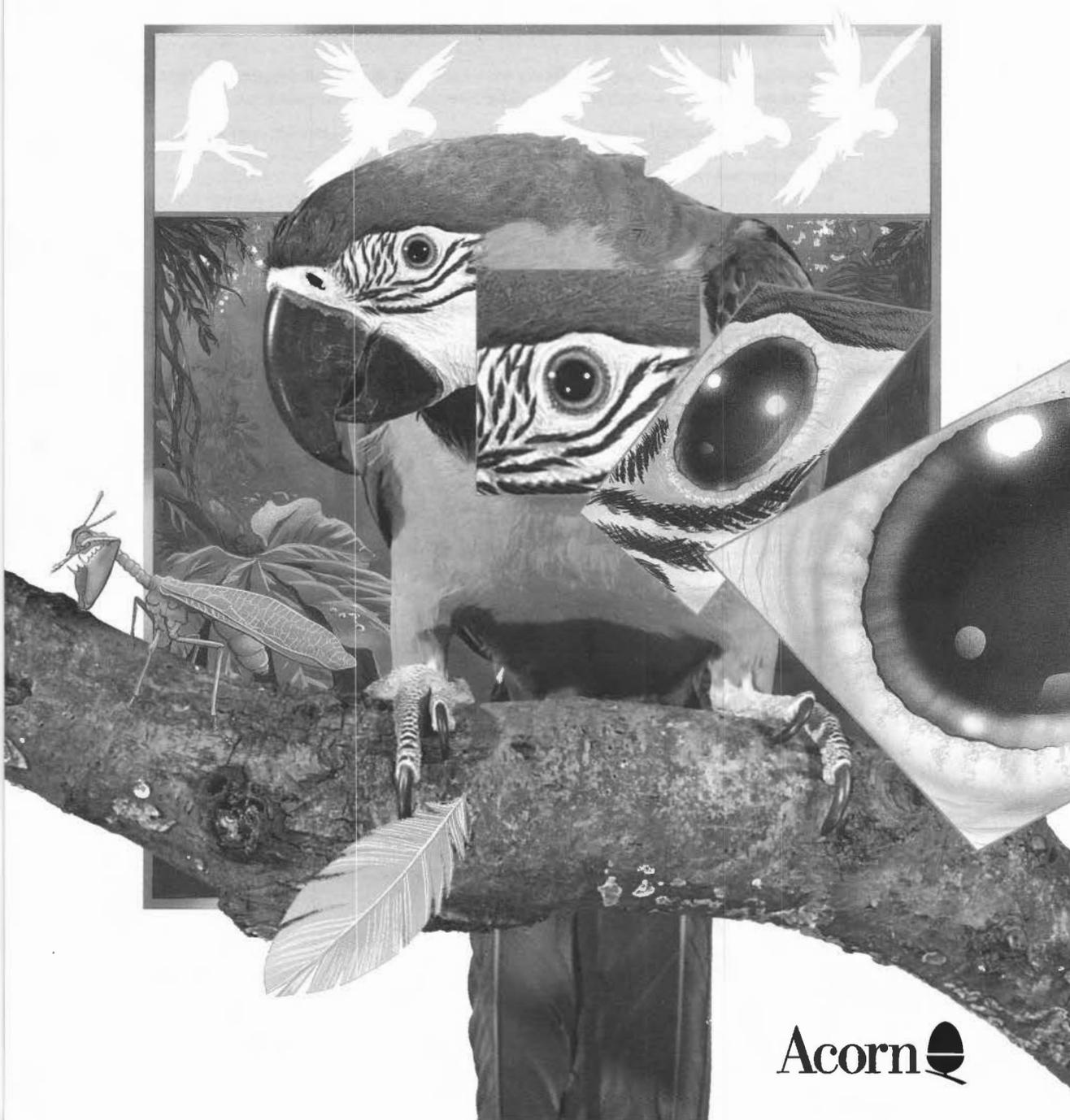


# RISC OS 3 User Guide



Acorn 

# RISC OS 3 User Guide



Acorn 

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Published by Acorn Computers Limited

ISBN 1 85250 163 4

Part number I403,110

Issue 1, March 1995

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# Introduction

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This guide, in conjunction with your *Welcome Guide*, describes the RISC OS 3 operating system.

If you are new to your computer, you should first read the *Welcome Guide*, which tells you how to set it up and start using it. This guide sometimes assumes your computer has a hard disc. If you're using a network machine, your network administrator or IT coordinator will help you out.

## About this guide

If you have read the *Welcome Guide*, you should already have a working knowledge of the desktop. This guide builds on that knowledge.

*Part 1: Managing the desktop* starts out by recapping on what you learnt in the *Welcome Guide*, and tells you more about manipulating files, directories and applications. It shows you how to use the Filer and the Pinboard, and how to select the colours and resolutions used on the desktop. There's information on changing the way the desktop behaves and changing the start-up procedure so that the most frequently-used applications are started automatically. There's also help if things go wrong. Finally there's a description of ADFS, Networks and other filing systems.

*Part 2: Printing* shows you how to set up your printer correctly, and how to configure your printer to make the most of the computer's capabilities.

*Part 3: RISC OS applications* introduces you to the applications supplied with your computer, and describes how to use different colours and fonts. It gives tutorial information on how to use the painting, drawing and editing applications, and follows this with detailed reference material about all the other RISC OS applications (with the exception of those concerned with printing, dealt with in *Part 2*).

The *Appendices* tell you about the Command Line Interface. This provides you with an additional way of communicating with the computer, one which programmers and experienced users will find especially useful. They also contain reference material on subjects such as BBC BASIC, file-types, character sets and error messages.

At the end you'll find the *End-user licence conditions* and *Index*. There's also a *Reader's Comment Form* to return with your comments or suggestions for this guide.

## The RISC OS operating system

RISC OS stands for **R**educed **I**nstruction **S**et **C**omputer **O**perating **S**ystem. RISC OS consists of three layers:

- The *core* contains the programs that actually make the computer work.
- The *command line interface* is a text-based interface used to write programs and scripts. Most people never need to use the command line.
- The outermost layer is the *desktop*. This manual is mostly about the desktop, which uses icons to represent files, directories and applications, and runs applications in windows. You can have many windows on the screen at once.

RISC OS allows you to load an application from a disc, for example, and then determines how that program is run, using your input from the mouse and keyboard. When you've finished, it lets you save your work back to a disc, in a file.

## Conventions used in this manual

The following conventions are used in this guide:

### Mouse techniques

Usually, you'll perform the following techniques with the Select (lefthand) mouse button, unless instructed otherwise in the text:

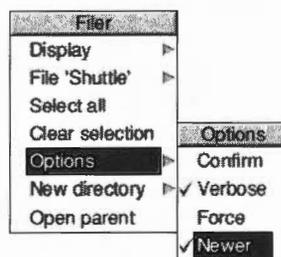
- *clicking* – pressing a button just once and then releasing it immediately.
- *double-clicking* – pressing and releasing twice in quick succession. This is most commonly used to load an application.
- *dragging* – moving an object from one place to another whilst holding down the Select (or Adjust) button.

Often, you'll be told to *Press Menu over* an object. This means move the pointer over the object and press the Menu button.

Menu names and options are shown in bold type. The path you need to take through a series of submenus to reach an option is described like this:

'Choose **File**/**Options**/**Newer**' means:

'Press Menu to display the **File** menu and choose **Newer** from the **Options** submenu'



## Other conventions

- Often you'll be told to 'press Return' (to enter a command, or confirm an action). This is the key marked with the following symbol: ↵
- The Shift key is marked with this symbol: ⇧
- Sometimes you will need to press one key while holding down another. For example, 'Press Ctrl-F9' means hold down the Control (Ctrl) key and press the function key F9.

## Important tips

Before using your computer, you should read the *Guidelines for safe operation* printed near the front of your *Welcome Guide*.

## Freeing up more disc space

If you require more hard disc space, you can free up space by deleting directories that you don't often use, such as the Video, Images and Sound directories. Before deleting them, you should always take a backup of any files, directories or applications that you may wish to keep (see *Backing up hard discs* on page 75). The *Welcome Guide* shows you how to delete files and directories.

## Unexpected behaviour

If your computer starts behaving unexpectedly, or doesn't do anything at all, see *If things go wrong* in the *Welcome Guide*. This has solutions to most common problems.

### If the screen goes blank

If your screen goes blank while you are not using it, it's probably because the screenblinker has automatically switched off the display to save electricity and wear on the screen. You can restore the display by moving the mouse or pressing any key on the keyboard (e.g. the Shift key).

### Getting out of a mess (resetting the computer)

Sometimes your computer will 'hang up' – where pressing a key or mouse button has no effect. You can normally cure this by resetting the computer. To do this, first try pressing Alt-Break or, if that fails, Ctrl-Break. If this fails, press the Reset button. Your *Welcome Guide* shows you where this is. Alternatively, turn the computer off, wait a short while (30 seconds) and turn on again. When you reset the computer, any unsaved data is lost. For more information about resetting your computer refer to *Troubleshooting* on page 65.

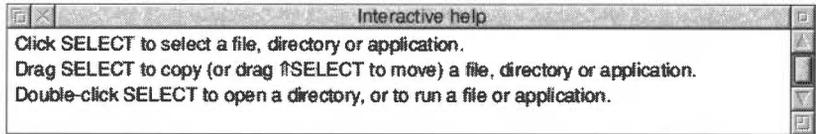
## Getting help

### The !Help application



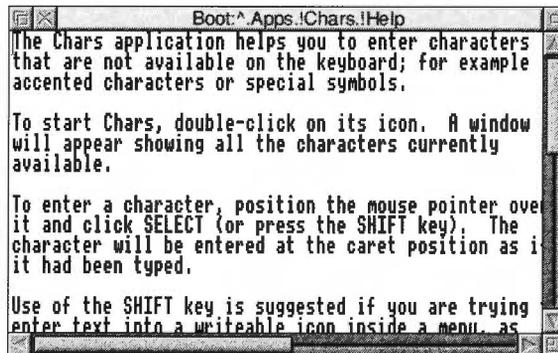
The !Help application provides on-screen information as you use your computer. You can use this to get help on the desktop and most applications. For information refer to *Help* on page 333.

This is what a typical help message looks like:



### The Help option on the Filer menu

You can get help on some applications by clicking Menu over an application's icon in a directory display and choosing **App./Help**. For example, here is the help text for the !Chars application (for more information, see *Information and help* on page 13).



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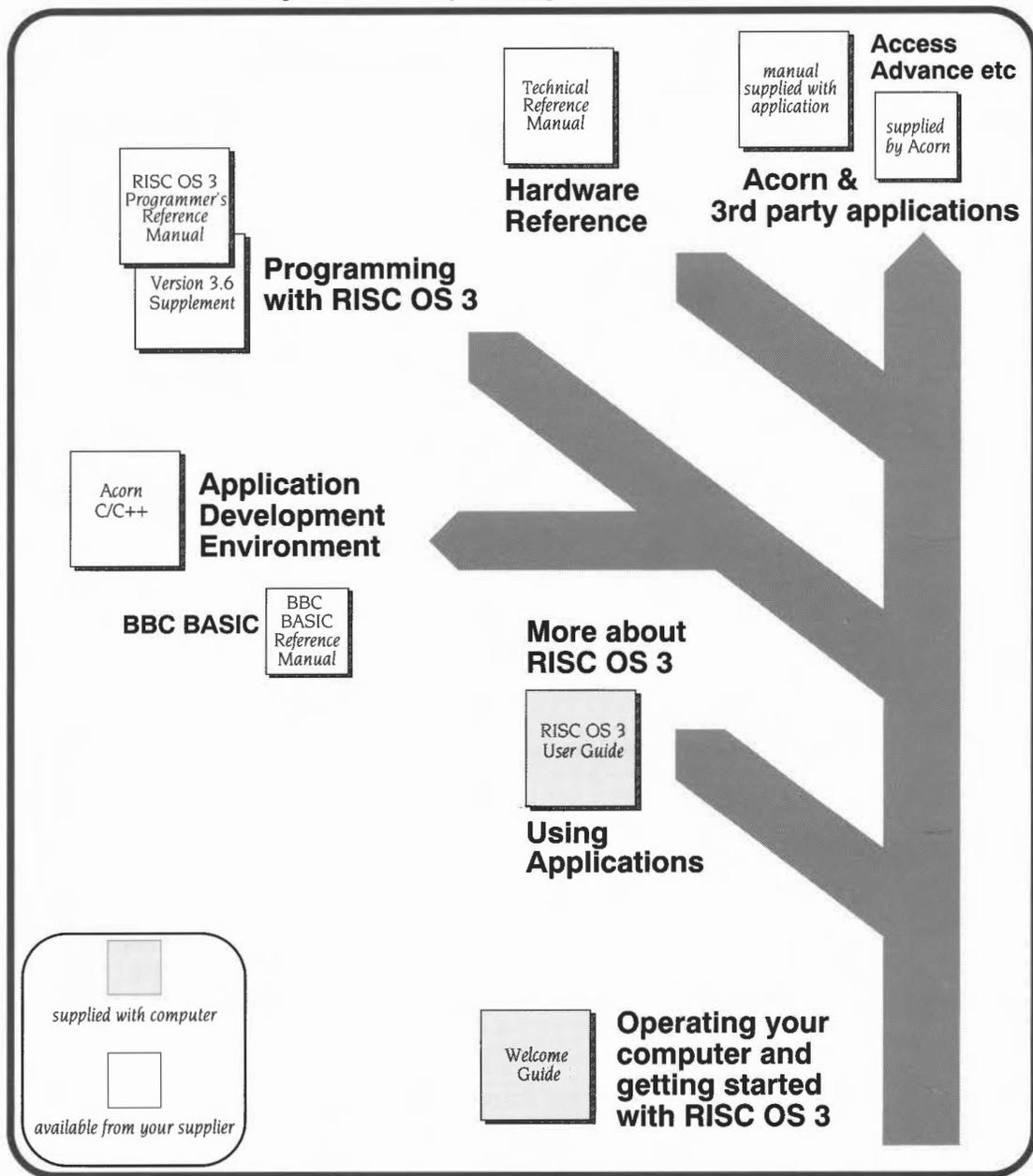
## Additional products and documentation

Your supplier should have the following Acorn products available:

<i>Acorn Product directory</i>	This lists most of the general purpose software and hardware available.
<i>Acorn Education directory</i>	This lists most of the software and hardware specifically produced for schools and colleges.
<i>BBC BASIC Reference Manual</i>	A reference manual for BBC BASIC V and VI.  The BBC BASIC programming language is provided with RISC OS. If you plan to write BASIC programs on your Acorn computer, you will find the <i>BBC BASIC Reference Manual</i> invaluable.
<i>RISC OS 3 Programmer's Reference Manual</i>	A four-volume reference manual for the RISC OS 3 operating system. Essential reading for all serious RISC OS programmers. This set also includes the <i>RISC OS Style Guide</i> . This sets out any user interface design guidelines you should follow.
<i>RISC OS 3 Programmer's Reference Manual Volume 5a – Supplement for Versions 3.5 and 3.6</i>	A special programmer's supplement for the RISC OS 3, Version 3.6 operating system that is used in this computer.
<i>Technical Reference Manuals</i>	These are available for most RISC OS computers. They give the technical specifications of all interfaces used in the computer. These manuals are essential if you are developing hardware add-ons and enhancements for the computer.
<i>Acorn C/C++</i>	If you are developing desktop applications, you'll need Acorn's Application Development Environment. This contains Application Development software, along with the Desktop C, C++ and Desktop Assembler languages.

# Documentation roadmap

This roadmap shows you some of the tools and manuals that are available if you want to get more out of your computer.



# Part 1:

## Managing the desktop

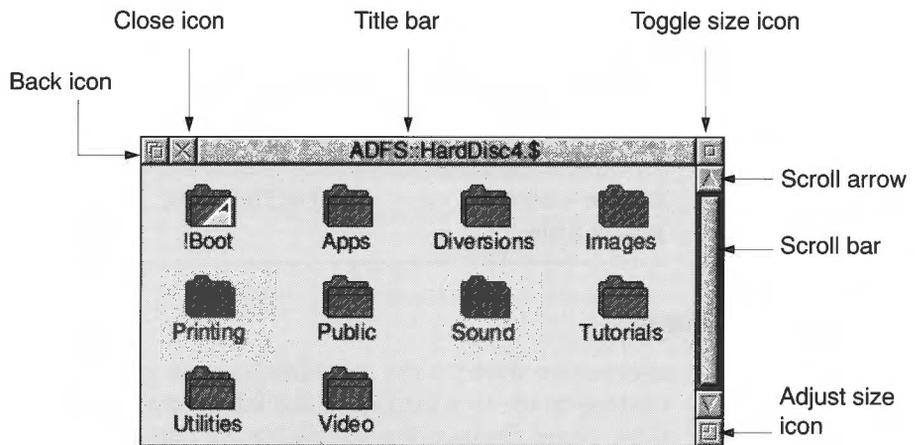


# 1 The desktop

The *Welcome Guide* provides an introduction to the desktop, and to the basic tasks of loading, saving, copying, moving and deleting files, etc. This chapter expands on the *Welcome Guide*, covering the desktop and Filer in much more detail.

## Manipulating windows

First, here's a reminder of how to use the various window icons:



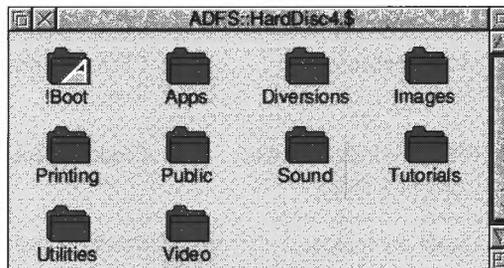
To	Do this	Notes
Move a window to the back of a stack	 Click on the Back icon.	
Bring a window to the front of a stack	Click on the Title bar.	You can also click on the Adjust size icon. 
Close a window	 Click on the Close icon.	Shift-click to iconise the window (see page 20).
Change a window's size	 Drag the Adjust size icon.	You can also click on the Toggle size icon. 

To	Do this	Notes
Bring the icon bar in front of a window	Press Shift-F12.	Toggles the icon bar in front/behind windows.
Move a window	Drag the Title bar.	Dragging with Select brings a window to the front. Dragging with Adjust maintains its position in a stack.
Scroll through a file step by step	 Click on a Scroll arrow.	Click either side of a Scroll bar for larger steps. Click Adjust to scroll in the opposite direction. 
Scroll through a file screen by screen	Click above or below the Slider.	Click Adjust to scroll in the opposite direction.
Display a different part of a file	Drag the Slider.	Drag Adjust to scroll horizontally <b>and</b> vertically.

## Directory displays



Information stored in the computer is shown on the screen in directory displays. Clicking on the icon for a particular information storage device (such as a disc drive) opens the root directory display for that device. For example, here's the root directory display for a hard disc:



The basic techniques used to move around the files and directories have already been introduced in the *Welcome Guide* in the chapter *Files and directories*. This section recaps on those techniques, and describes some more advanced operations.

## Opening and closing directory displays

Here's a summary of how to open and close directory displays on the desktop:

To	Do this	Notes
Open a directory display	 Double-click on the directory icon.	
Open a directory display without running internal files of applications	 Hold down Ctrl and double-click on the directory icon.	This speeds up the opening of large directories, and saves memory. Application icons are replaced by the generic RISC OS application icon. 
Open a subdirectory, and simultaneously close its parent	 Double-click Adjust on the subdirectory icon.	
Close a directory display and open its parent	 Click Adjust on the Close icon.	You can also press Menu over the directory display and click Adjust on <b>Filer/Open parent</b> . This option is not available from the root directory, or from the user root directory of a file server (in this case, use <b>Open \$</b> from the icon bar menu of the file server icon).
Open an application directory	 Shift double-click on the application directory icon.	This opens the application directory without actually running the application.
Bring an open directory display to the front	 Double-click on the icon for the directory.	You can Shift double-click to close any subdirectories.

To	Do this	Notes
Close a directory display	 Click on the Close icon.	You can also Shift double-click on the directory icon 
Close a directory display, leaving its icon on the pinboard	 Shift click on the Close icon.	See <i>Using the Pinboard</i> on page 20. 

**Note:** If a subdirectory is 'buried' too deeply in the overall directory structure, you may not be able to open it. See *Pathnames* on page 30.

## The Apps directory



When you click on the Apps icon on the icon bar you see a directory display containing some of the most frequently used Acorn applications (these are described in *Part 3: RISC OS applications* on page 153).



## Changing the sort order of files in a directory display

You can change the **order** in which objects are shown in directory displays:

To	Do this	Notes
Sort files in alphabetical order	Choose <b>File/Display/Sort by name.</b>	Files are sorted by name, in ascending alphabetical order.
Group files according to type	Choose <b>File/Display/Sort by type.</b>	Undated files appear first, then dated files in numerical order of file type, then applications, and finally directories.
Sort files according to size	Choose <b>File/Display/Sort by size.</b>	Files appear first, followed by applications then directories, sorted in descending order of size. (Directories are only in alphabetical order.)
Sort files in order of creation	Choose <b>File/Display/Sort by date.</b>	The most recent appear first.

The new sort order will be applied to any directory displays you open afterwards. This same format is also kept when you reboot or restart your computer.

## Selecting files and directories

Here's how to select or deselect icons in a directory display:

To	Do this	Notes
Select a single icon	 Click on it.	
Select a group of icons	  Click <b>Select</b> or <b>Adjust</b> on the first icon, and <b>Adjust</b> on each of the others in turn.	You can also drag a box round a group of icons. Use <b>Adjust</b> to deselect unwanted icons or to select additional icons. 
Select all icons in a directory display	 Press <b>Menu</b> , choose <b>Filer/Select all</b> .	There's more on the <b>Filer</b> menu on page 10.
Deselect an icon	 Click <b>Adjust</b> on it.	Useful for selecting many icons in a display: choose <b>Select all</b> then click <b>Adjust</b> on unwanted icons.
Deselect a group of icons	 Press <b>Menu</b> , choose <b>Filer/Clear selection</b> .	You can also click over a blank part of the directory display.

Once you've selected an icon, or a group of icons, you can perform various **Filer** operations on that selection. See *The File, Dir., App. or Selection submenu* on page 10.

## Creating a new directory

To create a new directory:

- 1 Open a directory display within which you want to create the new directory.
- 2 Press **Menu** and type the new directory name into the **New directory** writable icon.
- 3 Click on the name or press **Return** (↵).



A name must contain at least one, and at most ten, printing characters. The name must not contain a space or any of the following characters:

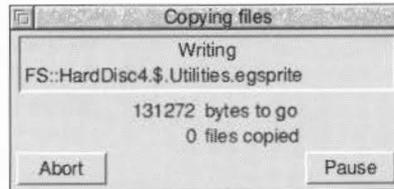
`$ & % @ \ ^ : . , # * " |`

## The Filer

The Filer is the part of the desktop that handles operations on files and directories, such as selecting, copying, deleting, moving and so on. This section tells you how to use the Filer to manipulate files and directories, and how you can modify its behaviour.

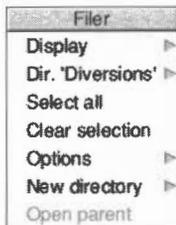
Filer operations normally run 'in the background', so that you can carry out other desktop activities while copying, searching, deleting and so on.

A typical background  
Filer copy operation



**Note:** If the computer is running out of memory (e.g. if you're running several applications) the Filer may not be able to continue in the background: It suspends other activities while it completes a task, and the normal message boxes are replaced by larger, simpler, windows.

### The Filer menu



Click Menu anywhere over a directory display to show the Filer menu.

Some operations when applied to a directory (such as copying and deleting) apply recursively to all objects within that directory. If any of those objects are themselves directories, the operation applies to their contents as well (and so on). Moving an application, for example, will move all of it: its directory and all its contents. So think, especially before you delete a directory!

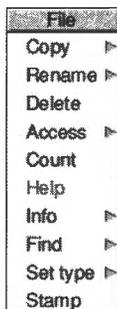
Although you can run several Filer operations simultaneously, you should not run more than one operation on the same file or directory at the same time. For example, don't copy or move files into a directory while at the same time deleting existing files from the same directory – you may lose files or data.

### The File, Dir., App. or Selection submenu

Once you've selected an icon or icons (see *Selecting files and directories* on page 9) you can use the Filer menu to perform various operations on your selection.

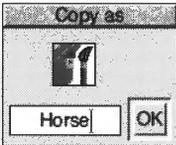
- If you select a directory icon, the **File** option changes to **Dir**.
- If you select an application icon, the **File** option changes to **App**.
- If you select more than one icon, the **File** option changes to **Selection**.

## Copying, moving and deleting files



You've seen how to open and close directory displays, select icons in a directory display, and how to control Filer menu operations. This section tells you how to manipulate your files, directories and applications using the Filer.

**Note:** For simplicity, this section refers to operations on a **File**, but most of the operations apply equally to a directory, an application, or a selection (see *The File, Dir., App. or Selection submenu* on page 10).

To	Do this	Notes
Copy a file	Drag the file's icon to the destination directory.	
Copy a file with a different name	Change the name in the <b>File/Copy/Copy as</b> writable menu box and click on <b>OK</b> .	To copy to a different directory, drag the <b>Copy as</b> icon to the destination directory display.
		
Move a file	Hold down Shift while dragging the file's icon to the destination directory.	This will copy the file and delete the original from the source directory.
Move a <b>large</b> selection from one floppy to another	<b>Copy</b> the selection then <b>Delete</b> the originals (see page 81).	You can also use a RAM disc (see page 89).
Rename a file	Type the new name in the <b>File/Rename/New name</b> writable menu box.	<p>Filenames can be one to ten characters long. They mustn't contain spaces or any of these characters:            \$ &amp; % @ \ ^ : . , # * "  </p> <p>Most filing systems are not case sensitive (the NFS filer <b>is</b> case sensitive, and filenames can exceed ten characters).</p>
		

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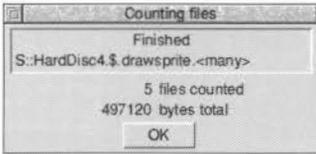
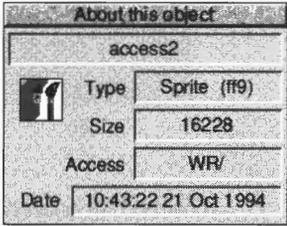
To	Do this	Notes
Rename a file on a DOS disc or partition	Type the new name in the <b>File/Rename/New name</b> writable menu box.	See <i>Filename limitations</i> on page 85.
Delete a file	Choose <b>File/Delete</b> .	You can't retrieve deleted files!
Delete a locked file	Choose <b>File/Access/Unprotected</b> before deleting the file.	You can override all file locks permanently by choosing <b>Options/Force</b> . Always turn this option off after you've used it; see page 28.

---

**Note:** When copying files to a 'Full info' directory display, you'll see blank icons appear with the word 'DEADDEAD' displayed on the line. When the file copying completes, these words and the blank icon are replaced by the filename and icon.

## Information and help

You can use the Filer menu to find out more information about your selection, or get help on an application:

To	Do this	Notes
Find the total size of a file or selection	Choose <b>File/Count</b> to see the number of files and their total size. 	There are 1024 bytes in a kilobyte and 1024 kilobytes in a megabyte. A 1.6MB format disc doesn't hold 1.6 × 1024 kilobytes: it actually holds 1600 kilobytes.
See information about a file	Choose <b>File/Info</b> . 	This displays the file type, size, access details and date last modified – information similar to that shown when you choose <b>Display/Full Info</b> (see page 7).
Get help on an application	Select the application and choose <b>App./Help</b> . Not all applications support this.	You can also use the !Help application – see page 333.

## Desktop colour and resolution



You can change the number of colours displayed, and the size of the desktop, using the Display manager. The Display manager icon is on the righthand side of the icon bar, next to the Task manager (see page 57).

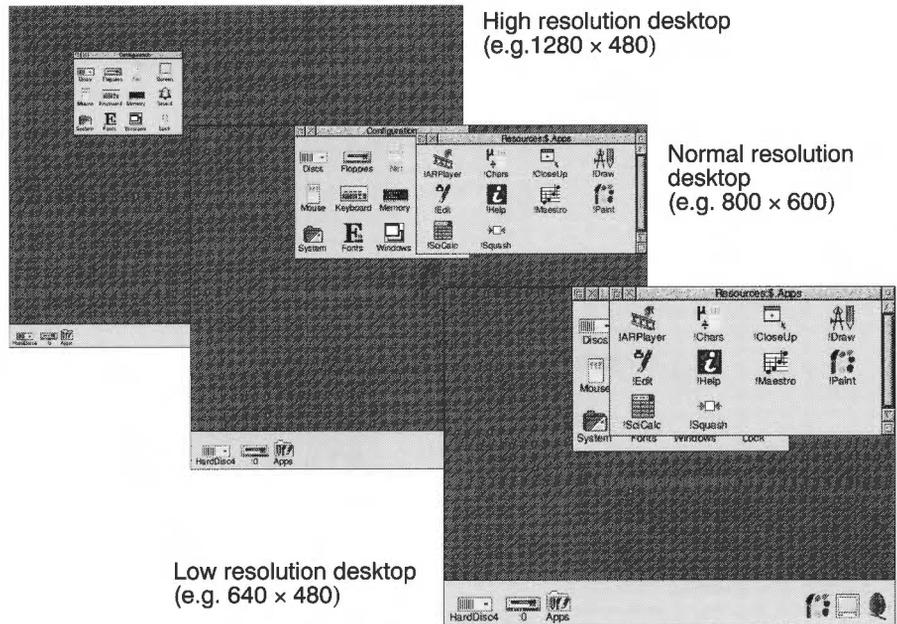
The 'resolution' is amount of information displayed on the computer screen:

- The higher the resolution, the more information on the screen, so the better the displayed quality of the applications and pictures on your computer.
- The higher the resolution, the more of an application or picture that can be viewed in the same screen space.

(Don't confuse resolution with the dot pitch of the monitor, which is fixed.)

The desktop itself only uses up to 16 colours, so you won't notice an immediate difference in appearance if you change to a 256-colour display (or greater). However you will see a difference if you display a sprite picture that uses many colours, or use an application such as !Draw that allows you to use many colours.

The following pictures show the same desktop at different resolutions:



## How colour and resolution interact

As you experiment with the Display manager, you'll find that you can only display certain combinations of colours and resolutions. These combinations are limited by the computer, the amount of video memory (if any) it contains and the capabilities of your monitor (defined in !Boot – see *Screen* on page 36).

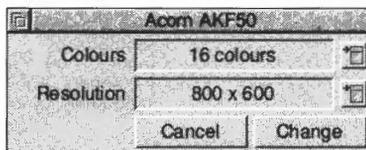
The Display manager assumes that the most recent change you make is the most important. If you choose a higher resolution, the Display manager may have to reduce the number of colours correspondingly. If this happens, it will try to pick the maximum number of colours possible at that resolution.

Similarly, if you choose a large number of colours, the Display manager may have to reduce the resolution at which it can display these colours. If this happens, it finds the highest resolution at which this number of colours is possible. The Display manager does not always pick the optimum resolution and you may have to change to a more appropriate resolution for the desktop.

## Changing the desktop display characteristics



Clicking on the Display manager icon on the icon bar shows the Screen display window, which you use to change the resolution and the number of colours for the current session. The information shown in the window gives the current settings of the desktop:



To	Do this	Notes
Change the number of colours or greyscales used in the desktop display	 Click on the <b>Colours</b> menu icon, choose a number from the list and click on <b>Change</b> . <div data-bbox="738 749 886 1004" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center; background-color: #cccccc;">Colours</p> <ul style="list-style-type: none"> <li>Black/white</li> <li>4 greys</li> <li>16 greys</li> <li><input checked="" type="checkbox"/> 16 colours</li> <li>256 greys</li> <li>256 colours</li> <li>32 thousand</li> <li>16 million</li> </ul> </div>	To see any difference for more than 16 colours, you'll need to run an application or display a picture that takes advantage of the higher number of colours available.
Change the resolution	 Click on the <b>Resolution</b> menu icon, choose the resolution you want and click on <b>Change</b> . <div data-bbox="742 1176 881 1359" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center; background-color: #cccccc;">Resolution</p> <ul style="list-style-type: none"> <li>1280 x 480</li> <li>1600 x 600</li> <li>-----</li> <li>480 x 352</li> <li>640 x 480</li> <li><input checked="" type="checkbox"/> 800 x 600</li> </ul> </div>	The resolutions you can select depend on the type of monitor you are using. The monitor type is defined in the Screen configuration menu (see page 36).

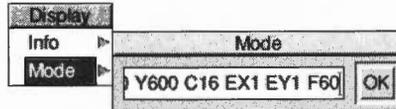
**Note:** Every time you switch on, the display will revert to the permanent settings defined in !Boot (see *Screen* on page 36). The Display manager only changes the screen for the current session.

## Advanced display options

Normally you won't need to use the information given in this section.

### Mode string

The mode string defines the current screen display mode:



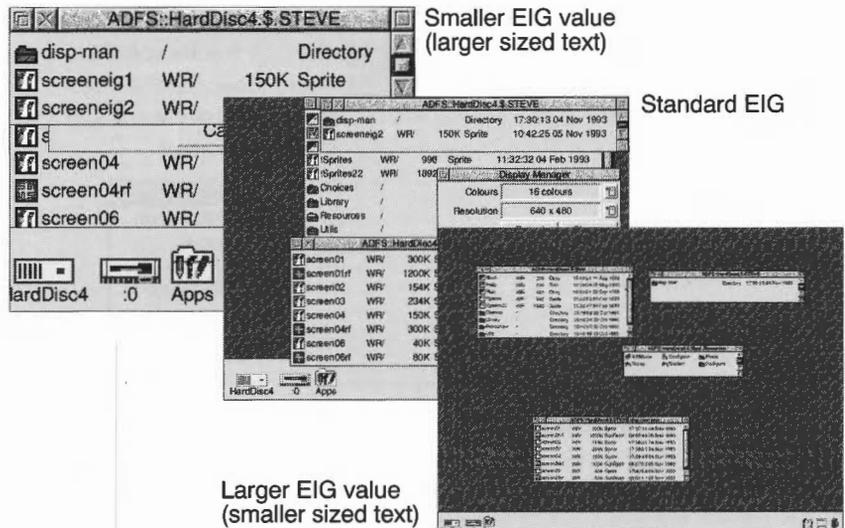
The mode string is made up of

- X horizontal resolution
- Y vertical resolution
- C number of colours
- G number of greyscales (16 or 256)
- EX horizontal EIG value
- EY vertical EIG value
- F frame rate (optional)

You can change the EIG values to change the size of the desktop, or you can replace the whole string by an old type mode number (see page 17).

### Changing the desktop size without changing the resolution

You can use the EIG factor to change the apparent size of the desktop, making everything displayed on the desktop smaller or larger than it should be:

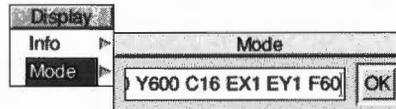


EIG stands for External-to-Internal Graphics. The EIG factor works as follows:

- 0 = larger than normal
- 1 = normal size
- 2 = smaller than normal size
- 3 = even smaller

Making everything larger can be useful if you want over-large text on the desktop. Making everything smaller allows you to fit more on the desktop, but reduces the definition of the desktop (less pixels are used to display the same information).

- 1 Click Menu over the Display manager and move to the **Mode** dialogue box.

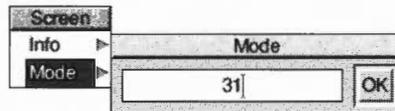


- 2 Move the cursor to the mode string and change the **EX** and **EY** EIG values. For example, to make the size of the desktop smaller, change  
`X640 Y480 C16 EX1 EY1 F73`  
to  
`X640 Y480 C16 EX2 EY2 F73`
- 3 Click on **OK** for the new EIG values to take effect.

**Notes:** The EIG values are changed back to their default values whenever you use the Display manager to change display modes. Some of the more extreme EIG values may not work with all applications.

### Using old type mode numbers

You can still display screen modes using the mode numbers associated with RISC OS 3 version 3.1 and earlier by typing the mode number directly into the mode box on the icon bar:



A list of old type RISC OS 3 version 3.1 screen modes appears in *Old-type screen modes* on page 425. Some of these modes may not be available on your monitor.

**Note:** If your monitor cannot display a given mode, the display manager will automatically choose a mode with the same number of colours. If the mode is supported by your hardware but not the desktop, you'll see an error message.

## Display characteristics

### Square pixel modes

Square pixel modes are the most useful for everyday use; they maintain the correct proportions of images on the desktop. The main square pixel modes are

- 640 × 480
- 800 × 600
- 1024 × 768
- 1280 × 1024.

(Your system may not be able to display all of these).

### Rectangular pixel modes

Rectangular modes do not maintain the correct proportions of the desktop. Some examples of these are

- 640 × 352
- 1056 × 256.

## Changing the amount of Video RAM

**Note:** Not all RISC OS computers can use VRAM.

When you change the amount of VRAM in your computer, the defaults you have set with the **!Boot/Screen** configuration window may need changing (see page 36).

VRAM upgrade kits, together with full instructions on how to perform the upgrade, are available from your supplier for certain Acorn models. Your *Welcome Guide* will tell you whether you can install VRAM in your computer.

## The Pinboard

This section shows you another useful part of the Filer: the **Pinboard**. The Pinboard adds another dimension to the desktop and the Filer. For example, you can

- pin file, directory and application icons to the Pinboard, to save having lots of directory displays open
- double-click on these pinned items to activate them just as you would if they were in a directory display
- move files around on the Pinboard
- display a picture on the background (a backdrop)
- shrink application windows and directory displays to icons to save space on the desktop.

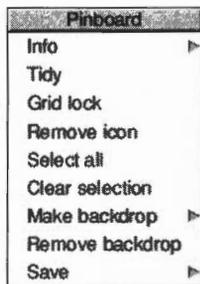


## Using the Pinboard

This section shows you how to use the Pinboard. The techniques you'll need are much the same as those used in normal file operations.

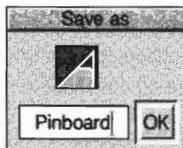
To	Do this	Notes
Pin an icon to the Pinboard	 Drag the icon from a directory display and drop it on the background (not the icon bar).	You can pin icons for files, directories and applications. Drag icons to reposition them.   
Open a directory display from a pinned directory icon	 Double-click on the pinned directory icon.	The pinned icon will stay on the pinboard.
Start an application from its pinned icon	 Double-click on the pinned application icon.	
Load a file from its pinned icon	 Double-click on the pinned file icon.	This also starts the application, if it's been seen by the filer.
Select a group of icons on the pinboard	 Click each icon with Adjust, or drag a selection box around them all.	You can also use <b>Pinboard/Select all</b> . See page 21.
Copy a selection from the Pinboard to an open directory display	Drag and drop the selection onto the destination directory display.	Your selection can include icons from different parent directories. You can't <b>move</b> files from the Pinboard to a directory display.
Iconise (close) an open directory display or active application window to an icon on the Pinboard	 Hold down Shift and click on the Close icon.	This saves cluttering the desktop with open windows. When you reopen an iconised window, the icon disappears from the Pinboard.  

## Pinboard menu options

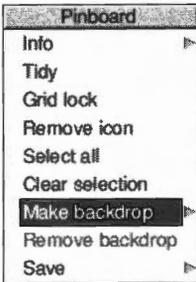


Like the Filer, the Pinboard is controlled by a menu. To display the menu options, press Menu anywhere over the desktop background. To see the options available for a particular icon on the background, select the icon and press Menu (or press Menu over the icon when there is no other selection).

To	Do this	Notes
Arrange icons neatly on the Pinboard	Choose <b>Tidy</b> .	This doesn't tidy iconised application windows. Changing screen display resolution may cause icons to disappear off the edge of the screen; <b>Tidy</b> brings them back.
Lock icons onto an invisible grid on the Pinboard	Choose <b>Grid lock</b> .	Ensures icons don't overlap each other. This option doesn't Grid lock iconised application windows.
Remove an icon or selection from the Pinboard	Select the icon and choose <b>Remove icon</b> or <b>Remove selection</b> .	This doesn't actually delete files. It simply removes icons from the Pinboard.
Remove an iconised window	Double-click on the icon to open the window, then click on its Close icon.	
Select all icons on the Pinboard	Choose <b>Select all</b> .	Choose <b>Clear selection</b> to de-select icons.
Use a sprite as a backdrop picture		See page 22.
Save the current Pinboard layout	Use the <b>Save/Save as</b> box.	Double-clicking on this file restores Pinboard to its saved state. You can't save information about iconised application windows. See also page 403.

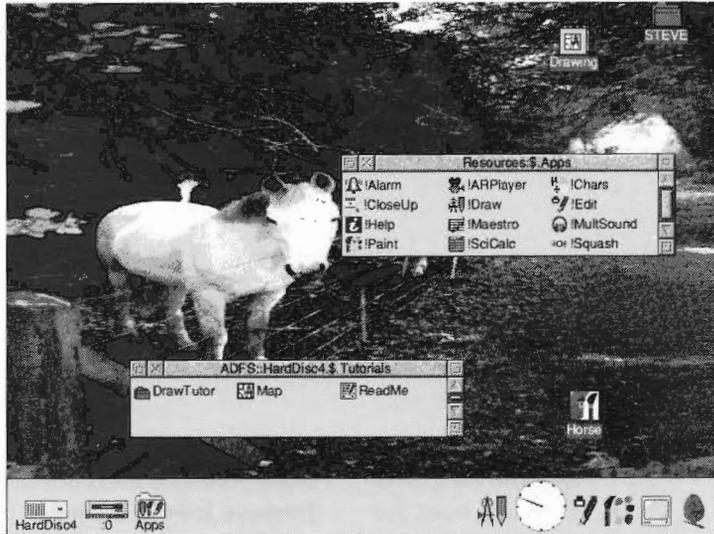


## Using backdrop pictures

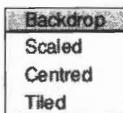


You can display any sprite file (see *Paint* on page 263) as a backdrop picture on the desktop. For best results, use a screen mode that can display at least the same number of colours as there are in the backdrop picture.

To display a picture, drag the sprite file icon onto the background. Click Menu over it and choose **Make backdrop**.



This scales the sprite to fit the whole screen, and may result in a distorted backdrop (as the proportions of the original picture are not maintained).



**Make backdrop** also has a submenu for finer control of backdrop pictures:

- **Scaled** has the same effect as **Make backdrop**: the sprite is scaled to fill the whole screen.
- **Centred** has the effect of centring a sprite on the background. The desktop maintains the correct proportions of the sprite (this may leave grey space around the edges of your backdrop picture).
- **Tiled** makes multiple copies of the sprite and tiles them so that the backdrop fills your screen.

**Note:** Each time you use the Display manager to change the resolution or colours used by the desktop, the original sprite is read again. This may take some time if the sprite is stored on floppy disc, so it's best to store it on your hard disc.

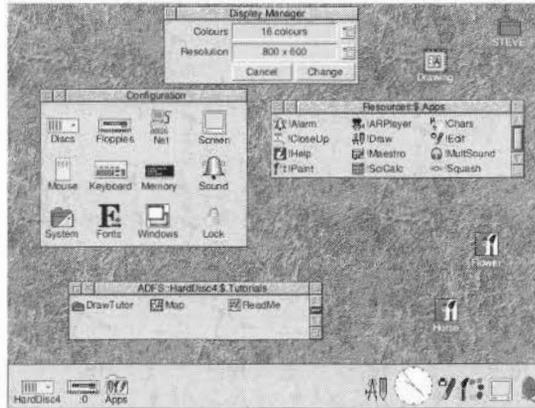
If you're creating a sprite to use as a tiled backdrop, make sure the sprite does **not** have a palette (using the **Paint/Edit/Palette** menu option – see page 283).

## Removing a backdrop

You can remove a backdrop picture by choosing **Remove backdrop**. This does not delete any files, or remove any icons from the backdrop.

## Textured desktop backdrops

The computer contains a number of textured desktop backdrops. You can change these using the **Screen** configuration window of !Boot; see page 36 for more information. The following picture shows a marbled backdrop being used with marbled window backgrounds.



**Note:** If you save a Desktop boot file that loads one of your own sprites as a backdrop automatically, you must set the Background texture to **None** in the Screen configuration window of !Boot (see page 36 and page 51).

## Iconised application menu options

Hold down Shift and press Menu over an iconised application window to display the **application** menu for that window (instead of the usual Pinboard menu):



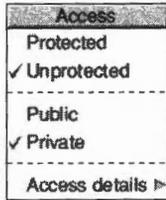
This can be useful if you want to save a file without actually opening its window.

## Advanced Filer operations

This section describes some of the more advanced Filer operations.

### Setting file access permissions

A file's access permission settings define who is permitted to read it, write to it or delete it.

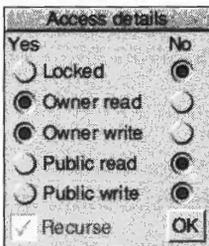


#### Using the File/Access submenu

To	Do this	Notes
Allow a file to be read and altered only by <b>you</b>	Choose <b>Access/Private</b> and <b>Access/Unprotected</b> .	This is the default setting.
Allow a file to be read but not altered by <b>anyone</b> on a network (including you)	Choose <b>Access/Public</b> and <b>Access/Protected</b> .	This is a good way of protecting finished files. The <b>Force</b> option (see page 28) overrides this.

If you change the access to a directory, all the files in the directory are affected.

#### Using the File/Access/Access details submenu



Most of the time you'll use the simple method above to set access permissions. However, you can also set access using the **Access/Access details** dialogue box:

- **Locked** – the file cannot be deleted (off by default). You can override this with **Force** (see page 28).
- **Owner read** – the file's owner can read it (on by default).
- **Owner write** – the file's owner can write to it (on by default).
- **Public read** – other network users can load your files or run an application in your network space (off by default).
- **Public write** – other network users can write to the file (off by default).

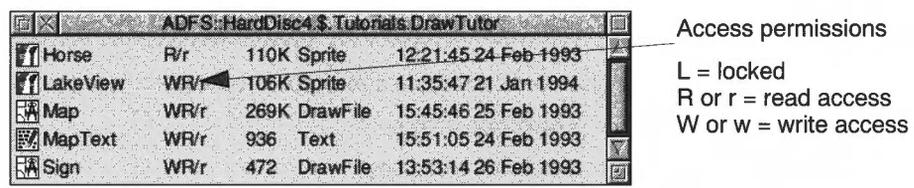
To apply access permissions recursively to the contents of a directory, switch the **Recuse** option on (this only works with applications and directories).

If you use a Level 4 Fileserver, take care when you set directories on it to **Locked**: this may make these directories invisible to other users on the network.

### How to identify file access permissions

There are several ways to find out the access permissions for a file.

- You can display the **Access/Access details** dialogue box.
- You can display the files using the **Display/Full info** menu option.

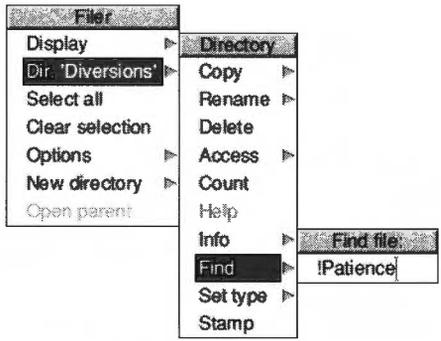


- You can use the **File/Info** option; see *Information and help* on page 13.

### Finding files

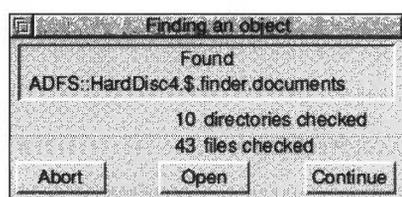
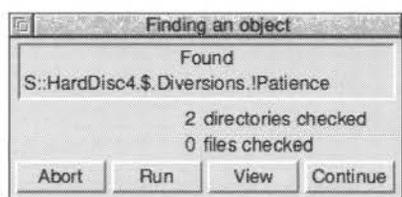
If you've saved a file somewhere in your directory structure, but can't remember where, **Find** will help you locate it:

- 1 Select the directory or directories you want to search.
- 2 Press Menu and type the name of the file you want to find into the **Dir./Find/Find file:** writable icon.



- 3 Click on the name, or press Return (↵).

If the object is found, you'll see one of two dialogue boxes:



If the object found is a file, you can

- **Abort** the search
- **Run** the file (if the file is a program, it will be run; if it is a file, it will be loaded into the appropriate application, if one can be found)
- **View** the directory containing the file
- **Continue** to search for another object with the same name.

If the object found is a directory, you can

- **Abort** the search
- **Open** the directory
- **Continue** to search for another object with the same name.

### Using wildcard characters

You can use *Wildcards* to represent unknown characters in the search string:

- \* represents zero or more characters of any sort.
- # represents one character of any sort.

For example:

- aeo\*** would match *aeo*, *aeon* and *aeons*, and any name that begins *aeo*.
- aeo#** would match *aeon*, and any four letter name that begins *aeo*.
- aeo##** would match *aeons*, and any five letter name that begins *aeo*.

All **Find** parameters are case-insensitive; **AEO#** is the same as *aeo#* or *Aeo#* etc.

### Setting a file's type

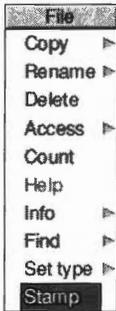
Every file has a file type, which determines what happens when you double-click on a file icon. For example, files of the type **Text** are loaded into **Edit**, files of the type **Obey** are interpreted as lists of commands to be carried out, etc.

To change a file's type:

- 1 Select the file whose type you want to change.
- 2 Press **Menu** and go to the **Filer/File/Set type** writable icon.
- 3 Enter the file type, in normal text or as a hexadecimal number.

For a list of file types, see RISC OS *file types* on page 421.

## Date/time stamping

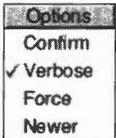


Files are marked with the date when they were last altered, and directories when they were first created. Applications show the date of the !RunImage file (or, if one is not present, of the directory). This information is shown when you display **Full info**, or when you select a specific file or directory and choose **File/Info** (see page 13). The time and date used is that provided by the computer's real-time clock, which you can set using the Alarm application.

**Stamp** enables you to update the date and time stamping on files and directories to the current date and time. To do this:

- 1 Select the object(s) you wish to stamp.
- 2 Choose **File/File/Stamp**. The date stamp will be updated. You can check this using the **Info** menu option.

## Modifying Filer operations



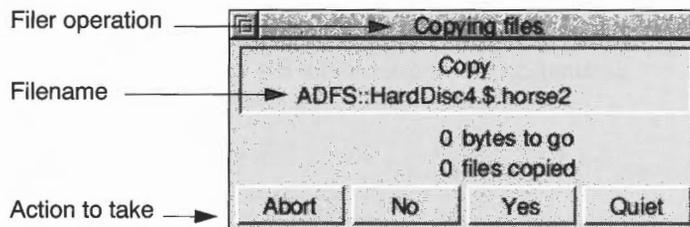
Four settings in the **Filer/Options** submenu provide finer control over most of the filing system operations invoked from the **Filer** menu. These options apply to all subsequent filer operations, as well as the current one.

### Confirm

This prompts you before performing an action. This helps safeguard against the accidental deletion of files, for example. It is off by default.

When this option is switched on, you can

- choose **Abort** to abandon an entire operation
- choose **No** to skip the present object and go to the next
- choose **Yes** to carry out the operation on the present object and go to the next.
- choose **Quiet** to continue with the operation without asking for further confirmation (in cases where the operation affects more than one object).



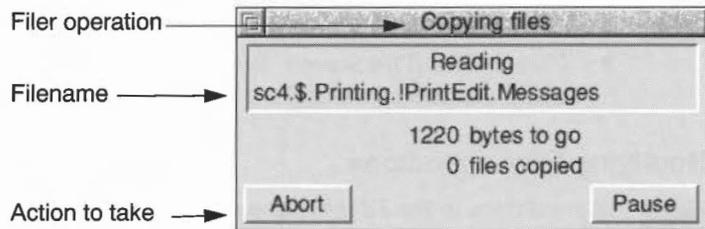
## Verbose

This tells you about the progress of an operation. It is switched on by default.

Information about the current operation is displayed in a dialogue box. You can

- choose **Abort** to abandon the entire operation
- choose **Pause** to interrupt it temporarily. The button will change to **Continue** (click on **Continue** to proceed with the operation, or on **Abort** to stop).

Verbose gives you useful information, so it's worthwhile leaving it switched on.



## Force

This enables you to delete files and directories even if they are locked (unless they are stored on a network server with different ownership). It is off by default.

This is particularly useful if you want to delete a directory containing a lot of files, some of which may be locked. However, use this option with great care, as it overrides all file protection (see *Setting file access permissions* on page 24).

## Newer

This applies only to copying, and is designed to ensure that you don't overwrite a file by an older version of the same file. It is off by default.

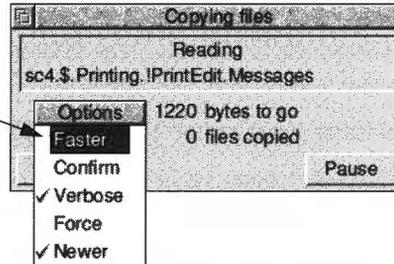
If you set out to copy a file to a directory where there is already a file of that name, the file will only be copied if it is newer than the file in the destination directory.

**Note:** This slows down copying operations over networks, since it must check the destination for a newer file of the same name.

## Faster

If **Verbose** is switched on, you can click Menu on any of the standard Filer dialogue boxes, such as those you get with copying, finding, deleting and moving. You will then be able to choose the **Faster** option.

Click here  
to speed up the  
Filer operation



This option makes file operations faster, at the expense of the appearance of the desktop. Normally during file operations, keeping the look of the desktop up-to-date takes priority over speed. If you choose the Faster option, speed takes priority: files and windows aren't updated until the current operation has finished.

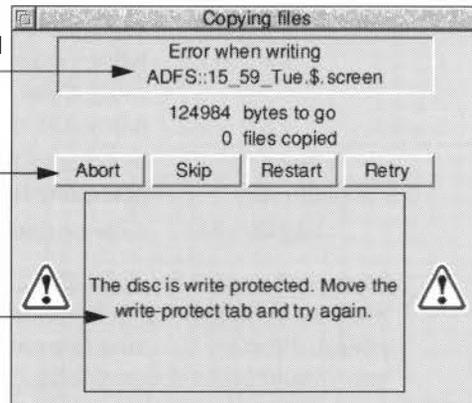
## Correcting problems

If a problem arises during a Filer operation, you'll see an error box displayed:

This is what has happened  
to the file screen

Choose one of these  
corrective actions

This is the error that  
occurred



- **Abort** lets you cancel the file operation completely.
- **Skip** skips the current file operation and starts afresh on the next file.
- **Restart** starts the operation on the current file from the beginning.
- **Retry** tries to start the operation again from where the error occurred.

Once you've cleared a problem, you'll find that clicking on **Retry** normally allows you to continue with the operation.

## Pathnames

The full pathname of a file or directory appears in the title bar at the top of the file window or directory display:



The pathname is the complete 'address' of a file or directory. Usually just the filename is sufficient, but sometimes you need to specify the whole pathname.

Technically, a pathname has the following general form:

*filing-system::disc-name.[directory-names.]filename*

So, in the above example:

<b>This text</b>	<b>Points to</b>
<b>adfs:</b>	the filing system name (note the trailing colon). If you omit the filing system name, the current filing system is used (see below). On a network, the filing system name is followed by the network name.
<b>:HardDisc4</b>	the name of the hard disc, floppy disc or other storage device (note the preceding colon).
<b>.\$</b>	the 'root' directory, usually the directory you first open when you click on a storage device icon. On network file servers, this will be replaced by &, your 'user root directory' (which may be one or more directories away from the root). If you omit this, and the filing system name and disc name, the path is taken relative to the current directory.
<b>.Images</b>	directories nested within the root directory (note the preceding full stops).
<b>.00-49</b>	
<b>.key00-24</b>	a file or directory within the 00-49 directory.

**Note:** If the pathname of a directory exceeds around 250 characters in total, you may not be able to open it. If this is the case, move the directory higher up the overall directory structure (it's unusual to have such a deeply-nested structure, and you should avoid it if possible).

### Current filing system

The default current filing system is that used by your hard disc drive (if fitted), usually ADFS. The current disc is also usually your hard disc drive.



This chapter tells you all about changing your computer's default configuration (hardware configuration, memory allocation and password protection).

## Introduction

There are two ways of customising your computer to suit your own way of working:

- Changing the default hardware and software configuration settings
- Changing the actions the computer performs, and hence the way the desktop looks when you first switch on (see *Customising the desktop start-up procedure* on page 47).



This chapter explains the first method; it tells you how to use the Configuration window (part of !Boot) to change your computer's default configuration.

On hard disc machines, the !Boot application is always stored in the root directory. Click on the hard disc icon and you will see it (on network systems, it is known as !ArmBoot or !ShareBoot).

### **Never move or delete !Boot; your computer may not work if you do!**

One term you'll come across many times in this chapter is **CMOS RAM**. This is part of the computer's memory where any configuration changes are stored. Using !Configure changes the default CMOS RAM settings. You can override some CMOS RAM settings with a Desktop boot file or the Task manager (described later on).

## Planning ahead

Before you change your computer's configuration in any way, it's a very good idea to save all the default settings. Similarly, when you've got the computer set up exactly as you want it, save the settings. That way, if you ever change something you don't mean to, you'll always be able to get back to a known state!

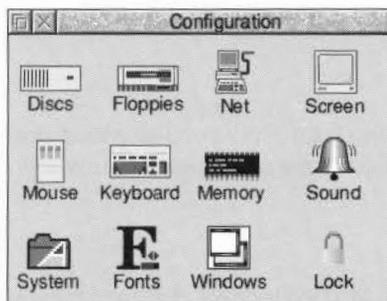
Here are the files you'll need to save:

- A Configure file (see page 33)
- A Desktop boot file (see page 49)
- A backup copy of the !Boot application (see page 52).

## Changing configuration settings with !Boot



Your computer will function well with the default settings that were set up when it was manufactured. However you can change many of these settings to suit your own way of working, by using the Configuration window of !Boot.



Changes to the configuration mostly take effect as soon as you make them, and are maintained even when you switch the computer off.

To	Do this	Notes
Display !Boot's Configuration window	 Double-click on the !Boot icon in your root directory.	Called !ArmBoot or !ShareBoot on a network.
Open one of the Configure dialogue boxes	 Click on the relevant icon in the main Configuration window (e.g. Sound)	
Ensure configuration changes take effect	Most have an immediate effect. For those that don't, either click on <b>Set</b> , or shut down and restart the computer (see page 62).	See the sections on individual Configure dialogue boxes, starting on page 34.
Close a Configure dialogue box	 Click on its Close icon or <b>Cancel</b> button.	Your changes may not take effect (see <i>Conventions</i> on page 33).

To	Do this	Notes
Save a Configure file	 Press Menu over the Configuration window and drag the Configure icon in the <b>Save/Save as</b> dialogue box to a directory display.	This saves all the changes you make in the Configuration window. You can save many configuration files. Keep your Configure files on a floppy disc. You can also use the SaveCMOS application in the <b>Diversions.Tools</b> directory.
Restore saved configuration settings	 Double-click on a Configure file you've saved to disc.	Loss of configuration is caused by failure of the computer's internal battery, or certain power-on reset combinations (see page 65).
Close the main Configuration window	 Click on its Close icon or press Menu over the Configuration window and choose <b>Quit</b> .	

\* A Configure file is particularly useful if you're running an application that uses a lot of memory. The application's documentation might tell you to release as much memory as possible, but this will produce a configuration that, while it is useful for that particular application, may not suit your usual requirements.

**Conventions**

The Configure dialogue boxes use some special conventions:



- Clicking Select (or Menu) on a menu icon displays a menu.
- When you type a number or word into a box, make sure you always press Return (↵) otherwise your changes will not be remembered by the computer.

The Configure dialogue boxes are described in detail in the following sections.

## Discs



Only use this dialogue box when you change the number of hard discs or CD-ROM drives you have in your computer.

**Warning:** If you set an incorrect number of discs, your computer may fail to start up correctly. In this case, see *Troubleshooting* on page 65).



Usually your computer will only support one type of hard disc: IDE. However, you can buy SCSI expansion cards which allow you to connect up to four SCSI hard discs, as well as SCSI CD-ROM drives (your supplier will tell you how many CD-ROM drives you can connect).

To	Do this	Notes
Define the number of hard discs and CD-ROM drives fitted in your computer	Click on the arrows to reflect the number of IDE discs, CD-ROMs or SCSI hard drives fitted*, then click on <b>Set</b> .	Some CD-ROM drives use the IDE interface; you can only attach two IDE devices to your computer.
Stop the IDE disc spinning after a defined period of inactivity	If applicable, click on the arrows to set the <b>Spindown delay</b> , then click on <b>Set</b> .	Some IDE discs support this. For most drives, it's not activated and cannot be used.

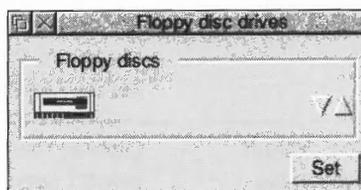
\* Do **not** select a larger number of discs than are in your computer.

## Floppies



Floppies

Only use this dialogue box when you add or remove floppy disc drives.



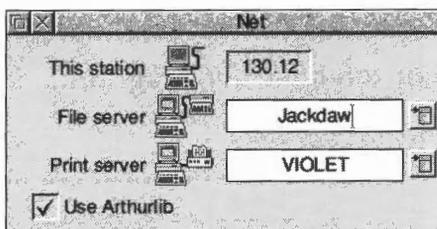
To	Do this	Notes
Define the number of floppy disc drives fitted in your computer	Click on the arrows to reflect the number of floppy drives fitted, then click on <b>Set</b> .	Some computers only support one floppy drive (in such cases you won't be able to change this option). Do <b>not</b> select a number of floppies different from that actually in your computer.

## Net



Net

You can only use this dialogue box if an AUN or Econet network card is fitted.



**This station** gives the Net station number of your computer. The number before the dot is the net number, common to all computers on your net. The number after the dot is the station number of your computer; it is set by your network manager.

**Use Arthurlib** – If this box is ticked, the library directory `$.ArthurLib` is selected after log on. If this box is not ticked, then the library directory `$.Library` is used. Your network manager will tell you which option to use. This option is not set immediately; the computer has to be reset before this option takes effect.

See *Networking* on page 91 for information on setting up your computer on a network.

To	Do this	Notes
Set the default file server	Display the list of possible file servers by clicking on the menu icon. Click on a server name to select it.	This file server will be selected by default when you click on the Net icon bar icon.
Set the default printer server	Display the list of possible printer servers by clicking on the menu icon. Click on a server name to select it.	This printer server will be used to print to a remote network printer.

### Screen



Use this dialogue box to set up the Screen configuration parameters.

The 'Screen' dialog box contains the following sections:

- Monitor type:** A list box showing 'Acorn AKF60'. A callout menu lists: Acorn AKF50, Acorn AKF52, Acorn AKF53, Acorn AKF60, Acorn AKF70, Acorn AKF85, and Auto.
- Colours:** A list box showing '16 colours'. A callout menu lists: Black/white, 4 greys, 16 greys (highlighted), 256 greys, 256 colours, 32 thousand, and 16 million.
- Resolution:** A list box showing '800 x 600'. A callout menu lists: 1280 x 480, 1600 x 600, 480 x 352, 640 x 480, and 800 x 600 (highlighted).
- Blank delay:** A dropdown menu set to 'Off'.
- Background texture:** Radio buttons for 'None', '1', '2', '3', '4', '5', '6' (selected), '7', and 'Random'. A 'Lighter' checkbox is also present.
- Buttons:** 'Default', 'Cancel', 'Set', and 'Try'.

When you have finished setting up the parameters click on the **Set** button. If you have made changes in the window but don't want to save them, click on **Cancel**. If you want to bring the screen back to a known state click on the **Default** option.

To	Do this	Notes
Define the type of monitor you're using	Choose from the <b>Monitor type</b> menu. <div data-bbox="689 257 844 481" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center; background-color: #cccccc; margin: 0;">Monitor type</p> <p>Acom AKF50</p> <p>Acom AKF52</p> <p>Acom AKF53</p> <p>Acom AKF60</p> <p>Acom AKF70</p> <p>Acom AKF85</p> <p>Auto</p> </div>	<p>If you can't get a picture, see page 65.</p> <p>If your monitor isn't listed, try the <b>Auto</b> option.</p> <p>If you change the amount of VRAM in your computer, reselect the monitor type.</p>
Configure the default number of colours used on start-up	Choose from the <b>Colours</b> menu. <div data-bbox="692 585 840 835" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center; background-color: #cccccc; margin: 0;">Colours</p> <p>Black/white</p> <p>4 greys</p> <p>16 greys</p> <p style="background-color: black; color: white;">16 colours</p> <p>256 greys</p> <p>256 colours</p> <p>32 thousand</p> <p>16 million</p> </div>	<p>16- or 256-colour modes are best as defaults. If you find you always work with more colours you can change this.</p>
Configure the default resolution used on start-up	Choose from the <b>Resolution</b> menu. <div data-bbox="697 937 835 1120" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center; background-color: #cccccc; margin: 0;">Resolution</p> <p>1280 x 480</p> <p>1600 x 600</p> <p>-----</p> <p>480 x 352</p> <p>640 x 480</p> <p style="background-color: black; color: white;">800 x 600</p> </div>	<p>Use a square pixel mode (640x480, 800x600 or 1024x768) to keep object proportions constant.</p>
Blank the screen after an idle period	Set the <b>Blank delay</b> using the arrows.	Move the mouse to restore the display*.
Change the background texture	Try out backgrounds (normal or <b>Lighter</b> ) first by clicking on <b>Try</b> .	You can also have a <b>Random</b> texture, or <b>None</b> at all, or use a sprite as a backdrop (see page 22†).

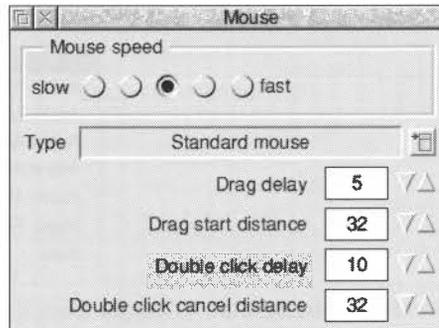
\* Audio may cause interference on a blanked screen. This is nothing to worry about.

† If you save a Desktop boot file which does this automatically, you must set the Background texture to None.

## Mouse



Use this dialogue box to set up the mouse configuration options.



To	Do this	Notes
Set the mouse/pointer sensitivity	Click on one of the <b>Mouse speed</b> buttons.	The faster the speed, the quicker the pointer moves around on the screen.
Define the type of mouse you're using	Choose from the <b>Type</b> menu icon to reflect the type of mouse fitted.	The first item in the menu is the default mouse type for your machine. Your computer will not work properly if you select the wrong type*.
Change the timings for a mouse 'drag'	Set the <b>Drag delay</b> and <b>Drag start distance</b> using the arrows.	Delay default <sup>†</sup> : 5 tenths of a second. Start distance default: 32 OS units.
Change the timings for a 'double-click'	Set the <b>Double click delay</b> and <b>Double click cancel distance</b> using the arrows.	Delay default: 10 tenths of a second. Cancel default: 32 OS units.

\* If you do set the wrong mouse type by mistake, you'll need to reset it from the command line. See page 399.

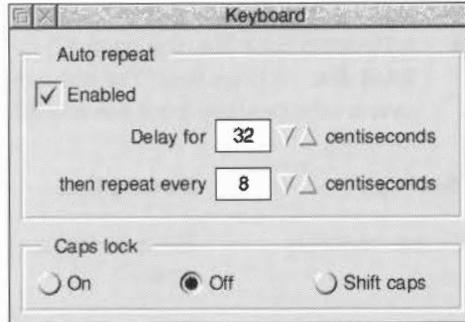
† Values that differ greatly from these may give rise to strange effects with some applications.

## Keyboard



Keyboard

Use this dialogue box to set the keyboard Auto repeat and Caps lock options.



To	Do this	Notes
Control how quickly characters repeat when you hold down a key on the keyboard	Tick <b>Enabled</b> , set the <b>Delay for</b> and <b>then repeat every</b> intervals.	Delay default: 32 centiseconds. Repeat default: 8 centiseconds*.
Configure the state of the Caps Lock key on start-up	Choose <b>On</b> (all caps), or <b>Off</b> (all lower case), or <b>Shift caps</b> (Caps Lock on, Shift gives lower-case).	In normal use Caps lock should be <b>Off</b> . Shift caps is like the reverse of Caps Lock.

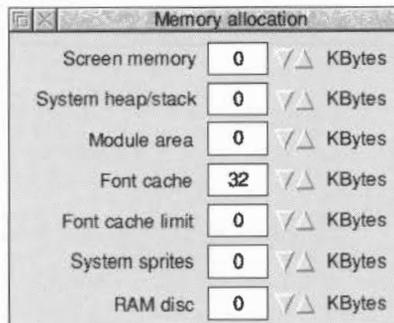
\* Values that differ greatly from these may give rise to strange effects with some applications.

## Memory



Memory

Use this dialogue box to configure memory allocation on start-up.



**Notes:**

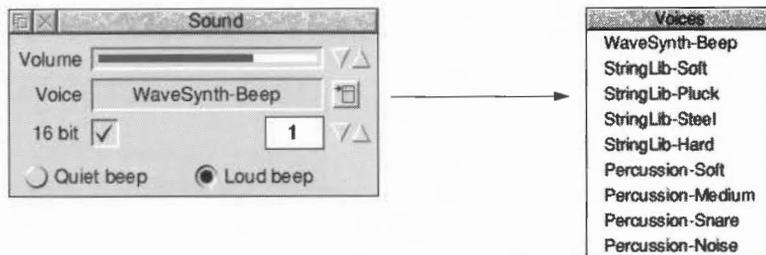
- You must reboot the computer before these changes take effect.
- You're most likely to want to change the **Font cache** and **RAM disc** settings.
- A Desktop boot file (see page 47) overrides **Font cache**, **System sprites** and **RAM disc** settings here. The only way to make these settings to take effect is to save a new Desktop boot file or edit the existing one (see page 49).

<b>Setting</b>	<b>Description</b>	<b>Notes</b>
Screen memory	Memory for use by the screen.	Best left at zero (default).
System heap/stack	Extra memory for the System heap.	Best left at zero (default).
Module area	Extra memory for modules loaded from disc.	Leave at zero, unless an application has many RAM modules.
Font cache	Memory for fonts. If you're using many fonts, increasing this speeds up screen redraws.	Must be <b>at least</b> 32K. See <i>Using fonts in applications</i> on page 165.
Font cache limit	Maximum size to which Font cache can grow.	See <i>Using fonts in applications</i> on page 165.
System sprites	Memory for system sprites.	Best left at zero (default).
RAM disc	Creates a RAM disc (see page 89 for more information).	It's far better to create a RAM disc using the Task manager (see page 60) each time you need it.

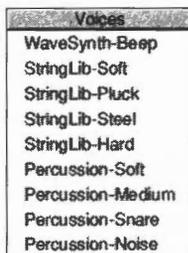
## Sound



Use this dialogue box to set the Sound configuration.



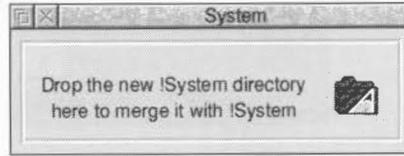
To	Do this	Notes
Set the volume of the computer's speaker	Use the arrows to set the volume level.	This controls the overall level of sound output from any sound-generating activity (except a CD-ROM – see page 315).
Change the system beep sound	Click on the menu icon to display a list of installed voices and choose a voice.	This sets the voice used by the first of the computer's eight sound channels. You can also cycle through the voices using the up/down arrows, or enter a voice number in the writable icon.
Change the system beep level	Choose <b>Quiet</b> or <b>Loud</b> .	The value of <b>Quiet</b> and <b>Loud</b> is determined by the sound Volume.
Set the computer's sound quality to 16-bit	Switch the <b>16-bit sound</b> option on.	Not all computers can use 16-bit sound. See your <i>Welcome Guide</i> .



## System



Use this dialogue box to update your computer system with replacement parts of the operating system or additional extensions required by applications. These parts are called modules and are supplied in an application called **!System**.



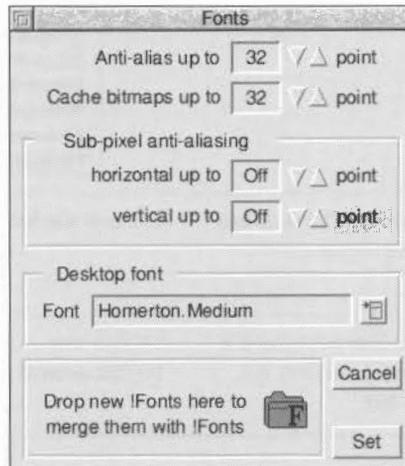
To	Do this	Notes
Merge a new !System with the existing !System in your computer	Drag the new !System icon over the !System icon in this screen.	Updating the !System may take a little while, as the modules are read from the disc and then stored in the computer.

**Note:** Access permissions may be changed during a merge, and some locked files may be overwritten.

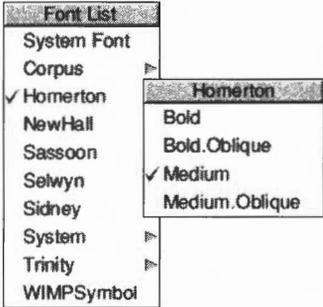
## Fonts



Use this dialogue box to change the font configuration.



Click on **Set** to redraw the screen using the values you specify in this window.

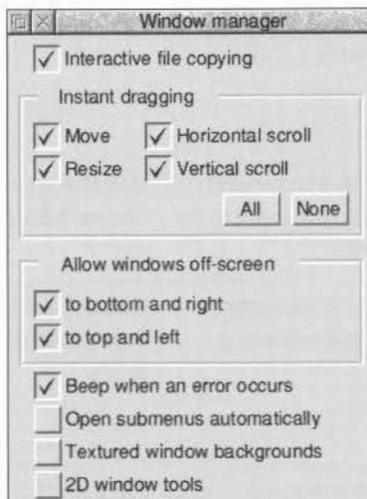
To	Do this	Notes
Place an upper limit on the size of anti-aliased fonts	Use the arrows to set the <b>Anti-alias up to</b> limit.	Never set to less than 12pt (the desktop font size). Larger fonts are usually printed with no anti-aliasing.
Specify the largest bitmap font size to be cached	Use the arrows to set the <b>Cache bitmaps up to</b> limit.	Set to the size of text you usually use in documents (e.g. 12pt).
Have more control over anti-aliasing	Use the arrows to set the <b>Sub-pixel anti-aliasing</b> limits.	If you use this option, you will need to increase your font cache (see page 39 and page 169). You should normally leave this <b>Off</b> .
Set the default desktop font	Click on the Font menu icon and choose from the Fontlist. 	Text in menus and directories is displayed at 12pt. The standard desktop font is Homerton.Medium. <b>Note:</b> We recommend that you only choose between Homerton.Medium, Trinity.Medium and System font as the standard desktop font, especially if you have no hard disc. These fonts are stored in the computer's ROM, which makes it very quick to redraw the desktop.
Merge a new !Fonts with the existing !Fonts in your computer	Drag the new !Fonts icon over the !Fonts icon in this screen.	Updating the !Fonts may take a while.

If you want to know more about these options, see *Using fonts in applications* on page 165.

## Windows



Use this dialogue box to configure the way the desktop windows behave.



To	Do this	Notes
Enable multi-tasking Filer operations	Switch <b>Interactive file copying</b> on.	When disabled, copying is quicker, but you can't use the desktop while copying.
Update the screen as you drag, resize or scroll a window	Switch on any or all of the <b>Instant dragging</b> options.	When disabled, only a dotted outline moves until you have finished the drag.
Allow windows to be dragged off-screen	Choose <b>to bottom and right</b> and/or <b>to top and left</b> .	You can't 'lose' a window, since part of the Title bar is always visible on screen*.
Cause a beep to sound when an error box is displayed	Choose <b>Beep when an error occurs</b> .	This uses the default system beep sound (see page 41).
Display submenus automatically	Choose <b>Open submenus automatically</b> .	If you point at a menu option that has an arrow next to it, the submenu will open automatically after a short time.

To	Do this	Notes
Display windows with a marble texture	Choose <b>Textured window backgrounds</b> .	
Use 2D window icons	Choose <b>2D window tools</b> .	

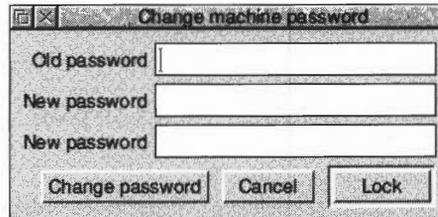
\* It can be difficult to see a window right at the bottom of the screen. Changing to a larger screen mode will 'find' any lost windows.

## Lock



### Lock

Use this dialogue box to set a password to protect your hard disc and computer configuration against unwanted changes.



The computer can be in one of three states:

- No password set – computer **unlocked** (the computer is supplied this way)
- Password set – computer **unlocked**
- Password set – computer **locked**

When **unlocked**, you can change files on the hard disc and modify the computer's CMOS RAM configuration settings using !Boot.

When **locked**, only the **Public** directory in the root directory of the hard disc is writable, but all of the hard disc is readable. However, the Public directory must exist **before** you lock the computer, or you won't be able to create it! You can **not** modify the computer's configuration when it is locked.

**Note:** Unlocking the computer does **not** override any individual file access permissions already in force (see page 24).

To	Do this	Notes
Set a password and lock the computer	Type the password in the two <b>New password</b> boxes (use the arrow keys to move between them) then click on <b>Lock</b> .	Passwords must be at least five characters long. The Configuration window changes so you can only use the <b>Lock</b> window.
Change an existing password	Type in the <b>Old password</b> . Type the <b>New password</b> twice, then click on <b>Change password</b> .	
Temporarily remove password-protection	Type the password in the <b>Old password</b> box and click on <b>Unlock</b> .	Next time you switch on, the computer reverts to being locked.
Lock the computer	Click on <b>Lock</b> .	This assumes you've previously set a password.
Unlock the computer permanently	Type in the <b>Old password</b> and click on <b>Change password</b> .	In effect, you're supplying a blank new password.
Restart the computer if you've forgotten the password	Reset the computer's CMOS RAM configuration to the default settings – see page 65.	This may fail if your computer is fitted with an internal configuration protection connector (see the <i>Welcome Guide</i> ).

### Using applications with a locked computer

Some applications automatically write information to the hard disc during use. If your computer is locked, this cannot occur. For example:

- !Alarm usually saves its alarm files onto the disc. You can't do this with a locked disc so you'll see an error message. However, you can explicitly save your alarm file to the Public directory (see *Save as alarms* on page 304).
- You can't modify !Printers while the disc is locked.
- You can't change applications that save configuration details using a **Save choices** option (such as !ARPlayer).
- You can't save a new **Desktop boot** file (see *Desktop boot files* on page 47).



**T**his chapter explains how to control the processes between switch-on and the time when you can start working. These processes are started and controlled by the !Boot application.

On hard disc machines, the !Boot application is always stored in the root directory. Click on the hard disc icon and you will see it. (On network systems, it is known as !ArmBoot or !ShareBoot.)

**Never move or delete !Boot; your computer may not work if you do!**

There are two ways of modifying the start-up procedure:

- Saving a Desktop boot file (or modifying an existing one by hand)
- Changing the contents of !Boot by hand.

## Desktop boot files



You can use a Desktop boot file to save your current working environment – the desktop – so that when you next switch on the computer you will see the same desktop again.

A Desktop boot file remembers

- which applications are running on the icon bar
- any changes made to running applications (e.g. default font, window size)
- the Pinboard and backdrop layout
- any network connections
- any system configuration changes (specifically, the current RAM disc size, Font cache and System sprite allocations – see page 59).

For instance you could automatically start up Edit and Alarm, and then log onto your file server, each time you switch on.

The following sections shows you how to make a Desktop boot file, and modify it to include your own commands and scripts.

## Setting up a Desktop boot file



Before you actually save a Desktop boot file, follow these steps:

- 1 Make a list of exactly what you want your Desktop boot file to do.
- 2 Save any files you are working on.
- 3 Delete any existing Desktop boot files (see page 50).
- 4 Shutdown and then switch off your computer (see page 62) then switch it back on again.
- 5 Set up your desktop as you want it to look when you switch on. This might include
  - starting one or more applications
  - opening one or more directory displays
  - loading a printer driver
  - logging on to a network.

### Notes

It is important that you do not do anything that you don't want to have in your Desktop boot file, as otherwise your Desktop boot file stores unwanted instructions. In particular:

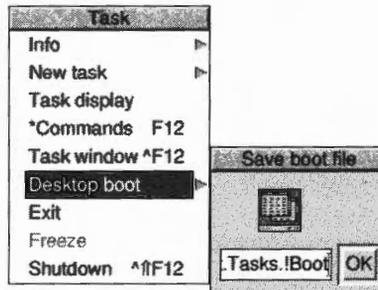
- If you want to change the name of your hard disc, do so **before** saving a Desktop boot file.
- Don't use the Task manager Task display window to change any configuration options before you save your Desktop boot file. If you want to change some of the configuration options it may be better to change them permanently using !Boot before you save your desktop boot file (see *Changing the computer's configuration* on page 31).
- If there's a floppy disc in the disc drive, dismount it. If you don't, the computer will ask you to insert it every time you switch on.

## Saving a Desktop boot file

Once you have a desktop layout on your screen that you would like to use each time you start your computer, you can save the layout:



- 1 Press Menu over the Task manager icon and display the **Desktop boot/Save boot file:** dialogue box:



- 2 Save the file by clicking on **OK**.  
**Don't change the path name given in the Save box.**

Now, each time you switch on or reset your computer, the Desktop boot file is used to start up and display the desktop in exactly the way it looked when you saved the Desktop boot file.

**Note for network users:** You can drag the **Save as** icon to your User Root directory on a Level 4 Fileserver (rename the file to **!ArmBoot**) or a writable directory on an Acorn Access network (you can give the file any valid RISC OS filename).

## Things to bear in mind

### Desktop boot file overriding the CMOS RAM settings

When you run a Desktop boot file, it may be set to override some CMOS RAM settings in the !Boot configuration application. This can cause confusion. If you have saved a Desktop boot file and then change these parameters using !Boot configuration, the changes don't have any effect. This is due to the Desktop boot file overriding !Boot's settings. The following settings are affected:

- Font cache size
- Sprite cache size
- RAM disc size.

If you're not changing these settings, delete them from your Desktop boot file so that changes you make using !Boot configuration are used correctly.

### Pre RISC OS 3 applications

Applications written before RISC OS 3 was released cannot automatically be saved using the Desktop boot option in this way. However, you can still add lines to your Desktop boot file by hand to start such applications automatically.

For example, the following line runs the application *!OldApp*.

```
Run adfs::HardDisc4.$.!OldApp
```

### Changing the name of your hard disc

When you create a Desktop boot file, the file includes the name of the hard disc. If you rename your hard disc, the Desktop boot file may cease to work unless you edit or reconstruct it.

### Moving applications

If you use the Desktop boot file to load applications, you must not move those applications to a different directory unless you also change the Desktop boot file to reflect the changes. If the Desktop boot file cannot find an application or file it simply ignores the instruction and continues.

