OpalVision

OpalPaint
Painting and Image Processing

Opal Presents!
Presentation and Multimedia

OpalAnimMATE
24-Bit Animation Playback

Opal Hotkey
Image Display Utility

Reference Manual

opalvision reference

OpalPaint
Opal Presents!
Opal Hotkey
OpalAnimMATE
Opal Utilities

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DEDICATION

This manual is dedicated to my wife Sharon and my little man Lachlan. We would all rather see more of each other, but I thank them for understanding the demands of a dream job like OpalVision.

Rob Roy, 1993.

CREDITS

This manual was written by Robert Roy with the assistance of the OpalVision Development and Production team listed on page 2 of the Getting Started Manual.

THE FINE PRINT

TABLE OF CONTENTS

A full Table of Contents for each of the sections can be found at the beginning of that section.

CONVENTIONS USED IN THIS MANUAL

The reference manual and tutorials use the following conventions.

- A dot will indicate each step in a sequence of instructions.

❖ This symbol will indicate a point in a list of options or things you can do.

type this Any text that you have to type from the keyboard will be shown in this typeface.

Enter This refers to the Enter key on the keyboard, sometimes called the Return key. Some keyboards show this key as ↵

Keyboard Shortcuts Most OpalPaint features can be accessed using keyboard shortcuts. Once you are familiar with these keys, it is possible to work much more quickly. For example, typing the capital letter R activates the Filled Rectangle drawing tool, just as if you had clicked on the Filled Rectangle button on the Main Menu Bar. Note that all keyboard shortcuts *are* case sensitive, so when you see a Capital Letter like S for Show Page, you need to hold down the Shift key as you type the letter. Other shortcuts require the Amiga, Alt or Control key to be used in conjunction with the letter key (see below).

Many experienced users find that they can work faster by holding the mouse or tablet stylus in their right hand and selecting keyboard shortcuts with their left, (or visa versa if you are left handed). If you are a computer artist familiar with the popular *Deluxe Paint*™ series of software from Electronic Arts, you will be pleased to know that where possible OpalPaint uses the same keyboard shortcuts.

Amiga When used in conjunction with another key, i.e. Amiga-v, this refers to the Amiga keys marked with a large *A* and located at each end of the space-bar. To use, press *either* of the Amiga keys and hold it down while typing the other key. Unlike other Amiga programs, OpalPaint doesn't mind whether you use the left or right Amiga key.

Ctrl This refers to the Control key marked Ctrl on some keyboards and is always used with another key. It is used by pressing the Ctrl key and holding it down while typing the other key.

Alt This refers to the Alt key on the keyboard and is always used with another key. It is used by pressing the Alt key and holding it down while typing the other key.

The Mouse   In this manual we will often use references to using the mouse buttons.

To CLICK on a menu button or the screen means to position the mouse pointer over the appropriate menu button or screen position, then press and quickly release the appropriate mouse button. If neither the Left nor Right Mouse Button is specified, you can always assume the Left Mouse Button is to be used.

To DOUBLE-CLICK is similar to CLICK, except you need to press and quickly release the appropriate mouse button *twice*. Double-Clicking is used in two ways; when selecting a menu button it is the equivalent of a single click on the desired button followed by a click on the OK button of the Menu and when the Left Mouse Button is Double-Clicked on a Main Menu Bar button it is the equivalent of a single click of the Right Mouse Button. This is so if you are using a graphics-tablets, which generally have only one button, you can still access option menus such as the Cutout Brush Manipulation Menu.

To DRAG means to hold down the appropriate mouse button while moving the mouse, unless otherwise indicated. To complete the operation release the mouse button.

Menus   Menus pop up when OpalPaint needs information from you to carry out a procedure. They often contain buttons to select options, text boxes where you can type in a number, name or other information, scroll boxes so you can move through a long list of items or image thumbnails that represent images, brushes or palettes.

Most menus have two buttons in common, marked "OK" and "CANCEL". The OK button tells OpalPaint to accept whatever options you have entered and use them. The CANCEL button, on the other hand, is a way of leaving the Menu without changing anything. If you have changed any options in the Menu these changes will be ignored. The Return key is a shortcut for the OK button while the Esc key is a shortcut for the CANCEL button. Other shortcut keys are "o" and "y" for the OK button and "c", "q" or "n" for the CANCEL button. (Shortcuts for **o**k, **y**es, **c**ancel, **q**uit and **n**o respectively).

Many menus can be repositioned by positioning the pointer close to the top edge, holding down the Left Mouse Button and dragging the menu to the new desired position. Note that menus containing 24-bit colour windows (such as the colour-stencil menu) cannot be repositioned.

OpalPaint

OpalPaint Overview

SCREEN LAYOUT

The main OpalPaint screen looks like this:
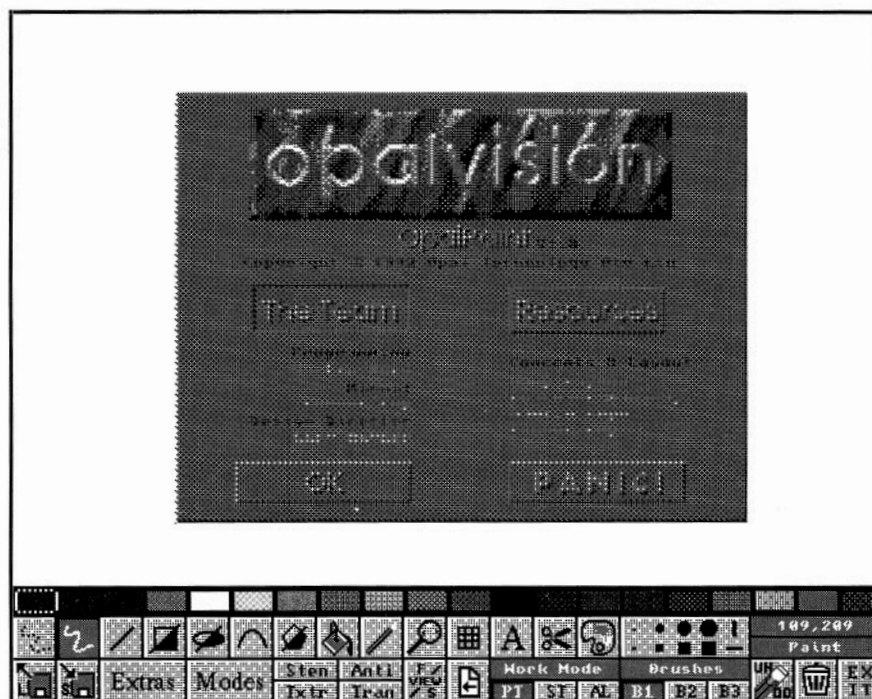
The menu bar at the bottom of the screen is called the Main Menu Bar. It provides access to the various Drawing Tools, Palette, file menus and other controls. The row of coloured boxes immediately above the Main Menu Bar is the working palette, called Paint-Pots in this documentation.

The blue area at the right-hand end of the Main Menu Bar's top row is the Feedback Area that provides information about the current options.

When the pointer is over any button on the Main Menu Bar, the top Feedback line gives a short reminder of the function of that button while the bottom line shows the equivalent keyboard shortcut for that button.

When the pointer is in the drawing area, the top Feedback line shows the current pointer coordinates and the bottom Feedback line shows the Drawing Mode being used. When "rubber-banding", such as when drawing a line, dragging a rectangle or ellipse, or drawing a polygon, the pointer coordinates are shown *relative* to the starting point of the operation (i.e. the first point clicked). At all other times the coordinates are *absolute* with reference to the top left-hand corner of the image. (Note: the image, not the screen. The screen can be scrolled around and zoomed over the image).

Menu Bar Buttons

Almost all buttons on the Menu Bars have two functions accessed by clicking the button with either the Left Mouse Button or Right Mouse Button. In general, if you click a Menu Button using the *Left* Mouse Button it will select that option for use, whereas if you click a Menu Button using the *Right* Mouse Button you will be presented with any appropriate option menu to customise that function. In summary, Left to select, Right to change options.

In addition several buttons have a diagonal stroke across them. This indicates that the button can be used to select or customise two separate but related options. For example, the top-left half of the Rectangle Drawing Tool button will select the Outline form of the Tool, while the lower-right half of the same button will select the Filled form of the Tool.

Other special buttons on the Main Menu Bar are the

Trashcan (Clear Screen)

The Trashcan is to clear the screen to a solid colour. To clear the screen to black,

Keyboard

K

- Click the Trashcan button using the Left Mouse Button, or hit the "K" keyboard shortcut.

To clear the screen to a Paint-Pot colour,

- First select a Paint-Pot containing the new screen colour by clicking on that Paint-Pot using the Left Mouse Button.

- Click the Trashcan button using the Right Mouse Button.

To "fix" the current image contents so that clicking on the Trashcan icon will clear the screen back to the fixed image rather than black or a solid colour,

- Hit the Amiga-b key.

To release the fixed background,

- Hit the Amiga-B key. (Note, capital B)

Undo

Keyboard

u

The OpalPaint Undo feature allows you to reverse the last changes you made to the image. Each time the Left Mouse Button is used to modify or add to the image, OpalPaint saves the changes in a temporary "undo buffer" so that the changes can be reversed. To completely reverse these changes,

- Click the Undo button on the Main Menu Bar button, or hit the "u" keyboard shortcut

The undo buffer holds all operations between the last time you clicked down on the Left Mouse Button and the present. Note that if you do any of the following operations the undo buffer will be lost:

❖ Scroll the screen over the image (see below).

❖ Switch to or from Magnify mode, or change the Magnify Zoom level.

❖ Enter any menu that has 24-bit colour window(s), such as the File Menu, the Area Fill Options Menu, the Texture Pattern Menu, etc. This applies whether or not the menu is displaying 24-bit colour at the time (eg the Area Fill Options Menu with the Solid fill type selected will still trash the undo buffer).

These restrictions are there so that OpalPaint can manage your Amiga's precious memory properly. They are almost never a problem if you keep them in mind when planning each step of your painting.

OpalPaint has another feature called Dynamic Undo that allows localised portions of the changed image to be restored to the appearance they had before the last use of the Left Mouse Button. This is accessed by using the Right Mouse Button in conjunction with any Drawing Tool and Brush. See the "When Using the Tool" section on page 23 for further information on the Dynamic Undo feature.

SCREEN SCROLLING

The drawing area extends from the top of the Main Menu Bar to the top of the screen and its dimensions or resolution is set up in the Page Options menu. For example, it can be low-res or high-res horizontally and interlaced or non-interlaced vertically. It can also include the overscan area so that the full screen is filled when painting for video. Note however that the actual size of the image in picture elements (pixels) is independent of this display resolution and is limited only by available RAM memory or hard drive space if using virtual memory.

The painting area acts as a window on the image being edited. If the image is larger than the painting area,

- use the arrow keys on the Amiga keyboard to move the painting area around on the image.

For example, if the image is wider horizontally than the painting area then use the Right Arrow key (⇨) to move to the right. Note that this effectively shifts the image to the left to reveal detail on the right edge.

To move in larger jumps

- Hold the Shift key down when pressing the appropriate arrow keys.

To move the image as far as it will go in a particular direction,

- Hold the Alt key down when pressing the appropriate arrow key.

To centre the image (as much as possible) around the pointer,

- press the "n" key.

This shortcut is especially useful in magnify mode to quickly move over an image by holding the pointer near the edge of the screen and repeatedly pressing the "n" key. The image will scroll in the direction of the pointer, even if the movement is on a diagonal.

To centre the image horizontally,

- press the "N" key.

To hide the Main Menu Bar so you can use the full screen for painting,

- Hit the F10 function key at the top of your keyboard. Hit F10 again to make it reappear. Alternatively, click the centre button if you have a three-button mouse.

If the host Amiga has limited Chip RAM, as on most Amiga 2000s, the Main Menu Bar may float a little up the screen. (Chip RAM is the memory able to be accessed by the special Graphics Co-Processors in your Amiga and varies depending on the model you own.) This is because OpalPaint, like most Amiga paint programs, requires Chip RAM for all editing operations. However, to view images full screen, even if you have very limited Chip RAM,

- Click the upper-left half of the View button on the Main Menu Bar that shows a diagonal slash with F (**F**ull) and S (**S**cale), or hold the Amiga key while hitting the "v" key.

This key will quickly show the image using the current display resolution, including image overscan if it exists. You can use the scrolling keys described above to move around if the image is larger than the display screen.

If you wish to shrink a large (super-bit-map) image to fit on the screen,

- Click the lower-right half of the View button on the Main Menu Bar, or Hit the "S" key. (Yes, the "S" needs to be in caps. All OpalPaint keyboard shortcuts are case [shift-key] sensitive). This scaling may take a little time, but the progress will show in the Feedback area on the right of the Main Menu Bar and you can interrupt the scaling at any time by hitting the Space bar or Escape key (see next section).

INTERRUPTION KEYS

Some useful keys for interrupting image modification are listed below

- ❖ The space-bar will interrupt the current painting or image modification operation and automatically undo the changes made up to that point.

- ❖ The Escape key (marked Esc on most keyboards) will interrupt the current painting or image modification operation but will leave intact those changes already completed before hitting the key. It also acts like the "Cancel" button when using menus.

THE HELP KEY AND PANIC BUTTON

OpalPaint has a powerful context-sensitive hypertext reference manual based on the Amiga standard AmigaGuide system. This on-line manual is available at all times, even if you leave this paper-based manual at home.

To show the help information for a particular button or menu,

- Position the pointer over the button or menu for which require help.

- Hit the Help key, located above the arrow keys between the letter keys and the numeric keypad. You can also hit the "?" key. The help screen for that option will then appear. Consult the "Help with Help" button in the On-line Manual for further information about navigating throughout this utility.

As will be described below, OpalPaint can be used at a variety of levels: from very simple to powerful, layered combinations of tools, modes, textures, stencils, transparency and so on. It is almost certain that at some stage you will totally confuse yourself and wonder why nothing (or the wrong thing) seems to happen. That is why OpalPaint has a PANIC Button, which is located on the "About OpalPaint" menu which also shows the names of the OpalVision Team and vital information about the current state of OpalPaint's resources.

To access the "About OpalPaint" menu,

- Hit the Shift and Help Keys, located above the arrow keys between the letter keys and the numeric keypad. You can also hit the "Alt-?" key.

The PANIC button switches off most of the features of OpalPaint such as Transparency, Texture, Stencils, Anti-Aliasing, Area Fills, Cutout Brushes, the grid, magnify etc., and leaves you with a single-pixel nozzle, the Sketch Drawing Tool and Paint Drawing Mode. You can then progressively "switch back on" the various OpalPaint features and observe the effect of each so you can be sure you know how everything is set up.

To switch off all OpalPaint options and return to a very basic starting point,

- Hit the Alt-Help or "Alt-?" key to enter the About OpalPaint menu, then click the "PANIC" button using the Left Mouse Button.

THE OPERATION CHAIN

OpalPaint supplies you the artist with a myriad of tools, brushes, stencils, textures, modes, transparencies and other options. It is useful to develop a good intuitive feeling for the way all these elements interact so that you can quickly and predictably get the exact effect you want.

When you pick painting options and apply some paint, OpalPaint goes through a very predictable sequence of steps to determine the final effect on the image of the operation you have performed. This sequence may be thought of as a chain of operators that take instructions from the operator "above" and then issue instructions to the operators "below" them in the hierarchy. Each operator has its own independent set of options and parameters, so that when combined in different ways you can produce an infinite range of effects.

Figure 1 shows these operators and the relationships between them in a graphical way. The rest of this chapter describes each operator in the chain in more detail. You will notice that this Reference manual groups different aspects of OpalPaint in the same order as shown on the diagram.

Drawing Tools

The *Drawing Tool* is the first operator in the chain. Each drawing tool is one of two types - outline tools that specify a path or outline and filled area tools that specify a solid area on which the underlying operators will act.

Brushes - Nozzles and Cutouts

If the drawing tool is an outline tool such as freehand sketch, outline circle, outline rectangle etc, the next operator is the *Brush*. The word brush is a generic term to describe the object that OpalPaint applies at the point where you click the mouse, or along the path or around the outline that the artist has traced with the drawing tool. This object can be either a shaped "tip" such as a square or circle, called a nozzle, or a cut-out brush that the artist has cut from an image, grabbed from a video image or loaded from a library.

When using an outline drawing tool, OpalPaint moves the brush, whether a nozzle or cut-out, along the path specified by the tool and applies the brush at each point along the path. This movement can be continuous or in steps specified by the artist to produce a dotted effect.

Drawing Tool
Specifies Shape Outline or Area to be affected

Outline Tool
Nozzle or Cutout moves along shape outline specified by tool and repeatedly pastes the brush. Layers below called once for each pixel each time brush is pasted.

Area-Fill Tool
marks out area and layers below are called once for each pixel in specified area

Texture Pattern
From Cutout Brush or Rub-Through Page

Stencil
Area and/or Colour

Drawing Mode

Transparency
Set Global Level if selected,

Draw Pixel
Update colour of a single image point.

Effect on Colour	*Effect on Transparency*
If Cutout Brush - from colours in cutout If Nozzle - from Paint-Pot	If Cutout, - from Cutout Transparency if specified If Nozzle, - some Artist's Tools use partial transparency
If Solid Fill - from Paint-Pot colour If Gradient Fill - from gradient colours If Brush Wrap - from cutout colours	If Gradient Fill - from transparency gradient If Brush Wrap - from cutout transparency
Colours from Texture Map, if used override all previous colours	Transparency from Cutout Brush combines with Transparency Gradient if used.
Colour Stencils work only with existing colours in the image.	
Some Modes ignore colour, eg smooth, blend, contrast, and generate new colour based on existing or surrounding pixel colours. If Colour-Source in Modes Menu s to "Paint-Pot", all previous colour info is discarded and replaced by current paint-pot colour	
	Global Transparency combined wi transparency levels from previous layers to generate final transparency.
New colours replace existing colours using final Transparency level as change ratio.	

The Operation Chain

The Mouse Buttons and Dynamic Undo

The operators used "below" this point depend on which mouse button is used by the artist. If the Left Mouse Button is used to invoke the drawing tool, the tool and brush (if using an outline tool) specify those parts of the image that will be painted, modified or otherwise acted upon by other operators. Each time the Left Mouse Button is used to modify or add to the image, OpalPaint saves the changes in a temporary "undo buffer" so that the changes can be reversed. The changes can be completely reversed using the Undo Main Menu Bar button or the "u" keyboard shortcut. OpalPaint's Dynamic Undo feature allows localised portions of the changed image to be restored to the appearance they had before the last use of the Left Mouse Button. Dynamic Undo is accessed using the Right Mouse Button and allows use of all Drawing Tools and Brushes to selectively "remove" various parts of the changes. It can also be accessed by holding down the Right Alt key (i.e. the Alt key on the Right-hand side of the keyboard) and using the Left Mouse Button or the stylus of a Drawing Tablet.

For example, in a scanned portrait, you may use the filled freehand area tool and the Left Mouse Button to tint the face of the subject. You could then use the freehand sketch drawing tool with a small nozzle and the Right Mouse Button to selectively remove the tint from the eye region and the lips and restore the image in those areas to their original colours.

Pixel Modification Operators

When using the Left Mouse Button, the pixel modification operators are called for each pixel in the area for Area Drawing Tools and for each pixel in each brush paste-down as it moves along the path with outline tools.

Texture Pattern and Rub-Through

The first operator in the pixel modification group is the *Texture Pattern*. If a Texture Pattern is selected, the colour of the Texture Pattern or Rub-Through replaces any colour information from previous operators for each pixel. As shown in the diagram on the previous page, if Texture Pattern is not selected the colour information from the Paint-Pot or the Cutout Brush (with Outline Drawing Tools), or the Solid Paint-Pot colour, Gradient Fill or Wrapped Cutout Brush (with Area Drawing Tools), is unchanged.

Stencil

The *Stencil* operator enables the artist to specify areas or colour ranges on the image that cannot be modified. The Area Stencil acts like a mask so any point on the image will be either free for modification, or fixed and unchangeable.

Area Stencils can be built up or "painted" in Stencil Work Mode using all the built-in Drawing Tools. You can also specify up to six Colour Stencils, each with a centre colour and tolerance range around that colour so that particular colour ranges can be protected from modification.

This stencil operator acts like a switch for each pixel. If the Area Stencil is selected for that particular pixel, or the current colour of the pixel falls within one of the Colour Stencil ranges, OpalPaint will do nothing further for that pixel and continue with the next pixel in the brush or area.

Drawing Mode

The various *Drawing Modes* are where the real powers of OpalPaint become apparent. The Paint Drawing Mode simply applies the colour from the Drawing Tool or Texture operator, but other Modes use this colour information and/or the colour of the existing pixel and those around it to perform such actions and effects as tinting, colourising, smoothing, blending, colour addition, gamma curve correction and many others. Each mode is fully described in this Reference's chapter on Drawing Modes commencing on page 117.

Transparency

The *Transparency* operator, when switched on, acts as a colour mixer and combines the colour information that preceding operators have generated for the pixel with the existing colour of that pixel. The transparency can be globally specified between 0% and 100% for the complete Drawing Tool operation. In addition it can be specified on a pixel by pixel basis with a transparency mask attached to a cutout brush or Texture Pattern and/or by the Transparency Gradient set up in the Area Fill Options Menu. An alpha (transparency) channel "painted" in Alpha Work Mode can also be used as a transparency mask for each pixel. These transparency settings have a cumulative effect, with the final combined transparency level giving the percentage of the original image colour that will remain after being replaced with the new generated colour. See page 195 for a more complete discussion.

Draw Pixel

The *Draw Pixel* operator is the last in the chain. It combines the colour from the New colour information or Mode and uses the final Transparency level to combine it with the existing colour of the pixel. It then writes the new colour information to that point in the image and OpalPaint then moves on to the next pixel in the brush or area.

Using the Mouse Buttons

USE WITH A MENU

In all OpalPaint menus, the Left Mouse Button is used for selecting a menu item without changing any options or defaults, "pushing" menu buttons, moving sliders and selecting from lists.

Most buttons on the Main Menu Bar have an Option Menu that is used to specify different ways of using that tool or option. These Option Menus are accessed by clicking on the button using the Right Mouse Button. For example, clicking on any area drawing tool icon with the Right Mouse Button will open a Menu allowing solid or gradient fill options and if you click the Stencil button on the Main Menu Bar with the Right Mouse Button, an Option Menu will appear so you can set up the various colour and area stencils.

So that OpalPaint can be used with other input devices such as Graphics Tablets that have may only one button, double-clicking with the Left Mouse Button on an icon has the same effect as clicking once using the Right Mouse Button. Further-more, double clicking with the Left Mouse Button on a menu button has the same effect as clicking once on the menu button then clicking on the "OK" button. This is useful, for example, when selecting options from the Modes Menu or choosing an image to load by double-clicking on its picture thumbnail.

WHEN USING THE TOOL

As described in the section on the Operation Chain, the effect of the Drawing tool, Brush and other options on the image depends on the mouse button used by the artist. If the Left Mouse Button is used, the drawing tool and brush (if applicable) specify an area of the image that will be painted, modified or otherwise acted upon by other operators, while the Right Mouse Button is used to invoke the *Dynamic Undo* feature of OpalPaint. Each time the Left Mouse Button is used to modify or add to the image, the changes are saved in a temporary "undo buffer" so that the last change can be reversed. The change can be completely reversed using the Undo button (or the "u" keyboard shortcut), but Dynamic Undo allows particular portions of the change to be removed using drawing tools, brushes and the Right Mouse Button.

Note that if you are using a Graphics Tablet with only one button (the tip), holding down the Right-Alt key while drawing is equivalent to the Right Mouse Button used to invoke the Dynamic Undo feature.

Colour

OVERVIEW OF COLOUR STANDARDS

Many different methods of describing and generating colour have evolved over the years. In order to achieve the best results when using OpalPaint, it is valuable to gain an understanding of how colours within OpalPaint images are selected, modified and stored. Three different colour systems, or methods of describing colour, are used in OpalPaint. They are HSV, RGB and CMYK.

HSV (Hue, Saturation, Value)

This colour system describes colours in terms of their appearance and relationships to other colours. *Hue* distinguishes among colours such as red, green, purple and yellow. *Saturation* refers to how far colour is from a grey of equal intensity. Red is highly saturated while pink is relatively unsaturated; royal blue is highly saturated while sky blue is relatively unsaturated. Another way of thinking about saturation is that as white is added to the pure hue it become
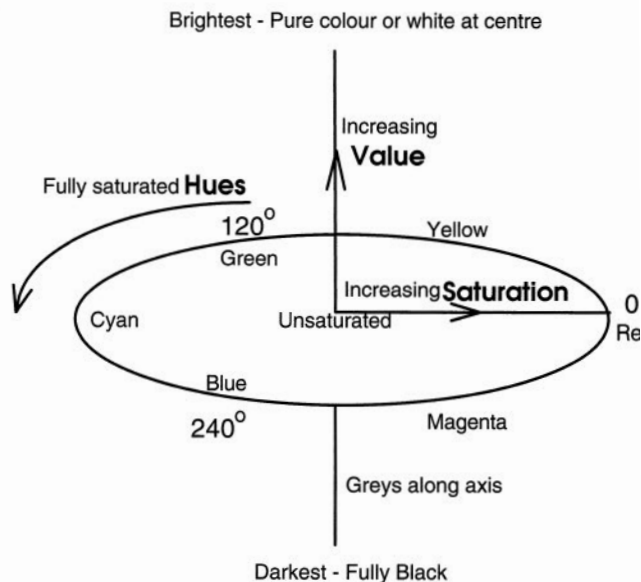

Figure 1. The HSV Colour Wheel

progressively less saturated. *Value*, sometimes called lightness or brilliance, is the perceived brightness of the colour, or the amount of black in the colour.

As with all colour systems, the relationships between the colours can only be represented using a three-dimensional diagram (see figure 1). The pure colour changes as you move around the circumference of the circle, the saturation increases as you move from the centre axis toward the pure colour on the outside of the circle and the value increases as you move from black to white along the centre axis.

Artists often specify colour as different tints, shades and tones of strongly saturated, or pure, pigments. A *tint* comes from adding a white pigment to a pure pigment, thereby decreasing saturation. A *shade* results from adding a black pigment to a pure pigment, thereby decreasing lightness or value. A *tone* is the consequence of adding both black and white pigments to a pure pigment. All these steps produce different colours of the same hue, with varying saturation and value. Mixing just black and white pigments creates greys.

RGB (Red, Green, Blue)

The RGB colour system describes each colour using three colours: red, green and blue. These three colours are the *additive* primaries, that is the individual contributions of each primary colour are added together to yield the resulting colour. If you get a magnifying glass and look closely at a colour television screen, you will see that each screen location is in fact a group of three dots of phosphor, one red, one green and one blue. By exciting each colour to various levels of intensity the television set can make each composite pixel appear as any colour.

The relationship between the red, green and blue components of a colour can be shown using a cube. (see figure 2) The main diagonal of the cube, with equal amounts of each primary, represents the grey levels: black is (R_0%, B_0%, G_0%); white is (R_100%, B_100%, G_100%); a 50% grey is (R_50%, G_50%, B_50%).
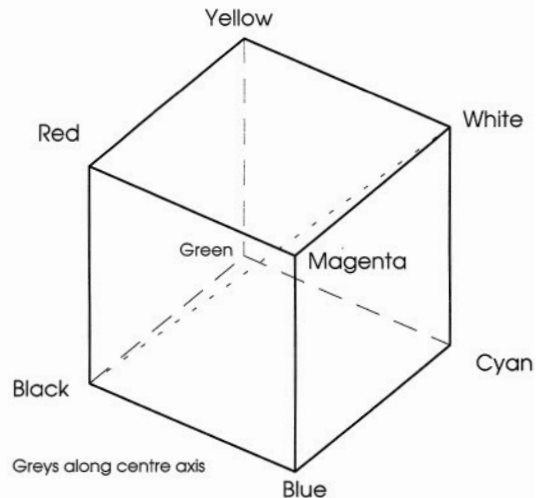

Figure 2. The RGB Colour Cube

Just out of interest note that if you follow the three edges of the cube moving away from black you reach the three additive primary colours Red, Green and Blue. Then follow the edges of the cube from Blue to Green and you will find Cyan. If you look at the HSV colour wheel on page 24 you will see that Cyan falls between, surprise surprise, Blue and Green. Similarly Yellow falls between Red and Green and Magenta falls between Red and Blue. Of course the fundamental nature of colour does not change, but we can look at it in different ways.

Because the OpalVision hardware is closely linked with video and monitor displays, it stores and manipulates images in RGB format. For the technically minded, there are 8 bits, giving 2^8 or 256 levels, for each of the three primary colours. This is why each RGB slider in the Palette Menu ranges from 0 to 255. This is also where the term "24-bits" comes from, as each pixel is described by a total of 24 bits of data (3 colours x 8 bits per colour).

However, while RGB is a useful way for a computer to describe colours, it is difficult for many people to mentally split colours into their primary colour components when choosing colours to paint with. This is why the HSV colour system is often more useful.

CMYK (Cyan, Magenta, Yellow, blacK)

Cyan, Magenta and Yellow are the *subtractive* primary colours. If you look at the colour cube in the previous section you will see that while the *additive* primaries "add" onto nothing (black) to form new colours, the *subtractive* primaries "take away" from White. As you would expect, additive primaries are used where components are added together, such as in the coloured dots of a television picture tube and you see the light emitted from the glowing phosphor. With paint or ink, however, light is not emitted from the paint but is reflected and what you see is the wavelengths of light (and colours) "left over" after the reflection. This is where you use subtractive primaries.

The printing industry nearly always uses the subtractive primaries Cyan, Magenta and Yellow. A separate Black component is included because combining cyan, magenta and yellow ink on a page to print a black area often results in a muddy brownish colour rather than a true black.

While the CMYK colour system is not directly utilised in OpalPaint you can enter them in the files used by the "Named Colour" feature of the Palette Menu, so that if you wish to enter and use colours described using CMYK variables, such as those from the Pantone™ system, you can do so. Note that the following procedure is not detailed but is described for experienced Amiga users and you may need to get help from a colleague or friend.

To define colours using CMYK values,

- Exit OpalPaint, then make backups of files in the directory OpalPaint: that end with ".clist". This way if you make a mistake you can recover easily.

- Create a new file by copying opal.clist to, say, `myfile.clist`. The ending ".clist" is necessary for OpalPaint to recognise the file.

- Using a text editor, edit the new file. You will see a comment at the start of the file describing the format used and you can then add and delete lines as necessary to change the names and colour values as required.

- Save the file (making sure it is in ASCII text format). Now when you click the "By Name" box in the Palette Menu you will be able to cycle through all available ".clist" files by clicking the List button.

PAINT POTS
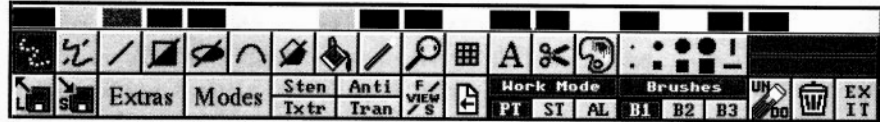
The 20 coloured squares in a row just above the Main Menu Bar are called the Paint-Pots. Just like the spots of paint on an Artist's palette, these Paint-Pots contain working colours for use in painting and modifying images. Unlike other Amiga painting programs that have a limited number of colours, changing the colour in a Paint-Pot does not have any effect on the image. After all, if an artist mixes a new colour on his or her palette, the paint already applied to the canvas does not change colour in sympathy! The colours in any or all Paint-Pots can be changed at any time.

At any time one Paint-Pot will be "selected", or used by any operation that needs a Paint-Pot colour. The selected Paint-Pot is indicated by a dotted white border around its edge. To change the selected Paint-Pot,

- click on the new Paint-Pot using the Left Mouse Button.

To cycle through the current row of Paint-Pots from the keyboard,

- Hit the "[" or "]" button to select the next Paint-Pot to the left or right respectively.

There are 13 such rows of Paint-Pots at any time, giving a total of 260 separate Paint-Pots in a "Palette Set". To cycle through the rows,

- Hit the "{" or "}" button to select the next row of Paint-Pots in the list. Note also that if you move "off the end" of a Paint-Pot row using the "[" or "]" key, the previous or next row of Paint-Pots will be shown automatically.

or

- Move the pointer to the extreme left or right of the Paint-Pot row. There is a "secret button" that is one pixel wide on each end of the Paint-Pot row that moves to the previous or next row of Paint-Pots. Click the Left Mouse Button to go to the next Paint-Pot row, or click the Right Mouse Button to go to the previous Paint-Pot row.

Changes to the colour held in a Paint-Pot can be made in two ways - by picking up a colour from the image, or by using the Palette Menu described below.

Pickup from screen

To replace the colour in any Paint-Pot with a colour from the image, locate the pointer over the Paint-Pot to be changed and press the Right Mouse Button. The pointer will change to a cross with the word "PICK" below it. Now as you move the pointer over the image, you will see the colour in the Paint-Pot position constantly changing to the colour under the centre of the pointer. When you have found the exact colour you want, click once with either mouse button and the change will be made. If you decide you don't really want a change, hit the ESC key or the space-bar, or click one of the menu buttons to continue.
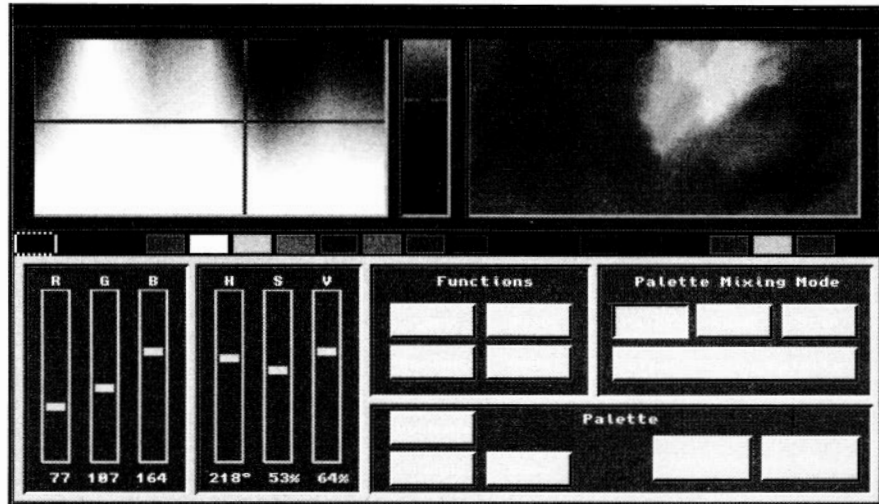
PALETTE MENU

Keyboard

p, P

To select the Palette Menu,

- Click the Palette button on the Main Menu Bar using either mouse button.

The Palette Menu looks like this:

Colour Selection Blocks

As discussed at the beginning of this chapter, the complete range of colours in any colour system can only be described using three dimensions. The OpalPaint Palette Menu uses the HSV (Hue, Saturation and Value, see page 24) system as this is the easiest for most people to use. As the computer screen is limited to two dimensions, it is necessary to split any fields of colour into at least two views, so the colour selection area shows two blocks of colour with cross-hairs over them. The larger block on the left has the complete range of *Hues* across the top with the range of fully saturated to unsaturated down the block. The cross hairs in this block locate the particular *Hue* and *Saturation* value for the Paint-Pot being modified. The second, smaller colour block to the right places the colour selected on the left at the top of the block and shows a complete range of *Values* right down to fully black at the bottom.

Although this may sound complicated, it means you can locate any colour with two clicks of the mouse, one to locate the particular shade of colour and the

other to specify how much black should be added. Both crosshairs also act like sliders, so that by holding down the Left Mouse Button in the colour area and moving the mouse around you can see the Paint-Pot colour changing. This way you can experiment and locate that exact shade you need.

Mixing Area

If you want to use the palette just like a real artists palette and paint, you can apply "paint" to the mixing area to the right of the two colour selection blocks. You can then mix and stir the colours to generate new colours that can be picked up and placed into any Paint-Pot. While the Paint button will be already selected for you, you can use any of the three mixing tools (Paint, Wash or Stir) by clicking on the appropriate menu button using the Left Mouse Button.

To pick up a colour from the Mixing area and place it into a Paint-Pot,

- Click the Paint-Pot you wish to change with the Right Mouse Button.

- The pointer will show the word "PICK" and as you move the pointer around over the mixing area the Paint-Pot will show the colour under the pointer.

- When you have found the exact colour you need, click once with the Left Mouse Button to copy that colour into the Paint-Pot.

- To cancel the Pick-up without changing the Paint-Pot colour, hit the ESC key or the Space-bar.

To quickly change the *current* Paint-Pot colour,

- Click on any colour in the Palette Menu using the Right Mouse Button.

Note that this option only works in the Palette Menu and needs the mouse.

Paint

Keyboard

p

Paint mode uses a medium-size circular nozzle (paint-brush) to apply paint in the colour of the current selected Paint-Pot.

- To apply, just hold down the Left Mouse Button while dragging the mouse around.
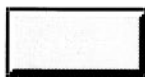
Wash

Keyboard

w

Wash uses the same brush to make colours blend smoothly into each other in the same way that water will make water-colours flow.

- Use in the same way as when applying paint and drag the pointer back and forth to increase the amount of blending.

Stir

Keyboard

S

This mixes the colours together to create new colours.

- Once again use by holding down the Left Mouse Button as you drag the pointer back and forth, around and around.

Clear Mixing Palette

This menu button clears the mixing area to a plain colour.

- Click the "Clear Mixing Palette" button with the Left Mouse Button to clear the area to *black*.

or

- Click the "Clear Mixing Palette" button with the Right Mouse Button to clear the area to *the current Paint-Pot colour*.

R G B Sliders

The RGB sliders automatically move to show the components of the current colour using the RGB (Red, Green, Blue) colour system, with one slider for each component colour. These sliders can also be adjusted directly, allowing you to precisely specify the value on each slider through a range from 0, corresponding to total absence of the Red, Green or Blue component to 255, corresponding to maximum presence of that component. See the discussion on the RGB colour system (page 25) for more information on the interaction of the three colour components.

To adjust the level of a slider,

- Drag the slider button to the desired level using the Left Mouse Button as necessary, or click in the slider box above or below the slider button to adjust the level in single steps. The level you set will show below the slider.

H S V Sliders

The HSV sliders also move to show the components of the current colour using the HSV (Hue, Saturation and Value) colour system, with one slider for each component. These sliders are automatically adjusted to show the HSV components of the colour specified in the colour blocks above, but can also be adjusted directly to "dial up" the exact colour you need.

With a little experimentation you will see that the Hue slider moves the crosshairs in the large colour block horizontally through the spectrum of pure hues. Because this is the same as rotating around the colour wheel described on page 24, the scale on this slider is from 0° to 359° with pure Red at 0°. The Saturation slider adjusts the percentage saturation of the colour from 0 to 100%, with 0 being totally unsaturated and 100% fully saturated. Note that as you move the Saturation slider the crosshairs in the large colour block move vertically. The third slider adjusts the Value of the colour and moves the reference line found in the smaller colour block as the amount of black or the Value of the colour under the crosshairs changes. The range of the Value slider is also from 0% to 100%, with 0% corresponding to fully black and 100% being the colour found under the crosshairs in the large colour block, ie with no black component at all.

To adjust the level of a slider,

- Drag the slider button to the desired level using the Left Mouse Button as necessary, or click in the slider box above or below the slider button to adjust the level in single steps. The level you set will show below the slider.

Paint Pot Manipulation

Use these buttons to rearrange the Paint-Pots and create spreads of colour into the Paint-Pots that fall between two other Paint-Pots.

Copy

To copy the colour from one Paint-Pot to another,

- Click with the Left Mouse Button on the first Paint-Pot to select it.

- Click the "COPY" button using the Left Mouse Button. The word "TO" will appear under the pointer when you move it over the Paint-Pot bar.

- Click with the Left Mouse Button on the Paint-Pot you wish to change. The colour from the first Paint-Pot will then replace the existing colour in the second Paint-Pot.

Swap

To swap the contents of two Paint-Pots,

- Click with the Left Mouse Button on the first Paint-Pot to select it.

- Click the "SWAP" button using the Left Mouse Button. The word "TO" will appear under the pointer when you move it over the Paint-Pot bar.

- Click with the Left Mouse Button on the other Paint-Pot you wish to swap with. The colours in the two Paint-Pots will then be exchanged.

Spread

The Spread button allows you to take the colours from two Paint-Pots and fill the intervening Paint-Pots with the spread of colours between the end colours. For example, if you have red and blue Paint-Pots spaced five positions apart, the Spread function will place four colours equally spaced in the range between red and blue into the intervening Paint-Pots.

To generate a spread,

- If necessary set up the Paint-Pots with the end-colours at the ends of the range you wish to change. You can use the Copy and Swap buttons, or change the Paint-Pots using the palette.

- Click with the Left Mouse Button to select a Paint-Pot at one end of the range.

- Click the "SPREAD" button using the Left Mouse Button. The word "TO" will appear under the pointer when you move it over the Paint-Pot bar.

- Click with the Left Mouse Button on the Paint-Pot at the other end of the range. The intervening colours will then be generated. Note that you can also move to a new paint-pot row using the mouse or keyboard before specifying the final paint-pot for the range.

Undo

Keyboard

u

The Undo button will reverse the last Copy, Swap or Spread operation. To use,

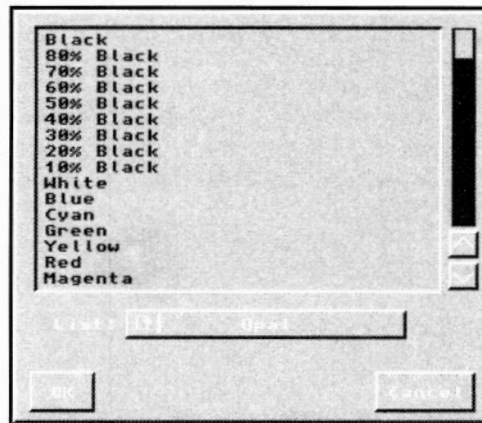- Click the "UNDO" button using the Left Mouse Button.

Control Buttons

Load By Name

To choose a colour by name to replace the currently selected Paint-Pot,

- Click the "By Name" button in the Palette Menu.

A list of colour names will appear, with choices such as "Twilight Blue", "Avocado Green", "Dusty Rose" and other evocative and creative descriptors. (Never fear, there are also simple names like "Red"). The scroll bar on the right allows you to scroll through the choices.

To select a colour name,

- Click the name describing the colour you are looking for. The currently Paint-Pot will show the selected colour.

To return to the Palette Menu,

- Double-click on a colour name, or click the OK button using the Left Mouse Button.

If you have set up your own named colour lists, you can select these lists by,

- Clicking on the "List" button to cycle through all files in the "OpalPaint:" directory ending with ".clist"

To save the currently-selected paint-pot colour as a new colour with your own imaginative name in a Named-Colour list,

- Click the "Save New Colour" button. The pointer will now show the word "ADD".

- Click on the colour name you wish to appear *after* your new colour, then type in the new name when requested.

For further notes on setting up your own named colour lists, see the section on the CMYK colour system (page 27).

Load Palette Set

To load a previously saved Palette Set from disk,

- Click the "Load" button in the Palette Menu.

The File Menu will then appear, with the words "Load Palette" at the top-centre of the menu. If you click on the "Show" button, a thumbnail image will be shown for each previously saved palette set. This thumbnail image will show a tiny version of the contents of the mixing area when the Palette Set was saved and the first row of Paint-Pots in the Palette Set are shown across the bottom of the thumbnail image.

- Choose the palette to be loaded from the thumbnail image or by name.

The use of this generalised File Menu is described in detail beginning on page 229.

Save Palette Set

To save the current Paint-Pots and Palette Set to disk,

- Click the "Save" button in the Palette Menu.

The File Menu will then appear, with the words "Save Palette" at the top-centre of the menu.

- Type in the name of the new palette or choose an existing palette to be over-written using its thumbnail image or name. Note that the colours from the first row of Paint-Pots and the current contents of the mixing area are saved in the thumbnail image for the palette file.

The use of this generalised File Menu is described in detail beginning on page 229.

Note that to save just the current Paint-Pot row,

- Access the Save Palette menu using the Amiga-r keyboard shortcut. There is no equivalent menu button for this function.

When this row is loaded using the Load Palette function it replaces just the current Paint-Pot row and leaves all other rows intact.

Drawing Tools

The *Drawing Tool* is the first operator in the chain described on page 18. Each drawing tool is one of two types - Outline Tools that specify a path or outline for the nozzle or cutout brush to follow and Area Fill Tools that specify a solid area on which the underlying operators will act.

To select a Drawing Tool,

- Click the Tool button on the Main Menu Bar using the Left Mouse Button (see the icons above). Where a button is divided by a diagonal line, the button controls both the Outline and Filled versions of that Tool. If the click is in the Top-Left half of the button, the Outline variant of the Tool is selected, while a click in the Lower-Right half of the button selects the Filled variant of the Tool.

To invoke the global Line Options Menu for Outline Drawing Tools,

- Click the Upper Left half of a Line, Curve or Outline Tool button on the Main Menu Bar using the Right Mouse Button.

To invoke the global Area Fill Menu for Area-Fill Drawing Tools,

- Click the Lower Right half of an Area-Fill Tool button on the Main Menu Bar using the Right Mouse Button.

The Line Options Menu and Area Fill Options Menu control the global options for Drawing Tools and each is described below.

LINE OPTIONS MENU

The Line Options Menu is used to specify the way Line and Outline Drawing Tools paste brushes. The options specified using this menu are global. That is, the options affect all lines and outlines regardless of the Tool button used to select the menu. The menu looks like this:
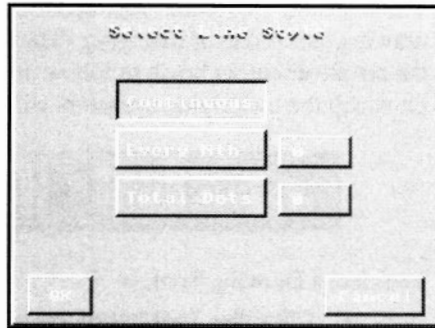
To access this menu,

- Click with the Right Mouse Button on the outline (top left) half of the Line, Rectangle, Ellipse, Arc or Closed Polygon icon.

A point to note:

❖ These options are global; that is if you change the options for, say, the outline rectangle, the options for the outline ellipse and outline polygon will also change.

The Menu allows you to choose the line type from three mutually exclusive options. They are:

Continuous

Probably the most used, Continuous application means just that - the brush is applied at each point along the path specified by the drawing tool with no gaps. To use this option,

- Click the "Continuous" button.

Every Nth

This option allows you to specify the number of pixels the brush handle will jump between each application of the nozzle or cutout brush. Note that if the brush is more than one pixel in size, the actual gap between the edges of each brush application will be less than the gap you specified and with large brushes they may actually touch or overlap.

To use this option,

- Click the "Every Nth" button in the Line Options Menu.

- In the text-entry box next to the button, enter the number of pixels to jump between brush applications.

Total Dots

With this option you can specify the total number of times you want the nozzle or cutout brush to appear along the line or outline specified by the drawing tool. As the line, rectangle, ellipse or polygon gets bigger, the distance between applications of the brush becomes greater.

