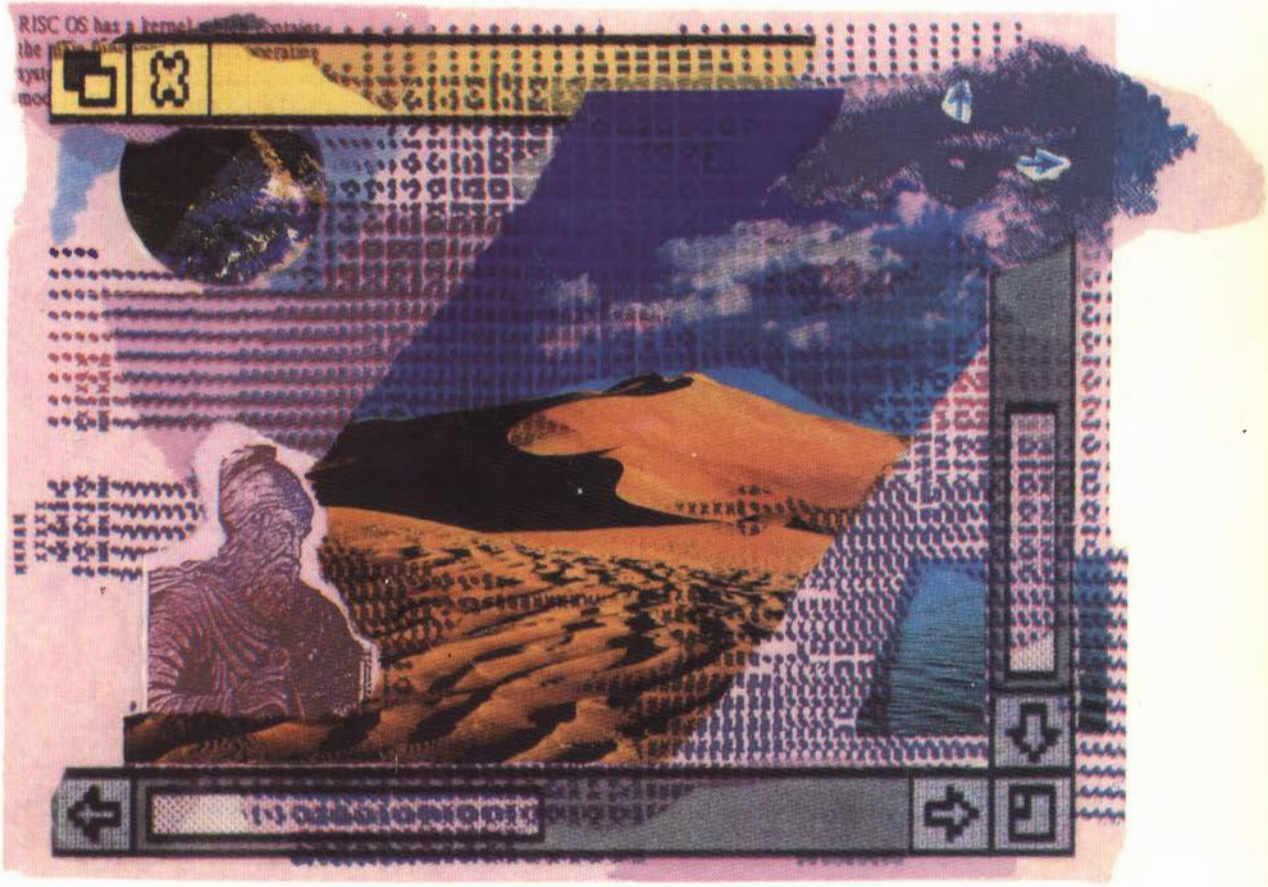
RISC OS 3

User Guide
Applications Guide



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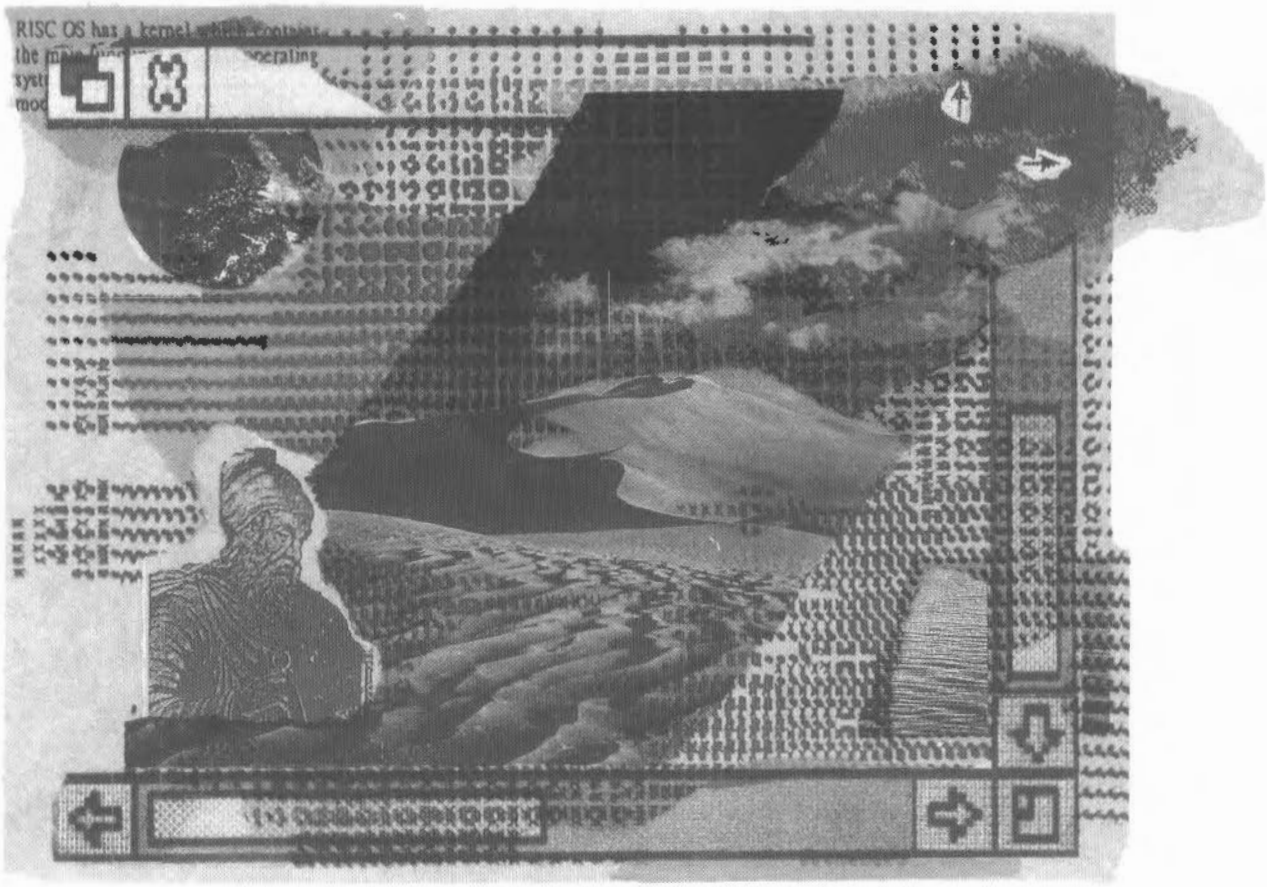

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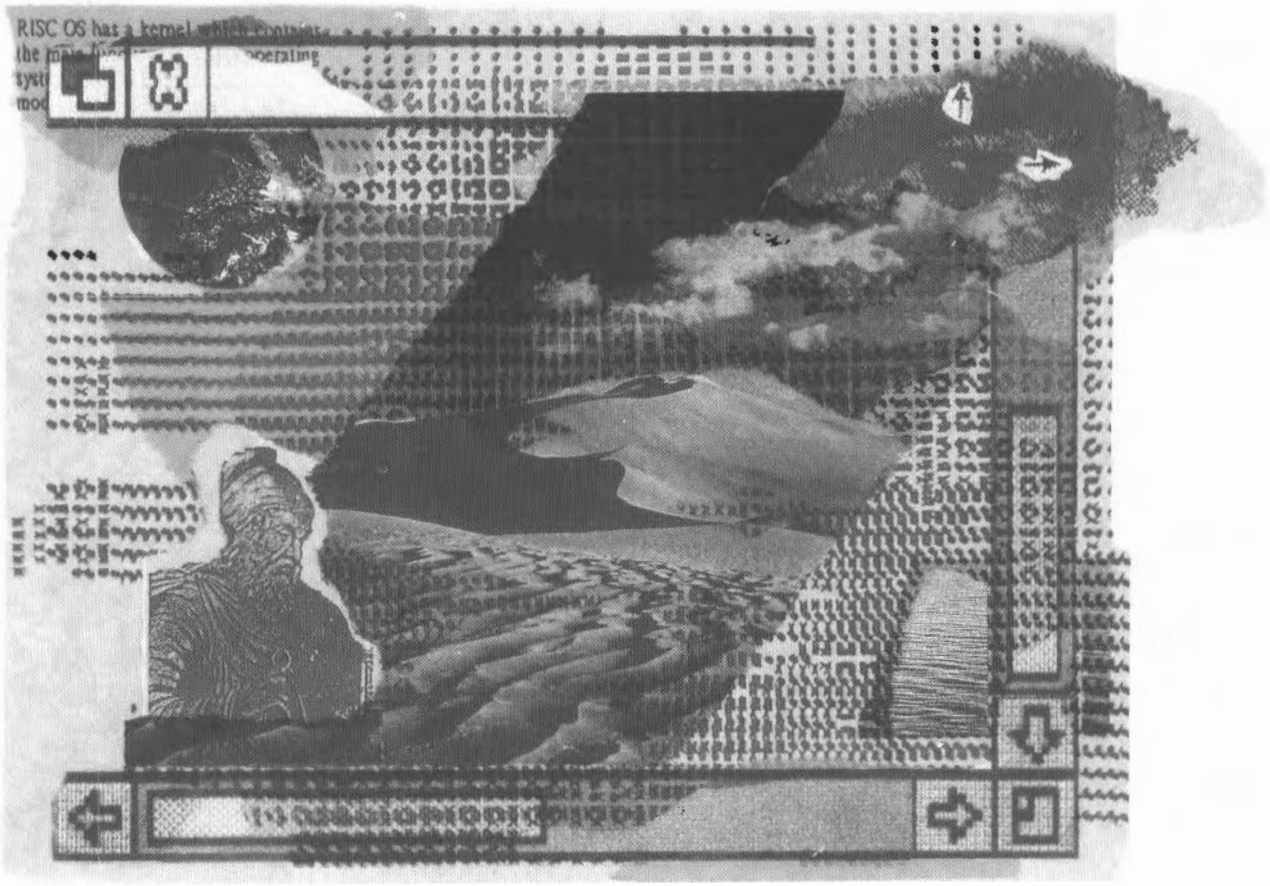

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Contents

About this guide

This guide, in conjunction with the *Welcome Guide*, describes the RISC OS 3 operating system. The applications that come with the operating system are described in the *Applications Guide*.

If you are new to your computer, you should first read the *Welcome Guide*. This tells you how to set the computer up and start using the RISC OS desktop, how to use the mouse to manipulate windows and files, and how to open menus and choose commands from them.

If you are upgrading your computer from RISC OS 2.00 (or 2.01), you should read the rest of this chapter and then turn to Appendix A, which lists the major changes in the desktop and operating system.

Throughout this guide the term 'RISC OS' refers to the current version (3) of the operating system. The previous version is referred to as 'RISC OS 2.00'. 'RISC OS 2.00' should be taken to include RISC OS 2.01.

What's in 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: *The desktop* tells you more about the basic task of manipulating files and directories. It also describes how to print files and use storage devices such as disc drives.

Part 2: *Desktop configuration* tells you how to change the way the desktop behaves and how to automate your start-up procedure using boot files.

Part 3: *Outside the desktop* tells 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.

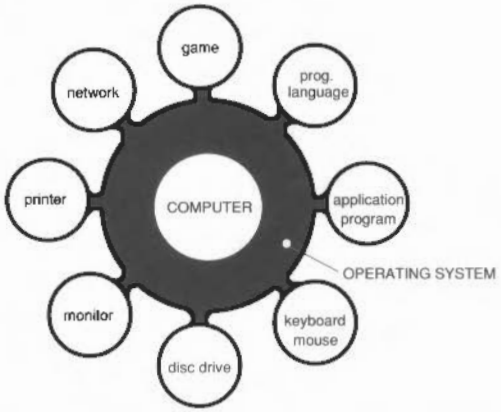
Finally, the *Appendices* contain reference material on subjects such as power-on reset variations, hard disc formatting and error messages.

At the end of the guide you will find a *Reader's Comment Form*, which you can return to us with comments or suggestions about this guide.

What is an operating system?

If you look in a computing textbook, it will probably describe an operating system in terms such as "*controls the operation, coordinating the use of input and output sources, the processing of data etc*".

In practical terms, the operating system of a computer is the software interface between the computer's hardware on the one hand, and the programs it runs plus the other pieces of equipment it uses on the other. It could be represented graphically like this:



The operating system is, as it were, the glue between the computer and its programs and peripheral equipment. It allows you to load an application program from a disc, for example, and then determines how the program is run. It takes input to the program from the mouse and keyboard, and arranges to display the results on the monitor. When you have finished your session, it enables you to save your work back to the disc in a file.

How RISC OS operates

The RISC OS operating system consists of three layers:

The innermost layer, or the *core*, contains the programs that actually make the computer work and which we don't need to understand here.

The next layer is the *command line interface*. This is a traditional text-based interface which programmers use to write programs and scripts. Part 3 of this manual, *Outside the desktop*, gives an overview of all the commands used with the command line, together with an introduction to using them. If you plan to use the command line commands in more depth (for programming) you should buy the RISC OS *Programmer's Reference Manual*.

The outermost layer is the *desktop*. This is the layer that this manual is mostly about. The desktop shows us files, directories and applications represented as icons. Applications display information in windows and, unlike some operating systems, you can have many different applications and windows on the screen at the same time. You should already have a good idea of how the desktop operates from reading the *Welcome Guide*.

Running programs on your computer

Sophisticated as it is, RISC OS just provides an infrastructure of facilities for your computer, making it easier for you to do things with it. Once you have grasped the basic principles of the RISC OS desktop, you will want to start using it seriously to run programs. You can keep coming back to this guide to learn more about the operating system and how to tailor it to suit your way of working.

Applications and games

Application programs, or applications, are designed to help you with your work or leisure activities. The best-known application is the word processor. Other applications include desktop publishing, drawing and painting. These and other software and hardware products are published both by Acorn and by many independent companies. Details of these may be obtained from your Acorn supplier.

A number of applications and games are supplied with RISC OS, including a text editor, draw and paint programs, a music editor and two different calculators. These are described in the *Applications Guide*.

Programming languages

The BBC BASIC programming language is provided with RISC OS and if you plan to write BASIC programs on your Acorn computer you will find the BBC BASIC *Reference Manual* invaluable.

Other programming languages available from Acorn include

- Acorn Desktop C
- Acorn Desktop Assembler

and for teaching purposes

- Fortran 77 (Release 2)
- ISO-Pascal (Release 2).

Programmers and other users who want to find out about their machine at a greater level of detail than is covered in this guide will also be interested in the RISC OS *Programmer's Reference Manual*, which covers the RISC OS operating system and the desktop environment in more depth.

The Applications suite discs

Your computer is supplied with a number of floppy discs containing applications. This is in addition to the applications permanently held inside the computer in ROM (Read Only Memory).

Applications that control a system operation, such as configuration or printing, are described in this guide, while other applications are described in the *Applications Guide*.

The following applications are described in this guide:

Configure	FontPrint	HForm
Fonts	Scrap	
Printers	System	

The following applications are described in the *Applications Guide*:

Alarm	Draw	Patience	65_Host
AlarmConv	Edit	PrintEdit	65_Tube
Calc	Madness	Puzzle	T1ToFont
ChangeFSI	Maestro	SciCalc	TinyDirs
Chars	Magnifier	SetIcons	TVTest
Clock	Paint	Squash	Usage

Important tips

Using your computer safely

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

Unexpected behaviour

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

Why has the screen gone blank?

If your screen goes blank while you are not using it, you can restore it by moving the mouse or pressing any key on the keyboard. This facility is designed to save wear on the screen, and is described in the section entitled *Screen* on page 97.

Getting out of a mess (resetting the computer)

You may run a program which causes your computer to 'hang up' – where pressing a key or moving the mouse has no effect. You can normally cure this by resetting the computer. To reset the computer, hold down the Ctrl key while pressing the Reset button. The position of the Reset button is shown in the *Welcome Guide*.

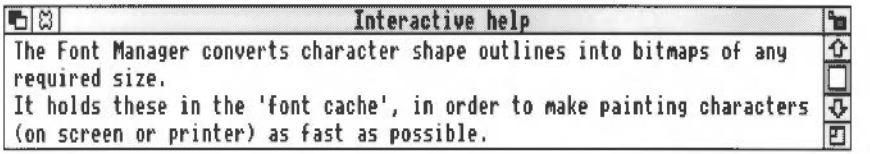
When you reset the computer, any unsaved data will be lost.

Getting help

The !Help application

The !Help application provides on-screen information as you use your computer. The desktop itself and most of the applications can give you help in this way. For information on how to use !Help, refer to the *Applications Guide*.

This is what the Interactive Help message looks like when you position the pointer over part of the Font window in the !Configure application.



The Help option

On the main Filer/Application submenu there is a Help option. Click on **Help** to display useful information about an application. For more information, see page 22.

Help on *Commands

If you want to find out about a particular *command, press the F12 function key to go into command line mode and then type *Help, followed by the command you want help on, and then press Return. To return to the desktop, press Return again. For more information, see the section entitled *The command line help system* on page 131. The following example shows help for the keyword Help.

```
*Help Help

==> Help on keyword Help
*Help (subjects) attempts to give useful information on the selected topics.
Special keywords include:
Commands        List all the available utility commands
FileCommands    List all the filing system-specific commands
Modules         List the module titles
Syntax          Explain the syntax message format
*
```

Conventions

The following conventions are used in this guide:

- Menu names and options are shown in bold type; for example:

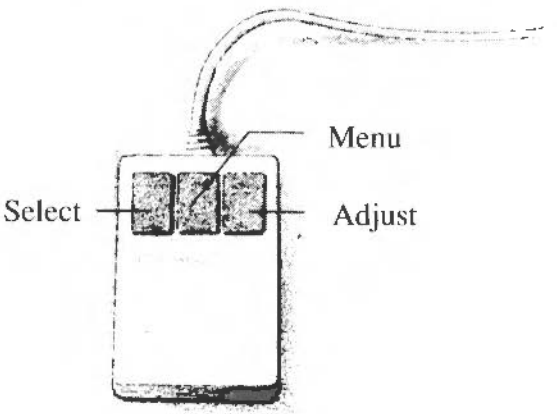
  Use the **Actual size** option in the **View** menu.

- Sometimes you will need to press one key while holding down another. This is shown like this:

  Ctrl-F9 (means hold down the Control key and press the function key F9.)

The mouse

The mouse has three buttons. From left to right their names are Select, Menu and Adjust. The functions they perform depend on the application you are using. For some general principles refer to the *Welcome Guide*.



The Applications discs

The applications supplied with your computer come permanently stored in memory or on disc.

At the top of the chapter or section referring to these applications you may see one of the following icons.

Applications on App 1 are denoted by this icon.

Applications on App 2 are denoted by this icon.

Applications in ROM (the Apps directory) are denoted by this icon.

If you've bought a computer with a hard disc, you'll find these applications already installed on your hard disc. The App 1 and App 2 symbols refer to subdirectories on the hard disc.

If you've bought a computer with a floppy disc only, you'll receive a single floppy disc that contains the applications. The App 1 and App 2 symbols refer to subdirectories on the floppy disc.

If you've bought an upgrade kit, you'll receive two floppy discs containing applications. The App 1 and App 2 symbols refer to these individual floppy discs.

Ordering information

The following additional manuals can be purchased from your supplier:

BBC BASIC *Reference manual* – A reference manual for BBC BASIC V and VI. These are the BASIC languages supplied with every computer.

RISC OS *Programmer's Reference Manual* – A complete reference manual for the RISC OS operating system. Essential reading for all serious RISC OS programmers.

Technical Reference Manuals for most Acorn computers are also available.

The following Acorn products can be purchased from your supplier:

Software products

PC Emulator	Acorn Desktop Publisher
1st Word Plus	Acorn Desktop C
Acorn Desktop Assembler	

Hardware products

I/O Expansion card	MIDI Expansion card
SCSI Expansion card	Memory Expansion card

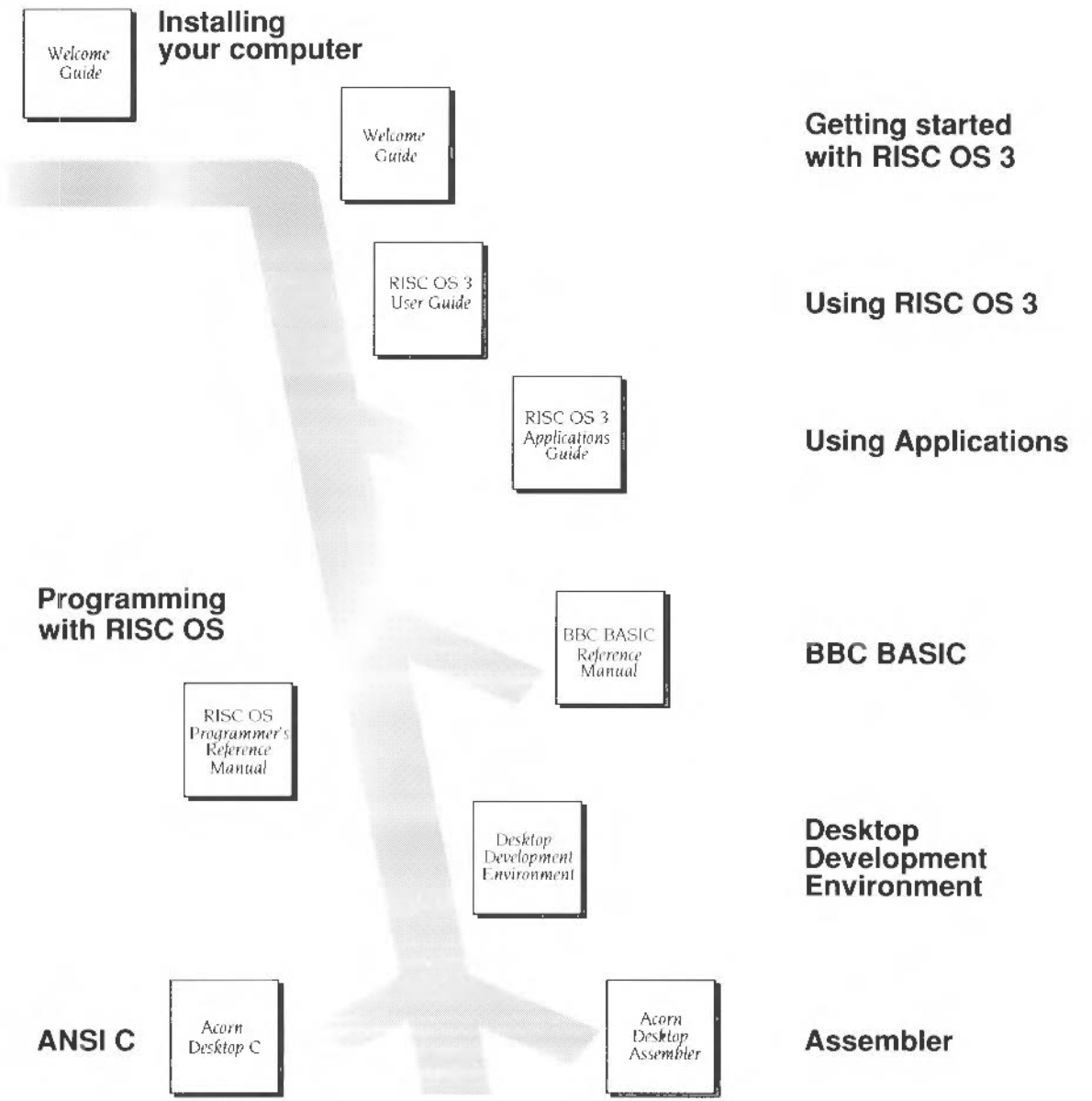
Network Products

Econet module	Broadcast loader
Ethernet Expansion card	Level 4 File Server
TCP/IP Protocol Suite	

Ask your Acorn supplier for an up-to-date list of all Acorn products and details of the many third party software and hardware products also available.

Documentation roadmap

This roadmap will help you decide which tools and manuals you will need, as you learn about RISC OS.



Part 1:
The desktop

1 The desktop Filer

The chapter *Files and directories* in the *Welcome Guide* provides an introduction to the concept of the filing system, and to the basic filing tasks of loading, saving, copying, moving and deleting files, and creating new directories.

This chapter expands on the *Welcome Guide*, covering in more detail how the filing system works, and how you can use the file-handling features which RISC OS provides to make the best use of your computer, whatever you are using it for.

You use the filing system whenever you use the computer, it allows you to display and manipulate your files, directories and applications. There are several types of filing system, but generally they all work in the same way and you need not be aware of the differences between them.

If you want to find out which filing system you are using, look at the name in the title bar of the window. This name always starts with the filing system name, for example, ADFS. Filing systems are usually associated with physical storage devices. Here is a list of the main types of filing systems:

- Floppy discs and hard discs usually use ADFS (the Advanced Disc Filing System).

- Network file servers use Net (NetFS, the Network Filing System).

- Applications in the Apps directory (stored in the computer's ROM) use Resources (ResourceFS, the Resource Filing System).

- Applications stored on RAM disc use RAMFS (the RAM Filing System).

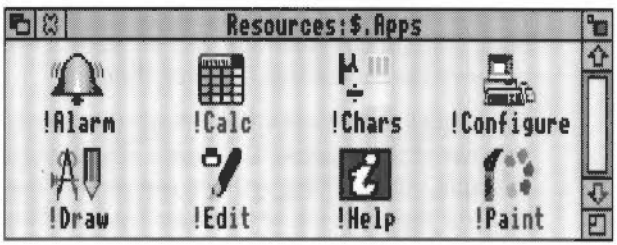
There are others which you may come across, such as SCSIFS (for computers fitted with SCSI interfaces), CDFS (for computers that use CD-ROM drives) and NFS, a high-speed networked filing system (for computers running the TCP/IP Protocol Suite).

The icons for the storage device(s) connected to your computer appear on the lefthand side of the icon bar. You can have only one RAM disc and one Resource filing system (the Apps directory), but you may be connected to more than one floppy drive, hard disc or network file server. These will be identified by different names or numbers.

Fortunately most users need to know very little about these different filing systems, as most of their functions are controlled from the desktop by one 'super' filing system, called the Filer, which is described later in this chapter. Features specific to individual storage devices and filing systems are covered in the next chapter.

Directory displays

The contents of filing systems are shown on the screen in directory displays. Clicking on the icon for a particular information storage device (such as a disc drive icon) opens a directory display. This is the directory display that you see when you click on the Apps icon:



Moving around the filing system

You can use the following techniques to find your way around the filing system:

To open a subdirectory display

Double-click Select on the subdirectory's icon (a folder). The subdirectory display will then appear on the screen in a new window.

If you double click on the icon for a directory that is already open somewhere on the screen, its directory display is moved in front of the other windows on the screen, rather than a new window being opened.

Advanced users may wish to know that pressing Ctrl while double clicking on a directory opens the directory without running the !Boot files of applications within that directory. This speeds up the opening of large directories, and saves memory.

To open a subdirectory display and close its parent

If a directory contains a subdirectory, then it is the 'parent' of that subdirectory. To open a subdirectory, and simultaneously close its parent, double-click Adjust on the subdirectory's icon.

To open the parent directory

To open the parent of a subdirectory, hold down Shift and click Adjust on the Close icon. You can also choose **Open parent** from the Filer menu (see page 17).

To open the parent of your user directory on an Econet file server, you will have to use **Open $** on the icon bar menu for the file server (see page 44).

To close a directory display

Click Select on the Close icon of the window.

To close a subdirectory display and open its parent

Click Adjust on the Close icon of the window.

To load any file into Edit

Any file, not just text files, can be viewed in Edit. Just hold down Shift and double-click on the file icon.

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 of a file or directory is a complete description of where the file or directory is located in the filing system structure of a particular storage device.

Usually on the RISC OS desktop you can refer to a file or directory by selecting it, or by giving its name (in an icon, for example).

Occasionally, however, you need to specify all or part of the sequence of directories that leads to it. The route down the directory tree is called a *path*, so the whole sequence, including the filename at the end, is called a *pathname*. At its most general, a pathname has the following form:

filing-system`::`*disc-name*`.`*directory-names*`.`*filename*

For example:

```
adfs::Work.$.letters.replies.ToBill
```

So in this example:

- `adfs` is the filing system name (the Advanced Disc Filing System). Note that it is followed by a colon. If the filing system name is omitted from a pathname, the current filing system is used (see below). On a network the syntax is slightly different; the filing system name is followed by the network number or name.
- `Work` is the name of the disc. It may be a hard disc or a floppy disc. The disc may be in the floppy disc drive or not; the filing system will ask you to put the disc in the drive if it needs it. It is preceded by a second colon; if you omit the whole disc name, the current disc is used.
- $ is the name given to the 'root' directory. This is usually the directory you first open when you click on a storage device icon – the structure of directories and files on a particular storage device grows out of that first directory.

  The exceptions to this are network file servers, where the directory display you first open will normally be your user directory, which is one or more directories removed from the root.

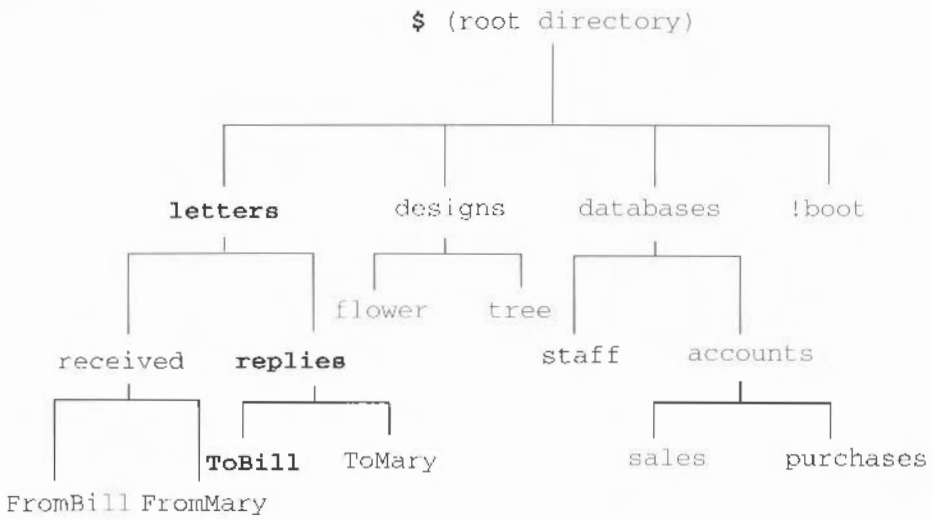
  If this, and the filing system name and disc name are omitted, the path is taken relative to the current directory.
- `letters` is the name of a directory contained within the root directory.
- `replies` is the name of a directory contained within the `letters` directory.
- `ToBill` is the name of a file within the `replies` directory.

  Each of the directory names in the path from the root onwards is separated from the next element of the path by a full stop.

Current filing system concept

The concepts of current filing system, current disc and current directory are more applicable to *Command Line Mode* than to the desktop; however, they do still apply when using the desktop. See the chapter entitled *Accessing the command line* on page 127 for information about the command line interface.

A graphical way of representing the filing system structure containing the file `ToBill` would be:



Application directories

A special sort of directory is used to contain application programs and the resources they use; logically enough, these are called application directories. They contain not only the application program itself, but other files needed to run it. Application directories have a name starting with an exclamation mark.

In general, you won't need to know about the internals of application directories. One point that you may notice, however, is that directory displays for discs and directories that contain applications take longer to appear on the screen than other directory displays. This is because the icons that are used to represent applications and the files they work on are loaded from special files in the application directories. Once the icons have been loaded, the computer does not need to load them again, but the more icons you load, the less workspace will be left for you to use. To check on how the computer is using its memory, see the chapter entitled *Fine tuning the configuration* on page 103.

To run an application

If you double-click on an icon other than a directory icon, the effect is to load and/or execute the associated file: a text file, for example, will be loaded into Edit, and an application will run. See the chapter *Loading and saving files* in the *Welcome Guide* for more details.

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.

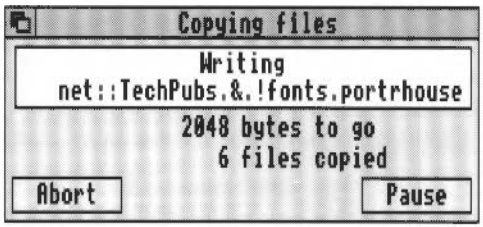
Opening an application directory

Unlike normal directories, double clicking on an Application directory will execute the application program. If you want to **open** an application directory, rather than execute it, hold down Shift and double-click on its icon.

Unless stated otherwise, references to directories in the rest of this chapter also apply to applications.

The Filer

As mentioned in the introduction to this chapter, the Filer provides the desktop interface between you and the filing system. It not only lets you carry out the basic filing operations mentioned in the *Welcome Guide*, plus many more, but also allows you to do so between **different** filing systems. You can open directory displays for several filing systems on your desktop, then, for example, copy files between your floppy disc drive and an Econet network (if you are connected to one), then delete a file on your RAM 'disc', and move files from your RAM disc to your floppy disc. All these actions are controlled by the Filer.



Filer operations normally run 'in the background', so that you can carry out other desktop activities while copying, searching, deleting, and so on, proceed. However, if your computer is running short of memory (if you have several applications running, for instance), the Filer may not be able to continue in the background and will have to suspend other activities while it completes its tasks. You can tell that this has happened by the fact that the normal message boxes that appear if you have the **Verbose** option set are replaced by larger, simpler, windows. You must then wait until the Filer has finished before doing anything else. For information on the **Verbose** option, see page 15.

Operations on directories

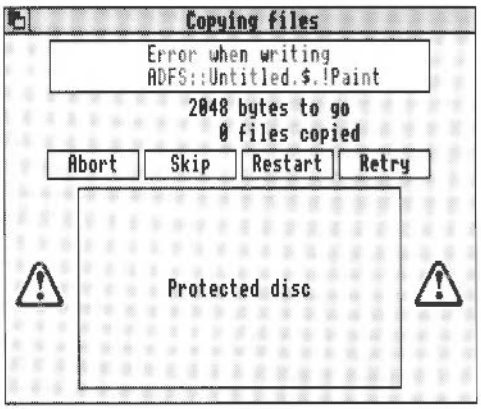
Some operations, such as copying and deleting, when applied to a directory, will normally also be applied to all objects within a directory. If any of those objects are themselves directories, the operation will apply to their contents as well (and so on). Moving an application, for example, will move all of it: its directory and all its contents.

Multiple desktop operations

Although you can run several Filer operations simultaneously, you should not run more than one operation on the same source or destination file or directory at the same time. For example, do not copy files into a directory while at the same time deleting existing files from the same directory. Doing so may result in data loss.

Correcting Filer problems

If a problem arises during a file operation, you will see an error box displayed with the following options:



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

This picture shows an error box and message combined. In this case an error occurred because you tried to write to a protected disc.

Once the problem that caused the error has been cleared, you will find that Retry will normally continue with the file operation. In this case the problem is most probably that the floppy disc has its write protect tab in the protect position.

Selecting files and directories

Before you can carry out a filing system operation, you must indicate which object or objects you wish to apply it to. There are several ways of doing this:

- To choose a single object, click Select on it.
- To choose a group of objects, click Select or Adjust on the first one, and Adjust on each of the others in turn. If the objects are conveniently placed, you can also choose them by using the mouse and pointer to drag a box round them. To do this, move the pointer to one corner of the group of objects (not over an icon) and drag to the opposite corner; then release the mouse button. You can use Adjust to deselect icons too.
- To select all objects in a directory display choose **Select all** from the Filer menu.

The selected objects are shown highlighted. After the operation, the objects are deselected.

To deselect an object by hand, click Adjust on it. The entire group of selected objects in a directory display may be deselected by choosing **Clear selection** from the Filer menu, or by clicking when the pointer is clear of any objects.

If there are no objects selected when you click Menu in a directory display, and the mouse pointer is over an object, that object will be selected before the menu appears.

See the *Welcome Guide* for basic details about selecting, copying and moving.

The icon bar

If you find that the icon bar gets covered by windows you can move the icon bar to the front by holding down Shift and pressing F12. If you want to send the icon bar to the back again press Shift and F12 again.

Facilities offered by the Filer

You can select, copy and move files between directory displays just by dragging file icons from one window to another, as described in the *Welcome Guide*. Other Filer facilities are accessed from the Filer menu.

Click **Menu** anywhere over a Filer directory display to show the Filer menu. The illustration opposite shows the options available from the main Filer menu. See the chapter entitled *Menus* in the *Welcome Guide* for information on how to choose from menus.

If an operation is shown in grey on the menu, it is not available at that point, and you will not be able to choose it.

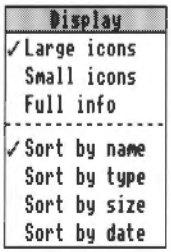
The table below shows which main menu options to choose to carry out different tasks with the Filer. The main menu options are then described in turn:

Task	Choose
Change the access on a file or directory	File*
Change the default options on Filer actions	Options
Copy	File*†
Create a new directory	New directory
Delete a file or directory	File*
Deselect all icons which have been selected	Clear selection
Display files & directories in different ways	Display
Ensure confirmation of file actions	Options
Find a file or directory	File*
Get information on a file or directory	File*
Learn the size of a file or directory	File* or Display
Open the parent directory	Open parent
Rename a file or directory	File*
Select all icons in a directory display	Select all
Set a file type	File*
Change the time stamp on a file	File*

*Only available if you first select (or click on Menu over) the file or directory you want to apply it to (see **File** below). **File** will change to **Dir.** if you select a directory, **App.** if you select an application, or **Selection** if you select more than one file.

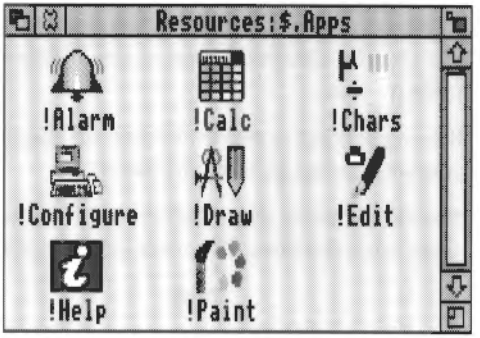
† Files and directories can also be **copied** merely by dragging their icons from one directory display to another. Additionally they can be **moved** by holding down Shift while dragging their icons from one directory display to another.

Display

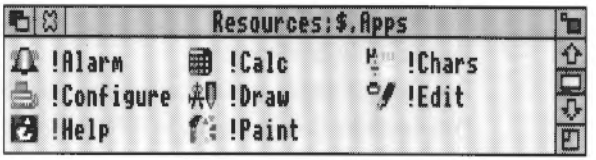


You can change the way file and directory information is shown in directory displays using the **Display** menu. The objects in the directory can be displayed as:

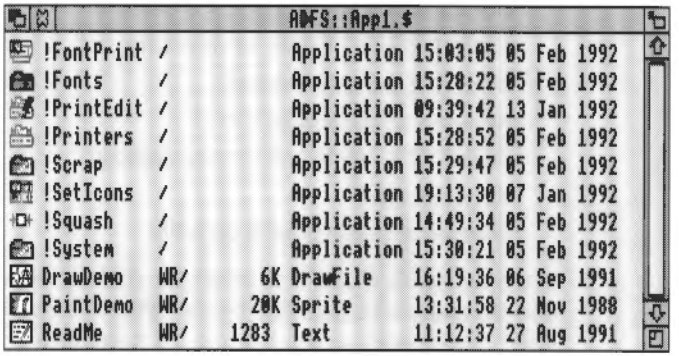
- **Large icons**:



- **Small icons**:



- **Full info**:



Full info consists of a small icon, followed by a number of attributes. The letters following the file or directory name indicate owner access when they occur before the /, and public access after the /. For how to interpret the access information, refer to *Access* on page 20. File sizes are shown in bytes and kilobytes – for more

information on displaying the sizes of files and directories, see **Count** and **Info** on page 22. For files which have a load and execute address, rather than a type and a date/time entry, the load address precedes the execute address in the display.

You can also change the **order** in which the objects are shown in the directory display. The options are:

- **Sort by name**: ascending alphabetical order. This is the default option.
- **Sort by type**: undated files first, then dated files in numerical order of file type, then applications, and finally directories.
- **Sort by size**: files in descending order of size first, then applications and finally directories.
- **Sort by date**: most recent first.

When you change the format for a directory display, the same format will be applied to any directory displays you open afterwards.

When copying files to a Full info directory display you will see blank icons appear with the code word 'DEADDEAD' displayed on the line. When the file copying is completed, these words and the blank icon are replaced by the copied file.

To set the computer's time and date, use the !Alarm application. See the *Applications Guide* for more information about !Alarm.

File (or Dir. or App. or Selection)

File is the main menu tree in the Filer, enabling you to carry out many different operations on files and directories. Because of its size, it is described at the end of this chapter, starting on page 17.

Select all

Choose **Select all** to select all the files and directories in a directory display, so that you can copy or move them into another directory display (by dragging) if you want to, or perform one of the operations listed in the **Selection** menu.

Use the **Adjust** mouse button to deselect individual objects. See also *Selecting files and directories* on page 10.

Clear selection

Choose **Clear selection** to deselect all the icons already selected in a directory display.

See also **Select all** above, and *Selecting files and directories* on page 10.

Options

You can set four options to provide finer control over most of the filing system operations invoked from the **File** menu described above. These are set using the **Options** menu. When an option is on, its menu entry is ticked.

Like **Display**, the options apply to all directory displays, rather than just the one from which they were set.

The table below shows which option to choose to carry out a particular task. The options are then described in turn:

Task	Choose
Override file locks	Force
Be advised about the progress of an action	Verbose
Request confirmation before carrying out an action	Confirm
Make sure you don't overwrite a newer file version	Newer

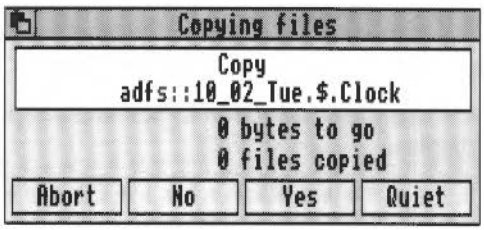
Confirm

The Confirm option causes the operation to ask you whether you really want to apply the operation before applying it to each object. This helps safeguard against the accidental deletion of files, for example.

The Confirm option is off by default, but to switch it on, choose **Confirm**. When the Confirm option is set, the menu item will be ticked.

When you have chosen **Confirm**, a window will appear asking whether you want to apply the operation in question to each object in turn. In reply, you can click one of the following:

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



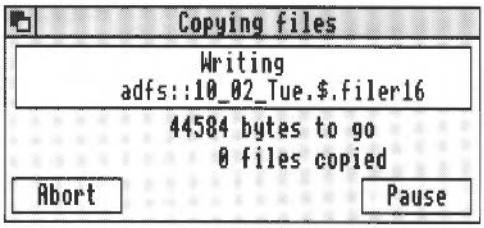
Verbose

The Verbose option tells you about the progress of an operation. By default, it is switched on.

The information about the operation will be displayed in a dialogue box. Click on:

- **Abort** to abandon the entire operation.
- **Pause** to interrupt it temporarily. The box will change to **Continue**. Click on **Continue** to proceed with the operation, or on **Abort** to stop.

Verbose often tells you useful information about Filer actions, so it is worthwhile leaving switched on.



Force

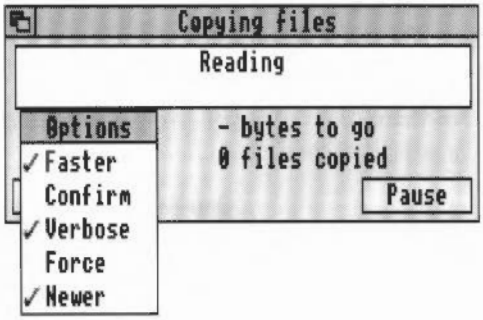
The Force option, when switched on, enables you to delete files and directories even if they are locked. This is particularly useful if you want to delete a directory containing a lot of files, some of which may be locked. However, this option should be used with great care, as it overrides all file protection (see page 20). It is off by default.

Newer

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

Going faster

If you have chosen the Verbose option, 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.



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 and files and windows are not updated.

The Faster option only lasts for the current filing option; as soon as it is finished the desktop is updated to show any changes that have taken place.

New directory

To create a new directory:

1 Open a directory display for the directory in which you want the new directory to reside.

2 Go to the **New directory** writable icon. If necessary, delete the name already in the box; a quick way of doing this is to press Ctrl-U. Type in the name you want for the new directory and click on the name or press Return. See page 18 for information on valid names.

Users of earlier Acorn operating systems should note that new directories are **not** locked by default when you create them.

Open parent

If a directory contains a subdirectory, then it is the 'parent' of that subdirectory. Opening the parent therefore takes you up one 'level' in the filing system tree.

To open the parent of a directory, choose **Open parent**.

Another way is to hold down Shift and click Adjust on the Close icon of the directory display.

This option is not available from the root directory, nor is it, less obviously, from the user directory of a file server. In the latter case, you should use **Open $** from the icon bar menu of the file server icon.

File (or Dir. or App. or Selection)

File is the main menu tree in the Filer, enabling you to carry out many different operations on files and directories.

The table below shows the submenus to choose to carry out specific tasks:

Task	Choose
Change the access on a file or directory	Access
Copy a file or directory	Copy
Copy a file or directory and change the name	Copy
Delete a file or directory	Delete
Find a file or directory	Find
Get information on a file or directory	Info
Find out how large is a file or directory	Count
Change the name of a file or directory	Rename
Set a file type	Set type
Change the time stamp on a file	Stamp

The **File** menu item applies to specific files and directories, and so is only available if you first select the file or directory you want to apply it to. The name of the file or directory will then be incorporated in the menu item – if you select a file called 'Tornado', for example, the menu item will change to **File 'Tornado'.**

You can also put the name of the file or directory in the menu if you move the pointer over an icon and press Menu.

The description will also change, from **File** to **App.** or **Dir.**, if the object selected is an application or directory respectively. If more than one object is selected, the description will change to **Selection**, although not all the submenu options are available when a number of files have been selected.

Copy

The *Welcome Guide* explains the easiest and simplest way of copying – by dragging icons from one directory display to another (from the source directory to the destination directory). The **Copy** option additionally allows you to change the name of the file or directory as you make the copy, so that you can either copy it under a different name to the destination directory, or back into the source directory, so that you can have two copies of the same file, with different names.

To copy a file or directory under a different name:

1 Select the file or directory, and display the **File/Copy** menu option. The **Copy as** box is displayed.

2 Type in the new name of the file or directory. See below for information on valid file names.

3 Click on **OK** for a copy of the file or directory to be made in the source directory, under the new name you have just supplied. To move the copy into a different directory, drag the icon (above the file name) into the destination directory. A copy of the file or directory will appear there, under its new name.

Moving multiple files between floppy discs

The normal way to move multiple files from one floppy disc to another is to select all of the files involved and then drag the file's icon while holding down the Shift key.

However on a computer with only a single floppy disc drive, moving multiple files between two floppy discs results in you having to swap floppy discs continually. We recommend that you first Copy the files, and then go back and delete the original files. This will substantially reduce the number of disc swaps you have to make.

See *Copying between floppy discs using a single drive* on page 46, for another quicker way of moving files.

Rename

To rename a file or directory:

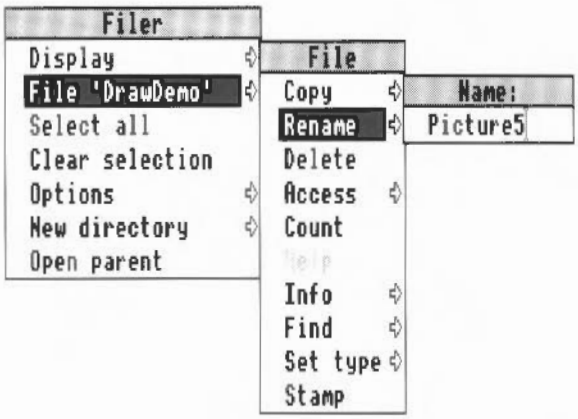
1 Select the file or directory, and from the **File** menu go to the **Rename** menu option and display the **Name** box.

2 Use the Delete key to erase the existing name and then type in the new name of the file or directory.

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

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

Upper- and lower-case letters are normally treated as equivalents in filenames. Thus, although a file may be stored under the name Fruit, you can refer to it as (for example) Fruit, fruit, FRUIT, FruiT, and so on.



3 Click on the new name, or press Return. The new name will appear in the directory display.

Take care if you are using the NFS Filer (in the TCP/IP Protocol Suite). This filer **is** case-sensitive since it displays files stored on other types of computer.

Delete

To delete a file or directory:

Select the file or directory, and from the **File** menu, then choose the **Delete** menu option. The file or directory will be deleted from the directory.

Warning: Make sure you really want to delete the file. After deletion the file cannot be recovered.

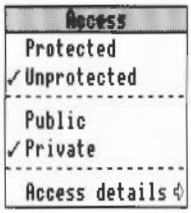
You may not be able to delete a file or directory if it has been locked. To unlock a file you should choose the **Unprotected** option from the **Access** submenu.

You can override all file locks permanently by choosing **Force** from the **Options** menu. This should be used with caution! Always remember to turn the Force option off after you have finished using it.

You can delete more than one file or directory at a time.

You can select more than one object in a directory display for deletion at the same time by using **Select all**, clicking on several objects with Adjust, or highlighting a block of them. See page 10 for more information.

Access



Access to files means **who** is permitted to do **what** to them. The **who** is either you or anyone else; the **what** is read, write to or delete the files. This is of particular interest when your computer is connected to a network.

You can control access to files in two ways: one relatively simple way, and a second way that requires a slightly greater understanding of how access is set. The simple way is as follows:

1 Select the file.

2 Go to the **File/Access** submenu. If you have selected only one object, there will be a tick alongside either **Protected** or **Unprotected**, and one alongside either **Private** or **Public**. If you have selected more than one object, none of the options will be ticked. The meaning of these options is as follows:

- **Protected**: the file cannot be deleted or altered (by anyone). This is a good way of preventing damage to files you have finished working on. However the Force option (see page 15), overrides any protection you may have set (unless the file is stored on a network server with different ownership).
- **Unprotected:** it can be deleted or altered by anyone.
- **Public**: it can be read by other users on a network (this is irrelevant if you are not using a network, but it is convenient for when you copy objects to a network, since this property will be preserved).
- **Private**: it can be read by no-one but yourself.

By default, objects are **Unprotected**, but **Private** – this means that you can read and alter them, but no one else can.

3 Choose which of these access parameters you want to set for the selected file.

If you change the access details of a directory, it affects the access details of all the files contained in the directory.

Access details

The simple form of access just described is likely to be all that most people need, most of the time. However, you can also set access in a more detailed way that corresponds more closely with the way the computer understands it. To do this, move to the **Access details** option and display its dialogue box

Each of these five options relates directly to one of the five access flags which form part of the properties of a file or directory. The last two come into play only when the object is stored on a network. When each flag is set:

- **Locked** means that the file cannot be deleted. By default, this flag is clear (ie not set). You can still delete a locked file if you set your file Options to Force. See page 15 for more information.

- **Owner read** means that the file's owner can read the file (for example, by loading it into an editor). By default, this flag is set.
- **Owner write** means that the file's owner can write to the file (ie, can change it and save it in the same place with the same name). By default, this flag is also set.
- **Public read** means that other network users can load your files or run an application in your network space. By default, this flag is clear.
- **Public write** means that other network users can write to the file. By default, this flag is also clear.

Click on the appropriate diamonds for the object(s) you have selected; click on **Yes** to set a flag, and on **No** to clear it. A diamond will appear when you do this; if you change your mind, you can remove it by clicking on it with Adjust. To apply the change to the contents of directories you have selected (and their contents, if any, and so on), click in the **Recurse** box so that a star appears. When you are ready, click on **OK**.

The two ways of setting access relate to each other as follows:

- If a file is **Protected**, its lock flag is set and its owner write flag is clear.
- If a file is **Public**, its public read flag is set.
- The owner read and public write flags can only be set using the **Access details** dialogue box.

