



Studio24 PRO

Digital painting and photo retouching for RISC OS

ProAction

3QD
DEVELOPMENTS LTD

APDL

Studio24 Pro

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1. Getting Started

Installation

Double-click on the !INSTALL application inside the compressed archive you downloaded from www.riscos.com and drag the Studio24Pro icon in the window which will appear to wherever on your hard drive you want Studio24pro to be installed.

During the installation process you will be asked to enter your name. This name will appear as the Licensed User in the 'Info' window.

The installation process does not install the various example files supplied as they would take up a lot of disc space. These can be used direct from the CD (although you obviously cant Save them back to it) or you can copy them to your hard drive by dragging in the usual way.

Overall Operation

Studio24Pro is based on the earlier Pineapple product called Studio24. One major improvement in the Pro version is the way that individual colour of images can be edited, called the 'changeling' feature. The advantage of this is that any of the main constituent colours making up the image may be edited completely independently of the others. For example, if the image is being created in RGB mode then any of the red, green or blue channels of the image may be edited independently. When using CMYK to create the image any of those four channels of the image may be edited.

This method allows much greater flexibility when editing existing images, or images loaded in from Scanners or PhotoCD sources. It also enables very powerful effects to be achieved.

In addition to the fundamental colour channels, additional channels may be created up to a maximum of 16 in total. The extra channels are called 'alpha' channels and may be used independently as variable transparency masks or stencils.

Various operations are available for copying or performing mathematical functions between any two channels which makes the system extremely versatile.

The mask channels perform an important role in many Studio24Pro operations and it is important to become completely familiar with their operation. The channels window in particular should be studied carefully as it controls which of the channels are being viewed, which are being painted to, and which are being used as masks.

Another major feature of Studio24Pro is its ability to load bit image files such as TIFFs, Sprites and JPEGs directly onto the existing image. Draw files may also be loaded in this way or created within Studio24Pro itself.

All these items are initially 'floating' over the main image where they may be manipulated in a similar way to Draw objects. They may be scaled, moved and rotated by dragging 'handles' on the selected object. These objects can remain 'floating' until such time as their position is finalised when they can be permanently transferred into the main image. With Drawfiles the option is available to translate any lines in the Drawfile into brush strokes. Drawfiles may also be used to 'Cutout' areas of the main image.

Text is treated in a similar way. It can be typed directly onto screen or dragged on as a Text file where it becomes an object with 'handles' which enable it to be moved, scaled and rotated until the final position is determined. A text object created in Draw which has been converted to a 'path object', can be used to cutout areas of the main image.

Cutting and Pasting parts of an image can be performed with a freehand tool or by using a Draw file within Studio24Pro which defines the required object outline for the area to be Cut & Pasted. This is then automatically transferred to the clipboard where it may be further manipulated before being finally 'Transferred' into a new position on the canvas (or to any other canvas on screen).

All these additional features would normally mean that a large amount of memory would be required to manipulate even quite small images. However, Studio24Pro employs a powerful Virtual Memory system which diverts parts of the image to temporary storage on the hard disc if there is insufficient memory available. Although this can slow down some operations if there is little RAM available the system is quite intelligent in the way it uses the available memory.

2 - The Main Window

The Main Canvas

Below is shown the main Studio24Pro main window, in this manual it is referred to as a *Canvas*.



There are a number of ways of creating a new canvas but the easiest is to just click on the Studio24Pro Icon on the Icon bar, and then click on the 'Create' box. This will produce a default size canvas with the same number of pixels horizontally and vertically as the current screen mode.

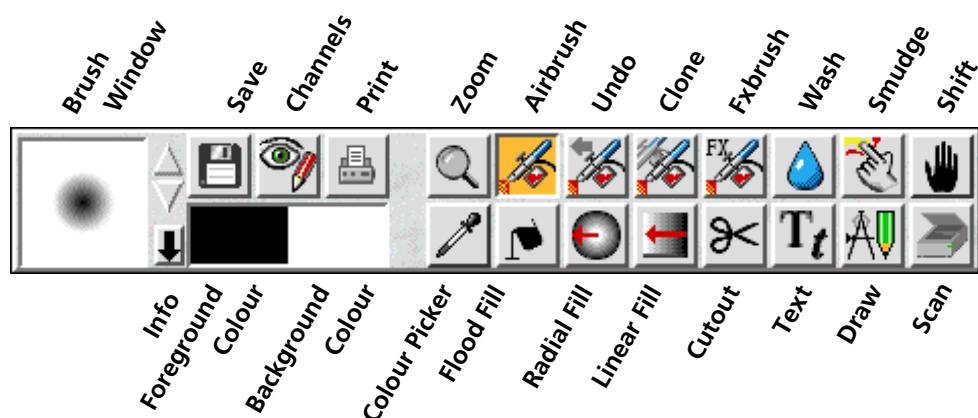
Any number of canvasses may be on screen at the same time.

The main window has the usual RISC OS features with scroll bars, a title bar, close and re-size icons. The area of window available for painting is the white rectangle which is surrounded by a border. The border cannot be painted on, but clipboard items may be moved here temporarily out of the way of the main image.

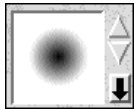
Just below the main toolbar is the 'additional info' bar. This is turned on or off using the small vertical arrow just above it. The options shown here depend on which tool is currently selected, but it is important for providing features to control the selected tool.

Toolbar Description

The main toolbar gives access to the most frequently used Studio24Pro features. Others are accessed from the mouse Menu button.



Before starting to use Studio24Pro you should have an understanding of all the tools available and these will be briefly described here. For fully detailed descriptions of each tool you will need to read the relevant chapter which describes each tool in detail.



Brushes icon. Click **Select** to show the complete set of brushes. Click **Select** on the arrows to step up and down through available brushes. The small downward pointing arrow is used to display the 'additional info' toolbar.



Save icon. Click **Select** to show the save window for saving the image in the default file format.



Channels icon. Click **Select** to display the channels window.



Printing icon. Click **Select** to open the printing options window.



Zoom icon. Click **Select** to enable zooming. Clicking **Select** doubles the magnification. Clicking **Adjust** halves the magnification. Dragging a box over an area of canvas will make that area fill the screen.



Airbrush icon. **Select** will spray paint in the foreground colour, **Adjust** will spray in the background colour.



Undo Brush. Click **Select** to use the undo brush. Holding down **Select** and 'spraying' with this brush will undo any areas on the canvas back to the state they were in when the Undo buffer was last reset. (F10 key). The Undo brush can be temporarily selected while using any of the other brush tools by pressing the **CTRL** key.



Clone Brush. Click **Select** to use the clone brush to brush a copy of any part of the canvas to a different position or onto any other Studio24Pro canvas which is on screen. Move the brush to the position to copy from, then press the **SHIFT** key to move the brush away from the rectangle marker to the new position or new canvas.



Fx_Brush. Click **Select** to use the Filter and Effects brush. Use the 'additional info' tool bar to select the type of Filter or Effect required and then simply start brushing after the hourglass disappears. If you wish to preview the filter move the pointer off the arrow to the right of the required filter and the filter preview window will be displayed. Click **Select** on 'Preview' to see the effect of the filter, and then on 'Apply' if you want to brush the effect on to your canvas.



Wash Brush. This has a fine blurring effect most noticeable on the edges of areas.



Smudge Brush. This can be used to create an effect similar to dragging your finger through oil paint.



Shift tool. Click **Select** to move the complete picture within the window. This is most useful when used with the Channel Selection window to move just a single channel with respect to other channels.



Colours icon. Click on the left to show the foreground colour selector, or to the right to show the background colour selector.



Colour Picker. Use this to set the foreground or background colour to an existing colour in the picture. Move the 'Picker' over the required colour and then click **Select** to set the foreground colour or click **Adjust** to set the background colour.



Flood fill tool. This will perform a flood fill within a boundary determined by outlines within the picture. The output fill can be directed to any channel, and this may be an alpha channel to create a masked area.



Radial Fill. This creates a radial fill using the foreground colour for the centre and the background colour for the edge.



Linear Fill. This creates a linear fill using the foreground colour for the start and the background colour for the end.



Cutout. Click **Select** to use the freehand cutout tool. You also need to select this tool to view objects which have been cutout previously, and bitmap objects which have been dropped onto the Studio24Pro window but not yet 'transferred' to the canvas.



Text. Click **Select** to add text to the picture or view text which previously created but not yet transferred to the canvas



Drawfiles selector. Click **Select** to create Drawfiles for use within Studio24Pro. These may be used for cutting out areas as well as providing vector images. This tool needs to be selected to view any vector images which have not yet been 'transferred' to the main canvas.



Colour Scanning icon. The 'additional info' tool bar allows selection of all the normal scanning options available with the 'Twain' drivers and the selection of the required area to scan using a box which can be dragged out over a preview scan.

The Info Window

The info window gives a continuous display of information about the main canvas. This includes the current colour values under the cursor, both RGB and CMYK, together with the distance of the cursor from the top left corner of the canvas in either pixels, centimetres or inches.

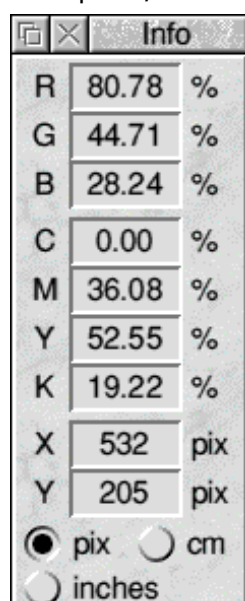
Click Menu over the main Studio24Pro window and choose **Edit/Information...** which will display the info window.

This window will remain present at all times until the close icon is clicked, allowing a constant readout of cursor position and colour values.

The main info window is shown here. The top three boxes display the RGB components of the colour under the cursor, and the next four show the corresponding CMYK values.

Naturally these values will be rapidly changing as the cursor moves around the screen and over different colours

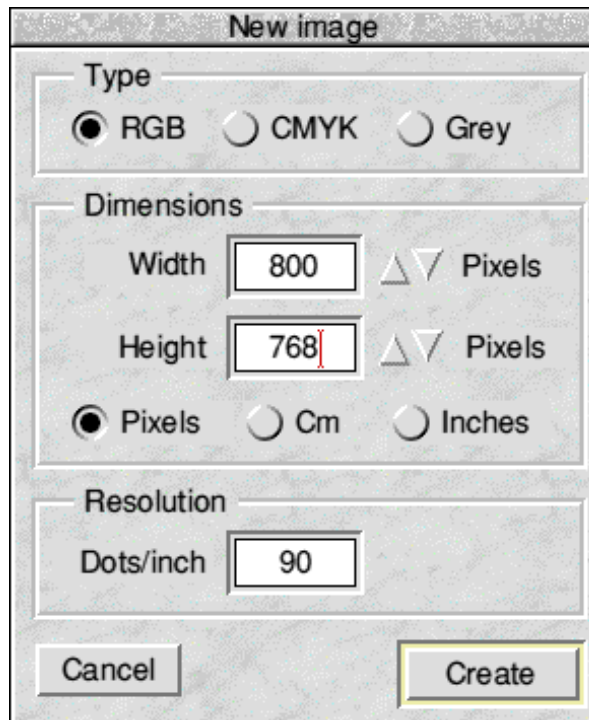
The last two boxes show the X and Y distances of the cursor from the top left of the canvas. This can be set to either pixels, centimetres or inches by clicking Select on the appropriate radio button.



3 - Starting a New Image

A New Blank Canvas

The 'New Image' window shown below determines the various features of a new canvas, and can be accessed by clicking **Select** on the Studio24Pro icon on the icon bar.



The top section selects the type of image that will be created.

RGB creates a three layer image consisting of the Red, Green and Blue layers.

CMYK creates an image with four layers, Cyan, Magenta, Yellow and Key. This is most likely to be used if the output needs to be in this format for professional printing.

The Grey or 'Indexed' option will create a single layer image which can contain 256 colour images but is really intended for producing greyscale pictures.

The Dimensions section lets you set the width and height of the canvas and the units of measurement. The default width and height will be set to the current screen resolution in pixels, but these may be changed using the up/down arrows or by typing directly into the boxes to give the required canvas size.

The final setting is Resolution which controls the number of pixels used by Studio24Pro per inch of final output.

The default settings may be changed to your own preference if required. See 'Customising Studio24Pro' in Chapter 17.

Once the settings are correct you can create the new canvas by simply clicking **Select** on 'Create'.

All of the above settings may be changed after the canvas has been created and even after painting has been started. Click **Menu** over the main window and then choose **Edit/Adjust Size** to allow the width, height and resolution of the canvas to be changed. Using the Channels window and clicking **Menu/Colour Mode** allows the type of canvas to be changed between the RGB, CMYK and Grey modes.

Loading an Existing Image

Under certain circumstances a new canvas can be created automatically. A file in any of the bitmap formats understood by Studio24Pro can be dragged to the Studio24Pro icon on the icon bar and a new image will be created in the same size as that bitmap image.

The type of canvas created will depend on the type of image loaded. Normally, any type of image created in 32,000 or 16 million colours will produce an RGB canvas. A 'normal' sprite with 256 colours or less will generate an 'Indexed' or 'Grey' image.

Editing 256 colour sprites in 'Indexed' mode may not work as expected if they contain colours rather than a greyscale. In this case it is best to convert the image into an RGB image before editing, and then save it back out as a 256 colour sprite using the **File/Export/8-bit sprite** option. This is covered in more detail in Chapter 4 on 'Channels'.

PhotoCD images may also be dragged straight to the Studio24Pro icon and they will be loaded, producing a canvas the same size as the PhotoCD image. The PhotoCD resolution and image type are set from the 'Choices' menu which is in turn accessed by clicking **Menu** over the Studio24Pro icon on the icon bar.

The Choices functions are covered more fully in Chapter 17.

One final way in which a new image may be created is when using the 'Cutout' tool. When part of an image is cut out, it may be edited using the menu option **Select/Edit** (or Ctrl E). This automatically creates a new canvas allowing the cutout part of the image to be edited in any way before returning it to the main canvas. This is covered in more detail in Chapter 6, 'Cut and Paste'.

The ability to have many Studio24Pro canvasses on screen at any one time allows very powerful editing and control over images. Most of the Studio24Pro features such as Cloning and Cut and Paste will work between windows, and this allows very easy editing and composition of complex images.

4 - Brushes

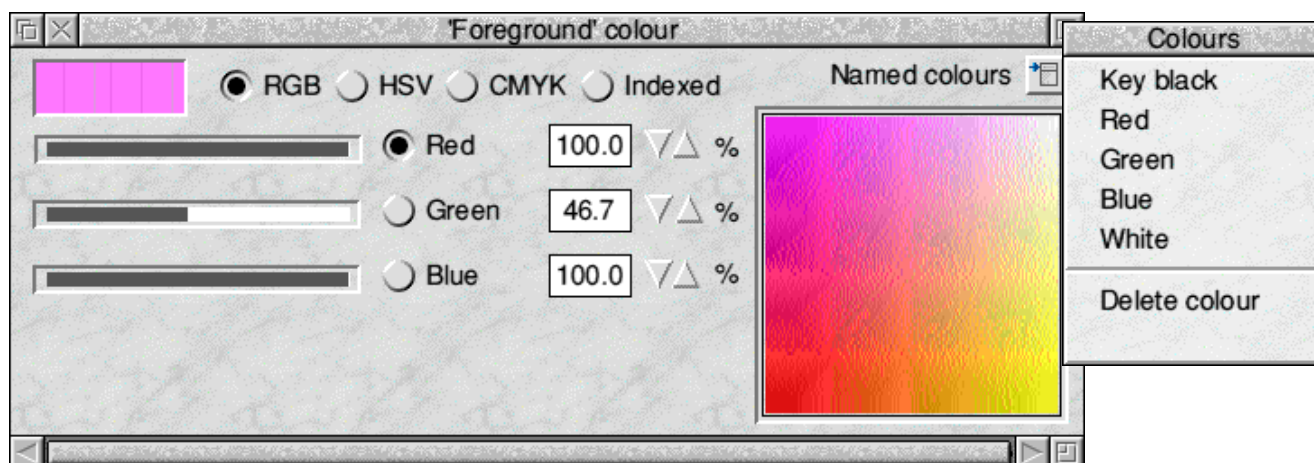
Before describing the types of brushes and their effects it is necessary to know how to select the various paint colours that can be used by Studio24Pro.

Selecting Colours

The top left of the toolbar shown above has two rectangular coloured areas which show the current foreground and background colours.



Clicking Select on the left hand rectangle will show the full colour selection window and allow selection of the foreground colour. Clicking Select on the right hand rectangle shows the window for selecting the background colour. The colours window is shown below.



The default colour selection is in RGB mode where the colour can be set by dragging any of the three colour sliders, typing values into the numerical boxes, or clicking on the adjuster arrows. Pressing the SHIFT key while clicking on the arrows speeds up the process. A colour may also be chosen simply by clicking in the colour square.

By selecting the other radio buttons at the top of the window, different methods of colour selection are available.

HSV also provides three sliders but these represent the Hue, Saturation and Value of the required colour.

CMYK provides four sliders to set the Cyan, Magenta, Yellow and Key components of the colour. If you are using a canvas created in CMYK mode then this may be the easiest colour selection option.

The final colour selection mode is 'Indexed'. This provides a single slider and 256 grey shades in the colour window. This would mostly be used when editing 'Grey' images.