## Deleting a Desktop boot file

If you've created a Desktop boot file that you no longer want, go to the directory

```
ADFS::HardDisc4.$.!Boot.Choices.Boot.Tasks
```

and delete the *!Boot* file that is in that directory.

## Inside the Desktop boot file



It is fairly easy to inspect and edit your Desktop boot file.

The Desktop boot file is stored in the following file:

```
ADFS::HardDisc4.$.!Boot.Choices.Boot.Tasks.!Boot
```

**Remember:** To view the contents of an application directory such as *!Boot*, hold down the Shift key when you double-click on the application.

To view the Desktop boot file, start *!Edit* and then drag the Desktop boot icon onto the Edit application icon on the icon bar.

This section looks at the typical lines found in a Desktop boot file. You don't need to know these details to **use** a Desktop boot file, but an understanding may be useful if you decide to **edit** your Desktop boot file. To look at a Desktop boot file, drag the boot file icon from the **Save boot file** box to the Edit icon.

The following example uses typical entries and values; however these may be different (or not present at all) on your computer. Note that entries usually appear on **one** line in the Desktop boot file.

### Line in Desktop boot file

```
WimpSlot -next 640K
```

```
ChangeDynamicArea -FontSize 32K  
ChangeDynamicArea -SpriteSize 0K  
ChangeDynamicArea -RamFsSize 0K
```

(Note: 3 separate lines.)

```
ColourTransLoadings &2 &4 &1
```

```
net:logon :Business Mart
```

```
Filer_OpenDir adfs::HardDisc4.$  
2 712 712 188 -sn -si
```

```
Filer_Boot  
adfs::HardDisc4.$ .Apps. !SciCalc
```

```
RMEnsure VProtect 0 RMLoad  
System:Modules.VProtect
```

```
Pinboard Backdrop -T ADFS::HardDisc4  
.$ !Boot.Resources.Configure.  
Textures.T6
```

### Action

Allocates memory to the next application, usually 640KB.

Reserves memory for Fonts, Sprite cache and RAM disc. Task manager changes are saved here and override !Boot configuration window settings.

Gives colour balance used by the desktop. Don't change this.

Logs user Mart onto file server 'Business', and prompts for password.

Displays root directory of HardDisc4. Four numbers define size and position in OS units. Following parameters define display format:

- li large icons
- si small icons
- fi full info
- sn sort by name
- st sort by type
- ss sort by size
- sd sort by date

Runs an application's boot file, storing its location and sprite in memory. Adding Filer\_Boot lines for files in frequently-used directories speeds up opening these directories the first time, but makes starting up or resetting the computer take longer.

Runs the virus protection module VProtect. Helps protect your system against viruses. See your *Welcome Guide* for more information.

Starts Pinboard and displays chosen desktop backdrop.

**Note:** If loading one of your own sprites as a backdrop, specify **None** in !Boot's Screen window (see page 36).

### Line in Desktop boot file

```
Run adfs::HardDisc4.$ .Apps.!SciCalc
```

```
Set Edit$Options F13 B1 W8 H12  
NTrinity.Medium
```

### Action

Starts SciCalc. You can run any application in this way.

Sets up configuration options for Edit (options are saved automatically in a Desktop boot file). See *Configuring applications* on page 403.

You can store configuration options without loading applications.

### Commenting out lines in a Desktop boot file

If you don't want the computer to run an application on start-up, you can comment out the relevant line in the Desktop boot file by typing a `|` character at the beginning. This is simpler than saving a whole new Desktop boot file; you can uncomment the line later if you want to start using the application again.

```
| Run adfs::HardDisc4.$ .Apps.!SciCalc
```

## Saving all of !Boot

!Boot is one of the most important applications on your computer. Without it your computer won't work correctly. Save a copy of !Boot before you start changing any configuration parameters within it (follow the directions given in *Backing up hard discs* on page 75, but only copy !Boot itself).

You could also make a copy of !Boot on the hard disc so that you can quickly copy back a working !Boot if you have problems. When you copy !Boot, give it a different name (for example, BootCopy) that does not begin with an exclamation mark. This ensures that the computer does not think it is an application. You can also restore the !Boot file to its factory default values using the **!ResetBoot** application in the **Diversions** directory (but this will **not** restore a completely deleted !Boot file).

## Inside the !Boot application



This section is not essential reading. If you don't feel you need to know about the !Boot application, you can skip this section.

!Boot is a collection of files and applications that are used to control the desktop. You won't need to know about all of them, just the few essential ones. The most important is the Desktop boot file, described earlier.

The !Boot application contains the essential resource applications that most applications use; !System, !Scrap and !Fonts. It also contains the configuration application !Configure (this is what you actually see if you double-click on !Boot).

---

## The PreDesktop file



The PreDesktop file is used to configure the computer for particular purposes. You won't normally need to change any of the parameters in this file. However, if you do need to change the way your computer works, put any changes in this file. Examples of how to use this file are given in the file itself.

The PreDesktop file has the following pathname:

**ADFS::HardDisc4.\$.!Boot.Choices.Boot.PreDesktop**

You can edit the PreDesktop file by loading it into Edit (Shift double-click).

### Aliases

This section is used for setting system aliases. This part of the file is only of use if you use the command line interface.

### Paths

This section of the file is used for defining standard paths and directories. It is only of use if you are programming.

### Options

A section for placing other options that may need to be set up.

### ResApps

This section registers applications with ResourceFS for display in Resources:\$Apps (the Apps directory on the icon bar). The line in the file registers all the applications currently in the Apps directory on the hard disc. You can also add your own choices of application here using the AddApp command:

**AddApp ADFS::HardDisc4.\$.Utilities.!ChangeFSI**

### Misc

A section for placing additional instructions such as

- modules and sprite files to be loaded
- obey files to be run
- application directories whose !Run files are to be run.

## Resource applications

Inside !Boot, there are three resource applications; these resources are used by the computer and by other applications to store essential information. However, you won't often use them directly in your everyday computing tasks.

### !System



!System is used to store new system modules (to replace or supplement existing parts of the operating system).

You may need to add modules by hand because they are not supplied as part of a !System. The !System application can be found in **!Boot.Resources**. Copy the modules to the **Modules** directory within !System.

When you buy more applications for your computer you may find that additional modules are supplied in the form of a !System application. The !System supplied with the application must be merged with the !System in the computer using the !Boot configuration application. See page 31 for more details.

### !Scrap



!Scrap is used to store temporary files. Applications often use temporary files during copying, printing and saving; these files are erased when they are no longer needed.

### !Fonts



!Fonts is used to store the fonts needed by the desktop and applications. If you have many fonts, !Boot may create additional !Fonts applications in which to store them.

When you buy additional fonts, or applications that contain new fonts, you will find that the fonts are normally supplied in a !Fonts application. This !Fonts must be merged with the !Fonts in the computer. Use the !Boot configuration option to do this; see page 42 for more details.

Similarly, you may need to add fonts by hand because they are not supplied as part of a !Fonts. The !Fonts application is in **!Boot.Resources**. Copy the new font directory into !Fonts.

## Other files in the !Boot application



### Resources directory

This contains the resource applications !System, !Scrap and !Fonts and the configuration resource !Configure and its associated Configure directory. If you want to make sure that no one changes the computer's configuration, it is possible to remove the !Configure application from this directory. If you do this, double-clicking on !Boot give a message that you cannot configure the computer.

### Utils directory

This contains utilities used by the !Boot application.

### Library directory

This contains utilities used by the !Boot application that can also be used by other applications.

### Choices.Boot directory

This contains:

- The PreDesktop file already described.
- The Desktop file (used as a supplemental file for commands not put in the PreDesktop file).
- The PreDesk directory which contains desktop configuration information. This is executed before the Desktop starts.
- The Tasks directory which contains the Desktop boot file (called !Boot). It also contains other files to be executed after the Desktop starts.





This chapter tells you about the day-to-day running of your computer. It shows you how to control the desktop using the Task manager, how to shut the computer down, and how to get the most out of your computer's memory.

## Introducing the Task manager



The Task manager controls all the 'tasks' running on the computer. Think of it as a control panel, with which you can monitor and control the computer system.

You'll mostly use the Task manager for three things:

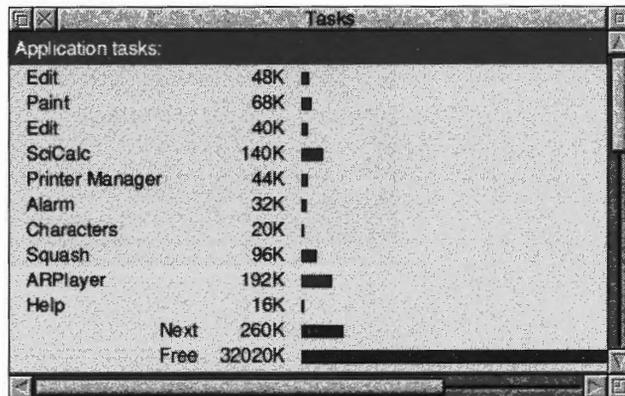
- Monitoring and controlling tasks and memory
- Saving Desktop boot files (this is described in detail in *Customising the desktop start-up procedure* on page 47)
- Shutting the computer down, prior to switching off or resetting.

You can also use the Task manager to access the RISC OS command line in various ways – see *The command line* on page 373.

## Controlling tasks and memory



Click on the Task manager icon to see a window containing details of the current tasks and the use of the computer's memory:



## Tasks window areas

The Tasks window is divided into four areas:

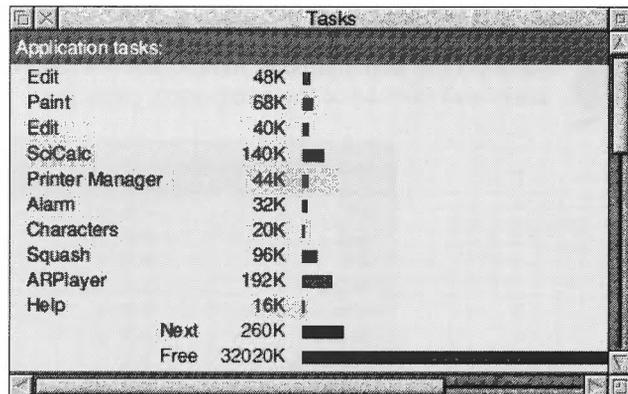
- Application tasks
- Module tasks
- System memory allocation
- Dynamic areas.

You can alter values shown with red bars by dragging the end of the bar. The Tasks window is updated as applications are running. This allows you to monitor the state of the system.

Any changes you make with the Task manager are forgotten when you reset the computer. If you need to change system settings often, you may find it more convenient to change them permanently using the !Boot configuration application (see *Changing the computer's configuration* on page 31).

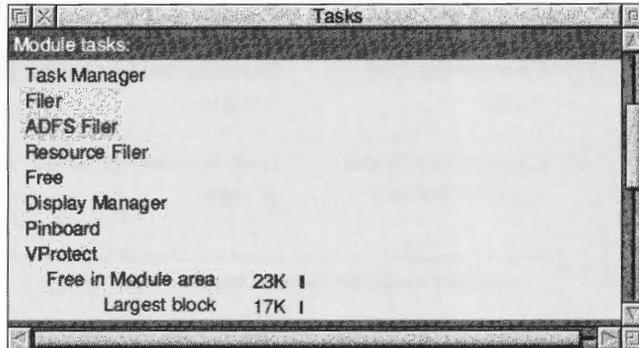
### Application tasks

This area shows how much memory current applications are using. The bars marked **Next** and **Free** show how much memory is allocated by default to an application when it starts up, and how much free memory is remaining in the system; you can change these values. However, most applications override the values allocated to **Next** and **Free**, and take as much memory as they need (assuming it is available).



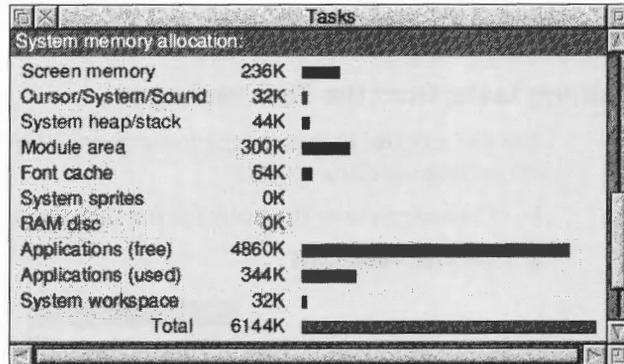
## Module tasks

This section lists all tasks which are running as relocatable modules (extensions to the operating system) and the amount of free memory in the module area.



## System memory allocation

This section shows how the computer's memory is being used.



You can change some of the values in this section:

**Note:** If you save a Desktop boot file (see page 49) after changing any settings in this section, the new values will override any configuration changes you've made using the Configuration window (see page 39).

To	Do this	Notes
Create a RAM disc	Drag a red bar to the right until the RAM disc is the size you want.	You can only change an existing RAM disc's size if it's empty.
Change the font cache	Drag the red bar to the left or right.	See page 170 for more information*.
Change the System sprites memory	Drag the red bar to the left or right.	If you're running short of memory, you can reduce this – it's not often used.

\* You can't reduce the cache to less than 32K.

### Dynamic areas

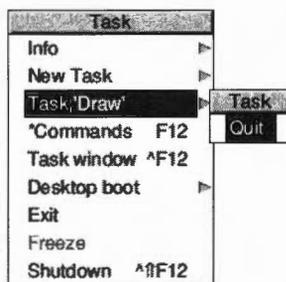
This section contains the entry **Wimp Sprite Pool**, a special memory area reserved for the sprites used by the Window manager. There may be other entries here too.

## Forcing tasks and applications to quit

### Quitting tasks from the Task manager

You can use the Task manager to force any of the tasks from the first two sections of the Tasks window to quit:

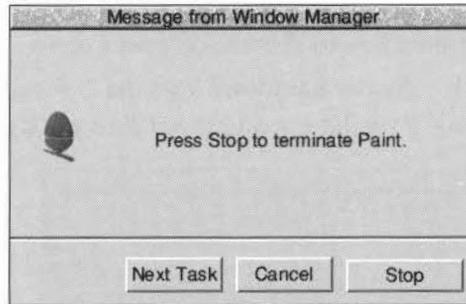
- 1 Click Menu over the entry for the task you want to quit.
- 2 Choose **Task/Quit**.



The task will quit, and the memory it was using will be freed. Although some programs (including Edit, Draw and Paint) warn you if there is some work you have not saved, not all programs do so; use this command with caution, as a last resort to force a program to quit.

## Quitting tasks using the system monitor (emergency use only)

Very occasionally the computer will lock up (pressing keys has no effect) or the hourglass will stay on the screen for much longer than is normal. Your *Welcome Guide* tells you which key combination to press to activate the system monitor (usually Alt-Break). This displays a dialogue box from which you can selectively quit current tasks.



You can **Stop** a particular task (quit it), go on to the **Next Task** running, or **Cancel** the system monitor window.

**Note 1:** This is really a last resort, if you're having problems. You may need to reset the computer (see *Troubleshooting* on page 65).

**Note 2:** You can also stop some tasks (e.g. printing a file) in a less permanent way by pressing Esc.

**Warning:** Don't stop the internal desktop tasks (Task manager, Filer, ADFS Filer, Resource Filer, Free and Mode Chooser) unless you know what you're doing.

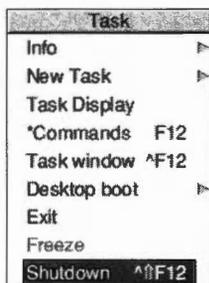
## Controlling tasks from the command line

Four entries on the Task manager give you access to the RISC OS command line:

- **New task**
- **\*Commands**
- **Task window**
- **Exit.**

These are all described in detail in *The command line* on page 373. There is a list of useful commands in *Useful star commands* on page 397. A full alphabetical list of star commands is given in the file **StarComms** in the directory **Tutorials** on your hard disc or network.

## Shutting the computer down



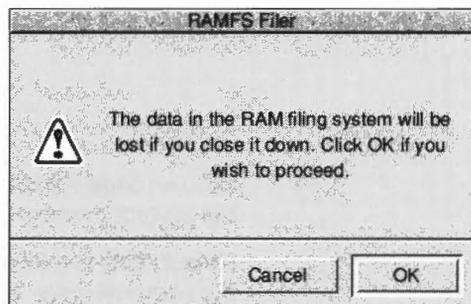
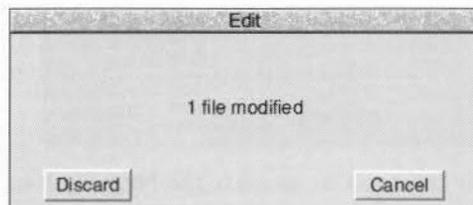
You should **always** shut down your computer immediately before switching it off with the On/Off switch. This

- quits all applications and ensures all your work is saved
- logs you off any networks and file servers
- parks any disc drives.

Here's how to shut the computer down:

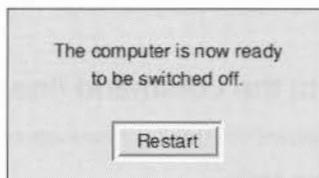
- 1 Choose **Shutdown** from the Task manager icon bar menu.

If you have any unsaved files, you'll see messages like these:



- 2 Either **Cancel** the shutdown, save your files then choose **Shutdown** again, or choose **Discard** to continue shutting down (this quits any unsaved files).

When your computer has shut down you'll see the following message:



- 3 Now you can switch off the computer, or restart it (as described on page 65).

*Troubleshooting* on page 65 tells you how to reset the computer once you've shut it down, or how to reset if there's a problem and you can't use **Shutdown**.

## Managing memory

This section gives some suggestions for getting the best out of the memory fitted to your computer. It's most likely to be of use to owners of computers with 4MB RAM (Random Access Memory) or less, but is relevant to all users.

## Maximising RAM

Some applications load extra modules to the operating system. When you remove such an application from the icon bar, it may leave some or all of these modules behind, since they may be needed by another application. However, when you are very short of space, this behaviour – normally helpful – may mean that you do not have enough memory for the next application.

It is therefore a good idea to shut down and restart the computer before attempting to load an application that will need almost all the computer's RAM.

Follow the instructions on page 62 to restart the computer, then load the application you want to use.

If you have a 2MB computer that runs applications each time you switch on, you can save memory not starting up these applications. *Commenting out lines in a Desktop boot file* on page 52 shows you one way of doing this.

## Choice of screen display



You can save some memory by using a screen display that does not use much memory. To do this you should typically only use a 16-colour screen display and use a relatively low resolution (typically not more than 640×480). For example, 640×480×16 colours uses 152KB, and 800×600×32k colours uses 940KB.

## Opening directory displays



When you open a display for a directory containing applications, the computer loads the applications' sprite files, which occupy some of the computer's memory. For example, if you have a hard disc and you keep a lot of applications in a single directory, their sprites might take up as much as 30K. If you are very short of memory, you cannot afford to waste this space and you should therefore not open directories containing applications you do not want to use. To achieve this, keep your applications – especially those with large sprite files – in separate directories.

If you hold down Ctrl when opening a directory by double-clicking, the sprites used by any applications are not loaded into the sprite pool; this also saves memory.

## Optimising memory usage

Use the Task manager to display the computer's current memory usage. You can change any of the red bars to release as much memory as possible for applications. Candidates for reduction include:

- Font cache (provided the application does not make extensive use of fonts; if redrawing the screen takes a long time, you've made the font cache too small).

You can't reduce the font cache to less than 32K if any fonts are in use.

- System sprites: you can reduce this to zero except when playing some games.
- Module area.

### Installing more memory

Perhaps the easiest way to increase the usability of your computer is to add extra memory. Ask your supplier for details.

### Installing video memory

If your computer is capable of using video RAM (VRAM), then you will benefit from adding some, especially if you want to use 256, 32-thousand or 16-million colour display modes regularly.

- VRAM speeds up the transfer of display information from the computer to the monitor dramatically.
- VRAM frees the main processor from the overheads of managing the transfer of information to the monitor, allowing it to spend more of its time processing information.
- VRAM also gives you access to improved screen display options; you can access more colours at greater resolutions.
- Any VRAM not used for the screen display is available for use by applications.

Your supplier will tell you whether you can install VRAM in your computer.

### Colour printing with little free memory

You can ignore this section if you are printing to a Postscript printer.

Printing in colour to non-PostScript printers can use large amounts of free memory (e.g. 1MB or more, depending on the printer, the paper size and the chosen settings).

If you get the error **Not enough memory to print**, first quit any unused applications, then try to maximise free memory as described above. If this fails, the following may help:

- Switch to a screen mode with less colours or a lower resolution (see *Changing the desktop display characteristics* on page 15).
- Print pages in Portrait orientation. This requires about half the free memory of printing in Landscape.
- As a last resort, consider using 256-colour quality or a lower resolution (dpi) on the printer. Both of these measures are likely to degrade quality.

**S**ometimes things go wrong and you need to be able to get out of a mess or restart your computer. Check in the *Welcome Guide* first for any hints and key combinations to press. Generally, you should always shut the computer down first (see page 62) but sometimes you can't do this.

## If things go wrong – reset options

Here are some problems you might encounter, and some possible solutions:

Problem	Likely solution	Notes
Keyboard and mouse have no effect	Use the system monitor to quit the current task, <b>or</b> try the reset methods described below.	See page 61.
Hourglass won't disappear	Use the system monitor to quit the current task.	See page 61.
Can't choose <b>Shutdown</b> or quit tasks using system monitor	Try these methods in order: Press Ctrl-Break, <b>or</b> Press the Reset button, <b>or</b> Switch off and on again.	You'll lose unsaved data.
Floppy LED flashes many times on start-up	There is a hardware problem: Contact Granada Microcare or your supplier for advice.	Normally associated with a red screen display.
Unexpected error messages during start-up or failure to start correctly (e.g. starts up at command line)	Press Shift-Break and check that !Boot hasn't been moved or renamed. Also check the start-up files in !Boot (you can restore them using the !ResetBoot application in the <b>Diversions</b> directory).	See <i>Inside the Desktop boot file</i> on page 50 and RAM discs on page 89. When you've cured any problems, <b>Shutdown</b> and restart the computer.

Problem	Likely solution	Notes
No picture on monitor; can't use !Boot to check or set monitor type	Switch on holding down <b>either</b> 0 or 3 on the numeric keypad, <b>or</b> R or Delete*, <b>or</b> T or Copy.	Once you have a usable desktop, use !Boot to choose the correct Monitor type.
CMOS RAM settings have become corrupted	Switch on <b>either</b> holding down R, <b>or</b> holding down Delete.	Use !Boot to reconfigure your CMOS settings then press Ctrl-Reset. <b>Suggestion:</b> As corrupt CMOS RAM settings can cause a variety of faults, if you have <b>any</b> strange problems on your computer, resetting CMOS RAM can be a useful first step.

\* Power-on-R preserves Econet station number, country code, number of floppy and hard discs and expansion card information. Power-on-Delete only preserves Econet station number. If there is a configuration protection connector inside the computer and it's set to the 'protected' position, these resets have no effect: see your *Welcome Guide*.

### Resetting CMOS RAM from the command line

Sometimes you need to be able to reconfigure your computer from the command line, rather than using !Boot. In such cases, (e.g. after a Power-on Delete operation) refer to *Useful star commands* on page 397. This gives a list of the most useful star commands, which you may need to use in an emergency. A full list of available star commands is given in the file **StarComms** in the **Tutorials** directory.



This chapter shows you some more desktop options to help you use hard discs and floppy discs.

## Floppy and hard discs



Most computers are fitted with a floppy disc drive and a hard disc drive. A hard disc can store large amounts of information for long periods of time; then, when needed, it can retrieve the information quickly so that it can be used again. A floppy disc holds much less information than a hard disc, and can't retrieve it so quickly. You'll find some more general information about discs and disc drives in the *Welcome Guide* supplied with your computer.

## Naming discs

All floppy discs and hard discs can be given names. Names that you recognise and understand are helpful.

The name of a hard disc appears underneath the hard disc icon on the icon bar, and in the title bar of directory displays. Names of floppy discs are only shown in the title bar of directory displays. The floppy disc drive icon on the icon bar always has the number :0 beneath it. If a hard disc is not given a name it is given the number :4. If a second hard disc is fitted, it is given the number :5.



Each disc may be referred to either by a name, or by the number of the drive on which it is mounted. You should use names, since the filing system can prompt you to insert a floppy disc by name if it is needed.

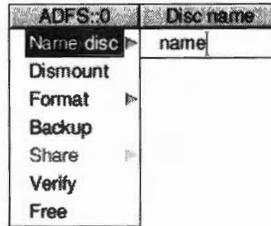
It is advisable to keep disc names unique, so that the filing system can tell them apart. If you don't name a floppy disc when you format it, it is automatically given a name based on the current date and time.

To set or change the name of a disc:

- 1 Click Menu over the disc icon on the icon bar.  
(If you're formatting a floppy disc, ensure that it is formatted and not write-protected before you insert it into the disc drive.)
- 2 Move to the **Name disc/Disc name** box.
- 3 Type in the name (it must be at least two characters long).



4 Press ↵ (Return) or click a mouse button.



If you have any directory displays open for the disc under its old name, they will be closed when you rename the disc.

## Naming restrictions

A disc name must contain at least two, and at most ten, printing characters. The name must not contain a space or any of the following characters:

\$ & % @ \ ^ . : # \* " |

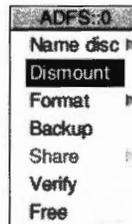
If you're using a DOS disc that was given a single-character name on another machine, you will only be able to rename the disc on the other machine.

## Changing the name of a hard disc

If you change the name of a hard disc you may find that certain start-up files no longer operate correctly. This is probably because they refer to the old hard disc name rather than the new one. The files that may need changing are discussed in *Customising the desktop start-up procedure* on page 47.

## Mounting and dismounting discs

When you've displayed a disc's root directory (this can be a floppy or a hard disc) the disc is said to be 'mounted'. When you have finished with a disc, it is useful to 'dismount' it. This closes all the files on the disc, removes its directory displays from the screen, and tells the computer to forget about it.



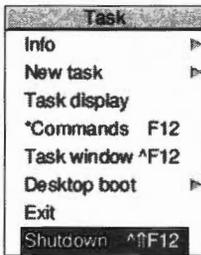
## Dismounting floppy discs

To dismount a disc:

- 1 Insert the floppy disc into the disc drive (if it's not still in there).
- 2 Click Menu over the floppy disc icon on the icon bar.
- 3 Choose **Dismount** from the icon bar menu for the disc drive.

**Warning:** Do not dismount a disc during a Filer operation on that disc.

## Dismounting hard discs



Dismounting a hard disc also parks its heads, so that once you've switched the computer off you can move it safely. The disc remains dismounted until the next time it is accessed, or until the machine is next switched on. It is good practice to dismount the disc before switching the computer off; you can do this automatically by using the **Shutdown** command from the Task menu. This command logs you off networks, prompts you to save any unsaved files and dismounts the disc.

## Formatting discs

Formatting a disc means setting up a structure on the disc within which data can be stored. You will need to format a disc in the following circumstances:

- To prepare a new, blank disc for use. (If you try to use a disc that has not been formatted, you'll see an error message.)
- To erase the entire contents of a disc and bring it to a known, clean state.

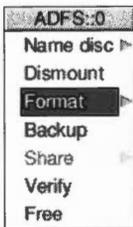
**Warning: When a disc is formatted, any data that was previously stored on it is permanently lost.**

### Formatting a hard disc



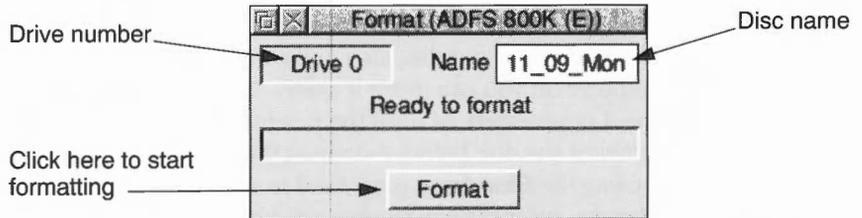
Hard discs are supplied ready-formatted, and you should not need to reformat them. In the unlikely event that a hard disc does have to be reformatted, use the application !HForm, described on page 335.

## Formatting a floppy disc



To format a floppy disc:

- 1 If the disc is not already in the drive, insert it.
- 2 Move to the **Format** submenu of the icon bar menu for the disc drive.
- 3 Choose the disc format. You should choose the ADFS 1.6M format if you have a high-density floppy disc and the ADFS 800K (E) format if you have a standard double-density floppy disc. This displays the Format dialogue box.



- 4 Give the floppy disc a unique name by deleting the contents of the Name box and typing in the new disc name. See page 67 for details of file and disc naming conventions.  
If you don't give a floppy disc a name, the default name given to the disc is based on the date and time: for example 11\_09\_Mon.
- 5 Click on **Format** to go ahead with the operation or click on the Close icon to abandon the operation.  
The disc is first formatted, then verified (checked for errors). During formatting and verification, an indication of the progress of the operation is displayed. You can interrupt the formatting process by clicking on **Pause**.
- 6 Finish formatting by clicking on **OK** when you see the message **Disc formatted OK**.

If the disc verification process finds errors on the disc, turn to page 71 for instructions on how to remove them.

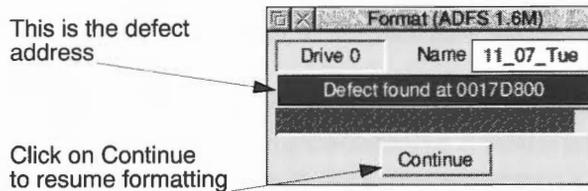
RISC OS *floppy disc formats* on page 71 and *Other disc formats* on page 72 describe the available disc formats in more detail.

## Disc errors during formatting

Faults that prevent data from being read from or written to a part of the disc are known as defects.

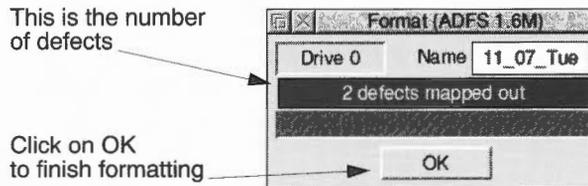
The formatting process is designed to deal with any defects found on the floppy disc. Any defects found are displayed during the formatting and verification process.

If a defect is found, click on **Continue**: this marks the area of the disc as defective and ensures that it is not used. If you don't want to continue with the format/verify process, click on the window's Close icon.



While RISC OS will allow you to use a floppy disc with defects (by 'jumping over' or ignoring those defects) we recommend that, unless you have an immediate need to use the disc, you throw it away at the first opportunity.

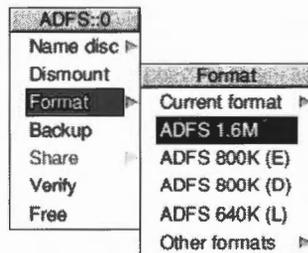
When formatting has finished the window shows you how many defects were mapped out (marked as not to be used).



## RISC OS floppy disc formats



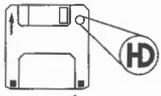
You choose disc formats from the Floppy disc icon bar menu.



Your computer can use both high-density and double-density discs. Always choose **ADFS 1.6M** to format high-density discs and **ADFS 800K (E)** to format double-density discs.

There are four different RISC OS formats available:

High density



(extra hole)

Double density

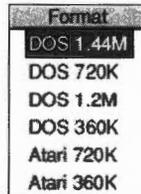


- **ADFS 1.6M.** This format can store 1.6MB of data.  
High-density floppy discs (1.44MB IBM type) must be used (they are normally marked HD). High-density discs **must** be formatted using this format. You must **not** format non-HD discs as 1.6M, as they will inevitably fail.
- **ADFS 800K (E).** This format can store approximately 800K of data.  
This format uses standard floppy discs (720K IBM type). These discs are also compatible with RISC OS computers that are **not** fitted with high-density disc drives.
- **ADFS 800K (D).** The format can store approximately 800K of data.  
This format is now obsolete and is included for backward compatibility only. It is compatible with RISC iX and the Arthur 1.20 operating system.
- **ADFS 640K (L).** The format can store approximately 640K of data.  
This format is now obsolete and is included for backward compatibility only. It is compatible with Arthur 1.20, ADFS on the Master, Master Compact, BBC Model B and BBC Model B+ computers fitted with 3.5" disc drives. Each directory can contain up to 47 files and subdirectories.

### Other disc formats



You can format floppy discs in different formats using the **Format/Other formats** sub-menu.



### DOS-formatted discs

DOS-formatted discs should **only** be used if you are transferring files to or from a DOS computer or storing DOS files on the disc. Files stored on DOS discs are stored according to DOS file naming conventions and not RISC OS conventions.

For more information about DOS files and discs, read *Using DOS and Windows discs* on page 84.

There are different PC-compatible formats for floppy discs. These formats are compatible with computers that use the DOS operating systems (i.e. MS DOS, DR DOS or PC DOS):

- **DOS 1.44M.** This format stores up to 1.44MB of data.  
Discs using this format can be read from and written to by any DOS computer with a high-density 3.5" disc drive. High-density floppy discs (1.44MB IBM type discs) **must** be used (they are normally marked HD).
- **DOS 720K.** This format stores up to 720K of data.  
The disc can be read from and written to by any DOS computer with a 3.5" disc drive. Double-density floppy discs (720K IBM type) must be used.

**Note:** If your machine has no VRAM, it is recommended that you switch to a screen mode that uses less memory than 800×600×256 colours (e.g. 800×600×16) to format discs in DOS format.

### **Atari-formatted discs**

Atari-formatted discs should **only** be used if you are transferring files to or from an Atari computer or storing Atari files on the disc. Files stored on Atari discs are stored according to Atari file naming conventions and not RISC OS conventions.

There are two different Atari-compatible formats for floppy discs:

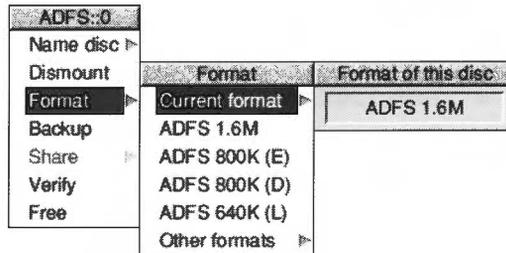
- **Atari 720K.** This Atari format stores up to 720K of data.  
The disc can be read from and written to by any Atari ST computer with a double-sided 3.5" disc drive. Double-density floppy discs (720K IBM type) must be used.
- **Atari 360K.** This Atari format stores up to 360K of data.  
The disc can be read from and written to by any Atari ST computer with a 3.5" disc drive. Double-density floppy discs (720K IBM type) must be used.

### **UNIX and Apple computers**

Many UNIX computers incorporate software that allows the computer to read and write to DOS-formatted discs in much the same way that RISC OS does. Most Apple computers also have software that allows the computer to read and write to DOS-formatted discs.

## Checking a floppy disc's format

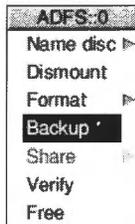
If you want to find out what type of format a floppy disc has, put the floppy disc in the disc drive and go to the **Format/Current format** box. This will tell you the format type and storage capacity of the floppy disc.



## Backing up discs

It's essential that you keep backup copies of your important files, in case they get damaged. You might delete a file by mistake, or you might get errors on a floppy or hard disc that mean some files become unusable.

### Backing up floppy discs



As well as making backups of important files, it is recommended that you make backup copies of applications supplied on discs, and use the backups as your working discs.

You should format the discs that you are using for the backup process and discard any that contain defects, even if they have been mapped out by the formatting process. Do not use discs that have defects.

The backup process copies an entire floppy disc (from the 'source' disc to the 'destination' disc) as a single operation. You can only back up onto discs with the same format as the source disc.

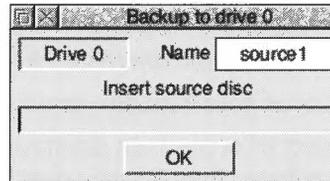
**Warning: Backing up a disc deletes the entire previous contents of the destination disc.**

**Note:** The floppy disc drive indicator light will remain on at some stages of the backup process, but don't worry, you can still insert and remove discs as instructed.

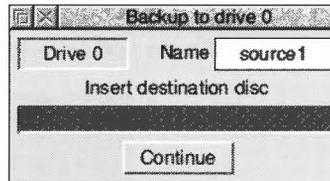
To back up a floppy disc:



- 1 Choose **Backup** from the icon bar menu for the disc drive. If the destination disc is a new, blank disc, format it first (see *Formatting discs* on page 69).
- 2 When prompted, insert the source disc into the disc drive and click on **OK**. For safety, write-protect the source disc.



- 3 Similarly, when prompted, insert the destination disc, and click on **OK**.
- 4 Repeat steps 2 and 3 as prompted until all of the data has been copied. The destination disc will be given the same name as the source disc.



- 5 When the backup has finished, click on **OK**.

If you're using your computer a lot, it's good practice to back up the files you've been working on at least once a day, and to back up all your files once a week, or once a month. Naming discs with the date of the backup will remind you when the backup was made, without having to check the date of the files on the disc.

## Backing up hard discs



You can back up your hard discs by copying valuable data and applications to floppy discs. The backup procedure used for hard discs differs from that used for floppy discs.

You should keep backup copies of the following directories:

- !Boot
- Apps
- Printing
- Utilities.

You should also back up any data you may have produced and applications that you have installed.

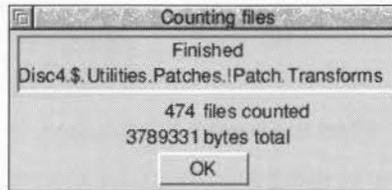
**Warning:** This backup procedure does not back up files that are bigger than the size of a single floppy disc (approximately 1.6MB). If you want to back up such files, you'll need additional software (not supplied by Acorn) or you should back up to alternative media with large enough capacities, such as a second hard disc or a network or tape streamer.

To back up files and directories from your hard disc:

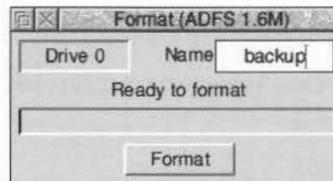
- 1 Click on your hard disc icon to see the directory display.
- 2 Select all of the main directories that you wish to backup. You can only choose directories from a single directory display.



- 3 Choose the **Count** option from the **Selection** menu.

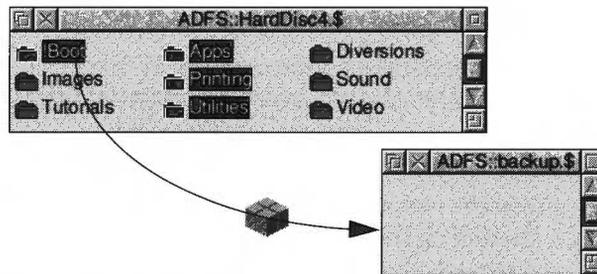


- 4 Take the figure given by the Count option and divide it by 1,000,000. This will give the **approximate** number of high-density floppy discs needed to store the information on.
- 5 Format this number of high-density floppy discs using the 1.6M format.
- 6 Give all of the discs exactly the same name.

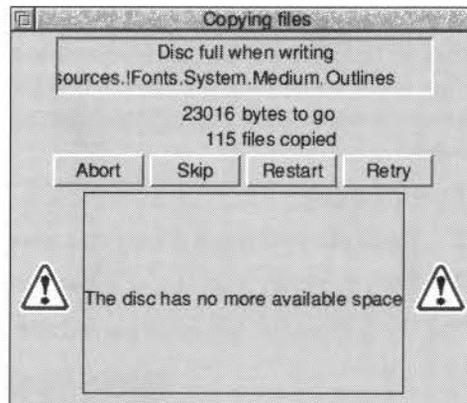


- 7 Put the first of the destination discs in the disc drive and click on the floppy drive icon to view the directory display.

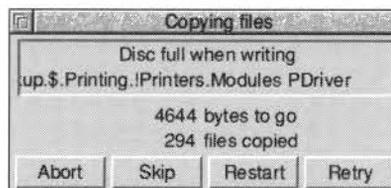
- 8 Select all of the directories you are to backup and drag (copy) them to the floppy directory display.



- 9 Wait while the files are copied.
- 10 When the **Disc full when writing** error message is displayed remove the floppy disc and replace it with the second destination disc. Be sure to label the discs in the order in which they are used.



- 11 Click on the floppy disc icon to view the directory display.
- 12 Click on **Retry**.
- 13 Repeat this procedure each time you see the **Disc full** error message.



When the copying process is finished, the backup is complete.

If you need more floppy discs you can format them, give them the correct disc name, and then continue with the backup.

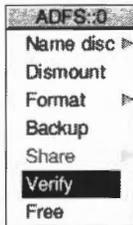
### Fitting more data onto backup discs

To fit more information onto floppy discs, you can use the file compression application !Squash; you'll find more information about this in *Squash* on page 367.

### Restoring backed-up data to a hard disc

You can restore your data by inserting the first backup floppy disc in the disc drive, clicking on the floppy disc icon and dragging its contents to the appropriate directory on your hard disc. When the first floppy disc has been copied over, **Dismount** it, insert the second disc, click on the floppy disc icon and repeat the procedure; carry on until you've copied all the discs.

## Checking for disc defects (verifying)

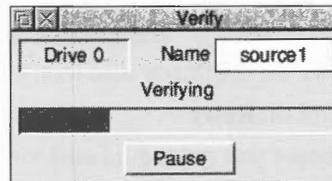


You can check whether a disc is free from defects by verifying the disc. This checks that all the data on the disc is readable (it does not check that the data is correct). This is not something you need to do very often, but is a good idea if, for example, you have made a backup of important data and want to check that it is stored safely.

To verify a disc:

- 1 If you are verifying a floppy disc, insert it in the disc drive.
- 2 Choose **Verify** from the icon bar menu for the disc drive.

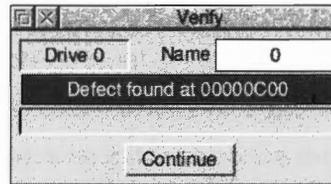
The Verify dialogue box is displayed and the operation starts.



If there are no faults on the disc, the message **Disc verified OK** appears.

## Defects on a floppy disc

If you find that there are defects on the floppy disc, click on **Continue** to carry on with the verify; repeat this process if any further defects are found.



The easiest way to remove the defects is to format the disc again. This allows you to mark the faulty areas of the disc as bad so that they are not used (don't forget to copy any important files off the disc first!).

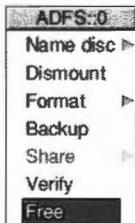
## Defects on a hard disc

If there is a defect on your hard disc, the position of the error on the disc is displayed during the verification process.

- 1 Write down the number displayed.
- 2 Click on **Continue** to carry on with the operation
- 3 Repeat this process if any further defects are found.

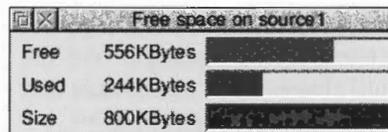
When the operation ends, you should have a list of the defects found. Turn to *Removing a disc defect* on page 431 and follow the instructions given there.

## Checking the amount of free space on a disc



To check how much free space is available on a disc, choose **Free** from the icon bar menu for the disc drive.

This shows the amount of unused space on the disc, together with the amount of space that has already been used. The total disc size is shown as well. This window is updated whenever the space available on the disc changes.



## Adding more applications to a hard disc

Adding applications to the hard disc is quite easy. Usually you only need to copy an application from the floppy disc to a directory on the hard disc. Some applications require you to add system modules or fonts to the computer. These are normally supplied as !System and !Fonts files. To add these to the hard disc, merge them using the !Boot application (see page 42).

Do **not** copy a !System or !Fonts directly onto your hard disc.

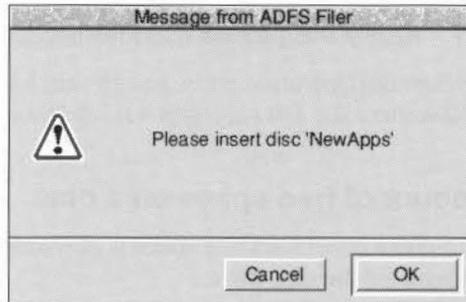
You must not double-click on a !Fonts or !System icon. This will confuse the computer resulting in erratic operation. If you have double-clicked on a !Fonts or !System icon by mistake, you should reset the computer.

**Note:** You won't need to copy or use any !Scrap applications you find, as one already exists inside the !Boot application.

## Using several floppy discs



If the file, directory or application you want is on a floppy disc that has been seen by the Filer but is not currently in the disc drive, the Filer asks you to insert the floppy disc. When you do this, the computer finds the required files automatically.



If you decide not to go through with the operation (for example, if the requested disc is not available) click on **Cancel**.

The desktop remembers the names of the last eight floppy discs that have been inserted into the disc drive. If you insert and use a disc that has exactly the same disc name as one already in use, the 'earlier' disc will be forgotten about. You should always try to use unique disc names, and dismount discs before removing them from the floppy disc drive.

## Copying between floppy discs

When you are copying from one floppy disc to another using a single floppy drive (by dragging a group of objects) you may be asked to swap the discs occasionally, which becomes tedious when copying many files and directories. It is probably faster to copy the files from floppy disc to hard disc or RAM disc, and then from there to the new floppy disc (see *Using a RAM disc* on page 90).

## What to do if something goes wrong

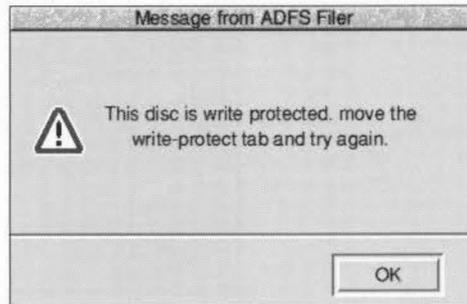
Most errors and problems connected with discs are accompanied by self-explanatory messages. Often all you need to do is acknowledge that you have read the error message by clicking in the appropriate box. There are a few cases that are more serious or need a little extra explanation.

### Protected disc



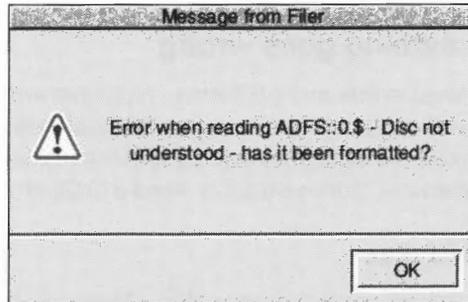
Write-protect hole

This message indicates that a floppy disc is write-protected. This prevents you from accidentally writing to the disc. You can remove the write protection by sliding the small tab at one corner of the disc so that the hole is blocked off. For more information, consult your *Welcome Guide*.



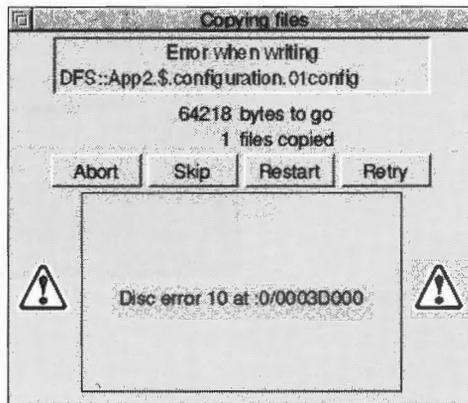
## Unreadable disc

The message below indicates that the computer can't read the floppy disc. The floppy disc may not be formatted at all, or it may be formatted in a way that cannot be read on the computer. The computer cannot read discs formatted with Commodore Amiga disc formats, or Apple Macintosh formats (although there is a third party application which does this – ask your supplier).



## Disc errors during use

If a disc defect error occurs with a floppy disc while you are using it (a rare occurrence) you will see a disc error message such as.



To correct the error you should copy any files you want to save from the affected disc onto another disc, and then throw the disc away.

A similar error can occur if you try to use a disc that has not been formatted.

If a disc defect error occurs on a hard disc, the error's position is displayed.

- 1 Write down the number displayed.
- 2 Turn to *Removing a disc defect* on page 431 and follow the instructions given there.



The last chapter told you about using ADFS hard discs and floppy discs. This chapter tells you about some other types of storage device, and how to control them using their own filing systems.

You'll find out about using DOS and Windows discs, CD-ROMs, PCMCIA memory cards, and RAM (an area of computer memory used as a disc).

## Types of filing systems

The RISC OS operating system provides and supports a number of different filing systems, which have been designed to suit the type of storage device on which they are found. Apart from ADFS, the main filing systems are

- SCSI, used with some types of hard discs
- DOSFS, used with DOS and Windows discs
- CDFS, used with CD-ROMs
- PCCardFS, used with PCMCIA memory cards
- RAMFS, used with RAM discs
- ShareFS, used on an Acorn Access network (see *Networking* on page 91)
- NetFS, used with file servers connected via a network (see *Networking* on page 91)
- NFS, used to communicate with non-Acorn computers on a network (see page 101).

The RISC OS Filer and desktop give a uniform user interface to all these filing systems, but with each system there are a few special features provided; these are accessed from each device's icon bar menu.

## Finding out the filing system type

If you want to find out which filing system you are using, look at the name in the title bar of the directory display. This always starts with the name of the filing system.

## Using DOS and Windows discs



Your computer can read and write any floppy discs that use standard DOS formats. This makes it easy for you to transfer information between your computer and any computer that can use these formats. Your computer can also format discs in the standard 720K and 1.44M DOS formats (see page 72).

### Using DOS floppy discs

You can use DOS-formatted floppy discs in the same way as RISC OS-formatted discs; just put them in the disc drive and click on the floppy disc icon. There are however some limitations:

- You should **only** use DOS discs to transfer files between your computer and a computer that can use DOS discs.
- You should **not** use DOS discs to store RISC OS applications and programs, as anything stored on a DOS floppy disc is subject to DOS naming conventions. This results in filenames being altered and shortened.
- To avoid possible data corruption you **must** dismount DOS discs before you remove them from the floppy disc drive.

The menu options available for DOS files and directories are exactly the same as those for RISC OS files and directories. You can copy and move files between RISC OS and DOS formatted floppy discs. To **run** DOS applications, you will need the PC emulator application, PC Soft, or a PC hardware expansion card.

### Transferring files between RISC OS and DOS computers

If you save files from a RISC OS computer to a DOS-formatted floppy disc you can transfer the files to a DOS computer. Similarly, you can transfer files from a DOS computer (or one that understands DOS discs) to a RISC OS computer.

#### Character conversion

You should be able to read RISC OS text files on a DOS computer. However, DOS and RISC OS use different 'top-bit set' characters, which are not interchangeable. In practice this means that all the letters you can type on the keyboard, except the £ sign, will be readable. Most other characters generated using !Chars won't be readable and may be translated into different characters on a DOS computer.

When moving files created on a DOS computer to RISC OS the same restrictions on top-bit set characters apply. Some DOS word processors end each line with a carriage return and a line feed; this makes text appear with a [0d] on the end of each line. You can cure this easily by using Edit to replace the carriage returns with nothing. You can search for carriage returns with a Hex [0d] (choose the Hex option in the Find text box).

Some other word processors only use carriage returns at the end of each line. When these files are imported into Edit the text is shown as continuous characters. Use the CR↔LF option in the Edit menu to convert it into lines again. Binary and other non-text files are transferable between computer systems.

### Filename limitations

This section shows you how filenames generated on DOS computers and RISC OS computers translate between systems.

On RISC OS computers, filenames are usually limited to 10 characters. On a DOS computer names are limited to eight upper case characters with a three letter extension. For example TESTFILE.TXT is a valid DOS filename.

- When copying files from a RISC OS disc to a DOS disc, names are truncated to eight characters and the names are translated into all uppercase. For example **Configure** becomes **CONFIGUR**. Bear this in mind (you may need to rename files after copying). The RISC OS file type of an object is preserved. DOS filenames are not case sensitive.
- If you are copying a file from RISC OS to a DOS disc, the filename must not start with a /, or contain more than one /, or contain more than three characters after a /.
- When copying files from a DOS disc to a RISC OS disc, the filename, including the extension, is truncated to 10 characters. One of the characters will be a '/' which is added to separate the filename from the extension. For example, **AUTOEXEC.BAT** becomes **AUTOEXEC/B**.
- Filenames are only truncated if the command **\*Configure Truncate** is set to **on**, which it is by default. If it is set to **off**, an error is generated. (See the file **StarComms** in the **Tutorials** directory.)
- You should **not** give a DOS disc a single-letter name using the letters A to G.

### Copying DOS files between DOS discs on a RISC OS computer

When copying from one DOS floppy disc to another (or a DOS hard disc partition) filenames are not truncated. All eight characters, the dot separator and the three character extension are copied. However, when looking at the files in a directory display the 'dot' separator is displayed as a '/

### File access

Since there is not a complete mapping between RISC OS file attributes and those provided by DOS, access rights are set as follows:

- A RISC OS file which is locked will be **read only** under DOS.
- A DOS file which is **read only** will be locked under RISC OS.

## DOS file icons



If you open a directory display that contains DOS files, the RISC OS Filer displays file icons using the DOS file icon.

If you want, you can assign RISC OS file types to DOS file extensions using the **\*DosMap** command (see the file **StarComms** in the **Tutorials** directory). This, for example, lets you assign DOS files with the extension TXT the RISC OS file type Text.

## Using DOS hard disc files



If you have a DOS hard disc partition (created using a PC hardware expansion card, for example) the Filer displays it with the DOS hard disc file icon. Double-click on this icon to display the files on your DOS hard disc. The Filer treats the DOS hard disc file as a normal directory and allows you access to the DOS files in a RISC OS directory display.

### Copying and moving DOS hard disc files

If you want to copy or move your hard disc file, it will be copied or moved as a single file, not as a series of files and directories.

If you want to copy it as a series of files and directories, double-click on the DOS directory icon, and then copy the files from within it.

### Deleting DOS hard disc files

If you want to delete your DOS hard disc file, the **Delete** option on the Filer will delete it as a single file (not as a directory).

You should be very careful not to delete your hard disc file by accident. You could lock it to protect it against accidental deletion – see *Using the File/Access/Access details submenu* on page 24.

## Using CD-ROMs



Some Acorn computers can use a CD-ROM drive. CD-ROMs have their own filing system: CDFS. This is very similar to ADFS, and allows you to read and copy the data from a CD-ROM disc. However, you can't delete files from a CD-ROM, or format a CD-ROM, as they are read-only devices.

A CD-ROM drive may use the same connections as the IDE hard disc drive on your computer (or it may be connected via a SCSI card, or other podule interface). The maximum number of drives supported by the IDE interface is two (including your hard disc drive). If your computer is not fitted with a CD-ROM drive, you **may** be able to add one yourself – ask your supplier about this.

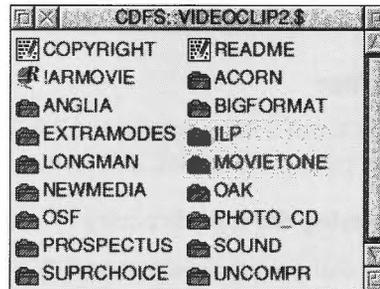
## Sharing CD-ROM resources



If your computer is connected to a network, you can share your CD-ROM drive with other users on the network (or have access to their CD-ROM drives, if they want you to). There are a couple of ways of going about this. See *Sharing CD-ROM resources* on page 93.

## Using CDFS

To open a directory display for a CD-ROM, click on the CD-ROM drive icon on the icon bar. The contents of the CD-ROM will be displayed by the RISC OS Filer:



### Viewing files stored on PC-format CD-ROMs

You can open RISC OS directory displays for PC-format CD-ROMs. PC file names are translated to a format compatible with the RISC OS environment.

You can view text files using Edit in the same way as usual, and use ChangeFSI (see page 319) to convert a wide range of graphics images to RISC OS sprites or JPEG files, which you can then view and manipulate using Paint or Draw. Some computers can also run the PC programs included on such discs, provided they are fitted with the appropriate expansion card – see your supplier for details.

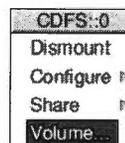
### Playing music CDs

You can play ordinary music CDs using a CD-ROM drive using the CDPlayer application – see *CDPlayer* on page 315.

### Volume control



To control the volume of an audio CD (played using CDPlayer) or any CD-ROM that has audio files on it, choose **Volume...** from the CDFS icon bar menu.



## Using PCMCIA memory cards

Some Acorn computers include support for PCMCIA memory cards. These are similar to floppy discs, in that they store information, files and applications.

There are different types of PCMCIA memory card available, some of which (e.g. ROM, MROM, EPROM and OTPROM) are read-only, and others (e.g. SRAM) which you can write to and format, like a floppy disc.

If your computer is fitted with PCMCIA slots, you'll see an icon on the lefthand side of the icon bar for each slot. These are numbered :0, :1 and so on. When you insert a PCMCIA memory card, the name under the corresponding PCMCIA slot icon will change to reflect the name of the card.

### PCCardFS filer

The PCCardFS filing system behaves in the same way as ADFS. For example, you can copy and move files, and format some types of PCMCIA memory card.

#### Displaying the root directory

If you click Select or Adjust on a PCMCIA slot icon, you'll see the root directory display for that PCMCIA card. Icons in the directory display behave in exactly the same way as in an ordinary ADFS display.

#### Icon bar menu

If you click Menu over a PCMCIA slot icon on the icon bar, you'll see the same familiar menu that you'd see for a floppy disc, with a couple of exceptions (e.g. **Name card** instead of **Name disc**). Some of the menu entries will be greyed out, depending on what type of PCMCIA memory card you've inserted. For example:

- You can't **Verify** PCMCIA memory cards
- You can't **Format** or **Name** read-only PCMCIA memory cards (e.g. ROM cards).

#### Formatting PCMCIA memory cards

This works in the same way as formatting a floppy disc. You can format a PCMCIA memory card in one of two ways:

- Choose **Format/PCCardFS** to format the card as a PCCardFS disc.
- Choose **Format/DOS** to format the card as a DOS disc.

If you see a '**Card not formatted**' message when you click on a PCMCIA slot icon, you'll need to use one of the above options.

If you see the '**Format not understood**' error message, you can format the card as above if you're sure there is nothing useful on it.

## PCMCIA I/O devices

There are many different types of PCMCIA card, not just memory cards. Any PCMCIA slots in your computer will accept PCMCIA I/O devices (such as Ethernet cards, or parallel ports) as well as PCMCIA memory cards. If the card in a given PCMCIA slot is an I/O device, the corresponding slot icon on the icon bar will be greyed out, as will all the menu options.

## RAM discs



A RAM disc is an area of computer memory that is being used just like a disc drive. It is called a RAM disc, because you use it in a way very similar to a hard or floppy disc. However, the important thing to remember is that objects on the RAM disc are not 'safe' in the way that objects on real discs are safe: they will be lost when the computer is switched off or reset.

The main reason for using a RAM disc is that saving and loading files and applications to or from the RAM disc is much faster than to a floppy or hard disc.

### Creating a RAM disc

There are two ways of creating a RAM disc. One method is to use !Boot's Memory configuration window to create a RAM disc of a given size every time you switch on the computer (see page 39).

#### Preferred method

The preferred method is to use the Task manager to create a RAM disc for the current session only (see *Create a RAM disc* on page 60). This is because

- it's less wasteful of memory
- configuring too large a RAM disc from !Boot may cause problems on start-up (e.g. if the disc is larger than the total amount of free space available, or if you physically remove some RAM from your computer and forget to alter your boot sequence). See *Troubleshooting* on page 65.

The largest RAM disc allowed is 16MB.

## Using a RAM disc

A RAM disc is a convenient way of speeding up some operations, at the cost of using some of the computer's memory. Here are two examples:

### Copying between floppy discs

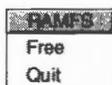
When you are copying a group of objects from one floppy disc to another, you have to change the disc after each file or directory. An alternative is to allocate as much space as you can to a RAM disc, copy as many files as will fit into RAM, and then copy them from RAM disc to the destination disc. When you've finished, delete the files from RAM, and quit the RAM disc by choosing **Quit** from the icon bar menu.

### Keeping frequently-used files in a RAM disc

Another common use of the RAM disc is to hold programs and data files that you use frequently. Keeping them in the RAM disc reduces the time they take to load, and may help you avoid having to change discs to find them.

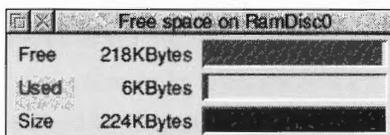
Don't keep files that you are **changing** in the RAM disc: it's too easy to switch off the computer without transferring them to a permanent storage medium.

## RAM disc icon bar menu

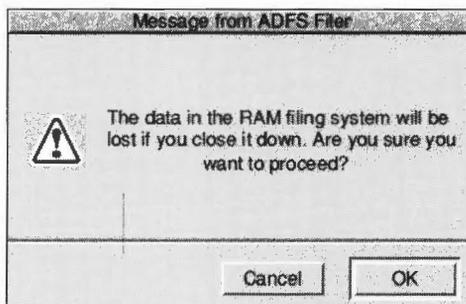


The RAM disc has its own icon bar menu with options specific to the filing system.

To see how much space is available, click Menu on the RAM icon, and choose **Free**. This displays the total free and used space, in KB.



You can remove the RAM disc from the icon bar by choosing **Quit**. If the RAM disc is not empty you'll be warned that you will lose its contents if you go ahead.





If your computer is connected to a network – maybe it is part of your school or office network – you’ll see the network icon on your icon bar. This chapter shows you how to use a network to communicate with other computers.

**If your computer isn’t connected to a network you don’t need to read this chapter.**

Networking uses many jargon terms – Econet, Ethernet, AUN, Level 4 and file server – to name a few. However, as you’ll see from this chapter, using a network is actually quite easy. There’s an overview of Acorn network types on page 101.

## Networking

Although your computer has a complete set of networking modules resident inside, they are automatically disabled by the !Boot application that is on the hard disc (if fitted). This is to leave as much memory as possible free for running applications if your computer is not on a network.

If you want to use your computer on a network, then you must remove the file that disables the network software. To do this:

- 1 Hold down Shift and double-click on !Boot to open its application directory.
- 2 Move the file **Choices.Boot.PreDesk.SetUpNet** to another directory, or a floppy disc. Don’t delete it altogether; you can then copy it back if you decide you want to disable the networking modules at a later date.
- 3 Perform a Power-on Delete (see page 66).

This procedure enables all the network software. You can refine this at a later stage by only enabling those software modules that are absolutely necessary, using an application called !SetupNet (available from your network dealer).

RISC OS computers use two types of networking:



- **Disc sharing on a network.** With this type of network you can share your discs with other users. It is also possible to share a printer with other users.



- **File server sharing on a network.** With this type of network you can access a file server, on which you can store files and access applications. You can also share a common printer with other users.

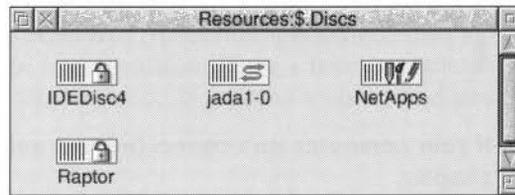
You can use both these types of network at the same time, if you want.

## Disc snaring on a network



If you have an icon like this on your icon bar it means you're connected to an Acorn Access network; there may be other discs on the network that you can access.

Click on the discs icon to display the available discs.

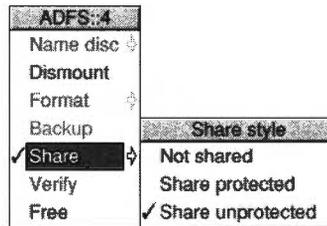


Double-click on the disc that you want to use. The disc name is displayed under the discs icon on your icon bar. You can now use the network disc. It is also possible to share your own disc with other users and to print using a shared printer. More information about disc sharing is available from your supplier.

Discs with a lock on them are Protected – you can only read and write to files and directories where public access has specifically been given.

### Sharing a hard disc

To share your hard disc with the other users on a network, choose **Share/Share Unprotected** from the hard disc icon bar menu. The disc will be made accessible to the network **unprotected** (see below).

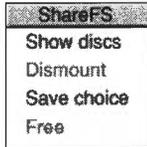


**Note:** If your disc has the same name as another already on the network, you will be asked to change it (first choose **Not shared**, and see *Changing the name of a hard disc* on page 68 if you need guidance on how to do this). Remember to update your Desktop boot file if you change your hard disc's name.

### Protecting a shared disc

If you want to stop others reading, changing or deleting files on the shared disc (which they can otherwise do) choose **Share/Share Protected**. If you do this, only files and directories you specifically grant public access to using the **Filer/Access** menu (see page 24) can be read and written to by others.

## Menu options



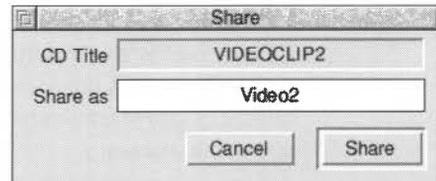
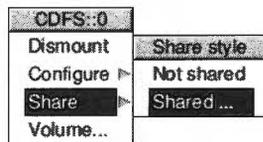
Click menu on a shared disc icon on the icon bar to display the ShareFS menu.

To	Do this	Notes
Display the available shared discs	Choose <b>ShareFS/Show discs</b> .	
Dismount a shared disc	Choose <b>ShareFS/Dismount</b> .	
Save ShareFS settings	Choose <b>ShareFS/Save choices</b> .	This setup will be used next time you switch on.
Find out how much free space is available	Choose <b>ShareFS/Free</b> .	

## Sharing CD-ROM resources



If your computer has a CD-ROM drive fitted, you can share that drive with other users on a network. It's as easy as sharing your hard disc drive:



More detailed information is supplied when you buy Acorn networking products.

**Note:** Access times are much slower for CD-ROMs, and the large files they contain can slow down networks if they're in use by more than a couple of users at once.

Your supplier will have details of Acorn products you can buy to speed things up. For example, you can use one computer as a dedicated CD-ROM server.

## Printing on a network

A printer connected to a computer on a network can be shared by other users on the network. The computer connected to the printer should have a hard disc with at least 5MB of free space at all times.

To print:

- 1 On the computer connected to the printer, choose **Printer control...** from the Printer manager's icon bar menu.
- 2 Select the printer to be shared, press Menu and choose **Shared**.
- 3 On the computer wishing to print, click Menu over the Printer manager's icon on the icon bar and choose **Printer control...**  
A list of available printers (**Connection Remote**) will be displayed.
- 4 Select one of these printers and choose **Active** from the **Printer control** menu.  
It will appear on the icon bar.

You can now print using the remote printer. Choose **Save choices** to remember this printer setup in future.

## File sharing on an Acorn Level 4 Fileserver network



A file server network consists of a number of computers connected together to a dedicated computer called a file server.

This type of network is usually looked after by a network manager (a person, rather than a piece of software). The network manager often allocates each person a user name. This name is used to identify them to the file server.

### File server

A file server is a computer that holds a central store of computer programs and data; all network users can read data from the file server. If your network manager allocates you storage space on the file server, you can store data there in your own special user area.

### Printer server

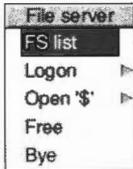
A network usually also includes a printer server. A printer server is a networked computer that is directly connected to a printer. All users of the network can use the printer.



### Other services

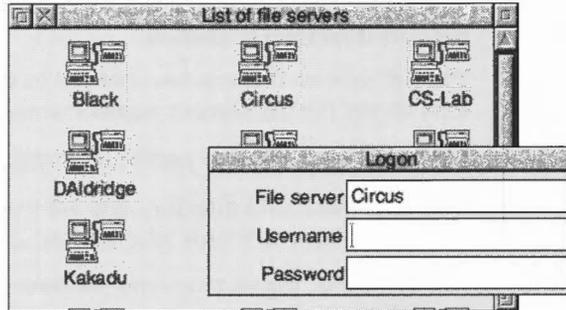
You may also be able to use electronic mail (known as 'email') – a way of sending electronic messages between network users. Ask your network manager for more information.

## Logging on



Before you can use a file server, you need to log on to it using the Net Logon dialogue box. If there is more than one file server on your network, you will need to choose which one to log on to. Choose **FS List** from the network icon bar menu to open a display showing the file servers available; there is an icon for each file server. If a file server has more than one storage device available for you to use (for example, an extra hard disc) there is an icon for each device in the FS List window.

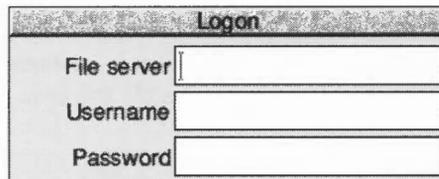
If you click on one of the file server icons, the Logon dialogue box appears, with the file server name already in the first writable icon. For example:



If you're not already logged on, you can also display this dialogue box by clicking on the Net icon on the icon bar. If you are logged on already, clicking on the Net icon will open your 'user directory' – there's more on this later.

To log on to a network file server:

- 1 Click on the Net icon. This displays the **Logon** window.



- 2 Type in the name of the file server (this may already be set up), your user name, and (if needed) your password.  
(Press **↓** to move to a new line.)

Your user name is set by the network manager. Your password does not appear on the screen: this is to prevent other users seeing your password.

Logon	
File server	Business1
Username	Steve
Password	-----



If you enter your user name and password correctly:

- A directory display for your user directory (the top-level directory in your own network directory) is opened
- The Net icon on the icon bar changes to show a connection (the text under the icon shows the file server's number or name).

If you get your user name or password wrong, an error message is displayed.

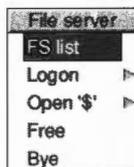
If you do not have a user directory, you are logged onto the root directory of the file server instead (but you'll only have limited access to its contents).

You can, of course, log on to several file servers; a Net icon is displayed on the icon bar for each file server.

You can set up the computer to fill in the file server entry automatically – see *Net* on page 35.

## File server network menu options

### FS list



To check which file servers are available, choose **FS list** from the File server menu. A list of file servers is shown in a window. **Full info**, reached via the Display menu in this window, shows the file server net address (a number) as well as its name.

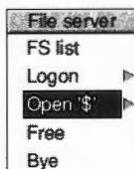
### Logon

To log on to a network file server from the File server menu, move to the **Logon** dialogue box.

File server	
FS list	
Logon	▶
Open '\$'	▶
Free	
Bye	

Logon	
File server	World
Username	
Password	

## Open \$



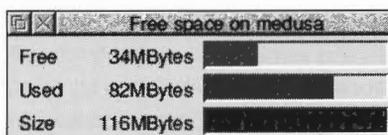
On a file server you log on to your user directory. This will normally be one or more levels down from the top level (root) directory. The user directory is sometimes referred to as the user root directory (URD). Pathnames to the user root directory begin with `&`.

In some cases, you may be prevented from looking at any directories other than your own. If you are not sure about your privileges, ask your network manager.

You can open the root directory of the file server by choosing **Open \$** from the File server menu. If the file server has more than one disc, the disc names are displayed as a submenu; click on the disc whose root you want to display.

## Free

To check how much space is available on a file server, choose **Free** from the File server menu. This displays the free space on the file server. **Free** is the amount of space you have left in your user area. **Used** is the amount of space that has been used (by all users) on the file server. **Size** is the total size of the file server disc.



If you find that you are running out of space, ask your network manager for more.

## Bye

When you have finished using a file server, log off by choosing **Bye** from the File server menu. Any directory displays for the file server will be closed. Choosing **Shutdown** from the Task Manager icon bar menu does this automatically.

## Logging on without displaying a directory

To log on **without** displaying the user directory, hold down Shift and press Return for the last time when logging on; do not release Shift until the file server name or number appears under the Net icon, indicating that you are logged on.

## Updating the file server directory display

If a file shown in a file server directory display on your screen is deleted by another user, your display is not updated automatically. If you try to open the deleted file, you will get a 'File not found' error message. You can update the display by closing the directory display and opening it again.

## Your network 'User' directory

Normally every user has their own directory on a file server in which they can work and save files. Your own network directory usually has the same name as your user name. It is represented on screen by the character **&**, so if you logged on to a file server on a hard disc called History, the directory display for your directory would have the title **Net : :History . &**.

If the file server can't find your user directory, the directory display shows the files and directories in the root directory of the file server; however, you won't 'own' this directory (unless you are the network manager), and so your access to many of the files and directories it contains may be restricted.

## Using files and applications

You can use files and applications on the file server in the same way as you would use them directly from your own computer. They load from the hard disc on the file server into your own machine.

If you want to load applications automatically when you start up, you can save your own Desktop boot file (see *Controlling tasks and memory* on page 57).

When you want to save a file to your file server directory, just drag its icon into your network user directory. If you try to save a file in someone else's directory, and you do not have the privilege to do so, you will get the error message **Insufficient access**.

### Using files from other users' directories

You may sometimes need to use a file that is stored in another user's directory. If the file has Public read access you can look at it, but not save any changes. However, you can change the file and then save it in your own directory by dragging the Save as icon to your own directory display.

To load a file from another user's directory, you need to display the file server's root directory, and then move down the directory structure into the other person's directory. To display the root directory, choose the menu option **Open \$** (see page 97).

The root directory display shows all the user root directories. Double-click on the directory for the user whose files you want to use. There may be some icons missing from the directory display: these are for files that the owner has locked against all public access. If you try to load an application from someone else's directory, it will generate an error message if the owner has not given public read access to it. There are other reasons why you may get an error message doing this; ask your network manager for advice.

## Setting the access permissions to your own files

### File ownership

You can look at, change and delete any files in your own user directory, but you cannot change or delete files from someone else's user directory (though you may be able to look at them). Some files and directories may be hidden from you completely, so that you do not even see their icons in the directory display.

By default, other users will have no access to your files. This section gives you a quick overview of access permissions on networks. For a full explanation of access options see *Setting file access permissions* on page 24.

You can set the public access to your files using the **Access** command from the Filer menu.

The Owner access sets what **you** can do with the file; the Public access controls what **other users** can do with the file. You can lock a file against deletion to prevent you accidentally deleting it yourself, but you don't need to set this to prevent other users deleting your file as it is locked to them anyway.

If you allow public write access to your file, other users are able to alter it without your knowledge. If you allow public read access only, they can look at the file but not alter it. Never completely remove the access rights to your files by denying read and write access to yourself as well as to others.

You cannot specify the access rights to a directory, only to the files within it, but you can lock a directory against deletion using **Access**.

### Hidden objects

If you lock a directory or allow no public access to a file, and the network manager has enabled the hidden objects option (at the fileserver) the directory or file becomes a hidden object and is not visible to other users.

## Setting your password

The password is a security measure to prevent other users logging on with your identity and gaining access to your protected files.

You should change your password occasionally to help preserve the security of your files. To change your password, use the **\*Pass** command:

- 1 Press F12 to move to the command line.
- 2 Type:

```
Net ↵
```

3 Type:

```
Pass oldpassword newpassword ↵
```

4 Type:

```
ADFS ↵
```

5 Press the Return key (↵) again to go back to the desktop.

The first time you set a password you may not have an old password, so use the null string "" in place of *oldpassword*. For example, to set your password for the first time to Hebrides, type

```
Pass "" Hebrides
```

If you later wanted to change this to Shetland, you would type

```
Pass Hebrides Shetland
```

Your password must be at least six and not more than 22 characters long.

### Choosing a password

When you are choosing a password, do not select something very obvious that could be guessed by someone else. Do not, for example, use the date of your birthday, the name of a member of your family or a pet, your telephone number, or the registration number of your car.

In some cases, the network manager may prevent you resetting your password, or looking at any directories other than your own. If you are not sure about your privileges, ask your network manager.

## Using a printer server

If your file server also has a printer attached to it, this printer can be accessed by other users on the network. Use the Printer manager application, !Printers, to access a printer server in the same way as you would an ordinary printer.

Ask your network manager for details about which printer driver to use and the name of the network printer, then set up the printer according to the instructions given in *Setting up printers* on page 105.

## Networking with non-Acorn computers

If you want to communicate with other types of computer on the network, such as DOS and UNIX computers, you may be able to use the TCP/IP protocol suite software. The TCP/IP protocol suite is available from your Acorn dealer.



The TCP/IP protocol suite lets you communicate with non-Acorn computers. If the host computer is running the Network File System (NFS) then you can display files resident on the host computer in a RISC OS directory display. You can manipulate these files in the same way as you would files on your own computer.



The other item of TCP/IP software is the VT220 terminal emulator. This software lets your computer emulate a VT220 terminal in a RISC OS window. With this application you can log in to and use a remote computer. Contact your network manager for more information.

## Types of network

Acorn uses several types of networking systems, based on Econet and Ethernet cabling. They use either the established Econet network software or the newer Access shared disc and AUN networking software. Here are brief descriptions of the types of network Acorn currently support:

### Econet

The standard networking in schools until relatively recently. Hardware is cheap, and there are many networks already installed, but by modern standards data transmission rates are fairly low. You can now run an AUN network with Econet.

### Acorn Access

An easy-to-install Ethernet network for small to medium-sized installations. Allows simple disc and printer sharing between all Acorn RISC OS computers on the network. The software for this type of network is supplied as standard in your computer's ROM; all you need to do is purchase the necessary hardware.

### Acorn AUN networking with file servers

An Ethernet network that goes one stage further than Acorn Access in that you can also have a dedicated computer that is used as a file server **and** a printer server (although this isn't necessarily recommended). It is also possible to use AUN on an Econet network or mixed Ethernet/Econet network.

### Acorn AUN networking with Acorn TCP/IP protocols

Large Ethernet networks can be set up to use TCP/IP-only protocols, as well as TCP/IP-AUN protocols, so you can connect to Acorn and non-Acorn computers.

## Network errors

### Error messages

<code>Station xxx not listening</code>	The file server is switched off, or is too overloaded to be able to deal with your request at the moment (try again later).
<code>No reply from station xxx.xxx</code>	The file server has received and acknowledged your request, but has subsequently failed to comply with it.
<code>Network not plugged in</code>	Your machine is physically disconnected from the network, either at the back of the computer or at the socket box at the other end of the cable.

### Newly-connected file servers

If a new file server has been connected to your network, it will not automatically appear on the FS list. To make it do so, log on to the new file server explicitly using the file server number (ask your network manager). The next time you display the FS list, the new file server will be included.

### Applications copied from a network

If you copy an application from the network, you need to run the application from your local disc. If you don't do this, and try to load a file produced by the application after logging off the network, you will see the message **Not logged on**. This is because the computer, having 'seen' that the application came from the network, is still trying to find it there.

**Note:** Take care that you're not breaching any copyright by copying applications.

### Network failures

Serious errors, such as damage to the disc of a file server, should be handled by the network manager. The only error you are likely to meet when using the network is failure of the network itself, rather than the filing system. This can happen for a variety of reasons: both 'hard errors', such as the network becoming disconnected, and 'soft errors', such as the network becoming jammed as a result of too many people using it at the same time. Most problems tend to be soft and can be cured by trying the operation again, or by logging on to the file server again.

# Part 2: Printing





All printing is handled by the Printer manager, !Printers. This provides an interface between your printer and the file that is being printed.

Before you start printing, you need to set up the Printer manager so that it is using the correct printer driver for your printer and communicates correctly with it.

This chapter tells you how to set up !Printers. If your printer is already set up correctly you can find out how to print files by referring to *Printing your files* on page 123.

This chapter tells you how to

- set up and connect your printer
- choose which printer driver to use
- configure the printer driver.

## Setting up the printer

Before you can print from your computer, you need three things

- a suitable printer
- a printer cable, with connectors for the computer and the printer
- an appropriate printer driver.

If you are connecting to a network printer, you'll need to make sure that you have the appropriate network connection for your computer. Contact your network manager for more information.

## Types of printer supported

Your supplier will advise you on suitable printers for your computer. RISC OS supports most types of popular dot matrix printer, Inkjets, as well as colour printers. It also supports laser printers compatible with the HP LaserJet as well as PostScript printers.

The following printers are among those supported:

Acorn JP150	Apple PostScript printers
Apple ImageWriter	Canon Bubblejet series
Citizen Swift series	Epson EX, FX, JX & LX series
Epson MX & LQ series	Epson Stylus Colour
HP Laserjet & Deskjet series	IBM Proprinter series
IBM PostScript printers	Integrex Colourjet
NEC P series	Olivetti JP360
QMS ColourScript	Qume ScriptEN
Star DP, LC & XB series	Star Laser Printers
TI OmniLaser printer	Most PostScript laser printers

### Other printers

If your printer is not on this list, check the ReadMe files in the Printers directory to see if your printer is supported. You can also often run your printer in emulation mode. Most dot-matrix printers can emulate the Epson FX or LQ printer. Most non-PostScript laser printers can emulate the HP Laserjet or Deskjet printers. Read your printer's user manual for more information.

!Printers also supports direct-drive printers. These are high performance printers that connect directly to the computer using an expansion card.

## Connecting the printer

### Serial and parallel



If you are connecting the printer directly to your computer you have two choices: connection via the serial port or the parallel port. If your printer can use either type of connection, use the parallel port (it's quicker!). Your supplier will be able to advise you on which port to use.

Your supplier will also be able to advise on a printer cable. If you are making one yourself, details of the pin connections from the computer's output ports can be found in the *Welcome Guide*. You will also need to consult your printer documentation for information on how to wire the connector to the printer. A standard PC (personal computer) printer cable will usually work.

## Network and NFS



If you are connected to a network of computers, you may have access to a network printer or printer server. Consult your network manager for more information.

## Direct drive

Direct drive printers connect to their own expansion card inside the computer. Instructions on how to fit an expansion card are given in the *Welcome Guide*.

## Loading the printer manager

In this section we assume that you have connected your printer to one of the communication ports on your computer or that you're using a printer on a network.

The printer manager application, !Printers, provides an interface between the printer and your application software (an editor or word processor, for example). It's used for printing files, and to provide printer support for applications.



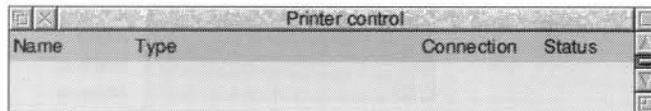
**Printers**

The printer manager uses printer definition files (often called printer drivers) to tell the computer what type of printer you are using. These files are contained in the directory `Printing.Printers`.

## Loading !Printers



- 1 Double-click on the !Printers icon (it's in the Apps icon bar directory). After a few seconds the printer manager icon appears on the icon bar.
- 2 Click Menu over the Printers icon on the icon bar and choose **Printer control**. This displays the Printer control panel:



## Loading a printer definition file



**Printers**

To load a printer definition file:

- 1 Open the `Printing.Printers` directory.
- 2 Open the directory that corresponds with the manufacturer of your printer.
- 3 Drag the appropriate printer definition file onto the Printer control window.

The definition file will have a similar name to that of your printer. See *Choosing a printer type* below.

The printer name appears in the control window.



JP-150

- 4 If you want to have more than one printer loaded, drag additional printer definition files to the Printer control window.

Printer control			
Name	Type	Connection	Status
JP 150	Acorn JP 150	Parallel	Active

### Choosing a printer type

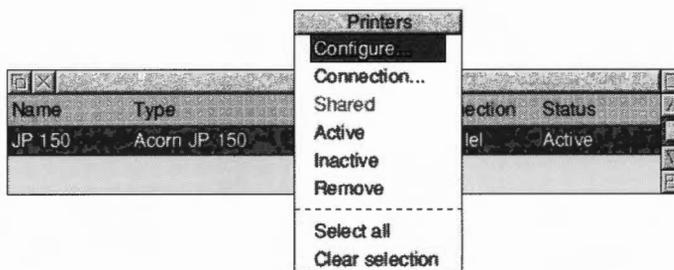
You should choose the printer definition file that is closest to the printer you have. If there isn't a file specific to your printer, you may be able to choose one that's compatible. 9-pin dot matrix printers can usually emulate the Epson FX printer, while 24-pin dot matrix printers can usually emulate the Epson LQ printer; your printer manual should give details.