If you select a directory, the access details are not set. If you then set any access details they will affect all of the files within that directory.

If you use a Level 4 file server, you should make sure that you do not set directories to Locked. This is because the Locked option may make directories invisible to other users on the network.

Count

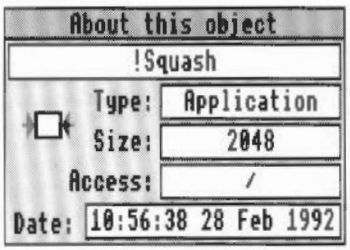
Choosing **Count** will display the number of files selected and their total size in bytes.

Help

Choosing **Help** will display a help file for the selected application. This option is greyed out if the application does not have a help file, or if the selection is a file or directory.

Info

Choose **Info** to display the file type, size, access details and date last modified – information similar to that shown when you choose **Full Info** from the **Display** menu.



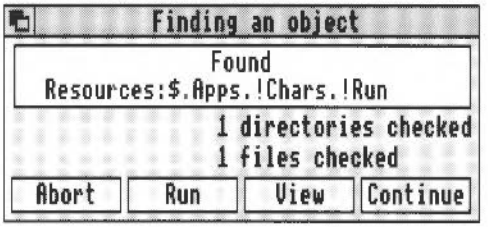
Find

You may believe that you have saved a file or directory somewhere in a directory structure, but are unable to remember where. **Find** enables you to do so.

To find an object:

1. Select the directory or directories you want to search.
2. Display the **Directory/** (or **Selection/** if you have selected more than one) **Find** writable icon.
3. Type in the name of the file you want to find. Click on the name, or press Return.

As the search proceeds, a box is displayed showing its progress through the directory structure you have specified.



If the object found is a **file**, the box gives you the following options:

- **Abort** the search.
- **Run** the file: if the file is a program, it will be run; if it is a document, it will be loaded into an appropriate editor (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 will see the following options:

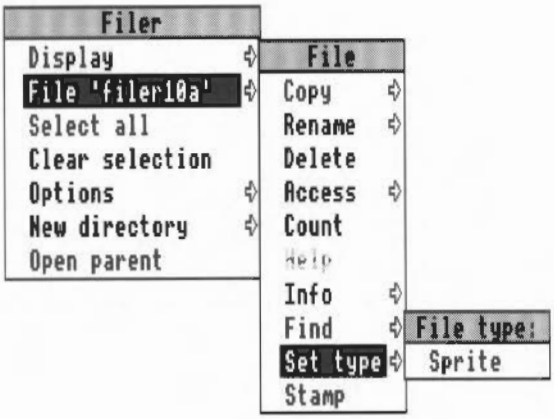
- **Abort** the search.
- **Open** the directory.
- **Continue** to search for another object with the same name.

Set type

Every file has a type, which determines what will happen when you double-click on its icon. Thus files of the type Text will be loaded into Edit, files of the type Obey are interpreted as lists of commands to be carried out, and so on.

To change a file's type:

1. Select the file whose type you want to change.
2. Display the **Set type** name box.
3. Type the name of the file type you want, in normal text or as a hexadecimal number. For a list of file types, refer to the appendix entitled RISC OS *file types* on page 231.



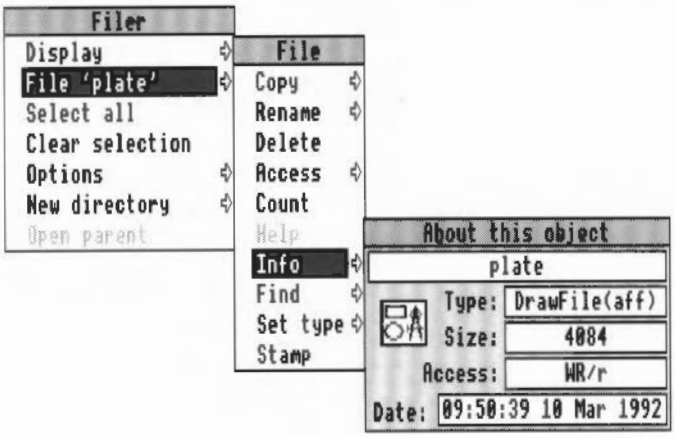
Stamp

Files record when they were last altered, and directories when they were first created. This information is shown when you display **Full Info**, or when you select a specific file or directory and ask for **Info** about it (see page 22). The time and date used is that provided by the computer's real-time clock, which can be set using the Alarm application described in the *Applications Guide*.

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 **Stamp** from the **File** (**Directory** or **Application**) subdirectory. The date stamp will be updated. You can check this using the **Info** menu option.



Using the desktop background

So far this chapter has shown you how to use the Filer to manipulate your files, directories and applications. This section shows you how you can add another layer to the Filer by using **Pinboard**. You might have found out about Pinboard already, if you accidentally dragged an icon onto the screen background.

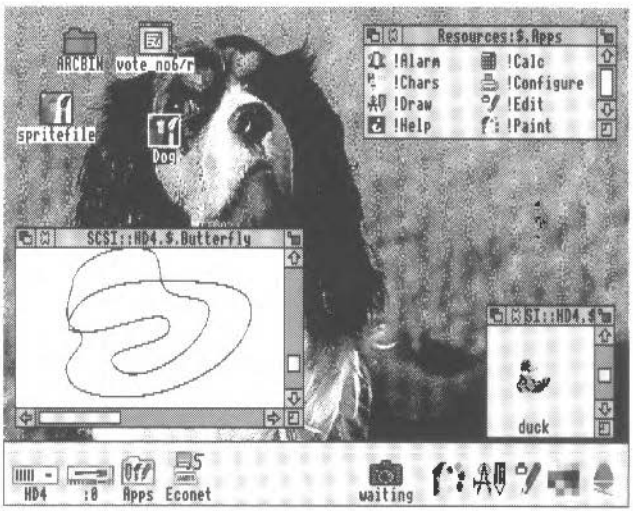
Pinboard

Without using Pinboard, the computer screen just shows the icon bar, one or two directory windows and maybe an application such as Edit. These windows sit on the screen background, which is normally a grey tint.

With Pinboard, the screen background is transformed into just that, a pinboard on which you can pin icons. You can

- pin files, directories and applications on the background
- double click on these pinned items to activate them just as you would do if they were in a directory display
- move files around on the background
- display a sprite picture as the backdrop
- shrink running windows into icons.

(A sprite is a picture that has been saved in the format used by the Paint application. See the chapter *Paint* in the RISC OS 3 *Applications Guide* for more details.)



Using Pinboard

This section shows you how to use icons on the background. The techniques used are much the same as those used in normal file manipulations.

Putting an icon on the background

To put an icon on the background, simply drag it from a directory and drop it anywhere on the background. Icons can be moved around the background in a similar way.

Double clicking

Double clicking on any of the icons has the standard effect. Files are loaded into their respective applications and displayed. Directories are opened and displayed. Applications are started. Application icons can also be started by dragging them to the icon bar.

Copying

Icons dragged from the background to a directory display are copied to the new directory. However files cannot be moved from the background (using shift-drag) to an alternative directory.

Iconising running applications

Pinboard allows you to iconise a running application's windows, that is to say, shrink a currently open window into an icon. For instance, you may have a file that you are editing that you want to set aside for a while; you can choose to iconise this Edit window. Iconised application windows are distinguished by having an icon enclosed by scroll bars.

By iconising application windows, you can keep many windows active on your desktop at the same time, without the problem of filling up your screen with unwanted windows.

How to iconise a running window

Any window that has a Close icon can be iconised by holding down the shift key and clicking on the Close icon.

Iconised windows can be redisplayed simply by double-clicking on them.

Displaying the Pinboard menu options

Like most RISC OS applications, Pinboard is controlled from a menu. To display the menu options, press Menu anywhere on the background. To see the options available for a particular icon on the background, click on the icon and press Menu; or press Menu over the icon when there is no other selection.

Use the following table to decide which menu option you need to carry out a particular task:

Task	Option
Tidy all icons into rows	Tidy
Do not allow icons to overlap	Grid lock
Remove a selected icon from the pinboard	Remove icon
Remove several selected icons	Remove selection
Select all the icons on the pinboard	Select all
Deselect icons	Clear selection
Use a sprite as a backdrop	Make backdrop
Remove a backdrop	Remove backdrop

The Remove option does not in any way delete your files. It simply removes the icon from the Pinboard display.

Tidy

Click on **Tidy** and all of the background icons will line up neatly from left to right along the top of your screen.

Grid lock

The **Grid lock** option ensures that icons do not overlap each other. Icons will line up on an invisible grid on the screen. If you want to be able to place your icons anywhere, make sure that this option is not ticked.

Remove icon/ Remove selection/ Close window

If you press Menu over an icon, you can remove it by clicking on **Remove icon**. You can also use this with the **Select all** option to remove all the icons. Removing an icon from the background does not delete it from your disc.

You can also use the Adjust button to select several icons and then use the **Remove selection** option.

You cannot remove iconised windows in this way since these iconised windows may contain data that you are currently changing. Iconised windows must be double-clicked on and then closed using the Close icon.

Select all/ Clear selection

Select all selects all icons on the background (apart from iconised application windows). **Clear selection** deselects all icons on the background.

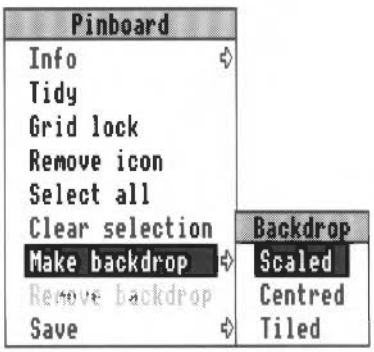
Make backdrop

One of the prettier uses of the Pinboard is to display a picture as a backdrop. You can display any Sprite file (as produced by Paint for example). The sprite is automatically resized so that it occupies the whole of the background. For best results, 256 colour pictures should be displayed using one of the 256 colour screen modes, such as mode 15. However, they can be displayed in any mode.

Changing screen modes is described in the chapter entitled *Colours and screen modes* on page 115.

To display a picture, drag the sprite file onto the background and click menu over it; then click on **Make backdrop**.

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



Scaled has the same effect as clicking on **Make backdrop**. A sprite is scaled to fill the whole screen.

Centred has the effect of centring a sprite on the background. The desktop retains the correct proportions of the sprite.

Tiled will make copies of a sprite and tile it so that it fills your screen from the top left; try it and see.

Remove backdrop

You can remove a backdrop picture by clicking on **Remove backdrop**.

Save

Save allows you to save your Pinboard configuration to a file. Double-clicking on this file will restore Pinboard to its saved state. The Pinboard configuration is also saved with a Desktop save. It does not save information about iconised application windows.

Iconised application menu options

If you press Menu when the pointer is over an iconised application window, you will see the standard Pinboard options. However if you hold down Shift and press Menu you will display the menu options associated with the running application's windows.

A menu may not appear if the window that was iconised did not allow menuing at the edge of its window, or if the window did not use menus at all.

Saving the pinboard configuration


!Boot

Saving a Desktop boot file (see the chapter entitled *Desktop boot files* on page 109) will save the exact configuration (including the icons and the backdrop) of your Pinboard. It does not save information about iconised application windows.

Pinboard display characteristics

You can edit your Desktop boot file by hand. Add one or more of the following lines to the file:

`Pinboard -Grid`	Starts the Pinboard with grid lock.
`Pinboard`	Starts the Pinboard without grid lock.
`Backdrop` *`filename`*	Gives the filename of the sprite to be used as a Pinboard backdrop, for example: `Backdrop adfs::4.$.alfalfa` Makes a backdrop by displaying the sprite `alfalfa`.
`Backdrop` *`filename`* `-Scale`	Scales the sprite so that it covers the background completely.
`Backdrop` *`filename`* `-Centre`	Centres the sprite so that it keeps its proportions.
`Backdrop` *`filename`* `-Tile`	Makes enough copies of the sprite to cover the background completely.
`Pin` *`filename position`*	Gives the position of an icon on the background, for example `Pin Resources:$.Apps.!Configure 350 500` puts the !Configure icon on the background at position 550 500 (given in OS units).

2 Discs, networks and filing systems

In the last chapter we mentioned that RISC OS 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. The main filing systems are:

filing system	used on
ADFS (or SCSIFS)	floppy discs, hard discs
NetFS	file servers
RAMFS	RAM discs
ResourceFS	ROM

The RISC OS Filer (described in the previous chapter) gives a uniform user interface to all these filing systems, but there are a few special features provided with each one, which are described here. These are accessed from each storage device's icon bar menu (displayed by clicking Menu over it).

Floppy and hard discs

All computers are fitted with a floppy disc and some have a hard disc too. These discs usually use ADFS. The main exception to this would be a SCSI hard disc, fitted as an option along with a SCSI expansion card, and as standard on some machines. Click Menu over the hard disc icon on the icon bar, and the menu header will tell you whether the hard disc is ADFS or SCSI. The differences between ADFS and SCSIFS are not apparent on the desktop, so this section will be relevant to both filing systems. (Acorn SCSI discs come with their own documentation – the SCSI *Expansion Card User Guide*.)

Displaying the disc icon bar menu

Click Menu over the floppy disc icon on the icon bar, and the disc menu will be displayed. This is the similar for floppy and for hard discs, although **Format** and **Backup** are greyed out on hard disc menus.

The disc menu gives you access to the filing system tasks you may need to carry out using discs and disc drives (in addition to the general tasks controlled by the Filer, which are described in the previous chapter). These tasks are covered overleaf.

Use the following table to decide which menu option you need to carry out a particular task:

Task	Option
Backup a floppy disc	Backup
Check a disc for defects	Verify
Check how much space is left on a disc	Free
Clear a disc's directory displays off the screen	Dismount
Close all the files on a disc	Dismount
Format a floppy disc*	Format
Park the heads of a hard disc	Dismount
Rename a disc	Name disc

*See *Format* on page 34 for information about formatting hard discs.

Name disc

Disc names

Floppy disc drives are identified by icons numbered :0 and (if a second floppy disc drive is fitted) :1. Hard disc drives are identified by icons numbered :4 and (if a second hard disc drive is fitted) :5, though if a hard disc has been given a name such as IDEDisc4, the name will appear on the icon bar instead of the number.

Each disc may be referred to either by a name, or by the number of the drive on which it is mounted. The former method is recommended, since it means you do not have to worry about where the disc is; the filing system will prompt you to insert a disc if it is missing from the drive.

Disc names follow the same rules as file names. It is advisable to keep disc names unique, so that the filing system can tell them apart. When you set up a floppy disc for the first time, it is given a name based on the current date and time.

Setting and changing disc names

To set or change the name of a disc:

1. In the case of a floppy disc, ensure that the disc is formatted and is not write-protected, then insert it into the disc drive.
2. Move to **Name disc** on the icon bar menu for the disc drive.
3. Type in the name (it must be at least two characters long).

Press Return or click a mouse button. If you have any directory displays open for the disc, they will be closed when you rename the disc. See page 18 for information about naming restrictions.

Dismount

Dismounting discs

When a floppy disc has been inserted into the computer, and its directory display is displayed, it can be 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. To dismount a disc:

1 Insert the floppy disc into the disc drive (if it's not still in there).

2 Choose **Dismount** from the icon bar menu for the disc drive.

Dismounting a hard disc also parks its heads so that it can be moved safely once the computer has been turned off. 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 turning the computer off, even if it is not going to be moved. The **Shutdown** command also dismounts and parks the disc drive heads.

Using more than one floppy disc

You can of course use the same floppy disc drive for more than one disc. When you open the directory display of a floppy disc, the computer makes a note of its name, so that if the disc is not in the drive when the computer needs it, a dialogue box appears, prompting you to insert the disc. Insert the required disc into the drive. You may then need to click on **OK** to tell the computer the disc is there; this depends on the disc drive that has been used in your computer.

If you decide not to go through with the operation (for example, if the requested disc is not available), click on **Cancel**. The response to this will depend on the command or application that needed the disc; in general it results in the operation being cancelled. An error message may be displayed as well.

If you insert a disc that has the same name as one already in use, you will be asked if you want the computer to forget the earlier disc. If you do, click on **OK**; otherwise remove the new disc and click on **Cancel**. For these purposes, a disc is still 'in use' if, for example, there is a directory display open for it.

When you are copying from one floppy disc to another using a single 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. See the section entitled RAM *discs* on page 46 for information on how to do this faster.

Format

Formatting discs

Formatting a disc means setting up information on the disc about the way data is stored on it. 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, an error message will be displayed.)
- 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.

To format a floppy disc:

1 If the disc is not already in the drive, insert it.

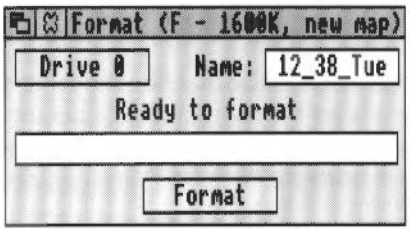
2 If the disc is not a new one, and a directory display for it is on the screen, dismount the disc by choosing **Dismount** from the icon bar menu.

3 Move to the **Format** submenu of the icon bar menu for the disc drive.

4 Choose the disc format.

  Normally you will want to choose ADFS 800K (E) format (or 1.6M format if your computer uses high density floppy discs). The section *Choosing the disc format* overleaf describes all of the available disc formats in more detail.

5 The Format dialogue box is displayed. Click on **Format** to go ahead with the operation; click on the close icon to abandon the operation. During formatting and verifying, an indication of the progress of the operation will be displayed. You can interrupt the formatting process by clicking on **Pause**.



6 When formatting is complete you will see the message **Disc formatted OK**. Finish formatting by clicking on OK.

  If the disc formatting process found errors on the disc you should turn to page 37 for instructions on how to map out the defect.

The Format dialogue box

In addition to formatting the disc, the Format dialogue box also lets you give the floppy disc a name.

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_27_Mon. If you want to give a disc a name, click over the **Name** box and type in the name. See page 32 for details of file and disc naming conventions.

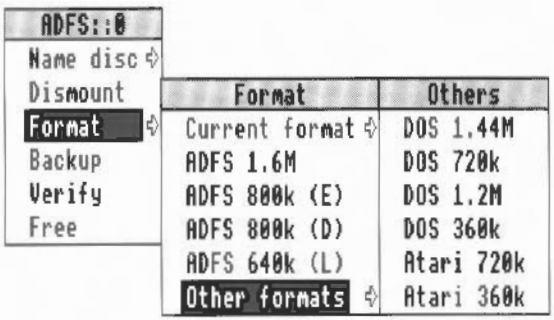
Formatting a hard disc

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 program **HForm**, described in the appendix entitled *Formatting a hard disc* on page 225.

If you wish to format a SCSI disc refer to the SCSI *Expansion Card User Guide*.

Choosing the disc format

Formats are chosen from the Floppy disc icon bar menu. Display the format sub menu to the formatting options.



If you have a computer that does not support high density floppy discs, the ADFS 1.6M, DOS 1.44M and DOS 1.2M options will not appear in your menu.

There are four different ADFS RISC OS formats for floppy discs:

- **ADFS 1.6M**. This format can store 1.6MB of data.

  You can only use this format if your computer has a high density disc drive fitted (see the *Welcome Guide* for details). High density floppy discs (1.44MB IBM type discs) must be used. High density discs must only be formatted using ADFS 1.6M format. Each directory can contain up to 77 files and subdirectories.

- **ADFS 800K (E)**. This format can store approximately 800K of data.
  It is the best format for discs that do **not** need to be used on older versions of the operating system (pre-RISC OS 2.00). It should be used whenever possible (unless your computer has a high density disc drive, in which case use ADFS 1.6M format). Each directory can contain up to 77 files and subdirectories.
- **ADFS 800K (D)**. The format can store approximately 800K of data.
  This format is compatible with the Arthur 1.20 operating system. Each directory can contain up to 77 files and subdirectories.
- **ADFS 640K (L)**. The format can store approximately 640K of data.
  This format is compatible with ADFS on Arthur 1.20 and 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.

There are four different DOS compatible formats for floppy discs:

- **DOS 1.44M**. This IBM format stores up to 1.44MB of data.
  The disc can be read from and written to by any MS-DOS computer with a high density 3.5" disc drive. You can only use this format if your computer has a high density disc drive fitted (see the *Welcome Guide* for details). High density floppy discs (1.44MB IBM type discs) must be used.
- **DOS 720K**. This IBM format stores up to 720K of data.
  The disc can be read from and written to by any MS-DOS computer with a 3.5" disc drive.
- **DOS1.2M**. This IBM format stores up to 1.2MB of data.
  It requires an IBM PC/AT type 5.25" disc drive attached externally. The disc can be read from and written to by any MS-DOS computer with a high density 5.25" disc drive. High density floppy discs (1.2MB IBM type discs) must be used. Contact your supplier for more information on using external 5.25" disc drives.
- **DOS 360K**. This IBM format stores up to 360K of data.
  It requires a standard 5.25" disc drive attached externally. The disc can be read from and written to by any MS-DOS computer with a 5.25" disc drive. Contact your supplier for more information on using external 5.25" disc drives.

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.
- **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.

Notes about formatting

When you are using ADFS 800K (D) and ADFS 640K (L) formats, you may occasionally need to 'compact' the disc. This is because the free space may become fragmented, making disc access slower and preventing large files from being saved. A message will appear on the screen when compaction is necessary. To compact your disc you use the *Compact command. For more information on *Compact, read the chapter entitled *Star command summaries* on page 161.

ADFS 800K (E) and ADFS 1.6M format discs never need compacting. These formats are also safer (more resistant to disc errors) in that the information which tells the computer where to find information on the disc, is held duplicated on the disc. However, because there is additional information stored on an 800K (E) format disc, there is slightly less space available, so it may not be possible to copy a completely full 800K (D) format disc to an 800K (E) format disc.

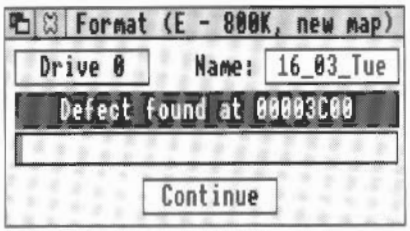
DOS-formatted discs can be used just like RISC OS format discs, and in addition they can also be used in any DOS computer with a suitable disc drive. This enables you to transfer files between the RISC OS and DOS operating systems. For more information about DOS files and discs, read the section entitled *Using DOS-formatted discs* on page 49.

Atari-formatted discs can be used just like RISC OS format discs, and in addition they can also be used in any Atari computer with a suitable disc drive. This enables you to transfer files between the RISC OS and Atari operating systems. For more information about Atari files and discs, read the section entitled *Using Atari ST-formatted discs* on page 52.

Some RISC OS computers may not support some types of 5.25" disc formats; check with your supplier for more details.

Disc errors and defects

If your floppy disc has a defect in it, this defect is flagged during the formatting and verifying process. If this occurs, click on **Continue** so that the area of the disc in which the defect occurs is not used. If you don't want to continue with the format/verify process, click on the window's Close icon.

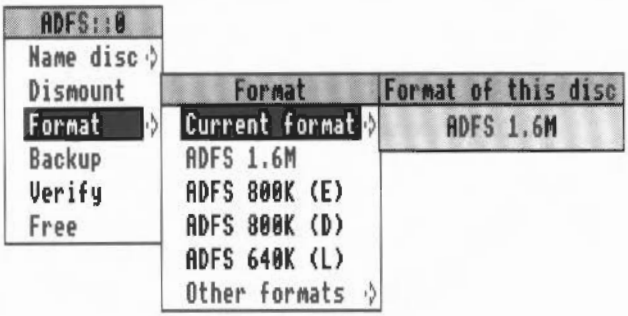


If a defect occurs with a floppy disc during its use (a rare occurrence) you will see a Disc error message. To correct the error you should copy any files you want to save on the affected disc onto another disc, and then reformat the affected disc. Formatting the disc will 'map out' the defect and the disc can then be used again.

If you do not wish to reformat your floppy disc, a defect can be mapped out using the *Defect command. See the chapter entitled *Star command summaries* on page 161 for more details. If you get continual disc errors on a floppy disc, the disc may be defective and you should no longer use it.

Current format

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



Backup

It is a good idea to make backup copies of floppy discs from time to time, in case a disc is damaged or a file is accidentally deleted. In addition, it is recommended that you make backup copies of applications supplied on discs, and use the backups as your working discs.

The backup process copies an entire floppy disc (from the 'source' disc to the 'destination' disc) as a single operation, and can be done using either one floppy disc drive or two.

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

If the destination disc is a new, blank disc, it must be formatted first (see *Format* above).

The destination disc will be given the same name as the source disc.

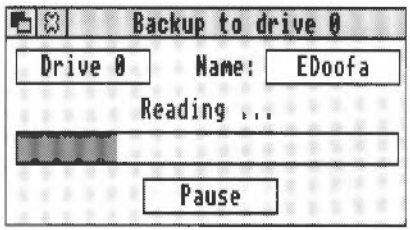
You cannot back up from a D or E format to an L format disc, nor from an L to a D or E format disc. In general you should only back up onto discs with the same format as the source disc.

During a backup, you should, for safety, write-protect the source disc.

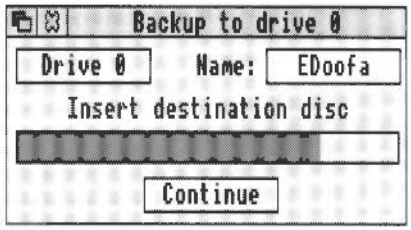
To back up using a single disc drive:

1 Choose **Backup** from the icon bar menu for the disc drive.

2 When prompted, insert the source disc into the disc drive and click on **OK**.



3 Similarly, when prompted, insert the destination disc, and click on **OK**. Repeat steps 2 and 3 as prompted until all of the data has been copied.



4 When the Backup has finished, click on the Close icon to conclude the operation.

To back up using two disc drives:

1 Insert the source disc into drive 1.

2 Insert the destination disc into drive 0.

3 Click Menu on the drive 1 icon and move to the **Backup** option, which now has a submenu: click on **to drive 0**. If you prefer, you can back up from drive 0 to drive 1 by inserting the source disc into drive 0, the destination disc into drive 1, and selecting **to drive 1**.

4 You will be asked whether you are sure you want to go ahead with the backup operation; click on **OK** to proceed.

5 When the Backup has finished, click on the Close icon to conclude the operation.

If you are using your computer a lot, it is good practice to back up the files you have been working on at least once a day, and to back up all your files once a week, or once a month.

Besides giving you some protection against hardware failures or discs becoming damaged, making backup copies also gives you a way of recovering files if you accidentally delete them or overwrite them. Naming discs with the date of the backup will help you find out when the backup was made, without having to check the date of the files on the disc.

Verify

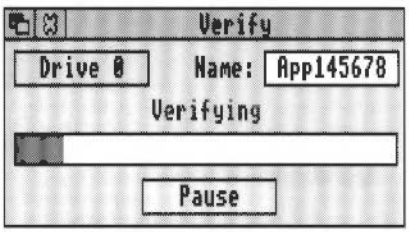
You can check whether the disc is free from defects by verifying the disc. Verifying checks that all the data on the disc is readable (it does not check that the data is correct). This is not something you need to do very often, but is a good idea if, for example, you have made a backup of important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

To verify a disc:

1 Insert the floppy disc into the disc drive.

2 Choose **Verify** from the icon bar menu for the disc drive.

The Verify dialogue box is displayed and the verify starts.



If there are no faults on the disc, the message **Disc verified OK** appears. If there is a fault, the position of the error on the disc is displayed. Clicking on **Continue** maps out the error so that the bad part of the floppy disc is not used again.

A defect can also be mapped out using the *Defect command. See the chapter entitled *Star command summaries* on page 161 for more details.

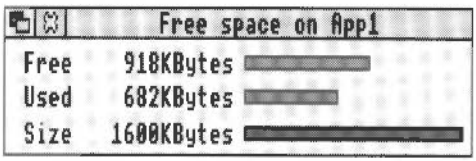
Free

To check how much free space is available on a disc:

1 Insert the floppy disc into the disc drive.

2 Choose **Free** from the icon bar menu for the disc drive.

The amount of free space on the disc, together with the amount of space that is in use, are shown in KBytes (Kilobytes). This window is updated whenever the space on the disc changes.



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 on the appropriate box. There are a few cases that are more serious or need a little extra explanation.

Protected disc

The message 'Protected disc' 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.

Disc errors

Occasionally, a disc may become damaged. For example a defect may develop in the magnetic surface of the disc. In this case, you may see a message such as:

```
Disc error 10 at :0/00000400
```

If a lot of these errors occur, you are advised to reformat the disc, first copying any undamaged files to another disc. If the disc errors persist after reformatting, throw the disc away (or in the case of a hard disc, consult your supplier).

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

For a full explanation of most user-level error messages refer to the appendix entitled *Error messages* on page 249.

Networking

If your computer is connected to an Acorn–supported network, such as Econet, you will be able to access file servers that use NetFS (the Network Filing System). This section describes the extra filing system features available that NetFS supports, additional to those of the Filer covered in the previous chapter.

An introduction to networks

A network is usually administered by a network manager (a person, rather than a piece of software). Each computer connected to a network (including the file server itself) has a station number, and the network manager can assign a network name to a network. The network manager allocates each network user a username, used to identify them to the network. Users may, if they wish, set a password, which prevents individuals from logging on under someone else's name.

Your computer can be configured to recognise a fileserver and printer server automatically; see the chapter entitled *Setting the configuration* on page 85 for more details.

Pathnames

The name used for NetFS in paths is `net` and the name and/or number of the file server; for example

```
net::Business
```

Updating of network directory displays

If a file shown in a directory display on your screen is deleted by another user, your display will not be updated automatically. If you then 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.

Displaying the Net icon bar file server menu

To display the Net 'File server' menu, click Menu on the Net icon.

Use the following table to decide which menu option you need to carry out a particular task:

Task	Option
Check how much space is left on a disc	Free
Display a list of available file servers	FS list
Log off from a file server	Bye
Log on to a file server	Logon
Open the root directory of the file server	Open $

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.

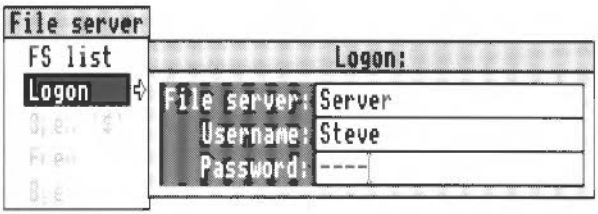
To log on to a file server from the file server list, click Select or Adjust on one of the file servers. The same dialogue box as is used in **Logon** below appears.

Logon

To log on to a network file server:

1 Move to the **Logon** submenu of the File server menu. Alternatively, click on the Net icon.

2 Type in the name of the file server (this may already be set up), the username, and (if needed) the password. Press Return at the end of each of these.



If the file server is available, and the username and password are valid, a directory display for the user directory (the top-level directory in the user's own network file directory tree) is opened; otherwise an error message is displayed. When you have successfully logged on, the Net icon on the icon bar changes (the text underneath the icon is the file server's number or disc name).

You can also log on from the file server list, as mentioned above in **FS list**.

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

If your network manager has not allocated you a user directory, you will log on to the root directory of the fileserver instead.

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

Open $

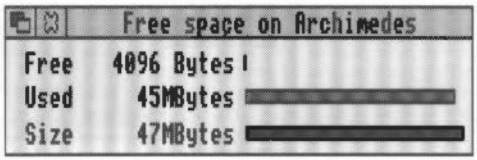
On a file server you log on to your user directory. This is one or more levels down from the root, unlike most other storage devices, where the first directory you open is the root directory. The user directory is sometimes referred to as the user root directory. Pathnames to the user root directory must begin with &.

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 will be displayed as a submenu; click on the disc whose root you want to display.

Access to areas, other than your user area, may be denied to you by the network manager.

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 to allocate you some more space.

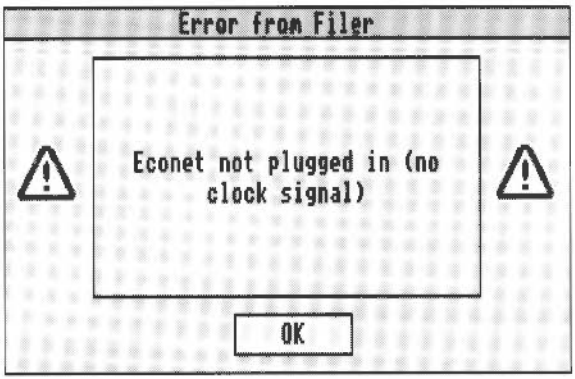
Bye

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.

What to do if something goes wrong

'Econet not plugged in' error message

Probably the most frequent error encountered when attempting to log on to an Econet network is 'Econet not plugged in'. This means that your machine is physically disconnected from the Econet 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 fileserver number (ask your network manager), and 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, log off the network, and then (without first loading the application itself) double-click on a file for that application, 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. When you have copied the application, you should therefore run it from your own disc (by double-clicking on it) before attempting to load a file into it.

Network failures

If there are any serious errors, such as damage to the disc of a file server, these should be handled by the network manager. The only error you are, in general, 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.

For a full explanation of most of the common error messages you might encounter, turn to the appendix entitled *Error messages* on page 249.

RAM discs

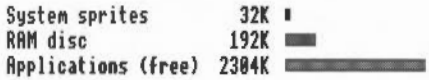
A RAM disc uses a block of memory reserved from the computer's RAM (Random Access Memory). It is called a RAM 'disc', because you can use it in a way very similar to a hard or floppy disc. However, the important thing to remember is that objects on the disc are not 'safe' in the way that objects on real discs are safe: they will be lost when the computer is switched off or reset.

Access to the RAM disc is much faster than access to a floppy or hard disc.

The RAM disc uses the RAM filing system (RAMFS).

Creating a RAM disc

You can create a RAM disc for the current session using the desktop Task Manager. The 'bar' is in the third section of the Task Manager window, marked **RAM disc**. Press Select to the right of the **OK** label – at the point where the bar will start – and drag the bar that appears to the size you want.



You can change the size of the RAM disc after you have created it, but only if it is empty. When you have created a RAM disc, an icon appears on the icon bar. Click on this icon to open the directory display.

If you want to set up a RAM disc each time you use the computer, use the !Configure application described in section entitled *Memory* on page 94.

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. Three examples are given here.

Copying between floppy discs using a single drive

As mentioned in the section *Dismount*, earlier in this chapter, when you are copying a group of objects from one floppy disc to another using a single drive, you have to change the disc after each file or directory. This can become tedious. An alternative

is to allocate as much space as you can to a RAM disc, copy all the files (or as many as will fit) into the RAM disc from the source disc, and then copy them from RAM disc to the destination disc. When you have finished, delete the files from the RAM disc, 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.

Do not keep files that you are **changing** in the RAM disc: it is too easy to switch off the computer without transferring them to a permanent medium such as a hard or floppy disc or a network file server. If you use the **Shutdown** option from the Task Manager, it will warn you if there are still files in the RAM disc.

Running part of an application from a RAM disc

If your computer has only a single floppy disc drive but more than 1MB of RAM, and the application you want to run uses two floppy discs, you can use a RAM disc as a substitute for a floppy disc drive. Decide which disc you wish to transfer to RAM and insert it into the disc drive. Choose **Free** from the icon bar menu; the Free space **Used** bar tells you how large the RAM disc needs to be. Create a RAM disc of the appropriate size. Then copy the contents of the floppy disc to the RAM disc.

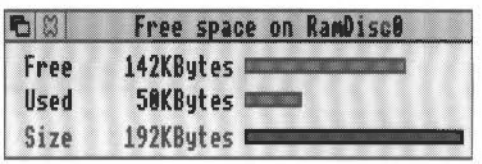
Before loading a file into the application, double-click on the parts of the application you have transferred into RAM, so that the computer knows that it should find them there, rather than looking for them on the floppy disc.

Displaying the RAM disc icon bar menu

As with most storage devices, the RAM disc has its own icon bar menu with options specific to the filing system. Click on Menu over the RAM disc icon on the icon bar and the RAMFS menu is displayed. This gives you access to two commands – **Free** and **Quit**.

Free

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 KBytes.

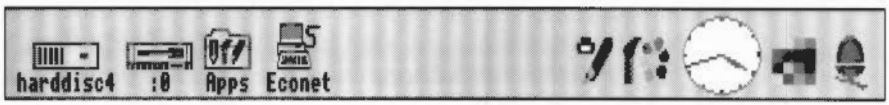


Quit

When you have finished using the RAM disc, you can remove it from the icon bar by pressing Menu on the RAM icon and clicking on **Quit**. If the RAM disc is not empty you will be given a warning that you will lose its contents if you go ahead. Click on **OK** to close the RAM disc if you don't mind losing it, or on **Cancel** if you want to keep it.

The Apps directory

The Apps directory on the icon bar contains applications that are held permanently inside the computer in ROM (Read Only Memory). Stored in ROM, these applications load more quickly than from disc, and take up less RAM while they are running. The four most generally useful RISC OS applications – Edit, Draw, Paint and Configure – are among those held in ROM.

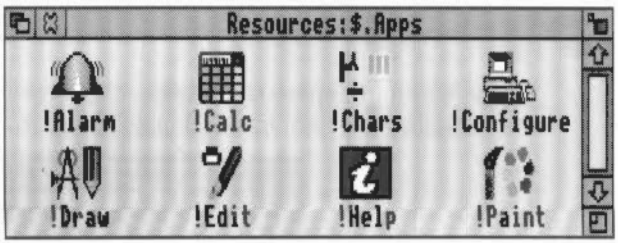


The Resource Filing System (ResourceFS) handles access to the applications and files stored in ROM. The principal difference between ResourceFS and other filing systems is that you cannot alter or delete anything held in it.

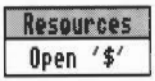
When you switch on your computer, one of the icons on the left of the icon bar is the ResourceFS icon, with the word Apps underneath it. Click on this icon to display the Apps directory of ResourceFS in a normal directory display.

The directory structure of ResourceFS is similar to that of any other filing system.

Here is the directory display for the Apps directory:



Displaying the Apps icon bar menu



The Apps directory has its own icon bar menu with an option specific to the filing system. Click on menu over the Apps icon on the icon bar. The menu will be displayed, containing the single option **Open '$'**.

When you click Select on the Apps icon, its directory display appears on the screen. Its title bar shows that it is not, however, the root directory of Resources; rather like the user directory on a file server (described earlier in this chapter), it is the one you are most likely to find useful. You can open the root directory if you wish by pressing Menu on the icon bar icon and clicking on **Open '$'**.

Auto-starting Apps applications

You may want some of the applications in the Apps directory to start automatically each time you switch on your computer. You can do this by using the Configure application. For more information about auto-starting applications, read the section entitled *Applications* on page 101.

This is particularly useful if you have a computer without a hard disc. If you have a hard disc, you can achieve the same – and more – by using the **Desktop boot** option from the Task Manager menu (described in the chapter entitled *Desktop boot files* on page 109).

Desktop boot files allow you not only to auto-start Apps applications, but also to log on to networks and to load applications stored on discs and file servers.

Using DOS-formatted discs

As well as using the standard RISC OS formats for floppy discs, you can also use floppy discs formatted using the standard DOS formats.

DOS-formatted discs can be used in exactly the same way as RISC OS-formatted discs; just put them in the disc drive and click on the floppy disc icon to view them. This feature is especially useful if you want to move files between RISC OS and DOS computers.

The menu options available for DOS files and directories are exactly the same as those for RISC OS files and directories. Files can be copied and moved between RISC OS and DOS directories in the normal way. To **run** DOS applications, you will need the PC Emulator (available from your supplier).

Instructions for formatting with the DOS disc formats are given in the section entitled *Floppy and hard discs* on page 31.

Moving RISC OS text files to a DOS computer

If you save RISC OS files to a DOS-formatted floppy disc you can transfer the files to a DOS computer simply by taking the floppy disc and reading it in a DOS computer.

You should be able to read text files (those created by Edit). However 'top-bit set' characters are not supported. In practice this means that all the letters you can type on the keyboard, except the £ sign, will be readable. Most characters generated using !Chars will not be readable and may be translated into different characters when read on a DOS computer.

Binary and other non-text files will probably not be readable on a DOS computer.

Moving text files from a DOS computer to RISC OS

You can transfer files from a DOS computer to RISC OS by taking the files stored on a DOS-formatted floppy disc and reading it on a RISC OS computer.

The same restrictions apply in that only standard characters will be readable. The £ sign will not be readable nor will any 'top-bit set' characters. In practice this means that all the characters you can type on the keyboard except the £ sign will be readable.

Some DOS word processors end each line with a carriage return and a line feed; this makes text look double-spaced when it is read into Edit. This can be cured easily by using Edit to replace the carriage returns with nothing.

Translating file names and attributes between DOS and RISC OS

RISC OS file names are limited to 10 characters without an extension whilst DOS names are limited to eight characters with a three letter extension. The DOS interpretation of special characters is also different. File names are therefore mapped as follows:

- When copying from RISC OS to a DOS disc, names are truncated to eight characters. For example Configure becomes CONFIGUR. The RISC OS filetype of an object is preserved.
- When copying from a DOS disc to RISC OS 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.
- File names are only truncated if the command *Configure Truncate is set to **on**, which it is by default. If *Configure Truncate is set to **off**, an error is generated.

When copying from one DOS disc to another DOS disc (or a DOS hard disc partition), file names are never truncated. All eight characters, the dot separator and the three character extension are copied. However, when looking at the files in a directory display, only the first 10 characters are displayed and 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 display a disc that contains DOS files, the RISC OS Filer displays them with this icon.

You can copy DOS files onto any RISC OS floppy or hard disc; the files retain their DOS filetype and are not translated in any way.

If you wish, you can assign RISC OS file types to DOS file types using the *DosMap command. This will, for example, let you assign DOS files with the extension TXT the RISC OS filetype Text. For more information refer to the DosMap command in the chapter entitled *Star command summaries* on page 161.

Accessing DOS hard disc files

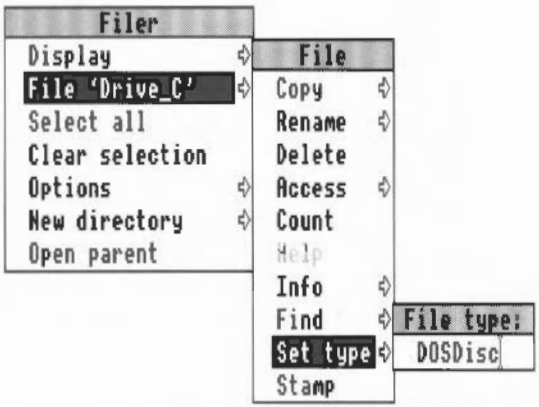
If you have a DOS hard disc file that you created using the PC Emulator, you can use the Filer to treat the file as a normal directory. This will allow you to access the DOS files in a RISC OS directory display. If you created the hard disc files using PC Emulator 1.7 or later this will happen automatically.

Before the DOS file can be accessed by the filer, you have to change its 'file type'.

To change the file type:

1. Display the directory in which your DOS hard disc file resides.
2. Click on the hard disc file.
3. Click menu and display the **Set type** box from the **File** menu.
4. Delete the wording in the **Set type** box and replace it with the name **DOSDisc.**

5 Press Return.



Your file now displays the DOS disc directory icon. Double-click on the icon to display the files on your DOS hard disc.

Copying and moving DOS hard disc files

If you wish 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 wish to copy it as 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 wish to delete your 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 accidentally delete your hard disc file.

Using Atari ST-formatted discs

Atari ST-formatted floppy discs can be used in exactly the same way as DOS-formatted floppy discs. See the previous section for details. Instructions for formatting with the Atari ST disc formats are given in the section entitled *Floppy and hard discs* on page 31.

3 Fonts

A font is a set of characters that share a similar design. Fonts are grouped into three categories:

- The **typeface** name (for example, Homerton) is common to a whole font family and describes all fonts with the same general appearance.
- The **weight** indicates the thickness of the characters. For example, a font of normal density is often called Medium, while heavily printed fonts are often called Bold.
- The **style** indicates other basic variations in the characters, for example, Italic, Oblique or Shadow.

For example the font *Homerton.Bold.Oblique* consists of the following: Homerton is the typeface. Bold is the weight. Oblique is the style.

Built-in fonts

RISC OS comes with a set of fonts permanently built into the computer's ROM. These fonts are available for use by all applications that can use fonts. The fonts are called Corpus, Homerton and Trinity:

This font is called Corpus
This font is called Homerton
This font is called Trinity

Each of these fonts also comes in Bold, Italic and Bold Italic (or Oblique) styles:

This is Corpus Medium Oblique
This is Corpus Bold
This is Corpus Bold Oblique

This is Homerton Medium Oblique
This is Homerton Bold
This is Homerton Bold Oblique

Disc-based fonts

As well as the built-in fonts, a collection of disc-based fonts is also included on the applications discs. The !Fonts application on the applications disc contains the disc fonts. To make the disc fonts available for use, you should open the directory display containing the !Fonts application. Once you have done this, the computer will then know where to find the fonts.

The fonts supplied with the !Fonts application are as follows:

This font is called System Fixed

This font is called System Medium

This font is called Portrhouse

Portrhouse is an additional font that has been designed to suit a standard monitor. However it is not an outline font, so it will begin to look ragged at large point sizes.

The system fonts are versions of the same font that is used for directory displays and icons on the desktop.

There is also a special symbol font, Selwyn. This has a character set that gives special symbols.

You can add further disc-based fonts to your !Fonts applications. See the section entitled *Adding more fonts* on page 57.

About fonts

The fonts supplied with your computer fall into two categories:

- Fixed-pitch fonts
- Proportionally-spaced fonts.

Fixed-pitch fonts (such as System font and Corpus) allow the same amounts of space for each character. An 'i' will take up the same amount of space as an 'm'.

Proportionally-spaced fonts (such as Homerton and Trinity) allocate different amounts of space to different characters. Thin characters take up less space than fat ones.

Anti-aliasing

All fonts (apart from the System font and Portrhouse) can be anti-aliased. Anti-aliasing uses shaded pixels at the edge of each character to blur the edges of a character, so making it lose its jaggedness. This makes the character look better on screen. To control the amount and type of anti-aliasing applied to each font, see the *Fonts* section of the Configuration application on page 98.

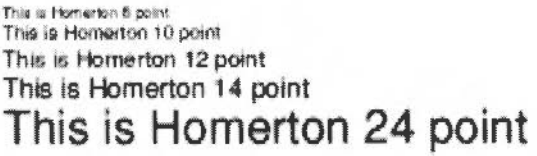
Font cacheing

The built-in fonts are stored within the ROM in outline form. When the fonts are requested for display they are processed and stored in a font cache for future use. Any subsequent use of that font will not require any processing and the characters will be displayed much faster. To control the amount and type of cacheing applied to each font, see the *Fonts* section of the Configuration application on page 98, and the *Memory* section on page 94.

For a more thorough explanation of both anti-aliasing and cacheing, see the appendix entitled *Fonts and the Font manager* on page 241.

Font size

Most applications let you select the size of the font you wish to use. The font size is measured in points, a point being 1/72 of an inch. 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.



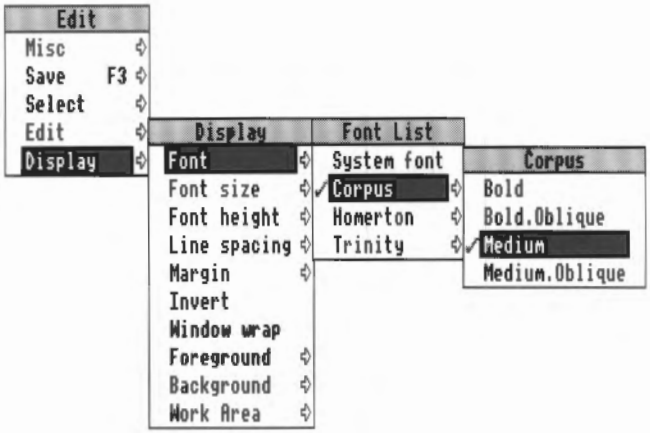
Using fonts

There are two applications in the applications suite that use fonts – Edit and Draw. These two applications use them in slightly different ways. Edit can display text in any type of font; however it can only print out in the font that is standard on your printer. On the other hand, Draw can both display and print fonts of varying size and typeface.

Fonts are used extensively by packages such as Acorn Desktop Publisher.

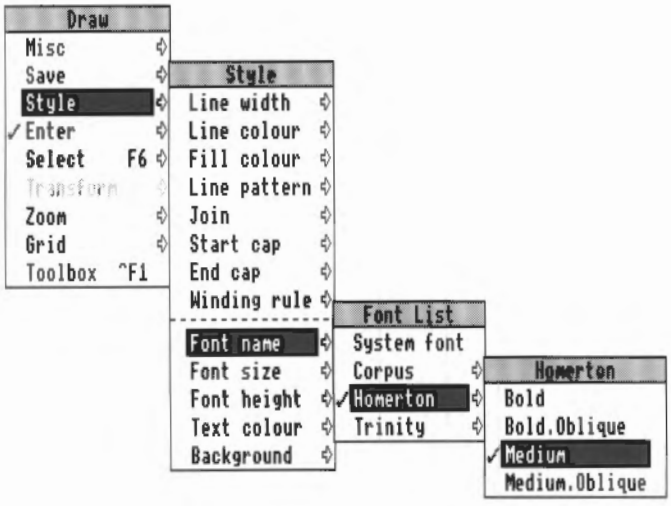
Using fonts in Edit

If you want to display your Edit text in a particular font on the screen, click Menu over the Edit window and choose the Display menu. Go to the Font menu and click on the font you wish to use.



Using fonts in Draw

You can put text using fonts into a drawing created with Draw. Select the Text tool, then click Menu over the Draw window and choose the Style menu. Go to the Font name menu and click on the font you wish to use. See the RISC OS 3 *Applications Guide* for more details.



Printing with fonts

If you have used fonts in your application, you can (if the application permits it) print out using those fonts also. Exactly the same outline fonts are used for both the screen and the printer. PostScript printers behave slightly differently.

The RISC OS printer manager program sits between the application and the printer. Printers, printing and printer drivers are explained fully in the next chapter entitled *Printing* on page 59.

Font mappings on PostScript printers

PostScript printers have their own set of fonts stored inside the printer. When you print to a PostScript printer the Acorn Screen fonts are mapped to the PostScript fonts inside the printer in the following way:

Acorn font family	PostScript font family
Trinity	Times
Corpus	Courier
Homerton	Helvetica
Selwyn	Zapf Dingbats
Sidney	Symbol

Acorn fonts not mapped directly to PostScript fonts are downloaded automatically by the printer manager as required.

Additional Acorn fonts can be mapped to PostScript fonts. For more information about using Acorn fonts with PostScript printers, refer to the section entitled *Downloading fonts to PostScript printers* on page 78.

Adding more fonts

The Applications Suite contains the utility !Fonts, which contains the Portrhouse, System and Selwyn fonts mentioned earlier. Additional Acorn fonts are available from your supplier. Some applications also supply you with additional fonts.

If you have a hard disc drive, you should normally keep your !Fonts application in the root ($) directory. If you do not have a hard disc drive, you should copy !Fonts to an empty floppy disc and use this disc to hold all your fonts.

You can have more than one !Fonts application, so if your fonts floppy fills up, or you have too many fonts to fit into a single directory, create a second !Fonts application on a new floppy disc. Make the computer recognise the new fonts contained in the !Fonts application by double-clicking on the !Fonts icon.

Adding Acorn outline fonts

These instructions show you how to copy new outline font directories into your !Fonts application.

1 Display the directory display containing !Fonts.

2 Open the !Fonts application directory (by holding down Shift and double-clicking on the icon).

3 Copy the directory containing the new font into the !Fonts application directory.

4 Close the !Fonts application directory.

5 Activate the new fonts by double-clicking on the !Fonts application.

At the start of each session in which you wish to use the fonts, you should open the directory display containing !Fonts, so that RISC OS knows where the fonts are held.

Acorn font packs contain a special program that automates the installation. Read the Acorn font pack documentation for more details.

Additional information about how to use !Fonts is given in the chapter entitled *System applications* on page 121.

Converting PostScript fonts to outline fonts

It is possible to convert standard PostScript Type 1 fonts to Acorn Outline fonts using the T1ToFont application supplied in the Application suite. For more information, look in the chapter *T1ToFont* in the RISC OS 3 *Applications Guide*.

4 Printing

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

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

This chapter tells you how to

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

It then goes on to explain further options such as:

- Screen and printer fonts
- Adding new fonts
- Using PostScript fonts
- Text formats
- Downloading and mapping fonts
- Customising printer drivers.

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 (supplied on the Applications discs).