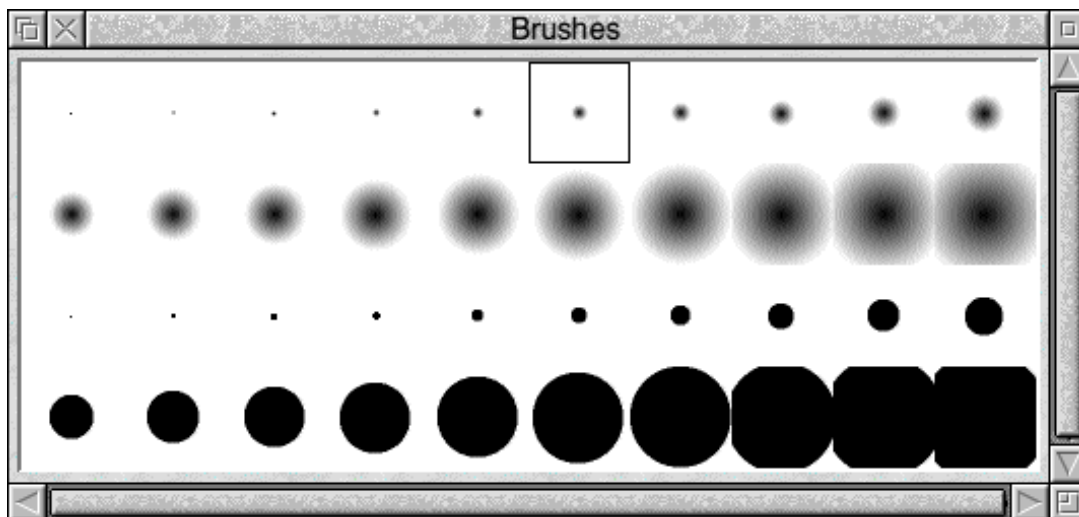
Colours you want to use on a regular basis can be given a name. Clicking **Select** on the 'Named Colours' icon produces a pop-up menu with the basic colours already available. To store and name a colour choose the colour in the normal way and then move the pointer to the blank area just below the words 'Delete colour'. A caret will appear and you can type in the name of your colour followed by <Return>. This will add your named colour to the list of available colours. To save your colours permanently you should use the 'Save' option from the 'Choices' menu.



Another way of choosing foreground or background colours is to use the 'Colour Picker'. This lets you set the colour to be exactly the same as an existing colour on the canvas. Select the Colour Picker tool and move the tip over the required colour. Clicking **Select** will update the foreground colour window and clicking **Adjust** will update the background colour. You can also do this if you wish to know the numerical values of any colours in your picture, although the info window also provides this information.

Brushes Window

The brushes window is displayed by clicking Select on the brush icon of the main toolbar, or choosing **Edit/Brushes...** from the main menu.



Any brush may be selected by clicking **Select** on it in the window. This is an alternative to using the adjuster arrows on the main toolbar which can only step forwards or backwards through the available brush set.

Click **Menu** over the brushes window and two options appear, one to edit brushes and one to save brush sets as text files.

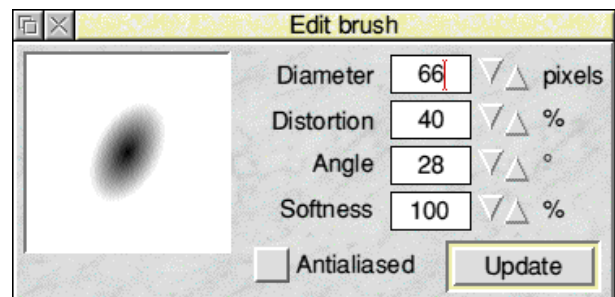
Once a brush set has been saved it can be loaded back into Studio24Pro by simply dragging the text file onto the brushes window.

The default brushes are stored as a Text file inside the !Std24Pro directory. To change the default brush set you can replace this file with one you have edited yourself or one supplied with the program.

Editing Brushes

The 'Edit Brush..' option is used to create new brushes and hence new brush sets. The Edit Brush window is opened by choosing the 'Edit brush' option from the menu in the brush window. This shows the settings for the currently selected brush and allows it to be altered.

The diameter setting is fairly obvious and as with the other options may be typed in or changed with the adjuster arrows.

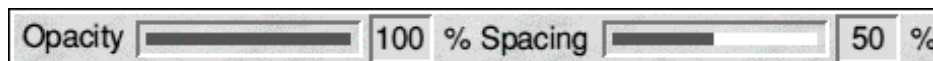


The distortion setting changes the relative vertical and horizontal sizes by changing the aspect ratio. The angle of this may be altered using the Angle option. The softness may be adjusted using the final setting. Antialiasing may be turned on or off by clicking in the box. Antialiasing is really only used for sharp edge brushes, i.e. with softness set to 0. Once the required brush has been edited click Select on 'Update' to add it to the current brush window.

Airbrush



The airbrush is selected by clicking Select on the airbrush icon, and it is best to click on the additional info icon as well to display the opacity and spacing toolbar shown below.



The basic spraying operation of the airbrush is achieved by pressing the **Select** or **Adjust** buttons to spray foreground or background colour respectively onto the canvas.

A number of features are available to control the way in which this happens. The opacity setting controls the power of the brush. When set to 100% the spray will completely cover any existing paint on the canvas. If the opacity is set much lower then the spray will be much finer, and much more of the canvas will show through. By spraying over a given area for a long time, however, you can still eventually cover anything already on the canvas.

An option is available in the Choices window to set the brush option to 'Repeat when Stationary'. This allows

the spray to continue flowing if the brush is held stationary while the **Select** or **Adjust** buttons are pressed. This is off by default which means that if the brush is held stationary the paint will not build up.

The Spacing option allows the 'smoothness' of brush movement to be set. If set to 100% then paint is applied immediately under the brush and follows the exact movements of the brush. If set to lower values the paint is sprayed at some distance behind the actual brush but the path it follows is smoothed into rounded curves.

The airbrush can also be made to follow a straight path. This is done by moving the pointer to the end point where the straight line is required and holding down **SHIFT** when the **Select** button is pressed. This draws a straight painted line from the previous location to its current position.

Undo Brush



The Undo Brush lets you return the canvas to some previous state by 'brushing away' part or all of your most recent actions.

The Undo Brush is used in conjunction with the **F8** and **F10** keys which are the 'Undo' and 'Reset Undo' keys. These functions are also available from the main menu by choosing **Edit/Undo** and **Edit/Reset undo**.

The 'Choices' menu also provides some control over the Undo feature. One option allows the Undo feature to be switched on or off. Another option allows the 'Reset Undo' to be controlled either automatically whenever the tool selection is changed, or just by the **F10** key.

The Undo feature works by keeping two complete copies of the image, so if memory is restricted this feature can be switched off. Whenever the 'Reset Undo' is activated by pressing **F10** the Undo copy of the image is made identical to the current image. After this any additions to the main image are then only made to the image being viewed on screen.

If you decide that you don't like what you have added to the image since you 'reset the undo', then you can restore that previous state by simply pressing the **F8** key which will restore the image to the state it was in when the undo was last reset.

The advantage of using the Undo Brush is that you can choose to undo just some of the most recent work. In fact by setting the opacity option quite low you can remove just some of the paint you have applied to allow more of the original to show through!

Use of the undo brush does not only apply to paint which is applied using the airbrush. Anything that affects the canvas such a filter or effect can equally be 'undone' at a later stage.

Remember that whenever you reach a point in your picture where you are satisfied press **F10** to 'Reset the Undo' you will then always be able to return to this point using either the **F8** key or the Undo Brush.

Don't forget that it is also advisable to save your image quite frequently using different filenames as a safeguard against any computer crashes!

Clone Brush



The Clone Brush can copy or duplicate parts of a canvas to a different point on that canvas or to a separate canvas.



The picture shows the operation of the Clone Brush. When the brush is first selected it will be superimposed on the small square. The size of this square determines the size of area being copied with each brush stroke. The size can be set by changing the brush size with the adjuster arrows.

Place the brush and the square box over the area you wish to copy. Press the **SHIFT** key and move the brush away from the square to the area where you want the copy to appear.

Use the **Select** mouse button to 'brush' the area of canvas and a copy will be brushed into place.

To copy to a different canvas simply move the brush over the new canvas (while **SHIFT** is pressed to leave the square in the old canvas), and click **Select** before starting to brush.

Note that it is possible to change the opacity setting of the Clone brush to achieve a copy which can be blended into the existing canvas.

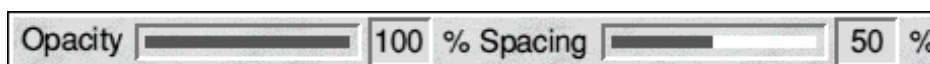
Don't forget that as with all the brush tools you can temporarily select the 'Undo Brush' by pressing the **CTRL** key while brushing.



Fx Brush

The Fx (Effects) brush is used to brush Filters and Textures on to the canvas. For a full description of the actual filters and textures available you should see the chapter devoted entirely to this topic. The following description will just show how these effects may be 'brushed' onto the canvas.

The additional info tool bar has an option at the right hand end to select any of the filters or the texture generator.



The menu options available are shown. The 'Filters' menu leads to sub-menus which allow selection of any of the Studio24Pro filters. The texture generator is found in the sub-menu of 'Effects'.

There are two ways to use the Fx Brush depending on whether or not you wish to see a preview of the filter effect.

To use the filter which is already selected and shown in the additional info bar, you simply start brushing on the required area of canvas with the Fx brush.

To select a different filter, click **Select** on the menu icon to the right of the filter name in the additional info bar and then move to the filter sub-menu and click **Select** on the required filter type.

If you wish to see a preview of the filter before using it, repeat the above process but instead of clicking on the required filter, move the pointer further to the right over the arrow. This will produce the filter preview window. This window is described fully in the Filters chapter.

When you are happy with any filter settings you may have made click on 'Apply' and when the window disappears you may start brushing the filter or effect onto the canvas with the Fx brush.

Note that you can set the opacity of the Fx brush to apply a proportion of the effect to the canvas which can provide a very controlled way of applying effects.

The Fx brush works by creating a complete new copy of the image and applying the filter to that image. When the brush is used it transfers some of the filtered image to the main canvas depending on the setting of the opacity.

Depending on the size of the canvas and the complexity of the filter it may take some time to create this new filtered copy of the image. This means that there may be a delay before the Fx brush can be used.

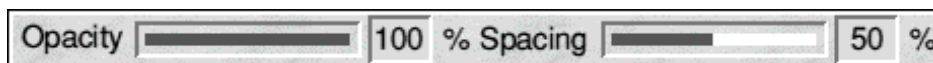
Filters	Blur
Blur	Small blur
Sharpen	Large blur
Effects	Gaussian blur
Edges	Motion blur
Mathematical	Spin blur
Colour	Zoom blur
Fill	
Custom	
Custom...	
Wraparound	



Wash Brush

The Wash brush is used to smooth the edges of colour transitions or areas of colour and produces an effect similar to pouring water on a surface.

The additional info toolbar shown below allows the effect to be applied either horizontally, vertically, or as an overall blurring effect.



It is usually best to zoom in to the area you are 'washing' to see the effect of this brush.



Smudge Brush

The Smudge brush behaves just as though you were smudging oil paints with your fingertip.

It can produce some excellent 'trailing' effects which are easier to try than to describe.

For best results set the 'Spacing' setting to less than 60%.

5 - Channels

Basic Features

Although it is possible to use Studio24Pro for painting and photo re-touching without understanding the concept of channelling, many of the more advanced features do require the technique to be understood.

Channelling is actually very easy to understand. Imagine that each of the fundamental colours in the picture is a separate layer or 'channel'. For example, if RGB mode is selected then each of the red, green and blue parts of the image is stored on a separate layer. This has the advantage that each channel can be viewed and edited independently of the other channels.

The other advantage is that extra channels may be created which can be used as masks. This may be essential for the creation of certain complex effects.

Studio24Pro can also use CMYK (Cyan, Magenta, Yellow and Key) processing. If this option is chosen then there are four layers that are independently editable. The CMYK version will use 25% more memory and produce a file 25% bigger than an image processed in RGB mode.

It is possible to switch between modes after starting work on an image. If this is done then all the necessary calculations are performed to convert the channels accordingly.

Up to sixteen channels in total may be created so that even in CMYK mode up to 12 extra Alpha channels are available. By default the extra channels are called Alpha #0, Alpha #1 etc., but they may be renamed with meaningful names if required.



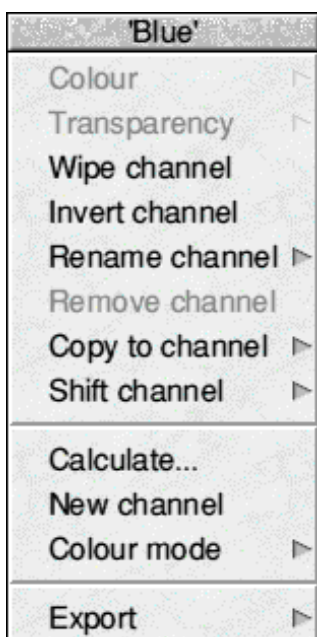
The Channels Menu

The channels icon is shown on the left. This appears on the main toolbar allowing quick access to the main channels window.

Clicking on the channels icon opens the window shown. This is probably the most important Studio24Pro window as it controls everything you see and do on the canvas.

As this is a frequently used window it can remain on screen continuously until the close icon is clicked.

The pencil icons on the left of the window, when selected, determine which channels will be affected by any painting or other actions. For example, if the red, green and blue pencils are all selected (the default state), then when the spray brush is used it will spray paint on to all three channels. How much paint will go to each channel will of course depend on the spray colour being used.



The pencils don't only indicate which channels will be painted to, they also determine which channels will be affected by filter operations etc.

The eye icons indicate which channels are being viewed on screen. This means that if all three red, green and blue icons are selected then those three channels will all be viewed superimposed on each other.

The icon on the right is the mask icon. Only one mask icon may be selected at a time and this causes that channel to act as a 'mask' for any actions being performed on channels with their pencil icons selected.

The pencil and eye icons at the very top of the window may be used to select or deselect all the main colour channels together, RGB or CMYK. Clicking Select on just one colour will of course allow the switching of individual colours.

Many more functions are available from the channels window by clicking the mouse Menu button over this window. It is important to position the pointer over the required channel before clicking the Menu button as the menu functions will be applied to that channel.

The channels menu is shown here and the name on the window title bar shows that it applies to the red channel. Note that the greyed out options apply only to

Alpha channels as they are actions which are not appropriate for main colour channels.

Clicking Menu over the RGB or CMYK row at the top of the channels window will produce a menu which applies to all of those channels.

Colour

The colour option applies only to alpha channels and allows the colour of the alpha channel to be set. This can be useful as if more than one alpha channel is used at the same time as different colours can be set to differentiate between the channels.

Transparency

The transparency of alpha channels may be set using this option. This should not be confused with the 'opacity' of the channel which controls its masking effect. The transparency setting merely affects the way the channel is displayed on the screen.

Wipe Channel

This will wipe the chosen channel. If RGB or CMYK is selected then all of those colour channels will be wiped. Note that this is similar to the option for clearing the image from the main menu, but would allow any alpha channel information to remain if required.

Invert Channel

This will convert the selected channel (or channels) to a negative version of the current image. This can be particularly useful where alpha channels are being used as masks and need to have their effect reversed.

Rename Channel

Any channels may be renamed using this option. Normally, only the alpha channels would be renamed to something meaningful when more than one alpha channel was being used.

Remove Channel

This option is only available for Alpha channels. In the same way that alpha channels may be individually created, they may also be removed complete with all the information that they contain.

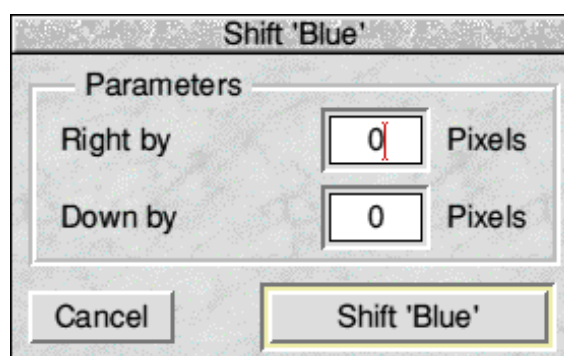
Copy to Channel

This allows any channel to be copied to any other channel. Choosing this option will produce a list of all available channels and clicking on the selected channel will perform the copy from the current channel to the channel clicked on the menu.

Shift Channel

Shift Channel allows a channel to be moved horizontally and vertically by a predefined number of pixels. This is particularly useful for creating shadows around text objects and other items.

The shift and can be applied to any of the selectable channels. Simply specify the number of pixels required for the move. To move the channel up or to the left use negative numbers in the writable boxes. This performs the same operation as the 'hand' icon available from the tool bar but lets you move a channel by an exact number of pixels.