Non-PostScript laser printers can often emulate the HP Laserjet, or have a compatibility mode that emulates the HP Laserjet (or Deskjet); again, your printer manual should give details.

## Configuring the printer

After you have loaded your printer driver, you must choose the correct printer configuration to give the results you want.

To display the configuration window, either double-click on the printer driver in the printer control window, or click Menu on the printer entry and choose **Configure**.



If you want to change the configuration of a printer that is already on the icon bar, click on the printer icon on the bar while holding down Shift.

There are three classes of printers:

- PostScript compatible printers (type PS).
- LaserJet and DeskJet compatible printers (type LJ).
- Dot matrix and Inkjet printers (type DP).

The following subsections describe how to configure each type of printer.

## Configuring dot matrix and inkjet printers



Dot matrix and inkjet-type printers use the Bit image printer configuration window:

### Choosing the printer name and paper type

The **Name** box gives the name that will appear beneath the printer icon on the icon bar. You can change this, if you wish, or leave it blank (in which case, the name is set to the connection type, e.g. **Parallel**).

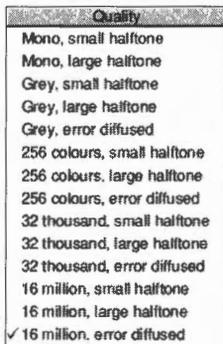
The **Paper** box gives the paper size to be used by the printer. This is usually **A4 (Generic DP)**. If you want to change the paper size, click on the menu icon; this displays the **Paper sizes** menu. Choose the alternative paper size you wish to use. The correct paper sizes are marked **Generic DP**. You can also generate other page sizes using the **Edit paper sizes option** from the icon bar menu (see page 119).

### Printer options

Resolution
60 by 72 dpi
✓ 120 by 72 dpi
120 by 144 dpi
120 by 216 dpi
240 by 72 dpi
240 by 144 dpi
240 by 216 dpi

To display the printer **Resolution** menu, click on the menu icon. Increasing the resolution usually gives a better quality image, but printing usually takes longer (see *Colour printing with little free memory* on page 64). Note that some high resolutions (e.g. 720dpi on an Epson Stylus colour printer) are only useful on special paper; see the manual supplied with your printer.

To display the **Paper feed** menu, click on the menu icon. This menu lets you choose between Auto, Manual and Roll paper feed. Choose **Auto** if your printer has a sheet feeder or uses fanfold paper. Choose **Manual** if you have to insert each page by hand while printing is under way; you are prompted to insert paper at the end of each page. Choose **Roll** if your printer is using a paper roll.

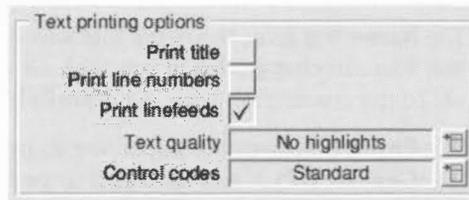


The **Quality** menu lets you choose the type of printout quality. Click on the menu icon to display the menu.

- **Mono** prints black and white output only. It does not halftone fonts or sprites; it only halftones Draw files. This is the fastest print mode.
- **Grey** prints pictures in shades of grey. It halftones all types of files. You should always choose this option, unless speed of printing is more important than print quality, in which case choose **Mono** instead.
- **Colour** prints in colour on colour printers. Only use the lower quality modes (32K or 256 colours) if you're short of memory. You'll get the best results using the 16 million colour options.
- **Small halftone** prints in 3x3 pixel halftones for grey scales and colour.
- **Large halftone** prints in 6x6 pixel halftones. Large halftones give better quality than small halftones.
- **Error diffused** usually gives the best quality results, especially for grey scale pictures (try Large halftone, as well, though). However it takes longer to print than the halftone options.

### Text printing options

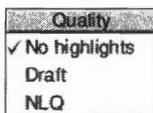
These options control the way text is printed from an editor (such as Edit).



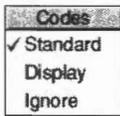
**Print title** puts the filename, time, date, and page number at the top of each page.

**Print line numbers** puts line numbers at the beginning of each line.

**Print linefeeds** sends a linefeed to the printer (as well as a carriage return) at the end of each line. If you find that your printer is producing a blank line after each line of text, you should turn this option **off**. If your printer is printing everything on one line, then you should turn this option **on**.



The **Text quality** menu controls the quality of the output print. Text quality can be either **No highlights**, **draft** or **NLQ** (near letter quality). NLQ looks better but takes longer to print. (NLQ also uses more ink and wears the printer ribbon out quicker).



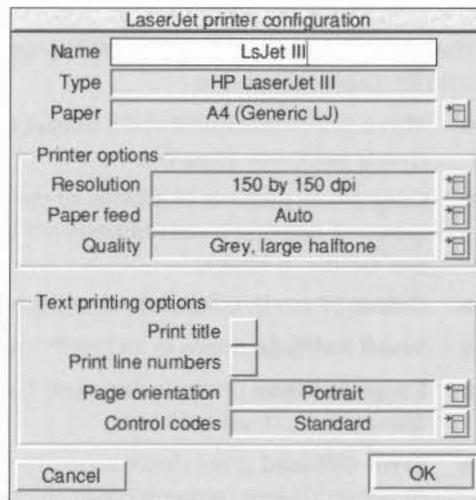
The **Control codes** menu alters the way in which text files are printed. This should normally be set to **Standard**. **Display** causes all control codes and top-bit-set characters to be printed in hexadecimal notation. **Ignore** causes all control codes and top-bit-set characters to be ignored.

When you have finished configuring your printer, click on **OK**. If you want to exit without saving your changes, click on **Cancel**.

## Configuring LaserJet and DeskJet printers



LaserJet is the collective name given to all laser printers that can emulate the HP LaserJet printer.

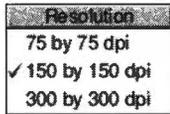


### Choosing the printer name and paper type

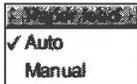
The **Name** box gives the name that will appear beneath the printer icon on the icon bar. You can change this, if you wish, or leave it blank.

The **Paper** box gives the paper size to be used by the printer. This is usually A4 (Generic LJ) in Europe; if you are using a DeskJet explicitly change this to A4 (Generic DeskJet). If you want to change the paper size, click on the menu icon; this displays the **Paper sizes** menu. Choose the alternative paper size you wish to use. The paper sizes marked **Generic LJ** are usually best for LaserJet type printers; paper sizes marked **Generic DeskJet** are usually best for DeskJet type printers (including the Acorn JP150). It is also possible to generate other page sizes using the **Edit paper sizes option** from the icon bar menu; see page 119 for more details.

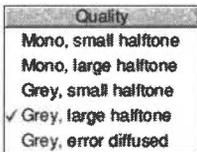
## Printer options



To display the printer **Resolution** menu, click on the menu icon. Increasing the resolution usually gives a better quality image, but printing usually takes longer. Most modern LaserJets (and LaserJet copies and clones) can use 300×300dpi. Some early models (LaserJet and LaserJet II) do not contain enough memory to print full page graphics at full resolution; in this case use 150×150dpi or purchase more memory.



To display the **Paper feed** menu, click on the menu icon. The menu lets you choose between Auto and Manual paper feed. Choose **Auto** if your printer has a sheet feeder or uses fanfold paper. Choose **Manual** if you have to insert each page by hand during printing.



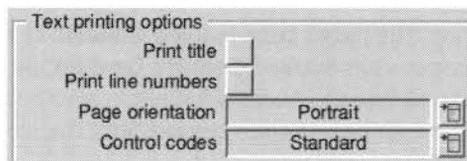
The **Quality** menu lets you choose the type of printout quality. Click on the menu icon to display the menu.

- **Mono** prints black and white output only. It does not halftone fonts or sprites; it only halftones Draw files.
- **Grey** prints pictures in shades of grey. It halftones all types of files. Unless speed of printing is more important than print quality, choose this in preference to **Mono**.
- **Colour** prints in colour on colour printers.
- **Small halftone** prints in 3×3 halftones for grey scales and colour.
- **Large halftone** prints in 6×6 pixel halftones. Large halftones give better quality than small halftones.
- **Error diffused** gives the best quality results, especially for grey scale pictures. However it takes longer to print than the halftone options.

If you're using a colour printer, you'll also be able to choose from three colour options (256, 32k and 16M colours) but printing with many colours can take a lot longer (see page 64). For each colour option, you'll be able to select small halftone, large halftone or error diffused.

## Text printing options

The text printing options control the way text is printed from an editor (e.g. !Edit).

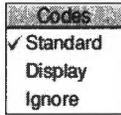


**Print title** puts the filename, time, date, and page number on each page.

**Print line numbers** gives each page line numbers.



The **Page orientation** menu gives you a choice between portrait or landscape orientation text. Portrait prints along the shorter side of the paper while landscape prints along the longer side.



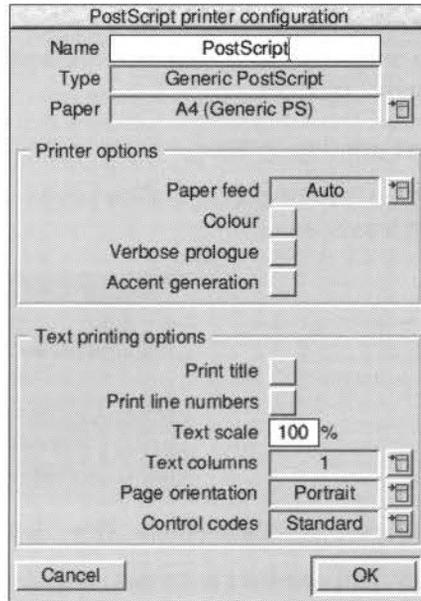
The **Control codes** menu alters the way in which text files are printed. This should normally be set to **Standard**. **Display** causes all control codes and top-bit-set characters to be printed in hexadecimal notation. **Ignore** causes all control codes and top-bit-set characters to be ignored.

When you have finished configuring your printer, click on **OK** then save the setup as described on page 118. If you want to exit without saving your changes, click on **Cancel**.

## Configuring PostScript printers



PostScript is the name given to all laser printers that are PostScript-compatible.



### Choosing the printer name and paper type

The **Name** box gives the name that will appear beneath the printer icon on the icon bar. You can change this if you wish, or leave it blank.

The **Paper** box gives the paper size to be used by the printer. This is usually A4 (Generic PS). If you want to change the paper size, click on the menu icon; this displays the **Paper sizes** menu. Choose the alternative paper size you wish to use.

The paper sizes marked **Generic PS** are usually best for PostScript type printers. It is also possible to generate other page sizes using the **Edit paper sizes option** from the icon bar menu; see page 119 for more details.

### Printer options



To display the **Paper feed** menu, click on the menu icon. Normally the **Paper feed** option should be set to **Auto**. If you are feeding paper or envelopes through the manual feed choose **Manual**.

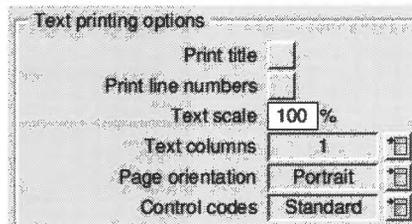
Choose **Colour** if you are printing in colour on a colour PostScript device.

Choose **Verbose prologue** if you wish to declare all of the PostScript printer fonts. This option gives you the same prologue as that used by the RISC OS 2.00 printer drivers; it is included for backward compatibility only. Do not choose this option unless your application requires it.

The **Accent generation** option will automatically generate accented characters even if they are not supported by your printer. Unless you need to print unusual accented characters such as w or y circumflex (used in Welsh) leave Accent generation off, as it slows printing and does not work with printers with small internal memory.

### Text printing options

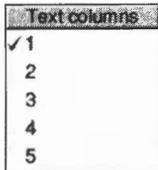
The text printing options allow you to control the way text is printed from an editor (such as Edit).



**Print title** puts the filename, time, date, and page number on each page.

**Print line numbers** gives each page line numbers.

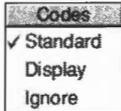
You can adjust the size of the printed type by giving a **Text scale** factor. PostScript printers have a wide range of available sizes, so you can scale the text from 20% to 200%. 100% gives standard sizes, 200% gives twice the size, and 50% gives half the size (twice as many characters per inch). Invalid sizes reset the text size to 100%.



To display the **Text columns** menu, click on the menu icon. Text columns specifies the number of columns of text to be printed on each sheet of paper. The printer manager defaults to one column for portrait printing and two for landscape printing.

To display the **Page orientation** menu, click on the menu icon. Page orientation allows choice of portrait or landscape orientation text. Portrait prints along the shorter side of the paper while landscape prints along the longer side.

**Note:** If you change this setting, the **Text scale** and **Text columns** values are reset to default values suitable for the current orientation.

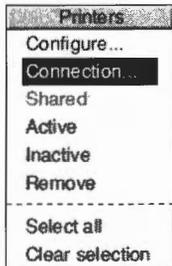


The **Control codes** menu alters the way in which text files are printed. This should normally be set to **Standard**. **Display** causes all control codes and top-bit-set characters to be printed in hexadecimal notation. **Ignore** causes all control codes and top-bit-set characters to be ignored.

When you have finished configuring your printer, click on **OK** then save the setup as described on page 118. If you want to exit without saving your changes, click on **Cancel**.

## Configuring the printer connection

**This section applies to both PostScript and non-PostScript printers**



Once you have loaded the printer driver, you need to set it up so that it can communicate with the printer.

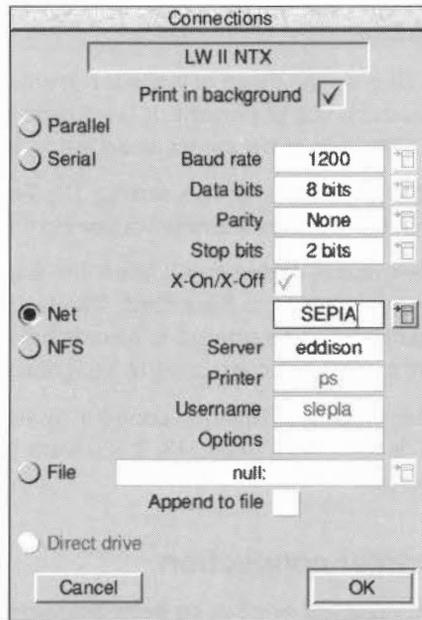
Click Menu over the Printer control window and choose **Connection**. This displays the Connections window.

The printer driver can send printed output to the printer using one or more of the following ports

- the **Parallel** port
- the **Serial** port
- through a **Network** or **NFS** connection
- through a **Direct drive** expansion card.

Additionally it can save printer output to a **File** for printing later.

The communications port you choose will depend upon your printer and printer cable. Check with your supplier for more details, or read your printer manual.



### Printer connection options

Some of the network options may be 'greyed out' so that you cannot choose them.

**Print in background** allows you to choose whether you want to define the printer and printing speed as a high or low priority task. If the box is ticked printing can be slower, although you can continue to use the computer while the printing takes place. If this option is not ticked, printing can be quicker, although you will usually have to wait for printing to finish before you can use the computer again. This option only works with applications that send their files to the print queue; some applications bypass the queue.

**Parallel** allows you to connect a printer to the parallel port.

**Serial** allows you to connect a printer to the serial port. You can set the Baud rate, Data bits, Parity, Stop bits and XON/XOFF. To alter the values, click on the menu icon and choose a new value. Consult the printer manual for the correct values.

The screenshot shows a configuration window for a serial printer. It has a radio button labeled 'Serial' which is selected. Below it are five fields, each with a menu icon to its right: 'Baud rate' is set to 57600, 'Data bits' is set to 8 bits, 'Parity' is set to None, 'Stop bits' is set to 1 bit, and 'X-On/X-Off' is an empty checkbox.

**Net** allows you to connect to a network printer. To use a different printer, click on the menu icon. Alternatively you can type in the name or station number of the printer to use. You must have a network connection to use this option.

**NFS** allows you to connect to printers available on NFS networks. You cannot use this option unless you are already running Acorn's TCP/IP communication protocol product. For an explanation of how to fill in the NFS fields, ask your network manager. Alternatively read the *TCP/IP Protocol Suite User Guide*. You must have an NFS network connection to use this option.

The screenshot shows a configuration window for an NFS printer. It has a radio button labeled 'NFS' which is selected. Below it are four fields: 'Server:' with the value 'eddison', 'Printer:' with the value 'ps', 'Username:' with the value 'slepla', and 'Options:' which is an empty field.

**File** allows you to send printer output to a file. Type the name of the file into the File field (using the complete pathname). Alternatively click on the menu icon and drag the **Save as** box to the desired directory display; your output will now be directed to this file.

**Append to file** works in connection with the **File** option. It adds printer output to the end of the file. Using this you can print several small files and produce a single file of the printed result.

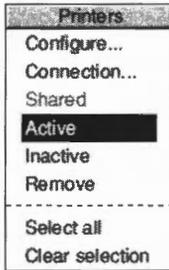
**Direct drive** allows you to connect a direct drive printer to the computer.

### Short-cuts

If you want to change the printer connection of a printer that is already set up on the icon bar, Shift-Adjust-click on the printer icon.

If you want to change the printer configuration, Shift-click on the printer icon.

## Activating the printer



The Printer control menu allows you to make a printer **Inactive**, so that it can't be used and is not displayed on the icon bar. However, its settings are saved so you can use it later by simply choosing **Active**.

You can remove a printer from the Printer control window permanently by choosing **Remove** and **Save choices**.

### Using more than one printer

If you have dragged more than one printer to the Printer control window you can activate them all. A printer icon is displayed on the icon bar for each active printer. This facility can be useful if you have a printer connected directly to your computer, and you also have access to another printer connected via a network.

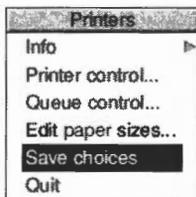
Although you can have many printers activated on the icon bar, only one of these printers is highlighted; all of the others are greyed out. When you click on the Print option in an application, the file to be printed is sent to the highlighted printer.

You can choose to print using a different printer by clicking on that printer's icon on the icon bar. This highlights the new printer driver and greys out the old one.

You can also print using any of the printer drivers (highlighted or not) by dragging files directly onto the desired printer's icon.



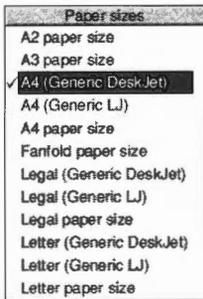
## Saving your choices



You should save to disc any changes you make to the settings for your printer, otherwise you will have to go through the setting-up procedure again, next time you start the printer manager. To do this, choose **Save choices** from the printer icon bar menu.

Once you have saved your settings to disc, the printer manager automatically loads your printer driver onto the icon bar using those settings each time you start the printer manager.

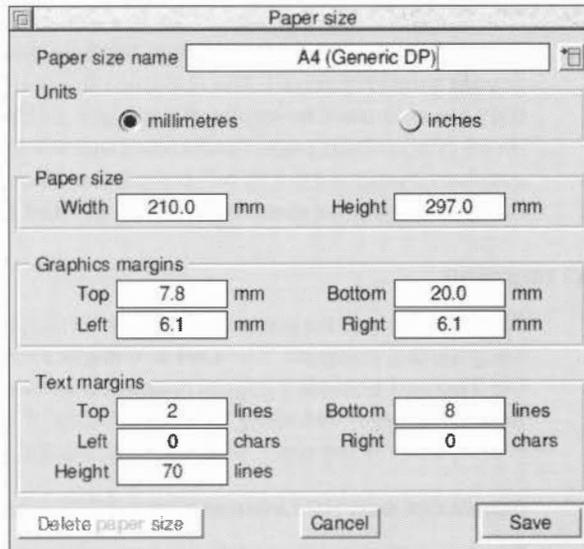
## Editing paper sizes



You can, if you wish, set up new page sizes for your printer. From the icon bar menu, display the **Edit paper sizes** dialogue box. If you use one of the standard paper sizes you need not read this section.

From this dialogue box you can select your paper size by clicking on the menu icon and choosing a paper size. These are:

A2	594×420mm
A3	420×297mm
A4	297×210mm (the default option)
Fanfold	279×203mm
Letter	279.4×215.9mm
Legal	355.6×215.9mm



These are the generic types of page size. Additional sizes that fine-tune these dimensions are also given for the various printer types: DP for dot-matrix printers, PS for PostScript printers and LJ for LaserJet and DeskJet for DeskJet printers. These additional sizes define the Graphics and Text margins for the printers.

## Defining your own paper dimensions

Once you have selected your basic paper size you can fine tune it to your own requirements. Change the name in **Paper size name** and change the **Paper height** and **width** if you are using a special sized paper. Finally you can change the margins within which text and graphics will be printed. Click on the **Save** box to save the new paper dimensions for future use.

PostScript printers, and some other printers, need to know which tray to take paper from. This information is derived from the Paper size name. The name should therefore be in the form *paper size (name)*, where the paper size is the size of the paper in the paper tray. For example, Letter (memo-letter) will use paper in the Letter tray.

**Note:** Don't use the plain paper sizes directly (A3 paper size for example); they are only given to define the basic paper size. Always use a paper size defined for a particular printer – A4 (Generic DeskJet), for example.

## Graphics margins

The graphics margins must reflect the true printable area of the page (look this up in your printer manual). The margins ensure that graphics are printed properly and they are also used by applications (such as Draw). The margins correspond to those of a portrait page; landscape page values are worked out automatically. The graphics margins exist to tell the printer where to print on a piece of paper. The margins cannot be used to move the printed result around on the page.

## Text margins

Text margins are measured as relative to the printable area of the page (defined by the graphics margins). The **Left** and **Right** margins are measured in characters and the **Top** and **Bottom** margins measured in lines. The **Height** is the total number of lines on a page, including the text margins. If you want to move the position of the text output on the page, alter the text margin settings.

### PostScript and HP LaserJet compatible printers

For these printers, the total number of lines per page and characters per line are determined automatically.

The printer is configured to use 10 characters per inch and 6 lines per inch in portrait orientation and 14 characters per inch and 8.5 lines per inch in landscape orientation.

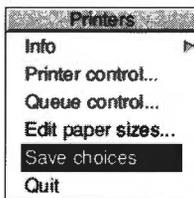
A LaserJet II cannot match these defaults exactly and uses its internal font at 10 characters per inch and 6 lines per inch in portrait orientation and 16.66 characters per inch and 8 lines per inch in landscape orientation instead.

PostScript printers determine the font size from the **Text scale** and **Text columns** values in the **Configure** dialogue box.

### Changing the page length on Dot-matrix printers

If you require an unusual page length you should set it by altering the Text margins Height box, as well as the Graphics margins. For example, if you are printing labels, you may have six rows of labels on a sheet of A4 paper. Set the Text height to be something like 11 lines so that the printer will form feed to the start of the next label correctly. This is because the Text height is used to tell the printer how long the paper is for both text and graphics printing.

### Saving your choices



To save any changes you make in the Page size dialogue box, click on **Save**; this saves them to disc. If you wish to save the changes permanently, you should click on the **Save choices** option in the icon bar menu.

If you wish you can delete a paper size by selecting it and then clicking on **Delete paper size**. You can only delete sizes that you have created or altered.

### Creating your own Printer definition file

You can create a Printer definition file that is specifically tailored for your printer. *PrintEdit* allows you to create a new printer driver (see page 131).





All printing is handled by the printer manager, **!Printers**. The printer manager looks after the job of sending the file you want printed to the printer and making sure that it is printed correctly.

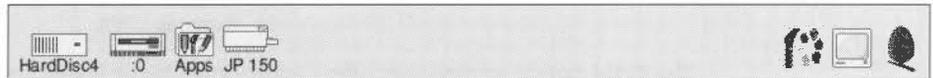
**This chapter assumes that you have already set up the printer driver configuration (or it has been set up for you) and that your computer is connected to the printer, either directly or via a network.**

If you want to set up !Printers yourself, you should find that the *Printing* chapter in the *Welcome Guide* will give you enough information, especially if you are connecting an Acorn printer. If you need more information, or you wish to configure some of the more advanced features of the printer manager, turn to *Setting up printers* on page 105.

## Starting !Printers



Load the printer manager by displaying the Resources root directory (click on the Apps icon bar icon) and double-clicking on !Printers. After a few seconds the printer manager icon appears on the icon bar.



If you see more than one printer icon on the icon bar you will be able to print on more than one printer (or print in different ways on the same printer).

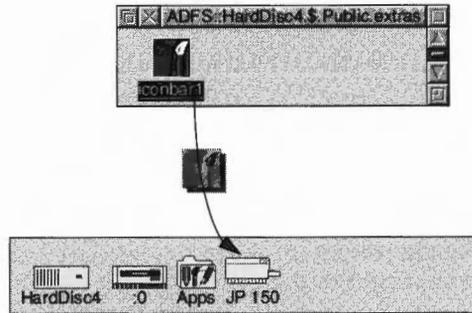
## Printing a file

There are three ways you can print a file:

### Drag the file you want printed to the printer icon

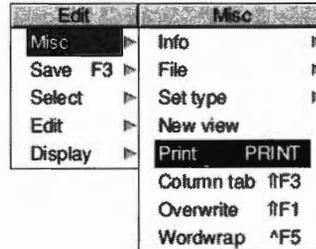
To print a Draw file, Paint file or other application file, drag the file (from a directory display or Save as box) onto the printer driver icon. If the application is not already running, it will be loaded before the file is printed (as long as the Filer has 'seen'

the application). For example, if you want to print a Draw file, Draw will be loaded onto the icon bar. However, Text files are printed directly (!Edit is not loaded). While a file is being printed, **Printing** appears beneath the printer manager icon.

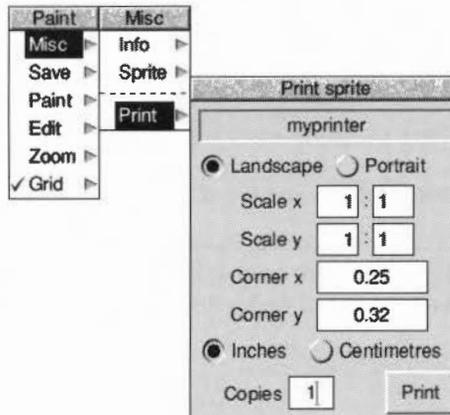


### Choose the Print option from the application's menu

You can also print Paint and Draw files (and those of many other applications) by selecting **Print** from the appropriate menu:



The **Print** option sometimes offers additional size or layout options; for example in the Paint application:



## Press the Print Scrn key on the keyboard

Alternatively you can press Print Scrn. This will often lead to the Print dialogue box.

## Stopping a print job

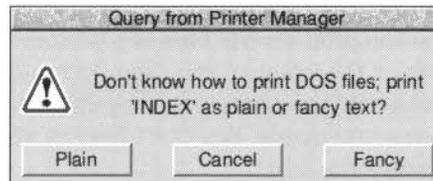
You can stop a print job by pressing Menu over the Printer queue window and choosing **Delete entry** (see page 127).

You also can stop a print job at any time by pressing Esc, although the above method is preferable. After pressing Esc you should reset your printer (see your printer manual for details on how to do this); this allows the printer to be ready for printing again. This may not work with text print jobs.

## Things you can't print

You cannot print directories and applications; if you try to do so you will see an error message.

If you try and print a file and RISC OS cannot find the application associated with the file, a dialogue box asks if the file should be printed as plain or fancy text.



If you see a message like this, you should click on **Cancel** and try to find the application that the file requires to print properly. For an application to be known to RISC OS it must have been displayed in a directory display.

If you don't have the application, try printing it using the **Plain** option. The **Fancy** option is most often used to print files created using the 1st Word Plus application. The fancy text file format is described in detail in the RISC OS 3 *Programmer's Reference Manual*.

## Using more than one printer

If you see more than one printer icon on the icon bar you will be able to print on more than one printer (or print in different ways on the same printer). For example, you might have a printer connected directly to your computer and another printer connected via a network.

Although you can have many printers on the icon bar, only one of these can be selected at a time; all of the others are greyed out. When you choose the **Print** option in an application or press the Print key, the file to be printed is sent to the selected printer.

To print using a different printer, click on that printer's icon on the icon bar. This selects the chosen printer and greys out all others. You can also print using any of the printers (selected or not) by dragging files onto the desired printer's icon.



### Using the same printer with different options

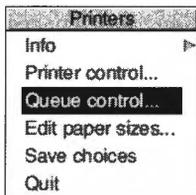
You can also set up several printer icons that print to the same printer but use different print options. You can, for instance set up different print resolutions and quality. If you need more information, turn to *Setting up printers* on page 105.

## Print queue control

### Printing several files

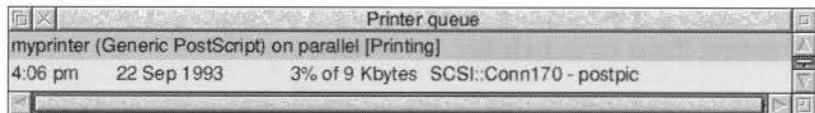
You can print several files one after another by dragging their icons to the printer icon on the icon bar. You can select multiple files to be printed and then drag their icons onto the printer icon together. The files waiting to be printed are placed in the printer queue. You don't have to wait until one has finished printing before sending the next.

### The print queue

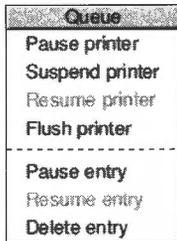


Files to be printed wait in a print queue until the printer is ready for them. This way you can carry on with your work at the same time as the printer is printing.

To control the print queue, choose **Queue control** from the !Printers icon bar menu. This displays a list of files to be printed in the **Printer queue** window. You can also display this window by clicking Adjust on the printer icon on the icon bar.



## The Queue menu



Clicking Menu over the Printer queue window displays the **Queue** menu from which you control the printer.

**Pause printer** stops sending your file to the printer. The rest of the unprinted part of the currently printing file is not printed until you click on **Resume printer**.

**Suspend printer** prints the file currently being printed and then stops the printer. No further files are printed until you click on **Resume printer**. The printer queue is frozen in its current state.

**Flush printer** removes all files currently on the queue.

**Pause entry** stops the current entry from printing until you click on **Resume entry**.

**Delete entry** removes an entry from the queue completely.

If you click Menu over one of the other entries in the printer queue (an entry not currently printing) you can choose the additional **Suspend entry** option. **Suspend entry** stops the printer from printing a file in the print queue. The print queue 'jumps over' the suspended file. The file can be put back in the queue to be printed by clicking on **Resume entry**.

These controls only effect your personal printer queue; they have no effect on other users using a shared network printer.

## Text printing and graphics printing

Your computer uses two modes of printing: text printing and graphics printing.

### Text printing

Text printing uses the standard font built into the printer. This makes printing very fast. Text printing is used by the application Edit.

There are two types of text printing – *Plain* and *Fancy*. The way in which a file is printed depends upon its type:

- Command and Obey files are always printed as plain text.
- Text files are always printed as fancy text (you can use 1st Word plus codes in the text – there's more on this in the RISC OS 3 *Programmer's Reference Manual*).

### Graphics printing

Graphics printing sends a complete image to the printer, effectively making the printed output the same as that seen on the screen. The applications Paint and Draw use graphics printing. If you print a JPEG file (photo-realistic image) by dragging its file icon to the printer manager, that also uses graphics printing.

This section refers only to dot-matrix, inkjet and HP LaserJet type printers; PostScript printers handle graphics printing in a different way.

You can speed up graphics printing in the following ways:

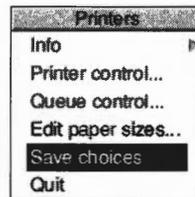
- Print in monochrome instead of grey scale. You only need grey scale if you are printing fonts, or printing sprites in shades of grey or in colour.
- Maximise the free memory in your computer by quitting all the applications you are not currently using and any RAM disc you may have.
- Configure a fairly large font cache – at least 128KB. You can change the font cache temporarily using the Task manager. See page 57 for information.

### Printing other file types

- PostScript files (with the file type PoScript) are sent to the PostScript printer for interpretation.
- Other files check with their application (e.g. Draw files check with !Draw) to see how they are printed.

### Saving your choices

You should save any changes you make to the settings for your printer, otherwise you will have to go through the setting-up procedure again, next time you start the printer manager. To do this, click on the **Save choices** option on the printer icon bar menu.



### Using PostScript printers

**You don't need to read this section unless you are printing to a PostScript printer.**

Dot-matrix, LaserJet and inkjet printers use RISC OS fonts for both displaying text on screen and for graphics printing. PostScript printers, however, use RISC OS fonts for displaying text on screen and use PostScript fonts for printing. These PostScript fonts can be both built into the printer and downloaded by (sent from) the computer.

Whenever you send a file to the printer, the printer manager

- converts any Acorn fonts needed to their equivalent in PostScript (if they are not already resident in the printer)
- sends these fonts to the printer
- sends the file to be printed
- erases the fonts it has sent.

The printer manager uses the printer's built-in PostScript fonts when they are available, speeding up printing text files considerably.

## Speeding up printing

There are other (more advanced) ways of speeding up printing. These options are handled by the FontPrint application. They are Downloading and Mapping:

### Downloading

If you constantly use fonts that are not resident inside the PostScript printer, you may find that your files print faster if you pre-send (download permanently) the fonts when you first start using the printer manager. Permanently downloaded fonts stay inside the printer, ready for use, until the printer is reset or switched off.

### Mapping

Instead of Acorn fonts being downloaded to the printer they can instead be mapped to a corresponding PostScript font. Mapping is the technique by which an Acorn font is used by the computer, but the equivalent PostScript font is used by the printer. For example, the Acorn font Homerton Medium is always mapped to the PostScript font Helvetica. This way the built-in PostScript fonts are used whenever possible.

For information on how to download and map fonts, refer to the chapter *FontPrint* on page 143.

## Hints and tips

### Attempting to print to non-existent printers

If you attempt to print to a printer which is not connected to your computer, the computer can freeze, waiting for the printer to be connected. Try using the System monitor (see page 61) or pressing Esc to stop the print job. If that fails, you may need to restart your computer.

---

## **Blank pages on dot-matrix printers**

If you find that a dot-matrix printer with fan-fold paper is printing alternate blank pages, try turning off the printer's form feed if it is switchable, or reduce the number of lines printed per page on the **Edit paper sizes** dialogue box.

## **Printing BASIC listings**

To print a listing of a BASIC program, drag the program file from a directory display to your printer icon.

## **Printing Maestro music files**

To print a Maestro music file, you have first to load it into Maestro and choose Print, rather than just drag it from a directory display to your printer icon.



This chapter provides an introduction to PrintEdit, an application which enables experienced users to edit existing printer definition files and experts to create them from scratch. It's unlikely that you'll need the information in this chapter, but it's provided for reference.

Printer definition files are used by the printer manager application !Printers. They define how the operating system translates the characters in the document into signals that can be used by the printer to print the document.

### Creating new printer definition files

Creating printer definition files is technically very complex and requires a deep understanding of how printers work. This chapter gives you only a very brief introduction and you should not expect to be able to design your own printer definition files using the information provided here alone. The chapter *Printer definition files* in the *RISC OS 3 Programmer's Reference Manual* contains the detailed information you will need for creating printer definition files.

### Modifying existing printer definition files

Occasionally, step-by-step instructions might be issued, for example, by Acorn or another printer supplier that tell you how to modify an existing printer definition file to change its use slightly.

The instructions list the exact operations you need to perform in each PrintEdit window. You will not need a full understanding of the features of PrintEdit.

This chapter gives you an overview of the functions of PrintEdit. This chapter should give you enough information to enable you to use PrintEdit to alter one of the existing printer definition files.

Before you can use PrintEdit you should

- have the user guide and technical manual for your printer, or
- have some step-by-step instructions from an expert.

Most people use PrintEdit to alter one of the existing printer definition file configurations, rather than make up a completely new one. So we shall use the printer definition file for the Epson FX85 as an example.

## Starting the application



To start the application:

- 1 Double-click on the Printing directory icon.
- 2 Double-click on the !PrintEdit icon. The application icon appears on the icon bar.

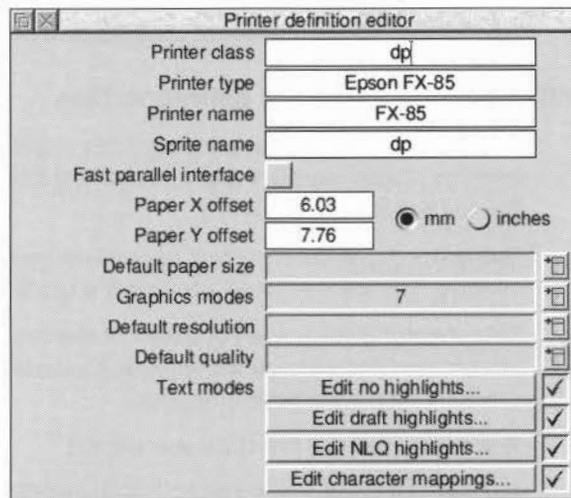
To load an existing printer definition file:

- 1 With the Printing directory display open, double-click on the Printers directory
- 2 Open the printer directory that corresponds to the printer you wish to modify.
- 3 Select the printer definition file you require and drag it over the PrintEdit icon on the icon bar.

**Note:** You can also load non-PostScript printer definition files by double-clicking on them.

## The PrintEdit window

The appearance of the PrintEdit window when the Epson FX85 definition file is loaded is as follows:



The **Printer class** represents a type of printer; it determines which processing type Printers uses for the printer. Use **dp** for dot matrix and other bit-image printers and **lj** for HP LaserJet compatibles. This application cannot be used for defining printer definition files for PostScript printers.

**Printer type** is the full name of the printer. If you are creating an alternative version of a standard printer definition file, alter this name.

**Printer name** is the name you want to appear underneath the printer icon on the icon bar. The name can be up to 10 characters long. If you are creating an alternative version of a standard printer definition file, alter this name.

**Sprite name** is the sprite to be used as the printer icon on the icon bar. These can again be **dp** for dot matrix and other bit-image printers and **lj** for HP LaserJet compatibles. You can also define your own sprites for this icon.

If your printer can use the **Fast Parallel Interface** then choose this option. Check in the printer ReadMe file for information; if you're not sure, don't use this option.

The **paper offsets** represent the top (Y) and left (X) sections of the paper on which the printer cannot physically print.

The **Paper Y offset** is the amount of cut sheet paper which has already gone past the print head before it can print anything; this differs for different printer models.

The **Paper X offset** is the small section at the lefthand edge on which the head cannot print, although why this is so is not always obvious. Together the paper offsets define the logical (0,0) origin on the physical paper. The Printers.Read\_Me file contains details on using the Printers.Top\_Left file to set the offsets for Epson and IBM-compatible dot matrix printers. Offsets only affect graphics printing.

**Default paper size** defines the standard paper type used by the printer.

**Graphics modes** displays how many graphics modes have been defined for this printer.

**Default resolution** defines the resolution that will be picked when you first install the printer.

**Default quality** defines the print quality that will be picked when you first install the printer.

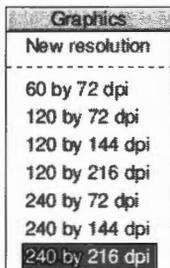
**Text modes** defines the type of text modes your printer can use. Find this information out from your printer manual.

- **Edit no highlights** defines the simplest print options of plain text only.
- **Edit draft highlights** includes all the standard highlights such as bold, italic, superscript and subscript in draft mode.
- **Edit NLQ highlights** is the same as Edit draft highlights but for the NLQ (Near Letter Quality) mode.
- **Edit character mappings** allows a character from the Acorn ISO8859 character set to be converted to the same character in the printer's character set.

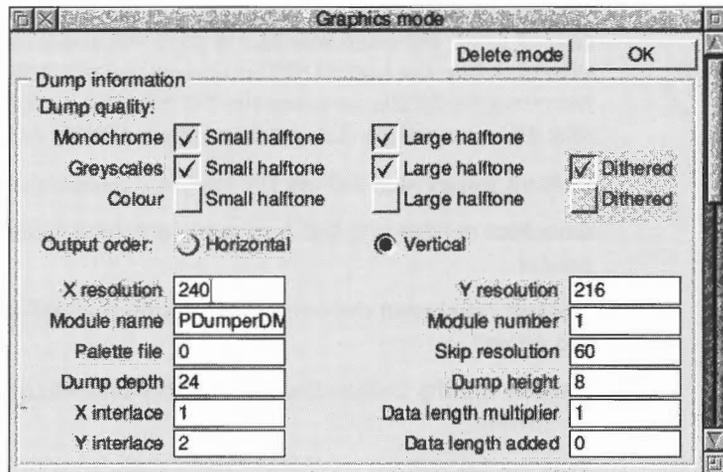
The differing text mode titles (**Edit portrait mode** and **Edit landscape mode** rather than 'Edit no highlights', 'Edit draft highlights' and 'Edit NLO highlights') are set up by PrintEdit when the **Printer class** is **Ij**. The information is still stored in exactly the same way as for Epson and IBM-compatibles.

For the rest of this chapter you should have your printer manual ready so that you can look up the information required by PrintEdit. It may also help to have the Help application active, as this will give you quick summaries about the function of each field in the dialogue boxes.

## Graphics mode



Display the Graphics modes dialogue box by clicking on the right arrow by the **Graphics modes** entry. Choose an existing resolution to edit or **New resolution** if you want to start afresh. In most cases it is probably easier to edit an existing file and tailor it to your needs. Here is the Graphics mode window for the Epson at a resolution of 240x216dpi.



### Dump information

The first part of the window gives the **Dump information** – the information the printer uses to print correctly.

The **Dump quality** boxes should normally all be ticked, as the software supports these features on all printers. However, don't tick the colour options unless you have a colour printer.

---

**Output order** defines how the image is printed. Most printers, like the Epson, use **Vertical**. Some, like the Integrex, use **Horizontal**. Note that when **Horizontal order** has been selected many of the other **Dump information** and **Dump strings** settings either become irrelevant, or must be set to certain values.

**X** (horizontal) and **Y resolution** (vertical) define the graphics resolution in dots per inch. These should be given in your printer manual, but may be in different units. The printer manual will usually quote resolutions before vertical interlacing has been applied (see later), so in this case the manual would quote 240×72dpi, rather than 240×216dpi (since  $216/3 = 72$ ). The manual is also likely to give dots per line rather than dots per inch for the horizontal resolution; for example, 960 dots per line on 8 inch paper is 120dpi horizontal resolution. The vertical resolution is often omitted altogether, in which case it is likely to be 72dpi for 9-pin printers, 180dpi for 24-pin printers doing 24-pin graphics, 60dpi for Epson 24-pin printers doing emulated 8-pin graphics, and 72dpi for IBM 24-pin printers doing emulated 8-pin graphics.

**Module name** and **Module number** define the dumper files used by the printer. These are currently four dumper files, although more can be defined if needed.

<b>PDumperDM:</b>	Module number 1 (dot-matrix and other bit-image printers)
<b>PDumperLJ:</b>	Module number 2 (HP Laserjet compatible printers)
<b>PDumperIW:</b>	Module number 3 (Apple Imagewriter II compatible printers)
<b>PDumperE2:</b>	Module number 6 (ESC/P2 compatible printers, such as the Epson Stylus Colour printer)

**Palette file** defines the Palette file – this is currently set to zero or one.

**Skip resolution** defines the leading zero skip resolution of the dump. This is always 60 for Epson printers and 120 for IBM printers.

**Dump depth** is the depth of one group of interlace passes.

**Dump height** is the number of rows of pixels in each vertical pass. This is the same as the number of pins on the print head; a 24-pin printer would print 24 dots.

**X interlace** defines the number of horizontal interlace passes.

**Y interlace** defines the number of vertical interlace passes.

**Data length multiplier** and **Data length added**. For Epson printers, you specify a line of graphics by saying '<27><42><0><number of columns>'. For IBM printers, you need '<27>[g<number of columns times 6 (or 3) plus 1><graphics mode>'. So, for Epson printers, the Data length multiplier is 1 and Data length added is 0. For IBM printers, Data length multiplier is either 6 or 3, and Data length added is 1.

## Additional Dump information for Printer Class Ij

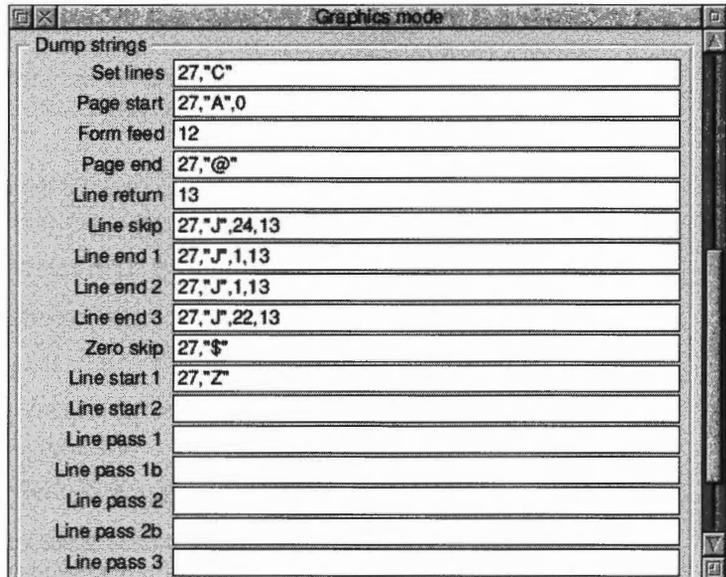
**Copies** should be selected if the printer supports this option.

**Compression** should be selected if the printer supports this option.

The Output order choices do not apply for this class of printer.

### Dump strings

The second part of the window gives the Dump strings (use the scroll bar to see this).



The screenshot shows a window titled "Graphics mode" with a "Dump strings" section. It contains a list of configuration items, each with a text input field. The items and their values are:

Label	Value
Set lines	27,"C"
Page start	27,"A",0
Form feed	12
Page end	27,"@"
Line return	13
Line skip	27,"J",24,13
Line end 1	27,"J",1,13
Line end 2	27,"J",1,13
Line end 3	27,"J",22,13
Zero skip	27,"\$"
Line start 1	27,"Z"
Line start 2	
Line pass 1	
Line pass 1b	
Line pass 2	
Line pass 2b	
Line pass 3	

These are codes sent to the printer that tell it to perform certain actions.

**Set lines** is the string set to define the number of lines per page.

**Page start** is the string sent at the start of a page.

**Form feed** is the form feed character. The string sent to the printer to tell it to form feed the paper after each page has been printed.

**Page end** is the string sent at the end of each page.

**Line return** moves the print head to the beginning of the line. Usually this will be a carriage return.

**Line skip** moves the print head to the beginning of the next line. It is used for skipping entirely blank lines.

**Line end 1** to **Line end 3** are the strings sent at the end of each vertical interlace pass. There can be up to three passes.

**Zero skip** is issued to skip leading zeros on graphics data lines, hence optimising out the white section at the left hand edge of the paper.

**Line start 1** is the string sent at the beginning of a graphics line. For Epson printers, **Line start 2** is not needed. For IBM printers, **Line start 2** must be '<graphics mode>', while **Line start 1** is '<27>[g]'.

**Line pass** is the string sent for each pass of a colour graphics dump. There can be up to four passes.

## Text modes

Almost all printers can use the first two text modes and many also support an NLO (Near Letter Quality) mode.

Choose which text modes your printer will use by clicking on the cross or tick next to each Text mode button. Changing to a tick allows you to select that mode.

Display the text mode window by clicking on the appropriate text mode button. Here are the Text draft highlights settings for the Epson FX85.

Text - draft highlights	
Set lines	27,"C"
Do backspace	8
Do tab	9
Do formfeed	12
Do start of line	13
Do new line	13,10
Start of text job	18,27,"W",0,27,"P",27,"R",0,27,"x",0
End of text job	12,27,"@"
Select pica font	18,27,"W",0,27,"P",27,"x",0
Select elite font	18,27,"W",0,27,"M",27,"x",0
Select condensed font	15,27,"W",0,27,"P",27,"x",0
Select expanded font	18,27,"W",1,27,"M",27,"x",0
Turn bold on	27,"E"
Turn bold off	27,"F"
Turn italics on	27,"4"
Turn italics off	27,"5"
Turn light on	
Turn light off	
Turn superscript on	27,"S",0
Turn superscript off	27,"T"

## Edit no highlights

The no highlights mode is a very simple mode without any special effects, so most of this window is blank.

**Set lines** sets the number of lines per page.

**Do backspace** moves the print head back one space.

**Do tab** moves the print head to the next tab.

**Do formfeed** starts a new page.

**Do start of line** moves the print head to the start of the line.

**Do new line** moves the print head to the beginning of the next line.

**Start of text job** is the string that denotes the start of a text print.

**End of text job** is the string sent at the end of a text print.

## Edit draft highlights

The draft highlights mode uses the same basic definitions as the no highlights mode, but expands this to include pica, elite, condensed, expanded, bold, italics, light, superscript, subscript and underline printing.

**Select pica font** sets pica font (10cpi).

**Select elite font** sets elite font (12cpi).

**Select condensed font** sets condensed font (17cpi).

**Select expanded font** sets expanded font (6cpi).

**Turn bold on** sets bold text on.

**Turn bold off** sets bold text off.

**Turn italics on** sets italic text on.

**Turn italics off** sets italic text off.

**Turn light on** sets light text on.

**Turn light off** sets light text off.

**Turn superscript on** sets superscript text on.

**Turn superscript off** sets superscript text off.

**Turn subscript on** sets subscript text on.

**Turn subscript off** sets subscript text off.

**Turn underline on** sets underline text on.

**Turn underline off** sets underline text off.

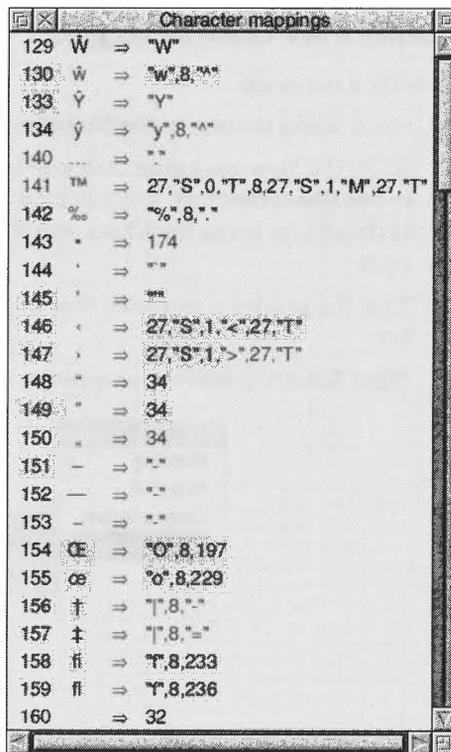
## Edit NLQ highlights

The NLO highlights mode uses the same basic definitions as the draft highlights mode, but alters these to enable the printer's NLQ operation.

## Edit character mappings

**Edit character mappings** allows a character from the Acorn ISO8859 character set to be converted to the same character in the printer's character set. Although all the standard characters normally map directly onto the corresponding printer characters, the top-bit-set characters normally need mapping from Acorn's character set to the printer's character set.

Mapping is done from the Edit character mappings window. Here is part of the Epson FX85's character mappings.



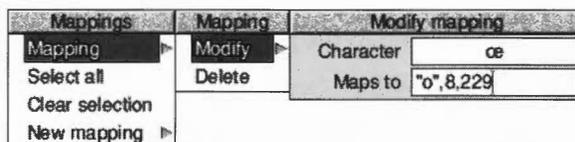
Acorn Character (Decimal)	Acorn Character	Printer Commands
129	Ŵ	"W"
130	ŵ	"w",8,""
133	Ŷ	"Y"
134	ŷ	"y",8,""
140	...	"."
141	™	27,"S",0,"T",8,27,"S",1,"M",27,"T"
142	‰	"%",8,"."
143	•	174
144	·	"."
145	¸	"."
146	¸	27,"S",1,"<",27,"T"
147	¸	27,"S",1,">",27,"T"
148	"	34
149	"	34
150	"	34
151	—	"."
152	—	"."
153	—	"."
154	Œ	"O",8,197
155	œ	"o",8,229
156	†	"I",8,""
157	‡	"I",8,"="
158	fi	"f",8,233
159	fl	"f",8,236
160		32

The number down the left column represents the Acorn character in decimal; next to it is the Acorn character itself. To the right of the arrow are the commands sent to the printer that reproduce the same character.

## Modifying an existing mapping

To alter an existing mapping:

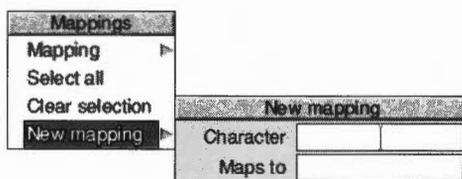
- 1 Press Menu over the character to display the **Mappings** menu.
- 2 Choose **Mappings/Modify** to display the Modify mapping dialogue box.
- 3 If you want to modify the printer commands, type the printer commands that produce the character in the **Maps to** box.
- 4 Press Return to modify the mapping list.



## Entering a new character mapping

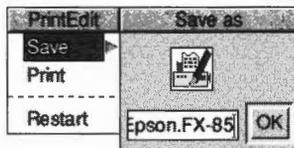
To enter a mapping:

- 1 Press Menu to display the **Mappings** menu.
- 2 Go to the **New mapping** dialogue box and type in the Acorn character to map in the **Character** box. You can type in the Acorn character directly from the keyboard, by using the Chars application or by using its decimal character code.
- 3 Type the printer commands that produce the same character in the **Maps to** box.
- 4 Press Return to add the mapping to the list.



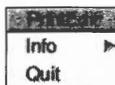
## Saving and quitting

When you have finished making changes to your the printer definition file, save the modified file by clicking Menu over the main Printer definition editor window and choosing **Save**.



If you want to discard any changes you have made and start again click on **Restart**.

To finish using the application, chose **Quit** from the icon bar:







**T**his application allows you to download fonts to a PostScript printer or to map Acorn fonts to PostScript fonts on a PostScript printer. Once downloaded, the fonts stay in the printer until you reset or switch off the printer.

**If you don't print to a PostScript printer you don't need to use this application.**

RISC OS fonts are used both for displaying text on screen and for printing on Dot-matrix, LaserJet and Inkjet printers. PostScript printers use PostScript fonts that are stored in the printer for printing.

When you print to a PostScript printer, the Printer manager has to make sure that for each RISC OS font used there is an equivalent or suitable PostScript font available in the printer.

FontPrint is a tool for configuring this aspect of PostScript printing. It allows you to tell the Printer manager which PostScript fonts are present in the printer and how your RISC OS fonts correspond to those in the printer.

It is important to understand that even if you don't use this application, RISC OS and the Printer manager will always try to print your documents correctly. Any fonts that are not available in the printer will be downloaded within the print job as required.

## Starting the application

Before running FontPrint you must have the Printer manager application Printers loaded onto the icon bar. The Printer manager must also be active and configured with the correct printer driver for your PostScript printer.

To start the application:



- 1 Click on the hard disc icon to view the directory display.
- 2 Double-click on the Printing directory icon to display the contents of the Printing directory.
- 3 Double-click on the !FontPrint application to start the application. The application icon appears on the icon bar.
- 4 To start using the application, click on the FontPrint icon on the icon bar.

The printer manager makes RISC OS fonts available to the printer in one of two ways: mapping and downloading.

# Mapping

The first, preferred, way of making fonts available to a printer is to map the RISC OS font to a PostScript font that is already resident in the printer's ROM. The printer manager instructs the printer to substitute fonts; for example, whenever the print job uses Corpus, the printer substitutes Courier. This technique is particularly useful for the standard RISC OS font families Corpus, NewHall, Selwyn, Sidney, Trinity and Homerton because they are visually close copies of the standard PostScript font families Courier, New Century Schoolbook, ZapfDingbats, Symbol, Times and Helvetica.

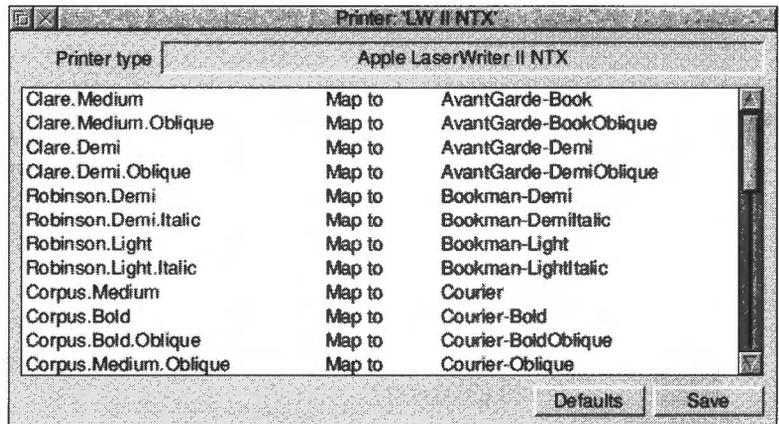
The standard set of RISC OS fonts are mapped to PostScript fonts (except for System and Sassoon, which are downloaded 'on the fly' each time you use them). You can map additional RISC OS fonts you have purchased to the same, or other PostScript fonts. This gives the most efficient way of printing with your fonts, but may give results that differ slightly from those on-screen due to slight variations in the design of RISC OS and PostScript fonts.

## Mapping a RISC OS font to a PostScript font

To map an Acorn font to a PostScript font:

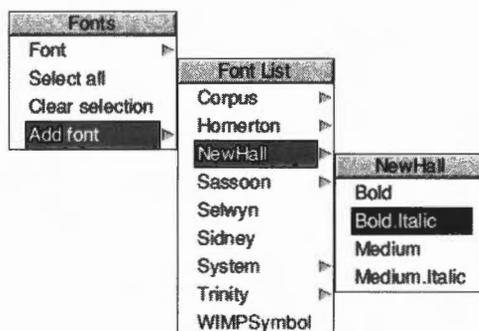
- 1 Load FontPrint and display the FontPrint window.

The window displays lines consisting of the RISC OS font name on the left and the equivalent PostScript font name on the right.



- 2 Click Menu over the window to display the **Fonts** menu.

- 3 If the RISC OS fonts you wish to map are not already shown, select the fonts that you wish to map to PostScript fonts from the **Add font** submenu. They will be added to the FontPrint window at the end of the list.



- 4 Choose each font in turn and map it to the corresponding PostScript font using the **Font/Map to** submenu, which lists the fonts available on the printer.
- 5 When you have finished mapping the fonts, click on **Save**. This saves the font mapping within the Printer manager. The printer manager will now use this information to map fonts in your documents to those in your printer. Each time the Printer manager is started this font mapping information is sent to the printer.

## Mapping to a non-standard PostScript font

If you want to map to an additional PostScript font resident in the printer (you may have an additional font cartridge for the printer), but which is not in the standard list of fonts in the printer driver, you can add the PostScript name in the field at the end of the **Map to** sub-menu. Repeat this for each font you want to add.

## Choosing the encoding type

If you are mapping fonts, you can also choose **Font/Encoding**. The encoding type determines the character set used by the PostScript printer. Most fonts will use the Adobe standard encoding; this is the default encoding.

## Downloading

The second way of making a RISC OS font available to a PostScript printer is to download the font into the printer. The printer manager converts the RISC OS font into PostScript and sends this to the printer. The print job may then use the font as if it were stored in the printer. The disadvantage of downloading is that fonts take a long time to send to the printer and occupy a lot of the printer's memory.

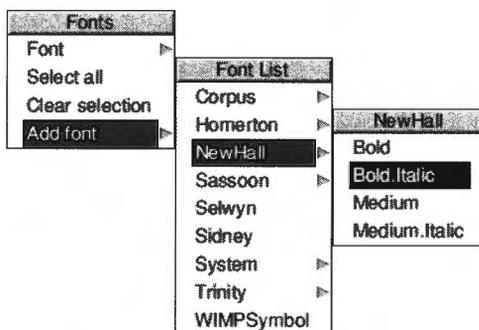
## Downloading fonts permanently

Downloading normally happens automatically during the print job, and fonts downloaded in this way are erased from the printer's memory at the end of the job.

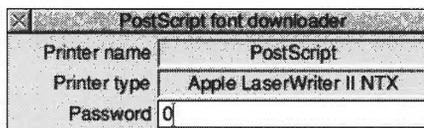
If you constantly use fonts that are not resident inside the PostScript printer, you may find that your files print faster if you download the fonts permanently when you first start using the printer manager. Permanently downloaded fonts stay inside the printer, ready for use, until the printer is reset or switched off.

To prepare fonts for downloading:

- 1 Click Select on the FontPrint icon to display the FontPrint window.
- 2 Click Menu over the window to display the **Fonts** menu.
- 3 Select the Acorn fonts that you wish to download by choosing the fonts from the **Add font** submenu. They will be added to the FontPrint window at the end of the list.



- 4 When you have selected the fonts you wish to download, click on the **Save** box. This saves the download information within the Printer manager.
- 5 The PostScript font Password box is displayed. You should now type in the password for your printer.



Unless the password has been changed, the printer will have the password '0' (the number zero).

The fonts are only downloaded if you type in the correct password. If you enter the wrong password, FontPrint still attempts to download the fonts but the download fails and the printer may issue an error message.

When you clicked on the **Save** box you stored the information about which fonts you wanted downloaded. The printer manager downloads your chosen fonts to the printer whenever the printer manager is started. The password box will be displayed each time you start using the printer manager.

Clicking on the **Default** button automatically loads the default PostScript Mappings. Any Mappings or Downloading that you have previously set up are lost.

### **Saving FontPrint settings**

To save any changes you've made permanently, so that font mappings will be used every time you switch on, you need to choose **Save choices** from the !Printers icon bar menu.

## **Downloading fonts to a network printer server**

Since a network printer is a shared resource, excessive use of permanent font downloading can inconvenience other users. To avoid this, it is suggested that only one machine on the network should be responsible for permanently downloading fonts.

Other machines may then map to the downloaded fonts as if they were ROM fonts within the printer. This is possible because you can identify the PostScript name under which the downloaded font is stored. The downloaded name is the RISC OS font name prefixed by the letters 'DL\_'. For example, if one machine has downloaded the RISC OS font called "Futura.Bold", it will be stored in the printer as the PostScript font "DL\_Futura.Bold". Other machines wanting to print this font can use FontPrint to map "Futura.Bold" to "DL\_Futura.Bold". Be careful to preserve the capitalisation of the font name. If the printer is switched off and on, the font will be lost. In this case, exit and re-start !Printers on the machine responsible for downloading and the fonts will be downloaded again.

## **Bitmap fonts**

You cannot download bitmap fonts to a PostScript printer. However, you can map them to one of the printer's resident fonts.

## **Advanced information**

To avoid the overhead of downloading every font you use, the printer driver uses the fonts built into the PostScript device whenever possible. To do this, the printer driver has a list describing which PostScript fonts are visually similar to which RISC OS fonts.

This list is set up automatically when you initialise a new printer, and you can subsequently change it using !FontPrint.

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Although a PostScript font might look very similar to a particular RISC OS font, the various glyphs can occupy different character codes, with the result that characters are jumbled when the font is printed.

A mechanism called 'remapping' is used to reorder the PostScript font so that the characters occupy the expected positions. The remapping is performed according to a textual description known as an 'encoding'.

## Mapping symbol fonts

A symbol font's mapping depends on the availability of an appropriate encoding file. The encoding tells the system which PostScript glyph to render for each ASCII character code.

The encoding file should be given the name **Encoding** and placed in the same directory as the font's Outlines and IntMetrics files. If you need an encoding file for a third party font, contact your vendor.

An encoding file should contain exactly 256 lines of the form

*/glyphname*

where a glyph called *glyphname* is known to exist in the printer font. Non-existent glyphs should be entered as */.notdef*.

If a particular glyph name is the Nth entry in the encoding file, then that glyph will be rendered for character code N.

For details about how to construct your own encoding files refer to the RISC OS 3 *Programmer's Reference Manual*.



**T**1ToFont is a program that converts fonts from Adobe Type1 format to the RISC OS outline font format. Once you've converted fonts, you can use them in your documents just like any other Acorn outline font.

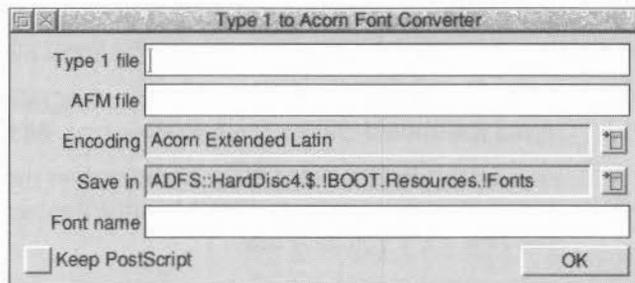
**Note:** This application is for advanced users **only**. Most people will never need to use it. Some complex fonts (and fonts not conforming exactly to Adobe Type 1 format) may not convert successfully.

This application should only be used to convert public domain fonts. While it is possible to convert proprietary fonts, it would, most probably, be a breach of copyright to do so without the consent of the copyright holder.

## Converting a font

Before you can use the converter you need to have your source font (the Type 1 file and the AFM file, described on page 151) on a RISC OS format disc. The Type 1 file (often called the PFB file) should be given the filetype **PoScript** and the AFM file given the filetype **Text**.

- 1 Load T1ToFont (it's in the Utilities directory on your hard disc or network).
- 2 Click on the icon bar icon to display the Font converter window.



- 3 Drag the Type 1 PFB file icon from its directory display onto the **Type 1 file** field in the converter window.
- 4 Drag the AFM file from its directory display onto the **AFM file** field in the converter window.
- 5 After a few seconds the name of the RISC OS font to be generated is displayed in the **Font name** field. You can change this name if required.

- 6 Use the **Save in** field to select a font directory to save the resulting font in. However you should not normally change this from the default path – typically **ADFS::HardDisc4.\$.!BOOT.Resources.!Fonts**. Click on the menu icon to display the alternatives.
- 7 Select the **Encoding** you need for the font, **Acorn Extended Latin** is nearly always used. Click on the menu icon to display the alternatives.
- 8 Click on the **Keep PostScript** option button if you want to keep the Type1 font and the AFM files with the Outline font. This is useful if you are printing to a PostScript printer as the printer will then use the PostScript font directly.
- 9 Start the conversion by clicking on **OK**.

When the conversion is finished (the hourglass reverts back to a pointer) the font is now stored in the computer as a RISC OS font.

You should now try to display the font using !Chars (see page 327) if the font displays correctly the conversion was successful. If the font does not display properly then it cannot be used with RISC OS and should be deleted from the font directory it was saved in.

## Other information

The **Save in** menu selects a font directory to save the resulting font in. The menu is constructed from the contents of the Font\$Path system variable, so !Font directories can be added to the menu by installing them on Font\$Path (you can do this by double-clicking them). The default path is **ADFS::HardDisc4.\$.!BOOT.Resources.!Fonts**.

### Encoding

The **Encoding** type for most fonts will almost always be **Acorn Extended Latin**.

Some fonts have their own special encoding information. If you have one of these fonts you should choose the Encoding type, **As specified in type 1 file**.

If you don't have an AFM file you can convert the font by leaving the AFM field blank. The resulting font will lack kerning (font spacing) information, so always use the AFM file if you have one.

Selwyn, Sussex and Sidney are encodings for special symbol fonts. The encoding file is automatically stored within the font's directory.

### Font types

Fonts must conform strictly to the Type 1 font definitions. Many Public Domain fonts do not obey the structure rules laid down by Adobe and consequently they may not convert properly. Type 3 fonts cannot be converted.

## Printing to a PostScript printer

If you print to a Postscript printer, the printer uses the original PostScript font (for downloading) if it is available. If it is not available, it converts and downloads the RISC OS outline font. To keep the original PostScript font available, select the **Keep PostScript** option before you start converting your font.

## Using Macintosh and MS-DOS type 1 fonts

### Macintosh fonts

Macintosh fonts are generally supplied as a Font/DA Mover document, containing the Macintosh version of the font, and one or more Type 1 files containing the PostScript code for use on the printer. There will be one Type 1 file for each weight and variation of the font.

#### AFM file

In addition to this you need an AFM (Adobe Font Metrics) file for each weight and variation of the font. The Macintosh does not seem to use this itself, but some fonts are supplied with it anyway. If you do not have the AFM file, contact the font supplier and try to obtain one.

You can convert a font without using an AFM file, however the resultant RISC OS font will lack kerning information.

#### Transfer the files

You need to copy files from the Macintosh to your computer. Macintosh Type 1 files usually occupy the Macintosh resource fork of the file, so you'll need a way to extract this. The Macintosh version of the file transfer protocol Kermit, is one way of doing this. It may be simpler to use a Macintosh multiformat floppy drive to copy the files to an MS-DOS format floppy disc. This disc can then be read directly by your RISC OS computer.

Transfer the resource fork of the font file to a file on your computer, and set its filetype to PoScript (&FF4). Transfer the AFM file (usually in the data fork) to your computer and give it the filetype Text.

### MS-DOS Fonts

Fonts for MS-DOS computers are supplied on MS-DOS floppy discs and can therefore be read directly by the RISC OS Filer. Among the files on the disc will be one or more Type 1 files containing the PostScript code for the printer. There will be one Type 1 file for each weight and variation of the font. The Type 1 files usually have the extension **.PFB**.

**AFM file**

In addition to this you need an AFM (Adobe Font Metrics) file for each weight and variation of the font. If you do not have the AFM file, contact the font supplier and try to obtain one.

You can convert a font without using an AFM file, although the resultant RISC OS font will lack kerning information.

Other files on the disc, including the PFM file, are not needed for the conversion.

**Setting the filetypes**

Transfer the AFM and PFB files to another floppy disc or to the hard disc. Change the filetype of the PFB file to PoScript (&FF4) and the filetype of the AFM file to Text.

# Part 3: RISC OS applications



**T**his chapter (together with the rest of this part of the manual) describes the suite of applications provided with your RISC OS computer. Many more are available from your supplier.

This chapter tells you where to look for the applications supplied with your computer. The next two chapters describes how to choose and work with colours and fonts. The remaining chapters in this part of the manual explain in detail how to use each application (with the notable exception of the printing applications, which are described in *Part 2: Printing*).

Four main applications are provided. These are comprehensive programs that show off the power and versatility of RISC OS.

- **Draw** – a sophisticated drawing program capable of producing full colour drawings.
- **Edit** – a fully featured text editor (also suitable for editing program listings).
- **Paint** – a painting and sprite editing program.
- **Printers** – a printer manager allowing you to print your work on a number of different types of printer (see *Part 2: Printing*).

## Where to look for applications



Your computer comes supplied with many useful applications. They're stored in the following locations:

- the computer's internal memory (ROM), which you can access from the Apps icon on the icon bar
- different directories on the hard disc or network.

Start by familiarising yourself with the locations of the different applications:

- 1 Click on the Apps directory on the icon bar to see the main applications.
- 2 Click on the hard disc (or network) icon and explore the various applications directories there.

## The icon bar Apps directory



Click on the Apps icon on the icon bar and you'll see a directory display containing some of the more important Acorn applications. The three most generally-used applications (Edit, Draw and Paint) are among those shown here.

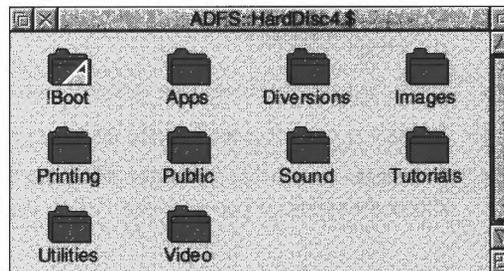
### Changing the contents of the icon bar Apps directory

You can't remove or delete any of the applications displayed here by default, but you can add applications from the hard disc, using !Boot. This saves you having to search the directories on your hard disc to load an application that you use frequently – you can see it with a single click on the Apps icon on the icon bar.

For more information turn to *ResApps* on page 53.

## Applications stored on hard disc

Click on the hard disc (or network) icon on the icon bar and you'll see many directories containing the other Acorn applications.



Each of the applications supplied is covered by a separate chapter in this part of the Guide, except for those concerned with printing (which are dealt with in *Part 2*).

**Note 1:** Double-click on a directory to open its display, as normal. However, if you double-click on !Boot you'll actually start the !Configure application (see page 31).

**Note 2:** Even if your hard disc is locked (see page 45) you can always save files into the Public directory. If you want to make files and applications available to anyone on your network, put them in the **Public** directory (which will be empty when you first switch on your computer).

## Starting applications

This is covered in detail in the *Welcome Guide*. To recap, there are three ways of starting an application:

- Double-clicking on an application icon.  
Clicking or double-clicking on the name next to an icon in a directory display has the same effect as clicking or double-clicking on the icon itself.
- Double-clicking on an associated file (e.g. double-click on an Edit file to start Edit) provided the application has been 'seen' by the Filer, or is in the Apps icon bar directory.
- Dragging an application icon onto the icon bar.

## Loading any file into Edit

You can load any file (not just text files) into the Edit application. Just hold down Shift and double-click on the file icon. Alternatively, you can drag the file icon onto the Edit icon on the icon bar. However, the result may not be quite what you're expecting! For example, if you load a DrawFile into Edit, you won't see a drawing, you'll see a text file containing all the information used by the Draw application to display a drawing on the screen.

This can be useful – you can often fine-tune something you're doing in an application by loading a file into Edit and 'tweaking' it by hand, but this is really for advanced users.

## Transferring data between applications

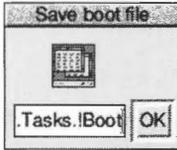
The techniques used for loading and saving applications are also used to transfer data between applications. When you want to do this, call up the first application's **Save as** dialogue box, and instead of dragging the file's icon to a directory display, drag it to an open window of the second application (or onto the application's icon on the icon bar). You can use this, for example, to

- load a Paint file into Draw
- load a text file into Draw
- load most types of file into Edit.

If the direct transfer fails (perhaps through lack of memory), some applications will attempt to use a temporary disc file for the transfer.

Not all applications can transfer data by this method, as data types are not always compatible. You can't, for example, drag a Draw file into Paint.

## Setting application options in Boot files



Most of the applications accessible from the Apps icon bar directory can have their current state saved in a Desktop boot file. This state includes any options that you've set and the size and position of the application windows on screen. This is explained fully in *Configuring applications* on page 403.

You can configure the Desktop boot file to be run automatically each time the computer is turned on. Beware: you can easily overwrite your Desktop boot file accidentally. Always keep a backup. For more information about using Boot files read *Customising the desktop start-up procedure* on page 47.

**M**any of the applications you can run on your computer (such as Draw and Paint) make use of colour. This chapter uses Draw as an example.

**Note:** There are actually two ways of choosing colour in Paint, depending on the screen mode. In modes up to 256 colours, you'll choose colours from a standard Paint Colours window (see *Paint* on page 263). In 32-thousand or 16-million colour modes, you'll use the methods described in this chapter.

## Colour models

First, here's a short explanation of the three different ways in which colour can be defined or specified: the colour models.

- RGB (Red, Green, Blue) – uses the principle of **emitted** colour
- CMYK (Cyan, Magenta, Yellow, Key) – uses the principle of **reflected** colour
- HSV (Hue, Saturation, Value) – uses the principle of **reflected** colour.

### RGB

This colour model is the one used by colour monitors. They mix beams of red, green and blue light in different proportions to display colours. With the green beam switched on and the other two switched off, you see the colour green. Mixing red, green and blue together at full intensity produces white.

### CMYK

This model works like an artist mixing colours on a palette. You see green on an artist's palette because the pigment being used absorbs every colour of the spectrum **except** for green, which it reflects back to your eye. Unlike the RGB model, if you mix all the colours on a palette together you get a muddy brown!

This model is used in four-colour process printing. Printers discovered that they can print any colour from a combination of cyan, magenta, yellow and black dots. They use white, too, but this is the paper colour, where no coloured ink is applied.

The black colour (Key) in CMYK is used to reinforce dark colours and grey shades that may otherwise appear muddy when printed.

## HSV

The HSV colour model uses the principle of reflected colour too.

**Hue** is the basic look of the colour – a particular tint of red or green for example.

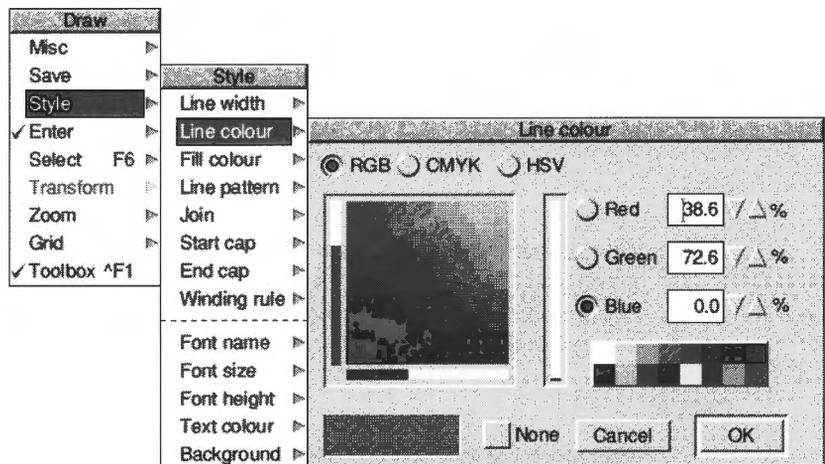
**Saturation** is the strength of the colour compared with the amount of white added. A green hue at full saturation (100%) is a very deep green, while a low saturation green has lots of white added, and is a very pale pastel green.

**Value** is the brightness of the colour compared with the amount of added black. 100% is the brightest (no added black), while 0% is all black.

## Using colour in Draw

The Draw application uses colour extensively. You can choose different colours for the graphic objects and for text. All the colour options are in the **Style** menu.

Graphics can be given a **Line colour** and a **Fill colour**. Clicking on one of these displays the RGB colour dialogue box:

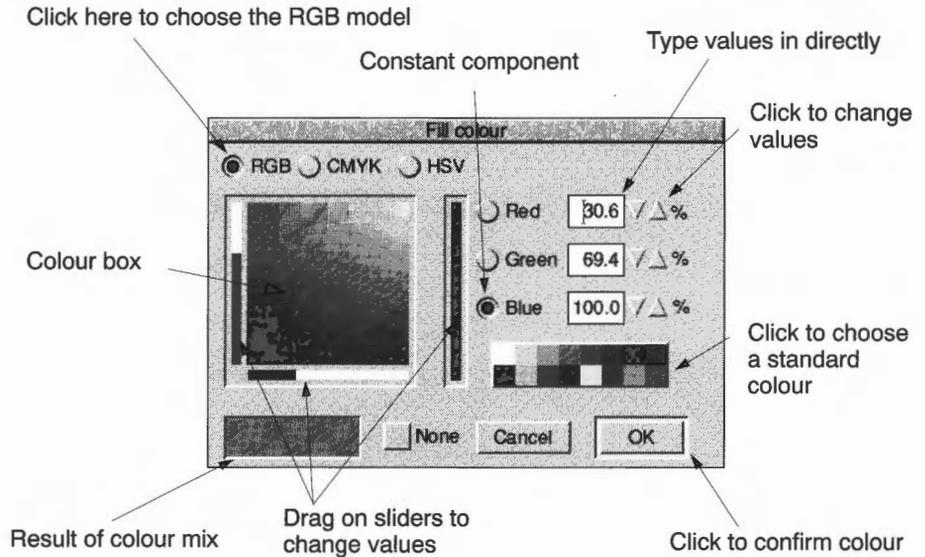


The **RGB**, **CMYK** and **HSV** option buttons allow you to toggle between the three different colour models.

### Which colour model?

Each of the colour models has its own colour selection dialogue box. Which is the best one to use? Well, that depends on the colour you want to end up with, and whether you're already familiar with a particular model. Each model has its pros and cons.

## Using the RGB colour model



There are six ways of choosing a colour in the RGB model. You can use one or a combination of two or more to choose the colour you want. The easiest ways are:

- Click anywhere in the colour box. You can also drag continuously around it.
- Drag the bars in the sliders. As you move the slider the colour you have chosen is shown in the box at the bottom left of the window. At the same time the numeric values change to show you the percentages of the colours chosen.

The other four ways apply to all the colour model dialogue boxes – see *Specifying a colour accurately* on page 164.

Click on **OK** to apply your chosen colour to the selected tool or graphic object.

**Cancel** ignores any colour changes you've just made.

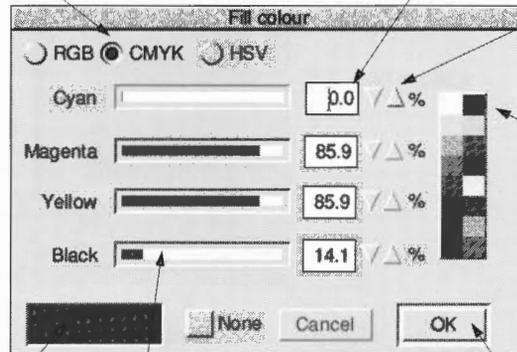
## Using the CMYK colour model

The colours in CMYK are added together. The amount of each colour can range from 0% (no colour) to 100% (full colour).

Click here to choose the CMYK model

Type values in directly

Click to change values



Click to choose a standard colour

Result of colour mix

Drag on sliders to change values

Click to confirm colour

There are five ways of choosing a colour in the CMYK model. The first is the easiest:

Drag the bars in the sliders. As you move the slider the colour you have chosen is shown in the box at the bottom left of the window. At the same time the numeric values change to show you the percentages of the colours chosen.

The other four ways apply to all the colour model dialogue boxes – see *Specifying a colour accurately* on page 164.

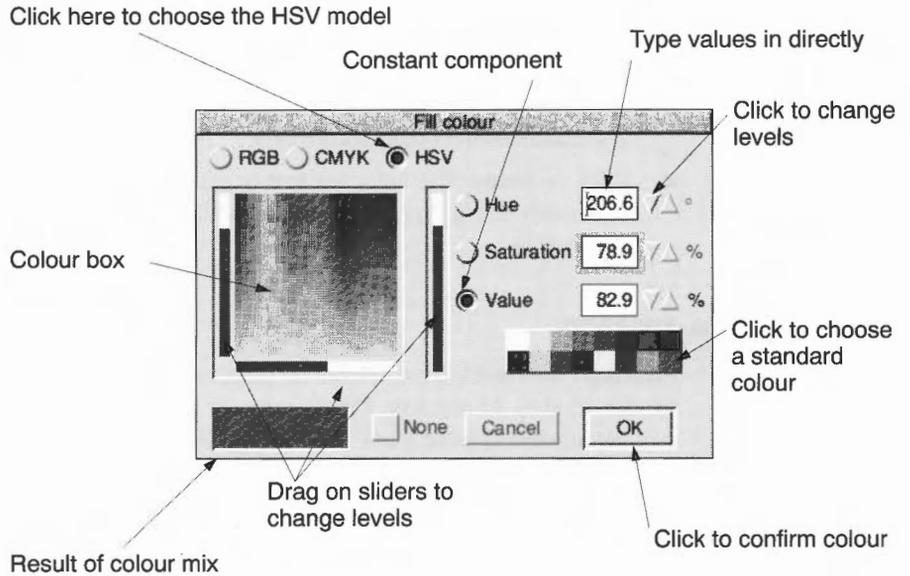
Click on **OK** to apply your chosen colour to the selected tool or graphic object.

**Cancel** ignores any colour changes you've just made.

## Using the HSV colour model

Click on the **HSV** button to display the HSV colour dialogue box.

