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# ArtWorX



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## Preface

ArtWorx was born from need. I needed rotated ellipses for a lecture but, true to Murphy's Law, none of the vector graphics programs I had allowed rotated ellipses. I have tried to simplify the use of ArtWorx as much as possible, without limiting its power. It is a program which uses only a small amount of system resources, but because of the module concept it has no restrictions. My particular thanks go to: Katrin, who has lost me often to the computer; Manfred Lippert, for his inspiration and constructive criticism; Gerd Bittel for the same reason; and, last but not least, W. Schottky, who has contributed by his work on semiconductors and without whom this program could not be written.

## The Manual

To use this manual you should understand the basic operations on your computer: how to left click, right click and double click with the mouse; what files and file names are; how to drag with the mouse; etc. If any of these give you difficulty, please read your computer manual. Some important ideas are also explained in the glossary, Appendix A.

Entries in **bold** are those which correspond to menu entries, dialog box titles, etc. This is also true for keys which you must press eg. **Return** or **Control**. When a menu entry is required, first the menu title is given, then a backslash, and then the actual menu entry: e.g. **File/Open...** means the menu entry with the name **Open...** under the title **File**.

## Overview

ArtWorx is an object-oriented graphic program which can be used to create drawings and text, for printing or in conjunction with another program. In contrast to a pixel drawing program, in which all the graphic elements are made up of individual pixels, objects are stored as information about that object. So a circle is defined by its radius and centre. When an object is output to the screen or printer, then the individual pixels are calculated.

This has the advantage that you can change and move objects, and always use



the full resolution of the output device. Whether you print to a 24-pin printer at 360dpi or to typesetter at 2540dpi, you will always get optimal quality.

Besides the usual attributes of a vector graphics program, ArtWorx has the following qualities:

- Runs on all Atari computers (ST/E, TT, Falcon) with all operating systems and in all resolutions with all graphics cards. Also, of course, on the Apple Macintosh under MagiCMac and on PCs with MagicPC.
- Import and export of GEM metafiles and ASCII text.
- Import of GEM Image files, including colour.
- Export of Encapsulated Postscript files, EPS (with a special module).
- Free rotation of all objects (including ellipses, grouped objects, text etc.).
- Colour support, also TrueColor with RGB, CMY and HSV colour models.
- Support for OLGA protocols as client and server.
- Drag and drop.
- Supports MagiC “iconify”
- Undo for all functions
- Context sensitive, hypertext help.
- Support for the GEM Clipboard.
- Module interface for user functions. Modules are small (or sometimes larger) programs, which run under the ArtWorx “operating system”. There is no limit to the uses to which these modules can be put: So a Macro recorder, ASCII editor, raster module or small game would all be possible.

## Installation and System Requirements

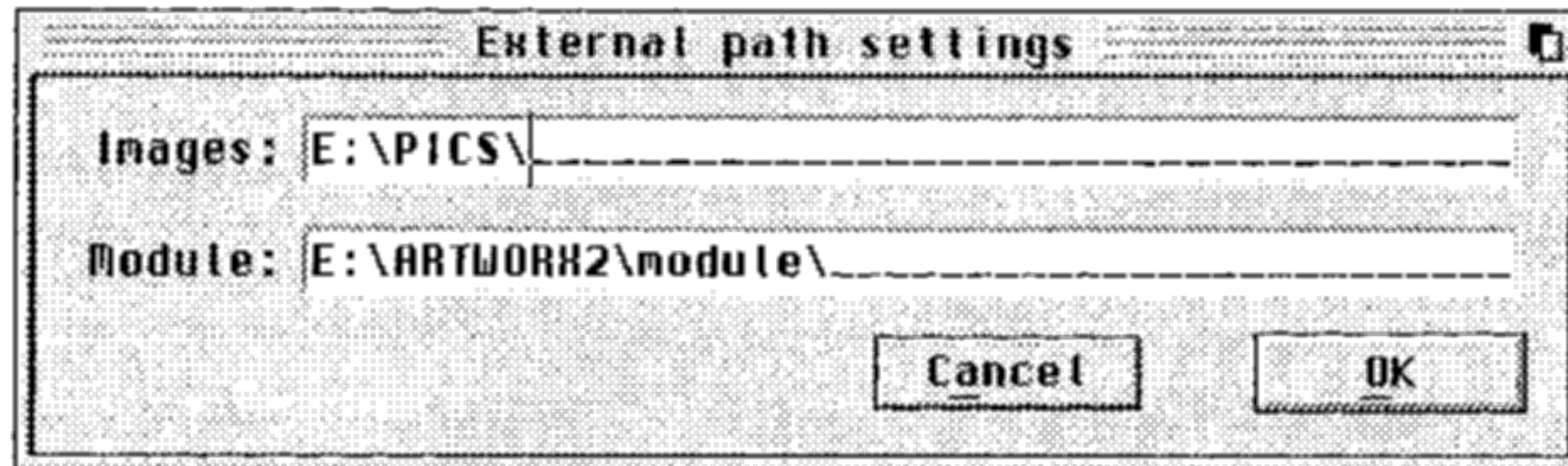
To use ArtWorx you need a TOS-compatible computer with a minimum of 512KBytes of free RAM. To print, and for text or frame text support, NVDI V3.0 or greater is required.

To install ArtWorx, start the program **SETUP.PR**G on the original disk. Type in the serial number (on the disk), your name, and the path where you would like the program installed into the appropriate fields.

When ArtWorx is first started, **ARTWORX.INF** will be saved automatically with



the current program settings. Choose the item **Path** from the **Options** menu. In the ensuing dialog box you can enter the default paths for ArtWorx to use when searching for data.



This saves you having to click through a maze of folders to find your files. **Graphic** is the folder where you normally keep your picture files and the **Module** entry is the path where the ArtWorx modules can be found.

You can either type in a path, or click with the left mouse button on the edit field to call the fileselector so you can browse to the desired folder.

Choose the item **Editor** from the **Options** menu. Enter your preferred ASCII editor in the edit field (e.g. qed, JAnE, Everest . . .). A click on the edit field calls the file selector to locate the ASCII editor. ArtWorx starts this editor automatically when you wish to edit a frame text object. These settings can be saved with the menu entry Options/Save settings, and will be used next time ArtWorx is started.

## Folder contents

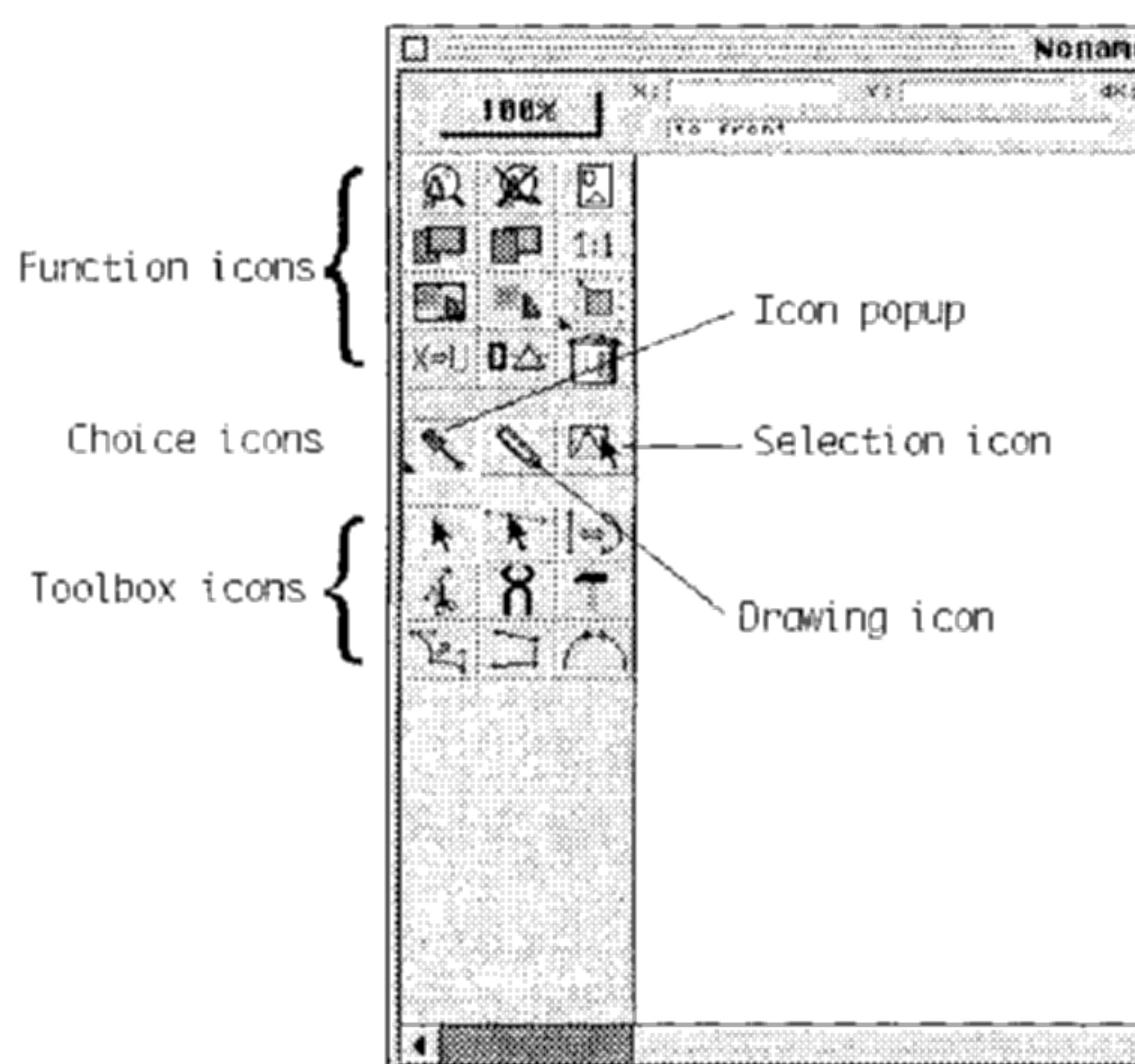
Following a fresh installation, you will find as a minimum the following files in the **ARTWORX** folder:

- **ARTWORX.PRГ** the main program file.
- **ARTWORX.RSC** the resource file.
- **STANDARD.APL** the standard colour palette which is used when you are running in a graphic mode using fewer than 256 colours.
- The **MODULE** folder, containing a number of modules.
- The **DEMO** folder, containing sample documents.
- The file **README.TXT** which contains the latest information about ArtWorx. Please read this file first.



## Quick guide “ArtWorx in 5 minutes”

If you open a file or create a new document (menu entry **File/Open...**) ArtWorx will open a document window. At the left-hand side you will see a selection of icons. There are general function icons at the top and toolbox icons at the bottom. To the right of the icons is the drawing canvas. The Info-line shows the current cursor position and the dimensions of the object you are working on.



The general function icons are for enlarging, reducing and deleting etc., and most of their functions are duplicated under the menus **Edit** and **Object**. These function icons are always visible.

With the three Choice icons you can choose the actual work mode (i.e. create a new object or edit an existing object) and switch between the various icons in the lower Toolbox. The leftmost icon of these three has a small black triangle on its bottom left corner, which means that further choices are hidden behind this icon. A double click on any icon with a triangle opens either a dialog box or a popup showing further choices; e.g. a double click on the screwdriver icon shows an icon popup.

The drawing icon opens the drawing toolbox, the pointer icon puts you in selection mode, and with the icon popup you can switch between the other toolboxes. (Path editing, Text editing and Picture editing).



When you wish to draw a new object, left click on the corresponding icon. As soon as you move the mouse pointer over the drawing canvas it will change into a crosshair. Left click on the canvas to start drawing the new object.

To edit a drawn object, you must first select it by clicking on the selection icon (pointer) or by right clicking on the canvas or pressing the spacebar and then clicking on the object. A selected object is shown with a frame and object-handles, which allow you to resize, move and rotate the object. These object-handles are also active in drawing mode. The right mouse button switches between drawing mode and selection mode (for moving, selecting, sizing objects etc). As an alternative you can press the spacebar.

If you click on the icon popup and then keep the mouse button pressed (a double click works as well) then the popup will open for the various toolbox options. Move the mouse to the desired icon and then release. A short click on the icon popup will switch to the toolbox whose icon is visible.

Double click on an object (and then keep the mouse button pressed) to bring up a line of icons pertaining to the current icon showing for the icon popup.

#### Background:

- ArtWorx keeps to all the GEM standards (menu items, keyboard shortcuts, dialog boxes . . .), which should make the program intuitive to use. Therefore if you are not sure how to perform a particular function, try copying the method used by the Desktop or another good GEM program. This usually gives the correct result.
- A click on the right mouse button when drawing in most cases aborts that drawing action. If you only have a single button mouse (e.g. on the Macintosh), then a double click is the same as a right click.
- Press the **HELP** key to open the help window (if you have loaded the help module).
- Press the **UNDO** key to undo the last edit to the document. (If you have **Undo** active, see the menu entry **Options/Settings**.)

ArtWorx uses the “Click-Move-Click” idea as well as “Click-Move” in the application. You must not keep the mouse button pressed during the whole drawing operation but only click at the beginning and end of the drawing action, e.g. when drawing a line, click to set the start of the line. You can



now move the mouse freely (without having to keep the button pressed), and the line follows the mouse. Left click to set the end point of the line. If you want to abandon drawing the line, right or double click. (Click-Move-Click)

Alternatively, you can click once, hold the mouse key down and, when you have determined the end point for the line, release the mouse button. (Click-Move).

You will find these basic principles everywhere in ArtWorx: when resizing, drawing, rotating. The only exception is when you move an object. Here the only option is Click-Move, otherwise the object would only be selected.

- To print and export Metafiles requires NVDI.
- Of course ArtWorx works with other GDOSes as well as NVDI, but ArtWorx can use some of the special features of NVDI, and if you do not use it you lose these features: text objects can be drawn with fill patterns and shadows; the output is more accurate -- a 1cm circle is exactly 1cm with NVDI; etc.

*Note:* You find several examples later in the manual showing some of the techniques you can use for drawing with ArtWorx.

### **Operation of dialog boxes.**

All dialog boxes in ArtWorx are windowed. This apart, they function like any other dialog boxes, and can be moved in the same way as a normal window is moved. In ArtWorx there are two kinds of dialogs:

- **Modal dialogs:** These correspond to the normal dialogs in the GEM environment. They lock the menus and other ArtWorx windows, i.e. you must leave the dialog before you can continue working with ArtWorx. The windows of other programs can be used, however, and in multitasking environments you can also switch to other programs. Modal dialogs only block ArtWorx. Modal dialogs are recognizable by the lack of closer in the top left of the box. Nor do they have an **Apply** button.
- **Nonmodal dialogs:** You do not have to leave these to continue working with ArtWorx. Nonmodal dialogs have a closer button in the top left corner and there is often an **Apply** button which can apply setting without





having to leave the dialog. As well as this button you will also have **Cancel** and **OK** buttons. You can leave the the dialog box open in the background while you continue with your work and use the right mouse key to work with it, e.g. you can open the **Line** attributes dialog, work in the document window and, without having to top the lines dialog box, use the right mouse button to set a new line width. This also works if the dialog box is half-covered by another window. Under a multitasking system such as MagiC, you are also able to work with these dialog boxes in the background with the left mouse button. To top a dialog box, left click once on the title bar of the dialog.


- If a dialog box becomes nearly hidden underneath another window, or the title bar is not visible, double click anywhere within the dialog box and it will be brought to the top.

All types of dialog and the main menu can be accessed from the keyboard:

- After each menu entry you will find the keyboard shortcut for that item, which can be used instead of selecting the item with the mouse. It does not matter whether you type a lower- or uppercase letter when using the shortcut. If you see a caret ^ before the letter, then you must press the **Control** key and the letter at the same time.

 stands for the **Alternate** key. The keys **Help** and **Undo** are written in text next to their corresponding menu items.

- The default button in a dialog is the one with a thick outline, and the **Return** key can be used for this. The default button is usually the **OK** button.
- The **Undo** key is a new addition: if you press this it has the same effect as clicking the **Cancel** button when in a dialog box.
- All buttons can be selected by pressing **Alternate** and the letter underlined within the text of the button.
- If there are no edit fields in the dialog box then it is enough to press the underlined letter for the button without holding down the **Alternate** key.
- Radio buttons have the form of a small circle (Mac-like):  which has lately become a *de facto* standard. These provide a choice between one thing and another.

- Check boxes are small rectangles which when selected become crossed:  
 They show whether the item turned is on or off.
- The cursor can be placed in an edit field with a mouseclick.
- In all edit fields where a value can be specified, you can also specify units and can input a calculation. If you call up the Object-information dialog and want an object that is 3.46cm wide to be 1.5mm wider, then enter **3.46cm+1.5mm** into the edit field instead of arduously working it out in your head. The following operators are understood: +, -, \*, and /. It is not always necessary to enter the units, e.g. when you have a scalar **3.46cm \* 1.5**, or when the units are the same as the default units. With the operators \* and / at least one of the numbers must have units.

Another form of dialog boxes is popup menus.

These appear when there is a choice to be made (e.g. choosing a fill pattern in the shadow dialog). Popups can be selected with the left or right (in the background) mouse button. You have a choice of GEM-like behaviour (first click opens the popup, next click chooses an item) or Mac-like (first click opens the popup, keep the mouse button pressed and release when over the item).

Keyboard operation: the entries can also be scrolled through with the cursor keys and the **Return** key selects the current item. **Undo** cancels the popup (or else a click next to the popup). You can change between mouse and keyboard operation at any time.

You can spot a popup on a dialog box by the shadow drawn round it.



## Using ArtWorx

### Starting and Quitting ArtWorx

ArtWorx can be set to open from the desktop with all the filetypes that it knows (depending on your TOS or desktop). For example, ArtWorx's own format **\*.CWG** or GEM metafiles **\*.GEM** can be double-clicked on and ArtWorx will start and then load the file. ArtWorx understands the **ARGV** protocol and can evaluate long command lines. If the menu entry **Quit** is chosen and the current drawing has not been saved (shown by a \* in front of the name in the title bar) a dialog box will appear asking what you wish to do with the document.

### Opening Files and Import/Export of Files

The menu entry **File/Open** is used to open existing drawings. The loading path can be preset (see **Options/Paths**). ArtWorx automatically detects if the file is one of its known filetypes, and will then open it. Using Modules it is possible for many other filetypes to be supported so that ArtWorx will read these as well.

If unknown fonts are used in the document, when opening a file a dialog box will appear so that you can choose a replacement font.

When you create a new document with **File/New** at first the name will appear in the title bar as **Noname**. The first time this file is saved a filename must be chosen for the file. **File/Save** or **File/Save as...** allows you to save the file. The filetype of the file you are saving is determined by the extender. If you choose to save **DRAW.CWG**, the file will be saved in ArtWorx's own format. If the ending is **GEM**, it will be saved as a GEM metafile. If the extender is not given then the file will be saved in CWG format.

### Working in Drawing Windows

When a drawing is first created or opened a new drawing window will be opened, which has the function and toolbox icons at the left-hand side and on the right the drawing canvas. A grid will be drawn on the canvas, to which objects may be snapped and which is freely configurable (see menu entry **Options/Grid**). At the top of the window are the Info-line and drawing coordinates. Within the drawing window there are two different work modes:



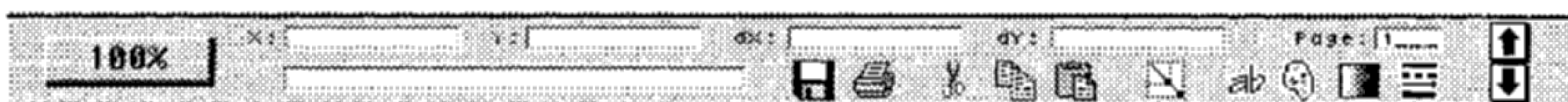
- Selection mode: used for selecting, rotating and moving objects. When this mode is selected the mouse pointer will be in the shape of an arrow.
- Toolbox mode: used to create new objects and edit existing objects. The mouse pointer takes various forms depending on the tool selected, and depending on what tool is in use a click on the drawing window will perform different actions. To change between selection and drawing mode:
  - click the right mouse button.
  - click on an item in the toolbox at the lower left hand side of the window.
  - click on the selection icon, which is between the function and toolbox icons.
  - press the spacebar - especially for users with a single-button mouse.

When working with the mouse — e.g. rotating, moving, sizing — it is always possible to press the **Control** key and have the object snap to the grid, even if the grid is not visible. This allows you to quickly align a few nodes to the grid.

If instead you press the Alternate key, the current mouse position will snap to the nearest node in an existing object. **Esc** redraws the document, which can be useful when other programs mess up the screen. Occasionally ArtWorx itself will fail to draw the screen correctly, e.g. a selection frame remains partly on the screen. **Esc** will clean up the screen in these circumstances also.

### The Document Window Info-Line

The Info-line can be found at the top of the window underneath the title bar.














**100%** With the zoom popup you can choose between one of the preset zoom values. **x:**, **y:**, **dX:** and **dY** show the actual cursor position, and if you are drawing a new object or altering the size of an existing object then the dimensions of that object are also shown. A click on the coordinates calls the Object Information dialog if an object has been selected. The text line beneath the coordinates shows a short description of the drawing tool which is under the mouse pointer.



**Page:** shows the page number of the page you are working on. You can change to another page by clicking on this.

From left to right the icons are as follows:

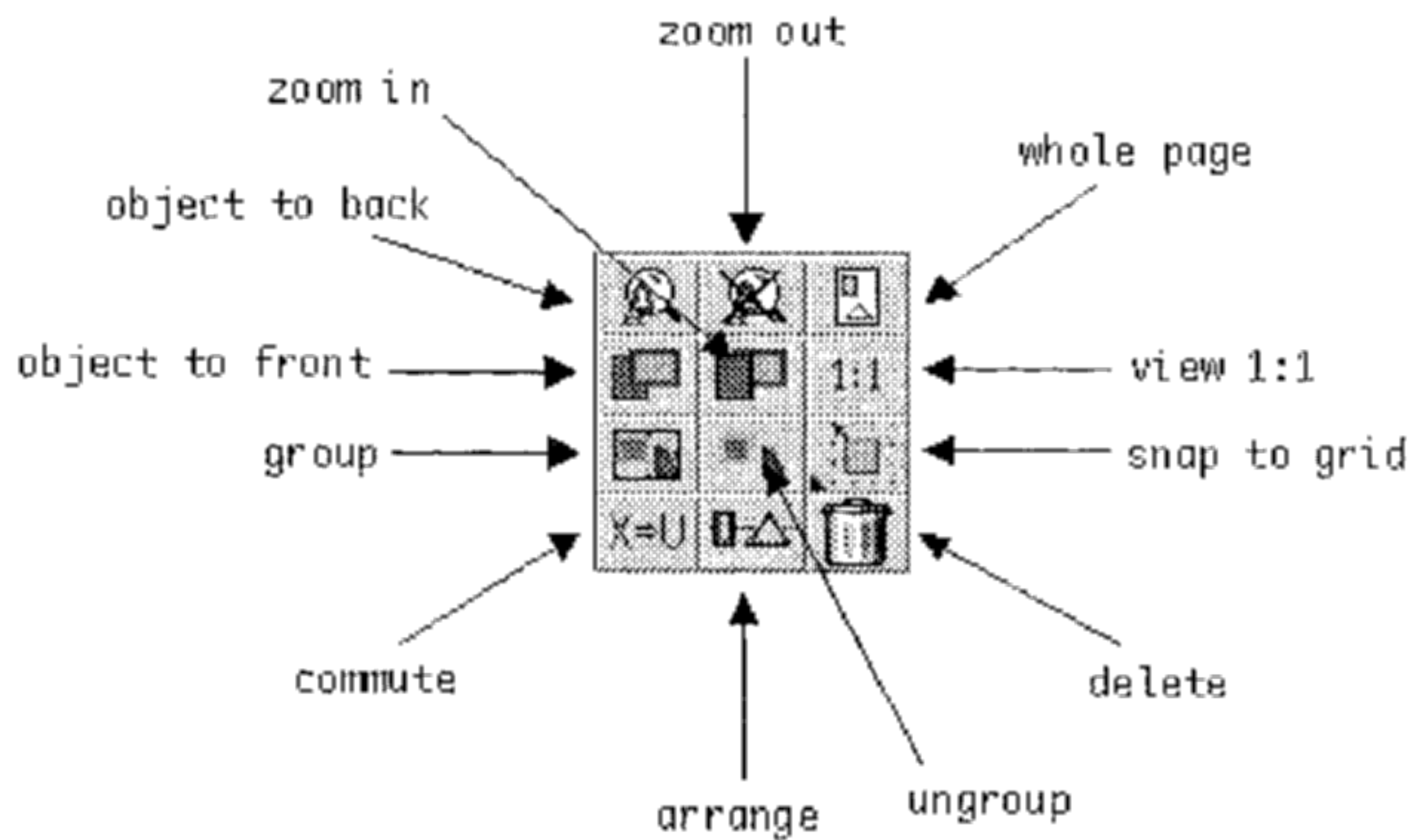
 save	 choose font
 print	 colour picker
 cut	 fill patterns
 copy	 line type and style
 paste	 next/previous page
 proportional resizing	

**The Icon Panel**

The icons are divided into three groups. The top group are the function icons. Clicking on one of these causes an action to be performed, e.g. enlarge/reduce. The middle set of icons are the choice icons, which allow you to choose a toolbox. The lower group of icons, the toolboxes, contains the drawing and editing tools. With the Drawing toolbox you can draw shapes and lines. The other ones allow you to edit the paths of existing objects and work with text and bitmap pictures. External modules can be linked to the list of tools, and will then appear in the toolboxes.

Most function icons also have corresponding menu entries (see **Object**), and also keyboard shortcuts. Many of the function icons require that an object be selected first. The function icons operate directly on an object, but the toolbox items remain current until you choose a new item. And if you choose a tool and then use one of the function items, the tool will still be current after the function has been executed.

## The Function Icons



The icons have the following meanings (if you wish to know more, look at the descriptions given with the corresponding menu item).