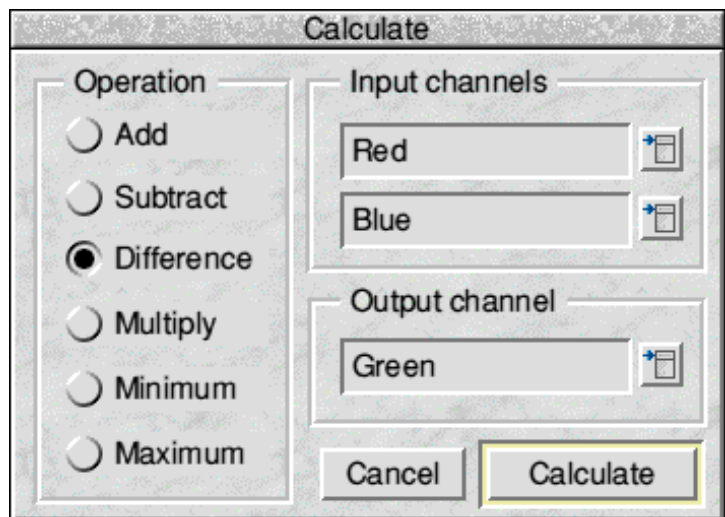


Calculate...

Calculate can perform various mathematical calculations between the individual pixel values of two channels with the result placed in a third channel.

The two channels on which the calculation will be performed are selected from the 'input channels' part of the window, and the result will be placed in the channel selected as 'output channel'.

The type of calculation to be performed is selected from the left hand side of the window. Most of these operations are fairly obvious with the possible exception of the last two. The 'minimum' option will choose whichever pixel is the smaller from the two input channels, and 'maximum' will select whichever is the greater.



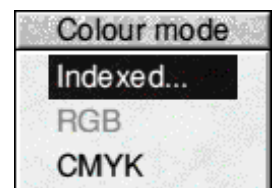
New Channel

Clicking on 'New Channel' will create a new alpha channel. The first will be called Alpha #0 and subsequent ones Alpha #1 etc. The names may be changed using the 'Rename channel' option described earlier.

The alpha channels are all '8 bit' channels. This means that they are not just an on/off image but may have a 'greyscale' in a similar way to any of the red, green or blue channels which are also 8 bits. This means that when using alpha channels as masks they may have a gradual effect at edges or transitions rather than just a sudden on/off action.

Colour Mode

The Colour Mode option lets you change an image between the three types of Studio24Pro canvas. The default canvas is RGB so this option is greyed out because that is the mode of the current canvas.



Choosing CMYK will produce an image almost identical to the present one but using four channels instead of three. This may be needed if editing of individual cyan, magenta, yellow or key channels is required, the mode most often used by professional publishers.

The RGB to CMYK conversion uses a set of colour curves to translate the colour values.

'Indexed' mode is a single channel mode which can be used for either 256 colour image editing or 8 bit, 256 shades, grey scale images.

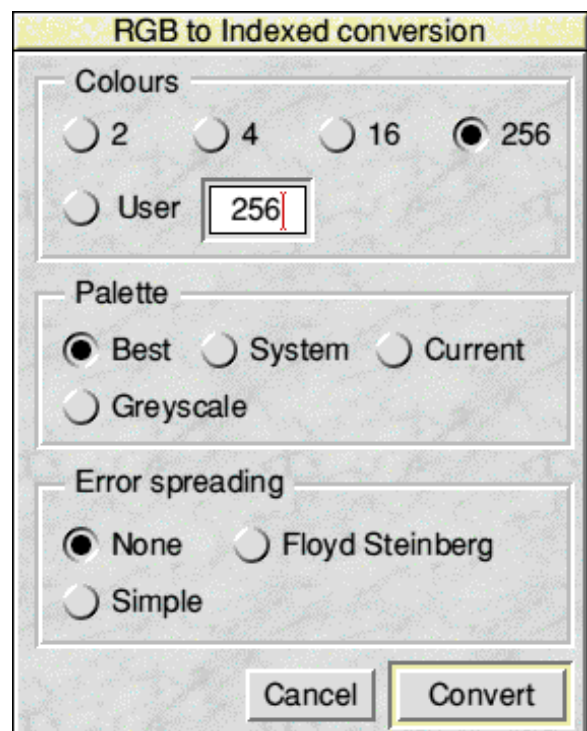
The RGB to Indexed conversion has a number of selectable features available as shown.

The number of colours to be used in the new palette is selected using the radio buttons at the top of this window. The 'user' option allows a user defined number of colours to be entered.

The Palette buttons choose the type of palette. 'Best' calculates the palette based on the colours present in the image to give the best possible result.

'System' uses the standard RISC OS palettes and would be used for displaying images on computers which do not support fully definable palettes in 256 colour modes.

'Current' uses the indexed palette shown in the Studio24Pro colours window. This palette can be edited if



required.

'Greyscale' uses a greyscale palette of the number of chosen colours.

The 'Error Spreading' option determines the way the conversion is carried out. 'None' uses the closest colour available.

'Floyd Steinberg' spreads the error in the nearest colour to surrounding pixels.

'Simple' spreads the error in the nearest colour to the pixel to the right only. This is faster than Floyd Steinberg but gives poorer results.

Export

This option allows individual channels to be saved as 'Sprite', 'Clear' or 'TIFF' files. It can be most useful for saving alpha channels which may be required to be used with other images.

Files saved in this way may be re-loaded into any Studio24Pro channel by dragging the file icon over the channels window.

When the file icon is dragged over the channels window the file will be loaded into whichever channel is under the mouse pointer when the Select button is released.

Only 'single channel' files may be loaded in this way, which might be a file saved from an alpha channel, a 256 colour file or a grey image etc.

If the horizontal or vertical size of the image is not the same as the canvas it is being dragged to, then the image will be 'tiled' onto the relevant channel. This can be particularly useful for loading certain types of texture file.

Files may of course be loaded to individual red, green or blue channels etc. as well as alpha channels.

6 - Using Alpha Channels

The Purpose of Alpha Channels

Chapter 4 describes how alpha channels are created and what functions can be applied to them. This chapter describes their purpose and gives some examples of their use in practical situations.

An alpha channel can be described in a number of ways. When a new channel is created by Studio24Pro it is initially called an 'alpha' channel. This term is used because it seems to have become a standard name for this type of feature in similar programs on other computer platforms.

In this manual the term 'alpha' channel is used to describe a channel which holds 'mask' or 'stencil' information. The term 'alpha' refers to the channel itself, and 'mask' refers to information which is placed in that channel. Another term which would be more meaningful to artists who use real paints and airbrushes, would be a 'stencil'.

Most people are familiar with stencils which comprise a piece of card with the cutout shapes of letters of the alphabet. This can be placed over a sheet of paper and when a paint brush or spray is applied over the combination neat printed characters can be produced quite easily.

The advantage of a stencil is that you don't have to carefully paint straight lines and curves for the edges of characters, you can just paint or spray over the stencil and know that underneath is a neat copy of the cutout area of the stencil. Using an alpha channel in Studio24Pro is similar to using a stencil. The following description will use the analogy of a piece of card with cutout characters to help you visualise the effects produced with the electronic version of a stencil, - a mask.

There are two concepts which are not quite so easy to visualise as simply spraying through a cutout hole. Firstly, the mask can be applied to any Studio24Pro operation, not just airbrushing. It can apply to things like filter effects and Cut & Paste operations.

Secondly is the effect of having an '8 bit' mask rather than just a simple 1 bit mask which would have just an on/off effect.

The effect of having an 8 bit mask can be described by going back to our piece of card with cutout characters. Imagine we have a can of spray paint held facing our sheet of paper with the stencil pressed firmly against the paper. If we spray the paint at the paper and then remove the stencil we will find an exact copy of the stencil cutout with hard straight edges defining the points where the cutouts in the stencil were touching the paper. This is the way in which most people would use a stencil.

A professional airbrush artist, however, might use a more subtle technique to achieve a better effect. He would hold the stencil a few inches away from the sheet of paper rather than firmly up against it. This would produce an interesting effect where some of the spray paint 'leaked' around the edges of the stencil to give nice soft edges to the characters which appeared on the paper. The spray paint would be solid in the centre of the characters but towards the edges would gradually 'tail off' because much less paint would leak around the edges than would pass straight through the central area.

This effect which can only be achieved with electronic painting if a mask is used which has more than 1 bit.

An 8 bit mask means that the alpha channel can have up to 256 different levels or greyscales. A level of 255 (the maximum, and the darkest mask colour on screen) would prevent all the paint from being passed. A level of 0 (black on screen) would allow all the paint to be passed by the alpha channel. In between these two extremes there are 254 levels which allow varying amounts of paint to be passed to the canvas when the alpha channel is activated. For example, if the alpha channel was activated and was set to a level of 127 it would allow half as much paint through to the canvas as if the level was 0.

The most common use for this effect is to produce a smooth transition around the edge of a masked area. With a 1 bit mask channel there can only ever be a sudden hard transition at the edge of a 'cutout' area.

An 8 bit mask can be created to have a gradual reduction in density at the edges and this produces a nice smooth transition whenever paint or effects are applied with an alpha channel activated.

Of course, you don't have to specify numbers 0-255 when creating a mask to set the density, in the simplest form you can just spray to the mask channel with the airbrush tool. This will produce a mask which is solid in the centre but gradually tails off to zero at the edges of the brush strokes. This will happen because the spray brushes themselves diminish in density towards the edges.

It is important to remember that alpha channels can be used to mask off virtually all operations performed with Studio24Pro - not just airbrushing. In fact some operations cannot be performed effectively without the use of alpha channels to limit their effect to the required area of canvas.

Because of the importance of understanding alpha channels, the next section of this chapter takes you through a number of exercises using different tools to demonstrate the various features of these channels.

Using simple masks

In its simplest form a mask can be created by simply spraying onto an alpha channel using the airbrush tool.

Create a new canvas about 300 x 300 pixels and click on the channels icon on the toolbar. This will produce the familiar channels window shown here which should be left on screen for the whole of the following exercise.



Create an alpha channel by clicking Menu over the channels window and selecting 'New channel'.

Now click on the RGB pencil and eye at the top of the window to prevent painting and viewing of the main RGB channels. This will make the canvas area go black.

Click on the pencil and eye icons of the new Alpha #0 channel. This will permit painting on this channel as well as viewing it.



Now increase the brush size to about half the maximum size and select the airbrush tool from the toolbar.

Now paint a simple shape (such as a cross) in the centre of the canvas. This will appear as a dark red colour which is the default mask colour. Notice that the edges of the cross will gradually reduce to black rather than being a sudden transition. This shows that the mask has a gradually reducing density as described earlier.

Now deselect the pencil and eye associated with the Alpha #0 channel and select the pencil and eye for the main RGB channels by clicking on those icons on the top row.



Finally select the Alpha #0 channel as an active mask by clicking on its mask icon. This should produce the channels window shown here.

There should be nothing visible on the canvas at the moment as the only channel we have painted to is now not visible. Just to prove it is still there you can click on the Alpha #0 channel 'eye' icon which will make the Alpha #0 channel appear superimposed on the main RGB channel, and then click on it again to remove it from view.

Now simply paint using the airbrush roughly over the area of the main canvas where you have positioned your cross. You should find that you can only paint where your mask is not present. Notice that the edges of the masked off area show a gradual transition from painted to unpainted which is the effect of the graded mask edge.

While we have this mask we can try another very useful operation.

Click **Menu** over the RGB channels on the channels window. (The top row). Now click on 'Wipe channel' of the menu options. This will clear the RGB channels while leaving the alpha channel untouched.

Now click **Menu** again, but this time over the Alpha #0 channel row on the channels window, and then click on 'Invert channel' to invert the mask channel. Use the 'eye' icons to view the Alpha #0 channel which should now be a negative version of the cross you drew earlier.

Select the correct combination of icons to make the alpha channel active again and try painting to the main RGB channels. You should now find that you can only paint on the area where you originally drew your cross on the Alpha #0 channel.

The above exercise should enable you to see the basic use of an alpha channel. The most important thing to remember is that masks are not only used in conjunction with the airbrush tool, they are used for any operation which involves applying paint to a canvas, or any operation which modifies the existing canvas such as filtering operations.

In most cases it is essential to use a mask to limit the area on which paint will be applied. A typical example of this is when using flood fill tools. These tools will normally work to the whole canvas area unless limited by the use of a mask.

Because masks are so important we will now look at some ways in which to rapidly create the sort of masks you are likely to need most.

Producing Masks

Masks may be produced in many ways. So far we have looked at just one way, by directly painting to the alpha channel using the airbrush tool. Although this method can be used for almost any requirement, it is normally much faster and more accurate to produce masks by transferring information from one of the main colour channels.

One of the simplest ways is by using the 'Copy channel' option. By clicking Menu on the channels window over the channel you wish to copy from, you can choose to copy all the information from that channel to an alpha channel.

A similar but more versatile method is to use the 'Calculate...' option, again accessed by clicking Menu over the channels window. This allows a number of mathematical operations to be applied to any two channels with the result being put in any other (possibly alpha) channel.



One of the most powerful and frequently used methods of putting information on a mask channel is to use the Flood Fill tool. This is selected using the toolbar icon shown. It is essential to also use the additional info bar associated with this tool.



The purpose of this tool is to flood fill a given area, with the boundary being determined by the outline of the shape in which the pointer is located when the Select button is clicked. The boundary is defined by a colour change which exceeds the 'tolerance' setting. The higher the tolerance the larger the area likely to be filled.

One or more channels are used to determine the outline and another (usually an alpha channel) is used for the resulting fill. Note that you cannot use the same channel for output and input.

As an example of how to use the flood fill, create a new canvas about 300 x 300 pixels and create an alpha channel as before. Paint onto the main RGB channels using the airbrush in any colour you choose.

Select the Flood Fill tool from the toolbar and display the additional info bar by clicking on the small downward pointing arrow to the right of the brush window.

Select Alpha #0 as the output channel for the Flood Fill from the additional info bar.

Now move the Flood Fill tool over part of the area you have painted and click **Select**.

After a few seconds nothing may appear to have happened but if you now look at the alpha channel by selecting its 'eye' and deselecting the 'eyes' for the RGB channels, you will see that a flood fill has been performed onto the alpha channel where the outline has followed the painted area on the RGB channels.

If you now return to looking at the RGB channels and click **Select** with the Flood Fill tool over any other part of the canvas, you will find that the rest of the alpha channel becomes a mask leaving just a thin outline around the edge of the original painted area. This outline is present because of the low default tolerance setting.

This is not the only way of creating a mask area. Almost anything that can be applied to a colour channel can also be applied to an alpha channel. This includes loading and transferring of images such as Sprites and Draw files by dragging them onto the canvas and of course textures can be applied directly to alpha channels.

The possibilities are endless. You can even use one alpha channel to mask something you are applying to a different alpha channel!

It is well worth spending a time experimenting with the use of alpha channels as masks because understanding their operation is essential if you wish to get the most out of Studio24Pro.

7 - Cut and Paste

Studio24Pro Clipboards

Studio24Pro clipboards are extremely important because they provide the means by which many different types of object may be manipulated before being put onto the canvas. There are three separate clipboards which may be individually viewed, superimposed on the main canvas. There is also an invisible clipboard which lets you transfer any selected object to other Studio24Pro windows or other RISC OS applications.

Of the three main clipboards, one contains Draw objects either created within Studio24Pro or from Draw files dragged onto the window.

Another contains Text which again can either be created directly from within Studio24Pro or dragged onto the main window as a text file.

The third holds bitmap images, Sprites, Clear, TIFF, JPEG or PBM files, which can be dragged to the main window. This clipboard also contains any areas of canvas which have been 'cutout' from the main canvas.

The main purpose of the clipboards is to allow objects to be scaled, moved and rotated before they are finally transferred onto the main canvas. This provides a versatile system for handling objects.

It is important to realise that the above types of object are only visible when their respective clipboards are being viewed until such time as they are 'transferred' permanently to the main canvas. Draw objects are only visible when the draw tool is selected, Text objects are only visible when the text tool is selected, Cutout and bitmap objects are only visible when the cutout tool is selected.

Text and Draw objects are dealt with elsewhere in this manual although they behave in exactly the same way as cutouts and bitmap objects.



Using the Freehand Cutout Tool

This tool is selected by clicking on the scissors icon shown. The additional info bar needs to be available when using this.



There are two further selections available from this tool bar. The arrow is used to select objects which have been cutout and bitmap images which have been dragged onto the canvas. Any number of objects may be placed on the clipboard and selected, either singly or in groups, for moving, scaling or rotating. The small scissors icon enables freehand drawing around any part of the canvas to select an area for cutting out.

1. To begin the cutout outline press **Select** and move the pointer. When **Select** is released the pointer may be moved to a new position which will produce a straight line between the two points. If **Select** is pressed continuously then a freehand line may be drawn. The result may look something the outline shown here.



2. When the cutout is complete double click **Select** or press RETURN to perform the cutout. If the end point is not exactly over the start point then a straight line will be used to join those two points.



At this point the outline will become a rectangle with Rotate and Scale handles on the right hand corners as shown here. The additional toolbar icons will now automatically change to the **Select** arrow.

The top right handle will allow the cutout object to be rotated, and the bottom right handle will scale the object. Simply place the pointer in the relevant handle, press **Select** for a short time and then move the pointer while holding down **Select**.



3. To move the object, place the pointer anywhere inside the main rectangle, hold **Select** and move the complete area. The result may look like this.

The selected object may be placed back onto the canvas at its current location by clicking the **Menu** button and using the **Select/Transfer** option or the

keyboard shortcut **Ctrl T**.

Although nothing may appear to happen at this point, moving the selected object away from its current position will reveal that the object has been placed on the main canvas.