The HSV colour model is useful for trying out different shades of the same colour – pick a colour then add black to it to make it darker, or add white to it to make it lighter (more of a pastel shade).



- 1 Choose the Hue you want by clicking on a colour in the colour box. The Hue will appear in the trial box at the bottom lefthand corner of the window, and as a number (in degrees) in the Hue writable icon.
- 2 Click on the **Hue** option button to make the hue constant while you change the Saturation and Value.
- 3 Drag the bottom slider to add white (to make the colour lighter) or to subtract white (to make it stronger).
- 4 When you have the right Saturation, drag on the lefthand slider to change the Value – to make the colour darker, if you want to.

Click on **OK** to apply your chosen colour to the selected tool or graphic object.

**Cancel** ignores any colour changes you've just made.

## Specifying a colour accurately

You can use the writable fields or up/down arrows in any of the three colour model dialogue boxes to specify a colour very accurately:

- If you know the percentages of the colour you want then it is easiest to type it into the writable fields directly. Use the Tab key to move between fields.
- You can fine-tune the currently selected colour by clicking on the up/down arrows. This changes the value in the appropriate writable field by 1%. Clicking with Shift held down changes the value by 0.1%.
- Click on one of the sixteen standard colours. This gives you access to the standard desktop colours directly.
- Click on **None**. The selected text or graphic will be transparent. This is especially useful in sprites (see page 282). This button may be greyed out if not applicable.

## Colour and the desktop

Although the desktop can be set to display only black and white, a number of shades of grey, 16 colours, 256 colours, 32 thousand colours or 16 million colours, you can always choose from 16 million. The application stores this exact colour information, even if you are working in a 16-colour screen mode.

The screen and colour selection box only show an approximation of what you've chosen; in a 16-colour display mode the representation will not be very accurate. The colour shown in the Colour picker can be different to that displayed in an application.

Colour information is stored within the application and is not lost when you change modes.

You can still choose colours when the desktop is in a greyscale mode – it is probably best to specify the colours by numerical value in this case, as otherwise you will have no idea from the appearance of the desktop what sort of colour you have chosen. If you particularly want to select a shade of grey in your application, use the CMYK model and set all colours except for Black at 0%.



**R**ISC OS uses fonts in all its windows and directory displays. This chapter shows you how to choose, use, control and print with fonts.

Strictly speaking, a **font** is a set of characters with the same fontname (or typeface), weight, style and size. An example is Homerton Bold Oblique 18pt:

- **Typeface** is the name (e.g. Homerton) given to a whole font family and describes all fonts with the same general appearance.
- **Weight** indicates the thickness of the characters (e.g. Bold).
- **Style** is the variation of the basic typeface (e.g. Oblique).
- **Size** is measured in points (see page 166).

## RISC OS fonts

Your computer is supplied with a set of fonts permanently built in. You can choose the font used by the Desktop (see *Fonts* on page 42) and use different fonts in some application windows that allow it (e.g. Draw). Here are the fonts supplied:

**This font is called System**

**This font is called Corpus**

**This font is called Homerton**

**This font is called Newhall**

*This font is called Sassoon*

\*□□▲ \*□■▼ □▲ Xα●●★\* \*★●□■ (Selwyn font)

Τηισ φοντι ισ χαλλεδ Σψδνεψ (Sydney font)

**This font is called System Fixed**

**This font is called System Medium**

**This font is called Trinity**

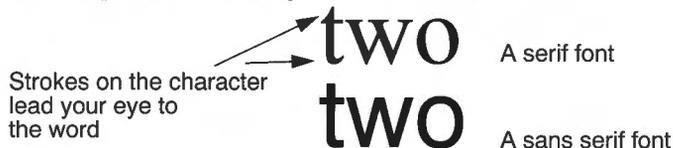
Most RISC OS fonts are Acorn versions of standard fonts. The table overleaf tells you more about this.

Most fonts can be used in any size and have italic and bold variants; some of them use proportional spacing, so that a narrow letter such as 'l' takes up less horizontal space than a wide letter, such as 'M'. Other fonts are 'monospaced' (or fixed pitch).

RISC OS font	Equivalent	Description
Corpus	Courier	Fixed pitch
Homerton	Helvetica	Proportional
Newhall	New Century SchoolBook	Proportional
Sassoon	None (special Acorn font)	Proportional
Selwyn	Zapf Dingbats	Includes arrows, stars, ticks and crosses
Sidney	Symbol	Includes greek and mathematical symbols
System (fixed)		'Old style' fixed pitch
System (Medium)		'Old style' proportional
Trinity	Times Roman	Proportional
WimpSymbol		Used by the desktop; don't use this in applications

## Serif and sans serif fonts

A serif font (like Trinity) has strokes at the edges of the letters which allow your eye to follow on from one letter to another. Sans serif fonts (like Homerton) don't have these. Sans serif fonts can make the page look tidier; they're often used for headings and other places where large font sizes are used.



## Font size

Most applications let you select the size of the font you want to use. Font size is measured in points (a point being 1/72 of an inch) and is the distance between the highest ascender and lowest descender of characters in the font:



Some applications also allow you to set the font height separately. If you want characters with different height and width values, set the size first and then the height. Acorn fonts can be sized to any height or width allowed by the application:

This is homerton 7pt  
 This is homerton 10pt  
 This is homerton 12pt  
 This is homerton 18pt

## Outline and bitmap fonts

Fonts are controlled by a part of the operating system called the Font manager. Initially, the Font manager stores just the outlines of fonts.

When you choose to use a particular font, the computer calculates the *bitmap* font needed to display that font at the desired size. A bitmap tells the computer exactly which pixels to paint on the screen to render a given character at a given size.

Outline fonts are converted into bitmap fonts because the computer can send these to the screen much faster.

### Adding more outline fonts

You can purchase additional Acorn outline fonts for your system from third party suppliers (use !Boot to add new fonts – see page 42). You can also use many of the PostScript type 1 fonts available (see page 149).

## Choosing and using fonts in applications

Two applications (Edit and Draw) are supplied that use fonts, but they use them in different ways:

- Edit can display text on the screen in any RISC OS font. However, it can only print out in the font that is standard on your printer.
- Draw can both display and print fonts of varying size and typeface.

Most applications you'll buy that can make use of fonts (e.g. desktop publishing packages, word processors or drawing tools) will behave like Draw.

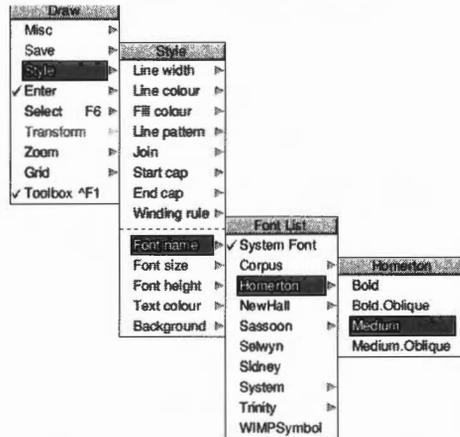
### Using fonts in Edit

You can use the **Display/Font/Font List** menu to change the font used to display text on the screen.

## Using fonts in Draw

To use different fonts in Draw:

- 1 Select the Text tool.
- 2 Click Menu over the Draw window.
- 3 Choose a font from the **Style/Font name/Font List** menu by clicking Adjust.



- 4 Choose a font size from the **Style/Font size/Size** menu.

Now, when you type in text, it will appear in your chosen font. See *Defining a path object's style* on page 217 for more details. You can also choose the outline and fill colours for the text.

## Using !Chars to preview a typeface

You can use the Chars application to see what a particular typeface looks like before you decide to use it. You can also use Chars to enter special characters into an application window or dialogue box. See *Chars* on page 327.

For other ways of entering special characters, see *Character sets* on page 433.

## How the Font manager works

The Font manager uses various techniques to optimise font quality (on-screen or printed) whilst ensuring that your computer's performance doesn't suffer:

- Anti-aliasing
- Hinting
- Font caching of bitmap fonts.

## Anti-aliasing

If the outline of a character passes partially through a pixel (a pixel is the smallest building block available on the monitor screen), a non-anti-aliasing font can only paint the whole pixel or none of it. The result is a jagged edge to the character.

Anti-aliasing relies on an optical trick: the jagged edges are smoothed out by the addition of extra pixels in intermediate colours. You can see how this is done by first typing some text in an **Edit** window using a fairly small size (12 or 14 point) and choosing **Display/Font/Trinity/Medium** to display the text in an anti-aliased font. Then use !CloseUp (described on page 331) to have a closer look at the text.



### Sub-pixel anti-aliasing

This controls a refinement of anti-aliasing in which four separate versions of each character are stored in the font cache. This can have a beneficial effect on the quality of characters at small sizes. However it is heavy on computing power (see *Controlling anti-aliasing* on page 170) and may result in unacceptably slow screen updates. This parameter is relevant only to the screen; it does not affect printing.

## Hinting

This is another technique used by the Font manager to improve the appearance of fonts. It applies both to the screen and to printers. The outline of the character being displayed (or printed) is subtly altered in ways that depend on the resolution of the image being produced. It is used on-screen if anti-aliasing is disabled.

Hinting is particularly effective when fonts are scaled, and when half-tones are not available (as on most printers). You can't control hinting, as you can anti-aliasing; it's used automatically if you disable anti-aliasing.

## Font caching of bitmap fonts

The computer keeps as many bitmap fonts as it can in an area of memory called the font cache. If the font cache is not large enough to hold the bitmaps of all the current fonts, any extra fonts are loaded as necessary.

The computer attempts to retain in memory the fonts which are in greatest demand, but this requires some sophisticated guesswork. Since this is not always totally successful (the computer cannot read your mind!) there is sometimes a delay as the font is loaded from the filing system and displayed on the screen.

## Matching font performance to your needs



The Font manager is set up to provide a reasonable blend of screen quality and performance for the majority of users. There is inevitably a trade-off between speed and font appearance. RISC OS provides two ways of tailoring font performance to your needs and preferences. You can

- change the way anti-aliasing is done (or switch it off altogether)
- change the size of the font cache.

### Controlling anti-aliasing

You can use the Fonts Configuration window of !Boot (see page 42) to place an upper limit on the size of anti-aliased fonts; fonts in larger sizes are printed without anti-aliasing. Larger fonts benefit less from anti-aliasing, and since a computed anti-aliased bitmap font occupies a lot more memory than a non-anti-aliased bitmap, for most purposes it is not worth displaying large fonts with anti-aliasing. This parameter is relevant only to the screen display.

**Note:** If you use sub-pixel anti-aliasing, you should increase your font cache by four times to store the extra font shapes needed. If you don't, your computer may slow down considerably.

### Changing the minimum size of the font cache



If you're using a lot of different fonts, increasing the minimum size of the cache means that the text is drawn more quickly. You can set it permanently (see *Memory* on page 39) or for the current session only (see *System memory allocation* on page 59).

The best size for the font cache depends on several factors: how much memory your computer has, whether you have a hard disc, and the number of fonts you're using. A computer with 4MB of memory can benefit from a cache of 256KB.

If the cached bitmaps value is set high, and you're using a few large fonts – for headlines, perhaps – they may take up all the font cache, flushing out smaller fonts. The smaller characters will then have to be cached again when needed. This effect can slow down printing and the display.

This parameter is relevant for the printer, especially if you are printing documents with a lot of text. Its ideal value depends on the screen mode, printer type and the printer resolution. If you are printing at a high resolution, you may want to increase the font cache.

**Warning:** The Font cache size set in the Memory allocation screen is overridden by the value given in your Desktop boot file. If you change the Font cache size you must also save your Desktop boot file again so that your change can take effect (see *Saving a Desktop boot file* on page 49).

**Note:** Do **not** set a font cache of less than 32K. Sub-pixel anti-aliasing (see page 169) requires more font cache. For example, Homerton.Medium as a desktop font needs a font cache of 32K. With sub-pixel anti-aliasing turned on, it needs 128K. If you see an hourglass on the screen as the desktop is redrawn you may need to increase the font cache size.

### Allowing the font cache to grow

You can set the maximum font cache size using the **Font cache limit** option on the Memory allocation screen of !Boot.

Memory allocation		
Screen memory	0	/△ KBytes
System heap/stack	0	/△ KBytes
Module area	0	/△ KBytes
Font cache	32	/△ KBytes
Font cache limit	0	/△ KBytes
System sprites	0	/△ KBytes
RAM disc	0	/△ KBytes

If the font cache is too small, the Font manager attempts to increase its size up to the **Font cache limit**. If this happens, it shrinks back to the normal current size as soon as any fonts can be discarded. The Font manager decides to do this rather than throw away cached blocks of fonts currently displayed.

If the Font cache limit is zero, or smaller than the default font cache, the cache will not expand. If you are using several fonts you may want to set this to a high value (e.g. 256K). A rough yardstick, if you're using fonts intensively, is to allow 64K per megabyte of memory.

## Printing with fonts



When printing, there are conflicting requirements for memory. The Font manager needs memory to cache fonts, and the printer driver needs memory to build up a page image to send to the printer. As both of these affect printing speed, you will have to experiment to find the optimum. Typically, more memory given to the font cache (or maximum font cache option) results in quicker printing.

The maximum size of cached bitmaps affects whether fonts are cached when printing. If this value is smaller than your typical body text size, there may be a very long pause at the start of each printed page, as all the characters on the page are rendered from the outline form.

The RISC OS Printer manager program sits between an application and the printer, and oversees the printing process. Printers, printing and printer drivers are explained fully in *Printing your files* on page 123 and *Setting up printers* on page 105.

### **PostScript printers**

PostScript printers have their own set of fonts stored internally. When you print to a PostScript printer, most Acorn fonts are mapped to these internal PostScript fonts. Acorn fonts that cannot be mapped to PostScript fonts (e.g. Sassoon) are sent to the printer by the Printer manager as they are needed.

Most Acorn fonts can be mapped to PostScript fonts. For more information about using Acorn fonts with PostScript printers, refer to *FontPrint* on page 143.

### **Converting PostScript fonts to outline fonts**

It is possible to convert standard PostScript Type 1 fonts to Acorn Outline fonts using the *T1ToFont* application (see *T1ToFont* on page 149).

## **Changing the desktop font**

You can change the font displayed in directory displays, menus and so on (see page 43). It's best to choose one of the fonts stored in the computer's ROM (e.g. Homerton or Trinity) as the screen will redraw more quickly.

## **Troubleshooting**

If every screen redraw causes intensive disc and hourglass activity, then the font cache may be too small to hold the range of fonts you are trying to use. In these circumstances, try the following:

- Increase the size of the font cache using the **Task manager/Task display** window. The addition of even small amounts of cache can often improve things dramatically.
- Reduce the maximum size for anti-aliasing. This will enable the font cache to be used more economically with a large number of fonts. You should not normally reduce the maximum anti-aliasing size below 12pt.
- Reduce the maximum size of cached bitmaps value. This should reduce disc activity, but the action of redrawing the screen will become much slower.
- Use a smaller selection of fonts and font sizes in your document.





**D**raw is a powerful and sophisticated drawing package; you can use it to draw and edit diagrams and pictures made up from various kinds of graphical objects.

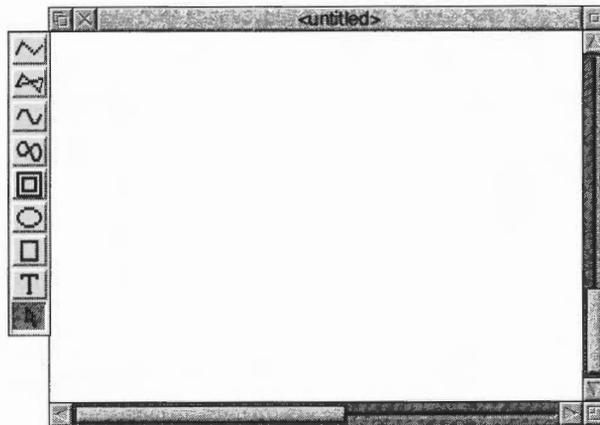
You'll probably find that the easiest way of learning Draw is to read through *Basic ideas* (on the next page) and then work through the *Draw tutorial* which follows, before reading the more detailed sections.

## Starting Draw



Draw is in the Apps icon bar directory display. To start Draw:

- 1 Double-click on the !Draw icon, to install it on the icon bar.
- 2 Click on the Draw icon bar icon to open a new Draw window.

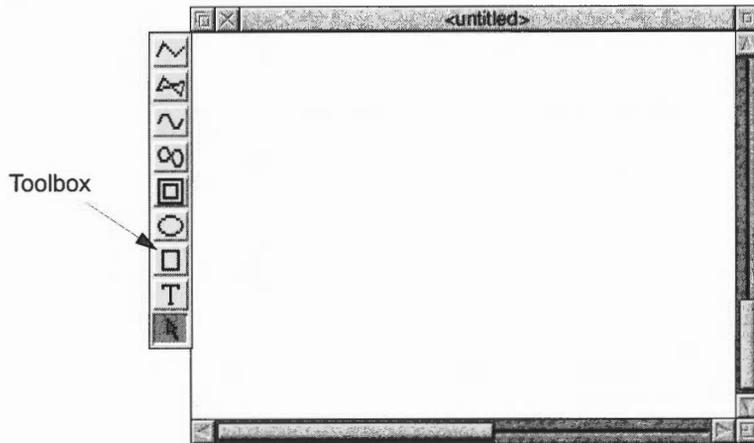


Alternatively, edit an existing drawing by dragging its file icon to the Draw icon on the icon bar, or by double-clicking on it.

## Basic ideas

### The Draw window

The Draw window looks similar to other application windows when you first load it, except that down its lefthand side there is a strip of icons called the Toolbox. The Toolbox allows you to draw or select objects without having to use menus.



### Draw objects

A Draw diagram is built up from objects of a number of different types. Draw stores information about each object, which means you can subsequently change individual objects without affecting the other objects.

The basic object types are:

- **Paths**, consisting of a sequence of line segments. Each line segment can be straight or curved. A path can be closed to form a polygon or curved object, or left open. The path is the basic element of a drawing.
- **Rectangles and ellipses**, which are also path objects. This means that you can edit them.
- **Text lines**, in a range of fonts and sizes.
- **Text areas**, consisting of several lines of text. Text areas can be used for simple desktop publishing, and for annotating drawings.
- **Sprites**, which are graphic shapes made up of an array of coloured pixels. You can create sprites using Paint (see next chapter) and then load them into Draw.
- **JPEG files** (compressed photographic images) such as those in the **Images** directory.

You can combine objects together as a group which you can then (usually) manipulate like any other object. Draw records the objects that were used to build a group, so that it may subsequently be ‘ungrouped’ into its constituents. Groups can also be used as components of other groups.

Each object has a style consisting of a number of *attributes*. Attributes are used to define the colours of an object, line widths, text fonts and sizes, and so on. The exact range of attributes depends on the type of object.

## Draw modes

You can use Draw in three operating modes:

- **Enter mode** – used to create new Draw objects (like lines and squares).
- **Select mode** – used to change object attributes (like line colour) and to move and alter objects.
- **Path edit mode** – used to reshape an object by altering its paths and segments.

Don’t worry about these names too much – when you’re actually using Draw you’ll change between the modes without thinking about it!

The mouse pointer changes according to which mode you are using: in Enter mode it is shown as a star, and in Select and Path edit mode as an arrow.



## Tools and short-cuts

To make it easier to construct a diagram, Draw has a number of tools and shortcuts:

- The **Toolbox** is attached to the lefthand edge of each Draw window. You can use this to draw and edit shapes, without having to use menus.
- You can display a **Grid** to help you align objects in a diagram. Various different sizes and shapes of grid are available.
- **Keyboard short-cuts** duplicate the effect of the more frequent Draw actions. These are listed at the end of this chapter on page 239, and also appear alongside the corresponding menu entries on the screen.
- You can use **New view** to display more than one view of a diagram; different views can have different grid and zoom factor settings. Changes made to the drawing in one view affect the other view as well.

When you start a drawing, the Draw window displayed on your screen only shows part of your actual drawing area. The drawing area is usually the size of an A4 sheet of paper, but you can make it as small as A5 or as large as A0, depending on the size of the drawing you want to create. You can also decide whether the drawing area is a landscape rectangle (where the horizontal side is longer) or a portrait rectangle (where the vertical side is longer). You can use the scroll bars on the Draw window to move around the drawing area.

This drawing area is Landscape A4

**A circular walk around Hardley lake**

Proceed along the main Swafford to Hasleley road and turn left to Barfell just before you reach Hasleley. Continue along this road until you arrive at a car park.

Go through a turnstile at the back of the car park and follow the footpath past Garston Hall. Continue until you cross over the Barfell road and then take the track that leads up into the wood. Once you are inside the wood keep the fence on your left. If you're lucky, you may see some horses behind the fence. Coming out of the wood take the footpath which passes by an old ruined house. Continue for about a mile until you reach a picnic site. From here you have uninterrupted views over the lake.

Leaving the picnic site take the path which climbs up, keeping Brooks Farm on your left. Follow the ridge for about two miles. You will be able to see Glaisle Fell in the far distance. The car park is now a few hundred yards away.

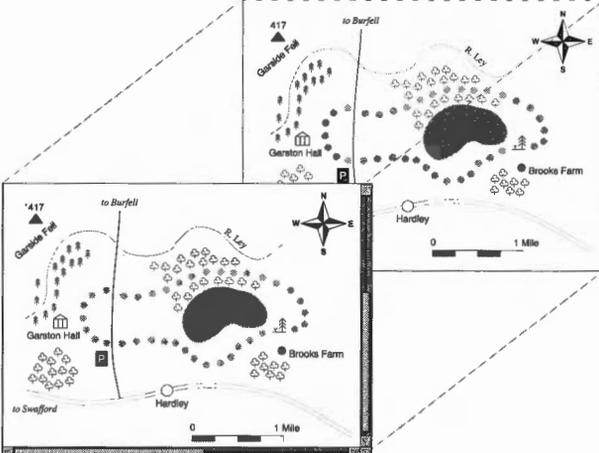
INFORMATION	
GOING	Wet
TIME	3 hours
LENGTH	6 miles



**\*\* Feature \*\***  
Horses you might see in the wood

*View from the Picnic site*





The Draw window shows part of the whole drawing area

## Draw tutorial

This tutorial section introduces Draw by helping you create the picture below. If necessary, remind yourself of general RISC OS ideas and terms before you start, by going back to your *Welcome Guide*.

### A circular walk around Hardley lake

Proceed along the main Swafford to Hardley road and turn left to Burfell just before you reach Hardley. Continue along this road until you arrive at a car park.

Go through a turnstile at the back of the car park and follow the footpath past Garston Hall. Continue until you cross over the Burfell road and then take the track that leads up into the wood. Once you are inside the wood keep the fence on your left. If you're lucky, you may see some horses behind the fence. Coming out of the wood take the footpath which passes by an old ruined house. Continue for about a mile until you reach a picnic site. From here you have uninterrupted views over the lake.

Leaving the picnic site take the path which climbs up, keeping Brooks Farm on your left. Follow the ridge for about two miles. You will be able to see Garside Fell in the far distance. The car park is now a few hundred yards away.

**INFORMATION**

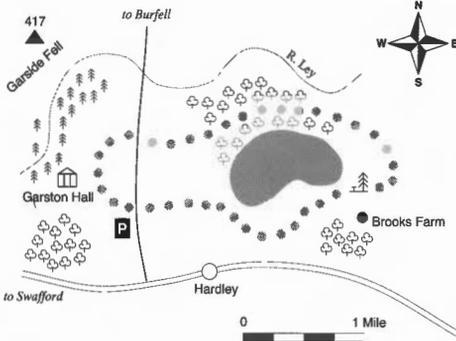
**GOING** Wet

**TIME** 3 hours

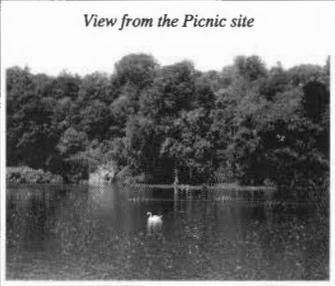
**LENGTH** 6 miles

**\*\* Feature \*\***  
*Horses you might see in the wood*





*View from the Picnic site*



The drawing above shows a six mile walk through the countryside, and is divided into four parts:

- A map showing the route of the walk and how to get to the starting point.
- A written description of the walk.
- A photographic view of part of the walk.
- An information box describing how many miles long the walk is, how long it takes to complete, the going (wet) and any points of interest.

The following pages will take you step-by-step through the process of creating the above drawing, showing you how to draw a map compass, lake, roads, road scale, woods and rivers. You'll also learn how to drag text files (created by Edit) and sprites (created by Paint) into a Draw window.

## Undoing your mistakes

If you do something by mistake while you're working through this tutorial, try pressing F8. This is a keyboard short-cut for the **Misc/Undo** option, and should undo your last operation. If you decide that you didn't want to undo something after all, just press F9 (**Redo**).

## Selecting Draw objects

Before you start on the map, it's worth spending a short time practising how to select objects. This is important: before you can do anything to a Draw object – move it, for instance, or change its colour – you need to select it.

A Draw picture will typically contain lots of objects overlapping each other, and often one object will be completely behind another. Selecting just the object you want to alter needs a bit of skill.

- 1 Open the **Tutorials.DrawTutor** directory and double-click on the file called **Sign**. Once this file is loaded it looks like this:

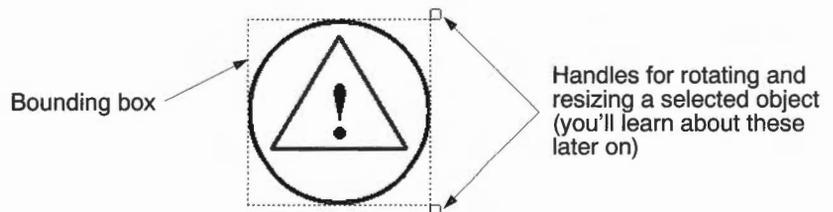


This drawing consists of three objects:

- the outside circle – this is at the front (i.e. on top) of the three objects
- the triangle
- the exclamation mark – at the back of the stack of three objects.



- 2 Choose the Select tool from the toolbox (if it's not already highlighted). The toolbox is the strip of icons down the lefthand side of the Draw window – click on the arrow at the bottom of the toolbox and it will be highlighted.
- 3 Click on the circle to select it. A dotted box (known as a bounding box) will appear around it, indicating that it is selected:

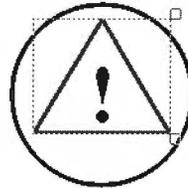


## Selecting 'buried' objects

When an object's bounding box extends beyond others, it's easy to select: as long as you click on that part of the object, it will be selected. When an object is in front of others (as the circle is), again, you'll have no problem: click anywhere within it to select it.

However, it can be difficult to select an object that's 'underneath' other objects. You can often see many objects apparently occupying the same physical place, but in fact they're 'stacked' on top of one another.

For instance, clicking on the triangle will in fact select the circle, because the circle is in front of the triangle. To select the triangle, you need to **double-click** on it.

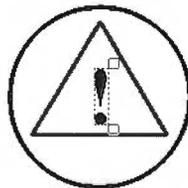


If you double-click many times, you'll 'tunnel down' through the objects that are stacked on top of each other, selecting each one in turn.

## Changing the 'stacking order' of overlapping objects

The exclamation mark is behind the triangle, so you **could** select it by double-clicking and tunnelling down through the stack of objects to reach it. However, another way of getting to a buried object is to send the objects covering it to the back of the stack:

- 1 Select the circle, press Menu and choose **Select/Back** (or press Ctrl-B).
- 2 Select the triangle (by double-clicking) press Menu and choose **Select/Back**.
- 3 Select the exclamation mark by single-clicking on it.



Now the exclamation mark is always at the front; you don't need to double-click repeatedly each time you want to select it.

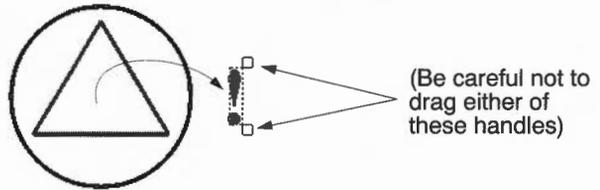
You can change the stacking order of objects using this method (e.g. you could bring the circle to the front of the stack by selecting it and choosing **Select/Front**).

Select	
Select all	^A
Clear	^Z
Copy	^C
Delete	^X
Front	^F
<b>Back</b>	<b>^B</b>
-----	
Group	^G
Ungroup	^U
Edit	^E
-----	
Snap to grid	^S
Justify	^J
Interpolate	^I
Grade	^G
Convert to path	^P

## Moving selected objects

Once you've selected an object, you can drag it anywhere within the Draw window. For example:

- 1 Select the exclamation mark and move the pointer inside the bounding box.
- 2 Now hold down Select and drag the exclamation mark outside the circle (don't click on the 'handles', these stretch and rotate the object):



Having practised selecting objects, there is nothing else you need to do with this file, so you can close it by clicking on its Close icon. If during your experimenting, you have changed the file at all, you'll see a message warning you of this; click on **Discard** to tell the computer you don't want to save your changes.

## Start the drawing: create the map symbols

Six different symbols are used on the map; two types of tree, a picnic site, a mountain, an historic building and a parking site symbol:



The first part of this tutorial takes you through creating these symbols.

### Set the size of the drawing area

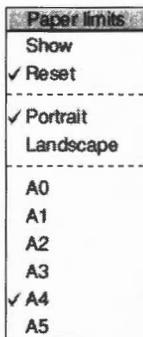
The first step in creating the map is to click on the Draw icon on the icon bar (if you don't have Draw loaded on the icon bar see page 173). This displays an empty Draw window. You should now check that the drawing area is A4, landscape:

- 1 Move your pointer into the Draw window and press Menu.
- 2 Make sure both **Landscape** and **A4** are ticked in the **Misc/Paper limits** menu.

### Make the Draw window larger

The Draw window that is displayed is quite small. Increase the size of this window:

- 1 Make sure that the zoom is 1:1 (press Menu and check the **Zoom** option).
- 2 Drag the window to the top left of your screen.
- 3 Drag the Adjust size icon down and to the right so the window is larger, and looks nearly square.

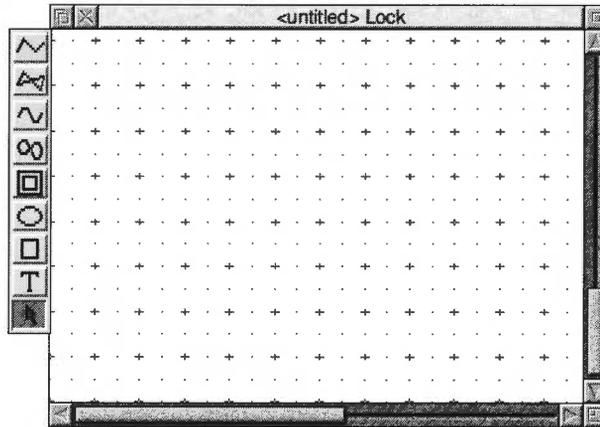


## Switch on Draw's grid

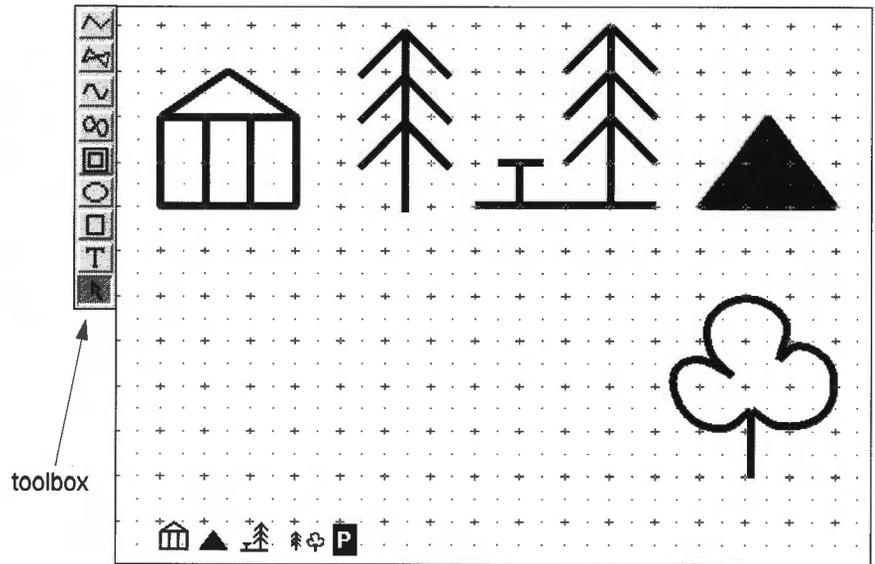
Grid	
<input checked="" type="checkbox"/> Show	F1
<input type="checkbox"/> Lock	⇧F1
Auto adjust	
-----	
Colour	▶
-----	
Inch	▶
<input checked="" type="checkbox"/> cm	▶
Inch (y only)	▶
<input checked="" type="checkbox"/> cm (y only)	▶
-----	
<input checked="" type="checkbox"/> Rectangular	
Isometric	

To superimpose a grid within the window:

- 1 Press Menu on the Draw window.
- 2 Choose **Grid/Show** by clicking with Adjust.
- 3 Choose **Grid/Lock** (this time click Select and the menu will disappear):



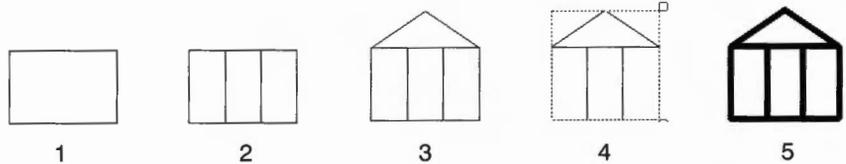
The easiest way to create most of the map symbols is to draw them large and then shrink them down to the size you want. When you have finished creating all the map symbols your Draw window will look something like this:





## Create the hall symbol

There are five steps involved in creating the hall symbol:



1 Choose the Rectangle tool from the toolbox, then move the pointer over one of the grid markers near the top lefthand corner and click. This marks one corner of the rectangle. Move the pointer down two grid units and right three grid units and click again. The rectangle will be displayed, locked to the grid.



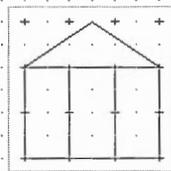
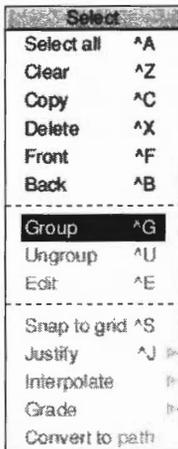
2 Now choose the Straight line tool. Create two vertical lines within the rectangle. (To draw a single line, click once at the start point of the line, move the pointer, then double-click at the end point of the line.)

3 Now draw a two-segment line for the roof: Move to the top left of the rectangle and click once. Move right one and a half grid units and up one grid unit and click again. Finally move to the top right of the rectangle and double-click.

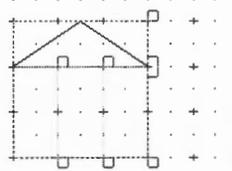
4 Next, to make the rectangle and all the lines in the symbol into one object, you have to select them all and then group them:



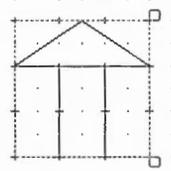
Choose the Select tool at the bottom of the toolbox. Select all the objects in the hall symbol (by dragging a *select box* around them), press Menu and choose **Select/Group**:



drag the pointer from the top left of the symbol down and to the right to create a select box



all the objects inside the select box will be selected



press Menu and choose **Select/Group**

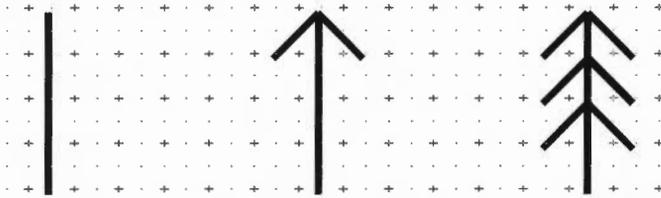
If you now click outside the new bounding box, it will disappear. To select the symbol again just click on it.

5 Finally, thicken the lines in the symbol to make it stand out more: Select the hall symbol, press Menu and choose **4** from the **Style/Line width** menu. All the lines in the symbol will be redrawn 4 points wide (a point is  $1/72$  inch).



### Create the conifer tree symbol

- 1 Choose the Straight line tool in the toolbox.
- 2 Move to the right of the hall symbol and draw a vertical line four grid units high (notice that the lines you draw now are very thick).
- 3 Move to the left of the line and create a two-line segment to act as the top two branches of the tree (do this in the same way you created the roof of the hall symbol).
- 4 Now move down and create two more sets of branches.



draw a vertical  
line 4 grid units  
high

draw a two-line segment  
at the top of the tree to  
represent two branches

draw the next two  
sets of branches in  
the same way



- 5 When you've finished the tree choose the Select tool, drag a select box around the tree and group it into one object.



### Create the picnic site symbol

The picnic site symbol is much easier to create than it looks:

- 1 Select the tree symbol you have just created, press Menu and choose **Select/Copy**. A copy of the tree will appear slightly below and to the right of the original. Drag this copy several grid markers to the right of the original tree.
- 2 Choose the Straight line tool and add three lines to the copy of the tree to make up the remainder of the picnic site symbol.
- 3 Once again make the symbol into a single object by grouping it.



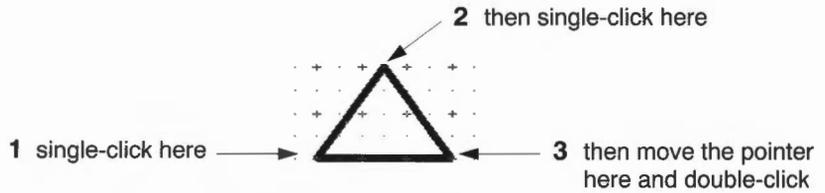
### Create the mountain symbol

The mountain symbol is just a solid triangle and is very simple to create.

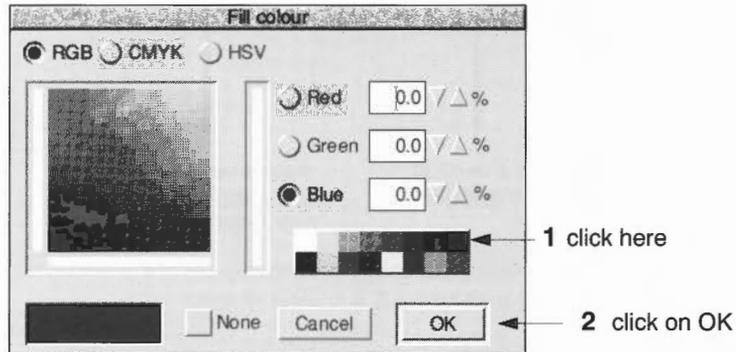


- 1 Choose the Joined line tool.  
This tool allows you to create straight lines with the added feature that, when you double-click to end your path, an extra line is drawn to join the last point to the first point.

- 2 Move to the right of the picnic site symbol and draw a triangle as shown below. (The third line is drawn automatically when you double-click on the last point.)



- 3 Now colour the inside of the triangle black: Choose the Select tool and Select the triangle, press Menu and go into the **Style/Fill colour** box. Click on the black patch near the bottom right of the Fill colour box and click on **OK**:



### How style options work

Before you draw your next symbol it is important that you understand how the Style menu works. Every time you choose a style, e.g. Fill colour, it stays in force until you change it again, **and** it affects other tools. So if you set Fill colour to black, any subsequent rectangles, lines and curves you draw will also be filled in black. To avoid drawing an object in the wrong style, each time you choose a new tool check that you have the correct fill colour, line width etc. **before** you draw the new object.



### Create the deciduous tree symbol

The deciduous tree symbol requires a little more time and 'artistry' to create. Draw this symbol below the other symbols. All your symbols will then be in full view without the need to scroll.

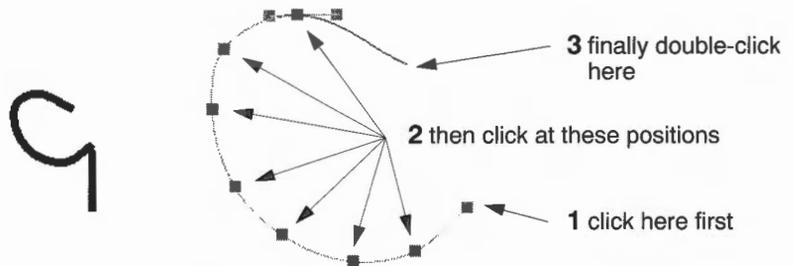


- 1 Choose the Straight line tool. Move the pointer near to the bottom right of the window and draw a small vertical line.
- 2 Turn off the **Grid/Show** and **Grid/Lock** options (it's very difficult to draw curves with the grid switched on).



- 3 Choose the Curved line tool.
- 4 Choose **None** in the **Style/Fill colour** box, then click on **OK**. This will ensure that whatever you draw next will **not** be filled in.
- 5 Move the pointer to the top of the small vertical line and click. Now move very slightly down and to the left.

You'll notice that there is a small blue square over the point where you first clicked **Select**, and as you move the pointer a small orange square will also appear. The blue squares are simply to show you where you clicked **Select** as you build up a curve. The orange squares are *control points*; they help to show you how the curve is being generated (there's more on this in *Editing curves* on page 223). Both types of square will disappear when you finish your curve. For the time being, just build up your curve clicking **Select** at roughly the points shown below:



When you come to the end of the curve double-click (and leave your pointer where it is). Don't worry if your curve isn't exactly the same as the one above.

- 6 Now you can create the other two curves in the same way. By starting the next curve where you finished the previous one you will create a smoother, more continuous effect to the outline of the tree.
 

If you are dissatisfied with your curves you can either delete them and start again, or edit them. You can delete a curve (or any object) by selecting it and choosing **Select/Delete**. If you want to learn how to edit curves see page 223.
- 7 Finally, make the symbol into a single object by grouping it.



### Create the parking symbol

There are five steps involved in creating the car parking symbol:



- 1 Turn on the **Grid/Show** option (but leave the **Grid/Lock** option off). Then choose the Rectangle tool and set the **Style/Line width** to **Thin**.
- 2 Now move to the left of the deciduous tree symbol. Click and drag the pointer to make a small rectangle, about half a grid unit wide, and almost one grid unit tall.



- 3 Choose the Select tool and select the rectangle. Then press Menu and go into the **Style/Fill colour** box. Click on the black patch near the bottom right of the box and click on **OK**.



draw the rectangle...

...then fill it in black



- 4 Choose the Text tool. Position the pointer near the rectangle you've just drawn and click. A red vertical bar (known as a 'caret') will appear. Type the letter **P**.



- 5 Use the Select tool to select the **P**. Now go into the **Style/Font size** box and click Adjust on **14pt**. The size of the **P** will increase to 14 points. Now move to the **Font name** submenu and choose **Homerton/ Bold**. The **P** will be changed into the new font.

- 6 While the **P** is still selected go into the **Style/Text colour** box and change the colour of the **P** to a light grey. Then drag the **P** so that it is centred inside the rectangle. Now go back into the **Text colour** box and change the colour of the **P** to white.



drag the P into the centre of the rectangle...

...then change the text colour of the P to white



**Note:** Never leave text colour set to white, or you won't see anything next time you type in any text. Always change it to black again. To do this, choose the Text tool, then click Menu and set the **Style/Text colour** to black (don't forget to click on **OK**).

- 7 Finally, choose the Select tool and group the rectangle and the P to make a parking symbol.

## Scale the map symbols

Now reduce the size of the first five symbols to the correct size for the map:

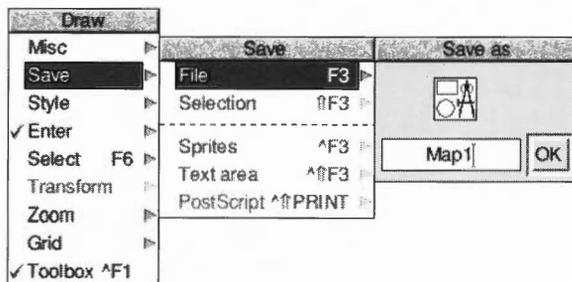
- 1 Begin by selecting the hall and mountain symbols (by clicking Adjust on each symbol). Press Menu and copy them using **Select/Copy**.
- 2 Now drag the two selected copies down towards the bottom lefthand corner. Notice that both selected objects move as you drag one of them. Deselect them, drag each one separately into the bottom lefthand corner, then select them both again.
- 3 Press Menu and move to the **Transform/Magnify** box. Use the Delete key to delete any value already in the box, then type in **0.2** and press ↵ (Return). The two symbols will be reduced in size.
- 4 Select and copy the picnic site symbol, reduce the copy of the symbol to **0.15**, and move it near the two already reduced.
- 5 Select and copy the two tree symbols, reduce the copies of these symbols to **0.1**, and move them near the three already reduced.
- 6 Now move the parking sign symbol to the right of the five reduced symbols.
- 7 Finally, select all five original, large symbols and press Delete. All that you should now see are the six symbols at the bottom left of the window:



## Save your work for the first time

Now is a good time to save the work you've done so far. To do this:

- 1 Make sure that you have a directory display visible.
- 2 Press Menu over the Draw window, go into the **Save/File/Save as** box, delete the word **DrawFile** and type in a new filename, for example **Map1**.
- 3 Drag the Save as icon to your directory display.



## Drawing the map compass

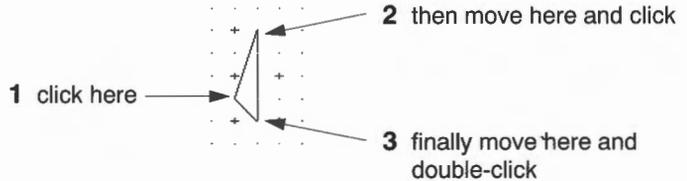


The next task before actually drawing the map is to construct the map compass.

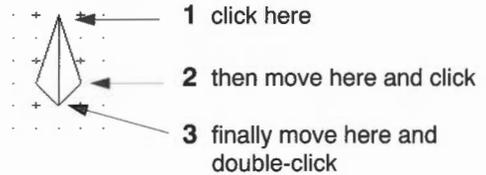
### Draw the first compass quadrant

The compass is made up of four quadrants, but you only need to create one.

- 1 Turn on **Grid/Lock** (**Grid/Show** should still be on).
- 2 Choose the Joined line tool. Change the **Style/Fill colour** to white. Then move to the middle of the Draw window and click on one of the small grid markers. Now move up 1.5 units and right 0.5 units and click again. Finally move down two grid units and double-click to create a closed triangle:



- 3 Move to the top of the triangle you've just created and click. Now draw a second triangle:



- 4 Choose the Select tool and select the first triangle (the lefthand one) and fill it in black using the **Style/Fill colour** box:

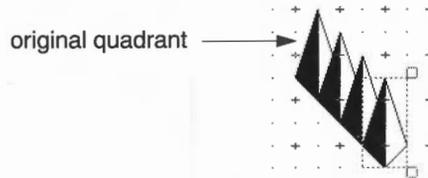


- 5 Finally, group the two triangles into a single object.

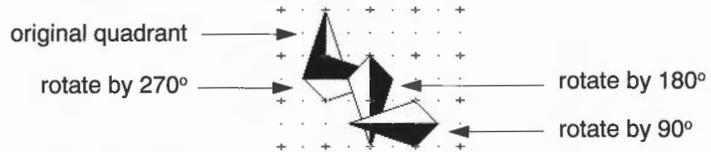
## Create the other quadrants of the compass

The next step is to make three copies of this quadrant and rotate them to form the four quadrants of the compass.

- 1 With the quadrant selected, copy it three times (instead of using the menu, just select the quadrant and then press Ctrl-C three times). As each quadrant is copied it will be drawn in front of the previous one:



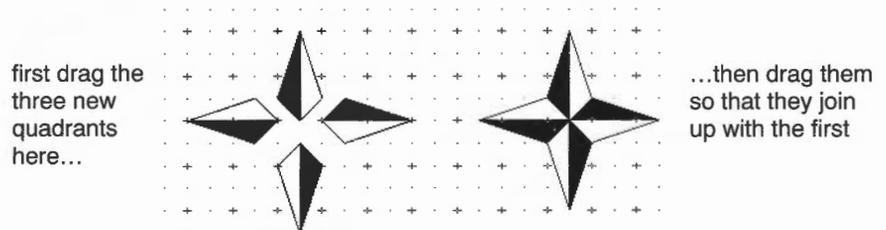
- 2 The last quadrant copied will still be highlighted. Press Menu and type 90 into the **Transform/Rotate** box, then press ↵ (Return). The quadrant will be rotated anticlockwise around its centre by 90°. Then highlight the quadrant above this one and rotate it by 180°. Rotate the other quadrant by 270°:



## Fit the quadrants together

The four quadrants overlap each other at the moment and will be difficult to join accurately:

- 1 First, drag the three copied quadrants so that they form a fragmented star.
- 2 Then drag them so that their tips all meet the bottom tip of the original quadrant:



- 3 Finally, group the four quadrants into a single object.

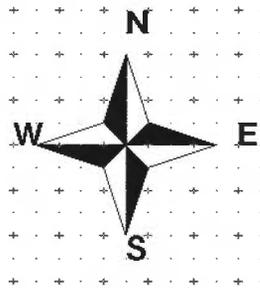
## Add the text

The next step is to add the text indicating north, south, east and west.

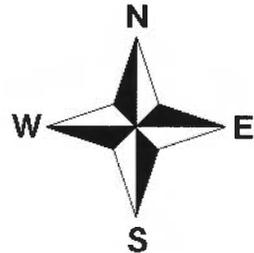


- 1 Choose the Text tool from the toolbox. Press Menu and choose **Style/Font size/20**. From now on the size of any text you type into the drawing area will be drawn at 20pt. (The font should still be set to **Homerton/Bold**.)
- 2 Position the pointer just above the top of the first quadrant and click. A caret will appear. Type **N**.
- 3 Move the pointer and click where you want to put the E. Type in the **E** then move the pointer again and add the **S** and **W**.
- 4 Press Menu and switch off **Grid/Show** and **Grid/Lock**.
- 5 Now choose the Select tool and drag the letters into the correct positions:

1 add N, E, S and W

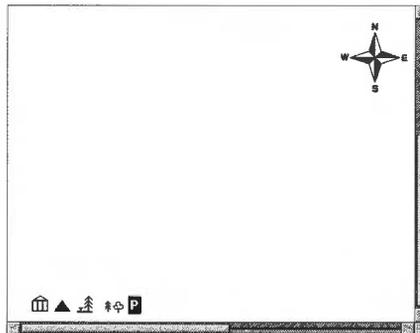


2 turn the Grid off and position letters accurately



## Scale and move the compass

When you finish drawing the compass drag a select box around it and group it. Then press Menu and **Transform/Magnify** the compass by 0.5. Finally drag it to the top right corner of the Draw window:



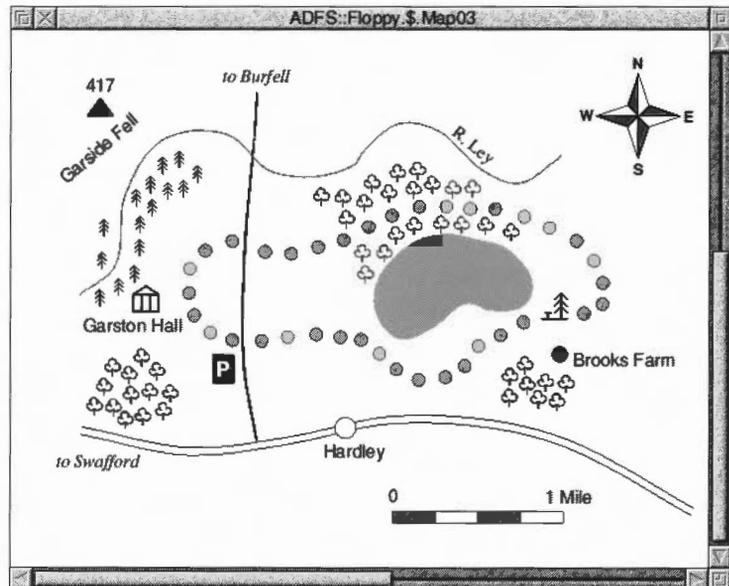
## Save your work as you go along

Now is a good time to save your drawing. The easiest way to do this is to use a shortcut – press the F3 button at the top left of the keyboard. This displays the **Save as** box. You've already saved your work in a file called **Map1**, so just click on **OK** and the work you've done since you last saved your file will be saved.

**Note:** It's a good idea to save your work every 10 minutes or so.

## Drawing the map

The next stage is to draw the map itself. When you have finished the map your Draw window will look something like this:



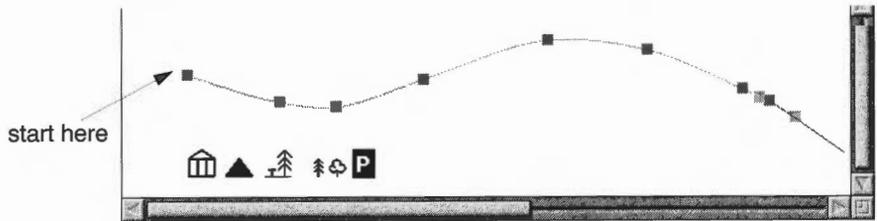
The sequence in which you'll build up the various parts of the map is:

- 1 Main road to Swafford
- 2 Road to Burfell and river
- 3 Hardley Lake, Garston Hall and picnic site
- 4 Path and Brooks Farm
- 5 Mountain and parking area
- 6 Conifers and deciduous trees
- 7 Map scale
- 8 Map text.

### Draw the main road to Swafford



Choose the Curved line tool and set the **Style/Fill** colour to **None**. Move the pointer above the Hall symbol and create the following curve (don't forget to double-click at the end of the curve):

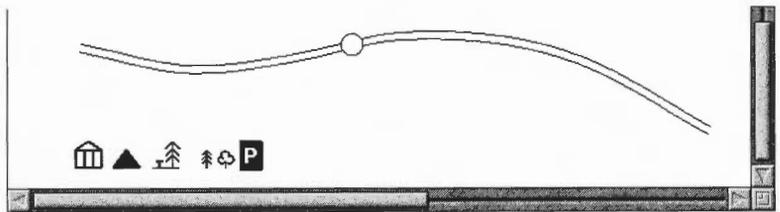


Once you've created the curve, copy it and drag the copy so that it is just below the original curve. The second curve should be parallel to the first curve to give the appearance of a road. Select both lines (**hint**: drag a select box that passes through both lines) and group them.

**Note:** If you accidentally select one of the symbols immediately beneath the two lines, you can deselect it by clicking Adjust on it.



To add the circle to the road, first choose the Ellipse tool. Then turn **Grid/Show** and **Grid/lock** on, click on any grid marker, and drag the pointer in any direction until a small circle is displayed. Click again to finish the circle. Then turn the Grid off again. Select the circle and magnify it by **0.5**. Then go into the **Style/Fill colour** box and fill the circle with white. Now drag the circle so that it sits on the road as shown below:



### Draw the road to Burfell and the river



The road to Burfell can be drawn as one thick line. Choose the Curved line tool and set the **Style/Fill colour** to **None**. Set the **Style/Line width** to **1**. Move the pointer to the upper line in the main road and draw a road going upwards almost to the top of the window (see the picture overleaf).

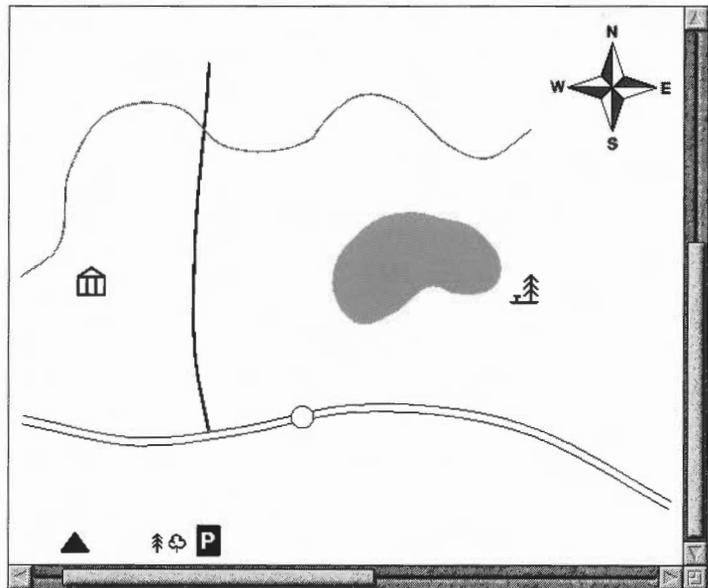
The river can be drawn using a thinner line. Set the **Style/Line width** to **0.5**, then go into the **Style/Line colour** box and choose light blue (the patch at the bottom right of the box). Now move to the left of the window and draw the river.

### Construct Hardley Lake, Garston Hall and the picnic site



Choose the Joined curve tool. Now draw the outline of the lake. (Remember that the Joined curve tool will join your last point and starting point when you double-click. Notice also that the line is drawn in blue, because you selected a blue line colour to draw the river.) Select the lake and fill it with light blue.

Drag the Hall symbol near the bottom left of the river, and then drag the picnic site symbol to the right of the lake. Your Draw window should now look like this:



### Draw the path and Brooks Farm

The path is made up of a number of filled circles. Select and copy the circle on the main road, then magnify the copied circle by 0.5. Go into **Style/Fill colour** and change the colour of the new circle to light grey.

Now drag the new circle to the right of the Hall symbol. Then repeatedly copy the circle and drag the copies to form the entire path (see the picture overleaf). If you drag the wrong object, don't forget you can press F8 to undo a mistake!

Make one more copy of the circle and drag it below the picnic site symbol (this will become the symbol for Brooks farm) then click Adjust on each circle in the path and group them all. (If you accidentally click Adjust on an object you don't want to group, click Adjust on the same symbol to deselect it and continue.)

Finally, magnify the circle below the picnic site by 1.2 and fill it with dark grey.

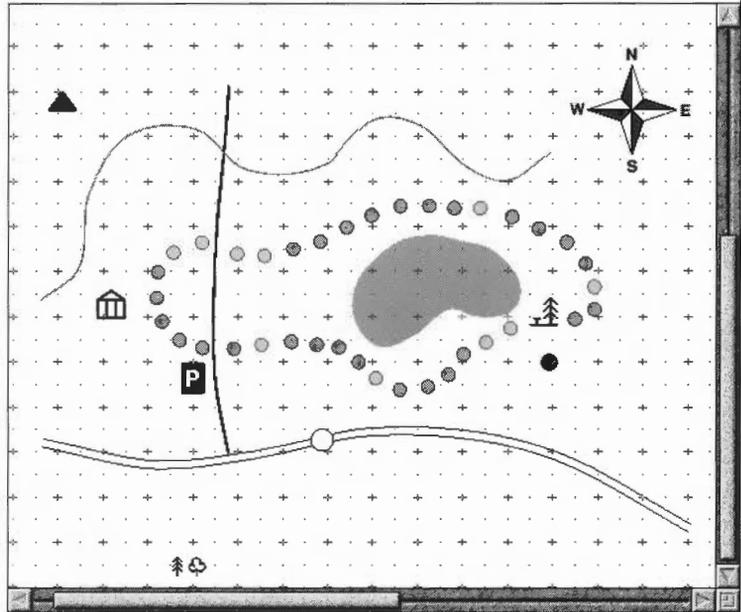
Now is a good time to save your work again.

### Draw the mountain and parking area

Drag the mountain symbol near the top lefthand corner of the Draw window.

Drag the parking symbol below and to the left of where the road to Burfell first passes through the path.

Your map should now look something like this:



### Draw the conifers and deciduous trees

Creating the conifer wood is very simple. Drag the conifer symbol near to the Hall symbol and copy and drag it until you have created a wooded area similar to the one on page 196.

Creating the deciduous woods is just the same. Drag and copy the symbol to each of the three deciduous woods shown on page 196.

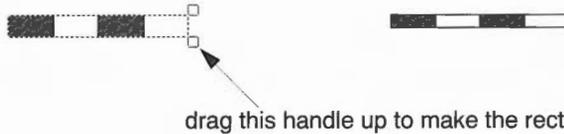
### Draw the map scale

- 1 Begin by switching on **Grid/Show** and **Grid/lock**.
- 2  Choose the Rectangle tool and set the **Line width** to **0.25**, the **Line colour** to black and the **Fill colour** to white.
- 3 Move below the circle on the main road and draw a rectangle one grid unit long and half a grid unit high.

- 4 Draw three more rectangles, joined together.
- 5 Select the first and third rectangle and fill them in dark grey:



- 6 Turn **Grid/Lock** and **Grid/Show** off, select the four rectangles and group them. While the grouped rectangle is still selected, click on the handle at the bottom right and drag it up so that the rectangle becomes thinner:



- 7 Choose the Text tool. Set the **Font name** to **Homerton/Medium** and the **Font size** to **12**.
- 8 Type in 0 at one end of the scale, and 1 mile at the other.



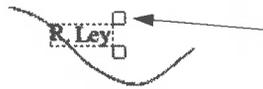
- 9 Finally group the scale and text.

### Add the map text

- 1 Type in the following text at the positions shown on the map on page 196:
 

Garston Hall	to Burfell	R. Ley	Garside Fell
Hardley	to Swafford	417	Brooks Farm
- 2 The text you have just typed in should still be in Homerton Medium 12pt. To make the text stand out, change **to Swafford** and **to Burfell** to **Trinity/Medium.Italic**. Then change **R. Ley** to **Trinity/Medium**.

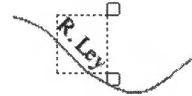
- Use the rotate handle to rotate **R. Ley** so that it is parallel to the direction of the river:



select the text and drag the rotation handle downwards

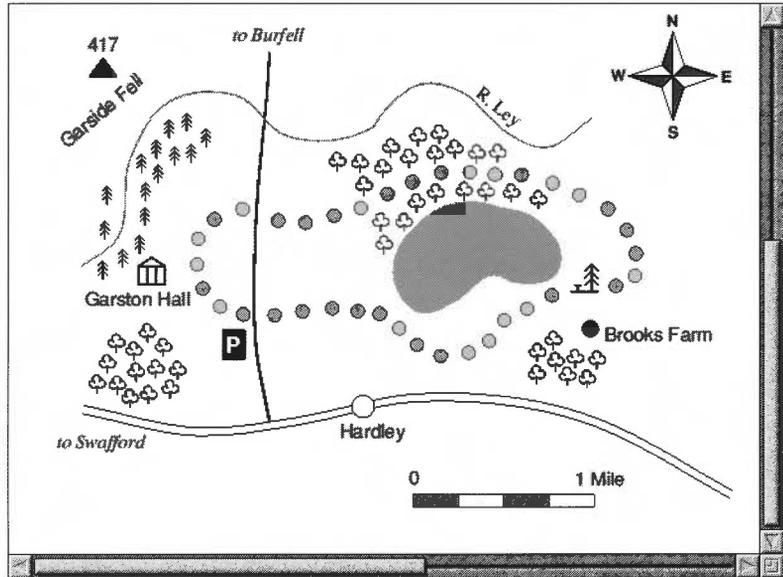


the handles remain stationary but a light grey rectangle appears rotated about the centre of the text



release Select and the text is rotated to fit inside the light grey rectangle

- Rotate the text **Garside Fell** in the same way. Your map should now look like this:



Now is a good time to save your work again.

## Adding a written description of the walk

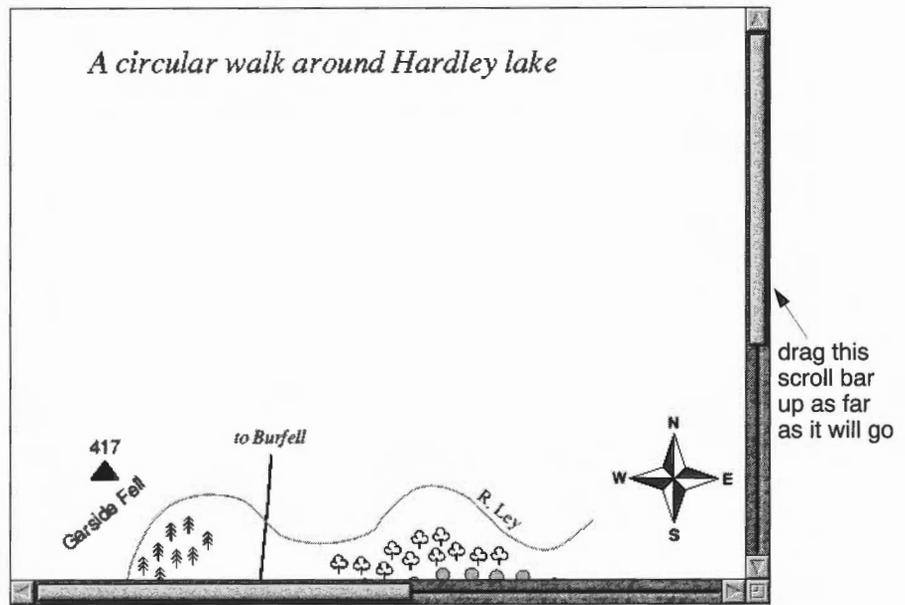
Now to add a written description of the walk immediately above your map...

### Add the title

Drag the scroll bar on the righthand side of the Draw window up as far as you can, then choose the Text tool. Set the font to Trinity Medium.Italic at 20pt.

Click at the top left of the window and type in:

*A circular walk around Hardley lake*

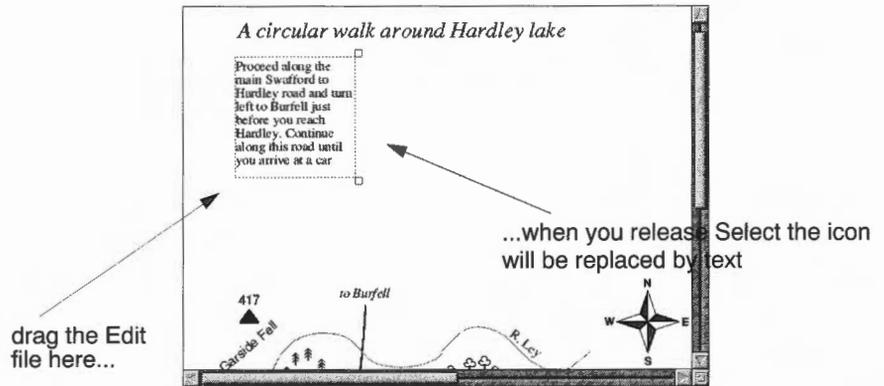


### Import a text file into your drawing

You can include the contents of a text file into a **text area** in a Draw file. A text area is a special object which accepts text from another file. An Edit file called **MapText** has been included in the **Tutorials.DrawTutor** directory which contains a description of the walk around Hardley lake. The first few lines of this file contain commands which specify the font, paragraph spacing and so on.

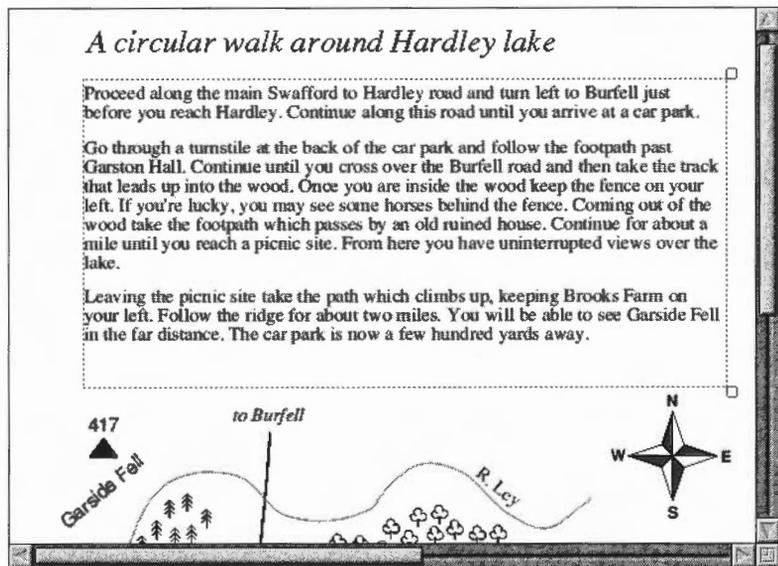
For a full description of text areas, and the special commands that you can include in a text editor to describe how to format the text, see *Text areas* on page 230.

- 1 Choose the Select tool.
- 2 Open the `Tutorials.DrawTutor` directory and you'll find an Edit file called `MapText`. Drag this file onto your Draw window. When you release Select some text will be displayed:



The text that is displayed is only part of the text contained in the Edit file. To display the entire contents of the file:

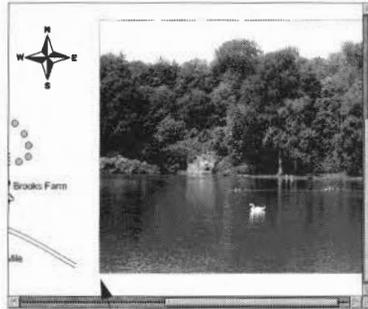
- 3 Select the text area and drag it beneath the title.
- 4 Drag the bottom handle down and to the right so that all the text in the file is displayed:



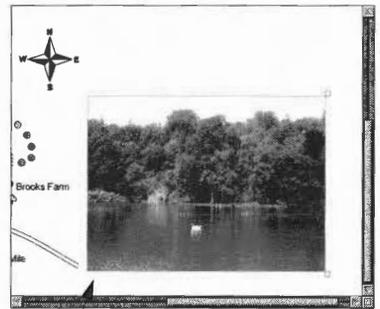
## Importing a picture

Now to import a photograph of the lake, which has been scanned into a sprite file:

- 1 Begin by dragging the scroll bars on of the Draw window as far down and right as you can, then go into the **Tutorials.DrawTutor** directory and drag the sprite file called **LakeView** onto the Draw window.
- 2 Select the sprite and magnify it by 0.7. The sprite will now be re-drawn slightly smaller. Drag it to the position shown below:

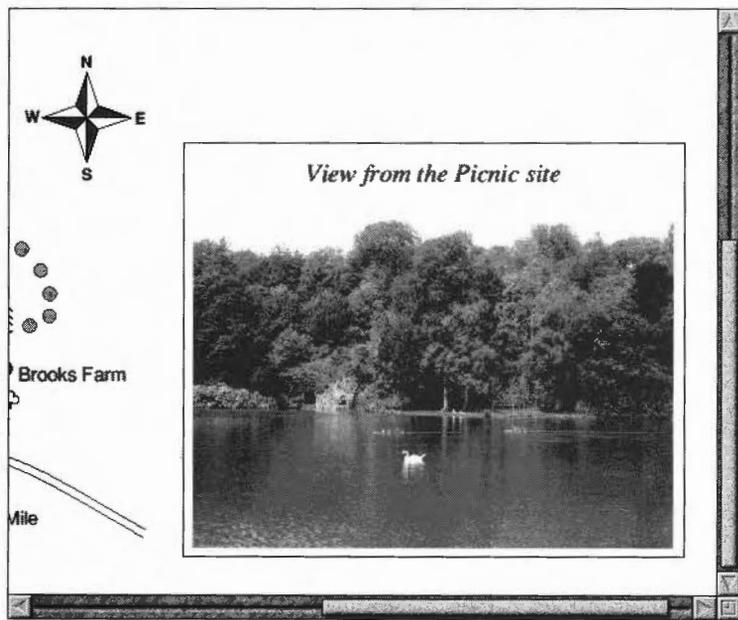


drag sprite file here



magnify sprite by 0.7 and drag here

- 3 Now choose the Rectangle tool (set the **Style/Fill colour** to **None**) and draw a rectangle around the sprite.
- 4 Choose the Text tool and type in **View from the Picnic site** at 16pt:

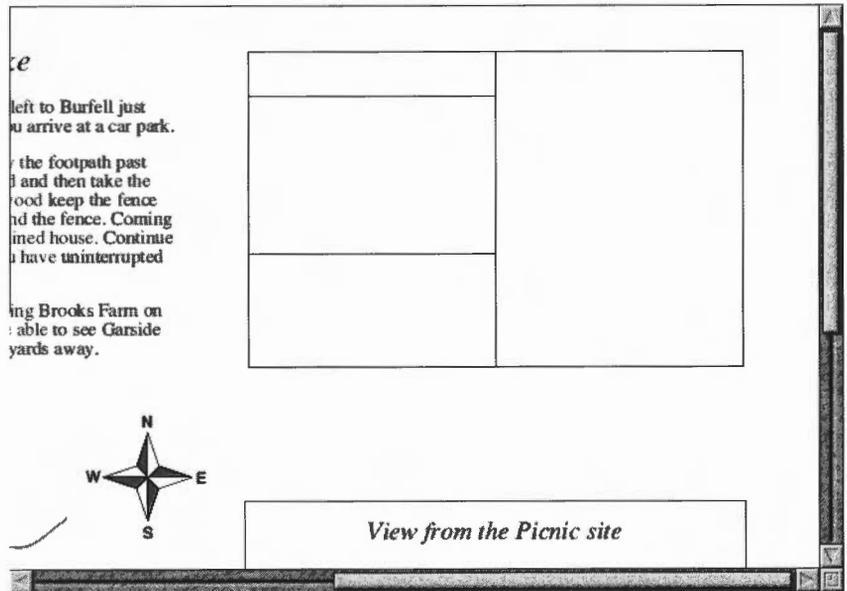


## Information box

The final part of the map is the Information box.

### Draw the box outlines

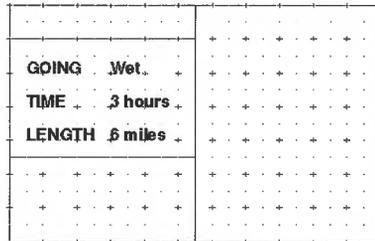
- 1 Begin by dragging the scroll bar on the bottom of the Draw window as far right as you can, and the scroll bar on the right of the window as far up as you can. Then switch on the Grid and Grid lock.
- 2 Choose the Rectangle tool and draw a rectangle near the top righthand corner of the window 11 grid units wide and 7 grid units deep.
- 3 Choose the Straight line tool and draw a vertical line dividing the box in two. Now draw a horizontal line one grid unit down from the top of the box, and a second horizontal line four and a half grid units down. The left side of the box is now divided into three smaller boxes:



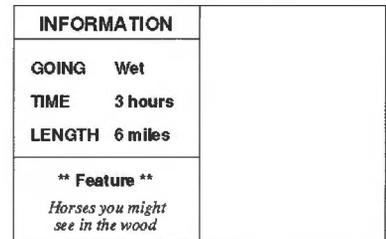
### Add text to the box

- 1 Choose the Text tool and change the font to Homerton Bold 14pt.
- 2 Click on the grid marker two grid units down from the top of the box and half a grid unit in from the left of the box. Type in the word **GOING**. Click down one grid unit and type in **TIME**, then click another grid unit down and type in **LENGTH**. Now click to the right of **GOING** and type in **Wet**, and then type in **3 hours** and **6 miles** one grid unit down and two grid units down from **Wet**.

- 3 Turn the Grid and Grid lock off. Then type **\*\* Feature \*\*** in the centre of the bottom box.
- 4 Click in the centre of the top box and change the font size to 16pt. Type **INFORMATION**.
- 5 Finally click below the word 'Feature', change the Font name to Trinity Medium.Italic and the Text size to 14pt, and type in **Horses you might** then press ↵ (Return) and type **see in the wood**. Now choose the Select tool and drag the two lines you have just typed in to centre them inside the box:



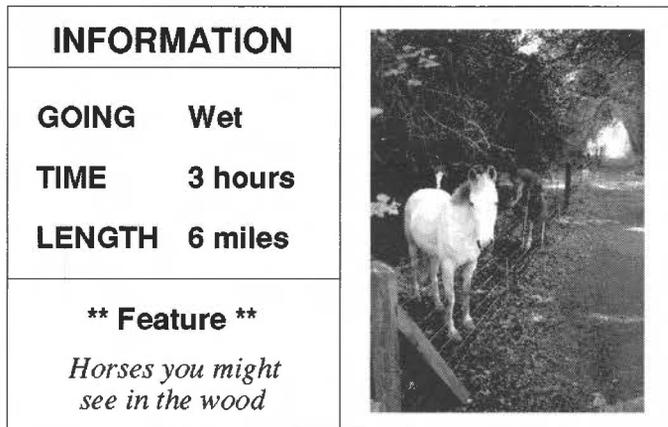
type this text in using the grid to line up the two columns of text...



...then remove the grid and type in the remaining text

### Import a picture of some horses

Scroll the Draw window down. Then drag the sprite file called **Horse** from the **Tutorials.DrawTutor** directory to a spot just above the word 'Farm' in 'Brooks Farm'. To start with, the horse is displayed far too large, so select and magnify it by 0.4. Now scroll back up and drag it so that it's centred inside the righthand side of the box:



## The final map

Your map is now finished. If you want to display the entire map in your Draw window, press Menu and set the zoom factor to 1:2 in the **Zoom/Magnifier** box.

The entire map will then be displayed (at half its original size) in the Draw window:

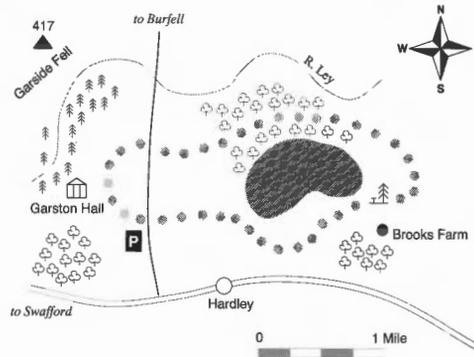
### *A circular walk around Hardley lake*

Proceed along the main Swafford to Hardley road and turn left to Burfell just before you reach Hardley. Continue along this road until you arrive at a car park.

Go through a turnstile at the back of the car park and follow the footpath past Garston Hall. Continue until you cross over the Burfell road and then take the track that leads up into the wood. Once you are inside the wood keep the fence on your left. If you're lucky, you may see some horses behind the fence. Coming out of the wood take the footpath which passes by an old ruined house. Continue for about a mile until you reach a picnic site. From here you have uninterrupted views over the lake.

Leaving the picnic site take the path which climbs up, keeping Brooks Farm on your left. Follow the ridge for about two miles. You will be able to see Garside Fell in the far distance. The car park is now a few hundred yards away.

INFORMATION	
GOING	Wet
TIME	3 hours
LENGTH	6 miles
<b>** Feature **</b> <i>Horses you might see in the wood</i>	



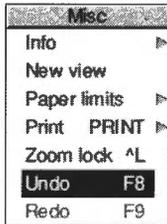
Save your map if you want to, and compare it with the file **Map** in the **Tutorials.DrawTutor** directory.

If you have a printer connected you can print your finished map by pressing the Print button on your keyboard; it may take a while to print due to the size of the picture files included. If it doesn't quite fit on your printer's paper, try grouping all the objects in the file and magnifying them (e.g. by 0.9). For more details about printing Draw files see page 229.

## Draw reference section

In this section, each of the Draw functions, including those you used in the tutorial, are explained in depth. Don't worry if you don't understand every last word; the real way to learn Draw is by using it.

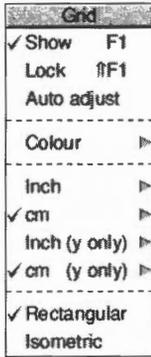
### Undoing and redoing operations



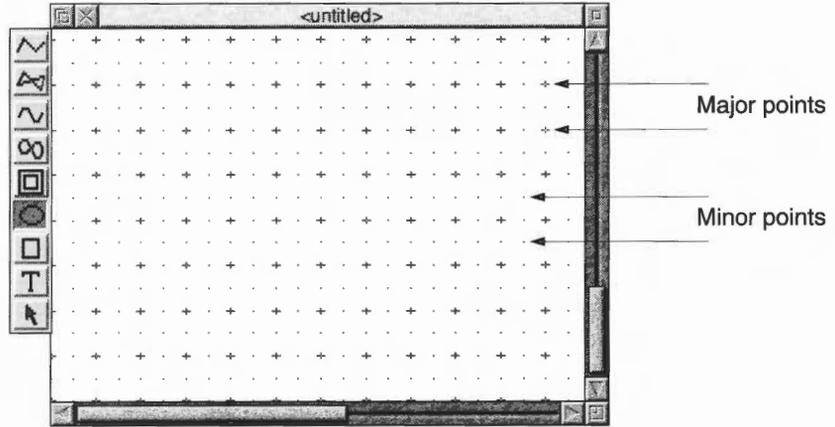
As you create a drawing, you'll often decide that you want to undo the last operation you performed. It's easy to retrace your steps and correct any errors you make:

To	Do this	Notes
Undo the last change you made to your drawing	Choose <b>Misc/Undo</b> .	You can also press F8; this is the keyboard short-cut you'll probably find most useful.
Redo an operation, if you decide that you didn't need to undo it after all	Choose <b>Misc/Redo</b> .	Keyboard short-cut: F9. You can Undo and Redo all the steps you performed since you last saved the file (providing the Undo buffer is sufficiently large – see page 412).

## Using the Grid to place objects accurately

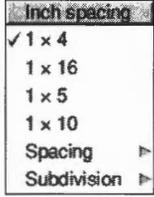


You can superimpose a rectangular or isometric grid on a drawing. This is useful for lining up objects and for checking their relative sizes. The grid is made up of 'major points' (marked by crosses) and 'minor points' (marked by dots).



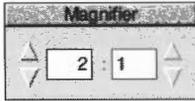
You can use the grid either just as a general guide for drawing, or you can lock objects to it, so that they always align with points in the grid (the exception is if you rotate an object). When you are creating objects with grid lock turned on, you will see them attach to the nearest grid point to the pointer position.

To	Do this	Notes
Switch the grid display on or off	Choose <b>Grid/Show</b> .	
Switch the grid lock on or off	Choose <b>Grid/Lock</b> .	Causes new objects to align with the grid as you create them. <b>Show</b> need not be on in order to use <b>Lock</b> .
Allow the grid spacing to change automatically	Choose <b>Grid/Auto adjust</b> .*	Draw inserts or removes minor points as you zoom in and out. Objects only lock to displayed points.
Change the colour of the grid points	Choose from the <b>Grid/Colour</b> submenu.	

To	Do this	Notes
Define the grid spacing	Choose a spacing from the <b>Grid/Inch</b> or <b>Grid/cm</b> submenu. 	First number gives major point spacing. Second number gives number of subdivisions. You can define your own values at the bottom of the submenu. Just clicking on <b>Inch</b> or <b>cm</b> uses existing submenu settings.
Set Y grid spacings to be different from X spacings	Enter the Y spacings in the <b>Grid/Inch (y only)</b> or <b>Grid/cm (y only)</b> submenu.	X spacings are still taken from the <b>Inch</b> or <b>cm</b> submenus.
Use a rectangular grid pattern	Choose <b>Grid/Rectangular</b> .	
Use an isometric grid pattern	Choose <b>Grid/Isometric</b> .	
Make existing objects snap to the grid	Choose <b>Select/Snap to grid</b> .	The baseline of the text snaps to the grid. For grouped objects, the top left of the bounding box snaps to the grid.
Snap all an object's control points to the grid	Go into Path edit mode and choose <b>Edit/Snap to grid</b> .	Path edit mode is described on page 222.

\* If you turn Auto adjust off and specify a very close spacing, the grid may take some time to draw.

## Zooming in and out of your drawing



You can alter the apparent size of your drawing. For example, you might want to look at something close-up to position it accurately, or you might 'zoom out' to see your whole drawing at once. This doesn't alter the actual size of your draw objects.