To use this option,

- Click the "Total Dots" button.

- In the text-entry box next to the button, enter the number of times the cutout brush or nozzle should appear along the path.

AREA FILL MENU

The Area Fill Menu sets the global options for the way Area-Fill Drawing Tools work and looks like this in its simplest form:
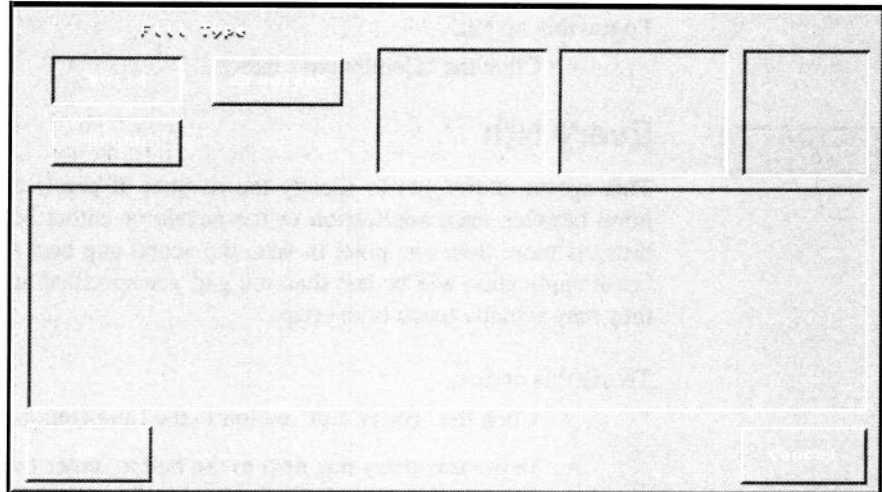

To access this menu,

- Click the Main Menu button of any area-fill drawing tool using the Right Mouse Button. These buttons are generally the lower Right-hand corner of a combination Outline/Area-Fill tool. See the sections on individual Drawing Tools for further details.

Points to note:

❖ These options are global; that is if you change the options for, say, the filled rectangle, the options for the filled ellipse and filled polygon will also change.

❖ When using some Drawing Modes (for example Contrast, Gamma, Smooth and Smear) the colour information is discarded. In these cases the only information used from the Area-Fill options is the Transparency Gradient if it is defined (see below).

There are three types of area fill; Solid, Gradient and Brush Wrap. Each are discussed separately below.
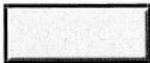
Solid

The Solid Fill mode uses the current Paint-Pot colour to fill the area specified by the Area-Fill Drawing Tool.

If the Texture Pattern is defined and selected (ie the "TXTR" button is highlighted on the Main Menu Bar), the current Texture Pattern from a cutout brush or Rub-Through will replace the Paint-Pot colour across the filled area.

If you want to apply the transparency levels from the Texture Pattern to a solid Paint-Pot colour, ie use the transparency information and ignore the colour information from the Texture Pattern, you should select the single-colour "Paint-Pot" button in the Drawing Modes Option Menu (see page 124).

To select the Solid Fill mode,

- Click the "SOLID" button using the Left Mouse Button.

Gradient Fill

A Gradient Fill provides a perfectly smooth transition between specified colours across a specified area. This gradient can be linear, with the transition occurring along a straight-line "front", or radial, where the colour change occurs along a circular or elliptical front like ripples in a pond. The direction and "size" of the gradient can also be specified. OpalPaint provides for 8 separate gradients, each with its own colours, spacing, direction and transparency.

Transparency? For each colour gradient OpalPaint also allows you to specify a parallel Transparency Gradient so that the transparency of the area fill changes smoothly across the specified area. Each transparency gradient will be of the same directional type as its colour gradient pair.

To select the Gradient Fill mode,

- Click the "GRADIENT" button using the Left Mouse Button.

The previously blank boxes on the Area Fill Menu will fill with buttons and sliders allowing you to set colours, transparency and various options for the gradient fill. The menu will now look like this:
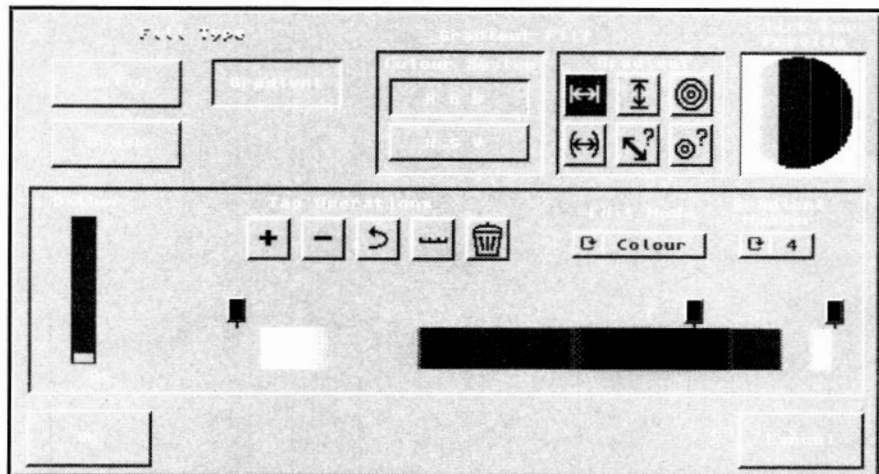
Colour System

Colour Gradients are produced by taking the colours at each end of the gradient, splitting them into their components using either the HSV or RGB colour

system (see pages 24 and 25 respectively) and then calculating the gradient for each component separately across the specified area.

R G B

Using the RGB (Red, Green, Blue) colour system generally results in a smooth blend directly between the two colours and is the most intuitive to use. Each component (R, G and B) changes directly from its level in the starting colour to its level in the end colour.

To use the RGB colour system in gradient fills,

- Click the "RGB" button on the Area-Fill Options Menu.

H S V

Using the HSV (Hue, Saturation and Value) colour system often results in a rainbow effect across a gradient, because the Hue component is rotated around the colour wheel from the Hue value of the starting colour to the Hue value of the ending colour. For example, if you specify a gradient from a reddish to a blue colour, the gradient will show a range of colours from red through orange, yellow, green, cyan then blue. To predict a range of colours, look at the main colour block in the Palette Menu which can be accessed from the Main Menu Bar. Locate the first and second colours on the block and the gradient will be from the first to the second colour in the order they are specified. The Saturation and Value components will move smoothly from their starting to their ending levels.

To use the HSV colour system in gradient fills,

- Click the "HSV" button on the Area-Fill Options Menu.

Tag Operations

The tag operations box allows you to specify the colours and spacing for the gradient. The Fill Options Menu shows a long gradient box with up to 15 colour "tags" above it, which represents the maximum dimensions of the area being filled. Each tag contains a colour (or transparency level when setting a Transparency Gradient) and OpalPaint calculates the colour gradient between each pair of tags using the colour system specified (see above). To change the gradient spacing and the relative range over which each gradient is calculated.,

- Drag the tags along the gradient box using the Left Mouse Button.

Two tags can be placed in the same horizontal position on the gradient box to produce a sharp "edge" in the gradient. To reverse the order of two stacked tags, i.e. swap their vertical positions,

- Click on the *bottom* tag using the Left Mouse Button.

Gradient Edit Mode

The mode buttons determine whether the gradient box and tags shown are for the colour or the transparency gradient of the current gradient pair.

To toggle between the gradient box and tags for the Colour and Transparency gradients,

- Click the "Edit Mode" menu button using the Left Mouse Button.

To select which of the 8 Gradient Pairs to display and use for Area Fill operations,

- Click the "Gradient Number" menu button using the Left Mouse Button to cycle forward through the 8 available gradient pairs, or click using the Right Mouse button to cycle backwards.

Add

To add a colour tag,

- If necessary, first set up the required colours in Paint-Pots using the Palette Menu, then return to the Area-Fill Options Menu.

- Select the Paint-Pot containing the colour for the new tag by clicking on the Paint-Pot using the Left Mouse Button.

- Click the "Add" button using the Left Mouse Button.

To add a transparency tag,

- Set the desired transparency level for the new tag using the Transparency slider to the left of the gradient box. A level of 0% corresponds to fully opaque, shown as white in the gradient box, while a level of 100% corresponds to fully transparent and is shown as black in the gradient box. Intermediate transparencies are shown as intermediate grey levels.

- Click the "Add" button using the Left Mouse Button.

For both colour and transparency gradients, the first tag added will be placed at the *left*-hand end of the gradient box, the second will be automatically placed at the *right*-hand end and subsequent tags will be placed at the *left*-hand end of the gradient box for you to drag and drop into place along the gradient box.

Delete

To delete a colour or transparency tag,

- Click the "Delete" button using the Left Mouse Button.
- Click the tag you wish to delete using the Left Mouse Button.

Reverse

To reverse the direction of the tags above the gradient box,

- Click the "Reverse" button using the Left Mouse Button.

The spacing between tags will not change, but they will start from the right-hand end of the gradient box instead of the left. Each click of the "Reverse" button will flip the direction of the gradient.

This reversal will affect only the mode selected, ie either the colour or transparency gradient.

Regular Spacing

To evenly space all existing tags across the gradient box in the current mode,

- Click the "Spacing" button using the Left Mouse Button.

Delete All

To delete all colour or transparency tags,

- Click the "Trash-can" button using the Left Mouse Button.

If you are in Colour mode all colour tags will be removed and if in Transparency mode all transparency tags will be deleted.

Change Colour

To change the colour of a colour tag after placing it, select the Paint-Pot containing the new colour (for colour tags) or the slider position (for transparency tags), then click on the colour tag to be changed using the Right Mouse Button.

Dither

The dither slider to the left of the gradient box adjusts the amount of random variation in the gradient. This can be set separately for the colour and transparency gradients in order to break up the otherwise perfectly smooth transitions. This can give a granular and sometimes more natural appearance.

To adjust the dither,

- Drag the button in the dither slider to the desired level using the Left Mouse Button, or click in the slider box above or below the slider button to adjust the setting by single points.

The slider range is from 0, which corresponds to no dither and perfectly smooth transitions, to 100% which is the maximum amount of introduced randomness.

Gradient Direction and Preview Box

OpalPaint provides two main types of gradient fill: linear and radial. A Linear gradient fill operates along a straight line "front" that moves across the area to be filled, while Radial fills work outwards from a point using a circular or elliptical "front", rather like ripples in a pond.

To preview how your current gradient box will look using selected gradient direction,

- Click in the square Preview Box at the top right of the Area-Fill Options Menu. The current colour and transparency gradients will be shown as if used to draw a filled circle.

There are four types of **Linear** fill:

Horizontal

This Linear fill operates horizontally across the fill area. The gradient box with its colour and transparency tags are scaled to fit the range between the furthest left and the furthest right dimension of the fill area even if they do not fall on the same horizontal line. The linear "front" of the vertical gradient line runs horizontally across the fill area.

Vertical

This Linear fill operates vertically across the fill area. The gradient box with its colour and transparency tags are scaled to fit the range between the highest and lowest points of the fill area. The linear "front" is horizontal and runs vertically down across the fill area.

Horizontal Line-by-line Scaled

This Linear fill is similar to the Horizontal fill and operates horizontally across the fill area, except that the gradient box with its colour and transparency tags is scaled to fit the length of each individual horizontal line. This way the gradient appears to follow the contours of elliptical, circular, polygonal and freehand area fills for a three-dimensional appearance. The linear "front" of the vertical gradient line runs horizontally across the fill area.

User-Specified Direction

This Linear fill operates at the angle and scale specified by the artist. To use this type of gradient fill,

- Specify the area to be filled using an Area-Fill Drawing Tool. The pointer will then change to show the word "GRAD".

- Drag out a line within or across the filled area using the Left Mouse Button. The gradient fill will then be done using the gradient box with its colour and transparency tags scaled to fit the length of the dragged line, with the direction from the starting to ending points of the line. The linear "front" is perpendicular to the dragged line and runs along the line across the fill area.

There are two types of **Radial** Fill:

Automatic

The automatic Radial Fill creates a gradient fill that works from the centre of the filled area toward the outside. This radial pattern is elliptical and is calculated using a rectangle that contains the maximum dimensions of the filled area.

The left-hand end of the gradient box is always at the centre of the radial fill, so to make the colour or transparency gradient work in the opposite direction use the "Reverse" button described above.

A useful trick is to make a gradient transparency that is fully opaque for most of the gradient box but fades to fully transparent over a short distance at the right-hand edge. This will produce elliptical and circular fills with edges that are perfectly faded into the background.

User-Specified Radial

Like the User-Defined Linear fill, this option allows the artist to specify the size and shape of the radial gradient. To use this type of gradient fill,

- Specify the area to be filled using an Area-Fill Drawing Tool. The pointer will then change to show the word "GRAD".

- Drag out an ellipse within or across the fill area using the Left Mouse Button and the colours in the gradient box will be scaled to fit between the centre of the ellipse and the edge of the ellipse along each radial line. Once again the left-hand end of the gradient box is always at the centre of the radial fill, so to make the colour or transparency gradient work in the opposite direction use the "Reverse" button described above.

To constrain the ellipse into a circle,

- Hold down either shift key while drawing the ellipse.

Brush Wrap

This third type of area fill takes a specified cutout brush and scales it horizontally and vertically to fill any area you specify with an Area-Fill Drawing Tool. In addition, you can specify a "Warp Factor" to make the filled area appear to bulge toward you. With this feature you can produce the effect of cutout brushes wrapped onto the surface of three dimensional spheres, ellipses, polygons and free form objects.

To use the Brush Wrap area-fill mode,

- Click the "Wrap" button using the Left Mouse Button. Three buttons and a slider will appear allowing you to specify options for the Wrap.

- Select the cutout brush to use for the wrap operation by clicking on button "B1", "B2" or "B3" using the Left Mouse Button.

- Specify the warp factor by dragging the "Warp" slider button to the desired level or clicking in the slider box above or below the slider button to adjust the setting by single levels. A level of 0 produces no warping or bulging effect, while a level of 100% produces the maximum warp.

Now exit the Area-Fill Options Menu.

- Use any Area-Fill Drawing Tool in the usual way to specify the area to be filled. The specified cutout brush will then be scaled and warped to fill the shape.

SKETCH (FAST FREEHAND)

Keyboard

S

Selection from the Menu

- Click with the Left Mouse Button on the Sketch Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Options

There is no options menu for the Sketch tool.

Keyboard Shortcut

s - select Sketch Tool (mnemonic **sketch**)

How to Use

To apply a single "copy" of the currently selected brush or nozzle,

- Position the mouse pointer over the desired application position on the image and click the appropriate mouse button once (Left to apply, Right for Dynamic Undo).

To quickly sketch or undo using the currently selected brush or nozzle,

- Position the pointer over the desired starting position on the image.

- Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer along the path you want the brush to follow. You will see a dotted trail of copies of the current nozzle or cutout brush following the mouse pointer.

- Release the button when you have completed the action.

If you used the Left Mouse Button, remember you can;

- ❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

- ❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

- ❖ Choose a new colour, mode, transparency or other options and hit the "a" (again) key to paste a copy of the nozzle or cutout brush at the last position.

Enhancement Keys

Shift - Holding either shift key down at any time will lock the brush's movement in either the horizontal or vertical direction, depending on the direction first moved immediately after pushing the key. Releasing the key will remove the constraint and allow free movement of the brush.

Background Information

The Sketch tool repeatedly applies the nozzle or cut-out brush as quickly as other selected options permit. Each application is done at the current pointer location, so if the pointer is moved faster there will be bigger gaps between copies of the brush. The actual time between applications is directly proportional to the amount of processing OpalPaint needs to do for each brush application, so increased resolution, larger brushes, complicated modes, transparency etc will all slow down the application rate.

Common Uses

❖ Use this tool to paste down a single copy of a nozzle or cut-out brush.

❖ Use to quickly sketch the outline of an image.

❖ Select when using modes such as smear and smooth to work on localised areas.

❖ Use with Right Mouse Button and a fine nozzle to allow fine control of Dynamic Undo.

❖ Use with processor-intensive Artist's Tool nozzles such as the air-brush and chalk to speed up their action.

CONTINUOUS FREEHAND - OUTLINE

Keyboard

d

Selection from the Menu

- Click with the Left Mouse Button in the Upper Left half of the Continuous Freehand Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Options

There is no options menu for this Drawing Tool.

Keyboard Shortcut

d - select Continuous Freehand Outline (mnemonic **d**raw)

How to Use

To apply the currently selected brush or nozzle along a freehand path,

- Position the pointer over the desired starting position on the image

- Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while moving the pointer along the path you want the brush to follow. You will see a trail of copies of the current nozzle or cutout brush following the mouse pointer.

- Release the button when you have completed the action.

If you used the Left Mouse Button, remember you can;

- ❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

- ❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

Enhancement Keys

Shift - Holding either shift key down at any time will lock the brush's movement in either the horizontal or vertical direction, depending on the direction first moved immediately after pushing the key. Releasing the key will remove the constraint and allow free movement of the brush.

Background Information

The Continuous Freehand - Outline tool moves the currently selected nozzle or brush along the path moved by the mouse pointer. It is similar to the Sketch tool in that the painting or modifying action is completed for each point as the artist moves the mouse and so the response time is proportional to the amount of processing OpalPaint needs to do for each brush application. Thus increased resolution, larger brushes, complicated modes, transparency etc will all slow down the application rate. When working with a complicated or large brush, the brush application may lag behind your movement of the pointer, so it is advisable to slow down your movement of the pointer until the line can "keep up". If you don't slow the pointer movement down, the line you are drawing may start "cutting corners".

Common Uses

❖ Use this tool to draw or modify arbitrary lines and outlines without gaps.

CONTINUOUS FREEHAND - FILLED

Keyboard
D

Selection from the Menu

- Click with the Left Mouse Button in the Lower Right half of the Continuous Freehand Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Fill Options

- Click with the Right Mouse Button in the Lower Right half of the Continuous Freehand Icon in the Main Menu Bar.

The Fill Options Menu described on page 42 will appear, allowing modification of the global Fill Options used by the tool.

Keyboard Shortcut

D - select Continuous Freehand Filled (mnemonic **D**raw)

How to Use

To paint or modify the inside of an arbitrarily shaped area,

- Position the pointer over the desired starting position on the image.

- Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer around the area to be filled.

- Release the button when you have completed the action.

The area will then be modified using the new colour information and mode, whether a Texture Pattern, Gradient Fill, Cutout Brush or solid colour from the currently selected Paint-Pot. If you release the button before reaching your starting point OpalPaint will complete the outline with a straight line between the starting and ending points.

- If you are using a directional gradient fill the word "GRAD" will show next to the pointer, reminding you to specify the direction and range of the gradient across the filled area.

If you used the Left Mouse Button, remember you can;

❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

❖ Choose a new colour, mode, transparency or other options and hit the "a" (again) key to redo the same freehand area with the same size, shape and position.

Enhancement Keys

Shift - Holding either shift key down at any time will lock the brush's movement in either the horizontal or vertical direction, depending on the direction first moved immediately after pushing the key. Releasing the key will remove the constraint and allow free movement of the brush.

Background Information

The Continuous Freehand Filled tool "records" the path moved by the mouse pointer and shows a single-pixel width line in the current Paint-Pot colour until the button is released. The area outlined is then filled using the new colour information and currently selected pixel modification operators; ie Texture Pattern, Stencil, Mode, Transparency, etc.

Common Uses

❖ Use this tool to draw or modify filled arbitrary shapes.

❖ Use with the "Brush" fill type in the Area Fill options menu to stretch cutout brushes on arbitrary shapes. For example, make a cutout brush of a face and fill a tear-drop shape.

STRAIGHT LINE

Selection from the Menu

- Click with the Left Mouse Button on the Straight Line Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Line Options

- Click with the Right Mouse Button on the Straight Line Icon in the Main Menu Bar.

The Line Options Menu described on page 40 will appear, allowing modification of the global Line Options used by the tool.

Keyboard Shortcut

l or v - select Straight Line (mnemonic line)

How to Use

To paint or modify a straight line

- Position the pointer over the starting point of the desired line on the image.

- Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer to the opposite end of the line.

You will see a line in the shape of the current brush or nozzle on the screen that changes length and direction as you drag the mouse.

- Release the button when you have completed the line.

The line will then be modified using the current cutout brush or nozzle and pixel modification operators.

If you used the Left Mouse Button, remember you can;

❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

❖ Choose a new colour, mode, transparency or other options and hit the "a" (again) key to redo the same straight line with the same size and position.

Enhancement Keys

Shift - Holding either shift key down at any time will lock the brush's movement in either the horizontal or vertical direction, depending on the direction first moved immediately after pushing the key. Releasing the key will remove the constraint and allow free movement of the brush.

To draw horizontal or vertical lines, press and hold either Shift key before beginning the line and move in the direction you want the line to go. At any time you can release the Shift key and remove all constraints on the line.

RECTANGLE AND SQUARE - OUTLINE

Keyboard

r

Selection from the Menu

- Click with the Left Mouse Button in the Upper Left half of the Rectangle Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Line Options

- Click with the Right Mouse Button in the Upper Left half of the Rectangle Icon in the Main Menu Bar.

The Line Options Menu described on page 40 will appear, allowing modification of the global Line Options used by the tool.

Keyboard Shortcut

r - select Rectangle Outline (mnemonic **r**ectangle)

How to Use

To paint or modify a rectangular outline,

- Position the pointer over one corner of your intended rectangle on the image. Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer to the opposite corner of the rectangular area to be outlined.

or, if "Drag Rectangle from Centre" is selected (see page 220)

- Position the pointer over the centre of your intended rectangle on the image. Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer any corner of the rectangular area to be outlined.

You will see a rectangle with the sides in the shape of the current brush or nozzle on the screen that changes size and shape as you drag the mouse.

- Release the button when you see the desired rectangle and the outline will then be modified using the current cutout brush or nozzle, Line Options and pixel modification operators.

If you used the Left Mouse Button, remember you can;

❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

❖ Choose a new colour, mode, transparency or other options and hit the "a" (again) key to redo the same rectangular outline with the same size and position.

Enhancement Keys

Shift - Holding either shift key down before beginning the rectangle will draw or modify a square by forcing the sides of the rectangle to equal length. Note that since the pixels on most monitors are not square, the resulting rectangle, although having the same number of pixels horizontally as vertically, may not appear square on the screen. This can be fixed by setting the "Be Square" option on the Preferences screen in the Extras Menu (see page 221) This option adjusts squares and circles so they are the same apparent height and width on a monitor.

Common Uses

❖ Use this tool to draw or modify square or rectangular outlines.

❖ Draw frames or borders for image areas by using various brushes and line options.

RECTANGLE AND SQUARE - FILLED

Keyboard
R

Selection from the Menu

- Click with the Left Mouse Button in the Lower Right half of the Rectangle Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Fill Options

- Click with the Right Mouse Button in the Lower Right half of the Rectangle Icon in the Main Menu Bar.

The Fill Options Menu described on page 42 will appear, allowing modification of the global Fill Options used by the tool.

Keyboard Shortcut

R - select Rectangle Filled (mnemonic **R**ectangle)

How to Use

To paint or modify a rectangular area,

- Position the pointer over one corner of your intended rectangle on the image. Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer to the opposite corner of the rectangular area to be filled.

or, if "Drag Rectangle from Centre" is selected (see page 220)

- Position the pointer over the centre of your intended rectangle on the image. Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer any corner of the rectangular area to be filled.

You will see a rectangular area with the current Paint-Pot colour on the screen that changes size and shape as you drag the mouse.

- Release the button when you see the desired rectangle shape.

The area will then be filled using the current Fill Options and pixel modification operators.

- If you are using a directional gradient fill the word "GRAD" will show next to the pointer, reminding you to specify the direction and range of the gradient across the filled area.

If you used the Left Mouse Button, remember you can;

❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

❖ Choose a new colour, mode, transparency or other options and hit the "a" (again) key to redo the same rectangular area with the same size and position.

Enhancement Keys

Shift - Holding either shift key down before beginning the rectangle will draw or modify a square by forcing the sides of the rectangle to equal length. Note that since the pixels on most monitors are not square, the resulting rectangle, although having the same number of pixels horizontally as vertically, may not appear square on the screen. This can be fixed by setting the "Be Square" option on the Preferences screen in the Extras Menu (see page 221) This option adjusts squares and circles so they are the same apparent height and width on a monitor.

Common Uses

❖ Use this tool to draw or modify filled square or rectangular shapes.

❖ Try setting up stencils to "mask out" an area of an image, invert the stencil, then draw a gradient-filled rectangle over the area to do a gradient fill of a complicated shape. This also works well with text. Paste down the text brush on the stencil screen, invert and use a rectangle area to gradient fill individual letters or the whole word.

ELLIPSE AND CIRCLE - OUTLINE

Keyboard

c, e

Selection from the Menu

- Click with the Left Mouse Button in the Top Left half of the Ellipse Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Line Options

- Click with the Right Mouse Button in the Top Left half of the Ellipse Icon in the Main Menu Bar.

The Line Options Menu described on page 40 will appear, allowing modification of the global Line Options used by the tool.

Keyboard Shortcut

c or e - select Ellipse Outline (mnemonic **c**ircle or **e**llipse)

How to Use

To paint or modify an elliptical outline,

- Position the pointer over the centre of your intended ellipse on the image. Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer outward.

or, if "Drag Ellipse from Centre" is *not* selected (see page 221)

- Position the pointer over one corner of an imaginary rectangle that will contain your intended ellipse on the image. Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer outward.

You will see an elliptical outline in the shape of the current brush and the current Paint-Pot colour on the screen that changes size and shape as you drag the mouse.

- Release the button when you see the desired shape.

The outline will then be drawn using the current brush, Line Options and pixel modification operators.

If you used the Left Mouse Button, remember you can;

❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

❖ Choose a new colour, mode, transparency or other options and hit the "a" (again) key to redo the same elliptical outline with the same size and position.

Enhancement Keys

Shift - Holding either shift key down before beginning the ellipse will draw or modify a circle by forcing the vertical and horizontal diameters of the ellipse to equal length. Note that since the pixels on most monitors are not square, the resulting circle, although the same number of pixels in diameter horizontally as vertically, may not appear perfectly circular on the screen. This can be fixed by setting the "Be Square" option on the Preferences screen in the Extras Menu (see page 221) This option adjusts squares and circles so they are the same apparent height and width on a monitor.

Common Uses

❖ Use this tool to draw or modify elliptical and circular outlines.

ELLIPSE AND CIRCLE - FILLED AREA

Keyboard
C, E

Selection from the Menu

- Click with the Left Mouse Button in the Lower Right half of the Ellipse Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Fill Options

- Click with the Right Mouse Button in the Lower Right half of the Ellipse Icon in the Main Menu Bar.

The Fill Options Menu described on page 42 will appear, allowing modification of the global Fill Options used by the tool.

Keyboard Shortcut

C or E - select Ellipse Outline (mnemonic **C**ircle or **E**llipse)

How to Use

To paint or modify an elliptical area,

- Position the pointer over the centre of your intended ellipse on the image. Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer outward.

or, if "Drag Ellipse from Centre" is *not* selected (see page 221)

- Position the pointer over one corner of an imaginary rectangle that will contain your intended ellipse on the image. Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer outward.

You will see an elliptical area in the current Paint-Pot colour on the screen that changes size and shape as you drag the mouse.

- Release the button when you see the desired shape.

The area will then be filled using the current Fill Options and pixel modification operators.

- If you are using a directional gradient fill the word "GRAD" will show next to the pointer, reminding you to specify the direction and range of the gradient across the filled area.

If you used the Left Mouse Button, remember you can;

❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

❖ Choose a new colour, mode, transparency or other options and hit the "a" (again) key to redo the same elliptical area with the same size and position.

Enhancement Keys

Shift - Holding either shift key down before beginning the ellipse will draw or modify a circle by forcing the vertical and horizontal diameters of the ellipse to equal length. Note that since the pixels on most monitors are not square, the resulting circle, although the same number of pixels in diameter horizontally as vertically, may not appear perfectly circular on the screen. This can be fixed by setting the "Be Square" option on the Preferences screen in the Extras Menu (see page 221) This option adjusts squares and circles so they are the same apparent height and width on a monitor.

Common Uses

❖ Use this tool to draw or modify elliptical and circular filled areas.

CURVE

Keyboard

q

Selection from the Menu

- Click with the Left Mouse Button on the Curve Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Line Options

- Click with the Right Mouse Button on the Curve Icon in the Main Menu Bar.

The Line Options Menu described on page 40 will appear, allowing modification of the global Line Options used by the tool.

Keyboard Shortcut

q - select Curve (mnemonic **q**urve. Be careful, "Q" [shift-q] will Quit)

How to Use

To paint or modify a smoothly curved line,

- To start, position the pointer over one end of the desired curve on the image.

- Hold the appropriate mouse button (Left to apply, Right for Dynamic Undo) down while dragging the pointer to the opposite end of the curve.

You will see a straight line in the shape of the current brush or nozzle on the screen that changes length and direction as you drag the mouse.

- Release the button when you have completed the straight line between the two ends of the curve.

- Now move the pointer and you will see the line bend toward the mouse pointer.

- Click the same mouse button when the curve is the exact shape you want.

The line will then be modified using the current cutout brush or nozzle and pixel modification operators.

If you used the Left Mouse Button, remember you can;

❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

❖ Choose a new colour, mode, transparency or other options and hit the "a" (again) key to redo the same curve with the same size and position.

Enhancement Keys

Shift - Holding either shift key down at any time will lock the brush's movement in either the horizontal or vertical direction, depending on the direction first moved immediately after pushing the key. Releasing the key will remove the constraint and allow free movement of the brush.

To draw arcs with the start and end points on the same horizontal or vertical line, press and hold either Shift key before beginning the line and move in the direction you want the line to go. At any time you can release the Shift key and remove all constraints on the line.

Common Uses

❖ Use this tool to draw or modify smooth arcs between two points.

POLYGON - OUTLINE

Keyboard

w

Selection from the Menu

- Click with the Left Mouse Button on the Polygon Outline Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Line Options

- Click with the Right Mouse Button on the Polygon Outline Icon in the Main Menu Bar.

The Line Options Menu described on page 40 will appear, allowing modification of the global Line Options used by the tool.

Keyboard Shortcut

w - select Polygon Outline (sorry, no mnemonic)

How to Use

To paint or modify an outline made up of any number of connected straight lines,

- Position the pointer over one end of the first intended line on the image and click the appropriate mouse button (Left to apply, Right for Dynamic Undo) once.

- Drag the pointer to the opposite end of the first line. You will see a straight line in the shape of the current brush or nozzle on the screen that changes length and direction as you drag the mouse.

- Click the same mouse button again when you have completed the line, then move the mouse pointer and you will see another line begin with its starting point at the end point of the first line.

- Move the pointer around until the next line is the right length and position and click the same mouse button.

- Continue drawing linked lines until you have as many as you need.

- At any time you can complete a closed polygon by drawing a line that ends back at the starting point, hit the Space-bar to automatically draw a line from the last to the first point, or hit the Escape key to leave the last line unconnected to the first point.

The lines will then be modified using the current cutout brush or nozzle and pixel modification operators.

If you used the Left Mouse Button, remember you can;

❖ click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

❖ Choose a new colour, mode, transparency or other options and hit the "a" (again) key to redo the same polygonal outline with the same size and position.

Enhancement Keys

Shift - Holding either shift key down at any time will lock the brush's movement in either the horizontal or vertical direction, depending on the direction first moved immediately after pushing the key. Releasing the key will remove the constraint and allow free movement of the brush.

Common Uses

❖ Use this tool to draw or modify connected lines and polygons.

POLYGON - FILLED

Selection from the Menu

Keyboard
W

- Click with the Left Mouse Button on the Polygon Filled Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Fill Options

- Click with the Right Mouse Button on the Polygon Filled Icon in the Main Menu Bar.

The Fill Options Menu described on page 42 will appear, allowing modification of the global Fill Options used by the tool.

Keyboard Shortcut

W - select Filled Polygon (sorry, no mnemonic)

How to Use

To paint or modify an area with the edges made up of any number of connected straight lines,

- Position the pointer over one end of the first edge on the image and click the appropriate mouse button (Left to apply, Right for Dynamic Undo) once.

- Drag the pointer to the opposite end of the line. You will see a straight line in the shape of the current brush or nozzle on the screen that changes length and direction as you drag the mouse.

- Click the same mouse button again when you have completed the line, then move the mouse pointer and you will see another line begin with its starting point at the end point of the first line.

- Move the pointer around until the next line is the right length and position and click the same mouse button.

- Continue drawing linked lines until you have fully outlined the area to be filled.

- To complete the procedure, complete a closed polygon by drawing a line that ends back at the starting point, or hit the Space Bar in which case OpalPaint will close the polygon and add a line from the end of your last line to the starting point. The Esc key will abort the whole procedure.

The area will then be modified using the pixel modification operators.

- If you are using a directional gradient fill the word "GRAD" will show next to the pointer, reminding you to specify the direction and range of the gradient across the filled area.

If you used the Left Mouse Button, remember you can;

❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

❖ Choose a new colour, mode, transparency or other options and hit the "a" (again) key to redo the same polygonal area with the same size and position.

Enhancement Keys

Shift - Holding either shift key down at any time will lock the brush's movement in either the horizontal or vertical direction, depending on the direction first moved immediately after pushing the key. Releasing the key will remove the constraint and allow free movement of the brush.

Common Uses

❖ Use this tool to draw or modify areas outlined by a closed polygon.

FLOOD FILL

Keyboard

f

Selection from the Menu

- Click with the Left Mouse Button on the Flood Fill Icon in the Main Menu Bar, or hit the "f" keyboard shortcut.

The icon looks like the one next to this reference item.

Set Flood Fill Options

- Click with the Right Mouse Button on the Flood Fill Icon in the Main Menu Bar, or hit the "F" keyboard shortcut.

The Flood Fill Options Menu shown below will appear, allowing modification of the Flood Fill Options used by the tool. The more sophisticated "Tolerance Fill" option is shown as selected. There are no sliders for the "Normal" option.
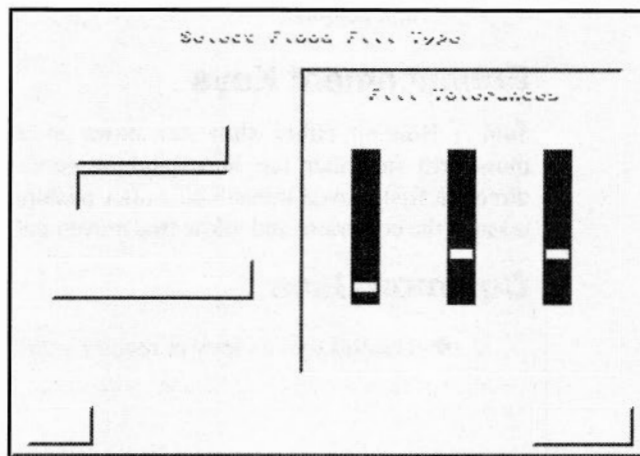
Set Fill Type

- Click the Set Fill Type Button on the Flood Fill Options Menu.

The Fill Options Menu described on page 42 will appear, allowing modification of the global Fill Options used by the tool.

Overview

The Flood Fill Tool works with the global Area Fill Options and gives you a way of filling an area without the necessity to draw around it. It enables you to paint or modify an area in two ways. The "Normal" method scans outward from the initial click point and operates over all adjacent or touching pixels of the same colour, replacing or modifying them with the operation selected. This method is useful when changing areas of solid colour, but when working with 24-bit frame-grabbed and scanned images you will often find no two identical colours, so the "Tolerance Fill" method is provided.

Tolerance Fill examines all pixels adjacent to the point where the mouse is clicked and changes those whose colour falls within a specified HSV tolerance around the colour of that first pixel. This fill method also extends outwards from the click point until all touching pixels that fit into the tolerance range are changed.

Once OpalPaint has scanned to determine all pixels that fall within the fill area it applies the global Area Fill Options to those pixels.

- If you are using a directional gradient fill the word "GRAD" will show next to the pointer, reminding you to specify the direction and range of the gradient across the filled area.

Normal

To use the Normal Flood Fill method,

- Click with the Left Mouse Button on the "Normal" button in the Flood Fill Options Menu.

When you return to the image screen,

- Select the colour source to be used in the Flood Fill, (Texture Pattern or Paint-Pot colour.

- Position the pointer and click once on the colour you wish to replace using the appropriate mouse button (Left to apply, Right for Dynamic Undo).

Tolerance Fill

To use the Tolerance Flood Fill method,

- Click with the Left Mouse Button on the "Tolerance" button in the Flood Fill Options Menu.

- Adjust the sliders to set the desired tolerance range for Hue, Saturation and Value, remembering that each tolerance range will be taken around the equivalent HSV colour component of the pixel clicked on to start the fill operation. See page 24 for a complete discussion of the HSV colour system.

When you return to the image screen,

- Select a pixel within the area to be filled whose colour is as close as possible to the "centre" colour of that area. Click once on the pixel using the appropriate mouse button (Left to apply, Right for Dynamic Undo).

If you used the Left Mouse Button, remember you can;

- ❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

- ❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

- ❖ Change the Tolerance settings, choose a new colour, mode, transparency or other options and hit the "a" (again) key to redo the Flood Fill at the same point.

Common Uses

- ❖ Use this tool to fill or modify irregular areas of the same or similar colour without needing to trace around the area or set up stencils.

MAGIC WAND

Selection from the Menu

- Click with the Left Mouse Button on the Magic Wand Icon in the Main Menu Bar.

The icon looks like the one next to this reference item.

Options Menu

- Click with the Right Mouse Button on the Magic Wand Icon in the Main Menu Bar.

The Magic Wand Options Menu will appear with a slider allowing you to set the level for Edge Tolerance.
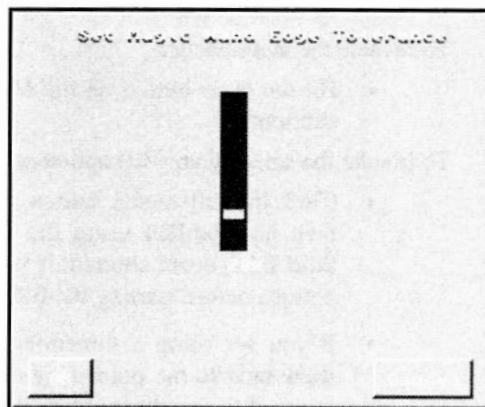
Keyboard Shortcut

There is no keyboard shortcut for this Drawing Tool.

How to Use

The Magic Wand acts as an intelligent area filler, automatically detecting the edges of objects and filling up to them. The best way to understand this tool is to think of it as a Continuous Freehand Area Fill Tool that works out where the edges are rather than you having to draw around an object.

To use the Magic Wand,

- Set the desired edge-detection level using the Magic Wand Options Menu. This will take some experimentation at first.

- Select the fill colour or options as you would for a Continuous Freehand Outline Fill.

- Click on a point inside the area to be included using the Left Mouse Button.

The Magic Wand first scans outward from the point clicked on the image and marks an edge when it encounters a colour gradient greater than the level you specify on the control slider. This marking is done using a "marquee" familiar to users of other computer platforms, and looks like a line of "marching ants".
To change the colour of the "marching ants" outline,

- Hit the Tab key.

To add to the selected area, possibly after adjusting the Magic Wand level,

- Click an unselected area of the image using the Right Mouse Button, or hold down either "Shift" key while clicking using the Left Mouse Button. The new marquee line will then be redrawn. Note that you do not have to wait until the marquee update has finished before clicking on another spot.

To reverse the last selection,

- Hit the undo button on the Main Menu Bar or use the "u" keyboard shortcut.

To invoke the selected area fill option over the marqueed area,

- Click the left mouse button anywhere on the image. The area will then be modified using the pixel modification operators. (Use the Shift-F keyboard shortcut if you wish to modify the selected Area-Fill options before starting the fill).

- If you are using a directional gradient fill the word "GRAD" will show next to the pointer, reminding you to specify the direction and range of the gradient across the filled area.

To cancel the whole Magic Wand operation,

- Hit the Escape key or the Space Bar, or select another Drawing Tool using the mouse or Graphic Tablet stylus.

If you used the Left Mouse Button, remember you can;

- ❖ Click the "Undo" Main Menu Bar button or type "u" to reverse everything you just did.

- ❖ Use the Right Mouse Button to selectively undo parts of your additions or changes.

- ❖ Choose a new colour, mode, transparency or other options and hit the "a" (again) key to redo the same area with the new options.

TEXT

Keyboard

t, T

Selection from the Menu

- First select the Cutout Brush to be used for the text by clicking on the B1, B2 or B3 button on the Main Menu Bar.

- Click with the Left Mouse Button on the "A" Text Icon on the Main Menu Bar.

The Text Options Menu will then appear.
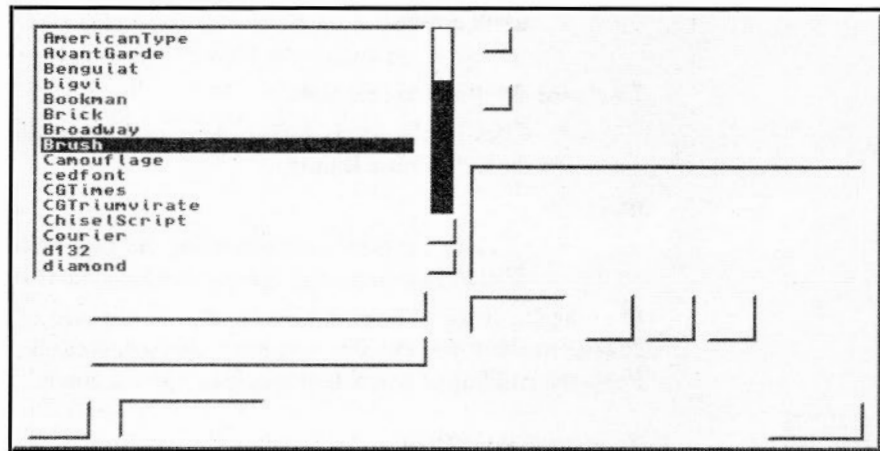
Keyboard Shortcut

T - select Text Options Menu (mnemonic **T**ext)

Font Compatibility

OpalPaint supports most standard Amiga fonts and if Workbench V2.x is installed you can also use Compugraphic™ fonts and ColorFonts with up to 16 colours such as Karafonts™. (Users of Workbench V1.3 can use ColorFonts if a special "wedge" program is run first. This program should be included when you purchase your ColorFonts.)

Note that some fonts may be CAPS-only fonts, so if the brush you create has gaps where you typed lower-case letters you will need to reenter the text using only CAPITAL LETTERS.

How to Use

The area at the top left of the menu contains the names of all standard Amiga fonts in the current font directory. If you have more than 16 fonts installed, you can scroll through the complete list using the scroll bar to the right of the font name box.

To select the font or typeface used for the text,

- Click the name of the font you wish to use using the Left Mouse Button. If the "Show" button is selected a sample of the font will appear in the preview box. (Use the scroll box to access additional font names by dragging the scroll bar or clicking and holding the scroll arrows).

To choose the required font size,

- Click on the scroll arrows above and below the point-size box using the Left Mouse Button.

or,

- Click in the point-size box using the Left Mouse Button, type in the desired font size using the number keys then hit "Return".

Once again, if the "Show" button is selected the size of the preview text will change to show you the size you have selected. Note that with Compugraphic Fonts the building of a new font may take a few seconds.

To make the text **Bold**,

- Click the Bold button in the Text Options Menu.

To make the text *Italic*,

- Click the Italic button in the Text Options Menu.

To make the text Underlined,

- Click the Underline button in the Text Options Menu.

To enter the text to be placed,

- Click in the text box next to the word "Text" and a cursor block will appear.

- Type in the text to be generated, using the normal Amiga text-box editing as necessary (see your Amiga Reference Manual for further details).

- Hit Return and the specified text will replace the currently selected cutout brush. It can then be used like any other Cutout Brush and pasted, manipulated using the Cutout Brush Manipulation Menu, used to create stencils and so on.

Common Uses

❖ Use this tool to precisely place text on your image.

❖ Make a stencil using the text brush then drag a gradient-filled rectangle over the area for wild coloured text.

Useful Tip

❖ When attempting to precisely place text, remember that you can move it around after pasting by using the Ctrl-Alt-Shift combination with the arrow keys. Each push of an arrow key works like a macro command that generates an undo command, moves the brush by one pixel in the indicated direction and re-pastes the brush.

Other Menu Options

There are several other options in this menu.

Path

If you wish to access fonts from another disk, directory or device,

- Click in the "Path:" text box, then type in the path name of the directory containing the fonts.

Keep List

If this button is selected, this option sets up a buffer to hold the font names OpalPaint has found on your system so that it doesn't have to rebuild the font list each time you re-enter the Text Menu.
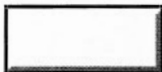
Show

If this button is selected, this option automatically displays a sample of the selected font whenever a new font or font point-size is chosen.

Brushes - Nozzles & Cutouts

OVERVIEW

As discussed in the chapter on the Operation Chain (see page 18) brushes are objects that OpalPaint uses when painting or modifying a freehand path or an outline specified by an outline drawing tool. They are of two types: nozzles and cutout brushes.

Nozzles are rectangular or circular and of variable-size. They also have the added advantage of selectable Artist's Tools, which provide realistic effects such as smooth airbrushes, pencil, charcoal, Texta and oil paints and a variety of "paper" types to give a textured feel to your painting. Artist's Tools can also be used with a Wacom or Calcomp pressure-sensitive tablet for incredible control and realism.

Cutout Brushes are areas "cut" from an image, grabbed from a video signal using the OpalVision Video Processor module, or loaded from disk. These cutouts can be repeatedly "pasted down", manipulated in many ways or used as texture patterns or in area fills.

NOZZLES

OpalPaint provides a selection of various sized and shaped nozzles. To select a nozzle when using sketch or outline drawing tools,

- Position the pointer over the desired nozzle and click with the Left Mouse Button.

To increase or decrease the size of a nozzle,

- Use the "+" and "-" keys. Note that with the key *unshifted* the size of the nozzle changes in single steps while using the *shifted* key changes the size in two-pixel steps.

To customise the size, shape or action of a nozzle, or to choose an Artist's Tool for that nozzle,

- Position the pointer over the nozzle you wish to change and click with the Right Mouse Button, or alternatively double-click with the Left Mouse Button. The Nozzle Manipulation Menu will then appear. You can also use the keyboard shortcut "B" if a nozzle is currently selected.

Each nozzle can be independently customised using resizing and/or Artist's Tools and will retain the options even if another nozzle or cutout is used. For example, you may have the smallest nozzle defined as a pencil, the next as an airbrush, and one of the square nozzles defined as a felt-tip pen. Each nozzle setup can be used after clicking on the appropriate nozzle.

NOZZLE MANIPULATION MENU

The Nozzle Manipulation Menu allows you to customise the size and sometimes shape of a nozzle and also allows access to the OpalPaint Artists Tools, Paper Types and Tablet Controls.

