13

A. Commercial Colour Printing

The first part of this chapter describes how to prepare Ovation Pro documents for *lithographic* (litho) printing. Litho printing is the most widely used printing process today, and is suitable for most applications (except for very short runs of less than, say, 500 copies).

If your document only needs to use two or three basic colours, you can print it very economically using *spot-colour printing*. If you want to print using the full range of colours, then you should use *full-colour* printing.

When printing it is often necessary to modify the appearance of pictures and graphics. Information on this is given in the second part of this chapter.

B. Image Processing

13.1 Installation

This chapter describes the facilities provided by the ***Ovation Pro*** **Colour Supplement**. This supplement to the main program is provided in the form of an extension applet, which must be installed before it can be used.

The applet is called **ColSupp** It must be installed in the usual way *(see Chapter 18)*.

By default the Colour Supplement applet is installed, so unless you have removed it, you probably need to do nothing.

13.2 Litho Printing

After completing and checking your document, the first job is to have it typeset. This involves printing the document to a PostScript file and sending it to a typesetting bureau *(see 13.8)*. Occasionally, a bureau will accept ***Ovation Pro*** files directly.

The bureau will print a very high quality *original* of your document using an imagesetter.

For high quality or full-colour work, they will usually produce *film*. This can be used directly to make the printing plates.

A cheaper alternative is a *bromide* (photographic paper), which needs to be photographed to produce the printing plate. This is often called *camera-ready copy*.

Your printer will be able to tell you which is the best material for a particular job.

Proofs

For full-colour work, it is essential to proof your work before it is printed. A proof is a high quality colour print produced directly from the set of four film separations. The two dry-proofing processes that are often available are called *Chromalin* and *Matchprint* proofs. They are quite expensive, but allow you to check that everything is correct before the more-expensive print job commences.

Ask your bureau which proofing process is available, and how much it will cost.

Printing

A litho press uses a printing plate wrapped around a revolving cylinder. The printing plate, which is presensitized with a light-sensitive coating, is placed in contact with the film and exposed to high-intensity light. After exposure the plate is treated with an emulsion developer leaving a hard image on the plate, which is then treated with a greasy medium.

After being mounted in the press, the plate is first dampened and then coated with ink. The areas coated with grease attract ink, while water on the areas not to be printed, repels ink. The ink is then transferred to a rubber blanket cylinder, before being transferred to the paper.

The process is often called *offset* litho printing because the printing plate does not come into contact with the paper.

Colour Printing

The process described above prints one ink onto the paper. To print another ink, the operator has to change the plate, change the ink and then print onto the paper for a second time. This explains why two-colour spot printing is cheaper than full-colour printing using four inks.

Some printing presses can print more than one ink at a time, but due to the more complex setting up required, they are normally only economical for long print jobs.

13.3 Spot-Colour Printing

If your document only needs to use two or three basic colours, you can print it very economically using *spot-colour printing*. If you want to print using the full range of colours, then you should use *full-colour printing*.

Spot colour work is simpler to achieve than full-colour work, and two or three spot-colour work is always cheaper than full-colour work.

First you need to decide whether you want to print with two or three colours. Using three colours will be more expensive, but will give a greater scope for designing the document.

Note that in addition to the basic colours you can use any number of tints of those colours. For example, if you are doing a two-colour job using black and red, you can use greys and pinks.

Menu➪Misc➪Edit colours…

Use the **Misc➪Edit colour** dialogue box to create named colours for each of the spots (in the example above, both black and red already exist), and for each colour choose the **Spot colour** option at the bottom of the dialogue box *(fig. 13.1)*.

Specifying Colour

When you print spot-colour separations, each basic colour and any tints are placed on a separate plate. It is essential for you to tell the printer the precise colour to be used for each plate. You can do this by choosing colours from a standard swatch.

Spot colours defined in ***Ovation Pro*** are used for the screen display only, so it doesn't matter if they don't match the eventual printed colour. However, in order to help you visualise what the printed document will look like, it is useful to define the screen colours to match the printed colours. You can do this by defining colours using CMYK values obtained from the colour swatch you are using.

In order for the printer to know the colour of each plate, ***Ovation Pro*** prints the colour name at the top of each separation. Therefore, it is useful to set the ***Ovation Pro*** colour name to the name given on the swatch.

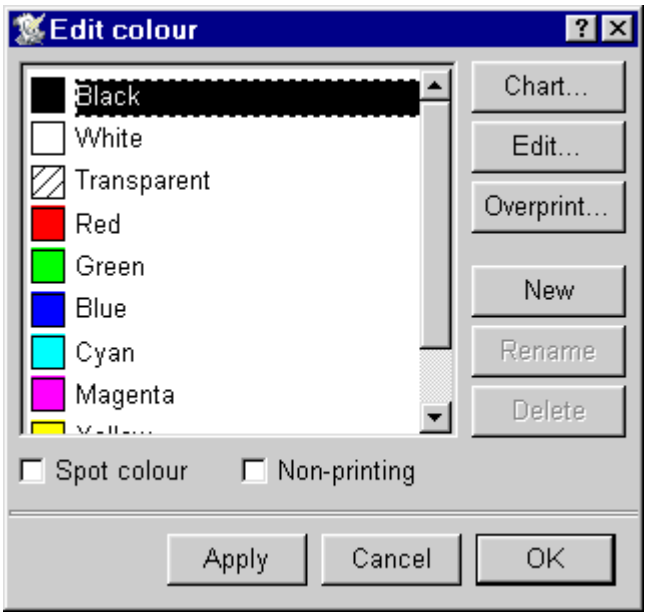

*Fig. 13.1 - The **Edit colour** dialogue box.*

13.4 Full-Colour Printing

In printing, most colours can be reproduced by mixing the correct proportions of the three process colours - cyan, magenta and yellow. Black and greys can be reproduced by combining equal amounts of cyan, magenta and yellow, but in practice this gives poor results, so a black ink is also used to add finer detail and greater density.