To	Do this	Notes
Zoom in and see your drawing at a higher magnification	Increase the ratio in the <b>Zoom/Magnifier</b> box, e.g. from 1:1 to 2:1, or from 1:2 to 1:1.*	You can also press Ctrl-W to zoom in by one magnification factor.
Zoom out to see more of your drawing	Decrease the ratio in the <b>Zoom/Magnifier</b> box, e.g. from 2:1 to 1:1, or from 1:1 to 1:2.	You can also press Ctrl-Q to zoom out by one magnification factor, or Shift-double-click Adjust.
Zoom in on a particular area of your drawing	Shift-Adjust-drag a box around the area.	
Return to the previous zoom factor	Press Ctrl-R.	
Go back to original size (1:1)	Press Ctrl-D.	
Lock the zoom factor	Choose <b>Misc/Zoom lock</b> .	Keyboard short-cuts are locked to 1:1, 1:2, 1:4, or 1:8. For example, each time you press Ctrl-Q, you halve the zoom factor. When you press Ctrl-W, it's doubled.

\* You can't have a number greater than 8 in the Magnifier box.

## Displaying two views of the same file

Choose **Misc/New view** to create a new view of the drawing you are editing, in a separate window. Edits you make in one view of a drawing show up in the other views as well. You can change the zoom on each view independently, use different grids in the separate views, scroll each one independently, and so on. To get rid of a view, close the window containing it.

## Creating objects (Enter mode)



This section describes each tool in the Toolbox. When you're in the process of creating any object (except text) you'll see a 'skeleton' version of it on the screen.

### Hints

You can cancel most operations part-way through by pressing Esc or choosing **Enter/Abandon**.

You can retrace your steps using **Misc/Undo** (keyboard short-cut: F8).

You can choose tools from the Toolbox on the lefthand side of the Draw window, or by using the **Enter** submenu.

Enter	
Text	^F7
Line	^F9
Curve	^F8
-----	
Move	
Complete	RETURN
✓ Auto close	
Abandon	ESC
-----	
Rectangle	
Ellipse	

To	Do this	Notes	
Draw an open-ended path made up of straight and/or curved line segments	 	Choose the appropriate line tool. Click to place end points for each segment. Double-click to complete the path (or press ↵, unless there are only two points).	You can change tools part-way through constructing a path. You can also choose <b>Enter/Line</b> or <b>Enter/Curve</b> .
Draw a closed path made up of straight and/or curved line segments	 	Choose the appropriate Joined line tool. Click to place end points for each segment. Double-click (or press ↵) to complete the path.	You can change tools part-way through constructing a path. You can also switch <b>Enter/Auto-close</b> on and use <b>Enter/Line</b> or <b>Enter/Curve</b> . If Auto-close is off, choose <b>Enter/Complete</b> or press ↵ to close the path.
Create a multi-path object		Use the Move tool.	See page 209. You can also use <b>Enter/Move</b> .

To	Do this	Notes
Draw an ellipse or circle	 Choose the Ellipse tool. Click once to define the centre. Move pointer and click again to draw the ellipse.	You can also choose <b>Enter/Ellipse</b> . Turn <b>Grid/Lock</b> on (page 204) to help draw a circle.
Draw a rectangle or square	 Choose the Rectangle tool. Click once to define a corner. Click again on the opposite corner.	You can also choose <b>Enter/Rectangle</b> . Turn <b>Grid/Lock</b> on to help draw a square.
Enter a line of text	 Choose the Text tool. Click where you want the line to start then type in your text.	You can also choose <b>Enter/Text</b> . If using anti-aliased fonts, you may need to increase the size of the font cache.
Select an object so you can edit it	 Choose the Select tool and click on the object.	See page 210 and page 222 for more on editing objects.
Switch the Toolbox on and off	Press Menu and choose <b>Toolbox</b> .	You can use the menu options described above to choose and use Draw's tools without using the Toolbox. You can also use keyboard short-cuts (see page 239).

## Drawing multi-path objects with the Move tool



You can use the Move tool to create a single object made up of apparently unconnected paths. This is useful for creating objects that have transparent holes in them. You can only use the Move tool with the four line segment tools.

### Creating a multi-path object

To create one object made up from multiple paths:



- 1 Choose one of the four line segment tools.
- 2 Construct the first path by clicking on the end points of each segment (don't double-click at the end of the path).
- 3 Click on the Move tool – the move icon will **not** be highlighted. This lets you move to the start of another segment without drawing a line.
- 4 Construct the next path.
- 5 Repeat steps 1 to 4 until you've created all the paths and double-click to finish.

You'll now have a single object, made up of many paths. You can't 'ungroup' such an object. You can edit it, though (see page 222).

### Creating a hole in a filled object

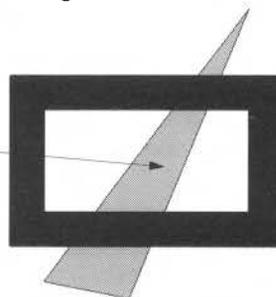
Here's an example of how to create a filled rectangle with a transparent hole in it:



- 1 Choose a fill colour from the **Style/Fill colour** dialogue box.
- 2 Choose **Style/Winding rule/Even-odd** (don't worry about this for now – it's explained on page 219).
- 3 Draw a rectangle using the Straight line tool (don't double-click to complete the shape; just click once to place the last point on top of the first).
- 4 Click on the Move tool (the move icon will **not** be highlighted).
- 5 Draw a smaller rectangle inside the first.

When you double-click, you'll be able to see through the hole:

This object is visible through the hole in the filled rectangle at the front



**Note:** You can't start or end a path with a Move.

## Manipulating objects (Select mode)

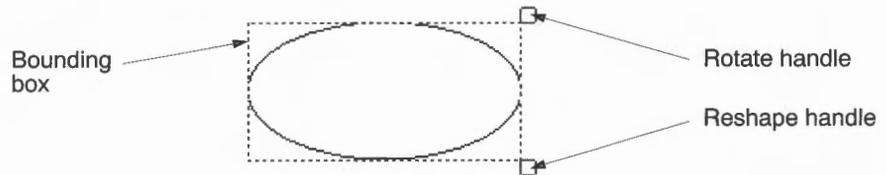
This section tells you how to select and deselect objects, and how to manipulate a selection.

### Selecting and deselecting objects



Choose the Select tool (at the bottom of the Toolbox) to enter Select mode. In Select mode, you can make changes to existing objects. To return to Enter mode and draw another object, choose one of the other tools.

When you select an object, you'll see its bounding box, with handles at two of its corners (not all objects have these – see page 212).



To	Do this	Notes
Select an object	Click on the object.	
Select a group of objects	Drag a select box around (or through) all the objects.	You can also click Adjust on each object in turn.
Select all objects in the drawing	Choose <b>Select/Select all</b> .	You can also press Ctrl-A.
Select <b>only</b> objects that lie wholly within a select box	Shift-drag a select box.	Normally, a select box selects everything it touches.
Select an object obscured by another	Double-click over the object.	If the object is one or more 'layers' deep, keep double-clicking to 'tunnel through' to it.
Deselect an object	Click Adjust on the object.	
Deselect all currently-selected objects	Click Select on an empty part of the drawing.	You can also choose <b>Select/Clear</b> or press Ctrl-Z.

## Copying and deleting objects

To	Do this	Notes
Copy a selection	Choose <b>Select/Copy</b> .	The new copy will be pasted into your drawing, slightly below and to the right of the original. You can make multiple copies of an object by repeatedly pressing Ctrl-C.
Delete a selection	Choose <b>Select/Delete</b> .	You can also press Delete. If you want to retrieve a deleted object, use <b>Misc/Undo</b> .

## Moving objects to the front or back of a stack

To	Do this	Short-cut
Bring an object to the front of a stack	Choose <b>Select/Front</b> .	Ctrl-F
Hide an object behind one or more other objects	Choose <b>Select/Back</b> .	Ctrl-B

## Grouping and ungrouping objects

To	Do this	Short-cut
Group a selection	Choose <b>Select/Group</b> .	Ctrl-G
Ungroup a selection	Choose <b>Select/Ungroup</b> .	Ctrl-U

## Aligning objects (justification)

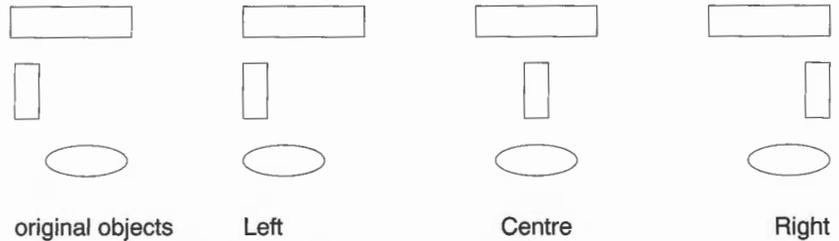
Justify	
Left	
Centre	
Right	
-----	
Top	
Middle	
Bottom	

You can align objects, both vertically and horizontally.

**Note:** You need to group any objects before you can align them.

To	Do this
Align a selection horizontally	<b>Group</b> the objects, then choose <b>Left</b> , <b>Centre</b> or <b>Right</b> from the <b>Select/Justify</b> menu.
Align a selection vertically	<b>Group</b> the objects, then choose <b>Top</b> , <b>Middle</b> or <b>Bottom</b> from the <b>Select/Justify</b> menu.

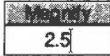
In the following example three objects have been grouped and then justified left, centre and right:



## Moving, rotating and scaling objects

There are different ways of rotating and scaling objects, depending on how accurate you want the operation to be.

To	Do this	Notes
Move a selection	Drag it to the new position and release Select.	If you move a selection when <b>Grid/Lock</b> is on, it moves in jumps of the grid spacing (see page 204).
Rotate a selection *	Drag the Rotate handle (at the top righthand corner of a bounding box).	The selection rotates about its centre.

To	Do this	Notes
Rotate a selection by a specified angle	Enter the angle into the <b>Transform/Rotate/Angle</b> box. 	
Resize a selection	Drag the Resize handle (at the bottom righthand corner of a bounding box).	Linewidths are <b>not</b> scaled when you use this method. To preserve the aspect ratio of the object, use the method below.
Resize (scale) an object accurately	Enter the scale factor into the <b>Transform/Magnify</b> box. 	You can also choose to scale an object in the horizontal or vertical plane only: Choose <b>Transform/Scale X</b> or <b>Scale Y</b> .
Scale the line width of an object	Enter the scale factor into the <b>Transform/Line scale</b> box. 	When you scale an object using this method, its linewidth <b>is</b> scaled. You can also define the linewidth of an object along with its other style attributes – see page 217. You can't scale lines of width <b>Thin</b> .

\* You can't rotate Text in System font, Text areas or imported JPEG files (they have no Rotate handle).

## Creating special effects in Draw (interpolation and grading)

Using interpolation and grading you can perform the following operations on two **grouped** objects:

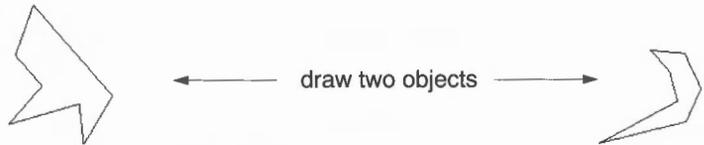
- change one object into the other object by inserting similar objects between them – cartoon animators call this 'in-betweening', 'tweening' or 'morphing'
- create intricate patterns using the two objects.

## Changing one object into another object (morphing or tweening)

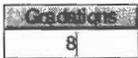
To change one object into a different object:



- 1 Draw two objects using the Joined line tool (see *Restrictions* on page 216).

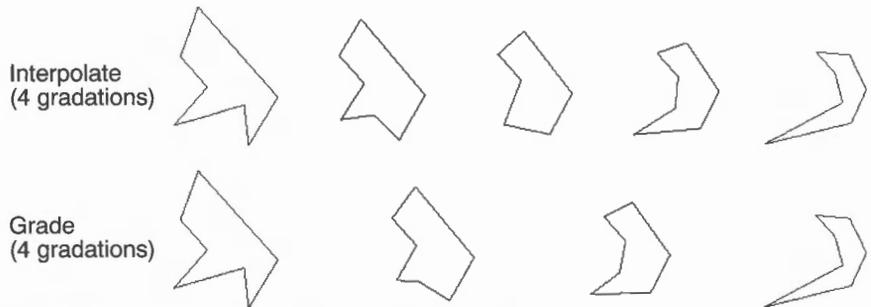


- 2 Group the two objects together.

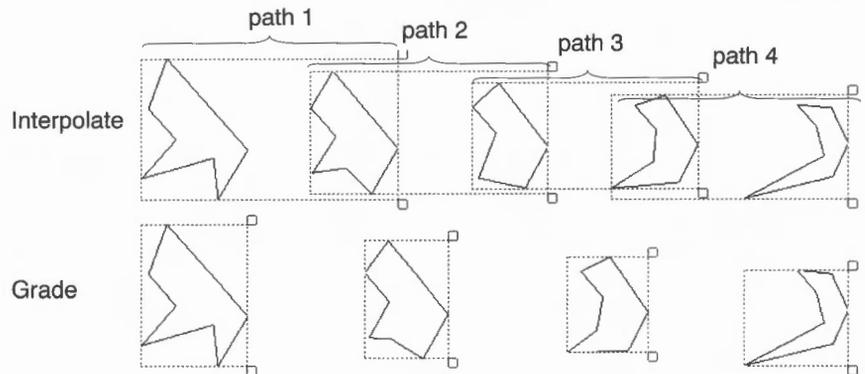


- 3 Enter the number of gradations into the **Select/Interpolate** or **Select/Grade** box (8 is the default value) and press ↵.

A new set of objects will be drawn. Each new object is a partial transformation between the first object and the second object:



**Interpolation** produces a number of new paths, each consisting of two objects. You cannot ungroup these paths. This means that when you interpolate two objects you'll lose the original objects (**Copy** them elsewhere in the Draw window **before** you interpolate them, or use **Undo** to start again if you want). **Grading** produces new objects which are not grouped as paths:

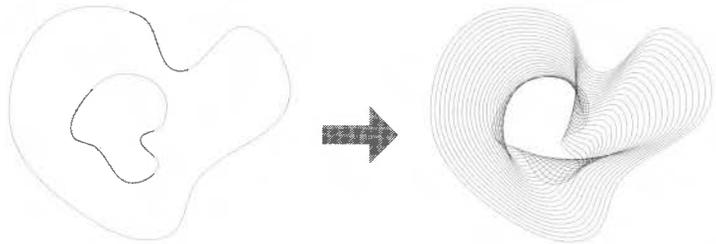


## Creating intricate patterns

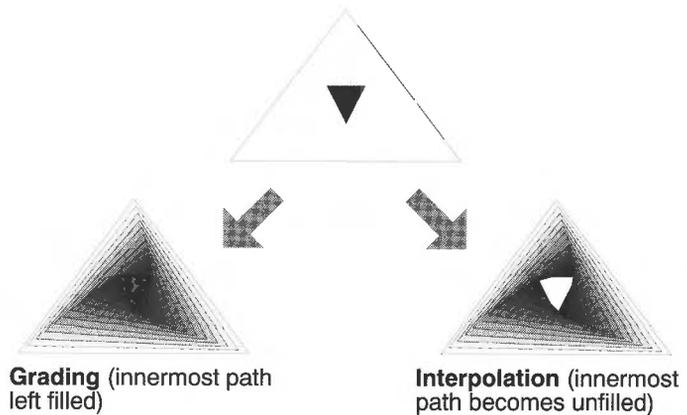
You can create interesting patterns if one object is inside (or on top of) the other:



You can interpolate between curved shapes to produce very intricate patterns:



The difference between interpolation and grading is most evident when both shapes are closed and filled:



## Properties used by interpolation and grading

The properties used by interpolation and grading are

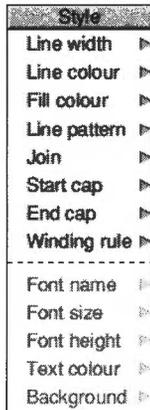
- line colour
- fill colour
- line width
- triangle start/end cap height
- triangle start/end cap width.

## Restrictions

A pair of path objects for interpolation or grading must have certain properties in common. For most practical purposes, this means they should be more or less the same shape (though they need not be the same size): two V-shapes, two rectangles, and so on. Specifically, the requirements are that

- for each line or curve in one, there must be a line or curve in the other
- for each move in one, there must be a move in the other
- for each close in one, there must be a close in the other
- objects must be drawn starting at the same end point
- objects must be drawn in the same direction (clockwise or anticlockwise)
- objects must be single-paths; they cannot be grouped objects.

## Defining a path object's style



Each object has a style consisting of a set of attributes (such as fill colour, line colour, line width and so on). Using the various **Style** menu options, you can

- set the style to be applied to every new object you create in Enter mode  
Any new object you create is given the style attributes currently defined in the Style menu. We suggest that you set up the style attributes **before** you actually draw an object. This can save you accidentally 'losing' objects because they're the same colour as the background.
- alter the style of existing objects when in Select mode.

Here's how to define an object's style:

To	Do this	Notes
Define the width of line used to draw an object	Choose a width (in points) from the <b>Style/Line width</b> submenu, or define your own at the bottom of the submenu.	'Thin' means 'the narrowest width possible'. This produces different widths on different output devices. It's more sensible to use 0.25pt, especially if you'll be printing on a typesetter.
Create path objects with coloured outlines	Choose a colour from the <b>Style/Line colour</b> window.	There's lots of help on using the colour picker window in <i>Using colour in applications</i> on page 159.
Fill path objects with a given colour	Choose a colour from the <b>Style/Fill colour</b> window.	You can fill open objects, as well as closed ones. Complex objects will be filled according to which winding rule you've set – see page 219.
Make a path object transparent	Choose <b>None</b> from the <b>Style/Fill colour</b> window.	

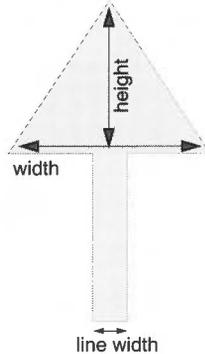
To	Do this	Notes
Draw a dashed or dotted path object	Choose from the <b>Style/Line pattern</b> submenu. <div data-bbox="694 179 852 350" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center; background-color: #cccccc; margin: 0;">Line pattern</p> <p style="margin: 0;"><input checked="" type="checkbox"/> </p> <p style="margin: 0;"><input type="checkbox"/> </p> <p style="margin: 0;"><input type="checkbox"/> </p> <p style="margin: 0;"><input type="checkbox"/> </p> </div>	You can modify dashed and dotted lines using the <b>Start cap</b> and <b>End cap</b> options; the cap settings apply to each segment in the line.
Define how lines are joined together	Choose a join type from the <b>Style/Join</b> submenu. <div style="margin: 10px 0;">  Mitred         </div> <div style="margin: 10px 0;">  Rounded         </div> <div style="margin: 10px 0;">  Bevelled         </div>	This is only effective for thick lines.
Define how lines start and end	Choose an end type from the <b>Style/Start cap</b> and <b>End cap</b> submenus. <div style="margin: 10px 0;">  Butt         </div> <div style="margin: 10px 0;">  Round         </div> <div style="margin: 10px 0;">  Square         </div>	This only applies to open paths; it's only significant for thick lines. You can't add caps of any sort to <b>Thin</b> lines. You can use Start caps on a closed path with a dashed line style.
Add arrows to line ends	This is an extension of the <b>Start</b> and <b>End cap</b> submenus.	See <i>Adding arrows to line ends</i> on page 219.

## Adding arrows to line ends

Cap	Width
Width ▶	✓ x1
Height ▶	x2
	x3
	x4
	1.00

Triangle caps are useful for creating arrows on the ends of line segments. You can set the height and width of a triangle cap independently. They are defined as multiples of the line width, as follows:

$$\begin{aligned}\text{Triangle height} &= \text{Cap height} \times \text{Line width} \\ \text{Triangle width} &= 2 \times \text{Cap width} \times \text{Line width}\end{aligned}$$



For example, to set an arrowhead of width 16pt and height 16pt on a line of width 4pt, you'll need to choose:

**Style/Start cap/Triangle/Width/x2**  
**Style/Start cap/Triangle/Height/x4.**

## Filling objects with colour – the winding rule

Winding rule
Non-zero
✓ Even-odd

**Style/Winding rule** allows you to specify which of two methods is used to fill different regions of an object with colour. It only affects objects for which a fill colour has been set. It's not commonly used, but you'll need to understand it if you're creating objects with transparent holes in (see page 209).

An object can be a single path (e.g. an ellipse), a collection of line segments, or a single line segment that crosses over itself any number of times.

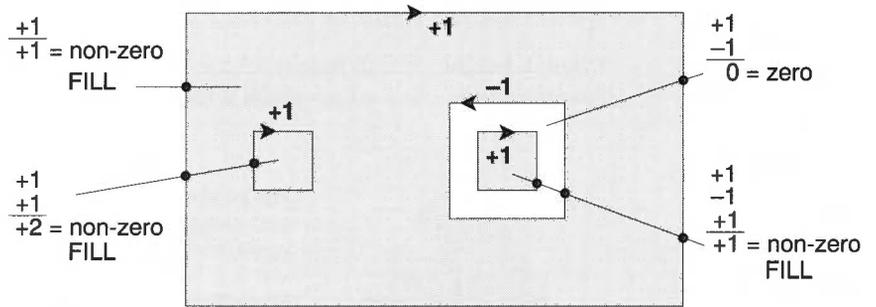
### Non-zero winding rule

This rule fills regions on the basis of whether they were drawn in a clockwise or anti-clockwise direction.

Note each region's direction as you draw it, clockwise or anti-clockwise, and give this direction a number: +1 for one direction and -1 for the other.

To see if a region is to be filled, construct an imaginary line from inside the region to outside the object. Keep a total of the direction values for each line it crosses. If the total is non-zero, the region will be filled (see the diagram overleaf).

In the following example, three rectangles were drawn clockwise and one rectangle was drawn anti-clockwise. The clockwise rectangles were assigned a value of +1, and the anti-clockwise rectangles were assigned a value of -1:

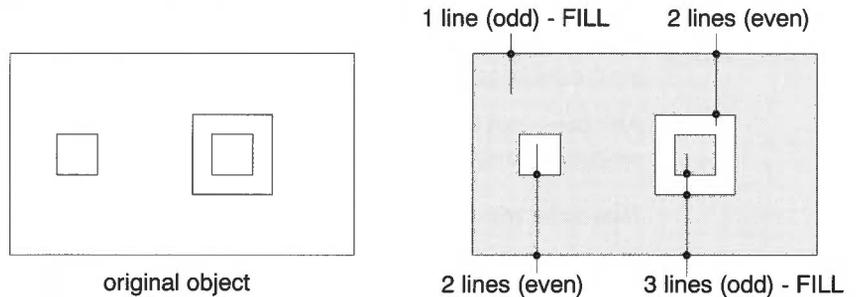


### Even-odd winding rule

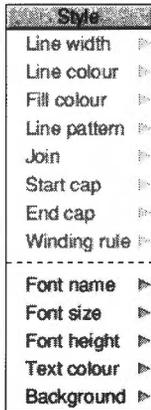
This rule fills regions if they are enclosed by an even number of other regions.

To determine whether a region inside an object is to be filled, imagine a line passing from inside the region to outside the object. Count the number of lines it crosses. If the number is odd, the area will be filled.

The following example shows this rule applied to a single path object made up of four regions (created using the Move tool – see page 209):



## Defining text style



You can change the style attributes of text lines using the Style menu. If you select a text line first, that line will have the style applied to it. All subsequent text lines will also have that style applied to them.

To	Do this	Notes
Set the font name	Choose from the <b>Style/Font name/Font list</b> submenu.	See <i>Using fonts in applications</i> on page 165 for more details about using fonts.
Set the font size	Choose from the <b>Style/Font size/Size</b> submenu.	You can supply a different font size (in points) at the bottom of the submenu.
Change the font height, but not its width	Choose from the <b>Style/Font height/Size</b> submenu.	
Define the colour of the text	Specify a colour using the <b>Style/Text colour</b> window.	
Set the colours used to anti alias fonts on a coloured background	Specify a colour using the <b>Style/Background</b> window.	See below for more details on this.

### Superimposing text on a coloured background

**Style/Background** sets the intermediate colours used around the edges of anti-aliased fonts. You don't usually need to worry about this, but it's useful if you're creating text on top of a coloured object:

- 1 Set the **Text colour** of your text line.
- 2 Select the object on which your text is superimposed and note down its colour from the **Style/Fill colour** window.
- 3 Set the **Style/Background** colour of the text line to be the same as that you noted down in step 2.

The anti-aliasing pixels will be in a range of shades between the **Text colour** and the **Background** colour. **Background** applies to text objects and text areas.

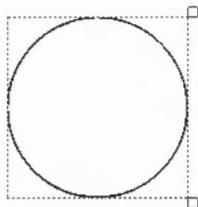
**Note:** This effect won't be visible if the text size is larger than the value set for anti-aliasing in Configure (see page 42).

## Editing Draw objects (Path edit mode)

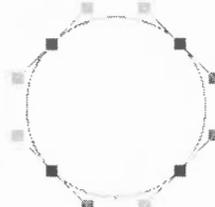
All objects you construct using Draw's tools are made up of paths. In turn, paths consist of straight and curved line segments. Each segment in a path has end points and (if it is a curve) control points.

You change an object in two ways:

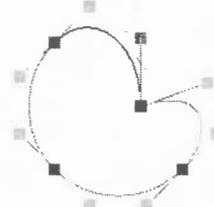
- resize it or transform it in Select mode (see page 210)
- change its basic shape (edit it) by going into Path edit mode and moving individual end points and control points:



Select mode:  
reshape and rotate  
handles visible



Path edit mode:  
control points (yellow)  
and end points (blue) visible



circle has been edited:  
control and end points  
have been moved

**Note:** You can't edit Text areas, JPEGs or sprites in Draw. See pages 228 to 230.

### Entering and leaving Path edit mode

You can only edit a single-path object in Path edit mode (so you'll need to ungroup any objects first).

To	Do this	Notes
Go into Path edit mode from Enter mode	Choose any path tool and click Adjust on the object you want to edit.	
Go into Path edit mode from Select mode	 Select an object then choose <b>Select/Edit</b> .	You can also press Ctrl-E once the object is selected.
Edit an object (move a control point or end point)	Drag the point with Adjust.	There's more on editing below.
Leave Path edit mode	Click Select on a blank area of the drawing.	

## Editing curves

Curved segments in a path object are defined by two end points and two control points. When drawing or editing a path, the control points are shown connected to the end points by straight lines.

The shape of a curve is determined by the control points as follows:

- The direction of the curve at the end point lies along the line connecting the end point to the control point (i.e. this line is a tangent to the curve).
- The degree to which the curve moves away from this straight line depends on the distance of the control point from the end point: the nearer together they are, the sooner the curve turns away.

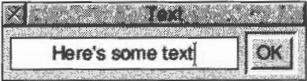
By moving the control points, you can produce many different shapes of curve. Some examples are shown below. In each case the thick line shows the path itself, and the control points (shown here as black squares, although they're yellow in the drawing) are joined to the corresponding end points (shown here as open squares) by thin lines.



If you hold down Shift while you drag a control point, the corresponding control point in the next curve is also moved to keep the angle of join constant.

## Editing text lines

**T** When typing in text, you can only delete text and type new text in if you are still on the same line. As soon as you press ↵ (Return) or click somewhere else in the drawing, the line is ‘frozen’.

To	Do this	Notes
Edit a ‘frozen’ text line	 Select the text line and choose <b>Select/Edit</b> to display the Text box.  Then edit the text and click on <b>OK</b> .	You can also press Ctrl-E after selecting the object.
Convert each letter in a text line into an editable path object	Select the text line and choose <b>Select/Convert to path*</b> .	All the letters are grouped initially; to edit them individually, <b>Ungroup</b> them. There’s an example below.

\* You can’t convert back to a text line, nor can you convert text in System font.

### Editing text as a path object

Once you’ve converted a text line to a path, it can be treated like any other path object (for example, you can use **Style** options that apply to objects other than text – see page 217).

For example, the following text was converted into a path, then ungrouped into individual letters, and each letter given a black line colour and a different fill colour (the second row of text was also given a much thicker line width):

Shaded text

Shaded text

**Note:** You can only convert outline fonts to a path.

## Editing objects using the Path edit submenu

Edit	
Change to curve	^F8
Change to line	^F9
Change to move	
Add point	F7
Delete segment	^X
Flatten join	
Open path	
Close path	
Enter coordinate	F5 ▶
Snap to grid	^S

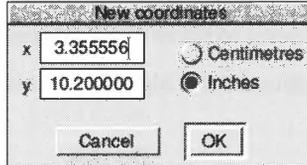
You can also change a path object's shape using menu options. This method gives you much greater control:

- 1 Enter Path edit mode (see page 222).  
If the path you want to edit is under another object's path, double-click Adjust to tunnel through to the next deeper path.
- 2 Select a segment by clicking Adjust on an end point or a control point.  
The line segment and end point will be highlighted (if you select the first end point of the path, there is no highlighting).
- 3 Click Menu to show the Edit menu.

Now you can edit the highlighted segment and end point:

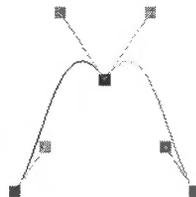
To	Do this	Notes
Change a straight line segment into a curve	Choose <b>Edit/Change to curve</b> .	Works if the selected segment is a line, or if you've selected a point inserted using a Move.
Change a curved segment into a straight line	Choose <b>Edit/Change to line</b> .	Works on a curved line segment or a Move.
Break a path at the highlighted segment (by replacing the segment with a Move operation)	Choose <b>Edit/Change to move</b> .	You can't change a segment to a move if it's at an end of the path, or if it's already preceded or followed by a move. See page 227.
Insert an extra point into the highlighted segment	Choose <b>Edit/Add point</b> .	In effect, this adds an extra segment to the object, of the same type as the selected segment.
Delete the highlighted segment	Choose <b>Edit/Delete segment</b> .	
Straighten the join between two segments	Choose <b>Edit/Flatten join</b> .	This joins the <b>control</b> points by a straight line. See page 226.

To	Do this	Notes
Change a closed path into an open path, or vice versa	Choose <b>Edit/Open path</b> or <b>Edit/Close path</b> .	This 'disconnects' or joins the first and last points in the path.
Specify an end point's position accurately	Choose <b>Edit/Enter coordinate</b> and type the position into the <b>New coordinates</b> box.	X and Y are offsets from the bottom lefthand corner of the drawing. You can specify them in inches or centimetres.
Make all the end points in an object snap to their nearest major grid points	Choose <b>Edit/Snap to grid</b> .	

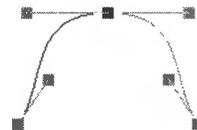


### How 'Flatten join' works

This flattens the join between two adjacent segments (unless both segments are straight lines). The curve is adjusted so that the tangent is continuous at the selected end point. For example:



The curve has been flattened at the top

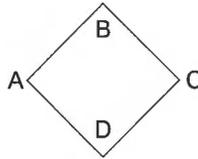


## How 'Change to move' works

If the path containing the line was closed, extra lines will be inserted to close each of the two sections of the path:



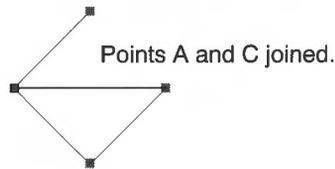
1. Here's a diamond shape, drawn starting at A.



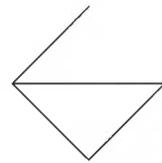
2. Clicking Adjust at C selects segment B-C.



3. Choosing **Change to move** replaces side B-C by a Move.



Final shape looks like this:



## Importing (loading) files into Draw

You can import five types of file into Draw:

- Existing Draw files and other files that use Draw's own file format
- Sprite files (see page 228)
- Text files, used to create text area objects (see page 230)
- Photo-quality images (JPEG files – see page 237)
- DXF files (see page 236).

To	Do this	Notes
Load any of the above file types into an open Draw window	Drag the file's icon over the Draw window.	If you drag a Draw file into an open Draw window, the default settings of the dragged file are used.
Load any of the above file types into a new Draw window	Drag the file's icon over the Draw icon on the icon bar.	

When you drag a file into a Draw window, it is added to any objects already in the window. The file is loaded so that its bottom lefthand corner lies at the mouse position at the instant the mouse button is released.

When you load a file by dragging it to the icon bar, the file appears in a new Draw window, aligned to the bottom lefthand corner of the diagram.

## Loading a sprite into Draw

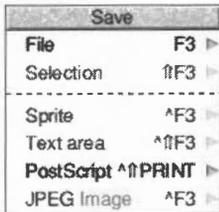


If you drag a sprite file containing many sprites into Draw, only the first sprite will be loaded. A more convenient method of loading a single sprite is to:

- 1 Load the sprite file into Paint.
- 2 Open a sprite window for the sprite you want to load into Draw.
- 3 Make sure the sprite has a palette (click Menu and switch **Edit/Palette** on).
- 4 Drag the icon in the **Save/Sprite/Save as** box into a Draw window.

This method also ensures that Draw displays the sprite in the correct colours.

## Exporting (saving) files from Draw



You can save objects from a Draw file in their own native file format. This means, for example, that if a Draw file has an imported sprite, you can save that out as a sprite again.

**Note:** You need to be in Select mode to save anything other than the whole Draw file (see page 210).

To	Do this	Notes
Save the whole file as a Draw file	Use the <b>Save/File/Save as</b> box as normal.	
Save a selection of Draw objects as a Draw file	Use the <b>Save/Selection/Save as</b> box.	
Save the currently-selected sprite	Use the <b>Save/Sprite/Save as</b> box.	You can only save a single sprite at a time (not a group or selection).
Save a selected text area object	Use the <b>Save/Text area/Save as</b> box.	

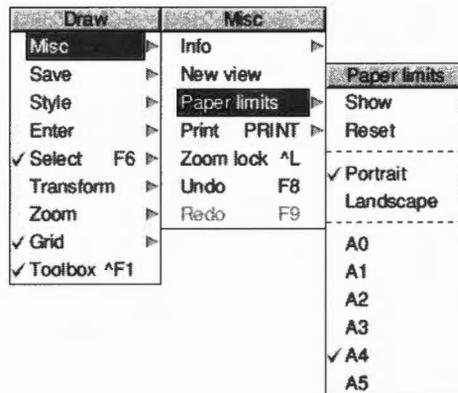
To	Do this	Notes
Save the whole drawing as Encapsulated PostScript	Use the <b>Save/PostScript/Save as</b> box.	You can use this to import the drawing into another application that accepts Encapsulated PostScript*. There must be a PostScript printer driver active for this option to be available.
Save a selected image as a JPEG file	Use the <b>Save/JPEG Image/Save as</b> box.	See JPEGs ( <i>photo-quality images</i> ) on page 237.

\* You should not use Encapsulated PostScript files for printing as they do not contain page size information.

## Printing Draw files

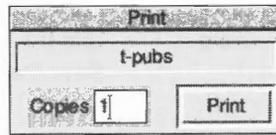
To print a Draw file:

- 1 Make sure you have a printer connected and set up (see *Printing your files* on page 123 and *Setting up printers* on page 105).
- 2 Make sure that your drawing will fit on the paper on which you are going to print (switch on **Misc/Paper limits/Show** then set the page size and orientation to match that of your printer).



- 3 Choose **Misc/Print** (or press the Print key).

- 4 Set the number of copies in the dialogue box and click on **Print**.



Only objects within the inner limits of the grey border in the Draw file will be printed. The outer limits of the grey border correspond to the limits of the page. If no printer driver is loaded, the limits default to A4.

**Misc/Paper limits/Reset** sets the paper limits to the printer driver defaults.

### Printing part of a diagram

You can also select **part** of the diagram to be printed at a time. This enables you to print a drawing on more than one sheet, so that you can make up a poster, for example, from several standard-size sheets 'tiled' together:

- 1 Choose **Paper limits/Show**.
- 2 Hold down Ctrl and use one of these methods to define the printed area:
  - click to mark the bottom lefthand corner of the printed area
  - click Adjust to mark the top righthand corner
  - drag a bounding box around the area you want to print; it will be scaled to fill the page when it is printed.
- 3 Choose **Misc/Print**, or press the Print key.

## Text areas

A text area is a special sort of object that allows you to perform simple 'desktop publishing'. A text area consists of a piece of text divided into one or more rectangular regions called **text columns**. Draw breaks up the text into lines which are just wide enough to fit into the columns, splitting it (principally) at spaces.

You can create a text area by using Edit (for example) to prepare a file containing the text, annotated with special commands (described below). When you load the text file into Draw, the text is formatted into columns. The number of columns is given by an annotation. You can move the text columns and change their size in Select mode. As you do this, Draw will reformat the text between the columns.

Text areas only use anti-aliased fonts: you cannot create a text area in the system font. If you try to use the system font you will find that it is automatically converted into the Trinity font. See *Default text area header* on page 236. If you want to create a text area in system font, use the outline font version of the system font: choose **Style/Font name/System/Fixed**.

## Creating and editing text areas



To create a text area from a text file, drag the file into a Draw window. The columns in the text area are initially set up to standard sizes. If you drag the text file over the top of a selected text area, the old text in the area is replaced with the contents of the new file. Use this method for altering the text in a text area.

Text area selection works in two slightly different ways, depending on how many text columns there are in the text area:

### Single text columns

When there is a single text column in the text area, selection works in the same way as any other object. You can move the text area, scale it, change its style, and so on, as described above.

### Multiple text columns

When there is more than one text column, selection is a two-stage process. When you first click (or click Adjust, in multiple object selection) over the text area, the entire area is selected. You can move the area, but it cannot be scaled.

Double-click (or double-click Adjust) to select a column of the text area. You can move and scale individual columns. Their new position and size need not lie within the original text area.

When you change the size of a text column, the text is reformatted to fit the new size of the column.

To select more than one column of a text area, select the first as described above, and select further ones by first clicking Adjust and then double-clicking Select over the column.

You can't rotate text areas and text columns (they don't have rotate handles).

Some select mode actions cannot be applied to text columns. If there are any text columns selected when you perform the operation, they are deselected first. An example of this is object deletion: you can delete a text area as a whole, but not a text column from within it.

## An example

Try typing the following text into Edit and loading it into Draw as an Edit file:

```
\! 1
\AD
\D2
\F0 Trinity.Medium 24
\L24
\P24
```

This is an example of a text area containing two columns. The text was prepared in Edit, and then saved directly into Draw. The columns were then stretched to the right size, using select mode, and the rectangles added.

creates the following text area:

This is an example of a text area containing two columns. The text was prepared in Edit, and then saved directly into	Draw. The columns were then stretched to the right size, using select mode, and the rectangles added.
---	---

The appearance of a text area is determined from commands which are included in the text used to create it. Each command starts with a backslash (\) character. The full list of sequences is given below, but the following is a brief description of the commands used in the example.

- \! 1 tells Draw that this is a text area.
- \AD causes the text to be justified to left and right in its columns.
- \D2 indicates the number of columns to be displayed.
- \F0 Trinity.Medium 24 specifies font 0 as Trinity.Medium, 24pt.
- \L24 sets the line spacing to 24pt.
- \P24 sets the spacing between paragraphs to 24pt. In this example, this just affects the space after the title.
- \0 selects font 0 for the following text.

## Text area commands

The following is a complete list of text area commands. Some commands must be terminated with either a newline or a slash (/) character. Others do not need a terminator (for example, where the command has a fixed number of characters) but may optionally end with a slash character. For clarity, it is often useful to include it. Note especially that **all commands are case sensitive**: this is unusual in RISC OS and applications written for it.

In the following descriptions

- Items in italics (for example *code*) indicate a parameter you must supply.
- Items in square brackets are optional (for example [ / ] indicates an optional slash character).
- Commands and parameters must normally be separated by spaces (though there does not have to be a space between the command and the first parameter).
- ↵ means a single newline character, and ↵/ means newline or /.

Here's the full list of annotations:

Command	Effect
<code>\! <i>version</i> ↵/</code>	This is a special line which must appear at the start of any file which is to be used for a text area. <i>version</i> must be 1. However, it forms part of a default header which is inserted at the start of the text; this is described below.
<code>\A <i>code</i> [/]</code>	Set alignment. <i>code</i> may be L (left aligned), R (right aligned), C (centred) or D (double, i.e. justified to both margins). An alignment setting forces a line break. The default setting is left aligned.
<code>\B <i>red green blue</i> ↵/</code>	Set the background colour to the given red/green/blue intensity, or the best available approximation. Each intensity is in the range 0 to 255; values outside this range will be limited to it (i.e. a value set higher than 255 will be realised as 255; a value set to less than 0 will be realised as 0). Background colour is used in the same way as for text objects; you should set it to be the same as the area of the drawing that the text area is to appear in front of (the text area itself is effectively transparent). The default is the background style attribute of the text area object, normally white (equivalent to <code>\B 255 255 255</code> ).

<b>Command</b>	<b>Effect</b>
<code>\C red green blue ↵</code>	Set the text colour to the given red/green/blue intensity, or the best available approximation. Each intensity is in the range 0 to 255; values outside this range will be limited to it. The default is the text colour style attribute of the text area object, normally black (equivalent to <code>\C 0 0 0</code> ).
<code>\D columns ↵</code>	Indicates that the text area is to contain the indicated number of columns. This must appear before any printing text. The default is 1.
<code>\F font-number name size [width] ↵</code>	Defines a font reference. <i>font-number</i> is either one or two digits. The font number is used subsequently to set the font. <i>name</i> is a font name such as Trinity.Medium. <i>size</i> and <i>width</i> are the height and width of the font in points. If <i>width</i> is omitted, the size is used for both height and width. There are no defaults.
<code>\font-number [/]</code>	Indicates that the text from the point at which the command appears is to appear in the specified font. If the font is not available when the text is being drawn, the effect is undefined. Draw will attempt to check that the font number and the corresponding definition are reasonable. There is no default.
<code>\L line-spacing ↵</code>	Sets the line spacing (the distance from the base of the characters in one line to the base of the characters in the next) to the given value, measured in points. Line spacing changes take effect from the end of the output line in which the command appears. The default is 10pt.
<code>\M left-margin right-margin ↵</code>	Sets the left and right margins to the given values, measured in points. If the total size of the margins is greater than the width of the column, no text is displayed. Margin settings apply from the end of the output line in which the command appears. The default is 1pt at each side.
<code>\P paragraph-spacing ↵</code>	Sets the extra space inserted between paragraphs to the given value, measured in points. Paragraph spacing changes take effect from the end of the output paragraph in which they appear. The default is 10pt.

<b>Command</b>	<b>Effect</b>
<code>\U position thickness ↵</code>	Switches on underlining, at the given position relative to the base of the characters. <i>position</i> is limited to the range -128 to 127, and <i>thickness</i> to the range 0 to 255. Both values are measured in units of 1/256 of the current font size. Underlining may be turned off by specifying a thickness of 0.
<code>\U. [/]</code>	An alternative way of turning underlining off.
<code>\V[-] vertical-move [/]</code>	Moves the following text by the given amount, measured in points, relative to the current character position. This is intended for superscripts and subscripts; use positive values for superscripts, negative values for subscripts.
<code>\-</code>	Inserts a soft hyphen. This tells Draw that it may split the word at this point if necessary, inserting a hyphen character in the output. If the word is not split at the soft hyphen, it has no printing effect.
<code>\↵</code>	Forces a line break.
<code>\</code>	Inserts a backslash character.
<code>\;text ↵</code>	Treated as a comment. Characters up to and including the next newline are ignored.

## Rules for displaying text areas

### Line splitting

Draw displays text in text areas by splitting it into lines and columns. When deciding where to split the text, Draw tries to split it at the space or soft hyphen that gives the most characters that will fit in the column. If this is not possible, the text is split at the character that gives the longest line that just fits in the column.

### Special characters and paragraph formatting

Certain characters have special interpretations:

- All control characters are ignored, except tabs, which are treated as spaces.
- Newline characters appearing before any printing text insert a paragraph spacing.
- A single newline character in the body of the text is treated as a space, unless it is preceded or followed by a space, in which case it is ignored.
- A sequence of *n* newline characters in the body of the text inserts *n*-1 paragraph spacings.

---

For columns other than the first, paragraph spacings at the head of the column are ignored. Lines which protrude vertically beyond the limits of the column are not displayed; however, all commands occurring in them are interpreted. This can occur if the line spacing is significantly smaller than the font height. You should take care (by using the `\M` command) to ensure that lines do not protrude beyond the limits of the column horizontally, since the text may not be displayed correctly in this case. The only circumstances in which this is likely to happen are when an italic font is used and the margin setting does not allow for it.

### Font usage

When a text area is being constructed from a text file, or being loaded as part of a Draw file, checks are made on the fonts contained in it. If a font is not available, a warning message is displayed. Text that should be in this font will appear in the most recently-used font.

## Exporting text from a text area

You can re-export text used to construct a text area back into a text file, by choosing **Save/Text area**. This can be useful for altering text areas in a Draw file, when the original text file used to create them is no longer available.

## Default text area header

If the text does not start with a version number line (`\! 1`), Draw will insert the following standard header:

```
\! 1
\F 0 Trinity.Medium 12
\F 1 Corpus.Medium 12
\0
\AD
\L12
```

This defines two font references, sets the text to be displayed in font 0 (Trinity Medium) justified to both left and right margins, with a line spacing of 12pt. If you subsequently export the text, the standard header will be exported as well.

## DXF files

Draw can read files in DXF (data interchange) format. This is a file format used by other graphics programs such as AutoSketch. Draw cannot save files in DXF format.

When you load a DXF file into Draw by dragging it into a window or onto the Draw icon, a dialogue box appears, in which you can specify:

- whether coordinates and sizes in the file are to be interpreted as being in inches or centimetres;
- a scaling unit to be applied to all coordinates and sizes;
- the name of the font in which text is to be plotted. If the name you give is blank, or is not the name of an outline font known to Draw, the text will be plotted in the system font.

To load the file, click on **OK**. If you click on **Abandon**, the file is not loaded.

The following restrictions apply to DXF files loaded into Draw:

- The following DXF object types are not implemented: SHAPE, ATTDEF, ATTRIB, 3DLINE, 3DFACE, DIMENSION.
- Line types are ignored: all lines are created as solid.
- Layers are not implemented.
- Text justification may be approximate in outline fonts.
- Straight line objects are drawn in a single width and colour.
- Colours are guessed from a set of standard values. Unknown colours are converted to black.
- Text may not be rotated or oblique. The text style table is not used. There is no backwards or upside-down plotting.
- A single font is used for all the text in the file.
- There is no curve fitting.
- Block INSERTs do not use column and row values, attribute entries, rotation, or z scaling.

## JPEGs (photo-quality images)

Draw can read files in JPEG format. JPEG stands for **J**oint **P**hotographic **E**xperts **G**roup, and is a standard format for compressing photographic images (see the pictures in the **Images** directory, for example).

Unlike Paint, if you load a JPEG into Draw, all the original file information is kept. This means, amongst other things, that you can save an imported image back out of Draw as a JPEG file again. It also means that if you change from one screen mode to another with more colours, you'll see an imported JPEG file at a higher quality.

---

## Working with multiple Draw files

You can work on several Draw files at the same time; simply click on the Draw icon on the icon bar to start up another Draw window.

It's easy to copy objects between Draw windows. Select the object you want to copy, move the pointer to the destination Draw window and choose **Select/Copy**. The selected object is copied into the new window. Alternatively you can use the **Save** and **Save Selection** menu options to drag Draw icons into new Draw windows.

If you are working with multiple Draw windows, only one window can be 'active' at a time. So, if you select an object in one window and then select an object in another window, you will nullify the selection in the first window. Additionally clicking on the Draw icon to create another Draw window also nullifies any current selection.

## Saving Draw features in a Desktop boot file



You may want to change some aspects of the way new Draw windows appear. For example, a new window normally opens with the Joined line tool selected, but you may prefer to have the Select tool ready to use each time you start Draw.

You can set features of this type by setting up Draw as you want to use it, then save these features by creating a Desktop boot file. Instructions on how to create a Desktop boot file are given in *Desktop boot files* on page 47.

There are several features of Draw that you can set before saving a Desktop boot file, so that they are set up the way you want them each time you switch on. The Draw features that will be recorded when you go through this process are known as Draw\$Options (see *Configuring applications* on page 403).

## Keystroke equivalents

Many Draw operations can be carried out from the keyboard instead of the menus and mouse; when you are familiar with the application, you may find this more convenient.

### In Enter mode

To	Use this keystroke
Save a file (calls up the normal <b>Save as</b> dialogue box)	F3
Save a selection	Shift-F3
Save a sprite or JPEG Image	Ctrl-F3
Save a text area	Shift-Ctrl-F3
Load a named file (calls up a dialogue box into which you can type the name of the file you want to load)	F2
Insert a named file (calls up a dialogue box into which you can type the name of the file to insert into the Draw file you are working on)	Shift-F2
Close a window	Ctrl-F2
Print a file	Print
Toggle between show and hide grid	F1
Toggle <b>Lock to grid</b> on and off	Shift-F1
Switch the Toolbox on or off	Ctrl-F1
Zoom out	Ctrl-Q
Zoom in	Ctrl-W
Zoom to 1:1	Ctrl-D
Go back to the previous zoom	Ctrl-R
Set the Zoom lock	Ctrl-L
Undo an action	F8
Redo an action	F9
Enter Select mode	F6
Move the pointer one pixel	←, ↓, →, ↑

## **in Select mode**

### **To**

Copy a selection  
Delete a selection  
Clear a selection  
Select all  
Bring a selection to the front  
Send a selection to the back  
Group a selection  
Ungroup a selection  
Snap a selection to grid  
Enter Path edit mode  
Justify a selection

### **Use this keystroke**

F7 or Ctrl-C  
Shift-F8, Delete, or Ctrl-X  
Shift-F6 or Ctrl-Z  
F5 or Ctrl-A  
Ctrl-F4 or Ctrl-F  
Ctrl-Shift-F4 or Ctrl-B  
F4 or Ctrl-G  
Shift-F4 or Ctrl-U  
Shift-F5 or Ctrl-S  
Ctrl-F6 or Ctrl-E  
Ctrl-F5 or Ctrl-J

## **In Path edit mode**

### **To**

Change a line to a curve  
Change a curve to a line  
Add a point  
Delete a segment  
Enter a coordinate  
Finish a path edit  
Snap to the grid

### **Use this keystroke**

Ctrl-F8  
Ctrl-F9  
F7 or Ctrl-C  
Shift-F8, Delete or Ctrl-X  
F5  
Return  
Shift-F5 or Ctrl-S

## **For tool selection**

### **To**

Enter text  
Enter a closed line  
Enter a closed curve  
Complete a path  
Abandon an operation

### **Use this keystroke**

Ctrl-F7 or Tab  
Ctrl-F9  
Ctrl-F8  
Return  
Escape



**E**dit is a text editor which you can use to create and edit plain text, and to generate simple text documents and command scripts.

Edit is also a BASIC program editor. It converts BASIC programs into text format for editing, and then converts them back again when they are saved.

Although Edit does have some sophisticated features for handling text, it has not been designed as a word processor; word processors offer facilities for pagination and page layout control as well as paragraph styles and printable fonts.

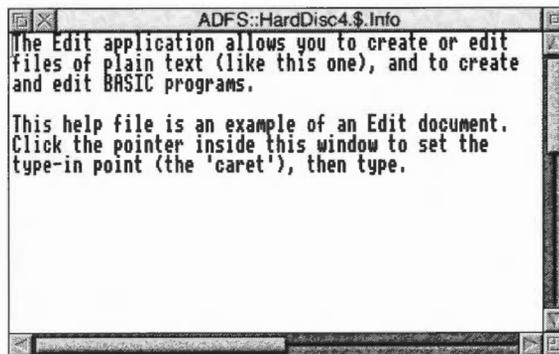
## Starting Edit



Edit is in the Apps icon bar directory display. To start Edit, double-click on the !Edit application icon. The application icon appears on the icon bar.

## Displaying an Edit file

To display an **existing text file**, just double-click on it, or drag the file's icon to the Edit icon on the bar.

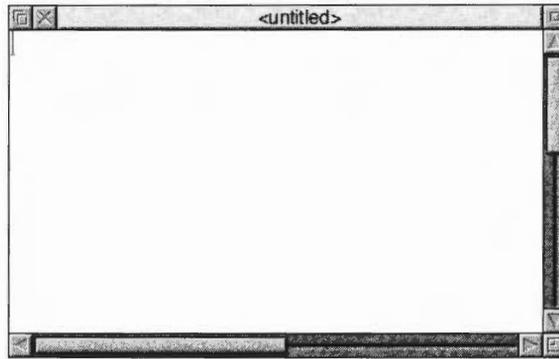


## Displaying other file types

To display **any other file type**, drag the file icon to the Edit icon on the bar, or hold down Shift and double-click on it. BASIC files are displayed as text.

## Opening a new text document

Click on the Edit icon on the icon bar to open a new document.



### Creating other file types

You can open new windows for other specific types of file: Text, BASIC, Obey and Command files. To do this, choose **Create** from the Edit icon bar menu and specify the file type you want. Alternatively you can type in a file type of your own choice at the bottom of the Create menu.

### Typing in text

When you first open a new Edit window, a red I-shaped bar – the *caret* – appears at the top left of the window. This is where text appears when you start typing. You can open more than one Edit window (see *Other features of Edit* on page 257) but only one (the current window) has the caret in it. This window is said to have the *input focus*, and is also identified by its cream rather than grey title bar. You can only type in the window which has the input focus.

If you type in some text without pressing ↵ (Return) at all, the window scrolls sideways (if your Edit window is smaller than your screen). You can break your text into lines by pressing ↵. Alternatively, click on the Toggle size icon to extend the window to the full size and avoid having to scroll sideways.

As you type, notice that Edit fills the current line and then carries on to the next line, often breaking words in the middle. By default, it doesn't automatically enter formatting characters such as newline, as these might create problems in scripts and programs, and in transferring text into other editors. *Formatting text* on page 252 tells you how to set wordwrap and other formatting options if you want them.

## Editing text

Here are some basic techniques for entering and deleting text:

To	Do this	Notes
Insert new text in an Edit window	Click <b>Select</b> to position the caret. You can now insert text by typing.	
Overwrite existing text	Press <b>Menu</b> and choose <b>Misc/Overwrite</b> .	Normally, when you type, new characters are <b>inserted</b> at the caret.
Delete characters to the left of the caret	Position the caret after the character and press <b>Backspace</b> or <b>Delete</b> .	Hold the key down to delete more characters.
Delete characters to the right of the caret	Position the caret before the character and press the <b>End</b> key.	Hold the key down to delete more characters.

There are quicker ways of deleting a lot of text – see *page 244*.

## Selecting text

You can edit more than one character at a time by defining a block of text you want to edit, then cutting, copying or pasting the whole block. A block of text can be one or two characters, a word, a line, a paragraph or the whole document:

To	Do this	Notes
Select a word	Double-click on the word.	
Select a line	Triple-click on the line.	
Select an area of text	Click <b>Select</b> at the start, then <b>Adjust</b> at the end of the block.	Another way is to drag <b>Select</b> across the block.
Extend a selected block	Click <b>Adjust</b> at the new start or end.	
Cancel a selection	Choose <b>Select/Clear</b> .	You can also press <b>Ctrl-Z</b> .

## Block editing operations

.First select a block of text as described in the previous section.

To	Do this	Notes
Delete a selection	Choose <b>Select/Delete</b> .	You can also press Ctrl-X.
Copy a selection	Place the caret where you want the selection to be copied to, then choose <b>Select/Copy</b> .	You can also press Ctrl-C.
Move a selection	Place the caret where you want the selection to appear and choose <b>Select/Move</b> .	You can also press Ctrl-V.

## Undoing changes

If you make a mistake or have second thoughts about an edit, choose **Edit/Undo** (or press F8) to step back through your most recent changes. The number of changes you can reverse in this way varies according to the operations involved.

**Edit/Redo** (or the F9 key) allows you to remake the changes you reversed with **Undo**.

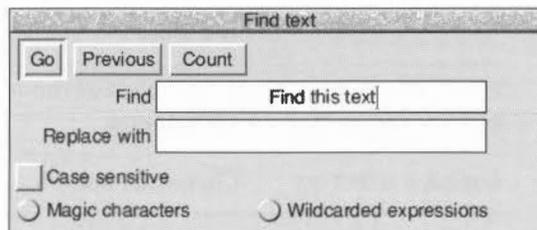
## Finding and replacing text

Edit has a very sophisticated find and replace function, to enable you to find words or characters in a document and replace them by others if you wish.

To find a particular word or character (the 'target string') position the caret at the start of the file before choosing **Find**. The target string may be any combination of words, numbers, letters, spaces or other non-printing characters.

### Searching for a string

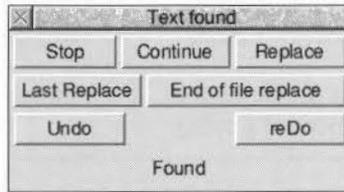
1 Choose **Edit/Find**:



- 2 Type in the string you wish to find and click on **Go**.  
(If you've already tried to find the string once and want to search for it again, click on **Previous**.)

If the string is not located, the message **Not found** is displayed.

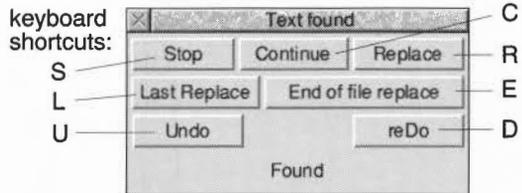
If it is found, the Text found dialogue box appears:



- 3 Click on **Continue** to look for the next instance of the string.

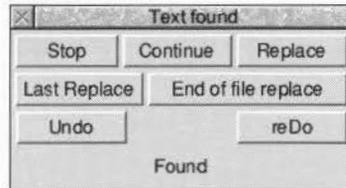
### Other Find and Replace options

To	Do this
Replace one string by another	Choose <b>Edit/Find</b> as above. Type in the string to be found, then press $\downarrow$ once. Type in the string to replace it and click on <b>Go</b> :



To replace just this string, click on **Last Replace**.

Replace the found string and move to the next instance	Click on <b>Replace</b> .
--	---------------------------



Replace all instances of the found string	Click on <b>End of file replace</b> .
---	---------------------------------------

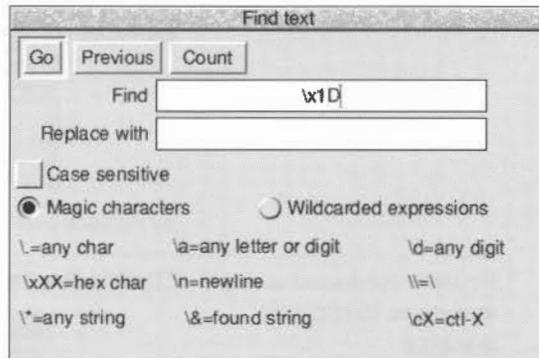
To	Do this
Undo the last replace	Click on <b>Undo</b> . Click on <b>ReDo</b> to replace it again
Quit <b>Find</b>	Click on <b>Stop</b> .
Delete more than one instance of a string	Find the string and replace it with nothing (leave the <b>Replace</b> box blank).
Count the number of instances of a string	Choose <b>Edit/Find</b> then click on <b>Count</b> .

### Making searches case sensitive

By default, **Find text** makes no distinction between upper and lower case: it will find for example HELLO, hello, or HeLLo. If you click on **Case sensitive**, however, it will find only those instances which match exactly in case.

### Using magic characters

You can also use find and replace special, or 'magic' characters. Click on **Magic characters** (or press F5) in the **Find** dialogue box and a list of them will be displayed in the lower half of the dialogue box:

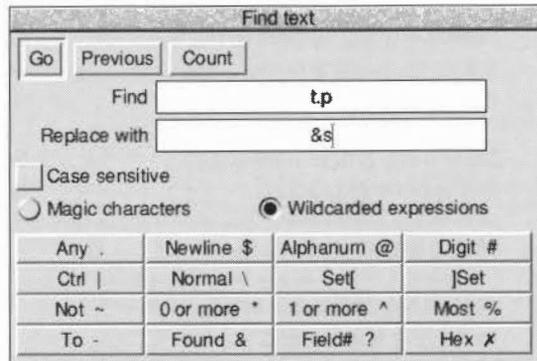


Magic characters start with a `\` character, and you type them into the **Find** and **Replace with** boxes exactly as shown:

To	Type in	Notes
Match any string (including a string consisting of no characters at all)	<code>\*</code>	This is most useful in the middle of a search string. For example, <code>jo\*n</code> matches <code>jon</code> , <code>john</code> , and <code>joha</code> an.
Match any single alphabetic or numeric character	<code>\a</code>	So <code>t\ap</code> matches <code>tip</code> , <code>tap</code> , and <code>top</code> , but not <code>trap</code> .
Match any digit (0 to 9)	<code>\d</code>	
Match any character at all, including spaces and non-alphabetic characters	<code>\.</code>	
Match the newline character	<code>\n</code>	To the computer, this is a character just like any other (Hex <code>&amp;0A</code> ).
Match Ctrl-X, where X is any character	<code>\cX</code>	Matches control codes, where X is in Hex.
Represent the found string in the <b>Replace with</b> box	<code>\&amp;</code>	This is particularly useful when you've used magic characters in the Find string. For example, if you've searched for <code>t\ap</code> , and you want to add an s to the end of all the strings found, <code>\&amp;s</code> in the <b>Replace with</b> box will replace <code>tip</code> , <code>tap</code> and <code>top</code> by <code>tips</code> , <code>taps</code> and <code>tops</code> .
Search for a string actually containing the backslash character <code>\</code> while using magic characters	<code>\\</code>	To search for the strings <code>cat\</code> a or <code>cot\</code> a, enter <code>c\at\\</code> a.
Match characters by their ASCII number, expressed in hexadecimal	<code>\xXX</code>	Thus <code>\x61</code> matches lower-case <code>a</code> . This is principally useful for finding characters that are not in the normal printable range.

## Using wildcard expressions

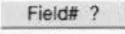
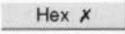
There is also a facility for specifying wildcard expressions in search strings. Click on **Wildcarded expressions** in the **Find** dialogue box to display the ones you can use:



Click on the wildcard character you wish to enter and it is copied into the text box at the caret.

To	Click on	Notes
Match any single character	Any .	
Match linefeeds	Newline \$	
Match any alphanumeric character (A to Z, a to z, 0 to 9, and _)	Alphanum @	
Match 0 to 9	Digit #	
Match any control character	Ctrl	For example, to search for Ctrl-Z, type in  z.
Match any character following it even if it is a special character	Normal \	# would be searched for as \#.
Match any one of the characters between the brackets	Set[ ]	This is always case sensitive.

To	Click on	Notes
Match any character (in the ASCII character set) between two given characters (e.g. <b>a - z</b> )	To -	
Not match character	Not ~	~ <b>C</b> matches any character apart from C. This can also be applied to sets.
Match zero or more occurrences of a character or a set of characters	0 or more *	<b>T*O</b> matches T, TO, TOO, TOOO etc.
Match one or more occurrences of a character or a set of characters	1 or more ^	<b>T^O</b> matches TO, TOO, TOOO etc.
% is the same as ^, except when used as the final element of a search string	Most %	In this case the longest sequence of matching characters is found.
Match the found string	Found &	This is useful with wildcard characters in the Find string. For example, if you've searched for <b>t.p</b> , and want to add an <b>s</b> to the end of all the strings found, <b>&amp;s</b> in the <b>Replace with</b> string will replace <b>tip</b> , <b>tap</b> and <b>top</b> by <b>tips</b> , <b>taps</b> and <b>tops</b> .

To	Click on	Notes
Match the nth ambiguous part of the search pattern, where n is a digit from 0 to 9		Ambiguous parts are those which could not be exactly specified in the search string; e.g. in the search string <code>%#fred*\$</code> there are two ambiguous parts, <code>%#</code> and <code>*\$</code> – which are <code>?0</code> and <code>?1</code> respectively. Ambiguous parts are numbered from left to right. (Only to be used in the <b>Replace with</b> string).
Match the character whose ASCII number is nn, where nn is a two-digit hex number		<b>X61</b> matches lower-case a. This is principally useful for finding characters that are not in the normal printable range.

The full power of the wildcard facility can be illustrated by a few examples:

- To count how many lower case letters appear in a piece of text:  
Find: `[a-z]`  
and click on **Count**.
- To count how many words are in a piece of text:  
Find: `%@`  
and click on **Count**.
- To surround all words in a piece of text by brackets:  
Find: `%@`  
Replace with: `(&)`  
and click on **Go**, then on **End of File Replace** in the Found dialogue box.
- To change all occurrences of strings like `#include "h.foo"` into `#include "foo.h"`:  
Find: `\#include "h\.%@"`  
Replace with: `#include "?0.h"`  
and click on **Go**, then on **End of File Replace** in the Found dialogue box.

- To remove all ASCII characters, other than those between space and ~, and the newline character, from a file:

**Find:** `~[ -\~$]`

**Replace with:** *(nothing)*

and click on **Go**, then on **End of File Replace** in the Found dialog box (i.e. find all characters outside the set from the space character to the ~ character, and newline, and replace them with nothing). In fact this could be written without the \, since ~ would not make sense in this context if it had its special meaning of **Not**:

**Find:** `~[ --$]`

## Reading in text from another file



If you want to add all the text from another file into the current file:

- 1 Position the caret at the point where the inserted text is to appear.
- 2 Open the directory display for the source file, and drag its icon into the destination text window.

The entire contents of the source file is then copied into the destination file, starting at the caret position. The caret appears at the end of the text you have inserted.

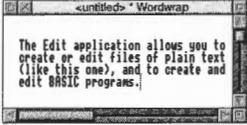
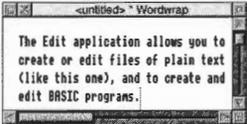
There are two ways of reading in **part** of one file into another:

- Highlight the text you want to save out, move the pointer over the destination document and click to position the caret. Then choose **Edit/Copy**, or press Ctrl-C.
- Position the caret in the destination file. Highlight the text you want to save out from the source file, then drag the **Edit/Save selection/Save as** icon into the destination file.

## Formatting text

Formatting describes how the text in Edit is arranged on the page.

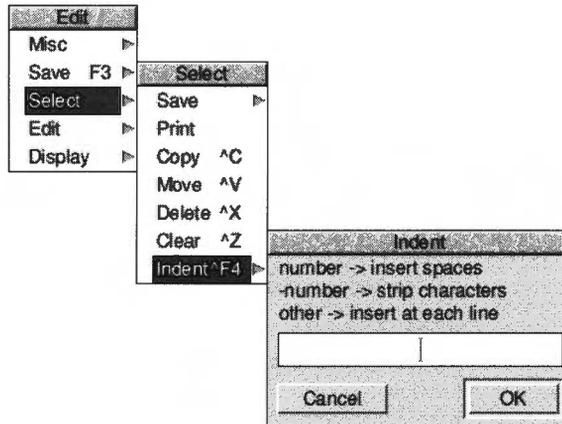
Before you can use these features, click in the Edit window to get the input focus (the title bar will turn yellow).

To	Do this	Notes
Set a margin	Choose <b>Display/Margin</b> . Type in a value and press ↵.	You can have one lefthand margin set at a time in Edit. The margin is set in pixels.
		
Set the line spacing	Choose <b>Display/Line spacing</b> . Type in a value and press ↵.	Line spacing is set in pixels, and can be a positive or negative value.
		
Reformat all lines in a paragraph to a given length	Place the cursor anywhere in the paragraph, choose <b>Edit/Format text</b> , type in a value for width and press ↵.	Useful for tidying up after editing. Width is measured in characters per line: this value is also used by the <b>Wordwrap</b> option.
Make your text fit the size of the window	Choose <b>Display/Window wrap</b> .	Revert to default by choosing the option again.
Prevent words being split over lines as you type	Choose <b>Misc/Wordwrap</b> .	A newline character is inserted at the end of a line and the next whole word is wrapped onto the next line. Line length is set in the <b>Edit/Format text</b> option.
Convert linefeeds to carriage returns (and vice-versa)	Choose <b>Edit/CR↔LF</b> . Choose again to undo.	Carriage returns appear as [ 0D ] in the text.

## Indenting text

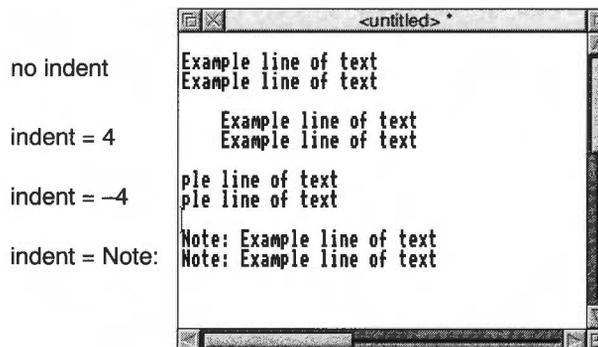
You can indent a selected block of text in Edit. The indent is defined in character spaces. You can indent using just spaces, or add a text prefix to the beginning of each line of a block.

To indent a selected block of text, choose **Edit/Select/Indent**:



You can then type in one of three different types of indent:

- **A positive number** gives you an indent of the specified width.
- **A negative number:** -5, for example, deletes the specified number of spaces or characters from the beginning of the block line – use this to cancel an indent.
- You can also type in text: **IGNORE**, or **Note**, for example. This will then appear at the beginning of every line in the selected block. You can remove this text by indenting with a suitable negative number:



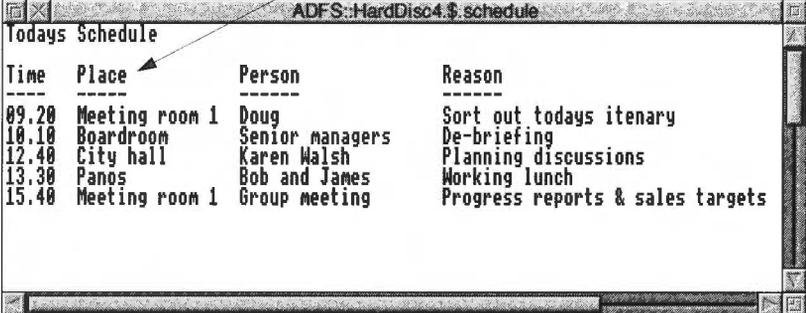
## Using tabs

Tabs in Edit are designed to work with fixed-pitch fonts, such as the System font. If you use tabs in Edit with proportionally-spaced fonts (such as Trinity, for example), tables will not line up properly.

### Laying out tables with irregular columns

Lay out the first line of a table (the headings, for example) using spaces between each column. On the next line, press Tab and the cursor will jump to each column in turn:

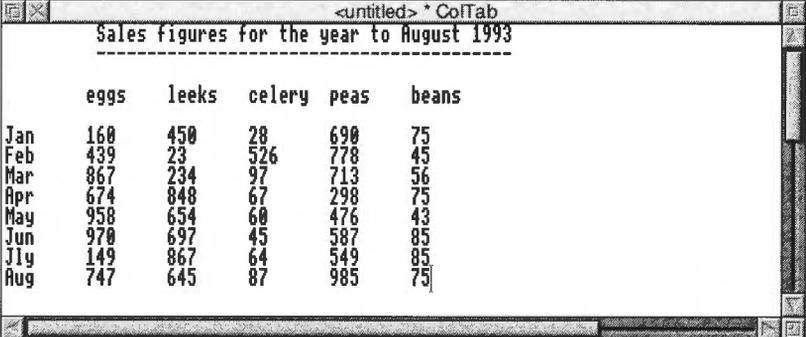
column headings



Time	Place	Person	Reason
09.20	Meeting room 1	Doug	Sort out todays itenary
10.10	Boardroom	Senior managers	De-briefing
12.40	City hall	Karen Walsh	Planning discussions
13.30	Panos	Bob and James	Working lunch
15.40	Meeting room 1	Group meeting	Progress reports & sales targets

### Laying out tables with regular columns

Pressing Tab with **Misc/Column tabs** switched on sets tabs every eight spaces.



	eggs	leeks	celery	peas	beans
Jan	160	450	28	690	75
Feb	439	23	526	778	45
Mar	867	234	97	713	56
Apr	674	848	67	298	75
May	958	654	60	476	43
Jun	970	697	45	587	85
Jly	149	867	64	549	85
Aug	747	645	87	985	75

### Converting tab characters to column tabs

You may have text imported from a word processor, which has tab characters ([09]) embedded in it. These can be expanded into Edit regular column tabs (eight spaces for each tab character) by choosing **Edit/Expand tabs**.

The text will be reformatted so that each tab character is replaced by eight spaces.

## Changing the display font

You can display Edit files using any available desktop font:

To	Do this	Notes
Change the screen font displayed by Edit	Choose from the <b>Display/Font</b> submenus.	Tabs and columns will not look right in proportional fonts.
Change the screen font size	Choose the size in points from the <b>Display/Font size</b> menu.	You can specify a different size in the bottom of the <b>Font size</b> menu.
Change the screen font height	Choose <b>Display/Font height</b> then the size you want (in points).	The current width will not be changed (use <b>Display/Font size</b> ).
Change the text colour	Choose a colour from the <b>Display/Foreground</b> submenu.	
Change the background colour	Choose a colour from the <b>Display/Background</b> submenu.	
Invert text and background colours	Choose <b>Display/Invert</b> .	Choosing this option again toggles back.

**Note:** Font information is not saved with the Edit file, so does not print. You can only have one style of text at a time in each Edit document.

## Exporting (saving) text

The **Save** menu allows you to save a complete file; you can also save part of a file.

To	Do this	Notes
Save a new file	Press Menu over the Edit file and drag the <b>Save/Save as</b> icon to the destination directory (changing the default name <b>TextFile</b> if necessary).	You can also press F3 to display the <b>Save as</b> box.
Save a file that's already been saved	Press F3 followed by ↵ (Return).	
Save part of a text file	Select the text you want to save. Press Menu, drag and drop the <b>Selection/Save /Save as</b> icon.	You can use this method to export text to another Edit file, or another application (e.g. Draw – see page 230).

## Printing Edit files

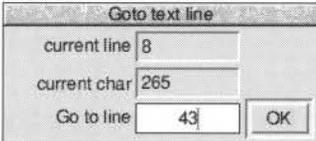
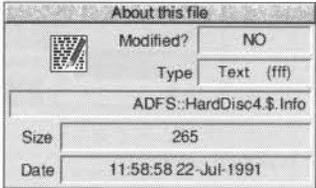
There are several ways of printing an Edit file; to use them, you first need to load the Printers application (refer to *Printing your files* on page 123).

To	Do this	Notes
Print an open Edit file	Choose <b>Misc/Print</b> .	You can also press the Print key, or drag the <b>Save/Save as</b> icon onto the printer's icon bar icon.
Print a selection	Choose <b>Select/Print</b> .	You can also drag the <b>Select/Save as</b> icon onto the printer's icon bar icon.
Print an Edit file not currently open	Drag the file's icon to the printer's icon bar icon.	You can also do this if the file is loaded. Unsaved changes will <b>not</b> print.

**Note:** Edit files are always printed out using the printer's default font. This overrides any screen font (chosen from the **Edit/Display/Font** menu).

## Other features of Edit

This section describes some features of Edit that you won't need to use very often.

To	Do this	Notes
Extend an Edit window so it's wider than the current screen mode	Enter the line length (in terms of System font characters) in the <b>Display/Work area/Width</b> box.	System font size is used even you're using a different font. This is useful for viewing text files 80 or 132 characters wide in mode 12. Max. size is 192 System font characters. <b>Not</b> available when <b>Window wrap</b> is on.
Send the caret to a specific line of text	Choose <b>Edit/Goto</b> . 	'Line' means the string of characters between two presses of $\downarrow$ . If you have not formatted your text, a line in this sense may run over more than one display line.
See information about Edit	Display the <b>Misc/Info</b> box.	You can also choose <b>Info</b> from Edit's icon bar menu.
See information about the current file	Display the <b>Misc/File</b> information box. 	This tells you the file type, whether it's been modified, the size in characters and creation (or modification) date.
Change a file's type	Enter the new type in the <b>Misc/Set type</b> box.	See also <i>Creating other file types</i> on page 242.
Open another window on the same file	Choose <b>Misc/New view</b> .	Changes you make in one window will be reflected in any others.

## Writing and editing BASIC programs

Edit allows you to write BASIC programs, converting the Text files produced in Edit to tokenised BASIC files. A tokenised file is one where BASIC keywords are replaced by seldom-used ASCII characters, to make the program smaller and faster in execution.

### Writing a new program

To write a new program, choose **Create/BASIC** from Edit's icon bar menu. You can type your program directly into an Edit window. There is no need to include line numbers, as Edit will insert them for you when you save the file. Press ↵ at the end of the last line of the program.

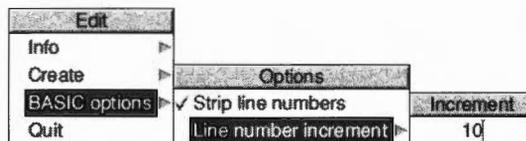
### Editing an existing program

To use Edit for working on an existing BASIC program, simply drag the program's icon from its directory onto the Edit icon on the icon bar, or Shift double-click on its icon.

### Line numbers

By default, line numbers will be stripped when a BASIC file is loaded. To turn this option on or off, choose **Strip line numbers** from the Edit icon bar menu. If a reference to a line is found, an error box will appear.

Line numbers are added when a BASIC file is saved. Use **Line number increment** from the Edit icon bar menu to set the number increment between successive lines in the program.



### Converting to a tokenised file

A tokenised file saves space: top-bit-set characters and control characters (non-printing characters) are used to stand for the BASIC keywords. So, for example, the Hex character E3 stands for the keyword FOR.

Converting a text file to a tokenised file is usually quite straightforward. If there are no line numbers, by default Edit will start at 10 and increment by 10. If line numbers are supplied, these are used as a basis for any lines without line numbers.

## Warnings

If there are line numbers, Edit will **not** sort them into ascending sequence and the resulting BASIC program may behave strangely.

If your code is incomplete, Edit will warn you about the following problems:

- Line number reference too large.
- Mismatched quotes.
- Mismatched brackets.

In all cases Edit will also quote the offending line number. After you have clicked on **OK**, the tokenising continues.

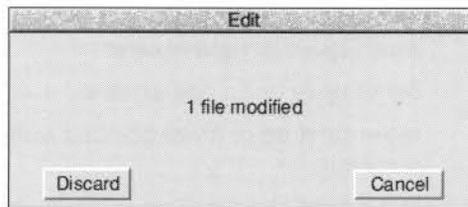
Attempts to tokenise a crunched program (e.g. one with the spaces removed) will generally result in a non-functioning program.

## Printing a BASIC program

If you have Edit running, you can print a BASIC program on paper by dragging its icon onto a printer driver icon. Edit will perform the conversion to allow the program to be printed.

## Quitting Edit

Choose **Quit** from the Edit icon bar menu to stop Edit and remove it from the computer's memory. A dialogue box may be displayed, warning you if there are any current files you have not saved.



## Saving Edit features in a Desktop boot file



You may wish to change some aspects of the way new Edit windows appear. For example, a new window normally opens using black text on a white background, but you may prefer to have blue text on a red background ready to use each time you start Edit.

You can set features of this type by setting up Edit just as you wish to use it, then save these features by creating a Desktop boot file. Instructions on how to create a Desktop boot file are given in *Configuring applications* on page 403.

## Keystroke equivalents

On occasions, it can be quicker when you are working in Edit to use the keyboard instead of the mouse, especially once you are familiar with the program.

### When editing

To	Press
Move caret one character left, right, up or down	←, →, ↑, ↓
Move caret one word left or right	Shift-←, Shift-→
Move caret one page up or down	Shift-↑, Shift-↓
Move caret to start of file	Ctrl-↑
Move caret to end of file	Ctrl-↓
Move caret to start or end of line	Ctrl-←, Ctrl-→
Scroll file without moving caret	Ctrl Shift-↑, Ctrl Shift-↓
Scroll all documents up by one line	Ctrl Shift - →
Scroll all documents down by one line	Ctrl Shift - ←
Delete character to left of caret	Delete or Backspace
Delete character to right of caret	End
Delete word at current caret position	Shift-End
Delete line at caret	Ctrl-End
Place caret at top of document	Home
Insert space to right of caret	Insert
Scroll up or down one window	Page Up/Page Down
Move caret up or down one line without scrolling	Shift-Page Up/Page Dn
Move caret and scroll up or down one line	Ctrl-Page Up/Page Dn
Toggle column tabs on or off	Shift-F3
Toggle overwrite mode on or off	Shift-F1
Toggle word wrap on or off	Ctrl-F5
Make where the caret is the current selection and move the caret to where the selection was (i.e. toggle caret and selection)	Ctrl-F7

## In the Select menu

To	Press
Clear selection	Ctrl-Z
Delete selection	Ctrl-X
Copy selection to caret	Ctrl-C
Move selection to caret	Ctrl-V

## In the Edit menu

To	Press
Display <b>Find</b> dialogue box	F4
Indent selected block	Ctrl-F4
Display <b>Goto</b> dialogue box	F5
If no block is selected, select the single character after the caret. If a block is selected, and the caret is outside it, extend the selection up to the caret. If a block is selected and the caret is inside it, cut the block from the caret position to the nearest end of the block.	F6
Clear the current selection	Shift-F6
Copy the selected block to the current caret position	F7
Move the current selection to the caret position	Shift-F7
Undo last action	F8
Redo last action	F9
Format text block	Ctrl-F6
Toggle between CR and LF versions of the file	Ctrl-F8
Expand tabs	Ctrl-Shift-F1
Close the Edit window	Ctrl-F2

## In the Find menu

Note: these keystroke definitions only come into play once the **Find** dialogue box has been displayed (e.g. by typing F4).

To	Press
Move caret between the find and replace text in the Find box	↑, ↓
This starts the search and displays the <b>Text found</b> dialogue box if the text string is found	F1
Use previous find and replace strings	F2
Count occurrences of find string	F3
Toggle case sensitive switch	F4
Toggle magic characters switch	F5
Toggle wildcard expressions switch	F6

## File options

To	Press
Open a dialogue box enabling you to load an existing Edit file into a new window	F2
Open a dialogue box enabling you to insert an existing Edit file at the caret position	Shift-F2
Save the file in the current window (this is a shortcut to the normal Save as dialogue box)	F3
Insert the <i>name</i> of a file into an existing Edit window at the caret position	Shift-drag the file's icon onto the Edit window
Load any text or non-text file into Edit	Shift-double-click



**P**aint is a pixel-based picture editor; you can use it to 'paint' coloured images by applying colours to an area with a variety of brushes and painting tools.

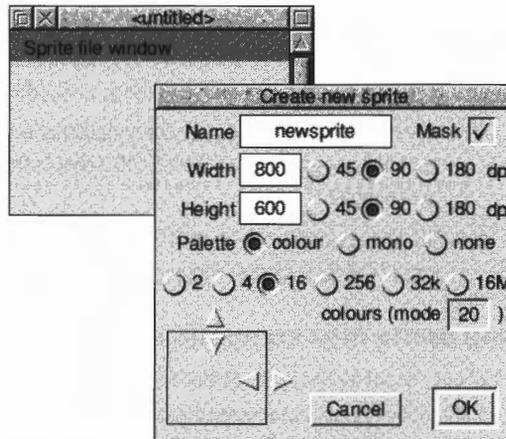
You'll probably find that the easiest way of learning Paint is to read through *Basic ideas* (on the next page) and then work through the *Paint tutorial* which follows, before reading the *Paint reference section* starting on page 277.

