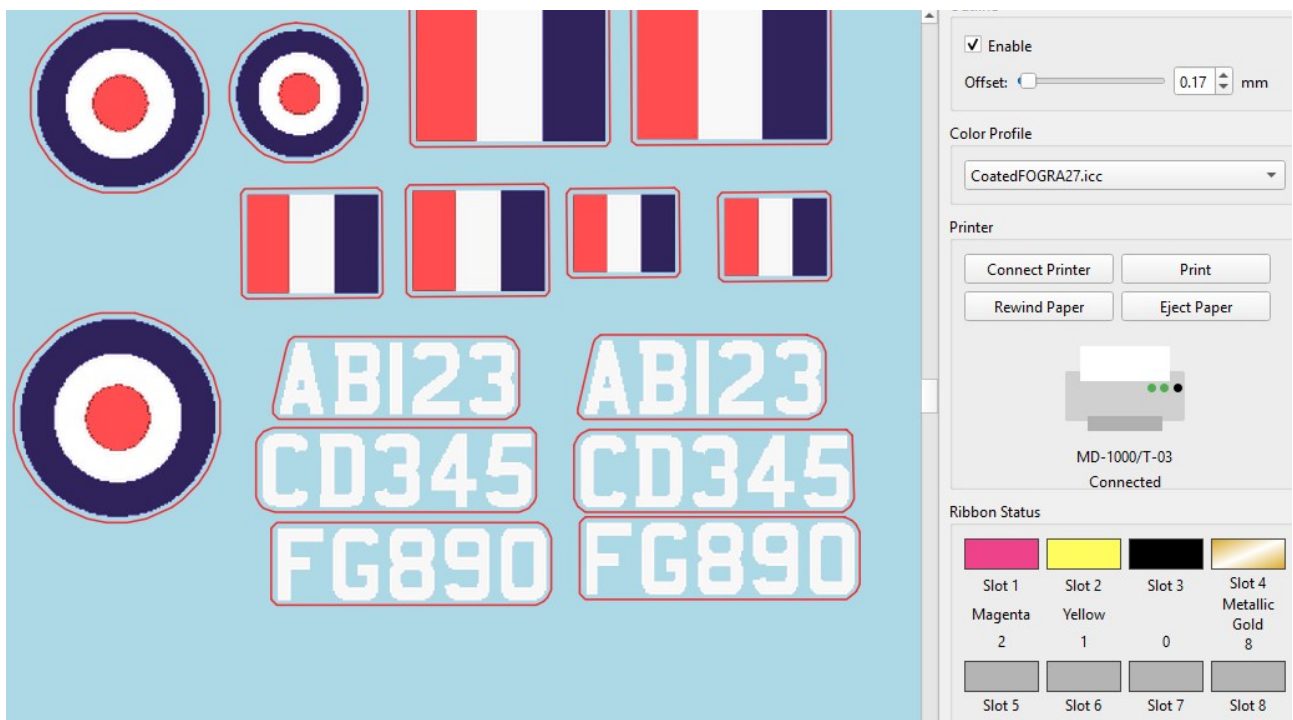
Click "Remove from CMY" to erase from CMY layers



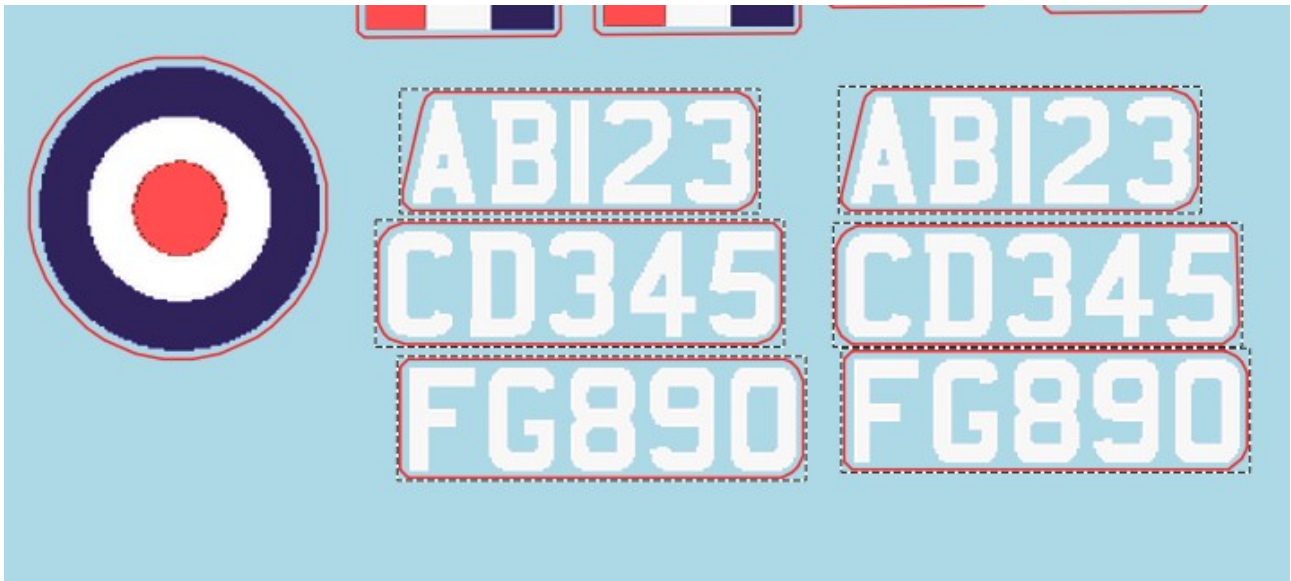
The same procedure applies to Flood Fill

Using Selection and Spot Colour Extraction.

Enable outlines to make regions selectable.



Select single or multiple regions

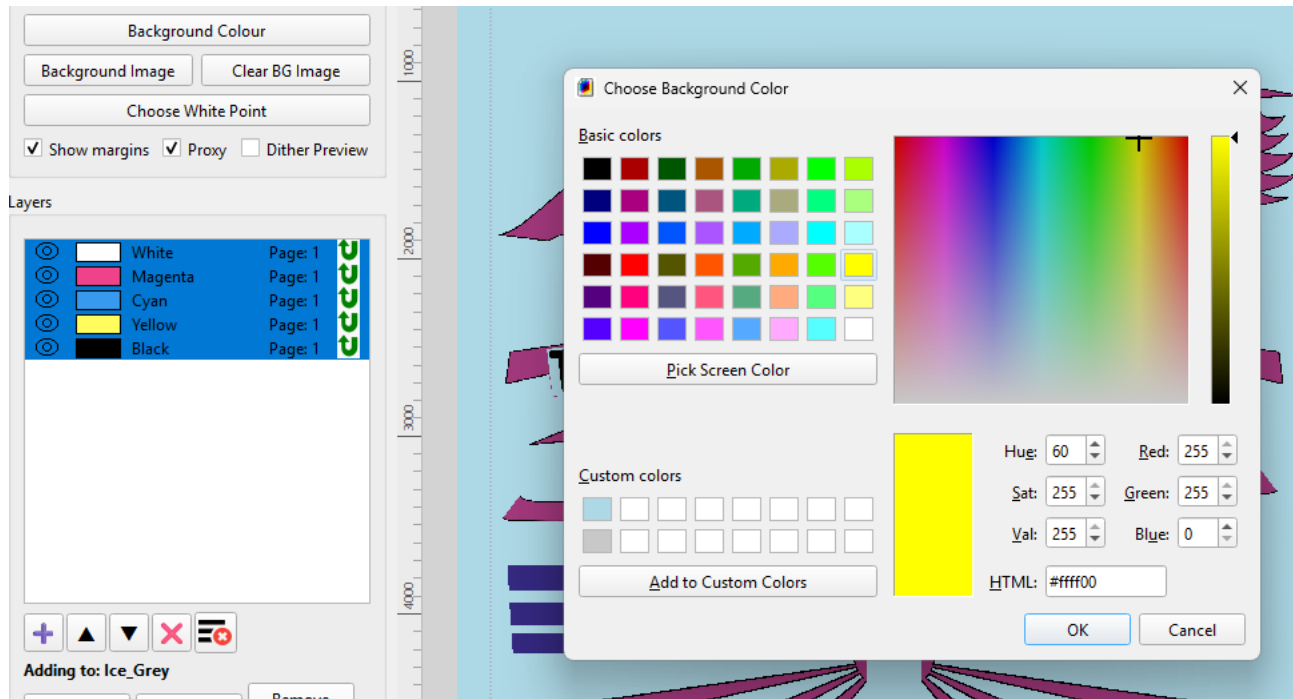


Spot Extraction only occurs in selected regions and other areas the same colour are unaffected e.g the white in the tail markings remains white.

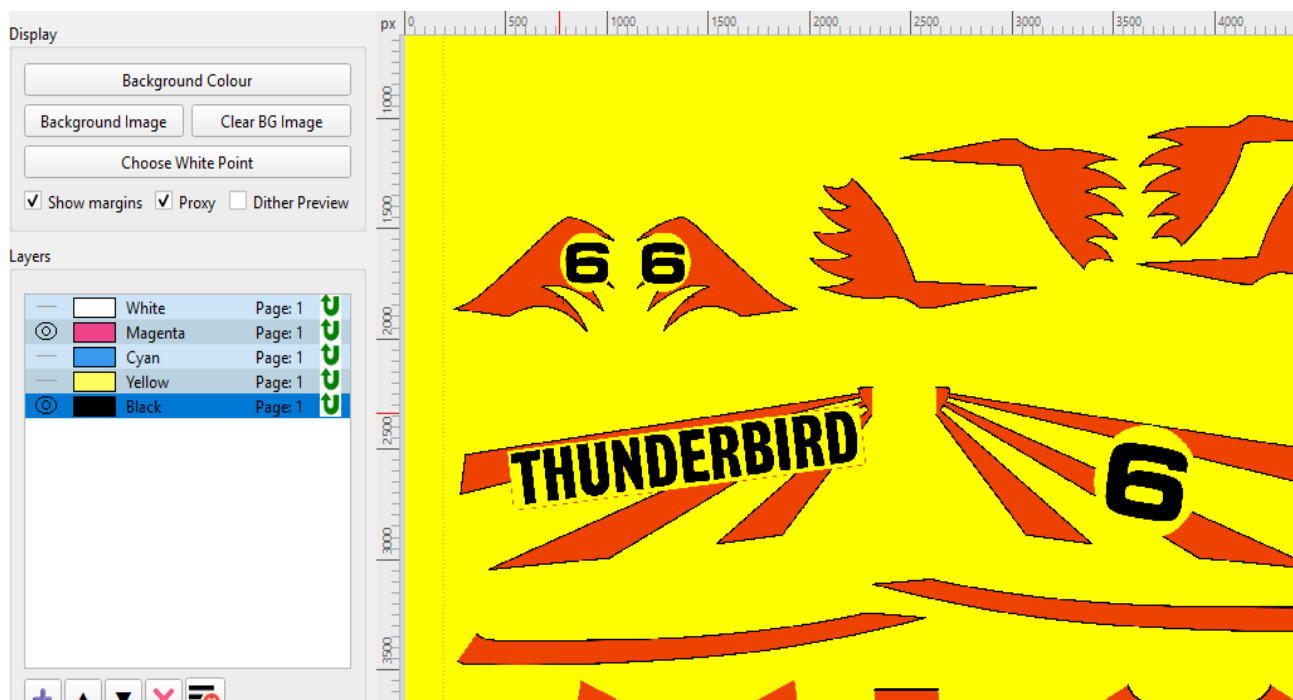


Preview Job

Choose a suitable background colour



Since this aircraft in this case will be painted yellow – we can print just magenta to get a nice saturated red without halftones or a white underlayer