Types of printer

Your supplier will advise you on suitable printers for your computer. RISC OS supports most types of popular dot matrix printer, such as the Epson FX and LQ and the NEC PinWriter, as well as colour printers such as the Integrex. It also supports laser printers compatible with the HP LaserJet and Apple LaserWriter (PostScript).

The following printers are among those supported:

- Acorn JP150
- Apple PostScript
- Apple ImageWriter II
- Canon Bubblejet
- Citizen Swift series
- Epson EX, FX & JX series
- Epson MX & LQ series
- HP LaserJet & DeskJet series
- IBM Proprinter series
- IBM PostScript printers
- Integrex Colourjet
- Linotype typesetters
- NEC P series
- OMS ColourScript
- Oume ScripTEN
- Star LC & XB series
- Star Laser Printers
- TI OmniLaser printer
- Most PostScript laser printers

If your printer is not on this list, check the RISC OS 3 Release Note to see if your printer is now 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.

All the printer drivers (technically, they are Printer Definition files) are contained in individual manufacturer's directories within the **Printers** directory on App 2.

You can create a printer driver that is specifically tailored for your printer. The *PrintEdit* application, described in the *Applications Guide*, allows you to create a new printer driver.

Connecting the printer

If you are connecting the printer directly to your computer you have two choices: connection via the serial port or the parallel port. Generally using the parallel port will be quicker; however not all printers have a parallel connection. 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 the printer documentation for information on how to wire the connector to the printer. A cable suitable for an IBM PC or compatible will often be suitable for your computer.

If you are connected to an Econet network or an Ethernet network (via NFS), you may have access to a network printer. Consult your network manager for more information.

The printer manager

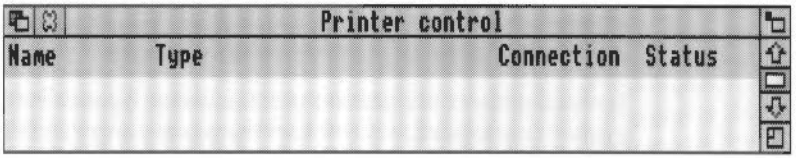
The printer manager is an application (called !Printers) that provides an interface between the printer and your application software (an editor or word processor, for example). The printer manager is used for printing files, and to provide printer support for applications.

The printer manager application uses printer definition files to tell the computer what type of printer you are using. These files are contained in individual manufacturer's directories within the **Printers** directory in App 2.

The rest of this chapter tells you how to load and set up the printer manager.

Loading the printer manager

Load the printer manager by double-clicking on the !Printers icon. After a few seconds the printer manager icon appears on the icon bar. Click Menu over the Printers icon and then choose the **Printer control** menu option.



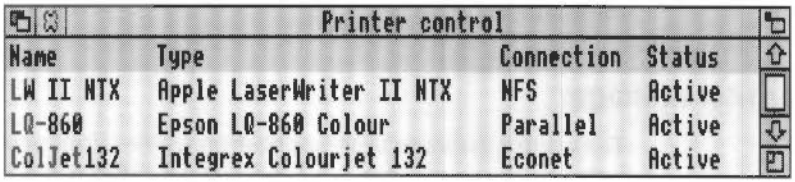
This displays the Printer control panel. The next step is to load a printer driver.

Loading printer drivers

Load a printer driver by opening the **Printers** directory in App 2. This contains the printer driver directories. There is a directory for each printer manufacturer. Open the directory that corresponds with the manufacturer of your printer.

Choose the appropriate printer driver for your printer; the driver will have a similar name to that of your printer. Drag the appropriate printer driver onto the Printer control window. The printer name will appear in the window.

If you want to have more than one printer loaded, drag additional printer drivers to the Printer control window.



Choosing a printer type

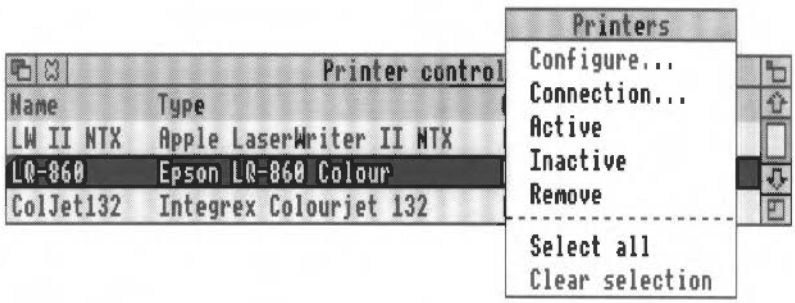
You should choose the printer type that is closest to the printer you have. If your printer is not listed, it may have a compatibility mode that can be selected. 9-pin dot matrix printers can usually emulate the Epson FX printer, while 24-pin dot matrix printers can usually emulate the Epson LQ printer; 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.

Choosing the right configuration

After you have loaded your printer driver, you must choose the correct printer type and 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 select the printer entry and choose the **Configure** option from the Printer control window menu.



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

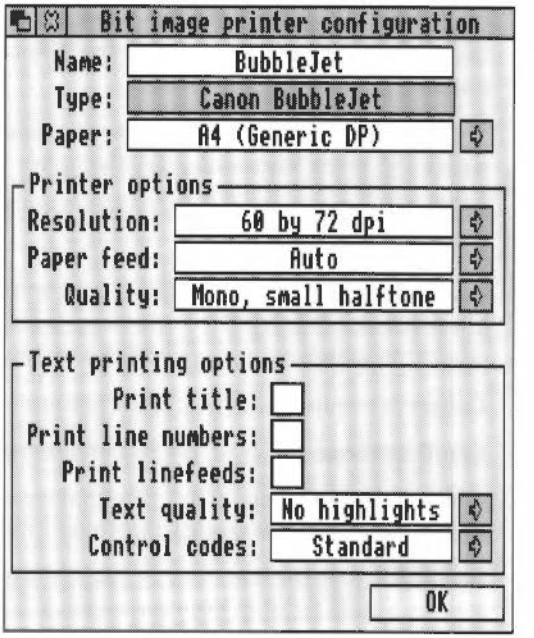
Classes of printers

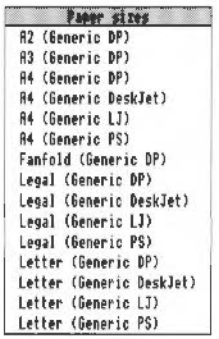
There are three classes of printers; each has a slightly different configuration menu. These are:

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

In the following sections, each configuration type is explained separately.

Configuring Dot-matrix and InkJet printers





Dot-matrix and InkJet-type printers use the Bit-image configuration window.

Choosing the printer name and paper type

The **Name:** box gives the name that will appear beneath the printer icon. You can, if you wish, change this to something more meaningful for you.

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

paper size you wish to use. The paper sizes marked **Generic DP** are usually best for non-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 71 for more details.

Printer options

The printer **Resolution** menu can be displayed by clicking on the righthand arrow icon. Increasing the resolution usually gives a better quality image, but printing usually takes longer.

The **Paper feed** menu can be displayed by clicking on the righthand arrow icon. This 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 while printing is under way; you will then be prompted to insert paper at the end of each page. Choose **Roll** if your printer is using a roll of paper.

The **Quality** menu lets you choose the type of printout quality. Click on the righthand arrow 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. 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.

Small halftone prints in 4x4 pixel halftones for grey scales and colour.

Large halftone prints in 8x8 pixel halftones for grey scales (no colour). Large halftones give better quality than small halftones.

Dithered gives the best quality results, especially for grey scale pictures. However it takes longer to print than the halftone options.

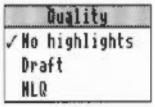
Text printing options

The text printing options allow you to control the way text is printed from an editor (such as Edit). Many applications override these options and replace them with other parameters.

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**.

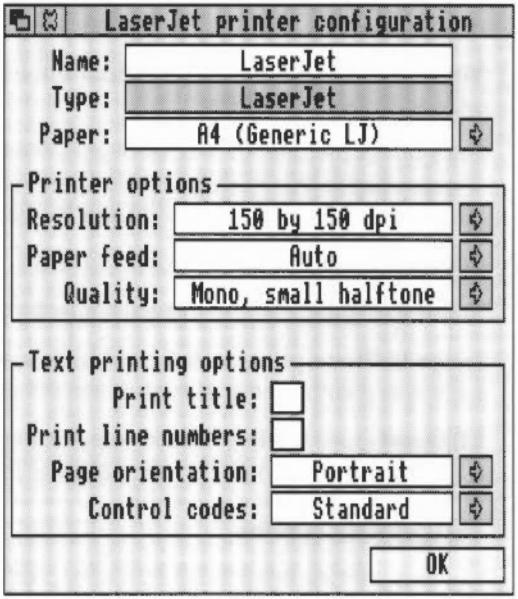


Click on the righthand arrow icon to display the **Text quality** menu. Text quality can be either **No highlights, draft** or **NLQ** (near letter quality). NLQ looks better but takes longer. (NLQ also uses more ink and wears the printer ribbon out quicker).

Click on the righthand arrow icon to display the **Control codes** menu. Control codes alter 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 go back to your old settings, ignoring any changes you may have made, click on the Close icon.

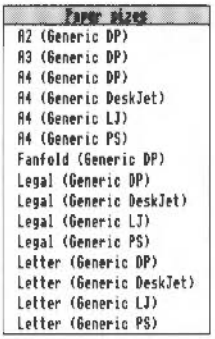
Configuring LaserJet printers



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. You can, if you wish, change this to something more meaningful for you.

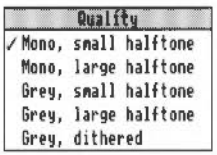


The **Paper:** box gives the paper size to be used by the printer. This is usually A4 (Generic LJ) in Europe. If you want to change the paper size, click on the righthand arrow icon; this displays the **Paper sizes** menu. Choose the alternative paper size you wish to use. The paper sizes marked **Generic LJ** are usually best for LaserJet type printers. It is also possible to generate other page sizes using the **Edit paper sizes option** from the icon bar menu; see page 71 for more details.

Printer options

The printer **Resolution** menu can be displayed by clicking in the righthand arrow icon. Increasing the resolution usually gives a better quality image, but printing usually takes longer.

Paper feed menu can be displayed by clicking on the righthand arrow 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 while printing is under way.



The **Quality** menu lets you choose the type of printout quality. Click on the righthand arrow 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. 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.

Small halftone prints in 4x4 halftones for grey scales and colour.

Large halftone prints in 8x8 pixel halftones for grey scales (no colour). Large halftones give better quality than small halftones.

Dithered gives the best quality results, especially for grey scale pictures. However it takes longer to print than the halftone options.

Text printing options

The text printing options allow you to control the way text is printed from an editor (such as Edit). Many applications override these options and replace them with other parameters.

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

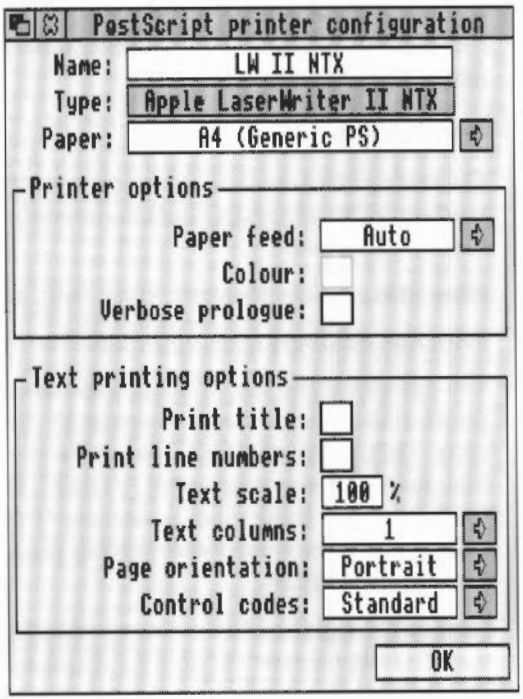
Print line numbers gives each page line numbers.

Click on the righthand arrow icon to display the **Page orientation** menu. 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.

Click on the righthand arrow icon to display the **Control codes** menu. Control codes alter 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 the Close icon.

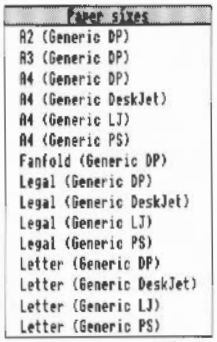
Configuring PostScript printers



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. You can, if you wish, change this to something more meaningful for you.



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 righthand arrow 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 71 for more details.

Printer options

Paper feed menu can be displayed by clicking on the righthand arrow 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. However, most applications are satisfied with a simple prologue. 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.

Text printing options

The text printing options allow you to control the way text is printed from an editor (such as Edit). Many applications override these options and replace them with other parameters.

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 to suit your taste. 100% gives standard sizes, 200% uses twice the size, and 50% gives half the size (twice as many characters per inch). The scale factor is in the range 20% to 999%. However there must be at least 10 characters on a line, so more than 700% will give an error if used with portrait mode. You can select a different scale factor for each orientation.

Click on the righthand arrow icon to display the **Text columns** menu. Text Columns specifies the number of columns of text to be printed on each sheet of paper. The printer manager remembers the two chosen values – one for portrait and one for landscape printing.

Click on the righthand arrow icon to display the **Page orientation** menu. 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.

Click on the righthand arrow icon to display the **Control codes** menu. Control codes alter 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 the Close icon.

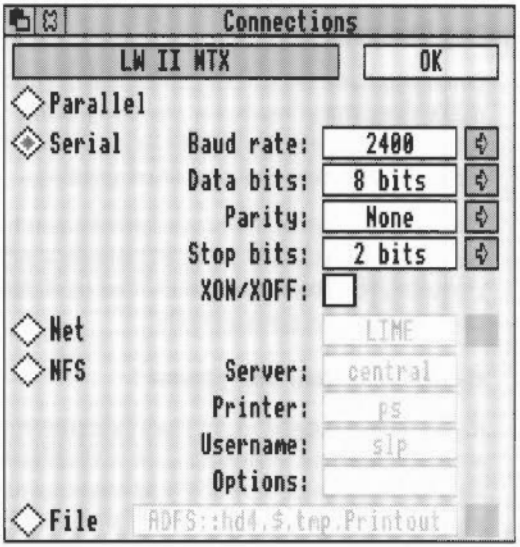
Communicating with the printer

This section applies to both PostScript and non-PostScript printers

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

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

The printer driver can send printed output to the printer using the **Parallel** port, the **Serial** port or through a **Net** or **NFS** network port; additionally it can save printer output in a **File** for later printing. 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.



Choose one of the following connection options:

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 righthand arrows and choose a new value.

Net allows you to connect to a network printer. To change the name of your printer, click on the righthand arrow and choose a new printer. 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 Econet or Ethernet network connection to use this option.

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 righthand arrow and drag the **Save as** box to the desired directory display; your output will now be directed to this file.

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

Activating the printer

Once you have set up the configuration and connection options correctly, you must make the printer ready for use by clicking on **Active** in the Printer control menu. When you do this the printer icon on the icon bar changes to reflect the printer you have chosen. You can now start printing.

The Printer control menu also allows you to make a printer **Inactive**, so that it can't be used. Additionally you can remove a printer from the Printer control window by choosing the **Remove** option. The next section, *Saving your choices*, shows you how to save changes permanently.

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.

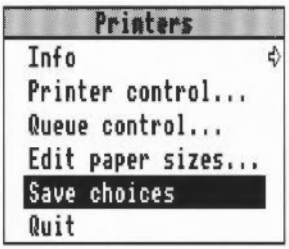
You can choose to print using a different printer by clicking on that printer's icon on the icon bar. This highlights the new printer driver and greys out the old one.

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

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.

Once you have saved your setting, the printer manager automatically loads your activated printer driver onto the icon bar each time you start the printer manager.



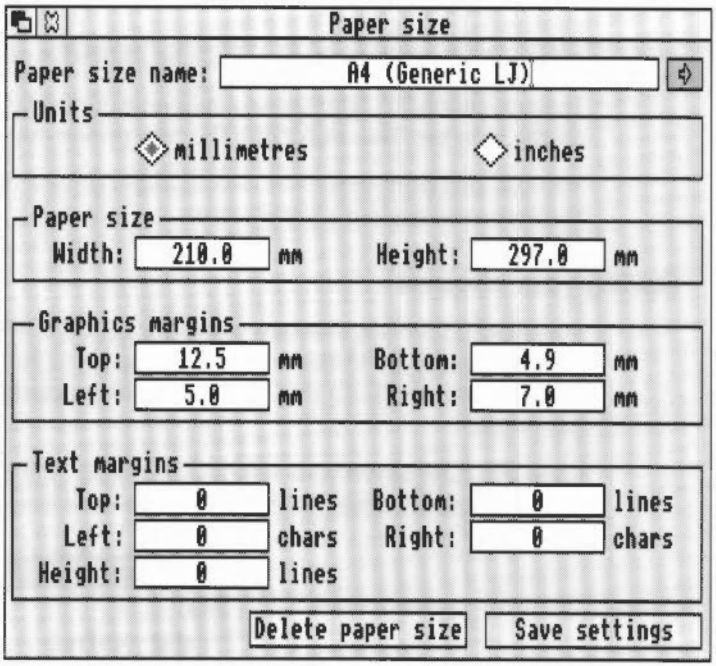
Editing paper sizes

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.

From this dialogue box you can select your paper size by clicking on the righthand arrow and choosing a paper size.

These are:

- A2 – 549.8 mm by 420 mm
- A3 – 420 mm by 297 mm
- A4 – 297 mm by 210 mm (the default option)
- Fanfold – 279 mm by 203mm
- Letter – 279.4 mm by 215.9 mm
- Legal – 355.6 mm by 215.9 mm



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. You can 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 settings** 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, A5 (memo-letter) will use paper in the A5 tray.

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, in effect, 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 in 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 settings**, this saves them for the current session. 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. When you have finished, close the window by clicking on the close icon.

Printing a file

Now that you have connected a suitable printer, loaded a matching printer driver and configured it to suit the printer and the job you want to print, you are ready to start printing.

To print a Draw file, Paint file or other application file, drag the file 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 icon.

Paint and Draw files and those of many other applications can also be printed by selecting **Print** from the appropriate menu in each application; alternatively you can press the Print key.

When the printer manager is loaded, it also loads a printer module, which can be used without the user interface offered by the printer manager. If you are short of memory you may find it convenient to use this module on its own: for example, when you are printing graphics from Draw (you can't use the module on its own when printing from Edit). To do this, install the printer in the normal way, and then remove it from the icon bar by selecting **Quit** from the icon bar menu. The printer icon will now disappear, but the printer module remains behind.

Printing several files

You can print several files one after another, either by opening their directory display, selecting the files to be printed and then dragging their icons onto the printer icon, or by dragging more file icons onto the printer icon while printing is in progress. The names of files to be printed are placed in a printer queue.

Pressing the Escape key

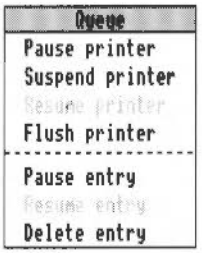
You can stop a print job at any time by pressing the Escape key. After pressing Escape you should then reset your printer. This allows the printer to be 'off-line' again.

Queue control

If you want to print several files, you do not have to wait until one has finished printing before sending the next. 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 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 icon bar.

Menu over the first entry in the queue



Clicking Menu over the first entry in 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.

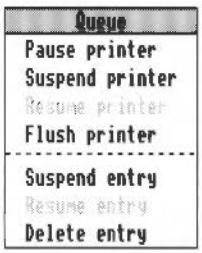
Flush printer deletes the entire print queue so that no more files are printed or queued.

Pause entry stops the current entry printing and carries on with the next entry in the print queue.

While an entry is suspended, it can be removed from the queue completely with **Delete entry.**

Menu over subsequent entries in the queue

If you 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**.



Advanced printing

You should now know enough about printing to be able to set up the printer manager to print with your printer. The rest of this chapter deals with some of the more advanced aspects of printing. These are:

- Types of text printing – plain and fancy
- Speeding up graphics printing
- Printing 1st Word Plus files
- Downloading and mapping fonts to PostScript printers.

Unless you are interested in one of these areas, you don't need to read the rest of this chapter.

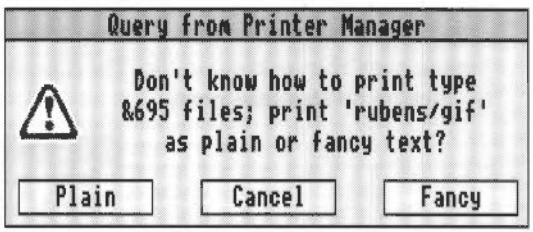
Plain and fancy text printing

Text printing (such as printing from Edit) uses the printer's own internal font to print in.

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

If the original application cannot be found, a dialogue box asks if the file should be printed as plain or fancy text.



If you see this message you should try to find the application that the file requires to print properly. 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 1st Word Plus.

Speeding up graphics printing

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

Graphics printing can be slow. However you can speed it up 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, any RAM disc you may have, changing to a different screen mode (mode 0 or mode 11 are better) and reducing the system sprite memory.
- Configure a fairly large font cache – at least 128KB. The font cache can be temporarily changed using the Task manager. See page 103 for information.
- Increase the size of the printer buffer using the *Configure PrinterBufferSize command. See page 172 for more information.

Printing 1st Word Plus files

1st Word Plus is a word processor, available from your Acorn dealer. You can print 1st Word Plus files when 1st Word Plus is not running by dragging the files onto the printer icon in the normal way.

If your 1st Word Plus file contains sprites, they will not be printed if you use this method; instead, use the printer drivers supplied with 1st Word Plus. You should also use the 1st Word Plus printer drivers if your document uses footnotes.

If 1st Word Plus is running, you can still print using the printer manager, but printing will in fact be controlled by 1st Word Plus. It is therefore still essential in such circumstances that you set the features you need on the 1st Word Plus keypad.

Printing 1st Word Plus files using the other printer drivers

For successful printing, you will need to do *one* of the following:

- Ensure that the computer has not 'seen' the 1st Word Plus application directory during the current session.
- Enter the Command Line (Press F12) and type:

```
*Unset Alias$@PrintType_AF8
```

- Edit two files within 1st Word Plus itself: the !Boot file and the !Run file. Remove the following line from both of these files:

```
*Set Alias$@PrintType_AF8 Run <Obey$Dir>.!Run %%*0 -print
```

The fancy text format

Fancy text format understands text printing options such as Paper feed, Title, Number lines, Print quality and Control codes. Plain text format ignores these settings.

The fancy text file format is mainly the same as the 1st Word Plus file format, and so most of the highlighting (in 1st Word Plus files) is printed correctly. This means you don't have to load 1st Word Plus to print out your 1st Word Plus files (although you can't print sprites). The fancy text file format is described in detail in the appendix entitled *The Fancy text file format* on page 247.

Downloading fonts to PostScript printers

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 are can be both built into the printer and downloaded (sent from) by the computer.

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

1. Converts (or maps) any Acorn fonts needed to PostScript fonts.
2. Sends the fonts to the printer.
3. Sends the file to be printed.
4. After the file is printed, it erases the downloaded fonts from the printer's memory.

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

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.

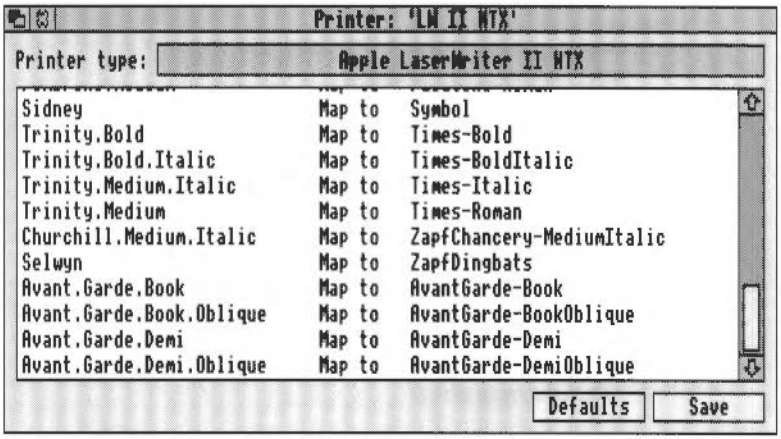
Downloading fonts 'permanently'

The application *FontPrint* is used to download fonts to the printer, where they will stay resident until you reset the printer. 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 for your PostScript printer.

To prepare fonts for downloading:

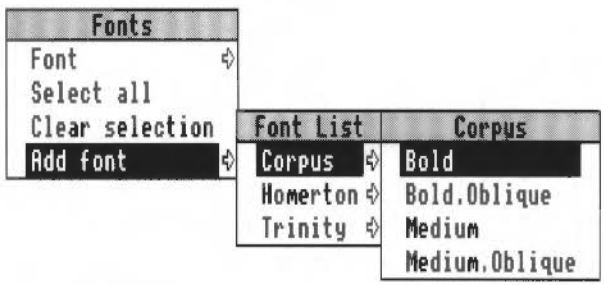
1 Load FontPrint onto the icon bar by double-clicking on its icon.

2 Click Select on the FontPrint icon bar icon to display the FontPrint window.



3 Click Menu over the window to display the **Fonts** menu.

4 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.



5 When you have selected the fonts you wish to download, click on the **Save** box. This saves the download information within the printer manager.

6 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 will only be downloaded if you type in the correct password.

When you clicked on the Save box you stored the information about which fonts you wanted downloaded.

The printer manager will now download your chosen fonts to the printer whenever the printer manager is started. It will also ask you to enter the printer password each time.

Mapping Acorn fonts to PostScript fonts

Instead of Acorn fonts being downloaded to the printer they can instead be mapped to a corresponding PostScript font.

What is mapping?

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.

You don't need to use this mapping facility unless you have purchased **additional** fonts that you wish to map to PostScript fonts. All of the Acorn fonts that are supplied with your computer are automatically mapped to PostScript fonts.

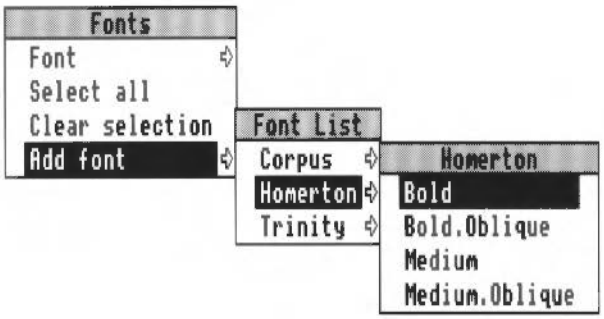
If you have added additional fonts to the !Fonts application you may want to map these to fonts in the PostScript printer. Mapping and downloading can be mixed: some fonts can be mapped while others are downloaded.

To map an Acorn font to a PostScript font:

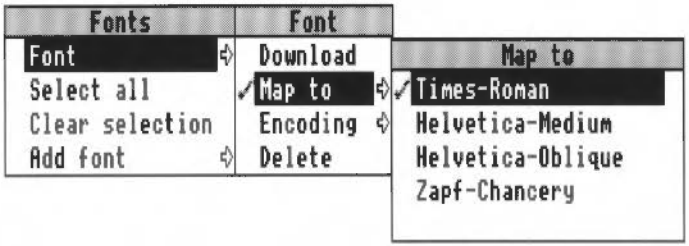
1 Load FontPrint and display the FontPrint window.

2 Click Menu over the window to display the **Fonts** menu.

3 Select the Acorn fonts that you wish to map to PostScript fonts by choosing the fonts from the **Add font** submenu. They will be added to the FontPrint window at the end of the list.



4 Once you have chosen the fonts, highlight each one in turn and map them to the corresponding PostScript font using the **Font/Map to** submenu. The **Map to** menu lists the fonts available on the printer.



5 When you have finished mapping the fonts, click on the **Save** box. This saves the file within the printer manager. The printer manager will now use this file to map fonts to your chosen printer whenever the printer manager is run.

Mapping to a non-standard PostScript font

If you wish to map to an additional PostScript font which is resident in the printer, but which is not in the standard list of fonts in the printer driver, you can add this additional PostScript name in the writeable field at the end of the Map to sub-menu.

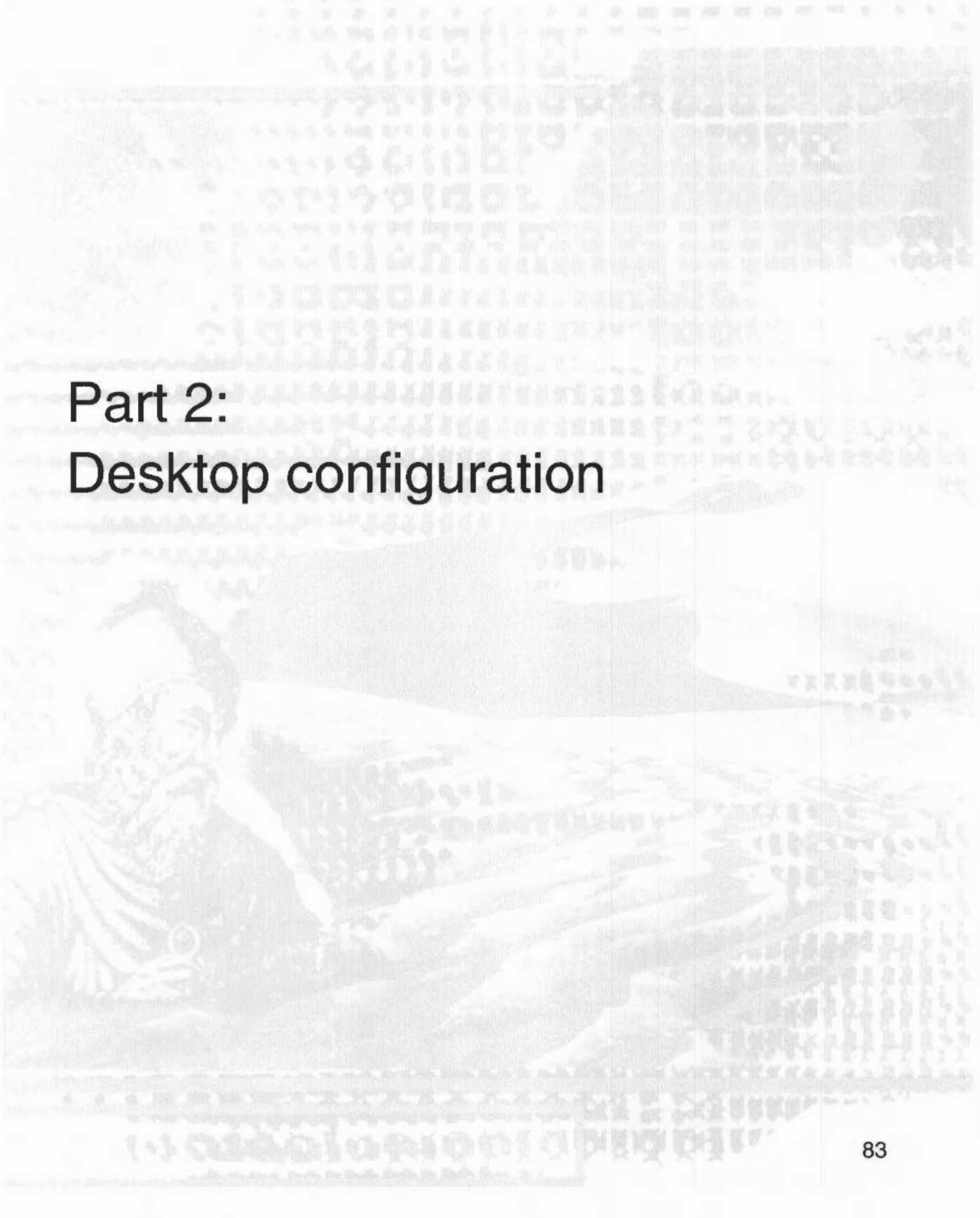
Choosing the encoding type

If you are mapping fonts, you can also choose **Encoding** from the **Font** menu. 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.

Bitmap fonts

Bitmap fonts, such as Portrhouse, cannot be downloaded to a PostScript printer.

Part 2:
Desktop configuration



5 Setting the configuration

Your computer will function well with the default settings that were set up when the computer was made. However you can change most of the settings that affect RISC OS configuration to suit more closely your own particular way of working, by using the application **!Configure**. Changes to the configuration mostly take effect as soon as you make them, and are maintained when you switch the computer off.

With Configure you can change the configuration of the

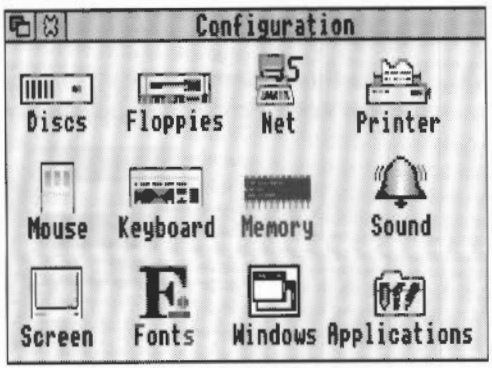
- hard discs and floppy discs
- networks and printing
- sound and screen
- windows and memory
- mouse and keyboard
- applications and fonts.

Warning: You should always keep a saved copy of the configuration of your computer so that you can restore the configuration to its original state. See the section entitled *Saving and loading configurations* overleaf.

Starting Configure

To start Configure, double-click on its icon in the Apps directory display.

The icon appears on the icon bar. Open the Configure window by clicking on the Configure icon on the icon bar.



To open any of the Configure option dialogue boxes, click on the relevant icon. For example, to change the sound system configuration, click on the sound icon. The table below shows the icons to choose to carry out specific configuration tasks:

To set the:	Choose
Hard disc drive configuration	Discs
Floppy disc drive configuration	Floppies
Network configuration	Net
Printer configuration	Printer
Sound configuration	Sound
Monitor configuration	Screen
Window behaviour	Windows
Memory allocation	Memory
Mouse gearing	Mouse
Keyboard rate	Keyboard
Application start-up	Applications
Font configuration	Fonts

Saving and loading configurations

You should always keep a copy of your own configuration file so that if you lose your configuration you can easily and simply restore it. The configuration can be lost (or partly lost) by

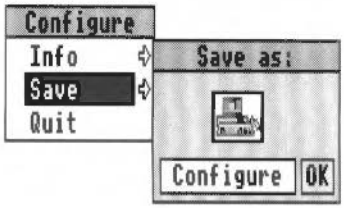
- the computer's internal battery failing
- using one of the special power-on reset combinations
- using an unwise *Configure command
- changing Configure without remembering your initial settings.

To save a configuration:

1 Press Menu on the Configure icon on the icon bar.

2 From the **Save** option display the **Save as** dialogue box, showing the special Configure icon.

3 Type in the filename you want, and save it by dragging the icon to a directory display. Keep a copy on floppy disc in a safe place.



You may also find it convenient to save more than one configuration; perhaps your computer is used by someone else who prefers a different setup from you.

You should keep your configurations on a floppy disc and keep them in a safe place. If the configuration in your computer is lost for any reason (when the CMOS RAM is cleared by a Delete power-on for instance) you will need to restore your configuration settings from disc.

Restoring a configuration

You can restore a configuration by dragging a previously-saved configuration file icon onto the Configure icon on the icon bar. However it is simpler just to double-click on the configuration file.

What is in a configuration file?

Configuration files record only those features that you can set using the Configure application, but not the aspects of your computer's configuration that can be changed using the Command line. You should keep a separate note of changes you make to the configuration via the command line. For more information about commands available from the command line, read the chapter entitled *Accessing the command line* on page 127.

The configuration file may prove particularly useful if you are running an application that uses a large proportion of the computer's memory. Such an application's documentation should contain advice about how to change configuration details so as to release as much memory as possible, but this may produce a configuration that, while it is useful for a particular application, may not suit your usual requirements.

You could therefore save several configuration files, each optimised to a particular application or way of working that you could use whenever necessary.

Quitting Configure

To exit from Configure, click Menu over the Configure icon, and select **Quit**. You can also close the Configure window, leaving the program running, by clicking on the Close icon. If you do this, the window can be re-opened by clicking on the Configure icon.

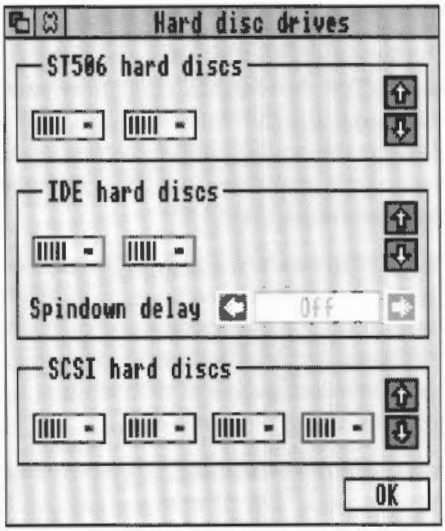
The configuration windows

The configure windows use some special conventions:

- When you click on the single righthand arrow a menu is displayed. You can also click Menu to display the menu.
- When you type a number or word into a box, make sure you always press Return, otherwise your typing will not be remembered by the computer.

Discs

Click on the up and down arrows to change the number of hard disc drives you have in your computer.



You can have

- up to two ST506 hard discs
- up to two IDE hard discs
- up to four SCSI hard discs.

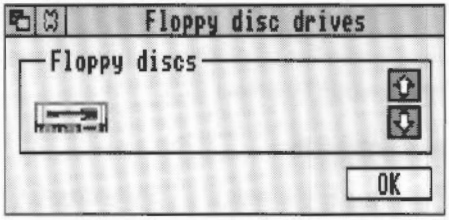
Usually your computer will only support one type of hard disc (ST506, IDE or SCSI). As a guide, computers introduced before A5000 have ST506 discs, except for A540, which has a SCSI disc (clicking Menu on the drive icon will display a SCSI menu). A5000 and later computers are fitted with IDE discs. Consult your supplier if you are in any doubt.

When you have selected the number of hard discs, click on **OK** to make the changes. Do not select a different number of hard discs from those actually in your computer as this may cause problems.

If you have a portable computer you can also set the IDE disc drive **Spindown delay**. This is the interval between the last disc access and the disc drive motor being turned off. Once the motor is turned off, the drive is reactivated (the motor is turned on again) as soon as you access the hard disc. Turning the motor off helps save the batteries.

Floppies

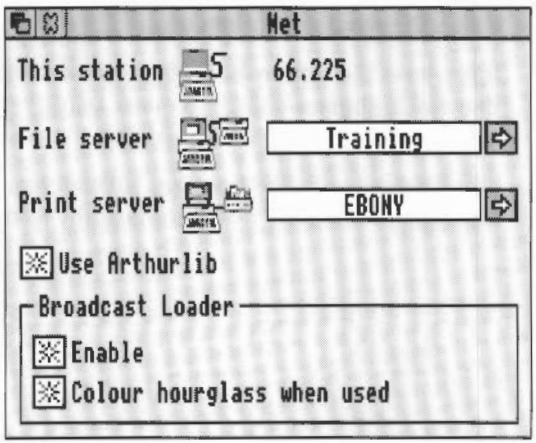
Click on the up and down arrows to change the number of floppy drives you have so that they reflect the number in your computer. RISC OS supports a maximum of four floppy disc drives.



When you have selected the number of floppies, click on **OK** to make the changes. Do not select a number of floppies different from that actually in your computer.

Net

This option is only available if you are connected to a network.



This station

This 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.

File server

This sets the file server (by number or name) that will be selected by default when you click on the Net icon bar icon, in order to log on to a network.

Display the list of possible file servers by clicking on the right arrow. Click on a server name to select it.

Print server

This sets the printer server (by number or name) that will be selected by default when you use the printer manager to print to a remote network printer.

Display the list of possible printer servers by clicking on the right arrow. Click on a server name to select it.

Use ArthurLib

If this box is starred, the library directory $.ArthurLib is selected after log on. If this box is not selected, 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.

Broadcast Loader

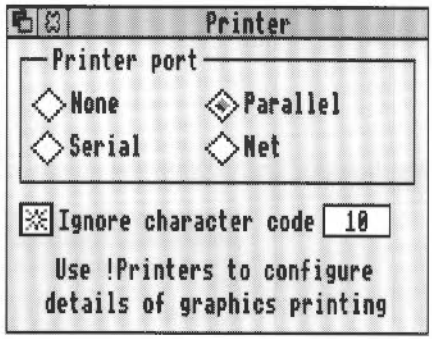
Click on **Enable** to activate the Broadcast Loader. The Broadcast Loader is used to increase performance when loading application software from file servers in a busy environment. Clicking on **Colour hourglass when used** displays the hourglass in a different colour during Broadcast Loader operation.

If you have the **Colour hourglass when used** configuration option set, you will see that the hourglass changes colour, going red when re-broadcasting a request and green when receiving a rebroadcast.

This network software operates without you having to take any actions. If a message packet fails it is automatically re-requested.

Printer

This dialogue box sets up the basic printer port configuration.



Printer port

This sets the type of printer connection that you are using. It can be set as follows:

- **None** tells the computer that no printer is connected.
- If you have a printer connected directly to your computer, it should be connected via the serial or parallel port: your printer manual will tell you which to use. The Printer port should then be set to **Serial** or **Parallel** accordingly.
- **Net** tells the computer to use a printer connected to your network (if you have one).

This dialogue box controls where print commands issued from the command line are sent. You will normally use the desktop application !Printers to do all your printing, so the options set in this window will not be used.

Using the Printer manager application is described in the chapter entitled *Printing* on page 59.

If you have more than one printer connected, decide which one of the printers should receive print commands from the command line and configure the window accordingly.

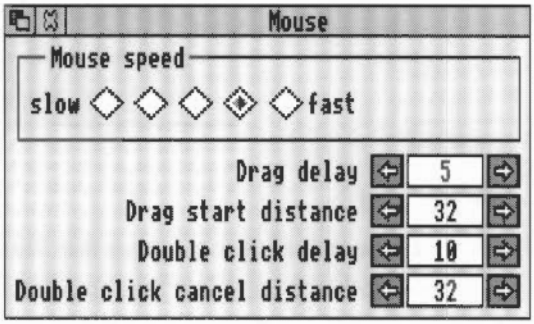
Ignore

This option tells your printer which character to ignore. This may be necessary because printers differ in whether they expect lines to end with a linefeed character (ASCII 10) or a carriage return. If you find your printer double-spaces all text, then click on the **Ignore** box and enter 10 in the box on the right. If, on the other hand, your printer produces overprinted lines, then click in the **Ignore** box to remove the star.

If you have two printers, and they both have different printer ignore characters, you can, most probably, change the printer ignore character by changing settings on the printer itself. Look in your printer manual for more details. You will normally use the desktop application !Printers to set the printer ignore character, so the options set in this window will not be used.

Mouse

This dialogue box sets up the mouse configuration options.



Mouse speed

This option controls how fast the pointer moves as you move the mouse.

Mouse speed can be set from slow to fast. The faster the speed set, the quicker the pointer moves around on the screen.

Drag delay is the amount of time you need to hold down the mouse button before the computer decides you are starting a drag operation. The default for this option is 5 tenths of a second.

Drag start distance is the distance you can move a mouse before the computer decides a drag has occurred. The default for this option is 32 OS (operating system) units.

Double click delay is the time interval in which two successive clicks are interpreted as a double-click. The default for this option is 10 tenths of a second.

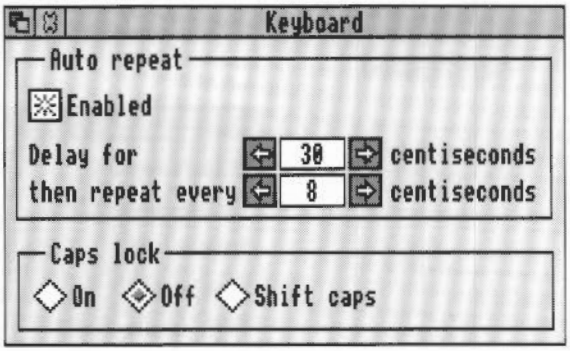
Double click cancel distance is the distance you can move the mouse during a double click operation before the double-click is cancelled. The default for this option is 32 OS units.

Values that differ greatly from those above may give rise to very strange effects with some applications.

There are approximately 180 OS units per inch in Mode 12 on a 14" monitor.

Keyboard

This dialogue box sets up the Auto-repeat and Caps Lock options for the keyboard.



Auto repeat

This option controls how quickly characters are repeated when you hold down a key on the keyboard.

To enable auto repeat, click on the **Enabled** box.

The **Delay for** rate is the time interval before a key starts to autorepeat. Use the arrow keys to adjust this rate. The default value is 32 centiseconds.

The **repeat every** rate is the time interval between the generation of auto repeat characters. Use the arrow keys to adjust this rate. The default value is 8 centiseconds.

Caps Lock

This option configures the state of the Caps Lock key when the computer is turned on.

Choose one of the following options by clicking on its radio icon (button):

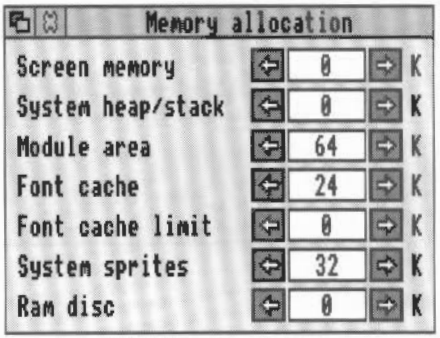
On configures Caps Lock to be on – when you type you will see uppercase letters.

Off configures Caps Lock to be off – when you type you will see lowercase letters.

Shift caps configures Caps Lock to be on – when you type you will see uppercase letters. However holding down the Shift key will produce lower case letters, which does not happen when **On** is chosen.

Memory

You can change the allocated memory by clicking on the right arrow to increase memory and on the left arrow to decrease memory. Alternatively you can click over the numbers and type in your alternatives. Remember to press Return when you have finished.



Screen memory

This reserves an area of memory for use by the screen. Normally you will not need to reserve any screen memory, since the memory required for the screen is taken automatically if it is available. However if you are low on memory and wish to reserve some for the screen, use this option. See the section entitled *Changing screen modes* on page 117 for information about the memory requirements for each screen mode.

System heap/stack

This reserves extra memory for the System heap over and above that needed initially by the system. We recommend that you leave this value at zero (0) unless you have a specific application that requires a different setting.

Module area

This reserves memory for modules that will be loaded from disc. This is extra on top of the area used by the ROM modules. We recommend that you leave this value at zero (0), unless you know that an application you will be using has a large number of RAM modules. Even then this will not be a problem unless you are running short of memory.

Font cache

This reserves an area of memory for use with outline fonts. If you never use outline fonts (if, for example, you only use the System font) you can set this to zero. If you do use outline fonts you should set this to a small value (approximately 32KB). The

size of the font cache depends on the font characteristics and the screen mode you are using. However the font cache can grow to the size defined by the font cache limit option if the free memory is available. See the appendix entitled *Fonts and the Font manager* on page 241 for more information.

Font cache limit

This value specifies the maximum size to which the cache may grow. When the cache reaches this setting, old fonts will be selectively deleted from the cache as new ones are added. If this value is zero or smaller than the Default font cache then the cache will not expand. See the appendix entitled *Fonts and the Font manager* on page 241 for more information.

System sprites

This reserves an area for use by system sprites. This option can normally be set to zero. Some games may require a small sprite area (approximately 32KB).

Ram disc

This reserves memory for a Ram disc, and if a non-zero value is set, the Ram disc icon appears on the icon bar. Unless you always use the Ram disc it is probably less wasteful of memory to start the Ram disc from the Task manager when you want it.

These memory allocation options are not set immediately. The computer has to be reset before these options take effect.

Desktop boot overrides !Configure settings

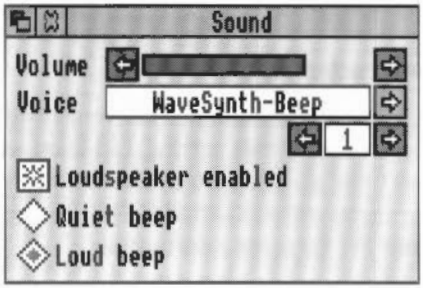
When you save a Desktop boot file, the values of the Font cache limit, System sprites and Ram disc are saved in the Desktop boot file.

When you switch on your computer, the values set by !Configure are read in. Then the computer reads the Desktop boot file. The values of the Font cache limit, System sprites and Ram disc then overwrite those just set by !Configure.

This can cause problems if you change these values (using the Task manager) before saving the Desktop boot file and are unaware of the consequences.

Sound

This dialogue box sets the Sound configuration.



Volume

Sound volume sets the volume of the computer's speaker. This controls the overall level of sound output from any sound-generating activity, and determines the range within which the computer's beep will sound.

Voice

Voice sets the voice which will be output by the first of the computer's eight sound channels. Since this is the channel used by the beep, you can use this setting to change the type of beep to any of the installed voices. Repeated clicking on the left or right arrows cycles through the voices available. Click over the right arrow to display a list of installed voices. Choose a voice by clicking on it.

Loudspeaker enabled

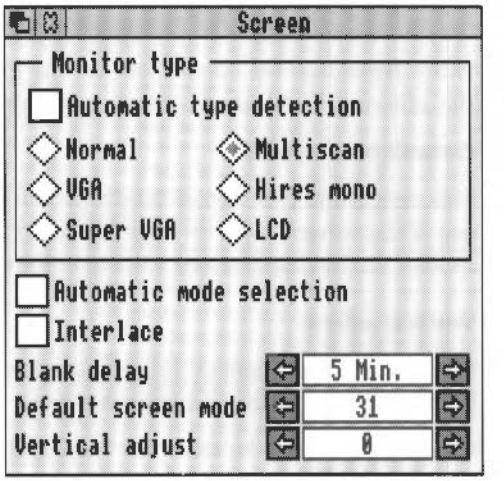
Clicking on Loudspeaker enabled switches the computer's own loudspeaker on or off. When switched off, sound may still be output via headphones or an external loudspeaker plugged into the socket on the back of the computer.

Beep

This sets the level of the computer's standard beep, used for giving warnings, drawing your attention to error messages, and the like. The 'meaning' of **Quiet** and **Loud** is determined by the value you have set for Sound volume: a Loud beep is not quite as loud as the highest value you have set the volume.

Screen

This window sets up the Screen configuration parameters



Monitor type

You can choose from six monitor types:

- **Normal** – for a standard monochrome or colour monitor.
- **Multiscan** – for a multiscan monitor.
- **VGA** – for a VGA-compatible monitor.
- **Super VGA** – for a Super VGA-compatible monitor.
- **Hires mono** – for a very high resolution monochrome monitor.
- **LCD** – for portable computers.

Additionally you can click on **Automatic type selection** if your computer can automatically detect monitor types.

For more information about monitors and the screen modes they can display, see the chapter entitled *Colours and screen modes* on page 115.

If you click on **Automatic mode selection**, the computer will automatically pick a mode that is compatible with your monitor type.

If **Interlace** is chosen, screen interlace is switched on. Interlace gives a better quality picture with some types of monitors and screen modes. Normally interlace is switched off.

Blank delay

This controls how long the interval is between the last key press or mouse movement and the screen blanking (turning off). Moving the mouse or pressing a key switches the monitor screen on again.

Note: There may be interference on the blanked screen if a sound is played while the screen is blanked out. This is nothing to worry about.

Default screen mode

This determines the screen mode in which the desktop starts up; it can be set to any of the values listed on page 220, but those that operate with most monitors are modes 12 (16 colours) and 15 (256 colours).

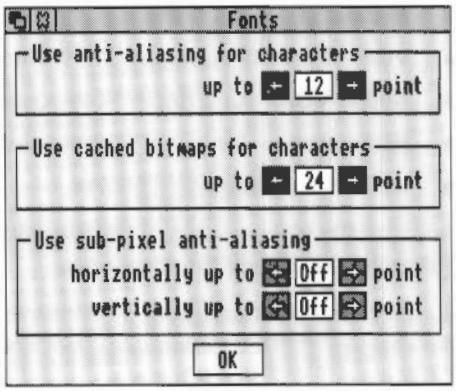
Vertical adjust

This allows you to adjust the vertical alignment of your screen. This is useful if the desktop is not centred on your monitor.

Click on the arrows to move the number between -4 and 3. -4 represents four lines down while 3 represents three lines up.

Fonts

This dialogue box allows you to change the font configuration.



The Font manager uses a technique called *anti-aliasing* to improve the quality of fonts. This technique blurs the jagged edges of characters making them look much smoother. All character sizes are given in points. A point is equivalent to 1/72 of an inch.

Use anti-aliasing

Click on the arrows to place an upper limit on the size of anti-aliased fonts. Fonts in larger sizes are usually printed without anti-aliasing. Larger fonts benefit less from anti-aliasing, and since an anti-aliased font occupies a lot more memory than a non-anti-aliased font, it is not worth displaying large fonts with anti-aliasing.