The opacity bar will set the opacity at which the object is transferred to the main canvas.

The same principles apply to any selectable object. This includes any bitmap files (TIFF, Sprite, Clear etc.) which have been dragged onto the Studio24Pro canvas.

Using Draw files to Cutout areas

It is possible to use the outline of a Draw object to cutout any section of the main canvas. This may be a Draw object which has been created within Studio24Pro, or a Draw object which has been loaded onto the Draw clipboard by dragging its file icon to the main canvas.

Draw objects behave in exactly the same manner as those previously described and may be moved scaled and rotated in the same way.

An additional feature, however, is the ability to use the outline to cutout an area of canvas. Click **Menu** over the canvas and choose **Select/Cutout**. This action will automatically cutout the area of canvas under the Draw object and select the cutout tool from the toolbar.

From this point onwards the cutout behaves in exactly the same way as an item cutout using the freehand tool.

Handling 'Selectable Objects'

There are a number of important points to remember when dealing with selectable objects.

- When an object is de-selected (by selecting another object or clicking elsewhere on the canvas), the dotted surround will disappear and the object may appear to be part of the main canvas. It is possible to identify objects either by using **Select/Select All**, to highlight them all, or to remove the view of all the channels which will just leave selectable objects on the screen.
- Selecting any tool other than the cutout tool will make all the cutout objects disappear until the tool is re-selected.
- Any number of objects may be selected at the same time and manipulated together. Use **Select** to choose the first one and then **Adjust** to select or de-select other objects.
- Selectable objects do not have to be placed over the main canvas. They can be kept on the border of the canvas until they are required to be positioned and pasted to the main canvas.

As well as using the handles to manipulate objects there are many other options available from the 'Select' menu which is accessed by clicking the mouse **Menu** button over the main canvas and then following the 'Select' option.

'Save' lets you save the selected object as a TIFF file.

'Select All' (Ctrl A) will select all the objects on the currently viewed clipboard.

'Clear' (Ctrl Z) will clear the selection of all the currently selected objects.

'Cut' (Ctrl X) will cut the selected objects onto an invisible clipboard for later pasting to either the same canvas, a different canvas, or any other Archimedes application which supports this protocol.

'Copy' (Ctrl C) will copy the selected item.

'Paste' (Ctrl V) will paste objects from the invisible clipboard onto a canvas. Note that this does not perform the same operation as 'transfer', it simply places a selected object onto a clipboard.

'Edit' (Ctrl E) will create a new Studio24Pro canvas (or canvasses if more than one object is selected). This new canvas or canvasses will contain just the selected item, which may then be edited using any of the Studio24Pro tools in the normal way. When editing is complete the edit window may be closed, restoring the edited item back to the original canvas. This is a very powerful feature!

Select	
Save	↗
Select All	^A
Clear	^Z
Cut	^X
Copy	^C
Paste	^V
Edit	^E
Transfer	^T
Stroke	↗
Cutout	
Reset scale	
Rotate	▶
X scale	▶
Y scale	▶
Magnify	▶

'Transfer' (Ctrl T) will finally place the selected object(s) onto the main canvas with the opacity of the transfer set by the opacity slider.

'Stroke' is only used for selected Draw objects and converts the Draw outline into a brush stroke. See chapter 13 on the Draw tool for more information.

'Cutout' is used when a Draw object is being used to cutout part of the main canvas.

'Reset Scale' is used to reset the scale of an object to its original value, for example, if it has been changed using the scale handle.

'Rotate' allows the selected object(s) to be rotated by an exact number of degrees.

'X Scale' will allow scaling in the x axis by an exactly defined amount.

'Y Scale' will allow scaling in the y axis by an exactly defined amount.

'Magnify' will allow the magnification to be adjusted by an exact amount.

Drag and Drop

As well as using the invisible clipboard to transfer selected items from one Studio24Pro canvas to another, it is also possible to use a powerful 'drag and drop' feature.

If both canvasses are on screen, select the object to be moved on the source canvas. Then with the pointer in the rectangle of the selected object, press Select and simply drag the object onto the destination canvas and release Select. This will transfer any selected object(s) directly from one canvas to another.

8 - Text handling

Adding Text to a Canvas

It is extremely simple to add text to a canvas in any of the available fonts. It is also possible to scale and rotate the text with ease.



First select the text tool shown here and also display the additional tool bar to allow selection of text font and size.



With the pointer over the main canvas type the required text. This will produce the characters on screen surrounded by a dotted outline with handles as shown. At this stage the text has not been applied to the canvas, it is being displayed on the text clipboard. The text may be positioned by placing the pointer inside the rectangular box, pressing **Select** and moving the box to the required position. The handle at the lower right hand corner of the box can be used to scale the text, and the handle at the top right can be used to rotate it.



The font is selected by choosing the required one from the additional toolbar. The font size may be set using the additional tool bar pop-up menu or by typing directly into the font size window.

When the text has been finally positioned it may be 'transferred' to the canvas using the menu option **Transfer** or the keyboard shortcut Ctrl T.

The text will be applied in the current foreground colour and with the opacity currently selected on the additional tool bar.

As well as using the handles to manipulate text there are many other options available from the 'Select' menu which is accessed by clicking the mouse Menu button over the main canvas and then clicking on the 'Select' option.

'Save' leads to an icon which allows the selected text object to be saved as a text file.

'Select All' (Ctrl A) will select all the text objects on the currently viewed clipboard.

'Clear' (Ctrl Z) will clear the selection of all currently selected text objects.

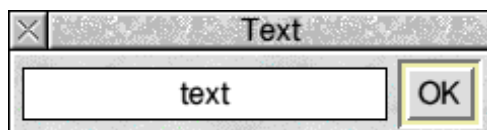
'Cut' (Ctrl X) will cut the selected text onto an invisible clipboard for later pasting to either the same canvas, a different canvas, or any other RISC OS application which supports this protocol.

'Copy' (Ctrl C) will copy the selected text item.

'Paste' (Ctrl V) will paste text from the invisible clipboard onto a canvas. Note that this does not perform the same operation as 'transfer', it simply places an object in a selected state onto a clipboard.

'Edit' (Ctrl E) will create a new window similar to that shown.

Select	
Save	▶
Select All	^A
Clear	^Z
Cut	^X
Copy	^C
Paste	^V
Edit	^E
Transfer	^T
Stroke	▶
Cutout	▶
Reset scale	
Rotate	▶
X scale	▶
Y scale	▶
Magnify	▶



The text may then be edited in the usual way. When editing is complete the edit window may be closed which restores the edited text back to the clipboard.

'Transfer' (Ctrl T) will finally place the selected text object(s) onto the main canvas with the opacity of the transfer set by the opacity slider and the colour by the current foreground colour. The transfer operation may be masked by any active alpha channels.

'Stroke' is used for selected Draw objects and converts the Draw outline into a brush stroke. See Chapter 13 on the Draw tool for more details.

'Cutout' is used when a Draw object is being used to cutout part of the main canvas.

'Reset Scale' is used to reset the scale of the text to its original value if it has been changed using the scale handle.

'Rotate' will rotate the selected text by an exact number of degrees.

'X Scale' will allow scaling in the x axis by a defined amount.

'Y Scale' will allow scaling in the y axis by a defined amount.

'Magnify' will allow the magnification to be adjusted.

Drag and Drop

As well as using the invisible clipboard to transfer selected text from one Studio24Pro canvas to another it is also possible to use 'drag and drop'.

If both canvasses are on screen, select the text to be moved on the source canvas. Then, with the pointer in the rectangle of the selected text, press **Select** and drag the text onto the destination canvas and release **Select**. This will transfer any text from one canvas to another.

As well as entering text from the keyboard it is possible to simply drag a text file to the Studio24Pro canvas. Only the first line of text from the file will be entered, however, as there are no text formatting facilities built into Studio24Pro

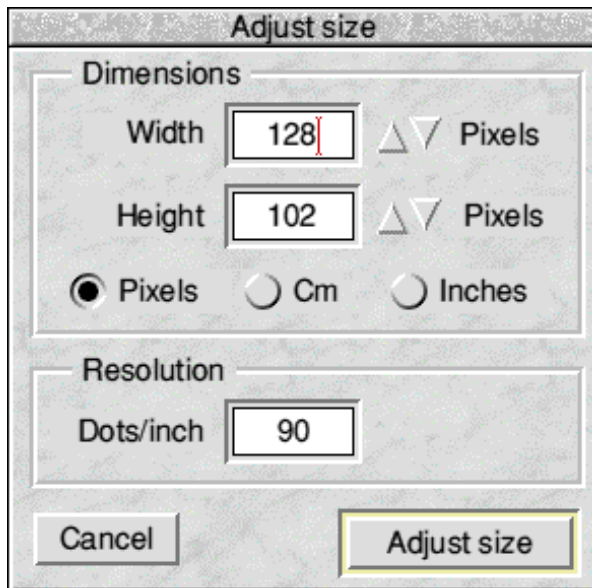
9 - Transforming an Image

There are a number of operations which can be applied to the whole of a Studio24Pro canvas. These are accessed from the submenus 'Edit' and 'Transform'. The 'Edit' menu is shown here and is accessed from the main Studio24Pro menu.

Adjusting the Image Size

The first option is 'Adjust size' which allows the size of the main canvas to be changed after creation.

This does not perform scaling of the image, it simply crops it. The window to perform this task is shown below.



This is very similar to the initial 'Create' window. The width and height show the current size of the canvas. Modify these values to the new size that is required and then click on 'Adjust size'.

The canvas will be cropped down the right hand side and at the bottom. If this area contains a part of the image you wish to keep, then move the whole image on the canvas before performing the adjust size operation. This can be done either using the hand tool from the main tool bar, or

by using the Shift Channel option from the channels window menu.

Duplicating the Image

If you wish to make an identical copy of the current Studio24Pro canvas you can use the 'Duplicate Image' option.

There are no submenus or windows involved with this process, simply click on the Duplicate Image menu option to start the process.

Clearing the Image

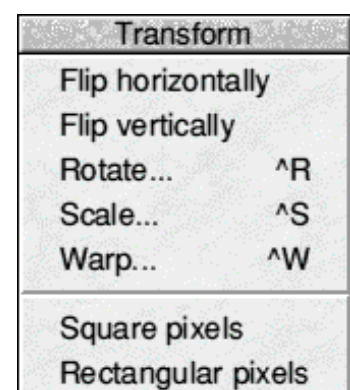
This option will clear all channels of the current image. Use with care!

Horizontal or Vertical flipping

Flipping the image horizontally and vertically is performed from the 'Transform' menu.

This is a sub-menu of the main Studio24Pro menu shown at the start of this chapter.

Simply click the Select mouse button on either of these options to flip the complete image in either direction.



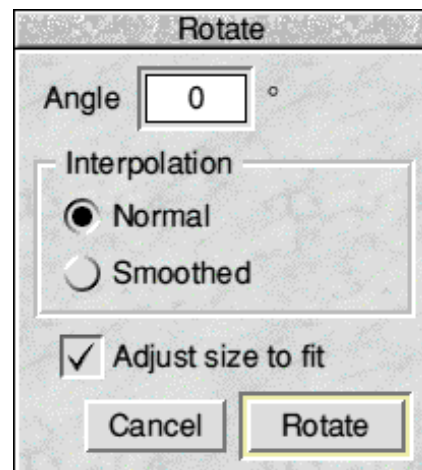
Rotating the Image

The 'Rotate' window can be accessed from the 'Transform' menu or by using the keyboard shortcut Ctrl R.

The number of degrees of rotation are entered at the top of the window in the 'angle' box. The rotation will be in a clockwise direction.

The interpolation can be set to either 'normal' or 'smoothed'. The smoothed option will reduce any stepping which may be visible when horizontal or vertical lines are rotated. This option may take considerably longer than the 'normal' mode, however.

The 'Adjust size to fit' option, if selected, will automatically increase the size of the canvas so that none of the image is lost during the rotate operation. If this option is not selected then the canvas will remain the same size but corners of the image will be cropped during the rotation.



Scaling the Image

The scaling option is accessed from the 'Transform' menu or by using the keyboard shortcut Ctrl S.

Scaling is different from the 'adjust size' operation because it actually scales the image to fit the new canvas size. No information is gained or lost in this process.

The Scaling window is shown here. The top section of the window shows the current size of the canvas.

The centre section initially shows the current size in pixels together with percentage boxes for width and height. All four of these boxes are writable and the scale can easily be adjusted by changing the percentage size of the canvas or by entering new width and height values.

The interpolation can be set to 'smoothed' to remove any scaling artifacts, but this option will increase the processing time considerably.

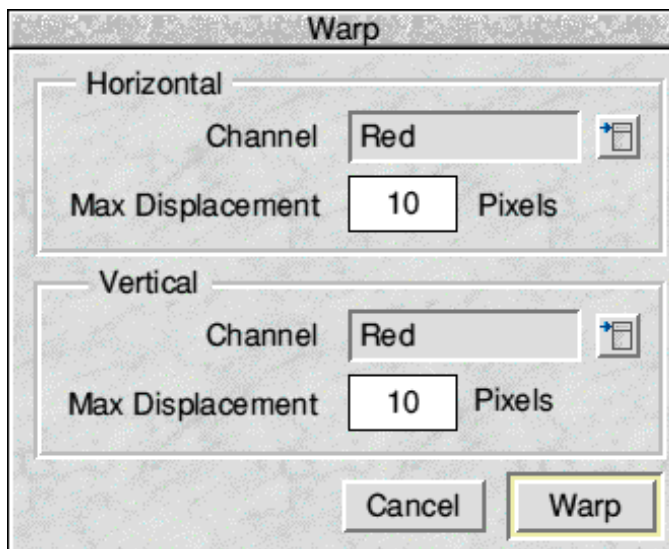
Warping

The Warp feature applies distortion to the whole of the main canvas image according to a number of presettable parameters. Horizontal and vertical distortion (warping) can be controlled separately by individual channels.

Usually, this would probably be done by a pre-prepared mask channel. The channel(s) from which the warp information is to be obtained is selected separately via the pop-up menus that appear from the selector boxes to the right of the channel indicators.

The warp window which is accessed from the 'Transform' menu, or by using the keyboard shortcut Ctrl W is shown here.

The amount of the distortion is set in the writable boxes by entering the maximum number of pixels that the distortion can move the original picture.

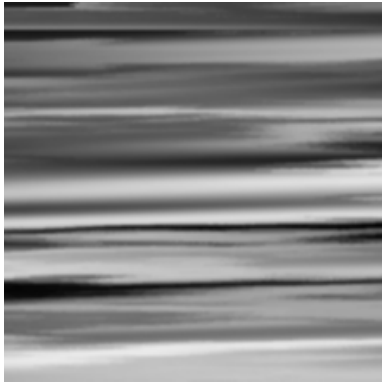


An example of how a picture can be warped is shown at the top of the next page.

Image Aspect Ratio

At the bottom of the 'Transform' menu are the options 'Square Pixels' and 'Rectangular Pixels'.

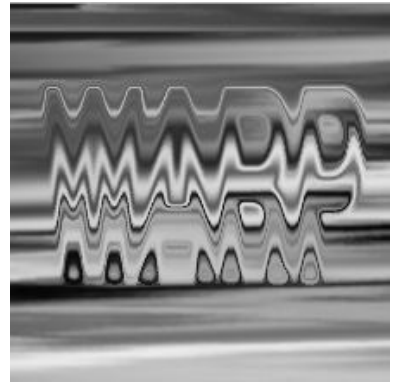
These options allow the image aspect ratio to be changed to suit images which may have been loaded into Studio24Pro after having previously been created in a mode with different aspect ratio pixels to those in the current mode.



Original Image



Warp Image



Result

10 - Filters and Effects

Using the Filters and Effects

The filters and effects available with Studio24Pro are very extensive. They are used mostly during photo re-touching operations but many of them are also useful when producing original artwork.

Filters may be applied to an image in two ways. The filters may be selected using the Studio24Pro main menu, and when used in this way will be applied to any selected channels of the image. Where the filter is only required on a certain area of the canvas, an alpha channel should be used to mask off areas which do not require filtering.

It is also possible to use the filter brush available on the tool bar to actually brush a filter or effect on to the canvas.