The Nozzle Manipulation Menu looks like this:
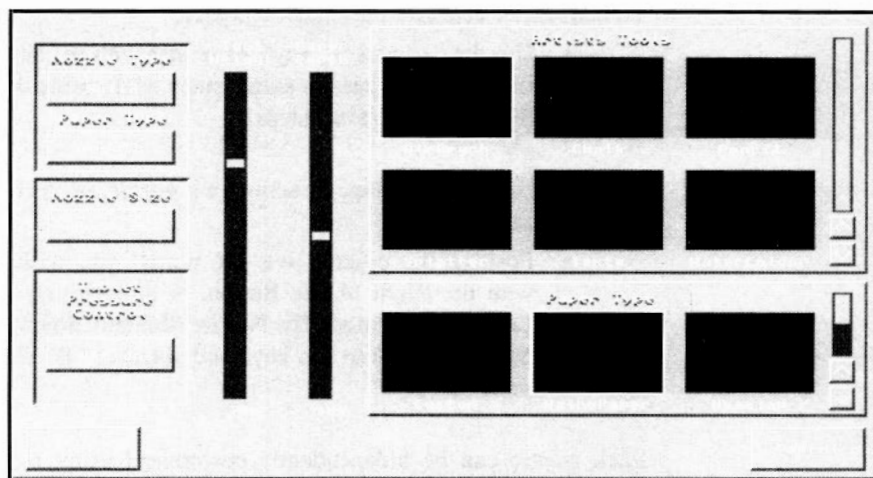
Nozzle Type

The Nozzle Type button is used to remove any Artist's Tool selected for that nozzle and return it to "normal", i.e. the way it was before choosing an Artist's Tool. This includes the nozzle size in place before choosing the Artist's Tool.

To reset a nozzle to its standard Solid shape and size,

- Click the "Solid" button.

Paper Type

To remove any Paper Type selected for that nozzle and return it to "normal", i.e. the way it was before choosing an Artist's Tool,

- Click the "Smooth" button.

Nozzle Size

To resize a nozzle,

- Click the "Re-Size" button on the Nozzle Manipulation Menu. The menu will disappear, taking you back to the painting screen with an outline of the current nozzle size and the word "SIZE" attached to the pointer.

- Hold down the Left Mouse Button while dragging out the new nozzle size. Release the button when the nozzle is the desired size and shape.

Some points to note:

- ❖ Obviously the size of the brush will radically effect the speed of the nozzle or Artist's Tool as it directly effects the number of screen pixels that must be updated for each nozzle "paste-down". So for faster painting - use smaller nozzles.

- ❖ Because the nozzle re-sizing uses a "rubber-band" method of showing the size and shape, this means you will not be able to use the "a" or Redo key to repeat the drawing operation you did immediately before entering the Nozzle Manipulation Menu. See page 237 for more information about the Redo function.

Artist's Tools

Artist's Tools give you the ability to use realistic, real-life tools such as airbrushes, textas (felt tips), pencils and charcoal with different textured "paper types". Each Artist's Tool is represented in the Nozzle Manipulation Menu by a thumbnail picture.

To select an Artist's Tool for a nozzle,

- click the thumbnail image for that tool using the Left Mouse Button.

In most cases a slider will appear in the centre of the menu controlling the Tool Weight or flow-rate of the Artist's Tool. Generally the higher the slider level, the faster the Tool will operate but with less of the "Painting medium" applied. Also remember that with a Pressure-sensitive Tablet this Tool Weight can be adjusted "on the fly" by pressing the stylus harder.

On occasion an Artist's Tool will have an Options menu to setup various aspects of the Tool's operation. Note that this menu is different to the Nozzle pressure options menu. Although not implemented for any of the Artist's Tools shipped at the time this manual was written (February, 1993), the facility has been included to allow for future enhancements. To access the options menu for the current Artist's Tool (if one exists),

- Hit the Amiga-t keyboard shortcut. There is no way to access this menu using the mouse or tablet stylus.

New Artist's Tools can be purchased from your dealer or can be obtained as shareware or in the public domain. If you are a programmer you can experiment with your own Artist's Tools, with the directions and source code available as part of the OpalVision Programmer's Toolkit.

Paper Type

Paper Types allow loadable textures that interact with different Artist's Tools for realistic textured effects.

To select a Paper Type to be used for a nozzle,

- click the thumbnail for that paper type using the Left Mouse Button.

In most cases a slider will appear in the centre of the menu controlling the Paper Depth or proportional effect of the Paper's texture on the Artist's Tool. Generally the higher the slider level, the more effect the paper texture will have.

On occasion a Paper Type will have an Options menu to setup various aspects of the Paper Types operation. Although not implemented for any of the Paper Types shipped at the time this manual was written (February, 1993), the facility has been included to allow for future enhancements. To access the options menu for the current Paper Type (if one exists),

- Hit the Amiga-r keyboard shortcut. There is no way to access this menu using the mouse or tablet stylus.

New Paper Types can be purchased from your dealer or can be obtained as shareware or in the public domain. If you are a programmer you can expreriment with your own Paper Types, with the directions and source code available as part of the OpalVision Programmer's Toolkit.

Tablet Pressure Control

The Tablet controls over the Artist's Tools currently work with supported pressure-sensitive tablets including the Wacom and Calcomp ranges. (See below for configuration information). Note that several other tablets have drivers that emulate the Amiga mouse but do not have a pressure-sensitive stylus. These should work well, but will obviously not use the features shown in this section. Other tablets may be supported in the future, so keep in touch with your OpalVision dealer. If OpalPaint finds an active tablet driver or the correct driver in the "devs:" directory the "Options" button will be "un-ghosted" and will be available for use.

To access the Tablet Pressure Control menu,

- Click the Tablet Pressure Control "Option" button in the Nozzle Manipulation Menu. The following menu will appear.
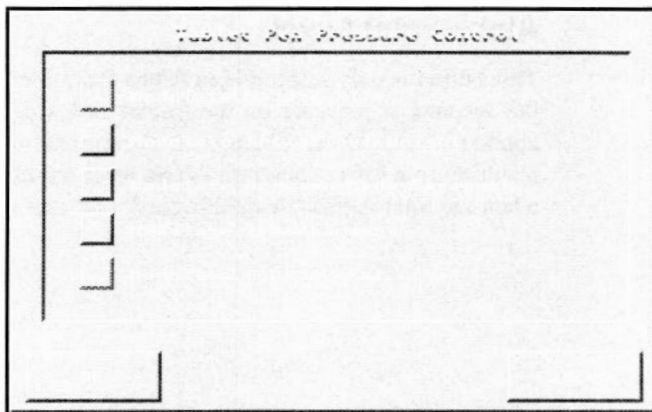
Note that with some Artist's Tools some options may be precluded and you will find those options ghosted and unselectable.

Nozzle Size

With this button selected the amount of pressure on the Tablet stylus directly changes the size of the nozzle tip, with harder pressure giving a larger nozzle and visa versa.

Nozzle Weight

With this button selected the amount of pressure on the Tablet stylus directly changes the Tool Weight, with harder pressure giving a faster flow rate. This is exactly the same control as the Tool Weight slider, except that it is constantly updated as you move the stylus and change pressure on the tip.

Drawing Mode Strength

With this button selected the amount of pressure on the Tablet stylus directly changes the strength of the currently selected Drawing Mode (assuming of course that the Mode has an option slider), with harder pressure giving a higher slider setting. This is exactly the same control as the Drawing Mode slider, except that it is constantly updated as you move the stylus and change pressure on the tip.

Transparency

With this button selected the amount of pressure on the Tablet stylus directly changes the transparency of the current operation, with harder pressure resulting in a lower transparency (more opacity) and visa versa. In this way you can build up areas of the image using light pressure to produce very transparent strokes, or press harder to make stronger changes to the image.

Alpha Paint Level

This button is only selectable in Alpha Paint Mode, but with this button selected the amount of pressure on the Tablet stylus directly changes the Alpha level applied to the Alpha Channel in the current operation, with harder pressure resulting in a lower (blacker) Alpha level (resulting in a more transparent area when the final Alpha Channel is used) and visa versa.

Installing and Configuring a Tablet Driver

OpalPaint provides three levels of tablet support with the following priority.

1) The AmigaDOS 3.x tablet support

2) The Trimedia / Workbench 2.x Calcomp drivers

3) The OpalVision Wacom and Calcomp Pressure Tablet drivers.

This means that if you have an Amiga 4000 or the Trimedia Calcomp driver there is no need to install the OpalVision drivers.

The Installation program included with the OpalVision Main Board and OpalPaint includes an option to install a driver for either the Wacom or Calcomp Pressure-sensitive Tablet, but if you purchased your tablet after initial OpalPaint installation you will need to install the tablet driver separately.

To install the tablet driver,

- Exit from OpalPaint, saving your work first if necessary.

- At the Workbench, insert the "Install" disk included with your OpalVision Main Board. Double-click on the "OVInstall" Icon to open a window for the disk

- Double-click on the OVInstall icon to run the general OpalVision installation program, and un-check all options except either "Wacom Driver" or "Calcomp Driver" before continuing. (For the technically minded, the script extracts a file called "WacomII.driver" or "Calcomp.driver" from the archive on the Install disk and copies it into the "Devs:" directory. It also copies a configuration program to the system preferences directory.)

To use the tablet,

- Connect your graphics tablet to the serial port of your Amiga using the cable provided and switch on the power to the tablet.

- From the Prefs window on the Workbench, double-click the "ConfigWacom" or "Config Calcomp" icon to enter the Wacom configuration program. This program allows you to set the usable area and configure the pressure sensitivity of your particular tablet.

The next time you enter OpalPaint and each time hereafter, you will hear a beep from the tablet (if supported) as it is recognized and configured by OpalPaint. If the tablet was turned off or not connected, exit from OpalPaint, correct the problem and re-enter OpalPaint.

CUTOUT BRUSHES

B1 B2 B3

OpalPaint provides three separate cutout brushes at any one time. They are called, very imaginatively, B1, B2 and B3 and each has a button on the Main Menu Bar. Each one can be independently cut, pasted, manipulated, scaled and loaded from or saved to disk. Each will retain all settings even if you select a nozzle or another cutout brush and later reselect the same cutout brush.

To change the current Cutout Brush for a paste down or outline drawing operation,

- Click the Main Menu Bar button (B1, B2 or B3) for the cutout brush you wish to use.

Keyboard

b

Cutout Brush Pickup

To cut an area of an image and use it as a cutout brush, you must first tell OpalPaint which brush (B1, B2 or B3) you want to pick up.

- Click with the Left Mouse Button on button B1, B2 or B3 on the Main Menu Bar.

- Then click with the Left Mouse Button on the Scissors icon from the Main Menu Bar and the pointer will change to give crosshairs on the screen.

At this point the Main Menu Bar will show the tools available for brush cutting; freehand, rectangle, ellipse or circle, polygon and Magic Wand. These tools are used in the same way as when painting.

- If the tool shape you wish to use for the brush cut is *not* highlighted, click the button for the desired brush cut tool using the Left Mouse Button. The selected tool will then be highlighted. (The selected tool will default to the rectangle).

If you wish to *copy* the cutout brush area, i.e. pick up the area of the cut without affecting the image,

- Use the selected brush cutout tool and the **Left** Mouse Button to specify the area of the image to be picked up.

Alternatively, if you wish to *cut* the cutout brush cut area by removing the brush and leaving behind a solid background colour,

- Use the selected brush cutout tool and the **Right** Mouse Button to specify the area of the image to be picked up. The background colour is determined by taking an average of the colours at four evenly spaced "corners" of the area. This is most useful when there is a solid colour "behind" the object you are picking up.

For example, to use the Freehand tool, draw around the area while holding down the appropriate mouse button (Left to copy, Right to cut), or to use the Magic Wand click with the pointer somewhere in the area to be picked up, repeatedly click with the Right Mouse Button until the area is properly defined then click the Left Mouse button again to initiate the brush cut.

Note that the area to be cut out *includes* the single pixel outline drawn by the brush cutout tool. Also note that if the Stencil is switched on, OpalPaint will not pick up any pixels within the cutout area that fall within a colour or keep-out stencil area but will instead make the cutout brush transparent at that point. This means that if you wish to pick up a complicated object but not the surrounding background, you can first go into Stencil Work Mode and define a stencil over the background using all the drawing tools and the magnify option and then pick up the brush using any cutout tool. The stencilled area will then be transparent in the cutout brush.

After releasing the mouse button the status area on the Main Menu Bar will tell you that cutting is in progress. The pointer will then change to show a simple line-art style representation of the brush you just cut. You can then, amongst other things,

- ❖ Paste down single copies of the brush using the Sketch Drawing Tool from the Main Menu Bar,

- ❖ Use it with any of the Outline Drawing Tools as you would a nozzle,

- ❖ Modify it in many different ways using the Cutout Brush Manipulation Menu,

- ❖ Wrap it onto an object using the Brush Wrap option in the Area Fill Options Menu and Area Fill Drawing Tools.

- ❖ Use the brush as a Texture Map to be repeated across an image.

Default Brush Selection

Note that if you forget to specify which brush you wish to cut to, OpalPaint defaults to the first (B1). For this reason it is probably a good idea to get in the habit of using the B1 brush for less important cutouts that you change all the time and use B2 and B3 for cutouts you may need to come back to later. That way if you cut a brush and forget to specify which one to cut into, you are less likely to loose a cutout by mistake. Of course the only really sure way to keep important brushes is to save them to disk.

Brush Cut Mode

Keyboard

b

To bring up the Brush Cut Mode Menu,

- Click the Scissors Icon with the Right Mouse Button or alternatively double-click with the Left Mouse Button.

The Brush Cut Mode Menu looks like this (Note that the "Tolerance" Mode is selected in this example):
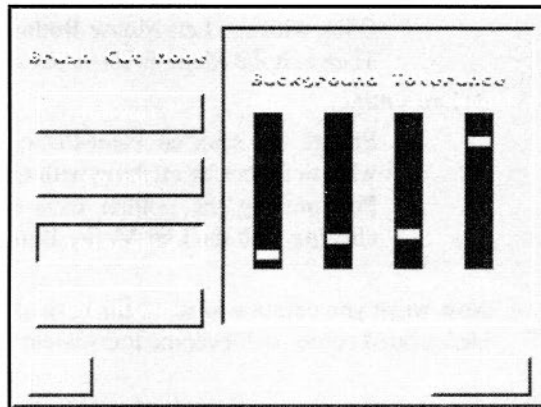
This menu allows you to tell OpalPaint to include all pixels within the cutout area to be picked up, or alternatively treat parts of the cutout area as background when cutting. In the same way that stencilled areas become transparent when cut out, these background areas will appear transparent when pasting or drawing with the new cutout brush, allowing the existing image at that point to show through.

The available Cutout options are

Normal

This picks up all pixels within the area specified by the cutout tool including the actual line drawn by the cutout tool. If the Colour and/or Area Stencil are switched on, ie the "STEN" button selected, the "excluded", stencilled areas will still be treated as transparent.

Background Colour

This option allows you to specify a single colour that will be treated as background when cutting. Note that in general this option is only useful when the section of image to be cutout has been painted on a solid background colour. Scanned or frame-grabbed images invariably have a range of colours as background even if they appear to be the same shade, so the Tolerance Pickup described below is generally more useful in these images.

To ignore the background colour when cutting,

- Click with the Left Mouse Button on the Background Colour button. Then exit the Menu in the usual way.

Before cutting,

- Ensure the selected Paint-Pot contains the background colour you wish to ignore by clicking with the Right Mouse Button on the Paint-Pot, moving the pointer over the background on the image and clicking with the Left Mouse Button.

Now when you cutout a brush in the normal way any occurrence of the specified background colour will become transparent in the cutout brush.

Tolerance Pickup

Tolerance Pickup takes the Background Colour option one step further by allowing you to specify a *range* of background colours that will appear transparent in the final cut brush. When you click with the Left Mouse Button on the Tolerance Pickup button, a set of sliders will appear in the box on the right of the Menu.

Hue, Sat, Val Sliders

The sliders labelled Hue, Saturation and Value allow you to specify a tolerance range for each colour parameter around the Paint-Pot colour in the same way as for Colour Stencils. See the section on Colour Stencils on page 111 for a full description of the use of HSV tolerance ranges. Also remember that the Colour Feedback area in the Extras Menu can be useful in estimating colour tolerance ranges (see page 228 for further details).

Smooth Slider

The Smooth slider allows you to specify how smooth the edges of the cutout brush will be. Image colours that fall within the Background Tolerance Range will always be excluded from the cutout (because the relative transparency of those pixels in the cutout will be 100%, or fully transparent), but the treatment of those pixels with colour "just outside" the Background Tolerance Range is determined by the setting of the Smooth Slider.

If the slider is set at 0%, there will be a sharp edge wherever colours are encountered that fall within the Background Tolerance Range. However, as the level of the Smooth slider is moved up, the transparency of those pixels that are just inside the Background Tolerance Range will be set to a level proportional to how far inside the Tolerance Range those pixels fall. Those pixels with colour just inside the Tolerance Range will be almost fully transparent, while the pixels with colour quite different to the Tolerance Range will have almost no transparency. The level of the slider controls the range of colours over which this variable Transparency works: a kind of Tolerance around the Tolerance range if you like. When the cutout is later pasted down, this transparency around the "edges" will give a smooth edge to the cutout.

Important Note - if the original image colours change rapidly from being outside the tolerance range (i.e. included in the cutout) to well within the excluded range you will still have "jaggies" along that edge in the cutout brush. Use the Anti-Aliasing feature when pasting the cutout to smooth out these edges.

Using Tolerance Pickup

- After setting the sliders to the desired levels, click with the Left Mouse Button on the "OK" button to exit.

Before cutting a brush,

- ensure the selected Paint-Pot contains the background colour at the centre of the Tolerance Range you wish to ignore by clicking with the Right Mouse Button on the Paint-Pot, moving the pointer over the background on the image and clicking with the Left Mouse Button.

Now when you cut out a brush in the normal way any pixels with a colour that falls within the specified tolerance around the colour in the selected Paint-Pot will become transparent in the cutout brush.

Use Alpha

If the "Use Alpha" option is selected, the Alpha (Transparency) channel generated in Alpha Work Mode (see page 200) will be cut out along with the image colours and will be used when pasting the cutout.

To toggle the "Use Alpha" option,

- Click the "Use Alpha" button using the Left Mouse Button.

A couple of tricks:

- ❖ If you have a cutout brush without an alpha channel and you wish to add an alpha channel, open a spare page just large enough for the cutout, paste it down, edit the alpha channel using Alpha Work Mode, then pick up the brush again with the "Use Alpha" option selected.

- ❖ To edit the existing alpha channel of a cutout brush, save the brush (perhaps to the Ram drive) then open a spare page and load in the brush as an image. Edit the Alpha Channel of the brush/image, jump back to Paint Work Mode then cut out the brush with the "Use Alpha" option selected. Voila!

CUTOUT BRUSH MANIPULATION MENU

The Cutout Brush Manipulation Menu provides options to resize, rotate, warp, load, save, copy and change the handle position of cutout brushes.

To manipulate a cutout brush,

- Click the appropriate brush button (B1, B2 or B3) with the Right Mouse Button (or double-click with the Left Mouse Button), or use the keyboard shortcut "B" if a cutout brush is currently selected.

The Cutout Brush Manipulation Menu will appear with the following options grouped by similar function.
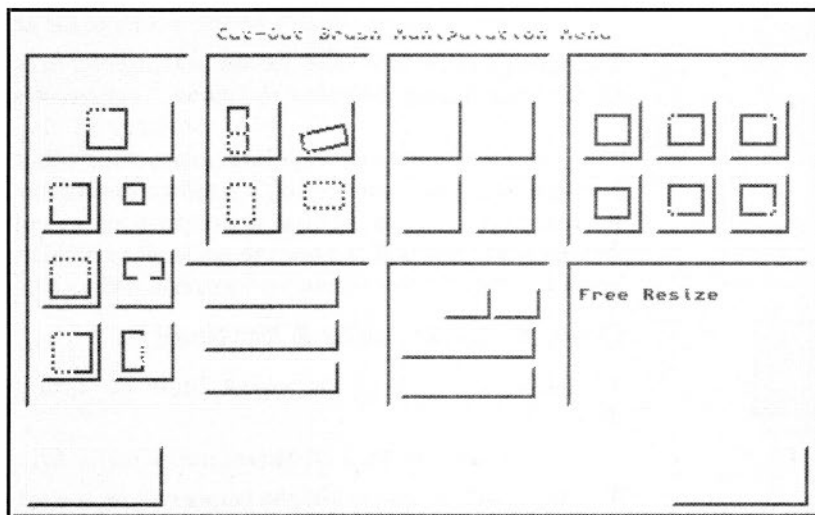
RESIZE OPTIONS
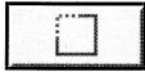
Free Resize

To freely resize the cutout brush,

- Click with the Left Mouse Button on the Icon shown here.

The Cutout Brush Manipulation Menu will disappear and the pointer will show the word "SIZE" next to it. To change the size of the cutout brush,

- Hold down the Left Mouse Button and move the pointer.

You will see the outline of the cutout change as the pointer moves,

- When the cutout is the desired size and shape release the Left Mouse Button and the cutout will be resized to the new dimensions.

The speed and method used for the resizing depends on the resizing option selected (see Blocky, Smooth 1 or Smooth 2 options on page 100)

Shift - Holding either shift key down at any time will lock the scaling factor in both the horizontal and vertical direction, so that the aspect ratio (the ratio between horizontal and vertical dimensions) of the cutout will be maintained. Releasing the key will remove the constraint and allow free movement of the brush and independent scaling of horizontal and vertical dimensions.
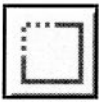
Double Horizontally & Vertically

To double the size of the cutout brush in both horizontal and vertical dimensions,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the cutout will be resized to the new dimensions. The speed and method used for the resizing depends on the resizing option selected (see Blocky, Smooth 1 or Smooth 2 options on page 100).

This option is especially useful when moving from a low-resolution non-interlaced image to a high-resolution interlaced image.

Keyboard
Z

Keyboard
H

Keyboard

h

Halve Horizontally & Vertically

To halve the size of the brush in both horizontal and vertical dimensions click with the Left Mouse Button on the Icon shown here. The menu will disappear and the cutout will be resized to the new dimensions. The speed and method used for the resizing depends on the resizing option selected (see Blocky, Smooth 1 or Smooth 2 below on page 100).

This option is especially useful when moving from a high-resolution interlaced image to a low-resolution non-interlaced image.
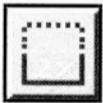
Keyboard

Y

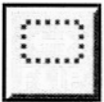## Double Vertically

To double the size of the cutout brush in the vertical dimension,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the cutout will be resized to the new dimensions. The speed and method used for the resizing depends on the resizing option selected (see Blocky, Smooth 1 or Smooth 2 options on page 100).
This option is especially useful when moving from a non-interlaced image to an interlaced image.

Halve Vertically

To halve the size of the cutout brush in the vertical dimension,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the cutout will be resized to the new dimensions. The speed and method used for the resizing depends on the resizing option selected (see Blocky, Smooth 1 or Smooth 2 options on page 100).

This option is especially useful when moving from an interlaced image to a non-interlaced image.
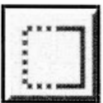
Keyboard

X

Double Horizontally

To double the size of the cutout brush in the horizontal dimension,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the cutout will be resized to the new dimensions. The speed and method used for the resizing depends on the resizing option selected (see Blocky, Smooth 1 or Smooth 2 options on page 100).

This option is especially useful when moving from a low-resolution to a high-resolution image.
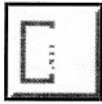
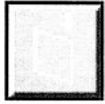### Halve Horizontally

To halve the size of the cutout brush in the horizontal dimension,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the cutout will be resized to the new dimensions. The speed and method used for the resizing depends on the resizing option selected (see Blocky, Smooth 1 or Smooth 2 below).

This option is especially useful when moving from a high-resolution to a low-resolution image.

Resizing Methods

All *reductions* in the size of the cutout use a sampling method to do true scaling of the cutout while retaining as much detail as possible, but there are three different methods available when enlarging cutout brushes. These options are described below.

Note that the option selected in this menu will be globally used by OpalPaint in other cutout resize operations such as resizing a cutout brush used as a Texture Pattern.

Blocky

The "Blocky" resizing method uses no smoothing at all when enlarging cutout brushes. Each pixel in the cutout is effectively enlarged to cover a larger area, but all pixels in that larger area will be exactly the same colour.

The advantage of the Blocky resize method is its speed, but you will often find "jaggies" and edges between colours when you paste the enlarged cutout.
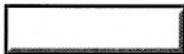
Smooth 1

Smooth 1 uses a linear interpolation method to predict the colour of intervening pixels when enlarging a cutout brush. This results in smoother gradients and trends of colour, but may still result in some blurring or visible edges if the "slope" of the colour trend changes quickly at a pixel.

Smooth 2

Smooth 2 uses a cubic-spline interpolation to choose the colours of intervening pixels when enlarging a cutout brush. This method calculates a smooth curve in the colour changes to get maximum smoothness in the enlarged cutout, while retaining as much detail as possible.

Smooth 2 usually yields the best results, but the extra calculations mean it is comparatively much slower than Smooth 1. For most work you should find that Smooth 1 is the best compromise. Experiment for yourself.

Rotation

90 Degrees

To rotate the cutout brush around the current brush handle by 90 degrees in the anti-clockwise direction,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the cutout will be rotated.

Keyboard

z

Variable Angle

To freely rotate the cutout brush around its lower-left corner,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the pointer will show the word "ROT" next to it.

- While holding down the Left Mouse Button , move the pointer until the outline of the cutout has been rotated to the required angle,

- Release the mouse button.

Flip Vertically

To flip the cutout brush vertically,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the cutout will be flipped.

Keyboard

y

Flip Horizontally

To flip the cutout brush horizontally,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the cutout will be flipped.

Keyboard

x

Warp

Bend Centre Horizontally

To bend the centre of the cutout brush horizontally while fixing the ends,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the pointer will be shown with the word "SKEW" next to it.

- Hold down the Left Mouse Button and drag the mouse and the centre of the cutout outline will bend in the horizontal direction.

- Release the mouse button when the outline is the desired shape and the cutout brush will be redrawn.

Bend Centre Vertically

To bend the centre of the cutout brush vertically while fixing the ends,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the pointer will be shown with the word "SKEW" next to it.

- Hold down the Left Mouse Button and drag the mouse and the centre of the cutout outline will bend in the vertical direction.

- Release the mouse button when the outline is the desired shape and the cutout brush will be redrawn.

Skew Horizontally

To shear the cutout brush horizontally,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the pointer will be shown with the word "SKEW" next to it.

- Hold down the Left Mouse Button and drag the mouse sideways. The top of the cutout outline will move in the horizontal direction.

- Release the mouse button when the outline is the desired shape and the cutout brush will be redrawn.

Skew Vertically

To shear the cutout brush vertically,

- Click with the Left Mouse Button on the Icon shown here.

The menu will disappear and the pointer will be shown with the word "SKEW" next to it.

- Hold down the Left Mouse Button and drag the mouse up and down. The right of the cutout outline will move in the vertical direction.

- Release the mouse button when the outline is the desired shape and the cutout brush will be redrawn.

Handle

The brush handle is the point at which the mouse pointer "holds" the cutout brush. This is important when attempting to paste the cutout brush near the edges of the screen, because although the brush can extend onto parts of the image outside the screen area the pointer cannot.

More importantly, however, the brush handle is the point of the brush that snaps to the grid and that moves along a path or outline specified when using an outline drawing tool.

As an example illustrated by the diagram opposite, if you draw an ellipse with a circular nozzle or cutout brush that has the brush handle placed at the centre of the brush, the resulting ellipse will be centred directly over the path you sketch out with the drawing tool. However, if the brush handle is not at the centre of the brush, the final ellipse drawn with that brush will be offset from the path you trace out with the drawing tool.

Ellipse drawn with handle in centre of brush

This can be useful when you want to generate a precise drop shadow or embossing effects when you want to paste down the same brush several times. By switching on the grid set to the desired size and offsetting the brush handle slightly, the shadows can

Same ellipse drawn with handle offset from brush

be placed over the image, then with the handle returned to the centre place down the copies of the actual cutout brush.
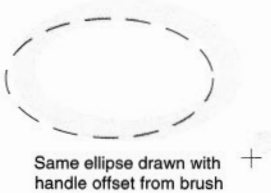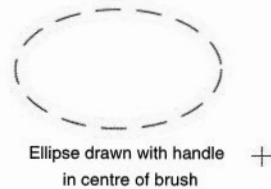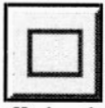
Handle at Centre

Keyboard
Alt-s

If you click with the Left Mouse Button on this button the brush handle will be moved to the geometric centre of the brush.
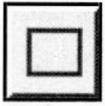
Place Handle

Keyboard
Alt-z

If you click with the Left Mouse Button on this button the menu will disappear and the mouse pointer will show the word "HNDL" next to it. To place the brush handle

- Press and hold the Left Mouse Button while dragging the crosshairs to the new brush handle position

- Release the mouse button.

Remember the grid, if selected, will also affect the movement of the handle.
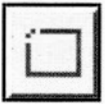
Handle at Top Left

If you click with the Left Mouse Button on this button the brush handle will be moved to the top left corner of the brush.

Handle at Top Right

If you click with the Left Mouse Button on this button the brush handle will be moved to the top right corner of the brush.

Handle at Bottom Left

If you click with the Left Mouse Button on this button the brush handle will be moved to the bottom left corner of the brush.

Handle at Bottom Right

If you click with the Left Mouse Button on this button the brush handle will be moved to the bottom right corner of the brush.

Brush Transfer Functions

Copy From

If you click on one of these buttons a copy of the specified brush will replace the current brush. For example, if you are in the Cutout Brush Manipulation Menu for brush B2 and you click the Copy From B3 button, the current cutout brush B2 will be replaced by a copy of Cutout Brush B3.

This can be useful when you wish to experiment with a lot of different manipulations of a cutout brush, say B3. By doing the actual manipulation in another cutout brush, say B2 or B1, you can copy from B3 at any time to get a fresh copy of the cutout and try another manipulation. Of course, if it is really important to keep brush B3 you should take a moment to save the cutout brush to disk, because accidents do happen (usually when you can least afford them!).

Load Cutout Brush

To load a previously saved Cutout Brush from disk,

- Select the Cutout Brush Manipulation Menu for the Cutout Brush you wish to replace by clicking the appropriate button (B1, B2 or B3) in the Main Menu Bar using the Right Mouse Button.

- Click the "Load" button on the Cutout Brush Manipulation Menu.

The File Menu will then appear, with the words "Load Cutout Brush" at the top-centre of the menu. The use of this generalised menu is described in detail in the section on the File Menu, beginning page 229. When you select a brush by name or from its thumbnail image, that brush will be loaded into the current cutout brush and will replace the current cutout.

Save Cutout Brush

To save the current contents of a Cutout Brush to disk,

- Select the Cutout Brush Manipulation Menu for the Cutout Brush you wish to save by clicking the appropriate button (B1, B2 or B3) in the Main Menu Bar using the Right Mouse Button.

- Click the "Save" button on the Cutout Brush Manipulation Menu.

The File Menu will then appear, with the words "Save Cutout Brush" at the top-centre of the menu. The use of this generalised menu is described in detail in the section on the File Menu, beginning page 229. If you specify a new name for the brush it will be saved, along with its thumbnail image. If you select a saved brush by name or from its thumbnail image, that brush on disk will be replaced by the current cutout brush.

Texture Patterns & Rub-Through

Overview

The use of texture patterns removes the limitations of a single Paint-Pot colour and allows you to paint or modify images using complicated and repeating patterns and textures using any combination of colours. As you paint or modify an image, the colour information for the nozzle or area no longer comes from the Paint-Pot but is instead taken from the Texture Pattern at that point.

This Texture Pattern can be taken from any one of the three cutout brushes B1, B2 or B3, or from another OpalPaint image held in a Spare Page (Rub-through option).

Note that if you are filling an area with the texture pattern and the fill-type is a gradient fill, the gradient colour information is ignored but if a transparency gradient has been set it will be combined with any transparency information stored with the Texture Pattern and then further combined with the Global Transparency setting to calculate the final transparency used in modifying the image.

Another point to note is that even the Texture Pattern's colour information can be discarded if the "Single" colour source button is selected in the Mode Selection Menu, leaving only the combined transparency settings. See further discussion on page 195.

Txtr

To switch Texture Patterns on or off,

- Click the "TXTR" button on the Main Menu Bar using the Left Mouse Button. Each Click will toggle the button between On and Off.

Brush Options

To specify options for the Texture Pattern, click with the Right Mouse Button (or double click using the Left Mouse Button) on the "TXTR" button from the Main Menu Bar. The Texture Pattern Options Menu will then appear.
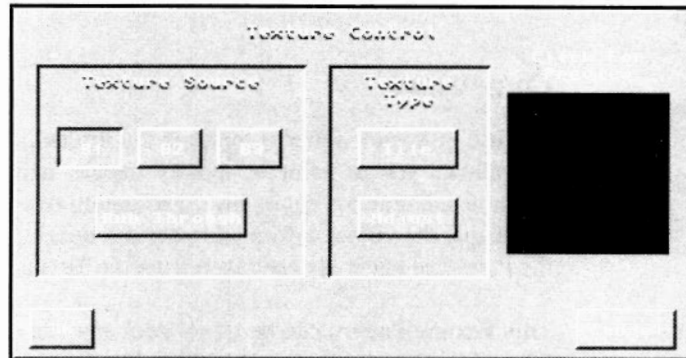
Specify Brush

To create a Texture Pattern from a cutout brush (see page 86 to cut a brush),

- Click one of the three brush buttons marked B1, B2 or B3.

To see a preview of what the texture pattern will look like,

- Click once in the Preview box using the Left Mouse Button.

The Texture Pattern is formed by repeating the selected Cutout Brush across the image with the edges of the cutout brush touching each other. Note that if you cut out a brush using a non-rectangular cutout tool, or specify a background colour to ignore when cutting a brush, the brush is still contained in a rectangular frame just large enough to cover the widest and highest points of the cutout area and the remaining space in the rectangular frame is stored as a fully transparent area. It is this rectangular frame that is repeated to form the Texture Pattern.
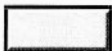
Tile

If you click the "TILE" button, alternate copies of the brush in the Texture Pattern will be horizontally flipped and alternate rows will be vertically flipped so that where the brush cutout was through a coloured and patterned area, these colours will be continuous across the edges of the Texture Pattern formed.

Adjust Size & Position

To adjust the size of the repeated copies of the cutout brush and the starting position of the repeating pattern,

- Click the "Adjust Size" button on the Texture Pattern Options Menu. The menu will disappear and a grid will be attached to the pointer. Each cell in the grid will be the size of the original cutout brush used for the Texture Pattern.

- Move the pointer and the attached grid. When you click the Left Mouse Button, the top left corner of the attached grid will become a corner point on the new grid and the Texture Pattern will repeat the cutout brush across the image using the spacing specified by the grid.

- To change the size or shape of the grid, hold down the Left Mouse Button after clicking to specify the grid position and drag the mouse until the cells of the grid are the required size and shape. Note you can hold down the Shift key while dragging to keep the aspect ratio of the cutout brush unchanged.

- Release the button and the cutout brush being used for the Texture Pattern will be resized using the Brush Resize Method specified in the Cutout Brush Manipulation Menu. The brush itself will also be resized, so if you wish to retain the brush unchanged you should save it to disk or copy it into another Cutout Brush before changing the Texture Pattern grid.

Rub-Through Options

To enable the Rub-Through options set in the Spare Page Options Menu ,

- Click the "Rub Through" button.

The colour and transparency information for the Texture Pattern will now come from the specified spare page rather than from a cutout brush. Please see the section commencing page 208 for a full discussion on Rub-Through and its use.

This button is merely to enable and disable the function, not set up its options.

Stencils

OVERVIEW

Stencils or friskets are traditionally used by airbrush artists to screen their work and confine paint to the required areas. OpalPaint provides a powerful set of stencil tools that enable you to speed up and fine-tune all painting operations.

As discussed in the section on the Operation Chain (see page 18), stencils act like a switch when modifying each pixel. This switching can be based on the existing colour of the pixel when using Colour Stencils, or on a pixel by pixel on/off overlay when using Area Stencils. This means that if the existing colour of the pixel falls within a specified exclude colour stencil, or the pixel falls within the keep-out stencil overlay, no further operation is performed on that pixel and it remains unchanged.

Sten

To enable or disable the current stencil options,

- Click the "STEN" button on the Main Menu Bar using the Left Mouse Button. Each click will toggle the setting between selected and deselected.

THE STENCIL OPTIONS MENU

| Sten |

To invoke the Stencil Options Menu so you can select or deselect either Colour and/or Area Stencils and adjust Colour Stencils,

- Click the "STEN" button on the Main Menu Bar using the Right Mouse Button, or double-click the "STEN" button using the Left Mouse Button.

The Stencil Options Menu looks like this:
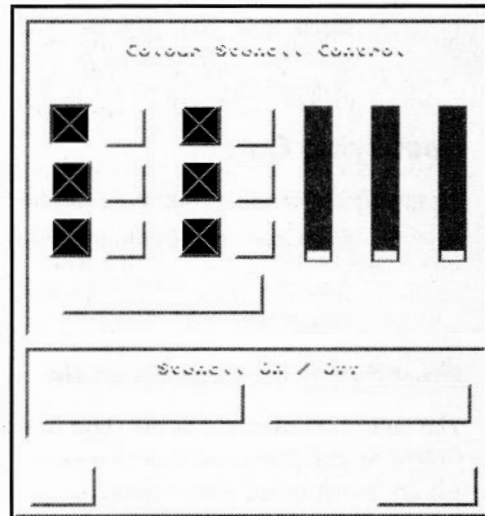
Colour Stencils

The Stencil Options Menu contains spaces for up to six Colour Stencil Ranges. For each colour stencil you specify:

- ❖ The central colour for the Colour Stencil Range.
- ❖ Whether pixels that fall within the Colour Stencil Range are to be included or excluded when painting or modifying.
- ❖ The Hue, Saturation and Value tolerances around the specified central colour

Exclude All

The "Exclude All" button is functionally equivalent to a colour stencil with all sliders set to 100%. Its main use is in conjunction with "Include" colour stencils to literally exclude all colours in the image *with the exception of* the colour tolerance ranges specified by the Include colour stencils.

Enabling a Colour Stencil Range

To enable or disable a Colour Stencil range,

- Click once in the Colour Box to select it.

- Each time you click the Colour Box it will now toggle between disabled, indicated by a cross over the Colour Box and enabled, indicated by the absence of a cross over the Colour Box.

Specifying Colour

To specify the central colour for a Colour Stencil Range,

- Click once in the colour box to select it.

- Click on any screen or Paint-Pot colour to "load" that colour into the colour box.

Specifying Include/Exclude

The button immediately to the right of each Colour Box indicates whether that Colour Stencil Range will act to *include* (i.e. paint over) image colours that fall within the specified colour range, or *exclude* (i.e. not paint over) those image colours. To toggle the setting,

- Click the Include/Exclude box using the Left Mouse Button. Each click will toggle between "I" for Include and "E" for Exclude.

Include Stencils always take priority over Exclude Stencils. See the section commencing on page 116 for further information on Stencil Priority.

Specifying Range

Each Colour Box has its own set of H, S and V (Hue, Saturation and Value) tolerances. Each tolerance setting is the acceptable percentage variation in that colour component on either side of the equivalent colour component in the Colour Box. When using the colour stencil, the colour components from each pixel are compared to the component ranges of each Colour Range Stencil and if within all tolerance ranges the appropriate include or exclude stencil is activated.

To adjust the Colour Tolerance Range for a particular Colour Stencil,

- Click once in the Colour Box to select it. The three tolerance range sliders in the box to the right of the Stencil Options Menu will change to show the HSV tolerances currently set for that Colour Box.

- Adjust each slider by dragging the slider button while holding down the Left Mouse Button, or by clicking in the slider box above or below the slider button. The exact percentage level set for each colour component is shown below its slider.

The Colour Feedback area in the Extras Menu can be useful in estimating colour tolerance ranges (see page 228 for further details).

Enable Stencils

In the lower half of the Stencil Options Menu are two buttons to separately enable and disable the Colour and Area Stencils. In this way you can temporarily switch off just the Colour or Area Stencil and leave the other active, but without loosing the settings for the disabled stencil.

To toggle Colour or Area Stencils between active and disabled,

- Click the appropriate button in the Stencil Options Menu using the Left Mouse Button. Each click will toggle that stencil between enabled and disabled.

Remember that the overall stencil operator can be switched on and off from the "STEN" button on the Main Menu Bar.

AREA STENCILS

The Area Stencil is a pixel-by-pixel on/off mask over the entire image that can be edited using Stencil Work Mode. This mask is like the cardboard stencils with cutout, letter-shaped holes for spray painting signs. Wherever the mask for a particular pixel is "on" or selected, that pixel will not be modified by any painting or image processing operations and when cutting brushes the brush transparency at that point will be set to 100%.

To modify the Area Stencil,

ST
Keyboard
CTRL-s

- Click the "ST" Work Mode button on the Main Menu Bar using the Left Mouse Button,

or

- Use the Ctrl-s keyboard shortcut to toggle between Paint Work Mode and Stencil Work Mode.

The lower row of the Main Menu Bar will change to show "Invert" and "Delete" buttons, replacing the Drawing Modes, Stencil, Anti-Aliasing, Texture and Transparency buttons, none of which are applicable to Area Stencils.

Stencil Work Mode

Stencil Work mode allows you to create and edit Area Stencils using all the normal Drawing Tools, magnification and other options. The main difference is that instead of applying any number of different colours only one can be applied to signify the stencil mask. If the Paint-Pot colour is changed, all pixels in the Area Stencil Mask will change to take up that colour. In this way you can choose a colour that has a high contrast to the colours in the area of the image you are working on and easily see where the stencil is set over the image.

If you use a drawing mode with the Left Mouse Button it will add *exclude* areas to the Stencil mask and if used with the Right Mouse Button it will add *include* areas to the Stencil mask (i.e. remove coloured areas from the mask and reveal the original image).

Note that with Area-Fill Drawing Modes the fill-type is always "Solid", ie gradient and brush-wrap fills cannot be used in Stencil Work Mode.

Invert

Invert

To invert the Area stencil, with all excluded (coloured) areas becoming included (clear) and visa versa,

- Click the "Invert" button on the Stencil Mode Menu Bar.

This can be useful when you wish to position an include stencil (ie a "hole" in the mask) over part of the existing image. Instead of "cutting a hole", first draw an exclude stencil over the object then invert the stencil. This way you can easily see where the stencil should go rather than starting "blind" with a solid sheet of colour over the image.

Delete

Delete

To remove the Area Stencil and free up the memory it was using,

- Click the "Delete" button on the Stencil Mode Menu Bar.

Trashcan

Keyboard
K

When in Stencil Work Mode the Trashcan button clears the current area stencil rather than the image as it does in Paint Work Mode.

To clear the Area Stencil,

- Click the "Trashcan" button on the Stencil Mode Menu Bar.

OVERALL STENCIL PRIORITY

Area and Colour Stencils have a strict priority in the following logical order, although the actual order of the Colour Stencils Boxes in the Stencil Options Menu makes no difference;

Area Stencils set up using the Stencil Work Mode have the highest priority and any portions of an image masked (excluded) by an Area Stencil will *always* be excluded regardless of any Colour Range Stencils. Painting, modification or brush cutting operations will always ignore these areas.

If there is no Area Stencil, or the Area Stencil mask is not set for a pixel or area of pixels, then Colour Stencils are checked.

If you specify an *Include* Colour Range Stencil it overrides any Exclude Colour Stencil (but not Area Stencils) and allows you to paint or modify all pixels whose colours fall within the specified include range. For example, you may wish to exclude a wide range of reddish colours, but still include and paint on a narrow band of reds within the otherwise excluded range. A useful technique is to use the "Exclude all" button to mask out the whole image and then set up Include Colour stencils to "chop holes" for those particular colour ranges you wish to paint on or modify.

If you specify an *Exclude* Colour Range Stencil for a particular range of colours, you will not be able to paint or modify any parts of the image whose pixels fall within the exclude range(s).

If there is no Area Stencil, or Colour Stencil set for the colour of a particular image pixel, you can paint or modify that pixel as normal.

Drawing Modes

OVERVIEW

As discussed in the chapter on the Operation Chain (see page 18), drawing modes act as modifiers to the way the image is changed. They act on each pixel in the cutout brush or nozzle as it moves along the path specified by an outline drawing tool, or on each pixel in the area marked out by an area fill drawing tool. They take the colour information passed down from the brush or area fill and can then modify this colour information based on the existing pixel colour at that point, surrounding pixels and various level settings specified for that mode.
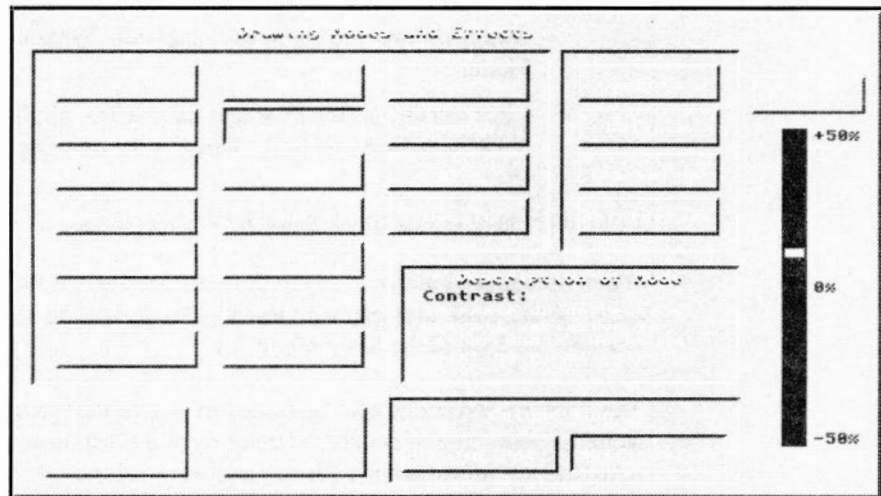
When you wish to apply a Drawing Mode to the whole image you can use the "Zap" option found in the Extras Menu. See page 225 for a complete description of this tool.

To change or adjust the setting on a drawing mode,

- Click with either mouse button on the "MODES" button on the Main Menu Bar. The Mode Selection Menu shown on the next page will appear.

- Click with either mouse button on the Menu button for the Mode you wish to use.

- If the selected mode is adjustable, a slider will appear at the right of the Mode Selection Menu. Drag the slider button to the desired level using the Left Mouse Button as necessary, or click in the slider box above or below the slider button to adjust the level in single steps. Some modes have a "Preview" button that allows you to interactively view the effects of your adjustment on the image without necessarily making a permanent change.

OR

- If the mode has its own options menu, an "Options" button will appear on the right of the Mode Selection Menu. Click this button to enter the Options menu, which will be described under the section for that mode. Note that if the currently selected drawing mode has an options menu then this menu can be directly accessed using the Amiga-d keyboard shortcut, completely bypassing the Mode Selection Menu.

- Click the OK button to accept the change, or click CANCEL to leave the Modes Menu without changing the drawing mode.

Each mode is fully described on the following pages.

When the mouse pointer is in the drawing area above the Main Menu Bar, the name of the currently selected Drawing Mode will be shown in the Feedback Area on the right of the Main Menu Bar.