## Starting Paint



Paint is in the Apps icon bar directory display. To start Paint and create a new sprite:

- 1 Double-click on the !Paint icon to install it on the icon bar.
- 2 Click on the Paint icon bar icon to display the Create new sprite window.



- 3 Fill in the details for your new sprite and click on **OK** (it's probably best to follow the tutorial starting on page 265 if you don't already know how to do this).

Alternatively, edit an existing sprite file by dragging its file icon to the Paint icon on the icon bar, or by double-clicking on it.

## Basic ideas



The pictures produced by Paint are called *sprites*.

A sprite is a graphic shape made up of an arrangement of pixels (the smallest unit the screen uses in its current mode). Sprites are stored in *sprite files*, which can contain more than one sprite. Sprites and sprite files use a standard format, so you can freely export images produced by Paint to other RISC OS applications (such as Draw) that recognise sprites. You can also use Paint to edit sprites produced by other RISC OS applications, and to import and edit JPEG files.

The important difference between Paint and Draw is that, unlike Draw, Paint knows nothing about 'objects' such as rectangles and circles; all it knows is the colour of each pixel in a sprite. Although you can paint regular shapes, you cannot then select them in order to delete, move or resize them.

When you export (save) a sprite from Paint into Draw, this remains true: regular shapes forming part of the sprite cannot be edited like Draw objects. The whole sprite becomes a single object in your Draw diagram; you can move or resize it, but not otherwise edit it.

### Choosing colours in Paint

Paint can create and edit pictures in any RISC OS screen mode: 16 million colours, 32 thousand colours, 256 colours, 16 colours, 4 greys and black and white. There are two different ways of choosing colours in a sprite:

- Sprites created in up to 256 colours use a Colours window, familiar to users of previous versions of RISC OS (the following tutorial uses this method – see page 267).
- 32-thousand and 16-million colour sprites make use of the Colours window described in *Using colour in applications* on page 159.

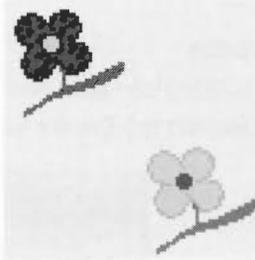
### Creating sprite files compatible with earlier versions of RISC OS

If you want to create sprite files that are compatible with earlier versions of RISC OS, make sure you choose a sprite type that has an equivalent old-type mode number. See page 294 for more information.

# Paint tutorial

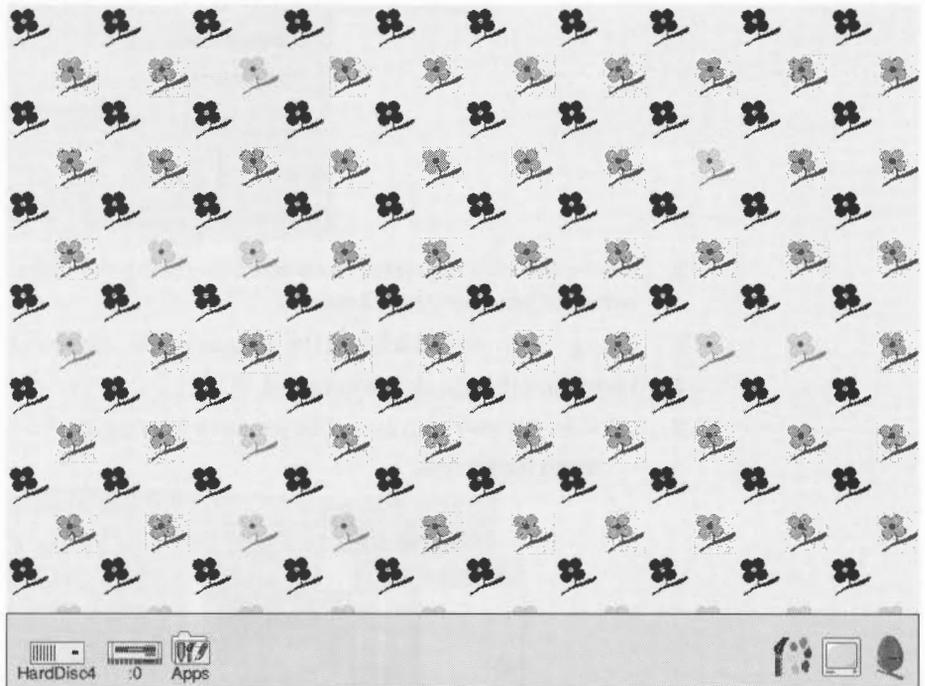
This tutorial section shows you how to use Paint to produce a small, simple picture, made up of two flowers in diagonal corners. In fact you'll only need to paint one flower, you can then copy it and re-colour it:

you'll paint this flower first...



...then copy it and change its colour

You can then use the Pinboard application to repeat this picture all over your screen producing a 'wallpaper' type background:



The tutorial is not designed to show you how to use all the Paint tools – in fact it only uses a few – but to give you a general idea of how the application works.

All of Paint's tools are described in detail in the *Paint reference* section on page 277.

## Start Paint



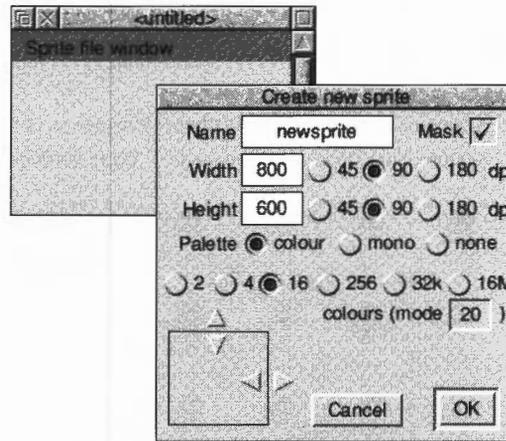
Start Paint by double-clicking on the Paint icon. As with other RISC OS applications, Paint's icon appears on the icon bar.

**Note:** Before you start this tutorial, change to a 16-colour square-pixel screen mode such as 800x600 (if you don't know how to do this, see page 13).

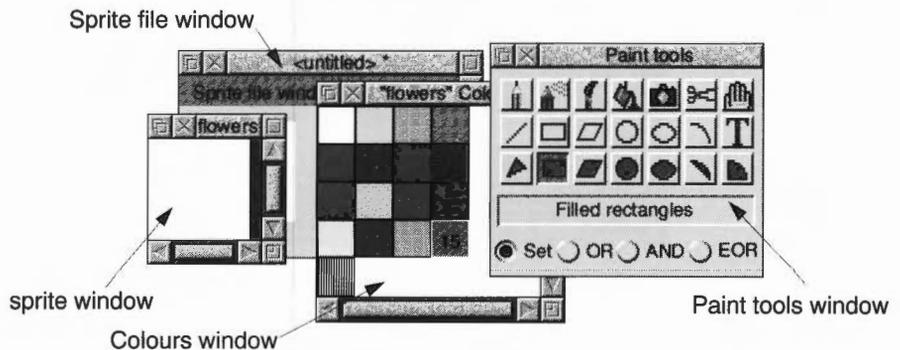
## Create a new sprite



- 1 Click on the Paint icon on the icon bar.  
This displays the **Create new sprite** and **Sprite file** windows.



- 2 Delete the existing name **newsprite** (using the Delete key) and type in the name for your sprite: **Flowers**.
- 3 Change both the **Width** and the **Height** of the sprite to be 80.
- 4 Make sure the **Mask** box is ticked.
- 5 Click on **OK** and your new (blank) sprite is created.



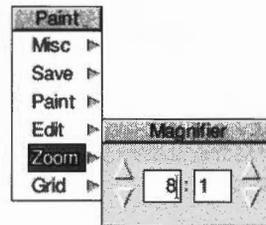
You should now have four Paint windows on your screen:

- the Sprite file window – shows all the sprites in that sprite file
- the sprite window – where you can make changes to the sprite using Paint
- the Paint tools window – contains the tools you can use for painting
- the Colours window – contains the colours you can paint with. (Note that you'll get a different type of colours window when you create a sprite with 32 thousand or 16 million colours – see *Using colour in applications* on page 159.)

Drag the tools window and the colours window to the right of your screen, and drag the Sprite file window to the bottom left of your screen. Leave the sprite window in the middle of the screen.

## Zoom in

The sprite you've just created is very small. To help you see what you're doing, click Menu on the sprite window and change the **Zoom** factor to 8:1 (see page 285 for more on zooming):



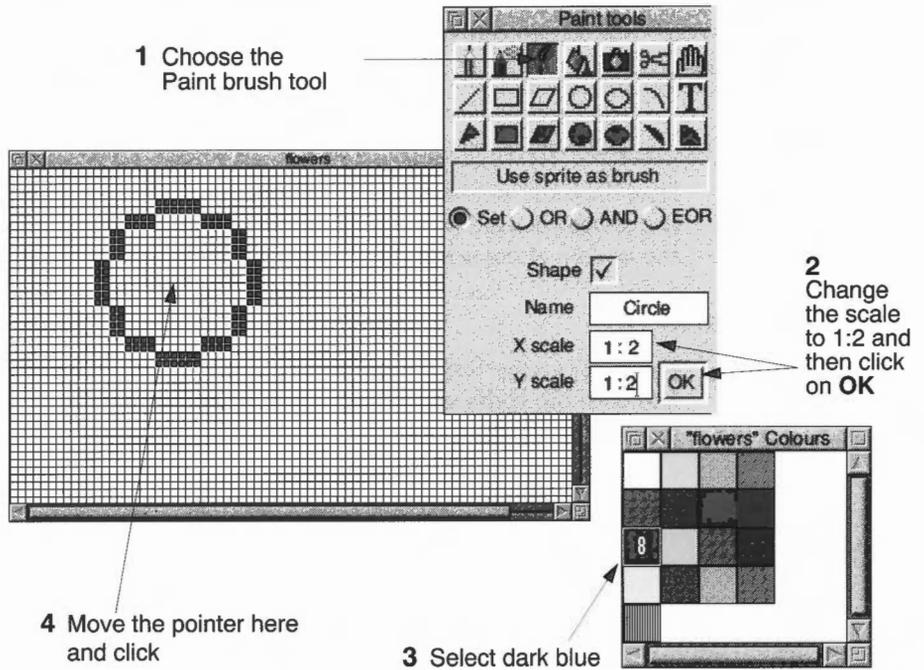
The blank sprite will now fill most of your screen, and at this magnification a grid is superimposed over the painting area. Each square in the grid represents one pixel.

## Create the first flower petal



- 1 Choose the **Use sprite as brush** tool from the Paint tools window (click on it). The bottom of the tools window will expand to display an area where you can define the type of paint brush you want to use and its size. The default brush type is a circle.
- 2 Reduce the brush size by changing the **X scale** and **Y scale** boxes to **1:2**, and then click on **OK**.
- 3 The first flower will be dark blue: Click on the dark blue colour in the Colours window. That colour will be highlighted and overlaid with the number 8 (to signify that this is colour 8 out of a palette of 16 colours).

- 4 Move the pointer into the sprite window. You'll notice that the pointer is now attached to the centre of a circle. Move the pointer to the approximate position shown below and click. A solid, dark blue circle will appear:



**Note:** If you accidentally remove either the colours window or the tools window from your screen you can restore them by pressing Menu over the sprite window, and choosing **Paint/Show colours** or **Paint/Show tools**.

### Save your sprite for the first time

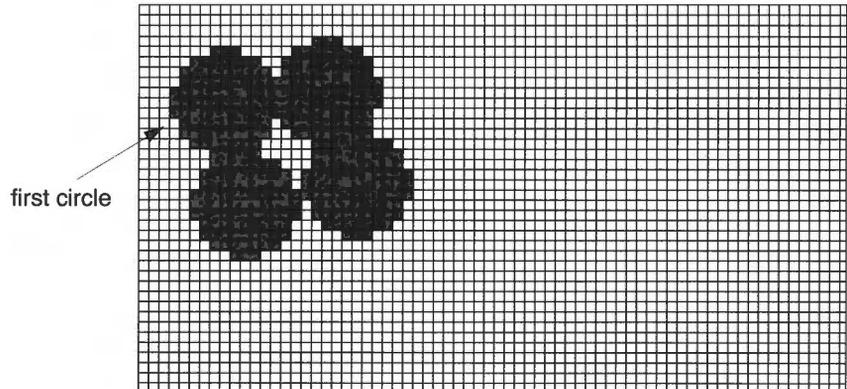
Now is a good time to save your sprite:

- 1 Click Menu over the Sprite file window (**not** the sprite window).
- 2 Change the name in the **Paint/Save/Save as** dialogue box to **Flower**.  
The name of the sprite file appears in the Title bar of the sprite file window.

**Note:** You should save your work frequently as you proceed. You can then return to the last step if you go wrong. This is an especially good idea with Paint, since with some of the tools you can easily make mistakes. Unlike Draw, you can't undo your work in Paint.

## Paint the next three petals

Move the pointer to the centres of the three other circles shown below and click. Don't worry if your circles are in slightly different positions:



**Tip:** If you've put a circle in the wrong position don't despair, change the colour to white then paint over the incorrect circle. You can then change the colour back to blue and redo the circle.

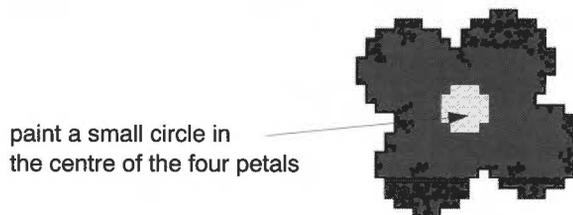
## Save your work again

Once you're satisfied with your four petals, save your work again before you go on: Just click Menu over the Sprite file window (not the sprite window) and choose **Save**. You don't need to supply a name this time.

## Create the middle of the flower

You need a smaller brush to paint the middle of the flower:

- 3 Change the **X scale** and **Y scale** boxes in the Paint tools window to **1:4**.
- 4 Select yellow (colour 9) from the Colours window.
- 5 Paint a small circle in the centre of your four petals:



### Touch up the centre of the flower

If you find that there are one or two white pixels still in the centre of the flower, you can turn them into dark blue pixels:



- 1 Choose the **Set/Clear pixels** tool from the tools window (the icon for this looks like the tip of a pencil).
- 2 Choose dark blue as your current colour.
- 3 Click Select over any white pixels inside your flower.

Save your work again at this point.

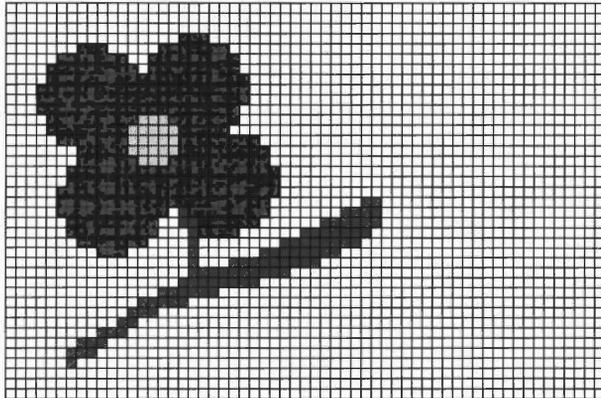
### Paint the stem

The final step in creating the flower is to paint in a green stem:



- 1 Choose light green (colour 10) from the Colours window.
- 2 Choose the **Set/Clear pixels** tool from the tools window (you may already be using this tool if you did any touching up).
- 3 Paint the pixels beneath the flower to look like a stem (click on each pixel in turn).

If you click over one pixel, only that pixel will be coloured. If you drag the pointer while holding down Select button, each pixel it moves over will be coloured:



**Tip:** If you make any mistakes, click Adjust to change the incorrect green pixels back into white ones.

This is another good point to save your work before going on.

## Create the second flower

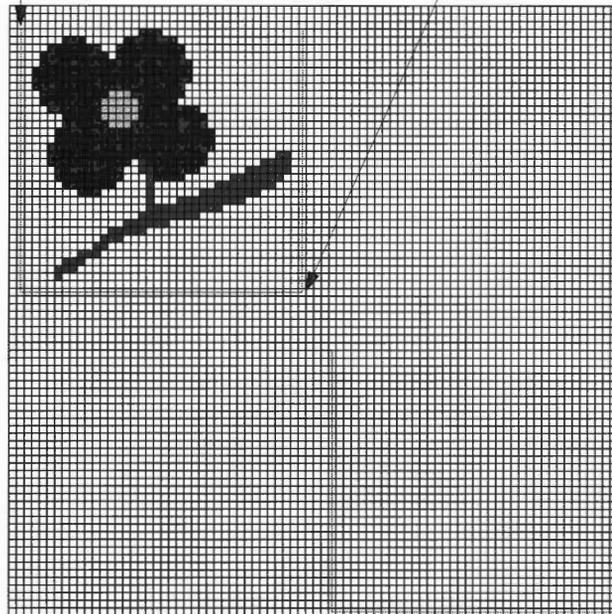
The second flower goes in the bottom right corner of the sprite. However, you don't have to paint a new flower; you can copy the one you've just made:



- 1 Go into the Zoom dialogue box and slightly reduce the magnification factor, then click on the Toggle size icon (in the top right corner of the sprite window) to display the entire sprite.
- 2 Choose the **Copy block** tool and make sure the **Local** option is switched on at the bottom of the tools window.
- 3 Position the pointer at the top left corner of the flower.
- 4 Hold down Select, drag the mouse to the bottom right corner of the flower and release Select. A light blue rectangle will show the block of pixels that you have copied.
- 5 Move the pointer to the bottom right corner of the sprite window and click.

position pointer here...

...then drag to here



...finally move the pointer here and click

The light blue rectangle will be replaced by a copy of the flower.

## Modify the second flower

There are two changes you can make to the second flower to make it clearly different from the first one; change the colour of its petals and centre, and trace around the petals.



### Change the colour of the flower

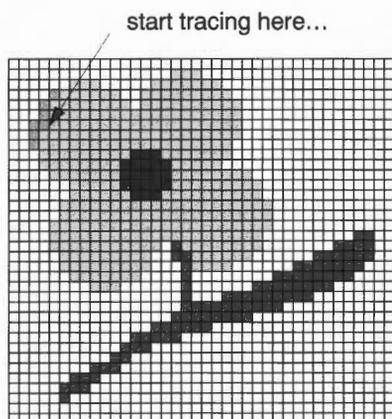
- 1 Choose the **Replace colour** tool.
- 2 Choose red (colour 11) from the Colours window.
- 3 Move the pointer over any part of the yellow centre of the flower and click. The centre will become red.
- 4 Choose yellow (colour 9) from the colours window.
- 5 Move over any part of the blue petals and click. All the blue pixels that touch each other will be instantly changed to yellow pixels.

### Trace around the petals

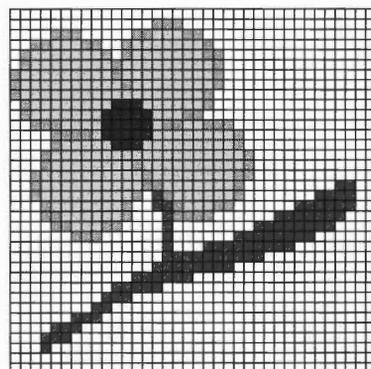
The final change to make to the second flower is to trace around the edge of the petals to give it more impact:



- 1 Choose orange (colour 14) from the colours window.
- 2 Choose the **Set/Clear pixels** tool.
- 3 Carefully trace around the outermost yellow pixels of the flower replacing them with orange:



...and continue around the entire flower



You can click on each pixel individually, or drag the pointer round the edge of the petals in one go.

## Change the background colour

The white background will be too stark when you use the flowers to cover your entire screen, so:



- 1 Choose the **Replace colour** tool, and switch the **Global** option on (at the bottom of the Tools window).
- 2 Choose cream (colour 12) from the Colours window.
- 3 Move to any white pixel in the sprite and click.  
The entire background of the sprite will be changed to cream.

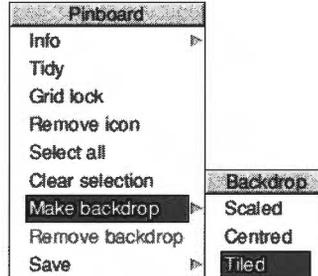


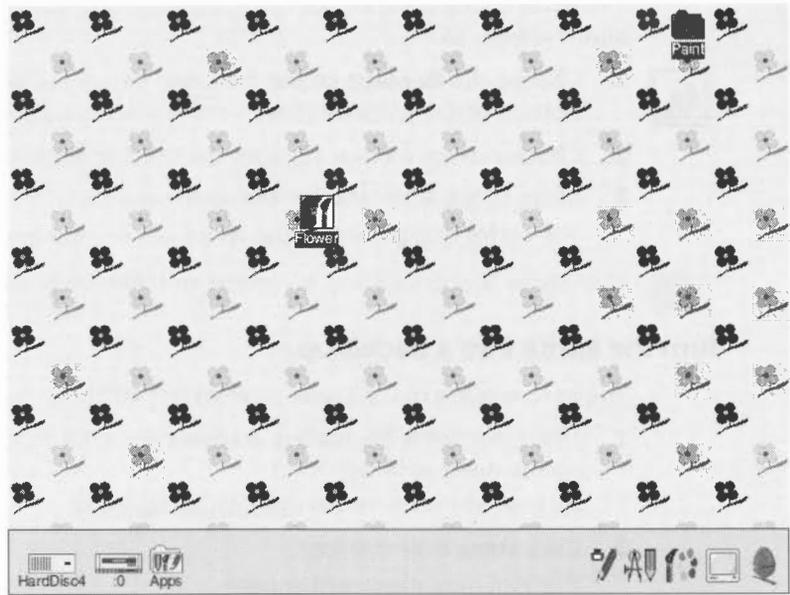
Your sprite is now finished, so save it and then close the file.

## Turn the sprite into a backdrop

You're now ready to wallpaper your screen with your flower sprite.

- 1 Drag your sprite file (called **Flower**) from its directory and drop it anywhere on the desktop background.  
Its icon will 'stick' to the desktop background.
- 2 Click Menu over this icon.  
The Pinboard menu will appear.
- 3 Choose **Make backdrop/Tiled** from this menu:





You've finished this part of the tutorial. Take a breather. The next two sections (before the *Paint reference section* on page 277) show you some advanced tricks you can use.

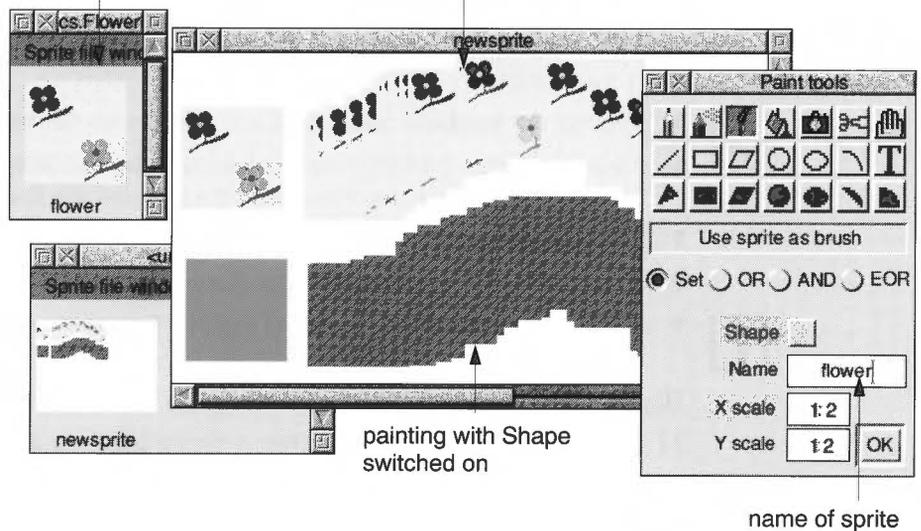
### Painting with a sprite

This section, and the next, show you how to create some special effects in Paint. Here's how to use a whole sprite as a brush tool, to produce interesting patterns:

- 1 Open the sprite file called **Flower**.
- 2 Now click on Paint's icon bar icon and create a sprite, 400 pixels by 300.
- 3 In the tools window, choose the **Use sprite as brush** tool.
- 4 Delete the default name **circle**, and type in the name of a sprite (in this case - **flower**).  
(The sprite file containing the sprite you want to use as a brush must be open.)
- 5 If **Shape** is switched on, switch it off.
- 6 Click on **OK**.



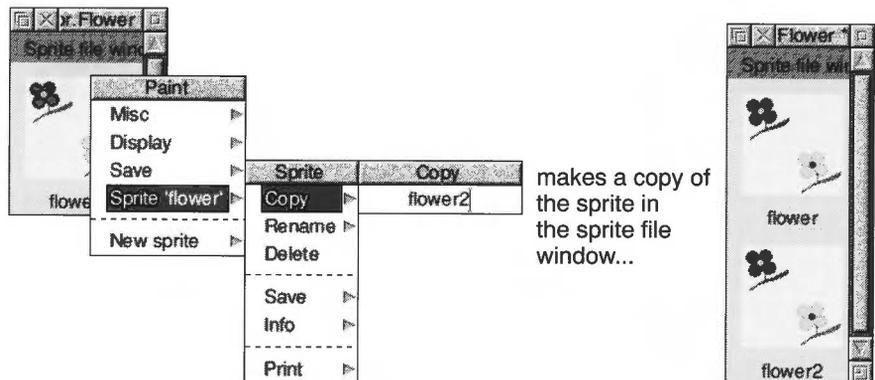
- 7 You can now paint using the sprite as a paintbrush. Clicking once paints a single sprite, and dragging the brush produces a snakelike effect of sprites: existing sprite painting with Shape switched off



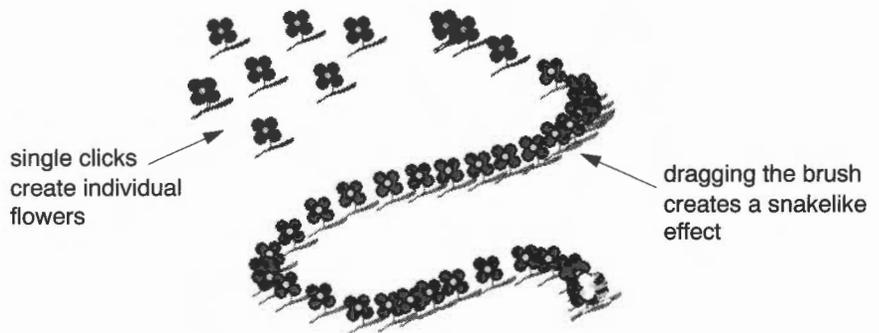
## Painting with the mask of a sprite

This section tells you how to use a special colour (a mask) to make parts of a sprite transparent:

- 1 Make sure the sprite file **Flower** is open.
- 2 Click Menu over the Sprite file window and copy your flower sprite – give it the name **flower2**:



- 3 Open **flower2**, choose **Edit/Adjust size** from the main menu, and change the width of the sprite to 40 pixels.  
This will chop off the right half of the sprite leaving only the flower in the top left half of the sprite.
- 4 Now, if it's not already ticked, choose **Edit/Mask** from the main menu to create a mask colour.
-  5 Choose the **Replace colour** tool and click on the **Global** button.
- 6 Choose the transparent colour (colour T) at the very bottom left of the Colours window – you might need to extend the Colours window down a bit to see it.
- 7 Click on the background of the sprite to fill it with the transparent colour.
- 8 Close the sprite by clicking on the close icon.
-  9 Click on Paint's icon bar icon and create a new sprite (don't forget to click on **OK**).
- 10 In the tools window, select the **Use sprite as brush** tool.
- 11 Delete the default name and type in the name of the sprite you just created – **flower2**.
- 12 If **Shape** is switched on, switch it off and click on **OK**.
- 13 You can now paint individual flowers, which will have a transparent background colour:



You have now completed the Paint tutorial. Save the files you've just created, if you want, or just quit Paint.

The rest of the chapter is a reference section describing the basic elements of Paint, the tools in detail, and how to customise Paint so that it always starts up the way you prefer it.

## Paint reference section



This section tells you in detail how to use Paint, and outlines the terms, concepts and basic techniques for creating and editing sprites. For a brief introduction to Paint and sprites, see *Basic ideas* on page 264.

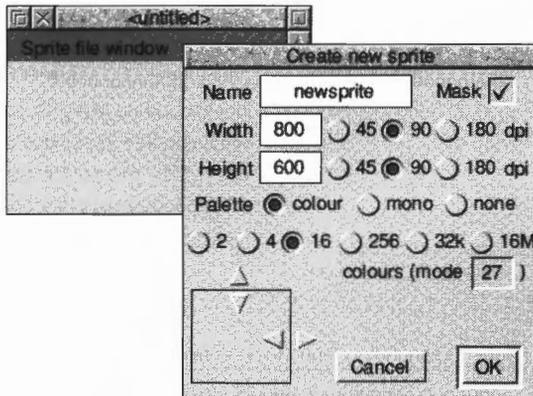
Paint has several windows with specialised functions:

- **Create new sprite** window – Use this to set up a new sprite.
- **Sprite file window** – Think of this as a sort of Paint ‘directory’; it can contain more than one sprite (see page 279).
- **Sprite** window – This is like any other application window (e.g. a Draw window): It contains the current file (in this case, a sprite) you’re editing.
- **Colours** window – You use this in conjunction with the tools window to change the colour of pixels in a sprite.
- **Paint tools** window – This contains the different tools you use to edit a sprite’s pixels.

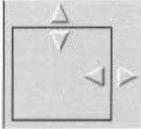
### Creating a new sprite

To create a new sprite:

- 1 Click on the Paint icon on the icon bar.
- 2 Define the sprite’s attributes in the Create new sprite window:



The table overleaf tells you what all the options in this dialogue box mean.

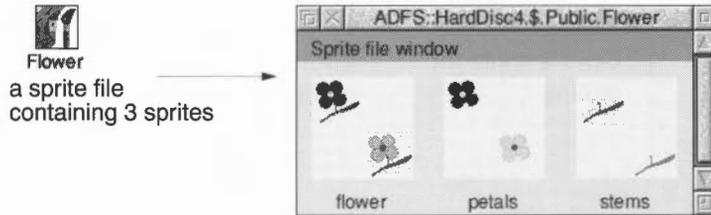
To	Do this	Notes
Name a new sprite	Fill in the <b>Name</b> box.	Sprite names can be up to 12 characters long.
Allow a sprite to use transparent pixels, as well as coloured ones	Switch the <b>Mask</b> option on.	This defines an extra 'colour' in the Colours window. Pixels painted in this colour are transparent.
Define the size of the sprite in pixels	Fill in the <b>Width</b> and <b>Height</b> boxes*.	The default is the size of the current display. You can also click on the resize arrows at the bottom of the window.
		
Change the pixel size	Choose from <b>45</b> , <b>90</b> and <b>180</b> dots per inch (dpi).	Larger dpi settings give smaller pixels (hence a smaller canvas).
Set the number of colours in the sprite	Choose from <b>2</b> , <b>4</b> , <b>16</b> , <b>256</b> , <b>32k</b> or <b>16M</b> .	Usually the same as in the current display mode.
Define whether the sprite uses a palette	Choose <b>colour</b> for backward compatibility with earlier versions of RISC OS, <b>mono</b> for grey shades or <b>none</b> for the default palette.	You can't set a palette in 32k and 16M modes. Colour sprites with a palette have white as colour 0; mono sprites have black as colour 0. Mono palettes may not display correctly on earlier operating systems.

\* For very large sprites (height greater than 1024 pixels) some Paint tools may not work properly (e.g. Replace colour).

**Note:** You can normally ignore the **colours (mode)** box. If there's a number shown here, the sprite is created as an old format sprite. If it's blank, the sprite created is a new format sprite.

## Handling sprite files

It's easy to become confused over the difference between sprites and sprite files. This section shows you how to create and manipulate sprites and sprite files.

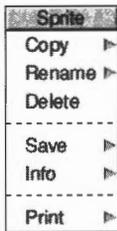


If you prefer, you can keep just one sprite in each sprite file. However, you can store many sprites in a sprite file:

To	Do this	Notes
Open a Sprite file window	Double-click on a sprite file icon, or drag its icon onto Paint's icon bar icon.	Shows all sprites in the sprite file at actual size if possible.
Save a sprite file (and all the sprites it contains)	Click Menu over the Sprite file window and drag the <b>Save/Save as</b> icon to a directory display*.	You can save it under a different name, if you want.
Create a new sprite in a Sprite file window	Click Menu over the Sprite file window and fill in the <b>New sprite/Create new sprite</b> box.	You can also double-click on a blank part of the sprite file window.
Change the Sprite file window display	Click Menu and choose one of the <b>Display</b> options.	This is rather like changing directory displays.
See information about Paint or the sprite file	Click Menu and display the <b>Misc/Info</b> or <b>Misc/File</b> box.	<b>File</b> gives you the sprite file's name, number of sprites and size in bytes.
See how the sprite would look if used as an icon	Choose <b>Misc/Use desktop colours</b> .	This option is ignored if the sprite has its own palette.

\* If you drop the **Save/Save as** icon onto another Sprite file window instead, any existing sprites in that window with the same name will be replaced.

## Manipulating sprites within a sprite file



You can perform various operations on the sprites in a Sprite file window:

To	Do this	Notes
Open a sprite for editing	Double-click on its picture in the Sprite file window.	See page 286 and page 290 for more on editing sprites. You can also open other views of the same sprite (rather like the <b>New view</b> option in Draw) at different zoom settings.
Copy a sprite within a sprite file	Click Menu over the sprite's picture in the sprite file and enter a new name in the <b>Sprite/Copy</b> box.	You can also enter a new name in the <b>Sprite/Save as</b> box and drag the icon onto the Sprite file window.
Rename a sprite	Use the <b>Sprite/Rename</b> box from the sprite file window menu.	
Delete a sprite from a sprite file	Click Menu over the sprite's picture in the sprite file window and choose <b>Sprite/Delete</b> .	Don't delete the last sprite from a sprite file, or you won't be able to save the sprite file.
Save a sprite from a sprite file	Click Menu over the sprite's picture in the sprite file window and drag the <b>Sprite/Save/Save as</b> icon.	

### Adding an existing sprite to a sprite file

There are three ways of adding an existing sprite to a different sprite file:

- Drag a sprite file icon and drop it onto the destination Sprite file window. If the source sprite file contains many sprites, they're all added to the destination Sprite file window. Sprites with the same name will be overwritten.
- Click Menu over a sprite's picture in the source Sprite file window and drag the **Sprite 'name'/Save/Save as** icon onto the destination Sprite file window.
- Click Menu over an open Sprite file window and drag the **Sprite/Save/Save as** icon onto the destination Sprite file window.

## Handling JPEG images



You can also use Paint to edit JPEG images. To load a JPEG file into Paint, drag the JPEG file icon onto Paint's icon bar icon.

The image will be converted into a sprite in the current screen mode. This means that it will be given the same number of colours as the current mode, so make sure you change to the correct mode before you load the image.

If you drag a JPEG file onto Paint's icon, a Sprite file window, a sprite window and a colours window will all open, ready for you to edit the image.

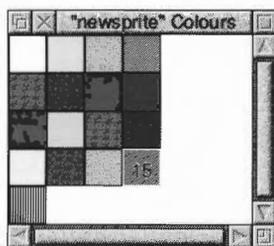
### Notes:

- Paint may automatically perform some dithering when you load a JPEG file. You can often get a better quality sprite by using ChangeFSI to process the JPEG file and saving the resulting sprite into Paint.
- Once you've loaded a JPEG file into paint, you cannot use Paint to change it back into a JPEG file. You can use ChangeFSI to do this, though – see *Output options* on page 323.
- If you double-click on a JPEG file, it will be loaded automatically into ChangeFSI.

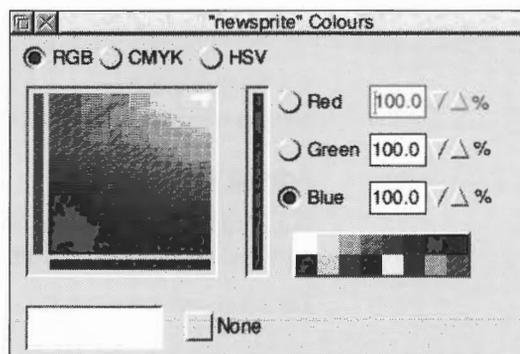
## Choosing and using colours

You use the Colours window to choose the colour that you are painting with. There is a separate Colours window for each sprite. To open the Colours window (if it's not already displayed) click Menu on the sprite window and choose **Paint/Show colours**.

There are in fact two different Colours windows (see *Using colour in applications* on page 159 for details on the second of these two windows):



Colours window for modes up to 256 colours (this one's for 16 colours)



Colours window for 32k and 16M colour modes

## Choosing a colour

To choose a colour, click on it in the Colours window.

For sprites with up to 256 colours, the current colour is highlighted in the colours window, and shows the colour number. The colours shown are the shades that can be displayed in the current screen mode. These may be an approximation to the actual palette of the sprite (see *Mixing new colours using a palette* on page 283).

### Finding out the colour of an individual pixel

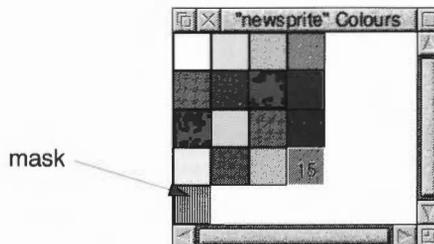
Another way to choose a colour is to point at a pixel in the sprite window, click Menu and choose **Paint/Select colour**. You can use this method to find out exactly which colour has been used to paint the pixel.

### Making the Colours window smaller

You can make the Colours window smaller by clicking Menu over the sprite window and choosing **Paint/Small colours**. This toggles the size of the sprite colours window; the colours window must be open. The small colours window takes less screen space than the large one. This is particularly valuable in 256-colour modes.

## Using a transparent mask

If a sprite with up to 256 colours has a mask, an extra, special colour is shown in the bottom lefthand corner of the sprite colours window as a shaded square.



If a 32-thousand or 16-million colour sprite has a mask, you will be able to select it by choosing **None** in the bottom of the Colours window.

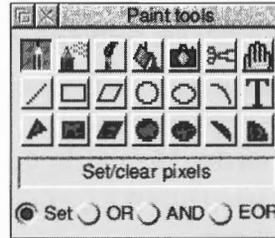
### Adding a mask

If a sprite doesn't have a mask, you can add one by clicking Menu over the sprite window and choosing **Edit/Mask**.

For more information about using masks, see page 275.

## Applying colours using logical operators

There are four different ways in which you can apply colour to a sprite, using the **Set**, **OR**, **AND** and **EOR** buttons in the tools window (the tools themselves are described starting on page 286).



**Set** causes the colour itself to be painted into the sprite. The remaining three styles cause the indicated logical operation to be applied between the colour number of the pixel on the screen and that selected in the Colours window.

For example, if you choose **EOR**, spraying with colour 11 (binary 1011) onto an area that is currently colour 12 (binary 1100) will produce pixels in colour 7 (binary 0111). For a description of logical operations, see the BBC BASIC *Reference Manual*.

- **OR** sets more pixels towards the higher numbered colours in the palette.
- **AND** sets more pixels towards the lower numbered colours in the palette.
- **EOR** maintains a wider variety of colours than **OR** or **AND**.

You can set a sprite's palette by dropping a palette file onto the sprite window – see page 284 for more on saving palette files.

The most interesting effects are achieved when spraying over a range of existing colours, or drawing overlapping filled shapes. Experiment for yourself!

## Mixing new colours using a palette

For 32k and 16M-colour sprites, you can paint a pixel in virtually any colour by choosing it from the Colours window. However, sprites which use 256 colours or less only have a limited range of colours to choose from. In such cases, if a sprite has a palette, you can use it to mix new colours.

### Giving a sprite a palette

If a sprite doesn't have its own palette, and you want to give it one, click Menu over the sprite window and choose **Edit/Palette**. Sprites which don't have their own palettes use the default desktop palette for a given mode (unless **Display/Use desktop colours** is off, in which case the old BBC colours are used).

By default, when you create a new sprite, it is given a palette.

## Notes:

If you want to use a sprite as a tiled backdrop, it should **not** have a palette.

If you intend to export a sprite to Draw, you should give it a palette (otherwise it won't retain the colours you give it).

## Redefining colours (editing a palette)

This method works for all sprites with up to 16 colours, and with 256-colour sprites with true-colour palettes.

- 1 Click on the colour in the Colours window that you want to change.
- 2 Click Menu over the sprite window and display the **Paint/Edit palette/Edit colour** box.
- 3 Mix a new colour and click on **OK** to redefine the Colours window.

*Using colour in applications* on page 159 tells you how to mix colours. The colour displayed is the best approximation available in the current screen mode to the shade you select. The exact colour is recorded by Paint; it is displayed more accurately if you change to a mode with more colours.

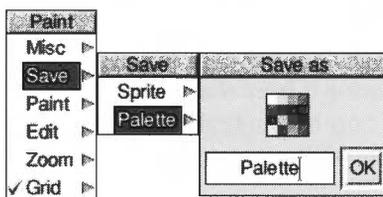
## 256-colour sprites with colour palettes

The one exception when mixing new colours is a 256-colour sprite with a **colour** palette (as opposed to a true-colour palette). In order to be able to edit such a sprite's palette, you need to save its palette back into the sprite window (see below). Alternatively, you can create a 256-greyscale sprite and edit its palette.

## Saving a palette

To save a sprite's palette:

- 1 Click Menu over the sprite window and display the **Save/Palette** box:



- 2 Drag the Save as icon to a directory display.

If you want to use the same palette in another sprite, drag this palette file onto the new sprite window. This modifies the palette used by the sprite.

## Creating an extended colour fill (ECF)

**Note:** ECFs are only really provided for backwards compatibility. We don't recommend that you use them.

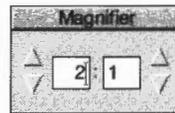
To create an ECF, click Menu over the sprite window and choose **Paint/Select ECF**. This leads to a dialogue box which you can use to extract the bottom lefthand pixels of a named sprite as an ECF pattern. ECFs are patterns that you can use in place of a colour, and are added to the sprite palette, below the plain colours.

You can't define an ECF for sprites with more than 256 colours. You can define up to four ECFs for each sprite.

## Zooming in and out (scaling a sprite window)

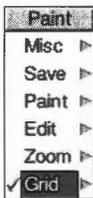


To scale the size of a sprite window to make it easier to edit, press Menu over the sprite window and set a zoom factor in the **Zoom/Magnifier** dialogue box:



The magnification only changes the size at which the sprite is displayed in the window; the actual definition, height and width are not affected. The magnification is expressed as a ratio; for example 2:1 means twice normal size, 3:4 means three-quarters of normal size, and so on. You can change the ratio either by clicking on the up and down arrows, or by typing in a new value at the caret.

## Using a grid



You can use a grid to see the boundaries between individual pixels in a sprite:

To	Do this
Toggle the grid on or off	Press Menu over the sprite window and choose <b>Grid</b> .
Change the grid's display colour	Press Menu over the sprite window and choose a colour from the <b>Grid</b> submenu.

The grid is displayed at different magnifications for sprites of different sizes (so for example, you might only see the grid at zooms of 3:1 or higher for one sprite, but at zooms of 5:1 or higher for another).

## Using Paint's tools

You choose tools from the Paint tools window to edit a sprite (or JPEG file).



If, when you open a sprite for editing, the tools window doesn't appear on the screen, you can display it by clicking Menu on the sprite window and choosing **Paint/Show tools**.

The top section of the window shows the tools. The currently-selected tool is highlighted and its name shown below the icons.

Below this are buttons used to define how colour will be applied to the image. When certain tools are selected, an extension may appear at the bottom of the tools window for setting extra parameters.

### Choosing tools

To use a tool to edit a sprite:

- 1 Click on the tool in the Paint tools window.
- 2 If you want, set or change any parameters, such as the size of the spray or brush to be used.
- 3 Choose a colour from the Colours window.
- 4 Move the mouse to the sprite window, and apply the tool as described below.

For operations such as drawing lines and rectangles, you can click Adjust instead of Select. This moves the point you just set to the current position.

While some operations are in progress, a skeleton line or area is shown.

You can cancel any of the sequences of operations described below by clicking again on the current tool in the Paint tools window.

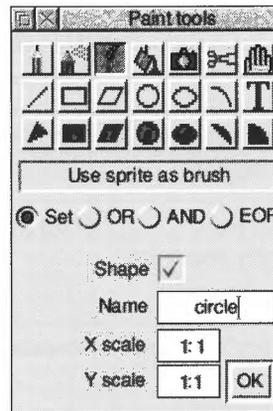
To	Choose this tool	Notes
Paint a pixel	 Set/clear pixels	Click Adjust to clear a pixel to colour 0. Drag the pointer to paint many pixels.
Spray pixels in an area around the pointer position	 Spray can	Set the spray <b>Density</b> and <b>Radius</b> at the bottom of the tools window. Spray with Adjust to clear pixels to colour 0.
Paint another sprite into the current one	 Use sprite as brush	See <i>Using a sprite as a brush</i> on page 289.
Replace one colour with another (flood fill)	 Replace colour	<b>Local</b> changes all touching pixels of the same colour. <b>Global</b> changes all similarly-coloured pixels in the sprite.
Copy a rectangular block from one part of a sprite to another	 Copy block (switch <b>Local</b> on)	Drag a select box around the block to be copied. Click to position the copied block.
Save (export) a rectangular block of a sprite	 Copy block (switch <b>Export</b> on)	Drag a select box around the block to be copied. Drag the <b>Save as</b> icon to a directory or sprite file.
Move a rectangular block from one part of a sprite to another	 Move block (switch <b>Local</b> on)	Works in the same way as Copy block (Local), but area left behind is filled with colour 0.
Save (export) a rectangular block of a sprite	 Move block (switch <b>Export</b> on)	Works in the same way as Copy block (Export).
Move the entire sprite within the sprite window	 Move whole sprite	Drag pointer to new position in sprite window. Any parts of image which move outside window are lost.

To	Choose this tool	Notes
Paint a solid line of pixels	 Lines	Click at each end of the line.
Paint a solid triangle	 Filled triangles	Click on each corner of the triangle.
Paint an outline or solid rectangle	  Rectangle outlines Filled rectangles	Click on opposite corners of the rectangle.
Paint an outline or solid parallelogram	  Parallelogram outlines Filled parallelograms	Click on three corners of the parallelogram.
Paint an outline or solid circle	  Circle outlines Filled circles	Click at the centre, then on the circumference.
Paint an outline or solid ellipse	  Ellipse outlines Filled ellipses	Click at the centre. Second click defines the width.
Paint an arc or solid circular segment	  Circle outline sections Filled circle segments	Click to define the centre of a circle, then click at each end of the arc.
Paint a solid circular sector	 Filled circle sectors	Click to define the centre of a circle, then click at each end of the arc.
Paint a text line onto a sprite	 Insert text	Enter the text, character sizes (pixels) and spacing (pixels) in the tools window. Click to define centre of text line. Only System font is available.

## Using a sprite as a brush

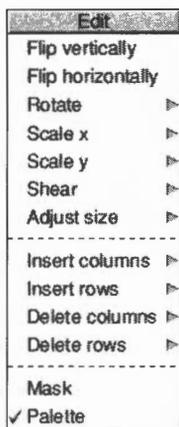


Here's a bit more on using a sprite as a brush (there are a couple of examples of using this tool in the *Paint tutorial*, on page 274):

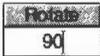


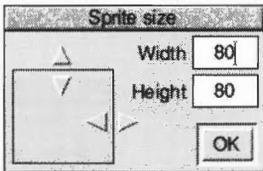
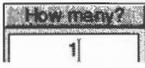
To	Do this	Notes
Use one of the default brush shapes	Type one of the default names into the <b>Name</b> box and click on <b>OK</b> .	You can use <b>square</b> , <b>triangle</b> , <b>circle</b> or <b>brush</b> .
Use one of your own sprites as a brush	Open the Sprite file window and type the sprite's name in the <b>Name</b> box and click on <b>OK</b> .	
Use just the outline of the source sprite	Switch <b>Shape</b> on and click on <b>OK</b> .	Pixels in brush sprite which are not transparent are set to the current colour.
Paint with the full coloured sprite image	Switch <b>Shape</b> off and click on <b>OK</b> .	
Use the source sprite at a different size	Set the <b>X scale</b> and <b>Y scale</b> multipliers and click on <b>OK</b> .	This is useful for using the same source sprite at different sizes.

## Changing a sprite's size, shape and orientation



You can perform many operations on a sprite using Paint's Edit menu (click Menu over a sprite window and choose from the **Paint/Edit** submenu):

To	Use this option or submenu	Notes
Invert a sprite vertically about its centre	<b>Flip vertically</b>	
Invert a sprite horizontally about its centre	<b>Flip horizontally</b>	
Rotate a sprite about its centre	<b>Rotate</b> 	Enter the angle in the Rotation box. The sprite size changes if you rotate for angles other than multiples of 90 degrees (unless the sprite has an even aspect ratio and pixel height/width).
Scale the sprite horizontally or vertically	<b>Scale x</b> or <b>Scale y</b> 	Enter the scale factor in the Factor box. Negative scale factors are not allowed.
Slant the sprite horizontally	<b>Shear</b> 	Enter the shear factor in the Shear box. The top row of pixels is moved right. The rows in between are moved proportionally. The factor is the tangent of the angle you want to shear by. A factor of 1 slants the sprite 45°.

To	Use this option or submenu	Notes
Add or delete rows or columns from the top or right edge of a sprite	<p><b>Adjust size</b></p> 	Use the arrows in the Sprite size box, or fill in the <b>Width</b> and <b>Height</b> boxes, and click on <b>OK</b> .
Add or delete columns at the pointer position	<p><b>Insert columns</b>  <b>Insert rows</b>  <b>Delete columns</b>  <b>Delete rows</b></p> 	<p>Inserted rows or columns are filled with colour 0.</p> <p>Columns are deleted to the right of the pixel over which you clicked Menu. Rows are deleted upwards.</p> <p>See below for more information.</p>

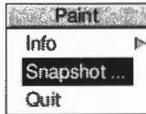
### More on adding and deleting rows and columns

Enter the number of rows or columns in the **How many?** box and click Select or press ↵. Alternatively, without passing over a menu, move the pointer over the sprite window to change the size of the highlighted area that appears and click when the **How many?** box shows the right number.

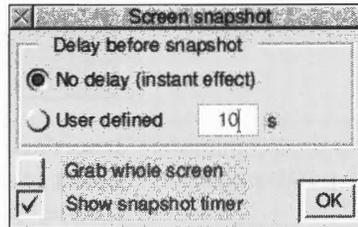
Deleting the column of pixels on the righthand edge of a sprite can be difficult. Increasing the zoom scale can help, or you can delete the last column separately by using **Adjust size** to decrease the width by 1 column.

## Taking screen snapshots

You can use Paint to save part of the screen as a sprite file (this is how the pictures of menus, windows and so on were produced in this User Guide).



Start snapshot by choosing **Snapshot** from the icon bar menu. This displays the snapshot dialogue box:



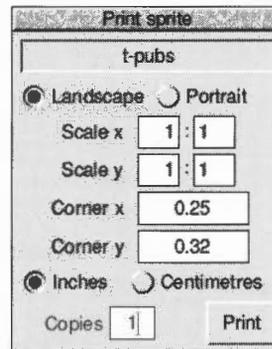
To	Do this	Notes
Take a snapshot of the whole screen	Tick the <b>Grab whole screen</b> box and click on <b>OK</b> .	Drag the resulting <b>Save as</b> icon to a directory display.
Take a snapshot of part of the screen	 Switch <b>Grab whole screen off</b> and click on <b>OK</b> . Then drag a select box (using the camera pointer that appears) round the area you want to snapshot.	Drag the resulting <b>Save as</b> icon to a directory display.
Set a delay before the snapshot is taken	Switch on <b>User defined</b> in the Delay before snapshot area and enter the delay in seconds. Then take the snapshot as above.	This allows you to take shots of transient items (like menus); while the timer is counting down, you can position menus etc. in the snapshot area you defined.

## Printing a sprite

Before you can print a sprite, you must have the Printer manager loaded (see *Part 2: Printing*). There are two ways you can print a sprite:

- Click Menu over the sprite's picture in the Sprite file window and display the **Sprite/Print/Print sprite** dialogue box.
- Click Menu over the sprite window and display the **Misc/Print/Print sprite** dialogue box.

The dialogue box is the same in both cases. The exact contents of the dialogue box depend on the printer driver in use, but it typically allows you to choose the orientation (**Portrait** or **Landscape**) scaling, and position on the paper.



**Scale** allows you to change the proportions of the printed image. Setting both x and y to 1:2 will produce a half-sized image.

**Corner** defines where on the printed page the image will be printed. The default settings define the edge of the printable page for your printer. Changing these settings will move the printing position of the image.

## Saving Paint features in a Desktop boot file



You may want to change some aspects of the way new Paint windows appear when you first open them. For example, a new window normally opens with Zoom magnification set to 1:1, but you may prefer to have the Zoom option set to 2:1 each time you start Paint.

You can set features of this type by setting up Paint as you want to use it, then save these features by creating a Desktop boot file. Instructions on how to create a Desktop boot file are given in *Configuring applications* on page 403.

There are several features of Paint that you can set before saving a Desktop boot file, so that they are set up the way you want them each time you switch on.

## Types of sprite that can be created by Paint

This table gives the various types of sprite that can be created by Paint. It shows if

- they are backward compatible with RISC OS 3.1 and earlier versions of the operating system – they have a mode number
- they can be modified by Paint.

You can select these combinations using the **Create new sprite** window. See page 277 for more information.

<b>Number of colours</b>	<b>Dots per inch (dpi)</b>	<b>Equivalent old mode number</b>
Two	90×90	25
	45×45	not backward compatible
	90×45	0
	Other combinations	not backward compatible
Four	90×90	26
	45×45	1
	90×45	8
	Other combinations	not backward compatible
Sixteen	90×90	27
	45×45	9
	90×45	12
	Other combinations	not backward compatible
256	90×90	28
	45×45	13
	90×45	15
	Other combinations	not backward compatible
32k	All combinations	not backward compatible
16M	All combinations	not backward compatible



**A**larm is a sophisticated alarm clock.

You can use Alarm to

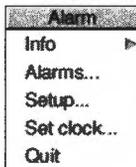


- display an analogue or digital clock on the icon bar
- set the computer's date and time
- set up alarms that can go off at a specified time in the future
- set up applications so that they are automatically started at a particular time
- set up urgent and repeating alarms
- store alarms automatically and remember them even when you switch off the computer.

## Starting Alarm

Alarm is in the Apps icon bar directory display. To start the application, double-click on the !Alarm application icon. The clock icon appears on the icon bar showing the time.

## Setting the time

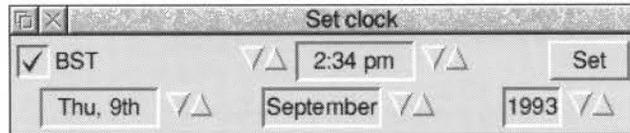


Use the **Set clock** dialogue box to set the clock's time and date. The new time and date applies to the entire RISC OS system, not just to Alarm. You only need to set the time the very first time you use the system. The time should then remain set correctly.

If you are setting the time during the summer months you should check to see if your country is running daylight saving time. If it is you should click on the **BST** option before setting the time.

To display the **Set clock** dialogue box, click Menu over the Alarm icon on the icon bar and choose **Set clock**.

To change the time and date:

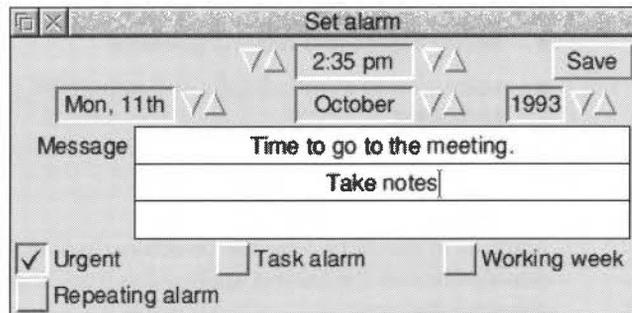


- 1 Click on the appropriate arrows in the **Set clock** dialogue box. Click on **BST** if British Summer Time is in operation.
- 2 Click on **Set** to set the clock to the new time.

## Setting an alarm



This section shows you how to set an alarm using the **Set alarm** dialogue box. To display the Set alarm dialogue box, click on the time display icon on the icon bar.



This is the dialogue box used to set the alarm date and time; you can also type in some text which will be displayed as a message on screen when the alarm goes off.

To set an alarm:

- 1 Adjust the time by clicking on the arrows either side of the time box. The arrows on the lefthand side adjust the hours, those on the right the minutes.
- 2 If you want to change the date, alter the date, month and (if necessary) year boxes.
- 3 In the **Message** box, type the text that you want to display when the alarm goes off.
- 4 Click on **Save** to save the alarm settings and set the alarm.

When an alarm is set, the box surrounding the time display on the icon bar changes colour.

---

The following options are also on the Set alarm window:

### **Urgent**

You can mark an alarm as urgent by clicking on the **Urgent** box. It will then sound an audible alarm when it goes off, even if you have selected the **Silent** option from the setup dialogue box menu (see *Configuring the Alarm setup options* on page 299).

### **Task alarm**

Instead of merely giving you a message when an alarm goes off, Alarm can carry out a task. A task can be anything you can do on the Desktop or command line: running a program or loading an application, for example. Click on the **Task alarm** box and enter the command you want carried out in the message boxes. You can also set up a Task alarm by dragging a file onto the Set alarm window. If you drag an application onto the window, for example, that application will run at the time set for the alarm. If you drag a text file, the text will be displayed in an Edit application window; you might use this option to display, at the start of the day, a list of things you have to do.

### **Working week**

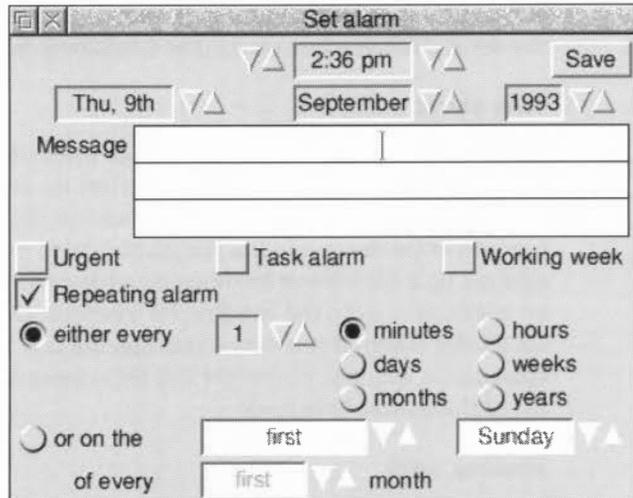
This limits the alarm settings for any repeating alarms to be within the specified working week; the working week is defined in the Alarm Setup window, and is Monday to Friday by default. This option only takes effect if the Repeating alarm option is also selected.

If you have set an alarm that falls outside the working week it will always go off on the last working day before the appointment. This is to prevent you missing an appointment that is scheduled outside the working week.

Any changes to the working week affect all Alarms, including those already set and saved.

## Repeating alarm

You can set an alarm to go off more than once by switching the **Repeating alarm** option on:



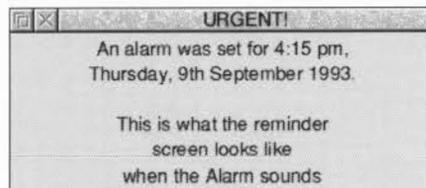
Choose whether you want the alarm to repeat at a set time (for example, every 19 days) or on a set day (for example, every second Monday of every second month).

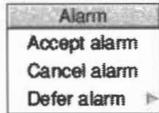
Alter the repeat interval by clicking on the arrow boxes, and by selecting the unit in which the interval is measured from the buttons shown. To limit just the current alarm to the working week, click on the **Working week** box. To limit **all** your alarms to the working week by default, choose the Repeating alarms option in the setup dialogue box.

You can set more than one alarm by simply repeating the Set alarm procedure.

## When an alarm goes off

When the alarm time is reached, a window similar to the one below appears on the screen.





If it is not a repeating alarm, cancel the alarm and remove the window by clicking on its Close icon. Alternatively, click Menu on the window and choose **Accept alarm**. If you wish to defer the alarm (like using a 'Sleep' button on an ordinary bedside alarm clock) choose **Defer alarm**, and select the time interval by which you want to delay the alarm. This then leads to a menu into which you can enter the number of minutes, hours, etc. If your alarm repeats every so many minutes or hours, it will be deferred from the current time. If its repeat unit is longer, it will be deferred from the alarm time.

When a repeating alarm goes off, click Menu on the alarm window. Choose **Accept alarm** to stop the alarm and remove the window, leaving the alarm set for next time, or choose **Cancel alarm** to stop it going off again.

If Alarm is not running when the alarm is due to go off, the alarm will be triggered next time Alarm is started. If the alarm is a repeating alarm, you will receive a message for the first repeat due for the period when Alarm was not running, but not for subsequent ones.

## Configuring the Alarm setup options

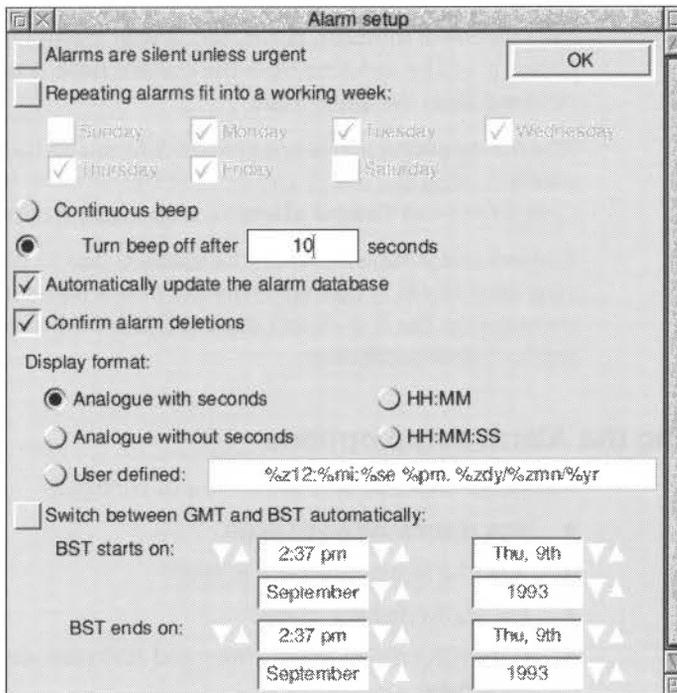
The setup dialogue box allows you to configure

- how alarms are acted upon
- how the alarm database is used
- the alarm display format
- GMT (Greenwich Mean Time) and BST (British Summer Time) timezone switching.

If your computer is locked (password protected) you won't be able to change any Alarm setup options until it is unlocked.

To change the Alarm setup options:

- 1 Click Menu over the Alarm icon on the icon bar.
- 2 Choose **Setup**.



- 3 Change the dialogue box options to suit your needs.
- 4 Click on the **OK** box. This saves the new options for your current session. However when your computer is reset, these changes will be lost.

You can save these changes permanently in a Desktop boot file. See page 305 for more information.

### **Alarms are silent unless urgent**

When this is selected, only urgent alarms sound an audible beep at alarm time. When it is not selected, all alarms sound an audible beep.

### **Repeating alarms fit into a working week**

When this is selected, any subsequent repeating alarms you set, or alarms that you defer, will skip those days you have not selected. An alarm repeating monthly or annually will go off on the working day before its due date.

**Continuous beep**

Click on this box if you want an audible alarm to sound continuously until you cancel the alarm.

**Turn beep off after**

The figure you type into the box is the number of seconds that the computer's beep will sound when there is an alarm.

**Automatically update the alarm database**

This option lets Alarm automatically update the alarm database file whenever you set or change an alarm. If you choose this option then each time Alarm starts it automatically remembers any alarms that have been stored. (If your hard disc is locked, you'll see an error box.)

**Confirm alarm deletions**

When this option is selected, you are prompted for confirmation each time an existing alarm is deleted.

**Display format**

This section allows you to choose how you wish the alarm clock to be displayed on the icon bar. The formats available are:



14.28

- analogue (with and without a second hand)
- digital (with and without seconds displayed) – called HH:MM and HH:MM:SS
- your own format.

**Typing in your own formats:**

For example, try typing in these formats in the **User defined** box.

```
%z12:%mi:%se %pm %zdy/%zmn/%zyr
```

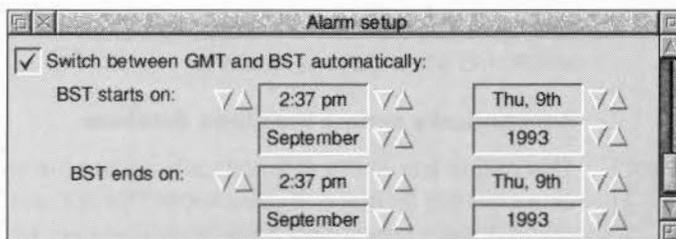
or

```
%we %zdy%st %m3 Week %wk
```

For information on how to set up your own formats, see *Time and date display formats* on page 305. The format and other features you select for Alarm will be saved in any Desktop boot file you create (providing Alarm is running when you save the file). These options are listed at the end of this chapter. For information on how to create a Desktop boot file, refer to *Customising the desktop start-up procedure* on page 47.

## Switch between GMT and BST automatically

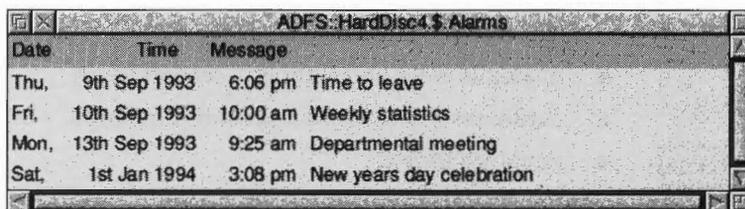
When this option is selected, Alarm will automatically switch between GMT and BST times on the dates you specify. Click on the arrows to change the time, day, month and year.



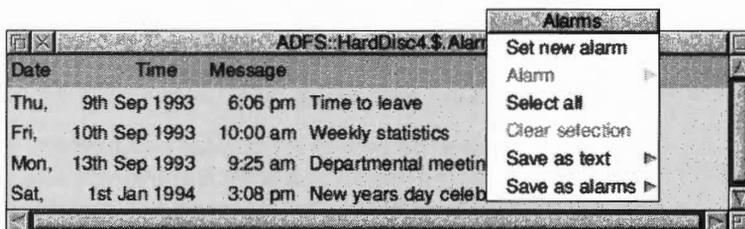
A reminder alarm is automatically set to go off 11 months after the start of BST; this is to remind you to set the GMT/BST time for the following year.

## Browsing through your alarms

Choosing **Alarms** from the icon bar menu displays the alarm browser. The browser lists the alarms you have set.



Clicking Menu over the browser window displays the menu options available for setting, changing, copying, deleting and saving alarms.



## The Alarms browser menu

### Set new alarm

Choosing this option displays the Set alarm dialogue box.

## Alarm

This option is only available when an alarm is selected. Select an alarm by clicking on an alarm line in the browser.

This option displays a submenu which allows you to perform the following operations:

- **Change alarm.** This displays the Change alarm dialogue box. Use this in the same way as the Set alarm dialogue box. You can also display the Change alarm box by double-clicking over the appropriate line in the browser.  
  
To choose a different alarm to change, press Menu in the dialogue box. This displays a submenu from which you can choose **Previous alarm** or **Next alarm** to move to the previous or next alarm in time order. Choose **Find alarm** to locate an alarm by specifying the time and date of the alarm.
- **Delete alarm.** Use this option to delete an alarm.
- **Copy alarm.** Use this option to copy an alarm so that it is duplicated in the alarm browser. You can then use the Change alarm option to modify the copied alarm.
- **Save as text.** This option saves the alarm text (as seen in the browser) as a text file. Drag the Save as text file icon to an appropriate directory.
- **Save as alarm.** This option saves an alarm as an alarm file. Drag the Save as alarm file icon to an appropriate directory. Alarm files can be read back into Alarm at a later date.

## Select all

Selects all alarms in the browser.

## Clear selection

Deselects all selected alarms in the browser.

## Save as text

This option saves the selected alarm text (as seen in the browser) as a text file. Drag the **Save as** text file icon to an appropriate directory.

You can load this text file into Edit to display a list of all your currently set Alarms, or, if you have a printer driver installed, drag the icon straight onto the printer driver icon to print the list on paper.



This option saves the selected alarms as an alarm file. Drag the **Save as** alarms file icon to an appropriate directory, or click on **OK** to save in the default file **Choices: Alarm.Alarms**. Alarm files can be read back into Alarm at a later date.

**Note:** If you save the Alarms file into the \$.Public directory on your hard disc, it will be updated even if the disc is locked.

## Quitting Alarm

To close down Alarm, choose **Quit** from the icon bar menu. Alarm will warn you if you have any alarms that have not been saved.

## Alarm files



Alarm files contain information about the current alarms. If you double-click on an Alarms file and Alarm is not running, then Alarm is started and the data file is read and treated as the main alarm file. If you double-click on an alarms file and Alarm is currently running, the contents of the alarms file is added to the existing list of alarms, if there are any.

## Saving Alarm configuration features



If you create a Desktop boot file while Alarm is running, it will incorporate any changes you have made to its setup and display. You can also manually edit your Desktop boot file to incorporate these changes. See *Configuring applications* on page 403 for more information.

## Time and date display formats

Use the **Setup** window to change the date and time format by choosing the **User defined** option and specifying a string made up of time and date variables as listed below.

<b>Name</b>	<b>Value</b>	<b>Example</b>
%se	seconds	59
%mi	minutes	05
%12	hours in 12 hour format	07
%24	hours in 24 hour format	23
%am or %pm	'AM' or 'PM'	pm
%we	weekday, in full	Thursday
%w3	weekday, in three characters	Thu
%wn	weekday, as a number	5
%dy	day of the month	01
%st	'st', 'nd', 'rd' or 'th'	st
%mo	month name, in full	September
%m3	month name, in three characters	Sep
%mn	month as a number	09
%ce	century	19
%yr	year within century	87
%wk	week of the year, Mon to Sun	52
%dn	day of the year	364
%tz	Timezone	BST
%%	insert a %	

Numbers are generated as a fixed-width with leading zeros (e.g. %mi can give a result of 05). To remove leading zeros, prefix the code with a z (e.g. %zmi gives a result of 5). Plain text can also be included in the variable string; for example:

```
%we the %dy%st %m3 %yr
```

would display in the form:

```
Wednesday the 21st Jan 95
```





This application is used to control the playback of Acorn Replay video movie and sound clips. The application allows you to control the video and sound using the same basic controls as you would find on a video recorder.

## Starting ARPlayer

ARPlayer is in the Apps directory on your hard disc or network. To start the application:

- 1 Double-click on the !ARPlayer icon to start the application. The application icon appears on the icon bar.
- 2 Click on the icon on the icon bar and the ARPlayer window is displayed:



## Playing Replay movie clips

### Playing a movie or sound file



- 1 Double-click on the **Video** directory and drag one of the video file icons to the Replay window. This loads the movie or sound clip.



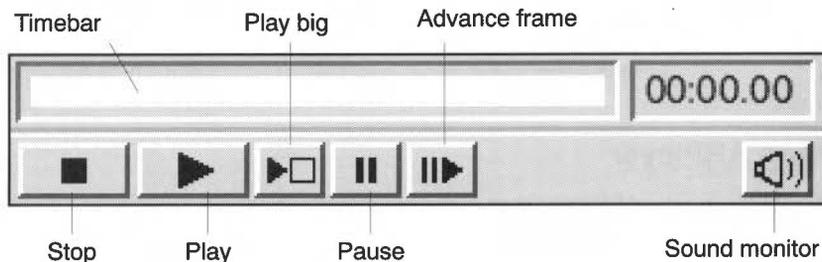
- 2 Click on the **Play** button to start the clip.

## Controlling the movie or sound clip

### Video buttons

You control movies using the five buttons and a bar at the bottom of the window.

The buttons are much the same as those on a video recorder:



**Stop** – this stops the video clip. With the video stopped you can change the point at which the video is restarted by using the red and white bar, much like fast forward and rewind. Clicking on **Stop** again rewinds the movie to the start.

**Play** – this starts the video clip.

**Play big** – this plays the video clip at a larger size outside the desktop.

**Pause** – this pauses the video; clicking the button again starts the video. Use this button in preference to the Stop button as the video starts again more quickly. You can also pause a movie by holding down the Adjust button.

**Advance frame** – this advances the movie one frame each time you click on this button. Click on Play to resume normal speed play.

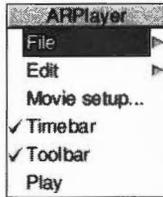
**Sound monitor** – this turns the sound off. Click again to turn it back on.

**Time bar** – the bar above the buttons controls the position the movie starts from when you click on Play. Drag the bar to the right to fast forward the movie; drag it to the left to rewind the movie. The bar can only be dragged when the movie has been stopped.

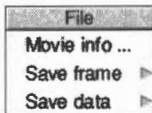
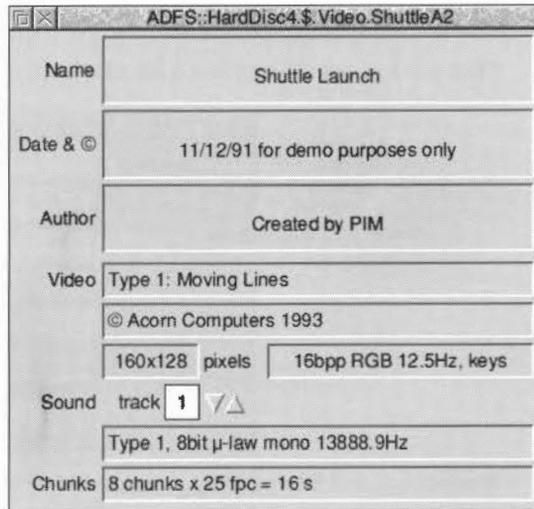
## Configuration options and information

The configuration options are controlled by the main ARPlayer menu which you access by clicking Menu over the ARPlayer window.

### File

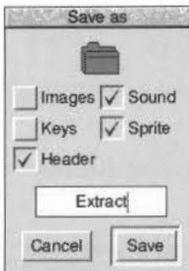


The **File/Movie Info** option gives you a window of information about the video clip you have loaded into ARPlayer.



The **Save frame** option saves the currently displayed frame of the movie as a sprite file.

The **Save data** option saves the various parts of the movie in a directory. You can save the following parts:



- **Images** – compressed chunks of video data.
- **Keys** – uncompressed key frames, stored with the movie to improve access times.
- **Header** – text shown in the movie info window.
- **Sound** – saves all of the movie's sound tracks.
- **Sprite** – picture shown when movie is first loaded.

Drag the directory icon to a directory display to save parts of the movie.

## Edit

**Copy frame** copies the currently displayed movie frame to the clipboard. Any application that supports the clipboard (for example Acorn Advance) can import the movie image.

**Clear clipboard** clears the clipboard if it contains a previously-saved movie clip. This option is not available if the clipboard is empty or if it is being used by another application.

## Movie setup

This window sets the options for playback of Replay movies.



**Trajectory** and **Shape** play a movie file along a path on screen. Either drag a trajectory or shape file to these options or click on the menu list icon and choose one. A Trajectory defines a path for the movie to travel along (on the screen) as it plays. A Shape defines the shape of the movie playback window on the screen.

Try choosing the RollFilm Trajectory; you'll see the movie displayed as a section of film.

**Loop** continuously repeats the movie. You can enter the number of times to repeat or choose **Forever**, in which case it will repeat until you press Stop.

**Sound track** selects which sound track to play. Some movies have more than one sound track.

**Video** plays both the video and sound part of the movie. Deselecting this option causes just the sound to play.

**Adjust rate** lets you alter the frame rate of the movie clip. A rate of 2 plays the movie at twice the normal rate. It may not be possible to play the movie at higher rates.

**Extra args** allows you to enter any other arguments to the text passed to the Player. This is to allow use of new features that may be added in the future.

## Timebar

This allows you to hide the display of the timebar and time counter at the bottom of the movie window.

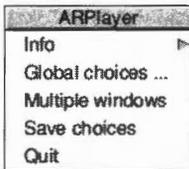
## Toolbar

This allows you to hide the controls at the bottom of the movie window. The movie can be controlled by clicking to start the movie. Press Menu to stop the move. If playing back sound only click Adjust to stop the soundtrack.

## Play

This starts playing the movie or soundtrack.

## Icon bar menu



**Info** leads to the standard program information box.

**Global choices** opens the global choices window. See below for details.

If **Multiple windows** is disabled then only one movie window will ever be displayed. If it is enabled then a new window is opened whenever you click on the icon bar icon.

**Save choices** will save the current ARPlayer setup information to disc. The following information is used next time you use the application:

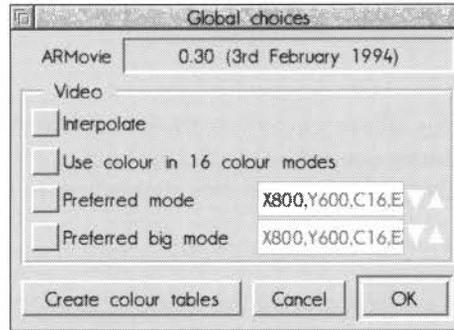
- The contents of the Movie setup window and other options.
- The state of the system variables set by the **Global choices** window.

## Global choices

This dialogue box gives control over various system variables used by the playback software. These variables affect playback at all times, in all applications that support Replay movies.

These options are not stored in the ARPlayer choices file but in a separate boot file. For more details see the file !Boot.Resources.!ARMovie.Documents.ProgIf.

The **ARMovie** field shows the date and version number of ARMovie. These are the resources used by ARPlayer and other Replay applications.



### Video playback

The first section contains options that affect video playback. Click on **OK** for all these options to take effect.

- **Interpolate** improves image quality at the expense of extra processing power used. If your machine is not powerful enough you will notice the frame rate of movies dropping (leading to jerky motion or 'tearing' of frames). In this case you should disable the interpolation feature.
- **Use colour in 16 colour modes**. The standard palette in 16 colour modes is not well suited for displaying real-life colour images, so by default movies are played back in grey scales only. If you enable this option then, assuming there is a suitable colour table for the current palette, playback will be in colour. If you want to use a different colour table click on **Create colour tables**; the process takes several minutes.
- **Preferred mode**. This is used by other Replay applications. You would not normally need this option.
- **Preferred big mode**. This is the screen display mode used when you click on the Play big button on the main window. Use this option to change this for a mode more suited to your monitor (for example, if you are using a VGA monitor).

This mode is used when you play the movie using the Play big button or from other applications by use of their Play big buttons. (Note that not all Replay-compliant applications supply a 'Play big' button). The preferred mode defaults to the current mode if it is not set. It accepts mode numbers or mode specification strings.

## Colour tables

**Create Colour Tables** allows you to create a new colour table for the current mode and palette. This operation takes quite a long time (up to 10 minutes approximately) during which you cannot use the computer for other purposes.

## Playing movies without using ARPlayer

If the ARPlayer application has not been loaded, double-clicking on a movie file plays the movie directly onto the screen at the movie's default screen size (which may be quite small).

While you play a movie, other computer operations are suspended until the movie is finished.

You can control the movie using the mouse buttons:

- **Select** pauses the movie; click Select again to restart the movie.
- **Adjust** pauses the movie only while the mouse button is held down.
- **Menu** stops the movie and removes it from the screen.





This application lets you play ordinary audio CDs using a CD-ROM drive on your computer. It allows you to control playback using the same basic controls as you would find on a CD player. It also has a comprehensive programming facility. It's only useful if your computer has a CD-ROM drive fitted (and configured). It is not supplied on all machines.

## Starting CDPlayer

CDPlayer is in the Utilities directory on your hard disc or network. To start the application:

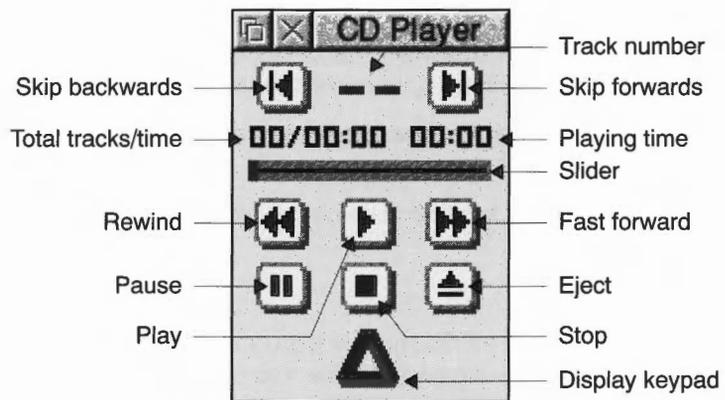
Application icon



Icon bar icon



- 1 Double-click on the !CDPlayer icon. Its icon appears on the icon bar.
- 2 Click on the icon on the icon bar to display the CDPlayer window:



## Playing an audio compact disc

To play an audio CD:



- 1 Put the CD you want to play in the CD-ROM drive.
- 2 Click on the Play button in the CDPlayer window (the other buttons are described on page 316).
- 3 Adjust the volume, if necessary: Press Menu over the CDFS icon bar icon and choose **Volume...** to display the CD volume control window.

## CDPlayer window

The basic set of controls work in the same way as those of a conventional audio CD player.

**Play** starts the audio CD playing.

**Pause** stops the CD playing, but holds it in its current position.

**Stop** stops the CD playing, and returns to the beginning of the CD.

**Eject** stops the CD and ejects it from the CD player.

**Skip backwards** and **Skip forwards** move to the previous or next tracks respectively.

**Rewind** and **Fast forward** move backwards or forwards through the audio track, speeding up as you hold down the button.

Moving the **Slider** takes you quickly to any point on the CD.

**Track number** shows the number of the track currently playing, or (as above) **00** if nothing is playing.

**Playing time** gives you three choices of display. It normally shows the time the disc has been playing. Clicking on this number changes the display to show the time the individual track has been playing; clicking again shows the time left on the disc; clicking again returns to the original display.

**Total tracks/time** gives the total number of tracks on the CD, and its total playing time.

**Display keypad** displays the keypad (described in the next section).

## Keypad window

Clicking on the triangle icon or choosing **Keypad** from the CDPlayer menu will open the Keypad window. You can use this window to select which tracks to play, and the order to play them in:



## To program the player to play a selection of tracks

- 1 Click on the first track number you want to hear, and then on **MEM**. The **Memory** window automatically appears, showing the tracks in the *program memory*:



- 2 Repeat this for any other tracks you wish to add to the program memory.
- 3 Play the tracks by clicking on **Play**.

## Other program play functions

**ALL** adds a list of all the audio tracks available on the CD to the program memory.

**RND** clears the program memory, and creates a randomly ordered list of all the audio tracks to the program memory.

**RPT** continuously repeats the tracks in the program memory until you click on the Stop key in the CD Player window. If no program has been set, the CD instead repeats continuously from start to finish.

**CLR** is used to clear the program memory. To clear all tracks from the program memory, click Adjust on **CLR**. To clear individual tracks, highlight the desired tracks and then click Select on **CLR**.

## Notes on playing programs

When CDPlayer is set to play a program, the following restrictions apply:

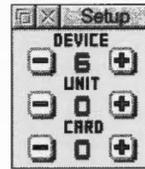
- You can't drag or click on the slider and slider bar.
- The time display will only show the time the disc has been playing.
- The main CD Player window must be open to allow the programmed tracks to be played.