When you print separations, any colours that have not been designated as spot colours will be separated into CMYK components. When the CMYK separations are printed, they will combine to reproduce the colour of the original.

Tint Charts

When full-colour printing, your document can use any colours defined using the **Edit colour** dialogue box. However, the eventual printed colours may differ from those viewed on the screen *(see 13.5)*. It is therefore essential to select colours from *tint charts*.

A tint chart usually shows samples of over a thousand tints made up from cyan, magenta and yellow. Once you have found the colour required, you should read the cyan, magenta and yellow values from the chart and use them to define a colour in ***Ovation Pro***. The chosen colour may not look correct on-screen, but provided it has been defined using the CMYK model, the printed colour should match the colour in the tint chart.

13.5 Colour Correction

RGB to CMYK Correction

In order to print RGB (and HSV) colours used in ***Ovation Pro*** documents in a full-colour process, these colours must be converted to CMYK. A simple translation that assumes process inks used in printing are the inverse of RGB light, gives inaccurate colour reproduction. ***Ovation Pro*** provides a correction system that improves this.

Before printing full-colour separations you should select the **Use correction table** option on the Colour Choices dialogue box *(fig. 13.2)*.

Menu➪Misc➪Choices➪Colours

When this is selected, ***Ovation Pro*** uses a special algorithm and separation tables to apply correction when converting RGB colours to CMYK colours.

Note that this does not affect colours defined using the CMYK colour model. Nor does it affect spot-colour printing.

The **Use correction table** submenu allows different separation tables to be chosen for different typesetters. The default table, `TypeSet`, should be suitable for most situations.

Alternative compatible tables can be added by copying them into the Colour Supplement applet.

CMYK to RGB Correction

Ovation Pro provides a system to improve the display of CMYK colours (intended for output to a four-colour press) on an RGB colour monitor.

To enable this feature, choose **Use inks to display CMYK colours** from the Colour Choices dialogue box *(fig. 13.2)*.

Note that even though this does improve the accuracy of CMYK colours on-screen, you should not entirely rely on the colour you see on the display. For precise colour reproduction always specify colours using CMYK values chosen from tint charts *(see 13.4)*.

The sub-menu provided above this option allows you to choose different ink mapping files that control how RGB is mapped to CMYK for different printing processes. Currently two ink mapping files are provided. Both are for SWOP printing (Standard Web Offset Printing) colours.

Note that currently the ink mapping file is only used for converting CMYK to RGB, not for separating RGB into CMYK.

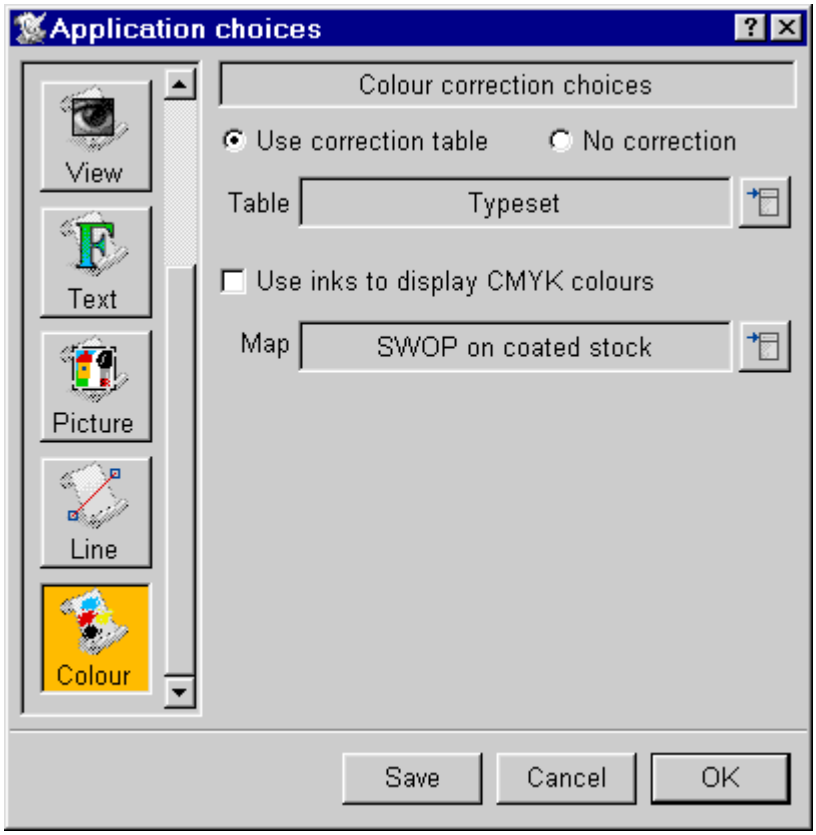

*Fig. 13.2 - The **Colour Choices** dialogue box.*

13.6 Preparing Your Document

Overprinting

Menu➪Misc➪Edit colours…

Overprinting is used to compensate for misalignment of printing plates during printing.