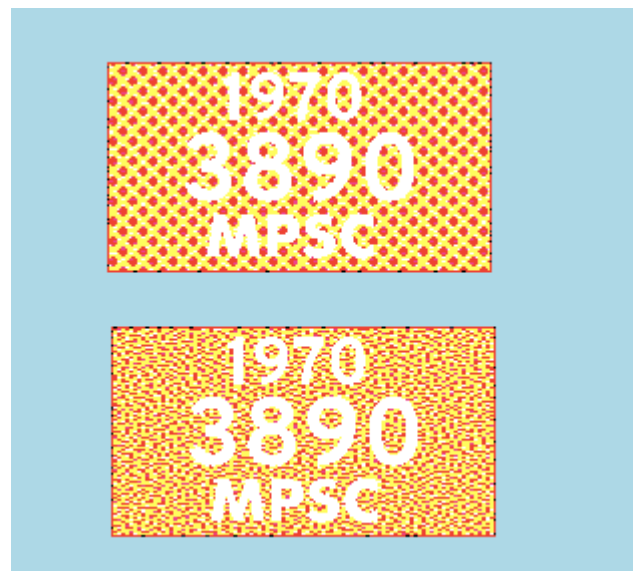
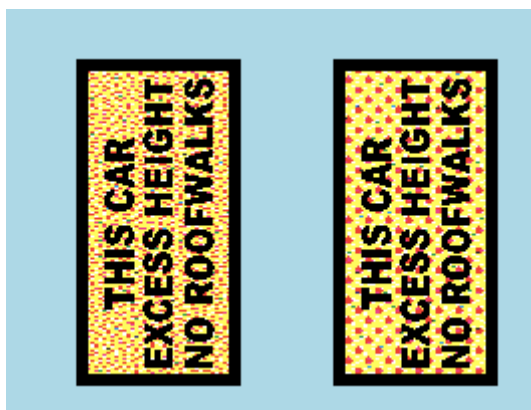
For more complex paint schemes a background image can be loaded to preview



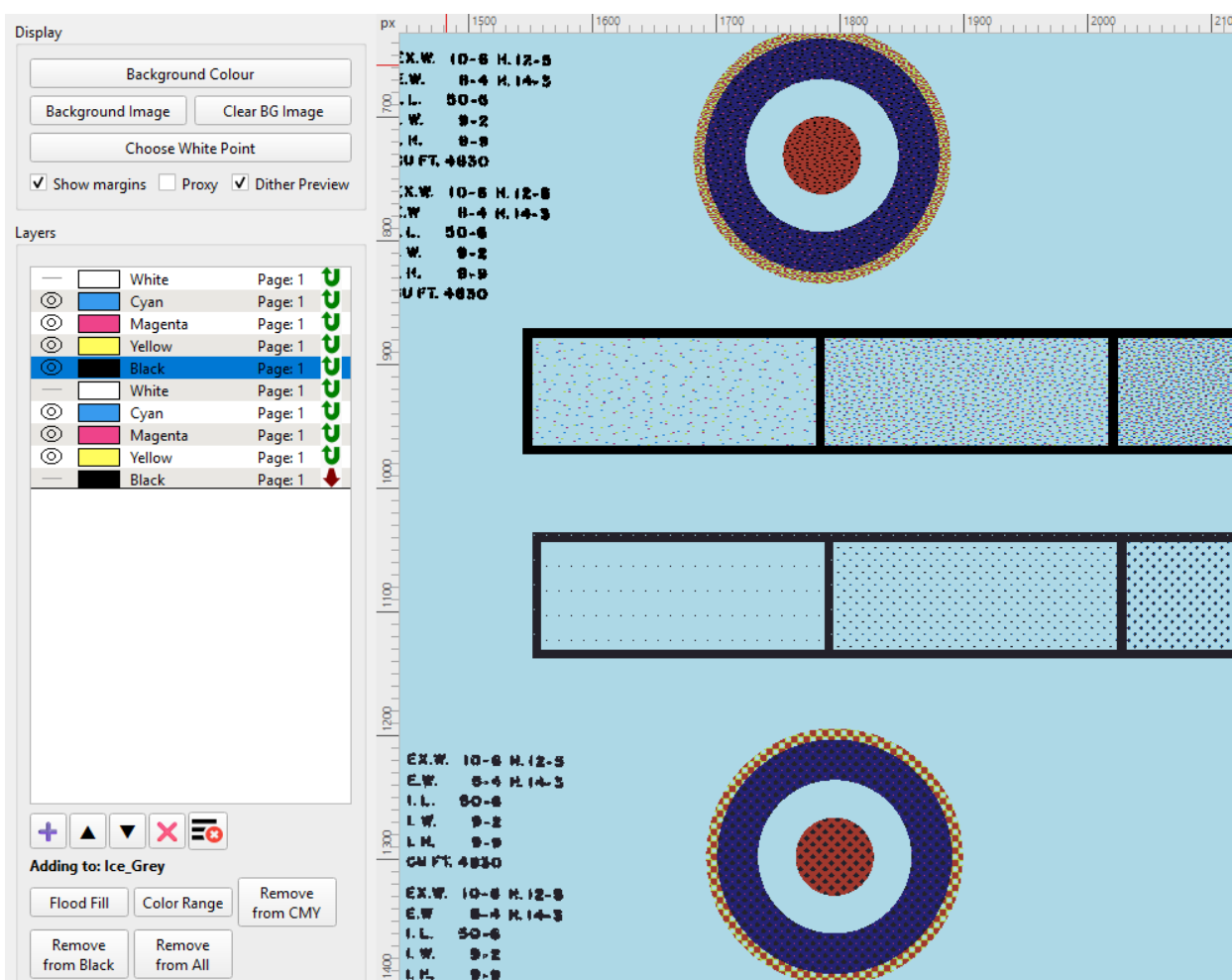
Examining Dither

The actual pixel data sent to the printer can be viewed by clicking **Dither Preview**. For best results turn **Proxy** off and set the zoom factor to 100% **View Menu->Reset View** Hotkey '1' Note that, depending on your monitor size, this will appear 6 to 8 times bigger than the actual print size.

The OEM halftones used a 5x5 grid which can look quite coarse and make small text difficult to read.



SpotMatrix defaults to a modern noise based dither which is more visually appealing.



You can see the noise based dither increases in density as the image gets darker. Regular dot patterns are clearly visible in the OEM style halftones.

For the clearest print quality aftermarket spot colour ribbons are recommended.

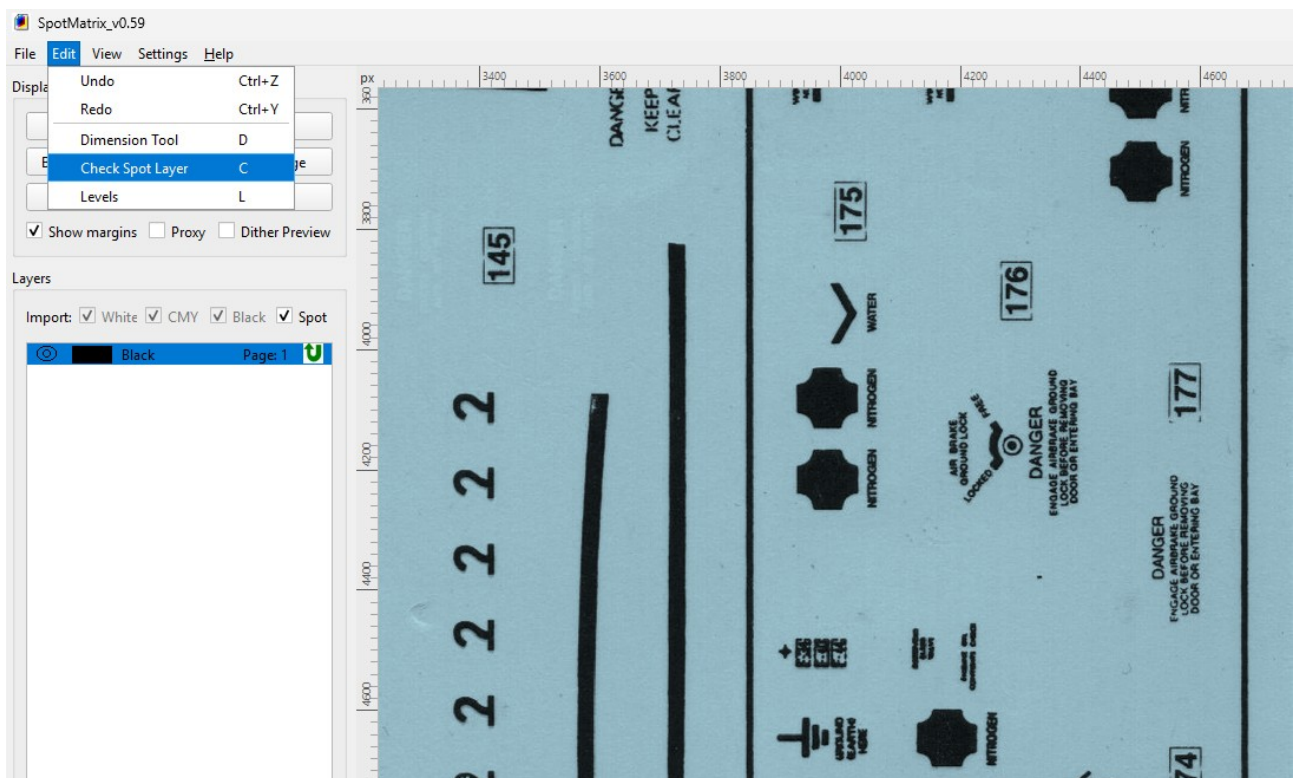
Best Practices

For the best results use images sourced from a vector drawing application. If using scanned artwork ensure the resolution is sufficiently high, edges are not too blurred and the background is completely white and that text or spot colour regions are completely opaque/black. You may need to adjust levels in a paint program before importing. 300dpi images can be scaled to 600dpi when loaded but the edges may look a bit fuzzy due to the upscaling. Ideally scanned artwork should be redrawn in vector form.