The drawing mode can also be forced to ignore any colour information passed from the preceding operators, whether from a brush or texture and use only the transparency information with the currently selected Paint-Pot colour. This is mainly used with modes such as additive and subtractive, where you wish to use the shape and transparency of a brush to add a constant colour amount to the image. See the section on Operation Source on page 18.

Effect of Multiple Strokes

The "Allow Brush Buildup" option in the Preferences menu will have a major bearing on what happens with multiple brush-stokes using many modes. With Allow Brush Buildup *enabled*, multiple brush strokes with the mouse button held down will often continue to change the image, while with the option *disabled* multiple strokes will only change any pixels missed in previous strokes.

Subsequent strokes after releasing and re-pressing the mouse button will always re-modify the image, regardless of the "Allow Brush Buildup" option's setting.

For a full discussion of this option see the Preferences section on page 222.

Use of Formulas

For the more technically minded, a formula is given where useful in explaining the operation of a particular mode. In these formulas there are variables R, G, B, H, S or V (Red, Green, Blue, Hue, Saturation or Value respectively) with subscripts showing the particular value being referenced and the element S is the value from the slider. Where used, the range of values for S is described for that mode.

The subscripts used are;

$_{old}$, The existing colour-component value of the pixel being modified, (RGB or HSV)

$_{draw}$, The colour-component value from the new colour information, which could be a Texture Pattern, cutout brush, gradient fill or current Paint-Pot colour.

$_{new}$, The resulting colour-component value of the modified pixel.

LOADABLE MODES

OpalPaint provides the capability to load up to four additional Drawing Modes from disk. A number of these Loadable Modes are supplied with OpalPaint and additional modes can be obtained from your OpalVision dealer. These Loadable Modes are in fact simple compiled C programs and if interested you can obtain the include files, sample programs and instructions from Opal Technology or its distributors. We expect that you will also be able to obtain additional Drawing Modes on Public Domain disks.

To load a mode into one of the four "SPARE" mode buttons in the Mode Selection Menu,

- Click the "Spare" button you wish to load. If a mode is not already loaded for that button the File Menu described on 229 will then appear, with the words "Load Mode" at the top-centre of the menu. Each loadable mode will end in .dmd for drawing-mode.

- Select the desired Loadable Mode and click OK.

- If the mode has its own options menu then it will appear at this time.

The Loadable Mode assigned to a button can be changed at any time. If a button already contains the name of a loadable mode

- Click the "Spare" button you wish to load using the Right Mouse Button, or double-click using the stylus button or Left Mouse Button.

The Loadable Modes shipped with OpalPaint are described with the others below and are noted as being "Loadable".

SOME COLOUR MAP THEORY

Many of the drawing modes adjust the balance of colours like the colour control knobs on a television set, except that their effect can be limited to a small part of the image. Many of these these modes use colour maps which are look-up tables that translate an input colour value to an output value. These maps can be represented by graphs that shown input values along the bottom, output along the side and a line on the map to show how each possible input value is "mapped" onto an output value.

First look at Figure 3 which shows a linear or neutral colour

Figure 3. Neutral Colour Map

map. Because the map has a straight line from corner to corner, any input value is unchanged at output. For example, if a colour with a level of 50% is input to the map it will generate an unchanged colour level of 50% and an input of 70% will generate an output level of 70%.

There is generally a separate colour map for each of the three colour channels, i.e. Red, Green and Blue. Each colour balance mode then operates by calculating a new curve for each channel's colour map and then using it to generate a new level for each existing colour in the part of the image being processed.

There are several common operations that reoccur in image processing in general and OpalPaint in particular. Each can be easily described in terms of its effect on a colour map.

Brilliance

A Brilliance colour adjustment modifies the general brightness of all pixels in the area being processed. In terms of our colour map, a change in

Figure 4. Brilliance Correction

Brilliance is a uniform shift of the colour map upwards or downwards, as shown in Figure 4. The input colour with a level of 50% is now converted to an output level of 70% and the input of 70% is now converted to an output level of 90%. Both have been shifted upward, but note that the difference between the output levels has not changed.

Another significant point to note is that as the brilliance mode moves the colour map upward, the higher level colours will begin to clip to 100%. In Figure 5 any inputs above 80% will all convert to an output of 100% and lose any distinction. This clipping effect also effects a downward movement of the colour map, with the lower input levels being clipped to 0% (solid black). More about clipping below.

Contrast

A Contrast colour adjustment modifies the general contrast of all pixels in the area being processed. In terms of our colour map, a Contrast shift uniformly rotates the colour map upwards or downwards as shown in Figure 5. The input colour with a level of 50% is now converted to an output level of 62% and the input of 70% is now converted to an output level of 88%. Both have been shifted upward, but note that the difference between the output levels has changed from 20 to 28%. As the line becomes steeper the contrast will be increased, i.e. a small change in input values (along the bottom) results in a much larger change in output values (along the side.

However, also note that as the line becomes steeper there will be "clipping". This is the flat area at the extreme right (high intensity inputs), and means that very high inputs will be clipped to the maximum possible output values. It is important to remember that if a colour map with this sort of clipping is permanently applied to an image then detail will almost certainly be lost.

Colours that are not clipped will have new levels and the ratio between colours will be increased (that is what higher contrast is all about), but you can later reverse the change by reducing contrast and more or less recreate the original colour range. However, once clipping has occured then all input colours within the clipped region will have been remapped to a solid maximum value, and from this point on they will all appear as a solid block of the same colour. With contrast levels less than 0 you will see a flatter line. In this case there will be no clipping,
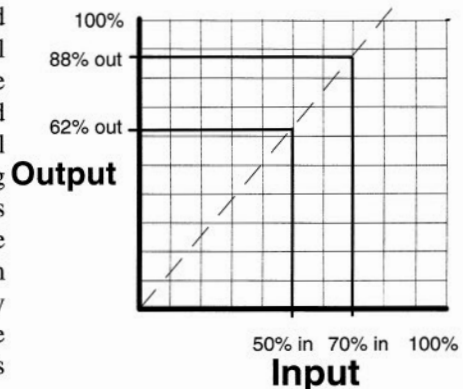
Figure 5. Contrast Correction

but instead you will no longer have the extremes of blacks or very bright colours.

With some image processing operations (such as a reduction of brilliance) you may have clipping at low levels.

Gamma

The Gamma colour adjustment enables you to brighten or darken an image (or a portion of it) while reducing the effect of clipping. In terms of our colour map, the Gamma mode introduces an upward or downward curve into the colour map as shown in Figure 6. The image area is brightened or darkened without the clipping problems encountered using the Brightness and Contrast modes.
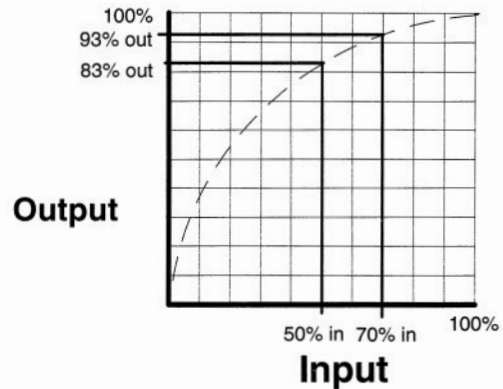
Figure 6. Gamma Adjustment

OPERATION SOURCE
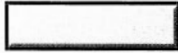
The drawing mode can be forced to ignore any colour information passed from the preceding operators, whether from a brush or texture and use only the brush transparency information with the currently selected Paint-Pot colour. To activate this option,

- Click the "Paint-Pot" Colour Source button on the Mode Selection Menu.

To return to using all colours passed from preceding operators,

- Click the "Multi Colour" Colour Source button on the Mode Selection Menu.

Remember that if you cut out a brush with an option to ignore background colours, or you cut it out with the Attach-Alpha option selected, the brush or texture will have fully or partially transparent areas in addition to the colours. This means that when you ignore the colour information and force use of the current Paint-Pot colour you will see an area of that Paint-Pot colour applied to the image with the transparency levels set by the original brush or texture.

ADD-NOISE

This is a loadable mode.

The Add-Noise Mode is used to add random noise (colour variations around the existing colours) to a portion of the image. This mode can be used to break up harsh outlines, as a visual effect, or to simulate a badly-tuned or out-of-range television picture.

It works by adding or subtracting a random amount to the colour information of each pixel in the specified area of the image.

Slider

The slider can be set from 0% to 100% and as the slider level increases the amount of noise increases by raising the limit on the range of random numbers generated (see calculation).

Multiple Application

Reapplying this mode in the same position progressively and cumulatively adds random noise to the image, eventually resulting in a totally random image.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Break up sharp edges

❖ Introduce "Natural" textures to computer-generated images or heavily smoothed images.

❖ Simulate a badly tuned television.

Calculation Used

$$R_{new} = R_{old} + random_{(-s \gg 0 \gg s)}$$
$$G_{new} = G_{old} + random_{(-s \gg 0 \gg s)}$$
$$B_{new} = B_{old} + random_{(-s \gg 0 \gg s)}$$

where

S is the slider input with a range from 0% to 100% (0.00 to 1.00)

ADDITIVE (F6)

This mode appears on the main Modes menu.

Additive mode takes the new colour information for each pixel and adds it to the colour information of the pixel that will be replaced. This addition is done using the RGB colour system, so the Red component of the colour being applied is multiplied by the scaling factor set on the slider then is added to the Red component of the existing pixel. The new values for the Green and Blue channels are calculated in a similar way.

Multiple Application

Each time you apply the additive process it works on the new colour levels, so if you are freehand drawing and go back and forth over an area, or use the "a" (again) button repeatedly, that area will become lighter and lighter in colour.
The limit of the additive process is a fully white pixel, with Red, Green and Blue colour components all at 100%. This assumes that the draw-colour you are using to add contains some Red, some Green and some Blue. If the draw-colour has (say) zero percent Blue, the Blue component level of the existing pixels will remain unchanged no matter how many times you apply the Additive mode. The limit of the additive process would, in this example, be Yellow (100% Red + 100% Green).
Also note that because of the way the Additive mode works the component levels in the draw-colour determines how "fast" the colour will move toward the limit. For example, if you are repeatedly applying the Additive Mode to a black background using a draw-colour with components 30% Red, 8% Green and 12% Blue, the area will become redder and redder until the Red component of the area reaches 100%, then more purplish and finally closer and closer to white as the other components move toward 100%.

Slider

The slider can be set from 0% to 100% and acts as a scaling factor on the additive process. For example, if set at 50% the additive effect will be reduced by half.

Ideas for Use

❖ Use a grey level to brighten an area of an image.

❖ Cutout a brush and set up a Texture Pattern. Using a dark grey or a low level on the slider, rub back and forth with freehand draw and a

medium nozzle or airbrush to progressively reveal areas of the texture. The more you rub, the more the texture will be revealed.

Use of New Colour Information

This mode uses the RGB components from the new colour information.

Calculation Used

$$R_{new} = R_{old} + sR_{draw}$$
$$G_{new} = G_{old} + sG_{draw}$$
$$B_{new} = B_{old} + sB_{draw}$$

where

S is the slider input with a range from 0% to 100% (0.00 to 1.00)

BALANCE

This is a loadable mode.

The Balance mode is an extremely useful one-stop colour balancing and image processing panel. In one menu you have sliders to increase or decrease the brilliance of the Red, Green and Blue channels individually in addition to the overall Contrast, Brilliance and Gamma of the image. All changes are reflected instantly in the image so you can immediately preview the results of your changes before committing to them.

After loading the mode in the normal way (see page 119) the Balance Mode menu will appear. To later invoke the Balance menu,

- Enter the Modes menu, select the loadable-mode button containing the Balance mode and click the "Options" button at the top right of the Modes menu. Alternatively, hit the Amiga-d keyboard shortcut to jump directly to the menu from the Main Menu.

The menu looks like this.
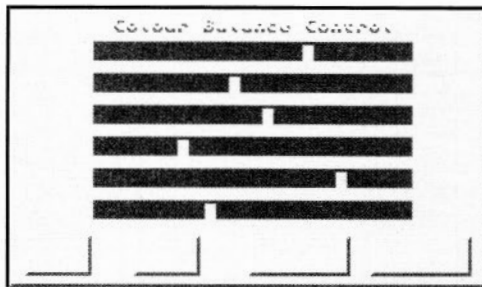
This menu can be fully reposisitioned.

Sliders

The Red, Green and Blue sliders increase or decrease the brilliance of each channel independently.
Each slider operates over the range -50% to 50%. See the section on Colour Processing (page 121) for more information and theory about each component of this mode.

Reset

To reset all sliders to their zero positions,

- click the "Reset" button.

ZAP

To apply the selected colour processing levels to the whole image,

- click the "Zap" button. See the section on the Zap function for further details (page 225).

Multiple Application

Reapplying this mode in the same position is cumulative. Take special note of the section on Clipping in the Colour Processing section.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Quickly adjust the colour balance of an image or a portion of one.

Also See

Blue, Brilliance, ChromaCtrl, Contrast, Contrast2, Green, Red modes.

BigSharpen

This is a loadable mode.

The Big Sharpen mode is a much more powerful version of the Sharpen mode (see page 182) and is used to highlight edge detail in the specified area of the image. Big Sharpen is best used when you wish to enhance the edges between areas of very similar colour or with subtle changes. Because of it's "strength" it will greatly amplify any noise (colour variations) in the image and often introduce coloured artifacts, so unless you specifically need its power or are trying to create a special effect we recommend the Sharpen mode in most cases. Try it and see!

Slider

The slider adjusts the "strength" of the Mode's sharpening effect. The higher the setting, the greater the effect.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively increase contrast of the edges in the area.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Quickly emphasize the edges of the image.

Also See

Sharpen, Sharpen2 modes.

BLUE

This is a loadable mode.

The Blue mode selectively increases or decreases the Brilliance of the Blue channel alone, thus adjusting the amount of blue information in the image or the area specified by the drawing tool.

You should note that this mode can clip the blue channel to maximum or minimum levels. Read the section on Colour Processing (page 121) for further information on clipping and other theory.

Slider

The slider adjusts the level of the Brilliance change and has a range from -50% to +50% with 0 being the neutral value. Setting the slider to a positive value increases the brilliance of the blue channel, while a negative setting reduces the blue intensity.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively increase or decrease the blue content of the area.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Correct colour imbalances

❖ Experiment for some great special effects.

Also See

Balance, Brilliance, ChromaCtrl, Green, Red modes.

BLUR

This is a loadable mode.

The Blur Mode is a simple smoothing function that replaces the colour of each pixel in the specified area with the average colour of the block of 8 surrounding pixels. This occurs regardless of the image content, whereas the Smooth mode may be more useful where you wish to smooth jaggy or sharp edges but retain their contrast.

Slider

The slider adjusts the amount of blurring and has a range from 0% to 100%. The higher the level, the more blurring will occur.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively blur the area and decrease its sharpness and contrast.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Smooth out regions of noise in a less-than-perfect scan or frame-grab.

❖ Produce an out-of-focus effect for background images.

Calculation Used

This mode is a "hard-wired" convolution operator using the following map. See the Convolve mode for further details.

1	1	1		
1	1	1	Scale:	9
1	1	1	Offset:	0

Also See

Blur More, Gaussian Blur and Smooth modes.

BLURMORE

This is a loadable mode.

The Blur More Mode is a slower but more powerful version of the Blur loadable mode, performing major smoothing function by replacing the colour of each pixel in the specified area with the average colour of the block of 24 surrounding pixels. This occurs regardless of the image content, whereas the Smooth mode may be more useful where you wish to smooth jaggy or sharp edges but retain their contrast.

Slider

The slider adjusts the amount of blurring and has a range from 0% to 100%. The higher the level, the more blurring will occur.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively blur the area and decrease its sharpness and contrast.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Smooth out regions of noise in a less-than-perfect scan or frame-grab.
❖ Produce an out-of-focus effect for background images.

Calculation Used

This mode is a "hard-wired" convolution operator using the following map. See the Convolve mode for further details.

1	1	1	1	1		
1	1	1	1	1		
1	1	1	1	1		
1	1	1	1	1	Scale:	25
1	1	1	1	1	Offset:	0

Also See

Blur, Gaussian Blur and Smooth modes.

BRILLIANCE

This mode appears on the main Modes menu.

The Brilliance colour adjustment modifies the general brightness of all pixels in the area being processed. See the section on Colour Map theory for a more complete discussion of how the Brilliance Mode actually effects the image. Take special note of the discission of "Clipping" and its results.

Slider

The slider has a range from -50 to +50 with 0 being the neutral value. Setting the slider to a positive setting shifts the input intensity uniformly upward, while a negative setting shifts them uniformly downward.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively brighten (or darken) the area.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Use where you would adjust the brightness control on your television set, i.e. where the image or portions of the image are too dark or light.

Also See

Balance, Blue, ChromaCtrl, Green, Red modes.

CHROMACTRL

This is a loadable mode.

The ChromaCtrl mode is a specialized mapping and manipulating module, allowing radical changes or fine tuning of the colour information within an image area. It provides a graphical view of colour maps as described above in the section about Colour Map Processing on page 121, although the operations performed by the sliders in this mode are optimized for the processing of non-linear maps and are thus slightly different. It also allows unlimited customization by allowing freehand "painting" of each colour map. This mode is very similar to the ChromaCtrl module that is part of the OpalVision Video Processor software, and the Colourmaps are in fact interchangeable.

The main ChromaCtrl options menu looks like this.
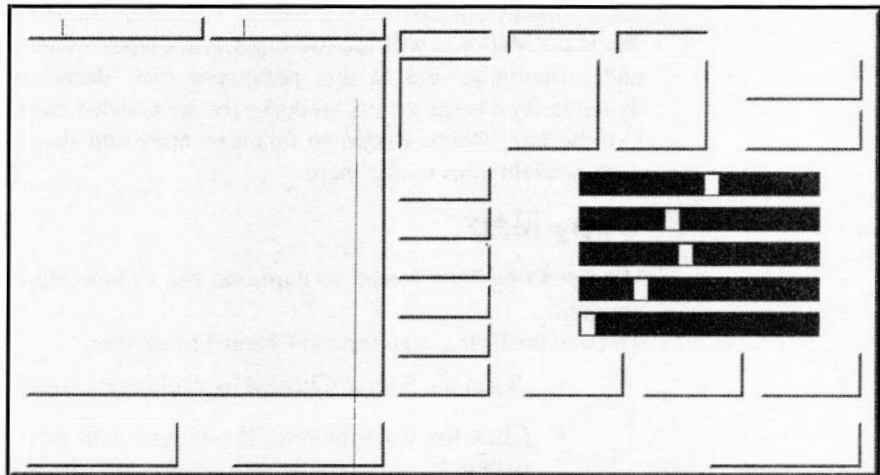
At any time the menu can be hidden by hitting the F10 key. This allows you to preview the changes you have made on the whole image. Hit F10 again to reinstate the menu.

The two buttons at the top left of the menu contain the names of the "Edit Map" and the "Morph Map". The ChromaCtrl preferences maintains a list of Colourmaps made up from a (possibly) larger set held in the OpalPaint:ColorMaps directory. Each time you click one of these buttons it will cycle to the next Colourmap in the list. (See the Load and Save buttons below for more details on setting up and maintaining the list of Colourmaps.)

The Edit Map (the one named on the left) is the one being edited by the sliders and drawings described below, while use of the Morph Map is described below in the section on the Morph slider.

Channel Buttons and Mini-Maps

A ChromaCtrl "Colourmap" in fact contains three separate maps - one for each colour Channel being   Red, Green and Blue. Each Channel has its own miniature colour map or histogram display called a Mini-Map. These are to be found along the top of the menu. The button above each one both names the Mini-map and shows which colour Channels are affected by the current operation performed with the sliders. Any combination of one, two or three colour channels may be selected by clicking its name button, although of course at least one must be selected at any one time.

The Main Map

Any one of the Mini-Maps can be chosen for display and direct editing in the Main Map by clicking on the chosen Mini-Map. As you move the pointer over the Main Map you will see the input and output values displayed numerically under the map, and at any point you can "draw" on the Main Map to dynamically change the colour curve for the selected channel(s).

Use the Left Mouse Button to freehand draw and the Right Mouse Button to draw straight lines on the map.

Copy Map

Use the Copy Map button to duplicate the Colour Map from one Channel to another.

To copy the Colourmap for one Channel to another,

- Select the Source Channel by clicking on its Mini-Map

- Click the Copy button. The pointer will now show the word "TO" next to it.

- Click the Mini-Map for the Destination Channel.

Shear Slider

This slider rotates (changes the slope of) the colour maps of the selected colour channel(s) up and down through a range of -99% to +99%. A Value of 0 is neutral.

Offset Slider

This slider moves the colour maps of the selected colour channel(s) up and down.

In terms of the generalized "straight-line" colour maps described on page 121, the offset slider is most like a Brilliance manipulation.

The slider moves the offset of the selected colour channel(s) through a range of -99% to +99%. A Value of 0 is neutral.

Gain Slider

This slider adjust the gain or "amplification" of the selected colour channel(s). This is similar to a contrast adjustment, but is more suited to the modification of "curvy" colour maps.

This slider will increase and decrease the Gain of the selected colour channel(s) through a range of -99% to +99%. A Value of 0 is neutral.

Morph Slider

This slider will gradually "morph" the selected colour map(s) between the Current edited settings (the "Edit Map") and the "Morph Map". The output value for each input value is moved evenly between its levels for each map as the slider is moved from left to right.

Posterise Slider

The Posterise slider introduces "steps" into the colour curve of the selected channels to reduce the number of final colours in the image. This works by mapping ranges of input values to the same output value.

Invert

The Invert Button takes the maps for the selected Channels and swaps them vertically. It is easier to see this graphically, so select, say, the Gamma map, hit the button and view the result.

Flip

The Flip button takes the maps for the selected Channels and swaps them horizontally. Just as with Invert, give it a try.
This can be useful when you wish to, say, shear a colour map around the right end of the line. You can flip the map, do the shear, then flip the map back again.

Apply

The Shear, Offset, Gain, Morph and Posterise sliders make temporary changes to the stored colour maps and these changes are represented visually both in the map displays and via the Preview as a change to the image. If you have introduced changes to the display by moving one or more sliders, these changes can be made "permanent" to the map by hitting the Apply button. The sliders will then be zeroed and further changes can be made as required.

Reset.

The Reset button returns the maps for all Channels to the values last loaded (or saved) for that Colourmap. A requester will appear asking you to confirm the reset.

New

The New button sets the maps of the selected Channels to a 45° (Input=Output) line like the Standard Colourmap. This is mostly of use when you wish to create a brand-new colour map and need to start with a clean slate.

Preview

If you hit the preview button the main ChromaCtrl menu will be replaced with a small, repositionable menu that looks like this:
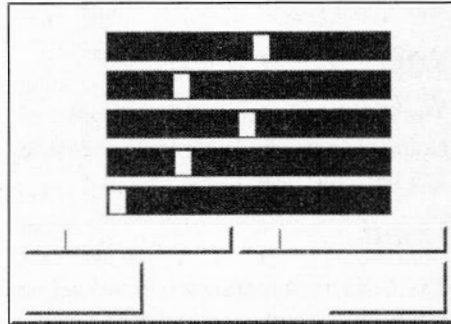
The sliders on the preview menu are exactly the same as those on the main ChromaCtrl menu. To return to the main menu, hit the OK (to retain any slider settings) or Cancel (to ignore any changes to slider settings).

Histogram

A histogram is a graph showing the relative frequency of each input value in the image.
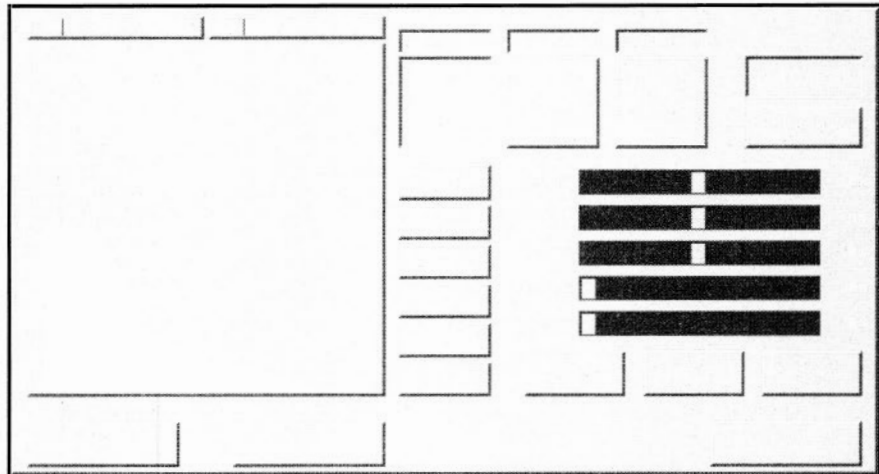
It can be useful in gaining some idea of how the colours are distributed and provide a guide to possible actions that will correct imbalances or produce

certain effects. When the Histogram button is depressed each Mini-Map will show a frequency histogram for a single Channel and the selected Mini-Map will be reproduced in the Main Map area for greater detail. The image processing sliders described below will be immediately reflected in the histograms of selected Channels. You cannot directly edit the Main Map in Histogram mode.

Zap

The Zap button works like all other zap buttons in OpalPaint and applies the Colourmap to the whole image regardless of the actual painting area. See page 225 for a full description.

Load

The Load button allows you to load new Colourmaps. A requester will appear asking you whether you wish to replace the Edit Colour Map or add a new map to the Colour Map List (those displayed when cycling the Edit Map and Morph Map buttons). You will then see a standard OpalVision file requester (described on page 229) that allows you to choose a new colourmap.

Save

The Save button allows you to save the contents of the Edit Map for later reloading. Once again you will see a standard OpalVision file requester so you can specify the directory (usually OpalPaint:Colourmaps) and a Colourmap name.

Keyboard Shortcuts

F10 : Toggle Hide/Show ChromaCtrl Requester. Note that the sliders, buttons and Main-Map painting area are still active when the menu is hidden so you can still move them and edit Colourmaps while viewing the image.

Del : Toggle Hide/Show Cursor while painting
Tab : Switch Edit Map and Morph Map
i : Invert
f : Flip
a : Apply
r : Reset
n : New
u : Undo

RETURN : OK
: Go to next Colormap
⇨ : Go to previous Colormap
Amiga-h : Toggle histogram on/off
Amiga-l : Load
Amiga-s : Save
Amiga-p : Preview
Amiga-z : Zap

Amiga-v : OK
Amiga-b : Cancel

Also See

Balance, Blue, Brilliance, Contrast, Green, Posterise, Red modes.

Colour

This mode appears on the main Modes menu.

The Colour adjustment modifies the saturation of all pixels in the area being processed and its operation is the same as the Colour control on your television set. Increasing the Colour level increases the overall saturation of the image toward pure colours, while decreasing the Colour level decreases saturation toward a Black & White image. In terms of the colour map explained on page 121, the Colour mode sets up a colour map for the Saturation component of the image and uniformly rotates the Saturation colour map upwards or downwards, i.e. adjusts the *contrast* of the Saturation. Note that clipping of saturation will occur if the mode slider is increased producing fully saturated, pure colours.

Slider

The slider has a range from -50 to +50 with 0 being the neutral value. Setting the slider to a positive increases the saturation of the input colours, while a negative setting reduces the saturation.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively increase (or decrease) the area's colour saturation. Note that if you reduce saturation completely (to black & white), the Hue of the original image colour will be lost because the image is stored using RGB components. Using the Colour mode with a positive slider level on this area will then have no effect.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Use where you would adjust the Colour control on your television set, i.e. where the image or portions of the image are incorrectly saturated.

❖ Move the slider completely to the bottom to convert portions of your image into grey scales for that black and white television appearance.

❖ Use negative and positive slider settings for selective Dodging and Burning operations as you would in the darkroom.

COLOURISE (F9)

This mode appears on the main Modes menu.

Unlike Tint H and Tint HS modes, Colourise mode is designed to tint grey-scale images with colours. It works by replacing the Hue and Saturation of the existing image with the Hue and Saturation of the Tint colour, so the new colour retains the Value or darkness of the original colour. Note that in true Black and White or grey scale images, the Saturation is always at zero and the Hue is thus undefined or ignored.

Slider

There is no slider for this mode.

Multiple Application

Reapplying this mode in the same area and the same tinting new colour information has no effect, because the Hue and Saturation of the image are completely changed to equal those components of the New colour information in the first application.

Ideas for Use

❖ Colourise black and white (monochrome) scanned images, just like those old hand-coloured postcards and portraits. The photo colourers of yester-year would have given anything to have the tools at your disposal.

Use of New Colour Information

This mode uses the Hue and Saturation components from the new colour information.

Calculation Used

$$H_{new} = H_{draw}$$
$$S_{new} = S_{draw}$$
$$V_{new} = V_{old}$$

See Also

Shade, TintH, TintHS modes

CONTRAST

This mode appears on the main Modes menu.

The Contrast colour adjustment modifies the general contrast of all pixels in the area being processed. In terms of the colour map explained on page 121, the Contrast mode uniformly rotates the colour map upwards or downwards.

This particular method of modifying contrast, ie by rotating the colour map around zero, is most useful when working with generally dark, low contrast areas of an image. Note that if you use this mode to increase contrast of generally bright areas of the image some clipping will occur. In the contrast diagram this clipping would occur with all input intensities greater than 80% being adjusted to 100%, or fully white. Another method of adjusting contrast is to rotate the colour map around its centre point. This has the disadvantage of major clipping at low and high input intensities, so is not as effective at adjusting generally very dark areas, which is the most common use of this mode. It does, however, work well with intensities in the medium range, so this alternative method is available as a Loadable Mode called Contrast2.

Slider

The slider has a range from -50 to +50 with 0 being the neutral value. Setting the slider to a positive increases the contrast between input intensities, while a negative setting reduces the contrast.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively increase (or decrease) the contrast of the area.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Use where you would adjust the contrast control on your television set, i.e. where the image or portions of the image have too much or too little range of colour intensities .

Also See

Balance, Blue, Brilliance, Contrast2, Green, Red modes.

CONTRAST2

This is a loadable mode

This mode is very similar to Contrast, except that the colour curve is rotated around its mid point rather than the origin. While this may result in major clipping at both low and high input intensities it is better suited than the standard Contrast mode for intensities in the mid range.

Slider

The slider adjusts the level of the Contrast change and has a range from -50% to +50% with 0 being the neutral value. Setting the slider to a positive value increases the contrast, while a negative setting reduces the contrast.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively increase (or decrease) the contrast of the area.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Use to adjust the contrast of images with mainly mid-range intensities.

Also See

Balance, Blue, Brilliance, Contrast, Green, Red modes.

CONVOLUTION

This is a loadable mode

This Mode lets you change the colour value of each pixel in the specified area using a mathematical process called a Convolution operator. While it is very powerful, (many other OpalPaint drawing modes are in fact "hard-wired" convolution operators), you shouldn't feel worried if you don't understand or don't need this mode, as it is included mainly for the hard-core image processing junkies! That said, have a quick read and see if it makes sense.

The Matrix

The Convolution operator processes in turn each pixel in the area specified by the Drawing Tool. For each pixel the operator applies a square matrix 3x3, 5x5, 7x7 or 9x9 pixels in size which contains a number for the pixel of interest (the *central* one) and the surrounding 1, 2, 3 or 4 rings of adjacent pixels. Each number is used to specify the effect the corresponding pixel will have on the central pixel, so each number is multiplied by the colour value of the corresponding pixel. The sum of these values is scaled by the Scale value and finally an offset value is added to generate a new colour value. Each colour channel (Red, Green and Blue) is processed separately. The pixel is replaced with the new RGB values and the Convolution operator moves to the next pixel in the specified area. The sequence is

> For each channel (R, G & B), **multiply** the colour value of each pixel by the corresponding matrix value.
>
> **Add** these numbers together.
>
> **Divide** the sum by the Scale factor
>
> **Add** the single or channel offset value.
>
> Replace the existing colour value using any transparency options selected.

Example 1

It is probably easiest to work through a few examples. First let's look at a simple Blur operation. The matrix for a simple Blur is

1	1	1
1	1	1
1	1	1

Scale: 9
Offset: 0

The pixel outlined with a double line corresponds to the current pixel being processed. For the Red channel of the first pixel in the selected range

> Add the Red value of the pixel to the Red values of the 8 surrounding pixels. Each matrix value is 1, so they are unchanged before adding.

> Divide the final sum value by the scale number, 9 in this case. Think back to your early maths lessons and you will recognize this as a simple averaging operation.

> Do not add any offset, since the Offset value is zero.

> Replace the pixel with the calculated new Red value.

> Repeat for Blue and Green

Now move to the next pixel in the selected range, and repeat the whole operation for the new pixel.

Example 2

A Gaussian Blur is similar to the above simple blur, except that pixels closer to the centre are given more "weight" in the averaging process. The matrix for a Gaussian Blur looks like

1	2	1
2	4	2
1	2	1

Scale: 16
Offset: 0

For this matrix and the Red channel,

> Add the Red value of the pixel above and to the left of the current pixel being operated on, two times the Red value of the pixel above, the Red value of the pixel above and to the right, two times the Red value of the pixel to the left, four times the Red value of the current pixel and so on for the rest of the matrix.

> Divide the final sum value by the scale value, 16 in this case.

Do not add any offset, since the Offset value is zero.

Replace the pixel with the calculated new Red value.

Repeat for Blue and Green

Now move to the next pixel in the selected range, and repeat the whole operation for the new pixel.

Matrix Size

This button enables you to set the size of the convolution matrix to be used. It will cycle through the options 3x3, 5x5, 7x7 and 9x9.

Scaling Method

This button toggles between Auto and Manual Scaling. With Auto Scaling the suggested scaling factor will be automatically calculated as the matrix values are entered so that the final new pixel colour will be in the range from 0 to 255, i.e. no clipping. If you wish to enter your own value select Manual Scaling, click in the Scale box and enter the required value, but this is only recommended for advanced users who fully understand the process.

Offset

The offset sliders are used to shift the final colour value upward. This is most used when a convolution operator is set up to emphasise only image changes, so that rather than showing lines on a black background you can show lines on a grey or coloured background.

The slider setup can be toggled between Single, which shows only one slider that affects all three channels (Red, Green and Blue) equally and Multi, which gives a seperate slider for each channel so that the base colour can be fully specified.

Load and Save

The Load and Save buttons present you with the standard OpalVision file requester so you can load and save convolution matrices. The recommended place to put them is in the `OpalPaint:Convolutions` directory. The name of the last saved or loaded convolution matrix is shown on the Convolution Mode control panel.

Clear

The Clear button sets each value in the matrix to zero.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will work on the new values of the area.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ An infinite range of image processing functions and effects. This is a common technique, so you should be able to find lots of fancy convolution matrices in image processing texts.

❖ Such programs as Art Department Professional and Adobe Photoshop (see the Custom filter) also use convolution operators. Reference books for these and other products will provide a rich source of operators to try out.

Also See

Blur, BlurMore, CrossHatch, Speckle modes.

CROSSHATCH

This is a loadable mode.

The CrossHatch Mode is a specialised blur function that creates a "camera-shake" defocussing rather than "smudged" effect.

Slider

The slider adjusts the amount of blurring and has a range from 0% to 100%. The higher the level, the more blurring will occur.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively blur the area and decrease its sharpness and contrast.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Another imaginative way to blur an image.

Calculation Used

This mode is a "hard-wired" convolution operator using the following map. See the Convolve mode for further details.

0	1	0
1	0	1
0	1	0

Scale: 4
Offset: 0

Also See

Blur More, Gaussian Blur and Smooth modes.

DARKENONLY

This is a loadable mode.

The DarkenOnly mode functions like normal paint mode with one difference. Before changing each pixel Opal Paint compares the luminance (brightness) of the existing pixel with the luminance of the colour it is about to paint down. The pixel is only replaced if the new pixel colour is darker than the existing pixel colour, i.e. if the pixel will be "Darkened" by the change.

Also see LightenOnly (page 166)

Slider

There is no slider for this mode.

Multiple Application

Reapplying this mode with the same options in the same area will have no effect as the "eligible" pixels will be changed in the first pass.

Use of New Colour Information

This mode uses the luminance levels of the existing and new colours to decide whether to paint or not at each pixel position.

Ideas for Use

❖ Use when you want to paint only on parts of an image that are brighter than some thresh-hold, say to clip them to a grey level.

DEEPPRESS

This is a loadable mode.

The DeepPress Mode creates an effect like pressed metal or a coin with a light source at the top left so that areas of light and shade are produced,

Slider

The slider scales the effect of the mode on the existing image. .

Multiple Application

Reapplying this mode in the same area is not usually useful as the image both shifts sideways and increasingly clips to solid white, black, red, green and blue.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Create coin effects.

Calculation Used

This mode is a "hard-wired" convolution operator using the following map. See the Convolve mode for further details.

0	0	1	0	0
0	0	3	0	0
1	3	1	-3	-1
0	0	-3	0	0
0	0	-1	0	1

Scale: 1
Offset: 0

Also See

East, Emboss modes.

DeInterlace

This is a loadable mode.

Interlacing is a video display method where all the odd-numbered lines are scanned followed by the intermediate even-numbered lines. While this has advantages for television and video, mainly in the reduction of bandwith requirements, it can cause unsightly flicker when there is high contrast between the colour information in odd and even scan lines.

This DeInterlace mode removes this interlace flicker by eliminating either the odd or even scan lines (the odd or even field) and creating new information for it by either duplicating the remaining scan lines or interpolating between them.

The options menu looks like this:
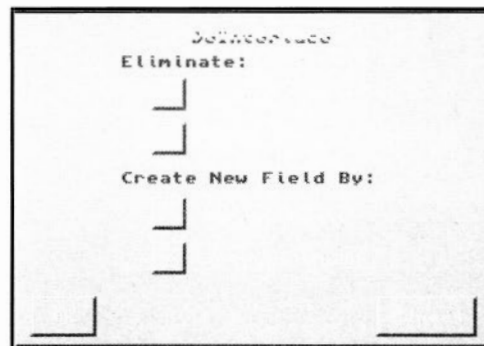
Slider

There is no slider for this mode.

Multiple Application

Reapplying this mode with the same options in the same area will have no effect as the eliminated scan line will be eliminated again, and recreated using the same method and source information as on the first pass.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Remove flicker from frame-grabbed images

❖ Prepare painted and rendered interlaced images for display on interlaced monitors.

DIFFUSE

This is a loadable mode.

The Diffuse mode shifts pixels in the selected area by random amounts to create an effect like frosted glass or charcoal.

Slider

The slider sets the size of the "box" within which the random shifting will occur. It has a range between 1x1 and 31x31.

Multiple Application

Each application of this mode increases the randomness of the area, mixing the pixels more and more randomly.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

> ❖ Break up images to create a frosted-glass look,
>
> .❖ Use with circular brush to give a chalk or charcoal effect.

Also See

AddNoise, LumaNoise mode.

EAST

This is a loadable mode.

The East Mode highlights the Right (Eastern) edges of significant brightness transitions in the specified area. It results in a series of coloured strokes against a black background.

Slider

The slider adjusts the strength of the effect and the depth of the black in the final result.

Multiple Application

Reapplying this mode in the same area will begin to reintroduce coloured artifacts along lines of original shading.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Highlight specific edges in the image.

Calculation Used

This mode is a "hard-wired" convolution operator using the following map. See the Convolve mode for further details.

-1	1	1
-1	-1	1
-1	1	1

Scale: 1
Offset: 0

Also See

Edge mode

EDGE

This is a loadable mode.

The Edge Mode highlights the areas of significant brightness transitions in the specified area. It results in a series of coloured strokes against a black background.

Slider

There is no slider for this mode.

Multiple Application

Reapplying this mode in the same area will begin to reintroduce coloured artifacts along lines of original shading.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Highlight image edges.

❖ Cutout and recombine the edges with the original image using Additive and Subractive modes, or with a colour stencil to ignore the background black.

Also See

East mode

EMBOSS

This is a loadable mode.

The Emboss Mode creates an effect like pressed metal or a coin with a light source at the top left so that areas of light and shade are produced,

Slider

There is no slider for this mode.

Multiple Application

Reapplying this mode in the same area is not usually useful as the image both shifts sideways and increasingly clips to solid white, black, red, green and blue.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Create coin effects.

Calculation Used

This mode is a "hard-wired" convolution operator using the following map. See the Convolve mode for further details.

-1	0	0
0	0	0
0	0	1

Scale: 0
Offset: 128

Also See

DeepPress, East modes.

GAMMA

This mode appears on the main Modes menu.

The Gamma colour adjustment enables you to brighten or darken an image (or a portion of it) without losing much detail. In terms of the colour map explained on page 121, the Gamma mode introduces an upward or downward curve into the colour map as shown in Figure 4. The image area is brightened or darkened without the clipping problems encountered using the Brightness and Contrast modes described below.

Slider

The slider has a range from -50 to +50 with 0 being the neutral value. Setting the slider to a positive setting shifts the input intensity uniformly upward, while a negative setting shifts them uniformly downward.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively brighten (or darken) the area.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Use where you would adjust the brightness control on your television set, i.e. where the image or portions of the image are too dark or light, but you don't wish to lose the very dark or very light portions of the image through clipping.

GAUSSIAN (BLUR)

This is a loadable mode.

The Gaussian Blur Mode is simple smoothing function that replaces the colour of each pixel in the specified area with the weighted average of the block of 8 surrounding pixels. Unlike the Blur mode where all pixels are weighted equally, the Gaussian Blur gives extra weight to pixels closer to the center of the block.

Slider

The slider adjusts the amount of blurring and has a range from 0% to 100%. The higher the level, the more blurring will occur.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively blur the area and decrease its sharpness and contrast.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Smooth out regions of noise in a less-than-perfect scan or frame-grab.

❖ Produce an out-of-focus effect for background images.

Calculation Used

This mode is a "hard-wired" convolution operator using the following map. See the Convolve mode for further details.

1	2	1
2	4	2
1	2	1

Scale: 12
Offset: 0

Also See

Blur, Blur More, CrossHatch and Smooth modes.

GREEN

This is a loadable mode.

The Green mode selectively increases or decreases the Brilliance of the Green channel alone, thus adjusting the amount of green information in the image or the area specified by the drawing tool. You should note that this mode can clip the green channel to maximum or minimum levels. Read the section on Colour Processing (page 121) for further information on clipping and other theory.

Slider

The slider adjusts the level of the Brilliance change and has a range from -50% to +50% with 0 being the neutral value. Setting the slider to a positive value increases the brilliance of the green channel, while a negative setting reduces the green intensity.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively increase or decrease the green content of the area.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

- ❖ Correct colour imbalances
- ❖ Experiment for some great special effects.

Also See

Balance, Blue, Brilliance, ChromaCtrl, Red modes.

GREY

This is a loadable mode.

The Grey mode removes the Hue and Saturation of the selected area leaving only the Value (Grey level) of each pixel. Note that once applied the Hue and Saturation components are lost forever.

Slider

There is no slider for this mode.

Multiple Application

Reapplying this mode in the same area has no effect - it is a once-only operation.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Create a black & white effect

Formula Used

$$H_{new} = 0$$
$$S_{new} = 0$$
$$V_{new} = V_{old}$$

Also See

Balance, Blue, Brilliance, ChromaCtrl, Green, Red modes.

HORIZONTAL

This is a loadable mode.

The Horizontal Mode emphasizes horizontal lines in the selected area of the image.

Slider

The slider adjusts the amount of change made to the image and has a range from 0% to 100%. The higher the level, the more blurring will occur.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively emphasize the horizontal lines in the image, with overuse leading to clipping and coloured artifacts.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Highlight horizontal grain in wood or fabric scans.

Calculation Used

This mode is a "hard-wired" convolution operator using the following map. See the Convolve mode for further details.

-1	-1	-1	
2	3	2	Scale 1
-1	-1	-1	Offset: 0

Also See

Edge, Convolve modes.

HUE

This mode appears on the main Modes menu.

The Hue mode enables you to rotate the Hue component of the existing image colours around the colour wheel. If you look at the diagram showing the HSV colour wheel (Figure 1 on page 24), you will see that rotating the Hue of a colour will change the basic pure component of the colour through the spectrum. This can produce some spectacular effects.

Slider

The slider has a range from -180° to +180° with 0° being the neutral value. Setting the slider to a positive value moves the hue of each colour that number of degrees in the direction equivalent to moving the main cross-hairs in the palette Menu to the right. Using a negative value rotates the hues in the opposite direction. Note that the main colour block in the Palette Menu does not show the way Hue values "wrap around" at each end, but the diagram will show you how there are no real start and end points when talking about Hue.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively change the Hue of the area in the direction and number of degrees specified by the slider.

Note that if you use this mode on grey scale (black & white) images there will be no discernible effect.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Use this mode to do colour correction of frame-grabbed images.

JIGGLEVERT

This is a loadable mode.

The JiggleVert Mode creates a "camera-shake" effect in the vertical plane only, with a soft doubling of the image.

Slider

The slider adjusts the amount of blurring and has a range from 0% to 100%. The higher the level, the more blurring will occur.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively blur the area and decrease its sharpness and contrast.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Defocus and blur where a regular blur would look too ordered and, well, too regular.

Calculation Used

This mode is a "hard-wired" convolution operator using the following map. See the Convolve mode for further details.

6	0	0	0	-6		
0	0	0	0	0		
0	0	1	0	0		
0	0	0	0	0	Scale:	11
-6	0	0	0	-6	Offset:	0

Also See

Blur More, Gaussian Blur and Smooth modes.

LIGHTENONLY

This is a loadable mode.

The LightenOnly mode functions like normal paint mode with one difference. Before changing each pixel Opal Paint compares the luminance (brightness) of the existing pixel with the luminance of the colour it is about to paint down. The pixel is only replaced if the new pixel colour is lighter then the existing pixel colour, i.e. if the pixel will be "Lightened" by the change.

Also see DarkenOnly (page 151)

Slider

There is no slider for this mode.

Multiple Application

Reapplying this mode with the same options in the same area will have no effect as the "eligible" pixels will be changed in the first pass.

Use of New Colour Information

This mode uses the luminance levels of the existing and new colours to decide whether to paint or not at each pixel position.

Ideas for Use

 ❖ Use when you want to paint only on parts of an image that are darker than some thresh-hold, say to clip them up to a grey level.

LOGICALAND

This is a loadable mode

This mode performs a bitwise Logical AND operation between the existing colour information and the new colour information, with Red, Green and Blue channels treated seperately.

This mode is included for a small number of image processing junkies and has a limited range of uses. If you need it you will certainly know how to use it, otherwise please ignore it.

Slider

There is no slider for this mode.

Multiple Application

Each application performs a new bitwise AND operation.

Use of New Colour Information

This mode uses both new colour information and existing colour information from the image.

Ideas for Use

❖ If you need it, you'll certainly know it.

Also See

LogicalOR, LogicalXOR modes.

LOGICAL*OR*

This is a loadable mode

This mode performs a bitwise Logical OR operation between the existing colour information and the new colour information, with Red, Green and Blue channels treated seperately.

This mode is included for a small number of image processing junkies and has a limited range of uses. If you need it you will certainly know how to use it, otherwise please ignore it.