Use cached bitmaps

Click on the arrows to specify the largest font size which is to be kept in the font cache. Fonts in the font cache are stored as bitmap fonts. Bitmaps allow speedy text drawing to the screen. Fonts larger than this size will be drawn from outlines directly to the screen without caching and without anti-aliasing. If the cached bitmaps value is set high, and you are using a few large fonts – for headlines, perhaps – they may take up all the font cache, flushing out smaller fonts.

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 have one of the larger and more powerful RISC OS computers, or are printing at a high resolution, you may wish to increase the values of this parameter.

Use subpixel anti-aliasing

This controls a refinement of anti-aliasing in which four separate versions of each character are retained. This can have a beneficial effect on the quality of characters (on the screen) at small point sizes. However it is heavy on computing power and may result in unacceptably slow screen updates. Therefore this parameter should not normally be changed from its default value of OFF.

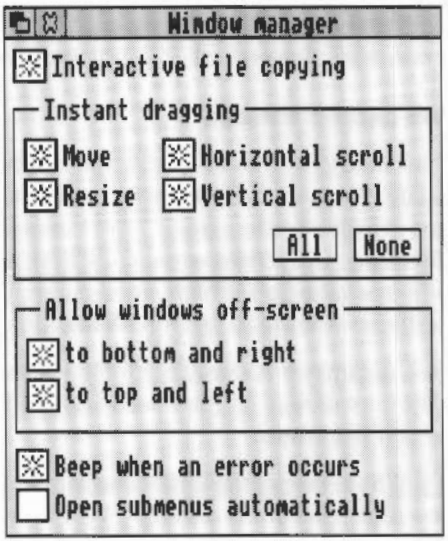
OK

Clicking on the OK box redraws the screen using the values you have set up with this window.

If you want to understand more about how the Font manager operates you should read the appendix entitled *Fonts and the Font manager* on page 241.

Windows

This window is used to configure the way the desktop windows behave.



Interactive file copying

This option allows background Filer operations, the normal way to use RISC OS. This option is normally left starred – enabling interactive file copying.

If you do not use Interactive file copying, the desktop cannot be used for other purposes while Filer copying operations are in progress. Not using Interactive file copying can sometimes result in quicker Filer operations. These Filer operations may also take up less memory.

Instant dragging

When set, these options update the screen as a window is dragged, resized or scrolled. There are four possible states, any of which can be on or off. When these options are starred, the screen is updated instantly, when off, only a dotted outline moves until you have finished the drag. Using outline moves is usually quicker than instant updating:

- **Move** gives instant effects when you move a window around the screen.
- **Resize** gives instant effects when you resize a window.
- **Horizontal scroll** gives instant updating of the windows' contents when using the horizontal scroll bars.
- **Vertical scroll** gives instant updating of the windows' contents when using the vertical scroll bars.

Click on **All** to select all of these options and **None** to deselect them all.

Allow windows off-screen

Windows can be dragged off screen so that part of the window is not on the desktop. You cannot lose a window, since part of the Title bar is always visible on screen:

- **to bottom and right** means that you can drag windows off the righthand and bottom edges of the screen.
- **to top and left** means that you can drag windows off the lefthand and top edges of the screen.

Beep when an error occurs

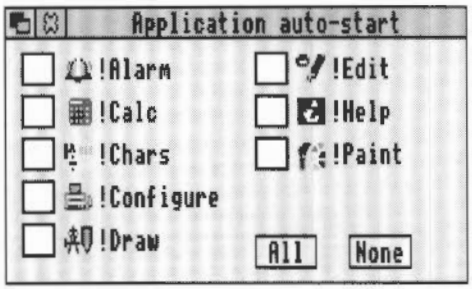
This causes a beep to sound whenever an error box is displayed on screen.

Open submenus automatically

This option allows submenus and dialogue boxes to display automatically after a short delay. Submenus are indicated by a righthand arrow on the menu.

Applications

This window allows you to specify which applications, if any, will be started automatically when you switch on or reset your computer.



Click over the applications you wish to auto-start each time you switch on or reset the computer. Auto-started applications appear automatically on the icon bar. Click on **All** to auto start all the applications and click on **None** to remove auto-start from all applications.

You can also automatically start applications in another, more versatile, way with a Desktop boot file. See the chapter entitled *Desktop boot files* on page 109 for more details. You cannot have a combination of Auto-start applications and a Desktop boot file. If you run a Desktop boot file, the Auto-start options will be ignored.

6 Fine tuning the configuration

To set the overall configuration of your computer, use the !Configure application described in the previous chapter. To change the configuration interactively, use the **Task manager**.

The Task manager is the control panel for the computer. Through it you can monitor and control your system resources. The Task manager differs from Configure in that Configure changes a setting permanently, while the Task manager can change settings on-the-fly for as long or as short a time as you want. All changes to the Task manager are 'forgotten' when the computer is reset.

'Tasks' include anything the computer is doing: running an application, controlling what appears on the screen, managing areas of memory, and running the Task manager itself.

The Task manager icon (the Acorn) is located at the extreme righthand end of the icon bar. It is used

- to control and monitor tasks and the use of the computer's memory
- as a means of access to the Command Line
- to enable you to start up your computer exactly the way you want, with specific applications running
- to leave the desktop
- to shut down your computer before switching it off.

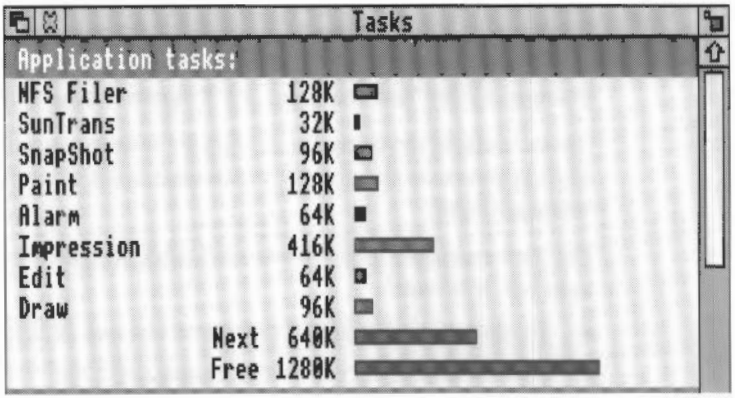
Monitoring and controlling tasks and memory

Clicking on **Task display** on the Task menu (or simply clicking on the Task manager icon itself) produces a window containing details of the current tasks and the use of the computer's memory. You will need to use scrolling and/or resizing to see all of this display. Memory usage is presented in the form of a number and a bar graph. When the bar is displayed in red, you can alter it by clicking Select within a bar, or by dragging the end of the bar to the value you want. The operating system imposes some restrictions on the amount of memory you can give to each item. The display's parameters are shown in several distinct sections:

- Application tasks
- Module tasks
- System memory allocation.

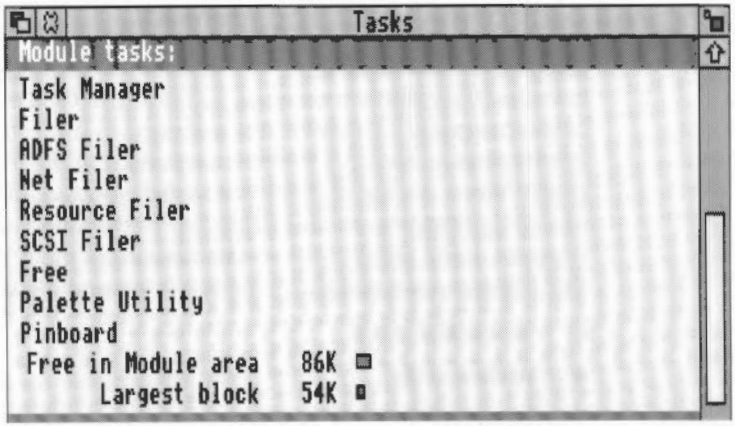
Application tasks

At the top, entitled **Application tasks**, there is a list of the tasks which are currently running, and how much memory they are using. The areas marked **Next** and **Free** indicate how much memory will be allocated by default to an application when it starts up, and how much free memory is remaining in the system. These two values can be changed. Most applications override the values allocated to **Next** and **Free**, giving them the new values they need. You may find it useful to allocate more space to **Next** before opening a new **Task window**; since the computer does not know what the task is going to be, it cannot automatically transfer space from **Free** to **Next**.



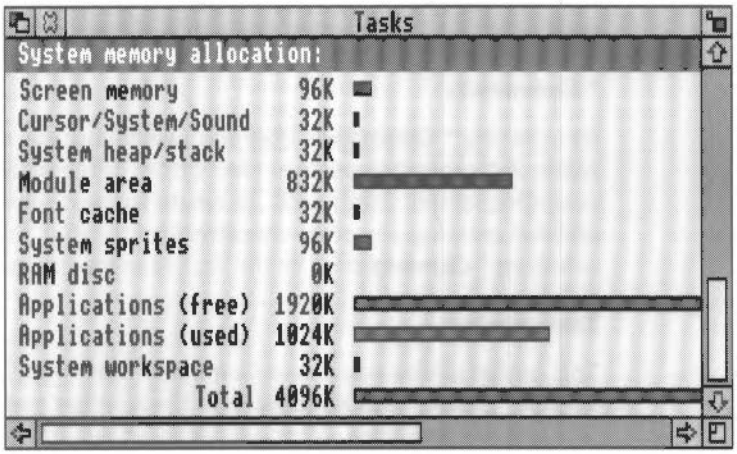
Module tasks

The next section – **Module tasks** – lists all tasks which are running as relocatable modules (applications which run as if they were extensions to the operating system), together with the amount of free memory in the module area.



System memory allocation

The third section of the display – **System memory allocation** – shows how the computer's memory is partitioned. Some of the values in this section can usefully be changed. For example, when using a large number of fonts the system may begin to run rather slowly; increasing the area allocated to the font cache will speed things up. However, if you are using any fonts besides the system font, you should not gain space for other tasks by reducing the font cache to zero. (For more information on fonts and the font cache, see page 99.) A second candidate for reduction is the **System sprites** memory, since this space is not normally used by the desktop.



Forcing tasks to quit

The Task manager can be used to force any of the tasks from the first two sections of the display to quit:

1 Position the pointer over the entry for the task you wish to quit and click Menu.

2 Move to the submenu entry for the task, and click on **Quit**.

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

The task display is updated dynamically as applications are running. This allows you to monitor the state of the system.

Command line options

The following options are used to access the command line. Most users will not normally need to use the command line. For more information on the following options, see the chapter entitled *Accessing the command line* on page 127.

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 selecting *** 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 selecting *** Commands** from the Task Manager menu.

Task window

This option allows you to use Command Line mode in a window. 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. Using the Task window is explained fully in the chapter entitled *Accessing the command line* on page 127.

Exit

Clicking on **Exit** causes the desktop and all tasks to be closed down and replaced by the command line. The desktop may be restarted by typing `desktop` at the * prompt, and then pressing Return.

Starting up your desktop 'world' automatically

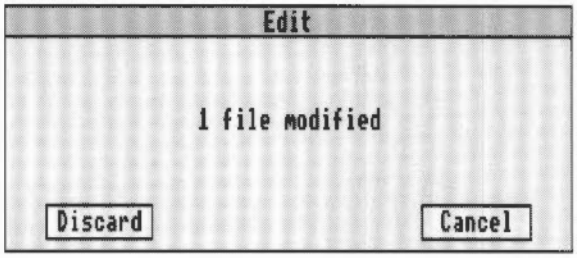
You may find that you want at least some applications running every time you use your computer. If you are connected to an Econet network, you probably want to log on to that every time you switch on, too. You can do things like this using the **Desktop boot** option. Using the Desktop boot option is explained fully in the chapter entitled *Desktop boot files* on page 109.

Shutting down and switching off the computer

The **Shutdown** option causes the desktop and all tasks to be closed down. You are logged off any network and file servers you were logged into and your disc drive(s) are parked so that it is safe for you to switch your computer off. This is more important if you are using a hard disc than if your computer only has floppy disc drives. After you have clicked on **Shutdown**, the computer then tells you that it is ready to be switched off. If you want to start using the computer again straight away, click on the **Restart** button.

Warning messages

As you shut down the computer, RISC OS checks your computer to see if you have saved all of your currently open files. If it finds a file that has not been saved you will see a message much like this one from Edit.



If you don't want to save the file, click on **Discard**. The file's contents are lost and the shutdown procedure carries on. If you want to save the file, click on **Cancel**. This stops the shutdown procedure so that you can save the file. After saving the file, start the shutdown again by clicking on the **Shutdown** option.

7 Desktop boot files

When you first switch on the computer, the desktop is empty waiting for you to start work. However by using a **Desktop boot** file you can tell the computer to start up certain programs and to set certain options each time you start up the computer. For instance you could start up Edit and Alarm, and then log onto your file server automatically.

These actions can all be controlled by the desktop boot file. The following section shows you how to make a desktop boot file. It then goes on to show you how to modify it to include your own commands and scripts.

Starting up your desktop 'world' automatically

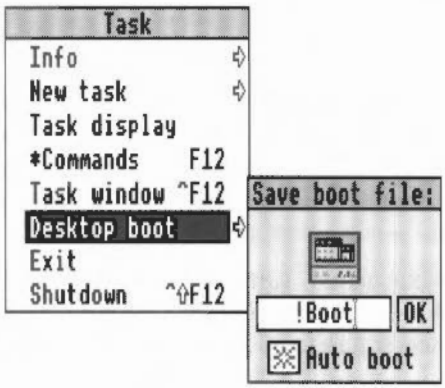
The desktop boot file takes a snapshot of the way your desktop looks and stores this snapshot in a file. When you next start your computer, the computer automatically runs the desktop boot file. This then changes the desktop to be exactly like the desktop you saved in the desktop boot file.

To create 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. Press Ctrl-Reset to restart your computer.
4. Set up your desktop just as you want it 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.

It is important that you do not do anything additional to this process, as otherwise your boot file will become cluttered with instructions you do not really want: hence the need for planning. For example, opening a window for a directory containing applications will tell the computer where to find those applications, and these instructions will also be incorporated into your boot file.

5 When you are ready, press Menu over the Task manager icon (the acorn) and move to the **Desktop boot** option and display its dialogue box, which looks like this:



6 If the box next to the words **Auto boot** does not contain a star, click on it so that it does. This ensures that the file is run each time the computer is started For the experts, it performs a:

- *Opt 4 2 command – This makes the Boot file run.
- *Configure Boot command – This ensures that a power on, Ctrl-Reset or Ctrl-Break runs the boot file.
- *Configure Drive command – This sets the drive to be selected at power on.

7 Save the file as !Boot in the root directory of your hard disc if you have one, or as !ArmBoot if your home directory is on the Econet network. If your computer has only floppy discs, save the file as !Boot in the root directory of a floppy disc. To run the desktop boot file you should insert this floppy disc before you switch on your computer. If the applications on the desktop you are saving have been loaded from more than one disc, the computer will remember the names of the discs and prompt you to insert them when necessary.

If you want to run the !Boot file without displaying the directory in which the Boot file is stored, save the !Boot file by defining a specific pathname in the Save as box.

Now each time you switch on or reset your computer, your desktop will be automatically configured.

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.

Inside the desktop boot file

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 will be useful if you decide to **edit** your desktop boot file by hand.

The following example uses typical values; however these may be different with your computer.

WimpSlot -next 640K

This gives the amount of memory allocated to the next application, usually 640KB.

ChangeDynamicArea -FontSize 0K
ChangeDynamicArea -SpriteSize 0K
ChangeDynamicArea -RamFsSize 0K

These give the amount of extra memory reserved for Fonts, the Sprite cache and the RAM disc. These are normally set by the Configuration application, Configure. However if you change them with the Task manager before saving your boot file, those changes will be saved here and will override any set by Configure.

WimpMode 20

This tells the desktop which screen mode to use.

Desktop SetPalette

This tells the desktop which set of colours to use. This reflects the settings chosen using the Palette.

net:logon :Business Steve

This line logs Steve onto the file server 'Business'.

Filer_OpenDir adfs::HD.$ 2 712 712 188 -sn -si

This line causes the root directory of the disc HD to be displayed when the desktop starts up. The numbers define the position of the display on the desktop and the parameters -si and -sn define the format: small icons and sorted by name.

The position of directory displays on the screen is given in OS units and, the display type given with one or more of the following parameters:

- –li, large icons
- –si, small icons
- –fi, full information
- –sn, sort by name

- –st, sort by type
- –ss, sort by size
- –sd, sort by date.

Filer_Boot Resources:$.Apps.!Alarm

This line defines a file stored in a directory. It causes the file's location and sprite to be stored in memory so that when the sprite is looked at again, this information does not have to be read in again.

You can hand edit the desktop boot file to add Filer_Boot lines. Adding lines for files in frequently-used directories will speed up opening these directories (the first time) but will make starting up or resetting the computer take longer.

Run resources:$.Apps.!Edit

This runs the Edit application so that its icon appears on the icon bar.

You can hand edit the desktop boot file to run any applications in this way.

Set Edit$Options F13 B1 W8 H12 NTrinity.Medium

This sets up some configuration options for the Edit application. These options are saved automatically when you save your desktop boot file.

You can also add configuration options to the file. Details of configuration options for each of the applications in the application suite can be found in the *Applications Guide*.

It is possible to have configuration options for applications that are not loaded immediately. These configuration options are kept in memory and used when the relevant application is loaded.

Editing the desktop boot file

It is fairly easy to edit your desktop boot file so that it performs exactly the actions you require.

To view the desktop boot file, start !Edit and then drag the desktop boot icon onto the Edit application.

Most of the applications in the application suite have a set of parameters that tell the application how to behave. These parameters can be saved using the Desktop boot option and then edited using the Edit application.

For example, if you use Edit and perform a desktop save, the following lines could appear within the desktop boot file:

```
Set Edit$Options F8 D NCorpus.Medium
Run resources:$.Apps.!Edit
```

The line beginning `Set...` tells Edit to display the text colour in dark blue, leaving the background white, switches word wrap on, and sets the font to Corpus.Medium.

The line beginning `Run...` starts the application. So if you were to delete the Run... line, Edit would not start but its option parameters would be read in and stored. Now, when you double-click on Edit, it will automatically start with a blue Corpus.Medium text.

Occasionally you might want to edit out the Run... line so that the application is not started. This will leave the Set... line which contains the parameters you use with your application. Now, whenever you start your application, it will use the parameters that are in the appropriate Set... line. Editing your file in this way will let you set up parameters for your applications without actually starting them.

Most applications have these option parameters and they can all be saved in your desktop boot file.

You should be careful when experimenting with desktop boot files. It is very easy accidentally to save a desktop boot file and in doing so wipe out your current desktop boot file. Take a copy of your current desktop boot file before you start experimenting, or save the resultant desktop boot files with a name other than !Boot. You can then use Edit to copy the relevant parts of the files into a new !Boot file.

Any edit file can be made a desktop boot file simply by giving it the file type Desktop (Use the Set type option in the File menu), naming it !Boot and placing it in the root directory.

Adding other parameters to the Boot file

You can add many other types of commands to your Boot file; however most of these commands apply only to the command line interface. However to show you what is possible you may want to add the following line to your boot file.

```
SetMacro CLI$Prompt <Sys$Time> *
```

This sets the command line prompt to display the time. Add it to the bottom of the boot file, restart the computer, press F12 and have a look.

For more information about how to make boot files containing parameters that affect command line operations, read the chapter entitled *Notes for command line users* on page 133.

Overriding the CMOS RAM settings

When you run a !Boot file that has been created by the Desktop boot menu option, it can override some CMOS RAM settings that are set by the !Configure application. This can cause confusion. The following settings are affected:

- Font cache size
- Sprite cache size
- RAM disc size
- Desktop screen mode
- Auto starting of applications.

Starting up

The !Boot file is executed after the desktop has been started. However, it is possible to use the desktop at the same time as the applications defined in your !Boot file are being loaded, so don't be surprised if you see your applications appear on the icon bar shortly after switching on.

8 Colours and screen modes

The **Palette** allows you to set up the colours used by the desktop, and the screen modes used to display the desktop.

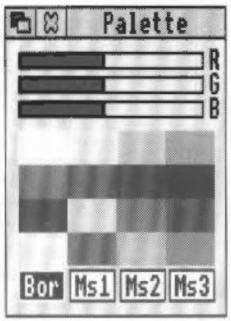
The **Palette icon** is located on the right of the icon bar.

It is used for

- setting the palette (the colours used on the desktop)
- inverting the screen grey scales
- changing to a different screen mode
- saving the current palette
- setting the desktop to its default values.

Setting desktop colours

The palette defines the set of 16 colours that will be used by the desktop, and the colours of the pointer and the screen border. Each colour is defined in terms of the intensity of the red, green and blue colour "guns" in your monitor. For example, setting all three guns to zero intensity produces black, and all three fully on produces white.



To see the current setting, click on the palette icon. The palette window then appears. The 16 desktop colours are shown in the middle section of the window. You can check the precise setting of a colour by clicking on it. The logical number associated with the colour is displayed, and the sliders at the top of the window

show the red, green and blue intensities. To change a setting, position the pointer within one of the sliders, and drag it to the level you want. The colours on the whole screen reflect the changes as you make them.

You can use the palette to change the border and pointer colours, by clicking on one of the boxes at the bottom of the window and adjusting the sliders as above. The boxes are:

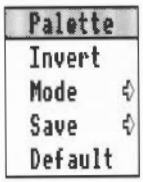
- **Bor** to set the screen border colour
- **Ms1** to set the pointer's outer colour
- **Ms2** to set the pointer's inner colour
- **Ms3** to set the alternative pointer colour (used for certain special pointers).

If you change the colour balance of colours 0 (white) or 7 (black), the grey tones 1-6 are changed to match when you release Select. However, if you then restore colour 0 or colour 7 by dragging the sliders back to their original positions, you will find that the grey tones are not identical to the ones you started with, and in particular, the main desktop background colour no longer matches the border. To restore the original palette, choose **Default palette** on the palette's icon bar menu.

When you have finished changing the palette, click on the Close icon in the palette window. If you want to save the changes permanently, see *Saving the palette options* overleaf.

Other Palette functions

Click Menu over the Palette icon to display the menu.



Inverting the grey scale

The first 8 colours of the palette (colours 0 to 7) are normally used to provide a scale of grey shades running from white to black. You can invert them by clicking on **Invert**. Inverting the colours causes light shades to become dark, and vice-versa, so white is changed to black, light grey to dark grey, and so on.

Changing the screen mode

Change the screen mode by displaying the **Mode** submenu and clicking on the mode you wish to use. If the mode number is not displayed, move to the bottom of the menu, type in the mode number and then press Return.

Screen modes and monitor types are dealt with in detail in the next section.

Saving the palette options

If you change the desktop colours, you may wish to save them for later use. To do this, move to the **Save** submenu. You can then save the file by dragging the icon to a directory display.

To restore the palette from a file, either double-click on a palette file, or drag the file onto the palette icon on the icon bar. Palette files are indicated by a palette icon in the directory display.

The current palette is also saved when you create a desktop boot file, as described in the chapter entitled *Desktop boot files* on page 109.

Setting the palette to its default values

A default palette is built into the computer. To set the current palette to this default, click on **Default**.

Changing screen modes

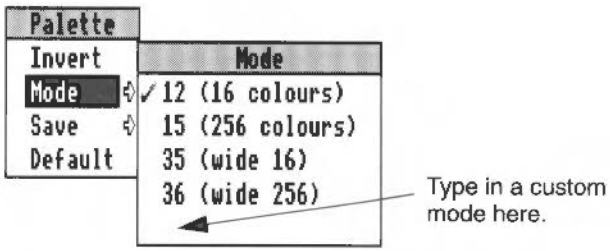
RISC OS can display its desktop in different **modes.** Modes change the size of the desktop display and the number of colours the desktop can display. For example, mode 12 can display 16 colours simultaneously and mode 15 displays 256 colours. Mode 16 can display more information on the screen than mode 12, but the text size is smaller.

You can change the screen mode by clicking Menu on the **Palette icon**, and moving to the **Mode** submenu. A list of standard modes is displayed. Either choose one by clicking on the menu item, or move the pointer to the bottom menu item, type in the number of the mode you want and then press Return.

A full list of screen modes with full information about their individual characteristics is contained in the appendix entitled *Screen modes* on page 219.

You must check your *Welcome Guide* to see which monitor types and screen modes are valid for your computer hardware.

This is the Mode menu you get if you are using a standard monitor (normal). If you are using a different monitor type, such as VGA or Multiscan you will see a slightly different Mode menu.



Mode versus performance trade-offs

For each monitor mode, there is a compromise between the graphics resolution, the number of colours, the display refresh speed, speed of processing and memory usage. Generally, the greater the graphics resolution or number of colours, the slower the screen displays and more memory is used.

The modes with larger graphics resolution generally give better quality graphic displays, while modes with greater OS (operating system units) resolution allow you to fit more on the screen.

In general, the higher the resolution chosen, the slower the overall performance of the computer.

Suggested screen modes

The modes available depend on the configured monitor type and the model of computer.

A 16-colour mode is most commonly used for 'everyday' use. Depending on your monitor type you may use different default settings.

For standard colour or monochrome monitors

Mode 12 is most commonly used. Mode 35 may provide a useful alternative, as it uses more of the monitor's border. Some users may find that it loses some pixels at the edges of the screen, so it may not be suitable.

Mode 15 has the some characteristics as mode 12, but displays 256 colours.

Mode 16 provides more pixels horizontally than mode 12 so that 130 columns of text can be displayed in the window. However, you may find it harder to read than mode 12.

Multi-frequency (multiscan) monitors

In addition to modes 12, 15, 16 and 35, these monitors can also use mode 20 and mode 27. Some users find that mode 27 may flicker less, as it has a higher refresh rate. Mode 39 (mode 40 for 256 colours) allows more information to be displayed on the screen and mode 31 may also be used on some monitors.

VGA and Super VGA monitors

Mode 27 is most commonly used on VGA monitors. For Super VGA monitors, mode 31 is most commonly used.

Mode 28 has the some characteristics as mode 27, but displays 256 colours.

Other considerations

If you need more memory or more processor power, than you can change temporarily to a mode with fewer colours or a smaller picture. For instance, when printing graphics, a move to mode 0 (or mode 25 for a VGA monitor) can release memory, so making printing faster.

If you use a VGA or multi-frequency monitor in the higher resolution screen modes, your computer's performance may suffer unless you change the settings in the **Fonts** window of the **Configure** application. Anti-aliasing should be set to at least 24 points high, and cached bitmaps on screen set to at least 48 points high. It may also be worth increasing the size of your font cache.

9 System applications

Your applications discs contain the system applications !System, !Scrap and !Fonts. !System and !Scrap are essential to allow applications to run on your computer. !Fonts is used to store any additional fonts you may buy.

If you were supplied with a single Applications disc you will find these applications in the root directory. If you were supplied with two applications discs you will find these applications on App1.

!System

!System is used as a standard location in which to keep system modules issued to replace or to supplement existing parts of the operating system.

When you buy additional applications for your computer you may find that additional modules are supplied. The documentation supplied with the application will tell you how to combine them with any modules you already have.

Modules kept in !System are loaded as required by applications; you will not need to take any special action.

Where to keep your !System

Hard disc users should always store !System in the root directory ($), so that !System is seen by the operating system as soon as the hard disc is accessed.

Floppy disc users should keep !System on a special floppy disc that should be inserted and clicked on whenever you restart the computer. This disc can also contain other system files such as boot files and fonts. Floppy disc users should not dismount this disc as the computer needs to remember its name and contents.

Network users who are booting their computers from a network or running applications stored on a file server can store !System on the file server. See your network manager for details.

!Scrap

!Scrap gives the computer somewhere to store temporary files. Applications often use temporary files during copying and saving; these files are erased when they are no longer needed.

Where to keep !Scrap

Hard disc users should always store !Scrap in the root directory ($), so that !Scrap is seen by the operating system as soon as the hard disc is accessed.

Floppy disc users should keep a copy of !Scrap on every floppy disc that contains an application. This may seem wasteful of disc space, but Scrap only takes up minimal space when not in use. Also keeping !Scrap on every disc will eliminate the need for frequent disc changes as long as you are using the !Scrap on the current floppy disc; always double-click on the new !Scrap after you change discs.

Network users who are booting their computers from a network or running applications stored on a file server can use a !Scrap stored on the file server. See your Network Manager for details.

!Fonts

RISC OS contains a range of fonts stored permanently inside the computer. In addition to these some additional fonts are also held on disc in the !Fonts application.

Fonts are used not only for screen displays but also by all printers, except for PostScript printers such as the Apple LaserWriter which have their own built-in fonts. The fonts are controlled by a part of the operating system called the Font manager.

Acorn's Font manager uses outline fonts, where only the outline of each character is stored. When you request a font, the computer loads the outline font, scales it to the size you want, and fills in the outline.

If you want to know more about outline fonts and how they are used, read the appendix entitled *Fonts and the Font manager* on page 241.

To display a list of available fonts, open a !Edit document. Press Menu, move the pointer to the **Display** submenu, and from there to the **Fonts** submenu. This will show a list of available fonts.

Where to place !Fonts

Hard disc users should always store !Fonts in the root directory ($), so that !Fonts is seen by the operating system as soon as the hard disc is accessed.

If you do not have a hard disc drive, you should copy !Fonts to a special floppy disc and use this disc to hold all your fonts.

Adding fonts

If you want to add more fonts to your system you can purchase font-packs from your supplier. Additional fonts are placed within the !Fonts application that was supplied on your Applications discs.

For more information about adding fonts, see the section entitled *Using fonts* on page 55.

Upgrading your old !Fonts application

If you have been using an 'old' !Fonts supplied with an earlier version of RISC OS you must upgrade your application by copying the font directories from the old !Fonts into the new !Fonts.

Because RISC OS now contains the Corpus, Homerton and Trinity fonts in ROM, these fonts should **not** be transferred across to the new !Fonts. Additionally, if you already have the Selwyn and Portrhouse disc-based fonts, do **not** transfer these across to the new !Fonts, as the latest versions of Selwyn and Portrhouse are already included.

To move font directories to the new !Fonts, follow these steps:

1. Open the application directories for both the old and the new !Fonts by holding down shift and double-clicking on the Fonts icon.

   In the old !Fonts you will see various directories. You must only copy the directories that contain the fonts. Do not copy anything else.

   Remember, do not copy the Corpus, Homerton, Trinity, Selwyn or Portrhouse font directories.
2. Copy the remaining font directories into the new !Fonts application.
3. Close the !Fonts applications and then double-click on the !Fonts icon. The disc fonts will now be available.

   You should also stop using the old !Fonts.

Hints and tips

RISC OS 3 can support a number of different Fonts directories being used simultaneously. This makes adding new fonts to the system very easy – whenever directories of fonts are seen, they can be accessed.

If your fonts directory contains fonts that duplicate those in the ROM, the ones on disc are used in preference (in case they are newer or better in some way).

The applications Draw, Edit and Chars refresh their font menus instantly when the list of fonts available changes – there is no longer a need to quit and restart those applications.

If you accidentally use a pre-RISC OS 3 type !Fonts, you will no longer be able to use any of the ROM fonts. The only way to cure this problem is to reboot the computer.

!Fonts Sidney encoding

The !Fonts application has within it a Sidney directory that contains a Sidney encoding but does not contain any font information. The encoding allows files that contain Sidney symbols to be printed on a PostScript printer. However, these symbols will not be visible on screen.

If you have a copy of the full Sidney font you should copy the contents of the Sidney font directory into the Sidney directory containing the encoding. Do not delete the encoding file.

Part 3:
Outside the desktop

10 Accessing the command line *

Most of you will use the RISC OS desktop for almost all of your computing tasks. However occasionally you may venture into the world of 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).

One of the main reasons for using the command line is to write scripts. Scripts are small programs that help you control the computer. The command line is also used to issue operating system commands from BASIC.

Accessing the command line

There are four different ways of accessing the command line. Two of these do so within the desktop itself; one suspends the desktop temporarily and one quits the desktop entirely. Additionally you can set up your computer so that it never starts the desktop.

The command line is accessed from the Task manager icon bar menu. To illustrate this we will use the simple * Command, *Cat. *Cat just displays a list of the files in the current directory.

The option **New Task** gives you a small box into which you can write a single * Command. Choose **New Task**. Type in the command *Cat, then press Return. The result will be displayed in a window on the desktop.

A more useful window into the command line is given by the **Task window** option. This displays an Edit-like window into which you can type commands. At the top of the window is a * (the command line prompt) and the caret. Choose Task Window and type *Cat again. The Task window behaves just like any other desktop window. Its menu options are explained in the section entitled *Using the Task window* on page 128.

To halt the desktop temporarily and replace it with the command line interface, click on ***Commands** (or press F12). A line will appear at the bottom of the screen, containing a * (the command line prompt) and a flashing line (the cursor). The lower part of the screen will display a list of the files in your current directory, with the * prompt at the foot of the screen again. Now press Return again: the desktop will reappear, looking just as it did when you saw it last.

To leave the desktop more 'permanently', choose the **Exit** option. If you have any work on the desktop that you have not saved, you will be asked if you want to save it first. The screen then goes blank and a * prompt will appear. To start the desktop again, type `desktop` at the * prompt.

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 referred to as 'Supervisor' on all screen displays.

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 by a star so that the computer knows how to interpret what follows.

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 (using capital letters):

```
FOR N=1 TO 20: PRINT "HELLO": NEXT N
```

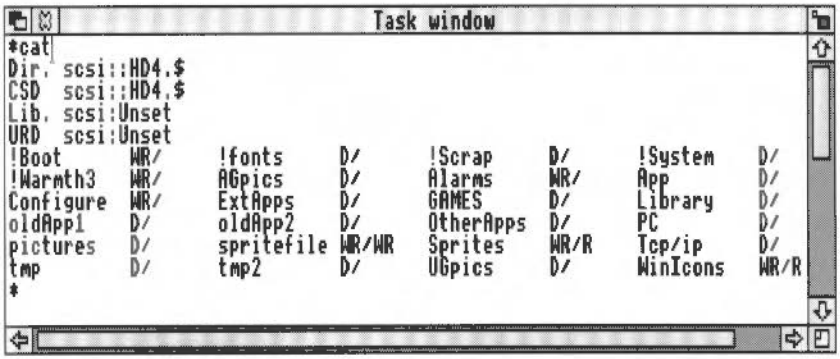
This will cause the word `HELLO` to be printed twenty times. Leave BASIC by typing `QUIT` or *Quit.

For more information on using BASIC, turn to the appendix on BBC BASIC on page 235.

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 that:

- 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.

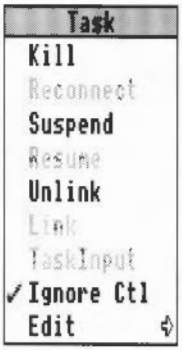
  You can change this by **unlinking** the window: in this case, anything you type in alters the contents of the window in the same way as any other Edit window, even while a task is running. Keyboard shortcuts only operate if the window is unlinked.

You can also supply input to a task window by selecting some text from another text file and choosing **TaskInput** from the task window menu.

You cannot use graphics in a task window. The output of any commands that use graphics will appear as screen control codes in the task window.

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 to the task 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 Ctrl, 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 shortcut features, **Unlink** the window first.

Some guidelines and suggestions for using Task windows

To use a Task window, you will need to be familiar with command line mode. There are some commands which you will find are more useful in a Task window than they are directly from the command line. However you will also find that nearly all of the commands that affect the configuration of the desktop can also be performed using the desktop application **Configure** and the Task manager **Task display**.

Here are a few commands to whet your appetite:

- `*wimpslot` *min* [*max*] can be used to adjust the amount of memory available to the task, which will otherwise start up using the **Next** space allocation. You can examine this using the Task manager window. *min* and *max* indicate how much memory the task is allowed to have. If you want to remove all the memory allocated to a task without closing its window or destroying the task, use the command `*Wimpslot 0 0`.
- `*Filer_opendir` *path* opens a new directory display for the directory with the given path. The path must start with a filing system name, but need not be a full pathname. For example, `adfs:@` will open a display for the current directory.

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. You should note that some time-consuming commands, for example, a `*Copy` of a large file, may prevent access to the filing system that they use until the command is complete.

Note that command line notions such as 'current directory' become relevant when you are using Task Windows.

All of theses commands are described in detail in the chapter entitled *Star command summaries* on page 161.

The command line help system

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.

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.

11 Notes for command line users

Command line users will find many hint and tips in the following sections. The chapter is split up into 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**, 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:

italics	indicate that an actual value must be substituted. For example, *filename* means that an actual filename must be supplied.
[...]	indicate that the item enclosed in the square brackets is optional.
|	indicates alternatives. For example, 0 | 1 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. Ordinary English is not so very different: in the sentence 'Give a dog a bone' the word *give* is like the

command, and a *dog* and a *bone* are the parameters. And because it doesn't make much sense just to say 'Give' – you have to say what to give, and who to give it to – these 'parameters' are not optional.

In the following descriptions, the parameters are in italics. So the English example would be described like this:

give *someone something*

but you would type, for example,

```
give a dog a bone
```

or

```
give everyone a pay rise
```

However, whereas in English you can substitute several words separated by spaces for a single parameter, in RISC OS 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 to 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. 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. (The section entitled *System variables* on page 137 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 it can be later examined in more detail or further processed.

The format of a redirection is:

`command { redirection spec }`

where the `redirection spec` is at least one of:

`> filename`	Output goes to `filename`.
`< filename`	Input read from `filename`.
`>> filename`	Output is appended to `filename`.

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 { > AllHelp }
```

This sends all the help information on the * command Cat, (elicited by the command `*Help Cat`) to a file called `AllHelp`.

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 the following:

System devices suitable for input

`kbd:`	the keyboard, reading a line at a time (this allows editing using Delete, Ctrl-U, and other keys)
`rawkbd:`	the keyboard, reading a character at a time
`serial:`	the serial port
`parallel:`	the parallel port
`null:`	the 'null device', which effectively gives no input

System devices suitable for output

`vdu:`	the screen, using GSRead format (see page 150)
`rawvdu:`	the screen, via the VDU drivers
`serial:`	the serial port
`parallel:`	the parallel port
`printer:`	the currently configured printer
`netprint:`	the currently configured network printer

`null:` the 'null device', which swallows all output

These system devices can be useful with commands such as *Copy, and the redirection operators (> and <):

`*Copy myfile printer:`	Send `myfile` to the printer
`*Cat { > printer: }`	List the files in the current directory to the printer
`*Cat netprint:`	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:`

System variables

Introducing variables

The section entitled *Saving and loading configurations* on page 86 describes how Configure stores the settings used at start-up time in the computer's RAM. As well as these, there are other settings that RISC OS needs, such as how you like the time and date to be printed, how you want the *Copy command to work, and what prompt you like. These are stored in system variables.

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. 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 the relevant chapter in the *Applications Guide*. 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 the chapter entitled *Desktop boot files* on page 109. 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. Even if you wish to edit the boot file created by the Task manager, that 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.

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 bound 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 '-' (eg `M+` or `S-`).
- Other options should consist of a single character, followed by a number (eg `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 that 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.

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 Copy at the command line.

System path variables

File$Path and Run$Path

These variables control where files are searched for during, respectively, 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. For details of the format used by this variable, see page 141.

!System and !Scrap

System$Dir and System$Path

These variables give the full pathname of the System application. They have the same value, save that System$Path has a trailing '.', whereas System$Dir does not. You must not change their values.

(There are two versions of this pathname for compatibility with some old applications).

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 chapter entitled *Star command summaries* on page 161.

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 *name* 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$WorkDir adfs::HardDisc.$.Applics.dtp.WorkDir
```

Setting the date and time format

The date and time format can be set by altering the system variable Sys$DateFormat. The text of this variable is printed as set, except when a % appears. In this case, the next one or two characters are treated as a special field name which is replaced by a component of the current time. The field names, which may use upper or lower case, are:

Name	Value	Example
CS	Centi-seconds	99
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' indicator	pm
WE	Weekday, in full	Thursday
W3	Weekday, short	Thu
WN	Weekday, as a number	5
DY	Day of the month	01
ST	Ordinal pre/suffix	st nd rd th
MO	Month name, in full	September
M3	Month name, short	Sep
MN	Month as a number	09
CE	Century	19
YR	Year within century	87
WK	Week of the year	52
DN	Day of the year	364
TZ	Timezone	BST
0	Insert an ASCII 0 zero byte	
%	Insert a %	

To cause leading zeros to be omitted, prefix the field with the letter Z. For example, `%zmn` means the month number without leading zeros. %0 may be used to split the output into several zero-terminated strings.

Changing Sys$DateFormat affects the output of some commands, such as *Info and *Ex, but does not affect the *Time command.

Example 1: changing the time and date format

Begin by typing

```
*Info ThisFile
```

where `ThisFile` is a file in your current directory. The information displayed includes the time when the file was last altered.

```
ThisFile   WR/r  Obey  18:53:39 26-Oct-1988  848  bytes
```

Change the date format, and get the information again, showing the time in the new format:

```
*Set Sys$DateFormat %we %zdy%st %mo %ce%yr (%z12:%mi %am)
*Info ThisFile
ThisFile WR/r Obey Wednesday 26th October 1988 (6:53
pm)   848  bytes
```

Example 2: creating your own command line prompt

You can also 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 programmers 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 the section entitled *Inside the desktop boot file* on page 111.

- 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 148.

Additionally there are the TaskExec and TaskObey file types. These are very similar to Command and Obey files. Their main advantage is that they multitask 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; see `*Configure Lib` in the section entitled *Configuration commands* on page 155.

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.

To do this, your file must be called `!Boot`, or `!ArmBoot` on the network (this is to distinguish a boot file for a machine running RISC OS from an existing `!Boot` file already on the network for the use of BBC computers).

In the first two cases you will need to use the `*Opt` command as well; see the section entitled *Filing system commands* on page 153.

For an example of the last case, you can look in any of the application directories in the Applications Suite. To do this on the desktop, hold down Shift as you double-click on the application directory, otherwise the application will run.

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> Desired-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-needed-in-file
```

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 I = 1 TO 10
  PRINT "Hello"
NEXT I
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, and so 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 GSTrans format (see the section entitled *Using* CS *formats in scripts* on page 150). These are not interpreted until the echo command is run, and are only interpreted then because `echo` expects GSTrans 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 GSTrans 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` – taking its name from the UNIX 'more' command – 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 GSTrans format (see the section entitled *Using GS formats in scripts* overleaf). 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 GSTrans 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.

Conventions

The GSRead or GSTrans 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	|*letter* eg	|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	|!*coded-symbol* eg	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 "".

12 Types of star command

This chapter gives a short summary of each of the types of *Commands and then gives a list of *Commands in each grouping. Once you have found the *Command of interest you can look up a summary of its function and its syntax in the next chapter.

For full information about the star commands in this and the next chapter, refer to the RISC OS *Programmer's Reference Manual*.

Filing system commands

Before you use these commands you should have read the chapters on filing systems. Those chapters introduce the filing systems and describe how they work, and also explain the terminology used in this chapter.

In many commands, reference is made to the current directory; many parameters, if omitted, will default to this directory. You can determine at any time which the current directory is by typing *Cat and then pressing Return; this displays a catalogue of the current directory. It is important to realise that opening or closing a directory display in the desktop does not change the current directory. Use the command *Dir to change directory within the command line.

General filing system commands

The commands in this section are relevant to the operation of all filing systems.

*Access
*Append
*Build
*Cat
*CDir
*Close
*Copy
*Count
*Create
*Delete
*Dir
*Dump
*EnumDir
*Ex
*Exec
*FileInfo
*Info
*LCat
*LEx
*Lib
*List
*Load
*Opt 1
*Opt 4
*PipeCopy
*Print
*Rename
*Remove
*Run
*Save
*SetType
*Shut
*ShutDown
*Spool
*SpoolOn
*Stamp
*Type
*Up
*Wipe

Filing system-specific commands

The commands below are specific to particular filing systems, and you can only use them when the relevant filing system is selected as the current filing system.

Disc-specific commands

The Advanced Disc Filing System (ADFS) is the default filing system, and is supplied with every system. However most of these commands also apply to other disc filing systems such as the SCSI Filing System (SCSI) and the Compact Disc Filing System (CDFS). ADFS controls the local disc storage media (floppy disc, and hard disc if fitted). This version of ADFS is compatible with previous versions of Acorn ADFS.

*ADFS	*Defect	*Mount
*Back	*Dismount	*NameDisc
*Backup	*DOSMap	*NoDir
*Bye	*Drive	*NoLib
*CheckMap	*Format	*NoURD
*Compact	*Free	*URD
*CopyBoot	*Map	*Verify

Network-specific commands

The Network Filing System is for use with a local area network, such as Econet. For general information on NetFS, see the chapter entitled *Discs, networks and filing systems* on page 31.

*Net	*I am	*Pass
*AddFS	*ListFS	*PS
*Bye	*ListPS	*SDisc
*Free	*Logon	*SetPS
*FS	*Mount	

Other filing system-specific commands

The Advanced Disc Filing System (ADFS) and, for network users, the Network Filing System (NetFS) are the most commonly used, but more specialised filing systems – such as the RAM filing system (RAMFS) and the desktop filing system (ResourceFS) – have commands to select them, which are listed below. Some of these filing systems may not be present on your computer.

*Ram	*SCSI	*CDFS
*ResourceFS		

Configuration commands

These commands are used to configure, or set up, the computer. The main command used is the *Configure command, which has many possible parameters, one for each of the CMOS RAM options you can set with it. CMOS RAM contains values of settings used at startup time; these values are not lost when mains power is switched off, since CMOS RAM is supported by batteries: the memory is therefore known as 'non-volatile'.

The Configure application, !Configure, can control most of these features, such as mouse speed, keyboard auto-repeat, sound volume, printer type, the keyboard Caps Lock, and the type of window dragging. The !Configure application is described on page 85.

Changes set with *Configure are recorded immediately, but take effect only after power on or a hard reset.

The Configure application also provides a facility for saving configurations as files. Such files will incorporate settings only for those features that can be set with the !Configure application, not for those that have to be set in the command line.

The *Status command displays a list of the current options and their currently assigned values, the entire collection of settings being known as the configuration status of the machine.

User preferences

This group of configuration commands allows you to customise the operation of your computer to suit your personal working style.

*Configure Boot
*Configure Caps
*Configure Delay
*Configure Dir
*Configure DumpFormat
*Configure FileSystem
*Configure Language
*Configure Lib
*Configure Loud
*Configure Mode
*Configure NoBoot
*Configure NoCaps
*Configure NoDir
*Configure NoScroll
*Configure Quiet
*Configure Repeat
*Configure Scroll
*Configure ShCaps
*Configure SoundDefault
*Configure Truncate

Desktop preferences

This group of configuration commands allows you to set up your desktop configuration to suit your own way of working. These commands are usually set using the !Configure application.

*Configure MouseStep
*Configure WimpAutoMenuDelay
*Configure WimpDoubleClickDelay
*Configure WimpDoubleClickMove
*Configure WimpDragDelay
*Configure WimpDragMove
*Configure WimpFlags
*Configure WimpMenuDragDelay
*Configure WimpMode

Hardware configuration

This group of configuration commands allows you to set up your computer to suit its hardware specification and the range of peripherals such as printers that are connected to it.

*Configure Baud
*Configure BST
*Configure Cache
*Configure Country
*Configure Data
*Configure Drive
*Configure DST
*Configure Floppies
*Configure FS
*Configure GMT
*Configure HardDiscs
*Configure IDEDiscs
*Configure Ignore
*Configure MonitorType
*Configure NoDST
*Configure Print
*Configure PS
*Configure Step
*Configure Sync
*Configure Territory
*Configure TimeZone
*Configure TV

Memory allocation

This group of configuration commands allows you to optimise the use of memory. The default memory allocations take into account the model number of your Acorn computer (and hence the overall size of memory), so these values should not be changed for general use.

For many of these commands you can specify the amount of memory to reserve either in kilobytes or in pages of memory. It is preferable to use kilobytes, as the page size could change on future versions of the hardware. For reference, the current page sizes are:

1Mbyte machines:	8Kbytes
2Mbyte machines:	16Kbytes
4Mbyte machines:	32Kbytes
>4Mbyte machines	32Kbytes

You can see how memory is allocated and make temporary changes by using the Task manager from the desktop.

*Configure ADFSbuffers
*Configure ADFSDirCache
*Configure FontSize
*Configure FontMax
*Configure FontMax1
*Configure FontMax2
*Configure FontMax3
*Configure FontMax4
*Configure FontMax5
*Configure PrinterBufferSize
*Configure RAMFsSize
*Configure RMASize
*Configure ScreenSize
*Configure SpriteSize
*Configure SystemSize

System variables

The chapter entitled *Notes for command line users* on page 133 describes how RISC OS stores settings used at start-up time in the computer's RAM.

These are the commands used for system variables:

*Show
*Set
*SetEval
*SetMacro
*Unset

Module-related commands

A relocatable module is a piece of software which, when loaded into the machine, behaves like a normal application program or as an extension to the operating system. Modules can contain programming languages or filing systems; they can be used to add new * commands.

Relocatable modules run in an area of memory known as the Relocatable Module Area (RMA) which is maintained by the system. They are 'relocatable' because they can be loaded at any particular location in memory.

RISC OS provides facilities for integrating modules in such a way that, to the user, they appear to be a full part of the system. For instance, the operating system responds to the *Help command, extracting automatically any relevant help text.

Several * commands are provided by the operating system for handling modules, including one for loading a module file from the filing system, and these are described in detail in the next chapter.

*Modules
*RMClear
*RMEnsure
*RMFaster
*RMInsert
*RMKill
*RMLoad
*RMReInit
*RMRun
*RMTidy
*ROMModules
*Unplug

Sound system commands

RISC OS contains a sound synthesizer which allows up to eight 'instruments' to be played at once, with mono or stereo sound production for each instrument. The sound system can be controlled with great subtlety, the details of which are outside the scope of this guide. Individual sound commands are listed below; for further information, refer to the chapter on Sound in the RISC OS *Programmer's Reference Manual*.

The Maestro program is included on the Applications disc; it enables you to compose and replay music.

*Audio
*ChannelVoice
*QSound
*Sound
*Speaker
*Stereo
*Tempo
*Tuning
*Voices
*Volume

FX commands

*FX commands access the operating system OS_Byte routines and require from one to three parameters. Like many of the operating system commands, many *FX actions can be carried out from the desktop. For example, the printer ignore character can be set using the Configure application. In addition, there is little error handling built in to *FX commands, and invalid values are not rejected and may have unpredictable results. Most *FX commands have now been replaced by better RISC OS operations; *FX commands have been retained for reasons of backwards compatibility.

For further information, refer to the RISC OS *Programmer's Reference Manual*.

Debugger commands

These commands are for use when debugging applications:

*BreakClr
*BreakList
*BreakSet
*Continue
*Debug
*InitStore
*Memory
*MemoryA
*MemoryI
*ShowRegs

Desktop commands

These commands are related to the desktop, filer and wimp behaviour:

*AddTinyDir
*Backdrop
*Desktop
*Desktop_...
*Desktop_SetPalette
*Filer_Action
*Filer_Boot
*Filer_CloseDir
*Filer_OpenDir
*Filer_Run
*Filters
*IconSprites
*Pin
*Pinboard
*Pointer
*RemoveTinyDir
*ShellCLI
*ShellCLI_Task
*ShellCLI_TaskQuit
*ShowFree
*TaskWindow
*ToolSprites
*WimpMode
*WimpPalette
*WimpSlot
*WimpTask
*WimpWriteDir

Sprite commands

These commands are used to control sprites:

*SChoose
*ScreenLoad
*ScreenSave
*SCopy
*SDelete
*SDisc
*SFlipX
*SFlipY
*SGet
*SInfo
*SList
*SLoad
*SMerge
*SNew
*SRename
*SSave

Font commands

These commands are used to control fonts and font usage:

*FontCat
*FontInstall
*FontLibrary
*FontList
*FontRemove
*LoadFontCache
*SaveFontCache

Miscellaneous star commands

These commands control the behaviour of the keyboard, VDU and printer ports, including customising the computer for international use. In addition, there are commands of interest to programmers and those who wish to prepare Obey files or startup scripts (for more information, see the chapter entitled *Notes for command line users* on page 133).

*Alphabet
*Alphabets
*BASIC
*BASIC64
*BlankTime
*Cache
*ChangeDynamicArea
*ColourTrans
*Country
*Countries
*Echo
*Error
*Eval
*Go
*Gos
*If
*Ignore
*Key
*Keyboard
*Obey
*Podules
*PoduleLoad
*PoduleSave
*Quit
*Shadow
*Territories
*Time
*TV

13 Star command summaries

This is an alphabetical list of every * Command available under RISC OS 3. 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. This is not intended as a complete explanation of the command, but as a quick reference for experienced users who may prefer to use the command line. All of these commands are explained in greater detail in the RISC OS *Programmer's Reference Manual*.

Command syntax

The syntax of each command in the following sections is described in a standard way. The symbols used in syntax descriptions are:

italics	indicate that an actual value must be substituted. For example, *filename* means that an actual filename must be supplied.
[...]	indicate that the item enclosed in the square brackets is optional.
|	indicates alternatives. For example, 0 | 1 means that the value 0 or 1 must be supplied.

The 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.

Attributes are:

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 NetFS)
R	Read permission for the public (on NetFS)

*Access *object_spec* [*attributes*]

*AddFS

*AddFS adds a remote file server's disc to the list of file servers' discs that are known to NetFS. If only the file server is specified, then all its discs will be removed from the list.

