

The CorelDRAW! 4 Prepress Tools

This article describes the purpose for, and use of, the Prepress tools implemented in CorelDRAW! 4 Rev B. If you are currently using CorelDRAW! 4 Rev A please contact Customer Service for an upgrade. The following sections are included in this document:

- 1./ General introduction
- 2./ Creating a color circuit
- 3./ Switches that affect the Print Engine

General introduction

In the main Print dialog box, there is a checkbox labeled Use Color Correction. By default, this checkbox is deselected. When the control is in this state, CorelDRAW! outputs color directly, without applying the color transforms discussed in the next section. In this respect, color vector objects are output uncorrected (as in previous versions of CorelDRAW!) and color raster objects are converted to CMYK using a rudimentary, but relatively fast, conversion algorithm. You may change the default status of this control if you like. See the section on Print engine switches for more information.

When the Use Color Correction check box is selected, the Color button becomes enabled (giving access to the prepress controls) and color is output from CorelDRAW! in a different fashion. In this situation, colors are passed through the circuit (discussed in the next section) in an effort to correct or calibrate the color output. It should be noted that when color correction is enabled, all color output from CorelDRAW! (except composite output to non-PostScript devices) will be affected.

The prepress controls, and the implementation of the circuits themselves, were developed based on output from devices, processes and inks conforming to SWOP (Specifications for Web Offset Publications) standards. In this respect, one must be outputting to such a device in order to achieve predictable results using a circuit. There are, however, special cases where the circuits may be of some benefit to non-SWOP processes. If, for example, you find the output of color bitmaps from CorelDRAW! to your color PostScript device unacceptable, you should be able to use the information in the next section to generate a circuit that produces satisfactory raster output. See the switches section of this document on how to send raster objects but not vector objects through the circuit.

Creating a color circuit

When the Use Color Correction checkbox, in the main Print dialog box, is selected, the Color button is available and the prepress tools and color circuits are enabled. A color circuit is a file that describes a color transform. The controls in the Prepress dialog offer the user a means of defining the parameters used in creating a color circuit. Complex color transforms require sophisticated numeric intensive algorithms. For this reason, circuit creation (via the Prepress dialog) has been

separated from the actual application of the circuit (which happens after you press OK in the Print dialog). Once a circuit has been created, it may be loaded and used in the output process anytime, without the need for further calculations.

Color circuits cannot be edited. If you make slight changes to an existing circuit, in the Prepress dialog, you will be prompted to enter a unique name for the new circuit.

The following controls are available in the Prepress dialog. They are different from traditional prepress controls in that they affect each other and are considered together, by the color transform generator, in creating a particular color circuit. They are presented in an order best suited for consideration by the user.

Dot Gain

Dot gain is an inherent characteristic of the printing process. A specified dot percentage, when printed and measured, will be found to have increased. This is due to both a physical change in the dot size (physical dot gain) and an apparent change due to the optical properties of the paper (optical dot gain).

The Dot Gain control allows the user to scroll to any value between 0% and 40%. This value will be the amount of dot gain compensated for during circuit creation (and, hence, in the output itself). When the Master channel is selected (in the listbox) the Dot Gain value is set for all channels (C, M, Y, and K). From this point, the individual channels may be selected from the listbox and the dot gain for each may be set explicitly.

The radio buttons offer target dot gain for each of the SWOP reproduction media; Off-press proof, Offset press and Web press.

Undercolor Removal (UCR)

Undercolor removal refers to the reduction of the colored inks (C, M and Y) in the dark or near neutral shadow areas in order to reduce the total amount of ink coverage. The Total Area Coverage (TAC) is defined as the sum of the dot percentages of all four colors contributing to a printed color. The maximum is 400% (100% of each of the process colors). Better shadow detail and more consistent reproduction may be achieved by limiting the TAC to a smaller value.

The UCR slider may be set to any TAC in the range of 200-400%. The radio buttons are used to indicate whether the TAC references the dot areas on the separations, before dot gain has occurred (in which case Film should be selected), or the dot areas on the final print, after dot gain has occurred (in which case Printer should be selected). If a color is found to exceed the percentage indicated by the UCR control, it will be substituted with a different balance of C, M, Y and K inks that produces the same visual color but conforms to the TAC restriction.

Black Point

A black produced by 400% TAC (100% each of C, M, Y and K) would be darker than a black produced by the C, M and Y inks alone. The Black Point specifies the "blackness" level relative to these two references. A Black Point of zero would give a black as dark as a three color black whereas a setting of one would give a black as dark as a full four color black. Typically, 0.5 is a good place to start. The scroll arrows may be used to change the value held by the control.

Note that the Black Point only specifies the apparent darkness of black. The actual CMYK percentages used to produce this appearance will be determined by the GCR and UCR settings.

Gray Component Replacement (GCR)

Gray Component Replacement refers to a technique that uses black to replace the gray component of a color previously described by a mixture of the chromatic colors (cyan, magenta and yellow). This process can produce cleaner colors with improved sharpness and color fidelity. Higher levels of GCR yield a reduction in the total amount of ink used, because the colored inks (C, M and Y) are replaced by a single black ink.