Suppose your document contains some black text printed on a cyan background. The black plate will contain the black text *(fig. 13.3)*. The cyan plate will contain the cyan background with a 'knock-out' for the black text *(fig. 13.4)*.

If the document is printed with the plates exactly in register, the black text will be printed exactly over the white 'knock-out' *(fig. 13.5)*. However, if there is misregistration, thin white gaps can be seen around the text *(fig. 13.6)*. This problem doesn't just happen with text, but applies to all overlapping objects.

Overprinting helps solve this problem by preventing the background from being knocked-out. So in the example above, the background is printed solid cyan without the knock-out, and the black text is printed on top of the cyan.

This generally only gives acceptable results when printing relatively opaque inks, such as black. Overprinting less opaque colours, such as yellow, may show a colour shift when overprinted.

Colour Level Overprint

You can specify that a particular colour will overprint by choosing the colour on the **Edit colour** dialogue box and then choosing **Overprint this colour** from the **Overprint** dialogue box *(fig. 13.7)*.

Overprint limit specifies the tint above which an object colour will overprint its background. So the default value of 90% means that overprint will only occur with tints of 90% and above. This option prevents lighter tints, which are less opaque, from overprinting.

Object Level Overprint

You can specify that a particular object will overprint by choosing **Overprint** on the colour picker when applying colour to an object.

Fig. 13.3 - The black plate containing the black text.

Fig. 13.4 - The cyan plate with knock-out for black text.

Fig. 13.5 - Correctly printed with no misregistration.

Fig. 13.6 - Printed with misregistration.

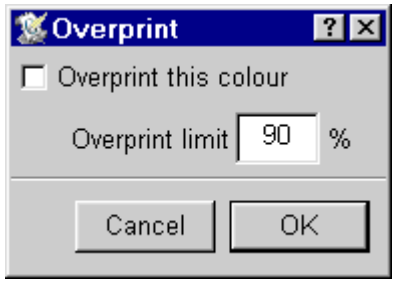

Fig. 13.7 - The Overprint dialogue box.

Font Mapping

Most PostScript printers have some fonts built in and these are the equivalents of common Windows fonts. For example Helvetica is the PostScript equivalent of Arial.

When printing to a PostScript printer it is possible to send the definitions of fonts along with the rest of the document (download fonts). The problem is that such fonts add to the size of the data transferred and use memory in the printer. There is thus some interest in using the built in fonts. However as the technology has improved this issue has become less important.

There may also be situations in which you don't want the built in fonts to be used. For example they may not contain all the characters that the Windows fonts do e.g. the Euro €.

If you are producing a file to send to a bureau it is important to consider the fonts that they will have available.

For these reasons there is a mechanism to control how Windows fonts are mapped onto PostScript fonts. It consists of two elements. If you open the Printers and Faxes window, and then right click the printer of interest and select Properties, then use the Device Settings tab there will be an entry Font Substitution Table. This allows you to arrange for each Windows font to either be asigned an equivalent from the fonts built in to the printer or to never be substituted.

Secondly if you open the printer properties window (from the expanded Ovation Pro print window) there will be PostScript options and a sub-option of True Type font download option. The actual values of this may vary however one (e.g. outline or use soft fonts) will force all fonts to be downloaded and another (e.g. automatic or substitute with device font) will download only fonts which appear in the font substitution table without PostScript equivalents, the rest will use the fonts in the printer.

Ovation Pro Page Size

Set the required page size in ***Ovation Pro*** using the **New** *(see 11.2)* or **Page guidelines** *(see 11.3 - Page guidelines)* dialogue boxes.

The maximum page size that you can typeset depends upon the typesetting bureau you are using. You should have no problem up to A3, but above that you should check the maximum width with your bureau. Remember that printers marks increase the overall dimensions by 14mm. That is if you use the default values for the crop marks *(see 12.3 - Printers marks).*

Printing Pictures

You can set half-tone screen information for the selected picture on the **Halftone screen** dialogue box *(fig.13.8)*.

Menu➪Picture➪Screen…

The options in this dialogue box are intended for experienced users, and should not normally be altered.

Note that you can also change the half-tone screen information for all pictures in a document *(see 13.7, step 6)*.

Frequency is the density of the half-tone screen, measured in lines per inch. Usually a frequency of 100 is suitable for monochrome work and 150 for process colour work.

Check with the bureau/printer if you are in doubt.

Spot specifies the shape of the half-tone dot. Use the default, unless you are experienced in creating PostScript separations.

Angle specifies the half-tone screen angle for the ink highlighted in the panel above. Unless you are experienced in creating PostScript separations, you should use the default angles as supplied. If the wrong halftone screen angles are set, an undesirable screen clash, called moiré, may occur.