- **Enlarge**: a single click on the icon causes the mouse pointer to turn into a magnifying-glass. Draw a rectangle to zoom in on the canvas. If you hold **Shift** when clicking on this icon, the next preset zoom level will be used.
- **Reduce**: the previous zoom level will be used.
- **Whole page**: (menu entry **Edit/Full page**) the whole page is shown in the window.
- **View 1:1** (menu entry **Edit/View 1:1**) the drawing is shown as near as possible to life size.
- **To front**: (menu entry **Object/To front**) the selected object is brought to the fore and is drawn above all other objects. If **Shift** is also pressed then the selected object is only brought forward one plane.
- **To back**: (**Object/To back**) the selected object is drawn behind all other objects. If **Shift** is also pressed then the selected object is only moved back one plane.
- **Group**: (**Object/Group**) the selected objects are bound together and can then be moved, rotated, resized together. They are treated as one object.
- **Ungroup**: (**Object/Ungroup**) the selected grouped object is broken down into its constituent objects.



- Snap to Grid: (**Object/Snap to Grid**) the top left corner of the object frame is moved to the nearest grid point. The grid can be specified under **Options/Grid**.
- Commute: (**Object/Commute**) some objects can be converted to other object types.
- Delete: (**Object/Delete**) deletes all selected objects. If Undo is active then the objects can be reinstated by pressing the **Undo** key as long as no other actions have taken place. It is possible to have a confirmation dialog when an object is deleted (see **Options/General**).
- Arrange: (**Object/Arrange**) calls the Arrange dialog box if an object is selected. Using this, it is possible to arrange objects precisely on the page or in relation to other objects.





In the centre part of the icon panel are three choice icons, which allow you to change between the various work modes.

The selection icon  allows you to select objects and size, rotate, move and distort the object.

To exit selection mode you have four options:


- 1.) Click on another icon in the lower toolbox.
- 2.) Click on one of the other two choice icons.
- 3.) Click once with the right mouse button, this changes to the last toolbox that you used.
- 4.) Press the spacebar.


The drawing toolbox icon  reveals the drawing tools. There follows a description of the drawing tools and the contents of the other toolboxes.

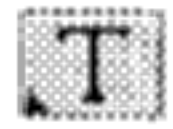
Behind the left-hand icon of the choice icons is a popup (here a ) to allow you to access the other available toolboxes. Press the left mouse button down and keep it down (or double-click on the icon), move the pointer to the required icon and release. If you click on the icon with a short left click, you will switch to that toolbox and its tools will be displayed.



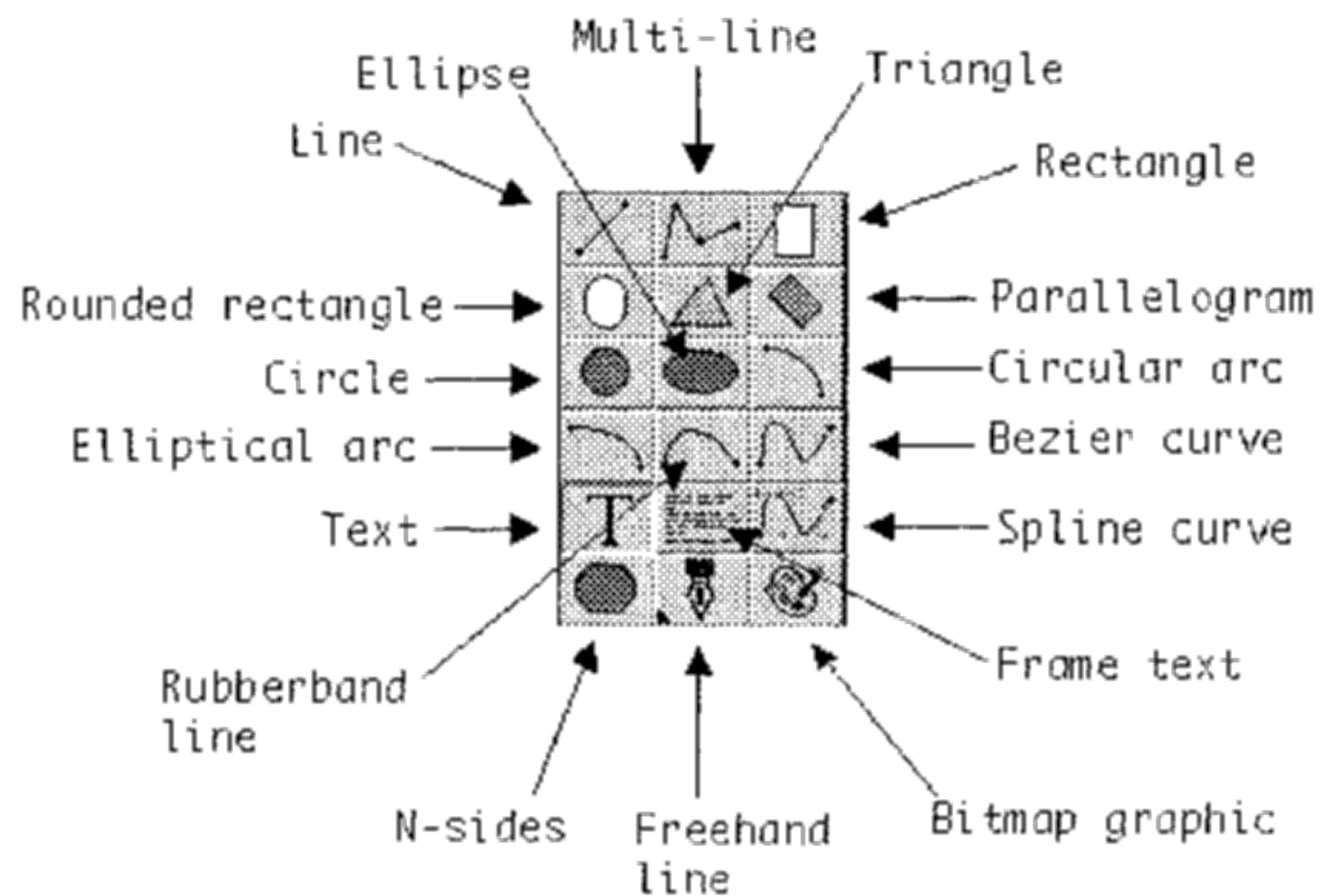
There are three icons in the popup:

 Path editing: with this toolbox you can edit paths and nodes of objects. eg. move nodes, insert nodes.

 Picture toolbox: here you can set the size of the graphic to fit the printer resolution, remove white frames from around the graphic and set the colour palette.

 Text toolbox: allows you to change the contents of text objects.

### The Drawing Toolbox Icons



To draw a new object you must first switch to this drawing mode.

The current tool is shown with the icon selected. If you move the mouse over the drawing canvas the mouse pointer will change to a crosshair. When the crosshair is visible you can click on the canvas and create a new object.

Also in drawing mode the **Control** key, enabling snap to grid, and **Alternate** key, enabling snap to object node, are available for use. The following tools are available in the drawing toolbox:

- **Line:** click left to set the start point. The line will then 'hang' from the mouse cursor. Click left a second time to set the end point. A right or double click aborts the action.
- **Multi-line:** as line, but draws a series of lines end-to-end. After drawing the last line, a right click will stop the drawing, but if the **Shift** key is also pressed, a closing line will be drawn, from end node to starting node.
- **Rectangle:** a left click sets one corner, a second left click the opposite corner. A right or double click aborts the action.
- **Rounded rectangle:** draws a rectangle with rounded corners.



- Triangle: the three corners are placed in sequence.
- Parallelogram: like a triangle.
- Circle: the first click sets the centre, the second the radius. A right or double click aborts the action.
- Ellipse: like a circle.
- Circular arc: first set the centre and radius (see circle), then the start and end angles can be set with two mouse clicks.
- Elliptical arc: like circular arc.
- Rubberband line: two mouse clicks set the start and end points, then the line can be pulled into shape with the mouse as if made of elastic.
- Bézier curve: two mouse clicks set the start and end points, and then the two tangent points can be set. Further béziers can be added to the first one until the right mouse button is clicked, but if the **Shift** key is also pressed a closing line will be drawn from the end node to the starting node.
- Text: a left click sets the text position, then you can type the text in. The **Backspace** key can be used to correct typing mistakes. **Esc** can be used to insert a special character. A dialog box will open into which you can enter the ASCII code for the character. **Insert** opens a dialog box showing all the characters in the current font, and if a character is selected it will be inserted into the text. **Return** end the text input, and **Shift+Return** starts a new line. In the Text toolbox mode the text can be further edited.
- Frame text: First draw a bounding box to contain the text, and then the text can be imported from your favourite text editor via the clipboard. Special formatting characters can be inserted into the text. The formatting characters are always preceded by a backslash ‘\’ and are as follows:
  - ‘k’: no formatting. The text is used exactly as you have typed it in. This is the default, if no formatting characters are found in the ASCII text.
  - ‘l’: left-justified, with automatic line padding. If the frame text box is later widened then the line padding is altered so that the text fits the width of the frame.
  - ‘r’: right-justified, as for left-justified.
  - ‘b’: paragraph
  - ‘c’: full justification.

- 'n': start a new line.
- 'f+': bold text.
- 'f-': bold off.
- 'h+/-': light text, as for bold.
- 'u+/-': underlining on/off.
- 'o+/-': outline text on/off.
- 'i+/-': italic text on/off.
- 't+/-': subscript on/off.
- 'g+/-': superscript on/off.
- 'z{FONTNAME}': uses the font 'FONTNAME'. Do not use spaces in the name. The fontname can be shortened where this will be unambiguous.

To insert text from the Gem Clipboard **use GEM clipboard** must be checked in the dialog **Options/General**. If the module **TRENNEN.LMD** is installed, then instead of padding the end of the lines the words are split according to their syllables.

- Spline curve: this is similar to a bézier curve, but you do not have to set the tangent points. A spline curve can be imagined as a thin piece of wood which is bent between a number of nails. The curve is calculated so that the curve on each node flows smoothly into the next curve. It is possible to edit the tangent points later, however.
- N-sides: click on the canvas and a popup will appear in which you can choose the number of sides in the shape you wish to draw. A left click sets the size of the shape.
- Freehand line: you can draw freehand with the mouse, and your drawing is automatically converted into a vector path. The icon has a small triangle in the corner, which shows that by double-clicking on the icon a settings dialog will be opened: in this dialog you can choose whether the pen is a quill or a pencil, and you can choose the line thickness and bézier curve accuracy. If you would like the object selected after drawing, check the check box. When you want to draw continuously, e.g. with a graphics tablet, it is practical to turn this off; otherwise every time you take the pen off the paper a frame is drawn around the line.
- Bitmap graphic: first draw a graphics frame and then afterwards insert



the graphic. There are two methods for inserting the graphic.

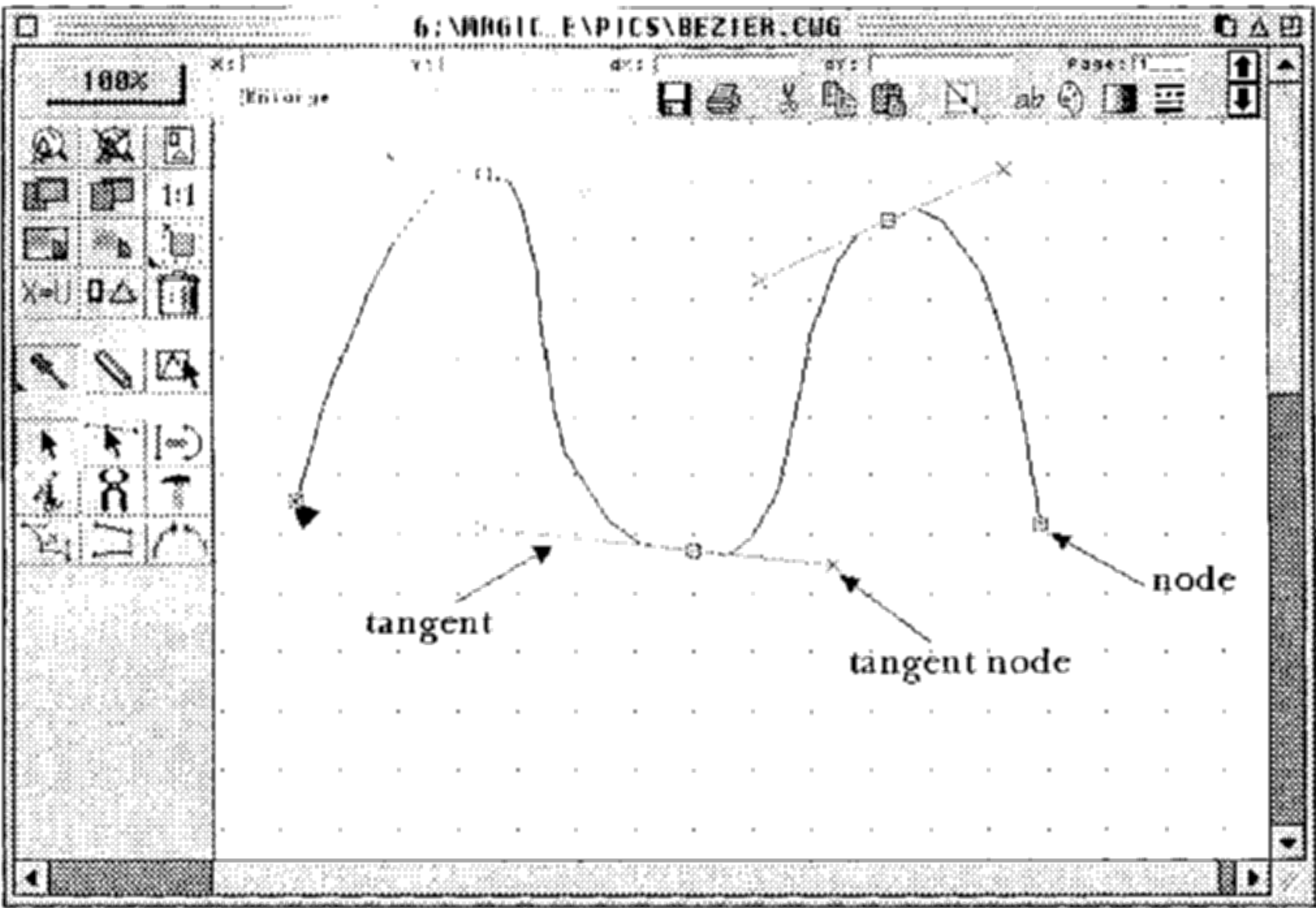
- 1.) Via the clipboard: select the graphic frame and then go to the menu entry **Edit/Paste**. Of course the GEM clipboard must be enabled (see **Options/General**);
- 2.) With the menu entry **Object/Import...**: after having selected the graphics frame. The file selector will appear so that you can import a graphic into the frame. If there was already a graphic in the frame, it will be replaced.

The frame will be resized when the graphic is imported so that it will print out 1:1 on the current printer. Therefore the size of the graphic on screen will depend on the resolution of the printer. You are, of course, at liberty to resize the graphic after it has been imported. With the picture toolbox you are able to process the image further. Any white border can be removed and the picture can be resized to fit the current printer.

**The Path Edit Toolbox**

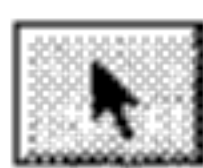
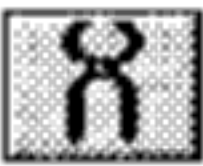

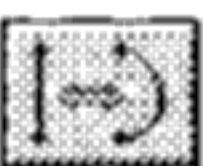
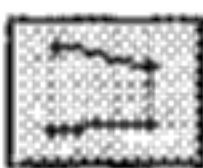
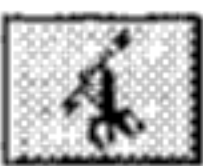
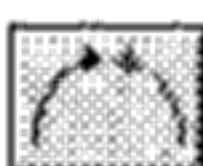
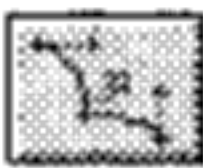
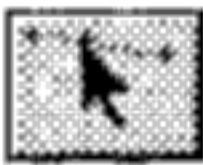
Objects can be modified at the node level. If you switch to path editing, you can either work on the object which had been previously selected, or if nothing was selected when entering this mode then all objects can be edited.

An object which is being edited looks similar to that in the following diagram:



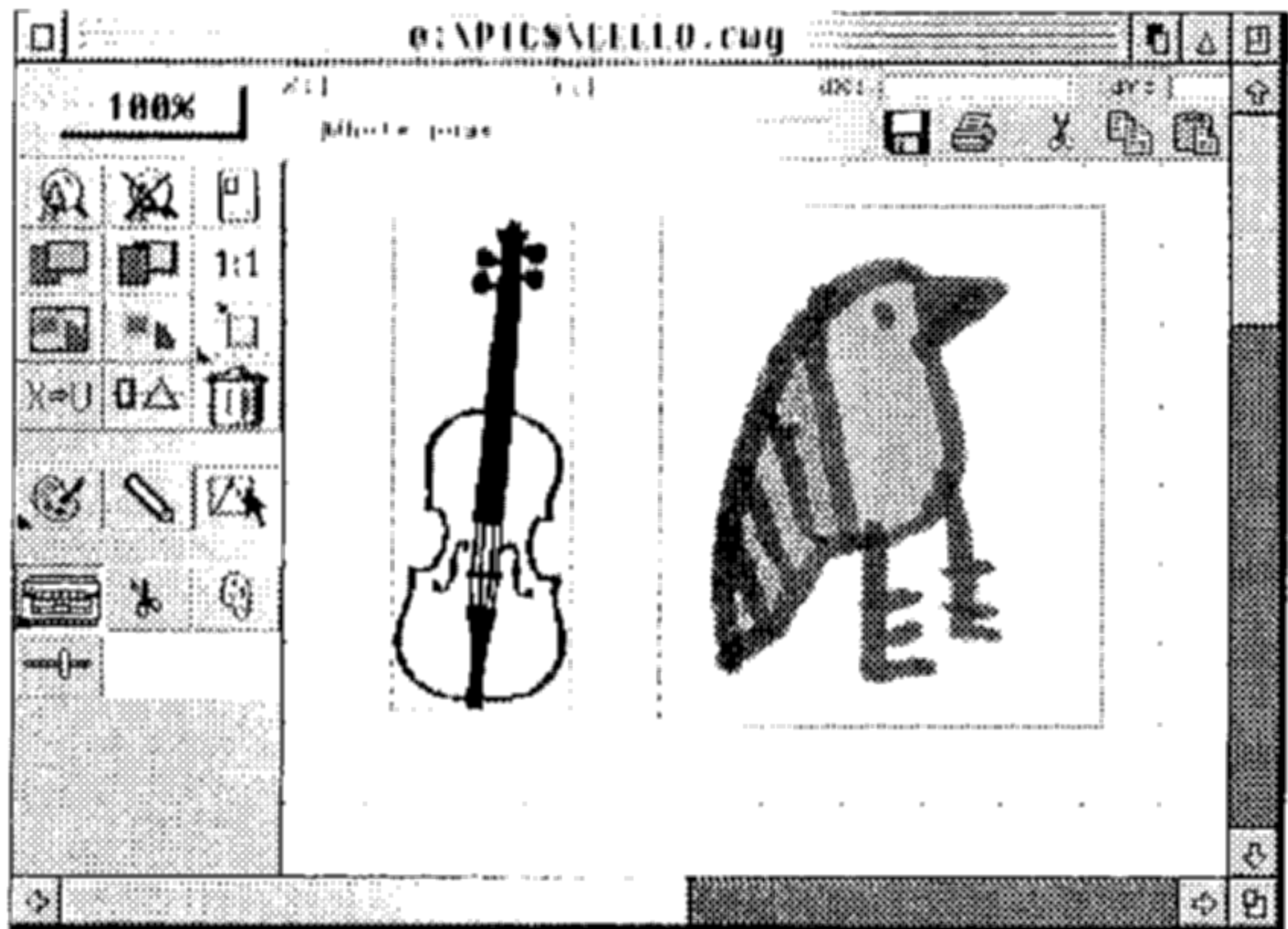
In path-editing mode you can move both the path nodes and the tangents nodes: left click on the node and, keeping the mouse button depressed, drag the node to its new position. This also works even if another path tool is active. A double click on an object when in path-editing mode calls up a popup containing the various tools so that you do not have to keep moving back and forth to the toolbox group. A double click on an object when in selection mode takes you straight into path-edit mode with the object selected.

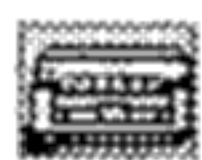
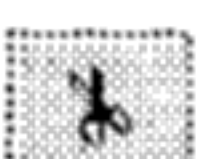

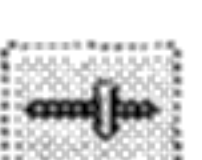
### Individual Tools Details

-  Move node or tangent node using either the 'click-move-click' or 'click-move' method.
-  Delete node, with a click on the node.
-  Add node. Click on a line or bézier curve to insert another node at this point. If you clicked on a bézier a new bézier segment will be drawn; if it was a line, a new line segment. The new node is inserted so as not to alter the shape of the object.
-  Change segment type. eg. a bézier is converted to a line, or a line to a bézier.
-  Insert jump point or remove existing jump point. A jump point is a place between two nodes which has no connecting line. Imagine it as an invisible line.
-  Cut path. Click on a bézier curve or a line and the path where it was clicked will be cut and become two separate objects. This is not the same as a jump point — with cut, the line is actually divided.
-  Change line direction. All paths have a direction which is from the start node to the end node when the line is drawn. Some operations take this direction into account, e.g. text along a path. The direction is shown when in path-edit node by an arrow at the start node, pointing to the end node. Simply click on any node with this tool and the line direction will be reversed.
-  Smooth: click on any tangent node with this tool. The effect is to smooth the bézier. You will notice that what actually happens is that the tangents are moved so that they are opposed.
-  Tangential move: a node can be moved and its associated tangents will move along with it.




The Picture Edit Toolbox



-  Fit to printer resolution: changes the size of the picture so that 1 pixel on screen is one dot on the printer; this ensures optimal quality when printed. A double click on the icon calls a dialog box into which you can input any dpi resolution for the picture.
-  Cut borders: removes the white frame from around a picture.
-  Set colour palette: this option is only available for pictures which have 256 colours and a colour palette. The colour palette of the picture will be the colour palette of the whole document. If only one picture is loaded then this will be shown with its true colours, but if more than one picture is loaded then the others will be shown with false colours. Use this tool to set which pictures[U+2019] palette will be used for the document.
-  Gradation curve: the contrast, brightness etc. of the picture can be manipulated. Click on a colour picture with the tool and the gradation curve will be applied if the gradation curve module is loaded (available separately).

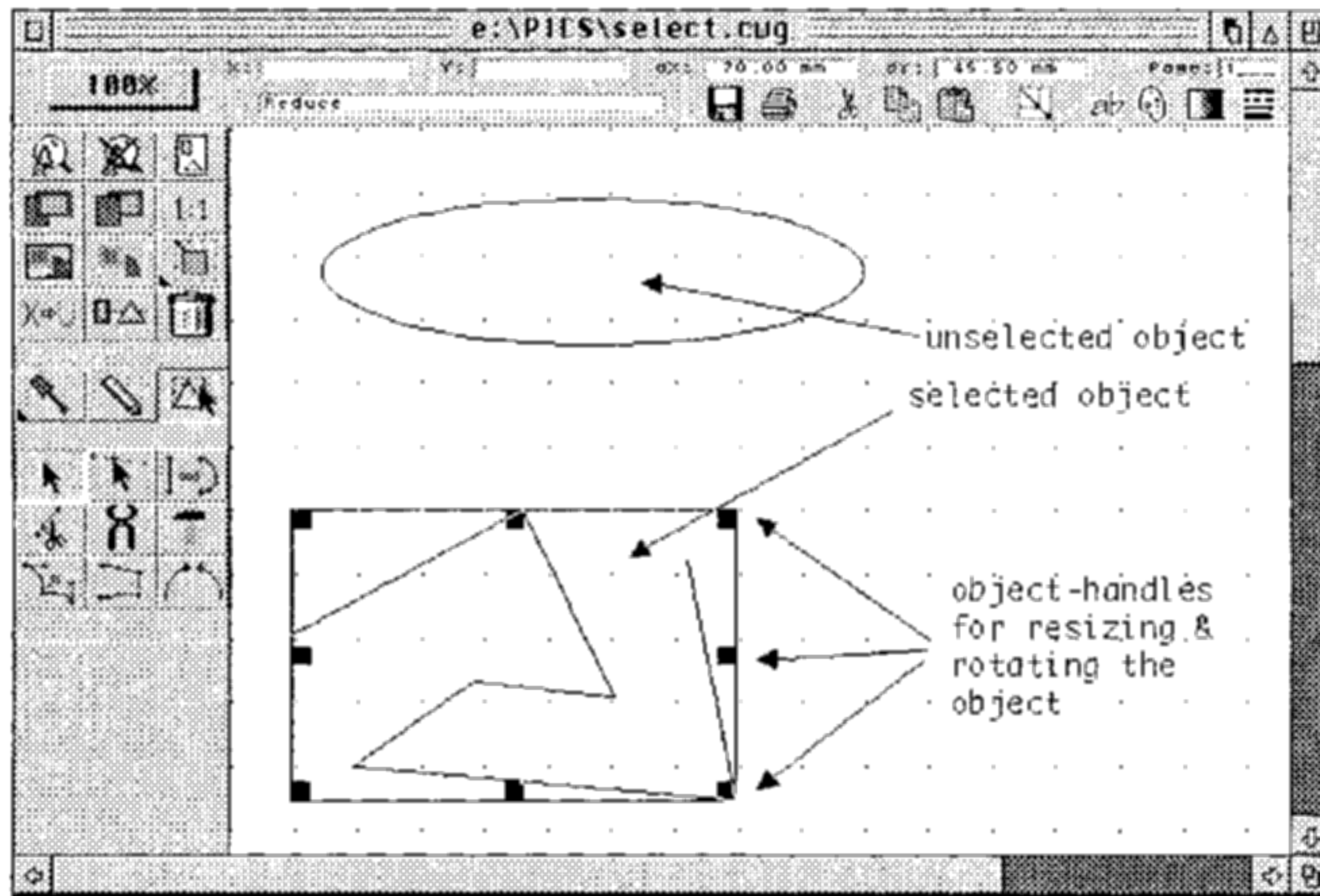
The Text Toolbox

This contains only one icon:  which enables you to edit text and frame text. If the clicked object is a text object, a dialog box will open allowing you to edit the text. If the object is a frame text object then your ASCII editor is called (see **Options/Editor**), to allow you to edit the text, and then either insert via the GEM clipboard (menu entry **Edit/Paste**), or import into a frame (see **Object/Import**).