```
*AddFS file_server_number [disc_number [:]disc_name]
```

*AddTinyDir

*AddTinyDir adds a file, application or directory to the icon bar. If no pathname is given, it adds a blank directory icon to the icon bar.

```
*AddTinyDir [object]
```

*ADFS

*ADFS selects the Advanced Disc Filing System as the current filing system.

```
*ADFS
```

*Alphabet

*Alphabet selects an alphabet, setting it according to the country name or alphabet name. With no parameter, this command displays the currently selected alphabet.

```
*Alphabet [country_name|alphabet_name]
```

*Alphabets

*Alphabets lists all the alphabets currently supported.

```
*Alphabets
```

*Append

*Append opens an existing file so you can add more data to the end of the file. Pressing Escape finishes the input.

```
*Append filename
```

*Audio

*Audio turns the Sound system on or off.

```
*Audio On|Off
```

*Back

*Back swaps the current and previously selected directories on the current filing system.

```
*Back
```

*BackDrop

*BackDrop puts the first sprite in the given sprite file on the desktop background. If no filename is specified, the current backdrop's placing is altered.

```
*BackDrop [-Centre|-Scale|-Tile] [filename]
```

*Backup

*Backup copies the used part of one floppy disc to another; free space is not copied.

```
*Backup source_drive dest_drive [Q]
```

*BASIC

*BASIC starts the ARM BBC BASIC V interpreter. For full details of BBC BASIC, see the BBC BASIC *Reference Manual*, available from your Acorn supplier.

```
*BASIC [options]
```

*BASIC64

*BASIC64 starts the ARM BBC BASIC VI interpreter, supplied on disc with your RISC OS computer – provided its module has already been loaded, or is in the library. For full details of BBC BASIC, see the BBC BASIC *Reference Manual*, available from your Acorn supplier.

```
*BASIC64 [options]
```

*BlankTime

*BlankTime sets the time in seconds before the screen blanks. If, during this time, there is no activity (i.e. no keyboard or mouse input is received, and – with the W option – there is no writing to the screen) the screen then blanks.

The blank time is only retained until the next reset.

```
*BlankTime [W|O] [time]
```

*BreakClr

*BreakClr removes the breakpoint at the specified address or register value. If you give no parameter then you can remove all breakpoints.

```
*BreakClr [addr|reg]
```

*BreakList

*BreakList lists all the breakpoints that are currently set.

```
*BreakList
```

*BreakSet

*BreakSet sets a breakpoint at the specified address or register value.

```
*BreakSet addr|reg
```

*Build

*Build opens a new file and directs subsequent input to it. Pressing Escape finishes the input.

```
*Build filename
```

*Bye

*Bye ends a filing system session by closing all files and unsetting all directories and libraries.

Other actions are filing system dependent, and where relevant may include dismounting discs, parking the heads of hard discs, and logging off the current fileserver.

```
*Bye
```

```
*Bye [[:]file_server]                    (NetFS syntax)
```

*Cache

*Cache turns the cache on or off. With no parameter, it gives the cache's current state.

```
*Cache [On|Off]
```

*Cat

*Cat lists all the objects in a directory (by default the current directory).

```
*Cat [directory]
```

*CDir

*CDir creates a directory with the specified pathname. On NetFS, you can also give the size of the directory.

```
*CDir directory [size_in_entries]
```

*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
```

*ChangeDynamicArea

*ChangeDynamicArea changes the size of the font cache, system sprite area and/or RAM disc.

```
*ChangeDynamicArea [-FontSize n[K]] [-SpriteSize n[K]] [-RamFsSize n[K]]
```

*ChannelVoice

*ChannelVoice assigns a voice to a channel. By default, only the first of the eight voices will be available. To make others available, use the BASIC VOICES *n* command.

```
*ChannelVoice channel voice_number|voice_name
```

*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]
```

*Close

*Close closes all open files on the current filing system.

```
*Close
```

*ColourTrans...

*ColourTrans... commands are for internal use only, and you should not use them.

*Compact

*Compact collects together free space on a disc by moving files.

```
*Compact [disc_spec]
```

*Configure

*Configure sets the value of a configuration option in the CMOS RAM. If no parameters are specified, the available configuration options are listed.

```
*Configure [option [value]]
```

*Configure ADFSbuffers

*Configure ADFSbuffers sets the configured number of 1 Kbyte file buffers reserved for ADFS in order to speed up operations on open files. A value of 1 sets a default value appropriate to the computer's RAM size; a value of 0 disables fast buffering on open files.

```
*Configure ADFSbuffers n
```

*Configure ADFSDirCache

*Configure ADFSDirCache sets the configured amount of memory reserved for the directory cache. A value of 0 sets a default value appropriate to the computer's RAM size.

```
*Configure ADFSDirCache size[K]
```

*Configure Baud

*Configure Baud sets the configured baud rate for the serial port.

```
*Configure Baud n
```

*Configure Boot

*Configure Boot sets the configured boot action so that a power on, reset or Ctrl Break runs a boot file.

```
*Configure Boot
```

*Configure BST

*Configure BST (short for British Summer Time) is identical to the command *Configure DST, and is provided only on machines configured for the UK territory.

```
*Configure BST
```

*Configure Cache

*Configure Cache sets the configured cache state to be on or off.

```
*Configure Cache On|Off
```

*Configure Caps

*Configure Caps sets the configured value for Caps Lock to ON.

```
*Configure Caps
```

*Configure Country

*Configure Country sets the configured alphabet and keyboard layout.

```
*Configure Country country_name
```

*Configure Data

*Configure Data sets the configured data word format for the serial port.

```
*Configure Data n
```

*Configure Delay

*Configure Delay sets the configured delay before keys start to auto-repeat.

```
*Configure Delay n
```

*Configure Dir

*Configure Dir sets the configured disc mounting so that discs are mounted at power on.

```
*Configure Dir
```

*Configure Drive

*Configure Drive sets the configured number of the drive that is selected at power on.

```
*Configure Drive n
```

*Configure DST

*Configure DST sets the configured value for daylight saving time to ON.

The time zone is set when you configure your computer's territory, rather than by this command.

```
*Configure DST
```

*Configure DumpFormat

*Configure DumpFormat sets the configured format used by the *Dump, *List and *Type commands.

```
*Configure DumpFormat 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 FontMax

*Configure FontMax sets the configured maximum size of the font cache.

```
*Configure FontMax mK|n
```

*Configure FontMax1

*Configure FontMax1 sets the maximum height at which to scale from a bitmap font rather than from an outline font.

```
*Configure FontMax1 max_height
```

*Configure FontMax2

*Configure FontMax2 sets the maximum height at which to scale from outlines to anti-aliased bitmaps, rather than to 1 bit per pixel bitmaps.

```
*Configure FontMax2 max_height
```

*Configure FontMax3

*Configure FontMax3 sets the maximum height at which to retain bitmaps in the cache, rather than the outlines from which they were converted.

```
*Configure FontMax3 max_height
```

*Configure FontMax4

*Configure FontMax4 sets the maximum width at which to use horizontal subpixel anti-aliasing.

```
*Configure FontMax4 max_width
```

*Configure FontMax5

*Configure FontMax5 sets the maximum height at which to use vertical subpixel anti-aliasing.

```
*Configure FontMax5 max_height
```

*Configure FontSize

*Configure FontSize sets the configured amount of memory reserved for the font cache.

```
*Configure FontSize sizeK
```

*Configure FS

*Configure FS sets the configured default file server for NetFS.

```
*Configure FS file_server
```

*Configure GMT

*Configure GMT (short for Greenwich Mean Time) is identical to the command *Configure NoDST, and is provided only on machines configured for the UK territory.

```
*Configure GMT
```

*Configure HardDiscs

*Configure HardDiscs sets the configured number of ST506 hard disc drives recognised at power on. These disc drives are the standard ones fitted to early models of RISC OS computers (e.g. the Archimedes 400 series).

```
*Configure HardDiscs n
```

*Configure IDEDiscs

*Configure IDEDiscs sets the configured number of IDE hard disc drives recognised at power on. These disc drives are the standard ones fitted to more recent models of RISC OS computers (e.g. the A5000).

```
*Configure IDEDiscs n
```

*Configure Ignore

*Configure Ignore sets the configured printer ignore character.

```
*Configure Ignore [ASCII_code]
```

*Configure Language

*Configure Language sets the configured language used at power on.

```
*Configure Language module_no
```

*Configure Lib

*Configure Lib sets the configured library selected by NetFS after logon (0 for the default library, 1 for $.ArthurLib).

```
*Configure Lib [0 | 1]
```

*Configure Loud

*Configure Loud sets the configured volume for the beep to its loudest volume.

```
*Configure Loud
```

*Configure Mode

*Configure Mode sets the configured screen mode used by the machine. It is identical to the command *Configure WimpMode.

```
*Configure Mode screen_mode|Auto
```

*Configure MonitorType

*Configure MonitorType sets the configured monitor type.

```
*Configure MonitorType n|Auto
```

*Configure MouseStep

*Configure MouseStep sets the configured value for how fast the pointer moves as you move the mouse.

```
*Configure MouseStep n
```

*Configure NoBoot

*Configure NoBoot sets the configured boot action so that a Shift power on, Shift reset or Shift Break runs a boot file.

```
*Configure NoBoot
```

*Configure NoCaps

*Configure NoCaps sets the configured value for Caps Lock to OFF.

```
*Configure NoCaps
```

*Configure NoDir

*Configure NoDir sets the configured disc mounting so that discs are not mounted at power on.

```
*Configure NoDir
```

*Configure NoDST

*Configure NoDST sets the configured value for daylight saving time to OFF.

The time zone is set when you configure your computer's territory, rather than by this command.

```
*Configure NoDST
```

*Configure NoScroll

*Configure NoScroll sets the configured scrolling so the screen does not scroll upwards at the end of a line.

```
*Configure NoScroll
```

*Configure Print

*Configure Print sets the configured default destination for printed output.

```
*Configure Print n
```

*Configure PrinterBufferSize

*Configure PrinterBufferSize sets the configured amount of memory reserved for printer buffering.

```
*Configure PrinterBufferSize mK|n
```

*Configure PS

*Configure PS sets the configured default network printer server.

```
*Configure PS printer_server
```

*Configure Quiet

*Configure Quiet sets the configured volume for the beep to half its loudest volume.

```
*Configure Quiet
```

*Configure RamFSSize

*Configure RamFSSize sets the configured amount of memory reserved for the RAM Filing System to use.

```
*Configure RamFSSize mK|n
```

*Configure Repeat

*Configure Repeat sets the configured interval between the generation of auto-repeat keys.

```
*Configure Repeat n
```

*Configure RMASize

*Configure RMASize sets the configured extra area of memory reserved for relocatable modules

```
*Configure RMASize mK|n
```

*Configure ScreenSize

*Configure ScreenSize sets the configured amount of memory reserved for screen display.

```
*Configure ScreenSize mK|n
```

*Configure Scroll

*Configure Scroll sets the configured scrolling so the screen scrolls upwards at the end of a line.

```
*Configure Scroll
```

*Configure ShCaps

*Configure ShCaps sets the configured value for Caps Lock to ON, Shift producing lower case letters.

```
*Configure ShCaps
```

*Configure SoundDefault

*Configure SoundDefault sets the configured speaker setting, volume and voice.

```
*Configure SoundDefault speaker volume voice_number
```

*Configure SpriteSize

*Configure SpriteSize sets the configured amount of memory reserved for the system sprite area.

```
*Configure SpriteSize mK|n
```

*Configure Step

*Configure Step sets the configured step rate of one or all floppy disc drives.

```
*Configure Step n [drive]
```

*Configure Sync

*Configure Sync sets the configured type of synchronisation for vertical sync output.

```
*Configure Sync 0|1|Auto
```

*Configure SystemSize

*Configure SystemSize sets the configured extra area of memory reserved for the system heap.

```
*Configure SystemSize mK|n
```

*Configure Territory

*Configure Territory sets the configured default territory for the machine. Use this command with caution; if you set a territory that is unavailable your computer will not start, and so you will have to reset your CMOS RAM.

```
*Configure Territory territory
```

*Configure TimeZone

*Configure TimeZone sets the configured local time offset from UTC. The time offset must be in the range –13:45 to +13:45, and must be an exact multiple of 15 minutes.

```
*Configure TimeZone [+|-]hours[:minutes]
```

*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
```

*Configure TV

*Configure TV sets the configured vertical screen alignment and screen interlace.

```
*Configure TV [vert_align[[,]interlace]]
```

*Configure WimpAutoMenuDelay

*Configure WimpAutoMenuDelay sets the configured time the pointer must rest over a menu item before its submenu (if any) is automatically opened.

```
*Configure WimpAutoMenuDelay delay
```

*Configure WimpDoubleClickDelay

*Configure WimpDoubleClickDelay sets the configured time after a single click during which a double click is accepted.

```
*Configure WimpDoubleClickDelay delay
```

*Configure WimpDoubleClickMove

*Configure WimpDoubleClickMove sets the configured distance from the position of a single click within which a double click is accepted.

```
*Configure WimpDoubleClickMove distance
```

*Configure WimpDragDelay

*Configure WimpDragDelay sets the configured time after a single click after which a drag is started.

```
*Configure WimpDragDelay delay
```

*Configure WimpDragMove

*Configure WimpDragMove sets the configured distance from the position of a single click that the pointer has to move for a drag to be started.

```
*Configure WimpDragMove distance
```

*Configure WimpFlags

*Configure WimpFlags sets the configured behaviour of windows when dragged, and of error boxes:

Bit	Meaning when set
0	window position drags are continuously redrawn
1	window resizing drags are continuously redrawn
2	horizontal scroll drags are continuously redrawn
3	vertical scroll drags are continuously redrawn
4	no beep is generated when an error box appears
5	windows can be dragged partly off screen to right and bottom
6	windows can be dragged partly off screen in all directions
7	open submenus automatically

```
*Configure WimpFlags n
```

*Configure WimpMenuDragDelay

*Configure WimpMenuDragDelay sets the configured time before an automatically opened submenu is closed. During this time you can move the pointer over other menu entries without closing the submenu, making it easy to reach the submenu.

```
*Configure WimpMenuDragDelay delay
```

*Configure WimpMode

*Configure WimpMode sets the configured screen mode used by the machine. It is identical to the command *Configure Mode.

```
*Configure WimpMode screen_mode|Auto
```

*Continue

*Continue resumes execution after a breakpoint, using the saved state.

```
*Continue
```

*Copy

*Copy makes a copy between directories of any object(s) that match the given wildcard specification. Options are taken from the system variable Copy$Options, and those given to the command.

Options (use '~' to force off, e.g. ~C):		**Default**
A(ccess)	Force destination access to same as source	ON
C(onfirm)	Prompt for confirmation of each copy	ON
D(elete)	Delete the source object after copy	OFF
F(orce)	Force overwriting of existing objects	OFF
L(ook)	Look at destination before loading source file	OFF
N(ewer)	Copy only if source more recent than destination	OFF
P(rompt)	Prompt for disc to be changed as needed in copy	OFF
Q(uick)	Use application workspace as a buffer	OFF
R(ecurse)	Copy subdirectories and contents	OFF
S(tamp)	Restamp date-stamped files after copying	OFF
(s)**T**(ructure)	Copy only the directory structure	OFF
V(erbose)	Print information on each object copied	ON

```
*Copy source_spec destination_spec [[~]options]
```

*CopyBoot

*CopyBoot copies the boot block from one MS-DOS floppy disc over the boot block of another.

```
*CopyBoot source_drive dest_drive
```

*Count

*Count adds up the size of data held in one or more objects that match the given wildcard specification. Options are taken from the system variable Count$Options, and those given to the command.

Options (use '~' to force off, e.g. ~C):		**Default**
C(onfirm)	Prompt for confirmation of each count	OFF
R(ecurse)	Count subdirectories and contents	ON
V(erbose)	Print information on each file counted	OFF

```
*Count object_spec [[~]options]
```

*Countries

*Countries lists all the countries currently supported.

```
*Countries
```

*Country

*Country selects the appropriate alphabet and keyboard layout for a given country. With no parameter, this command displays the currently selected country.

```
*Country [country_name]
```

*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]]]
```

*Debug

*Debug enters the debugger. Type `Quit` to exit.

```
*Debug
```

*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
```

*Delete

*Delete erases a single named file or empty directory.

```
*Delete object_spec
```

*Desktop

*Desktop initialises all desktop facilities, then starts the Desktop. It also runs an optional * Command or file of * Commands.

```
*Desktop [command|-File filename]
```

*Desktop_...

*Desktop_... commands (except for *Desktop_SetPalette: see below) are for internal use only, and you should not use them.

*Desktop_SetPalette

*Desktop_SetPalette alters the current Wimp palette.

```
*Desktop_SetPalette RGB0 ... RGB15 RGBbor RGBptr1 ... RGBptr3
```

*Dir

*Dir selects a directory (by default the user root directory) as the current directory on a filing system.

```
*Dir [directory]
```

*Dismount

*Dismount ensures that it is safe to finish using a disc by closing all its files, unsetting all its directories and libraries, forgetting its disc name (if a floppy disc) and parking its read/write head.

```
*Dismount [disc_spec]
```

*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]]
```

*Drive

*Drive sets the current drive if NoDir is set.

```
*Drive drive
```

*Dump

*Dump displays the contents of a file, in hexadecimal and ASCII codes. The optional file offset and start address are in hexadecimal.

```
*Dump filename [file_offset [start_address]]
```

*Echo

*Echo displays a string on the screen (after translating it using OS_GSTrans).

```
*Echo string
```

*EnumDir

EnumDir creates a file of object leafnames from a directory that match the wildcarded pattern (by default '').

```
*EnumDir directory output_file [pattern]
```

*Error

*Error generates an error with the given error number and explanatory text.

```
*Error [error_no] text
```

*Eval

*Eval evaluates an integer, logical, bit or string expression.

The expression can use the following operators:

+	addition or string concatenation
–, *, /, MOD	integer operations
=, <, >, <=, >=, <>	string or integer comparison
<<, >>	arithmetic shift left and right
>>>	logical shift right
STR, VAL	conversion between strings and integers
AND, OR, EOR, NOT	(bitwise) logical operators
RIGHT, LEFT	substring extraction
LEN	string length

You can also use brackets.

```
*Eval expression
```

*Ex

*Ex lists all the objects in a directory (by default the current directory) together with their corresponding file information.

```
*Ex [directory]
```

*Exec

*Exec instructs the operating system to take its input from the specified file. If no parameter is given, the current exec file is closed.

```
*Exec [filename]
```

*FileInfo

*FileInfo gives full file information for the specified object(s).

```
*FileInfo object_spec
```

*Filer_Action

*Filer_Action is used to start a Filer_Action task running. This command is intended for use only within desktop applications.

```
*Filer_Action
```

*Filer_Boot

*Filer_Boot boots the specified desktop application by running its !Boot file.

```
*Filer_Boot application
```

*Filer_CloseDir

*Filer_CloseDir closes a directory display on the Desktop, and any of its sub-directories.

```
*Filer_CloseDir directory
```

*Filer_OpenDir

*Filer_OpenDir opens a directory display on the Desktop. Switches are:

Switch	Alternative	Meaning
-SmallIcons	-si	display small icons
-LargeIcons	-li	display large icons
-FullInfo	-fi	display full information
-SortByName	-sn	display sorted by name
-SortByType	-st	display sorted by type
-SortByDate	-sd	display sorted by date
-SortBySize	-ss	display sorted by size

Each parameter – except for the switches – can be preceded by a keyword:

Keyword	Alternative	Precedes parameter
-directory	-dir	*directory*
-topleftx	-x0	*x*
-toplefty	-y1	*y*
-width	-w	*width*
-height	-h	*height*

```
*Filer_OpenDir directory [x y [width height]] [switches]
```

*Filer_Run

*Filer_Run performs the equivalent of double-clicking on an object in a directory display.

```
*Filer_Run object
```

*Filters

*Filters lists all currently active pre- and post-Wimp_Poll filters.

```
*Filters
```

*FontCat

*FontCat lists the fonts available in Font$Path, or in the given directory.

```
*FontCat [directory]
```

*FontInstall

*FontInstall adds a directory to the list of those scanned for fonts. It also rescans the directory, even if it was already known to the Font Manager.

```
*FontInstall [directory]
```

*FontLibrary

*FontLibrary sets a directory as the font library, replacing the previous library in the list of those scanned for fonts.

```
*FontLibrary directory
```

*FontList

*FontList displays the fonts in the font cache, its size, and its free space.

```
*FontList
```

*FontRemove

*FontRemove removes a directory from the list of those scanned for fonts.

```
*FontRemove [directory]
```

*Format

*Format prepares a new floppy disc for use, or erases a used disc for re-use.

Formats are:

F	1.6M	RISC OS 3	77-entry directories, new map
E	800K	RISC OS	77-entry directories, new map
D	800K	Arthur 1.2	77-entry directories, old map
L	640K	all ADFS	47-entry directories, old map
DOS/Q	1.44M	MS-DOS 3.20	double sided high density 3½" disc
DOS/M	720K	MS-DOS 3.20	double sided 3½" disc
DOS/H	1.2M	MS-DOS 3	double sided high density 5¼" disc
DOS/N	360K	MS-DOS 2, 3	double sided 3½", 5¼" disc
DOS/P	180K	MS-DOS 2, 3	single sided 5¼" disc
DOS/T	320K	MS-DOS 1, 2, 3	double sided 5¼" disc
DOS/U	160K	MS-DOS 1, 2, 3	single sided 5¼" disc
Atari/M	720K	Atari ST	double sided 3½" disc
Atari/N	360K	Atari ST	single sided 3½" disc

Early models of RISC OS computers cannot use DOS/H, DOS/Q and F formats. RISC OS 2 only supports L, D and E formats.

The default is to use F-format if possible; otherwise E-format is used.

`*Format` *`drive`* `[`*`format`* `[`*`disc_name`*`]] [Y]`

*Free

*Free displays the total free space remaining on a disc. For NetFS, *Free displays a user's total free space, as well as the total free space for the disc.

`*Free [`*`disc_spec`*`]`

`*Free [:`*`file_server`*`] [`*`user_name`*`]` (NetFS *syntax*)

*FS

*FS selects the current file server, restoring that file server's context (for example, its current directory). If no argument is supplied, information is given about your current file server, followed by any non-current servers.

`*FS [[:]`*`file_server`*`]`

*FX

*FX calls OS_Byte to alter status variables, and to perform other closely related actions.

`*FX` *`reason_code`* `[[,]` *`r1`* `[[,]` *`r2`*`]]`

*Go

*Go calls machine code at the given address (default &8000), passing it an optional environment string.

```
*Go [hexadecimal_address] [ ; environment]
```

*GOS

*GOS calls command line mode, and hence allows you to type * Commands.

```
*GOS
```

*Help

*Help gives brief information about each command. There are also some special keywords:

`*Help Commands`	lists all the available utility commands
`*Help FileCommands`	lists all the commands relating to filing systems
`*Help Modules`	lists the names of all currently loaded modules, with their version numbers and creation dates
`*Help Station`	displays the current network and station numbers of your machine
`*Help Syntax`	explains the format used for syntax messages

```
*Help [keyword]
```

*I am

*I am selects NetFS and logs you on to a file server. Your user name and password are checked by the file server against the password file before allowing you access.

```
*I am [[:]file_server_number|:file_server_name] user_name [[:Return]password]
```

*IconSprites

*IconSprites merges the sprites in a file with those in the Wimp sprite area.

```
*IconSprites filename
```

*If

*If conditionally executes a * Command, depending on the value of an expression.

```
*If expression Then command [Else command]
```

*Ignore

*Ignore sets the printer ignore character.

```
*Ignore [ASCII_code]
```

*Info

*Info gives file information for the specified object(s).

```
*Info object_spec
```

*InitStore

*InitStore fills user memory with the specified value or register value, or with the value &E6000010 (which is an illegal instruction) if no parameter is given.

```
*InitStore [value|reg]
```

*Key

*Key assigns a string to a function key.

```
*Key keynumber [string]
```

*Keyboard

*Keyboard selects the appropriate keyboard layout for a given country. With no parameter, this command displays the currently selected keyboard layout.

```
*Keyboard [country_name]
```

*LCat

*LCat lists all the objects in the named library subdirectory (by default the current library).

```
*LCat [directory]
```

*LEx

*LEx lists all the objects in the named library subdirectory (by default the current library) together with their file information.

```
*LEx [directory]
```

*Lib

*Lib selects a directory (the default is filing system dependent) as the current library on a filing system.

```
*Lib [directory]
```

*List

*List displays the contents of the named file using the configured DumpFormat. Each line is numbered.

```
*List [-File] filename [-TabExpand]
```

*ListFS

*ListFS displays a list of the file servers which NetFS is able to recognise. The optional argument forces the list to be updated before it is displayed.

```
*ListFS [-force]
```

*ListPS

*ListPS lists all the currently available printer servers, optionally showing their status as well.

```
*ListPS [-full]
```

*Load

*Load loads the named file. The optional load address is in hexadecimal.

```
*Load filename [load_addr]
```

*LoadFontCache

*LoadFontCache loads a file that was previously saved using *SaveFontCache back into the font cache.

```
*LoadFontCache filename
```

*Logon

*Logon logs you on to a file server. Your user name and password are checked by the file server against the password file before allowing you access.

```
*Logon [[:]file_server_number|:file_server_name] user_name [[:Return]password]
```

*Map

*Map displays a disc's free space map.

```
*Map [disc_spec]
```

*Memory

*Memory displays the values in memory, in bytes if the optional B is given, or in words otherwise.

```
*Memory [B] addr1|reg1
*Memory [B] addr1|reg1 [+|-]addr2|reg2
*Memory [B] addr1|reg1 +|-addr2|reg2 +addr3|reg3
```

*MemoryA

*MemoryA displays and alters memory in bytes, if the optional B is given, or in words otherwise.

```
*MemoryA [B] addr|reg1 [value|reg2]
```

*MemoryI

*MemoryI disassembles memory into ARM instructions.

```
*MemoryI addr1|reg1
*MemoryI addr1|reg1 [+|-]addr2|reg2
*MemoryI addr1|reg1 +|-addr2|reg2 +addr3|reg3
```

*Modules

*Modules displays information about all installed relocatable modules.

```
*Modules
```

*Mount

*Mount prepares a disc for general use by setting the current directory to its root directory, setting the library directory (if it is currently unset) to $.Library, and unsetting the User Root Directory. For NetFS, *Mount selects a disc from the file server by setting the current directory, the library directory and the User Root Directory.

```
*Mount [disc_spec]
*Mount [:]disc_spec        (NetFS syntax)
```

*NameDisc

*NameDisc (or alternatively, *NameDisk) changes a disc's name.

```
*NameDisc disc_spec new_name
```

*Net

*Net selects the Network Filing System as the current filing system.

```
*Net
```

*NoDir

*NoDir unsets the current directory.

```
*NoDir
```

*NoLib

*NoLib unsets the library directory.

```
*NoLib
```

*NoURD

*NoURD unsets the User Root Directory (URD).

```
*NoURD
```

*Obey

*Obey executes a file of * commands. Argument substitution is performed on each line, using parameters passed in the command. With the -v option, each line is displayed before execution. With the -c option, the file is cached and executed from memory.

```
*Obey [[-v][-c] [filename [parameters]]]
```

*Opt 1

*Opt 1 sets the filing system message level (for operations involving loading, saving or creating a file) for the current filing system:

`*Opt 1,0`	No filing system messages
`*Opt 1,1`	Filename printed
`*Opt 1,2`	Filename, hexadecimal addresses and length printed
`*Opt 1,3`	Filename, and either date stamp and length, or hexadecimal load and exec addresses printed

`*Opt 1 [[,]n]`

*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]`

*Pass

*Pass changes your password on your current fileserver.

`*Pass [old_password [new_password]]`

*Pin

*Pin adds a file, application or directory to the desktop pinboard, positioning its icon at the given coordinates (in OS units).

`*Pin object x y`

*Pinboard

*Pinboard initialises the pinboard, removing any existing pinned icons and backdrop.

`*Pinboard [-Grid]`

*PipeCopy

*PipeCopy copies a file one byte at a time to one or two output files.

`*PipeCopy source_file destination_file1 [destination_file2]`

*PoduleLoad

Copies a file into an expansion card's RAM.

```
*PoduleLoad expansion_card_number filename [offset]
```

*Podules

*Podules displays a list of the installed expansion cards and extension ROMs.

```
*Podules
```

*PoduleSave

*PoduleSave copies an expansion card's ROM into a file.

```
*PoduleSave expansion_card_number filename size [offset]
```

*Pointer

*Pointer turns the mouse pointer on or off.

```
*Pointer [0|1]
```

*Print

*Print displays the contents of the named file by sending each byte to the VDU.

```
*Print filename
```

*PS

*PS changes the default printer server, checking that the new one exists.

```
*PS printer_server
```

*QSound

*QSound generates a sound after a given delay.

```
*QSound channel amplitude pitch duration beats
```

*Quit

*Quit exits from the current application.

```
*Quit
```

*Ram

*Ram selects the RAM filing system as the current filing system.

```
*Ram
```

*Remove

*Remove erases a single named file or empty directory. No error message is given if the object does not exist.

```
*Remove filename
```

*RemoveTinyDir

*RemoveTinyDir removes a file, application or directory icon that was previously placed on the icon bar by a *AddTinyDir command. If no pathname is given, all such icons are removed from the icon bar.

```
*RemoveTinyDir [object]
```

*Rename

*Rename changes the name of an object, within the same storage unit.

To move objects between discs or filing systems, use the *Copy command with the **D**(elete) option set.

```
*Rename object new_name
```

*ResourceFS

*ResourceFS selects the Resource Filing System as the current filing system.

```
*ResourceFS
```

*RMClear

*RMClear deletes all relocatable modules from the module area. Use this command only with extreme caution, as it is so drastic in its effects.

```
*RMClear
```

*RMEnsure

*RMEnsure checks that a module is present and is the given version (or a more recent one). The command is executed if this is not the case.

```
*RMEnsure module_title version_number [command]
```

*RMFaster

*RMFaster makes a module faster by copying it from ROM to RAM.

*RMFaster *module_title*

*RMInsert

*RMInsert reverses the action of a previous *Unplug command, but without reinitialising any modules.

*RMInsert *module_title* [*ROM_section*]

*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*]

*RMLoad

*RMLoad loads and initialises a relocatable module.

*RMLoad *filename* [*module_init_string*]

*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*]

*RMRun

*RMRun runs a relocatable module, first loading and initialising it if necessary.

*RMRun *filename*

*RMTidy

*RMTidy collects together free space in the module area by moving and reinitialising all the modules it contains. Use this command only with extreme caution, as it is so drastic in its effects

*RMTidy

*ROMModules

*ROMModules displays information about all relocatable modules currently installed in ROM.

```
*ROMModules
```

*Run

*Run loads and executes a file, optionally passing a list of parameters to it.

```
*Run filename [parameters]
```

*Save

*Save copies the given area of memory to the named file. The length and addresses are in hexadecimal.

```
*Save filename start_addr end_addr [exec_addr [load_addr]]
*Save filename start_addr + length [exec_addr [load_addr]]
```

*SaveFontCache

*SaveFontCache saves the current contents of the font cache to a file.

```
*SaveFontCache filename
```

*SChoose

*SChoose selects a sprite from the system sprite area for use in subsequent sprite plotting operations.

```
*SChoose sprite_name
```

*SCopy

*SCopy makes a copy of the source sprite within the system sprite area, and renames it as the destination sprite.

```
*SCopy source_sprite_name dest_sprite_name
```

*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 an Acorn SCSI expansion card fitted.

```
*SCSI
```

*SDelete

*SDelete deletes one or more sprites from the system sprite area.

```
*SDelete sprite_name1 [sprite_name2...]
```

*SDisc

*SDisc selects a disc from the current file server by setting the current directory, the library directory and the User Root Directory.

```
*SDisc [:]disc_spec
```

*Set

*Set assigns a string value to a system variable.

```
*Set varname value
```

*SetEval

*SetEval evaluates an expression and assigns its value to a system variable.

```
*SetEval varname expression
```

*SetMacro

*SetMacro assigns an expression to a system variable. The expression is evaluated each time the variable is used.

```
*SetMacro varname expression
```

*SetPS

*SetPS changes the default printer server, without checking that the new one exists.

```
*SetPS printer_server
```

*SetType

*SetType sets the file type of the named file to the given textual file type or hexadecimal number. If the file does not have a date stamp, then it is stamped with the current time and date.

The command `*Show File$Type*` displays a list of valid file types.

`*SetType` *`filename file_type`*

*SFlipX

*SFlipX reflects a sprite in the system sprite area about its x axis.

`*SFlipX` *`sprite_name`*

*SFlipY

*SFlipY reflects a sprite in the system sprite area about its y axis.

`*SFlipY` *`sprite_name`*

*SGet

*SGet gets a sprite from a rectangular area of the screen, defined by the two most recent graphics positions (inclusive), and then saves it in the system sprite area.

`*SGet` *`sprite_name`*

*Shadow

*Shadow sets which bank of screen memory is used on subsequent mode changes.

`*Shadow [0|1]`

*ShellCLI

*ShellCLI invokes a command shell from a Wimp program, starting it as a Wimp task.

`*ShellCLI`

*ShellCLI_Task

*ShellCLI_Task runs an application in a window. This command is intended for use only within desktop applications.

*ShellCLI_TaskQuit

*ShellCLI_TaskQuit quits the current task window. This command is intended for use only within desktop applications.

*Show

*Show displays the name, type and current value of any system variables matching the name given. If no name is given, all system variables are displayed.

```
*Show [variable_spec]
```

*ShowFree

*ShowFree shows within a desktop window the amount of free space on a device.

```
*ShowFree -fs fs_name device
```

*ShowRegs

*ShowRegs displays the register contents for the saved state.

```
*ShowRegs
```

*Shut

*Shut closes all open files on all filing systems.

```
*Shut
```

*ShutDown

*ShutDown closes all open files on all filing systems, logs off all NetFS file servers and parks hard disc heads.

```
*ShutDown
```

*SInfo

*SInfo displays information on the system sprite workspace.

```
*SInfo
```

*SList

*SList lists the names of all the sprites in the system sprite area.

```
*SList
```

*SLoad

*SLoad loads a sprite file into the system sprite area.

```
*SLoad filename
```

*SMerge

*SMerge merges the sprites in a file with those in the system sprite area.

```
*SMerge filename
```

*SNew

*SNew deletes all the sprites in the system sprite area.

```
*SNew
```

*Sound

*Sound generates an immediate sound.

```
*Sound channel amplitude pitch duration
```

*Speaker

*Speaker turns the internal speaker(s) on or off.

```
*Speaker On|Off
```

*Spool

*Spool sends everything appearing on the screen to the specified file. If no filename is given, the current spool file is closed.

```
*Spool [filename]
```

*SpoolOn

*SpoolOn adds everything appearing on the screen to the end of an existing file. If no filename is given, the current spool file is closed.

```
*SpoolOn [filename]
```

*SRename

*SRename renames a sprite within the system sprite area.

```
*SRename old_sprite_name new_sprite_name
```

*SSave

*SSave saves the system sprite area as a sprite file.

```
*SSave filename
```

*Stamp

*Stamp sets the date stamp on a file to the current time and date. If the file has not previously been date stamped, it is also given file type Data (&FFD).

```
*Stamp filename
```

*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]
```

*Stereo

*Stereo sets the position in the stereo image of a sound channel.

```
*Stereo channel position
```

*TaskWindow

*TaskWindow starts a background task, which will open a task window if it needs to get input, or to output a character to the screen.

```
*TaskWindow [command] [[-wimpslot] nK] [[-name] taskname] [-ctrl]
            [-display] [-quit] [-task &xxxxxxxx] [-txt &xxxxxxxx]
```

*Tempo

*Tempo sets the Sound system tempo.

```
*Tempo tempo
```

*Territories

*Territories lists the currently loaded territory modules.

```
*Territories
```

*Time

*Time displays the day, date and time of day.

```
*Time
```

*ToolSprites

*ToolSprites merges the sprites in a file with those in the Wimp's pool of border sprites, which are used to redraw window borders.

```
*ToolSprites filename
```

*Tuning

*Tuning alters the overall tuning of the Sound system. A value of zero resets the default tuning.

```
*Tuning relative_change
```

*TV

*TV adjusts the vertical screen alignment and screen interlace.

```
*TV [vert_align[[,]interlace]]
```

*Type

*Type displays the contents of the named file using the configured DumpFormat.

```
*Type [-File] filename [-TabExpand]
```

*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]]
```

*Unset

*Unset deletes a system variable.

```
*Unset variable_spec
```

*Up

*Up moves the current directory up the directory structure by the specified number of levels.

```
*Up [levels]
```

*URD

*URD sets the User Root Directory (URD). If no directory is specified, the URD is set to the root directory.

```
*URD [directory]
```

*Verify

*Verify checks that the whole disc (by default the current disc) is readable.

```
*Verify [disc_spec]
```

*Voices

*Voices displays a list of the installed voices by name and number, and shows which voice is assigned to each of the eight channels.

```
*Voices
```

*Volume

*Volume sets the maximum overall volume of the Sound system.

```
*Volume volume
```

*WimpMode

*WimpMode changes the current screen mode used by the Desktop.

```
*WimpMode screen_mode
```

*WimpPalette

*WimpPalette uses a palette file to set the Wimp's colour palette.

```
*WimpPalette filename
```

*WimpSlot

*WimpSlot changes the memory allocation for the current and (optionally) the next Wimp task.

```
*WimpSlot [-min] minsize[K] [-max maxsize[K]] [-next nextsize[K]]
```

*WimpTask

*WimpTask starts up a new task from within another task.

```
*WimpTask command
```

*WimpWriteDir

*WimpWriteDir sets the direction of text entry for writeable icons to either the default for the current territory, or the reverse of that.

```
*WimpWriteDir 0|1
```

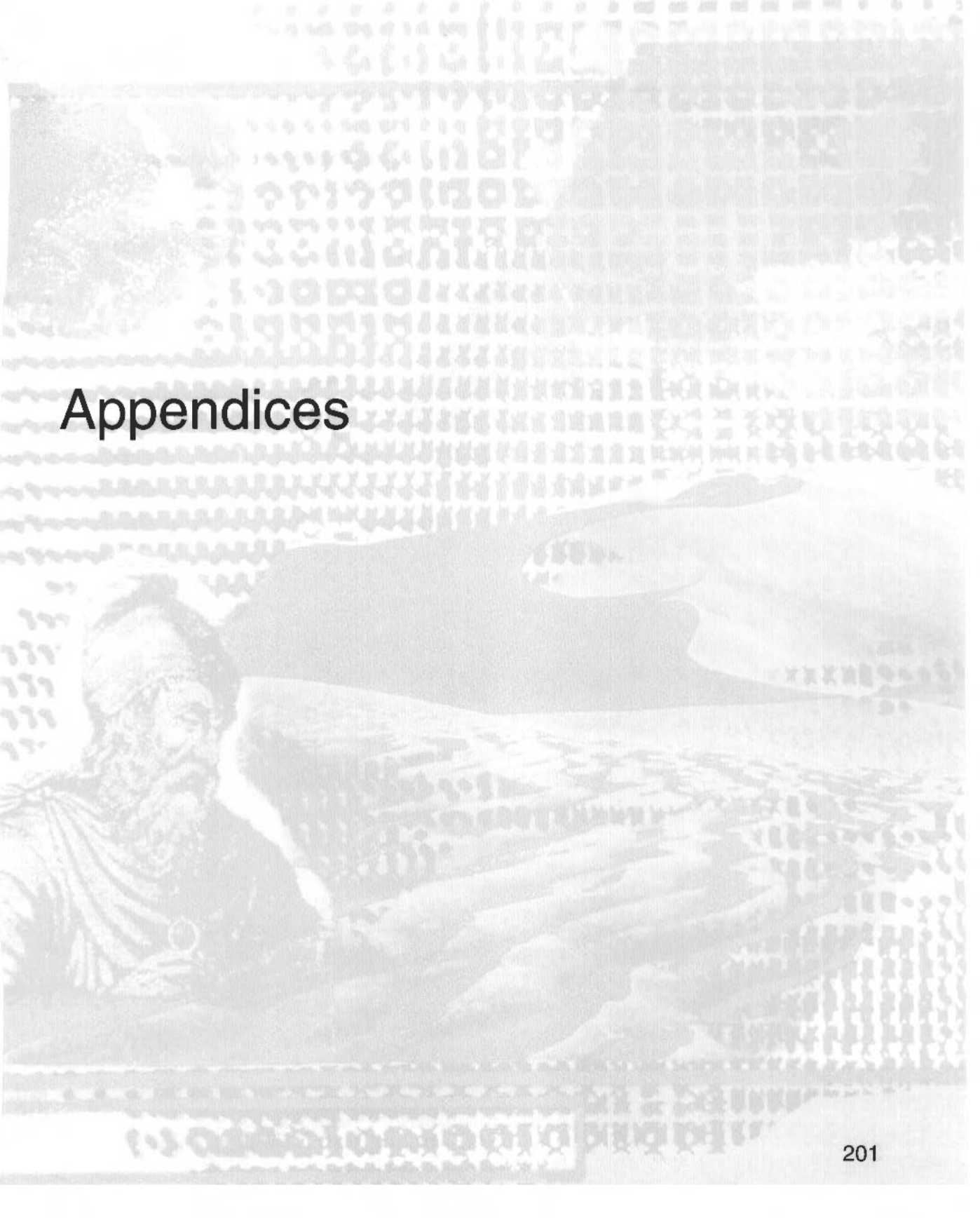
*Wipe

*Wipe deletes one or more objects that match the given wildcard specification. Options are taken from the system variable Wipe$Options, and those given to the command.

Options (use '~' to force off, e.g. ~C):		**Default**
C(onfirm)	Prompt for confirmation of each deletion	ON
F(orce)	Force deletion of locked objects	OFF
R(ecurse)	Delete subdirectories and contents	OFF
V(erbose)	Print information on each object deleted	ON

```
*Wipe object_spec [[~]options]
```

Appendices



Appendix A: Upgrading from RISC OS 2.00

Many changes have been introduced into RISC OS. If you have used RISC OS 2.00, you will find the new version very familiar; this summary will acquaint you quickly with the new features to look out for, which are all documented fully in the appropriate chapters of this guide.

Applications in ROM

The most important change introduced into RISC OS is the incorporation of several applications, including those you are most likely to use, into the computer's ROM. This means that instead of loading these applications from disc you run them from the ROM, so that not only do they load more quickly, they also occupy much less space in RAM (they do still need a little). This is particularly important if you have a 1MB computer.

Click on the Apps icon on the icon bar to display the applications stored in ROM.

Changes have also been made in many of the applications themselves, especially to Draw, Paint, Edit and Alarm, which have been enhanced. These are documented in the *Applications Guide*.

The desktop

If you have used RISC OS before, you will find the desktop quite familiar. One detail that you will notice straight away is that when you click a mouse button once, the pointer shape changes to a double arrow. As long as it stays double, the computer will recognise a second click as part of a double click.

The Filer menu and Filer operations have been considerably enhanced. New features include:

- Filer actions such as formatting, verifying, copying and deletion can now take place 'in the background', allowing you to get on with something else while lengthy activities proceed.
- A 'find' facility enabling you to search directory structures for files and subdirectories.
- Setting of a file's type and date from the desktop.

- Dragging the scroll bar with Adjust now puts the window into 2D scrolling mode. The mouse can alter both the horizontal and vertical view positions on the document.
- Changes in the way access is controlled.
- New Desktop options – Force and Newer – give you greater control over copying of files.
- You can now select a group of objects by dragging a box round them.
- Pressing Shift while clicking on the toggle full size icon displays the window full size but leaves the icon bar visible.

Windows can be dragged partially off the screen, and files can be run by dragging them onto the icon bar (provided an appropriate application can be found).

Task manager

A new feature in the Task manager enables easy creation of desktop boot files, so that you can start up your computer the way you want it without needing to know anything about the Command Line.

A Shutdown option now lets you shutdown your computer in a controlled way, allowing you to save all your files before switching off.

Printing

Printers are now controlled by the Printer manager application. This new application results in much improved printing. There is now a much greater range of printers supported. You can now also have several printer drivers operating at the same time.

Fonts

The standard range of fonts has now been stored in the ROM and can be used with applications without memory penalties. This means that all users can now use fonts. The fonts stored inside the computer are Trinity, Corpus and Homerton.

Pinboard

The icons of files, directories and applications can now be pinned onto the background. This enables them to be found easily without having to remember the directory structure.

Running applications can also be iconised in the same way.

ARM 3 support

There is now support for the ARM 3 processor with *Cache and *Configure Cache commands.

!Configure

The system configuration application has been greatly enhanced and improved. Most *Configure commands can now be performed (with 'instant effect') using this desktop application. There should no longer be any need to use the *Configure command line commands.

DOS and Atari discs supported

RISC OS can now read and write to DOS and Atari format discs. RISC OS can also recognise any DOS hard disc partition files you have created using the Acorn PC Emulator.

Additional disc formatting options for DOS and Atari discs have been added, as has support for high density discs (if appropriate hardware is available).

F12 key use

The use of the F12 key has changed slightly:

- F12 displays the command line at the bottom of the screen.
- Shift-F12 toggles the icon bar to the front or back of obscuring windows
- Ctrl-F12 displays a Task window
- Shift-Ctrl-F12 shuts down the computer.

Screen modes and monitor types

The number of screen modes and monitor types has been greatly increased.

Appendix B: Getting the best out of 1MB computers

Acorn computers have come a long way since the first BBC Model A, with 16KB of RAM. A 1MB RISC OS computer has 64 times as much memory. However, at the same time, applications have become a lot more powerful and some can use up a large part of your computer's memory, making it hard to get the best advantage of the multi-tasking facilities offered by RISC OS.

In addition, although some RISC OS computers have a hard disc and two or even more floppy disc drives, the majority have only a single floppy disc drive.

This appendix therefore presents some suggestions for getting the best out of 1MB computers without hard discs, including those with only one floppy drive.

Resetting the computer

Some applications require the loading of relocatable modules: software extensions 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 space for the next application.

It is therefore a good idea to reset the computer before attempting to load an application that will need almost all the computer's RAM. Before doing this, make sure you save any work you have done, as it will be lost from the computer's memory when you reset. To reset the computer, press Ctrl-Break or Ctrl-Reset. Then load the application you want to use.

If you have a 1MB computer with a hard disc containing a boot file that runs some applications each time you switch on, carry out the reset by holding both Ctrl and Shift while pressing Reset; this will prevent the boot sequence from being executed.

Choice of screen mode

The appendix entitled *Screen modes* on page 219 lists the screen modes that are available on RISC OS computers. The table there shows the memory used by each screen mode. If you are very short of memory, you should use mode 12 for a colour display (even if you have a multi-frequency scanning rate monitor). If you are happy with a monochrome display you can save even more memory by using mode 0, 8 or 11 on a standard-resolution monitor or mode 19 on a multi-frequency scanning rate monitor.

Opening directory displays

When you open a display for a directory containing applications, the computer runs the boot file for each application. This loads the applications' sprite files, which then 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.

Printing

If you do not intend to do any printing during your session, do not load the Printer manager at all. If you do intend to print, and you are using an application that enables you to print by selecting a menu option (rather than by dragging a file to the printer driver icon), you can save some space by first loading the printer driver and then removing it again. This leaves behind the printer driver module, which is all you actually need in order to print from such an application. You will of course need to do this **after** resetting the computer.

If you are using Edit, you must have the full Printer manager application loaded for Edit to print correctly. Edit will not print with only the printer module loaded.

For non-PostScript printers, the printing process also requires memory to use as a buffer space; the more that is available for this, the faster printing will be. You can increase the free space by temporarily switching to mode 0 while you print.

Finally, note that on non-PostScript printers, printing in landscape format uses more memory than printing in portrait format.

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:

- The Screen memory.
- The Font cache (provided the application does not make extensive use of fonts; if redrawing the screen takes a long time, you have made the font cache too small).
- The System sprites: this can always be reduced to zero except when playing some games.
- The Module area.

SetIcons application

SetIcons can use up a significant amount of free memory, up to 60KB. If you need this extra memory for running applications, do not use SetIcons.

Using a RAM disc

If your computer has only a single floppy disc drive but more than 1MB of RAM, and the application you want to run uses two floppy discs, you can use some of the available memory to create a RAM disc. Decide which disc you wish to transfer to RAM and insert it into the disc drive. Choose **Free** from the icon bar menu to see how large the RAM disc needs to be, and create a disc of the appropriate size, using the Task manager. Then copy the contents of the floppy disc to the RAM disc.

Before loading a file into the application, double-click on the parts of the application you have transferred into RAM, so that the computer knows that it should find them there. Otherwise, it will look for them on the floppy disc.

Installing more memory

Perhaps the easiest way to increase the usability of your computer is to add additional memory to your computer. Most RISC OS computers can be expanded beyond 1MB. With 2MB or more, memory constraints are no longer a problem and memory saving measures do not have to be employed.

Appendix C: Resetting and power-on

In certain circumstances you will find it necessary to 'reset' (switch off – then on again) your computer. These include:

- When a program or application has 'hung'; nothing is happening, and clicking mouse buttons or typing at the keyboard has no effect.
- When you upgrade your computer by, for example, inserting more memory, changing the system configuration, or connecting a different type of monitor.
- If you wish to use an application that will need nearly all of your computer's memory, a reset will remove such things as unwanted modules which may be using up space you need.

Resets come in increasing 'strengths', and to understand these you need to know a little about configuration. You have probably already met this through the desktop Configure application (see page 85). Configuration information is stored in memory which is supported by batteries and therefore retains its contents even when the computer is turned off, so that you do not have to set them every time you use it. This memory is sometimes referred to as the CMOS RAM. Configuration 'tells' the computer about, for example:

- What hardware you have in your system: for example, what type of monitor, printer (if any) or disc drives.
- What language you wish the computer to run when it is switched on. 'Language' here includes the desktop.
- How loud you want the beep to sound.

Resetting the computer involves the use of certain keys on the keyboard and the Reset switch. It sometimes involves switching your computer off and switching it on again while holding down a key. Each of the possible combinations is described in this chapter.

Switching on

When you first switch on the computer it goes through a power-on self test routine. While the test is in progress the screen changes colour and the floppy drive's LED flashes once. If the LED flashes more than once, or the screen display jams

showing the same colour, a fault has been detected and startup is halted. (Note that some third party hardware add-ons, such as a VIDC enhancer, may cause a 'fault' to be reported.)

Normally the startup proceeds to the desktop display. Any keys held down to alter the CMOS configuration are not detected until the self test has finished.

If you are using a Super VGA monitor, you won't see these self-tests. This is because Super VGA monitors only lock onto the display signal when the self-test is over.

Saving your configuration on floppy disc

You should always make sure you have a copy of your configuration saved onto floppy disc; you can then easily restore the computer to your required configuration after the reset. For full details refer to the chapter entitled *Setting the configuration* on page 85.

Resetting your configuration while switching on

You can reset the configuration when you switch on the computer. To do this hold down the appropriate key and switch the computer on. Do not release the key until text has appeared on the screen. There are two choices, **R** and **Delete**:

R causes some of the computer's CMOS RAM to be reset. The information that is retained relates to expansion cards, the Econet station number, the country code, and the number of hard and floppy discs. Information about these will not be lost when you hold R while switching on. Use this reset when upgrading your computer.

Delete causes **all** the computer's CMOS RAM to be reset to its initial factory values, with the exception of the Econet station number. You should not normally use this reset.

These actions are sometimes referred to as 'R-power on' and 'Delete-power on' resets.

Getting a picture on your screen

After you have reset your configuration you may need to alter some configuration values that control how the computer outputs its display to a monitor. Both the above power on resets set the Monitor Type, Sync, and Mode/WimpMode to 'Auto'.