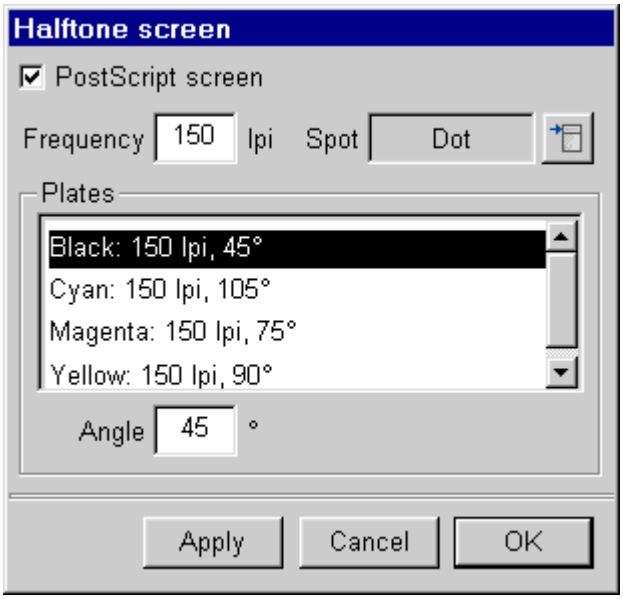

*Fig. 13.8 - The **Screen** dialogue box.*

Checking the Separations

At any time you can use the **Separations** menu to view any of the individual separations on-screen.

Menu➪View➪Separations

This menu will help you check that correct number of separations are being printed i.e. there are no additional spot colour plates. Experienced users will be able to use this option to check that the overprint settings are correct.

13.7 Creating a PostScript File

❶ **If you are producing full-colour separations, ensure that colour correction is enabled and the correct table is selected**.

The standard colour correction table called **TypeSet** should normally be used. This is confirmed in the title bar of the **Separations** dialogue box.

Print➪Print setup➪Separations

You can change the colour correction table using the Colour Choices dialogue box *(see 13.5)*.

Menu➪Misc➪Choices➪Colour

❷ **Load a suitable PostScript printer driver and configure it to print to file.**

A wide variety of PostScript printer drivers are supplied with Windows. These produce various types of PostScript. In general using a higher level of PostScript will give the best results, however you need to know that the final destination of the PostScript file is compatible with it.

You can print to file in various ways. One approach is to use Add Ports in the Windows Printer installation Wizard, then New Port and enter for the port name the file name (or right click to get Properties for a printer in the Printers and Faxes window and select the Ports tab). This way you can have a printer driver that always prints to file.

Alternatively Windows may have a port called File which you can select for any printer driver. This will prompt for a file name during printing.

Another method is to select **Print to file** on the expanded ***Ovation Pro*** print window. If you do this when you start the printing process you will be prompted for a file name. If you have followed one of the methods in the previous two paragraphs you do not need to select this option.

❸ **Choose a suitable PostScript paper size.**

PostScript printer drivers provide a wide range of standard paper sizes e.g. A2, A3 and A4. However, printers marks increase the dimensions of the page, so using these standard sizes may result in your page being cropped.

To avoid this you might create your own custom paper size when producing PostScript output for typesetting. Set the paper size to the ***Ovation Pro*** page size, plus 14mm for the printers marks. The graphics margins should be set to 0. So the paper size for an A4 page should be 224 x 311.

Note that if you do not set a big enough paper size, ***Ovation Pro*** will warn you when printing. However, to avoid this warning every time you print, you should set up a suitable paper size before printing as described above.

❹ Set the options on the Print dialogue box.

Menu➪File➪Print Ctrl+P

Reflect causes pages to be mirror printed, and should usually be selected if you are printing to film. However, please check with your bureau first. If they require *emulsion side down*, **Reflec**t should be selected; if they require *emulsion side up*, **Reflec**t should not be selected.

Choose **Print setup** to expand the **Print** dialogue box to display the advanced setup options.

Centre should be selected.

Bleed causes ***Ovation Pro*** to print an extra 3mm margin around the edge of the page. If your document contains objects that bleed off the edge of the page, choose the **Bleed** option.

Printers marks should be selected. This causes ***Ovation Pro*** to print the following special marks around the edge of the page *(fig. 13.9)*.

Crop marks show the edges of the page and are used to trim the page to size.

Registration marks are used to help align the separated film when preparing the printing plates.

Separation names causes the name of the ink to be printed on each separation. The document name, page number, date and time are printed after the ink name. You can edit this information or add your own text using the **Text** option on the **Separations** dialogue box (see overleaf).

The *Colour bar* is used to check the quality of the colours on the proofs. Note that the colour bar is not printed on spot separations.

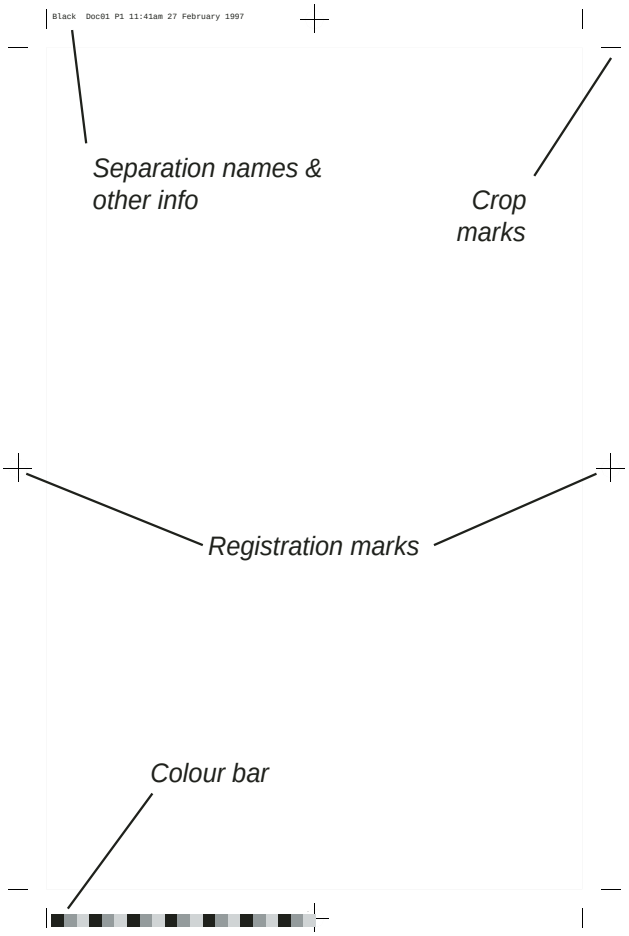

Fig. 13.9 - Printers marks.