## Selecting, Moving, Resizing and Rotating Objects

As is usual in GEM programs, when an object is selected it will be drawn with a frame and object-handles. These handles allow the object to be manipulated.



In selection mode the following actions are possible:

- Menu entry **Edit/Select all** (or keys **Control-A**): all objects in the document window are selected.
- Click on an object: if more objects lie beneath this one then keep clicking until the required one is selected. If you then keep the mouse key depressed the object can be moved. If you wish to select more than one object, press the **Shift** key (as on the desktop). If you click on a selected object with the **Shift** key pressed the object will be deselected.
- Draw a selection frame: click on a free part of the canvas and, with the left mouse button depressed, draw a rectangle around the object(s) you wish to select. All objects completely within the frame you have drawn will be selected when you release the mouse button.
- A click with the **Alternate** key pressed will deselect all currently selected objects, and if the mouse button is kept depressed then a new selection frame can be drawn.

An object can be moved by clicking on the object and holding down the mouse button. When moving the object only an outline of the bounding box



can be seen. The mouse pointer changes to a hand. All selected objects under the mouse pointer will be moved, but if none have yet been selected then only the topmost object will be moved. If while moving the object the **Shift** key is pressed then a copy of the object is made and this will be moved, with the original object staying where it was.

If you attempt to move an object to another ArtWorx drawing window then it will always be copied there regardless of whether you have the **Shift** key pressed.

When in selection mode, double-clicking on an object takes you into path edit mode with that object selected for editing.

Objects which have been selected are drawn with a bounding box and object-handles. Clicking on a corner handle allows you to resize the object. Only the bounding box will be shown enlarging or reducing whilst you are actually resizing. Clicking on one of the handles on the sides of the bounding box allows resizing in that one direction only. If any object can only be proportionally resized (e.g. text, circle), or the menu entry **Edit/Prop.** resizing is checked, then the object will only have an object-handle on the four corners of the bounding box.

If any handle of a selected object is clicked while the **Control** key is pressed, the object can be rotated. This functions in the same manner as resizing objects.

If any handle of a selected object is clicked while the **Shift** key is pressed, the object shape can be distorted. To produce attractive results, it may be appropriate first to convert the object to lines or bézier curves and also refine the curves. (see **Object/Commute**). Holding down both the **Shift** and **Control** keys allows a curve distortion.

In summary, a click on an object-handle with the following keys produces these results:

- No key: scale object.
- Control**: rotate object.
- Shift**: linear object distortion.
- Shift+Control**: curvilinear distortion.

## The Menus

### The ArtWorx menu

#### about ArtWorx

Shows the info box about the program. You can also load accessories here.

### The File menu

#### **New** (Control-N)

Opens a new window for drawing. This requires that there is enough memory free and that you have not reached the window limit for your operating system. This window title-bar will show the drawing as 'Noname', and the first time the file is saved the title-bar will change to show the name of the file.

#### **Open...** (Control-O)

You can load an existing file with this menu item. The file selector is called so that you may choose the file. If a file is selected which ArtWorx cannot read an error dialog with the text **Unknown format** will be shown.

#### **Close** (Control-U)

The top window is closed. If the file has changed since the last save (shown by '\*' before the filename in the window title bar), a dialog box will appear, asking what you would like to do:

**Close File? [Abandon] [Save] [Cancel].**

- **Abandon** closes the window without saving.
- **Save** saves the file and closes the window. The file is saved in the format shown by the ending of the filename. For instance, a file **LOLLY.GEM** will be saved in GEM-Metafile format and **CLOCK.CWG** in ArtWorx's own format. If the ending is not known or is left empty then it will be saved in ArtWorx format.
- **Cancel** does nothing except exit the dialog box. The window-close box can also be used to close a window.



**Insert... (Control-B)**

A file can be embedded within a document as an object, its filename is embedded too. With support from OLGA (Object linking for GEM applications) objects — for example, graphics — can be embedded in the ArtWorx document and they will be automatically updated if the file is changed and saved by another application. If you click on an embedded object the originator of the object is started and you are able to edit it.

**Update**

Updates an embedded object manually, if the data has changed and the original editor application is not OLGA-aware.

**Save (Control-S)**

Saves the top window under its own name. This menu entry is greyed out unless the drawing has changed since it was last saved, in which case a '\*' will be shown before the file name in the window title bar. After the save the '\*' will be removed from the filename. For data formats see **Close**.

**Save as... (Control-M)**

Saves the top window under a new name. This menu item is available as long as there is an open window. It is possible to use this entry to change the file type. See under **Close** for valid file formats.

**Abandon (Control-H)**

The contents of the top window revert to the last-saved version, and the current alterations are lost. A confirmation dialog is shown.

**Export... (Control-E)**

Saves the topmost window in a different format. A dialog box giving a choice of export formats appears before the file is saved. The exported file can then be read by another program (e.g. Calamus, Arabesque, Kandinsky). The name of the exported file which appears in the file selector is by default the name of the ArtWorx file with the appropriate extender added. The path used as a default when exporting files can be set under Options/Paths.

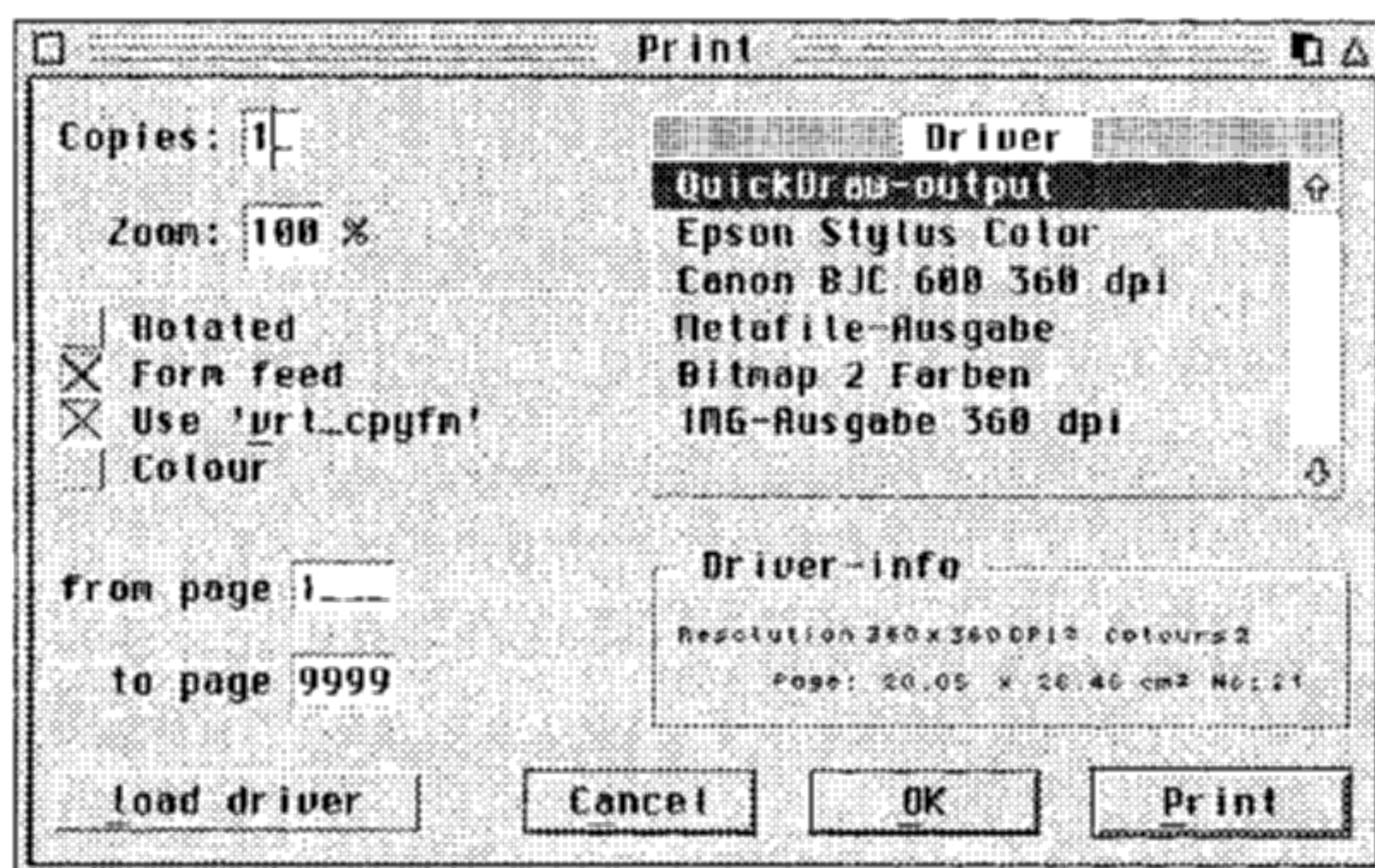
**Info... (Control-I)**

Shows information about the current top window in a dialog box: the name of the drawing, the size in bytes, and the number of objects the drawing contains.



**Print... (Control-P)**

Prints the top document window. This menu entry can only be selected if a version of **NVDI** is installed. If **WDIALOG.PRG** is installed in the **AUTO** folder then the **wdialog** printer dialog will be called instead of ArtWorx's own printer dialog.



The settings in this dialog are as follows:

- Rotated:** The output is rotated 90 degrees, to allow a DIN A4 landscape drawing to be printed to an A4-portrait format printer. If your printer driver also allows this (NVDI drivers > V3.0) then it is better to set this from the driver.
- Form feed:** If this box is checked, a form feed will be sent to the printer after every page. Many printers do not require this and will feed a blank page if it is checked.
- Use vrt\_cpyfm:** If this button is active, bitmap pictures are printed using the **vrt\_cpyfm** function, otherwise the **v\_bar** function. **vrt\_cpyfm** is faster but does not work with all printer drivers, especially older GDOS drivers. You should try printing with this function turned on and only deactivate it in an emergency.
- Colour:** If this checkbox is active, gradation curves will be applied to the printouts. This will often produce the best result. When ArtWorx is started the standard gradation curve **STANDARD.AGD** is loaded, and if you have the extra Gradation Curve module then you can change these curves, or define your own, and so produce optimal printouts.



- Copies:** The number of copies required can be set here. If you have NVDI 3.0 or greater, please set up the multiple print options in NVDI, so that the page does not have to be generated again for each copy.
- Zoom:** The output scaling can be set here.
- Driver:** If you have several GDOS drivers installed choose the driver you require here. Simply click on the driver you wish to use. In the Info field, under the listbox, you can see information relating to the current driver: the resolution, GDOS device number, the page size and the number of colours.

The Cancel button closes the dialog without printing, the Print button prints the top window drawing with the selected parameters, and the OK button accepts the settings without printing.

Load driver updates the contents of the driver list box by examining the contents of ASSIGN.SYS and showing all GDOS devices with a device number greater than 11. Information about each driver can be seen in the info box below the driver list. Choosing Options/Save parameters will save the driver information so that it does not have to be found out each time ArtWorx starts, and the program will start more quickly. The first time ArtWorx is run this information is saved to ARTWORX.INF. You must therefore reload the driver information and save this file if you install new GDOS drivers.

### **Quit** (Control-Q)

Ends the program. If a file is not yet saved a confirmation dialog is shown. (see **File/Close**)

## The Edit menu

If the top window is not a document window then the entries in this menu will be greyed out, and are not available.

### **Undo** (Undo)

When **Undo** is enabled the last action can be undone (see **Options/General**).

### **Copy** (Control-C)

Copies all selected objects in the top window to the Clipboard. The Clipboard can either be the program internal clipboard, an area of memory set aside for this purpose which is the fastest option, or the GEM clipboard. It is only possible to exchange data with other program via the GEM clipboard. Supported formats that can be imported by ArtWorx are ASCII-text, GEM and IMG files. Which clipboard to use as a default is set in **Options/General**. If the GEM clipboard is the default, the internal clipboard may be used if the **Shift** key is held when the copy operation takes place. This menu entry cannot be selected if no object is selected in the document window. Text objects can either be copied as text or as a metafile (see **Options/General**).

### **Cut** (Control-X)

As for copy, but the objects are moved to the clipboard and no longer exist on the drawing page.

### **Paste** (Paste)

Pastes objects from the clipboard into the top window. Again, either the GEM clipboard or the internal clipboard may be used. If a bitmap graphic frame is selected and there is IMG data in the clipboard then the graphic will be inserted into the frame. If a frame-text frame is selected then ASCII text will be inserted into the frame if it is available.

### **Select all** (Select-A)

Every object in the document window is selected.

### **Delete** (**Del** **BS**)

Deletes all selected objects in the document window. A click on the bin icon will also accomplish this. A warning dialog can be shown if this option is turned on in **Options/General**. If **Undo** is active then a deleted object can be reinstated by choosing **Undo**.



**Full page** (Alt-Q)

Shows the entire drawing page in the window.

**Size 1:1** (Alt-W)

The size of the drawing is zoomed to approximately 1:1. This cannot be entirely accurate since the size of the monitor is not known.

**Zoom...** (Alt-Z)

When this item is selected a popup is shown from which the zoom percentage can be chosen. Print shows each dot on the printer as a pixel on the monitor.

**Insert page**

Another page can be inserted before or after the current one.

**Delete page**

The current page is deleted. A warning dialog is shown allowing you to abort this operation.

**Cycle windows** (Control-W)

Brings the next document window to the fore.

**Prop. resizing** (Control-Z)

Turns proportional resizing on or off. If this is on, a check is shown before the menu item and all object-bounding boxes have only the four corner object-handles, and the width/height relationship of the object will be preserved when the object is resized.

**Layers...**

One of the most important features in this version of ArtWorx is the support for up to 32 layers per page. Layers can be thought of as a stack of transparent pages any of which can be brought to the top for drawing, whilst the contents of the other layers are visible. You can, for example, have a layer for the foreground and another for the background. The planes can be hidden, moved to the front or back, or deleted.

The layers dialog is not modal: it blocks use of ArtWorx and cannot remain open while you work. It has no **Apply** or **OK** button, and works in the same way as the palettes in other well known programs such as Papillon.

If you create a new ArtWorx document, no layers will exist and all objects will be drawn directly on the document canvas. The method of working is just as it was with previous versions of ArtWorx.

As soon as you press the **New** button in the Layer dialog a layer will be created and all new objects will be placed on this layer. All the layers you have created will be shown in the Layers listbox. To the left of these are the current attributes of the layer you have selected in the listbox.

Every layer can have three different attributes:

- **Locked:** no objects can be worked with on this layer. Every object is protected against alteration.
- **Only on screen:** this layer is only visible on screen and is ignored when the page is printed.
- **Invisible:** this layer is not displayed. It allows you to work on a layer without being distracted by what is on another layer. An invisible layer is also not printed.

The button **Activate** blocks all the other layers. You can now only work with this layer.

**Delete** removes a layer. You have the possibility of removing the layer along with its contents or just the layer itself. If you delete the layer and contents, all of the objects on the layer are deleted. If you delete only the layer, then the objects that were on that layer are placed on the layer that was immediately below it. If there is no other layer then the objects are placed on the document canvas itself. When you first create a layer, then that layer is given a default name: **layer X** where X is the number of the layer. You can alter this name by double-clicking it in the listbox and typing in a new name. For example the background layer could actually have the name **background**. If there is at least one layer in the document, then all operations will take place on the top, unlocked layer. If you work with several unlocked layers, it may happen that an object changes the layer, e.g. you group objects which are on different layers. When you break them up you may change an object on another layer. It is possible to open and edit documents containing layers in ArtWorx <= 2.0, but the layers will not be visible. Most of the layers will remain intact, and will be available again when the document is opened in ArtWorx2.



## The Object menu

This menu mainly duplicates the function icons. This menu is only available when the top window is a document window and an object is selected.

### **Import** (I)

Inserts a file into a selected object, e.g., insert an IMG into a bitmap graphic frame.

### **Export** (O)

The selected object is saved, according to the format you choose from the export dialog box.

### **To front** (V)

Brings the selected object to the front. If the **Shift** key is pressed, the object only moves forward one plane (see the icon description).

### **To back** (H)

Puts the selected object to the back. If the **Shift** key is pressed the object only moves back one plane.

### **Group** (G)

The selected objects are bound together and can then be moved, rotated and resized together. They are treated as one object.

### **Ungroup** (Z)

The selected grouped object is broken down into its constituent objects.

### **Lock** (S)

Locks or protects an object so that it can no longer be either manipulated or selected. The object is however still visible.

### **Unlock** (F)

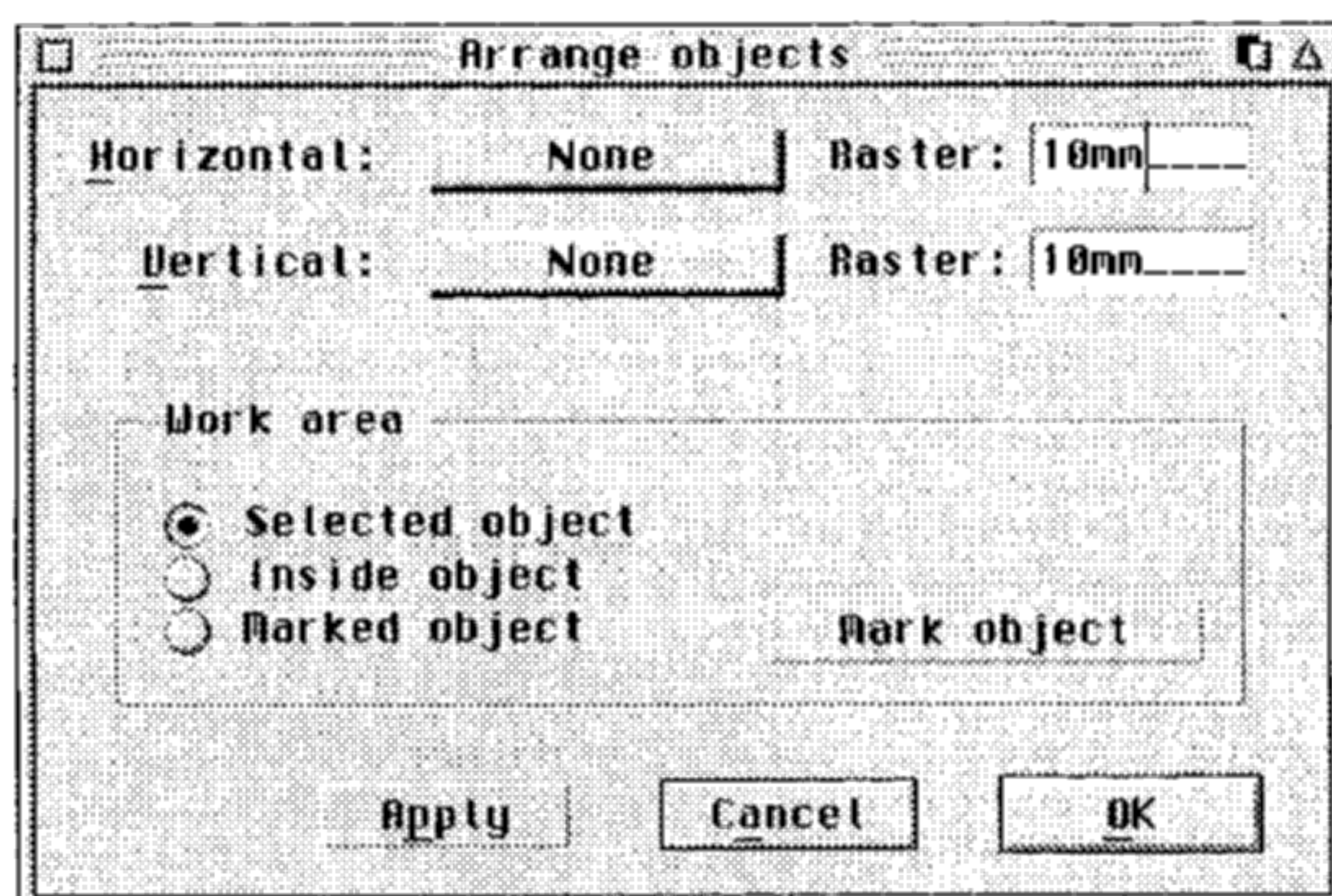
Unlocks or frees an object so that it can be normally selected and manipulated. This entry has no effect if the object was not locked in the first place. To select a locked object it is necessary to click on the object whilst holding down **Shift+Control**.

### **Info...** (N)

The dimensions and position of the selected object can be entered exactly in the resulting dialog. This dialog also shows other information, e.g., size and the type of object.

**Arrange... (A)**

Allows one to place objects exactly on the page and in relation to other objects.



In both the popup menus **Horizontal** and **Vertical** the following alignments are possible:

- None:** There will be no alignment in this direction.
- Left/Top:** The object is aligned to the left or the top.
- Centred:** The object is centred.
- Right/Bottom:** The object is aligned to the right or the bottom.
- Stacked:** The objects are placed end to end.
- Equidistant:** The objects are aligned at equal intervals. The interval is set in the edit field to the right of the popup. If spacing is set at **0** then the interval is set as the average of the objects.
- To grid:** The objects are placed on a grid, the spacing of which can be set in the edit field. If you specify a grid spacing of **0mm** then the objects are so positioned that they fill the available free space optimally.
- Absolute:** The objects are placed at the position specified in the edit field. If nothing is entered in the edit field then the position of the first object is used.
- To path:** First a path to which the other objects (e.g. text) are to be aligned must be selected. Immediately afterwards the selected path should be marked with the **mark object** button of the arrange dialog. Now you can select the objects and in the arrange dialog popup select **To path**. (If either horizontal or vertical is selected then the other will automatically change to



**To path**). The objects will now flow along the selected path (lines, bézier curves, circle(arc) etc.) This function is particularly used with text objects (remember to first change the text to bézier curves, and then ungroup).

In the **Work area** box, you can choose the object to which the alignment will apply:

If **Selected object** is chosen then the object will be positioned relative to the whole page, e.g., select an object and choose centred from both the horizontal and vertical popups. The object will be placed in the centre of the page.

If **Inside object** is chosen then any objects that are not selected but are inside the bounding frame of the selected object will be positioned in relation to the object. The selected 'mother' object does not have its position changed.

**Mark object** allows you to choose an object to use as the reference and position other objects in relation to it. Simply select the reference object and then press the Mark object button. A reference object can be deleted and the area that it occupied will then be used as the reference.

### **Snap to grid (E)**

The selected object snaps to the nearest grid point to its top left corner.

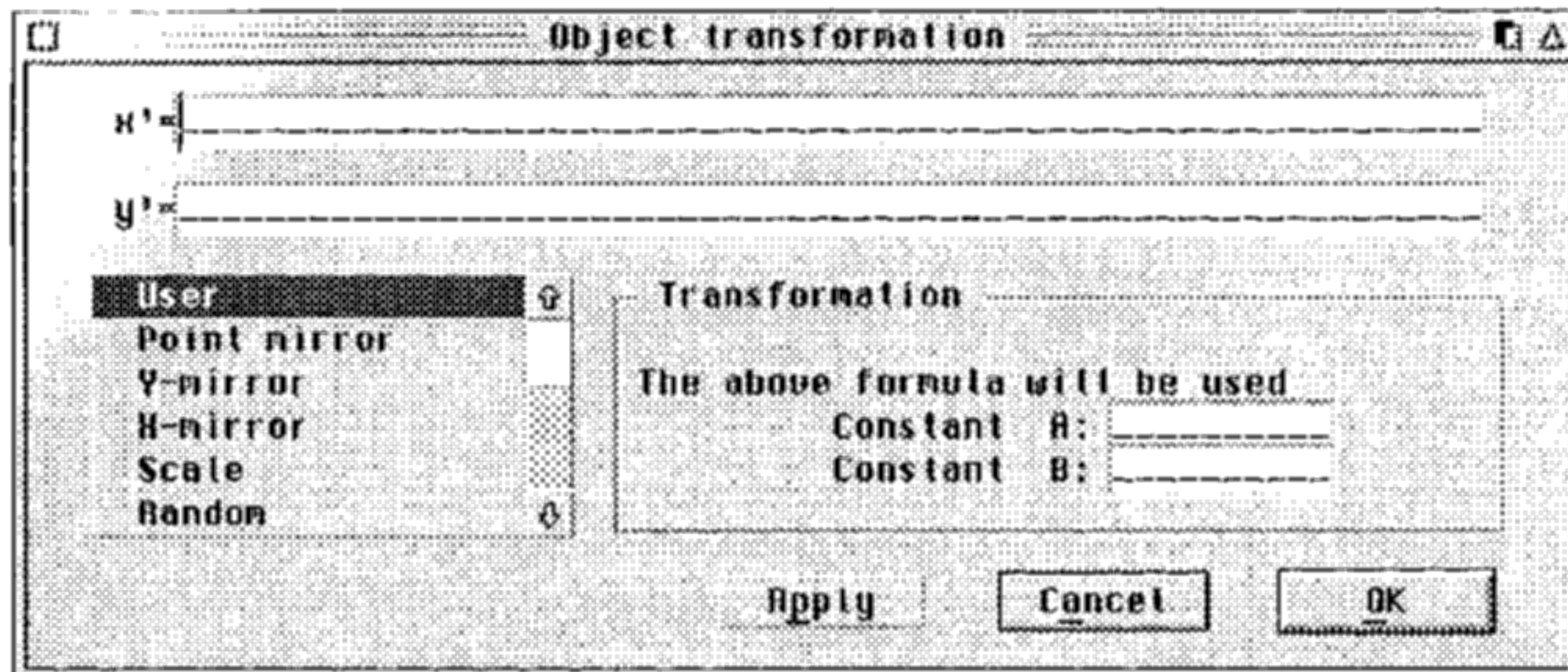
### **Commute...(U)**

With this it is possible to change some types of objects into other types of objects. A popup will appear with the possible alternatives available. Any commute operation that is not possible with this type of object will be greyed out. You can for example change lines to bézier curves, circles and ellipses to arcs etc. One of the most interesting actions is to change text into bézier curves - the individual letters are converted to bézier curves and then the letters are grouped together. This converted text can then have various effects applied, e.g. fill patterns.