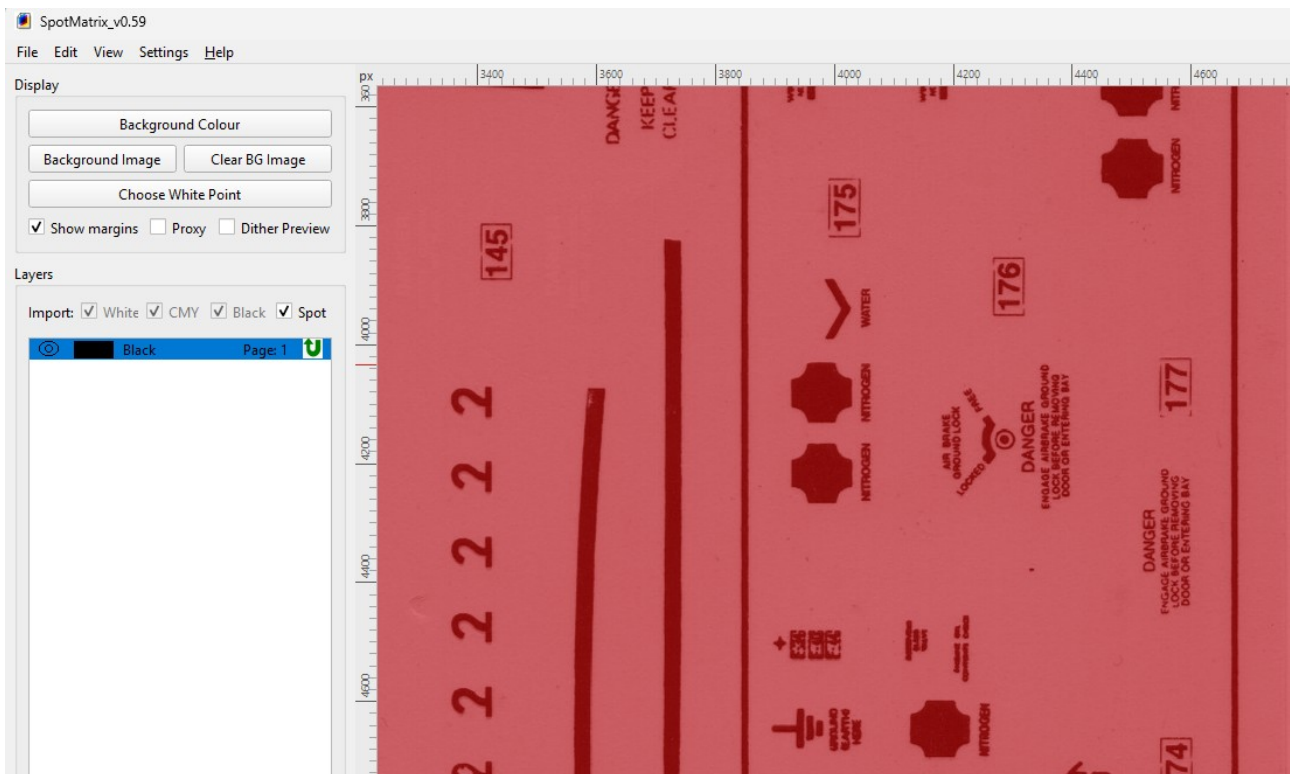
Working with Scanned Images

Scanned images should be processed before loading, however, some adjustments are possible in the application. Ensuring areas with no ink are 100% empty can save ribbon, even a small percentage of colour can consume as much ribbon as a pure black region.

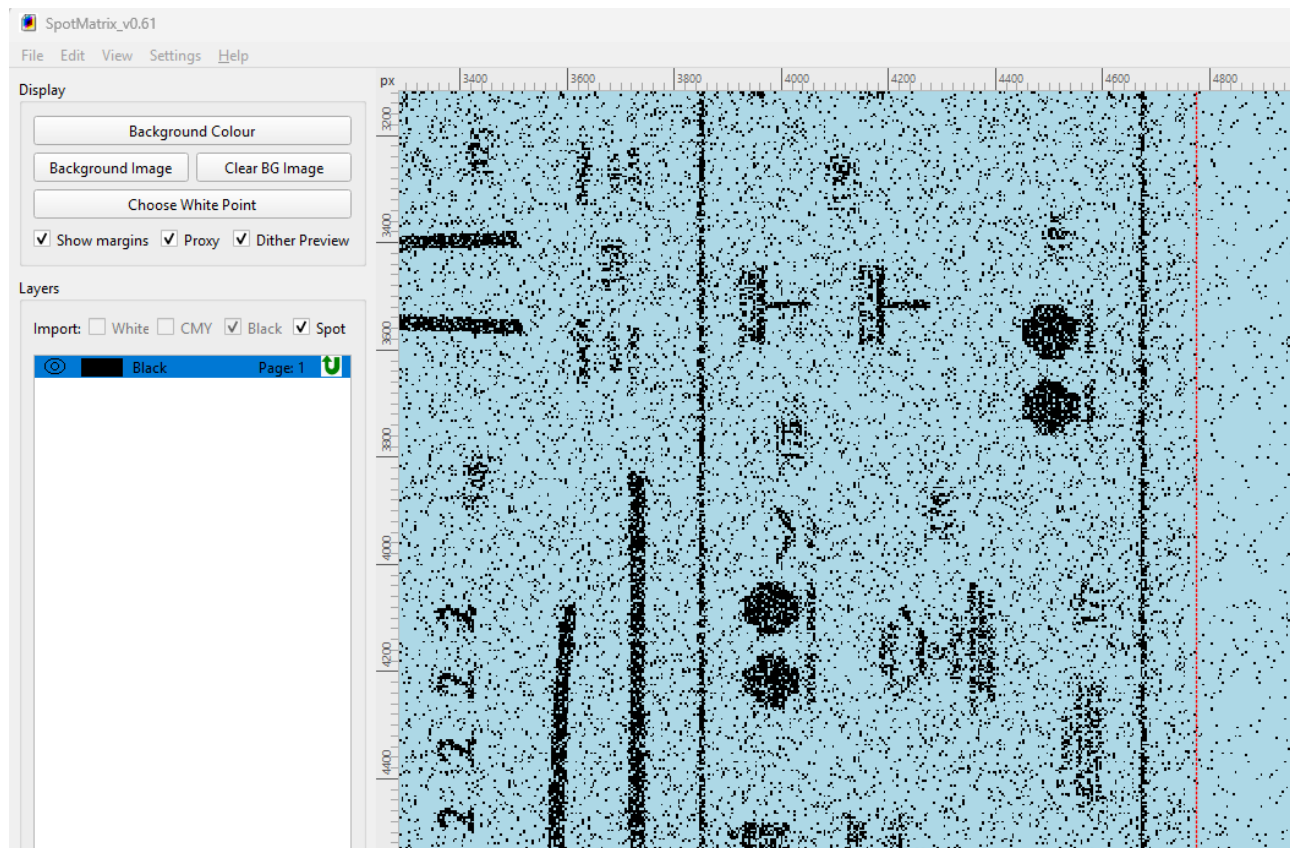
To verify the purity of a spot layer select a layer from the list and click **Edit** → **Check Spot Layer** (hotkey C)



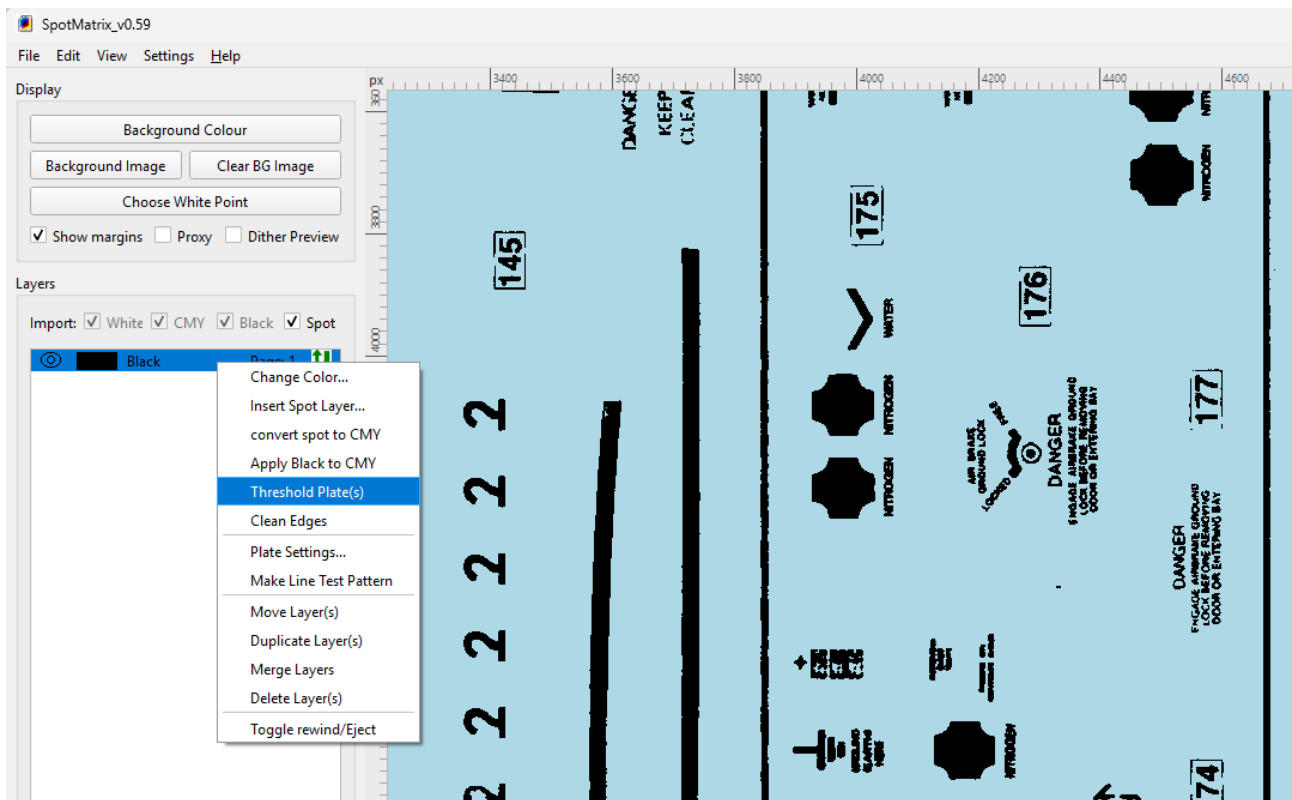
This will display a transparent red layer over any pixel which is not 100% white or 100% ink