When playing a mixed mode CD (mixed audio and data tracks), using the **ALL** button guarantees that all the audio tracks will be played, otherwise the drive will normally stop when it encounters a data track, even if there are subsequent audio tracks.

## Setup window

Each CDPlayer can be used to control a single CD-ROM drive at one time, which is selected using the **Setup** window. CDPlayer is supplied already set up to use an IDE CD-ROM drive. You'll only need to change the Setup if you wish to use a drive of a different type (e.g. SCSI).

To open the Setup window, choose **Setup** from CDPlayer's icon bar menu:



Click on the **+** and **-** icons until the correct device, unit and card numbers are shown for the CD-ROM drive you wish to use. If you're not sure what the numbers should be for a particular drive, you can find them out by typing at the command line:

```
*CDDevices ↵ (see the file Tutorials.StarComms).
```

It is not advisable to keep switching CDPlayer from one drive to another using the Setup window. This operation should only be performed when CDPlayer is first started. If you need to control more than one drive, you should start the CDPlayer application as many times as you require and change each copy's setup individually before use.

## Quitting CDPlayer

To quit the CDPlayer application, choose **Quit** from its icon bar menu.



**C**hangeFSI is a useful program for converting and displaying image files of various formats. These images can then be converted into sprites or JPEGs for viewing with RISC OS applications such as !Paint and !Draw.

ChangeFSI stands for 'Change Floyd Steinberg Integer' (ChangeFSI performs Floyd Steinberg error diffusion dithering).

You should make sure that your conversion and subsequent use of an image does not infringe on any copyright that the image may be under.

ChangeFSI can read image data, scale the data to improve an image, change the x and y size, sharpen an image and write the result using error diffusion dithering in one step (so it provides the best possible quality). All operations are carried out with 32-bit fixed-point numbers (three per pixel in the case of a colour picture).

## Starting ChangeFSI

ChangeFSI is in the Utilities directory on your hard disc or network. To start the application, double-click on the !ChangeFSI icon.

## Using ChangeFSI

- 1 Display the directory that contains the file for the image to be processed.
- 2 Choose whether to save the image as a sprite or JPEG file.
- 3 Change to a desktop screen display mode that you wish to view and store the image in, if you're exporting to a sprite.

ChangeFSI automatically converts the file to give the best possible image for any screen display mode. For example, if you choose a 16-colour display mode ChangeFSI will produce a 16-colour image; if you choose a 32-thousand colour mode ChangeFSI will produce an image with 32 thousand colours.

- 4 Drag the image file's icon onto the ChangeFSI application on the icon bar. ChangeFSI then attempts to convert the file to give a RISC OS sprite, or a JPEG file, displaying the result.

**Note:** ChangeFSI may not retain transparent sprite pixels during processing. Transparent pixels can be changed to a colour, depending on the screen mode (e.g. transparent pixels in a 16-colour sprite become white in a 256-colour sprite).

## Picture formats

ChangeFSI can convert many types of images to a sprite or JPEG file. These include the PC graphics formats TIFF, PCX, PIC and IMG, the Amiga format IFF, the Compuserver GIF format and the JPEG format (see page 325 for a full list).

ChangeFSI can also convert sprites or JPEGs from one display resolution into another. Be careful, though: every time you recompress a JPEG file it loses some information. Process a file first, and only save it as a JPEG once, right at the end.

## Additional information

The information in this chapter gives an overview of how ChangeFSI works from the desktop. Additional information in the form of text files is held within the application. If you want to read these files, shift double-click on !ChangeFSI to open the application directory, then open its Documents directory and double-click on one of the text files:

File	Description
<b>CmdBasUse</b>	Syntax for using ChangeFSI from the command line, and for calling it from BASIC programs.
<b>DesktopUse</b>	Instructions for using ChangeFSI from the desktop.
<b>Formats</b>	Details of formats that ChangeFSI can use as input or output.
<b>JPEGInfo</b>	Standard information about JPEG processing (taken from the Independent JPEG Group's JPEG software).
<b>Theory</b>	Theoretical explanation of how ChangeFSI works, likely only to be of interest to advanced users.
<b>256sprites</b>	Information for programmers about creating, recognising and displaying a sprite with a 256-entry palette.

## A couple of hints on memory usage

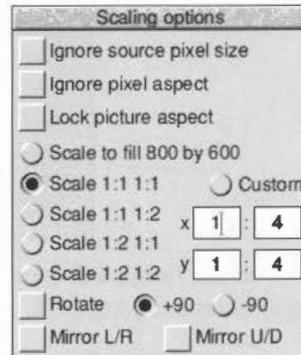
If you're short on memory, Drag the **Next** slot (in the Tasks display window) down to 320k. If you're converting wide images (e.g. PhotoCD images up to 3072 pixels wide) increase the **Next** slot to 500k or more.

## Icon bar menu options

This section tells you how to use ChangeFSI's menu options.

### Scaling options

The **Scaling** options set which scale factor you wish to apply to your image. You can also transform, rotate or mirror the image.



**Scale 1:1 1:1** gives a full-sized image (the same dimensions as the original). The other **Scale** options set different preset scaling ratios.

**Custom** gives you finer control over the size of the output image. You can either set your own scaling ratio by filling in all four boxes, or you can set the size in pixels by filling in the left **x** and **y** boxes only, leaving the right boxes blank.

**Scale to fill** scales the image so that it covers the entire screen area at the current display resolution; this may distort the aspect ratio.

**Ignore source pixel size** ignores any source information about the pixel size. This can be useful if you have images that use a non-standard pixel size. The pixels are all considered to be square.

**Ignore pixel aspect** ignores all the size information in the source file. Both source and output pixels are considered to be square.

**Lock picture aspect** prevents the Scale to fill and Custom options from stretching the image horizontally or vertically. The output image will fit within the size you specified; it may be smaller than you asked in one direction only, to avoid changing its aspect ratio.

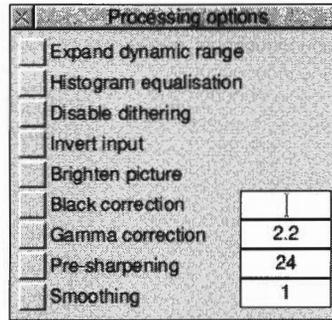
**Rotate** can shift an image through  $90^\circ$  (+90 is anticlockwise).

**Mirror** performs left/right and up/down mirror operations on an image.

If you select Rotate **and** Mirror, the rotation is performed first.

## Processing options

The Processing options control the image processing used in the conversion and display of the image. You'll notice that all of these options are 'off' by default; you will not normally need to change these settings.



**Expand dynamic range** will expand the range of colours in the image. This normally brightens the image. It expands the dynamic range of a picture to full scale.

**Histogram equalisation** will most often result in a worse picture but it can be used to recover detail from an otherwise useless image. Alternatively you can use it to look at information locked in a small part of the input scale.

**Disable dithering** will disable Floyd-Steinberg dithering. This will usually result in an inferior image.

**Invert input** will result in your colour images having their colours inverted. Black and white images are also inverted.

**Brighten picture** will produce a picture that is slightly brighter than it should be. Useful if you have dark pictures. This option only works with monochrome pictures.

**Black correction** is useful if you want to print the image on a laser printer. You should use a number between zero and 128, though values between 32 and 64 usually give the best result; experiment. Images treated in this way will give a poor result when viewed on screen. This only works for 1bpp (black and white) output.

**Gamma correction** is used to correct the image quality as displayed on your monitor. Low values of gamma (0 to 1) make colours darker and high values (above 1) make them lighter. Gamma correction is most often used to correct images that have been scanned in with a scanner. Different monitors may need different Gamma Corrections. A standard value is 2.2 (TV industry standard).

**Pre-sharpening** is used to sharpen the edges of objects in the image. Values between 10 and 20 can be used to sharpen an image. Values between 20 and 30 can be used to compensate for the blurring introduced by the dithering process.

For example, a value of 24 will counteract the general dither blurring. A value of 20 is noticeably sharp. All values from 1 to 99 can be selected.

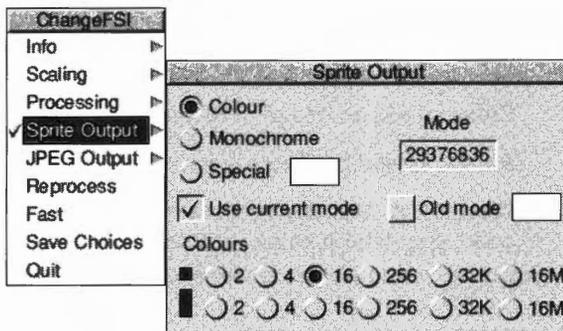
**Smoothing** does the reverse of sharpening; it smooths the edges of objects in the image. You can use values between 1 and 23, with low values giving the most smoothing. Values between 1 (the default) and 3 can be used to blur an image. Values between 3 and 10+ can be used to reduce noise in an image.

## Output options

The Output options control output to JPEG, or the screen mode in which sprites are created.

### Sprite Output options

To output an image in sprite format, choose **Sprite Output** from the icon bar menu and set up the output options:



**Colour** gives an image in colour.

**Monochrome** gives an image in shades of grey.

**Special** allows the use of special file suffixes. These are the same as the `<mode>` parameter described in the on-line documentation file `CmdBasUse`.

**Use current mode** outputs the image for display in the current desktop Display manager mode.

**Old mode** allows you to output the image for display in an old-type screen mode:

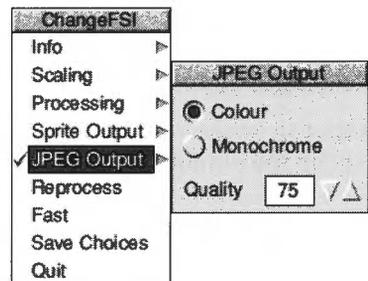
Enter a backward-compatible screen mode number. We don't recommend that you use this method (it is overridden if you set a colour mode and then use the **Monochrome** button).

The **Mode** number is only useful in old-type screen modes. It's an information box (you can't enter anything into it). When Use current mode is selected, the mode number generated with new style screen displays has no significance.

**Colours:** The two rows of **2**, **4**, **16**, **256**, **32K** and **16M** buttons set the number of colours in the output image. The top row beside the square box chooses a square pixel mode, and the lower row beside the oblong box chooses a non-square (90 × 45dpi) screen mode. For monochrome output the **2**, **4**, **16** and **256** buttons set 2, 4, 8 and 16 greys respectively, and you cannot use the **32K** and **16M** buttons.

**JPEG Output options**

To output an image in JPEG format, choose **JPEG Output** from the icon bar menu and set up the output options:



**Colour** gives an image in colour.

**Monochrome** produces a monochrome image.

**Quality** can take any value from 0 to 100 and is passed to the JPEG compression code. The default value is 75, but you can change this using **Save choices**. The default value gives a sensible compromise between quality and compression.

**Reprocess**

This option reprocesses the file according to any new options you may have set.

**Fast**

This option speeds up the processing of the image by blanking the screen during processing. If there is no benefit to be had from doing this, the option will be greyed out.

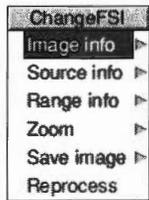
**Save Choices**

This option will save any changes you have made to the ChangeFSI options so that you can use these options as your default options next time you run ChangeFSI.

**Quit**

This quits the application, removing it from the icon bar.

## Image menu options



Once your image has been produced you can press Menu over the image to display a menu of information about the input and output images.

**Image Info** gives the information about the output file.

**Source Info** gives the information about the source file.

**Range Info** gives you information about the dynamic range of the image.

**Zoom** allows you to change the magnification of the image. This is not the same as scaling the source image.

**Save image** allows you to save the image as a Sprite file or JPEG file (this depends on the setting in **Output Options** – see page 323).

**Reprocess** allows you to process the image again using any options you have changed on the main menu.

## Image file conversion

ChangeFSI will convert any of the following image formats into the sprite or JPEG format. You can choose the type of RISC OS sprite that is created by setting the **Output Options**. If no special output mode is chosen, ChangeFSI produces a sprite that is compatible with the current display mode.

### Image type

RISC OS sprites

ArVis 15-bit HIP + LOP sprites

Watford digitiser pictures, 512×256, 64 greys –  
and triple red, green, blue separations

ProArtisan compressed pictures, 640×256,  
256 colours

JPEG 'JFIF' files

Kodak PhotoCD images

TimeStep satellite images, 800×800, 256 greys

PC TGA images

MTV 24-bit PIC images

ORT 24-bit RAW images

ZSoft .PCX files

### Recognised by

file type FF9

file type FF9, and file is beneath a HIP  
directory, and a similar LOP file exists

file type DFA

directory of type DFA files named RED,  
GREEN and BLUE

file type DE2

file type C85, or 'JFIF' in file

file type BE8, or file's name ends /PCD

file type 7A0

file type 69D, or file's name ends with TGA  
or VDA

file type 699, or file is beneath a PIC  
directory

file type 698, or file's name is RAW

file type 697, or &0A,&00|02|03|04|05,&01 at  
start of file, or file is beneath a PCX  
directory, or file's name ends /PCX

**Image type**

Degas P11, P12, P13 images  
 !Translator Clear format files  
 CCIR 601 4:2:2 images  
 !RayShade 'RGB' images  
 TimeStep satellite images, 128×256, 256 greys –  
     and triple red, green, blue separations

Wild Vision Hawk V12, 512×512, 256 greys  
 AIM/Wild Vision Hawk V10, 256×256, 256 greys  
 Wild Vision/Hawk V9, 256×256, 24 bit triple image

Wild Vision Hawk V9, 512×256, 12-bit colour  
 Wild Vision Hawk V9 Mk II, 16-bit colour  
 Pineapple 16 bit per pixel images  
 FITS astronomical format images  
 Irlam Instruments YUV 411 files  
 Irlam Instruments 24-bit files  
 Windows 3 .BMP files

Compuserve's GIF files up to 8 bit per pixel  
 .PIC 8 bit per pixel files  
 Sun 'pixrect' raster files  
 GEM .IMG images

Apollo GPR 16-colour images  
 RIX Softworks ColorIX 8 bit per pixel files  
 TIFF pictures  
 UNIX rle format files  
 Portable Bit Map (pbm) binary encoded formats  
 ChangeFSI packed portable bitmaps  
 PocketBook I and II PIC format files  
 Electronic Art's IFF ILBM pictures  
 MILLIPEDE PRISMA, 768×576, 8-bit colour images  
 MacPaint files, 576×720, 1 bit per pixel  
 MacPict2 v2 8 and 24/32 bit per pixel  
 RT 24-bit run length coded IMAGE files  
 PC EGA .DSP images, 640×350, 16 colours

Kodak RGB images, 24 bits per pixel

**Recognised by**

file type 691  
 file type 690  
 file type 601  
 file type 371  
 file type 300  
 directory of type 300 files named RED,  
 GREEN and BLUE  
 file type 006  
 file type 004  
 directory of type 004 files named RED,  
 GREEN and BLUE  
 'MercSoft' or 'SnapShot' at start of file  
 'MercSoft' at start of file  
 'FSIfile' at start of file  
 'SIMPLE ' at start of file  
 'IRLAM YUV 411' at start of file  
 'Irlam' at start of file  
 'BM' at start of file, or 'RIFF' at start of file,  
 and 'RDIBdata' and 'BM' in file  
 'GIF8' at start of file  
 'AV\_VO' at start of file  
 &956AA659 at start of file  
 &08000100 at start of file, or file is beneath  
 an IMG directory, or file's name ends /IMG  
 &01000100 at start of file  
 'RIX3' at start of file  
 'II\*null' or 'MMnull\*' at start of file  
 &CC52 at start of file  
 'P4', 'P5' or 'P6' at start of file  
 'P15' at start of file  
 'PIC' at start of file  
 'FORM' at start of file and 'ILBM' in file  
 'MILLIPEDE' in file  
 'PNTG' in file  
 &00,&11,&02,&FF,&0C,&00,&FF,&FE in file  
 file is beneath an IMAGE directory  
 file is beneath a DSP directory, or file's  
 name ends /DSP  
 file's name ends /RGB



**C**hars is an application that enables you to use text characters that are available on your computer but that cannot be typed in easily using the keyboard. It's also useful for previewing available outline fonts.

## Starting Chars

Chars is in the Apps icon bar directory. To start the application, double-click on the !Chars application icon. The application window appears on the desktop.



The Chars window shows the entire character set of the font. Control characters (outlined in black along the top row), standard characters and special extended characters not available on the keyboard.

You can use Chars to insert a character into any document, window or menu. For example, in an Edit window, in a 'menu item' (such as the **New directory** box or file **Rename** boxes), or in any text application.

## Inserting a character

There are two ways of using Chars to insert characters. The method you use depends whether you want to insert the character into an application window or a menu dialogue box.

### Inserting characters into application windows

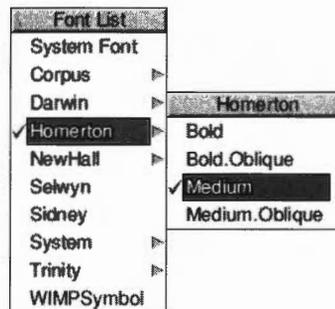
To insert a character into a window, click on it. It will appear at the caret position in the window you are currently typing in (the window with the light-coloured Title bar). For example, if you are using a word-processing package and want to put in a special character using !Chars, just click on the character in the !Chars window and it also appears in your word-processing document.

## Inserting characters into menus

You can also insert a character by positioning the pointer over the Chars character you wish to use, and pressing Shift. Use this method if you want to use a character from Chars as part of a filename (by entering it into a **Save as** dialogue box) or as part of any other menu box. Clicking on the Chars character in the normal way would make the **Save as** box disappear.

## Using fonts with Chars

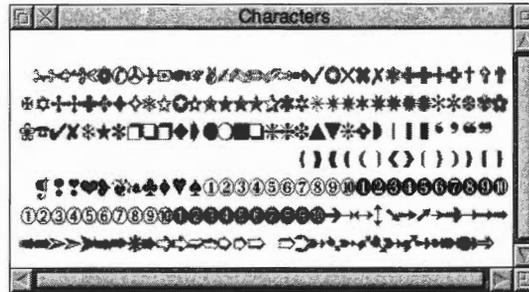
When you first run Chars, the font that appears is the System font. If you want to use a different font, press Menu on the Chars window. This displays a menu list of all the currently-available fonts; choose the one you want to use. The characters for that font will appear in the Chars window.



You will also need to select the corresponding font in the application you are using, otherwise the characters you choose appear in the font in use around the caret. For example, suppose the caret is in the middle of a text line displayed in Trinity Medium. Even if you display the Selwyn font in your Chars window, any characters you select from Chars will appear in the corresponding Trinity Medium form, rather than in Selwyn.

### Symbol fonts

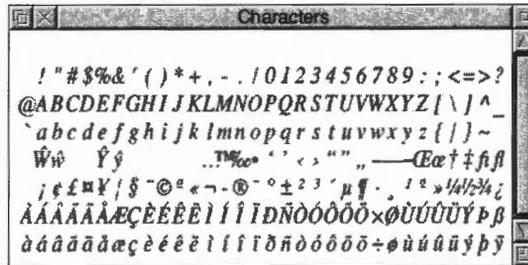
The Chars application is especially useful in allowing you to insert symbol characters into your documents. Here is !Chars displaying the Selwyn font:



### Using an outline desktop font

If you are using the one of the outline fonts as your desktop font you should make sure that when you insert Chars characters that the Chars display also uses the same outline font. If you don't you may find that the character you choose is not the same as the one entered in the menu box. It is recommended that you only use the fonts Homerton Medium or System as desktop fonts.

Here is !Chars displaying the Trinity.Medium.Italic font:



### Entering control codes

With the system font only, characters shown in inverse video correspond to control characters. For example, clicking on inverse L is the same as typing Ctrl-L.

## Alt key-numeric keypad combinations

The characters entered using !Chars can also be entered using Alt+numeric keypad combinations. To enter a character using the numeric keypad, hold down the Alt key, type the number on the numeric keypad, then release Alt. The numbers map to letters in the Latin I alphabet (or whatever alphabet is active in the computer). For example, Alt 64 will enter the @ character.

The codes for the Latin I alphabet are listed in *Character sets* on page 433.

You can also enter special characters using multiple keystrokes – see *Keyboard short-cuts* on page 434.

**Note:** Don't use Chars to insert spaces. Each space in a !Chars window generates a different character code, and may cause unpredictable results in other applications.

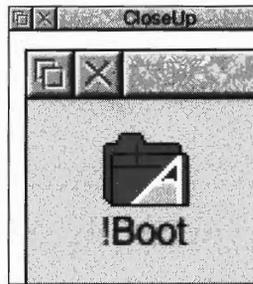


**C**loseUp acts like a magnifying glass. It displays a magnifying window on the screen which allows you examine portions of the desktop in greater detail.

## Starting CloseUp

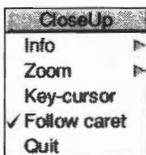
CloseUp is in the Apps directory on your hard disc or network. To start the application, double-click on the !CloseUp application icon. The application icon appears on the icon bar.

Click on the CloseUp icon on the icon bar icon to start the magnifier. You will see the magnifier on the screen. The CloseUp window simply shows a magnified portion of the desktop that is currently under the pointer. Move the pointer to see another area of the screen.



## CloseUp options

Click Menu on the CloseUp icon bar icon to display the following options:



### Info

This gives some information about the software.

### Zoom

This allows you to choose the enlargement ratio that will be displayed in the magnifier window. For example, a setting of 4:1 will make the picture in the magnifier window four times the size of the original.

### **Key-cursor**

This option lets you move the pointer around the screen using the cursor keys as well as the mouse. Anything under the pointer is shown magnified in the CloseUp window. This only operates if none of the windows on the desktop currently uses the cursor; for example, you can't have an active Edit window.

### **Follow caret**

If this option is ticked, and there is an application that uses a caret on the screen, for example Edit, the area around the caret is magnified. The magnified area follows the caret position as you type so that the letters you type in are shown magnified.

If the option is not ticked, the magnifying window will show the area that is around the pointer position.

### **Quit**

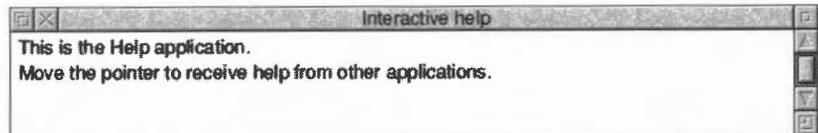
This will remove the program from the icon bar and the CloseUp box from the desktop if it is being displayed.



The Help application is a program that displays information about applications whilst they are working, and about the desktop generally. When you first use an application, you may find it useful to have !Help present.

## Starting Help

Help is in the Apps icon bar directory. To start the application, double-click on the !Help icon. The Help icon appears on the icon bar and the Help window opens:

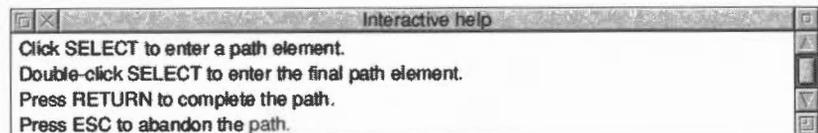


## What's in the Help window

The window contains concise help information about the desktop. Whenever you can't remember what an icon means or what an option does, use Help. Just move the pointer over the part of the desktop that you want help about, and the help text appears in the help window.

As you move the mouse to a different part of the desktop or application, the help information changes. You can get help with windows, icons, menu options and dialogue boxes.

For example here is the help you get when you move the pointer over part of a !Draw window.



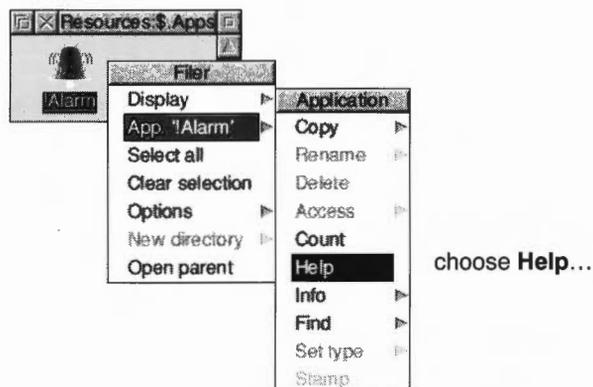
You can close the interactive help window by clicking on the window's Close icon. To display the help window again, just click Select on the Help icon on the icon bar. To close down Help altogether, choose **Quit** from the Help icon bar menu.

## Other help information

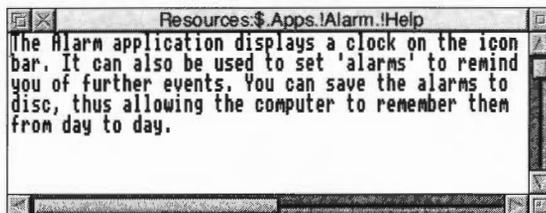
There are several other ways to get help information about the desktop and applications:

### Help information from applications

On the main **File/Application** submenu there is a **Help** option. Click on this to obtain helpful information about an application. This option is greyed out if the application does not have a help file.



...Help window for this application is displayed



### Help on command line \*commands

If you want to find out about a particular \*command, see page 378. You could also look in the text file **StarComms** in the **Tutorials** directory.



**T**his application is used to format or initialise the hard disc in your computer. Usually you won't need to use this application.

If your computer has a hard disc, it's supplied already formatted and loaded with the standard RISC OS applications. You'll only need to use this application if you fit a hard disc that has not been formatted, or if an existing hard disc develops a problem that can only be solved by formatting.

HForm only formats IDE drives. If you have a SCSI drive, refer to the guide supplied with your SCSI Expansion Card. This computer does not support ST506 disc drives.

**WARNING:** Formatting your hard disc will permanently remove all data stored on the disc. It is essential that you copy all the data and applications that you want to keep to floppy discs (or otherwise back them up) before you reformat the disc.

**WARNING:** Save your work and quit all applications before using HForm.

You should keep a spare copy of !HForm on floppy disc in case your hard disc becomes unusable.

## Formatting your existing hard disc

In the following instructions it is assumed that you have to reformat your existing hard disc because of repeated hard disc errors. In order to carry out the reformatting successfully you should have a record of the disc errors which have occurred and their addresses.

**HForm allows you to leave the program at any time by pressing Esc before you start formatting.** Additionally, at the end of the Format options you will be asked if you want to proceed with the formatting; answer **No** and HForm will quit without formatting your disc.

## Starting the application

HForm is in the Utilities directory on your hard disc or network. To start HForm, double-click on the !HForm icon. The application starts immediately.

## Using HForm

Once you've started HForm, the desktop will disappear and be replaced by a blank screen with just text on it. You'll need to reply to certain questions that appear on the screen. Text that you should type in is shown in bold below. You should press **↵** after anything you type in.

- 1 First, tell HForm which drive you want to format:

```
HARD DISC FORMATTER (V2.23 Jan 94)
Format which drive (4 - 7)? 4 ↵
```

If you want to accept the default drive number 4, press **↵**, otherwise type the desired number and press **↵**. HForm checks the type of hard disc and displays message similar to this:

```
Drive 4 is an IDE drive
IDE drive ADFS:4 identifies itself as:
Description: Conner peripherals 240MB - CP30254
Firmware version: 0.33
Configuration: 895 cylinders, 10 heads and 55 sectors/track
```

- 2 Next, tell HForm which hard disc shape to use.

You don't need to know the manufacturer of your hard disc or its specifications, since you can just accept all the defaults offered. If you want to use a different drive shape turn to *Changing the hard disc shape* on page 338, otherwise:

```
This disc supports the LBA (Logical Block Address) option *
This disc was last formatted using the standard shape:
    895 cylinders, 10 heads and 55 sectors/track
    Parking cylinder 894, Initialisation flag 1,
    LBA flag 1(enabled)
Do you wish to retain this shape (Y/N)? Y ↵
```

\*The first line will only appear on discs that support the LBA option (see *Changing the hard disc shape* on page 338).

- 3 Decide whether you simply want to format the disc, or whether you want to map out any defects found. HForm gives you the following choices:

```
A: no more changes
B: add defect by cylinder, head, byte/sector
C: add defect by disc address
D: remove defect
```

If you want to add some defects see *Recording a list of hard disc defects* on page 337. If you are simply formatting a disc:

```
A, B, C or D? A ↵
```

- 4 Decide whether to format or initialise the hard disc.

```
Disc will be formatted as: A
Format or just initialise the drive (F/I)? F ↵
```

You only need to format the disc if it has never been formatted before, or if it was previously formatted using the wrong parameters. This example assumes you want to format the disc:

- 5 Decide whether you want to carry out a soak test.

```
Soak test the hard disc for defects (Long/Short/None)? L ↵
```

Soak testing checks that the state of the defects on the disc is stable.

L is the long test; the disc is continuously tested until you press the Space bar. S is the short test, which is just one scan of the disc, lasting a few minutes.

- 6 You now have a final chance to quit the format process before it starts, or decide to proceed:

```
Are you SURE you want to do this to drive 4 (Y/N)? Y ↵
```

Entering Y and pressing ↵ starts the format or initialisation. Entering N will quit from the HForm application without formatting the disc.

If you specified the long soak test, the test continues until you press the Space bar. It is recommended that you carry out the soak test for at least 24 hours.

If you do not perform a soak test, and if the verification process detects any additional defects, HForm will then repeat the formatting and verification process in order to include the new defects. It will display the messages **Formatting** and **Verifying** as it does so.

- 7 At the end of the formatting process, you'll get one final prompt. Either accept the default file allocation unit of 512 by pressing ↵, or enter a different amount and then press ↵.

The final prompt is:

```
Large file allocation unit? <number>
```

The formatting process is now complete.

## Recording a list of hard disc defects

A defect is a fault that has been detected in part of the disc. The following process marks the defective part of the disc, so that the defective part is no longer used.

HForm lists the current defects (if any) on the hard disc and invites you to change the list by adding any new defects that you may have discovered. You may wish to add a new defect because ADFS has previously returned an error message, such as:

```
Disc error 10 at :4/00831E00
```

You should make a note of any errors on your hard disc of this type that the computer reports.

When HForm asks you if you want to map out any defects:

- 1 Type **C** then press ↵.
- 2 Type in the defect address exactly as it appeared in the disc error message, but omit anything up to and including the colon (e.g. for the error above, you'd just type **4/00831E00**) then press ↵.  
You can add multiple errors by typing them in, separated by ↵.
- 3 When you have entered all the defects you wish to, type **A** and press ↵ to indicate there are no more changes.

## Changing the hard disc shape

HForm prompts you to confirm the name of the disc in your computer. The application gets this information from the previous format type; you do not need to know the manufacturer of your hard disc.

However, you may need to change the specifications of the hard disc format used (known as the shape) if

- you are adding a new hard disc
- the hard disc has not yet been formatted
- the information on the hard disc has been corrupted or is incorrect.

If you want to change the disc shape you can answer NO to the following question:

`Do you wish to retain this shape (Y/N)? N ↵`

You will be presented with a list of alternative shapes to choose from. If you don't want to use any of these shapes use **OTHER**. You will have to enter the formatting specifications you require. Consult the manual accompanying your hard disc for its precise specifications or contact your supplier for details.

**Note:** During this process, if your disc supports it, you'll be given the opportunity to specify Logical Block Addressing (LBA):

`Drive LBA flag (0 disabled, 1 enabled)? 1 ↵`

LBA provides a faster calculation of disc addresses. If you don't set the LBA flag here, the normal Cylinder-Head-Sector (CHS) addressing will be used.

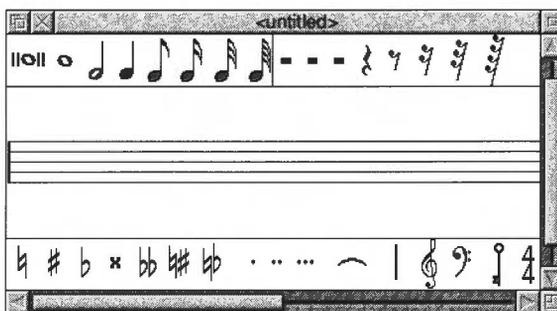


**M**aestro enables you to transcribe music in standard musical notation and play it through the computer's own sound system; it also provides some simple editing facilities. This chapter assumes that you are familiar with the basic ideas of musical notation.

## Starting Maestro

Maestro is in the Apps directory on your hard disc or network. To start the application:

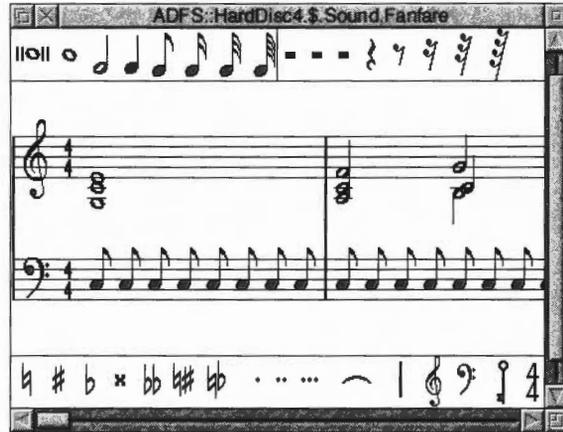
- 1 Double-click on the !Maestro icon. The application icon appears on the icon bar.
- 2 Click on this icon to display the Maestro window:



## Playing a tune

The best way to get started with Maestro is to load one of the tunes supplied as part of the Applications Suite. To do this, double-click on one of the tune icons in the **Tunes** directory, or drag it onto the Maestro icon on the icon bar.

If you load the file **Fanfare**, the window that appears looks like this:



The Maestro window is divided into three horizontal panels, with the staff in the centre. Scrolling affects only the central panel. Above and below the staff are toolboxes containing icons for notes, rests, clefs and other symbols.

To play the tune, press Menu to open the main Maestro menu. Choose **Play** to start the music. As the music plays, the score scrolls across the screen. Click on **Play** again to stop the tune: another bar or so will play before it actually stops. To return to the beginning of the score, use the horizontal scroll bar.

Before setting up your own score, try out the following editing procedures on one of the tunes supplied on the disc.

## Editing the score

### Adding and deleting notes and rests

To add a note or rest, select the value you want by clicking on its icon in the window above or below the score. The selected item will appear with a frame around it, and when you move the pointer onto the score window, a 'trial icon' appears, which moves around as you move the pointer. When the item is in the position you want, click Select. To get rid of the trial icon without adding a note or rest to the score and without selecting an alternative trial icon, press Menu, move the pointer off the Menu and press Select.

You can place notes anywhere; above and below each staff they will create their own ledger-lines. In the case of notes with stems, the stem trails behind the trial icon: if the pointer is moved downwards, the stem will be above the note; if upwards, the stem will be below the note.

Rests will appear only in their valid positions, in the centre of the stave.

To delete a note or rest, select the icon for the same value, and position the trial icon exactly over the item you wish to remove (it doesn't matter whether the stem goes the same way or not). When it is in the right place, the trial icon will appear to blot out the original item. Click Select and the item will be deleted.

### Adding dots, accidentals, bars and ties

Select a lengthening dot in exactly the same way as a note or rest. Move the pointer over the note you wish to lengthen and click Select. To delete a dotted note, you do not have to delete the dot separately: delete the note and the dot will disappear too.

Select and place accidentals, bars and ties in the same way: like notes and rests, they will appear only in valid positions. A bar will be inserted across all the staves in the score when you click on one of them.

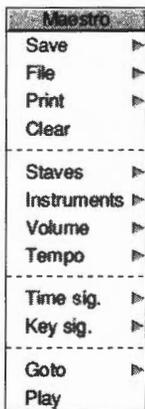
The tie character is of a fixed length, but when placed between notes of the same pitch, a single note will sound, with a duration equal to the two notes added together.

### Adding clefs and key and time signatures

You can select and place clefs like other items: they will appear only at the beginning of a bar.

You need to select key and time signatures before positioning them on the score. Use the Maestro menu to do this; the process is described on page 343 and page 344.

## The Maestro menu



As in any application, clicking Menu on the Maestro window will display the top-level menu.

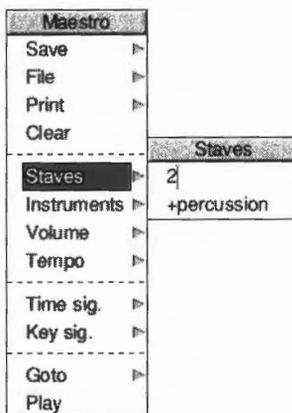
The **Save** procedure is exactly the same as for other applications such as Edit or Draw. Save a score by dragging the Maestro icon into the directory window where you want to save it, or by typing in the full pathname and clicking on **OK**.

**File** gives you some information about the file you are working on.

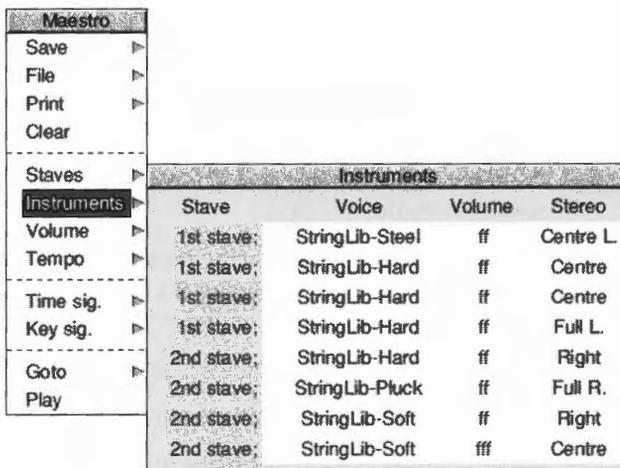
**Print** allows you to print your score.

**Clear** removes the current score from the stave but leaves the Maestro window on the screen.

**Staves** displays a box where you can enter the numbers 1, 2, 3 or 4 (others are not accepted), and an option **+percussion**. Clicking on this option will add a single line percussion stave; when it is selected, the menu item is ticked. Click on it again to remove the percussion stave.



**Instruments** presents you with a full window containing a line for each voice on each normal stave you have selected, and a single line for the percussion stave (if selected). If you click on **Instruments**, the window will stay on the screen. There is a maximum of eight voices: if you have selected more than two staves, they will be distributed roughly equally between staves. You can scroll this window vertically in the normal way.



You can change the following:

- **Voice** – Repeated clicking of Adjust takes you through the instruments available. Select takes you backwards through the options available.
- **Volume** – The volume of each voice can be set separately. Click Select to reduce the volume by one 'notch' and Adjust to increase it. To set the overall volume, use the **Volume** option on the main Maestro menu.
- **Stereo** – The position of each voice can be changed independently to any one of seven positions, so as to create a spread or stereo image when the music is played through more than one speaker. Click Select to move the voice to the left and Adjust to move it to the right.

If you have installed a MIDI expansion card in your computer, the **Instruments** box will have an extra column headed MIDI. The line for each instrument contains a figure 1 by default, indicating that it will play on MIDI channel number 1. Click on this number to change the channel number for each instrument. In addition, when a MIDI card is installed a **MIDI only** entry is added to the set of voices that appears when you click on the voice entry; choose this entry to prevent any sound being played through the computer's own speaker(s).

**Volume** enables you to set the overall volume on a scale from ppp to fff.

**Tempo** allows you to set the tempo on a scale from largissimo to prestissimo.

**Time signature** presents you with a small box containing a time signature.

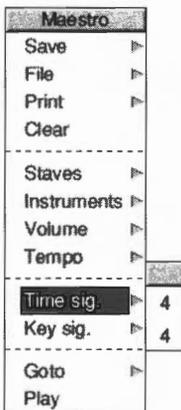
Position the pointer over the upper number; successive clicks cycle the values from 2 to 16. The lower number can take values of 2, 4, 8 and 16 only.

To assign a time signature to a score (or to add a new time signature in the middle of a score):

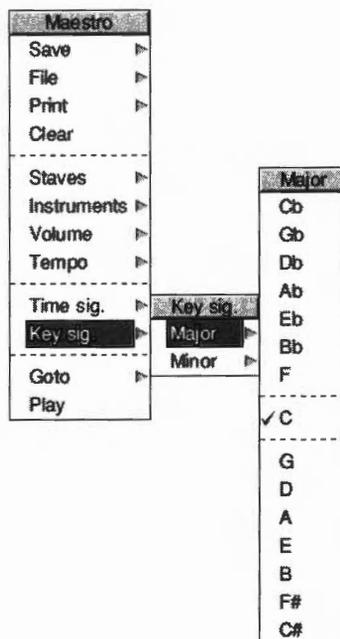
- 1 Make your choice using the Maestro menu.
- 2 Choose the '4/4' icon from the Maestro window.
- 3 Position the pointer where you want the time signature to appear.
- 4 Click Select.

The selected time signature will appear on all staves.

To delete a time signature, select the 4/4 icon, move the pointer onto the time signature and click Select.



Display the **Key signature** menu tree by choosing the **Key sig.** option.



The **Key signature** menu tree first asks you to choose between major and minor keys. Taking the major path offers you a set of key signatures with C at the centre, 'flat' key signatures grouped above and 'sharp' signatures below. For minor keys, A is at the centre.

To place a key signature at the beginning of a score, or at the beginning of a bar:

- 1 Make your choice using the Maestro menu.
- 2 Choose the 'key' icon from the Maestro window (the trial icon will appear in the form of the selected key signature).
- 3 Position the pointer where you want the key signature to appear and click Select.

The selected key signature will appear on all staves.

To delete a key signature, select the key icon, move the pointer onto the existing key signature and click Select.

**Goto** presents you with a box into which you type the number of the bar you wish to move to.

**Play** starts the tune playing from the point displayed on the screen. To stop, click on **Play** again.



Maestro tries to play these three notes in succession, not understanding that the first crotchet should start half way through the semibreve. Since the semibreve is long enough to complete the bar by itself, the two crotchets are lost. The solution is to write the top line like this:



This indicates to Maestro that the crotchet E starts half way through the bar. Problems of this type can generally be resolved by splitting notes into shorter notes tied together.

Note also that Maestro does not allow two rests in the same time slot on one staff, as is sometimes done in fugues to indicate that two parts are silent.

### **Staccato**

To achieve the effect of staccato, shorten the note value and make up the difference with a rest.

### **Grace notes and trills**

These are not implemented as such, but the effect can be achieved by entering notes of the appropriate small duration, and deducting their value either from the note they would normally be attached to (for an appoggiatura) or from the preceding note (for an acciaccatura). Very effective trills can be produced using an elaborated form of the same method.

## **Maestro's use of memory**

Maestro cannot extend its memory slot once it has started up. It therefore takes at least 256K, to allow for the editing of long transcriptions. However, if the Next slot in the Task manager is set to more than 256K, Maestro will use up all the space in Next. Since this may be more than you need, you can use the Task manager (described in *Managing the desktop* on page 57) to reduce Next to 256K, before loading Maestro.

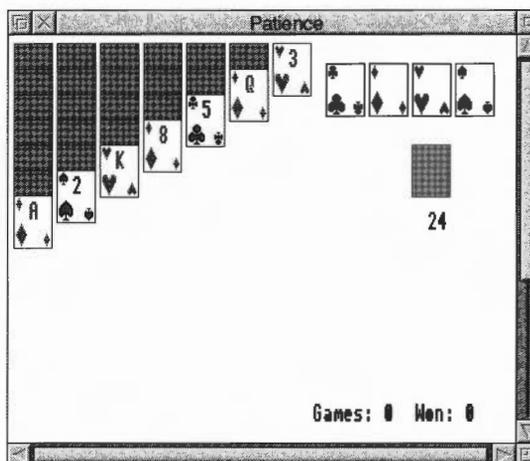


This version of Patience is probably the best-known version of the familiar solo card game.

## Starting Patience

Patience is in the Diversions directory on your hard disc or network. To start the application, double-click on the !Patience application.

To start the game, click on the Patience icon on the icon bar. The Patience window appears on the screen:

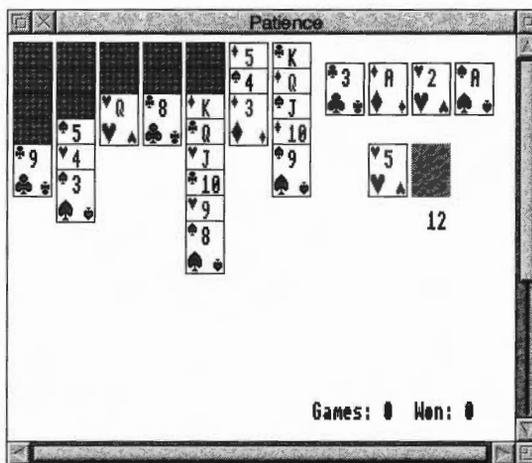


There are seven columns of cards, with the bottom card in each column turned up. The columns range in length from seven cards (on the left) to one (on the right). The rest of the pack is in a face-down 'pile' on the righthand side of the screen. A number below the pile tells you how many cards are face down. At the top righthand corner of the screen are four card outlines, each marked with the symbol for one of the suits.

## The rules

The object of the game is to place all four suits on top of their symbols in ascending order, starting with the ace and finishing with the king. To do this, you must reveal all the hidden cards by going through the pack and building chains of cards. Here are the basic rules:

- The chains you build downwards from each column must be in descending order (king, queen, jack, ten, nine, eight, seven, and so on) and must alternate between red and black suits (ten of hearts, nine of spades, eight of diamonds, seven of spades, for example). If you try to place a card incorrectly, the computer will refuse to move the card.
- When you move the top card from one column to another, the next hidden card is automatically turned up. You can move all or part of a chain to another column.
- There are only seven columns allowed in the game. If you have used up all the cards in one column you can only start a new column with a king.
- Once you have placed a card on one of the suit symbols (in ascending order) at the top righthand corner of the screen it cannot be taken off again.



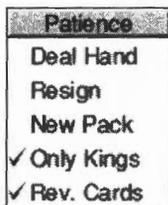
## Playing Patience

To play the game, proceed as follows:

- 1** Look at the cards which are revealed at the bottom of each column. If a card can be moved, use the mouse pointer to drag it to the correct place. When you release the button, the card will be in its new place and the next card turned up in the column where it came from. Continue this procedure until you have no more cards that can be moved.
- 2** Click on the pile of cards on the right, to reveal the next card (every third card in the pile is turned over). If you can use it, drag the card to the appropriate column. You may now be able to move one or more cards from one column to another. If you can't, click on the pile of cards again. If you can't use a card, continue clicking on the pack until one is revealed that you can use. When you use a card from the pack, the card beneath it is again revealed.
- 3** As soon as an ace is revealed, drag it to its place at the top righthand corner of the screen (alternatively, clicking Adjust on a card that can be added to one of these stacks automatically moves it to the correct stack). You can then start building (in ascending order from ace to king) as the cards that follow come up.
- 4** Continue going through the pack and moving cards. The number of cards left in the pack will continue to be indicated by the number below it. A grey rectangle indicates that you have gone through the pack once; click on it to go round again.
- 5** If you can't go any further and want to see where the hidden cards were, click Menu and choose **Resign**. If there are any cards left in the pack, you can see what they are by clicking on the pack; this will display each card in turn.

If you want to start a new game, choose **Deal hand** from the menu. If you do not wish to continue playing Patience, click on the Close box on the top lefthand corner of the window to finish.

## Varying the rules



You can vary the rules in two ways to make the game easier or harder, using two options displayed when Menu is pressed. These options are both on by default.

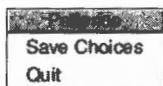
- **Only Kings** means that no cards other than Kings can be placed in empty columns. Switching this off makes the game very much easier; you can now move any card into an empty column.
- **Rev. Cards** refers to the process by which cards are turned over from the pack. The default is that when a group of three cards is turned over, their order is reversed as they are moved. This means that if you run through the pack twice, you will see two-thirds of the cards. Switching off **Rev. Cards** means that the cards are not reversed, so you will only see one-third of the cards, making the game much harder.

## Varying the Pack



You can vary the picture on the reverse of the cards by clicking on **New Pack** at any time during the game.

## Saving your choices



To save any changes permanently (such as the pictures on the backs of the cards, or whether only Kings can be placed in empty columns) choose **Save choices** from the icon bar menu.



**P**hotoView is a PhotoCD sample application which allows you to access the images on a PhotoCD disc. It is not supplied on all machines.

Using PhotoView to view and manipulate an image you can

- choose the display resolution of the selected image
- rotate the image through 0°, 90°, 180° and 270°
- flip the image in the vertical plane prior to rotation
- export the image in a choice of image formats
- save the image, or a selected area or the image, in a choice of image formats.

## Starting PhotoView

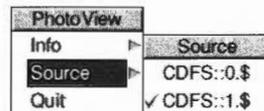


PhotoView is in the Utilities directory on your hard disc or network. To start the application, double-click on the !PhotoView icon. The application icon appears on the icon bar.

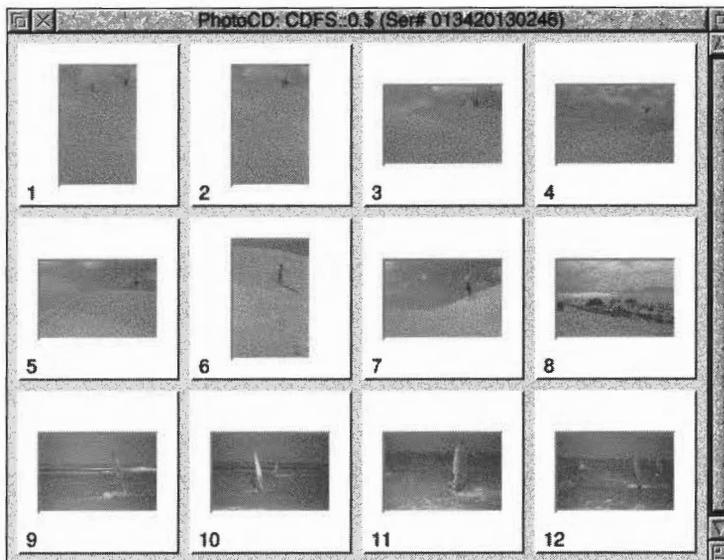
## Loading a contact sheet

A contact sheet is a PhotoCD directory display which contains a number of thumbnail images. A thumbnail is a small representation of an image; there is one thumbnail for each image stored on the PhotoCD disc. Thumbnails are numbered in order corresponding to the number of the stored image on the PhotoCD.

To open a contact sheet, click on the PhotoView icon on the icon bar. Alternatively, if you have more than one PhotoCD available, press Menu over the PhotoView icon bar icon, and choose the directory you want from the **Source** submenu:

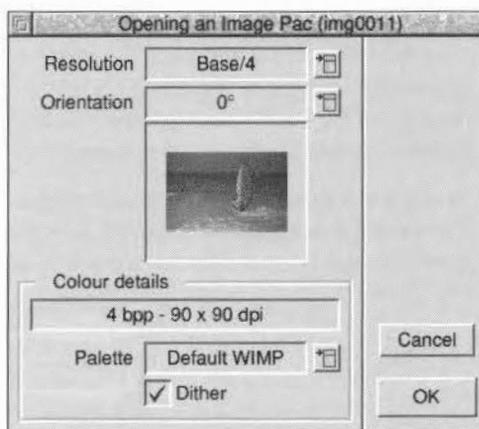


The contact sheet for the selected PhotoCD is opened on the desktop:



## Loading an image

Choose the image you want to load by clicking on its thumbnail. This opens a Control window containing the same thumbnail:



You use the control window to choose image display settings prior to displaying the image itself.

---

You can control

- the resolution at which the image will be displayed
- the orientation in which the image will be displayed
- the palette to be used to generate the image
- the use of dithering in the image generation.

The control window also displays the colour details (the colour depth in bpp, and the display resolution in dpi) of the current display mode.

Note that you cannot alter the current display mode within the control window.

### **Changing image resolution**

It is a good idea to work with a low resolution image in the desktop, and then export at a higher resolution if required. The higher the resolution of an image, the larger the size of that image, and the longer it takes to load and manipulate.

To change the resolution at which the image will be displayed:

- 1 Click on the menu icon to the right of the box containing the current resolution setting.
- 2 Choose the new resolution from the list displayed.

### **Changing image orientation**

By default, orientation is set to 0° for a landscape image, and 90° or 270° for a portrait image. To change the orientation at which the image will be displayed, click on the menu icon to the right of the box containing the current orientation setting. The list of orientations displayed includes four options with which you can flip the image in the vertical plane prior to rotation. Choose the new orientation from this list.

### **Changing the default palette**

By default, the palette used to generate the image is the default WIMP palette for the current display mode. To change the palette, click on the menu icon to the right of the box containing the current palette details, and choose another palette from the list displayed.

### **Enabling and disabling dithering**

By default, dithering during image generation is enabled. If you wish to change this setting, simply click on the button displaying the current setting. The legend on this button will toggle between a tick and a cross to indicate whether dithering is enabled or disabled.

## Displaying an image

To display an image:

- 1 Load the image by clicking on its thumbnail.
- 2 Set the display options you want to use, bearing in mind that the higher the resolution setting, the larger the size of the image, and the longer it will take to load and manipulate.
- 3 Click on **OK** (if at this point you don't want to continue, click on the control window's **Cancel** button instead).

### Manipulating a displayed image



Once you have displayed the image, further options become available via the **Image** menu. To display the **Image** menu, click Menu anywhere within the displayed image window.

The menu has the following options:

- **Image info** gives image details extracted from information pressed on the PhotoCD disc at the point at which the disc was pressed.  
If the disc was pressed in a single session, the Last Modified box contains a dash, otherwise it contains the date when the last session was written.  
If a copyright file is contained on the disc, the copyright filename is shown in the appropriate box. You can view the copyright information by clicking in the **Read Rights** button at the bottom of the window. If no copyright file is present, the Read Rights button is greyed out.
- **Save** displays a Save as box which allows you to save the image as a sprite file appropriate to the current display mode.
- **Export** displays the Export menu which offers you a choice of formats in which to export the current image.  
**Resolution** allows you to define the resolution at which the image is to be saved to disc.  
**Orientation** allows you to define the orientation at which the image is to be saved to disc.  
**24 bit sprite** allows you to save the currently selected image as a 24 bit sprite. 24 bit sprites give professional quality output on an appropriate printer (or other output device); This output is the best you can get.
- **Scale view** displays the Scale view control panel which allows you to specify the scale of the image view. You can choose from the six pre-defined scale options or type in your preferred scale. You can click on the arrowheads to make fine adjustments to the scale.

---

## Saving images to disc

It's worth bearing in mind that these images can use up an awful lot of storage space on your hard disc. If you're going to store PhotoView images, consider converting them to JPEG format using ChangeFSI. See page 319.

## Quitting PhotoView

To quit PhotoView, press Menu over the PhotoView icon on the icon, bar and choose **Quit**.

## Troubleshooting

You may encounter loading and display difficulties if you do not have enough free memory for the display. You need, for example, a colour card with 24MB of free memory to display an image at 16 base (the highest resolution) and 24-bit colour.

Warning messages are displayed when insufficient memory is available, and PhotoView will adjust the screen display accordingly:

- If you are loading a contact sheet, PhotoView will display as many thumbnails as it is able. Those images which could not be displayed are marked **N/A**.
- If you are attempting to display an image, PhotoView will offer you a scrolling partial image.

If you are warned that you are short of memory, it's best to quit PhotoView and then quit further running applications in order to free up more memory, before restarting PhotoView.





**P**uzzle is a simple move-the-tiles game. The object of the game is to move the tiles so that they are all in ascending order left-to-right and top-to-bottom.

### Starting the application

Puzzle is in the Diversions directory on your hard disc or network. To start the application, double-click on the !Puzzle application icon. The Puzzle window appears on the display.



The puzzle comprises fifteen number tiles and one space in a four-by-four grid. The object of the puzzle is to move the tiles into numerical order in four lines from the top left to the bottom right. Rearrange the tiles by clicking on any of the number tiles next to the space to move it into the gap.

To display a new board, press Menu when you are over the Puzzle window and choose **New board**.

If you want to learn how to solve the game you should look at the Help file supplied with the application. Here is what the completed puzzle looks like:





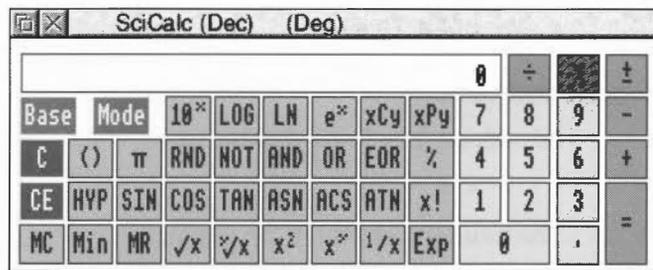


**S**ciCalc is a scientific calculator providing a range of scientific functions in addition to simple arithmetic ones.

## Starting SciCalc

SciCalc is in the Apps directory on your hard disc or network. To start the application:

- 1 Double-click on the !SciCalc application icon. The application icon appears on the icon bar.
- 2 Click on the icon bar icon to display the calculator window:



## Entering numbers

There are two ways of entering numbers into the calculator. You can use the mouse to move the pointer over the required key and then click, or you can use the keyboard directly. Clicking in the numeric display turns the title bar a cream colour, indicating that numbers and selected operators may be entered from the keyboard. When the title bar is grey, the keyboard does not affect the state of SciCalc.

If you use the numeric keypad, make sure that the Num Lock key is on. The keys in the numeric keypad are also equivalent to those on the calculator keypad.

## Arithmetic functions

These operate exactly like an ordinary calculator, except that you can enter numbers and operators (+, −, etc) either by clicking on the SciCalc display or by using the numeric keypad on the keyboard. When you enter a number it appears in the calculator's display. When you first load SciCalc it is set for normal **decimal** arithmetic (to base 10). This is denoted by the word (Dec) in the title bar.

### Rules of precedence

SciCalc treats the calculation you enter as a formula and does not perform the calculation until you click on the Equals button. SciCalc performs the calculation according to the precedence of operators. From highest to lowest; Multiply, Divide, Add and Subtract.

Multiplication takes place before addition so:

$$2 + 6 \times 5 = 32 \quad (\text{not } 40)$$

You can change the order of calculation by using brackets:

$$(2 + 6) \times 5 = 40$$

### Simple multiplication

To multiply 2 by 5 and view the result, enter the following in this order:

$$2 \times 5 =$$

The result will appear in the display.

### Changing the sign

The  $\pm$  key switches the sign of x.

### Calculating percentages

The percentage function operates as follows: to increase x by y percent, press:

$$x + y \%$$

To decrease x by y percent, type − instead of +.

### Clearing the last entry

Press **CE** to clear the current display. For example, pressing the following:

$$2 + 6 \times 3 \text{ CE } 5 =$$

calculates

$$2 + 6 \times 5 =$$

and thus gives the result 32.

## Erase all calculations - Clear

Press **C** to clear not only the display but also the whole input so far.

## Memory functions

SciCalc has a single memory. To enter the displayed value into the memory, press **Min**. To display the contents of the memory, press **MR**. To clear the memory, press **MC**.

## Advanced functions

### Calculating roots

To calculate the **square root** of  $x$ , press  $\sqrt{x}$ .

To obtain the  $y$ th root of  $x$ , press  $y\sqrt{x}$ , followed by  $y$ . For example, to calculate the fourth root of 52, click on the following keys:

52  $y\sqrt{x}$  4 =

which will display the result 2.685349614.

### Calculating squares and powers

To calculate the **square** of  $x$ , click on  $x^2$ .

To raise  $x$  to a power other than 2, click on  $x^y$  followed by the power you want to take. For example, to raise 52 to the power 4, click on the following keys:

52  $x^y$  4 =

which will display the result 7311616.

For example, to raise 10 to the  $n$ th power, press  $10^x$ . To raise  $e$  to the  $n$ th power, press  $e^x$ . ( $e$  is defined as 2.7182818).

### Calculating reciprocals and factorials

For the **reciprocal** of  $x$ , press  $1/x$ .

For  $x$  **factorial**, press  $x!$ .

### Calculating logarithms

To obtain the **logarithm** (base 10) of  $x$ , press **LOG**.

For the **natural logarithm** (base  $e$ ), press **LN**.

## Using brackets

To obtain a bracket, press **( )**. The same key produces a left or right bracket, whichever is appropriate in the context. For example, to calculate  $(2 + 3) \times 5$ , press

**( ) 2 + 3 ( ) x 5 =**

(There is only one level of brackets available.)

## Using $\pi$

To use  $\pi$  in a calculation, press  $\pi$ .

## Calculating exponents

To express  $x$  in exponent form, press **Exp** followed by  $y$ , the exponent. For example,

**50 Exp 4 =**

displays the result 500000.

## Trigonometric functions

Among the more advanced functions available in SciCalc are the standard trigonometric functions:

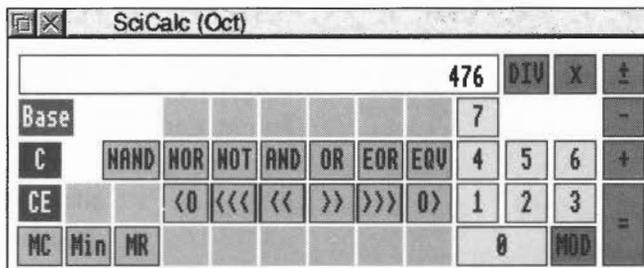
<b>SIN</b>	sine
<b>COS</b>	cosine
<b>TAN</b>	tangent
<b>ASN</b>	arcsine ( $\text{sine}^{-1}$ )
<b>ACS</b>	arccosine ( $\text{cosine}^{-1}$ )
<b>ATN</b>	arctangent ( $\text{tangent}^{-1}$ )

To obtain hyperbolic trigonometric functions, press **Hyp** before pressing the function button.

## Changing the number base

As already mentioned, when first loaded SciCalc normally works with decimals. Successive clicks on **Base** switch it to binary (base 2), octal (base 8) and hexadecimal (base 16) bases. The current base is shown in the Title bar. The calculator layout is modified to provide the input requirements for each base: for bases using fewer than ten characters, some are greyed out, while for hex, some of

the function keys are replaced with the necessary letters. In addition, when a function is not available in a base, it is greyed out. For example, in base 8 SciCalc looks like this:



**Base** provides a handy way of converting a number between bases. Once you have entered a number into the display, clicking on **Base** converts it successively to the other bases.

### Logic functions in the non-decimal bases

In the non-decimal bases – binary, octal and hexadecimal – the arithmetic functions are augmented by a **MOD** function. In addition, the scientific functions are replaced by logic functions: **NAND**, **NOR**, **NOT**, **AND**, **OR**, **EOR**, **EQV**, rotate, arithmetic shift and logic shift.

### Degrees, radians and gradians

You can switch between degrees, radians and gradians by clicking on the **Mode** button; the current unit is shown in the Title bar.

Changing from decimal to a non-decimal base rounds the currently displayed value to the nearest integer, but has no effect on previous parts of the current calculation. Rounding also occurs on numbers being recalled from memory in non-decimal bases.

## Keyboard short-cuts

### Calculator functions and their keyboard equivalents

Calculator	Keyboard	Function
0...9	0...9	numbers
+, -, x, ÷, =,	+, -, *, /, =	standard operators
	Return, Enter	same as =
±	#	change sign on number or exponent
Exp	E	allows entry of exponent
.	.	decimal point
10x, LOG, LN, eX		exponential and logarithmic functions
xCy		combination
xPy		permutation
()	(, )	brackets (one level only)
π		the number Pi
RND		random number between 0.0 and 1.0
NOT, AND, OR, EOR		logical functions
%	%	percentage
HYP (followed by a trig function)		hyperbolic functions
SIN, COS, TAN		trigonometric functions
ASN, ACS, ATN		inverse trigonometric functions
x!	!	factorial
√x		square root
y√x		Yth root of X
x <sup>2</sup>		square
x <sup>Y</sup>	^	X raised to the power Y
1/x		reciprocal
C	Delete	clear calculation
CE		clear current number only
MC		clear memory
Min		memory in
MR		memory recall
Mode		select radians/degrees/gradians
Base		select decimal/binary/octal/hexadecimal base

## Keyboard equivalents in non-decimal bases

Calculator	Keyboard	Function
NAND		NOT AND
NOR		NOT OR
EQV		NOT EOR (equivalence)
<O , O>		rotate left or right
<<< , >>>		logical shift left or right
<< , >>		arithmetic shift left or right
DIV		integer division
MOD		modulus (integer remainder)
A - F	A - F	hexadecimal base digits

## Operator precedence

Operators are evaluated in the following order of precedence (highest shown first):

- 1 unary operators
- 2  $y\sqrt{x}$
- 3  $x^y$
- 4  $xCy$ ,  $xPy$
- 5  $*$ ,  $/$ , DIV, MOD
- 6  $+$ ,  $-$
- 7  $<O, O>$ ,  $<<$ ,  $>>$ ,  $<<<$ ,  $>>>$
- 8 AND, NAND
- 9 OR, EOR, NOR, EQV

## Technical notes

SciCalc's accuracy is limited to that of BASIC VI – 64-bit floating point.

### Numeric range

Mode		Numeric range
Decimal	Real values	-9.9E99 to 9.9E99 entry -9.9E307 to 9.9E307 displayable
Binary	32bit signed	10000000000000000000000000000000 to 11111111111111111111111111111111
Octal	32bit signed	20000000000 to 17777777777
Hexadecimal	32bit signed	80000000 to 7FFFFFFF

### Accuracy

Mode	Accuracy	Number of digits displayed
Binary	Absolute	32
Octal	Absolute	10 - 11
Hexadecimal	Absolute	8
Decimal	64 bit FP	10 or 10 + 2 digit exponent

**Note:** Real number underflow is not trapped.

## Saving features in a Desktop boot file



You may wish to change some aspects of the way SciCalc operates. For example, the position of the SciCalc window when it is opened, the number base it uses and the angle mode.

These features are stored by setting up SciCalc as you wish to use it, and then saving the features by creating a Desktop boot file; instructions on how to create a Desktop boot file are given in *Configuring applications* on page 403.

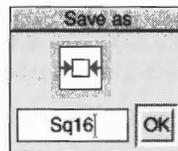
**S**quash is a simple application that compresses files and directories. Compression means that they take up less disc space, enabling more files to be fitted onto a floppy or hard disc.

## Starting Squash

Squash is in the Apps directory on your hard disc or network. To start the application, double-click on the !Squash application icon. The Squash icon appears on the icon bar.

## Compressing a file

- 1 Drag the file that you wish to compress onto the Squash icon on the icon bar. This displays the Squash Save as box.



- 2 Drag the icon from the Save as box to the directory display in which you want to save the compressed file. If you want to save it with a different filename, first change the name in the Save box.

If you want to replace the original file with the compressed version of the file, just click on the Save as **OK** box instead. The compressed file uses the squashed file icon.

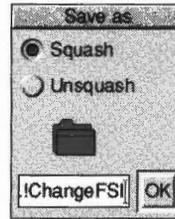
## Decompressing a file

- 1 Drag the Squashed file that you wish to decompress onto the Squash icon on the icon bar. This displays the Squash Save as box.
- 2 Drag the icon from the Save as box to the directory display in which you want to save the decompressed file. If you want to save it with a different filename, first change the name in the Save box.

If you want to replace the compressed file with the original file, just double-click on the Squashed file and it is replaced by the uncompressed file.

## Compressing a directory or application

- 1 Click Menu over the Squash icon bar icon and choose **Squash Apps**. This allows applications to be squashed. If you don't want applications to be squashed make sure this option isn't ticked.
- 2 Drag the directory or application onto the Squash icon on the icon bar. This displays the Save as box with two options, **Squash** and **Unsquash**.



- 3 Click on **Squash** to compress the entire contents of the directory or application.
- 4 Drag the icon from the Save as box to the directory display in which you want to save the compressed directory or application.  
If you want to replace the original directory or application with the compressed version, just click on the Save as **OK** button instead.

The directory icon and applications icon are not replaced by the squash icon when their contents are squashed.

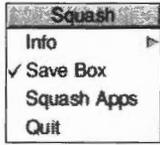
**Note:** You can't use compressed applications: you must decompress them first.

## Decompressing a directory or application

- 1 Drag the Squashed directory or application onto the Squash icon on the icon bar. This displays the Squash Save as box with two options, **Squash** and **Unsquash**.
- 2 Clicking on **Unsquash** will decompress the entire contents of the directory or application.
- 3 Drag the icon from the Save as box to the directory display in which you want to save the decompressed directory or application.

To replace the compressed directory or application with the decompressed version, just click on the Save as **OK** button.

## Icon bar menu



### Info

This gives you information about the application.

### Save box

When the Save box is ticked (normally) each compression (or decompression) prompts you with a Save as box. If you are converting a large number of files, you can use this option to turn off the Save box. Turning off the Save box allows all files and directories to overwrite the original versions during the conversion process.

### Squash Apps

If you choose this option, then when you drag a directory onto the Squash icon, any applications in the directory (or any subdirectories) are also squashed.

This option is not selected by default; Squash does not compress applications it finds in subdirectories.

Applications that are dragged to the Squash icon will always be squashed.

### Quit

Quit ends the Squash application, removing the Squash icon from the icon bar.

## Checking your archive

As with any archival mechanism, you should check that you can correctly compress and decompress back to the original size any information which is valuable or difficult to replace. Make a copy of the file before you compress it.

## Exceptions

Occasionally Squash decides not to compress a file. This is usually because either the file is already compressed in some way that would make squashing it uneconomic or because the file is so small that squashing it would make no difference to the amount of disc space used.



# Appendices



Usually you will use the RISC OS desktop for almost all of your computing tasks. However occasionally you may need to use the command line.

\*

The command line is very different from the desktop. Gone are the windows, icons and menus. These are replaced by a set of single line commands that always start with a star, the Star Commands (known as \*commands).

All the commands are described, in alphabetical order, in the file **StarComms** in the **Tutorials** directory. Alternatively, see *Getting Help* on page 378.

Using the command line you can run scripts. Scripts are small programs (which you usually write in Edit) that help you control the computer. The command line is also used to issue operating system commands from BASIC.

This chapter gives you an introduction to the command line. The RISC OS 3 *Programmer's Reference Manual* expands on all the information given in this chapter.

## Accessing the command line



The following options on the Task manager icon bar menu give you access to the command line.

### New task

To start a new task, move to the **New task** submenu of the Task menu. This produces a box into which you can type any Command Line command. If the command causes a task that is not a desktop application to run, any output from the task will be displayed in a new window; other tasks will be suspended until this task has completed. If the task is a desktop application, starting it from the **New task** submenu is equivalent to double-clicking on the application.

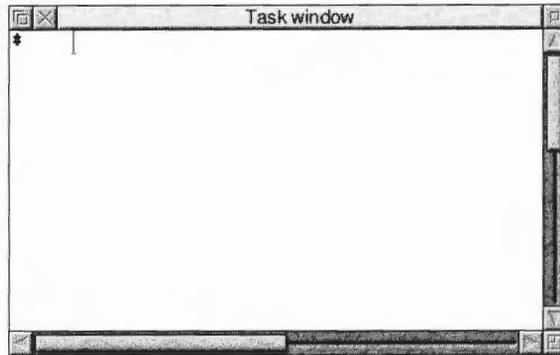


## \* **Commands**

By choosing \* **Commands** from the Task menu, you can enter Command Line Mode. A \* prompt appears at the bottom of the screen, and you can enter operating system commands. To return to the desktop, press Return (↵) at a \* prompt without entering any other characters on the line. Pressing F12 is equivalent to choosing \* **Commands** from the Task Manager menu.

## **Task window**

This option allows you to use Command Line mode in a window. If you ever have to use the command line for more than a single command, this is the best way to do it. To open the window, choose **Task window** from the icon bar menu. You can have more than one Task window open. When you open a task window, you will see the \* prompt. You can now enter operating system commands in the window.



## **Exit**

Clicking on **Exit** causes the desktop and all tasks to be closed down and replaced by the command line. You can restart the desktop by typing **desktop** at the \* prompt, and then pressing Return (↵).

## **Command line mode**

The star (\*) prompt indicates that you are in command line mode and that the computer is expecting a command to be typed. Note that command line mode is sometimes called 'Supervisor mode' (for example, when the machine starts up in command line mode).

The commands in this guide are always preceded by a star. The star is provided as a prompt in command line mode, so you do not have to type it (though it does not matter if you do: any extra stars are ignored). However, if you type a \* Command following some other prompt (at the BASIC > prompt, for example), you must precede it with a star so that the computer knows how to interpret what follows.

## Pausing on a full screen

If you are using the command line mode and you want to display a large amount of information you can set the system to pause at each full screen. Do this by typing Ctrl-N. Use the Shift key to scroll through the screenfulls. Ctrl-O removes this feature; the display no longer pauses. This does not apply to Task windows.

## Starting BASIC from the command line

Enter BASIC by typing **\*BASIC** from the command line. The prompt will change from **\*** to **>**. To confirm that you are in BASIC, type in the following one-line program (must be typed using capital letters):

```
FOR N=1 TO 20: PRINT "HELLO": NEXT N (press Return)
```

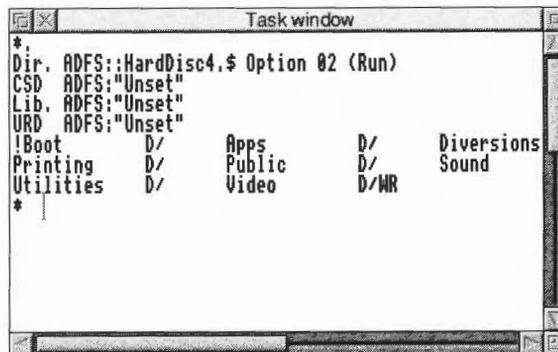
This will cause the word **HELLO** to be printed twenty times. Leave BASIC by typing **QUIT** or **\*Quit**.

For information on using BASIC, turn to BBC BASIC on page 413.

The BBC BASIC *Reference Manual*, available from your supplier, is a complete reference guide for the BBC BASIC language.

## Using the Task window

The Task window allows you to use the command line within a window. To open a Task window, choose **Task window** from the Task manager icon bar menu. When you open a Task window, you will see a **\*** prompt. You can now enter commands in the window just as if you were using the command line itself. Like any other application, you can have more than one Task window at the same time.



The major advantages in entering commands in a Task window instead of at the command line prompt are:

- Other applications continue to run in their own windows while you run the task. (This does mean, though, that the task may run more slowly than it would using other methods of reaching the command line.)
- Commands that you type, plus the output (if any), appear in a conventional Edit type window, and may therefore easily be examined by scrolling up and down in the usual way. When you type into the window, or when a command produces output, the window immediately scrolls to the bottom of the text. Anything you type in is passed to the task, and has the same effect as typing whilst in command line mode.

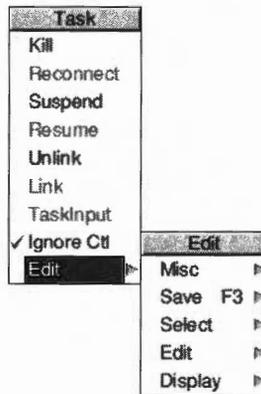
You can change this by **unlinking** the window: in this case, anything you type in alters the contents of the window in the same way as any other Edit window, even while a task is running. Keyboard short-cuts only operate if the window is unlinked.

You can also supply input to a task window by selecting some text from any text file and choosing **TaskInput** from the task window menu.

You cannot use graphics in a task window. If the **Ignore Ctl** option is not chosen, the output of any commands that use graphics will appear as screen control codes.

The Task window is controlled by Edit, so don't be surprised if you see the Edit icon on your icon bar.

The menu for a Task window contains the following options:



**Kill** stops and destroys the task running in the window. **Reconnect** starts a new task in the window, allocating memory from the Task manager's **Next** slot.

**Suspend** temporarily halts the task running in the window. **Resume** restarts a suspended task.

**Unlink** prevents the sending of typed-in characters to the task. Instead, they are processed as if the task window were a normal Edit text window. **Link** reverses the effect of **Unlink**.

**TaskInput** reads task input from the currently selected block.

**Ignore Ctl**, when selected, prevents any control characters generated by the program from being sent to the screen.

**Edit** leads to the normal Edit menu. Although this makes available most of Edit's features, you cannot use facilities such as the cursor keys or keys such as Page Up and Home while you are using a task window. If you want to use Edit's keyboard short-cut features, **Unlink** the window first.

### Memory requirements

The amount of memory that the Task window uses is controlled by the size of the Next slot in the Task manager window. If you need a lot of memory for the Task manager, you can increase the Next slot size.

## Some guidelines and suggestions for using Task windows

To use a Task window, you will need to be familiar with command line mode. However you will also find that nearly all of the commands that affect the configuration of the desktop can also be performed using the application **!Boot** and the Task manager window **Tasks**.

Here are a few commands:

- **\*Cat** gives a directory listing of the current directory.
- **\*Show** displays information about your computer. Press Shift to display the next screenful as necessary (or scroll a Task window).
- **\*Modules** shows you which versions of modules are currently loaded.
- **\*ROMModules** shows you which modules are stored in the ROM inside the computer.
- **\*Status** shows you the status of the computer's CMOS memory defaults.

The command **\*Spool** should not be used from a task window. Because its effect is to write everything that appears on the screen to the spool file, using **\*Spool** from the desktop will produce unusable files full of screen control characters. There is, in any case, no point in using **\*Spool**, since the output from the task appears in the window, and can be saved using Edit as normal.

When you run a command in a Task window, the computer divides its time between the Task window and other activities running in the desktop. Note that some time-consuming commands may prevent access to the filing system until the command is complete.

**Note:** Command line notions such as 'current directory' become relevant when you are using Task Windows.

**Note:** Using the \*Copy command in a task window may lead to Filer error. Only use \*Copy from the command line prompt (press F12).

All of these commands are described in detail in the file **StarComms** in the **Tutorials** directory.

## Getting Help

The command **\*Help** gives brief information about each command in the operating system. **\*Help keyword** displays a brief explanation of the keyword and, if the keyword is a command name, the syntax of the command.

If you are not sure about the name of a command:

- \*Help Commands** will list all the available utility commands;
- \*Help FileCommands** will list all the commands relating to filing systems;
- \*Help Modules** will list the names of all currently loaded modules, with their version numbers and creation dates;
- \*Help Syntax** explains the format used for help messages.

The usual use of \*Help is to confirm that a command is appropriate for the job required, and to check on its syntax (the number, type and ordering of parameters that the command requires).

When you issue the \*Help command at the normal command line prompt, 'paged mode' is switched on: the computer displays a screenful of text, then waits until you press Shift before moving on (in a Task window, you just scroll).

The specification of the keyword can include abbreviations to allow groups of commands to be specified. For example,

**\*help con.**

produces information on \*Configure and \*Continue. You can also use this to establish the current abbreviation for a command. Since RISC OS uses the first command it finds that matches an abbreviation, typing \*Con. is equivalent to \*Configure. For the \*Continue command, the minimum abbreviation must distinguish it from \*Configure, and is therefore \*Cont. These abbreviations may change as new commands are added.

## Using the command line

You'll find many hints in the following sections:

- *Command line syntax*, detailing the syntax you need to use within the command line.
- *System devices*, giving you a summary of useful system devices you can use.
- *System variables*, explaining how variables are used by the operating system.
- *Command and application options and other variables*, explaining how to use variable options with commands and applications.
- *Command scripts*, showing you how to write Command and Obey files to control the computer.
- *Using GS formats in scripts*, showing the formats used to handle control characters.

## Command line syntax

The interface to the command line is built into the RISC OS operating system and processes valid commands sent as text strings. The text string is normally terminated by Return.

The syntax of each command in the following chapters is described in a standard way, with examples of its use where these are helpful. The symbols used in syntax descriptions are:

- |                      |  |
|----------------------|--|
| <b>&lt;value&gt;</b> | indicate that an actual value must be substituted. For example, <b>&lt;filename&gt;</b> means that you must supply an actual filename. |
| <b>[...]</b>         | indicate that the item enclosed in the square brackets is optional.  |
| <b> </b>             | indicates alternatives. For example, <b>0   1</b> means that the value 0 or 1 must be supplied.  |

## What are parameters?

RISC OS commands are sometimes followed by one or more *parameters* which tell the computer how you want the command to be modified.

In the following descriptions, the parameters are in italics. You can leave spaces only **between** parameters, since otherwise the operating system cannot tell where you want one parameter to end and the next to begin.

Command line parameters may be optional: in this case they are shown in the syntax within square brackets. Often, when a parameter is specified as optional, the operating system will supply a default value; the value of this is specified for each command.

## Numeric parameters

Some commands have one or more numeric parameters. These are interpreted as decimal by default (unless the description of the command specifies otherwise), but it is possible to express them in any base by prefacing the parameter itself with the base followed by an underscore, as in the following examples:

**\*Eval 2\_1010101** Returns the integer value of the argument, 85.

**\*Eval 16\_FFF** Similarly, returns the value 4095.

An alternative form for hexadecimal uses the & sign to signify base 16:

**\*Eval &FFF**

Decimal and hexadecimal are likely to be the most useful bases.

## Wildcards

It is useful in many command line operations to specify objects using 'wildcards'. There are two wildcards:

\* stands for zero or more characters  
# stands for a single character

### Examples

**he\*** would stand for *he, help, hello, or hencoop*  
**he\*p** would stand for *help or hencoop*  
**he##** would stand for *help, hens or head*, but not *hen* or *health*

## Checks on the command

Before a command is executed, the command line interface carries out a certain amount of pre-processing on the line:

- Stars and spaces are skipped at the start of a command. The command line prompt includes a star, so there is no need to type one, but it doesn't matter if you do.
- Comment lines are ignored. Comments are introduced by typing '|' as the first non-space character on a line.
- Command length is checked. Command lines must be less than or equal to 256 characters, including the terminating character. Lines which are too long produce an error message.
- Redirection (output to a file, or input from a file) is checked.
- Single-character prefixes are checked, such as '/', equivalent to Run, or '%' which instructs the command line interface to skip alias checking.

- Alias commands are checked. (*System variables* on page 383 gives more information on the use of aliases.)
- The command is passed for execution. Commands offered to the command line interface are looked up in the OS table, passed to any other modules, the filing system manager, and finally \*Run as a file of the name given, in an attempt to execute the command.

Full details of this checking are given in the *RISC OS Programmer's Reference Manual*.

## File redirection

A powerful feature of RISC OS is the ability to redirect input or output streams (or both) for the duration of the command. By default, output is directed to the screen, but it may be convenient to redirect the output stream to a file so that you can examine it later in more detail, or process it further.

The format of a redirection is:

```
<command> { <redirection spec> }
```

where the **<redirection spec>** is at least one of:

> <filename>	Output goes to <b>filename</b> .
< <filename	Input read from <b>filename</b> .
>> <filename	Output is appended to <b>filename</b> .

Note the following:

- Spaces in the redirection specification are significant.
- The braces are a literal part of the redirection format.
- There must be a single space between each pair of elements for it to be recognised as a redirection.

Examples

```
*Cat { > mycat }
```

This sends a list of the contents in the current directory to a file called **mycat**.

```
*Help Cat { > CatHelp }
```

This sends all the help information on the \* command Cat, (elicited by the command **\*Help Cat**) to a file called **CatHelp**.