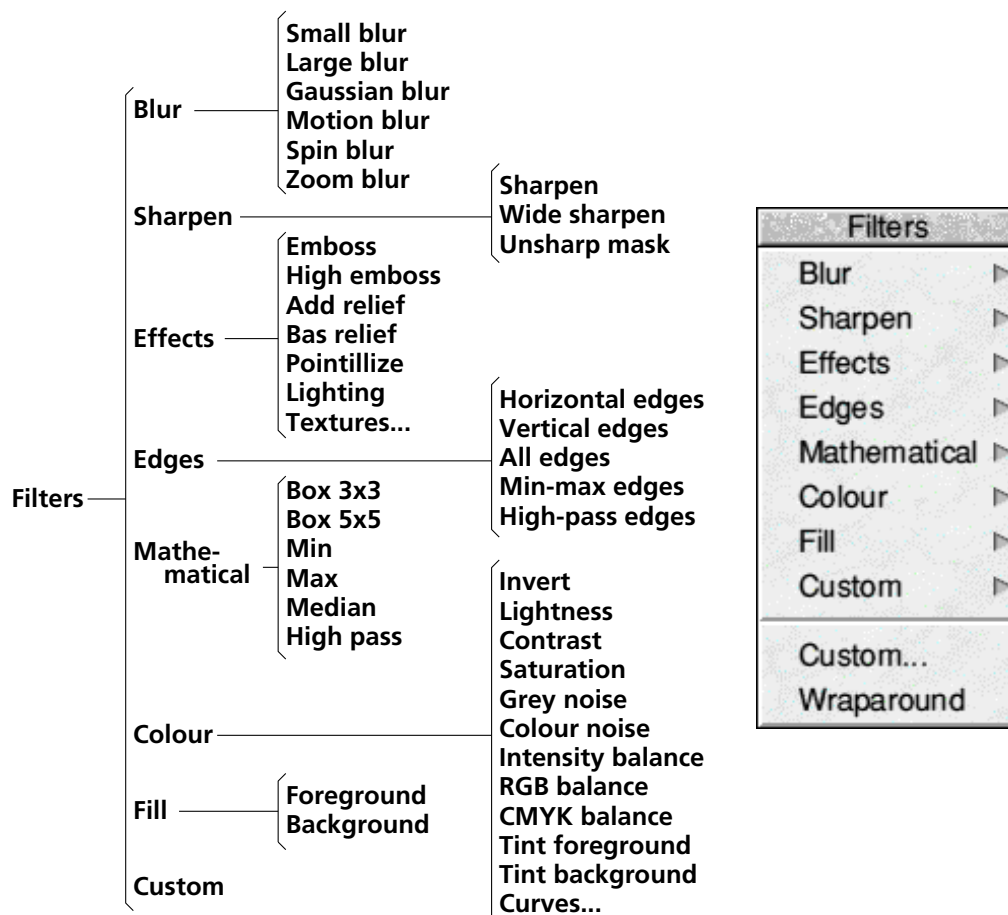
A filter preview window is available which enables any of the filter effects to be viewed before being applied to the canvas. As some of the more powerful filters can take some considerable time to implement, this can be a very useful option.

This chapter gives a description of every filter and effect, but before describing the individual filters, a general description of the way in which they are accessed, and a description of the filter preview window will be given.

The facing page contains a chart showing which filters are available and where to find them from the filter menus.

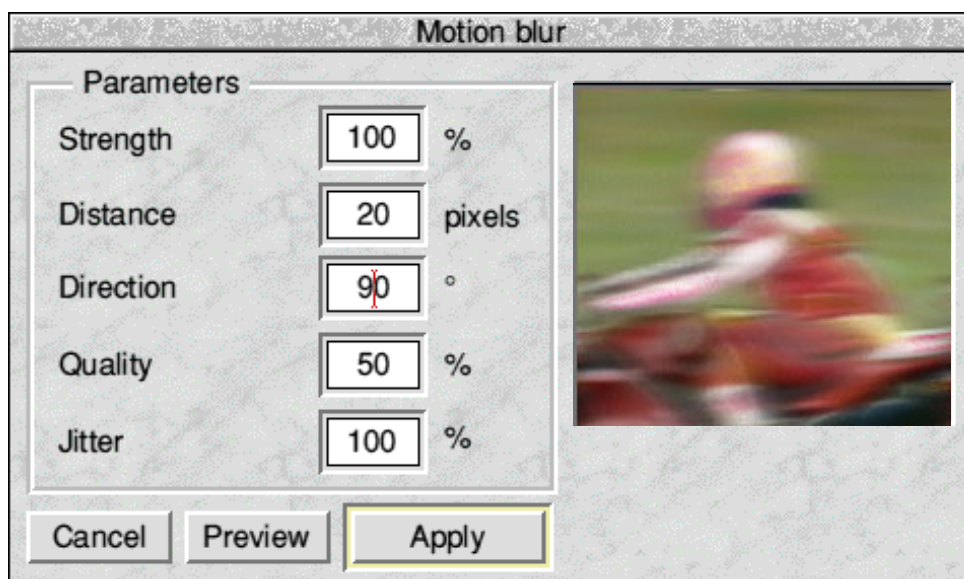
Filter List

Filters are accessed by clicking the mouse **Menu** button over the main canvas to display the main Studio24Pro menu. Slide the pointer off to the right of the 'Filter' option and a sub-menu will be displayed which contains eight further possible selections. These eight selections lead to the final filter choices as shown below.



The Preview Window

Sliding the pointer off one of these options will produce the filter preview window as shown. The title bar of this window shows the selected filter and depending on which filter is chosen there will be one or more parameters which can be set using writable boxes. Many of the 'Colour' filter options may be set to negative values if required.



The strength setting, which is common to most filters, determines how much of the filtered image is merged with the original. For example, if the setting was 50% then there would be an equal mix of filtered and unfiltered image.

The square to the right of the window contains a small area of the main canvas which is used to show a preview of the filter effect. Place the pointer in this square, press **Select** and drag the image in the square around to show any part of the main canvas. When the required section of the main canvas is visible click on 'Preview' and the effect of the filter will be shown in the preview square.

If you are not happy with the effect try changing the parameter(s) and reapply the filter to the preview window. When you are satisfied click on 'Apply' to apply the filter to the whole of the canvas.

Don't forget to use an alpha channel as a mask if you wish to limit the filter effect to just a part of the canvas.

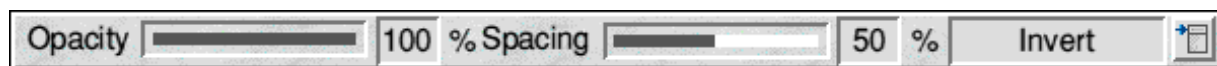
The filter will of course only affect those channels whose 'pencil' icons have been selected in the channels window.

Applying Filters with a Brush

A very powerful feature is the ability to apply filters and effects using a brush.



Select the Fx brush icon shown here, from the main tool bar. Also select the additional info bar which provides essential access to the available filters as shown below.



Opacity and Spacing have the same effects as for the standard airbrush. The right hand box will provide access to all the same filters as are available from the main filter menu including the filter preview window.

If the filter you require is already selected then all you need to do is to start brushing with the Fx brush and the filter will be applied just to the area over which you brush.

To choose a different filter click on the selector to the right of the current filter indicator and the standard filter selection menu will appear. Move the pointer to the required filter and either click on the filter name on the menu to select that filter, or if you wish to use the filter preview feature, slide the pointer off the arrow to the right of the required filter.

After viewing the filter preview, click on 'Apply' and you will be returned to the main canvas. At this point you can start brushing the filter on to the main canvas.

There may be some considerable processing time involved after selecting the required filter before you can start brushing it onto the canvas. This is because Studio24Pro creates a complete (invisible) copy of the existing canvas with the filter effect applied to it. The brushing action then just transfers some of the filtered image to the main canvas.

Because two copies of the canvas exist, one filtered and one unfiltered, it is still possible to use the undo brush feature. As well as just selecting this feature from the main toolbar don't forget that you can use a shortcut by pressing the Ctrl key while brushing with the Fx brush. This means that if you inadvertently brush the filter over the wrong part of the canvas, you can simply press the Ctrl key and go over the area again to restore the original unfiltered image. This shortcut works with all Studio24Pro brushes.

Blur

Small blur

This filter has the effect of blurring the image by a small amount.

Large blur

This blurs the image by a large amount.

Gaussian blur

This is another type of blur filter but you can specify the radius in pixels over which the blur operates, (Gaussian refers to the specific shape of the blur filter).

Motion blur

This filter blurs the image in a specific direction as if the object is moving. The example here shows a horizontal movement. There are a number of parameters which can be specified for this filter as follows:-

Distance This is the number of pixels of the movement.

Direction This is the direction of movement in degrees clockwise from the top of the image.

Quality This is a trade off between smoothness of effect and time taken, 100% is the smoothest but takes the longest.

Jitter This is a randomisation of the motion blur effect at low qualities. Try Strength = 100, Distance = 40, Direction = 0, Quality = 10, Jitter = 0. With no jitter you will be able to see separate images after blurring. Try the same with Jitter = 100. You cannot see separate images now but the effect will be very 'bitty', the jitter only makes a difference at low quality settings.



Spin blur

This produces the effect of the image spinning. Quality, Jitter and Strength have the same meaning as in Motion blur. The centre point of the rotation can be selected using the filter preview window. Click the mouse Adjust button over the preview window at the point where the centre of rotation is required. A small cross-hair will appear.

Remember that the area of image being viewed in the preview window can be changed by dragging it with the mouse Select button.



Zoom blur

This produces the effect of zooming into the image. Quality, Jitter and Strength have the same meaning as in Motion and Spin blur. The centre point of the zoom can be set using the mouse Adjust button in the filter preview window as for the Spin blur filter.



Sharpen

This is a sharpening filter with a small amount of sharpening.

Wide sharpen

Wider sharpening filter producing a more noticeable sharpening effect.

Unsharp mask

A configurable sharpening filter with a strength of from 0 to 400%. 'Radius' selects how far the sharpening effect will extend from an edge. 'Threshold' sets how defined an edge must be to be sharpened. If set to 0%, noise in the image can be increased by sharpening. Setting it to 5% will restrict the sharpening to edges only.

Effects

Emboss

This produces an embossed effect with lighting from the top left. It works best on grey scale images.

High emboss

This produces an increased embossed effect.

Add relief

This filter adds highlights and shadows to an image based on its colour. It is similar to emboss but retains the original colours of the image.

Bas relief

This filter is similar to emboss, but adds highlights only. The base colour is black rather than grey which is used for the emboss effects.

Pointillize

Provides automatic repainting of an image using the current brush. 'Density' sets the density of the brush strokes. 100% means one brush stroke for every pixel in the image. A jitter of 100% randomises the positions of the brushes, a jitter of 0% places the brushes on a regular grid.

Lighting

Produces an accurate simulation of the image being illuminated by a light source. Best used on a greyscale image. Light pixels are considered high, and dark pixels low. The following settings are available:-

Diffuse This sets the amount of diffuse light. It produces smooth shading with no highlights.

Specular This sets the amount of specular light. It produces highlights.

Coeff Controls the shininess of a surface. Setting this high (e.g.50) will produce small, sharp highlights, setting it low (e.g.5) will produce soft highlights.

Elevation Defines the direction of the light source. For an overhead light source it would be set to 90. For a light source from the side it would be set to 0.

Edges

Horizontal edges

Detects horizontal edges and produces outlines based on these edges.

Vertical edges

Detects vertical edges and produces outlines based on these edges.



All edges

This filter detects edges at any angle, producing complete outlines as shown here.



Min-max edges

This filter provides edge detection by choosing the darkest and lightest pixels within a given radius. The difference between these pixels gives the strength of the edge. Making the threshold greater than 0 will detect only true edges. Like the unsharp mask the threshold detects only true edges and not noise.

High-pass edges

A mathematical filter which removes low frequencies in the image (smooth variations in intensity) and retains high frequencies (quick changes in intensity) which are commonly referred to as edges.

Mathematical

Box 3x3

This is very similar to a blur, but uses a square filter shape of 3 x 3 pixels.

Box 5x5

Again, similar to a blur, but using a square filter shape of 5 x 5 pixels.

Min

This filter selects the darkest pixels within a given radius.

This filter is particularly useful for enlarging masks. A setting of 2 pixels, for instance, will enlarge mask areas by 2 pixels around their edges. Use the channels window to make the filter affect the alpha channel only.

Max

This filter has the opposite effect to the previous one. It selects the lightest pixels within a given radius.

This is particularly useful for reducing masks. A setting of 2 pixels, for example, will reduce the mask area by 2 pixels. Use the channels window to make the filter affect the alpha channel only.

24

Original

24

Min Filter

24

Max Filter

Median

In mathematical terms this filter selects all the pixels within a given radius, sorts them by intensity, and then picks the intensity of the pixel in the centre of the sorted list. This becomes the new pixel colour. This is used to remove noise. A setting of 1 or 2 pixels is usually sufficient.

High pass

This applies a high-pass filter to an image. Flat areas of colour will become grey and edges will become black or white.

Colour

With many of the following filters the writable boxes may have negative values entered into them.

Invert

The invert filter makes any selected channels negative.

Lightness

This adds or subtracts a given intensity to pixels, lightening or darkening them.

Contrast

This filter increases or reduces the contrast of the image.

Saturation

This filter increases or decreases the saturation of colours in the image.

Grey noise

This adds grey noise of the required intensity to the image. It is also sometimes called monochrome noise.

Colour noise

This filter adds noise of random colours to the image.

Intensity balance

This filter increases or decreases the intensity of colours in an image. It is very useful for improving the colours in scanned or digitized images.

RGB balance

Allows the intensity of the red, green or blue channels to be increased or decreased independently. This is the best filter for making subtle colour changes to an image when in RGB mode.

CMYK balance

This allows the intensity of the cyan, magenta, yellow and key channels to be increased or decreased independently. This is the best filter for making subtle colour changes to an image when in CMYK mode.

Tint foreground

Tints shadows, midtones or highlights using current foreground colour.

Tint background

This filter tints shadows, midtones or highlights using the current background colour.

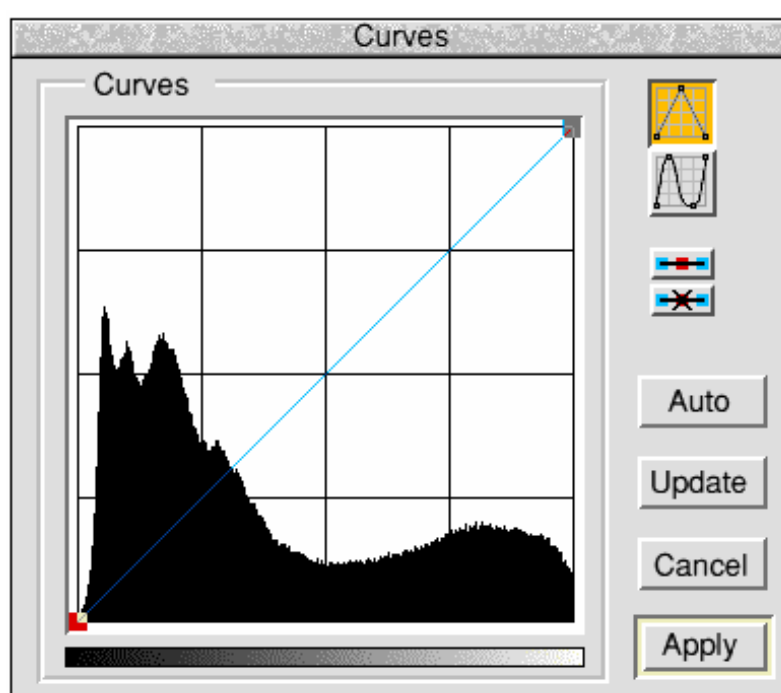
Curves...

This filter allows accurate control of intensities using a histogram chart.

Initially, a histogram of pixel intensities in the current image is shown. The height of the bar is the number of pixels with this intensity. Intensity is 0 to the left and maximum to the right. To have no effect the curve would be positioned from the bottom left corner straight to the top right.

Operations may be carried out on individual channels by using the channels window in the normal way.

The curve can be adjusted by dragging the

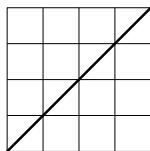


small 'handles' with **Select**. Handles may be added or deleted using the icons to the right of the main window. A new handle will be added or deleted to the left of the selected (red) handle.

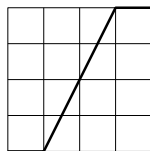
The 'Auto' option is useful for enhancing scanned or digitised images. It will automatically set the darkest pixel in an image to be black, and the lightest pixel to be white.

The 'Update' option is provided to update the histogram data if the picture on the main canvas changes while the 'Curves' window is being displayed. This could be caused by changing the selected channels in the channels window for instance. Note that the histogram reflects the channels which are being viewed on the canvas.

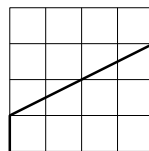
Making any part of the curve higher would lighten pixels in that intensity range and lowering the curve would darken pixels in that intensity range. Some example shapes and their effects are shown here.



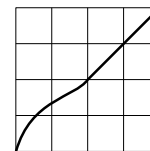
No effect



Increase contrast



Reduce contrast



Enhance shadow detail

The most frequent use is for lightening dark areas in scanned photographs as shown by the example picture of the Studio24Pro author below. The effect is most commonly known as 'Gamma' correction.



Original



Expanded Black Areas

Foreground Fill

This fills the whole image with foreground colour of the required intensity. It would mainly be used in conjunction with a mask to fill areas of the main image.

Background Fill

This fills the whole image with background colour of the required intensity. It would mainly be used in conjunction with a mask to fill areas of the main image.

Custom

The filters listed here are identical to some of those already described. However, these filters can be edited by the custom filter editor. The editor also lets you create new filters to your own design. When new filters are created they will be listed here with those shown below.

- Small blur
- Emboss.
- Sharpen
- Invert
- Motion blur (This is fixed to a 5 pixel horizontal blur.