❺ Set options on the Separations dialogue box.

Print➪Print setup➪Separations

Colour separations should be selected when you are printing full colour or spot colour separations *(fig. 13.10)*.

The **Plates** menu allows you to choose which separations to print.

All process prints separations for the four process colours. This is the default setting.

All spots prints separations for all spot colours.

The **Plates** menu also list the four process colours followed by any spot colours that have been defined. You can choose to print individual plates by ticking and unticking them directly on the menu.

The **Text** icon allows you to specify any additional text that is to be printed after the separation name in the top left corner of the page *(see fig. 13.9)*. In addition to ASCII text you can insert macros which will be expanded during printing. The following macros are particularly useful:

```
{filename}
{filepath}
{chapternumber}
{pagenumber}
{date}
{time}
{datetime}
```

The default string is set to:

```
{filename} P{pagenumber}{datetime}
```

which typically expands to:

```
Document1 P1 11:41am 27 February 1997
```

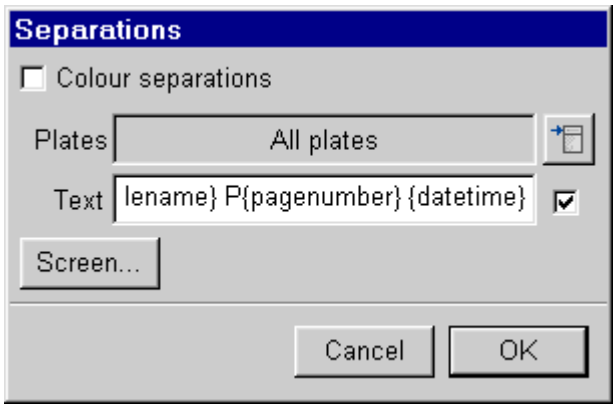

*Fig. 13.10 - The **Separations** dialogue box.*

❻ Set options on the Screen dialogue box.

Print➪Print setup➪Separations➪Screen

PostScript screen causes half-tone screen information to be written into the PostScript file, and should usually be selected *(fig. 13.11)*.

Note that the options in this dialogue box are intended for experienced users, and should not normally be altered.

Frequency is the density of the half-tone screen, measured in lines per inch. Usually a frequency of 100 is suitable for monochrome work and 150 for process colour work.

Check with the bureau/printer if you are in doubt.

Spot specifies the shape of the half-tone dot. Use the default, unless you are experienced in creating PostScript separations.

Angle specifies the half-tone screen angle for the ink highlighted in the panel above. Unless you are experienced in creating PostScript separations, you should use the default angles as supplied. If the wrong halftone screen angles are set, an undesirable screen clash, called moiré, may occur.

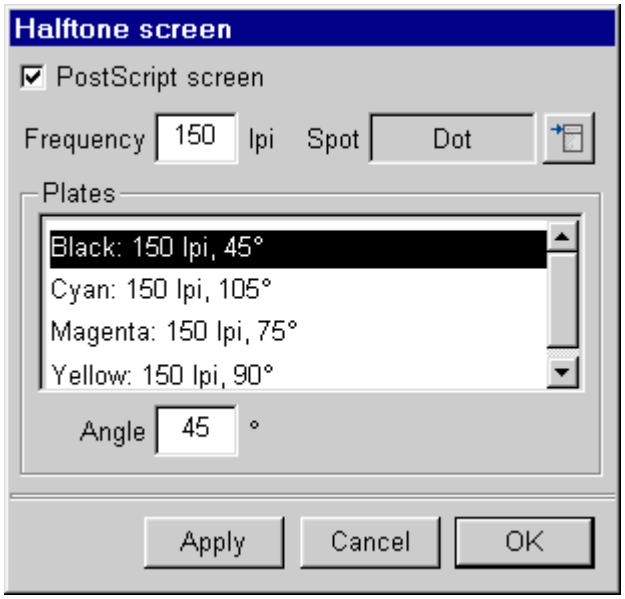

*Fig. 13.11 - The **Screen** dialogue box.*

❼ Print to the PostScript file.

Once all the above options are set correctly, click on **OK** in the **Print** dialogue box to create the PostScript file.

When printing the usual **Printing** dialogue box is displayed showing the progress that has been made. the icon in the bottom left-hand corner of this dialogue box shows the colour of the separation currently being sent to the printer.

13.8 Submitting the File to a Bureau

Check with the bureaux what format discs they can handle.

Make sure that any PostScript files are given a `ps` file extension.

To format and write to Apple format discs, you need to purchase a separate utility to do this.