**Multi-line** is a very useful transformation. It doubles the number of nodes in an object without changing its shape. If you wish, for example, to project a shape on to a globe (see **Object/Transformation**) it will look better if there are more nodes for the function to work with. Do not use **Multi-line** with béziers or they will be converted into multiple lines. Instead use the entry refine, which again doubles the number of nodes.

## Transform...(T)

The transform dialog contains a number of possible transformations to change the form of an object, and if you want even greater flexibility then you can design your own transformation:



In the listbox are all the predefined transformation functions. To the right a short definition of the transformation is shown. **Constant A** and **Constant B** are parameters which can be used for these functions. In the two lines **x'** and **y'** you can input your own function if you have chosen User.

There follows a description of the standard units and transformations available in ArtWorx:

**User:** In the two inputs lines enter the formula for your own function, which give the new coordinates for **x'** and **y'** calculated from the old coordinates **x** and **y**. The formula interpreter can accept brackets, points, negative signs (**-sin(x)**), factors (e.g. **3x-2sin(5x)** is recognised as **3\*x-2\*sin(5\*x)** )

The following operators are allowed:

- +** plus
- minus
- \*** multiplication
- / or :** division
- ^** power
- .** decimal point
- x, y** the old coordinates of the point



**e, p**     Eulers number e and pi.

**A, B**     Numerical constants that can be entered at the bottom right of the dialog.

The following are also accepted in formulae: **sin, cos, tan, cot, log, sqr, abs, ln, sgn, arcsin, arccos, arctan, arccot, sinh, cosh, tanh, coth, arsinh, arcosh, artanh, arcoth, sec and cosec.**

All functions are calculated to 1/10mm accuracy, so when you enter your own numbers they should also be accurate to 1/10 mm, e.g., if you wish to move an object 3.5cm in the x-direction and 17.68 in the y-direction then **x'=x+350, y'=y+1768.**

Predefined transformations:

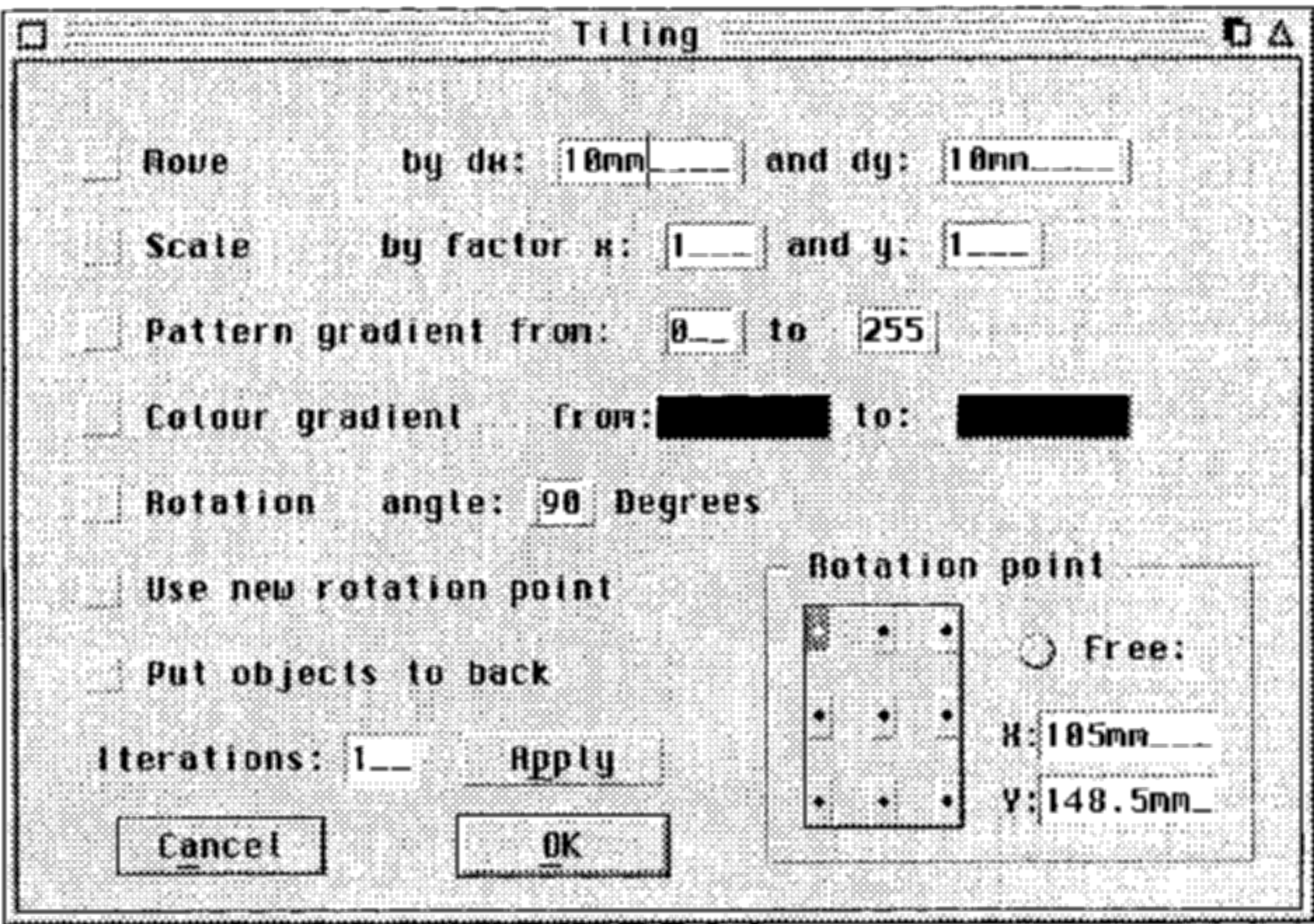
<b>Point mirror</b>	The object is mirrored from the lower, left corner.
<b>Y mirror</b>	The object is mirrored about the left of its frame.
<b>X mirror</b>	The object is mirrored about the bottom of its frame.
<b>Scale</b>	Resizes the object by the given factor in the x and y directions.
<b>Random</b>	Moves any point of the object randomly in any direction. You can set the maximum movement in cm. If movement is too great the object will be transformed beyond recognition. Movement in the mm area can produce some interesting effects.
<b>Rotate</b>	Rotates the object by the amount specified in degrees. The same effect can be achieved by pressing the CONTROL key (see Keyboard shortcuts).
<b>Sine (hor.)</b>	Bends the object into a horizontal sine form. You can set the maximum displacement in cm of the amplitude and period.
<b>Sine (ver.)</b>	As for horizontal sine, only in the vertical direction.
<b>Circ.</b>	Projects the object on to a circle. The radius equals the object size and the beginning and end should be given.
<b>Globe</b>	Projects the object onto a globe. The centre point lies in the centre of the page and the diameter is the page width.

Other transformations may be available if any transformation modules have been loaded.



### Tiling...(P)

A selected object can be copied several times and various effects applied at each copy:



In this dialog box you can choose what should happen on every copy (**move**, **zoom**, **greyscale gradient**, **colour gradient** and **rotate**). You can set the number of copies in Iterations. The operations always work on the last copy, e.g. when you set the number of iterations to 10 and the zoom to 1.5, the object will be copied 10 times and every time it will be a factor of 1.5 larger than the previous copy. This way you can, for example, fill the page with concentric circles.

It is also possible to set the rotation point: either in relation to the object or **Free**. If you choose **Free**, by default the centre of the page is used. The rotation point can change with each copy — if you have chosen **Free** this will have no effect — but if the rotation point refers to the object then at each copy the rotation point will be recalculated. Otherwise the rotation point of the first object is used.

To create a Colour gradient, if you click on the start or end colour, the current colour is used (see **Colours** dialog). In order to have a colour gradient between two colours, choose the start colour from the colour dialog, click on the start colour in the tiling dialog, immediately afterwards choose the end colour from colour dialog and click on the end colour in the tiling dialog. The colour gradient is always calculated in true colour. The Pattern gradient works in a similar manner, but the start and end pattern are set in the numeric edit fields.



### **Boolean(K)**

Here you can perform Boolean operations on two overlapping objects. You select two objects and then choose one of the options from the submenu Union, Intersect or Difference. Union calculates a new object which is the sum of the two objects. Intersect calculate the area where the objects overlap. Difference cuts the shape of the top object out of the bottom object. With these functions it is possible to create a rectangle with a hole in the middle. Dependent is similar to the Group function in that the two shapes are treated as one object, but if they are dependent then it is still possible to use the Path edit tools.

## **The Style menu**

### **Mask**

You choose two objects and select the menu item. The lower object is masked with the top one. The lower object status is set to **invisible** and can only be seen where the top object lies over it. After the calculation both objects are grouped and only one selected object is visible.

With the words **lower** and **upper** we are thinking of the drawing as three-dimensional, with one object placed on top of another. As an example of what can be achieved, import a picture and then lay some text on top of it. When it is masked you will see that the text characters appear to be filled with the picture, and the picture itself is hidden.

### **Remove mask**

The mask can be removed at any time, e.g., to move one of the objects.

### **As fill pattern**

Copies the selected object (of any type) to the fill pattern dialog so that it can be used as a fillpattern. The user-defined pattern will be shown as a **Thumbnail** in the listbox of the Pattern dialog as the last item.

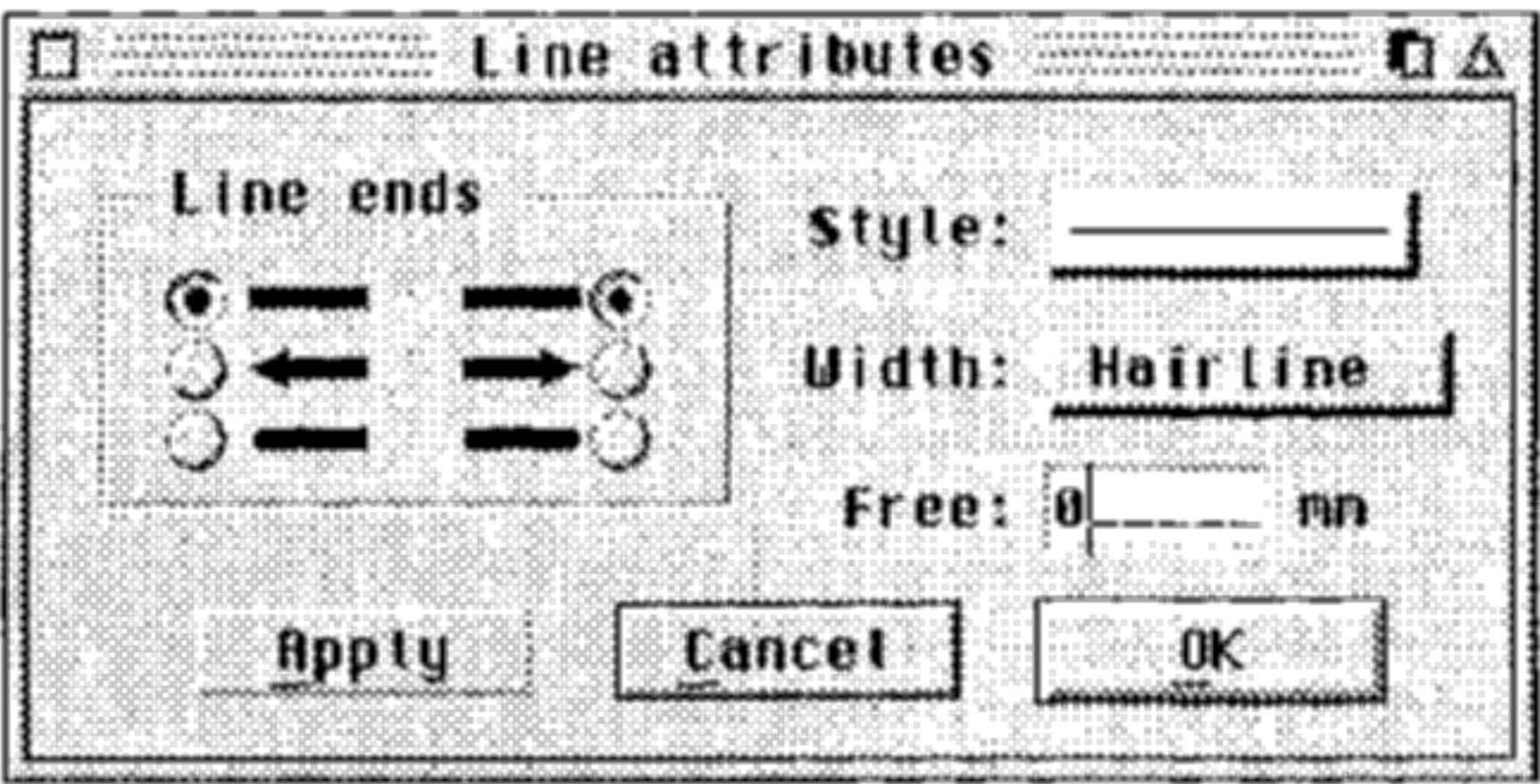
The icons on the right of the listbox allow you to open and save user defined fill patterns on disk. The rubbish bin will remove the selected pattern from the list. If a pattern is deleted, but is still used in an object, then that object



will be set to the status **not filled**. If ArtWorx finds the file **AWFILL.CWF** in its working directory, then this will be used as the default fill pattern file.

**Lines...(Alt-L)**

The line style, line ends and width can be set in this dialog box, and apply to all objects which have line attributes, e.g., lines, squares, circles etc.



**Line ends:** You set the beginning and end style of the line independently. Possible ends are: standard, with arrow, rounded. Rounded ends can only be used with a line thickness greater than **Hairline**.

**Style:** The seven predefined line styles are available here.

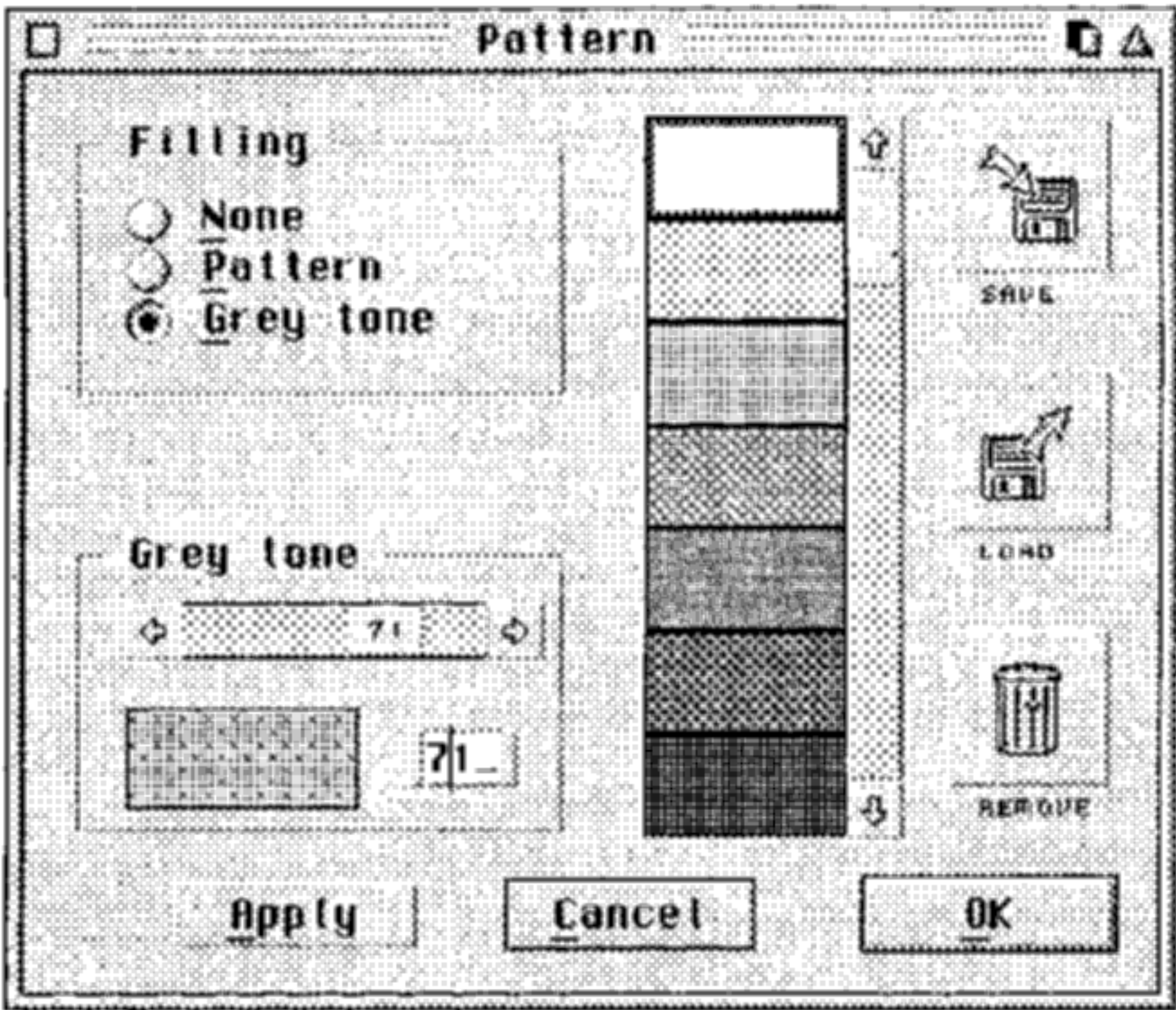
**Width:** The popup gives the line width from 0.5mm to 5mm, and the entries **Free**, **Null** and **Hairline**. On selecting Free you can enter the width in the edit field under the popup.

The **Hairline** is the thinnest line that it is possible to draw on the output device. On screen this is one pixel, for a Laserprinter 1/300 of an inch.

**Fill...(Alt-M)**

The fill pattern for various objects can be set here, also the greyscale pattern.

**Filling:** The fill pattern can be switched off in order to make an object hollow. Otherwise one has a choice between a fill **Pattern** and **Grey tone**. If you deactivate the **Pattern**, it is possible to alter the other parameters for one or more objects without changing the fill pattern.



**Grey tone:** Sets the shade of grey (as a pattern) here. The scale runs from 255 (pure black) to 0 (pure white).

**Fill listbox:** The predefined GEM fillpatterns are available in this listbox, also



if any have been set the user defined fill pattern are placed at the bottom of the list.

The **Load** and **Save** icons are for loading and saving user-defined fillpatterns. These files have the extension CWF. The **bin** icon is for deleting user defined fills, select the fill in the fill list and then push the bin icon.

**Colour...(Alt-F)**

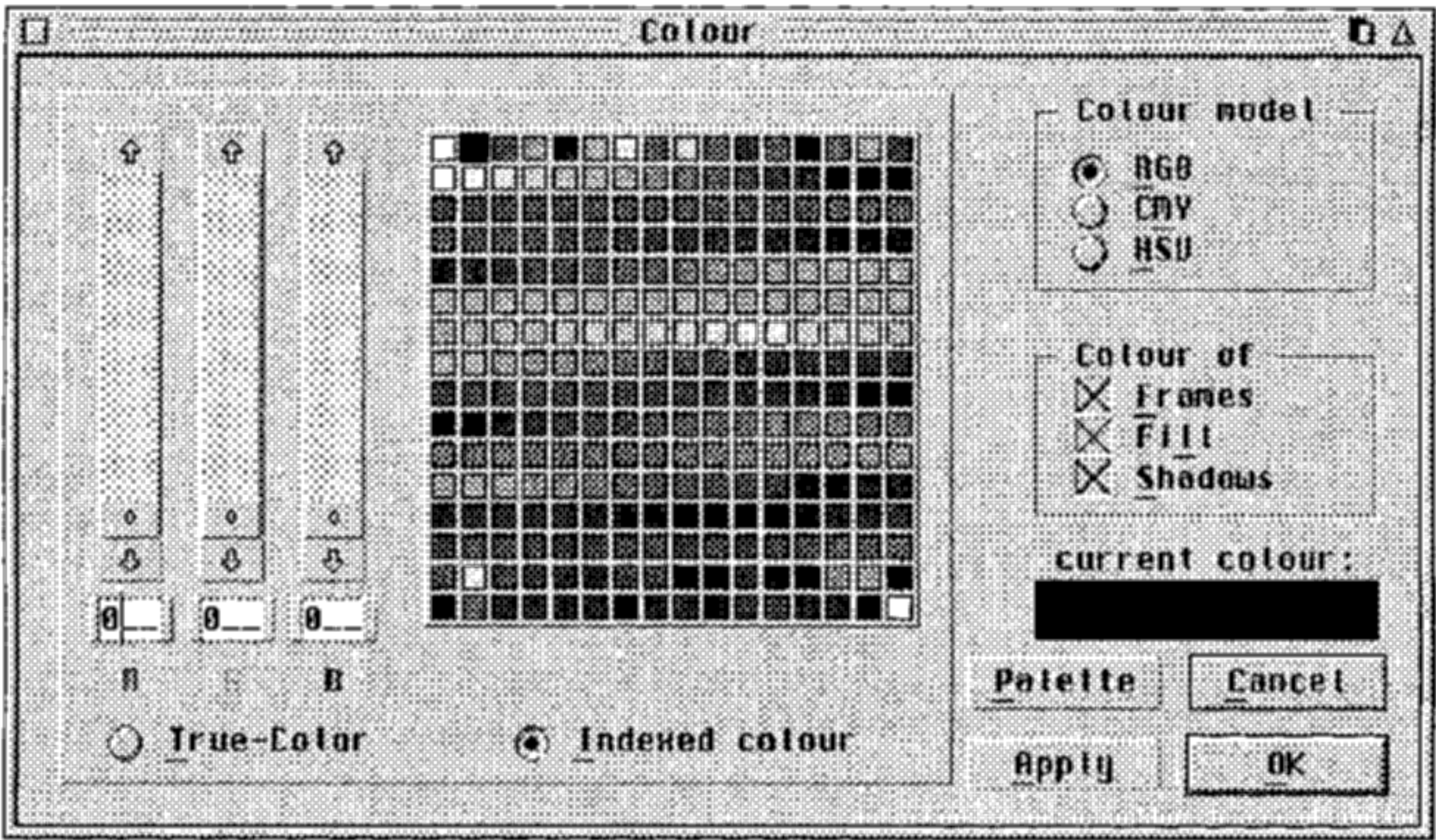
ArtWorx stores the colour of an object in three values which indicate the red, green and blue components of that colour. All colours can be produced with a combination of these values. There are two possible ways to choose the colour of an object: either to set the colour of a **TrueColor** object using the three sliders, or to choose one of the 256 predefined colours.

When an object is output the nearest colour to a **TrueColor** object is sought if the output device does not support **TrueColor**. For a Colour Index object, the nearest colour to that of the colour table of the output device is used. With black and white output devices the colour will be converted to a grey pattern for filled single colour objects. Lines and pattern-filled objects will be changed to either all white or all black.

With the radio buttons you can set whether to work with **TrueColor** or **Indexed Colour**.

**TrueColor:** If you choose **TrueColor** you can set the colour with the three sliders. Click on a colour in the colour selection area and the red/green/blue values on the sliders will change to reflect the colour you have chosen. (The colour selection area shows

the colours of the current palette either from the current document or from the default document colours.) When working in **TrueColor** mode the colour





selection area gives you fast access to the 256 defined colours so that you don't have to create it each time.

**Indexed colour:** When the **Indexed colour** button is chosen, click on the colour selection area to select a colour. If you move the sliders in **Indexed colour** mode the selected colour in the palette will be changed. All objects of this colour will also change their colour. If no objects are selected then altering the palette will alter the palette for new documents.