If your computer can auto-detect monitor types it will sense the type of monitor lead connected to it, and choose the correct monitor type and sync, and an appropriate screen mode. So long as your lead is the correct one for your monitor,

you will get a display. If your computer is an older model that cannot auto-detect monitor types it will select mode 12 on monitor type 0 (a standard monochrome or colour monitor), with sync type 1 (composite sync). In most cases this will still give you a display.

However if you cannot see a picture on your screen you should use the procedure below to set your monitor type and sync type.

Once you can see a picture on your screen, you can use the **Screen** window in the **Configure** application to set up your monitor correctly.

Setting the monitor type

You will need to follow the original power on reset with a second (different) reset to select the correct monitor type. Switch the machine on with the appropriate key from the numeric pad held down:

0	Standard monochrome or colour monitor
1	Multi frequency monitor
2	64Hz high-resolution monochrome monitor
3	60Hz VGA-type monitor
4	Super VGA-type monitor
5	LCD Liquid crystal displays

Setting the sync type

In a few cases you will still not get a display on your monitor, because the monitor has vertical instead of composite sync. In this case, repeat the reset process, but use the T or Copy key instead of the R or Delete key respectively. The same default values are set as before, except for the sync type, which will now be correct for your monitor. You may then need to set the monitor type again.

Summary

In summary, you should go through the following steps, stopping as soon as you get a display:

1. Reset the values by switching on while holding down the R or Delete key.
2. Set the monitor type by switching on while holding down the correct numeric key.
3. Reset the values by switching on while holding down the T or Copy key.
4. Set the monitor type by switching on while holding down the correct numeric key.

Using the Reset switch

Pressing the **Reset** switch alone causes a 'soft' reset. This resets your machine, restarting RISC OS. You will lose any unsaved work.

You can get other types of Reset options by holding down certain keys whilst you press the Reset switch:

- Holding down the **Ctrl** key causes a 'hard reset'. This is more severe than a soft reset (but still doesn't reset your machine as thoroughly as switching it off, then on again).
- Holding down the **Shift** key reverses the action of the configured boot option. If there **is** a boot file set to run, it is **not** run. If there is a boot file **not** set to run, it **is** run.
- Holding down ***(on numeric keypad)-Reset** causes the Command Line to be entered, rather than the configured language (such as the Desktop or BASIC).

You can combine the effects of these keys; for example pressing ***(on numeric keypad)-Ctrl-Shift-Reset** on a machine configured to auto-boot would cause a hard reset, after which the Command Line would be entered, and the boot file would not be run.

Using the Break key

Pressing the **Break** key (to the right of the twelve function keys) on its own acts like pressing the Escape key; for instance it may interrupt a program. However, if you press it whilst holding down any of the keys that affect the Reset switch it acts like the Reset switch, except that it does not reset the computer's hardware. For example:

- Pressing **Shift-Break** causes a soft restart of RISC OS, reversing the normal auto-boot behaviour.
- Pressing **Ctrl-Break** causes a hard restart of RISC OS, which is more severe in its effects.

The computer has a Break key as well as a Reset switch so that applications such as emulators can respond differently to them. For example, !65Host uses Break to reset the emulated computer, while Reset still resets the RISC OS computer itself.

Restoring default values

It is sometimes useful to restore all the values to their default settings. (For instance, someone else might use your computer and change the configuration, or the batteries that power the CMOS RAM might become flat.) To restore the default values, switch the machine on with either the R key or the Delete key held down.

Page size

Some of the default values depend on the size of a 'page' of memory. This value depends on how much RAM the computer has. A page is the smallest unit into which memory is split. The page sizes are given on page 156.

R power on

An '**R power on**' preserves the Econet station number, the country code, the number of floppy discs, the number of hard discs and all bytes relating to expansion cards. All other bytes are cleared to zero, and then the following defaults are set:

Configure option	Status	Meaning
Baud	4	Serial port set to 1200 baud
No Boot		Do not run boot file at power on or reset
No Caps		Caps lock off at power on
Data	4	Serial port set to 8 bit words, no parity, 2 stop bits
Delay	32	32 centisecond delay before keys auto-repeat
No Directory		No directory selected by ADFS at power on
DumpFormat	4	Control characters printed using GSRead, top-bit characters printed
FontSize	32K	RAM reserved for font cache
FontMax	0K	No maximum size for font cache
FontMax1	16pts	Fonts higher than 16 points not rescaled from bitmap
FontMax2	12pts	Fonts higher than 12 points not anti-aliased
FontMax3	24pts	Fonts higher than 24 points not cached
FontMax4	0	No horizontal sub-pixel anti-aliasing
FontMax5	0	No vertical sub-pixel anti-aliasing
Ignore	10	ASCII line feed ignored by printers
Language	10	Desktop selected at power on
Mode	Auto	Automatically determines the screen mode
MonitorType	Auto	Automatically determines the monitor type
MouseStep	3	Medium mouse movement

Configure option	Value	Meaning
Print	1	Parallel printer port used
PrinterBufferSize	1K	Printer buffer
Quiet		Beep set to half volume
RamFsSize	0K	No memory reserved for RAMFS
Repeat	8	8 centisecond keyboard auto-repeat rate
RMASize	0K	Extra RAM reserved for relocatable modules
ScreenSize	160K	RAM reserved for the display screen
Scroll		Screen scrolls when the end of a line is reached
SpriteSize	0K	RAM reserved for system sprite pool
Sync	Auto	Composite sync selected
SystemSize	0K	No extra memory reserved for system heap
TV	0,1	Interlace off
FileSystem	ADFS	ADFS selected at power on
Truncate	on	Truncates long file names for RISC OS
Territory	1	Territory UK
GMT		Greenwich Mean Time
TimeZone	+0:0	No offset
Cache	on	ARM 3 only
ADFSBuffers	4K/Mbyte	Sets default according to size of memory
ADFSDirCache	4K/Mbyte	Sets default according to size of memory
Step	3	3ms floppy disc drive step rate
FileServer	254	Default net file server set to 0.254
Library	ArthurLib	Network library set to $.ArthurLib
PrinterServer	235	Default net print server set to 0.235
SoundDefault	1 7 1	Speaker on, maximum volume, voice 1
WimpFlags	1 1 1	Windows fully instant when moving
WimpDragDelay		5 * 1/10 second
WimpDragMove		32 OS units
WimpDoubleClickDelay		10 * 1/10 second
WimpDoubleClickMove		32 OS units
WimpAutoMenuDelay		0 * 1/10 second
WimpMenuDragDelay		0 * 1/10 second
WimpMode	Auto	Mode used for desktop (Same as Mode)

The actual values of these defaults may differ with your computer and its memory size. To see the current settings of your computer, go into the command line by pressing F12 and then type Status and press Return. Press Return again to go back to the desktop.

If your computer cannot auto-detect monitor types, the Auto settings are equivalent to mode 12 on monitor type 0 (a standard monochrome or colour monitor), with sync type 1 (composite sync).

Computers with SCSI discs will have additional settings that are determined by the SCSI card itself.

If you have a portable computer, these settings may default to slightly different values.

Saving the configuration

You can save configuration to a file by using the following command line commands. You will need to put a floppy disc in the drive:

```
*Status { > adfs::0.$.Status }
*SetType adfs::0.$.Status text
```

Delete power on

A '**Delete power on**' also sets the defaults defined by an R power on. Additionally the following defaults are also set:

Drive	0	Drive 0 selected at power on or reset
Floppies	1	Single floppy disc
HardDiscs	0	No ST506 hard disc
IDEDiscs	0	No IDE hard disc
Country	UK	Country UK

Only the Econet station number is preserved.

Appendix D: Screen modes

RISC OS can display its desktop in different **modes.** Modes change the size of the desktop display and the number of colours the desktop can display. For example, mode 12 can display 16 colours simultaneously and mode 15 displays 256 colours. Mode 16 can display more information on the screen than mode 12, but the text size is smaller.

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 size in OS units, which corresponds to the area of desktop shown by the mode. (The greater the resolution, the larger the workspace area displayed).
- The number of colours available.
- The memory used to display the screen.
- The bandwidth used to display the screen. This corresponds to the load the mode places on the computer – the greater the bandwidth, the slower the computer operates.
- The monitor types that support that mode:

0	Standard monochrome or colour monitor
1	Multi frequency monitor
2	64Hz high-resolution monochrome monitor
3	60Hz VGA-type monitor
4	Super VGA-type monitor
5	LCD (Liquid crystal display)

Monitor types and screen modes

Not all monitors can display all screen modes. The following table lists the screen modes each monitor can display:

Monitor number	0	1	2	3 and 5	4
Monitor type	Standard	Multi frequency	Hi-res mono	VGA and LCD	Super VGA
Mode 0 – 15	✓	✓		✓†	✓†
16,17	✓	✓			
18 – 21		✓			
22	✓	✓			
23			✓		
24	✓	✓			
25 – 28		✓		✓	✓
29 – 31		✓			✓
33 – 36	✓	✓			
37 – 40		✓			
41 – 46		✓		✓	✓

† VGA and Super VGA type monitors can display modes 0 to 15 with reduced height (letterbox mode). These modes are retained for compatibility.

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	OS units resolution	Logical colours	Mem used	Band-width	Monitor types	Notes
0	80 × 32	640 × 256	1280 × 1024	2	20K	1M/s	0,1,3,4,5	③
1	40 × 32	320 × 256	1280 × 1024	4	20K	1M/s	0,1,3,4,5	③
2	20 × 32	160 × 256	1280 × 1024	16	40K	2M/s	0,1,3,4,5	③
3	80 × 25	Text only	Text only	2	40K	2M/s	0,1,3,4,5	③⑤⑦
4	40 × 32	320 × 256	1280 × 1024	2	20K	1M/s	0,1,3,4,5	③
5	20 × 32	160 × 256	1280 × 1024	4	20K	1M/s	0,1,3,4,5	③
6	40 × 25	Text only	Text only	2	20K	1M/s	0,1,3,4,5	③⑤⑦
7	40 × 25	Teletext	Teletext	16	80K	4M/s	0,1,3,4,5	③⑤
8	80 × 32	640 × 256	1280 × 1024	4	40K	2M/s	0,1,3,4,5	③
9	40 × 32	320 × 256	1280 × 1024	16	40K	2M/s	0,1,3,4,5	③
10	20 × 32	160 × 256	1280 × 1024	256	80K	4M/s	0,1,3,4,5	③
11	80 × 25	640 × 250	1280 × 1000	4	40K	2M/s	0,1,3,4,5	③
12	80 × 32	640 × 256	1280 × 1024	16	80K	4M/s	0,1,3,4,5	③
13	40 × 32	320 × 256	1280 × 1024	256	80K	4M/s	0,1,3,4,5	③
14	80 × 25	640 × 250	1280 × 1000	16	80K	3.9M/s	0,1,3,4,5	③
15	80 × 32	640 × 256	1280 × 1024	256	160K	8M/s	0,1,3,4,5	③
16	132 × 32	1056 × 256	2112 × 1024	16	132K	6.6M/s	0,1	⑥
17	132 × 25	1056 × 250	2112 × 1000	16	132K	6.5M/s	0,1	⑥
18	80 × 64	640 × 512	1280 × 1024	2	40K	2M/s	1	
19	80 × 64	640 × 512	1280 × 1024	4	80K	4M/s	1	
20	80 × 64	640 × 512	1280 × 1024	16	160K	8M/s	1	
21	80 × 64	640 × 512	1280 × 1024	256	320K	16M/s	1	
22	96 × 36	768 × 288	768 × 576	16	108K	5.4M/s	0,1	①⑧
23	144 × 56	1152 × 896	2304 × 1792	2	126K	8.1M/s	2	
24	132 × 32	1056 × 256	2112 × 1024	256	264K	13.2M/s	0,1	⑥
25	80 × 60	640 × 480	1280 × 960	2	37.5K	2.3M/s	1,3,4,5	
26	80 × 60	640 × 480	1280 × 960	4	75K	4.5M/s	1,3,4,5	
27	80 × 60	640 × 480	1280 × 960	16	150K	9M/s	1,3,4,5	
28	80 × 60	640 × 480	1280 × 960	256	300K	18M/s	1,3,4,5	
29	100 × 75	800 × 600	1600 × 1200	2	58.6K	3.3M/s	1,4	①②
30	100 × 75	800 × 600	1600 × 1200	4	117.2K	6.6M/s	1,4	①②
31	100 × 75	800 × 600	1600 × 1200	16	234.4K	13.2M/s	1,4	①②
33	96 × 36	768 × 288	1536 × 1152	2	27K	1.4M/s	0,1	①
34	96 × 36	768 × 288	1536 × 1152	4	54K	2.7M/s	0,1	①
35	96 × 36	768 × 288	1536 × 1152	16	108K	5.4M/s	0,1	①
36	96 × 36	768 × 288	1536 × 1152	256	216K	10.8M/s	0,1	①
37	112 × 44	896 × 352	1792 × 1408	2	38.5K	2.3M/s	1	①
38	112 × 44	896 × 352	1792 × 1408	4	77K	4.6M/s	1	①
39	112 × 44	896 × 352	1792 × 1408	16	154K	9.2M/s	1	①
40	112 × 44	896 × 352	1792 × 1408	256	308K	18.5M/s	1	①
41	80 × 44	640 × 352	1280 × 1408	2	27.5K	1.7M/s	1,3,4,5	①③④
42	80 × 44	640 × 352	1280 × 1408	4	55K	3.3M/s	1,3,4,5	①③④
43	80 × 44	640 × 352	1280 × 1408	16	110K	6.6M/s	1,3,4,5	①③④
44	80 × 25	640 × 200	1280 × 800	2	15.7K	0.9M/s	1,3,4,5	①③
45	80 × 25	640 × 200	1280 × 800	4	31.3K	1.9M/s	1,3,4,5	①③
46	80 × 25	640 × 200	1280 × 800	16	62.5K	3.8M/s	1,3,4,5	①③

Notes on the display modes

These notes refer to the note numbers in the far right column of the table.

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 These modes are handled differently with a VGA or Super-VGA-type monitor. **If you are using such a 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.
- The bandwidths shown in the table for these modes are lower than these monitor types consume, because no allowance has been made for the blank lines.
- Early models of RISC OS computers (i.e. the Archimedes 300 series, 440, and 400/1 series, and the BBC A3000) scan these modes slightly slowly. Most VGA and Super-VGA-type monitors can still successfully lock onto this signal, but some may not. Furthermore, these models do not provide a **Sync Polarity** signal. This makes the effect of letterbox modes (see above) more severe.

4 Early models of RISC OS computers (i.e. the Archimedes 300 series, 440, and 400/1 series, and the BBC A3000) scan these modes slightly slowly when used with multi-frequency monitors.

5 These modes do not display graphics, and are provided for compatibility with BBC/Master series computers.

6 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.

7 These are gap modes, where the colour of the gaps is not necessarily the same as the text background.

8 This mode is not available in RISC OS 3.00. It provides a double-sized display suitable for use by visually impaired people. Unfortunately some applications may not provide correct displays when used with this mode.

Other considerations

You must check your *Welcome Guide* to see which monitor types and screen modes are valid for your computer hardware.

Modes

- **Modes 33 to 36** display pixels right to the edge of the screen, leaving no border. You may find that some pixels are lost at the edge. One use for these modes is in superimposing captions or other material on top of video signals, where it is important to be able to use the whole screen.
- **Modes 44 to 46** provide displays for the PC Emulator CGA modes at full height.
- **Modes 2 to 7** and **mode 10** are not used by the desktop.
- **Mode 32** has not been defined.
- In some high-resolution modes your screen may flash as your floppy disc drive is accessed; this is nothing to worry about.

Refresh rates

Modes have different refresh rates; normally the higher the refresh rate the less flicker is seen on the display:

- **Modes 0 to 22, 24, and 33 to 36** have a refresh rate of 50Hz.
- **Modes 29-31** have a refresh rate of 56Hz.
- **Modes 25 to 28 and 37-46** have a refresh rate of 60Hz.
- **Mode 23** has a refresh rate of 64Hz.

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 an attempt is made to select a mode which is not appropriate to the current monitor type, a suitable mode for that monitor is used. For example, an attempt to select mode 23 on a type 0 monitor will result in mode 0 being used.

The monitor type 'AUTO' is used by computers that can automatically identify the monitor type connected.

Appendix E: Formatting a hard disc

HForm is used to format discs that use either the ST506 or IDE interface.

Hard discs fitted to Acorn computers and hard discs supplied as upgrades, are supplied ready-formatted and it is not necessary to reformat them. However, you may want to reformat your hard disc at a later date. For this purpose, the application HForm is used. This is supplied on the App2.

Hard discs with a SCSI interface are formatted in a different way: for information on this, refer to the guide supplied with your SCSI Expansion Card.

Normally, during the formatting, HForm will prompt 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.

There may, however, be some occasions when it is necessary to enter the specifications of the hard disc. For example:

- If you are adding a new hard disc.
- If the hard disc has not yet been formatted.
- If the information on the hard disc has been corrupted or is incorrect.

If you need to alter the specifications of the hard disc, you should consult the manual accompanying your hard disc for its precise specifications.

How to format a hard disc

WARNING: Reformatting your hard disc will permanently remove all data stored on the disc. It is essential that data you wish to keep is copied to a floppy disc (or otherwise backed up) before the disc is reformatted.

In the following instructions it is assumed that you have to reformat your 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 the Escape key. 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.

For the purpose of this example it is assumed that your computer is fitted with a 53Mb Rodime hard disc. However, you do not need to know the manufacturer of your hard disc or its specifications, since you can just accept all the defaults offered.

There are two stages to formatting the hard disc:

- Entering the specifications of the hard disc; known as the hard disc shape.
- Entering the list of defects on the hard disc.

Entering the hard disc shape

1 Double-click on the HForm application.

2 HForm will then prompt you as follows:

```
HARD DISC FORMATTER
Format which drive (4 - 7)? 4 (press Return)
```

The internally fitted hard disc drive is numbered 4, while subsequent hard disc drives (if fitted) are numbered 5 to 7. If you want to accept the default drive number 4, press Return, otherwise type the desired number and press Return.

3 Once you have told HForm which hard disc you want to format, HForm checks the type of hard disc and displays the following or a similar message:

```
Drive 4 is an ST506 drive
This disc was last formatted using the standard shape
for a 53Mb Rodime RO3065
Do you wish to use this shape (Y/N) ?
```

IDE drives display drive-type information on the screen.

To continue with the formatting, type Y and press Return.

```
Old or New map format (O/N) ?
```

Most hard discs now use the new format; type N to continue with the formatting. IDE drives do not give you this option.

4 HForm now 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
A, B, C or D?
```

If you are simply formatting a disc, type A for the formatting to contine.

If you wish to add a defect to the disc's defect list continue with the next section.

Recording a list of hard disc defects

Skip this section if you don't want to add any defects to the hard disc defect list. 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.

After you press Return at the last option, HFORM will list the current defects (if any) on the hard disc and invite 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
```

1 To record a single defect on the defect list, select option C. If you have more than one defect to record and your disc is in D format, see the following section entitled *Recording more than one error on a* D *(old map) format disc*. If your disc is in E format, multiple errors can be added in any order.

2 Type in the defect address exactly as it appeared in the disc error message, but omit the colon.

3 When you have entered all the defects you wish to, select option A.

Continuing the format

1 You will now be asked if you want to:

```
Format or just initialise the drive (F/I) ?
```

To continue with the format type F.

If you are reformatting an existing hard disc, just initialising the disc will be sufficient. You only need to format the disc if it has never been formatted before, or if it was previously formatted using the wrong parameters.

2 At this stage you will be asked if you want to carry out a soak test. Soak testing repeatedly formats and checks the disc. It can be used to check that the state of the defects on the disc is stable.

```
Soak test the hard disc for defects (Long/Short/None) ?
```

If you want to carry out a soak test, type in either L or S and press Return.

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.

If you don't want to soak test, type in N and press Return.

3 This is followed by a further prompt:

```
Are you SURE you want to do this to drive <drive number>
(Y/N) ?
```

Type Y and press Return to start the format or initialisation.

4 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.

5 The final prompt is

```
Large file allocation unit? 512
```

Press Return to accept this default.

If you expect to use the disc for a very large number (several thousand) of small files, type 256 in response to this prompt. Other values can also be used.

The formatting process is now complete.

Recording more than one error on a D (old map) format disc

If you have more than one disc error to add to the defect list, you must add them in descending order of hexadecimal address, giving the hexadecimal values of the addresses as shown in the disc error message. When you have listed the disc errors, follow steps 1 to 4, as described in the previous section.

Formatting a previously-unformatted hard disc

Formatting a brand new, previously unformatted hard disc is different from reformatting a hard disc which had already been formatted. This is because you need to record the defects on the hard disc by (physical) cylinder, head and section address rather than by logical address (the hexadecimal address given in disc error messages). There are normally only two circumstances which may require this. These are when you need to

- establish an initial defect list on a brand new, previously unformatted disc
- re-establish the defect list in the unlikely event that it has become corrupted, for example due to a power failure during a previous format operation.

The information on the cylinder, head and sector address is kept on a written defect list which the manufacturer attaches to the body of the hard disc drive. To gain access to the written defect list you have to remove the top cover of the computer. Instructions on how to remove it and basic safety precautions are given in the documentation which accompanies your computer.

1 If there are no initial defects, select option A. Otherwise, to record the initial defect list, select option B.

   If you wish to add any defects by logical addresses (option C) you must do this before entering the defects by (physical) cylinder, head and sector address, i.e. by option B. This applies only to old map discs, i.e. those prepared in formats other than E.

2 Type in the defect addresses exactly as they appear on the list.

3 When you have entered the defects, select option A and follow the procedure described in the previous sections.

Appendix F: RISC OS file types

File 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 public domain 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	
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	DebImage	
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 variables	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	Lotus123
CE5	TEX file	TeX
CAF	IGIS graphics	IGIS
CAE	Hewlett-Packard graphics language	HPGLPlot
C85	JPEG (Joint Photographic Experts Group) file	JPEG

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

Appendix G: BBC BASIC

BBC 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. Several examples of programs written in BBC BASIC are provided on the Applications suite.

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 RISC OS 2.00. 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 will make use of a floating point expansion card 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 option 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:

```
BASIC64
```

Press Return, and the BASIC VI version and memory option will be displayed on the screen. If BASIC VI is not loaded you will get the error message:

```
File 'BASIC64' not found
```

If you get this error message then you should type:

```
SYSTEM:MODULES.BASIC64
```

Press Return, and the BASIC VI version and memory option will be displayed on the screen.

If you now get the error message

```
File 'system:modules.basic64' not found
```

then either you have not seen a !System directory, in which case you should open a directory display on the directory containing your !System, or your !System does not contain a copy of BASIC64. If you don't have BASIC64, you should update it from the !System on the applications discs.

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`.

New features in BASIC VI

The new 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 new 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 the *Applications Guide*.

Command line syntax for BASIC

The following pages describe in full the command line interface for BASIC V and BASIC VI.

*BASIC

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. This form of the command is used by Twin (the editor) when returning to BASIC.

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
```

*BASIC64

The command to enter the BASIC VI interpreter.

Syntax

```
*BASIC64 [options]
```

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
```

Appendix H: Fonts and the Font manager

RISC OS computers contain a range of fonts stored permanently in ROM. These fonts are used not only by the screen but also by all printers except for some PostScript printers such as the Apple LaserWriter which have their own built-in fonts. The fonts are controlled by a part of the operating system called the Font manager.

One of these fonts is a simple font used, for example, in Title bars and for filenames in directory displays: this is the System font. It is available in only one size. Applications such as Edit also use the System font unless you decide otherwise. This internal System font should not be confused with the outline fonts System Fixed and System Medium.

The other 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 'I' takes up less horizontal space than a wide letter, such as 'M'. Most computers store such fonts in the form of bitmaps (like Paint files) specifying which pixels the computer should paint in order to create the shape of the character. Storing fonts this way takes up a lot of memory, and when larger or smaller sizes are wanted, scaling is often unsatisfactory, producing irregular shapes.

The Font manager

Instead of bitmap fonts, where a font is made up of lots of tiny dots, the Acorn Font manager uses 'outline' fonts (like Draw files), where only the outline of each character is stored. When you request a font, the computer loads the outline font, scales it to the size you want, and fills in the outline. This produces much better effects when fonts are scaled.

As supplied, the font management system is set up to provide a reasonable blend of screen quality and performance for the majority of users (typically those with 1 or 2Mb RAM). However, it is possible to change the Font manager's settings to produce a system with different characteristics, as described below.

Anti-aliasing and hinting

The Font manager uses two techniques to improve the quality of fonts. The first of these is called 'anti-aliasing', and applies only to screen displays. If the outline of a character passes partially through a pixel, 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, say), or loading an Edit file. Press Menu, move the pointer to the **Display** submenu, and from there to the **Fonts** submenu. This will show a list of fonts available. Click on Trinity.Medium to display the text in an anti-aliased font.

To examine the display more closely, use the Magnifier application, described in the *Applications Guide*.

The Font manager uses a second technique to improve the appearance of fonts, one that applies both to the screen and to printers. This is called 'hinting'. The outline of the character being displayed (or printed) is subtly altered in ways that depend on the resolution of the image being produced. This is particularly effective when fonts are scaled, and when half-tones are not available, as on most printers.

The fonts supplied with your computer are held in Resources:$.Fonts. You can see which fonts are available at any time, with the Command Line command:

```
*fontcat
```

Font cacheing

From each outline font that is requested, the computer calculates the bitmap it needs to display the font at the desired size. It keeps as many of these 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 fonts that are in use at a given time, any extra fonts are loaded from the filing system as necessary.

Bitmaps are used because the computer can send these to the computer screen at a much faster rate than it can outline fonts.

The computer will attempt to retain in memory the fonts which are in greatest demand, but to do this requires some sophisticated guesswork. Since this is not always totally successful (the computer cannot read your mind!) there will sometimes be a delay when text is being drawn on the screen, as the font is loaded from the filing system.

Matching font performance to your needs

There is inevitably a trade-off between speed and font appearance. Since users' priorities and aesthetic judgements vary, RISC OS provides two ways of tailoring font performance to your needs and preferences. You can

- change the size of the font cache
- change the way anti-aliasing is done (or switch it off altogether).

Changing the minimum size of the font cache

If you are using a lot of different fonts, you can increase the minimum size of the cache, so that the text is drawn more quickly. This is done by setting the **Font cache** in the **Memory allocation** screen of the **Configure** application (to set it permanently) or by setting the **Font cache** size option in the Task Manager's **Task display** window (to set it for the current session only).

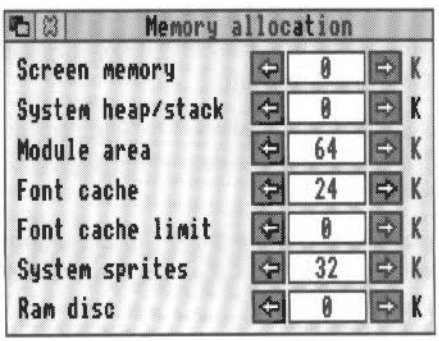
How to set the default font cache using Configure is explained on page 94.

The best size for the font cache depends on several factors: how much memory your computer has, whether you have a hard disc or not, and whether you are currently using many different fonts in an application. For example, a large application needs a font cache of about 64KB even in a 1MB computer, and can benefit from 128KB or 256KB in a 2 or 4MB machine. The default value is 32KB.

Allowing the font cache to grow

If the size of the font cache is too small, the Font manager will attempt to increase its size up to the maximum specified by the maximum font cache. If this happens it will then shrink 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 currently 'open' fonts.

The value for the maximum font cache size can be set using the **Font cache limit** option on the **Memory allocation** screen of **Configure**.

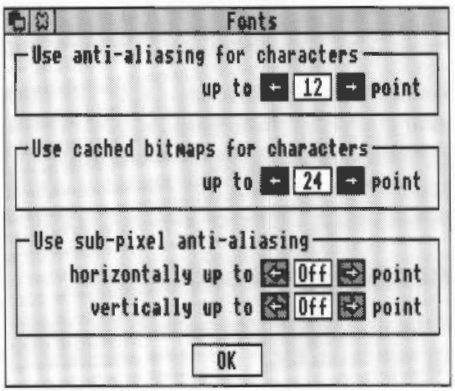


Controlling anti-aliasing and hinting

The effects of anti-aliasing can be fine tuned using the **Fonts** screen in the **Configure** application. Each parameter is specified in points and can be set for both screen and printer. How to set the Font configuration using Configure is explained on page 98.

Use anti-aliasing

This places 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. Its default screen value is 24 point in mode 12.



Use cached bitmaps

This specifies the largest font size which is to be kept in the font cache as a bitmap. Fonts larger than this will be drawn from outlines directly to the screen without cacheing and without anti-aliasing. If it is set high, and you are using a few large fonts – for headlines, perhaps – they may take up all the font cache, flushing out smaller fonts. You may find it most efficient to set this value to the size of the body text in your document.

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 have one of the larger and more powerful RISC OS computers, or are printing at a high resolution, you may wish to increase the values of this parameter.

Use subpixel anti-aliasing

This controls a refinement of anti-aliasing in which four separate versions of each character are retained. This can have a beneficial effect on the quality of characters at small sizes. However it is heavy on computing power and may result in unacceptably slow screen updates. Therefore this should not normally be changed from its default value of OFF.

Troubleshooting

If every repaint on the screen 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:

1. Increase the size of the font cache using the Task window. The addition of even small amounts of memory can often improve things dramatically.
2. Reduce the maximum size for anti-aliasing (or switch it off altogether). This will enable the font cache to be used more economically with a large number of fonts.
3. Reduce the maximum height of cached bitmaps value (or set it to zero). This should reduce disc activity, but the action of painting on the screen will become much slower.

Printing

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. Changing to screen mode 0 while printing, for instance, can speed it up considerably. As a general rule these remarks do not apply to PostScript printing, which operates in a different way.

Note also that if you have a non-PostScript printer, the parameter maximum height of cached bitmaps affects whether fonts are cached when printing. If the value in the Printer box 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.

Appendix I: The Fancy text file format

Fancy text format understands text printing options such as Paper feed, Title, Number lines, Print quality and Control codes. Plain text format ignores these settings.

The fancy text file format is mainly the same as the 1st Word Plus file format, and so most of the highlighting (in 1st Word Plus files) is printed correctly. This means you don't have to load 1st Word Plus to print out your 1st Word Plus files (although you can't print sprites).

The Fancy text file format

This section specifies the fancy text file format; it is of interest to advanced users only. The format consists of plain text with the following added special sequences. In a text file, the character sequence is a character that stands for the ASCII value given in brackets in the table below:

Character sequence	Meaning	Action
<8>	Backspace character	Backspace if possible
<9>	Tab character	Tabulate to next 8th column
<10>	Line Feed character	Possible end-of-line (depends on options)
<11><x>	Conditional page break	Page break if less than x-16 lines left on page, else a new line
<12>	Unconditional page break	Go to a new page (i.e. a page break)
<13>	Return character	Possible end-of-line (depends on options)
<24><x><y><n>	Footnote reference	Reference to footnote <n>, so print <n>. (x & y are ignored but must be present)
<25>	Soft hyphen	Always print a hyphen

Character sequence	Meaning	Action
<27>	Escape character	Start escape sequence
<28>,<29>,<30>	Soft space	Discard if precedes a <10>, <11>, <12> or <13>, else print a space
<31>	Format character	Start format sequence (reserved for Acorn use)
<127>	Delete character	Ignored

In a text file, the escape sequence is a character that stands for the ASCII value given in brackets in the table below followed by a binary number.

Escape sequence	Meaning
<27><%11000000>	Starts literal escape sequence. This is equivalent to <27><192>. A literal escape sequence is a sequence of characters which are sent directly to the printer – and hence are printer-specific. The sequence is ended by a <27><0>. A "||" pair sends a "|" character, a "|?" pair sends a <127>, and any other "|<x>" sequence sends <x AND 31>. Thus to send an escape character use "|[".
<27><%10fedcba>	If 'a' is 1 then bold style (on = 1, off = 0) If 'b' is 1 then light style (on = 1, off = 0) If 'c' is 1 then italic style (on = 1, off = 0) If 'd' is 1 then underline (on = 1, off = 0) If 'e' is 1 then superscript (on = 1, off = 0) If 'f' is 1 then subscript (on = 1, off = 0) This is equivalent to the range of escape sequences <27><128> to <27><191>.
<27><other>	Ignored

The file format is almost a subset of the 1st Word Plus file format, the basic omissions being headers and footers, and an incomplete implementation of footnotes.

Appendix J: 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.

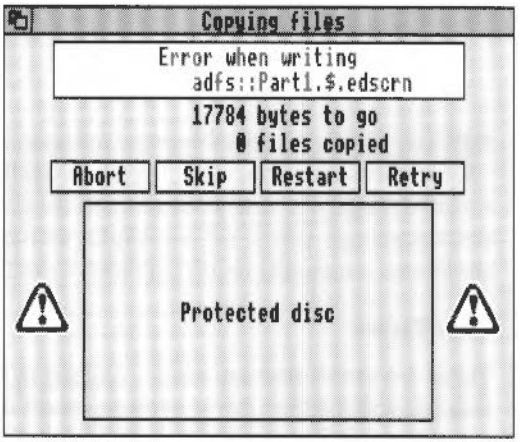
Internal errors

These errors are not caused by the user, 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.

The error message window

This is what a typical error message window looks like:

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 filer option. For an explanation of the filer options, turn to the section entitled *The Filer* on page 8.

Error messages

Ambiguous disc name

You either have two floppy discs with the same name, or a single floppy disc has been 'seen' by this machine, taken out and modified on another machine, and then returned to this one. Click on **OK** to tell the computer to regard the current disc as the right one.

Application needs at least xxx to start up

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 mode with a lower resolution and/or fewer colours;
- discarding the RAM disc (if you have one). See the appendix entitled *Getting the best out of* 1MB *computers* on page 207.

Bad wimp mode

You can't change to this screen mode.

Bad station number

You have tried to access a network file server, but you have used the wrong station number.

Can't rename as file <path>.<file>

This may occur when you try to rename a file with a name greater than ten letters. Files cannot have names greater than ten letters. Choose a name with less than ten letters instead.

Cannot transfer file (scrap directory not set)

The Filer needs to see !Scrap before it can transfer the file. Opening a directory display containing !Scrap will cure this problem.

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.

Data lost

There is a delay on the Econet. Try repeating the command that caused it. If the error happens repeatedly, ask your system manager for help.

Econet line jammed

The Econet is seriously overloaded: inform your network manager.

Econet transmission error

There is a delay on the Econet. Try repeating the command that caused it. If the error happens repeatedly, ask your system manager for help.

Econet station not listening

There is a delay on the Econet. Try repeating the command that caused it. If the error happens repeatedly, ask your system manager for help.

Econet not plugged in (no clock signal)

The Econet is not plugged in. Check the cable running from the socket at the back of the computer to the network socket.

File locked

You tried to do something forbidden to a locked file, such as delete it. You need to unlock it first if you really want to perform this action. The Access option on the Filer/File menu unlocks files.

File not found

The file you have requested has not been found. Make sure that the file exists and then try again. If this message appears when you are using the Econet network, refer first to section entitled *Networking* on page 42.

File open

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.

Font cache 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.

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. Discs are compacted using the *Compact command. See the Command Line section of this guide for the *Compact command.

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 free printer server of this type

This can sometimes be caused by network broadcasts going wrong. Repeat the command you used.

No reply from Econet station

There is a delay on the Econet or the Server is off net; try repeating the command that caused it. If the error happens repeatedly, ask your system manager for help.

No run action specified for this file type

Before a file belonging to an application can be loaded, its application must have been 'seen' (shown on a directory display) at some time in your session. This error message appears when this has not happened. To prevent this error occurring, keep your applications in the root directory of your disc(s), or include statements in your !Boot file that will cause !Boot files in the relevant subdirectories to be run when you power on.

Not enough memory for system variable

The area of memory reserved for the system heap has all been used. Use the Task manager to reserve more space for the System heap/stack. Note that the heap/stack can claim memory automatically from **Free** but not from **Next** slots.

Not enough memory in module area

The area of memory reserved for relocatable modules (the RMA) has all been claimed. Use the Task manager to reserve more space for the module area. Note that the screen/RMA can claim memory automatically from **Free** but not from **Next** slots.

Not enough memory in sprite area

The area of memory reserved for the sprite area has all been claimed. Use the Task manager to reserve more space for the sprite area.

Not enough memory on system heap

The area of memory reserved for the system heap has all been used. Use the Task manager application to reserve more space for the System heap/stack.

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.

Printer busy

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.

Protected disc

The floppy disc you are trying to access is write protected. Move the write-protect tab and try again.

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.

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Reader's Comment Form

RISC OS 3 *User Guide*
0496,075

We would greatly appreciate your comments about this manual, which will be taken into account for the next issue.

Did you find the information you wanted?

Do you like the way the information is presented?

General comments:

If there is not enough room for your comments, please continue overleaf

How would you classify your experience with computers?

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RISC OS 3
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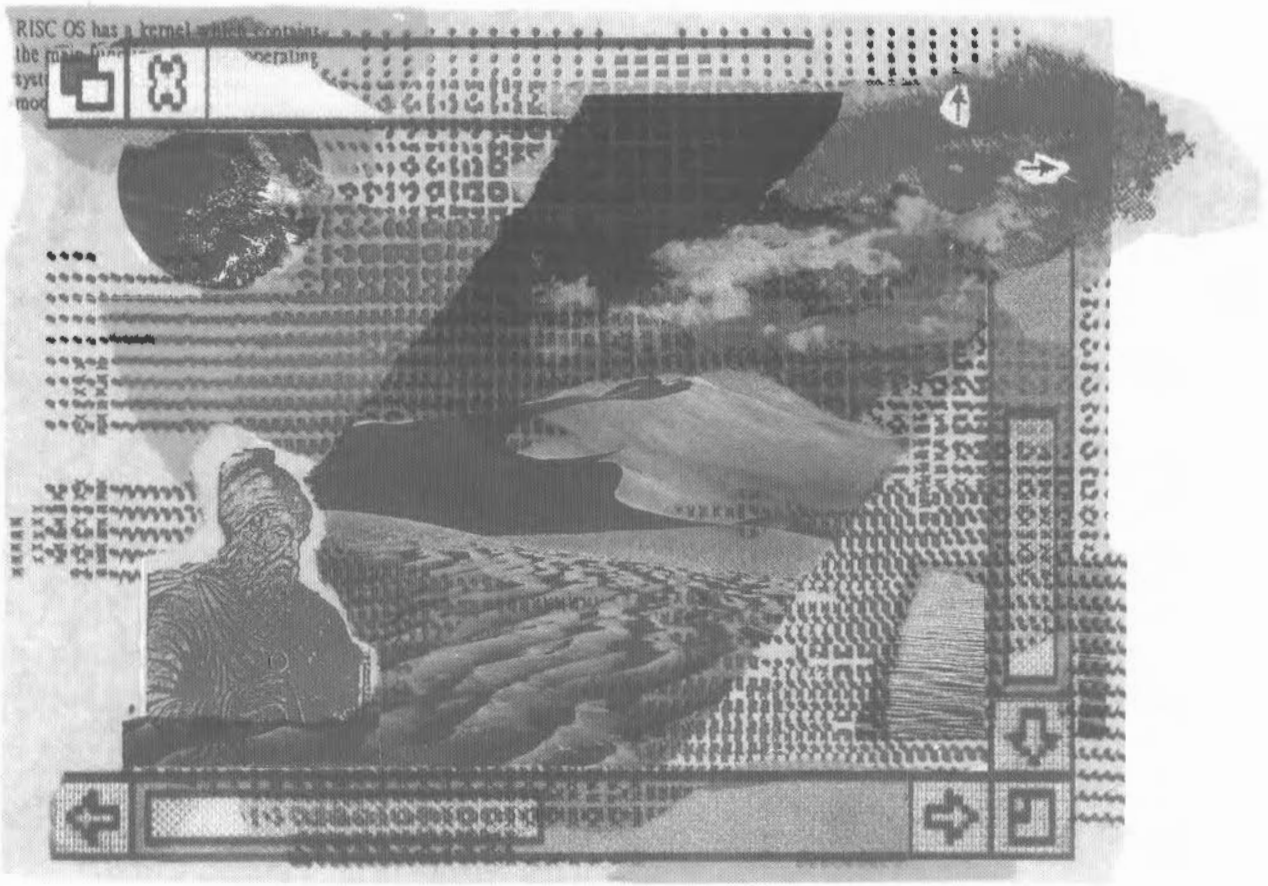


Acorn

Contents

Introducing the Applications Suite

This guide describes the suite of applications provided with RISC OS 3. Some additional applications (detailed below), which are also supplied and are closely related to the functioning of the operating system, are described in the RISC OS 3 *User Guide*.

The Applications Suite is a set of programs that introduces you to some of the capabilities of your RISC OS computer (and which are useful and powerful utilities in their own right). Some of the applications are stored permanently inside your computer, and do not have to be loaded from a disc; these are sometimes called ROM applications, since they are stored in the computer's ROM (Read-Only Memory). You can view these applications by clicking Select on the **Apps** icon on the icon bar.

Most of the rest of the Applications Suite is supplied on two Applications directories, App1 and App2.

Each of the applications supplied is covered by a separate chapter in the Guide. Next to the title of each chapter we print either the Apps icon, or a picture of a directory or disc, to indicate where the application is to be found.

Additional applications can also be found on the floppy disc labelled Support.

This Guide assumes that you are familiar with the mouse and with the general features of the desktop, such as windows, icons and menus. These are described in the RISC OS 3 *User Guide* and in the *Welcome Guide* supplied with your computer.

The Applications Suite

Major applications

Four major applications are included:

- *Edit* – a text editor
- *Draw* – a drawing program
- *Paint* – a painting program
- *Maestro* – a music composition program, which enables you to transcribe and play music in up to eight voices.

Desktop tools

Eight desktop tools are included:

- *Alarm* – a versatile alarm clock
- *Calc* – a simple four-function calculator
- *Chars* – enabling you to use special characters that are normally not available on the keyboard
- *Clock* – an analogue clock face
- *Help* – providing context-sensitive help on the desktop
- *Magnifier* – enlarging a portion of the screen
- *SciCalc* – a calculator incorporating scientific functions.
- *Change*FSI – an image conversion program that converts image files created on other systems into sprite files for use with the Paint application.

Emulators

Two applications which enable you to run BBC Model B software:

- *65Host* – emulating a BBC B Microcomputer
- *65Tube* – emulating a 65C02 second processor attached to a BBC B Microcomputer.

Utilities

Nine utilities are included to assist your productivity:

- *PrintEdit* – allowing you to set up your own particular printer configuration for use with the Printer Manager
- *SetIcons* – defining which set of desktop icons are to be displayed
- *Squash* – a file compressor, enabling you to fit more files on your discs
- *TinyDirs* – the desktop filing utility
- *Usage* – enabling you to observe the processor activity of your computer
- *AlarmConv* – converting old Alarm data files into the new format used by the Alarm application
- *TVTest* – a TV test card, useful for setting up monitors and televisions
- *HForm* – a utility that lets you format your hard disc
- *TIToFont* – allows you to convert Adobe Type 1 fonts into Acorn Outline fonts.

Games

Finally, if some of these seem a bit too serious, three programs are provided for your entertainment:

- *Patience* – the familiar one-player card game
- *Puzzle* – another test of skill and patience
- *Madness* – a more passive amusement.

Applications described in the *RISC OS 3 User Guide*

The following programs, although included as part of the Applications Suite, are described in the RISC OS 3 *User Guide*, as they are closely associated with the operating system:

- *Configure* – an easy way of changing some of the settings used when the machine is switched on; how loud the beep sounds, for instance.
- *HForm* – to format a variety of hard discs.
- *Printers* – the Printer manager described in the chapter *Printing*, enabling you to print your work on a number of different types of printer.
- *FontPrint* – to convert Acorn outline fonts to PostScript fonts so that they can be downloaded to a PostScript printer.
- *!System*, *!Scrap* and *!Fonts* – directories containing resources used by other programs; these are also available for use by your own programs.

ReadMe files

Information on any changes that have been made to disc-based applications since this guide was published, will be included in a ReadMe file on the Applications disc. To read this file, load it into Edit, as described in *Loading files* overleaf.

Loading applications

Before you load an application, you first need to display the directory containing it. If it is a ROM application, display the Apps directory by clicking Select on the Apps icon on the icon bar.

If the application is on a floppy disc, insert the disc that contains it and click on the disc drive icon. If you have a hard disc, you can copy any of the disc-based applications onto it using the instructions in the chapter entitled *The desktop Filer* in the RISC OS 3 *User Guide*; this will make them even easier to load.

You can load an application in either of three ways:

- double-click on its icon in a directory display
- drag the icon downwards onto the icon bar
- double-click on one of the data files associated with an application.

The application may either start running immediately, creating any windows it needs, or it may set itself up on the icon bar. In the latter case, the application is running, in the sense that it has been loaded into memory and is executing, but it is in a passive state, waiting for you to do something, such as opening a new page, loading a file or clicking Menu on the icon.

Loading files

You load a file into an application in the same way: by double-clicking on it or by dragging it onto the appropriate icon on the icon bar.

By double-clicking

When you double-click on a file which is not an application, this is what happens:

1 The computer looks at the file type. If it recognises it, the computer decides which application the file should be loaded into, and loads it. If it is not a known type, an error message is displayed ('No run action specified for this file type'), and the file is not loaded.

   This will happen if the computer has not 'seen' the application icon in the current work session. The computer knows where all the ROM applications are, but if it is not a ROM application you will have to put in the disc containing the application and then display the application icon on the screen. Thereafter, it will remember on which disc the application is stored if it needs it again, until you reset or switch off the computer.

2 If the application is not currently running, the computer will first load it and start it running, and then load the file into the application. If the computer cannot find the application, an error will be displayed.

3 The file is loaded by the application. The exact action now depends on the particular application, but typically a new window will be opened and the contents of the file displayed in it.

By dragging

A second way of loading a file is by pressing Select or Adjust on the file, and dragging until the mouse pointer is over an icon on the icon bar. If possible, the file will be loaded into the application you have dragged it to, normally in a new window.

You can also drag a file into an existing window of an application. Depending on the application, this will either open a new window for the file, insert the file into the existing contents of the window (replacing the old contents of the window), or insert the contents of the file at the insertion point.

When you load a file by dragging, it is up to the application whether to accept it. For example, the text editor Edit will allow you to load almost any type of file (though you will not be able to do much with some of them!), whereas Draw only permits a narrow range of file types. The application to which you drag a file can be different from the standard one for the type of file. An example of this is the sprite file type, which by default works with Paint (and therefore will be loaded into it on double-clicking), but which may also be dragged into Draw.

Saving files

Many applications use a standard method for saving files. There are two main variants to the method:

- Saving by dragging.
- Saving by specifying a pathname.

In both cases, saving is chosen from a sequence of menus that normally leads to a dialogue box (usually called **Save as**) containing an icon, an **OK** button and a box into which you can type the name you want to give the file. The filename that appears in the box will be the name of the file that was originally loaded (if one was), or a standard name for new files, such as `DrawFile`. You can change these names if you want to.

You can use either method for saving new files that have not been previously saved.

Saving by dragging

This is the easiest way to save a file – usually one which has not been saved before.

To save a file by dragging:

1. Open a directory display for the destination of the file (**where** you want to save it to).
2. Call up the application's **Save as** dialogue box.
3. Check the name under which the file will be saved. Change it if you need to.
4. Press Select or Adjust on the file icon and drag it to the destination directory display.

Saving by pathname

To save a file by pathname:

1 Call up the application's **Save as** dialogue box.

2 Check the name and the pathname of the file, and change it if you need to. The pathname must contain at least one directory name.

3 Press Return or click on the **OK** button. The file will be saved in the location indicated by the pathname.

Saving files which have been saved before

If you have saved a file before, you can still use either of the above methods, but there are easier ways:

- You can save a file under its existing name by opening the **Save as** dialogue box and just pressing Return or clicking **OK**. The existing file name and pathname will be used again.
- You can also just click on the **Save** option in the main menu; this will have the same effect as clicking on **OK** in the **Save as** dialogue box. However, it should be noted that in applications such as Edit and Draw where you can mark part of your document as a selection, clicking on **Save** in this way will save the whole file, not just the selection.

Saving on closing and quitting

When you close a window or quit an application, you may be asked if you want to **Save** any changes you have made. If you do, a **Save as** dialogue box will be displayed. Use it exactly as described above. If you don't want to save the changed file, click on **Discard**; this closes the file and your changes are lost.

Transferring data between applications

The techniques used for loading and saving 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

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.

Quitting applications

If you want to stop using an application for a short while, but want to start using it again later, simply close any application windows that may be open. This leaves your screen uncluttered by unused windows. In most, but not all, applications, you will have to save the files you have been working on first. Another way is to 'iconise' the applications window using Pinboard (see the RISC OS 3 *User Guide* for details). With both these methods the application is still in your computer's memory – signified by the application's icon still being on the icon bar. To start using the application again, just click on the application's icon. Double-click on an iconised application's icon to start using it again.

If you want to finish using an application permanently, click Menu over the application's icon on the icon bar and choose the **Quit** option. This removes the icon and clears the application from the memory. To restart the application you must double-click on its icon in the appropriate directory display.

Documents and document icons

Some of the programs in the Applications Suite produce 'documents': files containing the text, drawing, image or tune you have edited or produced. In each case, the documents have a distinctive framed icon which allows you to relate it visually to the application (or 'editor') which produced it so you can tell at once what the filetype is. Here are the icons used by Edit and Draw.

Edit icon 

Text file icon 

Draw icon 

Draw file icon 

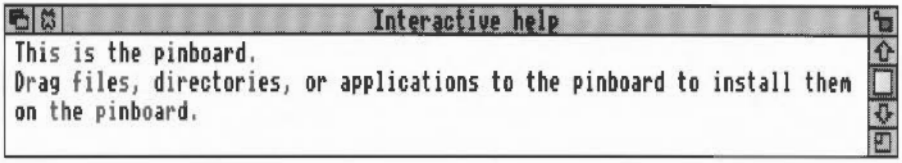
Getting help

This guide tells you how to use the applications supplied with RISC OS 3. As mentioned before, additional applications, which relate more closely to the operating system, are described in the companion RISC OS 3 *User Guide*.

An introduction to using RISC OS, and to your computer, is provided by the *Welcome Guide* supplied with the computer. The *Welcome Guide* also has a useful Glossary of computer jargon, and a Chapter on basic fault-finding.

The !Help application

The Help application is a program that displays information about other 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. To start Help, double-click on its icon in the directory display. A Help icon appears on the icon bar, and a window entitled **Interactive help** is displayed.



This window will contain information about whatever the mouse pointer is over, though not all applications and parts of the desktop make information available. As you move the mouse to a different part of the desktop or application, the information changes.

You can remove the interactive help window by clicking on its Close icon. To redisplay the window, click Select on the Help icon on the icon bar. To close down Help altogether, choose **Quit** from the Help icon bar menu.

The Help option

On the main **Filer/Application** submenu there is a **Help** option. Click on this to obtain helpful information about an application. This option may be greyed out if the application does not have a help file.

Help on *Commands

If you want to find out about a particular *command, press the F12 function key to go into command line mode and then type *Help followed by the command you want help on and then press Return. To return to the desktop press Return on a blank line. The following example shows help for the keyword Help.

```
*Help Help

==> Help on keyword Help
*Help <subjects> attempts to give useful information on the selected topics.
Special keywords include:
Commands        List all the available utility commands
FileCommands    List all the filing system-specific commands
Modules         List the module titles
Syntax          Explain the syntax message format
*
```

Shared features in the Applications Suite

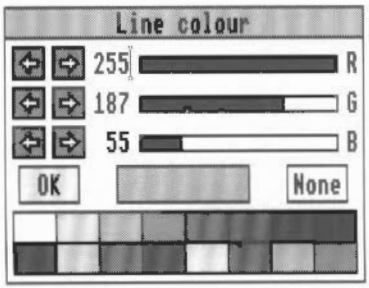
Several Applications Suite programs have features in common. Rather than explain these separately for each application, a description of the common features is given here. Remember, too, that the procedures for loading and saving files are similar in all the applications.

Keystroke symbols in menus

In many applications, frequently-used menu options can be chosen from the keyboard, with a set of keystroke equivalents, listed at the end of each chapter. These equivalents are also shown on the screen menus, where two symbols are used: ⇑ represents the Shift key, and ^ represents the Ctrl key.

The colour dialogue box

Draw and Paint (the latter in the Edit Palette facility) both make use of dialogue boxes for selecting colours for the picture being edited. Here is a typical colour dialogue box.



At any time, there is a range of sixteen standard colours. In addition, you can mix new colours. In screen modes which have fewer than 16 colours, some of the colours may be replaced by patterns.