For small jobs you will be able to send the PostScript files using floppy discs. For bigger jobs you will have to use one of the following alternatives:

- Split the job into separate parts so that each part will fit on a floppy disc.
- Use a file archiver to compress the files in Zip format. However, you must ensure that the bureau has suitable software to decompress the files.
- Transfer files using removable drives such as CDR or Zip drives.
- Transfer the files electronically via email or an ftp or web site.

13

B. Image Processing

Ovation Pro enables you to modify the appearance of imported bitmap and vector graphics using simple brightness, contrast and gamma sliders. You can also define custom settings by editing points on the colour map. Any of the three standard colour models may be used to make adjustments.

Ovation Pro also allows you to change colour pictures into monochrome pictures, and to change the foreground and background colours of monochrome pictures.

Image processing can be applied to Sprites, JPEGs, Draw files and Windows .bmp files.

13.9 The Process Dialogue Box

Menu➪Picture➪Process…

The **Process** dialogue box *(fig. 13.1)* is available from the main menu when a picture frame is active. Image processing can only be applied to one picture at a time.

Model

This is the colour model that will be used when you are modifying the picture. For CMYK pictures, **CMYK** is the default model. For other pictures, **RGB** is the default model. You can choose any colour model for any picture, irrespective of the picture type. However note that processing a CMYK picture using the RGB setting will often mix colours between the CMYK plates. This may be highly undesirable.

Colour

This is the colour component that will be modified. The colour map displays a coloured curve for each of the components.

If you choose **All**, all colour components for that model will be modified in one operation, and the curve of the map is shown in black.

Update

By default the **Update** option is selected, meaning that the picture is updated instantly as changes are made in the **Process** box.

If **Update** is not selected, the picture is not updated until you click on **OK**. This prevents the picture from being updated after each change you make, which might be quite slow for very large pictures.

Default

Click on **Default** to cancel any processing that has been applied to the picture.

If you have closed the **Process** dialogue box, you can always return to the previous picture settings using the **Undo** option.

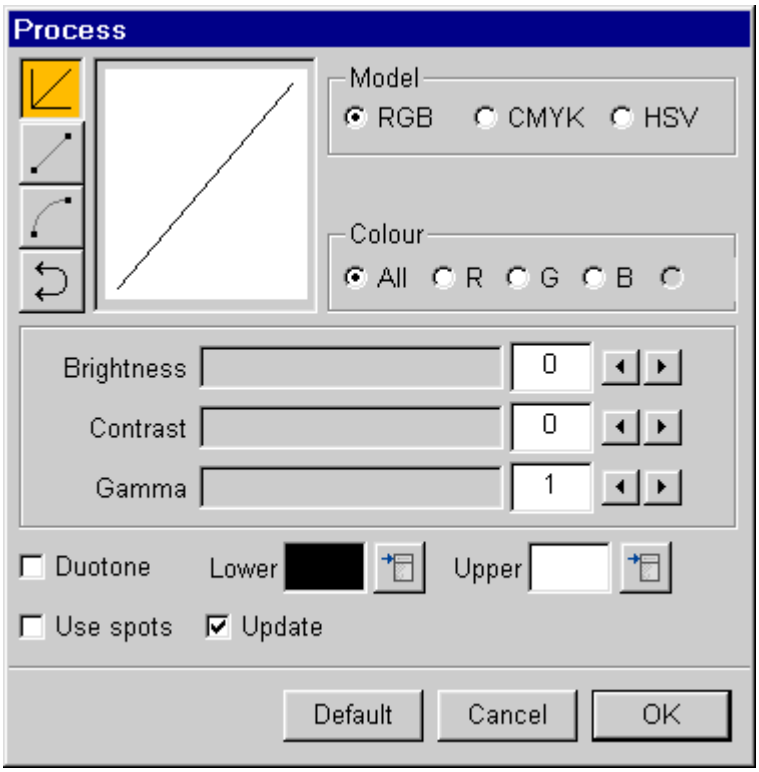

*Fig. 13.1 - The **Process** dialogue box.*

Colour Map

The *colour map* illustrates the changes made by the brightness, contrast and gamma sliders. Later on in this chapter you'll see how it can be used to define a custom colour map.

The map shows a picture's input values on the horizontal axis, plotted against output values on the vertical axis *(fig. 13.2)*.

When the map is a 45° line from 0, 0 to 1, 1, output values equal input values i.e. normal brightness and contrast *(fig. 13.3)*.

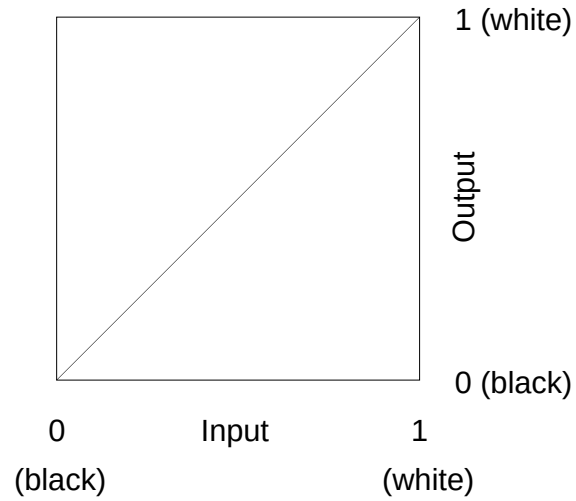

Fig. 13.2 Colour map.