Slider

There is no slider for this mode.

Multiple Application

Each application performs a new bitwise OR operation.

Use of New Colour Information

This mode uses both new colour information and existing colour information from the image.

Ideas for Use

❖ If you need it, you'll certainly know it.

Also See

LogicalAND, LogicalXOR modes.

LOGICALXOR

This is a loadable mode

This mode performs a bitwise Logical XOR (Exclusive OR) operation between the existing colour information and the new colour information, with Red, Green and Blue channels treated seperately.

This mode is included for a small number of image processing junkies and has a limited range of uses. If you need it you will certainly know how to use it, otherwise please ignore it.

Slider

There is no slider for this mode.

Multiple Application

Each application performs a new bitwise XOR operation.

Use of New Colour Information

This mode uses both new colour information and existing colour information from the image.

Ideas for Use

❖ If you need it, you'll certainly know it.

Also See

LogicalAND, LogicalOR modes.

LUMANOISE

This is a loadable mode.

The LumaNoise Mode is used to add random noise (small variations around the existing levels) to the luminance portion of the image. This mode can be used to increase the texture of smooth image areas without changing the basic Hue of the image.

It works by adding or subtracting a random amount to the Value level of each pixel in the specified area of the image.

Slider

The slider can be set from 0% to 100% and as the slider level increases the amount of noise increases by raising the limit on the range of random numbers generated (see calculation).

Multiple Application

Reapplying this mode in the same position progressively and adds random noise to the Brightness of the image, eventually resulting in a totally random Value distribution.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Break up sharp edges

❖ Introduce "Natural" textures to computer-generated images or heavily smoothed images.

❖ Simulate a badly tuned television.

Calculation Used

$$H_{new} = R_{old}$$
$$S_{new} = G_{old}$$
$$V_{new} = V_{old} + random_{(-s \gg 0 \gg s)}$$

where

S is the slider input with a range from 0% to 100% (0.00 to 1.00)

MAXIMUM

This is a loadable mode

The Maximum mode amplifies and exaggerates the lighter portions of the selected portion of your image and makes dark shadows lighter. It has the effect of spreading out the light areas of the image and choking in the dark areas.

Slider

The slider adjusts the amount of amplification that will occur. A higher level will result in a greater spread of lighter areas.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively amplify the light areas of the area.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Use to emphasise the lighter areas of images such as highlights and illuminated patches.

Also See

Median, Minimum modes.

MEDIAN

This is a loadable mode

The Median mode averages the brightness values of adjacent pixels.

Slider

The slider adjusts the amount of averaging that occurs.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively blur the image.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Useful to remove digital noise in scanned and frame-grabbed images.

Also See

Maximum, Minimum modes.

MINIMUM

This is a loadable mode

The Minimum mode amplifies and exaggerates the darker portions of the selected portion of your image and makes lighter areas darker. It has the effect of spreading out the dark areas of the image and choking in the light areas.

Slider

The slider adjusts the amount of amplification that will occur. A higher level will result in a greater spread of darker areas.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively amplify the dark areas of the area.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Use to emphasise the dark areas of images such as shadows.

Also See

Maximum, Median modes.

MODULATE

This is a loadable mode.

Uses new colour information to effect intensity of image. Useful to apply paper type to whole image
The Modulate Mode works in the HSV colour system and works by modulating or multiplying the Value of the existing colour with the Value from the colour-source. This is most useful using a cutout brush, texture map or rub-through in order to transfer the luminance of one image to another.

Slider

The slider can be set from 0% to 100% and adjusts the overall effect of the new colour information on the existing image (see calculation).

Ideas for Use

❖ Set up a rub-through and use ZAP to produce a "watermark" of the secondary image onto the image in the current screen.

Use of New Colour Information

This mode uses only the Value component of the new colour information.

Calculation Used

$$H_{new} = H_{old}$$
$$S_{new} = S_{old}$$
$$V_{new} = V_{old} \times V_{draw} \times s$$

where

S is the slider input with a range from 0% to 100% (0.00 to 1.00)

See Also

Colourise, TintH, TintHS modes

MOSAIC

This mode appears on the main Modes menu.

The Mosaic Drawing Mode is used to produce a square pixelised or posterised effect to a portion of the image, with the effected area changed to a collection of larger squares. This effect is often used in television to disguise the face of a person when interviewing them.

It works by dividing the specified area of the image into squares, the size of which is specified by the slider. The colours of each individual pixel in the square are then averaged and the whole square takes on the average colour.

This mode is most useful using area-fill drawing modes.

Slider

The slider controls the size of the mosaic squares and can be set from 1x1 to 31x31.

Multiple Application

Reapplying this mode in the same position has no effect as the first application will generate the larger coloured squares.

Use of New Colour Information

This mode ignores the New colour information and uses only existing colours from the image.

Ideas for Use

❖ Create a large-pixel effect.

❖ Disguise the face of a shy person who does not wish to be identified on television.

Also See

Mosaic2, OilPaint modes.

MOSAIC2

This is a loadable mode.

Like the Mosaic Drawing Mode, Mosaic2 is used to produce a square pixelised or posterised effect to a portion of the image, with the effected area changed to a collection of larger squares. However, it is much faster than Mosaic Mode because instead of filling each new square with the average of the pixels within it it simply repeats the colour of the top-left pixel over the whole square. This may or may not be acceptable, depending on the application.
This mode is most useful using area-fill drawing modes.

Slider

The slider controls the size of the mosaic squares and can be set from 1x1 to 31x31.

Multiple Application

Reapplying this mode in the same position has no effect as the first application will generate the larger coloured squares.

Use of New Colour Information

This mode ignores the New colour information and uses only existing colours from the image.

Ideas for Use

❖ Create a large-pixel effect.

❖ Disguise the face of a shy person who does not wish to be identified on television.

Also See

Mosaic, OilPaint modes.

NEGATIVE

This mode appears on the main Modes menu.

Negative mode is used to make parts of the image look like photographic negatives with all colours the exact opposite of their true colour. This is done by taking the existing colour information from the image and subtracting each RGB colour component from 100%. For example, a colour specified by (R_35%, G_67%, B_43%) would become (R_65%, G_33%, B_57%).
This means that any draw-colour information from any source is ignored. All processing is done using existing colours.

Multiple Application

Each time you apply the negative process it works on the new colour levels, so if you are freehand drawing and go back and forth over an area, or use the "a" (again) button repeatedly, that area will merely jump back and forth between the two states, ie the original colours and the negative of those colours.

Slider

There is no slider for this mode.

Ideas for Use

❖ This is an effect to make parts of the image look like photographic negatives.

❖ Alternatively, if you have an image that is scanned from a negative you can generate the positive image.

❖ In Alpha Work Mode use the Negative mode to Invert the Alpha (Transparency) map for selected portions of the image.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Calculation Used

$$R_{new} = 100\% - R_{old}$$
$$G_{new} = 100\% - G_{old}$$
$$B_{new} = 100\% - B_{old}$$

OILPAINT

This is a loadable mode.

The OilPaint Mode breaks the image into irregular "blobs" or spots of colour based on the existing colours - a bit like an irregular Mosaic effect. This creates an effect like an impressionist Oil Painting.
This mode is most useful using area-fill drawing modes.

Slider

The slider controls the general size of the "spots" and can be set from 1x1 to 31x31.

Multiple Application

Reapplying this mode in the same position will only cause slight changes in the edges of the blob, so is practically a once-off effect.

Use of New Colour Information

This mode ignores the New colour information and uses only existing colours from the image.

Ideas for Use

❖ Create a hand-painted effect of a scanned or frame-grabbed image.

Also See

Mosaic, Mosaic2 modes.

PAINT (F1, F2)

This mode appears on the main Modes menu.

Paint Mode is the default mode with no special effects or colour manipulation. The keyboard shortcut F1 selects the equivalent of Paint Mode with "Multi" colour source, while F2 is the equivalent of Paint Mode with the single colour "Paint-Pot" option described in the Operation Source section on page 124.

Note that other operators such as the stencil and global transparency are still in effect if selected.

Multiple Application

Each time you apply Paint the colour application is re-done. The only difference caused by multiple application of Paint mode will occur when Global Transparency is on and the colour of the image will progressively move toward the colour used in the painting operation.

Slider

There is no slider for this option.

Uses

❖ Use Paint mode to apply paint and when pasting down cutout brushes.

Use of New Colour Information

This mode uses the RGB components from the new colour information.

Calculation Used

$$R_{new} = R_{draw}$$
$$G_{new} = G_{draw}$$
$$B_{new} = B_{draw}$$

POSTERISE

This mode appears on the main Modes menu.

The Posterise mode reduces the number of colours used in portions of the image to give "computer displays", infra-red camera or nuclear-blast type effects. The slider determines the number of colour levels between full black and full white and the mode then moves each existing colour to the nearest level. For a more visual look at posterising, watch the effect on a colour map of the posterise slider in the ChromaCtrl mode.

Slider

The higher the slider, the fewer colour levels there are and the greater the posterising effect.

Multiple Application

Reapplying this mode in the same area has no effect - this is a once-only effect.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Use when you want your beautiful, true colour 24 bit scanned image to look like a "normal" Amiga image.

❖ Simulate the nuclear holocaust that looks less likely every passing day.

Also See

ChromaCtrl mode.

RED

This is a loadable mode.

The Red mode selectively increases or decreases the Brilliance of the Red channel alone, thus adjusting the amount of red information in the image or the area specified by the drawing tool. You should note that this mode can clip the red channel to maximum or minimum levels. Read the section on Colour Processing (page 121) for further information on clipping and other theory.

Slider

The slider adjusts the level of the Brilliance change and has a range from -50% to +50% with 0 being the neutral value. Setting the slider to a positive value increases the brilliance of the red channel, while a negative setting reduces the red intensity.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively increase or decrease the red content of the area.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

Correct colour imbalances
Experiment for some great special effects.

Also See

Balance, Blue, Brilliance, ChromaCtrl, Green modes.

SHADE *(F5)*

This mode appears on the main Modes menu.

The shade mode works in the HSV colour system and works by replacing the Value of the existing colour with the Value from the colour-source. This is usually done using a solid grey so that the portion of the image modified becomes the same uniform darkness.

Slider

There is no slider for this mode.

Ideas for Use

❖ To make a realistic drop shadow when pasting down a cutout brush, select a grey Paint-Pot, click the "Paint-Pot" Colour Source button in the Mode Selection Menu and paste down the brush where you want the shadow to appear. Return the pasting action to multi-colour by clicking the "Multi Colour" Colour Source button in the Mode Selection Menu, selecting Paint Mode then paste down the brush in its final position.

Use of New Colour Information

This mode uses only the Value component of the new colour information.

Calculation Used

$$H_{new} = H_{old}$$
$$S_{new} = S_{old}$$
$$V_{new} = V_{draw}$$

See Also

Colourise, TintH, TintHS modes.

SHARPEN

This mode appears on the main Modes menu.

Use the Sharpen Mode to highlight detail in the specified area of the image. It is especially useful when used with blurred edges and can be thought of as a selective contrast magnifier that works on edges in the image.

Slider

The slider adjusts the "strength" of the Mode's sharpening effect. The higher the slider setting, the greater the effect.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively increase contrast of the edges in the area.
Note that in some type of images, notably scanned and frame-grabbed pictures, overuse of the Sharpen mode will amplify the "noise" in the image and result in unsightly distortion.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Tidy up blurred edges in scanned or frame-grabbed images.

❖ Use with the Zap key to crisp up an image in one step.

Also See

BigSharpen, Sharpen2 modes.

SHARPEN2

This mode appears on the main Modes menu.

This is a more powerful version of the Sharpen Mode and quickly highlights detail in the specified area of the image.

Slider

The slider adjusts the "strength" of the Mode's sharpening effect. The higher the slider setting, the greater the effect.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively increase contrast of the edges in the area.

Note that in some type of images, notably scanned and frame-grabbed pictures, overuse of the Sharpen mode will amplify the "noise" in the image and result in unsightly distortion. This will occur much more readily than when using the Sharpen mode.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Tidy up blurred edges in scanned or frame-grabbed images.

❖ Use with the Zap key to crisp up an image in one step.

Also See

BigSharpen, Sharpen modes.

SMEAR (F4)

This mode appears on the main Modes menu.

Use the Smear Mode to drag and mix colours on the screen. It works by dragging the colours under the nozzle or cutout brush in the direction of drawing and progressively mixing them with the existing image colours. As the brush is dragged, the mixing effect reduces until it stops altogether at the limit specified by the slider.

Note that movement is required. Because of this, the Sketch and Continuous Freehand Drawing Tools are most useful. Outline Drawing Tools are a little less useful as they only work in one direction along the path of the tool and Area-Fill Drawing Tools are completely useless for Smear as there is no movement at all!

Slider

The slider adjusts the "strength" of the Mode's smoothing effect. The higher the slider setting, the greater the effect and the longer the underlying colour "sticks" to the brush

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively drag colour and increase the smearing action.

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Tidy up blurred edges in scanned or frame-grabbed images.

❖ Stir areas of colour to get an oil or water-colour effect.

❖ Drag areas of an image to enlarge facial features.

SMEAR-IN

This is a loadable mode.

The operation of this mode is very similar to standard Smear, except that a copy of the selected nozzle or cutout brush is pasted down first. This initial paste-down occurs once only, at the point the drawing begins and is then smeared into the image as the brush is moved.

This mode is most useful using the Sketch or Continuous Freehand Drawing Tools to add colour to an image and mix it in with the same operation. Note that movement is required. Outline Drawing Tools are a little less useful as they only work in one direction along the path of the tool and Area-Fill Drawing Tools are completely useless as there is no movement at all!

Slider

The slider can be set from 0% to 100% and adjusts both the strength (transparency) of the initial brush paste-down and the length of the smear effect as for smear mode.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively add colour and mix it into the image.

Use of New Colour Information

This mode uses the current Paint-Pot colour and the existing colours from the image.

Ideas for Use

❖ Add highlights and accent colours to an image and mix them in.

SMOOTH (F8)

This mode appears on the main Modes menu.

Use the Smooth Mode to blend sharp edges and reduce detail in the specified area of the image. It is especially useful when used on harsh "jaggy" edges and can be thought of as a selective contrast reducer that works on edges in the image.

Slider

The slider adjusts the "strength" of the Mode's smoothing effect. The higher the slider setting, the greater the effect.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - each application will progressively smooth edges .

Use of New Colour Information

This mode ignores all new colour information and uses only existing colours from the image.

Ideas for Use

❖ Tidy up jagged edges in scanned or frame-grabbed images.

❖ Drag an area-fill tool over a large area of the image.

❖ Use with the Zap key to smooth an image in one step.

SPECKLE

This is a loadable mode.

The Speckle Mode introduces a checkerboard-style speckle pattern in the selected area of the image, which becomes more pronounced in areas of faster colour change.

Slider

The slider adjusts the amount of change made to the image and has a range from 0% to 100%. The higher the level, the more speckling will occur.

Multiple Application

Reapplying this mode in the same area has a cumulative effect - however because the effect is greater in areas of fast colour change a second application will work most on the speckle introduced on the first application, leading to clipping and coloured artifacts.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Add texture to an image for backdrops or special effects

Calculation Used

This mode is a "hard-wired" convolution operator using the following map. See the Convolve mode for further details.

1	-2	1	
-2	5	-2	Scale 1
1	-2	1	Offset: 0

Also See

AddNoise, Convolve, LumaNoise modes.

SUBTRACTIVE (F7)

This mode appears on the main Modes menu.

Subtractive mode takes the new colour information for each pixel and subtracts it from the existing colour information for the pixel that will be changed. This subtraction is done using the RGB colour system, so the Red component of the colour being applied is multiplied by the scaling factor set on the slider then subtracted from the Red component of the existing pixel. The new values for Green and Blue channels are calculated in a similar way.

Multiple Application

Each time you apply the subtractive process it works on the new colour levels, so if you are freehand drawing and go back and forth over an area, or use the "a" (again) button repeatedly, that area will become darker and darker in colour. The limit of the subtractive process is a fully black pixel, with Red, Green and Blue colour components all at 0%. This assumes that the draw-colour you are using to add contains some Red, some Green and some Blue. If the draw-colour has (say) zero percent Blue, the Blue component level of the existing pixels will remain unchanged no matter how many times you apply the Subtractive mode. Also note that because of the way the Subtractive mode works the component levels in the draw-colour determines how "fast" the colour will move toward the limit. (See also Additive Mode on page 126)

Slider

The slider can be set from 0% to 100% and acts as a scaling factor on the subtractive process. For example, if set at 50% the subtractive effect will be reduced by half.

Ideas for Use

❖ Use a grey level to darken an area of an image.

❖ Cutout a brush and set up a Texture Pattern. Using a dark grey or a low level on the slider, rub back and forth with freehand draw and a medium nozzle or airbrush to progressively darken part of the image using the texture.

Use of New Colour Information

This mode uses the RGB components from the new colour information.

Calculation Used

$$R_{new} = R_{old} - sR_{draw}$$
$$G_{new} = G_{old} - sG_{draw}$$
$$B_{new} = B_{old} - sB_{draw}$$

where

S is the slider input with a range from 0% to 100% (0.00 to 1.00)

See Also

Additive mode

TINT H (F3)

This mode appears on the main Modes menu.

Tint H allows you to change the tint of an image section while retaining the shading and contours. It does this by changing the Hue component of the existing colours to the Hue of the New colour information, without changing the existing Saturation and Value that give light and shade to the image.

It can only be used with coloured images, as the Hue component has no effect on a grey colour where Saturation is zero (use Colourise to tint greyscales). You should also note that if tinting with a pastel shade, i.e. one that is relatively unsaturated, only the pure Hue of that colour will be used to tint the image, so you may not get quite the effect you need.

Slider

There is no slider for this mode.

Multiple Application

Reapplying this mode in the same area and the same tinting new colour information has no effect, because the Hue of the image is completely changed to that of the new colour information in the first application.

Ideas for Use

❖ Change the colour of clothing.

❖ Apply make-up using an airbrush.

Use of New Colour Information

This mode uses only the Hue component from the new colour information.

Calculation Used

$$H_{new} = H_{draw}$$
$$S_{new} = S_{old}$$
$$V_{new} = V_{old}$$

See Also

Colourise, Shade, TintHS modes

T*INT* *HS*

This mode appears on the main Modes menu.

Tint HS allows you to change the tint of an image section with partially saturated colours while retaining the shading and contours. It does this by changing the Hue component of the existing colours to the Hue of the New colour information, modulating the existing Saturation with the New colour information Saturation and leaving the existing Value component unchanged.

Like Tint H, it can only be used with coloured images, as the Hue component has no effect on a grey colour (use Colourise to tint greyscales). However, unlike Tint H mode, if tinting with a pastel shade, i.e. one that is relatively unsaturated, both the Hue and the Saturation of the Tint colour will be used to tint the image.

You can also use Tint HS to tint coloured images with a grey colour, as the Saturation modulates the existing Saturation.

Slider

There is no slider for this mode.

Multiple Application

Reapplying this mode in the same area and the same tinting new colour information has a cumulative effect, because although the Hue of the image is completely changed to that of the New colour information in the first application the Saturation components are continually multiplied together.

Ideas for Use

❖ Change the colour of clothing.

❖ Apply make-up using an airbrush.

Use of New Colour Information

This mode uses the Hue and Saturation components from the new colour information.

Calculation Used

$$H_{new} = H_{draw}$$
$$S_{new} = S_{old} \, x \, S_{draw}$$
$$V_{new} = V_{old}$$

See Also

Colourise, Shade, TintH modes

WOODCUT

This is a loadable mode.

The WoodCut Mode produces a very pleasing texture similar to a woodcut printing block, with even slight variations in a scanned image creating subtle embossing effects.

Slider

The slider adjusts the amount of change made to the image and has a range from 0% to 100%. The higher the level, the more embossing will occur.

Multiple Application

Reapplying this mode in the same area has a cumulative effect.

Use of New Colour Information

This mode ignores the new colour information and uses only existing colours from the image.

Ideas for Use

❖ Add texture to an image for backdrops or special effects

❖ Convert an old-fashioned effect by first using Grey Mode then WoodCut.

Calculation Used

This mode is a "hard-wired" convolution operator using the following map. See the Convolve mode for further details.

-2	0	0	
0	5	0	Scale 1
0	0	-2	Offset: 0

Also See

Convolution, East, Emboss modes.

Transparency

OVERVIEW

After applying the Drawing Mode to generate a new colour for each pixel, OpalPaint then calculates a transparency level to determine how the new colour will replace the existing colour for that pixel. As described in the section on the Operation Chain (see page 18), this transparency information is generated in several different parts of OpalPaint. The transparency mixer takes any transparency information attached to the cutout brush, the Texture Pattern and/or a transparency gradient if used and combines them. Finally, before actually changing the colour of the pixel, OpalPaint applies a last global or alpha channel transparency to the change. In this way, the effect of every image modification can be partially combined with existing pixel colours.

The final transparency level specifies the percentage of old colour information that will remain after applying the changes to a pixel. Each transparency is defined as a number between 0%, meaning any existing pixel colour is totally replaced and 100%, meaning the changes are fully transparent and there will be no change to existing pixel colour. For example, if the global transparency is set at 35%, the new colour will be a mix of 35% of the old, existing colour and 65% of the new colour.

To enable or disable the global transparency modifier,

- Click the "TRAN" button on the Main Menu Bar using the Left Mouse Button.

To invoke the Transparency Options Menu and adjust the level of global transparency,

- Click the "TRAN" button on the Main Menu Bar using the Right Mouse Button, or double-click using the Left Mouse Button.

TRANSPARENCY OPTIONS MENU

To invoke the Transparency Options Menu and adjust the level of global transparency,

- Click the "TRAN" button on the Main Menu Bar using the Right Mouse Button, or double-click using the Left Mouse Button.

The Transparency Options Menu looks like this:
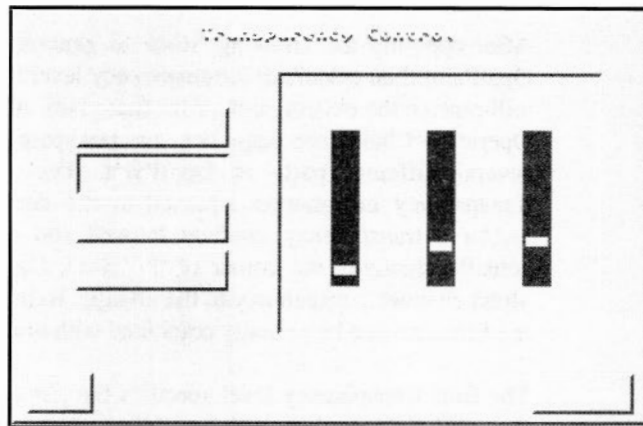
Standard

To adjust the level of standard global transparency, or the ratio between existing and new colour information when modifying the image,

- Click the "Standard" button in the Transparency Options Menu.

A single slider will appear on the right of the menu. A level of 0% corresponds to the existing pixel colours of the image being fully replaced, while a level of 100% corresponds to fully transparent, with no change to the existing image for that pixel. Remember that the setting of this slider is combined with all other transparency levels so that even if this slider is at 0% there may be other functions such as a transparency gradient affecting the final transparency level.

To adjust the slider level,

- Drag the slider button to the desired level using the Left Mouse Button. To adjust the slider level by single steps, click in the slider box above or below the slider button using the Left Mouse Button.

R G B

In certain circumstances you may wish to "filter" the effect of colour changes and selectively adjust the transparency of Red, Green and Blue components separately. To do this,

- Click the "RGB" button in the Transparency Options Menu.

Three sliders will appear on the right of the menu, with one each for Red, Green and Blue. For each slider a level of 0% corresponds to the new value for that colour component completely replacing the existing level of that colour component, while a level of 100% corresponds to that colour component of the image remaining unchanged.

To adjust a slider level,

- Drag the slider button to the desired level using the Left Mouse Button. To adjust the slider level by single steps, click in the slider box above or below the slider button using the Left Mouse Button.

H S V

In a similar way to filtering Red, Green and Blue components separately, this option allows selective adjustment to the Hue, Saturation and Value components. For example, you can cut out a brush from a frame grabbed image of a burlap bag then paste it over your image with the Hue and Saturation sliders at 100% (no change to Hue or Saturation components) and Value slider pushed up to, say, 20%. The original tones of the image will be unchanged, but the rough dark and light shading of the burlap will be transferred to your image.

To adjust HSV transparencies individually,

- Click the "HSV" button in the Transparency Options Menu.

Three sliders will appear on the right of the menu, with one each for Hue, Saturation and Value. For each slider a level of 0% corresponds to the new value for that colour component completely replacing the existing level of that colour component, while a level of 100% corresponds to that colour component of the image remaining unchanged.

To adjust a slider level,

- Drag the slider button to the desired level using the Left Mouse Button. To adjust the slider level by single steps, click in the slider box above or below the slider button using the Left Mouse Button.

Alpha

If you have created an Alpha (Transparency) mask using Alpha Work Mode
(see page 200) this button will be unghosted, allowing you to use the alpha
plane to specify the image's transparency on a pixel-by-pixel basis.

To adjust the strength of the Alpha channel,

* Click the "Alpha" button in the Transparency Options Menu.
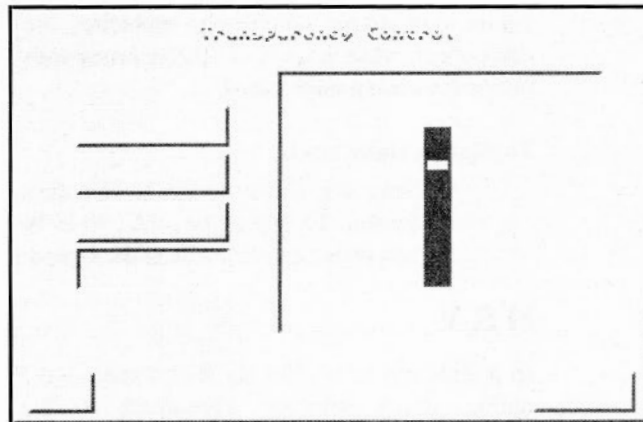
A slider will appear on the right of the menu marked "Strength". The slider
effectively scales the alpha channel's maximum effect so a slider level of 100%
means that "opaque" areas of the alpha map will be completely changed by the
painting or image processing operation while a level of 0% means that the
whole image will be fully transparent and remain unchanged.

To adjust a slider level,

* Drag the slider button to the desired level using the Left Mouse
  Button. To adjust the slider level by single steps, click in the slider
  box above or below the slider button using the Left Mouse Button.

Work Modes

Work Mode
PT ST AL

OpalPaint provides three Work Modes in order to edit and modify various aspects of an image. They all utilize the same basic and familiar techniques such as Drawing Tools, Magnify and Zoom, Grid, Cutout Brushes and Nozzles so that you don't need to learn completely new sets of commands.

The three Work Modes are Paint Work Mode, Stencil Work Mode and Alpha (or Transparency) Work Mode.

To switch between work modes,

- Click the button (PT, ST or AL) on the Main Menu Bar for the Work Mode you wish to switch to.

PAINT WORK MODE

Paint Work Mode is the most common mode used with OpalPaint with the full range of 24-bit colour and image manipulation tools.

We will not discuss this mode separately but rather show how the other two modes differ from it.

STENCIL WORK MODE

The Stencil Work Mode allows you to easily set up Area Stencils using the complete range of Drawing Tools. Instead of 16.7 million colours to paint with, you have only two - on and off. The Paint-Pots are still shown so you can change the display colour of the stencil, but you can only add to and remove from the 1-bit area stencil.

A full discussion of this work mode can be found in the chapter on Stencils, commencing page 113.

ALPHA (TRANSPARENCY) WORK MODE

Alpha Work Mode allows you to edit an 8-bit (256 level) transparency mask or channel over the image. Once created, this transparency mask is useful in three main areas:

- When painting or modifying the image in Paint Work Mode. Rather than limiting the definition of transparency to one global value for the whole operation, you can specify the transparency on a pixel-by-pixel basis.

- This transparency mask can be "cut" along with image colours when cutting brushes to specify the transparency of different parts of the new cutout.

- If the OpalVision Video Processor module is fitted you can use the alpha mask as a linear key or Alpha Channel. It is this use as an Alpha Channel that gives the Work Mode its name, and it lets you define the transparency of various parts of the image to live video. Alternatively the Alpha Channel of an image can be used to specify the transparency of one video source with respect to another. The use of Alpha Channels is more completely discussed in the Video Suite's reference manual.

The most obvious difference between Alpha Work Mode and Paint Work Mode is that instead of 16.77 million colours to paint with you only have 256 shades of grey. Each shade of grey corresponds to a transparency level with white equivalent to fully opaque (0% transparency) and black corresponding to fully transparent (100%), just as on the gradient transparency slider (see page 46).
In Alpha Work Mode the Paint-Pots and palette menu are simplified to generate only greys and ranges of greys, but tools such as gradient fills can still be used to generate smooth transparency gradients over the image.
You also have access to nearly all of the normal Drawing Tools and Drawing Modes familiar from Paint Work Mode. See the Mini-Tutorial below.

Alpha Work Mode Options

To invoke the Alpha Work Mode Options menu,

- Click the AL Work Mode button on the Main Menu Bar using the Right Mouse Button, or double-click using the stylus or Left Mouse Button.
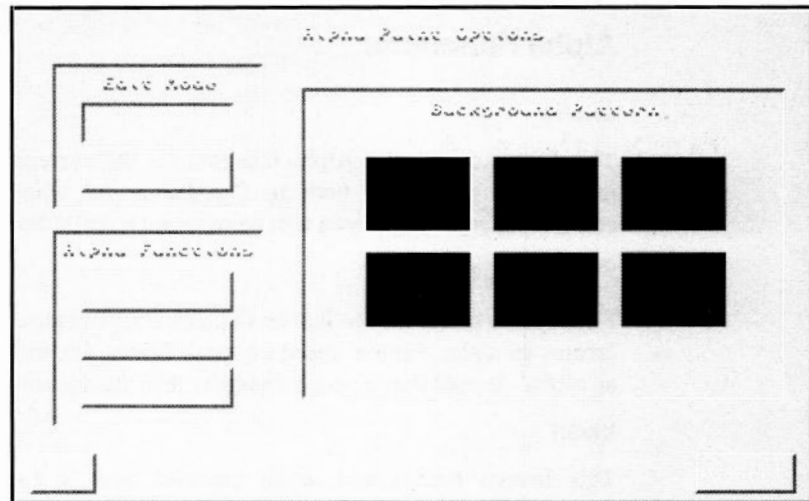
Edit Mode

The Edit Mode describes the way in which the Alpha channel is displayed for editing.

Pattern

Pattern mode shows the image colours combined with a background solid colour or grid pattern selected from the options on the right of the menu. Imagine the image is placed over a page with the selected colour or pattern. The alpha channel is then used to combine both images. The more transparent (black) the alpha map, the more the background colour or grid will dominate, while as the alpha channel moves toward opaque (white) you will see more of the image colours instead of the background or grid colours. As you paint over the image using darker and darker greys the background colour or grid will be progressively revealed through the image.

If you use the Alpha map with the OpalVision Video Processor module this background colour or grid will be replaced by the genlocked video image.

Grey Scale

In grey scale edit mode you will not see the original image at all, but will only see grey scales representing the various alpha levels in the alpha channel. While you cannot use the image as a reference in this view, it is generally much faster than Pattern mode and is quite useful in many cases where you don't need the alpha channel to be related or aligned with the underlying image.

Alpha Functions

Delete

This button deletes the Alpha Channel for the current image and frees up the memory it was using both in OpalPaint and when saved on disk. After confirming your choice you will be returned to Paint Work Mode.

Paste Image

This option takes the luminance (Value) components of the current image and creates an alpha channel based on these values. It can be useful when you want an alpha channel that is more transparent in the darker areas of the image.

Invert

This inverts the current alpha channel, and is functionally equivalent to dragging a solid rectangle over the whole image using the Negative mode. Put another way, each value will be subtracted from 100%, so a 65% alpha level will become 35%. This is useful in the same ways as the Invert button in Stencil Work Mode.

If you want to have soft-edged stencils, you may find it useful to draw over those parts of the image you wish to exclude using a mid-grey (half transparent) colour then process with Contrast Mode to make the mid-greys fully black (fully transparent), smooth the edges using a Blur or Smooth mode then set Alpha Transparency in Paint Work Mode before performing your desired operation.

Mini Tutorial

When in Alpha Work Mode it is possible to confuse yourself very quickly. The "colours" you are painting represent transparencies, but you still see both colour and transparency options in many menus. The trick is to remember that in Alpha Work Mode "Colour" refers to the level you are applying to the Alpha Channel (visually, to the image to show the grid or background) while "Transparency" controls the way the new "Colour" is combined with existing "Colours" in the Channel. Still confused? Lets work through an example.

Say you wish to generate an alpha channel to be used as a linear key over video. This is to be a frame for a wedding video with semi-transparent leaves and

flowers around the edges fading to a fully transparent oval "vignette" hole in the centre.

You could start with a scanned or frame-grabbed image showing leaves and flowers, then select the "Paste Image" button in the Alpha Options menu to generate an Alpha channel that follows the light and shade of the image.

Then you could enter the Area Fill Menu and set up a radial gradient from black in the centre to white at the outside. If you drag an ellipse out over your image you will now have a vignette frame that is fully transparent at the centre and fully opaque at the edges.

BUT . . . here lies the problem. The very outside of the ellipse will be fully opaque and show none of the background grid or colour, while right next to it will be variations of alpha where you pasted the image into the alpha channel. Rather than the alpha fading smoothly from its mottled leaf and flower pattern to a fully transparent centre there will be a sharp edge. UNDO! Not what we wanted at all!

This is where you employ the Transparency gradient. "But", I hear you say, "haven't I been painting transparencies all along?" Well, try to remember that although they will eventually be used as a transparency level (in Paint Work Mode) we are still in Alpha Work Mode, where the grey levels we have been painting are equivalent and act in the same way as the colours in normal Paint Work Mode. If you use a Transparency gradient (or transparency from the "Trans" menu for that matter) it will control the transparency of the chosen alpha grey level as it is combined with the existing alpha levels in the alpha channel.

In this example, set up a radial transparency gradient that is 100% at the left (the centre of the ellipse) and 0% at the right (the outside). Now when you drag out the ellipse it will still be black (or show 100% of the background colour or grid) at the centre, but at the outside edge it will merge smoothly into the existing alpha levels due to the Transparency gradient.

One last thing - you may like to move the inner (leftmost) tags on both Colour and Transparency gradient boxes toward the right so that the area of 0% alpha in the final alpha channel is larger, with the smooth edge limited to a smaller distance around the outside of the ellipse. Try it and see.

Use with Cutouts

The Cutout Options Menu described on page 93 includes a button called "Use Alpha". If this button is selected when cutting a brush, the alpha overlay will be cut out along with the image colours and used when pasting the brush. Note that if you use the "Ignore Background" feature when cutting the brush, those areas of the image that are the background colour or within the background colour tolerance range will still be given 100% transparency in the cutout's transparency overlay, regardless of the alpha level you have painted for those areas.

Memory and Time Requirements

Note that Alpha Paint Mode needs to take a copy of the full image in order to display the transparency and grid. It also requires additional memory to maintain the Alpha or Transparency overlay, so this option will not be available unless you have sufficient free RAM.

Also note that if you save an image with an attached Alpha Channel the size of the image file will be increased by up to an additional one third.

Just as with Area Stencils, the Alpha channel can be deleted if required using the "Delete" button on the Alpha Work Mode Options Menu.

The main time delays using the Alpha Work Mode occur when jumping into and out of the mode as OpalPaint has to recalculate the screen to show not the pure image colours but the colours as they appear when combined with transparency to show the background or grid. The more you can plan your work to avoid jumps back and forth between Work Modes, the faster you can be.

Magnify & Zooming

OpalPaint allows you to zoom in on sections of the image for fine adjustment and detailed work, or zoom out to show the whole image on your screen at once.

MAGNIFYING GLASS

Keyboard

m

The Magnifying Glass icon button on the Main Menu Bar switches the zoom-in feature on and off. To enable the Magnify feature,

- Click the Magnifying Glass button on the Main Menu Bar using the Left Mouse Button, or use the "m" keyboard shortcut. The advantage of using the "m" key is that the zoom area is centred around the current pointer position.

To switch off the Magnify,

- Click the Magnifying Glass button on the Main Menu Bar using the Left Mouse Button, or use the "m" keyboard shortcut.

If you use the Magnify button again, the image will be magnified to the same level and at the same position as it was when you switched off the Magnify. This enables you to switch back and forth easily between Magnified and Non-Magnified views of the image when doing fine adjustment.

Important Note: If you wish to use the Undo or Dynamic Undo features of OpalPaint, the operation must be done before changing zoom level or switching between magnified and non-magnified views.

```
IN  /
ZOOM
/OUT
```
Keyboard

<,>

Zoom Magnify

When Magnify is switched on, the Zoom button adjusts the level of magnification. Each level shows pixels at twice the size of the previous level, so the available magnifications are 2X, 4X, 8X and for Hi-Res only, 16X.

To zoom in, or increase the magnification to the next highest level,

- Click the top-left half of the Zoom button on the Main Menu Bar using the Left Mouse Button.

To Zoom Out, or decrease the magnification to the next lowest level,

- Click the lower-right half of the Zoom button on the Main Menu Bar using the Left Mouse Button .

Note that if you are already at 2X zoom and try to decrease the magnification the Magnify will be switched off (effectively 1X zoom). If you try to increase the magnification above the 8X or 16X (for Hi-Res) limit there is no effect.

Other Useful Keys

The arrow keys can be used to move the magnified area around on the image.

The "n" key centres the magnify area over the pointer position. A useful technique is to hold the pointer at one edge of the screen and repeatedly hit the "n" key to rapidly move the magnify area in that direction.

SHOW PAGE

When the Magnify Glass is not switched on, the Zoom button is replaced by the View button that provides two zoom-out views of the image.

Full Screen, Current Resolution

To show the image at the current resolution but filling the screen,

- Click the upper-left half of the View button on the Main Menu Bar using the Left Mouse Button. Alternatively use the Amiga-v keyboard shortcut.

This option will work even if you have limited Chip RAM, and is useful for viewing your image if you are forced to work with less than a full vertical screen.

Note that you cannot paint or otherwise modify the image while in this view, although the standard arrow-key screen panning will still work. Screen updates may be a little slow under certain circumstances, especially with larger images.

To return to the normal Work Modes,

- Click any mouse button or hit any key.

Scale to Fit Screen

To show the whole image scaled to fit on the screen regardless of its size,

- Click the lower-right half of the View button on the Main Menu Bar using the Left Mouse Button, or type the "S" keyboard shortcut.

Note that the same Chip-RAM limitations exist as when using the editing screen, so if Chip-RAM is a little low the image will be scaled to fit into the top portions of the screen.

To return to the normal Work Modes,

- Click any mouse button or hit any key.

Anti-Aliasing

OVERVIEW

Anti-Aliasing is the process of smoothing edges and eliminating the "jaggies" on lines that are not exactly horizontal or vertical. If selected it operates on the edges of all image changes.

To toggle (enable or disable) the Anti-Aliasing function,

- Click the "Anti" button on the Main Menu Bar using the Left Mouse Button.

SET OPTIONS

To enter the Anti-Aliasing Options Menu,

- Click the "Anti" button on the Main Menu Bar using the Right Mouse Button, or double-click using the Left Mouse Button.

The menu looks like this:
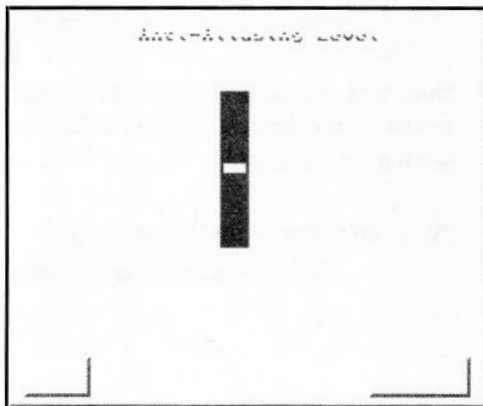
This menu allows you to set the level of Anti-Aliasing, with a higher level giving more smoothing on the edges.

Spare Pages

OVERVIEW

Keyboard

j,J

OpalPaint allows you to have multiple working pages for different projects or when cutting and pasting between images. Each spare page can have a different image size or resolution, and can be saved and loaded independently. The number of these spare or working images is limited only by available RAM. If the Virtual Memory option is selected, spare pages can be stored on Hard Disk so the number of pages is limited only by available Hard Disk space.

To jump between spare pages,

- Click the Spare Page button on the Main Menu Bar using the Left Mouse Button, or use the "j" keyboard shortcut.

To access the Spare Page Options Menu,

- Click Spare Page button on the Main Menu Bar using the Right Mouse Button, or use the "J" keyboard shortcut.

The icon looks like the one next to this reference item.

The Spare Page Options Menu looks like this and shows a familiar Art-Gallery of current pages.
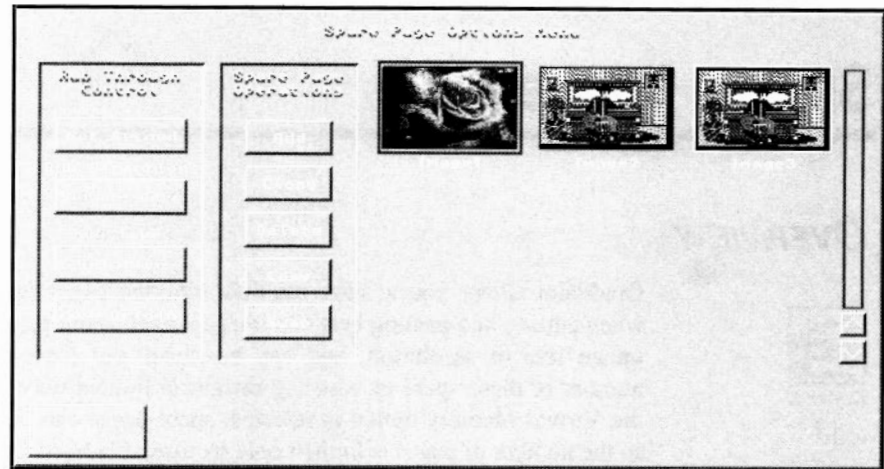
Select

To select a page for the following operations,

- Click once on the required image's picture-icon or Thumbnail image using the Left Mouse Button. A white line will appear around the selected thumbnail image.

To select a page to work on and return to the Main Menu Bar,

- Double-click the required image's Thumbnail image using the Left Mouse Button. The menu will disappear and show the selected image for modification.

Add

To add a new page,

- Click the "Add" button in the Spare Page Options Menu. A sub-menu will appear that allows you to specify the dimensions and resolution for the new page.

See page 216 for further information about this menu.
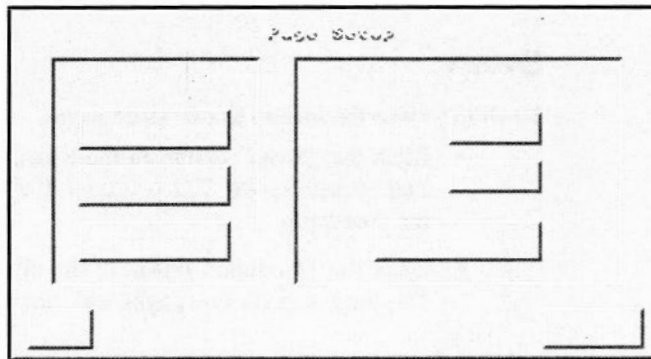
Clone

To create a new page with the same dimensions and resolution as the currently selected spare page (with its Thumbnail image outlined in white),

- Click the "Clone" button in the Spare Page Options Menu using the Left Mouse Button. A new page will be then be created.

If you want to create a copy of an existing page, first clone it to create a blank page and then copy it to the newly created page as described below.

Delete

To delete the currently selected spare page (with its Thumbnail image outlined in white),

- Click the "Delete" button in the Spare Page Options Menu using the Left Mouse Button. The currently selected page will be deleted from RAM, or Hard Drive if the virtual memory option is in use.

Copy

To copy the currently selected spare page (with its Thumbnail image outlined in white),

- Click the "Copy" button in the Spare Page Options Menu using the Left Mouse Button. The pointer will then show the word "TO" under the crosshairs.

- Click the Thumbnail image of the destination page that is to be replaced. The image will then be copied.

Swap

To simply swap the images in two spare pages,

- Click the "Swap" button in the Spare Page Options Menu using the Left Mouse Button. The pointer will then show the word "TO" under the crosshairs.

- Click the Thumbnail image of the other page that is to be swapped. The images in the two pages will then be exchanged.

RUB-THROUGH OPTIONS

Overview

Rub-Through is a type of Texture Pattern where the image from one spare page becomes the colour or transparency source when working in another page. Note that this menu is used to set the options for the Rub-Through, while the actual operation and use of the Rub-Through is controlled through the Texture Pattern Control Menu described on page 107.

Rub-through can occur in both directions; you can work in one screen and rub-through *from* the secondary screen, or work in one screen and rub-through *onto* the secondary screen. If the two screens are different horizontal and/or vertical resolutions, the pixels are doubled or halved horizontally or vertically in order to retain the same screen size and shape when rubbed.

Rub-through can be Absolute, where the rub-through occurs onto or from the same image coordinate location (i.e. relative to the top left corner of each image) on the two images. Alternatively it can be Relative, where you set an Origin point on the second screen. Each time you start drawing on the Current screen it starts the rub-through from the Origin point in the second screen and works left and right, up and down relative to that point.

There is nothing to stop you setting the Second page to the same page as the Current page so that you can use Relative Rub-Type to duplicate areas of your image around other parts of the image.

Rub Through Control

Set Second

To specify the Second page for the Rub-Through function,

- Click the "Set Second" button in the Spare Page Options Menu. The currently selected Thumbnail image (indicated by a white outline) will also show a blue outline to indicate that it is the Second page.

Alternatively,

- Click the Thumbnail image of the desired Second page using the Right Mouse Button. It will now show a blue outline around the Thumbnail image.

Rub Direction

To change the Rub Direction,

- Click the "Rub Direction" button using the Left Mouse Button. Each time you click the button it will flip between its two settings of "Secnd->Curr" and "Curr->Secnd".

Secnd->Curr means that when working in the Current page the Texture Pattern will be taken from the Second page and applied to the Current page.

Curr->Secnd means that then working in the Current page the modifications will be Rubbed-Through and will change the Second page. The advantage of this method is that you can precisely draw over a part of the Current image that you want to transfer.

Rub Type

To change the Rub Type,

- Click the "Rub Type" button using the Left Mouse Button. Each time you click the button it will flip between its two settings of "Absolute" and "Relative".

Absolute means that the rub-through occurs onto or from the same image coordinate location (i.e. relative to the top left corner of each image) on the two images. If the two screens are different horizontal and/or vertical resolutions, the pixels are doubled or halved horizontally or vertically in order to retain the same screen size and shape when rubbed.

When Relative Rub-Through is selected, a second button labelled "Set Origin" will appear on the menu. To set the Rub-Through Origin,

- Click the "Set Origin" button using the Left Mouse Button. The display will then jump to the selected Second page.