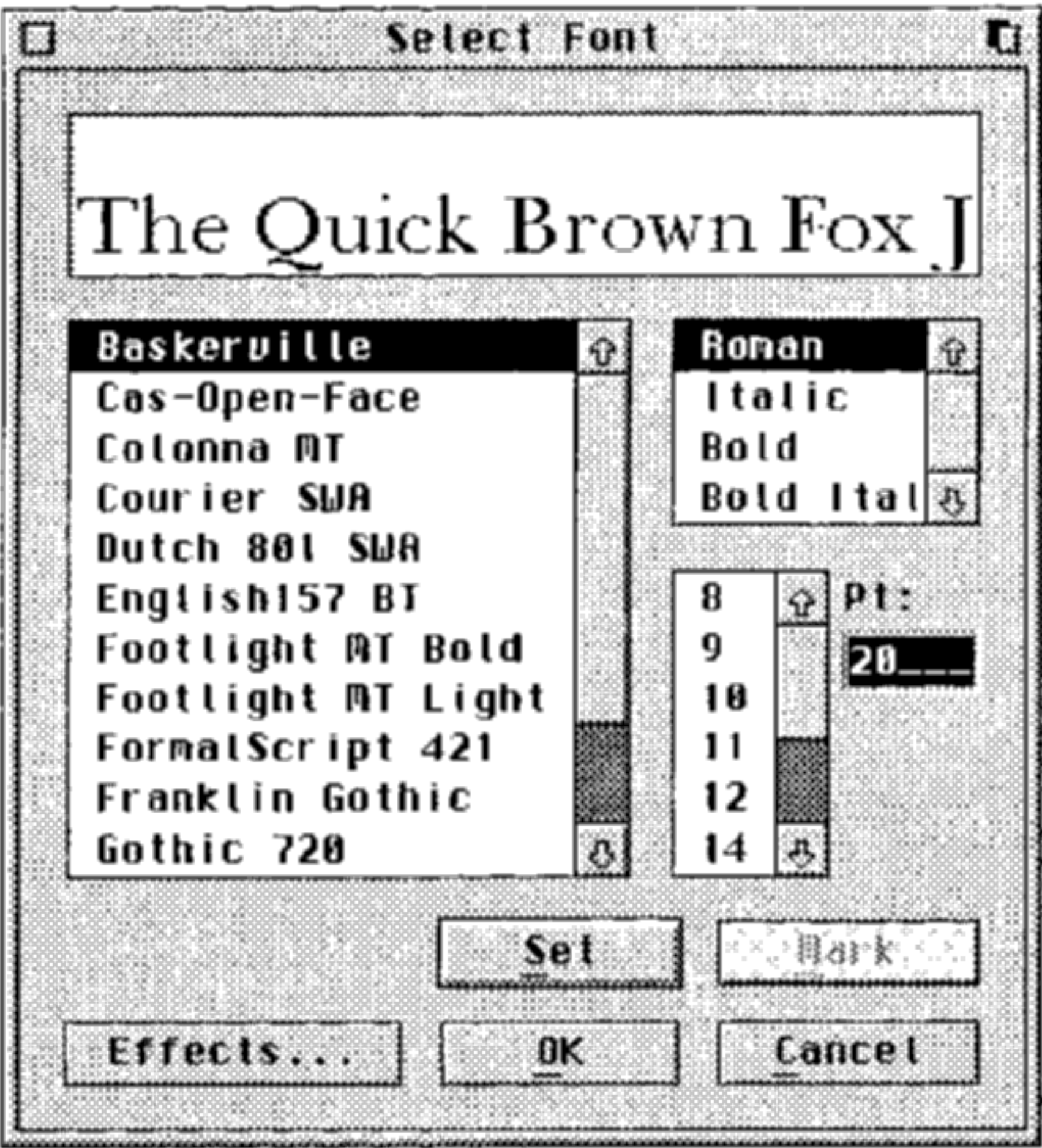
In the field under **Current colour** is shown the selected colour. If you are working in a screen mode with fewer than 256 colours then the nearest colour is shown. On black and white screens the colours are depicted as shades of grey (dot patterns).

In the **Colour of** box you can set which part of the object to use the colour for: the frames, the Fill, or the shadow. With the **palette** button you can replace the document palette with the standard palette. This may be necessary if the colour palette has changed when a bitmap picture is imported.

ArtWorx allows you to use one of three colour models: **RGB**, **CMY** and **HSV**. In the RGB colour model all colours are made up of a mixture of red, green and blue components. The CMY model is similar to RGB but uses instead the base colours Cyan, Magenta and Yellow. The HSV model uses a combination of Hue, Saturation and Value to determine colours.

**Text...(Alt-T)**

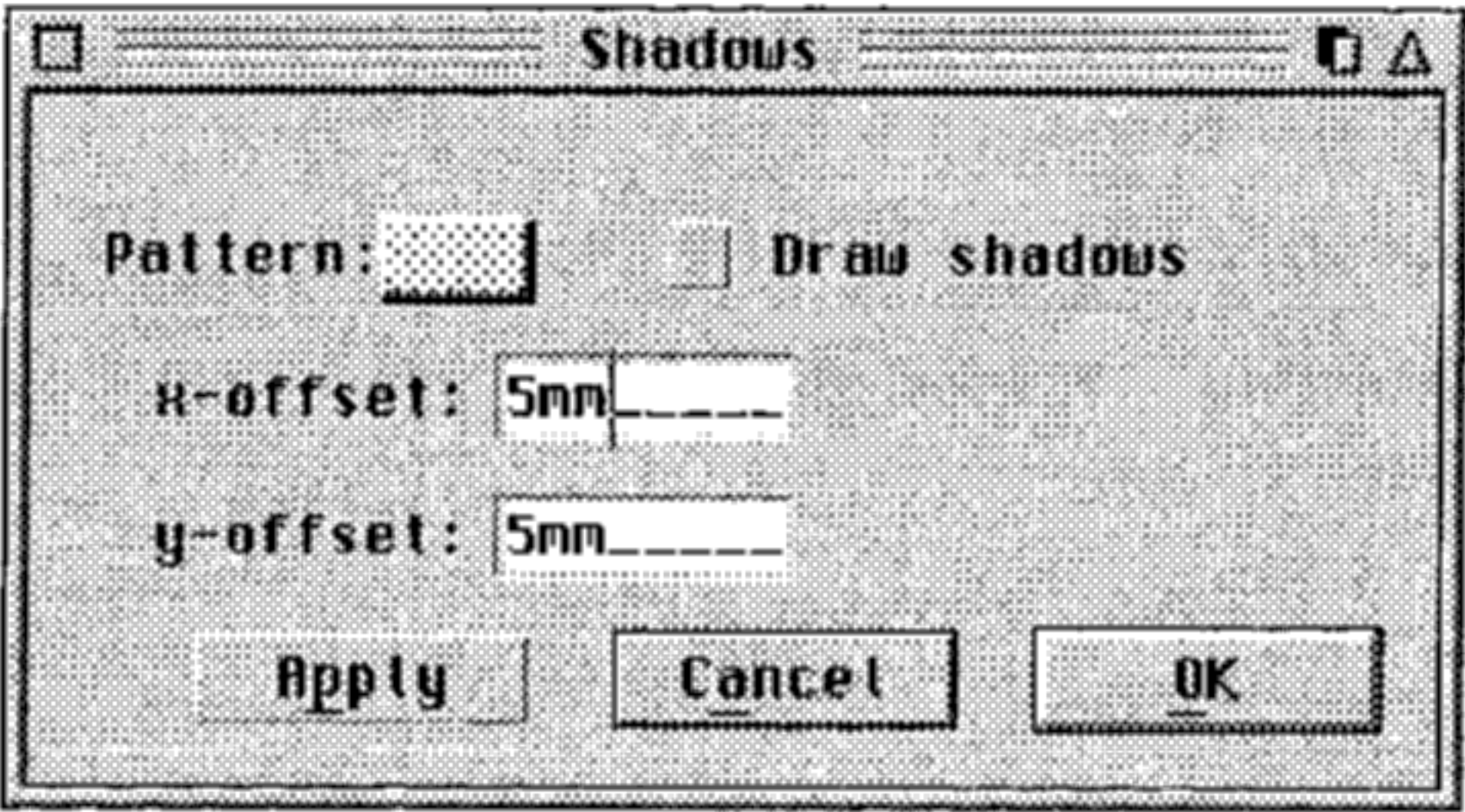
This calls the MagiC fontselector if it is installed. Only freely scalable fonts are shown: Speedo, TrueType or PostScript1.





**Shadows...(Alt-S)**

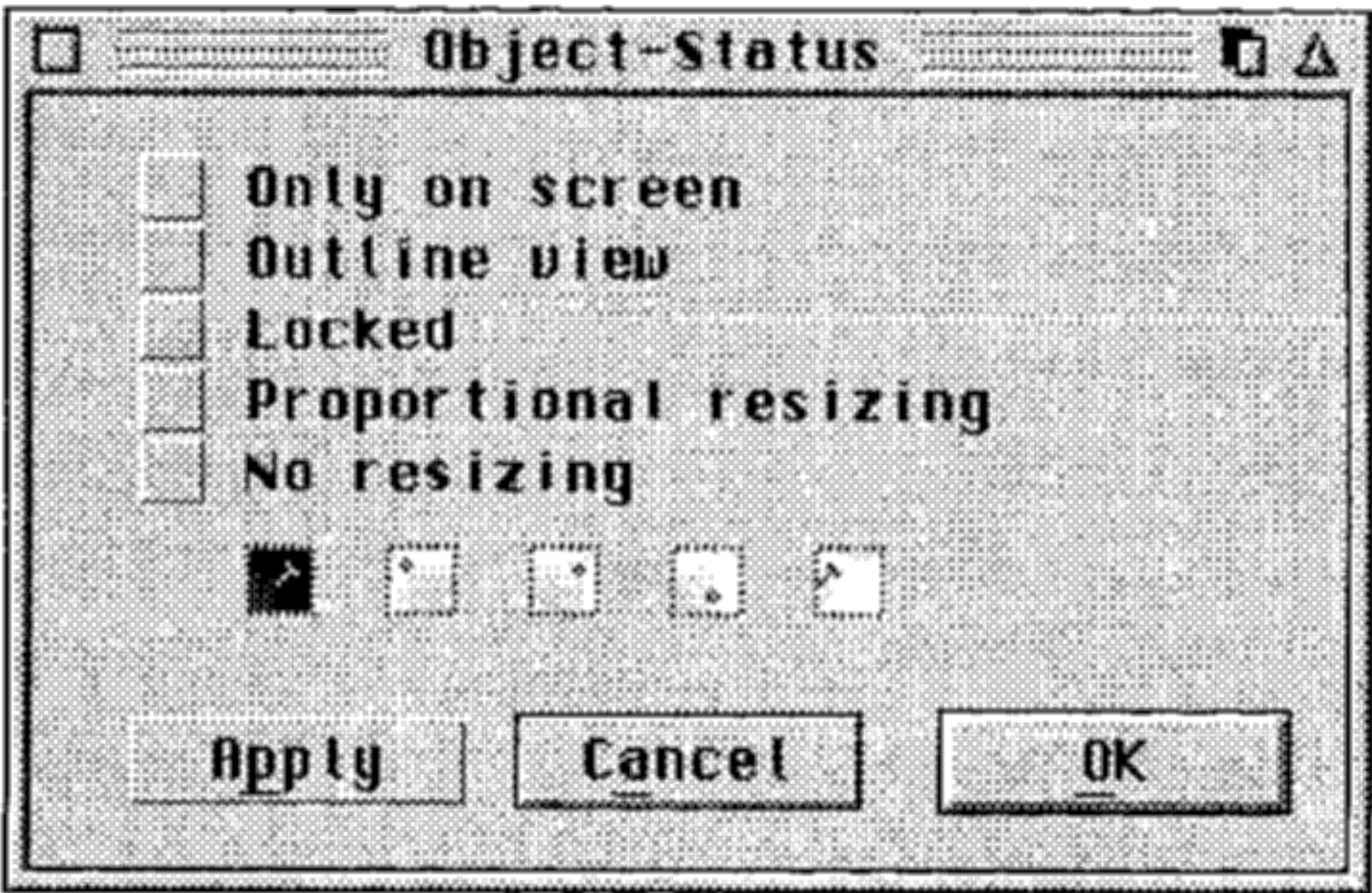
Every object including frame text and bitmap graphics can have a shadow.



**Status...(Alt-U)**

Sets the status of an object:

**Only on screen:** The object is only shown on screen, and will not be printed out. This can be useful for hint notes, and also during the positioning of objects. You can place alignment objects on screen and do not have to remove them before printing.



**Outline view:** When drawing complex objects on slow machines this can speed up screen redraws. The object is shown as a frame only, and need not be redrawn each time the screen is updated.

**Locked:** The object is protected from change. See also the menu entry **Object/Lock**.

**Proportional resizing:** The object can only be resized proportionally. Particularly with advanced drawings, it is all too easy to resize an object and lose the proportions — the square is now a rectangle. Check the button to prevent this happening.

**No resizing:** The object can be moved, copied, etc., but its size cannot be altered.



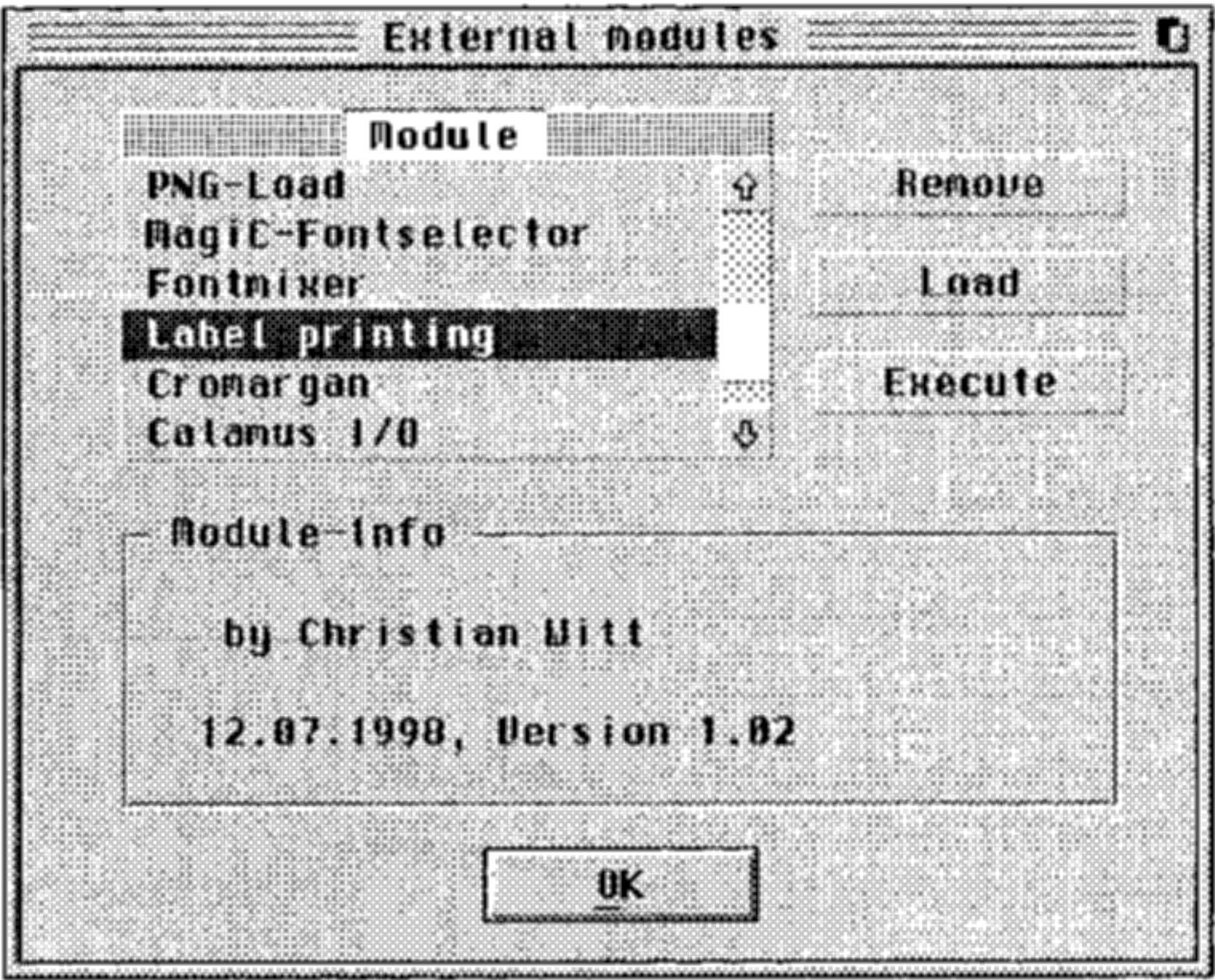
The Module menu

External module... (Alt-D)

Calls the module manager, which shows all the active modules in the module list. **Remove** removes a module from memory. Some modules cannot be removed this way and will generate an error message.

**Load** loads a new module. In the fileselector box all modules, both enabled and disabled, are shown. A disabled module has the file extender **LMX**. If the module cannot be loaded, you may have too little free memory or the module is already loaded and an error message will appear.

**Execute** starts the selected module. Not all modules can be run since many of them provide enhanced functions within ArtWorx. In the lower part of the dialog box the module information is shown: the module name, author, version number and module date. Other modules, over and above those supplied with this version of ArtWorx are available from the program supplier.





## The Options menu

The **options** menu allows you to set parameters which determine the way in which ArtWorx functions, e.g., the file paths, the bézier quality, the printer driver, etc.

### General... (Alt-A)

**"D" deletes object ...** Can be switched off in case you think this is 'too risky'.

**Beep on errors** If there is an error, then the system bell will sound.

#### Save parameters

**automatically:** ArtWorx save the settings

automatically every time the program is quit.

**Delete confirmation:** If you are concerned that you might delete an object accidentally, check this. A confirmation dialog will then be shown when you try to delete an object. Often it is more practical to lock the objects on the page, so they cannot be accidentally deleted.

**Dialogs to mouse:** Especially for large-screen users, there is nothing more irritating than to have to search for the dialog box.

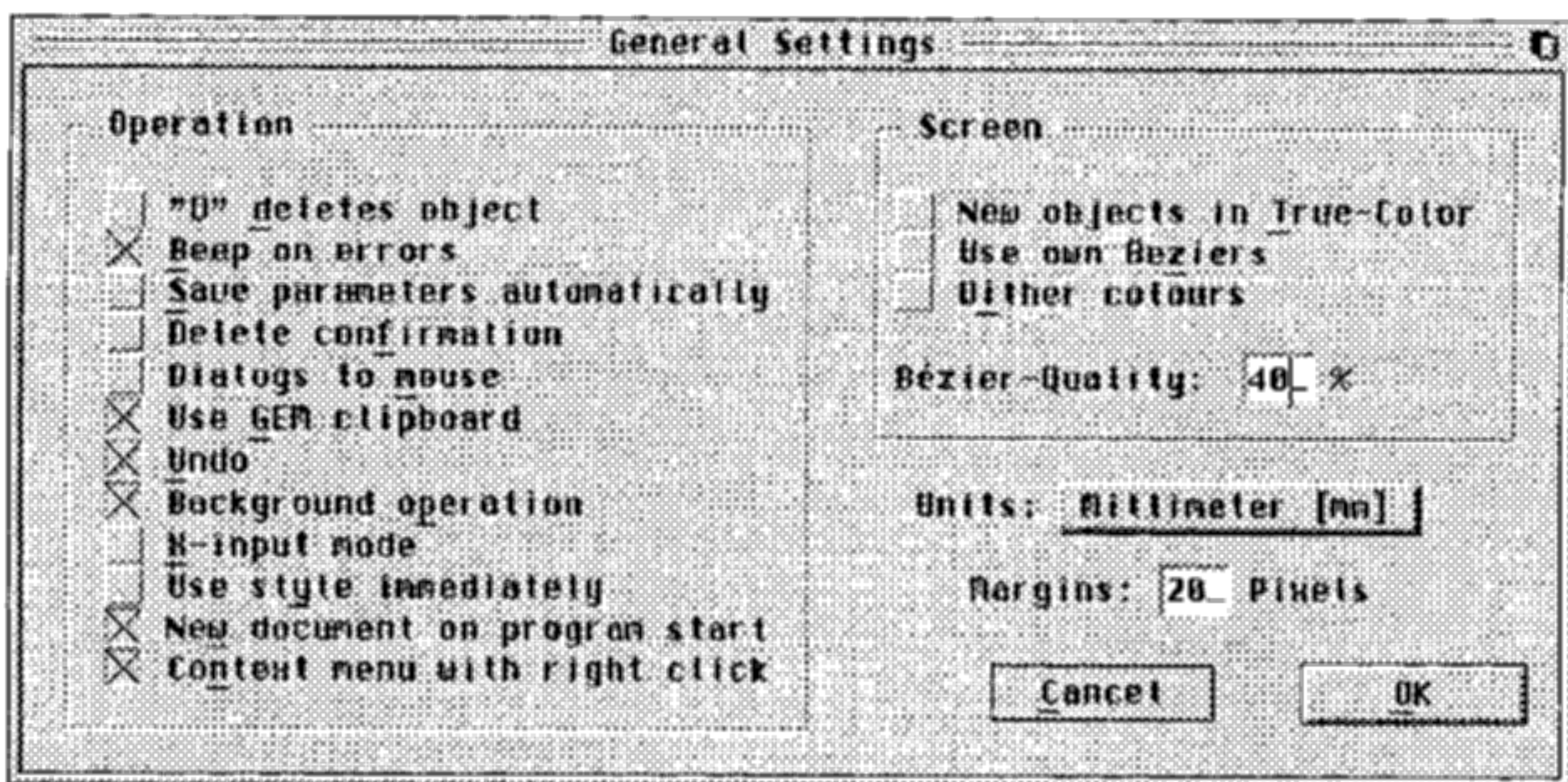
**Use GEM clipboard:** If this is checked then all copy/paste actions will use the GEM clipboard, and the data will be available for use in other programs. Otherwise the program internal clipboard is used and this is much faster.

**UNDO:** To conserve memory it is possible to turn off the undo function.

**New objects in TrueColor:** ArtWorx creates new objects in True Colour.

**Use own Béziers:** For those who wish to use ArtWorx's own Bézier routines rather than those of the VDI. Normally this button should be off, as the Bézier routines in NVDI are generally faster.

**Background operation:** Some people swear by it, others swear at it. My tip: leave





it turned on for a while. I am sure you will not wish to do without once you have tried it. This allows you to use the a document in the background without having to top it first.

**X-input mode ...** is for all those who use the X windows system. On this system the keyboard input is directed to the window that the mouse pointer is over. Under GEM all keyboard input is to the active window! If you can't exit a dialog box with the RETURN key you probably have this option checked. For the return key to work with X input the mouse pointer must be within the dialog box.

**Use style immediately:** If you want Macintosh-like operation, Check this option. All style dialogs (lines, colours, fills etc.) respond immediately to a change. You don't have to click **Apply** for the change to take effect.

**New document on program start:** If active, a new blank document will be created when ArtWorx is started, providing that a file name has not been passed on startup through drag and drop or the command line.

**Dither colours:** If turned on then True Colour pictures are dithered in 256 colour screen modes to give a better screen display.

**Bézier-Quality:** On slow machines Béziers can be slow to draw. Therefore it is possible to set a custom Bézier quality.

**Units:** The default units (Centimeter, Millimeter, Inch or Points (=1/72 Inch)) can be set from this popup.

The coordinates in the Info-line will be shown in these units and these units will be used as the default for values in the edit fields of dialog boxes. If you have chosen cm as the default units, then entering '1' into an edit field will be read as '1cm' by ArtWorx, so if you then wanted to specify an entry in mm you would have to enter '1mm'.

An exception to this is the font dialog box which only allows you to set the font size in points.

### **Paths...(Alt-E)**

The standard access paths are set in the two edit fields.

**Images:** On **Open** or **Save** the fileselector will use this path.

**Module:** ArtWorx looks for the modules here.

A click on the edit fields will call the fileselector for you to choose the paths.



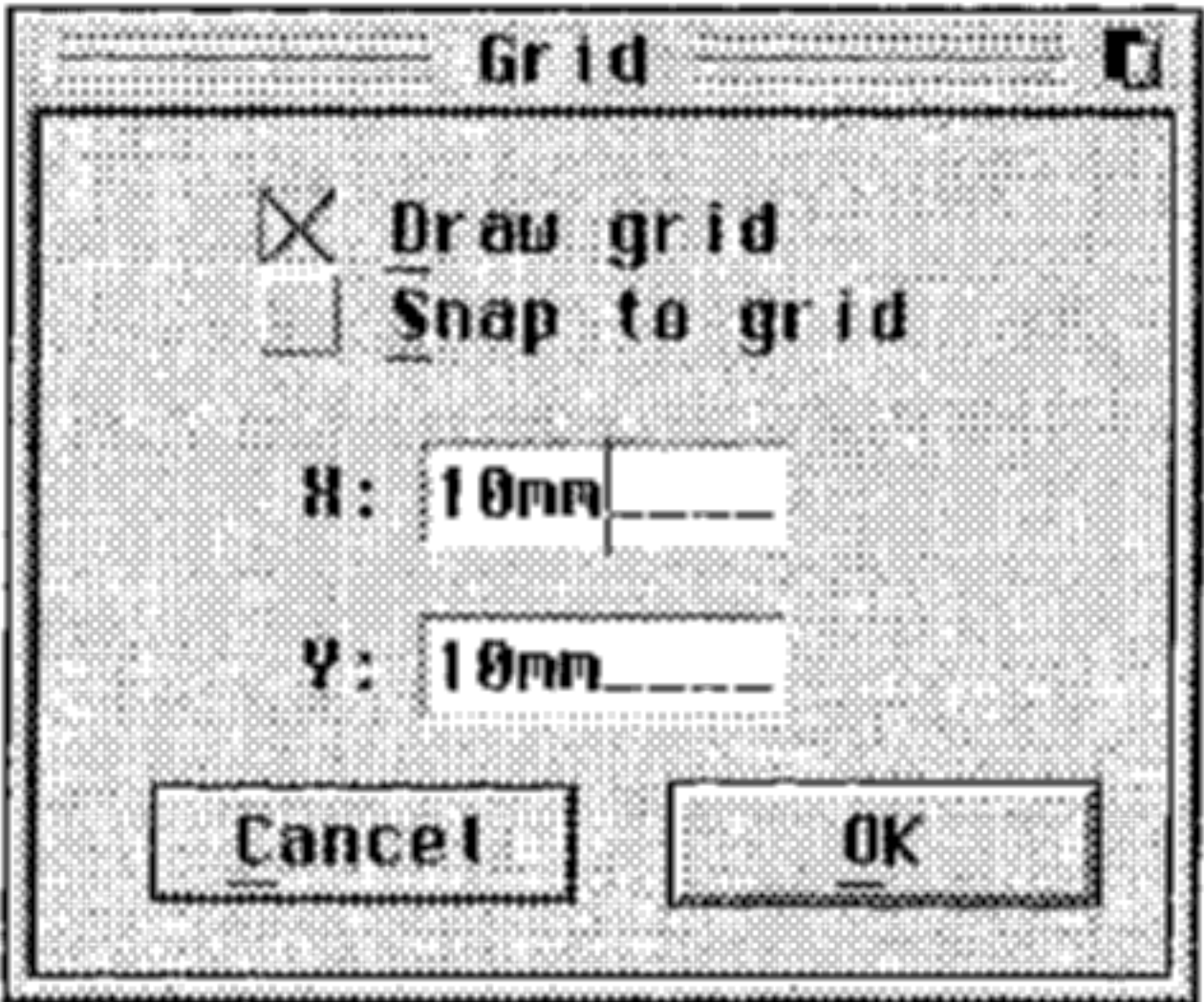
**Grid...(Alt-R)**

This dialog can only be called when a drawing window is open. A grid of points is shown over the drawing page with options in the dialog to alter the grid point spacing. With this function it is very easy to draw precise objects, eg for objects in whole Centimeters.