The standard colours are shown in the patches at the bottom of the dialogue box. To choose a standard colour, click on the patch, and then click on **OK**.

To mix your own colour, you must set the intensities of red, green and blue in it. Each intensity is expressed as a number in the range 0 to 255. There are three ways of adjusting them:

- Drag a slider to the level you want.
- Click on the number next to a slider, and type in the new value.
- Click on the left and right arrows.

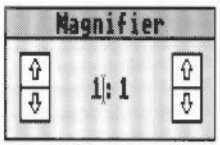
You can start off by clicking on a standard colour, then fine-tuning it to get the colour you want. As you mix a colour, it is shown in the colour mixing box next to the OK button. When you have selected the shade you want, click **OK**.

The colour displayed on the screen is the best approximation available in the current screen mode to the shade you select. The exact colour may be recorded by the application, so that it is displayed more accurately if you change to a screen mode which has more colours. 256-colour modes (such as mode 15) can often provide a good approximation.

Some colour dialogue boxes have a special entry used to specify that no colour is to be used. This takes the form of a box marked **None** to the right of the colour mixing box. To choose it, click on **None**, and then on **OK**.

The magnifier dialogue box (or Zoom)

The magnifier dialogue box (chosen from the Zoom option) is used for scaling the size at which a picture is displayed in Draw and Paint. An example magnifier is shown below.



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 magnification ratio either by clicking on the up and down arrows, or by typing in a new value at the caret.

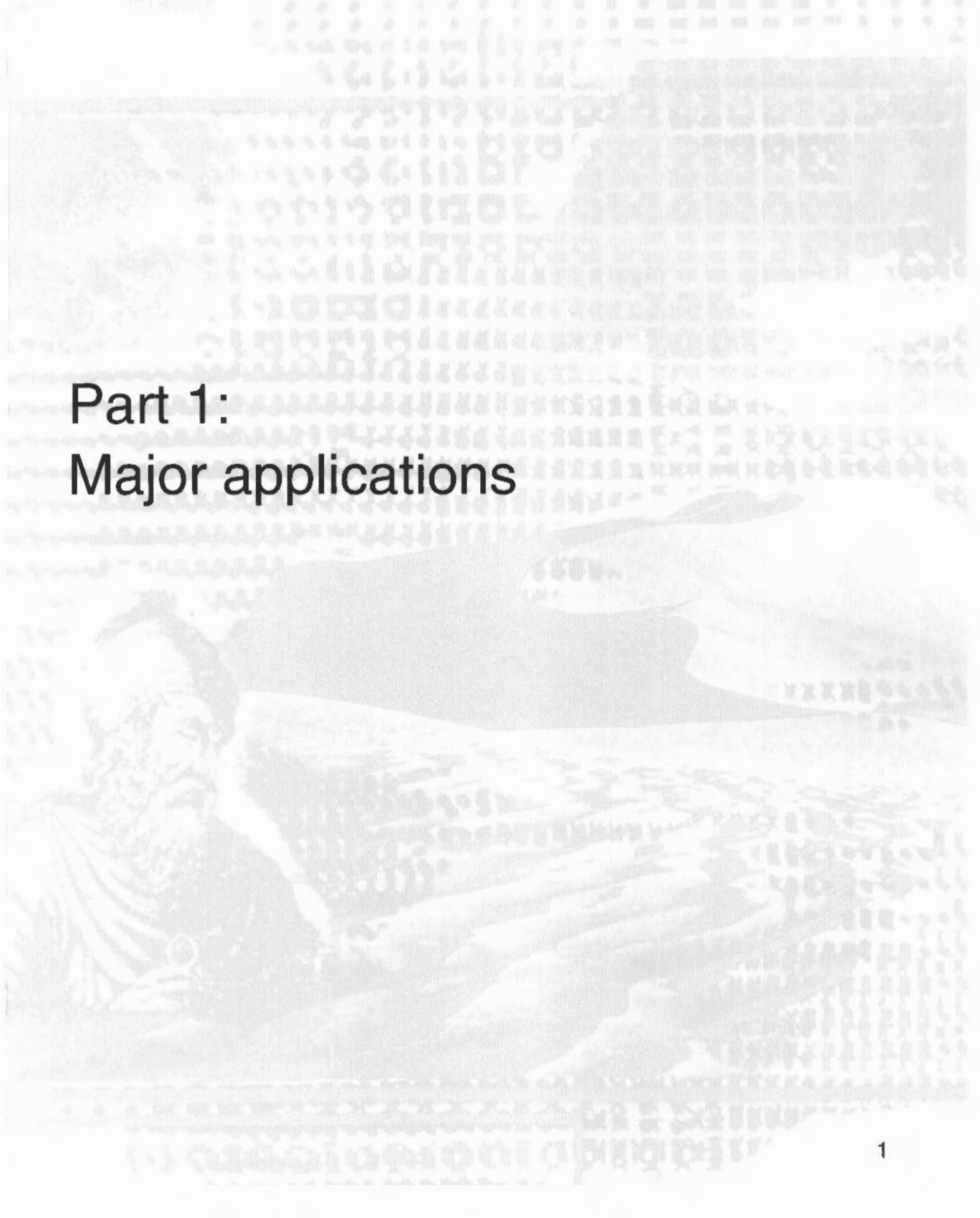
Setting application options in Boot files

All of the programs in the Applications Suite can have their current state saved in a Desktop boot file. This state includes any options that may have been set and the size and position of the application windows on screen.

Subsequently, clicking on the Desktop boot file will automatically restore your screen to its previously saved state. You can also configure the Desktop boot file to be run automatically each time the computer is turned on.

You can easily overwrite your Desktop boot file accidentally. Always keep a backup. More information about using Boot files is contained in the chapter entitled *Desktop boot files* in the RISC OS 3 *User Guide*.

Part 1:
Major applications



1 Edit

Edit is a text editor; you can use it to create and edit plain text, and to generate simple textual documents and command scripts.

Edit is also a BASIC program editor. It automatically converts BASIC programs into text format for editing, and then converts them back again when they are saved.

Edit is not a word processor: although it has many sophisticated features for handling text, word processors offer many additional facilities such as pagination and page layout control, style changes such as italic and underlined text, or continuous formatting.

Edit is controlled (like most RISC OS applications) from a set of menus. However, many menu choices are available directly from the keyboard, and once you are familiar with Edit, you may find that you prefer this method. These keystroke equivalents are listed at the end of this chapter.

Starting Edit

Edit is loaded in the same way as the other ROM applications.

1 Click on the Apps icon on the icon bar to display the Apps directory.

2 Double-click on the !Edit icon to install it on the icon bar.

3 Click on the Edit icon bar icon to start a new document.

Edit is a universal editor, which can edit and display most types of file:

- To edit an existing text file document, drag the file icon to the Edit icon on the bar, or double-click on it.
- To edit any other file type, drag the file icon to the Edit icon on the bar, or hold down the Shift key and double-click on it. BASIC files will be de-tokenised, and displayed as text.

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 will appear when you start typing. You can open more Edit windows, but only one of them will have a caret in it: this is called the **current window**. It is also identified by the fact that parts of its border appear in cream rather than grey. You can type only in the current window.

You can easily move from one window to another, simply by moving the pointer over the window you wish to use and then clicking Select.

If you type in some text without pressing Return at all you will find that the window scrolls sideways (if your Edit window is smaller than the size of your screen). You can break your text into lines by pressing Return. Alternatively, click on the Toggle Size icon to extend the window to the full screen and avoid having to scroll sideways. There is another way of getting all your text into the window, using the **Format** option; this is described on page 15.

As you type, you will notice that Edit fills the current line and then carries on to the next line, often breaking words in the middle. Ignore this for the moment, as there is a menu option, **Wordwrap**, that will take care of it, and this will also be described later.

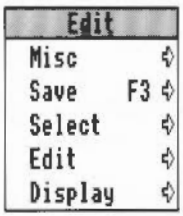
Inserting and deleting text

To insert or delete text, position the caret where you want to make the alteration by moving the pointer there and Clicking Select. You can insert text simply by typing. If you want to delete a character, position the caret immediately after it and press either Backspace or Delete; hold the key down and auto-repeat will come into effect, deleting more characters. If you want to delete characters to the right of the caret, press the Copy key.

There are quicker ways of deleting a lot of text – see *Manipulating blocks of text – the Select menu* on page 6.

Edit menus

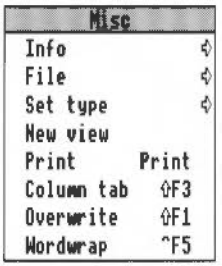
The top level menu contains the following options:



The Misc menu

This menu offers eight options:

Info tells you about Edit, including the version number of your copy of the program.



File gives information about the file you are working on, in particular

- whether it has been modified since you last saved it
- what type of file it is; a text file or a command file, for example (its icon, if it has one, is also shown)
- its name, including the full directory pathname
- its size, in number of characters
- the time and date it was last saved (or if you have not saved it yet, the time and date when it was first created).

New view opens a second window on the same text (you can in fact open several views, not just two; the total number of views open appears in the Title bar of each window, after the filename). This allows you to look at two parts of the same document, and makes many actions such as copying from one part of a document to another much easier. This feature is particularly useful with large documents. Remember that you are looking at one document, not at two separate copies of it: to illustrate this, try looking at the **same** part of a document in two views (**not** the way you will normally use **New view**!); enter some changes in the first view and you will see the same changes appearing in the second view.

Set type allows you to set the type of the file you are currently editing. For example, a text file will have the file type `Text`, and a BASIC file the file type `BASIC`.

Print sends the document to the currently activated printer driver. See the section entitled *Printing an Edit file* on page 17 for more information about how to print. The Printers application must be running to enable you to print.

Column tabs switches on a different type of tab insertion: this is explained in the section entitled *Laying out tables: the Tab key* on page 17. When this option is on, it is ticked in the Misc menu and 'ColTab' appears in the Title bar.

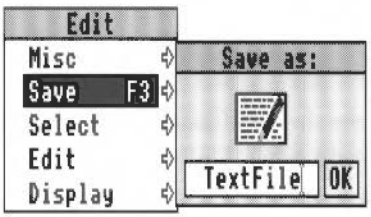
Overwrite, when switched on, means that each character you type replaces the character at the cursor, instead of pushing the cursor aside and inserting the new character. When this option is on, it is ticked in the Misc menu and 'Overwrite' appears in the Title bar.

Wordwrap prevents words being split over line-ends as you type. When this option is on, it is ticked in the Misc menu and 'Wordwrap' appears in the Title bar. Words are wrapped when they exceed the number of characters given in the **Format text** box.

Do not confuse this option with **Window wrap**, selected from the Display submenu: Wordwrap, unlike Window wrap, inserts a newline character (which is there although you cannot see it on the screen) when the cursor moves to a new line.

Saving text: the Save menu

The Save menu allows you to save a complete file; you can also save part of a file using the Select menu, described below.



The procedure for saving is common to many applications, including Draw and Paint, and is described in full in the chapter entitled *Introducing the Applications Suite* on page ix.

In order to save a file in the easiest way, you need to have on the screen the directory display for the directory where you want to save the file. Click Menu over the Edit window, and move to the **Save** submenu. A dialogue box appears, containing an icon, the current filename, and an **OK** button. If the file has not been saved before, Edit offers you a default filename of 'TextFile'. If you want a different name, use Backspace or Delete (or press Ctrl-U) to delete TextFile, then type in the name you want. Place the pointer on the icon in the box and drag the icon into the directory display where you want to keep the new file. An icon for the file then appears in the directory window.

This action assigns a full pathname to the file, as you will see from the Title bar of the Edit window. When you have made some changes to the text and want to save the file a second time, use the Save option again, but this time, provided you want to use the same filename, you can save the file by clicking the **OK** box. Saving the file with the same name overwrites your old file with the new information.

You can also save **part** of the text, typically for printing or transferring to another application, using the **Select/Save** option, described in the next section.

Manipulating blocks of text – the Select menu

You can select blocks of text, then manipulate them in various different ways.

The simplest way to select a block is to position the caret where you want the block to start, click and hold down the Select button, then drag the pointer to the end of the block and release the button. The selected block of text is highlighted.

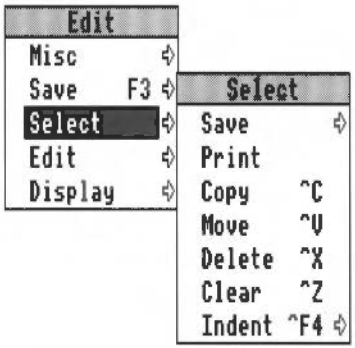
If necessary, you can then use Adjust to 'adjust' the ends of the block. Position the pointer exactly where you want the block to start or finish, click Adjust and the block lengthens or shrinks accordingly. This is particularly useful when you want to

select a block that extends beyond the part of the text you can see in the window. Select a few words or lines at the start of the block, scroll until you can see the point where you want the block to end, place the cursor there and click Adjust.

Here are some other ways of selecting blocks of text:

To	Do this
select a single word	double-click Select
select a single line	triple-click Select
extend block to whole word	double-click Adjust
extend block to include current line	triple-click Adjust

Once selected, text can then be saved, copied, moved, deleted, de-selected (cleared) or indented by choosing options from the Select menu:



To **Save** a selected block, move to **Save** from the Select menu, and follow the standard saving procedure. Use this option to copy a selection into another Edit window; open a new window and drag the icon into it. The copied block will appear after the current caret position in the destination window. The caret is also moved to the end of the copied text.

To **Print** a selected block of text, click on the Print option. See the chapter called *Printing* in the RISC OS 3 *User Guide* for information on printing.

To make a **Copy** of a selected block of text, select (highlight) your block of text and then position the caret where you want the copy inserted, then call up the **Select** submenu and click on **Copy**. The original block remains selected. Keep clicking on **Copy** to make as many copies as you want.

If the caret is already at the position where you want the copied block to appear, press and hold Ctrl while making the selection in the usual way. Copy the block by pressing Ctrl-C. This way you can make a selection without moving the caret.

If you copy to a position inside a selected block, both the original and the new copy remain selected. If you then make multiple copies you will get double the number you indicate. This may happen accidentally if you position the caret immediately to the right of a selected block ending in a newline character: because the newline character does not appear on the screen it is not highlighted, but is still part of the selected block. To undo an action, choose **Undo** from the Edit menu.

To **Move** a selected block of text, select your block of text and place the caret where you want the text moved to, then click on **Move**.

If the caret is already where you want the block to end up, press and hold Ctrl while making the selection in the usual way. Then still holding Ctrl, press V, and the block will be moved to the caret position. This way you can make a selection without moving the caret.

To **Delete** a selected block of text, click on **Delete**. The marked block then disappears. (**Undo** – in the Edit menu – allows you to reverse any changes or deletions made in the Select menu).

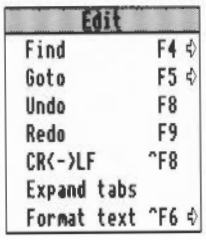
To **Clear** or 'deselect' a block of text you have previously selected, click on **Clear**. The highlighted block reverts to normal and the block is no longer selected.

Indent allows you to indent a selected block of text. The indent is defined in character spaces. You can also use Indent to add a text prefix to the beginning of each line of a block.

To indent a selected block of text, call up the Indent submenu, then type in a number.

- 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 NB, 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.

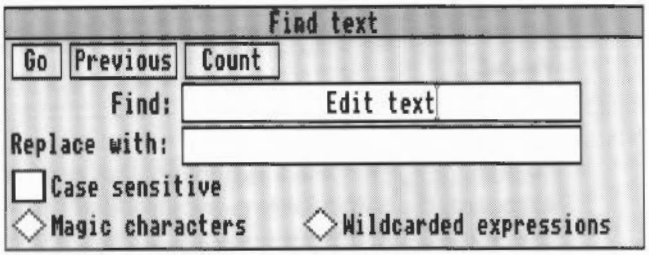
The Edit menu



The first option in the Edit menu is **Find**. At its simplest, this allows you to locate any character(s) in your file. You can also use it to replace text with other text. To make sure that the search is complete, always position the caret at the start of the file before giving the Find command. In the following description, the text being searched for is referred to as a 'string'; it may consist of any sequence of letters, numbers, spaces or other characters.

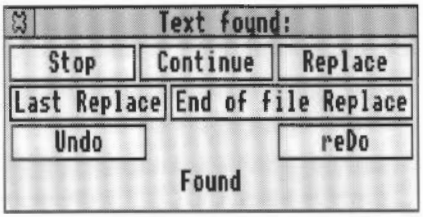
Searching for a string of characters

To use Find without doing anything with the found string, choose **Find** in the Edit submenu: the **Find text** dialogue box appears, with the caret in the **Find** box. Type in the string you want to locate and press Return. The caret then moves to the **Replace with** box.



Since on this occasion you do not want to replace the found strings with anything, either click on **Go**, press Return or press **F1**.

Edit finds the first occurrence after the caret of the word in your file, then displays the **Text found** dialogue box, indicating the operations available.



To look for the next occurrence of your string, click on **Continue**. To abandon the search, click on **Stop**, or press Return or Escape.

Replacing a string of characters with a new string

To use Find for replacing a string with a new string, go to the **Find text** dialogue box as before, but this time, insert the new string into the **Replace with** box. Then press Return, and the **Text found** dialogue box appears.

Click on **Replace** to substitute the new string for the old string; if you do not want to change this particular occurrence of the old string, click on **Continue** and Edit moves on to the next one.

If you click **Last Replace**, Edit replaces the currently found instance of the string, but does not search for further occurrences.

If you click on **End of file Replace**, Edit finds and replaces all occurrences of the string from the present one forward to the end of the file, without stopping at each one for instructions.

Clicking on **Undo** takes you back to the last string replaced and returns it to the original version; click **reDo** to change it back again.

The display at the top of the dialogue box keeps you informed of the state of the search; if Edit cannot find the word you have specified, it displays the message **Not Found**.

Using keyboard shortcuts

Besides using the Select button, you can control all these options from the keyboard; the particular keys are indicated by the capital letters in the dialogue box. Press S and the search **S**tops, press C and it **C**ontinues, D and it will re**D**o, and so on. Pressing Escape or Return also stops the search and removes the **Text found** window.

Other useful facilities

Note that you can use Find to delete strings in a text, by entering nothing in the **Replace with** box, and clicking on **Replace** in the **Text found** dialogue box, thus replacing the found string with nothing: deleting it, in effect.

There are several other useful facilities in the **Find text** dialogue box:

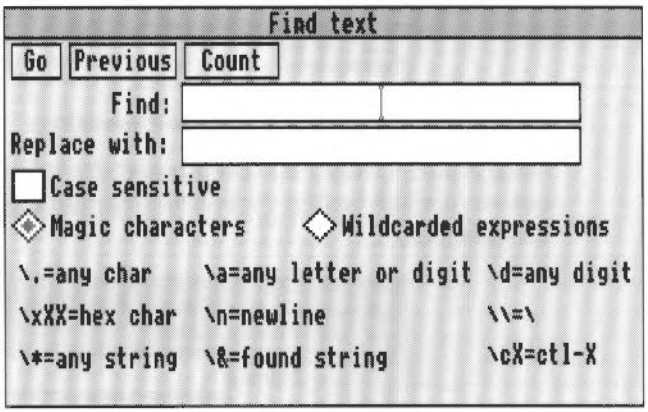
- You can carry out the last Find and Replace operation again, by clicking **Previous** (or by pressing F2).
- You can specify a string and ask Edit to count the number of times it occurs in your file (from the caret position to the end of the file) by clicking on **Count** (or by pressing F3).
- By default, Find makes no distinction between upper and lower case characters – Hello will match to both HELLO and hello, or for that matter, hELLo – you can specifically ask it to match case by clicking next to **Case sensitive** (or by pressing F4). Hello will then match only Hello. Case sensitivity remains selected until you deselect it by clicking again.

Magic characters and their meanings

You can also use the Find facility to search for classes of characters. To activate this feature, click on **Magic characters** (or press F5) in the **Find** dialogue box.

Magic characters are indicated by a \ character, as shown in the lower half of the dialogue box, which shows you the available characters.

Type these characters in directly as shown in the window.



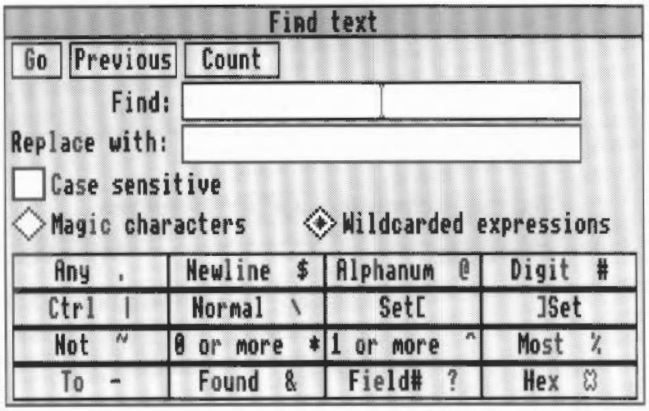
The magic characters operate as follows:

Character	Meaning
`\*`	matches any string (including a string consisting of no characters at all). This is really only useful in the middle of a search string. For example, `jo\*n` matches `jon`, `john`, and `johaan`.
`\a`	matches any single alphabetic or digit character. So `t\ap` matches `tip`, `tap`, and `top`, but not `trap`.
`\d`	matches any digit (0 to 9)
`\.`	matches any character at all, including spaces and non-alphabetic characters.
`\n`	matches the newline character (remember that to the computer, this is a character just like any other).
`\cX`	matches Ctrl-X, where X is any character.
`\&`	is used in the **Replace with** box to represent the **found string**: the string matched in the search. This is particularly useful when you have used magic characters in the Find string. For example, if you have searched for `t\ap`, and you want to add an s to the end of all the strings found, `\&s` in the **Replace with** box will replace `tip`, `tap` and `top` by `tips`, `taps` and `tops`.
`\\`	enables you to search for a string actually containing the backslash character `\` while using magic characters. To search for the strings `cat\a` or `cot\a`, enter `c\at\\a`.

Character	Meaning
\xXX	matches characters by their ASCII number, expressed in hexadecimal. Thus \x61 matches lower-case a. This is principally useful for finding characters that are not in the normal printable range.

Wildcarded expressions and their meanings

There is also a facility for specifying wildcarded expressions in search strings. In order to use this facility, click on **Wildcarded Expressions** (or press F6) in the **Find** dialogue box.



Click on the wildcard character you wish to enter and it is copied into the text box.

The wildcard characters operate as follows:

Character	Icon name	Meaning
.	Any	matches any single character
$	Newline	matches linefeeds
@	Alphanum	matches any alphanumeric character. A to Z, a to z, 0 to 9, and _
#	Digit	matches 0 to 9
|	Ctrl	matches any control character. For example, to search for Ctrl-z, type in | z
\	Normal	matches any character following it even if it is a special character. # would be searched for as \#.

Character	Icon name	Meaning
[ ]	Set	matches any one of the characters between the brackets. This is always case sensitive.
-	To	[a-z] would match any character (in the ASCII character set) between a and z.
~	Not	does not match character. ~C matches any character apart from C. This can also be applied to sets.
*	0 or more	matches zero or more occurrences of a character or a set of characters. T*O matches T, TO,TOO, TOOO etc.
^	1 or more	matches one or more occurrences of a character or a set of characters. T^O matches TO, TOO, TOOO etc.
%	Most	%c is the same as ^c, except when used as the final element of a search string. In this case the longest sequence of matching characters is found.
&	Found	refers to the whole of the 'Find' text. It is used in the **Replace with** box to represent the 'found string': the string matched in the search. This is particularly useful when you have used wildcard characters in the Find string. For example, if you have searched for t.p, and you want to add an s to the end of all the strings found, &s in the **Replace with** box will replace tip, tap and top by tips, taps and tops.
?	Field	If a string was found that matched the search pattern, then ?n refers to the part of the found string which matched 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 %#fred*$ there are two ambiguous parts, %# and *$, which are ?0 and ?1 respectively. Ambiguous parts are numbered from left to right. (Only to be used in the **Replace with** string).

Character	Icon name	Meaning
X	Hex	Xnn matches the character whose ASCII number is nn, where nn is a two-digit hex number. X61 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

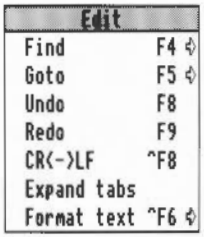
- To remove all ASCII characters, other than those between space and ~, and the newline character, from a file:

  Find: **~[-\~$]**
  Replace with:

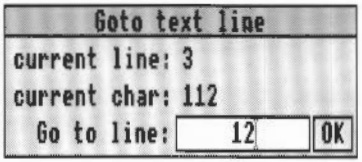
  and click on **GO**, then on **End of File Replace** in the Found dialogue box (ie find all characters outside the set from the space character to the ~ character, and newline, and replace them with nothing). In fact this could be written without the \, since ~ would not make sense in this context if it had its special meaning of **Not**, ie:

  Find: **~[--$]**

Other options on the Edit menu:



To send the caret to a specific line of text, use the **Goto** option. Call up the **Goto** submenu and Edit displays a dialogue box:



Type in the line number you want to move to, then click on **OK**. The dialogue box disappears, and the screen displays the caret, positioned at the beginning of the line you have just specified. Note that this option understands 'line' to mean the string of characters between two presses of Return. If you have not formatted your text, a line in this sense may run over more than one display line.

Undo allows you to step backwards through the most recent changes you have made to the text. The number of changes you can reverse in this way varies according to the operations involved.

Redo allows you to remake the changes you reversed with **Undo**.

CR↔LF allows you to convert the linefeeds in your text to carriage returns (and carriage returns to linefeeds).

If you convert from linefeeds to carriage returns, the file will be converted to one continuous line, with carriage return characters inserted where linefeeds have been removed. Though it is possible to edit a file in this state, you may find that updating the screen takes a long time. This facility is useful when importing text from other text editors, which may use carriage returns where Edit uses line feeds.

Expand Tabs converts each tab character into eight spaces, since some printers can interpret spaces more easily than the tab character.

Format text allows you to reformat a paragraph of text – from the caret to the next blank line or line starting with a space – so that the lines fill the screen and break correctly at the ends of words. It is useful for tidying up text after editing. Position the caret at the beginning of the paragraph, choose **Format text** in the Edit menu and enter the number of characters per line you want your text to have in the **Format width** dialogue box. Then move the pointer back over the Edit menu and click on **Format text** to format the paragraph.

The setting in the **Format width** dialogue box also controls the length of lines when you are entering text with **Wordwrap** switched on.

The Display menu

Display allows you to change the way your text looks on the screen: you can experiment with fonts, colours, line spacing and margins. However, the features you select do not form part of the text when you save it. If you choose **New view** in the Misc menu to display two windows on the same file, the Display features in both windows can be different.

Font offers you a choice of fonts (typefaces). **System font** is the default font, and has a fixed character width. For further information on fonts, see the RISC OS 3 *User Guide*.

You can use **Font size** to set the point size (height and width) of the characters displayed on the screen. Either select one of the sizes indicated, or position the pointer on the bottom (blank) line of the menu; you can then type in another size.

Font height allows you to set the height of the characters displayed on the screen, leaving their width unchanged.

Line spacing increases or decreases the space between lines. It is measured in pixels, the smallest unit the screen uses in the current mode. The selected font size assigns a suitable line spacing; this option is therefore used only to increase (or if you type a negative number, to decrease) the given spacing.

Margin sets a left margin, again in pixels.

Invert swaps foreground and background colours, so that black text on white becomes white text on black, and so on.

By default, Edit assumes a text width of 76 characters, but the default window is not as wide as the full screen. You can of course change the number of characters per line (by choosing **Format text** in the Edit menu) or enlarge the window to the full screen by clicking on the Toggle Size icon. Alternatively, clicking **Window wrap** makes your text fit the size of the window. When Window wrap is on, you can change the window to any size, and the width of the text will change accordingly. You can revert to the default by selecting **Window wrap** again.

Foreground allows you to display the text in any one of the sixteen colours, by clicking on the selected colour from the palette displayed.

Background allows you to set the window's background colour, as above.

Work area allows you to set the extent of your Edit windows so that you can have windows which are wider than the current screen mode. Normally Edit restricts the maximum horizontal extent of a window to the size of the screen in the current mode, but you can specify a longer line length in terms of System font characters in the **Work area** submenu (the size of System font characters is used even if the current font used is a fancy font). This is particularly useful if you have a text file

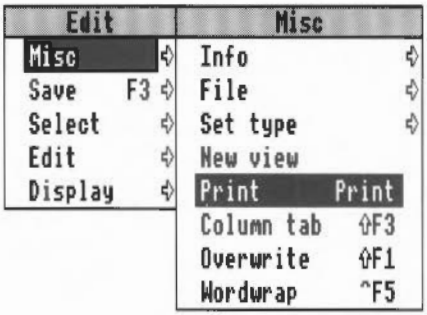
which, for example, is 80 or 132 characters wide and you are viewing it in mode 12. The maximum size of window width which can be specified in this manner is 192 System Font characters.

This option is not available when the **Window wrap** option is on.

Printing an Edit file

There are several ways of printing an Edit file; however, to use them, you first need to load the Printers application. For how to do this, refer to the chapter *Printing* in the RISC OS 3 *User Guide*.

If the file you want to print is already loaded into Edit you can simply click on the **Print** option on the **Misc** menu. Another way is to call up the **Save as** dialogue box and drag the icon onto the printer driver icon on the icon bar. This will print the current version of the file, whether or not it has been saved.



If the file is not loaded into Edit, you can simply drag the file's icon from its directory display onto the printer driver icon. You can also do this if the file is loaded, but if you have made any changes to it since you last saved it, they will not appear in the printed copy; only what has been saved will be printed by this method. Finally, you can also print by pressing the Print key on the keyboard.

Laying out tables: the Tab key

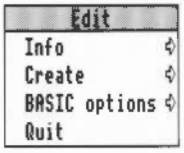
To set out a table, type in the first line – the column headings, for example – as you want it to appear, using spaces to separate the text in the columns. Then press Return. On the next line, pressing Tab will make the cursor jump to the position underneath the start of the next word in the line above.

If you want your table to have columns regularly spaced eight characters apart, click on **Column tabs** in the Misc submenu. The word ColTab will appear in the window's Title bar to remind you that you have done this. Pressing Tab will then cause the cursor to jump to the next tab position.

Reading in text from another file

If you want to add all the text from another file into the file you are currently editing, position the caret at the point where the inserted text is to appear. Call up the directory display for the incoming file, and drag its icon into the text window. The entire contents of the source file is then copied into the destination file at the caret position. The caret will then appear at the end of the text you have inserted.

The Edit icon bar menu



Pressing Menu on the Edit icon on the icon bar produces a menu with the following options:

Info gives you some information about the version of Edit you are using.

Create leads to a submenu which enables you to open windows for specific types of file: Text, BASIC, Obey and Command files. Alternatively you can type in a file type of your own choice at the bottom of the menu.

Create also allows you to start a Task window. Task windows can also be started from the Task manager icon bar menu. How to use Task windows is described in the chapter *Accessing the command line* in the RISC OS 3 *User Guide*.

BASIC options leads to a submenu with which you can choose how to display BASIC programs. **Strip line numbers** causes line numbers to be stripped out when loading BASIC files. **Line number increment** sets the number increment between successive lines in the program.

Quit stops Edit and removes it from the computer's memory, first presenting you with a dialogue box for confirmation if there are any current files you have not saved.

Using Edit to write and edit BASIC programs

Edit also allows you to write BASIC programs. It converts the Text files produced in Edit to tokenised BASIC files.

Writing a new program

To write a new program, click Menu over the Edit icon on the icon bar and from the **Create** menu choose **BASIC**. You can now 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 Return at the end of the last line of the program.

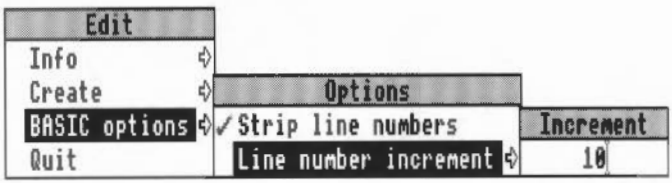
Editing an existing program

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.

Icon bar menu

Pressing Menu on the Edit icon bar icon displays a menu containing the Edit options. Move to the **BASIC options** submenu:

- **Strip line numbers** produces a text file with no line numbers. If a reference to a line is found, an error box will appear asking whether you want to leave the number in. This option is on by default.
- **Line number increment** sets the number increment between successive lines in the program.



Converting to a tokenised file

Converting a text file to a tokenised file is usually quite straightforward. If there are no line numbers, 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 very 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.

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 the RISC OS 3 *User Guide* in the chapter *Desktop boot files*.

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 following the instructions above and in the RISC OS 3 *User Guide*.

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 resave the !Boot file.
(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.

Letter	Feature specified	Default
F	Foreground (text) colour	7 (black)
B	Background	0 (white)
W	Font width	10
H	Font height	10

Letter	Feature specified	Default
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	Format width	77
N	Font name	System font

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

Keystroke	Effect
←, →, ↑, ↓	Move caret one character left, right, up or down.
Shift-←, Shift-→	Move caret one word left or right.
Shift-↑, Shift-↓	Move caret one page up or down.
Ctrl-↑	Move caret to start of file.
Ctrl-↓	Move caret to end of file.
Ctrl-←, Ctrl-→	Move caret to start or end of line.
Shift Ctrl-↑, Shift Ctrl-↓	Scroll file without moving caret.
Ctrl Shift - →	Scroll document up by one line
Ctrl Shift - ←	Scroll document down by one line
Copy	Delete character to right of caret.
Shift-Copy	Delete word at current caret position.
Ctrl-Copy	Delete line at caret.
Home	Place caret at top of document.
Insert	Insert space to right of caret.
Page Up/Page Down	Scroll up or down one window.
Shift-Page Up/Page Dn	Move caret up or down one line without scrolling.
Ctrl-Page Up/Page Dn	Move caret and scroll up or down one line.
Shift-F3	Toggle column tabs on or off.
Shift-F1	Toggle overwrite mode on or off.

Keystroke	Effect
Ctrl-F5	Toggle word wrap on or off.
Ctrl-F7	Make where the caret is the current selection and move the caret to where the selection was (i.e. toggle caret and selection).

Keystroke equivalents in the Select menu

Keystroke	Effect
Ctrl-Z	Clear selection.
Ctrl-X	Delete selection.
Ctrl-C	Copy selection to caret.
Ctrl-V	Move selection to caret.

Keystroke equivalents in the Edit menu

Keystroke	Effect
F4	Display **Find** dialogue box.
Ctrl-F4	Indent selected block.
F5	Display **Goto** dialogue box.
F6	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.
Shift-F6	Clear the current selection.
F7	Copy the selected block to the current caret position.
Shift-F7	Move the current selection to the caret position.
F8	Undo last action.
F9	Redo last action.
Ctrl-F6	Format text block.
Ctrl-F8	Toggle between CR and LF versions of the file.
Ctrl-Shift-F1	Expand tabs.
Ctrl-F2	Close the Edit window.

Keystroke equivalents 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).

Keystroke	Effect
↑, ↓	Move caret between the find and replace text in the Find box.
F1	This starts the search and displays the **Text found** dialogue box if the text string is found.
F2	Use previous find and replace strings.
F3	Count occurrences of find string.
F4	Toggle case sensitive switch.
F5	Toggle magic characters switch.
F6	Toggle wildcard expressions switch.

Keystroke File options

Keystroke	Effect
F2	Open a dialogue box enabling you to load an existing Edit file into a new window.
Shift-F2	Open a dialogue box enabling you to insert an existing Edit file at the caret position.
F3	Save the file in the current window. This is a shortcut to the normal **Save as** dialogue box.
Shift-drag	If Shift is held down and a file icon is dragged onto an existing Edit window, the name of the file is inserted at the caret position.
Shift-double-click	Shift double-clicking on a file icon loads any text or non-text file into Edit.

2 Draw

Draw 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.

Learning to use Draw

You will probably find that the easiest way of learning Draw is to read through *Basic ideas* (on the next page), where you will find an introduction to how to create and edit the different kinds of object which Draw uses. Then work through the *Draw tutorial* which follows, before reading the more detailed sections.

Starting Draw

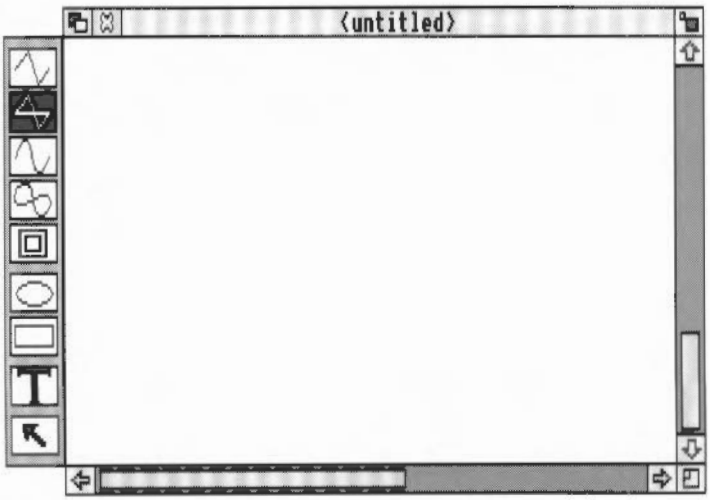
Draw is loaded in the same way as the other ROM applications.

1 Click on the Apps icon on the icon bar to display the Apps directory.

2 Double-click on the !Draw icon, to install it on the icon bar.

3 Start a new drawing by clicking on the Draw icon bar icon.

Alternatively, edit an existing drawing by dragging its file icon to the Draw icon on the 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 choose what sort of object you wish to draw, or to select objects in order to alter them without having to use the menus.

Objects

A Draw diagram is built up from **objects** of a number of different types. Draw stores information about each object used to construct the diagram. This means you can subsequently change individual objects – for example, by moving them, scaling them to a different size, or changing their colour – without affecting the other objects.

The basic object types are:

- **Paths,** consisting of a sequence of line segments. Each of the line segments may be straight or curved. A path may be closed to form a polygon or curved object, or left open. The path is the basic element of a drawing.
- **Rectangles and ellipses**: these are, in fact, also paths, which means that they may be edited in a very flexible way.
- **Lines of text**, in a range of fonts and sizes.
- **Sprites**: graphic shapes made up of an array of coloured pixels. For an introduction to sprites, see the next chapter about Paint. Sprite objects can only be created by loading sprite files.
- **Text areas**, consisting of several lines of text. Text areas can be used for simple desktop publishing, and for annotating drawings.

Objects may be combined together as a **group**. For most purposes, a group can be manipulated like any other object. Draw records the objects that were used to build the 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 the object, line widths, text fonts and sizes, and so on. The exact range of attributes depends on what type of object it is.

Draw 'modes'

You can use Draw in three operating modes:

- **Enter mode** is used to create new objects.
- **Select mode** is used to change object attributes, and to move and alter objects on the screen.
- **Path edit mode** is a special mode used to change parts of paths.

Enter mode and **Select mode** are chosen from the main Draw menu or from the toolbox (described below). **Path edit mode** is entered via Enter mode or from the Select menu.

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.

Shortcuts

To make it easier to construct a diagram, Draw has a number of tools and shortcuts. Firstly, there is the Toolbox attached to the lefthand edge of each Draw window. You can use this to indicate the sort of action you want to carry out, without having to use the menus.

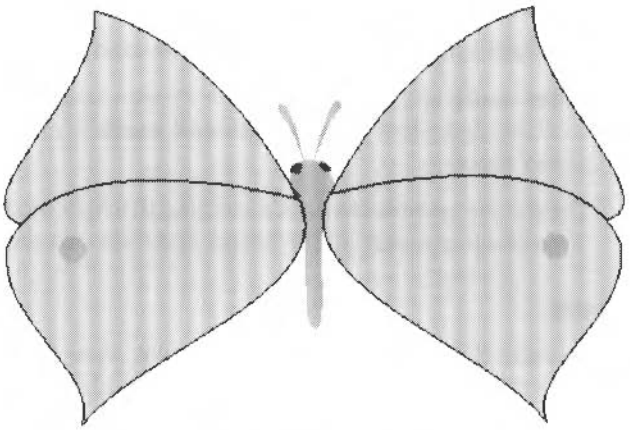
To help you align objects in a diagram, a grid may be displayed. Various different sizes and shapes of grid are available.

When you are familiar with Draw through its menus, you may find that you prefer to use the keystrokes that duplicate the effect of the more frequent Draw actions. These are listed at the end of this chapter, and also appear alongside the corresponding menu entries on the screen.

Finally, you can display more than one view of a diagram; these can have different grid and zoom factor settings. Changes made to the drawing in one view affect the other view as well.

Draw tutorial

This tutorial section provides you with an introduction to Draw through the creation of a simple picture. If necessary, remind yourself of general RISC OS ideas and terms before you start, by going back to your *Welcome Guide* or *User Guide*.



Brimstone butterfly

In the tutorial, you will be taken step-by-step through the process of creating this picture of the Brimstone Butterfly.

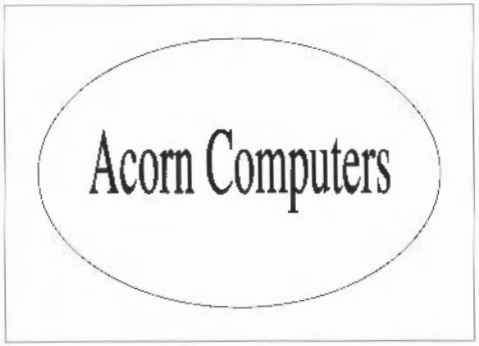
Selecting Draw objects

Before you start on the butterfly, you should spend a short time practising how to **select objects**. This is important because before you can do anything to a Draw object – move it, for instance, or change its colour – you must select it. A Draw picture will typically contain lots of objects overlapping each other, or you may have one object completely behind another. As you work on a drawing you will inevitably find quite often that the object you want to change is not selected, if only because you had to interrupt your work and reload the file.

In the App 2 disc or directory you will find a **Tutorials** directory. In this are the files used in the tutorials in this guide.

Before you start work on the butterfly, here is a quick lesson on selecting stacked objects.

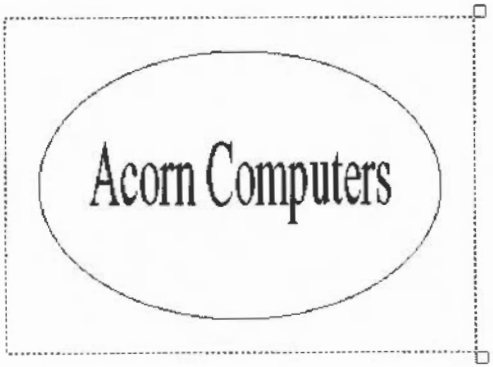
Go to the `Tutorials` directory and double-click on the file called `Plaque`. Once this file is loaded it looks like this:



This drawing consists of three objects: the rectangle, the ellipse and the text 'Acorn Computers'. They are stacked from front to back, in that order. (Incidentally, as you create a series of objects, a newer one will always be in front of an older one, though you can change their order later if you wish.)

To select an object, you first need to choose the correct tool (shown on the left): this is the arrow at the bottom of the toolbox. Click on this and it will be highlighted.

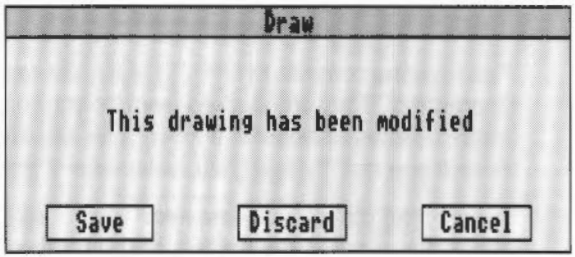
When part of an object sticks out beyond others, you have no problem: as long as you choose that part of the object to click on, it will be selected. When an object is in front of others, again, you have no problem: click anywhere within it to select it. You can do this with the rectangle: click on it and a dotted box will appear around it, indicating that it is selected:



However, suppose you actually want to select the ellipse, perhaps in order to delete it. No parts of the ellipse extend beyond the edges of the rectangle. A click within the ellipse will just leave the rectangle selected, because the rectangle is in front of the ellipse. To select an object that is completely behind another object, you must double-click on it. So now double-click within the ellipse.

The text is behind the ellipse, so you can probably guess by now that to select the text, you should double-click on it. You can think of this as a series of double clicks 'tunnelling down' through a stack of objects.

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 will see a message warning you of this; click on **Discard** to tell the computer you don't want to save your changes.



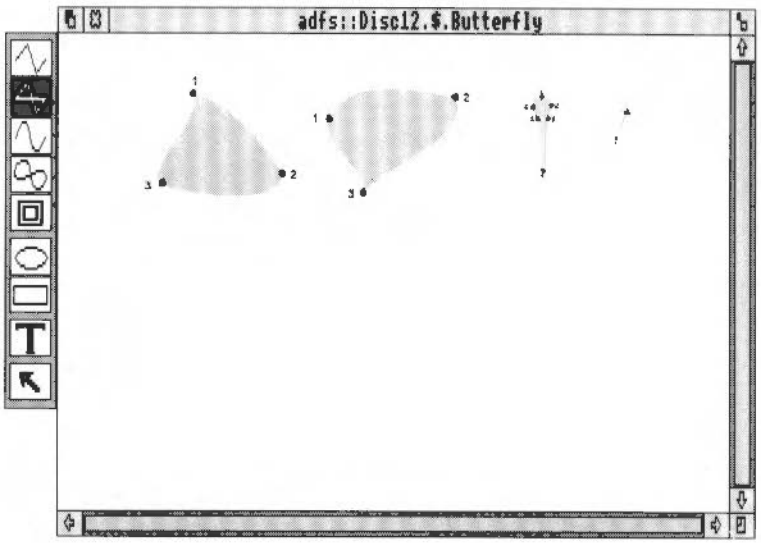
Draw the butterfly

You're now ready to start on the main tutorial activity: drawing the butterfly.

On the App 2 disc or directory look for the **Tutorials** directory, open it and you will find a Draw file called `Butterfly`. The first thing you should do is to make a copy of this file to another disc, and work with the copy. We have copied ours onto a disc we have named Disc12, with the same filename, Butterfly. Save your work occasionally as you proceed.

Double-click on the icon for your copied file to load it into Draw. Press Menu on the Draw window that appears, move the pointer to **Zoom**, and rightwards to display the Magnifier box. Click on the righthand up-arrow to give a magnification of 1:2, and then click on the Toggle size icon at the top righthand corner of the window: this will enable you to see the whole file on the screen at once.

At the top of the window are four grey objects which serve as templates: you will trace them to form the two wing shapes, the body, and the antenna (you can do the eyes by yourself!). Below the templates there is a space where you will create your picture.



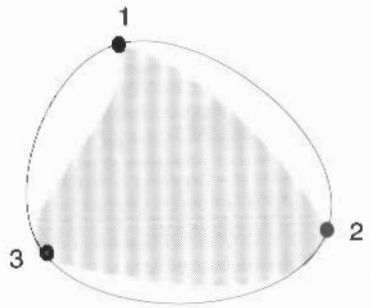
Draw the first wing

Call up the Magnifier box again, and set the magnification to 1:1 by clicking once on the righthand down-arrow. Use the scroll bars to move around the page until you see the upper wing template near the top lefthand corner of the page.

Click on the closed curve tool in the toolbox. When you move the pointer back onto the Draw window it changes shape to a star. To trace the wing, follow these steps:

1. Position the pointer over the top corner of the shape, at point 1. Click Select.
2. Without holding any mouse buttons, move the pointer to point 2. Click Select again.
3. Move the pointer to point 3, and double-click Select. This completes the path automatically, connecting point 3 to point 1.

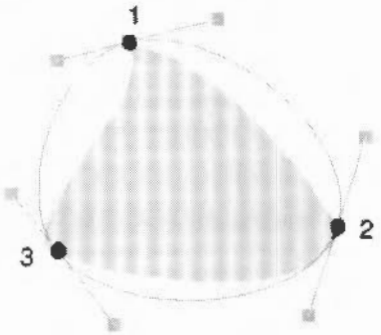
You have now drawn an outline shape like this, meeting the wing template at the three points where you clicked or double-clicked.



This doesn't look much like the wing yet. The next stage is to edit the shape you have drawn.

Choose the Select tool at the bottom of the Toolbox. The pointer changes back to an arrow. Click somewhere in one of the spaces between the grey wing template and the shape you have drawn. This selects your shape ready for editing. Now follow these steps:

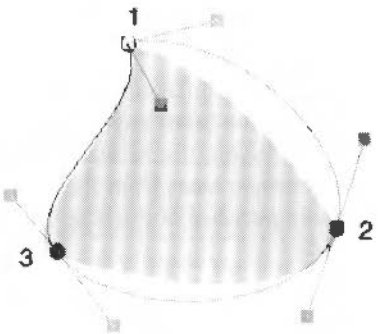
1 Press Menu and move to the Select submenu. Click on **Edit**. The shape now appears like this:



At each point where you clicked or double-clicked when creating the shape is a blue square (though they are superimposed on the black squares around the template). These are the **end points**. From each end point two lines sprout, each ending in an orange square. These are the **control points**. Use the control points (and the end points if necessary) to make your shape match the grey template, as follows:

2 Move the pointer over the top lefthand control point, and press Adjust. The leftmost segment of your shape will change to yellow. This means that the segment is selected for editing.

3 Using Adjust, drag the lefthand control point down and to the right. As you do so, the red segment changes shape, getting closer to the template. When it meets the concave curve of the template, release Adjust. Your selected segment will appear in green if its path crosses the template – this is just due to the combination of red and grey. You will also notice that the orange control point you moved is now yellow. None of these colour changes is significant in itself.



4 Move the pointer over the leftmost control point, and drag it with Adjust leftwards and downwards so that the selected segment matches the template as closely as possible.

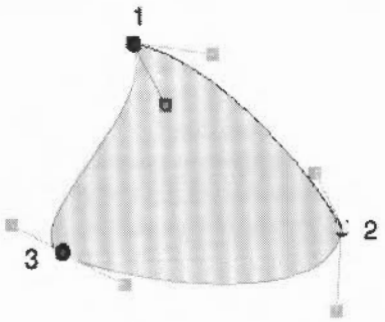
5 You may now need to return to the control point you moved first to adjust it again.

6 Repeat the process with the other control points, until the template and your path match.

Tips:

- If at any time you press the Select button by mistake, move the pointer over the shape and press Adjust; this is an alternative way of selecting an object for editing.
- If you have misplaced an end point, it can also be dragged using Adjust, until it is where you want it.
- If you make a mistake while drawing, use the **Undo** option in the **Misc** menu. Each time you click on Undo you erase any changes you have just made. Clicking on Undo twice erases the last two changes you have made. Choose **Redo** to reinstate the changes.

The template and your outline will now look like this:

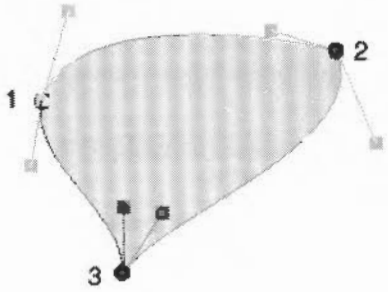


Click Select with the pointer anywhere on the Draw window (but away from the other templates). This takes you out of Edit mode. Choose the arrow tool again, move the pointer inside the wing shape and click Select to select it. Drag your outline up the screen, away from the template. It doesn't matter exactly where you leave it; the only purpose of moving it is to make it easier to select the next time you need it.

Draw the second wing

To create the second (lower) wing, the process is the same:

1. Select the closed curve tool again.
2. Draw the initial outline by clicking at the three marked points.
3. Choose the select tool (the arrow) and select the outline shape you have drawn.
4. Go into Edit mode by choosing **Edit** from the Select submenu.
5. Drag the control points so that your outline and the template look like this:



Again, click Select away from the template, select your outline of the second wing and drag it away from the template.

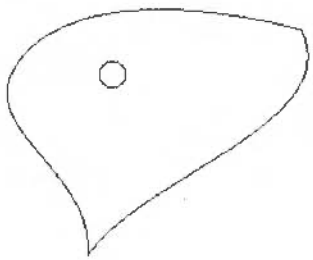
This wing will have a small circle on it; this is not provided on the template, as it is very easy for you to create. Follow these steps:

1 Press Menu and move to the **Grid** submenu. Using Adjust, click on **Lock**. The menu will remain on screen (because you clicked with Adjust instead of Select), and the word Lock will appear in the Title bar of the Draw window, indicating that the Grid Lock is on. The purpose of locking to the grid is to make it easier to use the ellipse tool as a circle tool.