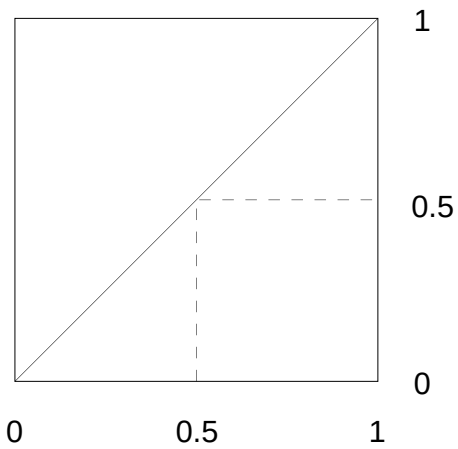

Fig. 13.3 Output values equal input values.

13.10 Brightness, Contrast & Gamma

Menu➪Picture➪Process…

You can change the brightness, contrast and gamma values of a picture using the sliders located in the centre of the **Process** dialogue box.

Brightness

Drag the **Brightness** slider to the right to increase brightness, or to the left to decrease brightness. When the slider is in the middle, there is no modification.

Brightness may also be specified by setting a value in the writable icon to the right of the slider. A value of 0 means no modifications, -100 means minimum brightness and 100 means maximum brightness.

The colour map illustrates the changes made to the brightness slider. If you increase the brightness, the line on the map moves up and the output values become higher than the input values *(fig. 13.4)*. If you decrease the brightness, the line moves down and the output values become lower than the input values *(fig. 13.5)*.

Note that the brightness slider adjusts the levels of colour according to the current colour model, so the description given above is only true for the RGB colour model.

CMYK and HSV Models

With the CMYK model, the brightness slider increases or decreases the levels of Cyan, Magenta, Yellow and Black. So, an increase in levels of CMYK, results in a decrease in brightness. A decrease in levels of CMYK, results in an increase in brightness.

With HSV, the brightness slider increases or decreases the levels of Hue, Saturation and Value. It is not very useful to increase or decrease all three HSV levels simultaneously, but it can be useful adjusting them individually.

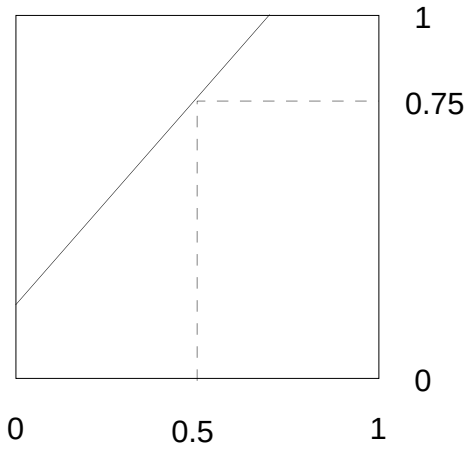

Fig. 13.4 Increased brightness.

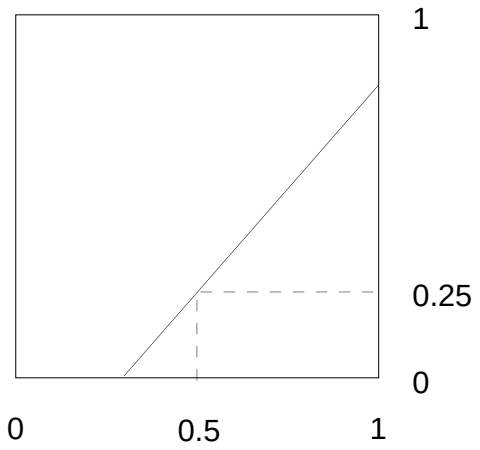

Fig. 13.5 Decreased brightness.

Contrast

Drag the **Contrast** slider to the right to increase contrast, or to the left to decrease contrast. When the slider is in the middle, there is no modification.

Contrast may also be specified by setting a value in the writable icon to the right of the slider. A value of 0 means no modifications, -100 means minimum contrast and 100 means maximum contrast.

The colour map illustrates the changes made to the contrast slider. If you increase the contrast, the line on the map is rotated anti-clockwise, reducing the range of input values *(fig. 13.6)*. If you decrease the contrast, the line is rotated clockwise, reducing the range of output values *(fig. 13.7)*.

Note that the contrast slider adjusts the levels of colour according to the current colour model, so the description given above is only true for the RGB colour model.

CMYK and HSV Models

With the CMYK model, the contrast slider increases or decreases the levels of Cyan, Magenta, Yellow and Black. So, an increase in levels of CMYK, results in a decrease in contrast. A decrease in levels of CMYK, results in an increase in contrast.

With HSV, the contrast slider increases or decreases the levels of Hue, Saturation and Value. It is not very useful to increase or decrease all three HSV levels simultaneously, but it can be useful adjusting them individually.

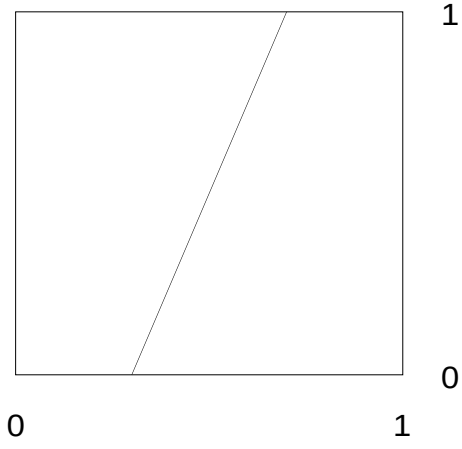

Fig. 13.6 Increased contrast.