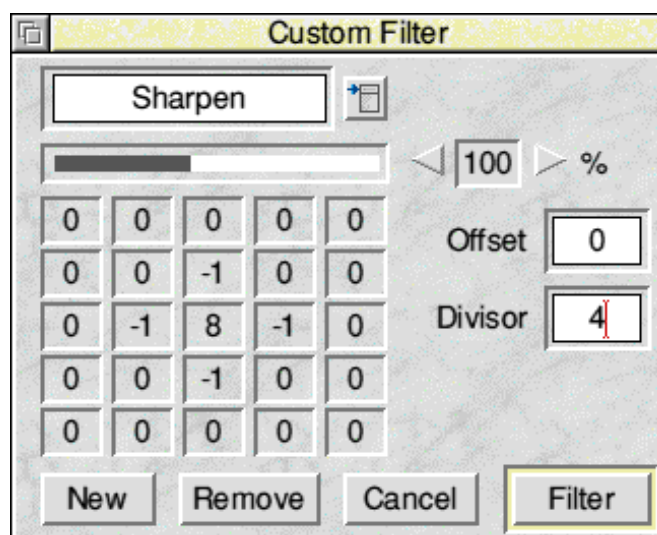
Creating your own Filters

The Custom... option (below the dotted line in the main filter menu) lets you edit those filters which are available from the custom selection.

Completely new filters can also be created here to your own design.

A number of custom filters are provided which can be viewed by clicking on the menu option to the right of the filter name box. These are provided as a starting point to show the type of numbers used to produce various effects. These filters may be edited or new ones created using the 'New' option. Any filter in the list may also be removed using the 'Remove' option.

To change values in the main filter area click **Select** to increase values or **Adjust** to decrease. The values can vary between -99 and +99.



The name of the filter and the offset and divisor values can be changed by typing in the writable boxes as usual.

The filters work by performing a calculation for each individual pixel of the image (separately for R,G and B pixels), using the surrounding pixels shown in the 5 x 5 box. The method used to calculate the new value of the central pixel is that each pixel is multiplied by its corresponding value in its box, including the central one. They are then all added together, the offset is added, and then the result is divided by the divisor. This becomes the new value of the central pixel.

Wraparound

The final option on the filter menu is 'Wraparound'. When filters are being used for areas which touch the edges of the picture there are two different ways of obtaining the pixels used for calculations at the edges.

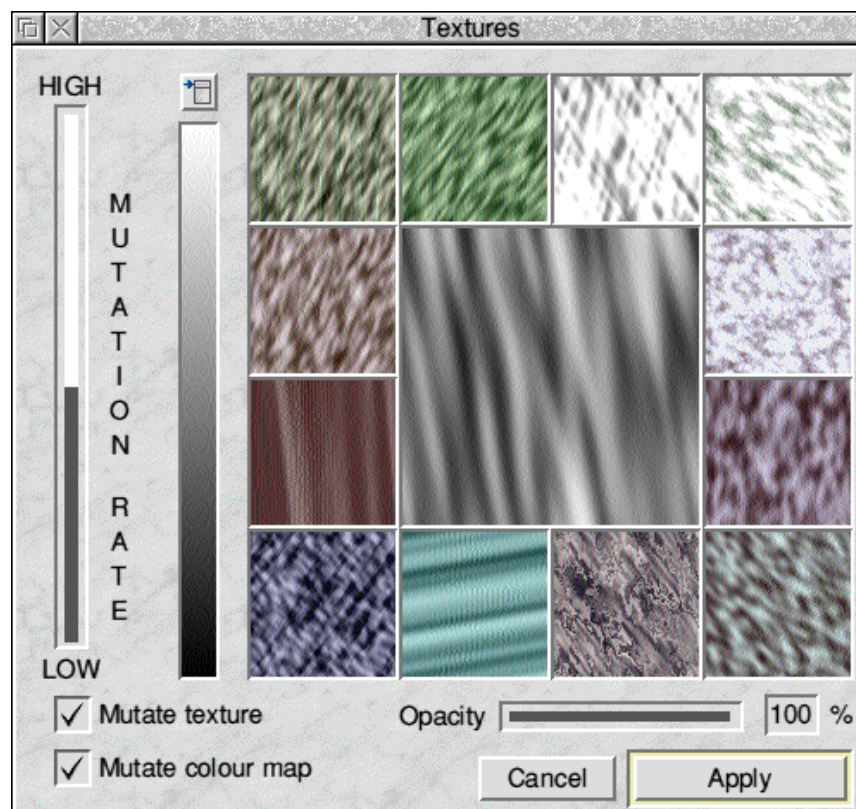
If 'Wraparound' is selected then the pixels for calculating the values near the edges are obtained from the opposite edge of the picture. If 'Wraparound' is not selected then the pixels used for calculations will be the nearest ones available.

Textures

The texture generator window is viewed by accessing Filter/Effects/Textures... from the main Studio24Pro menu. The window used to create and view textures is shown overleaf.

Textures are produced by an algorithm which uses a small texture description specifying parameters like turbulence, stretch, distortion, amount of noise and colours. One advantage of this system is that texture descriptions are very compact and Studio24Pro can save and re-load texture definitions which are stored as simple 'Text' files.

The central texture square contains the texture which will be applied to the canvas. The surrounding smaller squares all contain textures which have been generated from the main texture using the chosen algorithm.



Any of the smaller textures may be moved to the centre by clicking Select on that square. At this point a new set of smaller texture windows will be generated from the new master texture.

Clicking Menu over this window will allow the main texture to be saved as a Text file. Dragging a text file previously saved in this way to the window will re-load a texture.

The degree of texture modification is chosen by the mutation rate slider on the left of the window and you can also choose whether to mutate the texture only, or its colour map as well using the ticked boxes.

Various colour maps may be selected by clicking on the pop-up menu icon at the top of the colour indicator slider.

Another setting which is available is a 'seed' for the generator algorithm. This is accessed by clicking Menu over the texture window and selecting Edit/Seed. This may be set to any three digit number and will change the texture in a fairly subtle manner. Also available here are X and Y scaling options.

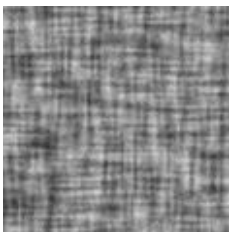
When you are finally happy with your texture you can set the required opacity and click on 'Apply' to add the texture to your canvas. The texture will of course only be applied to those channels which have their 'pencil' icons selected, and an alpha channel may be used to prevent the texture being applied to masked areas of canvas.

Textures may also be applied using the Fx brush in exactly the same way as the filters. Simply access the textures window via the Fx brush additional icon bar, rather than via the main menu selection.

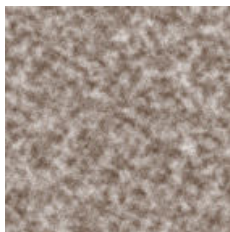
If you wish to use bitmap textures rather than the random mutation texture generator then you can do this by dragging a bitmap texture file to the channels window as described in Chapter 4. A file dragged in this way will tile itself to whichever channels it is dragged to.

Texture Examples

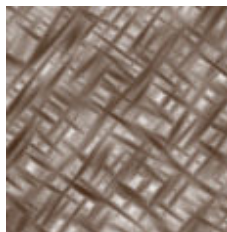
Studio24Pro is supplied with a selection of pre-defined textures. Some examples are shown below.



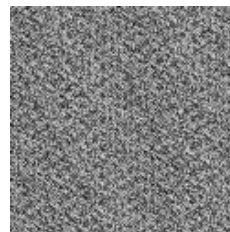
Canvas



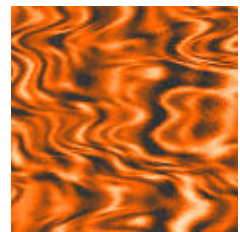
Crayon



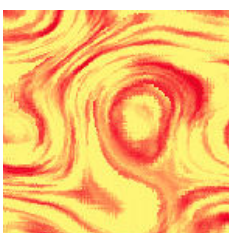
Crisscross



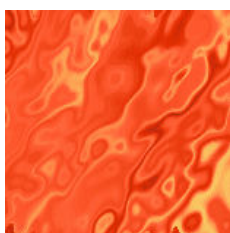
Fineweave



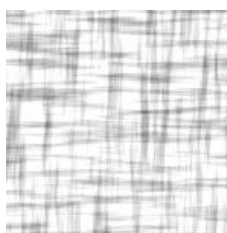
Fire 1



Flow



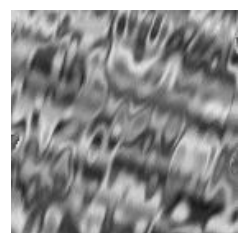
Jupiter



Largeweave



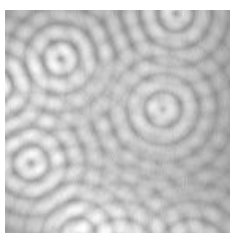
Marble



Puddles



Reflection



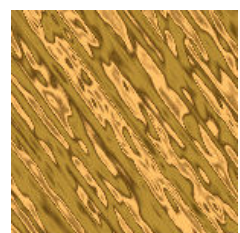
Ripples



Rock



Warptoise



Wood1

11 - Flood Fills

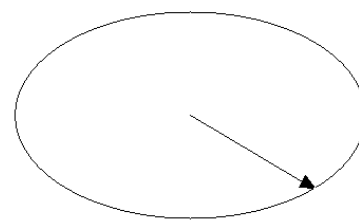
Radial and Linear Fills

Flood fills are very straightforward to use. The most important thing to remember is that you will nearly always need to set up a mask on an alpha channel to limit the area to which the fill will be applied.



The radial fill tool shown here can be selected from the main Studio24Pro toolbar.

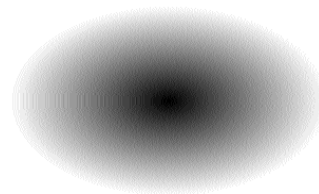
To apply a radial fill, move the pointer to the place on the canvas where the centre of the fill is required. Click **Select**, and then move the pointer away from the central position. An ellipse will be drawn as shown. To produce a circle simply press the **Shift** key.



The fill will start at the centre with the current foreground colour, and will have become the background colour by the time it reaches the outer edge of the ellipse.



A second click of **Select** will activate the fill and produce a result similar to that shown. This will be applied to any channels which have their 'pencil' icons selected and inhibited by any active alpha channel masks.



A linear fill is applied in the same way as the radial fill. The tool shown on the left is selected from the main Studio24Pro toolbar.

When using this tool a straight line with an arrowhead replaces the ellipse of the radial fill, but in all other ways is identical. The current foreground colour is the colour used at the start of the fill, and this becomes the current background colour at the end point of the fill.

Flat Fills

Flat fills are generated using the filter option **Filter/Fill/Foreground** or **Filter/Fill/Background**. The first will perform a flat fill using the current foreground colour and the second using the current background colour.

For full details of these fills see Chapter 9 describing the use of filters and effects.

There are other ways of producing flat fills which are described elsewhere in the handbook. Draw objects can be created which can have a fill colour, and the 'Flood Fill' can of course produce a flat fill of primary colours or mask colour.

12 - The Grid

Using the Grid

A grid is available which can be viewed on screen, and any actions can be 'locked' to it.

Click **Menu** over the main canvas and choose the 'Grid' option from the menu.

The 'Show' option controls whether or not the grid is visible. This can either be selected with the mouse or the **F1** key can be used to switch it on and off.

Similarly 'Lock' can be switched on and off using either the mouse or **Shift F1**.

The grid colour can be chosen from the colour option on the menu, and the size and height of the grid can be set in numbers of pixels using the last two options.

The grid is particularly useful when creating 'tiled' patterns which require exact spacing of items which are repeatedly 'transferred' to the canvas from the clipboard. It is also useful when adding lines of text which need to be equally spaced.

Grid	
Show	F1
Lock	↑F1
Colour	▶
Size	▶
Height	▶

13 - Undo

Using the Undo feature

The undo feature in Studio24Pro is very versatile, and once the principles are understood it is also very easy to use.

There are two ways in which it can operate. It can either be controlled using keyboard function keys, or by using the undo brush.

There are also a number of Undo options which can be set from the 'Choices' window. (Choices is accessed by clicking the **Menu** mouse button over the Studio24Pro icon on the icon bar).

One of these options is to enable or disable the undo feature. When undo is enabled, Studio24Pro uses much more memory than if the undo is switched off because a complete second copy of the image needs to be stored in memory.

This is not normally a problem because 'virtual memory' will always take over if there is not enough RAM available. However, using virtual memory will slow down many of the operations and this may be undesirable.

The **F10** key performs a very important function for undo. It performs the 'Reset Undo' operation. Whenever the image reaches a point where you are completely satisfied with it, you can press the **F10** key and any future actions will be capable of being 'undone' back to that state.

The undo action is initiated by pressing the **F8** key. This will return the canvas to its state when the **F10** key was last pressed.

A more versatile method of 'undoing' the image is to use the Undo brush. When selected, this brush will 'brush' the canvas back to its state when the **F10** key was last pressed. The big advantage of this method is that the image does not have to be 'undone' in the reverse order to which extra things have been added.

As the undo brush also has an opacity setting, it is possible to just partially undo things which have been superimposed on the original canvas, for example, just allowing some of the original to show through a new layer of paint!

It is not even necessary to select the undo brush from the toolbar while painting. When using any of the Studio24Pro brush tools, the undo brush can be temporarily selected by simply pressing the **Ctrl** key. This allows you to instantly go back over an area you may just have painted, restoring the original image.

Another useful feature available from the 'choices' settings is to make the undo automatically reset when a new tool is used. This will work in addition to the **F10** key which can always be used to reset the undo feature.

Although the undo can provide a powerful facility to return the canvas to previous states, it is always good practice to store frequent copies of the image at various states on disc using different filenames.

14 - Draw Images

Creating Draw Images

Studio24Pro can both load and create images in Draw format. This can be particularly useful where you wish to include things like Draw format clipart images in Studio24Pro canvasses.

To load Draw files into Studio24Pro simply drag the file icon over the main canvas. The Draw tool will automatically be selected, and the Draw object placed on the clipboard where it may be edited before 'transferring' it to the main canvas.

The ability to produce Draw images within Studio24Pro itself has many advantages. It effectively gives you a program which can create both bitmap and vector style images in one package!



To create a Draw image select the Draw icon shown left from the main toolbar and also display the additional info bar shown below



There are four types of line which may be created. The selected one shown above is the *straight line tool*, to its right is the *curved line tool*, and finally there are the *rectangle* and *ellipse* tools. The rectangle and ellipse tools can produce squares and circles respectively if the **Shift** key is held down while producing the shape.

The tool at the left of the additional info bar is the 'Select' tool. This allows objects to be selected for editing after they have been created.

When an object is first created it is placed on the Draw clipboard in the same way as text and bitmap objects are placed on their clipboards. Once the position, scale and rotation of an object is finalised, it can be transferred to the main canvas using **Select/Transfer** or **Ctrl T**

An extra feature available with Draw objects is that they can be 'Airbrushed' or 'Smudged' onto the canvas as well as simply being transferred. The airbrush option uses the current brush and foreground colour to brush round any lines in the Draw object as it is being transferred. The smudge option uses Draw lines to smudge anything already on the canvas with an effect similar to the smudge brush.

Draw object creation and editing is fully described in the RISC OS User Guide and Studio24Pro closely follows the standard Draw implementation. However, for those not familiar with the Draw application, the following tutorial will describe most of the more useful features which are implemented in Studio24Pro.

Draw Tutorial

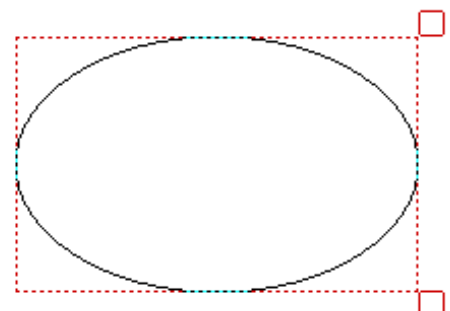
This short tutorial will attempt to show all the main features available with the Draw tool. It describes the creation of a simple Draw object and the facilities available for editing it, followed by the ways in which it may be 'transferred' to the main canvas.

It is important to remember that all the same editing and transferring facilities are available with Drawfiles that have been created by the Acorn Draw application. These would then be loaded into Studio24Pro by dragging their file icons to the main canvas. At this point they become Draw objects identical to those created within Studio24Pro.

Select the Draw tool on the main toolbar and display the additional info bar by clicking on the small arrow to the right of the brushes window.

Choose the ellipse tool, move the pointer to the main canvas and click **Select** at the point where the centre of the ellipse is required. Move the pointer and an ellipse will be drawn as the pointer is moved. When the ellipse is the required size click **Select** again and the outline will be fixed

At this point the ellipse is not actually on the Studio24Pro canvas, it is on the Draw clipboard. Now click on the select icon which is at the left of the additional info tool bar, and then click somewhere inside the ellipse. This should produce a rectangular dotted outline around the ellipse as shown here.



At this stage the object can be moved scaled and rotated in exactly the

same way as text and bitmap objects.

To move the object put the pointer anywhere inside the dotted rectangle, press the **Select** mouse button and drag the object to its new position. The handle at the bottom right is used to scale the object and the handle at the top right is used to rotate the object.

When the size, position and rotation of the object is finalised it can be 'transferred' to the Studio24Pro canvas in a number of ways.

To transfer the object in its current form, simply use the **Select/Transfer** option or the keyboard shortcut **Ctrl T**. After the object has been transferred it will still remain on the clipboard and should be moved to reveal the transferred image underneath.

To convert the Draw outline into a brush stroke use the **Select/Stroke/Airbrush** option. This will convert any lines in the object into brush strokes using the current brush size and foreground colour as shown on the right.