Most visible colors may be reproduced with more than one combination of CMYK percentages. These combinations may be arranged in a sequence where the black content is minimal at one end and increases to a maximum at the other end. The GCR value is used, during circuit generation, to select one of the possible colors along the sequence. A GCR value of zero would select the color at the beginning of the sequence whereas a value of one (100%) would select the color at the end of the sequence (where black has it's maximum).

Each of the five handles on the GCR graph may be moved up or down to increase or decrease the amount of GCR over any portion of the tonal range. Typically, skeletal blacks are desired and may be produced by setting the GCR level very low in the highlights and quarter tones (the sliding handles to the right of the graph) and higher in the shadows and three-quarter tones (to the left of the graph).

Calibration

The Calibration button causes the Calibrate dialog box to be displayed. The six colored boxes are intended to represent the process colors and their pair-wise overlays (red = magenta + yellow). As each of the six colored boxes is selected, the color selection dialog is presented, allowing the monitor color to be mixed to most closely match the printed version. By matching each of these six colors to the six printed equivalents (from a four color print) the user may inform the color circuit generation process of the capabilities and gamut of the destination device.

This technique does not change the output to match the screen colors in

CoreIDRAW!. Its purpose is to provide data about the output device. This data is then used in bringing the Preview in the Color dialog closer to the actual output color. It is also used in bringing the output color closer to actual true color (based on the SWOP standard). In this manner, it is more of a normalization than a calibration.

Quality

The Quality radio buttons specify the degree of accuracy used in calculating the color transforms. When the Best radio button is selected, the highest degree of accuracy will be upheld during circuit generation. This setting also affects the number and intensity of calculations required. Many of the calculations are carried out using floating point math, so slower systems, especially those without floating point math coprocessors, may suffer extremely slow circuit creation. In this case, the Better radio button should be selected instead. It merely lowers the degree of accuracy used in the calculations. The length of time required for circuit creation will be minimal and the output quality will rarely suffer.

Switches that affect the Print Engine

The following switches are located in the [Config] section of the CORELPRN.INI (located in the CONFIG directory). They are queried every time the Print dialog is initialized. These, and all other printing related switches, are documented in the CORELPRN.INI - [Config] section of the on-line help. In order to change one or more of these switches back up the CORELPRN.INI and use an ASCII text editor to edit the file as described below.

UseColorCorrection=0/1

Default: 0 (false)

Description: This flag allows the user to set the default status of the Use Color Correction checkbox in the Print dialog. Normally it defaults to disabled. To force color correction to be always enabled, this flag may be set to 1.

Benefit: The calibration and prepress tools will be enabled. Output color will be closer to the Color dialog's Preview window representation and to true color (based on SWOP standards).

Trade-off: Output colors will not match exactly those of previous versions of CoreIDRAW!.

The following three switches will only have effect when Color Correction has been enabled, either through the Print dialog or by setting UseColorCorrection=1 (as previously described).

UsePrepressToolsOnVectors=0/1

Default: 1 (true)

Description: This flag determines whether vector objects will be passed through the

color circuit when outputting composites to color PostScript devices or separations in general. To force vector objects to output using colors identical to those from previous versions of DRAW! set this flag to 0.

Benefit: Vector objects will output in uncorrected color (matching DRAW! 3.0) when this flag is disabled.

Trade-off: The calibration and prepress tools will have no effect on vector objects.

UsePrepressToolsOnBitmaps=0/1

Default: 1 (true)

Description: This flag determines whether bitmaps will be passed through the color circuit when outputting composites to color PostScript devices or separations in general.

Benefit: Bitmaps will output faster when this flag is disabled.

Trade-off: The calibration and prepress tools will have no effect bitmaps.

PrintTrueGrayscale=0/1

Default: 1 (true)

Description: This flag only applies to vector objects. It determines whether black (and percentages of black) is sent through the color circuit when outputting composites to color PostScript devices or separations in general.

Benefit: Disabling this flag will cause the prepress tools to act on objects that have pure and screened black but no primary color. This allows Dot Gain and the other controls to have effect.

Trade-off: Black objects will be comprised of the three primary colors (C, M and Y) as opposed to strictly black.

If you decide that, for your particular application, bitmaps would benefit from being passed through the color circuit, but vectors would not, set the following switches in the [Config] section of the CORELPRN.INI:

```
UseColorCorrection=1
UsePrepressToolsOnVectors=0
UsePrepressToolsOnBitmaps=1
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This causes the color circuit, and the color correction tools, to be enabled by default, but it prevents color vector objects from being affected. Experimentation with circuit creation will lead you to the best possible results on your particular device. In the case of color PostScript composite printers, you'll probably want to set Dot Gain at zero and use the Calibration dialog to inform the circuit generator about the capabilities of the device. In this manner, raster output can be improved dramatically.