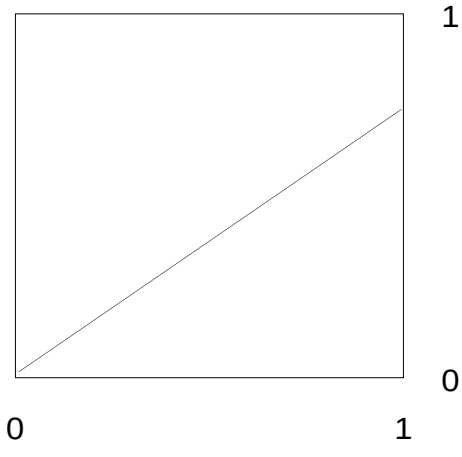

Fig. 13.7 Decreased contrast.

Gamma

Drag the **Gamma** slider to the right to increase the gamma value, or to the left to decrease the gamma value. When the slider is in the middle, there is no modification i.e gamma value is 1.

Gamma may also be specified by setting a value in the range is 0.05 to 5.75, in the writable icon to the right of the slider. The up/down icons can be used to step through this range in 0.01 increments for values below 1, and 0.05 for values above 1.

The colour map illustrates the changes made to the gamma slider *(figs. 13.8 & 13.9)*.

Note that the gamma slider adjusts the levels of colour according to the current colour model.

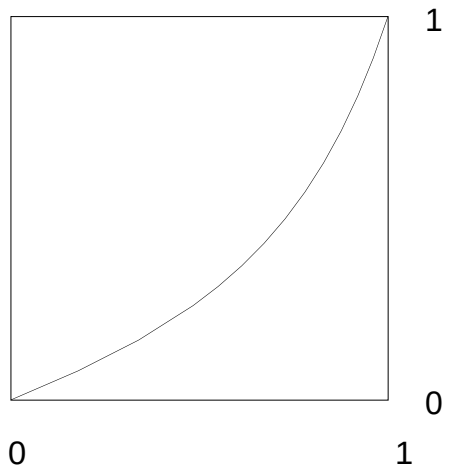

Fig. 13.8 Gamma value of 1.8.

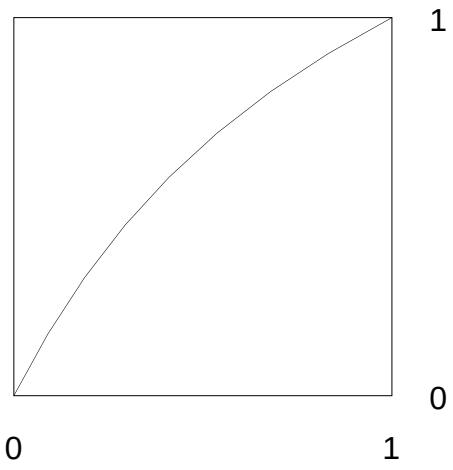

Fig. 13.9 Gamma value of 0.75.

13.11 Custom Colour Map

Menu➪Picture➪Process…

You can create custom colour maps using the 4 tools provided *(fig. 13.10)*.

Linear

Choose this tool to reset the colour map to a 45° line from 0, 0 to 1, 1. This sets output values equal to input values i.e. normal brightness and contrast.

Note that the brightness, contrast and gamma sliders are only available when this tool is selected.

Straight Segment

Choose this tool to convert the current map into a series of straight line segments. You can edit the map by dragging the control points. Click Select to add new points, or right click over points to delete them.

Curved Segment

Choose this tool to convert the current map into a series of curved line segments. You can edit the map by dragging the control points. Click Select to add new points, or right click over points to delete them.

Invert

Choose this tool to flip the colour map upside down. This produces a negative of the curve currently shown on the graph.

Note that you can use the Invert tool to invert the adjustments made by the brightness, contrast and gamma sliders.

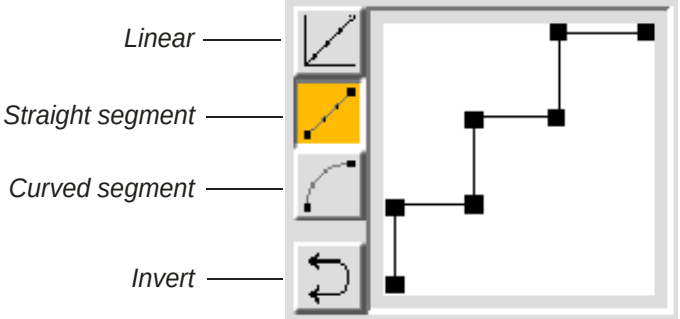

Fig. 13.10 - The custom colour map.

13.12 Duotones

Menu➪Picture➪Process…

The **Duotone** option allows you to specify the two colours used in a monochrome picture. If the current picture is multi-coloured, it is converted to monochrome first.

Lower allows you to specify the new colour for the black component of the monochrome image using the standard colour picker. **Upper** allows you to specify the new colour for the white component of the monochrome image.

Duotone is particularly useful when commercially printing documents using spot colours. It allows a colour or monochrome picture to be printed using white and any individual spot colour, or even using two spot colours.

Deselect **Duotone** to revert back to the original image.

Fig. 13.11 - The original picture

Fig. 13.12 - In black and white