Another option is to use the draw outline to smudge part of the existing canvas. Bring the object back over the airbrushed ellipse and reduce its size by using the handle at the lower right corner. The result should look something like this.

Now use the **Select/Stroke/Smudge** option which causes the draw outline to smudge areas of the main canvas. The result will appear something like that shown on the right.

We can now try some more of the object editing features. Select the ellipse object again and use **Select/Edit** or the keyboard shortcut **Ctrl E** to enter edit mode. A further alternative is to select the ellipse tool on the additional info bar and then click the Adjust mouse button inside the ellipse object on the clipboard. Whichever method is used the result should look something like this.

The handles on the ellipse can now be used to modify the shape of the object. Position the pointer over any of the handles and use the mouse **Adjust** button to drag the handle to a new location.

The shape of any Draw object may be modified in this way and the result may look something like the fourth image on the right.

Style	
Line width	▶
Line colour	▶
Fill colour	▶
Line Pattern	▶
Join	▶
Start cap	▶
End cap	▶
Winding rule	▶

There are many other ways in which Draw objects may be modified. The Style menu shown here is accessed from the main Studio24Pro menu and leads to many further ways of modifying the object.

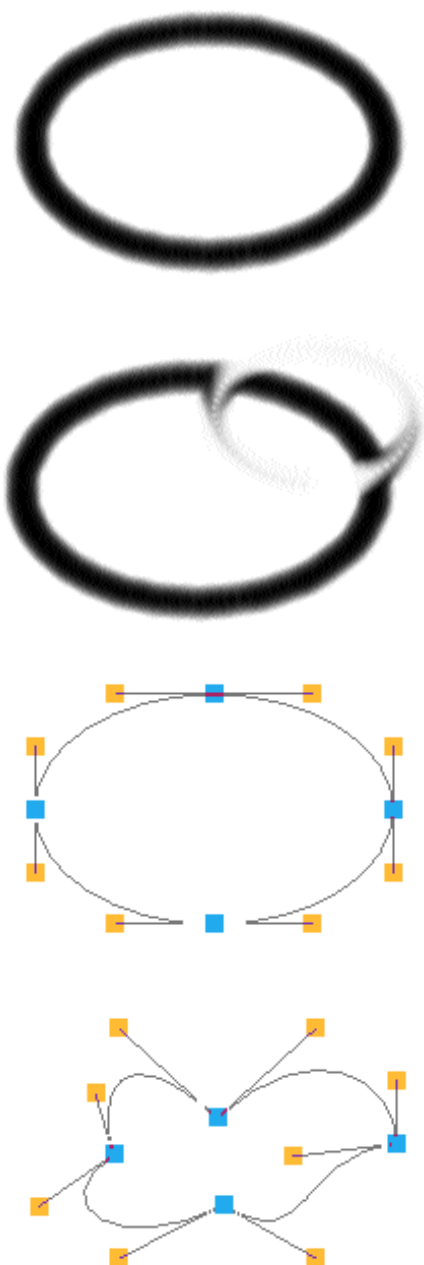
The line width of the object may be set to any required value using the first option. The line colour option will lead to a colour window allowing the line colour to be set, and the fill colour can be set in a similar way using the fill colour setting. Line patterns may be chosen from the next sub-menu.

The final four options are unlikely to be used very frequently. Join, Start Cap and End Cap control the appearance at joins and at the ends of thick lines.

Join provides the options of mitred, round and bevelled, and controls the appearance of angled joins in lines.

Start Cap and End Cap determine the appearance of the ends of lines (and segments of dashed lines). The options are for butt, round, square and triangle. The triangle option is probably the most useful one as it allows arrow heads to be placed at the ends of lines.

The final option is the 'winding rule'. This is probably very rarely used. It controls the way in which overlapping



object paths are filled. For a full explanation of this feature see the Risc OS 3 User Guide.

There are a number of important things to remember about selectable objects.

There is no limit to the number of objects which are placed on the Draw clipboard, but they will only be visible when the Draw tool is selected.

The objects may be placed on the border around the edge of the canvas until required.

More than one object may be selected and manipulated at the same time. Use the Adjust mouse button to select objects if more than one is required. When multiple objects are selected they will all move, scale and rotate together.

Using Draw files as Cutouts

Another useful application for Draw objects is to use the outline to cutout areas of canvas.

Position the object over the area which is to be cut and use the menu option **Select/Cutout**. The toolbar will automatically change to select the cutout tool and the cutout area of canvas will be placed on the cutout clipboard.

The manipulation of cutouts is fully described in Chapter 6.

15 - Saving Images

Default File Type

Studio24Pro images may be saved in a number of different formats.

The default file type is the TIFF format, although this default may be changed to any of the available formats. (See customising Studio24Pro).

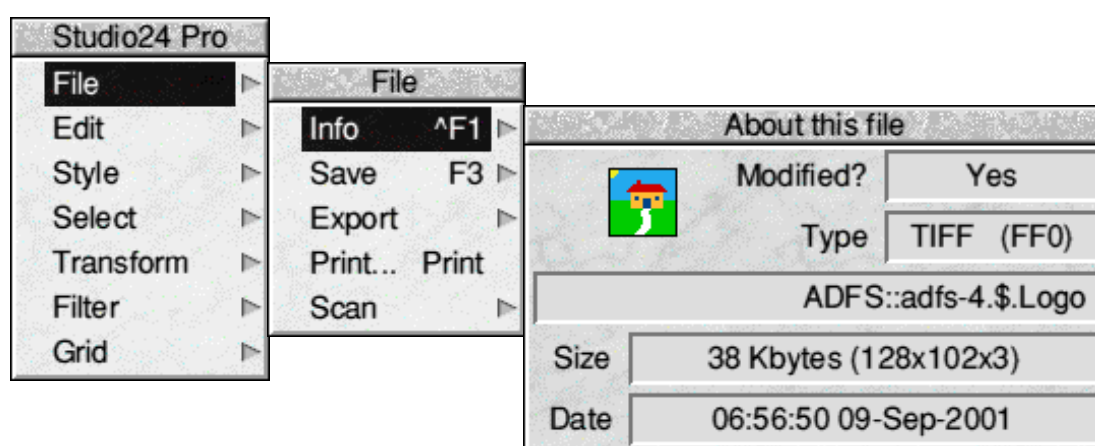
The TIFF format has the advantage that multiple Alpha channels may be stored with the main image in a single file. This means that a complete work session may be saved for later use, which is often essential for complex images. It is possible to save a single alpha channel with the main image if the file is saved as a 32 bit Sprite, where the spare 8 bits will be used for the first alpha channel. All other formats will only save the main image channels.

However, the TIFF format including alpha channels, may not be compatible with other applications. If you need to save in a TIFF format which is fully compatible with other applications, then you should remove any alpha channels from the image before saving.

Info Window

Before saving a file it is sometimes useful to know how much disc space will be used, and this information can be obtained from the file 'Info Window'. This is accessed from the main Studio24Pro menu under the heading of 'File' which also provides access to other file saving options.

The main and file sub-menus are shown below.



The Info Window is the first option on the file menu. The icon at the top left shows the current file type and the box at the top right indicates whether it has been modified.

The next box shows the full pathname of the file location. This is the location from which the file was loaded into Studio24Pro, or the location where it has already been saved. If it is a newly created canvas which has not yet been saved then this window will contain the words <Untitled>.

The next box contains details of the file size in kilobytes with information in brackets detailing the horizontal and vertical size of the image and number of channels.

Finally, the bottom box gives the current time and date.

Saving the Default File Type

The next option on the file menu is simply 'Save'. This leads to a standard save window, and also shows that the **F3** key can be used as a keyboard shortcut for file saving. This is standard throughout RISC OS applications. This option will save the image in the default file type. This is normally as a TIFF file, but the default file type can be changed as described in 'Customising Studio24Pro'.

Exporting in other formats

The next option is 'Export'. This leads to a new menu which allows the file to be saved in many other file formats.



The TIFF format has already been described at the start of this chapter and is generally used when multiple alpha channels are to be saved at the same time as the main image.



The 'Clear' format is a standard uncompressed format which is quite popular with other Acorn applications. It will save the image in 24 bits, or in 'Indexed' format, but not in CMYK.



The 1, 2, 4, and 8 bit Sprite options which are greyed out in the above menu will only be available for saving 'Indexed' images. These are images which are created in 256 (or less) colour modes. If you have created an image in RGB or CMYK mode and wish to save it as an 8 bit Sprite then it is still possible to do this. Simply convert the image from its current format into Indexed mode using the channels window menu option.

The 16 and 32 bit Sprite options will be available for images created in RGB or CMYK modes. The 32 bit Sprite mode will allow the saving of one alpha channel in the spare 8 bits. This will be the first alpha channel created.

The 256 Greys Sprite is available for any format image. It will save the image in a monochrome format with a 256 level grey palette.



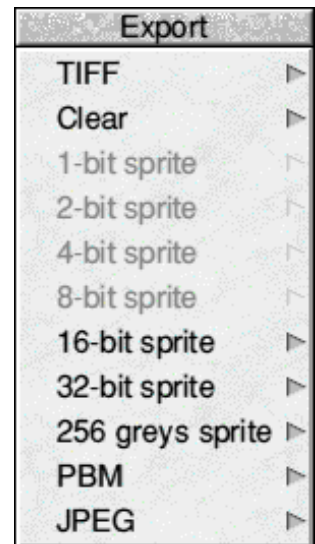
The PBM file format is useful as a way of saving images which may then be transferred to PC applications. It can only be used for 24 bit images.



The JPEG format is extremely popular for saving large images in a highly compressed format which greatly reduces the file size. The amount of compression is adjustable in the 'Choices' options. This format is capable of very large amounts of compression and is particularly useful where large images need to be put onto floppy discs.

There is a small loss of image quality although this is generally only noticeable with very large amounts of compression. However, because of this loss of quality, which will apply every time the image is Saved, JPEG format should not be used if you intend to re-load and edit the image at a later date.

As the compression takes place during the saving process it is not possible to predict the file size in the 'Info' window.



Saving Channels and Selections

As well as saving the complete Studio24Pro image there are a number of other save options which save just parts of the complete image.

It is possible to save any individual channel of an image. This includes individual colour channels as well as any alpha channel. To save a channel, click Menu over the required channel on the channels window, and access the Export option which is the last choice on the menu. The ability to save the channel as a Sprite, Clear or TIFF file is available.

It is also possible to save any 'selectable object' from any of the Studio24Pro clipboards. After the object has been selected, click Menu over the main canvas and choose the **Select/Save** option. Bitmap objects will be saved as TIFF files. Text objects will be saved as Text files, and Draw objects will be saved as Draw files.

When an object is 'cutout' and placed on the bitmap clipboard, it will be saved as a TIFF file. However, if the 'Edit' option is used for this object, it will be put into a completely new Studio24Pro canvas and from there any of the Export options will be available.

16 - Loading Images

Loading Bitmap Images

Studio24Pro can import existing images in many ways. Images which were created by the program as standard TIFF files can be loaded simply by double clicking on their file icon in the usual way. This is usually the most convenient way of saving and loading files which are being worked on over a period of time, simply because any alpha channels being used are saved and re-loaded automatically.

If you have any other applications on your computer which use TIFF files, then you may need to drag the file icon over the Studio24Pro icon on the icon bar to ensure that it is Studio24Pro which loads the image.

The same procedure applies with all other file types recognised by Studio24Pro. Normally, double clicking on the file icon will load the image, but if this causes the file to load into some other application, then simply drag the file icon to Studio24Pro on the icon bar.

The exceptions to this are Sprite files. These are deliberately not directed to Studio24Pro, and if you need to load a Sprite file as the main image then it will need to be dragged to Studio24Pro on the icon bar. If you drag a Sprite file which contains multiple sprite images then only the first sprite will be loaded.

Note that the type of canvas created by Studio24Pro will depend on the type of image being loaded. For example if an 8 bit Sprite file is loaded, Studio24Pro will generate an 'Indexed' image. It may then be necessary to convert this into an RGB image using the Menu option from the channels window if you want to work in full 24 bit colour mode. It is important to realise that the Studio24Pro editing capabilities may be severely limited if you try to edit colour images in 'Indexed' mode.

Merging Bitmap Images

As well as loading bitmap images to make them the main canvas it is possible to add bitmap images to an existing canvas and create a 'collage' of mixed images. This is done by dragging the file icon over the main Studio24Pro canvas. The 'scissors' or cutout tool will automatically be selected and the bitmap image will be placed on the clipboard where it may be moved, scaled and rotated until such time as it is ready to be transferred to the main canvas.

Any number of bitmap images may be dragged to the clipboard in this way and left there to be manipulated before being transferred down. This process is fully described in Chapter 6 - Cut and Paste.

Merging Draw Files

Draw files may be loaded in a similar way to bitmap images. Simply drag the Draw file to the main Studio24Pro canvas. The Draw tool will be selected automatically and the image placed on the Draw clipboard. It may then be moved, scaled and rotated (or edited) before being transferred to the main canvas. See Chapter 13 for a full explanation of Draw file handling.

PhotoCD Images

This type of image may be treated exactly like any other bitmap image.

To use a PhotoCD image as the main canvas simply drag the file icon over the Studio24Pro icon on the icon bar. This will generate a new canvas with the correct dimensions and type for the PhotoCD image which is being loaded.

PhotoCDs may also be merged with an existing canvas simply by dragging their file icon over the main canvas. The image may then be moved, scaled and rotated before being transferred to the main canvas in the normal way.

The PhotoCD resolution and colour type are set in the Choices menu which is accessed by clicking the mouse Menu button over the Studio24Pro icon on the icon bar. This procedure is fully explained in Chapter 17 - The Choices Menu.

Using Colour Scanners

Studio24Pro provides direct support for any colour scanner providing a Twain driver is installed for that scanner.

The scanning options can be accessed either from the Studio24Pro icon bar menu or directly from the Studio24Pro toolbar.

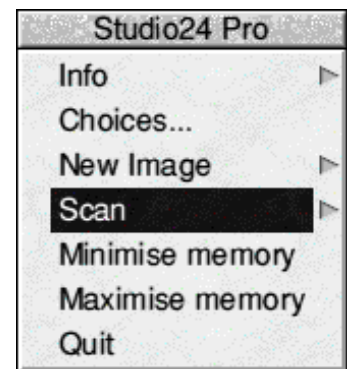
Click the mouse **Menu** button over the Studio24Pro icon on the icon bar and a menu will be displayed as shown here.

The 'Scan' option leads to two choices, 'Select Source' and 'Acquire'. The Acquire option is also available from the main toolbar although it is generally more convenient to use it from here for the initial preview scan. The Select Source option may need setting up if this is the first time the scanner has been used.

The Select Source option will lead to a window which allows you to set the type of scanner that you are currently using.

Click on **OK** to exit this window once you have chosen the correct scanner type.

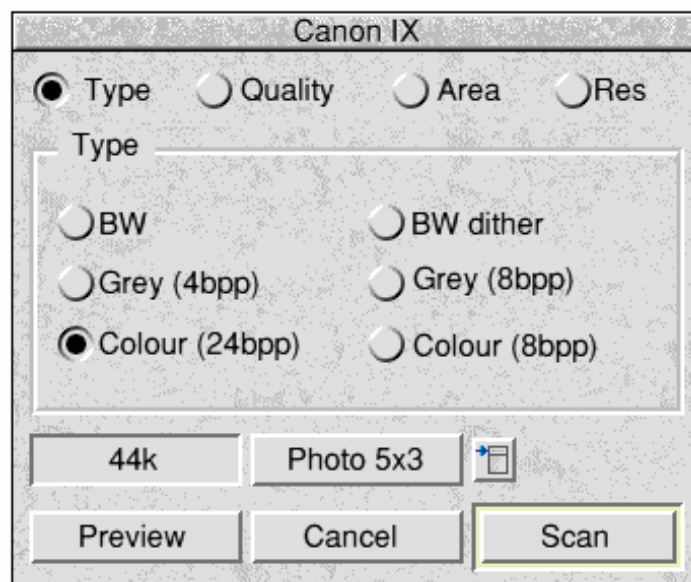
Now click on the Studio24Pro icon and generate a new Studio24Pro canvas. The size of the canvas will be unimportant as the final size will be determined by the size of the scan.



Select the Scan tool shown here from the toolbar and display the additional info bar which has two options available, shown here on the right.



There may be another option which requires setting if the scanner has not been used before and this is to set whether the scanner is connected to a SCSI card or the parallel port. If it is connected to a SCSI card then the SCSI ID number will also require setting.



Click the right hand option on the additional info bar (the downward pointing arrow) and the main scan window shown will appear.

Now click Menu over this scan window and the 'Device' option will lead to a new menu which allows the SCSI ID number to be set. If the scanner is connected to the parallel port, this should be selected instead.

The 'Select Source' and 'Device' settings will only need to be set once as they will be stored and remembered the next time the software is used.

If you have never used a scanner before then the usual procedure is to perform a 'Preview' scan which is a very rough black and white scan of the whole A4 page. This uses the minimum amount of memory and allows you to view the image well enough to choose which area you wish to scan in full colour.

It is important to realise that to scan a full A4 sheet in 24 bit colour at 600 x 600 dpi would generate a file size of around 87 Mb! For this reason it is best to only scan the required area, and not use a higher resolution than absolutely necessary.

Click on Preview and the scanner should start to operate. When the scan has finished a coarse black and white image should appear on the Studio24Pro canvas. (Note that you could also perform an 8 bit grey scan as a preview to provide a more viewable image).