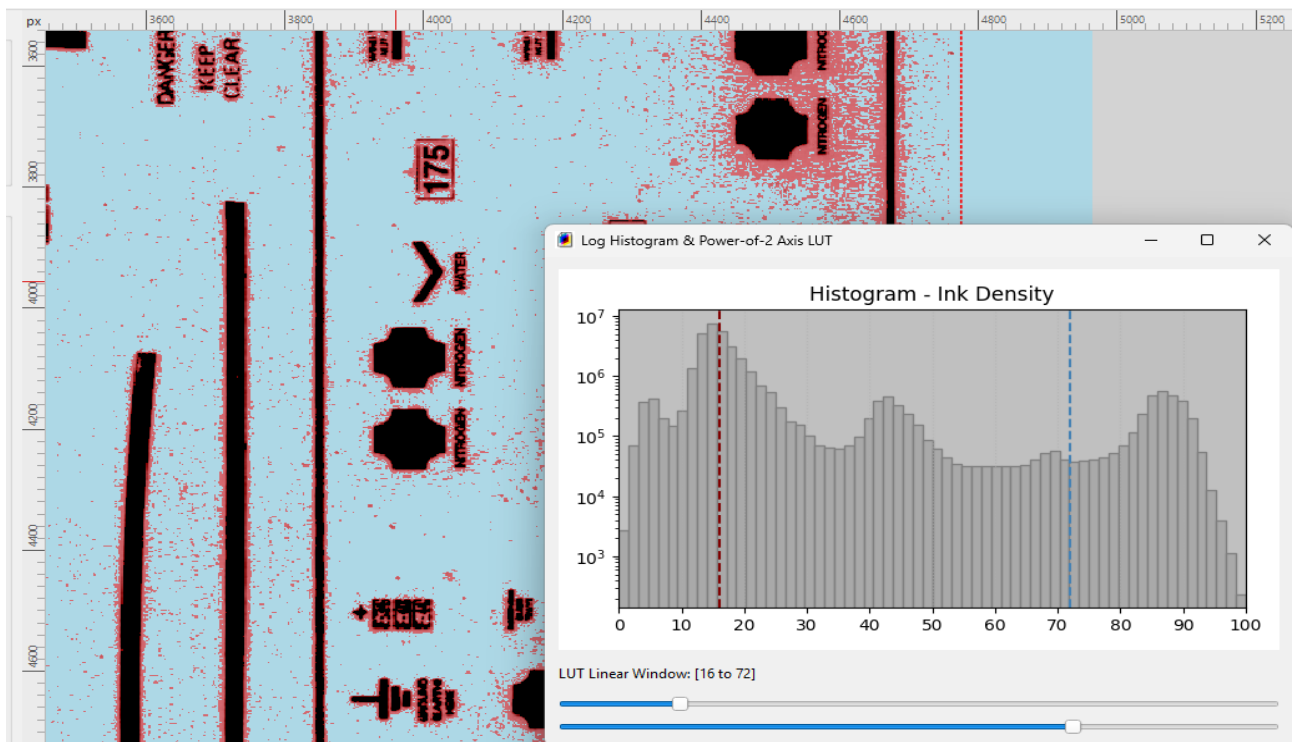
In this case there are no pure regions so blacks will print as gray and the white regions will consume ink. If printed as-is, the light and dark areas will be speckled as seen in this dither preview.



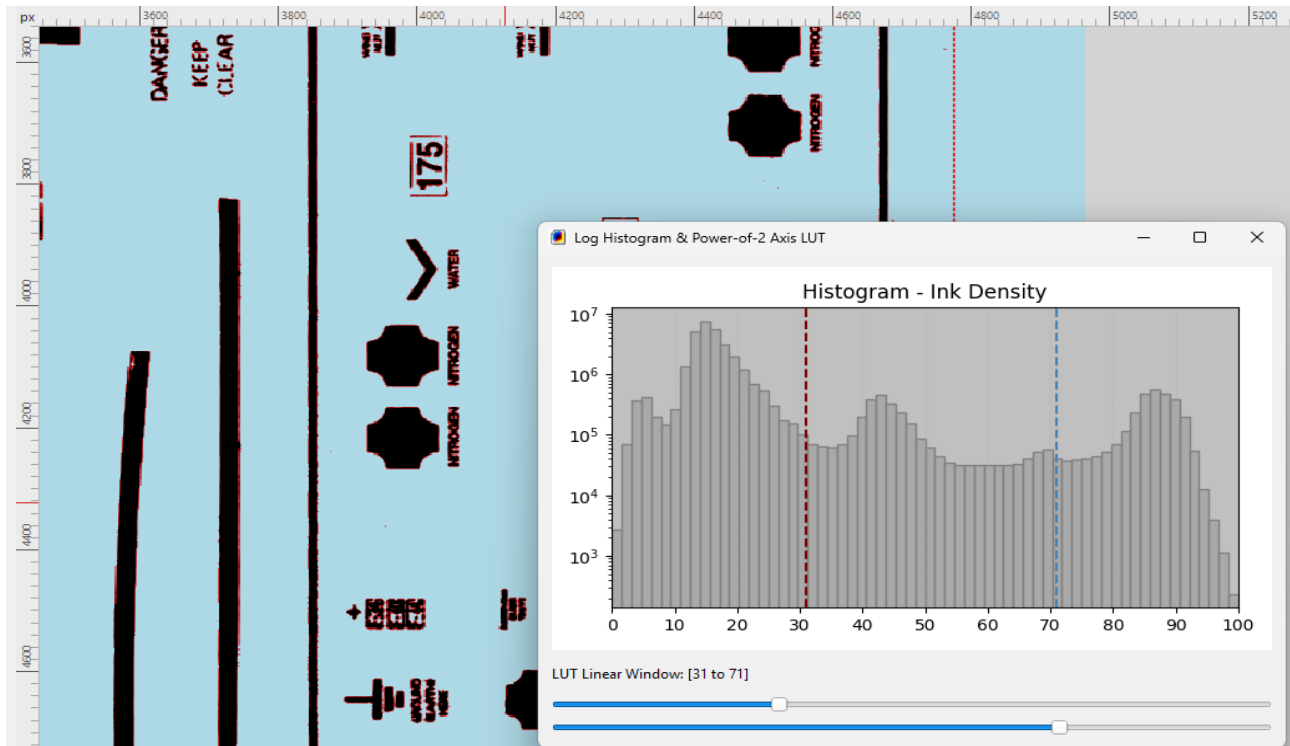
Selecting **Threshold Plate(s)** from the right click menu on the layer will be sufficient to fix most cases.



For finer control click Edit → Levels (hotkey 'L') which will display a histogram with low and high sliders



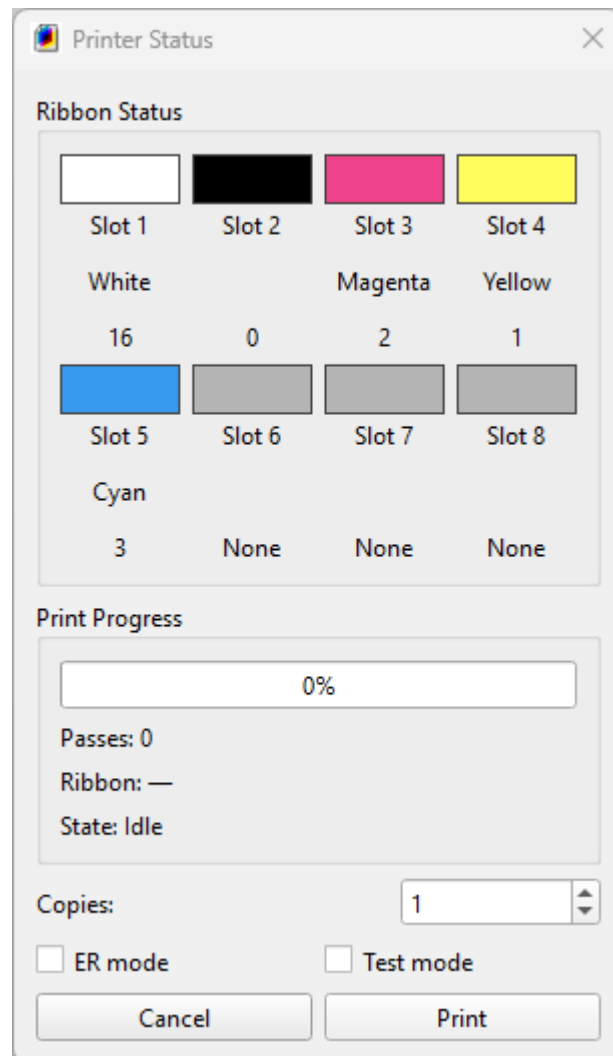
Slide the left side in to purify white areas. Slide the right side to purify black areas



Note that thresholding is a destructive operation. The levels tool computes a look-up table which is only applied during display and dithering so the original image data remains intact. The high and low values are stored in the .exr job file and the look-up table is recomputed and applied when the job file is re-opened

Printing a Job

Clicking the print button will pop up a dialog box and disable the sidebar in the main window. If you need to make changes to the layer visibility you should cancel and make the desired changes before opening the print dialog box.