- Position the pointer over the desired Origin point and click using the Left Mouse Button.

Each time you start painting on the Current screen it will now start the rub-through from the Origin point in the second screen and work left and right, up and down relative to that point. Each new starting point will start taking a new copy from the Second-Screen at and around the Origin point.

Extras

To use the Extras Menu Bar that provides access to other Image control options,

- Click the "Extras" button on the Main Menu Bar.

The Extras Menu Bar looks like this.

Page Format	Preferences	WorkBench	⚡ Zap Image	259,285 Paint
Main Menu	ARexx Control	Frame Grabber	Merge Stencil	H:1% R:119 S:1% G:68 V:1% B:51

PAGE FORMAT

To adjust the dimensions or resolution of the current page,

- Click the "Page" button on the Extras Menu Bar. The Page Format Menu will then appear.
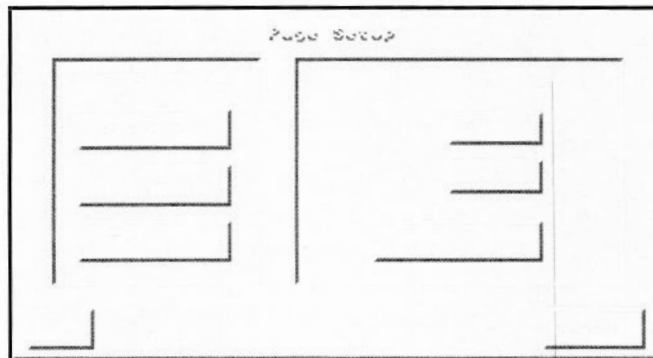
An important point to note is that the Display Format or the physical number and spacing of pixels in the screen display is independent of the Page Size or actual number of pixels in the image. For example, you could quite easily have an image with a page size of 1000 x 1000 but a display format that was low-res and non-interlaced.

Display Format

The Display Format main box to the left allows setting of the pages Display Resolution options. There are three buttons in the box. To toggle the setting of a button (from Selected to Deselected or visa-versa),

- Click the appropriate button once using the Left Mouse Button.

Hi-Res

This button controls the horizontal resolution. When unselected the low-res, non-overscan horizontal resolution will be 320 pixels and when the Hi-Res button is selected the hi-res, non-overscan horizontal resolution will be doubled to 640 pixels.

Interlace

This button controls the vertical resolution. When unselected, the non-interlaced, non-overscan vertical resolution will be 200 pixels in NTSC and 256 pixels in PAL systems. When the Interlace button is selected the vertical resolution doubles to 400 in NTSC systems and 512 in PAL systems.

Overscan

This button toggles the image overscan, which is the extra pixels around the image to fill right to the edges of a video screen. You can only paint on this area if you have Workbench 2.x or higher *and* you have 2M of Chip RAM, otherwise you will have to scroll the image to paint in the overscan area (or paint it as non-overscaned and scale the image up in size when finished).

Page Size

The Page Size box to the right of the menu allows you to adjust the size of the image in pixels and has numeric entry boxes for both horizontal and vertical pixel dimensions.

To directly adjust the dimensions of the image in pixels,

- Click in the horizontal or vertical numeric entry box. A cursor block will appear and you can enter the numeric width or height of the image in pixels.

Alternatively, if you want to set the image dimensions to the standard number of pixels for the Display Options selected in the left main box,

- Click the "Screen Size" button below the page dimensions and the horizontal and vertical dimensions will be set automatically.

Note that the "Page Size" doesn't automatically change after selecting or de-selecting the Display Format buttons. This is left for you to do in case you wish to change the display resolution but not the image size.

Changing Page Size for an Existing Image

If you change the Page Size for an existing image you will be asked whether or not you wish to scale the existing image to fit the new size.

If you choose not to rescale the existing image one of the the two following cases will apply. If the existing image is resized to a *larger* sized image without scaling the existing pixels will be placed in the upper-left corner of the enlarged image. If, however, the page format of an image is changed to a *smaller* image size without scaling, the right and bottom sides will be cropped as necessary and that part of the image will be lost.

PREFERENCES

To access the Preferences Menu,

- Click the Prefs button on the Extras Menu Bar or use the Amiga-P keyboard shortcut.

The following menu will then appear:
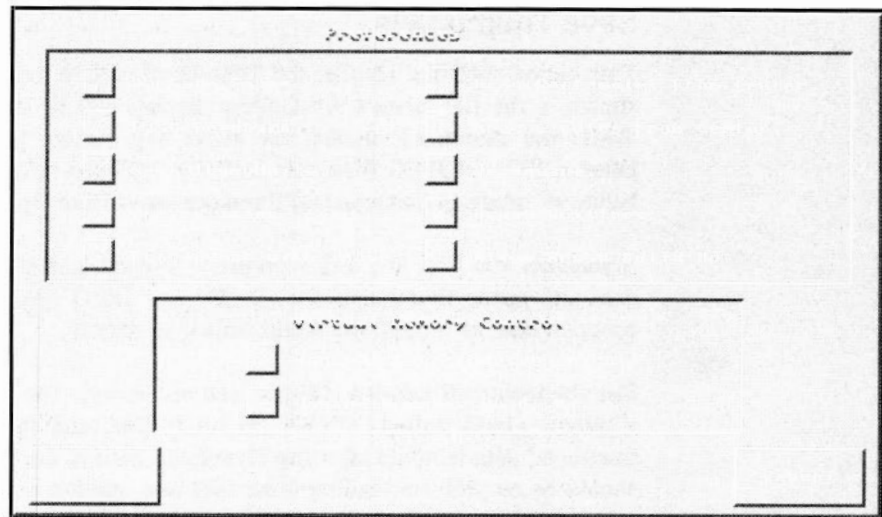
To toggle an option between selected and unselected (active or inactive),

- Click the check-box using the Left Mouse Button. Remember that some options have a keyboard-shortcut equivalent that can be used when the Preferences menu is not on the screen.

Do Safe Saves

When Safe Saves are selected, all files written to disk are first saved using a temporary dummy name. Only when the save action has been completely successfully is the temporary dummy name changed to the correct name you have specified. This means that if you are saving an image or other file to replace an existing file on disk and run out of space on that disk, the original copy of that file is not lost.

The disadvantages of Safe Saves are a slightly longer save time and the need to have enough free space for effectively two copies of your file, although if you are running that close to the limits of your drive you should probably think about archiving some files and clearing space.

Fast Feedback

With Fast-Feedback selected, the "rubber band" outlines shown when drawing rectangles, ellipses, circles, polygons etc are a single pixel wide regardless of the actual dimensions of the cutout brush or nozzle that will be used for the final drawing.

The keyboard equivalent for this option is Amiga-f.

Save Thumbnails

This option specifies whether the Thumbnail picture icons (thumbnail images) shown in the file menu's Art-Gallery display will be saved with image files. While the thumbnail should not affect any Amiga program that properly handles IFF and JPEG files, this option is included in case you have a "badly behaved" program that rejects IFF images saved from OpalPaint.

Remember you have the utility program shipped with the system to scan your disk and create thumbnails for all IFF and JPEG files, so you can use this program later to "insert" the thumbnails if so desired.

For the technical minded (Others need not worry). The Thumbnail is saved as a private chunk called "OVTN" in an Iff file, and for JFIF-JPEG files the thumbnail data is stored after the Thumbnail-Size in the "APP0" marker. There should be no problem loading these files into another program if that program ignores unknown private chunks, but if all else fails, de-select this option and resave your image.

Create Icons

This option specifies whether Workbench Project icons will be created whenever you save an image. This allows you to start OpalPaint and load an image in one operation by double-clicking on an icon. Note also that the OpalPaint file menus "filter out" and ignore all .info (icon) files, so adding the icons will not clutter up file lists in OpalPaint.

Load Setup with Image

This option specifies whether the setup of a new image including the palette, gradient settings, selected drawing mode etc are taken from those settings current when the spare page was created, or whether the setup will be replaced with the setup that was saved with the image.

Drag Rectangles From Centre

This option specifies whether OpalPaint drags rectangles from the centre of the rectangle to be drawn (if this option is selected), or from one corner to an opposite corner (if this option is deselected). You will find these options variously useful in different circumstances.

The keyboard equivalent for this option is Amiga-C.

Drag Circles from Centre

This option specifies whether OpalPaint drags circles and ellipses from the centre of the circle or ellipse to be drawn (if this option is selected), or from one corner to an opposite corner of an imaginary rectangle containing the ellipse or circle (if this option is deselected). You will find these options variously useful in different circumstances. The "drag from centre" is probably most often used, but it can also be useful to drag out a rectangle into which you wish to fit a circle or ellipse.

The keyboard equivalent for this option is Amiga-c.

Be Square

Because the pixels on most monitors are not square, the resulting rectangle, although having the same number of pixels horizontally as vertically, may not appear square on the screen. This is especially true with NTSC displays. This can be compensated for by setting this "Be Square" option, which adjusts squares and circles so they are the same apparent height and width on a monitor or video display.

Note that this is often not necessary when using a PAL display, as the additional vertical resolution compensates somewhat for the aspect ratio problem.

You will probably *not* want to use the Be Square option when editing images for use in desktop publishing programs, which generally print "square" pixels.

Brush Outlines

This option specifies whether OpalPaint displays a single-colour outline of the features within each cutout brush when moving the pointer (option selected), or whether it shows only the outline of the outer rectangle.

This option is provided mainly to speed Cutout Brush Manipulation, as the recalculation of the cutout's internal outlines often takes a significant proportion of the time required for the resize, rotation, warp etc.

However, precise placement of the cutout without the internal outlines may be difficult.

Allow Brush Buildup

This option specifies whether repeated passes of a nozzle over the same area of the image will continue to modify the image (Option enabled) or will be active only on the first pass (Option disabled). Note that this option specifies the action only for the time between when the mouse button is depressed and when it is released, so if you have the Allow Brush Buildup switched *off* you will have to release the mouse button between each stroke in order to build up colour or an effect in a certain area. This can be useful if, for example, you wish to apply an additive mode to a certain area using a nozzle. You can then move the nozzle back and forth to make sure you change all the pixels in the area without worrying about continual buildup of "additive" effect.

Virtual Memory Control

Virtual memory allows you to work on much larger projects than the available RAM in your Amiga would normally allow by placing unused pages or brushes onto a hard drive and recalling them as needed. While this obviously takes longer than keeping the objects in RAM, it does make the Hard Drive size the limit rather than RAM size.

These temporary files are saved in the device *OpalSwap:*, so be careful not to jump out of OpalPaint and delete any files in the directory assigned to this name.

Unused Spare Pages on Disk

This option specifies that unused spare pages will be paged out to disk. One point to note is that if you have two pages set up for a Rub-Through (i.e. separate Current and Second pages), you must have sufficient RAM to hold both pages in RAM at once.

Unused Brushes on Disk

This option allows you to send unused Cutout Brushes to disk. This means if you are working with (say) cutout brush B2, then if memory runs low OpalPaint will save cutouts B1 and B3 to a temporary area on your hard drive.

Third-Party Virtual Memory Software

While OpalPaint will operate on images with size up to approximately 32,000 by 32,000 pixels, you will need sufficient RAM to load the image. For larger images or machines with reduced RAM we recommend software products such as GigaMEM that allow the use of Hard Drive as overflow RAM.

WORKBENCH

When OpalPaint runs it automatically closes the Workbench screen to free up valuable Chip RAM and speed up painting. If you want to temporarily switch to the Workbench or CLI screen,

- Click the "Workbench" button in the Extras Menu Bar, or use the keyboard equivalent for this option which is Amiga-w.

This will display the Workbench or CLI screen with a small window labelled "Opal Paint" overlapping the menu bar. This window can be repositioned on the Workbench screen if required.

To return to Opal Paint,

- Click anywhere inside the OpalPaint window on the Workbench using the Left Mouse Button.

Important Note: OpalPaint cannot close the Workbench screen if a Shell or CLI window or any other program that opens a window on the Workbench Screen is running. Because your valuable Chip RAM will be reduced this may cause memory shortages in OpalPaint, so this situation should be avoided if possible.

ZAP IMAGE

The Zap or Lighting-Bolt button in the Extras Menu Bar provides an easy way to apply a particular set of drawing options to the whole image. This is more commonly used when performing image processing over an image, for example when globally modifying contrast or sharpness. The easiest way to predict the outcome is to think of the Zap tool as the same as a Filled Rectangle, with Solid fill type, dragged out over the whole image. Other options such as Texture Patterns, Drawing Modes, transparencies etc all work in exactly the same way as if you had dragged a Solid Filled Rectangle over the whole image.

Because the Zap function does not show progress on the image and may take some time, especially with more complicated operations, it is always advisable to test the effect of the change on a small portion of the image using a Filled Rectangle and with Solid fill type set in the Area Fill Options Menu.

To Zap the image,

- Click the lightning-bolt button in the Extras Menu Bar, or hit the Amiga-z keyboard shortcut.

If you have insufficient RAM to allocate an Undo buffer for the Zap process you will be given the opportunity to proceed without undo. If you request OpalPaint to continue under these circumstances your Zap operation will be final.

MAIN

To return to the Main Menu Bar click the "Main" button in the Extras Menu Bar using the Left Mouse Button.

AREXX CONTROL

To quote from the Amiga Version 2.0 System Documentation, Chapter 10, "ARexx is a programming language designed to offer flexibility to customise your working environment. ARexx acts as a central hub through which applications may send data and commands to each other. This allows software created by different companies to interact and, in turn, allows the user to create custom applications by integrating off-the-shelf software products."

Please see Chapter 10 of your Amiga Version 2.0 documentation, or if you purchased ARexx for your Version 1.3 see the included manual, for a complete discussion of installing and using ARexx. In this manual we will only discuss how the programs in the OpalVision environment interact with ARexx.

A full description of all OpalPaint ARexx functions is given in a separate section titled "OpalPaint ARexx Functions" commencing page 248.

For convenience OpalPaint ARexx scripts should be placed in the OpalPaint:Rexx directory. OpalPaint will look here first then in the REXX: directory for any specified script. If you enter the script name *without* a suffix say `MyScript`, OpalPaint will look first for for the script named `MyScript` then for the name `MyScript.oprx`

Once you have written your ARexx script it can be executed in several ways. To execute an ARexx script from within OpalPaint,

- Hit the Amiga-A key and the following menu will appear

- Type the name of the script and hit return. The script will then execute.

To execute an ARexx script from within OpalPaint using a function key,

- Click on the "ARexx Control" button on the Extras Menu Bar and the following menu will appear.
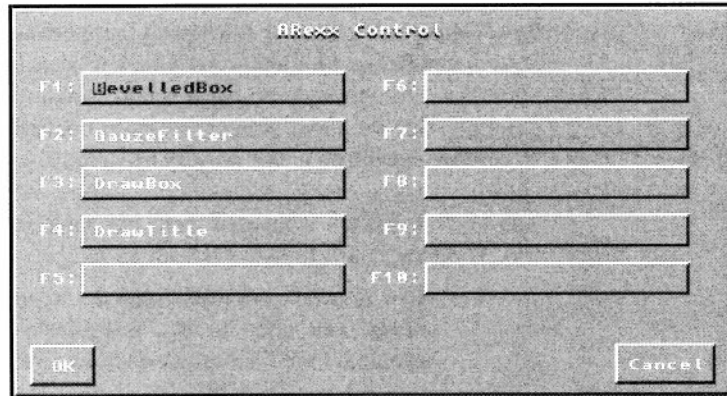
- Click on the text box next to the function key you wish to assign and enter the script name.

- Exit from the menu, then while holding down either Amiga key press the function key to which you assigned the function. The script will then execute.

FRAME GRABBER CONTROL

The Frame Grabber integrates with the OpalPaint environment to grab full fields or frames, or portions of an image as Cutout Brushes.

A full discussion of Frame Grabber control is included with the OpalVision Video Processor module which is available from the same source as you purchased your OpalVision Main Board.

MERGE STENCIL

This option creates a Priority Stencil for use in the Opal Hot-key program, other OpalVision software and third-party supporting software. Briefly, the Priority Stencil can be used to determine whether parts of the OpalVision 24-bit picture appear as foreground or background when combined with normal Amiga graphics. See the Opal Hotkey program documentation commencing page 323 for further details on using Priority Stencils.

The Priority Stencil is created from the Area Stencil and saved with the image file. To merge a priority stencil with an image,

- Use Stencil Work Mode to draw an area stencil over those parts of the image you want to be "foreground" when the Priority Stencil is enabled. (See the section on Stencil Work Mode, page 114)

- Click the "Merge" button on the Extras Menu Bar to merge the area stencil with the image file. You can then change the area stencil as needed without changing the merged priority stencil.

- The keyboard shortcut "Amiga-/" is also available to perform the same function as clicking the "Merge" button.

COLOUR FEEDBACK

The colour component information under the feedback area of the Extras Menu bar refers the the pixel directly under the pointer and changes as the pointer moves. It shows the colour components in both Red, Green, Blue and Hue, Saturation and Value.

If you hold down the ALT key while moving the pointer over the image the colour component numbers will be cumulative, i.e. they will show the maximum range of each component in the portion of the image traversed. If you note these numbers they can be very useful when guessing tolerance ranges for colour stencils or cutting brushes.

Files

OpalPaint uses a common file menu for both loading and saving and for both Images and Cutout Brushes. In this way you only need to learn how to use one menu rather than several. This menu can be accessed in different ways depending on the operation to be performed.

THE STANDARD FILE MENU

The File Menu looks like this:
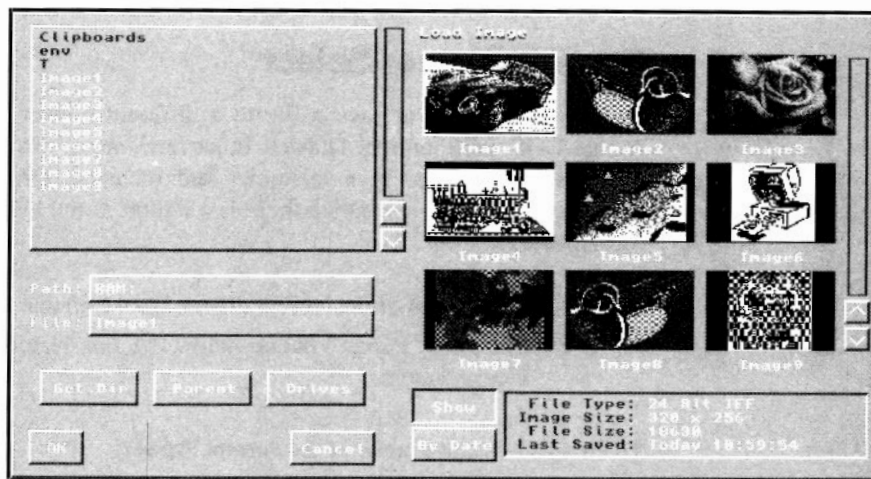
The title at the top of the menu will change depending on the current action being performed, for example "Load Image", "Save Image", "Load Cutout Brush", "Save Palette" etc. Otherwise the appearance and operation of the rest of the menu are identical for each action.

File Name Area

This area shows the names of all files in the current drawer or directory, as well as any sub-directories of the current one. If there are more items in the directory than there is room in the window, you can move up and down through the list using the scroll bar to the right.

To select an existing file,

- Click the name using the Left Mouse Button.

The name will then be placed in the File Name text box.

To change the name in the File Name text box, for example when saving an image, brush or palette for the first time,

- Click in the File Name text box using the Left Mouse Button. A cursor block will appear, allowing you to edit the text using the normal Amiga options. Hit Return to accept the file name.

Drive & Drawer Select

If you wish to load or save a file to a different drawer, you can change the Amiga-DOS path of the Drawer in several ways. Remember Amiga-DOS Drawers are arranged in a hierarchy and for every Drawer except the Root Directory or Drawer of a Drive there is a Parent at the level above and possibly sub-Drawers.

To move to the parent of the current drawer (move up one level),

- Click the "Parent" button below the File Name Area using the Left Mouse Button.

To change to a sub-drawer of the current drawer,

- Click the name of the drawer using the Left Mouse Button.

When changing directories, the Amiga-Dos path is shown in the Drawer text box below the File Name Area. To type or edit this Drawer path directly,

- Click in the Drawer text box using the Left Mouse Button. A cursor block will appear, allowing you to edit the text using the normal Amiga options. Hit Return to accept the Drawer path.

To change to a completely different Drive or move to the very top level of the current path,

- Click the "Drives" button below the File Name Area using the Left Mouse Button.

The File Name Area will now list all drives installed in the system, such as DF0:, DF1:, DH0: etc, as well as names and labels assigned in your startup-sequence. To place one of these names in the Drawer text box and list the contents of the drawer in the File Name Area,

- Click the name using the Left Mouse Button.

The OpalVision Software Installation program creates the following entries in your startup-sequence (remember that the label OpalPaint: is first assigned to the drawer you installed the program into).

    assign images24: OpalPaint:images

    assign cutouts24: OpalPaint:cutouts

This means you can go directly to your images or cutouts drawer at any time. You can change these lines in your startup-sequence if you wish them to point at some other drawer in your system. Refer to your Amiga DOS manual for information on editing your system's startup-sequence.

Get Dir

To save time when entering the Load and Save Image menus, OpalPaint keeps a buffer with the file names and thumbnail images in memory.

NOTE: If you later add images or other files to a directory they will not appear in the menu unless you click the "Get Dir" button. This option refreshes the buffer so all files appear.

Show Thumbnail images

To show a thumbnail picture icon or thumbnail image for each image, cutout brush or palette in the current drawer using Opal Technology's *Art Gallery* system,

- Click the "Show" button using the Left Mouse Button.

Note that if the image was created by another graphics program, or was saved from OpalPaint with the "Save Thumbnails" option switched off in the Preferences Menu (see page 218) you will not see a thumbnail.

To generate thumbnail images for all IFF images on your system,

- Run the OVInstall program from your OpalVision drawer.
- Un-check all options except the "Create Thumbnails" option and continue.

Show by Date

The "By Date" button toggles the display order of file names and thumbnail images between alphabetic order and in date order with the most recently saved files first. This enables you to list and show all your recent work first and reselect them without having to scroll through the list (assuming of course you wish to do keep working on the same images).

To toggle between listing files in alphabetic order or by date,

- Click the "By Date" button using the Left Mouse Button.

Image File Details

To show file details such as File Format, resolution, File size and date saved,

- Click once on a file name or thumbnail image using the Left Mouse Button.

The details for that file will be shown in the File Details box in the lower right corner of the File Menu. Items listed are File Type or Format, Image size, File size and the date the image was last saved.

LOAD IMAGE FILE

Keyboard
Amiga-l,
Amiga-o

To load an image file from disk,

> • Click the Load Image icon on the Main Menu Bar using the Left Mouse Button.

The File Menu will then appear, with the words "Load Image" at the top-centre of the menu. Select the image to be loaded by name or from its thumbnail image in the Art Gallery display.

To set the options to be used for loading,

> • Click the Load Image icon on the Main Menu Bar using the Right Mouse Button.

In almost all cases the Load Image File function automatically senses the format of the image file being loaded and uses the appropriate loader routines to bring the image into OpalPaint. OpalPaint recognises the following image file formats at time of writing: (see below for a full discussion of the various formats)

> ❖ Amiga IFF with up to 256 palette-mapped colours, including HAM (Hold and Modify), HAM8 (from AA Chip-set Amigas) and EHB (Extra Half Brite)

> ❖ Amiga IFF-24. This is the standard Amiga 24-bit true-colour file format.

> ❖ JPEG - (JFIF)

> ❖ OV_FAST

The options menu also allows loading of area stencils and alpha channels seperately, without affecting other image components already loaded.

If the dimensions or resolution options of the current page are different from those of the image to be loaded, the following menu will appear.
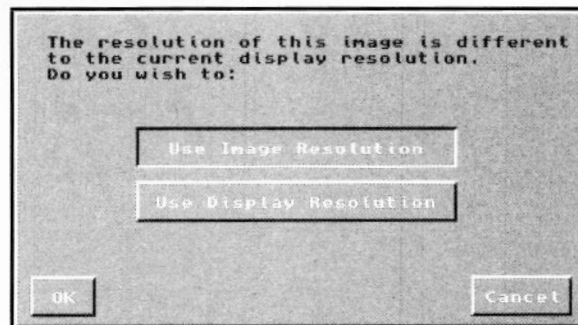
The first button tells OpalPaint to change display resolution to match the resolution of the image when it was saved, while the second tells OpalPaint to keep its current display resolution and change the image's resolution. Remember that the image *size* and the image *display resolution* are independent, so changing display resolution does not affect the actual number of pixels in the image but only the way they are displayed for editing.

SAVE IMAGE FILE

To save an image file to disk,

  • Click the Save Image icon on the Main Menu Bar.

To set the options to be used for loading,

  • Click the Save Image icon on the Main Menu Bar using the Right Mouse Button.

A small menu will appear allowing you to specify the format to use when saving the image file (see below for details on available formats). It also allows saving of individual image components such as the image, area stencil and/or alpha channel.

  • Select an image file format and the component(s) you wish to save.

The File Menu will then appear, with the words "Save Image" at the top-centre of the menu. Specify a new name for the file, or choose the name of an existing file to be replaced.

If you have chosen an existing name, a menu will appear that allows you to cancel the save or tell OpalPaint to overwrite the existing file. Also see the Safe Saves option in the Preferences menu (page 219) that tells OpalPaint to only replace the existing file when the save has been fully successful.

When Saving

When saving images you must specify the format of the image file. The available image file formats for saving are:

IFF-24

This format is the most commonly used and is a Commodore standard shared by the vast majority of Amiga software for 24-bit image generation and processing. The image is compressed to conserve disk space and a thumbnail is saved with the image so all software in the OpalVision range can use Graphic Image Menus.

OV_FAST

The OpalVision OV_FAST image format is optimised for maximum re-loading speed with standard 68000-based Amigas as no image decompression is required. With an accelerator card fitted to your Amiga the time required to decompress an image saved using IFF-24 format will almost certainly be less than the additional time required to load the image in the larger OV_FAST format.

JPEG

This cross-platform image compression standard from the Joint Photographic Experts Group allows amazing compression ratios for minimum file size. The important point to remember is that JPEG uses a deliberately "lossy" technique. That is, some of the image colour details are deliberately thrown away to achieve the reduction in file size. The amount of detail that can be sacrificed while still maintaining acceptable image quality varies widely for different types of image, so you should experiment using different compression factors to find the optimum settings for various images.

Also note that JPEG compression and decompression is done in software, so speed will probably be a factor in your decision whether to use this save method.

Useful Stuff

The following information doesn't fall under any particular category so is grouped together here.

REDO KEY

The Redo key lets you repeat your last drawing-tool operation, whether it is with an outline or a filled area, a nozzle or a Cutout brush. For example, this can be very useful if you wish to progressively apply an additive effect to precisely the same rectangular or elliptical area. However, the real power becomes apparent when you realise that before triggering the Redo function you can change the OpalVision options such as Paint-Pot colour, nozzle/Artist's Tool, Cutout Brush, Area fill or Line options, Drawing Mode or the slider level for the current Mode, Drawing Tool (from outline to filled, or visa versa), change Texture Patterns or switch them on or off, Stencils, Anti-Aliasing . . .

Note: The inevitable exceptions.

❖ When used with the Sketch or Continuous Drawing Tools, Redo will only "redo" the very last pixel drawn.

❖ Any OpalPaint procedures that involve the use of a "rubber band", including Nozzle Resize, Grid Resize, Cutout brush resizing or skewing, use the same low-level procedures as the Drawing Tools. This means that if you do one of these procedures you will loose your "Redo" instruction buffer and will not be able to Redo the last Drawing operation.

To Redo the last Drawing Tool operation, subject to the exceptions mentioned above,

• Hit the "a" keyboard shortcut key. Remember "a" for "**a**gain".

RIP UP AND REDO

This is a tricky extension to the Redo key that effectively does an Undo operation, moves the drawn object or cutout brush one pixel in the indicated direction and does a "Redo" in the new location. This is very useful when trying to precisely position text, a Cutout brush, or some other object.

To use this option,

- Hold down the Alt and Shift keys together, then press the appropriate arrow key (once) to specify the direction you want to move the text or other object.

GRID

Keyboard
g,G

The Grid in OpalPaint gives you a resizable, rectangular array of "snap" points that the pointer will jump to when drawing or pasting cutout brushes. This can be useful when drawing grids, tables of points, or when attempting to precisely paste cutouts at a regular spacing.

To switch the grid-snap function on and off,

- Click the grid button on the Main Menu bar using the Left Mouse Button, or hit the "g" keyboard shortcut.

To simultaneously switch the grid-snap function on and set a grid point at the current brush handle position,

- Hit the "G" keyboard shortcut.

To open the Grid Setup menu,

- Click the grid button on the Main Menu Bar using the Right Mouse Button, or alternatively double click the button using the Left Mouse Button.

The following menu will appear:
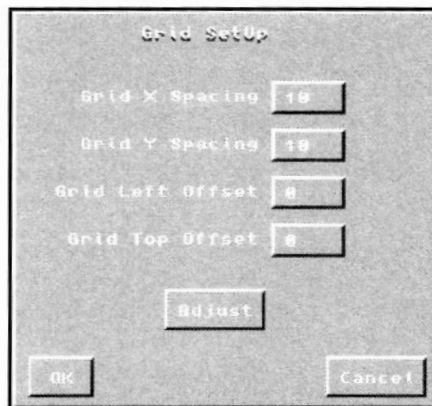
The Grid Spacing for X and Y sets the number of pixels between each grid snap position in the horizontal and vertical directions respectively.

The Grid Offset for Left and Top sets the starting point of the first grid snap position as a number of pixels relative to the top-left corner of the image.

To change any of these numbers,

- Click the box containing the number and type in the desired number using the normal Amiga text-box editing.

To easily and graphically adjust the grid,

- Click the "Adjust" button using the Left Mouse Button. A grid will appear over the image with the spacing currently set in the Grid X and Y Spacing text boxes.

- Move the pointer until the top-left corner of the grid is over one of the desired grid snap points, then depress the Left Mouse Button.

- While holding down the mouse button, drag the pointer until the grid stretches or shrinks to the desired horizontal and vertical spacing, then release the mouse button. Hold down the shift key to force a square grid. The numbers in the Grid Setup menu will be changed to reflect the new settings when you next enter the menu.

Keyboard Shortcuts

DRAWING TOOLS

a	Again or Redo key - repeat last drawing operation
Amiga-b	Fix current image as background (Clear to fixed background, not solid colour)
Amiga-B	Free background (Allow clear to solid colour)
c	Outline Ellipse / Circle
C	Filled Ellipse / Circle
D	Filled Freehand
e	Outline Ellipse / Circle
E	Filled Ellipse / Circle
f	Flood Fill
F	Flood Fill Options Menu
g	Grid on/off
G	Grid on/off using current brush handle position as a grid point
K	Clear screen, stencil (stencil work mode) or mixing area (palette menu)
l,v	Line
L,V	Line Options Menu
m	Magnify on/off
q	Curve
r	Outline Rectangle
R	Filled Rectangle
s	Sketch (Dotted Freehand)
t,T	Text Menu
u	Undo
w	Outline Polygon
W	Filled Polygon
>	Increase Magnification (& switch on Magnify if necessary)
<	Decrease Magnification (& switch off Magnify if at lowest zoom level
Tab	Change marquee colours

Colour & Palette Options

p, P	Palette Menu
,	Pick colour into current Paint-Pot
[ ]	Change selected Paint-Pot
{ }	Change Paint-Pot bank
( )	Decrease/Increase Paint-Pot intensity (Value)
Alt-t	Transparency on/off
Ctrl-t	Transparency Options Menu
p	Paint Mode (Palette Mixing Area)
s	Stir Mode (Palette Mixing Area)
w	Wash Mode (Palette Mixing Area)
Amiga-l, Amiga-o	Load Palette Set (or Open Palette Set)
Amiga-s	Save complete Palette Set
Amiga-r	Save single Paint-Pot row
Amiga-n	Select named colour
K	Clear mixing area
u	Undo

Modes

F1	Paint Mode with Multi-colour option
F2	Paint Mode with forced Paint-pot colour on
F3	Tint H Mode
F4	Smear Mode
F5	Shade Mode
F6	Additive Mode
F7	Subtractive Mode
F8	Smooth Mode
F9	Colourise Mode
Amiga-m	Mode Menu
Amiga-d	Options Menu for current Drawing Mode

PREFERENCES & EXTRAS KEYS

Amiga-c	Circles drag from centre (toggle)
Amiga-C	Rectangles drag from centre (toggle)
Amiga-f	Fast Feedback (toggle)
Amiga-g	Frame-Grabber Menu
Amiga-p	Page Size Menu
Amiga-P	Preferences Menu
Amiga-w	Go to Workbench, iconize OpalPaint

NOZZLES & CUTOUT BRUSHES

-	Nozzle Smaller by 1 step
_	Nozzle Smaller by 2 steps
=	Nozzle Larger by 1 step
+	Nozzle Larger by 2 steps
.	Select Single-pixel Nozzle
Amiga-1	Select Cutout Brush B1
Amiga-2	Select Cutout Brush B2
Amiga-3	Select Cutout Brush B3
Alt-b	Cycle through Cutout Brushs
b	Cut out Cutout Brush
B	Cutout Brush Manipulation Menu for current cutout brush, **or** Nozzle Options Menu for current nozzle.
h	Halve current Cutout Brush both horizontally & vertically
H	Double current Cutout Brush
o	Outline current Cutout Brush using current Paint-Pot colour.
O	Trim outline of current Cutout Brush by one pixel.
X	Double current Cutout Brush horizontally
Y	Double current Cutout Brush vertically
x	Flip current Cutout Brush horizontally
y	Flip current Cutout Brush vertically
z	Rotate current Cutout Brush 90° Anti-Clockwise
Z	Free resize current Cutout Brush
Alt-s	Centre handle of current Cutout Brush
Alt-x	Flip handle of current Cutout Brush horizontally
Alt-y	Flip handle of current Cutout Brush vertically
Alt-z	Move and Place handle of current Cutout Brush
Amiga-F	Feather current cutout brush
Amiga-r	Paper-Type Options Menu
Amiga-t	Artist's-Tool Options Menu

Amiga-T   Tablet Pressure Control Menu

ARexx Keys

Amiga-a   ARexx Control Menu
Amiga-A   Enter and run single ARexx script
Amiga-F1 thru   Run ARexx script assigned to function key in ARexx
Amiga-F10   Control Menu

Scrolling Keys

Arrow Keys (⇦⇨⇧⇩)   Scroll Page in small steps
Shift-Arrow Keys   Scroll Page in larger steps
Alt-Arrow Keys   Scroll Page to limit in specified direction
Alt-Shift-Arrow Keys Undo last operation or Cutout Brush pastedown and Redo
                      after moving one pixel in specified direction.
n   Scroll image to centre area under the pointer
N   Scroll image to horizontally centre image in view-screen
S   Scale to show whole image on screen while maintaining
                      aspect ratio.
Amiga-v   Use whole screen to display, even when Chip Ram low

File Keys

Amiga-l, Amiga-o   Load (or Open) Image File Menu
Amiga-s   Save Image using current file name (show Save File Menu
                      if no filename specified)
Amiga-S   Save Image File Menu
Amiga-%   Scale image to 48x30 and save as ".picon" file (for Artist's
                      Tool or Paper Type)

SPECIAL KEYS

F10	Main Menu Bar on/off (if Chip Ram available)
Help, ?	Invoke context-sensitive hypertext help for menu or button under the pointer.
Alt-Help, Alt-?	Displays "About OpalPaint" information. Includes "PANIC Button" that selects single-pixel nozzle, Sketch tool, Normal Mode and switches all options off.
Spacebar	Cancel operation in progress, abort marquee.
Esc	Cancel operation and undo (or Cancel from Menu), abort marquee.
Delete	Cursor cross-hairs on/off
j	Swap through spare pages
J	Spare Page Options Menu
Q, Amiga-q	Quit from OpalPaint
Ctrl-s	Toggle Paint-Stencil Work Mode
~ (Tilde)	Stencil Control Menu (incl colour stencils)
` (Grave)	Toggle Stencil on/off
Alt-/	Anti-Aliasing Options Menu
Amiga-/	Merge Area Stencil with image
Shift (freehand, lines)	Constrain pointer to horizontal or vertical movement
Shift (rect, ellipses)	Constrain to square or circle
Amiga-z	"Zap" whole image, equivalent to Solid Rectangle Fill over entire image. NOT UNDOable.

Workbench & CLI Parameters

WORKBENCH TOOL TYPES

In Workbench 2.x and higher, Tool Types are used to specify startup parameters to programs run from the Workbench and are entered and edited from the Icon Information screen. For instructions about adding and editing Tool Types consult your Workbench Reference manual.

The following Tool Types are allowable from the WorkBench:

PAGEWIDTH=N	Set initial page width
PAGEHEIGHT=N	Set initial page height
HORIZRES=HIRES	The startup page must be Hires
VERTRES=INTERLACED	The startup page must be Interlaced
SCANWIDTH=OVERSCAN	The startup page must be overscan

CLI PARAMETERS

You may wish to start OpalPaint the CLI to add an "OpalPaint" button to utility programs such as Directory Opus or write an ARexx script and include Opal programs to demo and multi-media scripts.

The command line syntax is:

```
OpalPaint [Options] [ImageName]
```

Where: [Options] can be:

-h	The startup page should be hires.
-i	The startup page should be interlaced.
-o	The startup page should be overscan .
-pw n	Set the startup page width to n pixels.
-ph n	Set the startup page height to n pixels.
-q	Quiet, don't display About requester (for ARexx call).
-r script	Execute ARexx script on startup.

examples:

1) Start OpalPaint in hires-interlaced-overscan mode.

```
OpalPaint -h -i -o
```

2) Start OpalPaint with an image.

```
OpalPaint Images24:MyPic
```

3) Start OpalPaint with an image and execute an image processing ARexx script on it.

```
OpalPaint -r mutilate.oprx -q Images24:MyPic
```

OpalPaint ARexx Commands

AREXX OVERVIEW

To quote from the Amiga Version 2.0 System Documentation, Chapter 10, "ARexx is a programming language designed to offer flexibility to customise your working environment. ARexx acts as a central hub through which applications may send data and commands to each other. This allows software created by different companies to interact and, in turn, allows the user to create custom applications by integrating off-the-shelf software products."

Please see Chapter 10 of your Amiga Version 2.0 documentation, or if you purchased ARexx for your Version 1.3 see the included manual, for a complete discussion of installing and using ARexx. In this document we will only discuss how OpalPaint interacts with ARexx.

WRITING SCRIPTS

You can create and edit ARexx scripts using any Amiga text-based editor. Note that if you use a word-processor you will have to save it as a "text-only" or "ASCII" file.

All scripts must start with a comment.

If ARexx is generating error messages for command arguments, try enclosing the arguments in quotes, this will happen if you try to use negative numbers as parameters (Arexx interprets the '-' sign as a subtraction operator). e.g.

```
SetDrawMode 9 -20   Doesn't work
SetDrawMode "9 -20"    Works
```

The spellings *colour* and *color* are interchangeable in OpalPaint ARexx commands. For example, *ColourSource* is equivalent to *ColorSource*.

Also note that where a command accepts a text Message string it will also accept the '\n' sequence to signify a new line. This allows multiple lines of text to be displayed in the requester.

E.g. to display 3 lines of text, use

Okay "This is line 1 \nThis is line 2 \nWow!!!! Isn't this fun!!!"

Note that if you wish to include a single quote in the Message string then use double quotes at the beginning and end, and visa versa. ARexx attempts to match quotes to determine where the string begins and ends.

FILENAMES

The suggested filename extension for OpalPaint ARexx macros is '.oprx'. The ARexx support menus in OpalPaint will then be able to easily find your scripts.

For convenience it is also suggested to place Opal ARexx scripts in the "OpalPaint:Rexx" directory. OpalPaint looks first in this location then in the standard REXX: pathname.

AREXX PORT

The Port name for OpalPaint is:

OpalPaint_Rexx

Note that when using other OpalVision programs you will need to use the correct ARexx port name for that program.

EXECUTING SCRIPTS

See the section on the OpalPaint ARexx control menu on page 226 for a full description of how to run OpalPaint ARexx scripts.

RETURN VALUES

OpalPaint will return an Error (RC=10) if illegal parameters are given or if an error occurs. For example if a script attempts to invert the stencil plane when it doesn't exist, or if there is insufficient memory to execute a function.

Setup

Every spare page has its own setup information stored for it. It is important to remember that any modes, gradients, etc. that you set up for a page are local to that page, so if the active page is changed the setup information will also be changed.

The setup data includes gradients, transparency settings, drawing mode and tools, stencil enables, Paint source, Grid setting, Texture settings, magnification, brush cut modes, line styles, Flood fill tolerances, anti-aliasing settings, colour stencil settings, magic wand setting, paper type, alpha settings, rubthrough modes, and fill modes.

Drawing Commands

Using ARexx you cannot draw any object larger than the visible display size (even if the page is larger). The drawing coordinates passed to ARexx are absolute coordinates within the current page. If a drawing function is performed outside the current viewing area, the view will automatically be panned to that section. If the object being drawn is smaller than the screen there will be no problems, but if the object is larger OpalPaint will center the display the best that it can and clip the drawing to the visible area. Note that the current magnification level will also effect the size of the object that can be drawn. Also note that low ChipRAM (especially evident when only 1M of Chip RAM is installed) will result in the size of the drawing area being reduced as the Menu Bar "rises" up from the bottom of the screen.

SYMBOLS

In the following command descriptions several labels will appear frequently. The meaning and acceptable range for these symbols are:

PotNum   = Paint Pot number. Range: 1 to 260
NozzleNum   = Nozzle number (artist tool). Range: 1 to 10
PageNum   = Spare Page number. Range: 1 to Number of Open Pages
BrushNum   = CutOut brush number. Range: 1 to 3
GradNum   = Gradient number. Range: 1 to 8
DModeNum   = DrawingMode number. Range: 1 to 18 for built in modes and
                       19 to 22 for spare (loadable) modes.
SpareNum   = Spare drawing mode number. Range: 1 to 4

NOTE: Any parameters in brackets [] are optional.

Many commands also have a BOOLEAN parameter. A Boolean value is one that has only 2 states, True or False. OpalPaint treats 0 as False and any other value as True.
e.g: A Typical command accepting a boolean value is:

   Trans 0   /* Turn transparency off */
   Trans 1   /* Turn transparency on */

OpalPaint will also accept the words ENABLE (=1) and DISABLE (=0) in appropriate places. Commands will also accept other labels where noted.

SUMMARY OF COMMANDS

User I/O Commands

AskBool
AskBool2
Okay
AskFileName
AskFont
AskString
AskInt
GetPoint
GetRect
DisplayStatus
DisplayPercent

Drawing Commands

Line
Rectangle
SolidRect
Curve
FloodFill
Ellipse
SolidEllipse
Poly
SolidPoly
Point
LastPoint
FreeHand
SolidFreeHand
MagicWand
ReadPixel
CurrentFont

File I/O

Load
Save
Loader
Saver

Brush Manipulation

Double
DoubleX
DoubleY
Halve
HalveX
HalveY
FlipX
FlipY
Rotate90
Rotate
BendH
BendV
ShearH
ShearV
Rescale
Resize
HandleCenter
Handle
CopyBrush
ActiveBrush
RescaleMethod
BrushSize
Feather
MakeText
CutMode
PutBrush
LoadBrush
SaveBrush
RectCut
EllipseCut
FloodCut
FreeHandCut
MagicWandCut
PolyCut

Spare Pages

ClearPage
SetPage
CopyPage
MovePage
SwapPage
PickPage
DeletePage
AddPage
OpenPages
PageName
CurrPage
SecondaryPage
ClonePage
PageSize
PageRes

Setup

RGBtoHSV
HSVtoRGB
GetPrefs
SetPrefs
WorkMode
Menu
SaveSetUp
RestoreSetUp
CopySetUp
Pan

Operation Parameters

Undo
Again
Magnify
MagLevel
ColourSource
Key
Refresh
Busy
NotBusy
Version
Panic

Stencils

ClearSten
SetSten
DeleteSten
InvertSten
ExcludeAll
StenEnable
ColSten
MaskSten
SetColSten
EnableColEntry
AddStencil

Draw Modes

SetSpare
SetDrawMode

Artist Tools

SetATool
ResetATool
AToolWeight
GetATool
NozzleSize
ActiveNozzle

Various

Zap
AntiAlias
Grid
TransType
Trans
LineStyle
SetPen
GetPen
VideoMode
Texture
TextureType
RubDirection
RubMode

Paper Type

SetPaper
SmoothPaper
PaperDepth

Palette

LoadPalette
SavePalette
SaveRow
SetPot
GetPot
ActivePot
Find Pixel
FindNextPixel

Area Fills

ClearColGrad
ClearTransGrad
ColourDither
TransDither
GradType
GradRange
ColEven
TransEven
ColReverse
TransReverse
ColGradTag
TransGradTag
ActiveGrad
WarpFactor
WarpBrush
FloodType
FillMode

Detailed Descriptions

ActiveBrush

Usage:ActiveBrush BrushNum

Make the specified cutout brush the active brush (1 to 3).

ActiveGrad

Usage: ActiveGrad GradNum

Set the currently active gradient pair to 'GradNum'. Note that each gradient pair contains parallel colour and transparency gradients.
GradNum must be in the range of 1 to 8.

ActiveNozzle

Usage: ActiveNozzle NozzleNum

Set the specifed nozzle to be the active nozzle (1 to 10).

ActivePot

Usage: ActivePot [PotNum]

Returns the active pot number, this is in the range of 1..260. If 'PotNum' is specified then the active pot will be changed to this value.

AddPage

Usage: AddPage Width Height Resolution

Add a new spare page with the deminsions given by 'width' and 'height'. 'Resolution' sets the display resolution of the page, this parameter is a set of flags, valid flags are:

    HIRES   Hires
    INTERLACE   Interlaced
    OVERSCAN Overscan
These flags can be added together, i.e to open a hires interlaced page,
    Resolution = HIRES INTERLACE.

AddStencil

Usage:AddStencil

Add a mask stencil plane to the current image if one doesn't already exist. A stencil will automatically added when entering Stencil edit mode.

Again

Usage: Again

Repeat the last drawing operation. Same as the 'a' key.

AllowSaves

Usage: AllowSaves Enable

The Enable parameter can be ENABLE (=1) to turn allow use of the save menu, or DISABLE (=0) to not allow saving.

AntiAlias

Usage: AntiAlias Enable [Level]

The Enable parameter can be ENABLE (=1) to turn antialiasing on, or DISABLE (=0)to turn it off.
Level sets the antialiasing level to be used and must be in the range of 0 to 100.

AskBool

Usage: AskBool Message

Creates a requester containing the 'Message' text, as well as OK and CANCEL gadgets. The Message string can contain '\n' to start a new line in the text.
The return value is a boolean value indicating whether the user hit OK or CANCEL, a true value is returned if OK is hit.