Now click on the left hand tool on the additional info bar which allows selection of the area to be scanned.

Place the pointer at one corner of the required area and drag out a box of the required size. This may be modified by dragging the small handles around the edge of the selected area.

Now click on the right hand tool again to show the main scan window. The four radio buttons at the top of this window allow selection of 'Type', 'Quality', 'Area' and 'Resolution'.

'Type' allows the choice of different types of scan to be chosen. Various black and white modes will be available, and possibly different colour modes (depending on the type of scanner being used).

'Quality' allows setting of the Brightness and 'Contrast' of the scan. Although Studio24Pro can adjust these settings later using filters and effects, it is best to use these settings to get the best possible scan quality.

'Area' is only rarely used as it is much more convenient to drag out the required area as described previously.

Finally, 'Resolution' allows the horizontal and vertical scan resolutions to be set. This will have a significant effect on scan time and file size, so use the minimum consistent with the required image quality.

Now click on 'Scan' to start the main scan. When the scan is finished the Studio24Pro canvas will be adjusted to the size of scan and the type of canvas will reflect which type of scan was requested. For instance, a monochrome scan will generate an 'Indexed' canvas, and a 24 bit colour scan will generate an RGB image etc.

A scanned image can also be merged with an existing canvas.

In this case a second canvas should be created for the scanned image, and when the image has been scanned, it can be merged with the main canvas by dragging its 'Save' icon over the main canvas. This is then treated in exactly the same way as any other bitmap image which is being merged with a Studio24Pro canvas.

17 - Printing

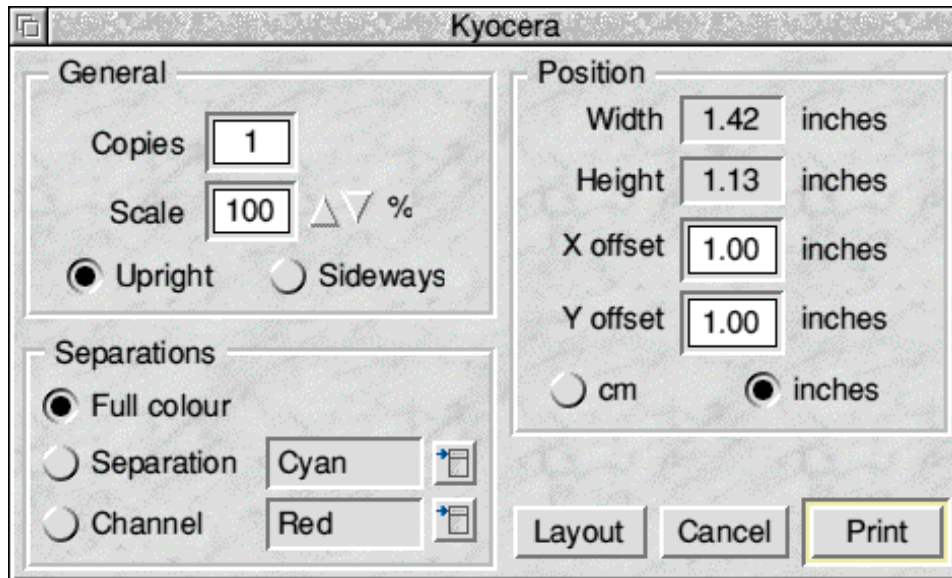
Studio24Pro has a number of printing options which are available from the main print window.

Facilities include scaling and rotation of the printout, together with a facility for viewing the paper, and placing the image in the required position on the paper before printing.

It is also possible to print any of the RGB or CMYK channels independently.

The Printing Window

The print window is most conveniently accessed from the main toolbar using the print icon shown. It can also be accessed from the Studio24Pro main menu using the **File/Print...** option.



The window title bar shows the type of printer driver which is currently active. If there is no printer driver loaded then this will be replaced with <Unknown printer>.

The general options at the top left allow the number of copies and the scale to be set. Both may be set by typing new values in the writable boxes, and the scale may also be set using the adjuster arrows.

The position settings at the top right of the window may be displayed in either cms or inches by clicking on the appropriate radio button. The horizontal and vertical position of the print can be set by typing in the writable boxes for X and Y offset. The width and height boxes are merely indications which will change as the scale values are altered.

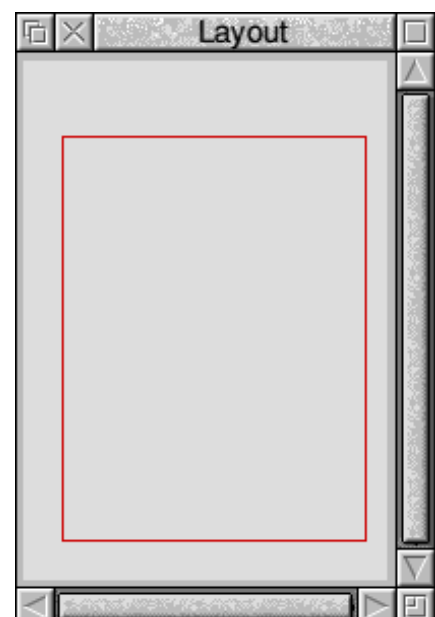
The easiest way to set the scale and the offsets is by displaying the 'Layout' as show here.

The red rectangle represents the size and position of the final print, and the pale grey area the printable area of the paper. The print position may be changed by 'dragging' the rectangle with the Select button and the size changed by clicking on the scale adjuster arrows.

Changing the orientation of the print using the radio buttons for 'upright' or 'sideways' will also be apparent on the layout window.

The 'Separations' option allows the choice of which channels are actually printed. Full colour will print the complete image in colour (if a colour printer is being used).

'Separation' allows any of the CMYK channels to be printed if the canvas is in this mode, and 'Channel' allows any of the RGB channels to be printed if the canvas is in RGB mode.

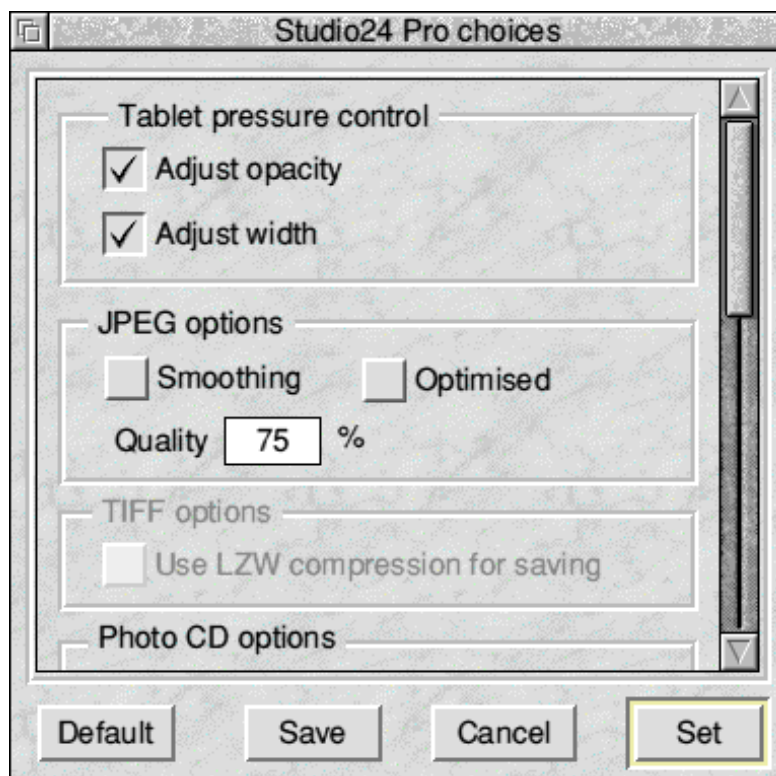


18 - The Choices Window

The function of the choices window is to allow the user to set up various options which do not require frequent changes.

Most of the settings enable the user to set options to their personal preference, and these settings can be saved by Studio24Pro so that every time the program is used, the settings will remain the same.

Selecting 'Choices' from the Studio24Pro icon bar menu open the main choices window.



The first option at the bottom of the window allows the default settings to be restored at any time. The next option is used to save the settings so that the next time Studio24Pro is loaded it will apply the current settings. The next option removes the window without any action being taken, and the final option puts the changes into effect without saving them permanently.

The window has a vertical slider which allows access to more options than are currently displayed.

Graphics Tablet Settings

The first settings are for a graphics tablet. If a pressure sensitive tablet is being used it can be set to adjust either the opacity or width (or both) of the brush stroke, depending on the amount of pressure being used.

JPEG Options

There are three options which can be used to control the quality and compression ratio of JPEG file loading and saving.

'Quality' is a writable box which controls the amount of compression used during file saving. A setting of 0 is for maximum compression and 100 for minimum compression. Note that a setting of 100 will probably produce a file that is much larger than the original. Normally values between 50 and 95 would be used. The default value of 75 provides a good compromise between amount of compression and quality. If defects are seen when the image is re-loaded, then try slightly higher values until the quality of the image is satisfactory.

'Optimisation' will produce a slightly smaller file but the process will take somewhat longer.

'Smoothing' is used during loading of a JPEG file. It is only useful for images which have been saved at very low quality. At normal quality settings switching smoothing on may make the image worse.

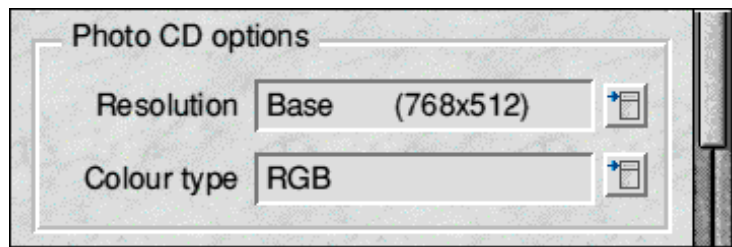
TIFF Options

The TIFF option allows LZW compression to be used if required during saving of the image.

PhotoCD options

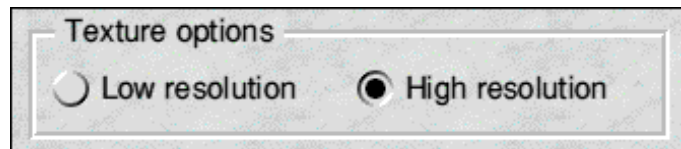
Two options can be set which control the loading of PhotoCD images. The resolution setting leads to a menu allowing resolutions from Base/64 up to 16xBase. Higher resolution settings can take some time to load!

Colour type can be set to either Grey or RGB.



Texture Options

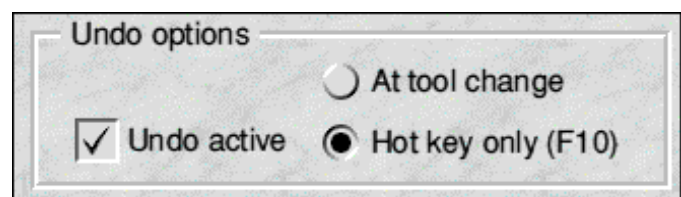
The texture generator can be set to either high or low resolution using this.



Undo Memory Settings

Undo is switched on by default but may be switched off if required. This will reduce memory requirements and slightly speed up some operations

The undo memory needs to be reset at times during painting operations and by default this is only done by pressing the F10 key. By clicking the 'At tool change' radio button, the undo memory will be reset every time a new tool is used, as well as by using the F10 key. See Chapter 12 for more information about the undo feature.

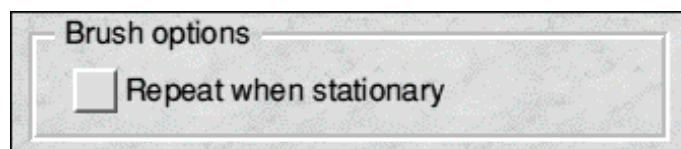


Cut and Paste Options

Cut and Paste operations can be set to have smoothing which will help remove any 'jagged' edges at the expense of taking somewhat longer.

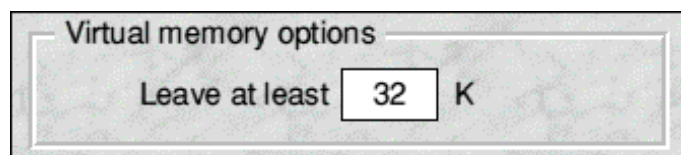
Brush Options

The 'repeat when stationary' brush option controls what happens when the airbrush is stationary but Select is still pressed. The default option is that this situation will not cause paint to be continuously applied over the same spot. However, if the option is switched on then paint will continue spraying even when the airbrush is stationary. The difference between these settings is most obvious at low opacity settings.



Virtual Memory Settings

Virtual Memory allows images to be edited which are much larger than the available RAM or main memory. When the RAM is used up, information is temporarily stored in the harddisc !Scrap directory. The penalty for this is that access speed to the hard disc is much slower than when using RAM.



If you are editing a large image which requires more memory than is available in RAM you may still need to load other applications onto the icon bar. This is the purpose of the 'Leave at least' setting. Whatever value is entered here is always left free by Studio24Pro. This means that virtual memory is used when available RAM is reduced to the set value

There are two other items on the Choices menu which control the virtual memory. These are 'Minimise' and 'Maximise' memory. Clicking on either of these items will have an immediate effect.

Minimise memory will make Studio24Pro use the bare minimum of RAM. This leaves the maximum amount of memory for other programs but will greatly reduce the speed of operation of Studio24Pro.

Maximise memory will have the reverse effect. Studio24Pro will use the maximum amount of RAM available to the exclusion of other programs.

Another way of controlling virtual memory is to drag the Studio24Pro memory slider in the Task Manager window. This allows a finer control of the relative amounts of RAM and disc memory used by Studio24Pro.

Customising Studio24Pro

The Choices window is the main way of setting up Studio24Pro to your personal requirements. However, the features provided in this window may not include all the things you wish to be able to set. Other items may be customised by directly altering the text file inside the !Std24_Pro application directory. This file stores all the information saved by the Choices window, together with many other items which determine the way in which Studio24Pro operates.

To view this file double click on the !Std24_Pro file icon while holding down the Shift key. One of the files displayed will be a Text file called 'Choices'. Drag this file icon onto !Edit to view its contents. Many items will be familiar as being those set by the Choices window. Some will be unfamiliar and the more useful ones are listed here.

Warning - Altering this file may cause problems with Studio24Pro if you enter invalid parameters. You are strongly advised to keep a copy of the original before making any changes so you can restore the old version if you experience any problems.

VM_Use: 1

The Choices window allows you to set the minimum amount of memory that Studio24Pro will always leave available for other applications to use. This option allows you to turn off the Virtual Memory completely. However, this action will prevent some operations working and should generally not be altered.

Border_Colour: 85 170 170

This allows the colour of the Studio24Pro border to be set to your requirements. The values are in the order Red, Green, Blue. Change these settings to anything in the range 0 - 255 to set the border colour.

Alpha_Colour: 255 0 0

Sets the default colour of Alpha channels. The values are for Red, Green and Blue. Note that the colour of alpha channels may be set individually from the channels window. This setting just sets their initial colour.

Alpha_Opacity: 50

Sets the opacity of Alpha channels. This does not affect the way the channel uses its masks, it merely sets the way that the channel is viewed on screen.

Default_FileType: 0

This sets the file type which is used for all the default saving of Studio24Pro files. For instance, the file type used when F3 is pressed. The file types and their corresponding numbers are listed here:

0 - TIFF	1 - Clear	2 - 1 bit Sprite	3 - 2 bit Sprite
4 - 4 bit Sprite	5 - 8 bit Sprite	6 - 16 bit Sprite	7 - 32 bit Sprite
8 - 256 Greys Sprite	9 - PBM	10 - JPEG	

Default_ImageType: -1 Default_ImageWidth: -1 Default_ImageHeight: -1
Default_ImageDPI: -1

These allow the size and type of any new images which are created to be given default values. A setting of -1 will use the standard defaults which will depend on the screen mode which is currently active.

TurboDriver_Enhanced: 0

A setting of 0 allows the standard RISC OS colour conversion to be used when printing with Turbo driver software.

If set to 1 then printing with turbo drivers will use the colour conversion tables. Note that this may give strange results if the colour tables are incorrectly set.

19 - Hotkeys

	F1	Show grid
	F3	Save
	F4	Pickup colour
	F8	Undo
	F10	Reset Undo
	F11	Zoom in
SHIFT	F1	Lock grid
SHIFT	F11	Zoom out
CTRL	F2	Close image
CTRL	F1	File Info
PRINT		Print...
RETURN		Close freehand cutout
SHIFT		Move relative position in clonebrush
-		Select a smaller brush
+		Select a larger brush
Left Arrow		Move pointer left
Up Arrow		Move pointer up
Down Arrow		Move pointer down
Right Arrow		Move pointer right
CTRL	A	Select All
CTRL	Z	Clear
CTRL	X	Cut
CTRL	C	Copy
CTRL	V	Paste
CTRL	E	Edit
CTRL	T	Transfer
CTRL	R	Rotate...
CTRL	S	Scale... (snap to grid in draw mode)
CTRL	W	Warp...
SHIFT		Straight brush stroke
CTRL		Undo brush (in any brush mode)

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Here are just a few of the other products you will be able to
download from RISCOS.com free of charge
(You can make a donation to help support future product releases but this is entirely voluntary)



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Other Products list last updated 29/2/26