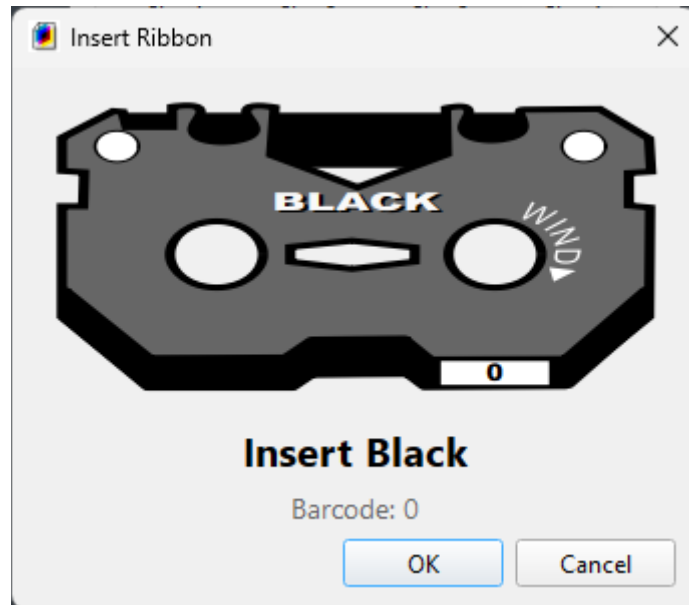
Multiple copies of a print can be set here. For this to work the last pass of a job must be set to eject the paper.

ER mode is only for use with printers which have the ER switch modification. In this mode only one ribbon should be in the printer, and it must have barcode 0 (black or spot colour) before activating the ER switch on the printer. In this mode the software will prompt the user to insert all ribbons, not just missing or spot colours.

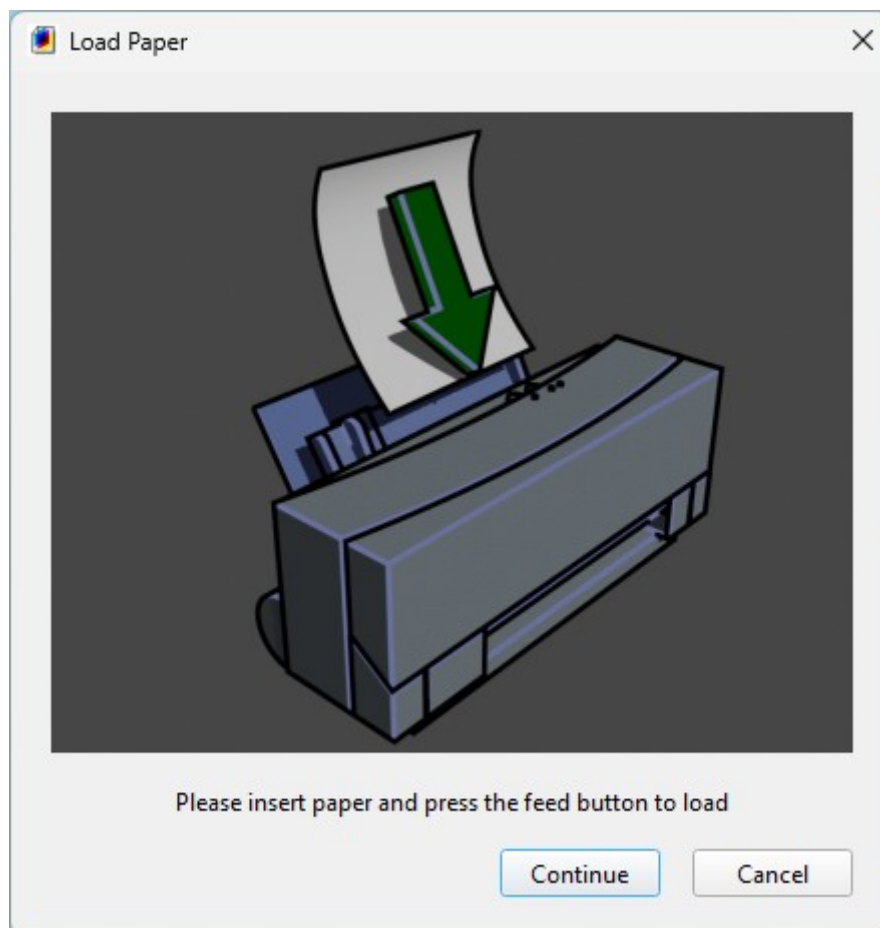
Test Mode This mode will replace all print data with zero bytes. This means that the amount of data sent to the printer will be the same but no ribbon will be used so the print job will feed and rewind paper and ask for ribbon changes as if it were a "real" print job. This was extremely useful during development to save ink. It may be useful as a practice mode to help the user develop muscle memory for printing a spot colour job – or as validation that the software is behaving as it should.

Clicking the **Print** button will launch the print job.

If the ribbon required for the first pass of the job is not present in the ribbon inventory, the user will be prompted to insert the correct ribbon.

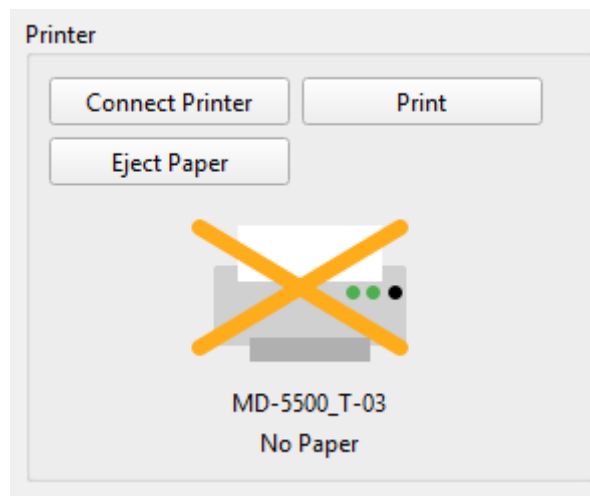


The first thing the software does is send a zero length page to the printer. If no paper is loaded this will raise the error-lamp and paper-out status bits and the user will be prompted to insert paper and press the feed button.



The dialog box will dismiss itself when paper is detected and the print will continue.

Cancelling here will leave the printer with the paper out flag set and this message in the printer status section of the main window.



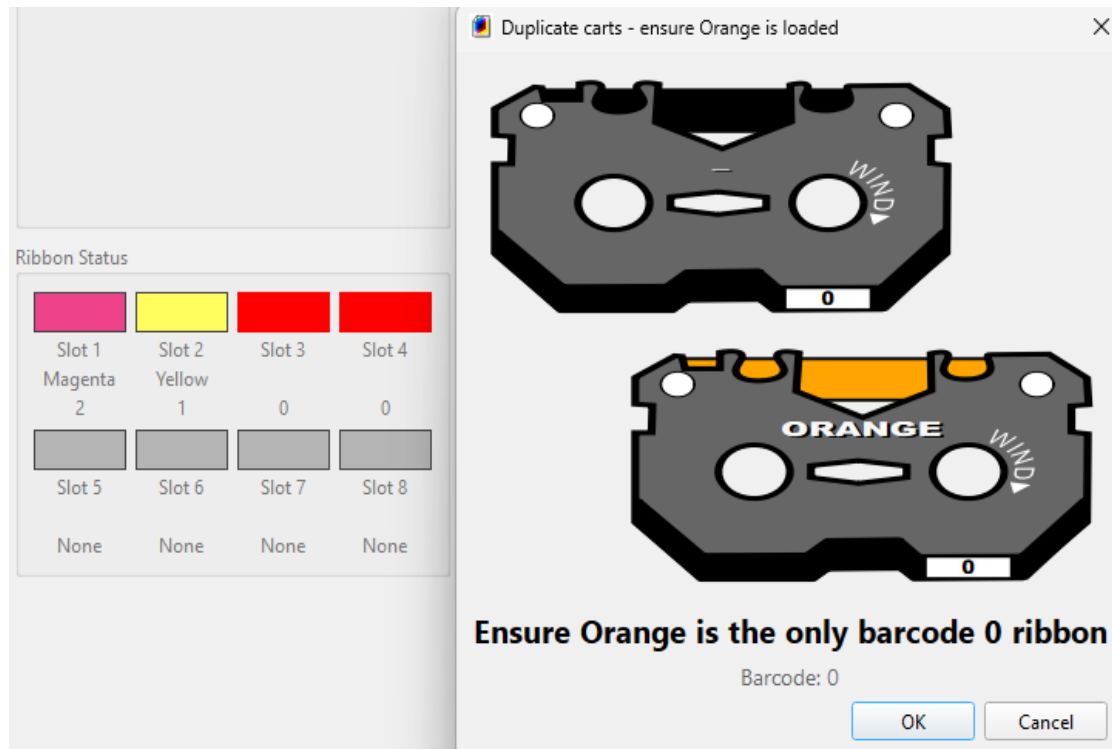
An in-progress print can be cancelled at any time. If a ribbon dialog is open (between passes) pressing "Cancel" will abort the job and return to idle. The page will not be ejected. If the printer is in the middle of a pass, pressing "Cancel" in the Print Dialog will pop up a confirmation box.

Pressing "Resume" will continue printing. Pressing "Cancel" will abort the print at the next available point – usually the next status poll or end of the current page. If the current pass is set to "Eject" the paper will be ejected. If it's set to "Rewind", the paper will be rewound. This allows a print to be aborted without wasting ink. If the job is unsalvageable – pressing the feed button on the printer or the "Eject paper" button in the printer section of the main window will eject the paper.

Print progress is shown in the progress bar in the print dialog. As a print pass progresses an indication of the progress is shown in the main window as a highlight that moves down the paper. This is approximate and shows bytes what has been sent to the printer and not the physical page position as the printer and/or USB adaptor may have buffered some data.

If a ribbon is required that is not currently in the printers ribbon inventory or a spot colour is required the user will be prompted to insert the required ribbon. Aftermarket spot colour ribbons have a 0 barcode and the printer is unable to tell them from a black cassette. If a black layer is encountered after a spot colour layer the user will be prompted to insert the black ribbon.

If 2 ribbons with the same barcode are present – the application will warn and prompt for the user to ensure only one is present before the print can continue. The ribbon inventory will flash the ribbon slots as a warning.