Show grid: With fine grids the screen display can get overcrowded, so it is possible to turn off the grid drawing.

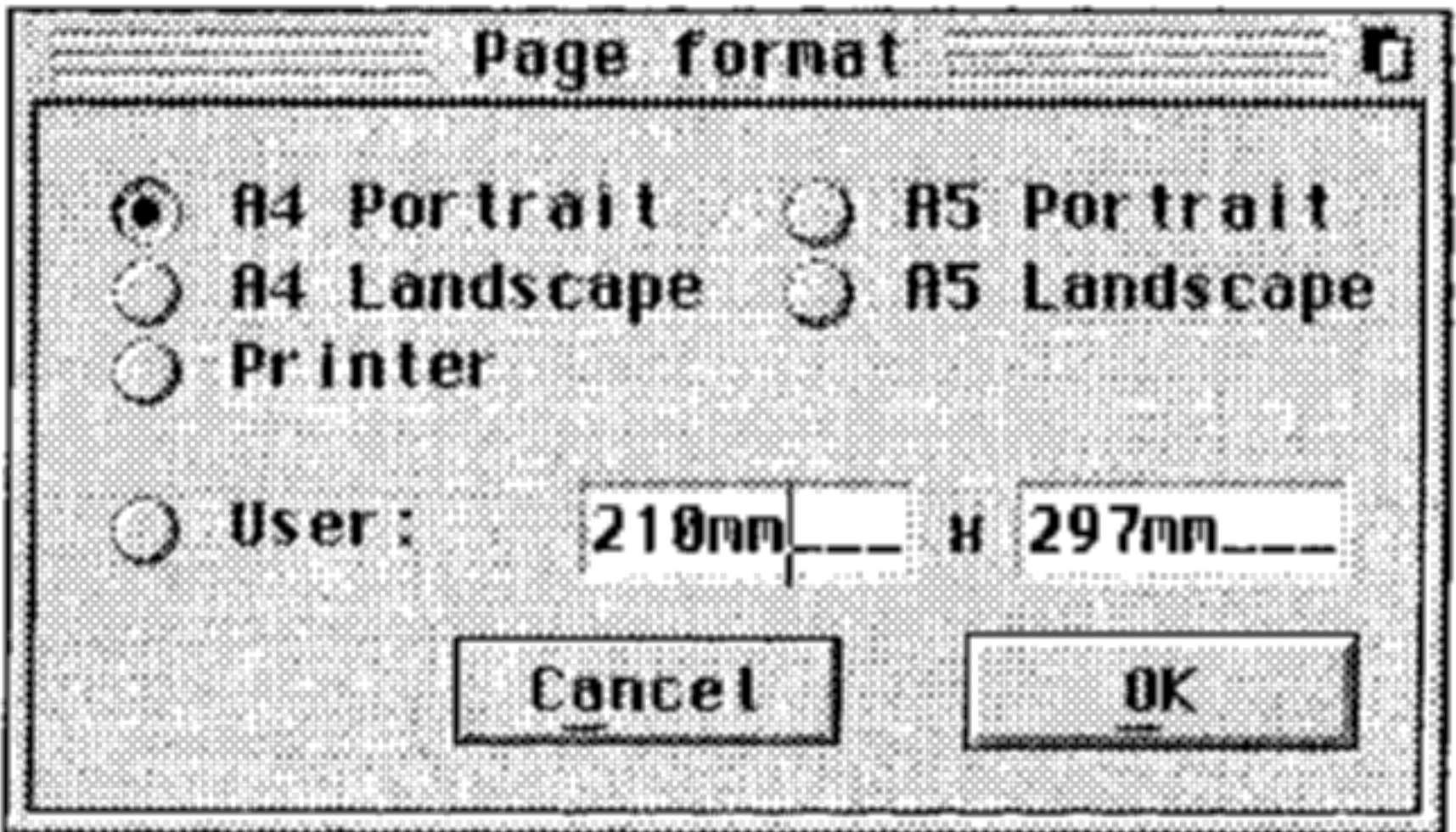
Snap to grid: For when you do not want to be constrained to the grid but to draw freely.

X: and Y: The grid width can be set in centimeters (cm), Millimeters (mm), Inches (in) and Points (pt).



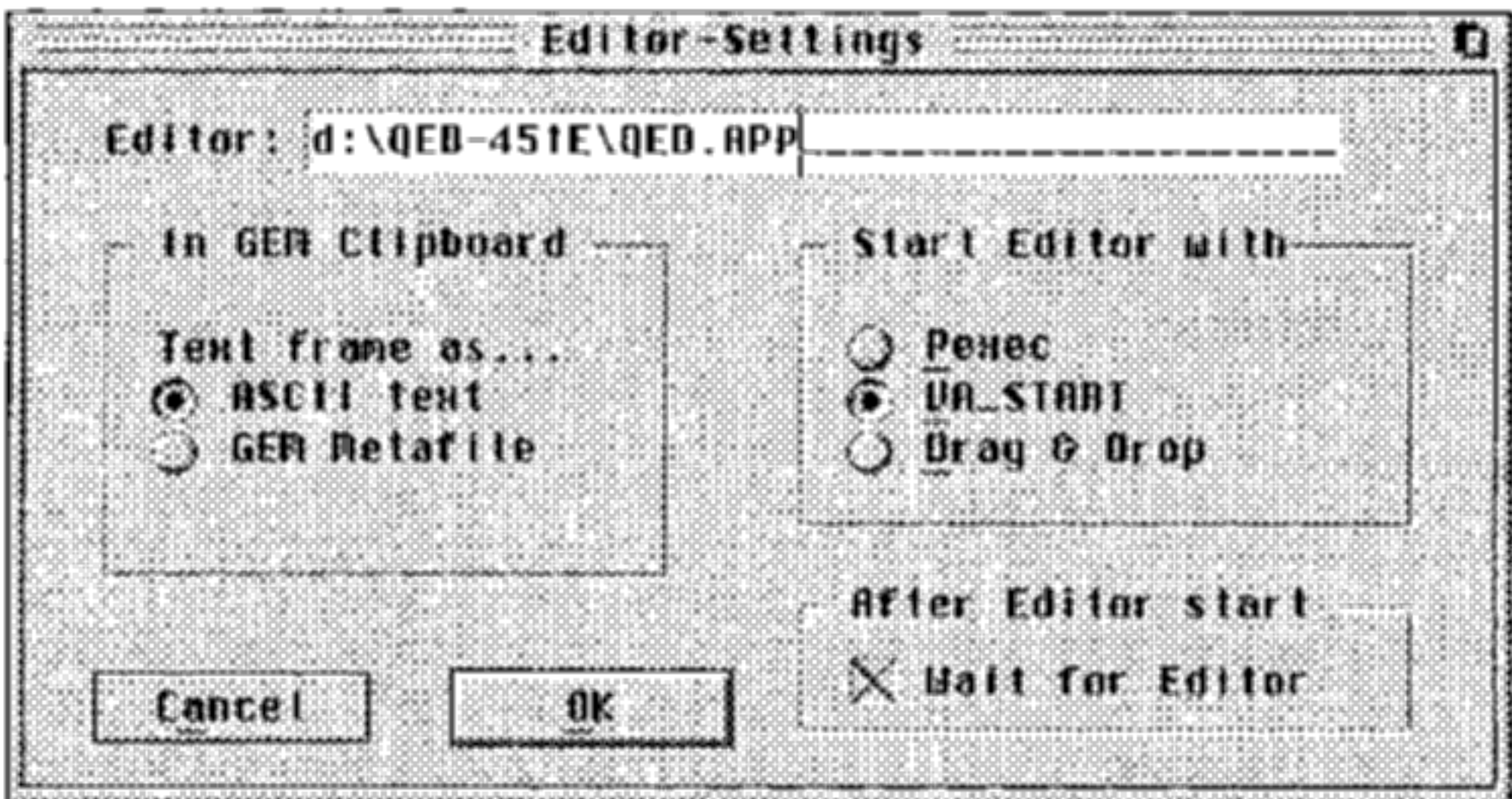
**Format...(Alt-O)**

The page size of a document window is set or altered here. The following sizes can be set as standard **A4** and **A5** in either **portrait** or **landscape** format, and a **User defined** page size. If a printer driver is installed then the driver will be able to report the actual print area on a page. All printers have a border area in which they cannot print and this is taken into account by ArtWorx. **User** allows a custom paper size, which will be used for the current document. All non-active windows will use the standard page size as will all new documents.



**Editor...(Alt-B)**

Enter your preferred ASCII editor in the edit field.d (e.g., qed, JAnE, Everest...). A click on the edit field calls the file selector to locate the ASCII editor.





Frame text can be exported from ArtWorx as **ASCII** (which most text editors and word processors can read), as well as in **GEM Metafile** format.

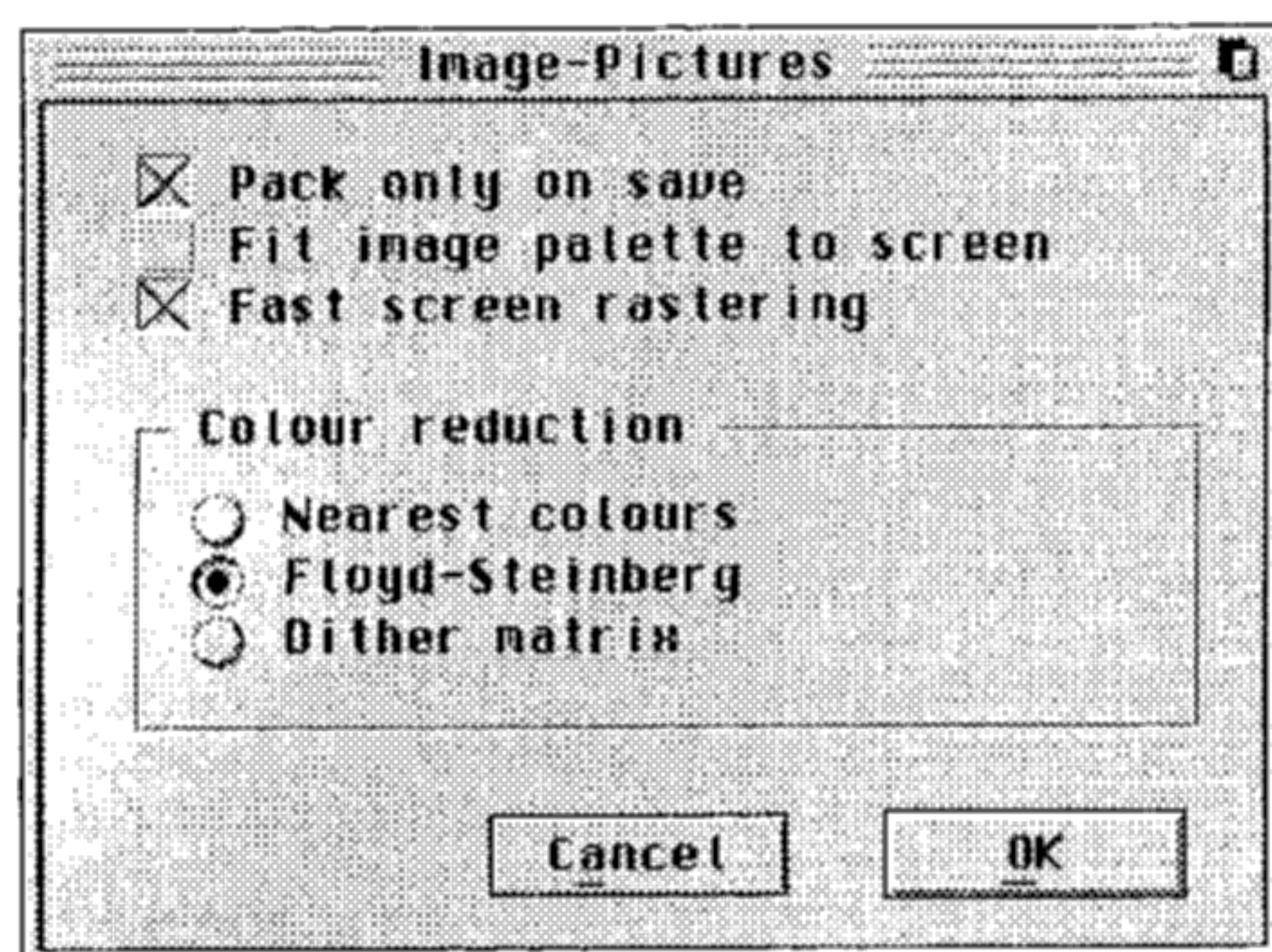
A text editor can be started with the system called **Pexec** or **VA\_START**. If possible use **VA\_START** so that the editor can be started in parallel in a multitasking environment (e.g. MagiC)

If **Wait for Editor** is checked, when the editor is quit the altered text is automatically updated.

### Images... (Alt-I)

**Pack only on save:** Normally ArtWorx holds the image compressed in memory. This means that to work on the image it first has to be unpacked. This requires additional memory and also computer time. If you check this button the image is stored in memory unpacked and only packed in order to save it.

If you work with a lot of images in a document, it may be wise to switch off this option in order to conserve memory. However, if you have a slow computer and only a couple of images you should check this option. (The packing/unpacking of images on a Mega STe slows things down noticeably whereas on a Mac it happens in the blink of an eye.)



**Fit image palette to screen:** This has only one meaning if you work with images in 256 colours. With colour pictures the colour palette of the picture is saved in the picture file. When this option is active, the colour palette of the document is set to the colour palette of the selected picture. Since there can only be one colour palette per document, if you have several images each with its own palette, then in some circumstances the pictures may appear in false colour. This setting is valid only for the screen; when the images are printed the correct palettes will be used for the pictures. If you deactivate this setting then each colour in the images will be set to the nearest colour from the document palette. Of course the pictures will be shown with small



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errors in their colour but at least they will be shown reasonably correctly.

**Fast screen rastering:** If this is checked, images will be displayed by the fastest process. Otherwise the same process as that used for printing will be used. With b&w screens this will be a quick dither process, and with colour screens the nearest colour will be used. This corresponds to the setting of **nearest colour** under the **colour reduction** heading. If fewer colours are available in the output device than the document then the colour palette will be reduced.

**Nearest colour:** For every colour in the image the closest match in the document palette will be used. Pictures which only have a few colours will produce good results when printed. The only way to find out is to print a test page.

**Floyd-Steinberg** is a process whereby the errors in colour are distributed over the image so that the human eye perceives more colours than in reality are available. This process produces the best quality. Unfortunately it is the one that takes longest.

**Dither-Matrix:** The image is passed through a Beyer dither matrix. For a later version of ArtWorx it is foreseen that a user-defined matrix can be used.

**Save parameters:** All the current settings are saved in the file ARTWORX.INF, so that they are restored when you next start the program.

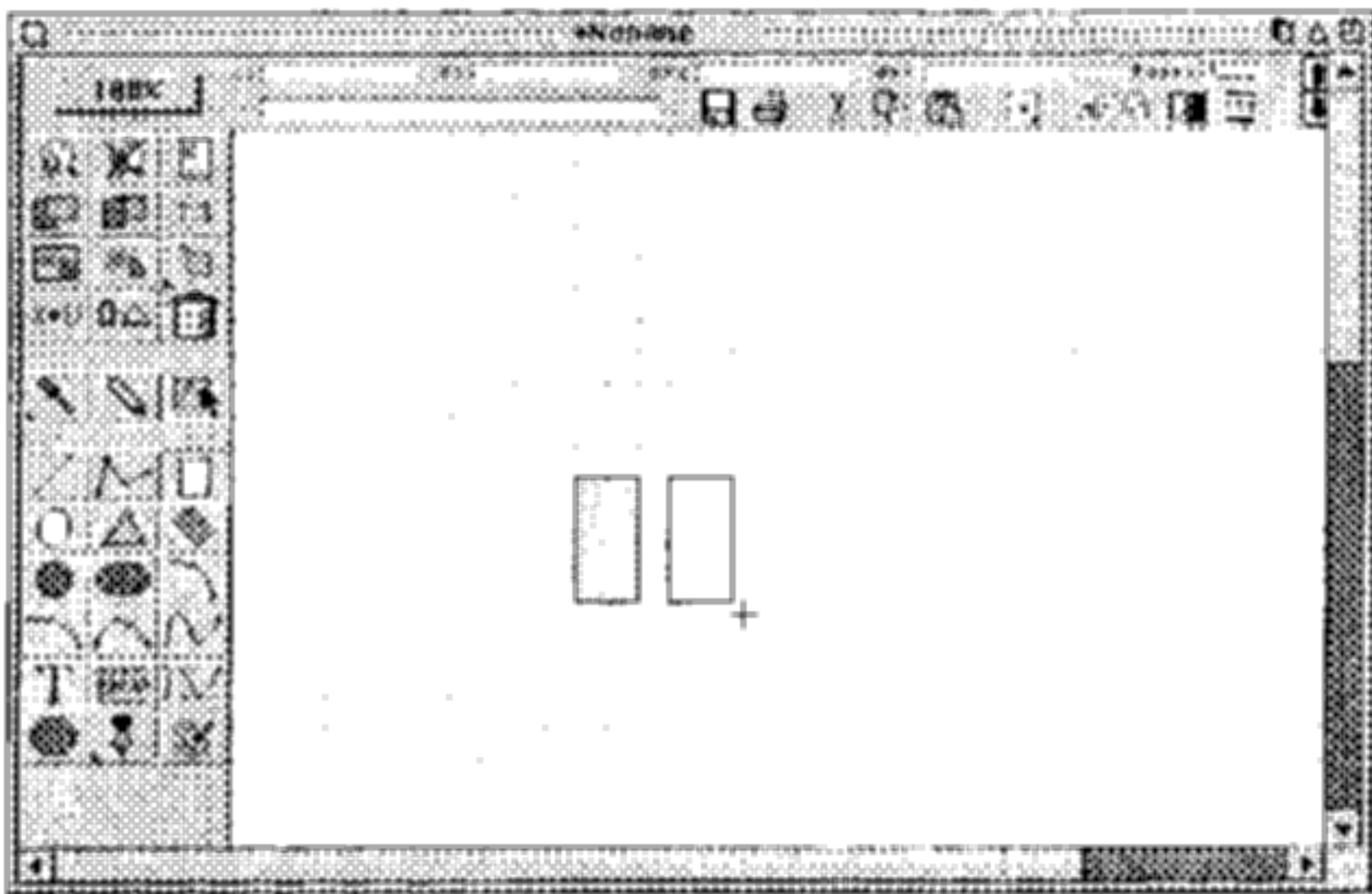


## Practical examples

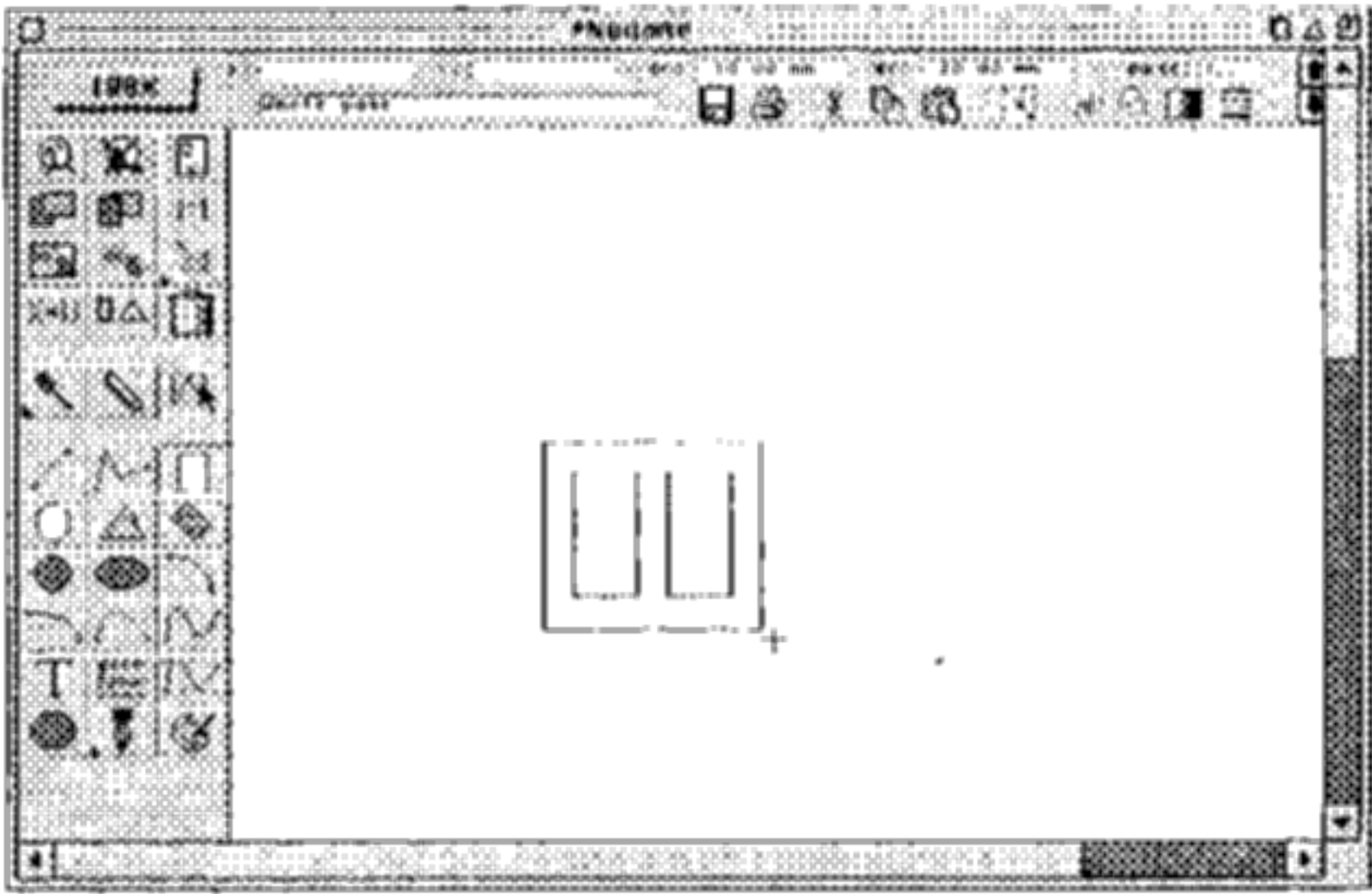
### Lets build a house

Start ArtWorx and under **Options/Grid...** enable **Draw grid** and **Snap to grid** with the values of **X:** and **Y:** set to **0.5cm**. Before drawing, set the **Style/Drawing mode...** to **overwrite** and in **Style/Fill...** choose the second **fillpattern** in the list box (note this changes the Filling radio buttons to Pattern).

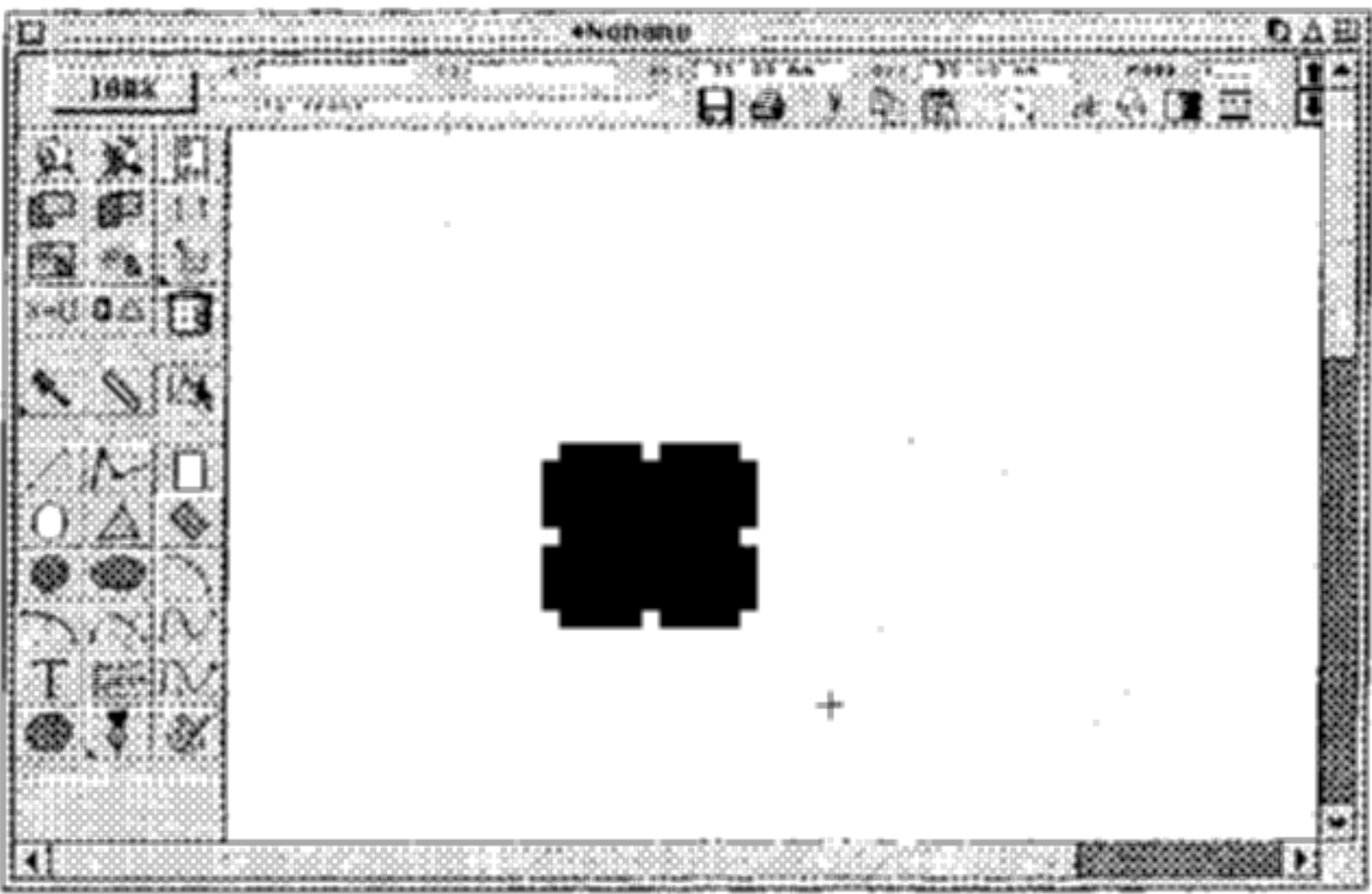
Now draw two rectangles as in the picture.