Example:
```
AskBool 'Are you sure?'
if Result=0 then
    Okay 'I Guess not'
else
    Okay 'You are!!'
```

AskFileName

Usage: AskFileName Hail Path FileName

Bring up the OpalVision file requester. The 'Hail' string will be displayed at the top of the requester and the initial path and filename will be set the the values specified.

If the user hits CANCEL, RC will be set to WARN (5) otherwise the selected filename (including) path will be returned.

e.g.   AskFileName 'Pick a file Images24: clowns'

AskFont

Usage: AskFont

Bring up the font requester to allow the user to select a font.

If the user hits CANCEL, RC will be set to WARN (5) otherwise the selected font name, size and style is returned. An example return string would be:

topaz 8 0

The Style value is a set of flags, with the valid flags being:

Underlined   1
Bold   2
Italic   4

These flags can be added together to get composite styles. For example, Underlined Bold will return the value 3 while bold italic will return the value 6.

AskInt

Usage: AskInt Min Max Default Message

Brings up a requester containing a 'Message' text as well as string, OK and CANCEL gadgets. The Message string can contain '\n' to start a new line in the text. The text entry box will contain the default value.
 The string gadget can be used to enter an integer value only, 'Min' and 'Max' set the minimum and maximum allowable values. If Return is hit without changing the value, the default value will be returned.

If the user hits CANCEL, RC will be set to WARN (5) otherwise the entered integer value will be returned.

Example:
    AskInt 0 100 50 'Enter Tolerance'

AskString

Usage: AskString Message

Brings up a requester containing a 'Message' text as well as string, OK and CANCEL gadgets. The Message string can contain '\n' to start a new line in the text.
The string gadget can be used to enter any text string.

If the user hits CANCEL, RC will be set to WARN (5) otherwise the entered text will be returned.

Example:
    AskString 'Whats your name?'

AToolWeight

Usage: AToolWeight Weight

Set the weight of the current selected Artist's Tool (nozzle).
Weight is the value it should be changed to (0 to 100).

BendH

Usage: BendH Distance

Bend the current cutout brush horizontally by the number of pixels specified by 'Distance'.

BendV

Usage: BendV Distance

Bend the current cutout brush vertically by the number of pixels specified by 'Distance'.

BrushSize

Usage: BrushSize

Returns the size of the current cutout brush. The value returned is in the form "W H" with the W and H values being in pixels.
If the brush is not defined, -1 -1 is returned.

Busy

Usage: Busy

Disable the menu bar and changes the mouse pointer to the busy sprite. Busy calls can be nested, i.e. multiple Busy commands can be issued and a corresponding number of NotBusy commands have to be issued to restore the pointer to its normal state.

ClearColGrad

Usage: ClearColGrad

Clears the colour gradient of the current gradient pair. This is equivalent to the trashcan gadget in the gradient menu.

ClearPage

Usage: ClearPage

Clears the current page to black. Note, the verification requester that normally appears when hitting the trashcan gradget on the main menu will not be displayed.

ClearSten

Usage: ClearSten

Clears the mask stencil for the current page.

ClearTransGrad

Usage: ClearTransGrad

Clears the transparency gradient for the current gradient pair. This is equivalent to the trashcan gadget in the gradient menu.

ClonePage

Usage: ClonePage [PageNum]

Add a new spare page with the same dimensions and resolution as the specified page. This is equivalent to the clone gadget in the spare page menu.

ColEven

Usage: ColEven

Regularly spaces (evens out) the colour tags in the colour gradient of the current gradient pair. This is equivalent to the even space gadget in the gradient menu.

ColGradTag

Usage:ColGradTag Position R G B

Adds a colour tag to the colour gradient in the current gradient pair.
Position specifies the position of the tag within the gradient, where 0 corresponds to the start of the gradient (left hand of colour bar in the gradient menu) and 1 corresponds to the end of the gradient (right hand side).
R,G,B sets the Red Green and Blue components for the colour of the tag (0-255)

For example to create a gradient from white through blue to red in the 5th gradient pair, use:

```
ActiveGrad   5
ColGradTag  0    255 255  255
ColGradTag  0.5 0    0    255
ColGradTag  1    255 0    0
```

ColourDither (or ColorDither)

Usage: ColourDither Dither

Set the colour dither for the colour gradient in the current gradient pair.
Dither must be in the range of 0 to 100.

ColourSource (or ColorSource)

Usage: ColourSource Source

If Source=PAINTPOT set the colour source to 'paint pot' else if
Source=MULTICOLOUR or MULTICOLOR set the colour source to
'multicolour'. These settings correspond to those in the modes menu.
See the Reference Manual for a full discussion of the differences between these
settings.

ColReverse

Usage: ColReverse

Reverses the direction of the colour gradient in the current gradient pair. This is
equivalent to the reverse gadget in the gradient menu.

ColSten

Usage: ColSten Enable

The Enable argument can be ENABLE (=1) to enable the use of the colour
stencil, else DISABLE (=0) to disable it. This corresponds to the colour stencil
enable gadget in the stencil menu.

CopyBrush

Usage: CopyBrush SourceBrushNum

Copy the source brush (1 to 3) to the current selected cutout brush.

CopyPage

Usage: CopyPage SrcPageNum DestPageNum

Copies the contents of the source page to the destination page. The destination page will be resized if it is not the same size as the source page. This is equivalent to the Copy gadget in the spare page requester.

CopySetUp

Usage: CopySetUp DestPageNum

Copies the setup of the current page to the destination page. See the description of 'SetUp' above.

CurrentFont

Usage: CurrentFont

The current font name, size and style is returned. An example return string would be:

   topaz 8 0

See AskFont for details on the format of this string.

CurrPage

Usage: CurrPage

Return the current page number.

Curve

Usage: Curve X1 Y1 X2 Y2 X3 Y3

Draw a curve between the three points.

CutMode

Usage: CutMode BGMode [Alpha [HTol STol VTol Smooth]]

This mode sets the options in the brush cut menu.
Allowable values for BGMode are:

    NORMAL
    COLOUR or COLOR
    TOLERANCE

If Alpha is ENABLE (=1), the alpha channel will be enabled for brush cutting.
If HTol, STol, VTol and Smooth are specified, the cut tolerances and smooth factor will be set to these values.
Htol, STol, VTol & Smooth must be in the range 0 to 100%

DeletePage

Usage: DeletePage PageNum

Delete the specified page. Equivalent to the Delete button in the Spare Pages Menu.

DeleteSten

Usage: DeleteSten

Delete the mask stencil plane from the current image if one exists.

DisplayStatus

Usage: DisplayStatus Text

This command will print 'Text' into the status bar on the main menu.
'Text' cannot be longer than 11 characters.

DisplayPercent

Usage: DisplayPercent Current Max Text

This command will display 'text' as well as a percentage count on the status bar in the main menu.
'Current' can range from 0 to 'Max'.
Max is the number of steps in an operation, and Current is the current step. For example if you have a function that takes 6 steps, you can use

DisplayPercent 3 6 'Scaling:'

OpalPaint will determine the percentage by calculating Current/Max * 100. In the example above, 50% would be displayed.

Text cannot be longer than 7 characters.

Double

Usage: Double

Double the current cutout brush size both horizontally and vertically.

DoubleX

Usage: DoubleX

Double the current cutout brush size horizontally only.

DoubleY

Usage: DoubleY

Double the current cutout brush size vertically only.

Ellipse

Usage: Ellipse Xc Yc a b

Draw an ellipse centered around Xc,Yc with a horizontal dimension of 'a' and a vertical dimension of 'b'. To draw a circle, set 'a' and 'b' to the same value.

EllipseCut

Usage: Ellipse Xc Yc a b

Perform an elliptical brush cut centered around Xc,Yc with a horizontal dimension of 'a' and a vertical dimension of 'b'. To cut a circle, set 'a' and 'b' to the same value.
The cutout will be placed in the currently selected cutout brush (1 to 3).

EnableColEntry

Usage: EnableColEntry ColEntry Enable

Enable or disable a colour stencil entry.
'ColEntry' is the colour stencil to be modified (between 1 and 6).
The Enable arguement can be either ENABLE (=1) to Enable the stencil entry or DISABLE (=0) to disable it.

ExcludeAll

Usage: ExcludeAll Enable

Sets or clears the ExcludeAll gadget in the stencil menu.
The Enable arguement can be either ENABLE (=1) to Exclude all colours in the image, or DISABLE (=0) to Include all colours by default.
See the section in the OpalVision Reference Manual on Stencil Priority for further details of how stencils are combined and how priorities are determined.

Feather

Usage: Feather Radius

Feather the current cutout brush using the radius given.
Radius is measured in pixels.

FillMode

Usage: FillMode Mode

Set the current fill mode, the allowable values for 'mode' are:

    SOLID   = Solid fill
    GRADIENT = Gradient fill
    BRUSH   = Brush warp fill

FindPixel

Usage: FindPixel R G B

Returns the coordinates of the first pixel encountered which has a colour value matching 'R G B'. Search starts at the top-left hand corner of the image.

FindNextPixel

Usage: FindNextPixel

This command should be called only after FindPixel.
Returns the coordinates of the next pixel matching the colour given in FindPixel. '-1 -1' is returned if no pixels are found.
FindNextPixel can be called repeatedly until it returns '-1 -1'.

FlipX

Usage: FlipX

Flip the current cutout brush horizontally.

FlipY

Usage: FlipY

Flip the current cutout brush vertically.

FloodCut

Usage: FloodCut X Y

Cut a brush using a flood fill. The fill will start at X,Y.
The cutout will be placed in the currently selected cutout brush (1 to 3).

FloodFill

Usage: FloodFill X Y

Start a flood fill at X,Y.

FloodType

Usage: FloodType Type [HTol STol VTol]

Set the current flood fill options. Allowable values for type are:

    SIMPLE   = Simple fill
    TOLERANCE = Tolerance fill

If HTol,STol and VTol are specified the fill tolerances will be set to these values.
Htol, STol & VTol must be in the range 0 to 100%

FreeHand

Usage: FreeHand [X Y X Y ....]

Start freehand drawmode. If coordinates are specified a continuous line will be drawn between the coordinates. This command is used in conjunction with the Point and LastPoint commands.

FreeHandCut

Usage: FreeHandCut [X Y X Y ...]

Start a FreeHand cut into the current selected cutout brush. The vertice parameters are the same as the Poly command. This command is functionally identical to the PolyCut command and has been added only for consistency. Note that the filled polygon gadget will be highlighted after this command. The cutout will be placed in the currently selected cutout brush (1 to 3).

GetATool

Usage: GetATool NozzleNum

Returns the artists tool name for the specified nozzle.
NozzleNum must be in the range (1 to 10)

GetPen

Usage: GetPen

Returns the colour of the current selected paintpot in R G B format.

GetPoint

Usage: GetPoint

Ask the user to select a point on the image. When this command is executed, the mouse pointer changes to 'Point' and waits until the user selects a point using the mouse.
The coordinates of the selected point are returned in X Y form relative to the top left corner of the image, *NOT* the position within the visible painting area.

GetPot

Usage:GetPot PotNum

Returns the colour of the specified paint pot. The colour is returned in R G B format.

GetPrefs

Usage: GetPrefs

Returns the current preferences settings. A single number is returned specifying the active preferences, the number is made up of flags, the current valid flags are:

1	= Don't save thumbnails.
2	= Do safe file writes.
4	= Unused Spare pages -> Disk.
8	= Unused brushes -> Disk.
16	= Outside of work area -> Disk.
32	= Fast feed back on.
64	= drag rectangles from center.
128	= drag circles from center.
256	= Don't save icons.
512	= Rectangles/circles aspect correct (be square).
1,024	= Don't calculate brush outlines.
2,048	= Don't Load setup struct with Image.
4,096	= Allow Brush Buildup

To test if a particular mode is set, use the ARexx logical AND operator, e.g.:

```
Prefs = GetPrefs
if (Prefs & 32) then FastFeedBack = 1
```

GetRect

Usage: GetRect

Ask the user to select a rectangular area of the image. When this command is executed, the mouse pointer changes to 'Rect' and waits until the user drags out a rectangle. Once the rectangle has been selected, the upper left and lower right coordinates of the rectangle are returned in X1 Y1 X2 Y2 form.

GradRange

Usage: GradRange X1 Y1 X2 Y2

This command is used to specify the gradient range for the 'Linear Free' and 'Radial Free' gradient modes. Normally OpalPaint asks the user to drag out a line or ellipse when these gradient modes are used, under ARexx control however this command is used instead, to specify the gradient range. Note that this command must be specified before the filled object is drawn.

e.g To draw a circle with a 45 degree angle gradient across it.

    GradType LinearFree HSV /* Set up 'linear free' mode */
    GradRange 120 90 180 150
    SolidEllipse 150 120 30 30

GradType

Usage: GradType Type [ColourSystem]

Setup the gradient type options. 'Type' specifies one of the 6 possible gradient types in the gradient menu. Allowable values for 'type' are:

HORIZONTAL	= Horizontal Gradient
VERTICAL	= Vertical Gradient
RADIAL	= Radial Gradient
HORIZONTALFIT	= Horizontal Fit gradient.
LINEARFREE	= Linear Free Gradient
RADIALFREE	= Radial Free Gradient.

Types LINEARFREE and RADIALFREE must also be used in conjunction with the GradRange command.

If the 'ColourSystem' arguement is specified, allowable values are
    RGB = RGB colour mode
    HSV = HSV colour mode
There is no default ColourSystem, but if none is specified the old setting remains.

Grid

Usage: Grid Enable [W H [X Y]]

Enable is used to turn the Grid on/off. If the argument is ENABLE (=1) grid is enabled, else if DISABLE (=0) it is disabled.
If W and H are specified, the grid spacing is set to these values. If X and Y are specified, the grid origin is moved to that location.

Halve

Usage: Halve

Halve the current cutout brush size both horizontally and vertically.

HalveX

Usage: HalveX

Halve the current cutout brush size horizontally.

HalveY

Usage: HalveY

Halve the current cutout brush size vertically.

Handle

Usage: Handle X Y

Move the brush handle to location X,Y within the brush.
e.g.
    ActiveBrush 1   /* Set the current cutout brush to B1 */
    Handle 0 0/* Handle to top left on brush 1 */
    BrushSize
    Handle Result   /* Handle to bottom right on brush 1 */

HandleCenter

Usage: HandleCenter

Center the handle within the current cutout brush.

HSVtoRGB

Usage: HSVtoRGB H S V

Convert a colour specified in the HSV colour system to the RGB colour system.
HSV values range from 0 to 65535,
i.e.

Actual Value	0	65535
Hue	0 degrees	359 degrees
Saturation	0%	100%
Value	0%	100%

RGB values range from 0 to 255.

InvertSten

Usage: InvertSten

Invert the mask stencil for the current image.

Key

Usage: Key [Qualifiers] Character

Process a key as if it was typed on the keyboard.
The allowable qualifiers are:

    AMIGA
    ALT
    CONTROL
    SHIFT

The qualifiers may be freely mixed, e.g. CONTROL SHIFT is acceptable.

'Character' can either be a single character or a name for an unprintable character. The accepted key names are:

    LEFTARROW   = Left Arrow key
    RIGHTARROW   = Right Arrow key
    UPARROW   = Up Arrow Key
    DOWNARROW   = Down Arrow Key
    HELP   = Help Key
    DEL   = Delete key
    F1 to F10   = Function keys.

e.g.
    key 'ALT SHIFT LEFTARROW'   /* Rip up and Redo to left*/

KillMarquee

Usage: KillMarquee
Terminate the current Marquee without filling it.

LastPoint

Usage: LastPoint [X Y X Y...]

This command is used to finish the drawing or cutting using freehand or polygon modes. To draw or cut freehand or a polygon, first enter the correct drawing mode, specify the points for drawing using Point and complete the object using last point.
e.g.

```
FreeHand X1 Y1
Point  X2 Y1 X2-10 Y1+10 X1+10 Y1+10
LastPoint X1 Y1
```

Line

Usage: Line X1 Y1 X2 Y2

Draw a line between point 1 (X1,Y1) and point 2 (X2,Y2).

LineStyle

Usage: LineStyle Style [Dots]

Set the current line style. Allowable values of 'style' are:

```
CONTINUOUS = Continuous
SPACED  = Every Nth
TOTAL   = Total Dots
```

If Style = SPACED then 'Dots' specifies the spacing between dots on the line.
If Style = TOTAL, 'Dots' specifies the total number of dots making up the line.

Load

Usage: Load FileName

Load a file using the current loader. FileName must include the full path of the image name.

LoadBrush

Usage: LoadBrush FileName

Load 'Filename' into the current selected cutout brush (1 to 3).

Loader

Usage: Loader Name [Parameters]

Set the current image loader. Allowable names of inbuilt OpalPaint loaders are IFF, FAST and JPEG. External modules can be referenced by name. 'Parameters' will be local to each loader, and these values will be passed directly to the loader. For example, the JPEG saver parameter is a quality factor.

LoadPalette

Usage: LoadPalette FileName

Load a new palette set. If the saved palette was a complete set of 260 paint pots then all paint-pots will be replaced. If the saved palette only contains a single paint-pot row then the current paint-pot row will be replaced. To select the row to be replaced, first select any paint-pot in the row using the ActivePot command.

MagicWand

Usage: MagicWand x y

Start a Magic wand fill at x,y. This command can be issued several times to build up a marquee, each new call to MagicWand is equivalent to pressing the mouse button while holding down the shift key. The Marquee generated will not be filled until a 'MarqueeFill' command is issued.

MagicWandCut

Usage: MagicWandCut x y

Defines a Marquee to be used as a brush cut area. Like MagicWand, this command can be issued many times to define multiple areas. The brush will not be cut until a 'MarqueeFill' command is issued.

MagLevel

Usage: MagLevel Level

Set the current magnification level. If the page is currently in magnify mode, the display will be refreshed at this level. Allowable Level's are 1,2,4,8 (and 16 in hires only).

Magnify

Usage: Magnify Enable

The Enable arguement can be ENABLE (=1) to turn magnify on, else DISABLE (=0) to turn magnify off.

MakeText

Usage: MakeText Font FontSize FontStyle Text

Create text in the current cutout brush using the font specified and text string. The values for FontStyle are the same as those returned by AskFont.

e.g.
    MakeText 'cgtimes 50 2 Hello'

MaskSten

Usage: MaskSten Enable

If the Enable arguement is ENABLE (=1) then enable the use of the mask stencil, else use DISABLE (=0) to disable it. This corresponds to the mask stencil enable gadget in the stencil requester.

MarqueeFill

Usage: MarqueeFill

Fill or cut the currently active marqueed area, returns an error if a marquee is not active.

Menu

Usage: Menu Enable

If the Enable arguement is ENABLE (=1) then display the menu/tool bar, else use DISABLE (=0) to make the menu bar disappear.

MovePage

Usage: MovePage SrcPageNum DestPageNum

Move the source page to the destination page. This function simply shuffles the order of spare pages around.

NotBusy

Usage: NotBusy

Disables the Busy mouse pointer and enables the menu bar. If there are nested Busy commands this command will 'unest' them and not change the mouse pointer until the number of NotBusy commands equals the number of Busy commands executed.

NozzleSize

Usage: NozzleSize [W H]

Returns the size of the current selected nozzle. If W and H are specified, the size of the nozzle will be modified to this size.

Okay

Usage: Okay Message

Brings up a requester containing the 'Message' text and an OK gadget only. The Message string can contain '\n' to start a new line in the text.

e.g. Okay 'Operation complete'

OpenPages

Usage: OpenPages

Returns the number of open pages.

PageName

Usage: PageName [PageNum]

Returns the name of a page. If PageNum is not specified, the current page's name will be returned. A page is named by saving it.

PageRes

Usage: PageRes

Returns the current page resolution. The returned value can contain any combination of the tokens HIRES, INTERLACE and OVERSCAN (as accepted by the AddPage and PageSize commands).

PageSize

Usage: PageSize [W H Modes Scale]

Returns the current page size in W H format. If the optional parameters are specified, the page will be resized to the WxH and Modes will be used for the display mode (see AddPage for description of display Modes).
The value of Scale determines the way in which the page is resized. If Scale is false (=0), the page is cropped to the new size, else the page is rescaled to fit the new size.

Pan

Usage: Pan X Y

This command sets the X,Y location of the top left hand corner of the viewing area. This allows the displayed to be panned around within a larger image.

Panic

Usage: Panic

Same as the panic button in the About requester. Sets single-pixel brush, continuous draw and Paint Mode. Switches off all options such as transparency, stencils, textures etc.

PaperDepth

Usage: PaperDepth Depth

Set the depth of the current paper type.
Depth must be between 0 and 100.

PickPage

Usage: PickPage PageNum

Change the active page to 'PageNum'.

Point

Usage: Point [X Y X Y ...]

Specify points for freehand and Polygon drawing modes. (See LastPoint)

Poly

Usage: Poly [X Y X Y ...]

Start poly drawing mode. If the vertices are given, lines will be drawn to the given points.
Additional points can be given using the Point command, and the polygon is terminated using the LastPoint command.

PolyCut

Usage: PolyCut [X Y X Y ...]

Start a Polygon cut into the current selected cutout brush. The vertice parameters are the same as the Poly command.
The cutout will be placed in the currently selected cutout brush (1 to 3).

PutBrush

Usage: PutBrush X Y

Draws the currently active brush or nozzle at X,Y location given.

ReadPixel

Usage: ReadPixel X Y

Return the colour values of a given pixel. The return value is the pixel colour in R G B format.

Rectangle

Usage: Rectangle X1 Y1 X2 Y2

Draw a rectangle between Point1 (X1,Y1) and Point2 (X2,Y2).

Point1 defines the top left-hand corner of the rectangle,
Point2 defines the bottom right-hand corner.

RectCut

Usage: RectCut X1 Y1 X2 Y2

Make a rectangular cut into the current cutout brush. The vertice parameters are the same as Rectangle.
The cutout will be placed in the currently selected cutout brush (1 to 3).

Refresh

Usage: Refresh

Refresh the current display by updating the image in Amiga memory into the OpalVision Hardware. This command is rarely required however as OpalPaint will generally keep the displayed version of the image consistent with that in memory.

The only time this command will be required is to update the display after the palette data has been changed. OpalPaint does not do this automatically to increase the speed of modifying palette colours.

Rescale

Usage: Rescale %x %y

Rescale the current cutout brush using percentage values. %x and %y define the percentage scaling for the x and y axis respectively.

e.g.

```
    ActiveBrush 2      /* Make brush B2 active */
    Rescale 50 50      /* Halve the current (B2) brush 2  */
    ActiveBrush 3      /* Make brush B3 active */
    Rescale 200 200      /* Double the current (B3) brush */
```

RescaleMethod

Usage: RescaleMethod Method

Set the rescaling method for the current cutout brush. Allowable values for 'Method' are:

    BLOCKY (Multiply pixels. Fastest)
    SMOOTH1   (Linear interpolation)
    SMOOTH2   (Cubic Spline interpolation. Slowest)

ResetATool

Usage: ResetATool

Reset the current nozzle to its default 'solid' state. Has the same effect as the Solid gadget in the Artists Tools menu.

Resize

Usage: Resize W H

Resize the current cutout brush to an absolute pixel size.
e.g.
   ActiveBrush 2   /* Select brush B2 */
   Resize 100 100 /* Resize brush 2 to 100 by 100 pixels */

RestoreSetUp

Usage: RestoreSetUp

Restore the setup information stored using SaveSetUp.
Note, the same page should be active as when SaveSetup was called if you wish to restore the users setup back to the way it was before the macro was executed. If a different page is active the result will basically be the same as the CopySetup command.

RGBtoHSV

Usage: RGBtoHSV R G B

Convert a colour specified in the RGB colour system to the HSV colour system (See HSVtoRGB).

Rotate

Usage: Rotate Angle

Rotate the current brush by any angle. 'Angle' must be an integer value in degress.

e.g.
    ActiveBrush 3   /* Select brush B3 as the current brush */
    Rotate 45 /* Rotate Brush 3 by 45 degrees */

Rotate90

Usage: Rotate90

Rotate the current cutout brush 90 degrees anti-clockwise.

RubDirection

Usage: RubDirection Dir

If 'Dir' is false (=0) the rub direction will be set to 'Secondary to Current' else the direction will be 'Current to Secondary'. This corresponds to the direction gadget in the spare page menu.

RubMode

Usage: RubMode RubType [XOffset YOffset]

Set RubThough mode.
Allowable values for the 'RubType' parameter are

   RELATIVE = Relative rubthrough mode
   ABSOLUTE = Absolute rubthrough mode.

If 'XOffset' and 'YOffset' are specified, the rub through origin will be set to that location. These functions correspond to the gadgets in the spare page menu.

Save

Usage: Save FileName

Save the current image using the filename given. The filename must include the full path of the image name. The currently active saver will be used to perform the save.

SaveBrush

Usage: SaveBrush FileName

Save the current cutout brush in IFF format. Filename must include the full path of the brush file.

SavePalette

Usage: SavePalette FileName

Save the current palette (all 260 entries) and the mixing area to an IFF file. FileName must include the full path.

Saver

Usage: Saver [Parameters]

Set the current image saver. Allowable names of inbuilt OpalPaint loaders are IFF, FAST and JPEG. External modules can be referenced by name. Parameters will be local to each saver, and these values will be passed directly to the loader.

SaveRow

Usage: SaveRow FileName

Save the current Row of palette colours (20 entries) and the mixing area to an IFF file. FileName must include the full path. To select the active row, use ActivePot to select any paint pot within that row.

SaveSetUp

Usage: SaveSetUp

Save the current Setup information to a temporary memory area. This includes the SetUp structure (see description above), the preferences values, the active paint pot and the colour palette. This is useful to make a snapshot of the users configuration before performing any operations, when your macro exits use RestoreSetUp to restore the configuration to the way it was. Note, if your using this technique you must be on the same page when you call SaveSetUp and RestoreSetUp.

SecondaryPage

Usage: SecondaryPage [PageNum]

Returns the page number of the secondary page. If 'PageNum' is specified, the secondary page will be set to this page.

SetATool

Usage: SetATool AToolName [Weight]

Load an artist tool into the current nozzle.
AToolName specifies the tools to be loaded, and must be the name of a file in the OpalPaint:ArtistTools directory.
Weight specifies the initial tool weight (0 to 100).

e.g.
```
ActiveNozzle 3     /* Select nozzle 3 to be active */
SetATool AirBrush 50   /* Nozzle 3 = airbush at 50% */
```

NozzleNum must be in the range (1 to 10).

SetColSten

Usage: SetColSten StenEntry Include R G B HTol STol VTol

Modify a colour stencil entry. 'StenEntry' is the entry to be modified (1 to 6). If 'Include' is false (=0) the entry will be an Excluded colour, else it will be an included colour. R,G,B sets the stencil colour. HTol,STol,VTol sets the HSV tolerance range for the colour entry.

SetDrawMode

Usage: SetDrawMode DModeNum [Weight]

Set the current drawing mode.
DModeNum must be in the range 1 to 18 for built in modes and 19 to 22 for spare (loadable) modes.
'Weight' optionally sets the weight for the mode. The range of 'Weight ' will vary depending on the mode. The valid ranges are 0 to 100, -50 to 50 or 1 to 31, depending on whether the mode takes a normal range, split range or convolution window size.

e.g.
```
SetDrawMode 6 50    /* Posterise at 50% */
```

SetPage

Usage: SetPage R G B

Set the current page to a solid colour, R,G and B specifies the colour to be used.

SetPaper

Usage: SetPaper PaperName [Depth]

Set the paper type for the current page.
PaperName must be the name of a file in the OpalPaint:PaperTypes directory.
Depth can be used to specify the 'roughness' of the paper, the range for Depth is 0 to 100.
e.g.
   SetPaper RicePaper 50

SetPen

Usage: SetPen R G B

Set the current pen colour used for drawing. This function is equivalent to calling SetPot for the currently active paint pot.

SetPot

Usage: SetPot PotNum R G B

Set the colour of a paint pot entry.
PotNum must be in the range (1 to 260).

SetPrefs

Usage: SetPrefs Prefs

Modify the preferences. 'Prefs' is a single integer value, see GetPrefs for flag values.

SetSpare

Usage: SetSpare SpareNum DModeName [Weight]

Load a drawing mode into a 'spare mode' location. DModeName is the name of the mode to load, Weight can be used to set the mode weight and should be in the range 0 to 100.
e.g.
   SetSpare 1 AddNoise
SpareNum must be in the range (1 to 4).

SetSten

Usage: SetSten

Set the mask stencil for the current image to a solid colour (all 1's).

ShearH

Usage: ShearH Distance

Shear the current cutout brush horizontally by the number of pixels specified by 'Distance'.

ShearV

Usage: ShearV Distance

Shear the current cutout brush vertically by the number of pixels specified by 'Distance'.

SmoothPaper

Usage: SmoothPaper

Reset the paper type for the current page to smooth.

SolidEllipse

Usage: SolidEllipse Xc Yc a b

Draw a solid ellipse centered around Xc,Yc with a horizontal dimension of 'a' and a vertical dimension of 'b'. To draw a solid circle, set 'a' and 'b' to the same value.

SolidFreeHand

Usage: SolidFreeHand [X Y X Y ...]

Start Solid FreeHand drawing mode. If the vertices are given, lines will be drawn to the given points. Additional points can be given using the Point command, and the freehand outline is terminated using the LastPoint command.

SolidPoly

Usage: SolidPoly [X Y X Y ...]

Start Solid poly drawing mode. If the vertices are given, lines will be drawn to the given points. Additional points can be given using the Point command, and the polygon is terminated using the LastPoint command.

SolidRect

Usage: SolidRect X1 Y1 X2 Y2

Draw a solid rectangle between Point1 (X1,Y1) and Point2 (X2,Y2).
Point1 defines the top left-hand corner of the rectangle,
Point2 defines the bottom right-hand corner.

SpreadPots

Usage: SpreadPots Pot1 Pot2

Create a spread of colour between Pot1 and Pot2. Equivalent to the Spread button in the Palette menu.
Pot1 and Pot2 must be in the range 1 to 260.

StenEnable

Usage: StenEnable Enable

This is the main stencil enable. If 'Enable' is false (=0) stencils will be disabled, else stencils are enabled. This enables/disables both the mask and colour stencils. This control corresponds to the STEN gadget on the main menu.

SwapPage

Usage: SwapPage SrcPageNum DestPageNum

Swaps the order of two pages, this simply reorders the pages in memory. This is equivalent to the swap gadget in the spare page requester.

Texture

Usage: Texture Enable

The Enable arguement can be either ENABLE (=1) or DISABLE (=0).

TextureType

Usage: TextureType Mode [Tile]

Set the current Texure modes. Valid values for mode are:

    BRUSH1 = Use brush 1 as texture.
    BRUSH2 = Use brush 2 as texture.
    BRUSH3 = Use brush 3 as texture.
    RUBTHROUGH   = Rubthrough mode.

Allowable values for the Tile parameter are
    TILE
    NOTILE

Trans

Usage: Trans Enable

The Enable arguement can be either ENABLE (=1) or DISABLE (=0).

TransDither

Usage: TransDither Dither

Set the dither level for the transparency gradient in the current gradient pair. Dither must be in the range 0 to 100.

TransEven

Usage: TransEven

Regularly spaces (evens out) the transparency tags in the transparency gradient of the current gradient pair. This is equivalent to the even space gadget in the gradient menu.

TransGradTag

Usage:TransGradTag Position Trans

Adds a transparency tag to the transparency gradient in the current gradient pair.

Position specifies the position of the tag within the gradient where 0 corresponds to the start of the gradient (left hand of colour bar in the gradient menu) and 1 corresponds to the end of the gradient (right hand side).

Trans sets the transparency of the tag (0 to 100).

For example to create a gradient from fully transparent through to solid and back to fully transparent:

```
ActiveGrad 5    /* Select the 5th gradient pair as active */
TransGradTag  0    100
TransGradTag  0.5 0
TransGradTag  1    100
```

TransReverse

Usage: TransReverse

Reverses the direction of the transparency gradient in the current gradient pair. This is equivalent to the reverse gadget in the gradient menu.

TransType

Usage: TransType Type [Alpha [Trans1 [Trans2 Trans3]]]

Set transparency options. Valid values for 'Type' are:

    STANDARD = Standard
    RGB   = RGB Transparency
    HSV   = HSV Transparency

If Alpha is ENABLE (=1), Alpha transparency is enabled, else it is disabled (default value).

The meaning of the tolerance values varies depending on the value of 'Type'.
If Type is STANDARD, Tol1 sets the standard transparency value.
If Type is RGB, then Trans1, Trans2 and Trans3 set the Red, Green and Blue transparencies respectively.
If Type is HSV, then Trans1, Trans2 and Trans3 set the Hue, Saturation and Value transparencies respectively.

Undo

Usage: Undo

Undo the last operation if possible. Note that the undo buffer will be lost if the display view is paned or the magnification level is changed.

Version

Usage: Version

Return the version string for OpalPaint. The string will be of the form:

    $VER: OpalPaint 1.0 (14.10.92)

VideoMode

Usage: VideoMode

This command is used to determine whether OpalPaint is running in PAL or NTSC mode. The returned value will be either 'PAL' or 'NTSC'.

WarpBrush

Usage: WarpBrush BrushNum

Set the brush number used in the Warp/Fill mode. This command corresponds to the brush gadgets in the fill menu.
BrushNum must be in the range (1 to 3).

WarpFactor

Usage: WarpFactor Factor

Set the warp factor used in brush fill mode. Factor must be in the range 0 to 100.

WorkMode

Usage: WorkMode WMode

Set the current work mode. 'WMode' can be:

    IMAGE   = Image edit mode
    STENCIL = Stencil edit mode
    ALPHA   = Alpha edit mode

This command corresponds to the work mode gadgets on the main menu.

Zap

Usage: Zap

Zap the current page.

EXAMPLE SCRIPT

Bevelled Box.

```
/* Draw a bevelled drop box using OpalPaint.
 */

address 'OpalPaint_Rexx'

options Results

SaveSetUp
GetRect
parse var Result X1  Y1  X2  Y2

Depth = 10      /* Could use AskInt here */

GetPen
RGBtoHSV Result
Parse var Result Hue Sat Val

   /* Box body. Set up a diagonal HSV gradient */

FillMode Gradient
ClearColGrad
ClearTransGrad
ColourDither 0
TransDither 0

HSVtoRGB Hue Sat Val
ColGradTag 0 Result
S2 = (Sat-(0.4*65535))%1 /* Note: %1 converts number to an integer */
S2 = MAX(S2,0)
HSVtoRGB Hue S2 Val
ColGradTag 0.5 Result
HSVtoRGB Hue Sat Val
ColGradTag 1 Result
GradType LinearFree HSV
```

```
GradRange X1+Depth Y1+Depth X2-Depth Y2-Depth
SolidRect X1+Depth Y1+Depth X2-Depth Y2-Depth

FillMode Solid

/* Top */

V2 = (Val+0.1*65535)%1
V2 = MIN(V2,65535)

HSVtoRGB Hue Sat V2
SetPen Result

SolidPoly X1 Y1 X2 Y1 X2-Depth Y1+Depth X1+Depth Y1+Depth X1 Y1
LastPoint

/* Right */

V2 = (Val-0.15*65535)%1
V2 = MAX(V2,0)

HSVtoRGB Hue Sat V2
SetPen Result

SolidPoly X2 Y1 X2 Y2 X2-Depth Y2-Depth X2-Depth Y1+Depth X2 Y1
LastPoint

/* Left */

V2 = (Val+0.15*65535)%1
V2 = MIN(V2,65535)

HSVtoRGB Hue Sat V2
SetPen Result

SolidPoly X1 Y1 X1+Depth Y1+Depth X1+Depth Y2-Depth X1 Y2 X1 Y1
LastPoint

/* Bottom */

V2 = (Val-0.1*65535)%1
V2 = MAX(V2,0)
```

HSVtoRGB Hue Sat V2
SetPen Result

SolidPoly X2 Y2 X1 Y2 X1+Depth Y2-Depth X2-Depth Y2-Depth X2 Y2
LastPoint
RestoreSetUp

OpalPresents! & Player

Opal Presents!

OVERVIEW

Opal Presents! is a powerful multi-media and slide-show manager to control the sequenced display of 24-bit images and the transitions between them. It offers selection of images from an Image File Menu with Opal Technology's Art Gallery display and shows picture icons or Thumbnail images for the images in the slide show. It also allows graphical selection of transition effects, timing and control of integration with Amiga graphics and other OpalVision Modules.

Also included with the OpalVision system is a program called OpalPlayer, which is called by OpalPresents! to actually execute the scripts. OpalPlayer can operate as a stand-alone program to play scripts saved from OpalPresents! and also as an ARexx host for interactive presentations incorporating 24-bit images and transitions between them.

To start the OpalPresents! program,

- Open the OpalVison draw in Workbench and double-click the OpalPresents! icon. You can also start the program from the CLI.

SCREEN LAYOUT

The main control screen of OpalPresents! looks like this:

At the top of the screen is the "filmstrip" containing the thumbnail images of the images to be displayed. Below the filmstrip are the control buttons to add and delete images, load and save script files and run the script. Below the control buttons and on the left is a block of transition pattern buttons, used to select the transition used for the introduction of each image. In the centre are buttons to select the relative priority of the various displays including standard Amiga graphics, the OpalVision 24-bit display and live video (if you have the OpalVision Video Processor module fitted to your system).

On the right is a block of controls to set the advance method and speed and below that are option buttons for the priority stencil and genlock controls (again for if you have the OpalVision Video Processor module fitted to your system).

THE FILMSTRIP

The filmstrip across the top of the screen displays the picture icons (thumbnail images) for the images in the slideshow. If there are more than 5 images in the slideshow the strip can be scrolled backward and forward in several ways,

- Click on the arrow buttons at each end of the filmstrip using the Left Mouse Button. The lower buttons move the filmstrip in single steps, while the upper buttons move in larger steps.

- Drag the slide-box under the filmstrip.

- Use the left and right arrows on the keyboard to move in single steps, or hold down the Shift key to move in larger steps.

The selected image is shown with a white border and the transition and display options for that image are displayed in the control panels below it. To change the selected image,

- Click once on the thumbnail image for the image to be selected, or scroll using the arrow buttons or the slide-box.

For each image you can select a different combination of transition effect, timing and display options and the options for each image are remembered by OpalPresents! even after you move to another image.

CONTROL BUTTONS

The top row of control buttons are used to add, delete and display images, load and save script files and play the script.

Add Image

To add an image *after* the current image,

- Click the "Add" button,

or

- double-click the empty box after the last thumbnail image.

A standard OpalVision file menu will appear. (See page 229 for a full description of the file menu)

- Select the image to be loaded by double-clicking its thumbnail image or file name.

The thumbnail of the selected image will now be displayed in the filmstrip and you can set up the transition and other options for that image as described below.

Keyboard Shortcut = Amiga-a

Add Blank

"Add Blank" works just like "Add Image", except that instead of presenting the file menu a blank, black screen is inserted. This is useful for the first and last images in a presentation to give you time to switch displays on or off, or part way through a slideshow to separate sections or give time for speaking.

Keyboard Shortcut = Amiga-b

Delete

This button deletes the current selected image from the slide-show and moves the following images up to fill the gap. Note that this button does not delete the image from disk, just from the script!

Keyboard Shortcut = Delete, Amiga-d

Show

This button will load and display the current image so you can see it full-size.

Keyboard Shortcut = Amiga-v

Play

The Play button will start the script using the images, transitions and other options specified.

Keyboard Shortcut = Amiga-p or Amiga-P to play from current image to end.

Load

The Load button allows you to load a previously-saved OpalPresents! script, replacing the current script.

To load a script,

- Click the "Load" button and the standard OpalVision File Menu will appear.
- Select the name of the script you wish to load and double-click on the name using the Left Mouse Button.

Keyboard Shortcut = Amiga-l, Amiga-o (**o**pen)

Append

The Append button will load a previously-saved script and add it to the current script after the last image. See the previous point for more details.

No Keyboard Shortcut

Clear

This will clear the current script and give you an empty filmstrip, first giving you an opportunity to save your script for later use.

No Keyboard Shortcut

Save

The Save button allows you to save the current filmstrip images and options as a script file. To save a script,

- Click the "Save" button and standard OpalVision file menu will appear.

- Click in the Name text box and type in the name of the script. You can also click on an existing name to replace that script with the current filmstrip contents.

Keyboard Shortcut = Amiga-s

Quit

This button, to be found in the bottom right-hand corner of the control screen, lets you exit from Opal Presents!. If you have made any changes to the Opal Presents! script since the last time you saved it you are given the opportunity to save before exiting.

Keyboard Shortcut = Amiga-q

IMAGE INFO AND RUN CLI PROGRAM

Each image has an information menu that provides details about the image and also allows you to initiate a CLI (Amiga Command Line Interface) batch or program after the image is displayed.

To invoke the Info and CLI menu,

- Double-click on the thumbnail of the image whose information you wish to view or add a CLI program to.

The following menu will then appear.
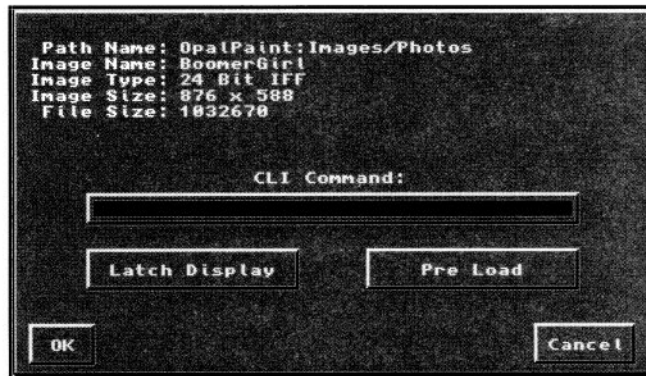
CLI Command

To enter a CLI (Command Line Interface) program that will be automatically executed *after* the transition pattern for that image has finished,

- Click the text box below the "CLI Command:" heading and enter the full command as you would type it from the Workbench Shell or CLI window.

Note that you will need to specify a path to either or both command and any arguments if they are not found in the OpalPaint: directory.

An important note is that this CLI command can be of the form;

```
execute MyBatch
```

where MyBatch is a standard CLI batch file of any length. Also remember that to execute an ARexx script you need only enter;

```
rx MyARexxScript
```

Latch Display

If this option is selected the image will be loaded into the OpalVision Main Board's on-board memory and latched so that the Amiga's normal display is freed for animations or other overlays. The downside is that on some OpalVision systems there will be a slight sideways movement of the image as the latching occurs. This is, unfortunately, an unavoidable result of the way the internal timing of some Amigas varies. It is also necessary to latch the display with some hard drive controllers which cause the image to flicker and jump while pre-loading the next image file. This is, again, an unfortunate but unavoidable result of the way these controllers issue and handle interrupts.

To quickly adjust the Latching setting for an entire script the following keyboard shortcuts are available.

To enable the "Latch Display" option (**h**old) for the current image,

- Hit the Amiga-h keyboard shortcut.

To enable the "Latch Display" option (**H**old) for the rest of the script, commencing with the current image,

- Hit the Amiga-H keyboard shortcut.

To disable the "Latch Display" option (**u**nhold) for the current image,

- Hit the Amiga-u keyboard shortcut.

To disable the "Latch Display" option (**U**nhold) for the rest of the script, commencing with the current image,

- Hit the Amiga-U keyboard shortcut.

Pre Load

Depending on availability of RAM in your system, images can be marked for Pre Loading so that they will be instantly available as and when required to perform a transition. All images marked for Pre Load are loaded into RAM before the script actually begins execution.

If you use OpalPlayer as an ARexx server you can use even more control, setting up blocks of Pre-Loads for transitions and later releasing the memory for yet more Pre-Loads. See the section on OpalPlayer ARexx beginning page 315.

TRANSITION PATTERNS

Bang

Does a simple cut from the previous image to the current image using no transition effect. The Transition-Speed setting is ignored.

Numeric Keypad Shortcut = (

Fade via Black

The previous image is first faded to solid black then the new image is faded-in from black. The total transition time is the number of seconds specified by the Transition-Speed slider.

Numeric Keypad Shortcut =)

Fade via White

The previous image is first faded to solid white then the new image is faded-in from white. The total transition time is the number of seconds specified by the Transition-Speed slider.

Numeric Keypad Shortcut = /

Checkerboard Reveal

The new image is progressively revealed by a series of squares in random positions across the screen. The total time for the transition is set by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = *

Wipe Up

The new image is revealed by a horizontal wipe line moving up the screen in the number of seconds specified by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = 7

Wipe Down

The new image is revealed by a horizontal wipe line moving down the screen in the number of seconds specified by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = 8

Wipe Right

The new image is revealed by a vertical wipe line moving from left to right across the screen in the number of seconds specified by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = 9

Wipe Left

The new image is revealed by a vertical wipe line moving from right to left across the screen in the number of seconds specified by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = -

Square Reveal Out

The new image is revealed by a square growing from the centre-point to the outside of the screen in the number of seconds specified by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = 4

Circle Reveal Out

The new image is revealed by a circle growing from the centre-point to the outside of the screen in the number of seconds specified by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = 5

Diamond Reveal Out

The new image is revealed by a diamond growing from the centre-point to the outside of the screen in the number of seconds specified by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = 6

Streak Up

This transition has a horizontal wipe line that moves up the screen like a wipe-up and the pixels of the new image under the wipe-line are repeated from the top of the screen down to the wipe-line. (Yes we know this sounds confusing - we suggest you try it out.) The total time for the transition is set by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = +

Zig-Zag Vertical

The wipe in this transition is a square block that scans up and down and then across the screen to reveal the new image. The total time for the transition is set by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = 1

Zig-Zag Horizontal

The wipe in this transition is a square block that scans left and right across and then down the screen to reveal the new image. The total time for the transition is set by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = 2

Spiral Out

The wipe in this transition is a square block that scans outwards in a spiral pattern from the centre of the screen to reveal the new image. The total time for the transition is set by the Transition-Speed slider. Both images are static.

Numeric Keypad Shortcut = 3

Bounce Down

The new image drops down from the top of the screen over the previous image and "bounces" a few times before coming to rest. The total time for the transition is set by the Transition-Speed slider.

Numeric Keypad Shortcut = Enter

Slide Up

The new image slides upward and covers the previous image. The total time for the transition is set by the Transition-Speed slider.

No Numeric Keypad Shortcut

Slide Down

The previous image slides downward off the screen to reveal the new image. The total time for the transition is set by the Transition-Speed slider.

No Numeric Keypad Shortcut

Horizontal Slats

The new image is revealed in a series of horizontal strips that expand from a single line and eventually join, looking a little like venetian blinds being closed. The total time for the transition is set by the Transition-Speed slider.

No Numeric Keypad Shortcut

Vertical Slats

The new image is revealed in a series of vertical strips that expand from a single line and eventually join, looking a little like vertical drapes being closed. The total time for the transition is set by the Transition-Speed slider.

No Numeric Keypad Shortcut

DISPLAY PRIORITY

Opal Only

This option allows OpalVision graphics only, with no Amiga graphics overlay. Note that the Amiga graphics may still be generated, but the OpalVision card will not combine them with its 24-bit display.

Amiga Only

This option switches off the OpalVision 24-bit display and shows only Amiga graphics. As with the previous option, OpalVision graphics may exist but the card will not display them.