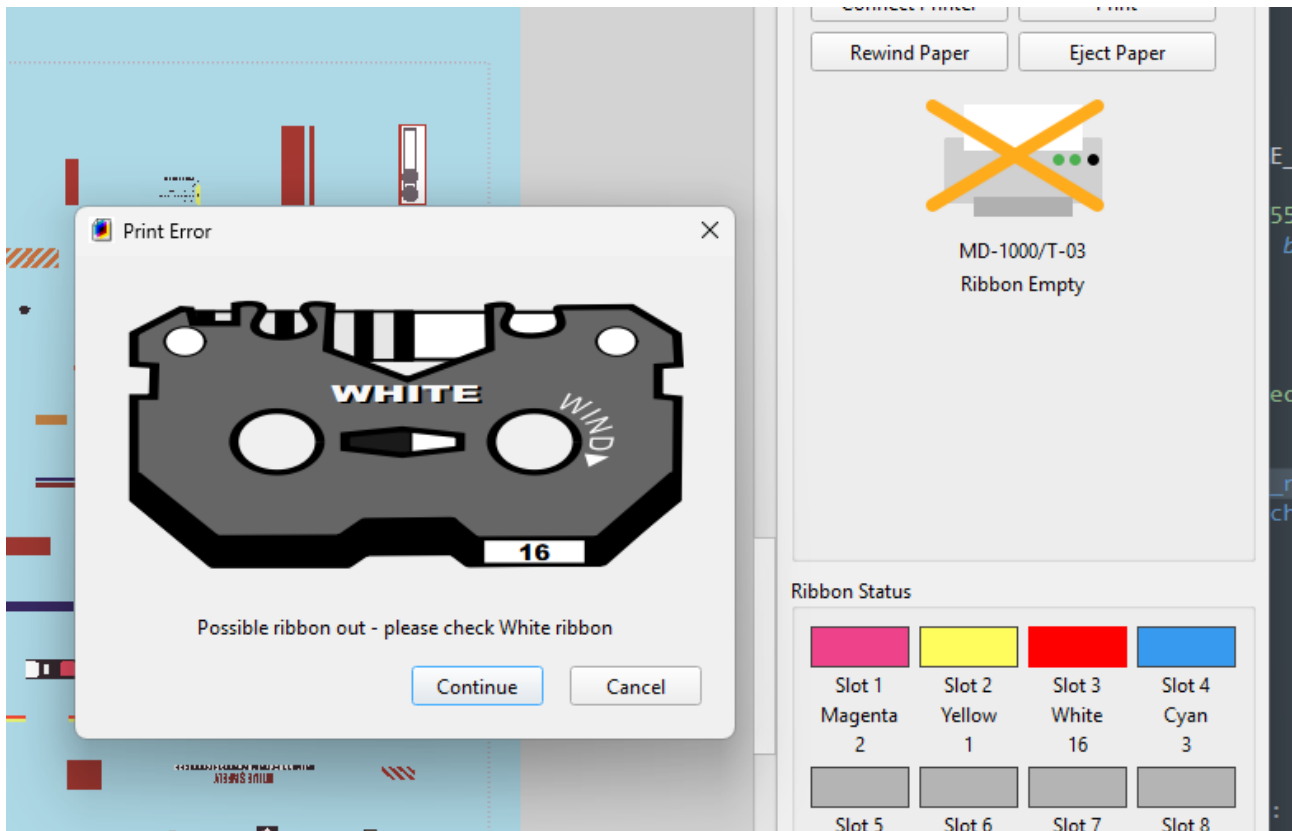


If the last pass of a job has the paper eject flag set, paper will be ejected, otherwise the page will rewind to the top. Pressing the feed button on the printer or the "Eject Paper" button will eject the paper. If the feed button is pressed after a rewind pass on the MD5500 the paper will be rewound into the paper feed tray. On MD1000 the paper will be fed through the printer and ejected.

Important tip. If paper is loaded in an MD5500 and it's native USB cable is unplugged and reconnected, the printer will be reset and the paper will be ejected. MD1000 or MD5500 with USB to parallel adaptor can be unplugged and replugged safely without it ejecting the paper.

Error Conditions:

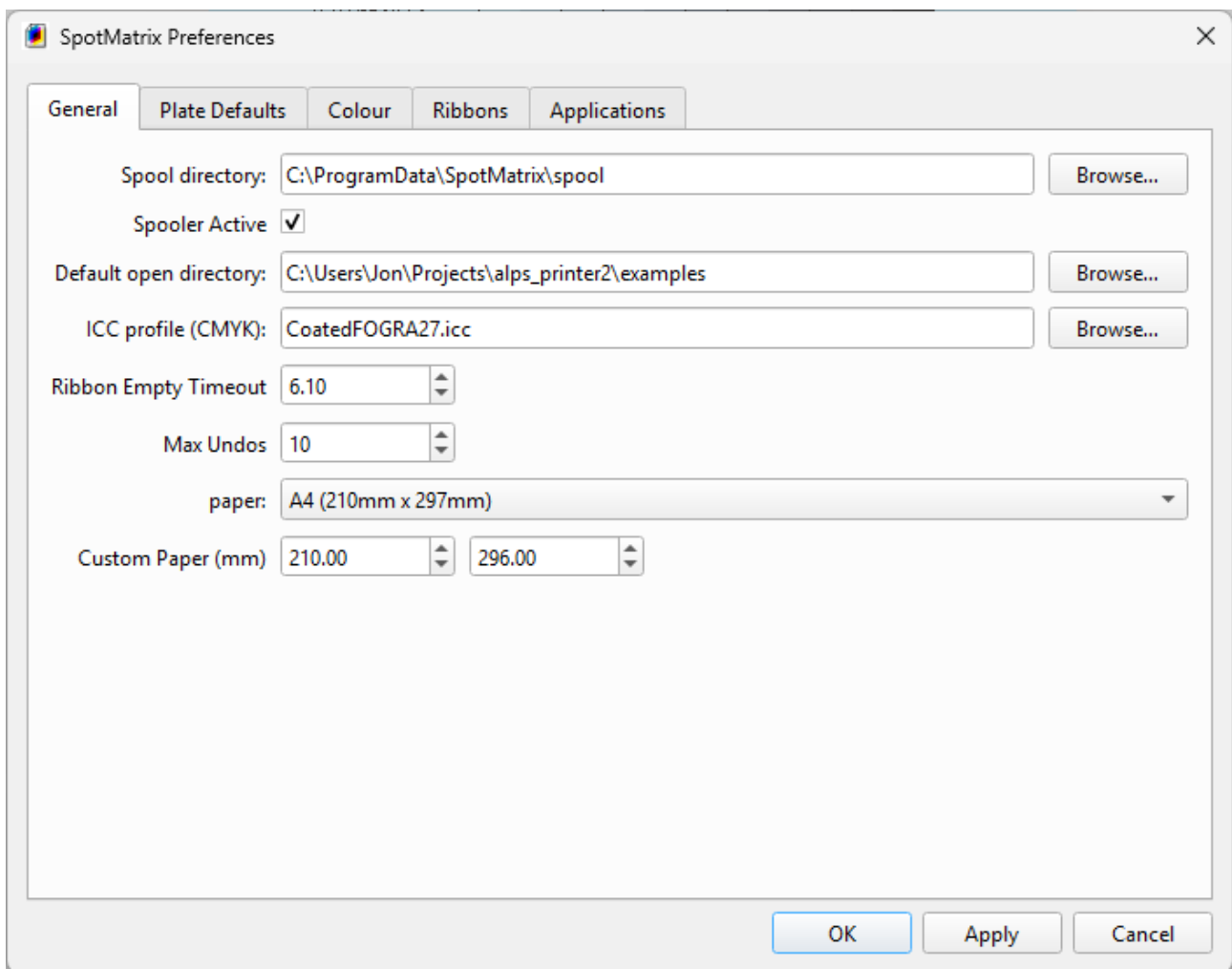
Empty Ribbon



If a ribbon runs out during a print, the printer firmware will remember where it occurred, rewind the paper and flash the error lamp. To catch this event SpotMatrix will time-out on sending raster data. When this occurs it will pop up a ribbon empty dialog and, on MD5500, the printer icon and ribbon inventory will flash the colour swatch for that ribbon. On MD-1000 printers, the USB port is blocked and cannot be queried once the printer has detected error, but the Ribbon-Out dialog will still be displayed using the current pass's ribbon for the icon. Once the empty ribbon is replaced, the printer firmware will continue the job and the dialog will automatically be dismissed. If the user wishes to abandon the job – the printer must be powered off and on again as this is a hardware error requiring user intervention.

Other error states can occur which can stall the print – MD-5XXX printers may provide useful information – e.g paper jam or ribbon breakage visible in the **Printer Status** panel. If a hardware error occurs on an MD1000 it may be necessary to unplug the usb cable, restart the application, re plug the USB and check the status panel for more information.

Global settings



The settings dialog contains several tabs:

General Tab

Spool Directory

directory where spooled files are retrieved from.

Spooler active:

If checked the application will watch the spool directory for files and load them automatically

Default Open Directory

where the application looks for files by default – this is set from the last file open operation and saved when the application closes

ICC profile:

only used for CMYK conversion – CoatedFOGRA27 has been chosen as a default as it gives a solid black and bright primary colours.

Ribbon Empty Timeout.

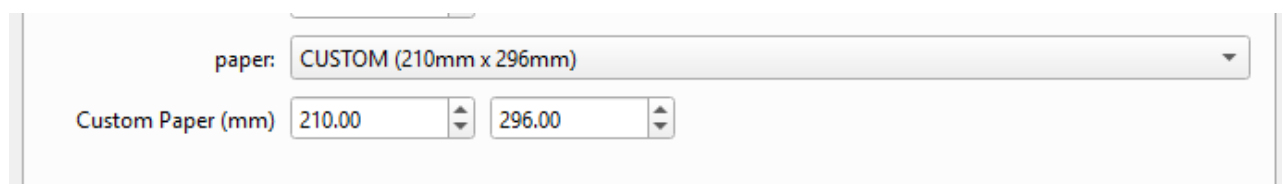
If a print stalls due to an error – a timeout will prompt the user to investigate. The most likely cause would be a ribbon running out. MD1000 has limited ability to tell the application what went wrong during a print due to the USB protocol not responding to status requests during an error state.

Max Undos.

The application fully function undo redo with <Ctrl>Z and Ctrl>Y. Most operations affecting the plate list are undoable. Complex, multilayer or multipage jobs may cause the application to pause slightly while the undo buffer is created. To disable Undo – set this value to zero. Setting it to a higher value will consume more memory.