Next to draw the window frame. Choose the black fill from the fill patterns, then draw a rectangle encompassing both windows.

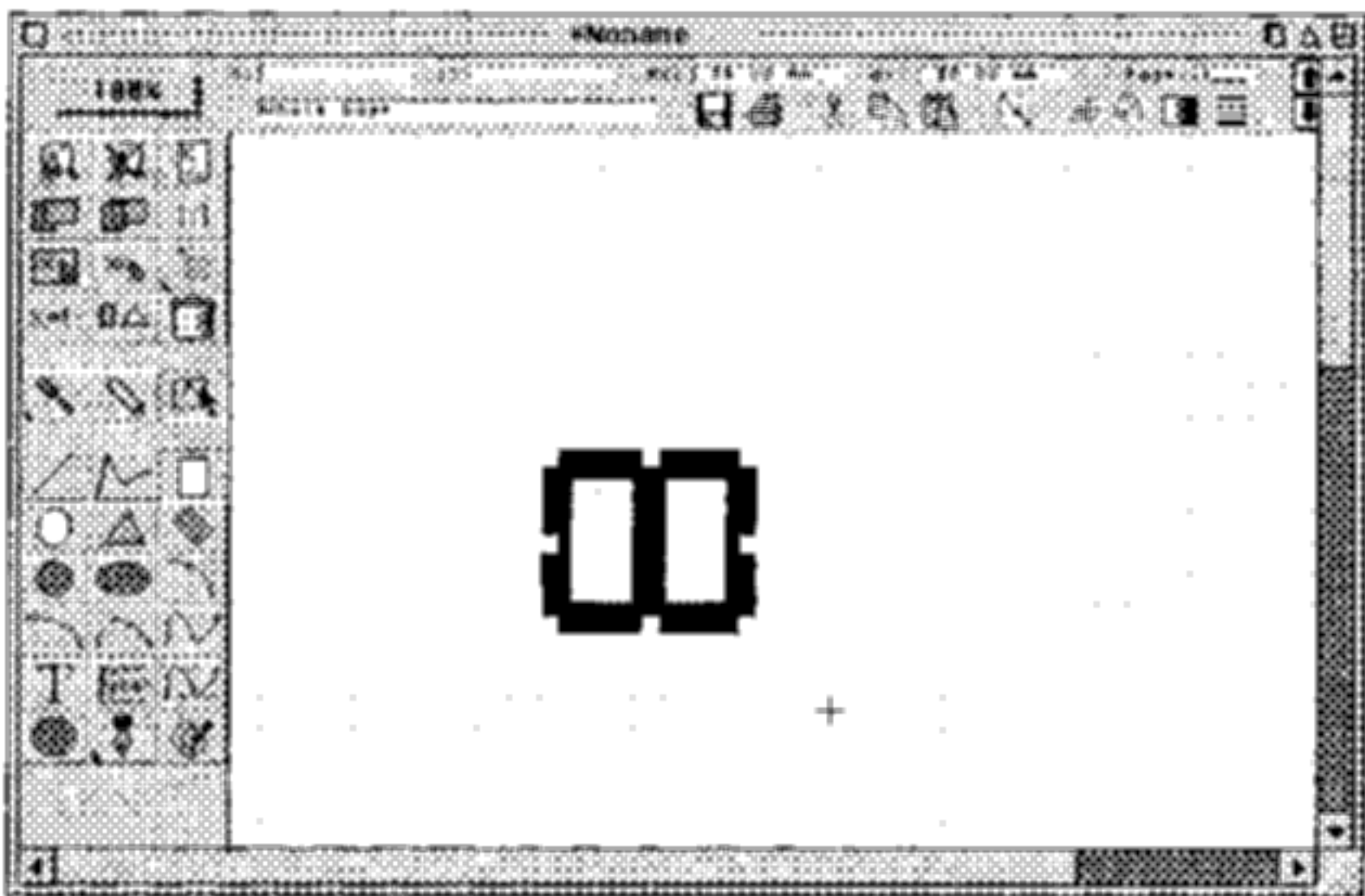


The window frame will cover both the window panes as we have the drawing mode set to overwrite.



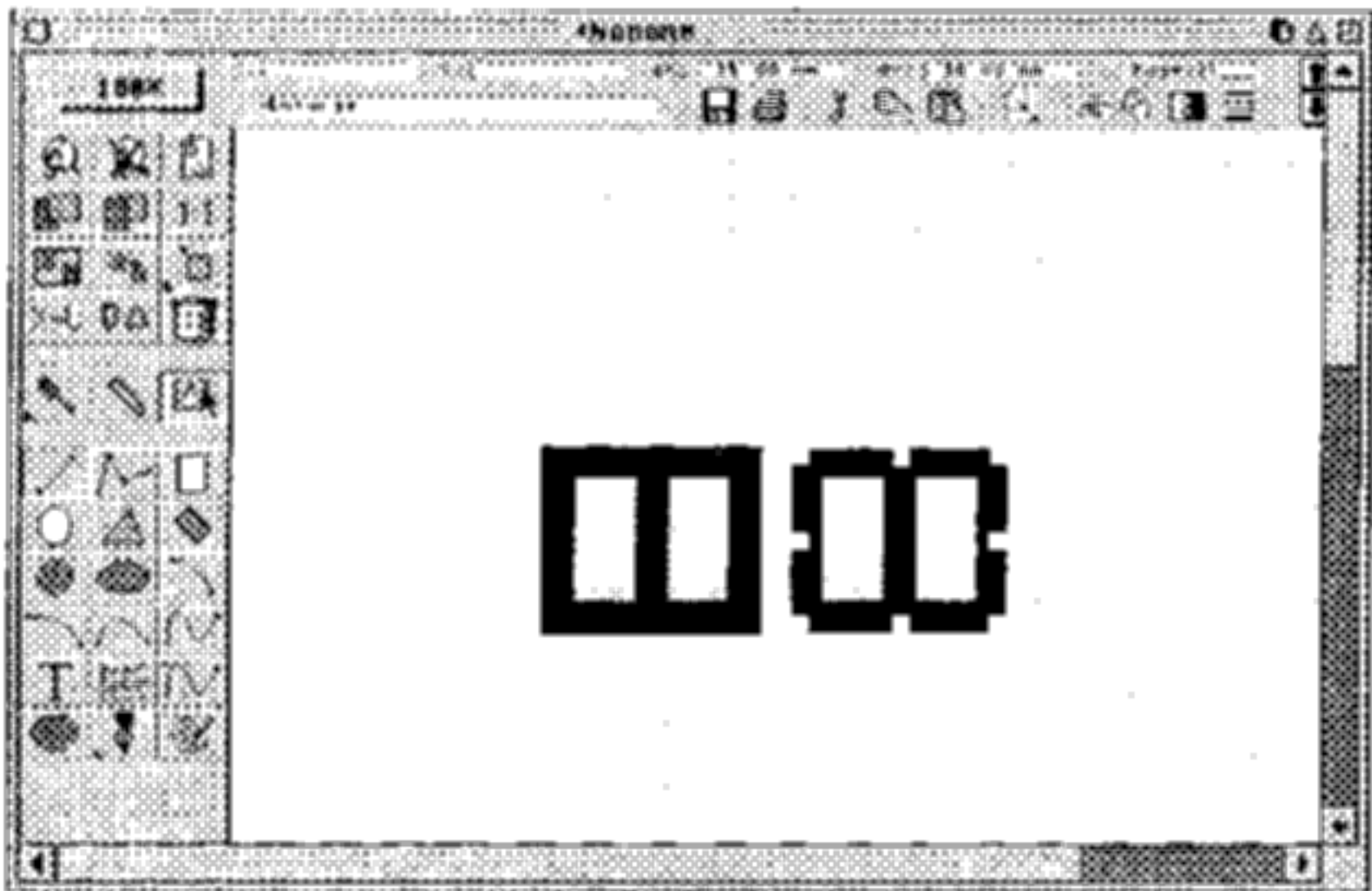


This can be fixed by moving the window frame behind the panes. Either choose **Object/to back** or press the key H.

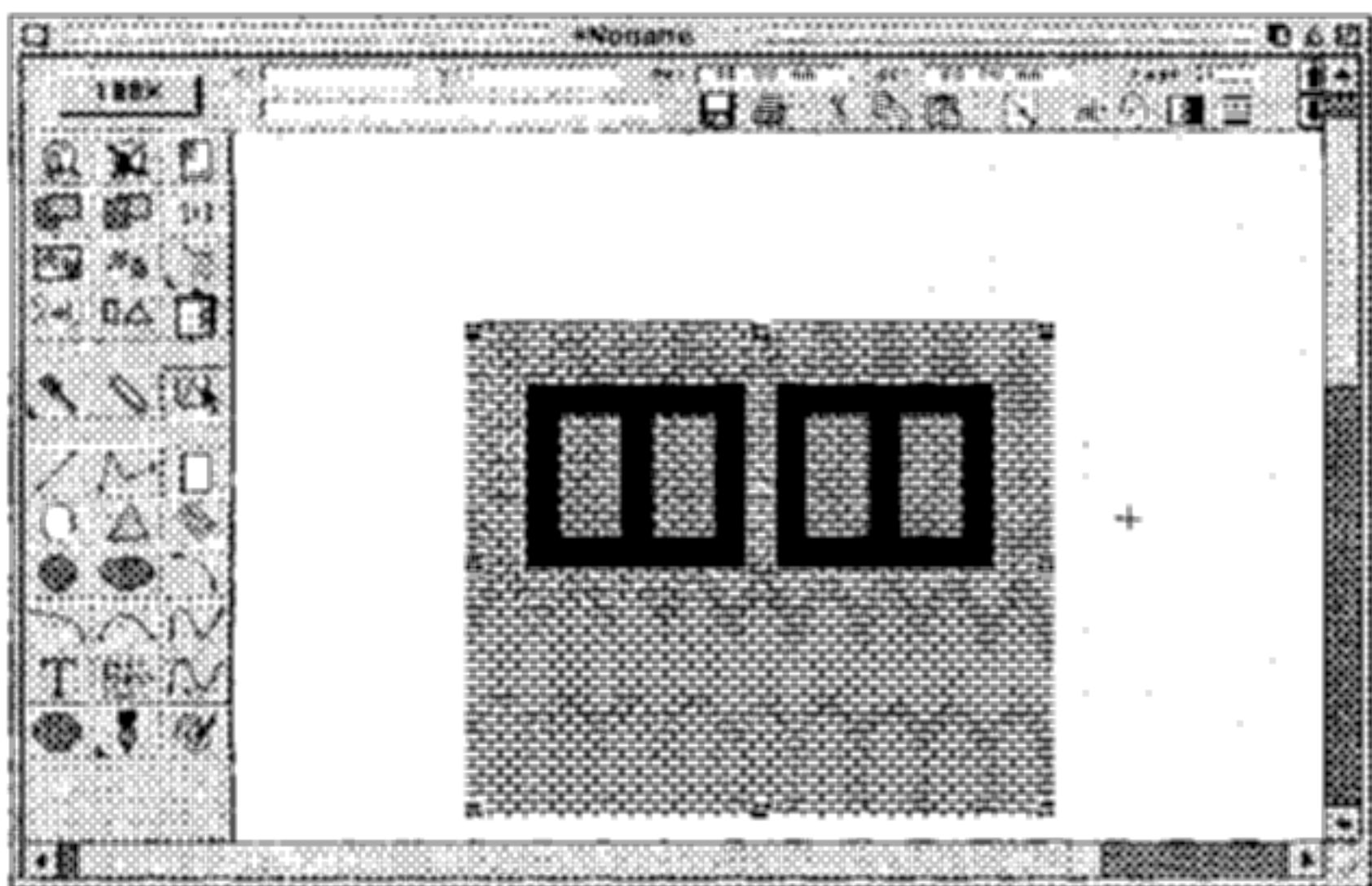


Now you have a window, and the components can be grouped together to form a complete window unit. Select all three objects, with **Control-A** and click on **Object/Group**. You now wish to create a second window, so copy the window to the clipboard with **Control-C**, and then paste in this copy with **Control-V**. The second window will be placed over the first window (ArtWorx always pastes objects into exactly the same place on the canvas that they were copied from).

Click on this inserted window and move it to its new location with the mouse.

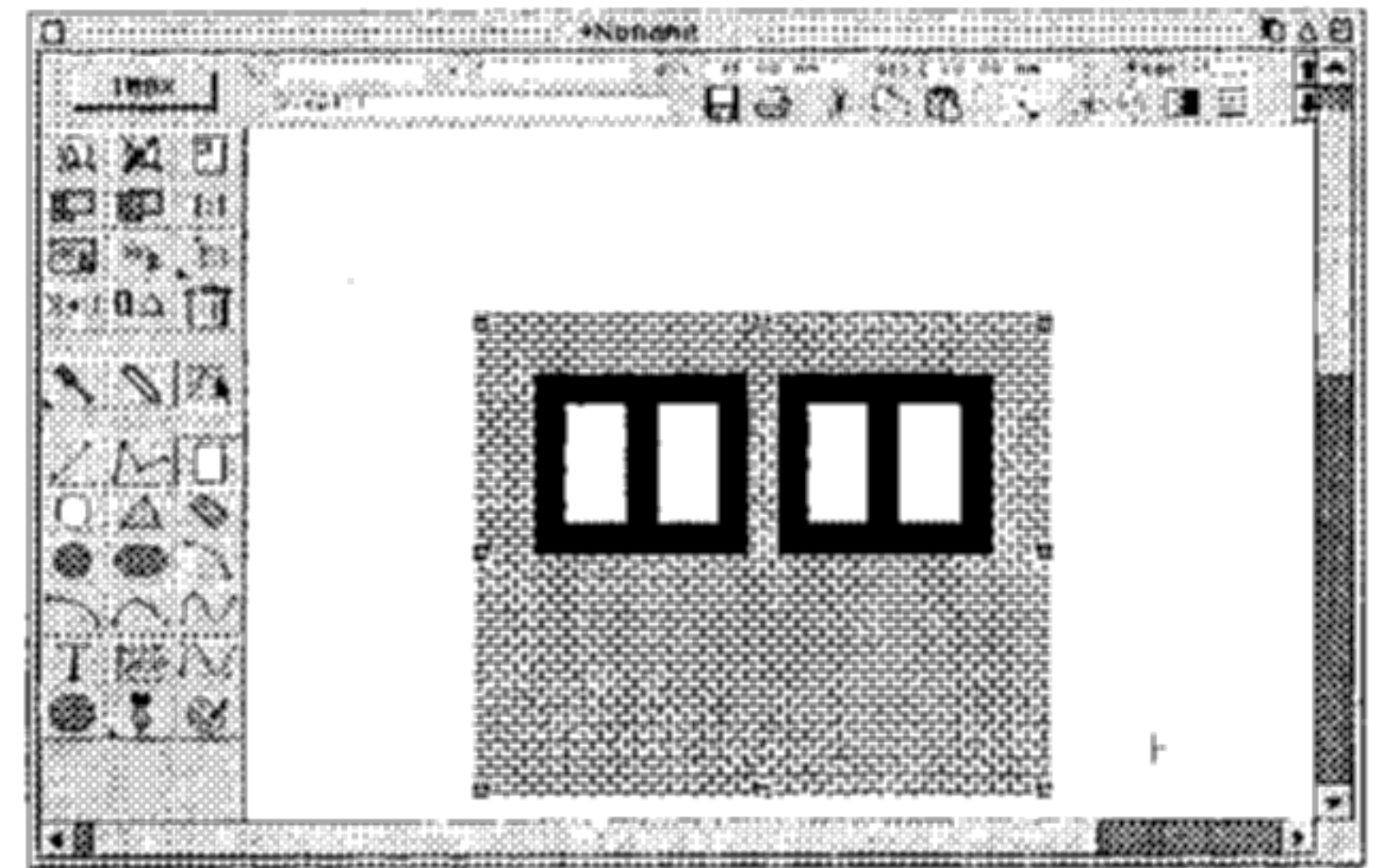


Now to draw the house wall. Choose a brick pattern from the fill dialog and set the **drawing mode** to **transparent**. Now draw a large rectangle over the windows to form the house wall.

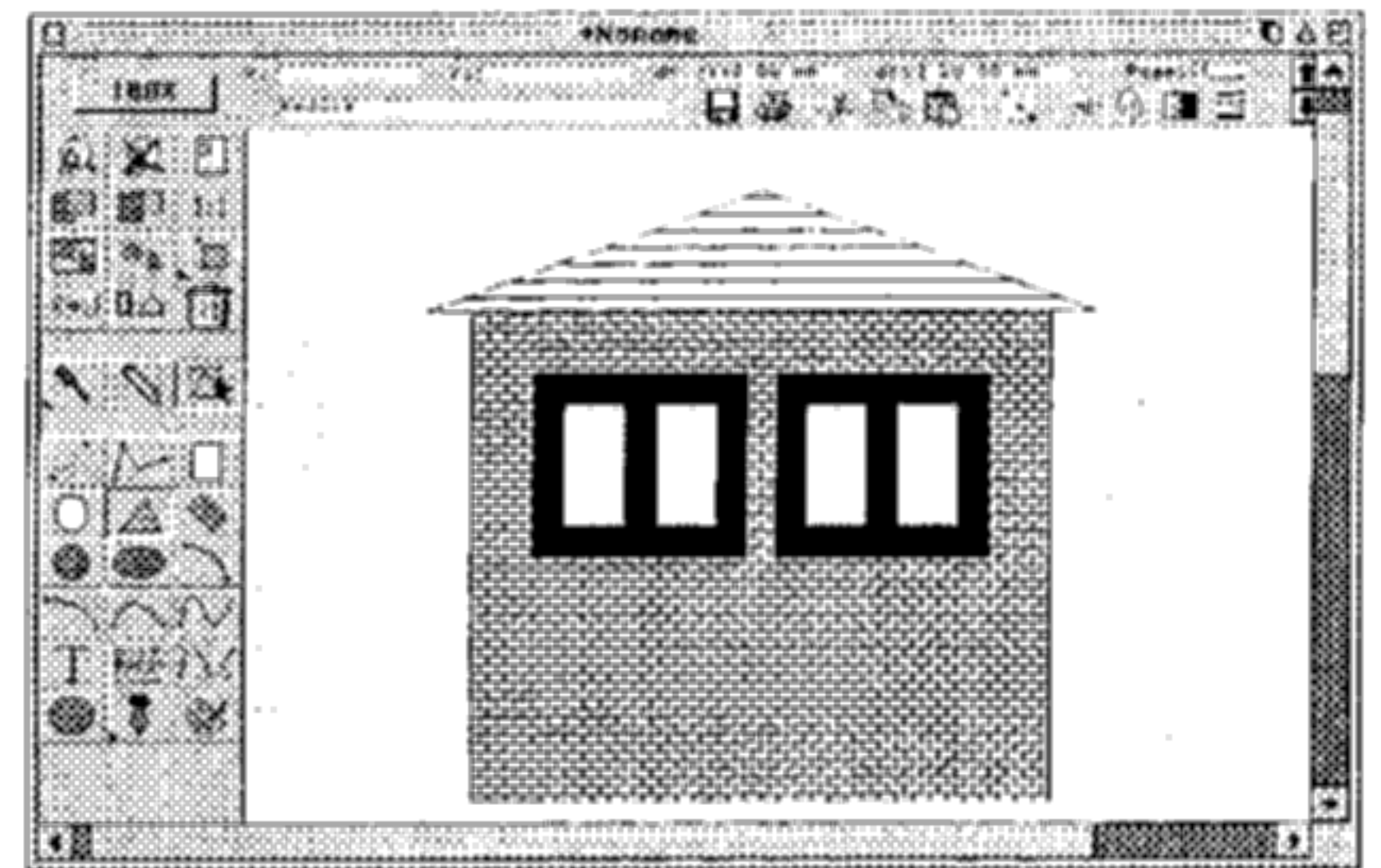




Because the house wall has been drawn transparent, you can see the size and position of the windows. Resize the wall until you think it looks in proportion with the windows, then, making sure the wall is selected, change the **drawing mode** to **overwrite** and then set it to the back with H.



Now to draw the roof. To ensure that the apex of the roof is centred over the house change the grid settings to **X: 0.25cm**. Choose a horizontal striped fill pattern, and then choose a triangle shape from the drawing toolbox. Click 4 grid points left of the top of the house wall, then 4 grid points to the right and click. Move the mouse to the apex of the roof and click again.



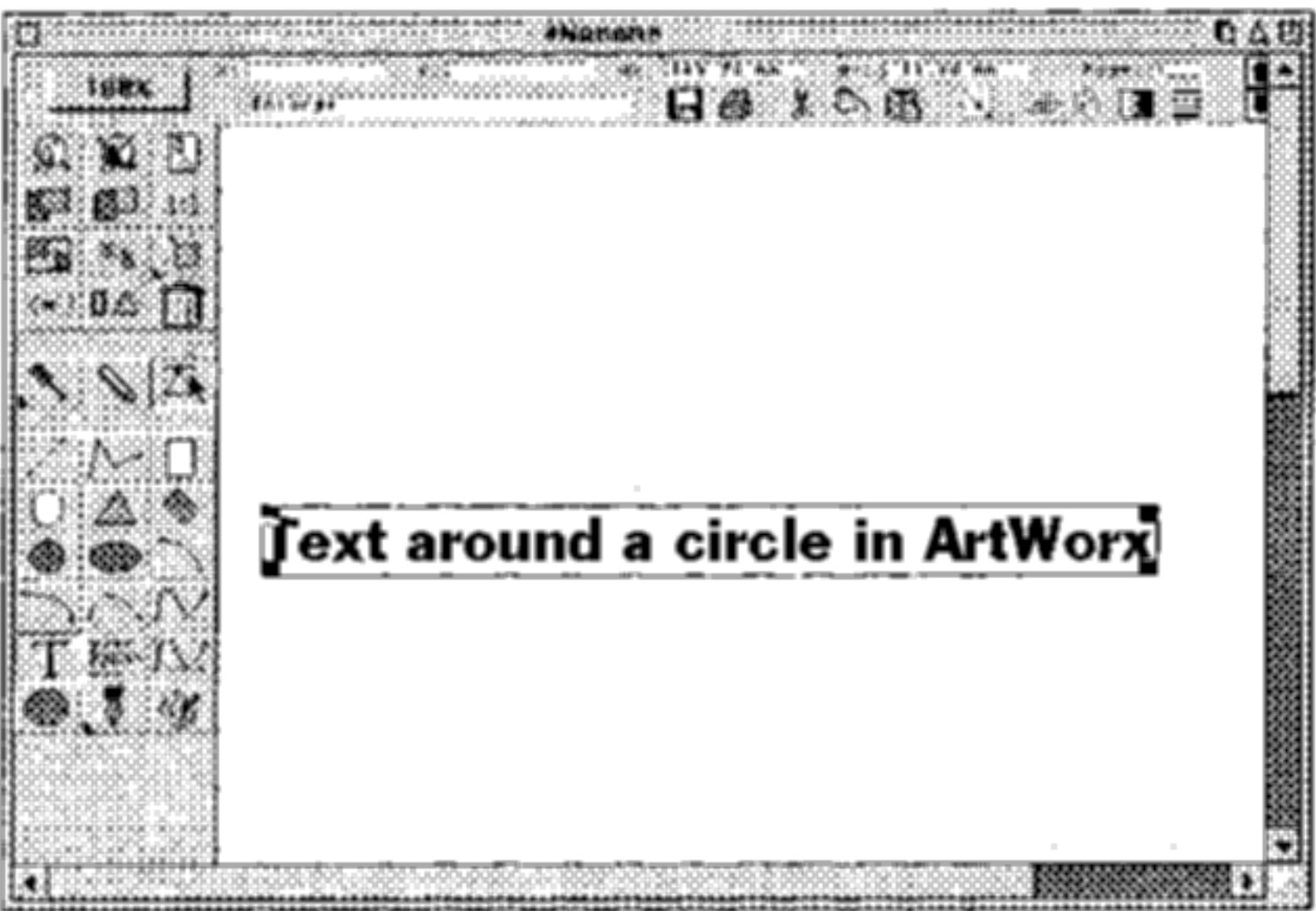
To finish you can draw a door, maybe a yellow sun, a blue background etc. You can of course alter any of the shapes you have already drawn - maybe a thick line around the roof: select the roof, choose **Style/Lines...** and set the **line width** to **2mm**.