Opal on Amiga

This option will show Amiga graphics whenever the OpalVision generates Colour∅ (pure black).

Amiga on Opal

This option will show OpalVision 24-bit graphics whenever the Amiga generates Colour∅.

Live Video Only

This option will disallow both Amiga graphics and OpalVision 24-bit graphics and display live video only. This option requires the OpalVision Video Processor module to be fitted to your system.

DISPLAY OPTIONS

Priority Stencil On

This option switches on and off the action of the Priority Stencil that can be saved with OpalVision images. See Merge Stencil (page 228) for more details on how to create Priority Stencils.

Transparency

This option switches on and off the action of the Transparency Overlay that can be generated in Alpha Work Mode and saved with OpalVision images. The OpalVision Video Processor Module is required to utilize this feature.

Genlock Overlay

This option switches on and off the live video being passed through the OpalVision Video Processor Module (if fitted).

ADVANCING & TIMING

Advance Method

The advance method determines how the transition between the previous image and the current image will be triggered.

Button

This trigger corresponds to the Left Mouse Button. (The Right Mouse Button will abort the script).

ARexx

When run with a script, OpalPlayer will accept ARexx messages to trigger image changes. See the section below for a complete description of ARexx support in OpalPlayer.

Timer

This option will wait for the number of seconds specified by the Hold-Time slider and text box before going on to the next image.

Trans Speed

This slider and text-box specifies the number of seconds that should be taken for the image transition. To adjust the transition time,

- Drag the slider until the desired number of seconds is shown,

or

- Click in the time text-box and type in the number of seconds required.

Note that with some transitions such as fades via black or white each phase of the transition takes half of the total transition time.

Hold Time

This slider and text-box specifies the number of seconds that the image will be held before the next transition. To adjust the transition time,

- Drag the slider until the desired number of seconds is shown,

or

- Click in the time text-box and type in the number of seconds required.

Note that although the program pre-loads the next image into Fast RAM, if you specify a hold time less than the required file load time you will still have to wait for this file load to finish before the transition can occur.

KEYBOARD SHORTCUTS

Amiga Keys

⇦,⇨	Scroll in single image steps
Shift ⇦,⇨	Scroll in four-image jumps
Amiga-a	Add Image - Brings up File Menu
Amiga-b	Add Blank
Delete, Amiga-d	Delete Image
Amiga-h	Hold (Latch) Display for current image
Amiga-H	Hold (Latch) Display for all images from current image to end of script
Amiga-l, Amiga-o	Load or Open *Script* - Brings up File Menu
Amiga-p	Play Script
Amiga-q	Quit from OpalPresents!
Amiga-s	Save *Script*
Amiga-u	Unhold (Unlatch) Display for current image
Amiga-U	Unhold (Unlatch) Display for all images from current image to end of script
Amiga-v	View (show) current image

Numeric Keypad - Transition Types

The keys on the numeric keypad provide a convenient and fast method of setting transition type, and map over the top 16 transitions on the control screen. There is no way to select the lowest four transitions from the keyboard.

)	Bang
(	Fade via Black
/	Fade via White
*	Checkerboard Reveal
7	Wipe Up
8	Wipe Down
9	Wipe Right
-	Wipe Left
4	Square Reveal Out
5	Circle Reveal Out
6	Diamond Reveal Out
+	Streak Up
1	Vertical Zig-Zag
2	Horizontal Zig-Zag
3	Spiral Out
Enter	Bounce Down

OpalPlayer

AREXX

OpalPlayer has two different methods of being used with ARexx. The first method involves creating a script file using OpalPresents! and then using ARexx commands to effect the transition timing (if ARexx advance method is selected) as well as to abort the script and change display priorities and options.

The second method is to use OpalPlayer as an ARexx host without using a script. To use this method, simply run OpalPlayer giving it the 'ARexxHost' keyword, i.e:

```
OpalPlayer ARexxHost
```

When in ARexxHost mode, the player will wait for ARexx commands, processing them as they come in.

MESSAGE PORT NAME

The name of the OpalPlayer message port is
OpalPlayer_Rexx

ARexx Detailed Commands

Advance

Usage: Advance

If OpalPlayer is waiting for and advance command for the current image, (as set in OpalPresents!) the Player will perfrom the transition to the next image.

Note: This command has no meaning in ARexxHost mode.

Stop

Usage: Stop

This command will remove the OpalVision display and terminate the player program. This command is recognised in Timer and Button advance modes.

AddPreLoad

Usage: AddPreLoad FileName

If the image specified by 'FileName' is not present in the active preload list it will be loaded into memory. FileName must include the full path.

After images have been added into the preload list they remain resident and can be used repeatedly without any disk access.

FreePreLoad

Usage: FreePreLoad ImageName

If the image specified by 'FileName' is present in the active preload list, it will be removed from memory.

LoadImage

Usage: LoadImage ImageName

This command will load an image into memory for subsequent use in a transition. This command does not effect the current display but will load an image into memory only.

If the image is already preloaded (resident) the imagename will be noted and this command will return immediately.
If the image is not resident in memory the complete image pathname must be supplied.

If the ImageName is 'Blank' a blank (black) image will be inserted.

Note: This command can only be used in ARexxHost mode.

Transition

Usage: Transition TransType TransTime [Tokens]

This command will perform a transition from the current contents of the OpalVision framebuffer to the image specified by the last LoadImage command. NOTE: a LoadImage command must be issued before executing this command, if not Transition will return an error. Note that a LoadImage command can be issued with the name of a previously loaded image name. This will not reload the image but "prime" it for the next transition.
Once the transition has completed, the loaded image will be removed from memory (unless it is a resident image).
The parameters are:

TransType

Must be in the range 0 to 19, with the numbers corresponding to the effects available from the OpalPresents! main screen and listed below.

Transition No	Transition Name
0	Bang
1	Fade via Black
2	Fade via White
3	Checkerboard Reveal
4	Wipe Up
5	Wipe Down
6	Wipe Right
7	Wipe Left
8	Square Reveal Out
9	Circle Reveal Out
10	Diamond Reveal Out
11	Streak Up
12	Zig-Zag Vertical
13	Zig-Zag Horizontal
14	Spiral Out
15	Bounce Down
16	Slide Up
17	Slide Down
18	Horizontal Slats
19	Vertical Slats

TransTime

The duration of the transition in 10th's of a second. e.g to perform a fade over 2 seconds, use

```
Transition 1 20
```

Tokens

'Tokens' can be a series of tokens equivalent to the ones specified in the OpalPlayer script files. These tokens can be used to set display priorities, enable stencils etc. All display options set with these tokens will take effect AFTER the transition has been performed. The following list is the tokens currently accepted:

Display Priorities:

    OpalOnly - OpalVision graphics only.
    AmigaOnly - Amiga graphics only.
    OpalPri   - Dual Opal/Amiga display with Opal in front.
    AmigaPri - Dual Opal/Amiga display with Amiga in front.
    LiveOnly - Live video only.

Other Display Options:

    PriStencil - Enable Priority stencil.
    Alpha   - Enable Alpha Channel.
    Genlock   - Enable Genlocking.
    Latch   - Latch the OpalVision display on.

Example:

    LoadImage 'gfx:pic1'
    Transition 1 20 OpalPri PriStencil

Note: This command can only be used in ARexxHost mode.

DisplayPri

Usage: DisplayPri Token

This command can be used to change the current display priority.
'Token' must be one of the 5 tokens mentioned above.

PriStencil

Usage: PriStencil [Enable|Disable]

This command can be used to switch the priority stencil on or off. Either
'Enable' or 'Disable' must be specified.

Genlock

Usage: Genlock [Enable|Disable]

This command can be used to switch the genlocking on or off. Note that this
command requires the OpalVision Video Processor module to be installed.
Either 'Enable' or 'Disable' must be specified.

DispLatch

Usage: DispLatch [Enable|Disable]

This command can be used to latch or unlatch the current display. If the display
is latched, any amiga animations or iff viewers can be used over the 24bit
display. Either 'Enable' or 'Disable' must be specified.

Alpha

Usage: Alpha [Enable|Disable]

If the current image has a alpha channel information attached, this command will enable or disable the use of this information for keying over live video. Note that this command requires the OpalVision Video Processor module to be installed.

EXAMPLE SCRIPT

```
/* OpalPlayer test.
 */

Address 'OpalPlayer_Rexx'

LoadImage 'OpalPaint:Images/Photos/Boomergirl'
transition 2 40

LoadImage 'OpalPaint:Images/Photos/Clowns'
Pristencil enable
DisplayPri AmigaPri
Transition 5 40

address command wait 3

LoadImage 'blank'
Transition 1 40 OpalPri
Stop
```

Opal HotKey

TABLE OF CONTENTS

Overview of Use

Opal HotKey is a small program that is designed to run in the background and provide useful access to your OpalVision board. When inactive (ie not actually doing anything) it takes up less than 23K of Fast RAM, so it is worthwhile to leave it running all the time.

Firstly it enables you to load 24-bit images into the OpalVision board and use them as backdrops to your normal Amiga display. A very effective technique is to use a photographic quality, 24-bit backdrop in combination with your favourite titling or animation package. Depending on the options chosen with the HotKey program, the Amiga display is combined with the 24-bit image without affecting the program generating the Amiga graphics because with the image stored in the OpalVision's on-board memory the Amiga doesn't even know the OpalVision exists. To make things even better, with OpalPaint you can save a priority stencil with a 24-bit image that specifies certain parts of the image to be *foreground*, ie the Amiga graphics will appear behind the foreground parts of the OpalVision 24-bit image and in front of the rest of the image. This happens totally within the special graphics processor on the OpalVision Main Board and does not affect the Amiga-Graphics program(s).

Secondly, the HotKey program provides, you guessed it, Hot Keys that let you easily change the way OpalVision interacts with your normal Amiga display and live video (if you have the OpalVision Video Processor fitted).
Finally, Opal HotKey also acts as a host for ARexx-compatible programs running on your Amiga. ARexx is a special programming language that allows programs to issue commands and interact with other programs and with the HotKey program active other programs can load images, use the file menu and change display options just as you do with the function keys.

Starting the Program

WORKBENCH TOOL TYPES

If you are running Workbench 2.x or higher OpalHotKey functions as a Workbench Commodity. It then also accepts the following standard commodity parameters and key assigns when entered as Tool Types in the Icon Information window. Consult your Workbench Reference manual for more information about Commodities and entering and editing Tool Types.

Standard Commodity Tool Types

CX_PRIORITY	Set priority of commodity.
CX_POPKEY	Set key combination to bring up help screen.
CX_POPUP	Detirmines whether help screen should pop up when installed.

Key Assign Tool Types

LoadImage=F1	Invokes the OpalVision file requestor so you can specify an image to load.
DisplayPriority=F2	Toggles the relative display priority of Opal and Amiga graphics.
DualDisplay=F3	Toggles the Dual (Opal *and* Amiga) and Single (Opal *or* Amiga) display modes.
PriorityStencil=F4	Toggles the Priority Stencil between enabled and disabled
RemoveDisplay=F10	Removes the current Opal image but leaves OpalHotKey running.
Quit=DEL	Removes the current Opal image and removes OpalHotKey from memory.
FileWatch	Specify filename to watch. For example, use RAM:QuickRender for Imagine

CLI PARAMETERS

The command line syntax is:

```
OpalHotKey [Options]
```

Where: [Options] can be:

Reset	Reset the frame buffer, remove 24bit display if the Amiga has been reset with the 24bit display 'Latched' on.
Imagine	Install Imagine patch, this will cause the file 'Ram:QuickRender' or other specified file name to be automatically displayed after being written to.
-f FileName	Overides the file name for the imagine patch, you can assign your own name to the file to be displayed.
-q	Be quiet. (Don't output any text).

When running under Workbench 2.x or higher you can also use any of the keyboard assigns as shown in the section on Workbench Tool Types above. Just add the same command as a CLI option. Note that if you need to list several keys or key qualifiers you will need to put quotes around the combined option. e.g. "PriorityStencil=LAlt RCommand Shift F1"

CLI Example

```
OpalHotKey Reset Imagine -f ram:Pic "RemoveDisplay=Shift
F10"
```

For best results place the OpalHotKey icon into the Workbench Startup or add the command to the file s:user-startup (for Version 2.x) or s:startup-sequence (for Version 1.3) so that it will run automatically every time your Amiga starts up. The Reset option (Tool Type or CLI option) is useful to flush the OpalVision buffer if you happen to crash your Amiga with a 24-bit image displayed.

Amiga Display Colours - Important Note

Because of the way your OpalVision card interacts with the standard Amiga display, you may occasionally encounter problems when combining an Amiga-graphics overlay with an OpalVision backdrop. These problems may appear as a "tearing" of the image, jumping or rolling or simply a black screen.

These will all be prevented if you ensure the Amiga display being combined with the OpalVision display has the Blue component of ColourØ set up in the correct way, which is different depending on the graphics chipset used in your Amiga.

ECS & Pre-ECS (Amiga 2000, 2500, 3000)

Set the Blue component of ColourØ to an odd value. In other words, ensure the first colour in the palette of the Amiga screen you display has a Blue value of 1, 3, 5, 7, 9, 11, 13 or 15. The values of Red and Green can be any value you choose, as can all three components of all other colours in the screen's palette. In the vast majority of cases this will make no difference to your image as ColourØ is the one replaced by the OpalVision image.

For the technical minded, the lowest significant bit of Blue must be set.

AA (Amiga 600, 1200, 4000)

With the increased colour bandwidth of the AA chipset the required bit of the ColourØ's Blue component is bit 4 (starting from 0). In practical terms, just ensure that the Blue component of ColourØ falls within one of the following ranges -

16-31,	48-63,	80-95,	112-127,
144-159,	176-191,	208-223,	240-255

The values of Red and Green can be any value you choose, as can all three components of all other colours in the screen's palette. In the vast majority of

cases this will make no difference to your image as ColourØ is the one replaced by the OpalVision image.

Function Keys

When the OpalHotKey program is running in the background, the following function keys, in conjunction with the Alt, Shift and Control keys, will directly change various settings of the OpalVision system. To change a setting;

- While simultaneously holding down the Ctrl, Shift and Amiga keys on the *left* side of your keyboard, press the appropriate function key.

The action of each function key is described below.

Help   Startup Options Menu

The Ctrl, Shift and Left-Amiga keys held down with the "Help" key will invoke the following menu. Note that most options have a corresponding function hot-key and the use of each option is described below.

One point to note is that at least one of the Display Control options must be selected at all times, i.e. Opal/Amiga, Live Video or both. These combinations are the equivalent of function keys F6, F7 and F8 described below.
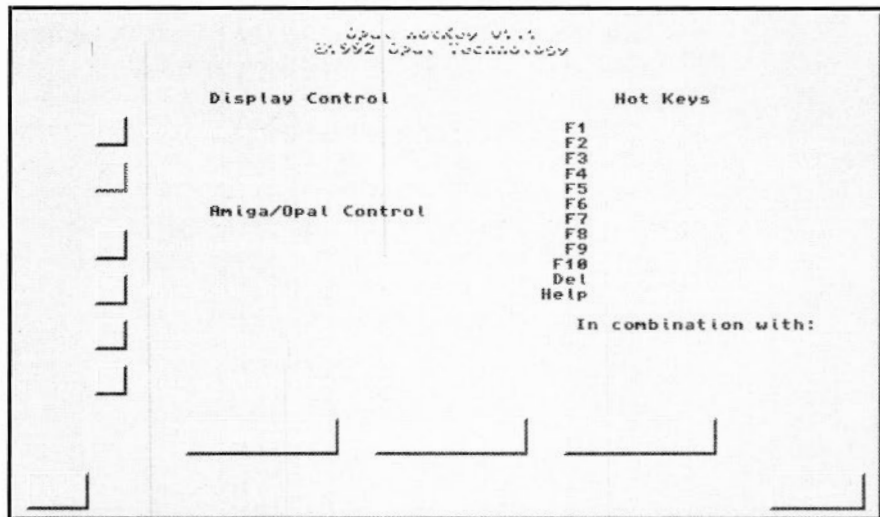
F1   Load Image as Backdrop

This function key will invoke the general file menu described in the Files chapter of the OpalPaint reference. See page 229 for a full description of this menu and its use.

When you select an image by name or from its thumbnail in the "Art Gallery" it will be loaded into the OpalVision frame buffer and latched. From this point in time onwards the Amiga is effectively unaware of the image's existence, but by selecting appropriate HotKey options described below it can be displayed as a backdrop with various priority and mixing options.

F2   Toggle Amiga / Opal Priority

This function key toggles the priority of Amiga graphics and OpalVision graphics, i.e. which display appears "above" the other.

Also see the next key which determines whether the display with higher priority completely covers the lower-priority display, or whether the lower-priority display "shows through" any ColourØ areas of the higher-priority display.

Each press of the function key reverses the setting.

F3   Toggle Dual Amiga / Opal Display

This function key toggles whether both Amiga graphics and OpalVision graphics are displayed or whether only the highest-priority "top" display (set by the F2 key, see the previous point) is displayed.

When in Dual Display mode, any areas of the "top" or higher-priority display that are ColourØ will appear transparent and reveal the lower-priority display. A good example of this combination of in action is the "King of Karate" game included with your system, where animated Amiga-Graphics characters are overlayed on a 24-bit OpalVision background.

Each press of the function key reverses the setting.

F4   Toggle FG/BG Priority Stencil

Any image saved by OpalPaint has the option of being saved with a Priority Stencil. This Stencil defines areas of the OpalVision image that will appear as Foreground with respect to standard Amiga Graphics, with the remainder of the image appearing as Background to the Amiga Graphics. This priority switching is carried out by the OpalVision hardware and is totally transparent to the program generating the Amiga graphics.

This Priority Stencil is created using OpalPaint's "Merge Stencil" option described on page 228 and will automatically be saved with the image using the normal save-image option in OpalPaint.

Each press of the function key reverses the setting between active and inactive.

F5   No Function

F6   Live Video Only

This option requires the OpalVision Video Processor Module to be fitted to your system, and forces the display of live video only, switching off the display of both Amiga and OpalVision graphics.

Repeated pressing of this key has no further effect.

F7   Amiga and OpalVision Graphics Only

When you have the OpalVision Video Processor Module fitted to your system, this key switches off the live video and displays only Amiga and OpalVision graphics. Note that the various priority and dual-display options described above then come into effect.

Repeated pressing of this key has no further effect.

F8   Mix Amiga, OpalVision and Live Video

When you have the OpalVision Video Processor Module fitted to your system, this key allows display of live video, Amiga and OpalVision graphics. Note that the various priority and dual-display options described above then come into effect.

Repeated pressing of this key has no further effect.

F9   Toggle Alpha Channel (Transparency)

This option requires the OpalVision Video Processor Module to be fitted to your system.

Any image saved by OpalPaint has the option of being saved with an Alpha or Transparency Mask. This mask defines the transparency of each pixel of the OpalVision image with respect to live video being passed through the OpalVision Video Processor module.

This Alpha or Transparency Mask is created using OpalPaint's "Alpha Work Mode" described on page 200 and will then be automatically saved with the image or saved separately using the normal save-image option in OpalPaint.

Each press of the function key reverses the setting between active and inactive.

F10   Reset

This key will remove the displayed image and deactivate the OpalVision card, but leave the OpalHotKey program running in the background.

Del   Remove Opal HotKey Program

This key will remove the displayed image, deactivate the OpalVision and remove the Opal HotKey program from memory.

ARexx and Opal HotKey

ARexx Overview

The Opal HotKey program acts as an ARexx host so that other programs running in the Amiga environment can access functions of the OpalVision. These functions include all the options available using the HotKey menu or function keys.

See the chapter on ARexx in the OpalPaint reference for further information about ARexx and where to get help.

The ARexx commands supported by the Opal HotKey program at time of publication are listed below.

Message Port Name

The name of the Opal HotKey message port is

OpalHK_Rexx

ARexx Commands

GetFileName

This function brings up an OpalVision file menu. Once the user has selected a file either by thumbnail or by name, the full file name (including path) is returned in RESULT. If the user hit cancel, or an error occurred RC_WARN is returned (i.e RC=5).

GetImage

This function also brings up an OpalVision file menu. Once the file has been selected, it is loaded and displayed (see *DisplayImage* for supported file formats). If the user hit cancel, RC_WARN is returned (i.e RC=5). If a file load error occurred, an error code is returned in RESULT (see *DisplayImage* for return codes).

DisplayImage

This function loads and displays a given file. The full filename including path must be specified. All memory is freed after the image is updated.
e.g.

DisplayImage 'Gfx:Analyse'

The supported file formats are:

All Palette mapped IFF files (up to 256 colours).
Ham IFF.
Extra HalfBrite IFF.
24Bit IFF.
OpalVision Fast Format.
JPEG JFIF format.

AmigaPriority

Gives the Amiga graphics priority over the OpalVision graphics in dual display mode (see *DualDisplay*). This has the effect of making Amiga graphics appear in front of the 24 bit display.

OVPriority

Gives the OpalVision graphics priority over the Amiga graphics in dual display mode (see *DualDisplay*). This has the effect of making Amiga graphics appear behind the 24 bit display.

AmigaOnly

Puts the OpalVision into single display mode with Amiga priority. After this function is called, only Amiga graphics are visible, but the current image is still resident in the OpalVision frame buffer.

OVOnly

Puts the OpalVision into single display mode with OpalVision priority. After this function is called, only OpalVision graphics will be visible.

DualDisplay

Puts the OpalVision into DualDisplay mode. This mode enables both Amiga and the 24bit display to be visible at once. AMIGAPRIORITY and OVPRIORITY can be used to set the relative priorities of the two displays.

SingleDisplay

Turns off dual display mode, either Amiga or 24Bit graphics will be displayed, depending on the current priority setting.

EnablePriSten

This enables the OpalVision priority stencil. When enabled the priority stencil is used to determine whether OpalVision or Amiga graphics will be displayed on a pixel by pixel basis. The priority stencil can be edited using OpalPaint. (See page 228)

DisablePriSten

Turns off the use of the priority stencil.

HelpRequestor

Brings up the OpalHotKey help menu, enabling the user to manually set display options.

KillDisplay

Removes the current display and deactivates the OpalVision.

RemoveHK

This function removes the Opal HotKey program from memory. This function should be used with caution, as the host environment will no longer exist after this command is executed.

EXAMPLE SCRIPT

```
/* OpalHK Test Script
This script presents you with an OpalVision file menu, waits for you to select an
image, then loads that image and steps through various priority options with a 1
second pause between each operation.
*/
options results              /*Allows return of parameters to ARexx*/
address 'OpalHK_Rexx'        /*Specify message-port name for Opal HotKey*/

GetFileName                  /*Display file menu and wait for name*/
if RC=5 then exit            /*Exit script if User hit Cancel or other error */

displayimage result          /*Loads and displays the specified image*/

address command 'wait 1'     /*Wait for 1 second*/
OVOnly                       /*Switch to Single Display mode with OV only*/

address command 'wait 1'     /*Wait for 1 second*/
DualDisplay                  /*Switch to Dual Display mode OV + Amiga*/

address command 'wait 1'     /*Wait for 1 second*/
OVPriority                   /*Give priority to OV display over Amiga*/

address command 'wait 1'     /*Wait for 1 second*/
AmigaPriority                /*Give priority to Amiga display over OV*/

address command 'wait 1'     /*Wait for 1 second*/
EnablePriSten                /*Enable Priority Stencil*/

HelpRequestor                /*Display Opal HotKey menu*/

KillDisplay                  /*Remove the current display and deactivate OV*/

exit
```

Hints for Using Opal HotKey

The ability to load an image into the OpalVision's on-board memory and use it as a backdrop for standard Amiga graphics presents many practical uses. Often the main requirement for high-quality titling is a high-quality backdrop with one or two-colour text overlaying it. It is also often more practical to generate animations using standard Amiga graphics and overlay them on a 24-bit backdrop for reasons of both design and run-time speed. A side-benefit is that the limited and precious available colours in the Amiga display can all be used for the animated figures or objects without reserving any for backgrounds. This technique allows larger, more colourful animations on photographic-quality backgrounds.

When overlaying Amiga graphics, remember that the 24-bit backdrop will show wherever you have ColourØ in the Amiga graphics and remember to ensure the Blue component of ColourØ is an odd number (see above on page 326). Don't forget that you can use Opal HotKey to load the background image behind the program you are using to generate the titles or animation for a true WYSIWYG display.

OpalAnimMATE

TABLE OF CONTENTS

Overview

OpalAnimMATE is a set of programs to generate and play high quality animations on the OpalVision system. MakeAnim24 takes a sequence of image frames, scales them in size and/or number of bit-planes and builds an animation file. These source frames can be generated by software such as paint and animation packages, 3D renderers or ray-tracers, morphing or image-processing software, landscape generators etc. PlayAnim24 reads the animations created by MakeAnim24 and, you guessed it, plays them. Playback can be from RAM or hard drive with adjustable frame rate.

Aside from the processing power of your Amiga, the final frame rate is determined by three main factors: the size on screen of the final animation, the number of bit planes selected (24, 18, 15, 12 or 8 bits) and whether you choose Raw or Delta-compressed data.

MakeAnim24

To start MakeAnim24

- double-click on the MakeAnim24 icon in Workbench, or use the MakeAnim24 command from the CLI.

The main control panel looks like this:
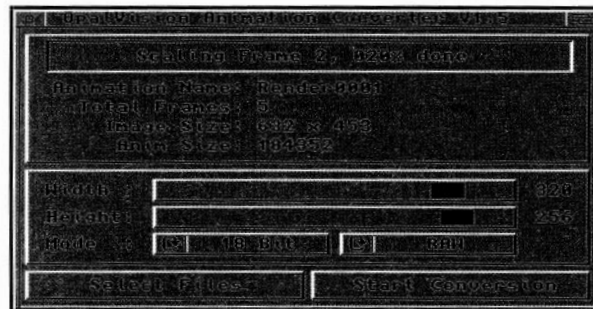
MakeAnim24 scales and converts a sequence of image files into the OpalVision animation format. First we select the first and last images in the sequence, then specify the final size and number of bit-planes required before actually generating the animation.

VALID SOURCE IMAGES

Most 3D programs generate animations in form of a sequence of IFF frames. Usually they are called "frame.0001" to "frame.0120" or "0001picture" to "0120picture" etc. MakeAnim24 requires you to select the first and last frame of the animation. In order to process the files correctly, all frames have to be in sequential order. Note that it is not possible to select filenames that vary in length, for example "pic.1" to "pic.800".

All source frames have to be in IFF24 or JPEG format 24 Bit (allthough IFF24 should be preferred to JPEG for speed reasons). Although the format should be hires/interlaced (640 x 400 NTSC or 640 x 512 PAL) for best results from the scaling algorithm, the bottom line is that that the source screensize has to be the

same or bigger than the size being scaled to. At the other end of the scale, the source screensize also should not exceed about 800 x 600 pixels unless you have lots of free memory. Enlarging to a given size is not useful for this application and therefore not supported.

For generation of 8 Bit animations the source images have to be palette mapped 256 color IFF images as generated by, for example, Art Department Professional. MakeAnim24 will not convert 8 bit files into 24 bit files or vice versa. The screensize and resolution of the source image will be used for the final animation, and the following sizes are possible:

From 32*20 to 368*286 in LoRes

From 32*20 to 768*286 in Hires

Notes:

Make sure the width is divisible by 16 !

Hires does **not** mean Interlaced as well - OpalAnimMATE cannot perform interlaced animations.

SELECTING IMAGES

First select the images to be converted to an animation by clicking the "Select Files". Depending on the Kickstart version you are running the procedure for selecting the files varies.

Workbench 1.3

Under Workbench 1.3 the "req.library" should have been installed in your LIBS: directory.

After clicking on the "Select Files" button, a file requester will pop up and ask you to select the first frame of your animation. Use the file requester to get into the correct directory and make your selection by double clicking on the correct file. A new requester will then come up so you can select the last frame of your animation. Again, make your selection by double clicking on the desired filename.

Workbench 2.0

Under Workbench 2.0 this procedure is easier. Note that the "asl.library" has to be installed in the LIBS: directory.

After clicking on the "Select Files" gadget, the ASL filerequester will pop up and you can select the animation's first and last frame. Select the correct directory and click on the first frame. Now press the shift key and WHILE HOLDING DOWN the shift key, click on the last frame and end your selection by clicking on the OK gadget. If you've selected more than two files or invalid filenames (e.g. "pic.1" and "pic.800") the "Invalid Filename Selection" error message will come up.

ANIMATION OPTIONS

Once first and last frame of the animation are selected, the memory requirements are displayed and you should choose:

- The screensize of the final animation. Drag the Width and Height sliders to the desired values.

- The number of bit-planes (24, 18, 15, 12 or 8 bit). Click the button until the desired value appears on the button.

- The compression mode used. This can be RAW (uncompressed) or Delta (see below).

Of course the bigger the screen chosen then the slower the playback and the larger the animation file, so again choose the options that fit your needs.

OpalAnimMATE provides a wide range of animation options that allow you to trade off playback speed, animation file size and animation quality to fit your own requirements. For many applications using a lower number of bit planes will not significantly affect the image quality but will greatly reduce the animation file size and increase playback speed.

The width of the final animation can be any size from 32 to 368 pixels in 16 pixel increments. The height can be changed from 20 to 286 lines. In NTSC, only 236 lines will be visible though.

As described above, the size selection is not possible in the 8 Bit mode. Here the picture size is taken from the source image and must not exceed 768*286 pixel. The width has to be a multiple of 16.

A two pass spatial transform algorithm is used to achieve the best results for scaling images.

Delta compression will often greatly reduce the size of the animation as stored on disk and increase playback rate. It works best where there are areas of the image that do not change. Note that Delta-compressed animations can not be played in Ping-Pong mode (see page 345). MakeAnim24 will also add two additional frames to the end of the animation when doing Delta compression to smooth the transition from the last to first frame.

START CONVERSION

To actually convert the selected frames into the OpalVision animation file, click on the "Start Conversion" Gadget. A filerequester lets you select the destination animation filename. Check that enough harddrive space is available to store the completed animation. (Note that the animation size shown is the maximum size, as the reductions available through use of Delta compression cannot be calculated until the conversion is actually being done.

After clicking on the OK gadget, the scaling and conversion process begins. The program informs you about the current frame and operation. Depending on screensize etc. about 10-20 frames are processed per minute on a 68030/40 based machine. Converting frames on a stock Amiga 2000/68000 takes about one minute per frame.

To abort the conversion process,

- Press and hold the "Escape" key.

The message "Conversion finished" informs you about the succesfull conversion of all image files. PlayAnim24 can be loaded now to play the animation.

WORKBENCH ICON SETUP

You can specify the default animation parameters of MakeAnim24 by using the following tooltypes with the MakeAnim24 icon

WIDTH=320	for default horizontal scaling size
HEIGHT=200	for default vertical scaling size
MODE=18	default color mode 8,12,15,18 or 24 bit planes
COMPRESSION=DELTA use DELTA or RAW compression	

PlayAnim24

PlayAnim24 plays animations created with MakeAnim24.

To start PlayAnim24

- double-click on the PlayAnim24 icon in Workbench, or use the Anim24 command from the CLI. See below for the available parameters.
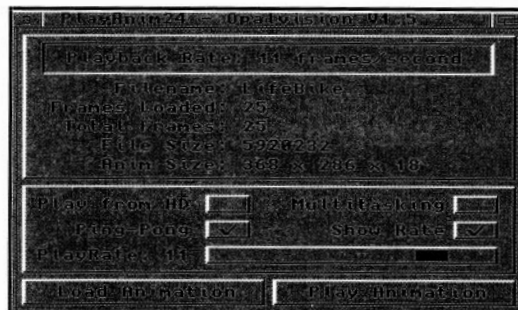
Status Area

The status area shows the animation file name, the number of frames loaded, the total frames in the animation, the file size and the animation's image size and number of bit planes.

Play from HD

Animations can be either played from memory or directly from harddrive. Playback from harddrive is a lot slower than playing from memory and varies depending on your controller and harddrive, but can be very useful if your animation is to large to fit into memory and you want to be able to see the complete animation.

The highest playback speeds can be achieved on an Amiga 3000 or Amiga 4000. The chipmemory bandwidth on these machines is higher than on an Amiga 2000, so data refresh is faster and the framerate higher.

Multitasking

This option enables and disables multitasking.

Ping-Pong

This option enables and disables ping-pong playback mode. With ping-pog the animation is played from the first to last frame and repeated backwards from last to first.

Note that Ping-pong playback is **not** available if the animation is Delta-compressed (generated in MakeAnim24 using Delta format) or you playback from harddrive.

Show Rate

If this option is enabled the playback rate achieved will be displayed after animation playback is completed.

Speed

The playback speed in Frames per Second can be adjusted by moving the slider between 60 and 1. Note that if the maximum framerate on your system for a particular animation is, say, 18 then slider settings greater than 18 will not increase playback speed.

Load

The Load button opens a filerequester and lets you select the animation you want to play. If you do not have enough memory for the complete animation file then a partial animation will be loaded. After loading, playback will commence automatically.

Play

Plays an animation that has already been selected from memory or harddrive.

MOUSE AND KEYBOARD

The Left Mouse Button or the Escape Key will abort the animation playback. The Right Mouse Button will pause the animation on the current frame.

CLI ACCESS

The complete CLI options for PlayAnim24 are:

```
PlayAnim24 [-P] [-H] [-M] [-S] <filename>
```

The options are

[-P] Use Ping-Pong Playback.

[-H] Playback from Hard Drive

[-M] Enable multi-tasking during playback

[-S] Show playback rate achieved after completion

Each option is equivalent to those accessed from the Workbench control panel and is discussed above.

To force the use of the normal Workbench control panel, use the command

```
PlayAnim24 @
```

TIPS TO IMPROVE PLAYANIM24 PERFORMANCE

Because of the large size of 24-bit files (a 24 Bit frame at 320*200 takes 192,000 bytes), OpalVision animations can take a lot of memory - a short 50 frame animation in this format eats up about 9 MB. To assure minimal memory fragmentation, reboot your machine before running PlayAnim24 and avoid running other programs at the same time.

Multitasking should be switched off during playback to maximize the playback speed, and tasks running in the background (printing, loading and saving files, music playback etc.) will pause while the animation is played. If Multitasking is enabled then background programs will run but overall performance will naturally be reduced.

Utility Programs

TABLE OF CONTENTS

Show24

This program loads and displays an image or list of images. The program automatically senses and loads all images supported by the OpalVision library including the following image formats: IFF-24, OV-FAST, JPEG JFIF, all IFF palette-mapped formats up to 256 colours, standard Amiga HAM, HAM8 and other installed loaders such as GIF, TIFF etc.

Workbench Usage

To display a image with one of the supported file formats,

- Click once on the Show24 icon in the OpalUtils drawer, then while holding down the Shift key double-click on the icon for the image you wish to display.

To sequentially display more than one image,

- Click once on the Show24 icon, then while holding down the Shift key click once on the icon for each image and double-click on the icon for the last image. To advance

To load Show24 as an AppIcon,

- Double-click on the Show24 icon. An AppIcon will appear on the Workbench.

- To display an image with a supported file format drag its icon and drop it onto the Show24 AppIcon. For more than one image hold the Shift key down while clicking the icon for each image, then drag them all and drop the icon under the pointer onto the Show24 AppIcon.

To remove the Show24 AppIcon

- Double-click on the Show24 AppIcon. A requester will appear allowing you to "Quit" from Show24 or "Continue" to return to Workbench.

To stop the display of an image and show the next image (or return to the Workbench if the last image),

- click the Left Mouse Button.

CLI Usage

```
Show24 filename [filename...]
```

To stop the display of an image and show the next image (or return to the CLI if the last image),

- click the Left Mouse Button.

Backdrop24

This program loads an image into the on-board memory of the OpalVision Main Board to be used as a backdrop behind the Workbench and other Amiga screens. The program automatically senses and loads all images supported by the OpalVision library including the following image formats: IFF-24, OV-FAST, JPEG JFIF, all IFF palette-mapped formats up to 256 colours, standard Amiga HAM, HAM8 and other installed loaders such as GIF, TIFF etc.

Workbench Usage

To load an image as a Backdrop,

- Click once on the BackDrop24 icon in the OpalUtils drawer, then while holding down the Shift key double-click click on the icon for the image you wish to use as a backdrop.

To remove the backdrop image,

- Double-click on the BackDrop24 icon.

CLI Usage

```
BackDrop24 filename
```

To remove the backdrop image,

- Run the program again with no arguements, i.e. BackDrop24

Convert24

This program converts image files between various image formats. The program automatically senses the format of the source image in the following image formats: IFF-24, OV-FAST, JPEG JFIF, all IFF palette-mapped formats up to 256 colours, standard Amiga HAM, HAM8 and other installed loaders such as GIF, TIFF etc.

Workbench Usage

This program is designed to be run from the CLI only, and will not show a Workbench icon.

CLI Usage

```
Convert24    SourceFile    [TO]    DestFile    [AS]
[FAST|IFF24|JPEG][QUALITY nn]
```

Default output file format is IFF24, and default Quality Rating is 75%. The Quality argument is only used when converting to JPEG format and must be an integer percentage value between 1 and 100.

OpalBlanker

This little program runs in the background and after a specified period of inactivity generates a display of ever-changing radial colour gradients. This display continues until a key is pressed or the mouse is moved.

Note that because it uses the OpalVision frame buffer, OpalBlanker will

    a) Remove any backdrop image placed by BackDrop24 or OpalHotKey.

    b) Not activate itself if OpalPaint is running,

CLI Usage

To run OpalBlanker from the CLI or user-startup file, use the command

```
OpalBlanker n [-<option>]
```

where

    n   : is the number of seconds that will elapse before the screen is blanked.

Option

Can be any one of the following

    -o   outer revolving circle gradients

    -i   inner revolving circle gradients

    -m   the above gradients mixed to create an interference pattern

    -s   small circles

    -r   One of the above at random (default)

To remove the program from memory, run the program again without parameters, i.e.

```
OpalBlanker
```

MakeThumbnails

The MakeThumbnails program scans nominated areas of your hard drive for images in IFF-24, OV-FAST, JPEG JFIF, all IFF palette-mapped formats up to 256 colours and standard Amiga HAM and HAM8. Each time it finds an image with one of these formats it inserts a Thumbnail into the image file. These tiny 24-bit thumbnails add only 5K to the size of each file but allow all programs that use the common OpalVision File Menu to display a minature but very clear 24-bit representation of each image before loading it.

The control panel also lets you select a "Remove Thumbnails" option to remove all image thumbnails in the specified directory and sub-directories. Although OpalVision uses a "private chunk" to store the thumbnail that should not interfere with other programs that implement IFF or JPEG correctly, you may need to remove thumbnails before loading images into some other image processing programs or computer platforms.

To run the MakeThumbnails program,

- Double-click the MakeThumbnails Icon in the OpalUtils drawer, or type MakeThumbNails at a CLI prompt.

The following menu will then appear.
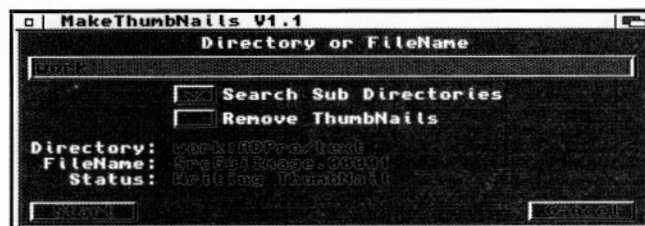
To enter the file name to be converted, or a root directory for the search,

- Click once in the text box under the "Directory or File Name" and enter either a single file name or a directory name to be searched.

If the "Search Sub Directories" is selected (ticked) then all subdirectories under the directory specified will be searched for suitable IFFor JPEG image files and

thumbnails created or removed. If not selected then thumbnails will be created only for files in the specified directory.

If the Remove Thumbnails box is selected then thumbnails will be removed as described above when found in the search path.

To commence the creation or removal of thumbnails,

- Click the "Start" button.

The status lines will keep you notified as to progress of the search and creation or removal process.

To interrupt the creation or removal of thumbnails, or to exit from the program,

- Click the "Cancel" button.

TabletMouse

This program enables or disables mouse emulation by a graphics tablet using an OpalVision driver (this requires Workbench 2.x). Note that the standard mouse is still active, although there may be some conflict and strange pointer-movement if you try and use them simulataneously! Note that the tablet driver (eg WacomII.device or Calcomp.device) must be present in the devs: directory. Also see the section below on the Wacom or Calcomp configuration programs that can be found in the Prefs drawer to set up the threshold and other settings of the tablet driver. In particular note the Right Mouse Button emulation settings when using the WacomII driver.

Workbench Usage

To toggle the mouse-emulation action of the Tablet between active and inactive (depending on the current setting), double-click the TabletMouse icon in the OpalUtils drawer.

CLI Usage

TabletMouse [ON|OFF]

If no arguments are supplied the program will merely toggle between active and inactive depending on the current setting.

Art Department Professional / Morph Plus Interface

The programs Art Department Professional (ADPro) and Morph Plus from ASDG process images in the same way; each utilizes Loaders, Operators and Savers to input images, process images and output or display images respectively. For the sake of this discussion we will refer only to ADPro, but everything applies equally to ADPro and Morph Plus.

The OpalVision system supports each of these sections with

A Loader - Grab 24-bit frames directly from Live Video into the ADPro image buffer. This will be supplied with the OpalVision Video Processor module.

An Operator - use OpalPaint as an operator from within ADPro to perform powerful painting, image processing and retouching.

A Saver - display the contents of the ADPro buffer on the OpalVision display in 24-bit colour.

To use these modules they must be installed to the correct directories on your hard drive using the OpalVision installation program. We will also assume you are familiar with the functions and operation of ADPro.

OPALPAINT OPERATOR

The OpalPaint Operator allows ADPro and OpalPaint to work on the same image resident in memory.

To access the OpalPaint operator,

- Ensure that OpalPaint is NOT already running.

- Click on the Operator box and select "OpalPaint" from the list of Operators. If it does not appear on the list then you almost certainly haven't installed it properly.

When you execute the OpalPaint Operator it will launch OpalPaint and copy the current image from ADPro over to OpalPaint, naming it's spare page "ADPro Buffer".

Use OpalPaint to process your image as per normal. You will not be able to delete or resize the ADPro spare page buffer, although you will be able to save it to disk from within OpalPaint.

To return the image to the ADPro image buffer,

- Click on the Quit button in the OpalPaint Main Menu bar and OpalPaint will ask you whether you want to copy the changes to the image back to ADPro or exit without changing the image.

Note that two copies of the image need to be kept in memory at once while the operator is active. Also enough memory for OpalPaint must be reserved. ADPro will attempt to allocate all contiguous memory when it is run, so to force ADPro to leave enough memory for OpalPaint you must give it a MAXMEM parameter. You should allow a spare 4 to 5 megabytes for OpalPaint. For instance if you have 10MBytes of RAM you may wish to allocate 5 MBytes to ADPro and 5 MBytes to OpalPaint.

To force ADPro to use a limit of (say) 5 MBytes of memory,

- Run ADPro from the the CLI by typing:

```
ADPro:ADPro MM=5000000
```

- or run ADPro from the Workbench after adding the tooltype

```
MAXMEM=5000000
```

to the ADPro icon. (See you AmigaDOS manual for further details on adding ToolTypes).

Of course you can specify any amount in bytes after the MM or MAXMEM arguement.

OPALVISION SAVER

The OpalVision Saver gives you control over the OpalVision display board from within ADPro or MorphPlus. The Saver allows raw 24bit or grey scale images or rendered images from 2 to 256 colours to be displayed.

To access the OpalPaint operator,

- Click on the Saver box and select "OpalVision" from the list of Savers. If it does not appear on the list then you almost certainly haven't installed it properly.

When the Saver is activated the OpalVision Saver control panel is displayed. This control panel contains several button to control the image being displayed.


```
Opalvision Saver V1.3

      24 Bit-Plane Data

Hi Res    Lace     Overscan

     Image         Abort
```
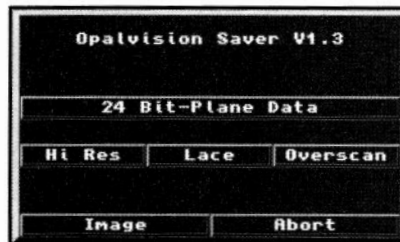
Image Type

The uppermost button indicates type of image to be displayed. This button allows you to switch between the raw 24bit or grey scale image and the rendered image if one exists. The rendered image data can contain 1 to 8 bit-planes (2 to 256 colours) in a standard palette mapped configuration. That is, the rendered image data cannot be in one of the rendering modes unique to the Amiga such as HAM, HAM8 or EHB.

Resolution Control

Below this button are the resolution control buttons. These three buttons control the horizontal resolution, vertical resolution and overscan respectively. These buttons are much the same as the screen control buttons on ADPro's main screen. The Overscan button controls both the hoizontal and vertical.

View

To view the image using the current settings,

- select the Image button.

Once the image has been displayed, the saver will accept the following key commands:

```
Del          : Toggle cross hair pointer on/off.
Arrow Keys       : Scroll display.
Shift-Arrow Keys   : Scroll display in larger steps.
Alt-Arrow Keys    : Jump to the extremeties of the image.
n          : Center screen under mouse pointer (if possible).
```

The scroll keys are only applicable if the image is larger than the display screen size.

To exit the Saver,

- click the left mouse button and you will be returned to ADPro's main screen.

Note:

Any changes made with the Color Balancing controls on ADPro's main screen will effect the displayed image immediately without the need the re-render it or use the Apply Map Operator.

ADPro ARexx Interface

Syntax:

```
SAVE FILENAME TYPE


SAVE FILENAME TYPE SCREEN_TYPE STYPE


SAVE  FILENAME  TYPE  SCREEN_TYPE  STYPE  DURATION
TICKS
```

FILENAME

The FILENAME parameter must be specified but is ignored by the saver.

TYPE

The TYPE parameter is also required and defines the image type to display, accepted values are RAW or IMAGE, SCREEN is not supported by the saver.

SCREEN_TYPE

If the SCREEN_TYPE token is specified, it must be followed by a value indicating the display resolution to use (STYPE). This value is the same as ADPro's screen type flags given in table 16.5 of the ADPro manual. Allowable flags are:

       Hires   (1)
       Interlace   (2)
       Horizontal Overscan   (8)
       Vertical Overscan   (16)

Note that either Horizontal overscan (8) or Vertical overscan (16) will put the display into overscan mode. If SCREEN_TYPE is not specified, the last selected display resolution will be used.

DURATION

If the DURATION token is specified, it must be followed by a duration in ticks (fiftieths of a second) to display the image. If TICKS is 0 or DURATION is not specified, the image will be displayed until the user clicks the left mouse button.

Examples:

1. Display Raw image data in hires-interlaced mode.

```
SAVE "X" RAW SCREEN_TYPE 3
```

2. Display Rendered image data in lores-overscan for 2 seconds.

```
SAVE "X" IMAGE SCREEN_TYPE 8 DURATION 100
```

Index

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Centaur Development, Inc.
4451-B Redondo Blvd.
Lawndale, CA 90260
Phone: (310) 542-2226
Fax: (310) 542-9998

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opal tech
sydney, australia