## System devices

The operating system contains a number of useful system devices, which behave like files in some ways. You can use them anywhere you would normally use a file name as a source of input, or as a destination for output. These include:

### System devices suitable for input

<b>kbd:</b>	the keyboard, reading a line at a time (this allows editing using Delete, Ctrl-U, and other keys)
<b>rawkbd:</b>	the keyboard, reading a character at a time
<b>serial:</b>	the serial port
<b>parallel:</b>	the parallel port
<b>null:</b>	the 'null device', which effectively gives no input

### System devices suitable for output

<b>vdu:</b>	the screen, using GSRead format (see page 395)
<b>rawvdu:</b>	the screen, via the VDU drivers
<b>serial:</b>	the serial port
<b>parallel:</b>	the parallel port
<b>printer:</b>	the currently configured printer
<b>netprint:</b>	the currently configured network printer
<b>null:</b>	the 'null device', which swallows all output

These system devices can be useful with commands such as `*Copy`, and the redirection operators (`>` and `<`):

<b>*Copy myfile printer:</b>	Send <code>myfile</code> to the printer
<b>*Cat { &gt; printer: }</b>	List the files in the current directory to the printer
<b>*Cat netprint:</b>	Display the currently selected network printer and a list of available network printers.

The system device `null:` is useful to suppress unwanted output from a command script or program:

**\*myprogram { > null: }** Runs `myprogram` with no output

The most useful system devices for the general user are likely to be `printer:` and `netprint:`

## !Run and !Boot files within applications

If you Shift-double-click on an application you'll see a !Run file (it has the file type Obey). An application's !Run file is obeyed whenever you start the application. This file sets up the application's environment, loads any resources it requires and then starts the application code (often called !Runimage).

The application also contains a !Boot file, this is used when the application is first 'seen'. This occurs when the directory containing the application is displayed on the screen. The !Boot file sets up the application sprite used in the directory display.

### Using !Draw as an example

Most !Boot and !Run files have lines containing Set commands. For example, !Draw sets up variables that include a RunType and a PrintType for the normal DrawFile file type &AFF.

Draw also sets up a variable called Draw\$Dir which sets up the computer to remember where the Draw application is on the computer. It uses another variable called Obey\$Dir, this contains the path of the directory in which the current obey file is running.

You will find all these variables explained in greater detail later in this chapter.

## What is a module?

A module is a piece of software that is loaded into memory. A section of memory is reserved for use by modules and is known as the RMA (relocatable module area).

If you look at the !Run file of !Draw you'll see some RMEnsure commands are used these particular commands make RISC OS check the named module is present in the RMA.

## System variables

### Introducing system variables

System variables are used by RISC OS to store settings that control the behaviour of the computer. For example, they store how you like the time and date to be printed, how you want the \*Copy command to work, and what prompt you like.

However, unlike configuration features, your settings for system variables are not preserved when you switch the computer off or reset it. When you do this, the computer always goes back to the default values for the standard set of system

variables, but if you have a Desktop boot file loaded, your favourite settings will be kept. You can see these default values by typing \*Show just after switching on your computer.

In addition to RISC OS system variables, applications commonly use variables of their own, to control their default behaviour. For example, Edit uses variables to store your choices of display font, background colour and so on. Where there are such variables, they are listed in *Configuring applications* on page 403. Some suggestions for using them are also included later in this chapter.

### **Setting variables in a Boot file**

If the default values are not the ones you want, you can change them using the \*Set command. The computer does not remember system variables between sessions, so if you want different default values you must change the variable each time you use your computer. Rather than typing them each time by hand, you can include the \*Set commands in a boot file (a file that is run each time you use the computer).

However, although you could create such a boot file 'by hand', typing it in Edit, a much easier way is to use the Task manager's Desktop boot facility, described in *Customising the desktop start-up procedure* on page 47. You will then not need to understand anything about system variables as such, since you can simply set up the desktop the way you want it and make a Desktop boot file. Creating your own boot file by editing one created by the Task manager is the easiest way to start.

### **Referring to variables**

Each variable is accessed by its name, which can contain any character which is neither a space nor a control character. As with filenames, the case of characters is remembered, but is ignored when the names are looked up.

### **What are variables for?**

RISC OS uses the values of variables to make the desktop work. When you double-click on a file (not an application), RISC OS looks up the alias for RUNning that file type in the variable list. If it finds a match, the command stored in the variable (for example RMLoad %\*0) is executed, substituting the name of the file in place of the marker %\*0; otherwise an error box is displayed.

In general, files which are displayed as white squares (they have no file type icon) will give this error if you try to use them in this way.

## Application variables

There are many different system variables provided and used by RISC OS, as well as some which may be added by applications. You can see them all by typing `*Show` (use Shift to display each successive screenful).

The following section gives standard names used for some of the variables that are connected to a particular application.

### **App\$Dir**

An `App$Dir` variable gives the full pathname of the directory that holds the application `App`. This is typically set in the application's `!Run` file by the line:

```
Set App$Dir <Obey$Dir>
```

### **App\$Path**

An `App$Path` variable gives the full pathname of the directory that holds the application `App`. An `App$Path` variable differs from an `App$Dir` variable in two important respects:

- The pathname includes a trailing `'`
- The variable may hold a set of pathnames, separated by commas.

It's common to use an `App$Dir` variable rather than an `App$Path` variable, but there may be times when you need the latter.

An `App$Path` variable might, for example, be set in the application's `!Run` file by the line:

```
Set App$Path <Obey$Dir>.,%.App.
```

if the application held further resources in the subdirectory `App` of the library.

### **App\$Options**

An `App$Options` variable holds the start-up options of the application `App`:

- An option that can be either on or off should consist of a single character, followed by the character `'+'` or `'-'` (e.g. `M+` or `S-`).
- Other options should consist of a single character, followed by a number (e.g. `P4` or `F54`).
- Options should be separated by spaces; so a complete string might be `F54 M+ P4 S-`.

This variable is typically used to save the state of an application to a Desktop boot file, upon receipt of a desktop save message. A typical line output to the boot file might be:

```
Set App$Options F54 M+ P4 S-
```

An application should only save those options that differ from the default, so there will be no line at all if the application is in its default state.

### **App\$PrintFile**

An *App\$PrintFile* variable holds the name of the file or system device to which the application *App* prints. Typically this will be **printer:**, and would be set in your application's !Run file as follows:

```
Set App$PrintFile printer:
```

## **Changing and adding commands**

### **Alias\$Command**

An *Alias\$Command* variable is used to define a new command named *Command*. For example:

```
Set Alias$Mode echo |<22>|<%0>
```

By using the name of an existing command, you can change how it works.

## **Using file types**

### **File\$Type\_XXX**

A *File\$Type\_XXX* variable holds the textual name for a file having the hexadecimal file type XXX. It is typically set in the !Boot file of an application that provides and edits that file type. For example:

```
Set File$Type_XXX <TypeName>
```

The reason the !Boot file is used rather than the !Run file is so that the file type can be converted to text from the moment its 'parent' application is first seen, rather than only from when it is run.

### **Alias\$@LoadType\_XXX, Alias\$@PrintType\_XXX and Alias\$@RunType\_XXX**

These variables set the commands used respectively to load, print and run a file of hexadecimal type XXX. They are typically set in the !Boot file of an application that provides and edits that file type. For example:

```
Set Alias$@PrintType_XXX /<Obey$Dir> -Print  
Set Alias$@RunType_XXX /<Obey$Dir>
```

**Note:** The above lines **both have a trailing space** (invisible in print!).

The reason the !Boot file is used rather than the !Run file is so that files of the given type can be loaded, printed and run from the moment their 'parent' application is first seen, rather than only from when it is run.

## Setting the command line prompt

### CLI\$Prompt

The CLI\$Prompt variable sets the command line interpreter prompt. By default this is '\*'. One common way to change this is so that the system time is displayed as a prompt. For example:

```
SetMacro CLI$Prompt <Sys$Time> *
```

This is set as a macro so that the system time is evaluated each time the prompt is displayed.

There's more on this in *Creating your own command line prompt* on page 389.

## Configuring RISC OS commands

### Copy\$Options, Count\$Options and Wipe\$Options

These variables set the behaviour of the \*Copy, \*Count and \*Wipe commands. For a full description type **\*Help command** at the command line.

## System path variables

### File\$Path and Run\$Path

These variables control where files are searched for during read operations or execute operations. They are both path variables, which means that – in common with other path variables – they consist of a comma-separated list of full pathnames, each of which has a trailing '.'.

If you wish to add a pathname to one of these variables, you must ensure that you append it once, and once only. For example, to add the 'bin' subdirectory of an application to Run\$Path, you could use the following lines in the application's !Boot file:

```
If "<App$Path>" = "" then Set Run$Path <Run$Path>,<Obey$Dir>.bin.
Set App$Path <Obey$Dir>.
```

## Obey files

### Obey\$Dir

The Obey\$Dir variable is set to the directory from which an Obey file is being run, and may be used by commands within that Obey file.

## Time and date

### Sys\$Time, Sys\$Date and Sys\$Year

These variables are code variables that are evaluated at the time of their use to give, respectively, the current system time, date and year.

### Sys\$DateFormat

The Sys\$DateFormat variable sets the format in which the date is presented by some commands.

## !System and !Scrap

### System\$Dir and System\$Path

These variables give the full pathname of the System application. They have the same value, except that System\$Path has a trailing '.', whereas System\$Dir does not. You must not change these values.

(There are two versions of this pathname for compatibility with some old applications). !System and !Scrap are contained in the !Boot application.

### Wimp\$Scrap

The Wimp\$Scrap variable gives the full pathname of the Wimp scrap file used by the file transfer protocol. You must not use this variable for any other purpose, nor change its value.

### Wimp\$ScrapDir

The Wimp\$ScrapDir variable gives the full pathname of a scrap directory within the Scrap application, which you may use to store temporary files. You must not use this variable for any other purpose, nor change its value.

## The desktop

### Wimp\$State

The Wimp\$State variable shows the current state of the Wimp. If the desktop is running, it has the value 'desktop'; otherwise it has the value 'commands'.

## Command and application options and other variables

Some commands, such as `*Copy` and `*Wipe`, can operate in a variety of ways. For example, you can effectively turn `*Copy` into a `Move` command by setting the `D(elete)` option, which deletes the source file after copying it to another directory or filing system. You would do this by typing

```
*Set Copy$Options <Copy$Options> D
```

at the command line prompt. These options are described in the entries for each command in the file `StarComms` in the `Tutorials` directory.

Several applications, such as `Edit`, `Draw`, `Alarm` and `Paint`, also use system variables to record, for example, whether you want the `Paint` colours window to appear automatically when you open a sprite window, or whether you want the toolbox to be displayed by default in `Draw`. Such variables use the format `App$Options`, where `App` is the name of the application in question. These variables will only be listed in the computer's response to the `*Show` command if you have changed them from their default values.

In addition to 'options', applications may use other variables for a variety of purposes. For example, `Acorn Desktop Publisher` needs to know where its 'Work' directory is. It will find this out when the `Work` directory has been displayed on the screen, and it assigns the directory's pathname to the variable `dtp$WorkDir`. To avoid having to carry out this action each time you use the application, you can put a `*Set` command identifying the directory in your boot file, for example:

```
*Set dtp$WorkDir <Obey$Dir>.WorkDir
```

### Creating your own command line prompt

You can use a system variable to change the operating system prompt – normally `*` – by setting the variable `CLI$Prompt` to (for example) the character `#`:

```
*Set CLI$Prompt #
```

You can also set one variable to the value of another:

```
*Set CLI$Prompt <Sys$Time>
```

This sets the prompt to the system time, but only does so once, when the command is given. However, it would clearly be more useful if the prompt always showed the current time. To do this, change `CLI$Prompt` from a variable into a macro. A macro is similar to a variable, but is evaluated every time it is used, instead of just once when it is set. Therefore, type the following:

```
*SetMacro CLI$Prompt <Sys$Time> *
```

Each time Return is pressed at the command line prompt a new prompt is given (unless you have not typed anything since the last Return; you will then be returned to the desktop); the current time is worked out and displayed, followed by a space character and an asterisk:

```
12:59:06 *
12:59:07 *
12:59:08 *
```

## Other uses for system variables

The names of commands may be changed using the \*Set command with variables whose name starts *Alias\$...* This allows you to add new commands, to change the meaning of existing commands, to combine commands together, and to add your own parameters to a command.

Programmers can use system variables to pass values between programs. One program can create and write to a variable which another program can then read. Such variables should have names starting *App\$*, where *App* is your program; this avoids problems caused by different programs using the same system variable names.

## Command scripts

Command scripts are files of commands that you would normally type in at the command line prompt. There are two main uses for such files:

- To set up the computer to the state you want, either when you switch on or when you start an application.

This type of command script is commonly known as a boot file, because it is used to 'boot up' the computer. You can create such a file without needing to know anything about the command line, using the **Desktop boot** facility in the Task manager, described in *Customising the desktop start-up procedure* on page 47.

- To save typing in a set of commands you find yourself using frequently. For example, if you often want to display information about a file and then print it, you can combine the commands \*FileInfo and \*Type into a command script.

You may find using an *Alias\$...* variable to be better for the second case. The main advantage of using variables rather than command files is that they are held in memory and so are quicker in execution; however, they are only really suitable for short commands. If you use variables you will probably still want to use a command file to set them up when you switch on.

## Command and Obey file types

There are two types of file you can use for command scripts: Command files, and Obey files. The differences between these two file types are:

- An Obey file is always passed to the command line interpreter, whereas a Command file is passed to the current input.
- An Obey file is read directly, whereas a Command file is treated as if it were typed at the keyboard (and hence usually appears on the screen).
- An Obey file sets the system variable `Obey$Dir` to the directory it is in.
- An Obey file can have parameters passed to it.

The differences between Command and Obey files is explained in an example on page 393.

Additionally there are the `TaskExec` and `TaskObey` file types. These are very similar to Command and Obey files. Their main advantage is that they multi-task under the desktop:

- A `TaskExec` file is \*Exec'd in a task window.
- A `TaskObey` file is \*Obey'd, opening a task window only if needed for I/O. It quits the window when finished.

## Creating a command script

A command script can be created using any text or word processor. If you created the file using Edit, you should set the file's type by pressing Menu over the Edit icon on the icon bar and choosing the desired file type, such as Command or Obey.

When you save the file you should consider in which directory you will save it. By default, files are looked for first in the current directory, then in the library. Therefore, if you want to avoid having to type the full pathname of the file every time you run it you should save it in one of the following:

- The directory from which the command script will be run (typically your root directory, or an application directory).
- The library. The library is typically `$.Library`, but may be `$.ArthurLib` on a network.

## Running the script

Provided that you have set the file type to Command or Obey, the file can then be run in the same ways as any other file, by

- typing its name at the \* prompt
- typing its name preceded by a \* at any other prompt (some applications may not support this)
- double-clicking on its icon in a directory display.

The same restrictions apply as with any other file. If the file is not in either your current directory or the library, it will not be found if you just give the filename; you must give its full pathname. This assumes you have not changed the value of the system variable Run\$Path.

## Making a script run automatically

You can make scripts run automatically

- from the network when you first log on
- from a disc when you first switch the computer on
- from an application directory when the application is run.

You'll find information on how to do this in *Customising the desktop start-up procedure* on page 47.

## Using parameters

An Obey file – but not a Command file – can have parameters passed to it, which can then be used by the command script. The first parameter is referred to as %0, the second as %1, and so on. You can refer to all the parameters after a particular one by putting a \* after the %, so %\*1 would refer to all the parameters from the second one onwards.

These parameters are substituted before the line is passed to the command line interpreter. Thus if an Obey file called **Display** contained:

```
FileInfo %0  
Type %0
```

then the command **\*Display MyFile** would do this:

```
FileInfo MyFile  
Type MyFile
```

Sometimes you do not want parameter substitution. For example, suppose you wish to include a **\*Set Alias\$** command in your file, such as:

```
Set Alias$Mode echo |<22>|<%0> <Command>
```

The effect of this is to create a new command 'Mode'. If you include the \*Set Alias command in an Obey file, when you run the file the %0 will be replaced by the first parameter passed to the file. To prevent the substitution you need to change the % to %%:

```
Set Alias$Mode echo |<22>|<%%0> <Command>
```

Now when the file is run, the '%%0' is changed to '%0'. No other substitution occurs at this stage, and the desired command is issued.

## Examples

These example files illustrate some of the differences between Command and Obey files:

### Example 1

```
*BASIC
AUTO
FOR J= 1 TO 10
  PRINT "Hello"
NEXT J
END
```

If this is a command file, it will enter the BASIC interpreter, and input the file shown. The command script will end with the BASIC interpreter waiting for another line of input. You can then press Esc to get a prompt, type **RUN** to run the program, and then type **QUIT** to leave BASIC. This script shows how a command file is passed to the input, and can change what is accepting its input (in this case to the BASIC interpreter).

On the other hand, if this is an Obey file it will be passed to the command line interpreter, and an attempt will be made to run these commands:

```
*BASIC
*AUTO
*FOR I = 1 TO 10
* PRINT "Hello"
*NEXT I
*END
```

Only the first command is valid, as an Obey file all this does is to leave you in the BASIC interpreter. Type **QUIT** to leave BASIC; you will then get an error message saying **File 'AUTO' not found**, generated by the second line in the file.

## Example 2

The next example illustrates how control characters are handled:

```
echo <7>
echo |<7>
```

The control characters are represented in GStans format (see *Using GS formats in scripts* on page 395). These are not interpreted until the echo command is run, and are only interpreted then because **echo** expects GStans format.

The first line sends an ASCII 7 to the VDU drivers, sounding a beep. In the second line, the | preceding the < changes it from the start of a GStans sequence to just representing the character <, so the overall effect is:

```
echo <7>           Send ASCII 7 to VDU drivers – beeps
echo |<7>         Send <7> to the screen
```

## Example 3

The last examples are a Command file:

```
*Set Alias$more %echo |<14>|m %type -tabexpand %*0|m %echo |<15>
```

and an Obey file that has the same effect:

```
Set Alias$more %echo |<14>|m %type -tabexpand %%*0|m %echo |<15>
```

The only differences between the two examples are that the Command file has a preceding \* added, to ensure that the command is passed to the command line interpreter, and that the Obey file has the %\*0 changed to %%\*0 to delay the substitution of parameters.

The file creates a new command **more** by setting the variable **Alias\$more**.

- The % characters that precede **echo** and **type** ensure that the actual commands are used, rather than an aliased version of them.
- The sequence |m represents a carriage return in GStans format (see *Using GS formats in scripts* below). It is used to separate the commands, just as Return would if you were typing the commands.
- The two **echo** commands turn scroll mode on, then off, by sending the control characters ASCII 14 and 15 respectively to the VDU drivers.
- The | before each < prevents the control characters from being interpreted until the aliased command **more** is run.

The command turns scroll mode on, types a file to the screen expanding tabs as it does so, and then turns scroll mode off.

## Using GS formats in scripts

The GStran and GSRead formats are used by a number of commands that need to be able to handle control characters, and characters whose top bit is set. They enable you to use these characters, which would otherwise cause unpredictable output from your monitor or printer, and which would be difficult to enter directly from the keyboard. The two formats are identical.

The GSRead or GStran format is used by some commands to read characters that you type in. The characters are interpreted using the following conventions:

- A character preceded by a | is converted into the relevant control code: |C would become ASCII 3 (which is Ctrl C).
- An integer within angle brackets is converted into the equivalent ASCII code: <7> would become ASCII 7.
- A variable name within angle brackets is replaced by the value held in the variable, or is ignored if the variable does not exist.
- All other characters are unchanged.

A full list of ASCII codes and how to obtain them is given below. Of course, any ASCII code may be obtained by enclosing it in angle brackets as described above, and this may be easier to remember than the symbol encoding.

ASCII code	Symbols used	
0	@	
1 – 26	<i>letter</i> e.g.	A (or  a) = ASCII 1  M (or  m) = ASCII 13
27	[ or  {	
28	\	
29	] or  }	
30	^ or  ~	
31	_ or  '	
32 – 126	keyboard character, except for:	"            "                <           <
127	?	
128 – 255	<i>!coded-symbol</i> e.g.	ASCII 128 =  ! @ ASCII 129 =  ! A etc

You must use |< to prevent the < from being interpreted as the start of a number or variable name enclosed in angled brackets.

To include leading spaces in a definition, the string must be in double quotation marks, " ", which are not included in the definition. To include a literal " character in the string, use |" or "".

---

# Appendix B: Useful star commands

---

This chapter provides a short list of useful star commands which you may need to reconfigure your computer or recover from a crash. There is an alphabetical list of every \* Command available under RISC OS 3 in the file **StarComms** in the directory **Tutorials**. It does not contain \* Commands provided by the addition of expansion cards or extra filing systems.

Each command is followed by a short explanation of its function and its command syntax. All of these commands are explained in greater detail in the *RISC OS Programmer's Reference Manual*. One very useful command is \*Status (see page 402).

## Command syntax

The syntax of each command in the following sections is described in a standard way. The symbols used in syntax descriptions are:

<code>&lt;value&gt;</code>	indicate that an actual value must be substituted. For example, <code>&lt;filename&gt;</code> means that you must supply an actual filename.
<code>[...]</code>	indicate that the item enclosed in the square brackets is optional.
<code> </code>	indicates alternatives. For example, <code>0   1</code> means that the value 0 or 1 must be supplied.

## Useful star commands

### \*Access

\*Access changes the attributes of all objects matching the wildcard specification. These attributes control whether you can run, read from, write to and delete a file.

Valid attributes:

L	Lock object against deletion by any user
W	Write permission for you
R	Read permission for you
/	Separator between your permissions and the public's
W	Write permission for the public (on a network)
R	Read permission for the public (on a network)

**\*Access <object\_spec> [<attributes>]**

### **\*ADFS**

\*ADFS selects the Advanced Disc Filing System as the current filing system.

\*ADFS

### **\*CDFS**

\*CDFS selects the CD-ROM Filing System as the current filing system. This command is only available if you have a CD-ROM drive fitted.

\*CDFS

### **\*CheckMap**

\*CheckMap checks that the map of an E- or F-format disc has the correct checksums and is consistent with the directory tree. If only one copy of the map is good, it allows you to rewrite the bad one with the information in the good one.

\*CheckMap [`<disc_spec>`]

If the map information cannot be cured, you should backup all of your files and then reformat your hard disc. Contact your supplier for more information.

### **\*Close**

\*Close closes all open files on the current filing system.

\*Close

### **\*Configure Boot|NoBoot**

\*Configure Boot (the default setting) sets the configured boot action so that a power on, reset or Ctrl Break runs a boot file.

\*Configure NoBoot sets the configured boot action so that a Shift power on, Shift reset or Shift Break runs a boot file.

\*Configure Boot|NoBoot

### **\*Configure Drive**

\*Configure Drive sets the configured number of the drive that is selected at power on.

\*Configure Drive `<n>`

**\*Configure FileSystem**

\*Configure FileSystem sets the configured filing system to be used at power on or hard reset.

`*Configure FileSystem <fs_name> | <fs_number>`

**\*Configure Floppies**

\*Configure Floppies sets the configured number of floppy disc drives recognised at power on.

`*Configure Floppies <n>`

**\*Configure IDEDiscs**

\*Configure IDEDiscs sets the configured number of IDE hard disc drives recognised at power on.

`*Configure IDEDiscs <n>`

**\*Configure Language**

\*Configure Language sets the configured language used at power on.

`*Configure Language <module_no>`

**\*Configure MouseType**

\*Configure MouseType sets the configured pointer device to be used thereafter. Device types are 0 (Acorn quadrature mouse), 1 (Microsoft serial mouse), 2 (Mouse Systems serial mouse), or 3 (PS/2 serial mouse).

`*Configure MouseType <device_type>`

**\*Configure Truncate**

\*Configure Truncate sets the configured value for whether or not filenames are truncated when too long for a filing system to handle.

`*Configure Truncate On|Off`

**\*Create**

\*Create reserves space for a new file. No data is transferred to the file. The optional load and execution addresses and length are in hexadecimal.

`*Create <filename> [<length> [<exec_addr> [<load_addr>]]]`

**\*Defect**  
\*Defect reports what object contains a defect, or (if none) marks the defective part of the disc so it will no longer be used.

**\*Defect** <disc\_spec> <disc\_addr>

## **\*DOSMap**

\*DOSMap specifies a mapping between an MS-DOS extension and a RISC OS file type. If the only parameter given is an MS-DOS extension, then the mapping (if any) for that extension is cancelled. If no parameter is given, then all current mappings are listed.

The mappings are only retained until the next reset.

**\*DOSMap** [<MS-DOS\_extension> [<file\_type>]]

## **\*FSLock\_Unlock**

\*FSLock\_Unlock unlocks the computer, so you can alter its CMOS RAM and hard disc. If the **-full** switch is not given then the computer will only be unlocked until it is next reset.

**\*FSLock\_Unlock** [-full] [<password>]

## **\*Help**

\*Help gives brief information about each command. There are also some special keywords:

<b>*Help Commands</b>	lists all the available utility commands
<b>*Help FileCommands</b>	lists all the commands relating to filing systems
<b>*Help Modules</b>	lists the names of all currently loaded modules, with their version numbers and creation dates
<b>*Help Station</b>	displays the current network and station numbers of your machine
<b>*Help Syntax</b>	explains the format used for syntax messages

**\*Help** [<keyword>]

**\*List**

\*List displays the contents of the named file using the configured DumpFormat. Each line is numbered.

```
*List [-File] <filename> [-TabExpand]
```

**\*Opt 4**

\*Opt 4 sets the boot action for the current filing system:

```
*Opt 4,0      No boot action
*Opt 4,1      *Load boot file
*Opt 4,2      *Run boot file
*Opt 4,3      *Exec boot file
```

```
*Opt 4 [[,]<n>]
```

**\*Podules**

\*Podules displays a list of the installed expansion cards and extension ROMs.

```
*Podules
```

**\*Ram**

\*Ram selects the RAM filing system as the current filing system.

```
*Ram
```

**\*ResourceFS**

\*ResourceFS selects the Resource Filing System as the current filing system.

```
*ResourceFS
```

**\*RMKill**

\*RMKill deactivates and deletes a relocatable module. Use this command only with extreme caution, as it may be drastic in its effects.

```
*RMKill <module_title>[<%instantiation>]
```

**\*RMReInit**

\*RMReInit reinitialises a relocatable module, reversing the action of any previous \*RMKill or \*Unplug command. Use this command only with extreme caution, as it may be drastic in its effects.

```
*RMReInit <module_title> [<module_init_string>]
```

---

### **\*ScreenLoad**

\*ScreenLoad loads the contents of a sprite file into the graphics window.

\*ScreenLoad <filename>

### **\*ScreenSave**

\*ScreenSave saves the contents of the graphics window and its palette to a file.

\*ScreenSave <filename>

### **\*SCSI**

\*SCSI selects the SCSI Filing System as the current filing system. This command is only available if you have a SCSI expansion card fitted.

\*SCSI

### **\*Shut**

\*Shut closes all open files on all filing systems.

\*Shut

### **\*ShutDown**

\*ShutDown closes all open files on all filing systems, logs off all network file servers, and parks hard disc heads.

\*ShutDown

### **\*Status**

\*Status displays the value of a configuration option in the CMOS RAM. If no option is specified, the values of all configuration options are shown.

\*Status [<option>]

### **\*Unplug**

\*Unplug kills and disables all copies of a ROM resident module. If no parameters are given, the unplugged ROM modules are listed.

\*Unplug [<module\_title> [<ROM\_section>]]

# Appendix C: Configuring applications



Using a Desktop boot file enables you to specify exactly how your computer starts up, so that the applications you most commonly use are available as soon as you switch on. You can also control the way these applications behave by setting options within the Desktop boot file. This chapter describes these options.



**This appendix assumes that you know how to generate and edit the contents of the Desktop boot file stored within the !Boot application (see page 50). The information in this chapter is not needed for general operation of the computer and should only be used with care. Make a copy of your existing !Boot before changing anything.**

## Alarm configuration



If you create a Desktop boot file while Alarm is running, it will incorporate any changes you have made to certain user preferences in a line beginning

```
Set Alarm$Options
```

### Alarm\$Options

Alarm\$Options also uses the values of `-timeout`, `-weekwork` and `-format` to set up Alarm. It is, however, much easier to set these using the Alarm setup window and then to save a Desktop boot file than to edit these options directly.

Alarm\$Options controls the format of the time and date display on the icon bar when the Display format is set to **User defined**. The default setting is

```
-format %z12:%mi:%se %pm. %zdy/%zmn/%yr
```

and produces displays like this:

```
12:12:32 pm. 23/1/90  
1:15:30 am. 1/12/89
```

### Time and date display formats

You can set the date and time format by giving the system variable Alarm\$Options a string made up of time and date variables (see *Time and date display formats* on page 305). You can also enter these variables in the !Alarm Setup window in the **User defined** field.

## Paint configuration



You may wish to change some aspects of the way new Paint windows appear when you first open them. For example, a new window normally opens with zoom magnification set to 1:1, but you may prefer to have the Zoom option set to 2:1 each time you start Paint.

You can set features of this type by setting up Paint as you wish to use it, then saving these features in a Desktop boot file.

There are several features of Paint that you can set before saving a Desktop boot file, so that they are set up the way you want them each time you switch on. The Paint features that will be recorded when you go through this process are known as Paint\$Options.

### Saving display features

Any Paint display features that you set before creating your boot file will be saved, so that the computer not only loads Paint, but sets the display features you have chosen.

If you wish to set the Paint display features, **without running Paint itself**, follow these steps:

- 1 Create a Desktop boot file, but drag it to a directory display rather than clicking on **OK** when saving.
- 2 Load the resulting file into Edit by dragging it onto the Edit icon (not by double-clicking: this will run the file).
- 3 Search for the line which runs Paint. This will read something like

```
Run Resources:$ .Apps.!Paint
```

or

```
\Resources:$ .Apps.!Paint
```

- 4 Delete that line and save the !Boot file again.  
(Leave the line starting

```
Set Paint$Options  
unchanged.)
```

### Customising the Desktop boot file

If you change some of Paint's display features and then create a Desktop boot file using the Task manager, you can load the file into Edit to examine it. You will find a line starting with

```
Set Paint$Options ...
```

where the string of letters and numbers corresponds to the display features you have selected.

Here are two examples:

```
Set Paint$Options "DFW C+ T+ G7"
```

This means show full info, use desktop colours, colours window and toolbox on, grid displayed in black (colour 7).

```
Set Paint$Options "DDB CS T- Z4:1"
```

This means show drawing and name, use BBC colours, small colours window on, toolbox off, zoom factor 4:1.

If you create a Desktop boot file automatically, you may still want to edit it later. The following list of options therefore shows the parameters for Set Paint\$Options.

Letter	Feature controlled	Possible values	Meaning
D	Sprite file window display	D or F W or B	Drawing and name or Full info Desktop colours on (Wimp) or off (use BBC colours)
C	Colours displayed when new sprite window opened	+ or - L S	Colours window on or off Small colours off Small colours on
T	Toolbox displayed automatically	+ or -	Toolbox on or off
Z	Default zoom factor	a : b	Specifies zoom factor
G	Automatic grid display	+ or - n	Grid on or off (at zoom factors of 4:1 or above); n specifies colour for the grid.

If you have not changed any settings for Paint, the line will appear in your Desktop boot file as:

```
Set Paint$Options ""
```

## Default values

Default values for Paint are:

```
DDW C+L T+ Z1:1 G+7
```

- DDW Show drawing and name, use desktop colours.

- **C+L** Display colours window (normal size) when a sprite is loaded.
- **T+** Display toolbox when Paint is loaded.
- **Z1:1** Zoom 1:1 (normal size).
- **G+7** Grid on with black grid lines.

When editing the Desktop boot file, you should make sure that the Paint\$Options line is placed before the line that runs the Paint application.

## SciCalc configuration



Saving a Desktop boot file will save your SciCalc configuration; however, you may wish to change some aspects of the way SciCalc operates. For example, the position of the SciCalc window, the number base and angle mode it uses.

These features are stored by setting up SciCalc as you wish to use it, and then saving the Desktop boot file.

### Customising the Desktop boot file

You can open the SciCalc window at a chosen place on the screen by editing your Desktop boot file and changing the system variable SciCalc\$Window. For example, change

```
Unset SciCalc$Window
```

to

```
Set SciCalc$Window 700,900
```

The numbers are the x and y graphics coordinates for the bottom-left corner of the displayed window.

You can also choose a particular base and trigonometric mode in which SciCalc is to start, by setting SciCalc\$Options, for example

```
Set SciCalc$Options 2,1
```

The first number specifies the base, the second the mode. Allowed values are

Base		Mode	
1	Decimal	1	Radians
2	Binary	2	Degrees
3	Octal	3	Gradians
4	Hexadecimal		

The last example sets the base to binary and the trigonometric mode (used when you next change to decimal base) to radians. The default values are 1,2 (decimal and degrees).

## Pinboard configuration

Saving a Desktop boot file will save the exact configuration (including the icons and the backdrop) of your Pinboard. It does not save information about iconised application windows.

Add one or more of the following lines to the Desktop boot file:

<b>Pinboard -Grid</b>	Starts the Pinboard with grid lock.
<b>Pinboard</b>	Starts the Pinboard without grid lock.
<b>Backdrop filename</b>	Gives the filename of the sprite to be used as a Pinboard backdrop, for example <b>Backdrop adfs::4.\$.alfalfa</b> Makes a backdrop by displaying the sprite <b>alfalfa</b> .
<b>Backdrop filename -Scale</b>	Scales the sprite so that it covers the background completely.
<b>Backdrop filename -Centre</b>	Centres the sprite so that it keeps its proportions.
<b>Backdrop filename -Tile</b>	Makes enough copies of the sprite to cover the background completely.
<b>Pin filename x_pos y_pos</b>	Gives the position of an icon on the background, for example <b>Pin Resources:\$.Apps.!Configure 350 500</b> puts the !Configure icon on the background at position 350 500 (given in OS units).

**Note:** To use a backdrop specified in the desktop boot file, you must set the background texture in !Boots Screen configuration window to **None**.

## Edit configuration



You may wish to change some aspects of the way new Edit windows appear. For example, a new window normally opens using black text on a white background, but you may prefer to have blue text on a red background ready to use each time you start Edit.

You can set features of this type by setting up Edit just as you wish to use it, then save these features by saving a Desktop boot file.

There are several features of Edit that you can set before saving a Desktop boot file, so that they are set up the way you want them each time you switch on. The Edit features that will be recorded when you go through this process are known as `Edit$Options`.

### Saving display features

Any Edit display features that you set before creating your boot file will be saved, so that the computer not only loads Edit, but sets the display features you have chosen.

If you wish to set the Edit display features each time you start your computer, **without running Edit itself**, follow these steps:

- 1 Create a Desktop boot file.
- 2 Load the resulting !Boot file into Edit by dragging it onto the Edit icon (not by double-clicking: this will run the !Boot file).
- 3 Search for the line which runs Edit. This will read something like  

```
Run Resources:$.Apps.!Edit
```
- 4 Delete that line and save the !Boot file again.  
(Leave the line starting  

```
Set Edit$Options
```

unchanged.)

### Customising the Desktop boot file

If you change some of Edit's display features and then create a Desktop boot file using the Task manager, you can load the file into Edit to examine it. You will find a line reading

```
Set Edit$Options...
```

where the string of letters and numbers corresponds to the display features you have selected. (If you have not changed any display features, no `Edit$Options` line will appear in your boot file.)

Here are two examples:

```
Set Edit$Options F13 B0 W8 H12 NTrinity.Medium
```

This sets the text colour to olive green (colour 13) on a white background (colour 0), the font width and height to 8 and 12 points respectively, and the font to Trinity Medium.

```
Set Edit$Options F8 D NCorpus.Medium
```

This sets the text colour to dark blue, leaving the background white, switches word wrap on, and sets the font to Corpus Medium.

If a font name is specified it must appear last in the list of Edit\$Options.

The table below identifies the display features that will be recorded when you do this, and provides a reference for those who may wish to create their own boot file without using the Desktop boot facility, or who may wish to edit a boot file after creating it.

<b>Letter</b>	<b>Feature specified</b>	<b>Default</b>
F	Foreground (text) colour	7 (black)
B	Background	0 (white)
W	Font width	10
H	Font height	10
M	Left margin in pixels	0
L	Extra spacing between lines (a negative number will produce closer lines)	0
R	Window wrap	off
D	Wordwrap on new windows	off
O	Overwrite in new windows	off
T	Column tab	off
U	Size of undo buffer in bytes	5000
A	Work area	77
N	Font name	System font



You may wish to change some aspects of the way new Draw windows appear. For example, a new window normally opens with the closed line tool selected, but you may prefer to have the Select tool ready to use each time you start Draw.

You can set features of this type by setting up Draw as you wish to use it, then save these features by creating a Desktop boot file.

There are several features of Draw that you can set before saving a Desktop boot file, so that they are set up the way you want them each time you switch on. The Draw features that will be recorded when you go through this process are known as Draw\$Options.

### Saving display features

Any Draw features that you set before creating your boot file will be saved, so that the computer not only loads Draw, but sets the features you have chosen.

If you wish to set the Draw features, **without running Draw itself**, follow these steps:

- 1 Create a Desktop boot file.
- 2 Load the resulting !Boot file into Edit by dragging it onto the Edit icon (not by double-clicking: this will run the !Boot file).
- 3 Search for the line which runs Draw. This will read something like

```
Run Resources:$ .Apps.!Draw
```

or

```
\Resources:$ .Apps.!Draw
```

- 4 Delete that line and save the !Boot file again.  
(Leave the line starting

```
Set Draw$Options
```

unchanged.)

### Customising the Desktop boot file

If you change some of Draw's default features and then create a Desktop boot file using the Task manager, you can load the file into Edit to examine it. You will find a line reading

```
Set Draw$Options "..."
```

where the string of letters and numbers between the double quotes corresponds to the features you have selected. If you have not changed any features, the **Set Draw\$Options** line will appear in your boot file as

**Set Draw\$Options ""**

Here are two examples of Draw\$Options:

```
Set Draw$Options P4L T- MS
```

This selects a paper size of A4 in landscape format, turns the Toolbox off and chooses the select tool as default.

```
Set Draw$Options G1x10SL ML
```

This causes a 1 inch grid with 1/10 inch subdivisions to be displayed, with grid lock on, and the line tool selected as default.

If you do not specify an option in the command, it will be set to the default. Case is not significant, except for the values that can be given to the M option: L or l, and C or c (see the list below).

The table below provides a reference for those who may wish to create their own boot file without using the Task manager, or who may wish to edit a boot file after creating it.

<b>Letter</b>	<b>Feature controlled</b>	<b>Possible values</b>	<b>Meaning</b>
P	Paper size and format	<i>n</i> L S	Paper size <b>An</b> (e.g. A4) Landscape format (if not set, portrait is used) Show paper limits
G	Grid	<i>a</i> × <i>b</i> I A S L C	<b>a</b> = spacing, <b>b</b> = subdivisions Isometric (rectangular if not set) Auto-adjust on Show grid Grid lock on cm units (inches if not set)
Z	Zoom	<i>a</i> : <i>b</i> L	Set zoom to <b>a:b</b> Zoom lock on
T	Toolbox display	+ or -	Toolbox on or off
M	Tool/mode selected	One of: L l C c R E T S	Line Closed line Curve Closed curve Rectangle Ellipse Text Select

---

## Default settings

The default settings used by Draw are as follows:

Setting	Meaning
P4	A4 portrait format, paper limits not shown
G1x4A	1 inch rectangular grid with 1/4 inch subdivisions, not shown or locked, auto-adjust on.
Z1:1	Zoom 1:1, zoom lock off.
T+	Toolbox on.
Ml	Closed line tool selected

## Increasing the Undo buffer size

When you make a change to your diagram, such as deleting an object, Draw stores the previous state of the diagram in a buffer (area of memory) so that it can restore it if you use the **Undo** option. This buffer has, by default, a size of 5KB. Experienced users of RISC OS may wish to use the Command Line to increase the size of the buffer. To do this, enter the Command Line and type

```
Set Draw$Options Un"
```

substituting for *n* the size you want, in bytes (must be divisible by four). To make the buffer this size each time you use Draw, edit the line that the Task manager will have created for you in your boot file (described in *Saving display features* on page 410) adding the **Un** immediately before the double quotes at the end of the line.

---

# Appendix D: BBC BASIC

---

**B**BC BASIC is still one of the most popular and widely-used programming languages. It consists of special keywords from which the programmer can create sequences of instructions, or programs, to be carried out by the computer. Such programs might perform calculations, create graphics on the screen, manipulate data, or carry out virtually any action involving the computer and the devices connected to it.

The BASIC language operates within an environment provided by the computer's operating system. The operating system is responsible for controlling the devices available to the computer, such as the keyboard, the screen, and the filing system. For example, it is the operating system which reads each key you press and displays the appropriate character on the screen. Operating system commands can be entered directly from within BASIC by prefixing them with an asterisk (\*).

If you want to find out more about the BBC BASIC programming language, you need the BBC BASIC *Reference Manual* available from your Acorn supplier.

On-line help is available within BASIC; just type HELP (in uppercase) for more information.

## **BBC BASIC V and VI**

There are two variants of BBC BASIC supplied with RISC OS 3: BASIC V and BASIC VI.

BASIC V is in the ROM and is almost identical to the BASIC V supplied with earlier versions of RISC OS. A small number of faults have been corrected.

BASIC VI is essentially the same as BASIC V, but it uses 8 bytes (or 64 bits) to store floating point numbers. BASIC V only uses 5 bytes, so it is slightly less accurate. The 8 byte representation used follows the IEEE standard. Unlike BASIC V, BASIC VI makes use of a hardware floating point unit if it is fitted.

## Entering BASIC

### Basic V

To start BASIC V, display the Task manager menu (click Menu over the Acorn icon at the bottom righthand corner of the desktop). Choose the **Task window** option and then type the following:

```
BASIC
```

Press Return, and the BASIC V version and memory will be displayed on the screen.

BASIC can also be started from the New Task option on the Task Manager or from the command line (press F12).

### Basic VI

BBC BASIC VI is different to BBC BASIC V in that it is stored on disc, not in the computer's ROM. BASIC VI is also known as BASIC64.

BASIC VI is used by some applications (for example SciCalc) so it may get loaded into memory without you having to take any special action.

To start BASIC VI, display the Task manager menu (click Menu over the Acorn icon at the bottom righthand corner of the desktop). Choose the **Task window** option and then type the following:

```
System:Modules.BASIC64
```

Press Return, and the BASIC VI version and memory option will be displayed on the screen. (Note: You can't just type BASIC64, as the BASIC64 module is not in the library directory).

BASIC 64 can also be started from the New task option on the Task manager menu or from the command line (press F12).

BASIC files saved from both BASIC V and BASIC VI are the same and can be run using either BASIC.

## Leaving BASIC

To leave BASIC, type **QUIT** (which must be in uppercase) or type **\*Quit**.

## Features in BASIC VI

The CRUNCH command strips various spaces from a program. Its argument is a 5-bit binary word. Each bit in the word has a different meaning (for instance bit 0 controls the stripping of spaces before statements; bit 2 controls the stripping out of REM statements).

The TEXTLOAD command can load a file that is either a BASIC program, or a BASIC program that was saved as a text file. In the latter case, TEXTLOAD automatically renumbers the program. TEXTSAVE stores a BASIC program as a text file, and strips out the line numbers.

## Writing and editing BASIC files

Edit will automatically convert BASIC files to and from BASIC tokenised format. Now all editing of BASIC files can be done using Edit. Edit is fully described in *Edit* on page 241.

## Command line syntax for BASIC

The following pages describe in full the command line interface for BASIC V and BASIC VI.

The command to enter the BASIC V interpreter.

## Syntax

**\*BASIC** [*options*]

## Purpose

To enter BASIC V.

The options control how the interpreter will behave when it starts, and when any program that it executes terminates. If no option is given, BASIC simply starts with a message of the form:

```
ARM BBC BASIC V version 1.05 (C) Acorn 1989
```

```
Starting with 643324 bytes free
```

The number of bytes free in the above message will depend on the amount of memory in your Next slot. The first line is also used for the default REPORT message, before any errors occur.

One of three options may follow the **\*BASIC** command to cause a program to be loaded, and, optionally, executed automatically. Alternatively, you can use a program that is already loaded into memory by passing its address to the interpreter. Each of these possibilities is described in turn below.

In all cases where a program is specified, this may be a tokenised BASIC program, as created by a SAVE command, or a textual program, which will be tokenised (and possibly renumbered) automatically.

**\*BASIC -help**

This command causes BASIC to print some help information describing the options documented here. Then BASIC starts as usual.

**\*BASIC [-chain] filename**

If you give a *filename* after the **\*BASIC** command, optionally preceded by the keyword **-chain**, then the named file is loaded and executed. When the program stops, BASIC enters immediate mode, as usual.

**\*BASIC -quit filename**

This behaves in a similar way to the previous option. However, when the program terminates, BASIC quits automatically, returning to the environment from which the interpreter was originally called. If you have a variable **BASIC\$Crunch**

defined, it also performs a **CRUNCH** %1111 on the program. This is the default action used by BASIC programs that are executed as \* commands. In addition, the function QUIT returns TRUE if BASIC is called in this fashion.

**\*BASIC -load filename**

This option causes the file to be loaded automatically, but not executed. BASIC remains in immediate mode, from where the program can be edited or executed as required.

**\*BASIC @start,end**

This acts in a similar way to the **-load** form of the command. However, the program that is 'loaded' automatically is not in a file, but already in memory. Following the @ are two addresses. These give, in hexadecimal, the address of the start of the in-core program, and the address of the byte after the last one. The program is copied to PAGE and tokenised if necessary.

Note that the in-core address description is fixed format. It should be in the form:

**@xxxxxxxx,xxxxxxxx**

where **x** means a hexadecimal digit. Leading zeros must be supplied. The command line terminator character must come immediately after the last digit. No spaces are allowed.

**\*BASIC -chain @start,end**

This behaves like the previous option, but the program is executed as well. When the program terminates, BASIC enters immediate mode.

**\*BASIC -quit @start,end**

This option behaves as the previous one, but when the BASIC program terminates, BASIC automatically quits. The QUIT flag will return TRUE during the execution of the program.

## Examples

```
*BASIC
*BASIC -quit shellProg
*BASIC @000ADF0C,000AE345
*BASIC -chain fred
```

The command to enter the BASIC VI interpreter.

## Syntax

```
*BASIC64 [options]
```

This assumes that the BASIC64 module has been 'seen'. If not, you need to type

```
*System:Modules.BASIC64
```

## Purpose

This has exactly the same purpose as the \*BASIC command, and takes the same options, the only difference being that it enters the BASIC VI interpreter instead of the BASIC V interpreter. Additionally CRUNCH is used automatically by BASIC64.

If no option is given, BASIC VI simply starts with a message of the form:

```
ARM BBC BASIC VI version 1.05 (C) Acorn 1989
```

```
Starting with 581628 bytes free.
```

The number of bytes free in the above message will depend on the amount of free space in your Next slot.

## Examples

```
*BASIC64
```

```
*BASIC64 -quit shellProg
```

```
*BASIC64 @000ADF0C,000AE345
```

```
*BASIC64 -chain fred
```

## Features available in RISC OS 3 Version 3.50 or later

The version of BASIC in your computer has been extended for use with the new systems available.

### Colour

- COLOUR n [TINT t]: set text foreground colour [and tint]
- GCOL n [TINT t]: set graphics foreground colour [and tint]

If n is less than 128, the foreground colour is set to colour n

If n is greater than 128, the background colour is set to colour n-128

- COLOUR n,p: set palette entry for logical colour n to physical colour p.
- COLOUR r,g,b: set colour to r, g, b.
- COLOUR n,r,g,b: set palette entry for n to r, g, b physical colour.
- GCOL <action>,n [TINT t]: set graphics foreground/background colour and action.
- GCOL [<action>],r,g,b: set colour to r, g, b.

### Mode

Set the screen mode:

- MODE <number>|<string>  
See *Changing the desktop size without changing the resolution* on page 16 for more information about this string.

As a function MODE gives the current screen mode.

### Point

POINT (X,Y) supports 16bpp and 32bpp colours.



---

# Appendix E: RISC OS file types

---

**F**ile types are three-digit hexadecimal numbers. They are divided into ranges:

E00 - FFF	allocated by Acorn for generic data types
B00 - DFF	allocated by Acorn to software houses for applications
A00 - AFF	reserved for use by Acorn applications
400 - 9FF	allocated by Acorn to software houses for applications
100 - 3FF	allocated by Acorn to individuals for applications
000 - 0FF	free for users

For each type, there may be a default action on loading and running the file. These actions may change, depending on whether the desktop is in use, and which applications have been seen. The system variables `Alias$@LoadType_XXX` and `Alias$@RunType_XXX` give the actions (XXX = file type).

Some types have a textual equivalent set at start-up, which may be used in most commands (but not in the above system variables) instead of the hexadecimal code. These are indicated in the table below by a dagger '†'. For example, file type `&FFF` is set at start-up to have the textual equivalent **Text**. Other textual equivalents may be set as an application starts – for example, Acorn Desktop Publisher sets up file type `&AF9` to be **DtpDoc**, and file type `&AFA` to be **DtpStyle**. These textual equivalents are set using the system variables `File$Type_XXX`, where XXX is the file type.

You should use the hexadecimal file type in command scripts and in programs, otherwise you will find that your files will give an error if you try to run them on a machine that uses a territory with different textual equivalents.

The following types are currently used or reserved by Acorn. Not all file types used by software houses are shown. This list may be extended from time to time:

## Acorn file types

Type	Description	Textual equivalent	
FFF	Plain ASCII text	Text	†
FFE	Command (Exec) file	Command	†
FFD	Data	Data	†
FFC	Position independent code	Utility	†
FFB	Tokenised BASIC program	BASIC	†
FFA	Relocatable module	Module	†
FF9	Sprite or saved screen	Sprite	†
FF8	Absolute application loaded at &8000	Absolute	†
FF7	BBC font file (sequence of VDU operations)	BBC font	†
FF6	Font	Font	†
FF5	PostScript	PoScript	†
FF4	Dot Matrix data file	Printout	†
FF3	LaserJet data file	LaserJet	
FF2	Configuration (CMOS RAM)	Config	†
FF1	Raw unprocessed data (e.g. terminal streams)	RawData	
FF0	Tagged Image File Format	TIFF	
FED	Palette data	Palette	†
FEC	Template file	Template	†
FEB	Obey file	Obey	†
FEA	Desktop	Desktop	†
FE9	ViewWord	ViewWord	
FE8	ViewPS	ViewPS	
FE7	ViewSheet	ViewSht	
FE6	UNIX executable	UNIX Ex	
FE4	DOS file	DOS	†
FE3	Atari file	Atari	
FE2	Commodore Amiga file	Amiga	
FE1	Make data	Make	
FDf	TCP/IP suite: VT220 script	VTScript	
FDE	TCP/IP suite: VT220 setup	VTSetup	
FDD	Master utilities	MasterUtl	
FDC	TCP/IP suite: unresolvable UNIX soft link	SoftLink	
FDB	Text using CR and LF for line ends	TextCRLF	
FDA	PC Emulator: DOS batch file	MSDOSbat	
FD9	PC Emulator: DOS executable file	MSDOSexe	

Type	Description	Textual equivalent
FD8	PC Emulator: DOS command file	MSDOScom
FD7	ObeY file in a task window	TaskObey †
FD6	Exec file in a task window	TaskExec †
FD5	DOS Pict	Pict
FD4	International MIDI Assoc. MIDIfiles standard	MIDI
FD3	Acorn DDE: debuggable image	DebiImage
FD1	BASIC stored as text	BASICTxt
FD0	PC Emulator: configuration	PCEmConf
FCF	Font cache	Cache †
FCE	FileCore floppy disc image	FileCoreFloppyDisc
FCD	FileCore hard disc image	FileCoreHardDisc
FCC	Device object within DeviceFS	Device †
FCA	Single compressed file	Squash
FC9	Sun raster file	SunRastr
FC8	DOS MultiFS disc image	DOSDisc †

### Industry standard file types

Type	Description	Textual equivalent
DFE	Comma separated values	CSV
DEA	Data exchange format (AutoCAD etc)	DXF
DB4	SuperCalc III file	SuperCalc
DB3	DBase III file	DBaseIII
DB2	DBase II	DBaseII
DB1	DBase index file	DBaseIndex
DB0	Lotus 123 file	WK1 (was Lotus123)
CE5	T <sub>E</sub> X file	TeX
CAF	IGES graphics	IGES
CAE	Hewlett-Packard graphics language	HPGLPlot
C85	JPEG (Joint Photographic Experts Group) file	JPEG

## Acorn Advance file types

Type	Description	Textual equivalent
C25	Acorn Advance Wordprocessor	AWord
C26	Acorn Advance Spreadsheet	ASheet
C27	Acorn Advance Database	ADBase
C28	Acorn Advance Graph	AGraph

## BBC ROM file type

Type	Description	Textual equivalent
BBC	BBC ROM file (ROMFS)	BBC ROM †

## Acornsoft file types

Type	Description	Textual equivalent
AFF	Draw file	DrawFile †
AFE	Mouse event record	Mouse
AFA	DTP style file	DtpStyle
AF9	DTP documents	DtpDoc
AF8	First Word Plus file	1stWord+
AF7	Help file	HelpInfo
AF1	Maestro file	Music
AF0	ArcWriter file	ARCWriter
AE9	Alarm file	Alarms
ADB	Outline font (obsolete file type)	New Font

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# Appendix F: Old-type screen modes

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This appendix gives information about the numbered screen modes that were used with earlier versions of the RISC OS operating system. This information is only needed for backward compatibility purposes: for example, you may be using an old software application or game that demands a particular old type screen mode.

## Display manager

This section gives a quick recap on how the new screen Display manager operates and where to find more information.



In the Screen configuration option of !Boot, the type of monitor used with your computer is defined. This controls the selection of resolutions used by the Display manager. The Screen configuration option of !Boot is described in *Screen* on page 36.



Use the Display manager to choose the display resolution and number of colours used by the desktop. The Display manager is described in *Desktop colour and resolution* on page 13.

The display options that your monitor can use depend upon the characteristics of your monitor. These characteristics are described in a special file called a ModeInfo file. This file is tuned to each monitor type and should not normally be changed. If there is no monitor type for your particular monitor you should contact your Acorn dealer for information.

## Backward compatible screen modes

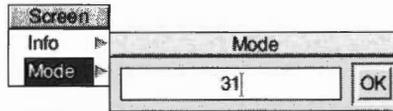
This computer still supports old type screen modes. Screen modes were the way colours and resolutions were selected in the RISC OS 3.1, RISC OS 3.0 and RISC OS 2 operating systems.

There are several reasons why you may want to use an old type screen mode:

- To play a game that demands an old type screen mode.
- To use an application that demands an old type screen mode.
- To generate old type sprite files using !Paint.

## Choosing a backward compatible mode

You can choose old-type numbered modes from the Display manager icon bar menu. Choose the Mode window, delete any information in the box, and then type in the mode number you want to use. Click on **OK**.



If your chosen mode is not available, the Display manager will substitute one with the same number of colours.

## Old type sprite files

Your computer uses a new sprite file format, the file type used to save !Paint pictures. However you cannot use one of these new format sprite files on a computer running RISC OS 3.1 or earlier. If you want to use a sprite on a computer running an earlier version of the operating system you should create it while using one of the backward compatible screen modes. Alternatively the graphic translator application !ChangeFSI can convert between sprite types.

## Mode table

The table of modes on the following pages show:

- The mode number.
- The text resolution in columns × rows.
- The graphics resolution in pixels, which corresponds to the clarity of the mode's display.
- The number of colours available.
- The monitor types that support that mode:

0	Standard monochrome or colour monitor
1	Multi frequency monitor
3	VGA-type monitor
4	Super VGA-type monitor

## List of screen modes

This is the list of screen modes supplied with RISC OS. Third party suppliers may produce software and hardware that produces different video modes; such modes are not listed here.

Mode	Text resolution	Pixel resolution	Logical colours	Monitor types	Desktop mode?	Notes
0	80 × 32	640 × 256	2	0,1,3,4	Yes	③
1	40 × 32	320 × 256	4	0,1,3,4	Yes	③
2	20 × 32	160 × 256	16	0,1,3,4		③
3	80 × 25	Text only	2	0,1,3,4		③④⑥
4	40 × 32	320 × 256	2	0,1,3,4		③
5	20 × 32	160 × 256	4	0,1,3,4		③
6	40 × 25	Text only	2	0,1,3,4		③④⑥
7	40 × 25	Teletext	16	0,1,3,4		③④
8	80 × 32	640 × 256	4	0,1,3,4	Yes	③
9	40 × 32	320 × 256	16	0,1,3,4	Yes	③
10	20 × 32	160 × 256	256	0,1,3,4		③
11	80 × 25	640 × 250	4	0,1,3,4	Yes	③
12	80 × 32	640 × 256	16	0,1,3,4	Yes	③
13	40 × 32	320 × 256	256	0,1,3,4	Yes	③
14	80 × 25	640 × 250	16	0,1,3,4	Yes	③
15	80 × 32	640 × 256	256	0,1,3,4	Yes	③
16	132 × 32	1056 × 256	16	0,1	Yes	⑤
17	132 × 25	1056 × 250	16	0,1	Yes	⑤
18	80 × 64	640 × 512	2	1	Yes	
19	80 × 64	640 × 512	4	1	Yes	
20	80 × 64	640 × 512	16	1	Yes	
21	80 × 64	640 × 512	256	1	Yes	
22	96 × 36	768 × 288	16	0,1	Yes	①
23	High resolution monochrome monitor only					
24	132 × 32	1056 × 256	256	0,1	Yes	⑤
25	80 × 60	640 × 480	2	1,3,4	Yes	
26	80 × 60	640 × 480	4	1,3,4	Yes	
27	80 × 60	640 × 480	16	1,3,4	Yes	
28	80 × 60	640 × 480	256	1,3,4	Yes	
29	100 × 75	800 × 600	2	1,4	Yes	①②
30	100 × 75	800 × 600	4	1,4	Yes	①②

Mode	Text resolution	Pixel resolution	Logical colours	Monitor types	Desktop mode?	Notes
31	100 × 75	800 × 600	16	1,4	Yes	①②
32	100 × 75	800 × 600	256	1,4	Yes	①②⑦
33	96 × 36	768 × 288	2	0,1	Yes	①
34	96 × 36	768 × 288	4	0,1	Yes	①
35	96 × 36	768 × 288	16	0,1	Yes	①
36	96 × 36	768 × 288	256	0,1	Yes	①
37	112 × 44	896 × 352	2	1	Yes	①
38	112 × 44	896 × 352	4	1	Yes	①
39	112 × 44	896 × 352	16	1	Yes	①
40	112 × 44	896 × 352	256	1	Yes	①
41	80 × 44	640 × 352	2	1,3,4	Yes	①③
42	80 × 44	640 × 352	4	1,3,4	Yes	①③
43	80 × 44	640 × 352	16	1,3,4	Yes	①③
44	80 × 25	640 × 200	2	1,3,4	Yes	①③
45	80 × 25	640 × 200	4	1,3,4	Yes	①③
46	80 × 25	640 × 200	16	1,3,4	Yes	①③
47	45 × 60	360 × 480	256	1,3,4	Yes	①⑦
48	40 × 60	320 × 480	16	1,3,4	Yes	①⑦
49	40 × 60	320 × 480	256	1,3,4	Yes	①⑦

### Notes

- 1 These modes were not available in RISC OS 2.00, nor (except for mode 31) were they available in RISC OS 2.01.
- 2 These modes are not available on early models of RISC OS computers (i.e. the Archimedes 300 series, 440, and 400/1 series, and the BBC A3000).
- 3 If you are using a VGA or Super-VGA-type monitor, these modes are all displayed on a screen having 352 raster lines. Where a mode has fewer than 352 vertical pixels, it is centred on the screen with blank lines at the top and bottom. Because of their appearance these modes are known as letterbox modes. The refresh rate is 70Hz.
- 4 These modes provide compatibility with BBC and Master series computers.
- 5 In these modes circles, arcs, sectors and segments do not look circular. This is because the aspect ratio of the pixels is not in a 1:2, 1:1 or 2:1 ratio.
- 6 These are gap modes, where the colour of the gaps is not necessarily the same as the text background.
- 7 These modes were not available in earlier versions of the operating system.

## 256 colour modes

In 256 colour modes, there are some restrictions on the control of the colours. Only 64 base colours may be selected; 4 levels of tinting turn the base colours into 256 shades. Also, the selection from the colour palette of 4096 shades is only possible in groups of 16.

## Monitor types

If you attempt to select a mode which is not appropriate to the current monitor type, a suitable mode for that monitor is used.

## Monitor types and screen modes

Not all monitors can display all of the old type screen modes. The following table lists the screen modes each monitor can display:

Mode	Multi-freq monitor	VGA & LCD monitor	Super VGA monitor
0 - 15	✓	✓ †	✓ †
16,17	✓		
18 - 21	✓		
22	✓		
23	Not supported	Not supported	Not supported
24	✓		
25 - 28	✓	✓	✓
29 - 31	✓		✓
32	✓		✓
33 - 36	✓		
37 - 40	✓		
41 - 46	✓	✓	✓
47	✓	✓	✓
48-49	✓	✓	✓

† VGA and Super VGA type monitors can display modes 0 to 15 with reduced height (letterbox mode). These modes are retained for compatibility.



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# Appendix G: Removing a disc defect

---

**T**his appendix shows you how to map out a defect in your hard disc. You can still use your hard disc without using the part of the disc that contains the defect.

## What is a defect?

If you are using your hard disc and see an error message such as:

```
Disc error 08 at :4/0001040
```

then you have found a disc defect.

You might also find a disc defect if you are Verifying your disc.

## Removing a defect

Assuming that you see an error message such as:

```
Disc error 08 at :4/0001040
```

write it down. The last number is the disc address.

- 1 At the command line type `*Defect`, the disc name and the last part of the disc address:

```
*Defect HardDisc4 1040
```

- 2 If this section of disc is in use you will see a message such as:

```
.myfile1 has defect at offset 800  
.myfile2 must be moved
```

- 3 Try to copy these files to another part of the disc (into another directory) and delete the originals. The affected part of the disc is now unallocated.
- 4 At the command line type the `*Defect` command again:

```
*Defect HardDisc4 1040
```

The affected part of the disc is now made inaccessible.

Reports what object contains a defect, or (if none) marks the defective part of the disc so it will no longer be used.

### Syntax

```
*Defect disc_spec disc_addr
```

### Parameters

<i>disc_spec</i>	the name of the disc or number of the disc drive
<i>disc_addr</i>	the hexadecimal disc address where the defect exists, which must be a multiple of the sector size (512 for IDE drives; 1024 for floppies) – that is, it must end in '00'

### Use

\*Defect reports what object contains a defect, or (if none) marks the defective part of the disc so it will no longer be used. \*Defect is typically used after a disc error has been reported, and the \*Verify command has confirmed that the disc has a physical defect, and given its disc address.

If the defect is in an unallocated part of the disc, \*Defect will render that part of the disc inaccessible by altering the 'map' of the disc.

If the defect is in an allocated part of the disc, \*Defect tells you what object contains the defect, and the offset of the defect within the object. This may enable you to retrieve most of the information held within the object, using suitable software. You must then delete the object from the defective disc. \*Defect may also tell you that some other objects must be moved: you should copy these to another disc, and then delete them from the defective disc. Once you have removed all the objects that the \*Defect command listed, there is no longer anything allocated to the defective part of the disc; so you can repeat the \*Defect command to make it inaccessible.

Sometimes the disc will be too badly damaged for you to successfully delete objects listed by the \*Defect command. In such cases the damage cannot be repaired, and you must restore the objects from a recent backup.

---

# Appendix H: Character sets

---

This chapter shows the character table for the Latin1 alphabet set available on your Acorn computer. The Latin1 character set is the alphabet normally used by the desktop. It is based on the International Standards Organisation ISO 8859 document.

## Loading an alphabet

When you load an alphabet it overlays the previous alphabet. Most alphabets have a number of undefined characters. These are shown in the table by a light grey square. In such cases, the previous character definition for that code remains in effect.

The character codes 0 - 31 and 127 are not printable characters. They are represented in the table by a dark grey square. You can load an alternative alphabet using the \*Alphabet command.

## How alphabets are initially set up

### The default alphabet

The default alphabet always contains all characters that are defined in the Latin1 alphabet. Note that this definition has been gradually extended by the addition of extra characters in the range &80 - &9F (128 - 159).

The computer's representation of characters that are not defined in the Latin1 alphabet varies. They are represented by the hexadecimal value of their character code. In the future some of these undefined characters may be used to further extend the Latin1 alphabet, or their representation may change. Consequently, you must not rely upon their initial representation.

### The configured alphabet

The default alphabet is overlaid by the alphabet that is correct for the computer's configured territory, as set by \*Configure Territory.

---

## Keyboard short-cuts

There are some useful keyboard short-cuts which you can use to access various characters and alphabets while you are working. You can use these wherever you can use the keyboard: for example, in the Command Line, in an application like !Edit, or when entering a filename to save a file.

### Using top bit set characters

Although the easiest way of inserting top bit set characters into your document is using the !Chars application (see *Chars* on page 327) you can also insert them by using special key combinations. You enter characters using the Alt key and the numeric keypad. For example:

**Alt** <decimal character code typed on numeric keypad>

enters the character corresponding to the character code typed.

### Changing between alphabets

**Alt Ctrl F1** Selects the keyboard layout appropriate to the country UK.

**Alt Ctrl F2** Selects the keyboard layout appropriate to the country for which the computer is configured (if available).

### Switching between other alphabets

The following sequence also switches the keyboard layout:

- 1 Press and hold Alt and Ctrl together.
- 2 Press and release F12.
- 3 Release Ctrl.
- 4 Still holding Alt, type on the numeric keypad the international telephone dialling code for the country you want (e.g. 49 for Germany, 39 for Italy, 33 for France).
- 5 Release Alt.

**Note:** Check in your *Welcome Guide*; there may be alternative keystrokes if your computer uses a different keyboard.

## Typing special characters

Sometimes you need to be able to type special characters that are not apparently on the keyboard, such as accented characters, or symbols like ©. You can in fact get at lots of extra characters using the Alt key. Your *Welcome Guide* tells you much more about this in the chapter on the keyboard.

## Latin1 alphabet (ISO 8859/1)

This is the default alphabet used by Acorn computers.

	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
+0			0	@	P	`	p		'		°	À	Ð	à	ð		0
+1		!	1	A	Q	a	q	Ŵ	'	ı	±	Á	Ñ	á	ñ		1
+2		"	2	B	R	b	r	ŵ	<	ç	²	Â	Ò	â	ò		2
+3		#	3	C	S	c	s		>	£	³	Ã	Ó	ã	ó		3
+4		\$	4	D	T	d	t		"	¤	'	Ä	Ô	ä	ô		4
+5		%	5	E	U	e	u	ÿ	"	¥	µ	Å	Õ	å	õ		5
+6		&	6	F	V	f	v	ÿ	„	ı	¶	Æ	Ö	æ	ö		6
+7		'	7	G	W	g	w		–	§	·	Ç	×	ç	÷		7
+8		(	8	H	X	h	x		—	ˆ	ˆ	È	Ø	è	ø		8
+9		)	9	I	Y	i	y		–	©	¹	É	Ù	é	ù		9
+10		*	:	J	Z	j	z		Æ	ª	º	Ê	Ú	ê	ú		A
+11		+	;	K	[	k	{		œ	«	»	Ë	Û	ë	û		B
+12		,	<	L	\	l		...	†	¬	¼	Ì	Ü	ì	ü		C
+13		-	=	M	]	m	}	™	‡	-	½	Í		í			D
+14		.	>	N	^	n	˘	‰	fi	®		Î	Þ	î	þ		E
+15		/	?	O	_	o		•	fl	˘	¿	Ï	ß	ï	ÿ		F
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

In RISC OS 2 characters &80 - &9F (128 - 159) are undefined.

In RISC OS 3 (version 3.00) characters &80 - &8B (128 - 139) are undefined.



## Latin3 alphabet (ISO 8859/3)

	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
+0			0	@	P	`	p		‘		°	À		à			0
+1		!	1	A	Q	a	q		’	Ħ	ħ	Á	Ñ	á	ñ		1
+2		"	2	B	R	b	r		<	˘	²	Â	Ò	â	ò		2
+3		#	3	C	S	c	s		>	£	³		Ó		ó		3
+4		\$	4	D	T	d	t		"	¤	´	Ä	Ô	ä	ô		4
+5		%	5	E	U	e	u		”		μ	Č	Ĝ	č	ĝ		5
+6		&	6	F	V	f	v		„	Ĥ	ĥ	Č	Ö	č	ö		6
+7		'	7	G	W	g	w		–	§	·	Ç	×	ç	÷		7
+8		(	8	H	X	h	x		—	“	¸	È	Ĝ	è	ĝ		8
+9		)	9	I	Y	i	y		–	ı	ı	É	Ù	é	ù		9
+10		*	:	J	Z	j	z		œ	Ŗ	ŗ	Ê	Ú	ê	ú		A
+11		+	;	K	[	k	{		œ	Ǧ	ǧ	Ë	Û	ë	û		B
+12		,	<	L	\			...	†	Ĵ	ĵ	Ì	Ü	ì	ü		C
+13		-	=	M	]	m	}	™	‡	-	½	Í	Û	í	Û		D
+14		.	>	N	^	n	˘	‰	fi			Î	Ŝ	î	ŝ		E
+15		/	?	O	_	o		•	fl	Ž	ž	Ĭ	ß	ï	·		F
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

In RISC OS 2 characters &80 - &9F (128 - 159) are undefined.



# Cyrillic alphabet (ISO 8859/5)

	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
+0			0	@	P	`	p						А	Р	а	р	0
+1		!	1	А	Q	а	q				Ё	Б	С	б	с	ё	1
+2		"	2	В	Р	в	р					В	Т	в	т		2
+3		#	3	С	С	с	с					Г	У	г	у		3
+4		\$	4	Д	Т	д	т					Д	Ф	д	ф		4
+5		%	5	Е	U	е	u					Е	Х	е	х		5
+6		&	6	Ф	V	ф	v					Ж	Ц	ж	ц		6
+7		'	7	Г	W	г	w					З	Ч	з	ч		7
+8		(	8	Н	X	н	x					И	Ш	и	ш		8
+9		)	9	І	Y	і	y					Й	Щ	й	щ		9
+10		*	:	Ј	Z	ј	z					К	Ъ	к	ъ		А
+11		+	;	К	[	к	{					Л	Ы	л	ы		В
+12		,	<	L	\	l						М	Ь	м	ь		С
+13		-	=	М	]	м	}				-	Н	Э	н	э		Д
+14		.	>	N	^	n	~					О	Ю	о	ю		Е
+15		/	?	О	_	о						П	Я	п	я		Ф
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	

# Greek alphabet (ISO 8859/7)

	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
+0			0	@	P	`	p					°	ı̇	Π	ı̇	π	0
+1			!	1	A	Q	a	q				‘	±	Α	Ρ	α	ρ
+2			"	2	B	R	b	r				’	²	Β		β	ς
+3			#	3	C	S	c	s				£	³	Γ	Σ	γ	σ
+4			\$	4	D	T	d	t				’	Δ	Τ	δ	τ	4
+5			%	5	E	U	e	u				ˆ	Ε	Υ	ε	υ	5
+6			&	6	F	V	f	v				ı̇	Ά	Ζ	Φ	ζ	φ
+7			'	7	G	W	g	w				§	·	Η	Χ	η	χ
+8			(	8	H	X	h	x				”	Έ	Θ	Ψ	θ	ψ
+9			)	9	I	Y	i	y				©	Ή	Ι	Ω	ι	ω
+10			*	:	J	Z	j	z					Ί	Κ	Ϊ	κ	ϊ
+11			+	;	K	[	k	{				«	»	Λ	Ύ	λ	ϋ
+12			,	<	L	\	l					-	Ό	Μ	ά	μ	ό
+13			-	=	M	]	m	}				-	½	Ν	έ	ν	ύ
+14			.	>	N	^	n	~					Ύ	Ξ	ή	ξ	ώ
+15			/	?	O	_	o					—	Ό	Ο	ί	ο	
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	

# Hebrew alphabet (ISO 8859/8)

	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
+0															א	ב	0
+1															ב	ס	1
+2															ג	ע	2
+3															ד	ף	3
+4															ה	פ	4
+5															ו	ץ	5
+6															ז	צ	6
+7															ח	ק	7
+8															ט	ר	8
+9															י	ש	9
+10															ך	ת	A
+11															כ		B
+12															ל		C
+13															ם		D
+14															מ		E
+15															ן		F
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	

# Cyrillic2 alphabet (DOS code page 866)

	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
+0			0	@	P	`	p	А	Р	а						р	0
+1		!	1	А	Q	a	q	Б	С	б						с	1
+2		"	2	В	Р	b	r	В	Т	в						т	2
+3		#	3	С	S	c	s	Г	У	г						у	3
+4		\$	4	Д	Т	d	t	Д	Ф	д						ф	4
+5		%	5	Е	U	e	u	Е	Х	е						х	5
+6		&	6	Ф	V	f	v	Ж	Ц	ж						ц	6
+7		'	7	Г	W	g	w	З	Ч	з						ч	7
+8		(	8	Н	X	h	x	И	Ш	и						ш	8
+9		)	9	І	Y	i	y	Й	Щ	й						щ	9
+10		*	:	J	Z	j	z	К	Ъ	к						ъ	А
+11		+	;	К	[	k	{	Л	Ы	л						ы	В
+12		,	<	L	\	l		М	Ь	м						ь	С
+13		-	=	M	]	m	}	Н	Э	н						э	Д
+14		.	>	N	^	n	~	О	Ю	о						ю	Е
+15		/	?	O	_	o		П	Я	п						я	Ф
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	

## BFont characters

This character set is used in the BBC Master microcomputer. It is retained for the sake of compatibility, but should not be used for new applications.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	Nothing	Clear graphics	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣	␣
1	Next to printer	Define text colour	!	1	A	Q	a	q	ä	ä	ï	ÿ	À	P	α	ρ
2	Start printer	Define graphics colour	"	2	B	R	b	r	⊖	æ	-	˘	B	Σ	β	σ
3	Stop printer	Define logical colours	#	3	C	S	c	s	⊘	⊘	Γ	˘	Γ	T	Υ	τ
4	Separate cursors	Default logical colours	\$	4	D	T	d	t	é	é	-	˘	Δ	Υ	δ	υ
5	Join cursors	Disable VDU	%	5	E	U	e	u	ö	ö	γ	˘	È	⊖	ε	φ
6	Enable VDU	Select mode	&	6	F	V	f	v	ü	ü	-	˘	Z	X	Z	x
7	Bell	Reprogram characters	'	7	G	W	g	w	@	˘	T	˘	H	⊖	η	ψ
8	Back	Define graphics area	(	8	H	X	h	x	+	˘	'	T	⊖	Ω	⊖	ω
9	Forward	Plot	)	9	I	Y	i	y	+	˘		⊖	I	∇	∇	à
A	Down	Default text / graphics areas	*	:	J	Z	j	z	+	˘	˘	'	K	I	K	≈
B	Up	Nothing	+	;	K	C	k	c	†	˘	†	˘	˘	˘	˘	≡
C	Clear screen	Define text area	,	<	L	\	l	!	à	ü	˘	˘	M	±	μ	ξ
D	Start of line	Define graphics origin	-	=	M	J	m	˘	è	ÿ	†	˘	N	∥	v	≠
E	Paged mode	Move text cursor to (0,0)	.	>	N	˘	n	˘	è	ÿ	†	˘	√	∑	U	ε
F	Scroll mode	Move text cursor	/	?	O	˘	o	˘	è	ÿ	†	˘	⊖	∩	o	□



---

# Appendix I: Error messages

---

There are many possible error messages; this appendix lists some of the more common ones you might see. It also tells you what the more likely causes of an error message are, and what you can do about it. You may occasionally see other error messages which will usually be self-explanatory. If you have serious problems, especially recurring ones, consult your supplier.

## User Errors

These are errors that are mainly caused by you, the user, performing an inappropriate action. Most of these errors are listed in this chapter, together with a way of curing the error.

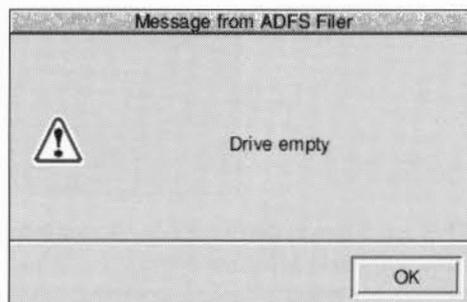
## Internal errors

These errors are not caused by you, but are problems with the system or the application you are using. The most common internal errors are listed here, together with an explanation as to their cause. Most errors of this type start with the word **Internal**.

## Error message windows

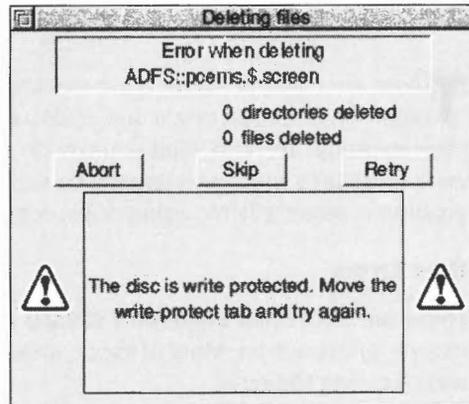
### Standard error boxes

This is what a typical error message window looks like:



## Filer error messages

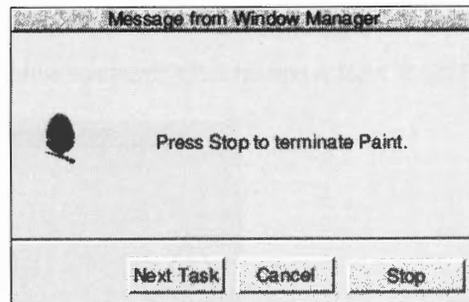
There is another type of error window you may see. This is generated by the desktop Filer and looks like this:



This type of error box is generated when a file operation is not completed. You should clear the fault and then click on the appropriate option. For information about these options, turn to *The Filer* on page 10.

## Application error boxes

This type of error box is displayed when one of the applications in the computer generates an error.



This error box is displayed by the system monitor. It acts like a watchdog and is only activated when something is wrong. The system monitor allows you to selectively remove tasks from the memory of your computer. It is used when you want to remove a task that is misbehaving but you do not want to restart the whole computer system. You'll find out how to use the system monitor in *Managing the desktop* on page 57.

## Error messages

Most error messages are self-explanatory; just follow the instructions given in the error message and try again. This section lists the error messages that may need more explanation.

### **An application that loads a file of this type has not been found by the filer...**

Before you can load a file, the application that the file uses must be loaded. The computer cannot find the application unless the operating system knows where it is stored. The easiest way to tell the computer this is to display the application in a directory display. You could also tell the computer about the application in your Desktop boot file.

### **Chars is unable to display the currently selected outline font**

There is not enough memory reserved for the font cache. Use the Task manager to increase the amount of font cache memory.

### **Disc error**

This may appear for a variety of reasons. The most common explanation is that the floppy disc has a fault on it. You should copy the data onto another disc and then reformat the disc. If you want to try to salvage the disc without formatting it use the command \*Defect.

### **Disc not understood – has it been formatted?**

This error message occurs if you put in a disc that has not been formatted or has been formatted in an unknown format. For example an unused and unformatted disc will give this error message and so will a disc formatted to an Apple Macintosh standard since RISC OS does not understand this format.

### **Filename not recognised**

The file you have requested has not been found. Make sure that the file exists in the directory you have specified and then try again.

### **This file has been left open from a previous operation**

An operation was interrupted by an error, a reset, or similar. Go to the command line by pressing F12 and type in \*Close to close the open file. Press F12 to return to the desktop and then repeat the command that caused the error. If the error persists, restart your computer. \*Close will close all files on the current filing system only. \*Shut closes all open files on all filing systems.

## **File type is unrecognised**

An unrecognised file type is usually displayed as an empty white icon. Nothing will happen when you double-click on it. You should find the application needed to run it. If you drag the file to !Edit you can view the contents of the file in ASCII format (though this may be unhelpful if the file is not a text file).

## **Free space map full**

The data on your disc has become fragmented, and you should compact the disc. This error is only encountered if you are using the old type D or L formats. Use the \*Compact command to compact discs. See the file `Tutorials.StarComms`.

## **Internal error: undefined instruction**

This error may be caused by a bug in the application you are using. Quit the application and then restart the application.

## **Internal error: abort on data transfer**

This error may be caused by a bug in the application you are using. Quit the application and then restart the application.

## **Internal address error**

This error may be caused by a bug in the application you are using. Quit the application and then restart the application.

## **No reply from the network station**

There is a delay on the network, or the Server is not answering; try repeating the command that caused it. If the error happens repeatedly, ask your system manager for help.

## **Not logged on**

You have asked the computer to load a file or application from the network, but you are not logged on. You will see this message if you have just copied an application from the network, logged off, and then tried to load a file straight into the application without loading the application first. The computer tries to load the application from where it first saw it – the network. To avoid this problem, you should first load the application from your disc copy of it, and then load the file.

### **No free printer server of this type**

The printer is not responding. Check that it is plugged in. If you are using the network printer server, try again later when it may be free; if this error occurs repeatedly, consult your system manager.

### **Printer in use**

You are trying to print from more than one application at once. Wait for the first application to finish before printing from the other one.

### **Printer jammed**

The printer is not responding. Check that it is plugged in. If you are using the network printer server, try again later when it may be free; if this error occurs repeatedly, consult your system manager.

### **System resources cannot be found**

The !System application (provided on disc with your computer) cannot be found. Display the directory containing !System and repeat your command. Some applications need to 'see' !System, even though they do not use it.

### **The access details set for this item do not allow this**

Change the access details using the **File/Access** menu so that access is allowed and then try again.

### **The area of memory reserved for fonts is full**

The space reserved for fonts has been used up. Use the Task manager to reserve more space for the font cache. Alternatively use the Configure application to set the font cache automatically.

### **The area of memory reserved for relocatable modules is full**

The space reserved for modules has been used up. Try quitting some applications, or, if that fails, shutdown and reboot your machine to free up module space.

### **The disc is write protected...**

The floppy disc you are trying to access is write protected. Move the write-protect tab and try again.

### **The maximum number of items in a directory has been reached**

You cannot have more than 77 objects in an ADFS directory. You should create a new directory to save your work in.

### **The network is not plugged in**

Check the cable from the socket at the back of the computer to the network socket.

### **The network station you have requested does not appear to be listening**

There is a delay on the network. Try repeating the command that caused it. If the error happens repeatedly, ask your system manager for help.

### **There is a problem with the network...**

Follow the instructions given in the error message. If the errors persist inform your supervisor or network manager of the problem.

### **There is no reply from the Network station requested**

You've tried to access a network file server using the wrong station number.

### **There is not enough memory...**

#### **xxx free memory is needed before the application will start**

You need to free more memory before the application will run. You can do this by

- quitting other applications and modules.
- using the Task manager application to reduce the amount of memory used by other things, such as the font cache and system sprite pool
- changing to a screen display with a lower resolution and/or fewer colours
- discarding the RAM disc if you have one. See *Managing memory* on page 62.

There's a limit on the amount of memory any single application can use (28MB approx.) and you may see this message if your application reaches this limit.

### **This item has been locked to stop changes being made to it**

You tried to do something forbidden to a locked file, such as delete it. Change the lock access details using the **File/Access/Access** details window so that access is allowed and then try again.

### **This screen mode is unsuitable for displaying the desktop**

You cannot use this display mode with the desktop. Change to another mode using the Display Manager.

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