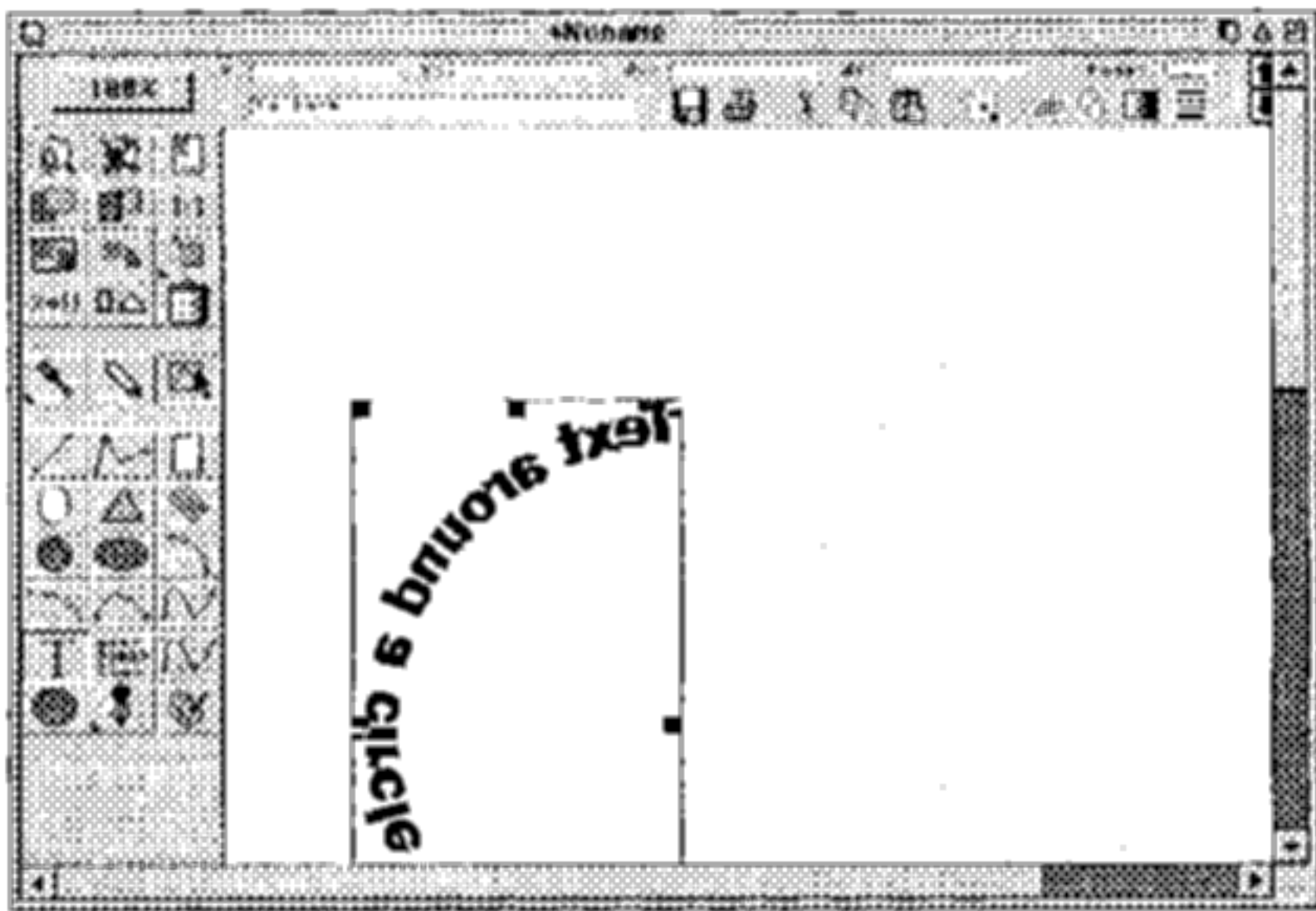


**Text around a circle**

Click on the text icon and choose the menu entry **Style/Text...**, from this select a vector font and set it to say 20 points. Now click on the drawing canvas and enter a long line of text, finish by pressing **Return**. You should have a produced something like the following.

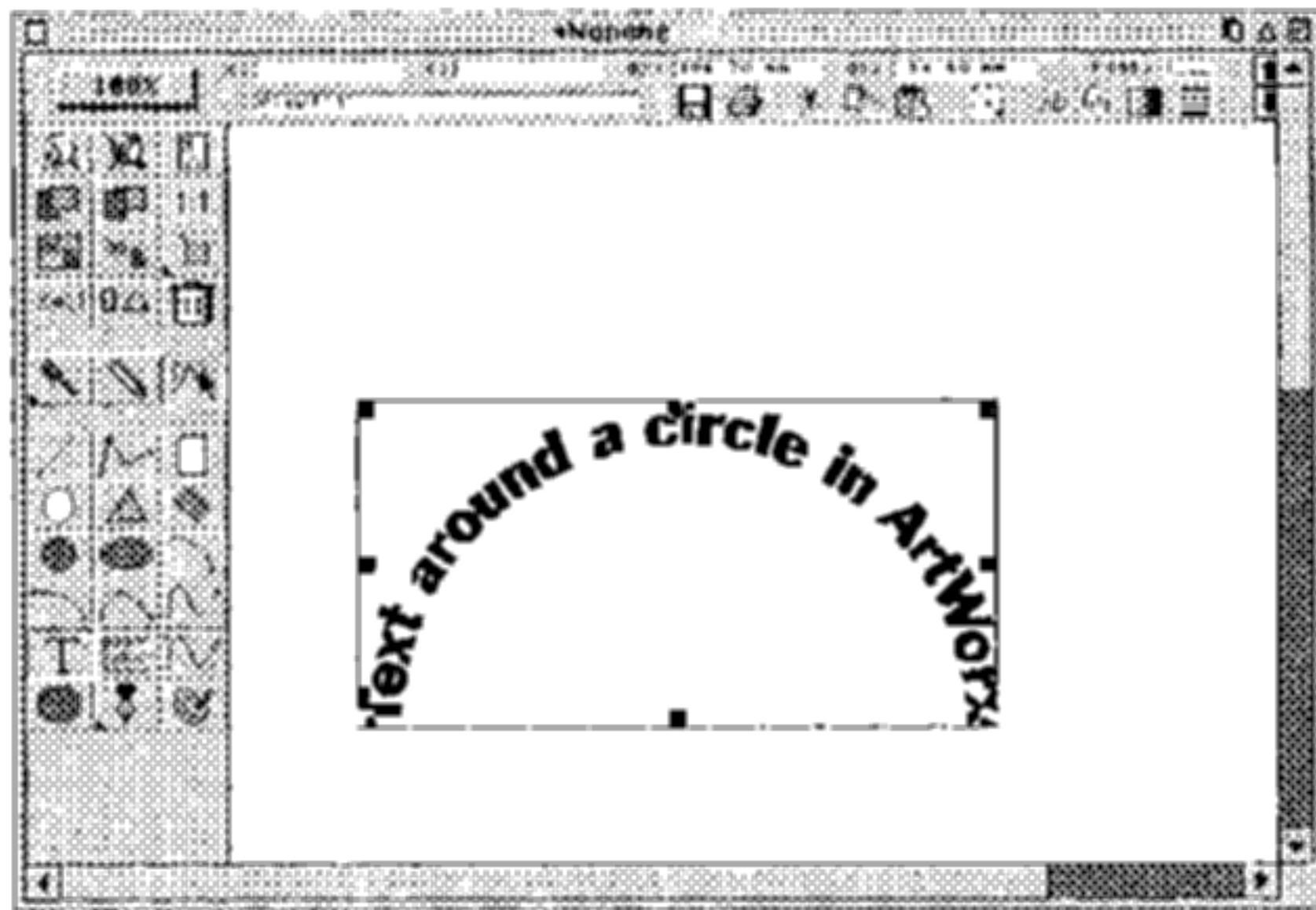


Now click on **Object/Commute** and choose **Bezier** from the popup. The text is converted to curves, and you are no longer able to edit it in a text editor, but you are able to distort and modify the letters e.g. with in ArtWorx. If the text has ended up 'hollow' then choose **Style/Fill** and set the fill to black. Now click on **Object/Transform** and the **Circ.** function. The **start angle** should be set to 90 degrees and the end 270 degrees then click on **OK**. You should see something similar to this:



This is not quite what was required.

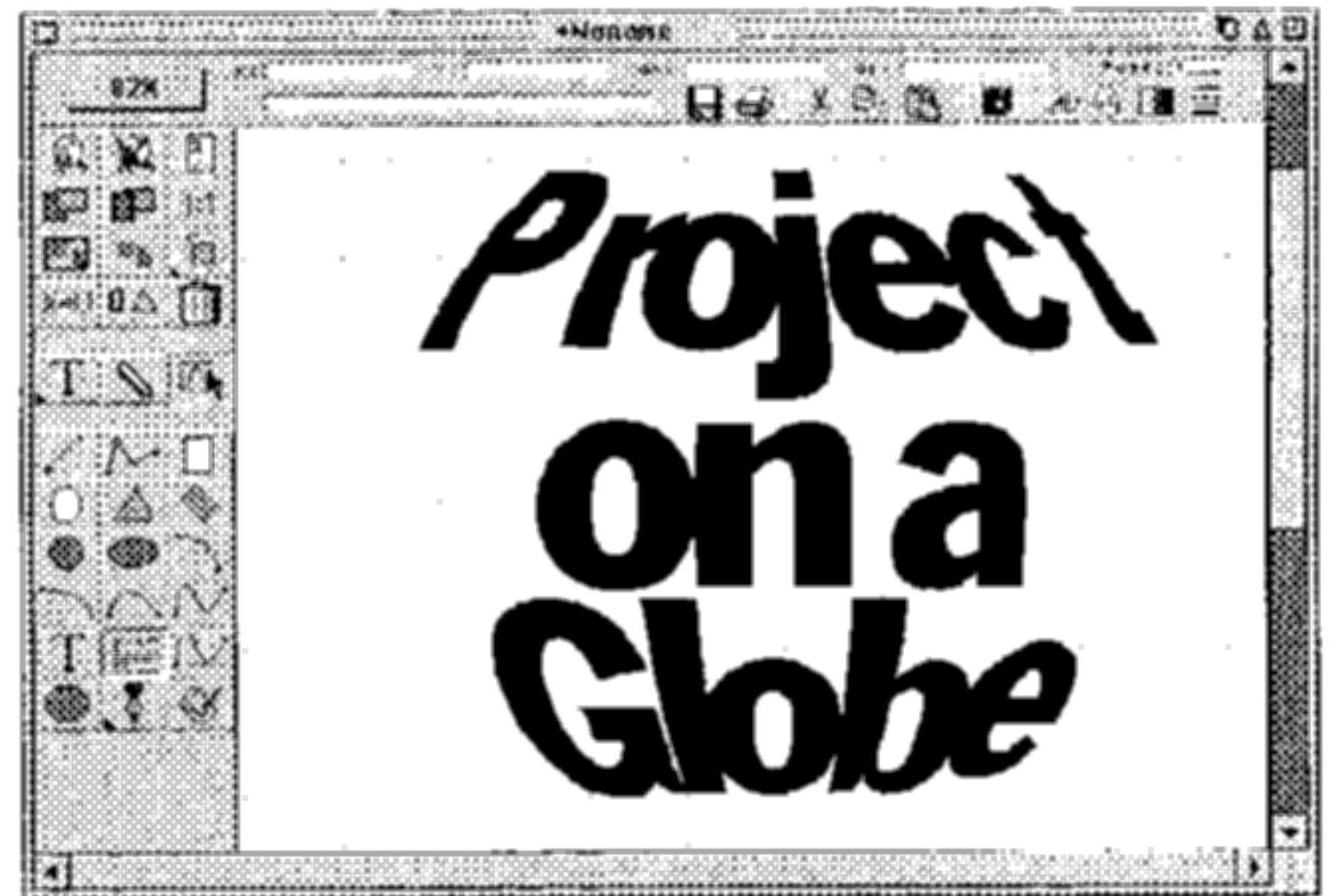
Choose **Object/Transform** and this time select the function **Y-mirror**, click **Accept** then choose the function **Rotate** with an angle of 90 degrees.





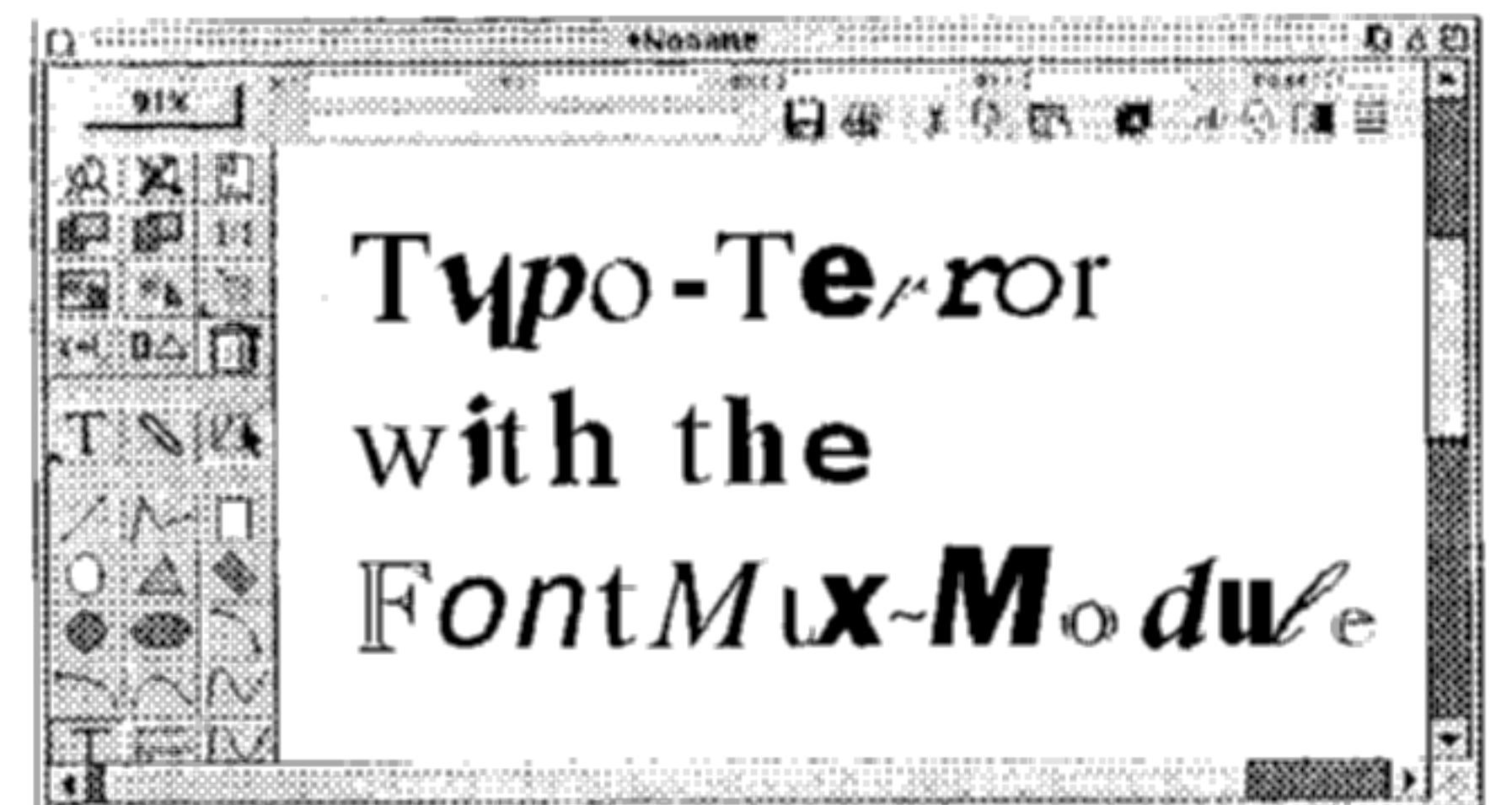
### Projection on to a globe

Use **Commute** to change some text (in a large point size) into Beziers. Use **Object/Ungroup** to split the text into single objects (letters). Make sure all the letters are selected and then choose **multi-line** so that the projection will look better. Group all the letters into one large object (**Object/Group**) and then select **Object/Transform** with the **Globe** function.



### Fontmix module

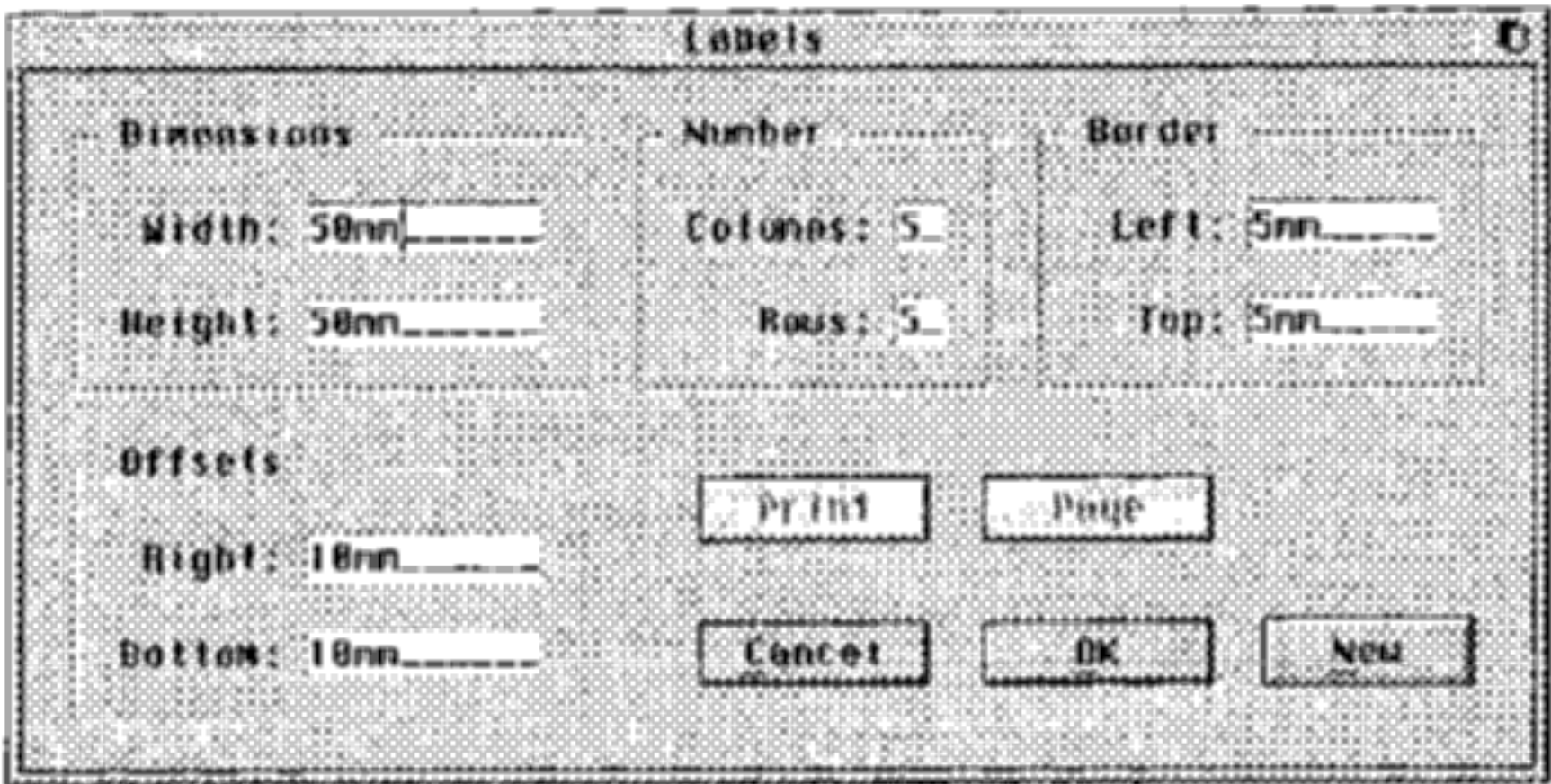
With the **Fontmix module** you can create the text effect on ransom and blackmail notes, where all the letters have been cut out of various publications and pasted into the note. Write the text in ArtWorx as a text object and then convert this into individual letters with **Object/Commute/Letters**. Next choose the **Fontmix module** from the **Transformation** dialog, this will cause every letter to be assigned a font at random.





Labels and business cards

A small example showing how to create visiting cards. Call the module **Labels** from the **Modules** menu.



Under **Dimensions** enter the width and height of the card, **Number** the number of rows and columns of cards on the page, **Border** the distance of the first card from the top, left of the page and **Offset** the distance between cards. When you have finished click **New**. This will open a new window with one card of the size specified visible. Add text and graphics as you wish to your card.  
N.B. if you save the single label then all its attributes border, number etc. are saved with it.



Now call the **Label** module again, and click on the button **Page**. A new ArtWorx document will be created filled with labels.





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**Index A: Glossary**

- **ASSIGN.SYS:** file which contains the names of all the GDOS device drivers and the device fonts.
- **Bézier curves:** mathematical definition of curves, each curves has two nodes with which you can alter the shape of the curve. Many graphics programs use béziers. Another variation on the bézier is the spline curve.
- **Drag&Drop:** a protocol for program intercommunication, allows data from one program to be dragged into the window of another program, where it is inserted. ArtWorx can only accept files that it supports.
- **GDOS:** the part of the operating system that allows printing to various printers without each program having to have its own special printer driver for that printer. A recommended GDOS is NVDI, which has fast Speedo and TrueType vector font support.
- **GEM:** part of the operation system which manages the graphic user interface. This is split into the AES for regular program management and the VDI for the graphics output.
- **GEM Clipboard:** a folder on the hard drive (usually **C:\CLIPBRD**) which is used by many programs for the exchange of data. A program can copy data into this folder and another may then load this data for further editing.
- **GEM Image:** the standard format for saving bitmap graphics on the Atari. The original specification did not allow the palette to be saved in the file, but the XIMG extension to this format makes this possible.
- **GEM Metafile:** a standard vector format for the exchange of data between programs. When exporting metafiles some types of information may be lost e.g. frame text cannot be exported as frame text in a GEM metafile, but will be converted to single lines of text.
- **MagiC:** an alternative operating system for Atari computers, allows multitasking and is also available as MagiCMac on Apple Macintosh computers.
- **NVDI:** a faster alternative to the original VDI, which has its own inbuilt GDOS and in the latest versions support for vector fonts.
- **Pexec:** operating system call, which allows other programs to be started. It



is the most inflexible of the methods by which you can call an external editor from within ArtWorx.

- **TOS:** operating system for Atari ST/TT/Falcon computers.
- **VA\_START:** part of a protocol for interprogram communication, which makes it possible to ask other programs to open a file. ArtWorx itself understands these messages and can use them to ask an external editor to for example load frame text for further editing.
- **VDI:** part of the atari operating system, used for graphics output to the screen. Together with GDOS other output devices can also be addressed.



## Index B: Mouse and keyboard overview

### Keyboard shortcuts

Pressing the **Help** key calls the help window as long as the Help module has been installed.

The **Tab** key calls the dialog **File info** if no objects are selected, if an object is selected the the dialog **Object info** is called.

The **+** and **-** keys operate the zoom and work in the same way as a click on the enlarge and reduce icons.

**Control** together with cursor up/down allows you to change between different document pages. Page up/down works in the same way under MagiCMac.

### Keyboard shortcuts for menu items

Most menu items have a keyboard shortcut as an alternative. The keyboard shortcut is shown after each menu entry. A single character shows that this entry can be called by pressing just that key, it does not matter whether you use lower or uppercase. If there is a **^** before the letter then you must press the **Control** key in combination with that letter. A **<P9A.IMG>** before the letter means press the **Alternate** key at the same time as the letter. There are a couple of other keys to be found in the menus, **DEL** for the **delete** key, **BS** for the **backspace** key and **Help** for the **help** key.

### Keyboard shortcuts in dialogs

As well as the normal keyboard functions you would expect in GEM dialog boxes, ArtWorx allows you to press the **Alternate** key in conjunction with the underlined letter for the item you want in the dialog box. Also the **Undo** key will operate the **Cancel** button.

### Keyboard shortcuts in the drawing window

The cursor keys allow you to scroll in the window in the same way as the scroll arrows on the window edge. If the **Shift** key is pressed at the same time then it is possible to scroll a page at a time (as if you had clicked on the scrollbar background).

**Clr/Home** takes you to the beginning of a drawing, and **Shift/Clr/Home** takes you to the end. **Esc** causes the document window to be redrawn.



### Mouse operation - in dialog windows

- Single click: selection of buttons, as under GEM.
- Double click: a double click on a non-modal dialog brings the dialog to the fore.

### Mouse - in drawing windows

*When drawing:*

When drawing, holding down the Control and the Alternate key allows drawing only in the horizontal or vertical direction.

*Left click:*

- On an object: the object is selected, all other objects are deselected. If several objects are on top of each other, keep clicking until the required object is selected. If the left mouse button is clicked and held depressed then the object can be moved, but if the **Shift** key is pressed a copy of the object is created and this copy can be moved.
- On the drawing canvas: if no object is under the mouse pointer then all objects are deselected.
- If the left mouse button is clicked and held depressed, and there are no objects under the mouse pointer then a selection box can be drawn. All objects within this box will then be selected.
- Together with the **Alternate** key: all objects are deselected, even those under the cursor. If the mouse button is kept depressed then it is possible to then draw a selection box, and all the objects within the box will then be selected.
- On an object-handle: resize the object.
- On an object-handle together with the **Control** key: rotate the object.
- On an object-handle together with the **Shift** key: distort the object.
- On an object-handle together with the **Shift+Control** keys: curvilinear distort of the object.
- When drawing: sets points, lines etc.



*Right click:*

- In selection mode: return to the drawing mode.
- In drawing mode: return to the selection mode.
- In edit mode: return to selection mode.
- When drawing: abort the action.
- In dialogs: background operation of non-modal dialogs under a non-multitasking TOS.

**Index C: Questions and Answers**

*When I click on **Object/Commute** nothing happens.*

You cannot use Commute on a grouped object, it works only on individual objects. Select the menu item **Ungroup** with the group selected, and then use the command on those objects you wish to change.

*How can I import drawings into Signum?*

Signum cannot read either **CWG** or **GEM** files, but by using an extra module, you can output (even in colour) pictures in the CDI bitmap format used by Signum. It will not be possible to edit these pictures again in ArtWorx.

*How can I see a bitmap picture at its original size?*

Choose the Picture toolbox and click on the printer icon then on the bitmap. If the picture is now too small use **Object/Transform** to **scale** the picture, and set the **x** and **y factors** to **2**. Click on **Apply** to double the size of the picture until the picture is the size you want.

*How can I draw a line starting in the centre of a circle?*

Press the **alternate** key when setting the start point of the line, then release the key and set the end point where you want it. This will cause the start point of the line to snap to the centre point of the circle.



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