Paper:

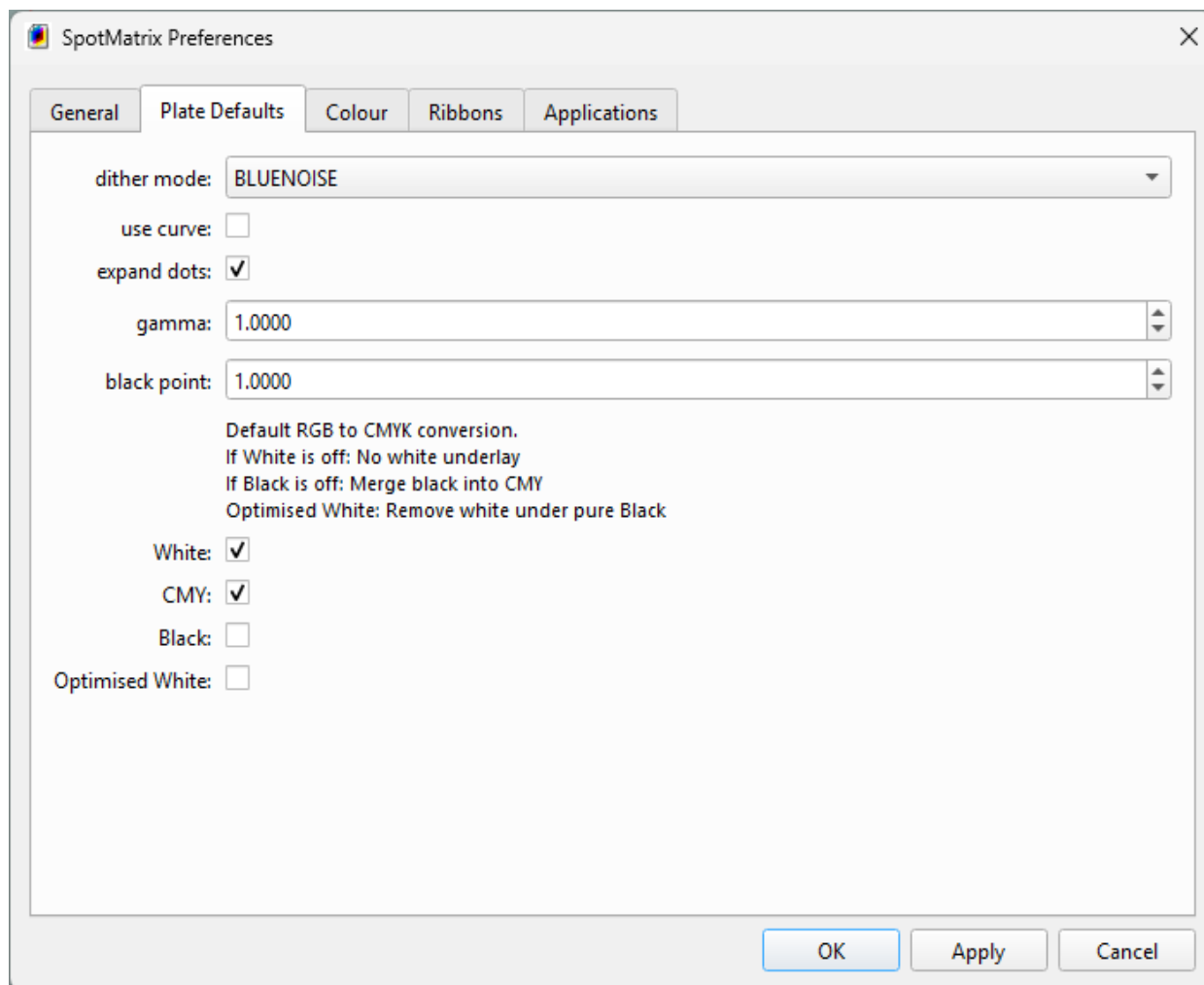
set the canvas size – ideally this should match the page size used to create the image. Changing paper size should be done before loading any images. If a custom size is desired – select CUSTOM from the dropdown and set the width and height in mm.



paper: CUSTOM (210mm x 296mm) ▼

Custom Paper (mm) 210.00 296.00

Plate Defaults Tab



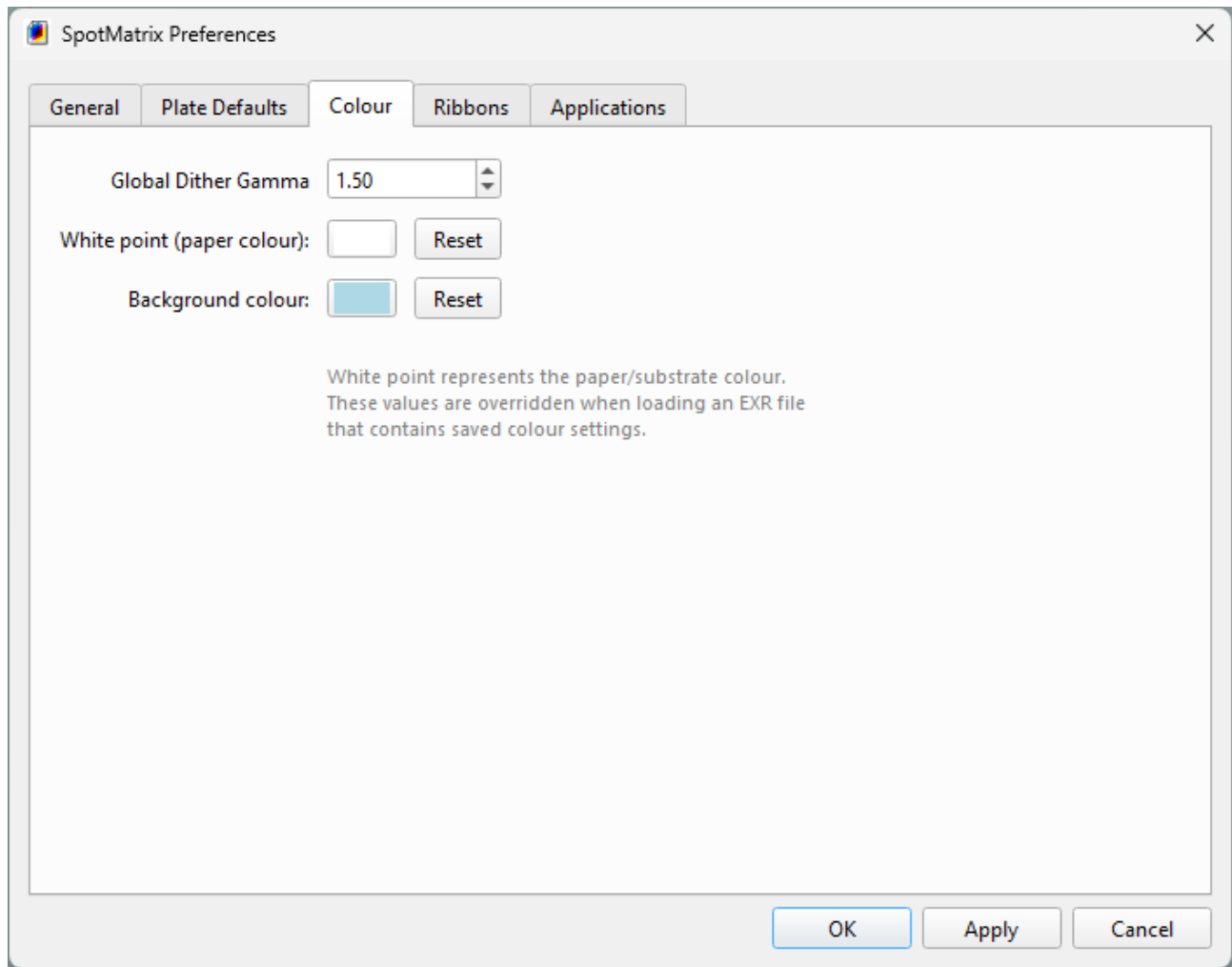
Defaults used when creating plates are set here.

Default Layer Creation

The checkboxes at the bottom control which layers are created when importing artwork. The same settings are also shown at the top of the layer list in the main window.

For decals being applied to a darker background it is recommended that white is always selected so a White underlay is generated. If Black is unchecked the RGB to CMYK conversion will apply the black value to the CMY plates. This allows full colour plus a white underlay to print using only 4 ribbons – on a printer with only 4 ribbon slots this can speed up printing – however if your artwork contains a lot pure black, less ink will be used if the black layer is created.

Colour Tab



Global Dither Gamma

A gamma is applied to each layer prior to dithering. This compensates for excess darkening in the mid-tones due to dot size. This represents a global value applied to all plates. Control of gamma for individual layers can be adjusted in *Dither Settings* in the plate list view context menu.

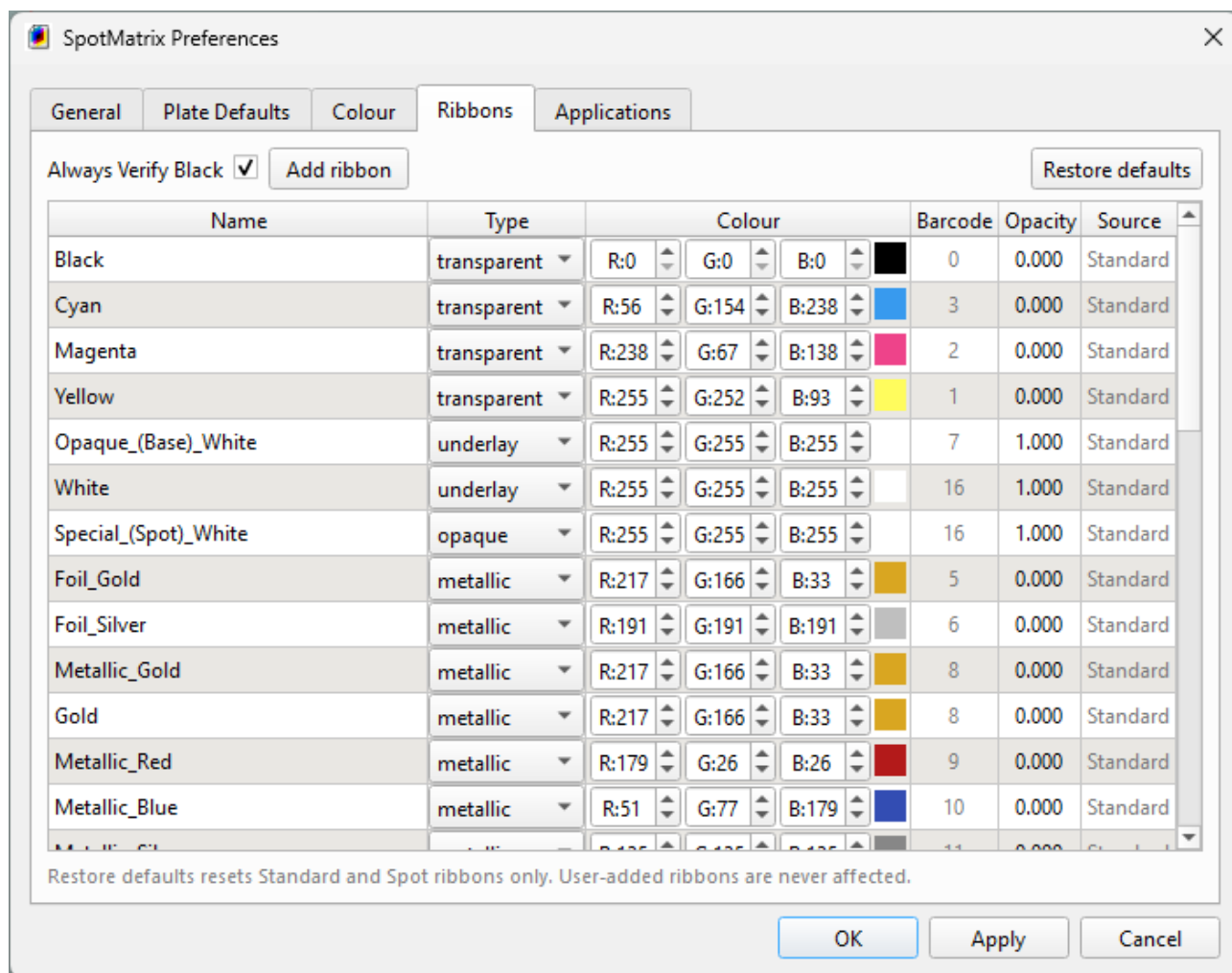
White Point

This tints the display to simulate different lighting conditions .

Background Colour

Default is a decal paper blue which allows white layers to be seen. If decals are going to be placed over a specific colour you can set any colour here to see how layers will react – for example a bright red stripe over a yellow background can be printed with just magenta ink. Note that a background image can also be used – see *Main window -> Display Settings*

Ribbon Tab



SpotMatrix Preferences

General Plate Defaults Colour **Ribbons** Applications

Always Verify Black ☒ Add ribbon Restore defaults

Name	Type	Colour	Barcode	Opacity	Source
Black	transparent	R:0 G:0 B:0	0	0.000	Standard
Cyan	transparent	R:56 G:154 B:238	3	0.000	Standard
Magenta	transparent	R:238 G:67 B:138	2	0.000	Standard
Yellow	transparent	R:255 G:252 B:93	1	0.000	Standard
Opaque_(Base)_White	underlay	R:255 G:255 B:255	7	1.000	Standard
White	underlay	R:255 G:255 B:255	16	1.000	Standard
Special_(Spot)_White	opaque	R:255 G:255 B:255	16	1.000	Standard
Foil_Gold	metallic	R:217 G:166 B:33	5	0.000	Standard
Foil_Silver	metallic	R:191 G:191 B:191	6	0.000	Standard
Metallic_Gold	metallic	R:217 G:166 B:33	8	0.000	Standard
Gold	metallic	R:217 G:166 B:33	8	0.000	Standard
Metallic_Red	metallic	R:179 G:26 B:26	9	0.000	Standard
Metallic_Blue	metallic	R:51 G:77 B:179	10	0.000	Standard
Metallic_Green	metallic	R:135 G:135 B:135	11	0.000	Standard

Restore defaults resets Standard and Spot ribbons only. User-added ribbons are never affected.

OK Apply Cancel

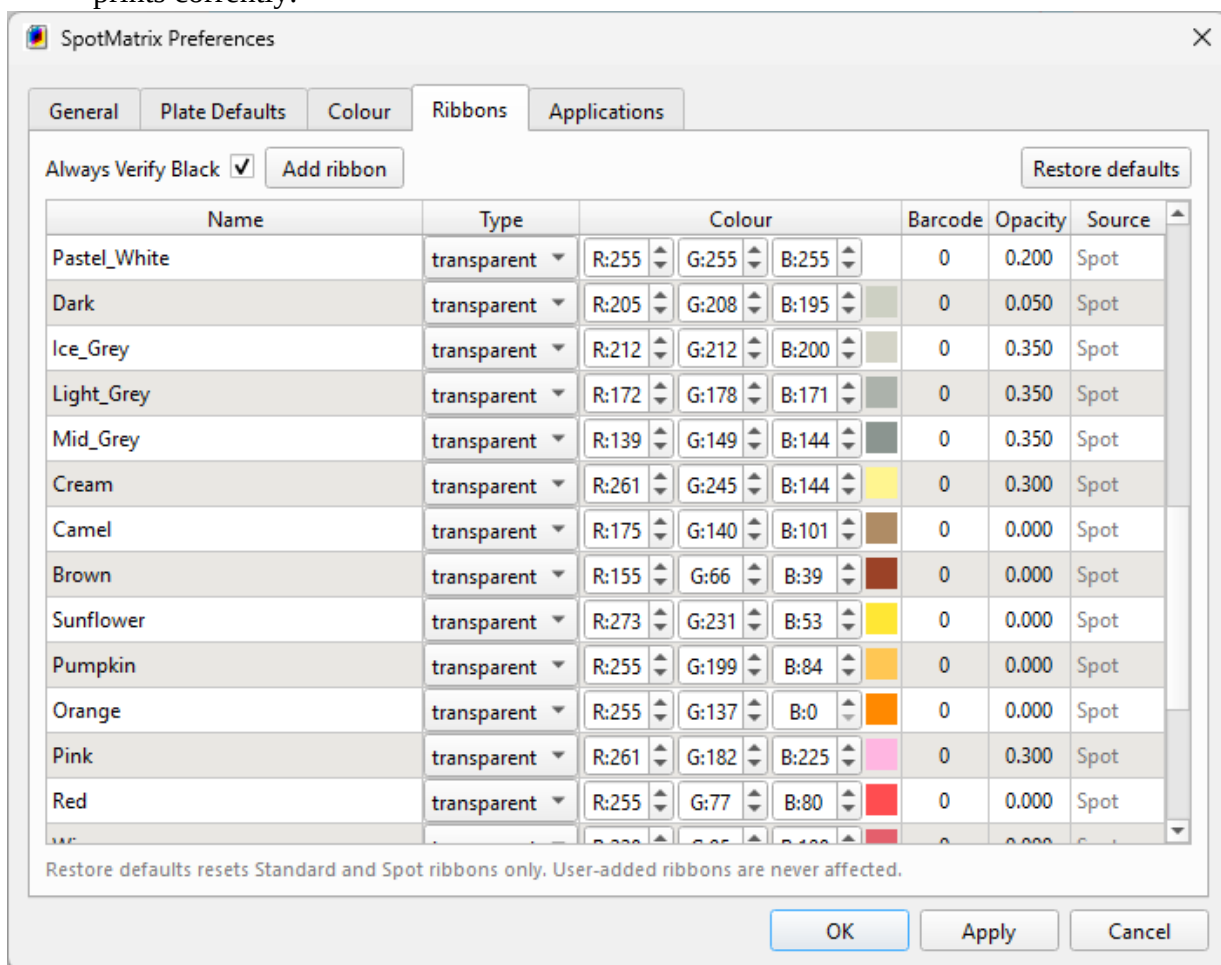
Always Verify Black: If you print with a lot of spot colours the application will always prompt when it encounters a black layer – this is to ensure the user had removed a previous spot colour. If you never print with spot colours – or you’re sure any ribbons with barcode 0 in the printer are black – you can uncheck this.

Standard ribbons

(ribbons supplied by ALPS) should not be edited – the display colours and opacity have been tuned for optimum display.

Spot colour ribbons

Spot Colour ribbons from aftermarket suppliers – e.g Elephant’s Rocket in Japan, can be represented and edited. The colours have been set based on the Elephants Rocket Colour chart and are approximate. Pastel white, all the greys, cream, pink and aqua all seem to suppress the underlying colour with the addition of a white pigment The **Opacity** value represents the amount of white pigment in the ribbon. Dark is a transparent grey which darkens the underlying colour. All Elephant’s Rocket spot colours have a barcode of 0 – which means the printer thinks they are black. If SpotMatrix encounters a spot colour layer while printing it will automatically prompt the user to insert the required ribbon. If you have the ability to change the barcode on a spot colour ribbon you can enter the change in the **Barcode** field. Note that each OEM ribbon type has specific speed and temperature settings. If you change a barcode on a spot colour ink to one of the OEM colours – please test that it prints correctly.



User specified ribbons

Custom ribbons can be added.

Restore Defaults

reset all non-user added ribbons to default values.

Differences between Models.

The MD1000 and MD5500 have some behaviour differences. Obviously the MD5500 has 8 ribbon slots, however it requires one free to be able to swap ribbons so, practically speaking it can only hold 7 ribbons. The ribbon scan when closing the door takes much longer on the MD5500 than the MD1000. This means a complex job using multiple spot colours can take longer – this is why Elephant’s Rocket has developed the ER switch modification to speed up ribbon changes.

MD1000 firmware is older and slower than MD5500 which means it can become unresponsive to queries from the host computer during paper movement. To work around this SpotMatrix inserts a USB soft reset periodically which keep the printer interface alive. On the MD5500 a soft reset ejects the paper, which is not what we want. Similarly, unplugging and replugging the USB cable from the printer’s USB-B port will reset the printer and eject the paper. A USB to Parallel port adaptor on the MD5500 does not reset the printer on unplug/replug. The Native USB interface on the MD5500 also has more precise timing and handshaking requirements where an USB to parallel adaptor is more forgiving.

MD5500 is more responsive to status queries during a print and can show which ribbon is currently on the print head and where ribbons are positions during a print. MD1000 is supposed to be able to tell which ribbon is mounted (there are status bytes in the protocol for this) but I can’t get it to tell me which ribbon is in use during a print.

MD5500 can use print closer to the bottom edge of the paper. Printing beyond the bottom margin will result in the paper being ejected. SpotMatrix maintains a conservative safe bottom margin for A4 and US Letter sized paper and will crop the image to prevent printing too far. Caution must be used with shorter paper. I frequently print a row of decals at the top of a page, then trim the paper and save the shorter tail for re-use – the software cannot automatically determine shorter paper and set the bottom margin automatically.