2 Before drawing the circle, you must change the units of the grid; their default is 1/2 centimetres, which for our purposes is too coarse. While you still have the Grid menu on the screen, move to the **Inch** option and display the **Inch spacing** submenu. Using Select this time, click on **1 x 10**.

3 From the Toolbox, choose the ellipse tool.

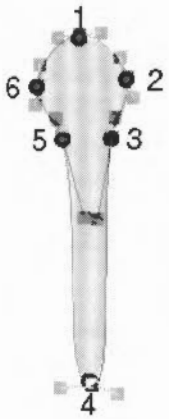
4 Move the pointer onto your outline of the second wing, and position it roughly where the circle is in the drawing below. Click Select once, then move the mouse downwards and rightwards, to create a circle like this:



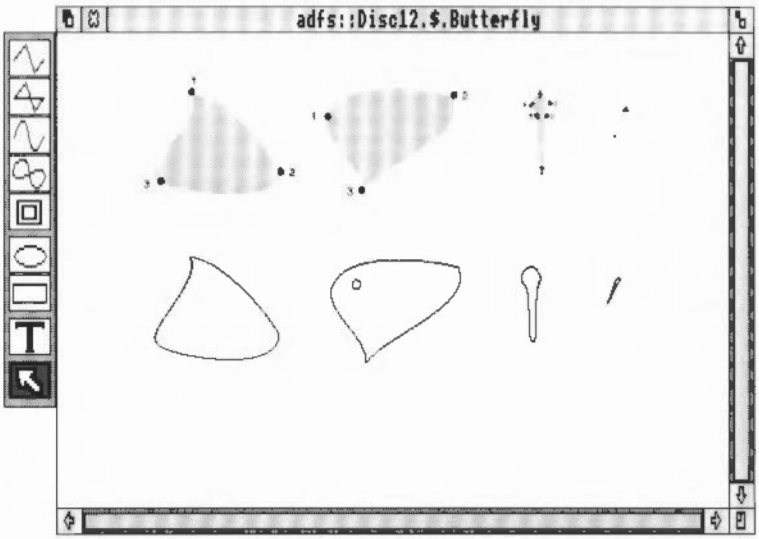
Click Select again when the circle is about how you want it. When you have done this, if your circle is not exactly the right **size**, select it, and drag the 'ear' at the bottom righthand corner of the box until it is the size you want. If it is not in the right **place**, position the pointer inside the circle and drag it with Select.

Draw the butterfly's body and antennae

Follow the same steps to trace the body and one of the antennae; templates are provided for each of these. Switch off grid lock before you start. For the antenna you will need to zoom in to a much larger magnification: try 4:1 or 5:1. The target positions for the control points are like this:



For editing the body shape, you will only need to move the control points attached to 4. When you have traced all four objects, reduce the magnification to 1:2 so that you can again see the whole page. It should look more or less like this:

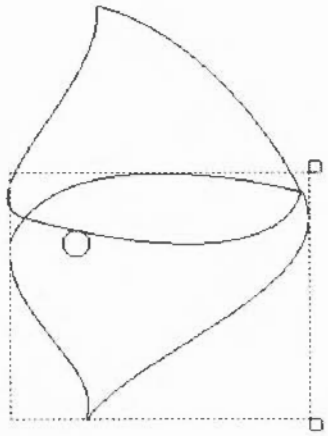


Start assembling the butterfly

From now on, you can ignore the grey templates, as you will just be working with your own shapes. The first task is to put the two wings together and create a mirror-image pair of wings. Use a magnification of 1:2 while you get the components into roughly the right place, then change to 2:1 or 1:1 to position them more accurately.

Before you move the lower wing, you should group the wing and the small circle together. Choose the select tool and start with the pointer above and to the left of the wing outline. Drag using Select to stretch a box around the two objects. When you release Select, they will both be selected. Click on **Group** in the Select submenu to group them together; they will then behave like one object until you ungroup them again. When you select a grouped object, it will have just one dotted box around it.

Now select your outline of the first (upper) wing, and if necessary drag it to a clear space. The window will scroll if you drag over its frame. Select the second wing, and drag it so that it is just below the first wing, with the points on the righthand side meeting, like this:



Colour the butterfly's wings

This is a suitable point at which to choose the colours for the butterfly's wings (before you make the second copy). First select the lower wing and ungroup the wing and the circle by selecting **Ungroup** from the Select menu.

Click Adjust outside the circle but inside the wing: this deselects the wing, leaving the circle selected.

Display the **Style** submenu. Carry out the following sequence of operations with Adjust, so that you do not have to keep redisplaying the menu.

1 Display the **Line colour** dialogue box. Click on **None**, then on **OK**.

2 Display the **Fill colour** dialogue box. Click on the orange box, next to the sky blue in the bottom righthand corner of the box. Using Select (since this is the last step in this sequence), click on **OK**.

Now to colour the wings themselves.

1 Select the two wings by clicking Select on one, then Adjust on the other.

2 Display the **Style** menu again.

3 Leave the line colour as it is (it is black by default).

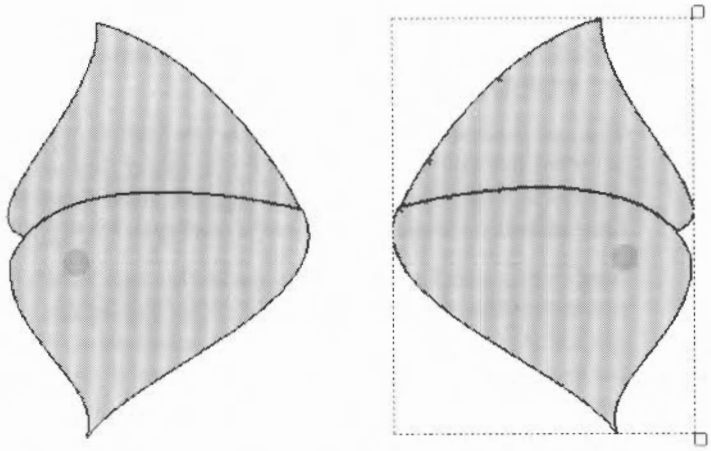
4 For the fill colour, use the bright yellow (next to the royal blue in the bottom lefthand corner of the **Fill colour** dialogue box).

Now that the lower wing and the circle have been coloured, group them together again, and this time go on to group the two wings together as well. You now have a 'nested structure' of objects: the lower wing and the circle form a single grouped object, which is itself grouped at the next level up with the upper wing to produce another grouped object. You will find this multi-level grouping very useful when using Draw.

Create the second pair of wings

The next step is to create a copy of the pair of wings and turn it into a mirror image.

Select the wings and click on **Copy** from the **Select** menu. A copy of the wings will appear slightly below and to the right of the original. To flip the copy around its vertical axis, use the **Transform** submenu. Move to the **X scale** option and display the small box labelled **X scaling**. It will appear with the number 1.0 entered; change this to −1.0 and click on the box or press Return. The copied pair of wings will flip over, and you can drag them roughly into position.

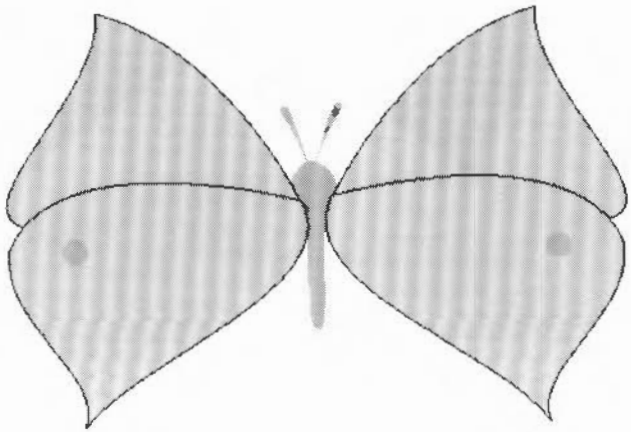


The copy will have the same grouping structure as the original.

Colour the body and assemble the butterfly

Using the same technique that you used to colour the wings, select the butterfly's body and give it a light grey colour, with no Line colour. Colour the antenna the same grey, make a copy of it and flip the copy, using the same technique as for the second pair of wings.

Select the body and drag it into position next to the first pair of wings (you may need to move the body to the front). Drag the second pair of wings and the antennae into position (you will need to zoom in to do this accurately – 2:1 should be enough):



Add the eyes

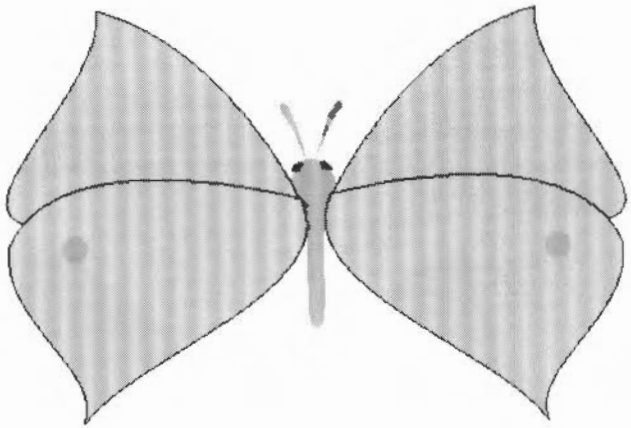
It remains only to draw the eyes and write a caption to your picture.

Select the ellipse tool. Choose a large magnification – such as 4:1 – so that you can see what you are doing.

You can choose the style of an object before you draw it. As you have already selected the ellipse tool, the style you select now will apply to any objects you draw with that tool, until you change the style. From the **Style** submenu, set the **Line colour** to **None** and choose a dark grey for the fill colour.

Now draw a small ellipse for the butterfly's eye. Rotate it if necessary by placing the pointer on the 'ear' at the top right of the dotted box, and dragging down (to rotate clockwise) or to the left (to rotate anti-clockwise). To create the second eye, copy the eye you have drawn and flip it, as before. If you cannot see the copy, this will be because at this magnification, it has been created outside the area you are currently displaying with your window. Enlarge the window or use the scroll bars (looking down and to the right of the original) until you find the copy. Move both eyes into position.

Return the magnification to 1:1; you can do this using Ctrl-D as an alternative to using the magnifier dialogue box.



Finish off and give your picture a caption

Choose the select tool and position the pointer above and to the left of your picture. Drag a box around the picture and release Select when the box encloses the whole picture. All the objects that comprise your picture will be selected. From the **Select** menu, click on **Group** to make your picture into a single object. Pressing F4 is a shortcut you can use instead of the menu.

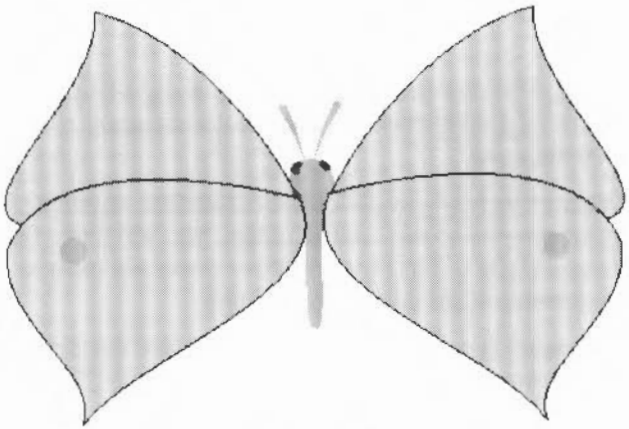
To create a caption, select the Text tool. Move the pointer to an area below your picture and click Select. A red caret (an I-shaped bar) will appear. Select a font for the title from the **Style** submenu, as follows:

1. From the **Font name** submenu, select `Trinity.Medium` (click with Adjust and the menu will stay on the screen).
2. Display the **Font size** submenu and click on **14**.

Type `Brimstone`, and press Return. Then type `butterfly`, and press Return. Select both lines of the caption and **Group** them. From the Select submenu, go to the **Justify** submenu and click on **Centre**.

Brimstone
butterfly

Finally, move the caption to the position you want next to your picture and group it with the picture.



Brimstone
butterfly

That concludes the Draw Tutorial; the rest of this chapter is the reference section, which details in full the features of Draw.

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 do not understand every last word; the real way to learn Draw is by using it.

Using the Toolbox

This gives an overview of how you can create and edit objects, and describes each object type on the Toolbox. When you are in the process of creating any object except text, you will see a 'skeleton' version of it on the screen.

Note that most operations can be cancelled by pressing Escape part way through.

The items in the Toolbox can also be chosen from the Enter submenu. This is outlined at the end of this section.

Paths

The top five icons in the toolbox are used for path objects. To construct line segments in a path, choose one of the first four icons (their meanings are given below), and click Select at the place in the Draw window where you want the path to start. Move to the end point of the line segment and click again. You can keep on adding line segments to the path by moving to the end point of each new line segment in turn and clicking. To finish creating the path, double-click or press Return.

Using this tool you can create straight line segments.

Using this tool you can also create straight line segments; when you complete the path by double-clicking, an extra line segment is inserted to join the last point to the first one.

Using this tool you can create curved line segments. A curve is defined by the two end points and two control points. You will find a fuller explanation of control points later in this chapter. When curves are created, they are arranged so that the segments of the path join smoothly.

Using this tool you can also create curved line segments; when the path is completed, an extra curve is inserted to join the last point to the first one.

This tool allows you to move from one point in the diagram to another without inserting a line. The move forms part of the path you are constructing. A path cannot start or end with a move, and cannot contain adjacent moves; that is, move may only be selected when a path is already in progress. Use Move to create an object consisting of subparts that you know you will always want to treat alike.

During the construction of a path, you can freely switch between these types of line; for example, you can construct a path which begins with a straight line, then has a curved line, then moves to another point, and finally closes with a straight line.

Ellipses and rectangles

The next two icons are used to create ellipses and rectangles. Initially these are aligned with the horizontal and vertical axes. However you can subsequently rotate them to any other angle. Ellipses and rectangles are in fact just a type of path: once you have created them, you can alter them in the same way as any other path.

You can use this tool to create an ellipse. Ellipses are arranged to fit within a rectangular area. Click Select to mark the centre of this area, then move the mouse to a corner of it and click Select again.

To create a circle, use the ellipse tool with the grid switched on.

Using this tool creates a rectangle. Click Select to mark one corner of the rectangle, then move the mouse to the other corner of it and click Select again.

Text

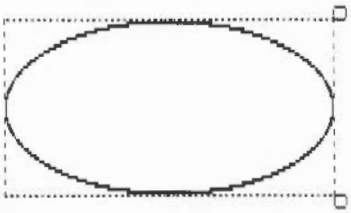
Using this tool creates one or more text objects. Click Select to place a caret where you want the text to start. While you are entering text, keys such as Delete have their normal effect. Press Return, or double-click Select to complete the text object.

When you are using anti-aliased fonts, you may find the Draw window takes a long time to scroll. To improve this, use the Task manager (described in the RISCOS 3 *User Guide*) to increase the size of the font cache.

Select mode

Click on the arrow tool at the bottom of the Toolbox to enter Select mode. With Select mode, you can make changes to objects which are already in the diagram. To return to Enter mode, click on one of the other toolbox icons.

To **select** an object, position the mouse over or within the object and click Select. When an object is selected, a dotted box is drawn round it, with ears at two of its corners.



You can select more than one object by clicking Adjust on each additional object. Clicking Adjust on an object that is already selected causes it to be deselected.

To **deselect** an object, click Adjust on it or click elsewhere on the screen.

Another way of selecting all the objects in an area of the diagram is to construct a **select box** round the area by pressing Select at one corner of the area to be selected and dragging the box out over the area. The position at which you press Select to start the box must be outside any objects. Release Select when all the objects to be selected are wholly or partly within the select box; the objects will then be selected. If you wish to select only objects that lie wholly within the selected box, use Shift-Select in the same way.

You may find that the object you want to select is obscured by another object. In this case, double-click Select over the object. Keep on doing this to 'tunnel' down to progressively deeper objects.

There are many operations that you can carry out in Select mode. Only the simplest ones are described here; for the others, see the section entitled *Editing existing objects using the Select menu* on page 56.

Moving an object

To move the selected objects, press Select over any of the selected objects and drag them to their destination; then release Select.

Rotating an object

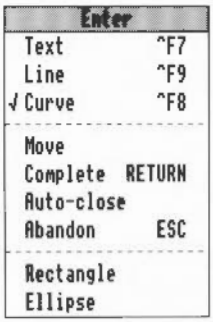
To rotate the selected objects, press Select over the ear at the top righthand corner of a select box, and drag the mouse until the objects are at the angle you want; then release Select. Each object rotates about its own centre. Note that text in System font cannot be rotated.

Scaling an object

To scale (or stretch) the selected objects, press Select over the ear at the bottom righthand corner of a select box and drag the mouse until the objects are the size you want; then release Select. You can use this to turn objects upside down, by dragging the mouse above the top of the box.

When you have more than one object selected, move, rotate and scale, apply to all selected objects.

The enter submenu



Exactly the same effects as those that can be chosen in the toolbox can also be chosen from the **Enter** submenu.

Text, **Rectangle** or **Ellipse** creates objects of the given type in exactly the same way as the Toolbox.

Line, **Curve** or **Move** construct paths, also using the same method as the Toolbox.

Complete to finish creating a path. This has the same effect as pressing Return at the end of a path.

Auto-close to set whether the path will be automatically closed when you complete it. If the line or curved line tool is selected, the Toolbox will change the selection to the corresponding closed path tool.

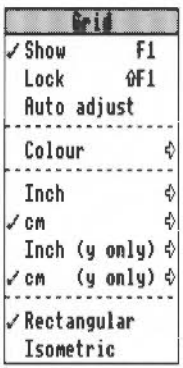
Abandon to abandon the path that you are constructing. It has the same effect as pressing Escape.

Using the Grid to place objects accurately

Draw can superimpose a rectangular or isometric grid on a drawing. This is often useful for lining up objects and for checking their relative size. The grid is made up of 'major points', which are marked by a cross, and 'minor points', which are marked by a dot.

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. When you are creating objects with grid lock turned on, you will see them attach to the nearest grid point to the mouse position.

The grid is controlled from the grid submenu:



Show displays the grid: click on it again to remove the display.

Lock switches grid lock on or off. The grid need not be shown in order to use grid lock. Grid lock causes new objects to align with the grid as you create them. If you move an object when the grid lock is on, its bounding box will move in jumps of the grid spacing. You can make existing objects lock to the grid by choosing **Snap to grid** from the Select menu.

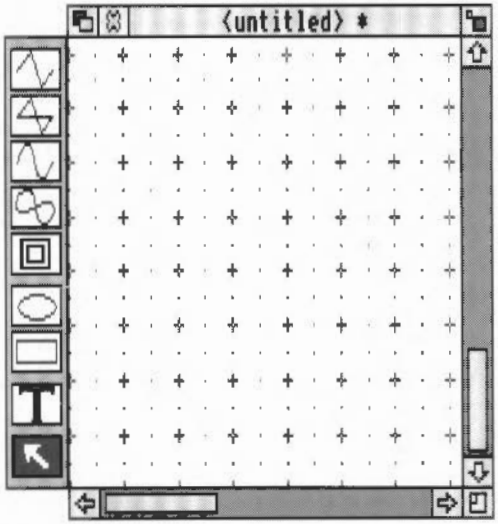
Auto adjust indicates whether Draw may change the grid if it is too dense or too sparse. When Auto adjust is turned on, Draw will insert extra minor points if the grid is very widely spaced, and remove points if they are very close together. Objects will lock only to the points that are currently displayed. If you turn Auto adjust off and specify a very close spacing, the grid may take some time to draw.

Colour sets the colour of the grid, from a range of values.

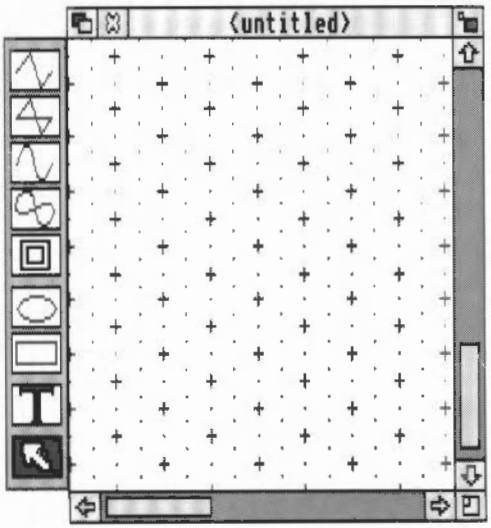
Inch and **cm** are used to set the spacing of the grid. Each menu item leads to a submenu, from which you can select one of a range of standard spacings. The standard spacings are expressed in the form M x S: major points are M units (inches or centimetres) apart and divided into S subdivisions; for example, 1 x 4 on the inches menu gives major points one inch apart, and minor points 1/4 inch apart. You can define your own spacing by typing values to the Spacing and Subdivision submenus. Choosing **Inch** or **cm** from the Grid submenu (without moving to Inch or cm submenus) uses the last setting you specified in that unit. For rectangular grids, changing the grid settings in this way changes both the X (horizontal) and Y (vertical) settings.

Inch (y only) and **cm (y only)** allow you to set a different grid setting in the Y direction from that in the X direction.

Rectangular sets the grid to a rectangular pattern.



Isometric sets the grid to an isometric pattern. In this case, the Y spacing of the grid is not used. For reasons of clarity, only those minor points lying on lines joining major points are shown; however, when grid lock is in use, the drawing still locks to intermediate minor points between them.



Advanced details

Moving a selection with grid lock on

If you move a selection when the grid lock is on, it moves in jumps of the grid spacing.

Lining up an existing selection to the grid

From the **Select** sub-menu, **Snap to grid** snaps the object's bounding box to the nearest grid point and scales the points in the object to fit the new bounding box.

Lining up object points to the grid

The Path edit menu entry **Snap to grid** snaps each point individually to the nearest grid point.

Zooming in and out of your drawing

Zoom, on the main menu, leads to a magnifier dialogue box. This can be used to change the size at which objects are displayed relative to their actual size. You cannot set either part of the zoom ratio to a value greater than 8; if you try to do so, 8 is used instead. There are three other ways of zooming:

- If you want to enlarge a particular area of your work, hold Shift and use Adjust to drag a box around the area you want. The window will expand if necessary and the zoom factors will be set appropriately. To return to your previous scaling, press Ctrl-R, or to go to full size (1:1), press Ctrl-D.
- To zoom out, press Ctrl-Q: this will change the zoom factor from, for example, 1:1 to 1:2, or from 3:1 to 2:1. (Double clicking Shift-Adjust has a similar effect).
- To zoom in, press Ctrl-W: this will change the zoom factor from, for example, 1:2 to 1:1, or from 2:1 to 3:1.

From the Misc submenu, you can set Zoom lock x2. When you then zoom using one of the three methods above, the zoom ratio is forced to 1:1, 1:2, 1:4, or 1:8, and so on (and the same when zooming out). This means, for example, that each time you press Ctrl-Q, you halve the size of the drawing on the screen. When you press Ctrl-W, you double its size.

Displaying an alternative part of the same file

Choose **New view**, from the Misc sub-menu, to create a new view of the diagram you are editing, in a separate window. Changes made in any view of a diagram affect 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.

Editing objects

When you designed your object in Draw, you constructed it out of paths; you can edit these paths to fine-tune your object's shape. This is done using Path edit mode and the Path edit menu.

Path edit mode

To start editing your object, enter Path edit mode in one of the following ways:

- From Enter mode (when one of the top eight icons is highlighted), click Adjust on the object you wish to edit.
- From Select mode (when the arrow icon is highlighted), first select an object, then choose **Edit** from the Select submenu.

The end points and control points of the path are shown on the screen. To move any of the points, position the pointer over the point and press Adjust. Drag the point to where you want it and release Adjust.

When you have finished editing your object, leave Path edit mode by clicking Select or Adjust when the mouse position is not over a path.

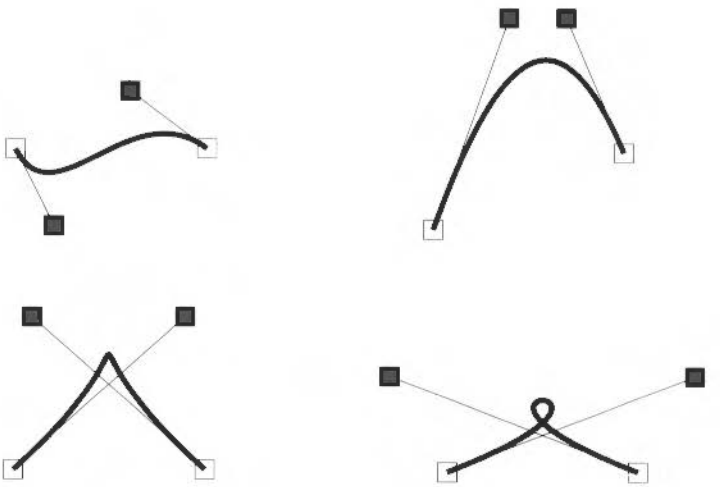
Editing curves

Curves in a path object are defined by two end points and two control points. When you are 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 as follows:

- The direction of the curve at the end point lies along the straight line connecting the end point to the control point (ie 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 as black squares) are joined to the corresponding end points (shown 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

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 the line is frozen. To edit a text line once it is frozen use the following procedure:

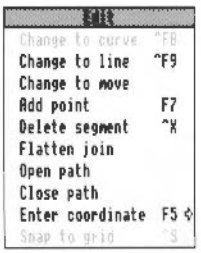
1 From Select mode (when the arrow icon is highlighted) first select the text line by clicking over it.

2 Use the **Select** menu to move to the **Edit** option and display the **Text** box.

3 Change the text in the text box and when you have finished press Return and the text is changed.

Text areas and Paint images (sprites) cannot be edited within Draw. Text areas should be exported to Edit and edited. Paint images (sprites) should be exported to Paint and edited.

The Path edit submenu



To view the Path edit menu, first enter Path edit mode as explained above. If the path you want to edit is under another object's path, clicking Adjust over that path will find the next deeper path in the diagram if there is one. This is similar to tunnelling through objects in a selection.

Select part of a path by clicking Adjust on an end point or a control point of the path. The selected line segment is highlighted. (Note that if you select the first point of the path, there is no highlighting). You can now click Menu to show the list of Path edit actions:

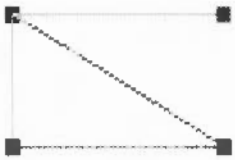
Change to curve turns the selected part of the path into a curved line segment. You can use it when the selected segment is a line, or when you have selected a point inserted using the move icon (or **Move** from the Enter menu).

Change to line similarly changes a curved line segment or a Move into a straight line segment.

Change to move replaces the selected straight or curved line segment with a move, effectively splitting the path into two sections. However, you cannot change a line segment to a move if it appears at an end of the path, or if it is already preceded or followed by a move.

If the path containing the line was closed, extra lines will be inserted to close each of the two sections of the path. The following example illustrates this. First, draw a rectangle, starting at the top lefthand corner and working clockwise, then enter Path edit mode. Click Adjust at corner 3: this selects side 2-3 for editing.

Click Menu and choose **Change to move**. Side 2-3 is now replaced by a Move, and corners 1 and 3 are joined.



Add point inserts a new point (and hence a new line segment) into the path, of the same type as the selected segment.

Delete segment deletes the selected line segment from the path.

Flatten join straightens the join between two lines (unless they are both straight lines). The curve is adjusted so that the tangent is continuous at that point.

Open path and **Close path** turn open paths into closed ones, and vice versa. In making a path open, the line segment joining the last point to the first one is not deleted; it is just 'disconnected'. On closing a path, the end point of the last line segment is moved to join up to the first segment.

Enter coordinate leads to a dialogue box which shows the current coordinates of the point. You can select the unit the coordinates are shown in by clicking on the Inches and Centimetres buttons. To change the coordinate, type in the new value and click **OK**. To leave the coordinate unchanged, click **Cancel** or press Escape. If the point you have chosen is the start point of the path, only **Enter coordinate** is available.

Snap to grid causes the selected object to align with the grid.

To leave Path edit mode, click Select elsewhere in the diagram.

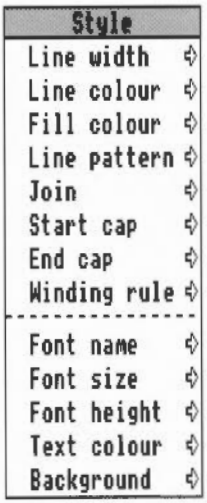
Cancelling your last operation

Undo cancels the last operation you carried out, restoring your work to its previous state.

Redo cancels Undo, if you decide you were right after all.

Changing the way an object looks – its style

Setting and editing the object style



Each object has a style consisting of a set of attributes. You can set the style to be applied to each new object you create (the default style), and alter the style of existing objects. In both cases, the style is chosen from the Style submenu of the Draw menu.

The style chosen from the Style menu is the default style; all new objects created will be given this style.

To change the style of existing objects, first select the objects you want to change and then change the default style settings.

The Style menu contains the following entries. Each entry has a submenu giving the range of values available.

Line width. You can set the line width to any of a range of predefined values, measured in points (a point is 1/72 inch), or to 'Thin', which means that the line will always appear in the narrowest width possible. You can use the last position in the menu to type in a value for the thickness if the one you want is not in the menu. Line width applies to paths.

Note that the line width 'Thin' means 'as thin as the output device can manage'. This results in different line thicknesses on different output devices. It is more sensible to use 0.25 points as the default line thickness for a thin line, especially if you will be printing on a typesetter. A 'Thin' line on a 1200dpi imagesetter will be too thin to reproduce subsequently on a litho printer.

Line colour and **Fill colour** are both set using a colour dialogue box. See the chapter entitled *Introducing the Applications Suite* for details, but note the following:

- The fill colour applies to the region within the object.
- For a simple line drawing, with no interior, use **None** as the fill colour.
- Line and fill colours apply to paths.
- Open paths may be filled.

Line pattern is used for dashed and dotted lines. You can set the line pattern to any of a range of patterns, including solid. The pattern applies to paths, rectangles and ellipses.

Dashed and dotted lines can be modified using the Start cap and End cap options.

Join sets how lines are joined together:

A mitred join brings the outer edges of lines together at a point:

A round join rounds off the point where the lines join:

A bevelled join cuts off the corner where the lines join:

The join style only has a significant effect for thick lines.

Start cap and **End cap** determine what the ends of lines look like. Caps apply only to open paths, and their effect is only significant for thick lines. The following are the cap styles:

Butt caps square off the line at the end point.

Round caps add a semicircular arc to the end of the line. The diameter of the arc is the same as the width of the line.

Square caps add a square to the end of the line. The square has half the width of the line.

Triangle caps add a triangle to the end of the line. The triangle option has its own submenu allowing you to set the height and width of the triangle independently, these values being multiples of the width of the main line. Use this option to create lines with arrowheads.

In a path, the same style applies to all the line segments.

Note, to generate arrow heads of a reasonable size from start triangle caps and end triangle caps options, you should use values of at least x4 on a 0.5 point line width.

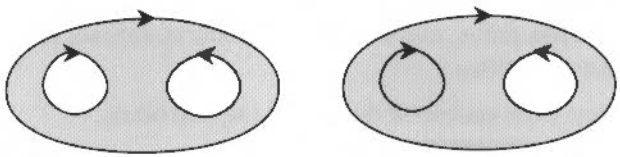
Winding rule is only used for areas (ie parts of the diagram bounded by lines) for which a fill colour has been set. Even-odd winding means (roughly) that an area is filled if it is enclosed by an even number (including zero) of areas. Non-zero winding, on the other hand, fills areas on the basis of the direction in which the paths that surround the area were constructed: if an equal number of paths in each direction surround the area, it is not filled, otherwise it is. Most of the time, the even-odd winding rule is used.

More formally, the two winding rules are defined as follows:

Even-odd: to determine whether an area of a object is to be filled, imagine a line passing from inside the area to outside the object. Count the number of lines it crosses. If the number is odd, fill the section.

Non-zero: first assign each path a direction, expressed as a number: +1 for one direction and –1 for the other. Then, to see if an area is to be filled, construct an imaginary line from inside the area to outside the figure. Keep a total of the direction values for each line it crosses. If the total is non-zero, fill the section.

These pictures illustrate the two winding rules:



Even-odd Non-zero

Note that each of these drawings is a single object, consisting of a single path containing two moves (the first from the outer line to one of the 'eyes', the second from one eye to the other). The arrows show the direction in which each segment of the path was drawn.

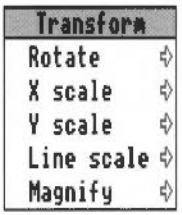
Font name applies to text objects. You can set the font either to the system font, or to an outline font. The list of fonts shows all those that Draw could find when it was loaded. See the RISC OS 3 *User Guide* for more details about how fonts work.

Font size and **Font height** also apply to text objects. Both values are measured in points (1/72 inch units). You can use the last position in the menu to type in a value if the size or height you want is not already there. Changing the size causes the height to be set to the same value; you can subsequently change the height, leaving the font width set to the size value. System font is 6.4 point wide and 12.8 point high by default.

Text colour is used to set the colour of the text, and the initial text colour of text areas. It is set using a colour dialogue box.

Background is used for setting the intermediate colours used in displaying anti-aliased fonts. You should set this to the same colour as the part of the diagram that the text appears in. For example, if you set the text colour to green and the background to blue, the anti-aliasing pixels will be in a range of shades between green and blue. The background applies to text objects and text areas, and is set using a colour dialogue box.

Rotating and enlarging objects accurately



To rotate or enlarge objects by specific amounts, first select the object(s), then use the **Transform** submenu, reached from the main menu. This provides the following options:

Rotate leads to a submenu into which you can type a rotation angle, measured in degrees. All selected objects are rotated anticlockwise by this angle. Alternatively, you can group the objects and drag on the top righthand ear. You cannot rotate text areas or text lines in System font. See page 57 for information about converting text objects to paths.

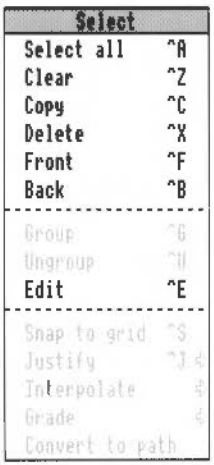
X scale and **Y scale** lead to submenus into which you can type scale factors. All selected objects are scaled in size by this amount, in the given direction (X = horizontal, Y = vertical). The scaling is relative to the current size. Line widths are not scaled.

Line scale leads to a box in which you can enter a scale factor for the line widths of the selected paths. The scaling is relative to the current size. Lines of width 'Thin' cannot be scaled.

Magnify applies all three scalings – X, Y and Line – to the selected objects (though lines are left unchanged if their width is set to Thin).

Editing existing objects using the Select menu

Select mode is used to alter existing objects. You can enter Select mode from the Toolbox (click on the arrow icon), or choose Select from the Draw menu. The Select submenu contains a number of operations that you can apply to the currently selected objects:



Select all selects all objects in the diagram.

Clear deselects all selected objects.

Copy makes a copy of the selected objects, slightly offset from the originals.

Delete deletes all the selected objects.

Front moves the selected objects so that they are at the front of the diagram, obscuring any other objects in the same physical position.

Back moves the selected objects so that they are at the back of the diagram, obscured by any other objects in the same physical position.

Group turns the selected objects into a group object.

Ungroup breaks down a group into the objects that make it up. Ungroup only has an effect when there are groups in the selection.

Edit has two functions. When there is a single path object selected, it provides a means of entering Path Edit mode. The effect is the same as clicking Adjust on the path object when in Enter mode. When there is a single text line selected, it leads to an edit box in which the text line can be edited.

When a piece of text is selected, an arrow will appear, signalling the presence of the submenu **Text**. The selected text will appear in the **Text** box off the submenu. Make your edits to the text, then press Return for the changes to take effect. Existing text cannot be edited directly in a Draw file.

Snap to grid applies only if the grid is locked. It causes the selected objects and each point in them to move to the nearest grid point. In the case of text objects, it is the base line of the characters that will align with the grid.

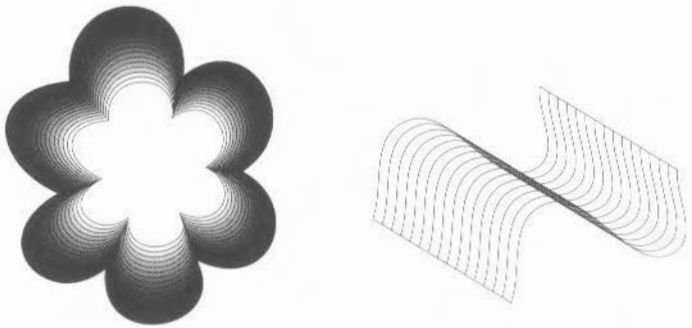
Justify applies to groups. It leads to a submenu from which you can select how the objects forming the group are arranged within the bounding box of the group object: at the left, centred or at the right horizontally, and at the top, positioned in the middle, or at the bottom vertically.

Convert to path can be applied to a text object to convert it into a normal path. Each letter in the text line is an object, though when you first make the conversion they will be grouped together. Once you have converted a text line to a path, it can be treated like any other path object, and you can also use the options in the Style menu that apply to objects other than text. For example, you can create hollow text by setting a solid line colour and no fill colour.

Note, you can only convert outline fonts to a path.

Interpolation and grading

Draw provides you with two ways of creating interesting effects by taking a pair of objects and inserting similar objects between them. All you have to do is to create two objects, group them, and choose **Interpolate** or **Grade** from the Select menu. Each option leads to a submenu into which you can type the number of objects to insert between the two you have drawn yourself (the default is eight, and the maximum is 255). Here are two simple examples to start with:

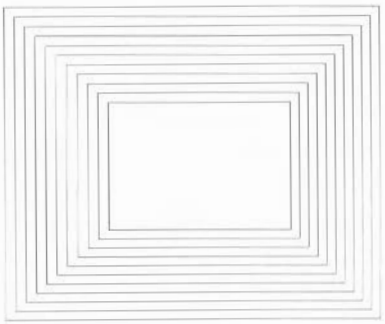


A pair of path objects for interpolation or grading must have certain properties in common. For most practical purposes, this means they should be more or less the same shape (though they need not be the same size): two V-shapes, two rectangles, and so on. Specifically, the requirements are that

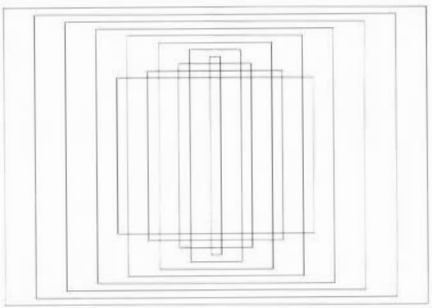
- for each line or curve in one, there must be a line or curve in the other
- for each move in one, there must be a move in the other
- for each close in one, there must be a close in the other.

The path objects must be single path objects; they cannot be grouped path objects.

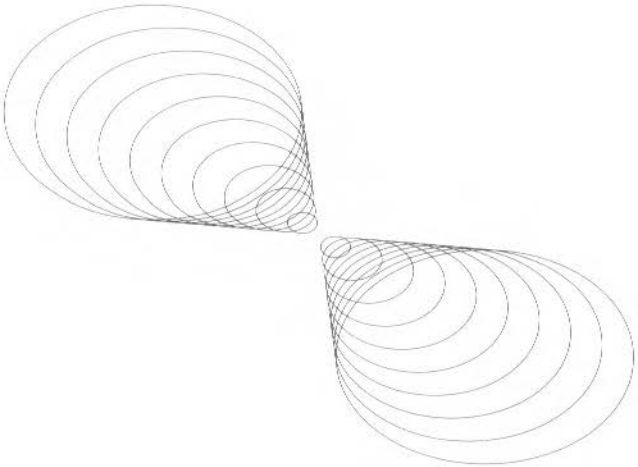
The order in which you draw the objects is significant. This is particularly important when you are interpolating between rectangles and ellipses; usually, you should create them in the same way (for example, start at the top lefthand corner and move round clockwise). This will produce an interpolation like this:



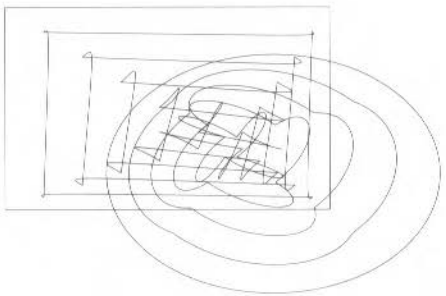
However, creating the objects in a different order (or rotating the copy before you group the two objects) can make some interesting patterns which may be just what you want. In the example below, the larger rectangle was created by drawing clockwise from the top left, while the smaller one was drawn anti-clockwise from top left.



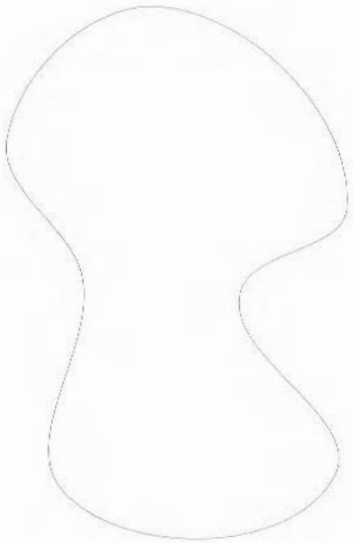
For the next example, an ellipse was drawn and copied, but the copy was rotated 180° before grouping and interpolating:



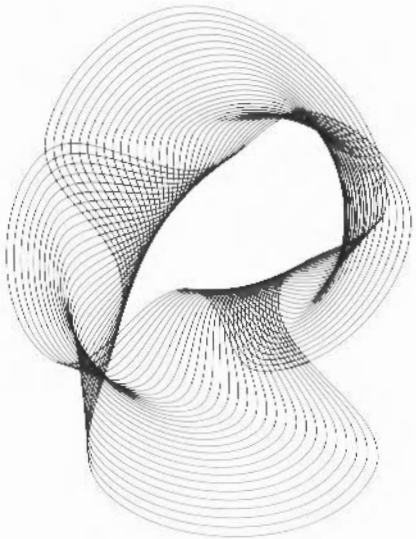
Although the two objects must match as described above, this does not mean they have to be the same type of object. The next example was created by grouping a rectangle and an ellipse, and interpolating 10 objects:



You can achieve some particularly attractive effects by drawing an object, copying it, and rotating the copy. The next example started with this closed curve:



This was then copied, and the copy shrunk by about one-third and rotated by about 90°. The original and copy were then grouped, and interpolation with 30 objects carried out. The result looks like this:



The properties used by interpolation and grading are

- line colour
- fill colour
- line width
- triangle start/end cap height
- triangle start/end cap width.

The difference between interpolation and grading

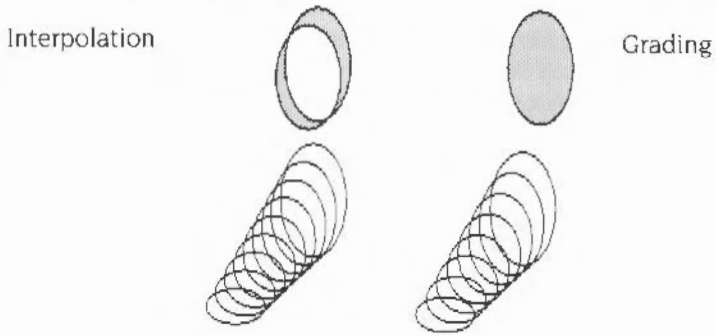
The difference between interpolation and grading is only evident when the shapes are closed and filled. In the example below, the pairs of objects are identical, but interpolation was selected for the lefthand pair, and grading for the righthand pair.

In the case of interpolation, the innermost path is unfilled, but the fill colour you assigned to it is used to fill the ring or doughnut shape between the innermost path and the next one out. The same process is followed, producing a tunnel effect.

In the case of grading, the effect is that of a stack of solid discs, rather than rings. The innermost or 'top' path is left filled with the colour you gave it.

Another example to illustrate the difference. In the **interpolation** of the circle, the band, as in a wedding ring, constructed by the innermost path is filled.

The rings in a **graded** circle are simple single edged paths enclosing each other and the area enclosed by the path is filled in.



If you interpolate two objects using N gradations, a total of N objects will now exist. Each object consists of two objects grouped together that cannot be ungrouped.

Loading and saving Draw files

Draw can load four types of file:

- Files in Draw's own file format.
- Sprite files, containing one or more sprite objects (from Paint, for example).
- Text files, used to create text area objects (from Edit, for example).
- DXF files.

All the file types can be loaded by dragging the file to the Draw icon on the icon bar, or by dragging it into a Draw window. Draw files can also be loaded by double-clicking on them in a directory display.

Text area objects and DXF files are discussed in the section entitled *Text area objects* on page 64.

Loading a sprite

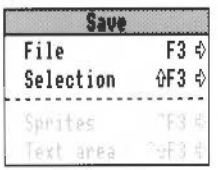
Loading a sprite file into Draw will in fact load only the first sprite. A more convenient method of loading a single sprite is to:

1. Load the sprite file into Paint (following the instructions in the chapter on Paint).
2. Open a sprite window for the sprite you wish to transfer.
3. Click Menu and move to the **Edit** submenu. If Palette is not switched on (ie there is no tick beside it), click on Palette to give the sprite its own palette.
4. Choose **Save**, then **Sprite**.
5. Drag the icon in the **Save as** box into a Draw window.

This method also ensures that Draw displays the sprite in the correct colours.

When a file is loaded by dragging it into a window, it is added to the diagram which is 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 a file is loaded by dragging it to the icon bar, a new diagram is created in a new window, with the file aligned on the bottom lefthand corner of the diagram.

Saving files from Draw



To save files from Draw, use the **Save** option in the Draw menu. This leads to a submenu with the following entries:

File saves the entire diagram in Draw file format.

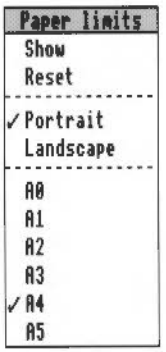
Selection saves the currently selected objects as a Draw file.

Sprites saves all selected sprites as a sprite file.

Text area saves the text used to define a text area, as a text file. There must be a single text area selected. For more information about text areas, see the section entitled *Text area objects* on page 64.

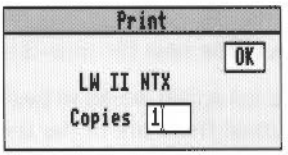
Printing Draw files

First you must make sure that your drawing will fit on the paper on which you are going to print. The option **Paper limits**, from the **Misc** menu, helps you with this.



Paper limits leads to a submenu which you can use to set the size and orientation of the 'paper' you are constructing the drawing on. The orientation is either portrait (longer side vertical) or landscape (shorter side vertical). The size may be any of a range of standard 'A' paper sizes. Choosing **Show** causes a grey border to appear surrounding the part of the diagram which will be printed. Those areas within the grey border are considered to be part of the margin of the page, and are not printed. The limits of the grey border correspond to the limits of the page. If no printer driver is loaded, the limits default to A4. When you load a file into Draw, the paper size is set to the value which most closely matches the area defined by the file. **Reset** sets the paper limits to the printer driver defaults.

Print leads to a dialogue box which you can use to print the diagram. The printer dialogue box contains the name of the printer driver in use, a box into which you can enter the number of copies to be printed, and a button to start the printing process.



You can also select **part** of the diagram to be printed at a time. This option 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.

First click on **Show** in the Paper limits submenu. Then hold Ctrl and click Select to mark the bottom lefthand corner of the printed area, or hold Ctrl and click Adjust to mark the top righthand corner. Hold Ctrl and drag with Select to drag a box around the area you want to print; it will be scaled to fill the page when it is printed.

Text area objects

A **text area** is a special sort of object that allows you to do 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. A text area may have more than one column. Draw again works out how to divide the text between the columns, filling up each one before moving to the next.

Create a text area by using a text editor (such as Edit) to prepare a file containing the text, annotated with special commands (described below). When the text file is loaded into a Draw diagram, the text is formatted into columns. The number of columns is given by an annotation. By using Select mode, you can move the text columns and change their size. 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 the sub-section *Default text area header* on page 70.

If you wish to create a text area in system font, use the outline font version of the system font instead of the normal system font. You can choose the outline version, called **System Fixed**, from the **Font name** sub-menu off the **Style** menu.

Creating and editing text areas

To create a text area object 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 an existing 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:

- 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.

- When there is more than one text column, selection is a two-stage process. When you first click Select (or 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 Select (or Adjust) to select a column of the text area. The individual columns can be moved and scaled. Their new position and size need not lie within the original text area. When the size of a text column changes, the text is reformatted to fit the new size of the column. At the end of the operation, the bounding box of the text area is changed to reflect any changes made to the column; it is arranged to contain all of the text columns, with a small additional border. 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.

Text areas and text columns cannot be rotated.

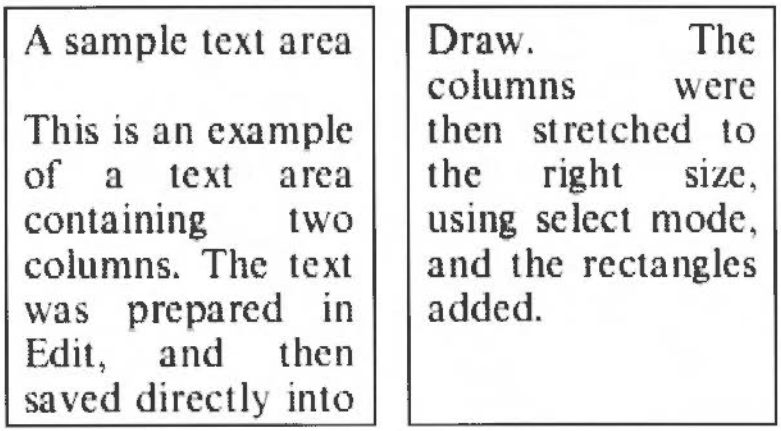
Some select mode actions cannot be applied to text columns. If there are any text columns selected when you do the action, they are deselected first. An example of this is object deletion: you can delete a text area as a whole, but not a text column from within it.

An example

The text shown below, typed into Edit and loaded into Draw as an Edit file, creates the text area shown overleaf:

```
\! 1
\AD
\D2
\F0 Trinity.Medium 24
\L24
\P24
\0A sample 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 used.
- \F0 Trinity.Medium 24 specifies font 0 as Trinity.Medium, 24 point.
- \L24 sets the line spacing to 24 points.
- \P24 sets the spacing between paragraphs to 24 point. 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).
- `nl` means a single newline character, and `nl/` means newline or /.

The full list of annotations is as follows:

Command	Effect
\! *version* nl/	This is a special line which must appear at the start of any file which is to be used for a text area. *version* must be 1. However, it forms part of a default header which is inserted at the start of the text; this is described below.
\A *code* [/]	Set alignment. *code* may be L (left aligned), R (right aligned), C (centred) or D (double, ie justified to both margins). An alignment setting forces a line break. The default setting is left aligned.
\B *red green blue* nl/	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 (ie 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 `\B 255 255 255`).

Command	Effect
\C *red green blue* nl/	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 \C 0 0 0).
\D *columns* nl/	Indicates that the text area is to contain the indicated number of columns. This must appear before any printing text. The default is 1.
\F *font-number name size* |*width*| nl/	Defines a font reference. *font-number* is either one or two digits. The font number is used subsequently to set the font. *name* is a font name such as Trinity.Medium. *size* and *width* are the height and width of the font in points. If *width* is omitted, the size is used for both height and width. There are no defaults.
font-number |/|	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.
\L *line-spacing* nl/	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 10 points.
\M *left-margin right-margin* nl	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 1 point at each side.
\P *paragraph-spacing* nl	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 10 points.

Command	Effect
\U *position thickness* nl	Switches on underlining, at the given position relative to the base of the characters. `position` is limited to the range –128 to 127, and `thickness` 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.
\U. |/|	An alternative way of turning underlining off.
\V|-| *vertical-move* |/|	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.
\-	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.
\nl	Forces a line break.
\\	Inserts a backslash character.
\;*text* nl	Treated as a comment. Characters up to and including the next newline are ignored.

Rules for displaying text

Line splitting

Draw displays text in text areas by splitting it into lines and columns. When working out where to split the text, Draw first 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 being equivalent to 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. If no valid font has ever been seen, the text is not displayed.

Exporting text from a text area

Text used to construct a text area may be re-exported into a text file, by choosing **Text area** from the Save menu. 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 12 points.

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.

Working with multiple Draw files

You can be working 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 is easy to copy objects between Draw windows. Select the object you wish to move, move the pointer to the destination Draw window and choose **Copy** from the **Select** menu. 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 selected 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 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. Instructions on how to create a Desktop boot file are given in the RISC OS 3 *User Guide* in the chapter *Desktop boot files*.

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 following the instructions above and in the RISC OS 3 *User Guide*.
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
```

4 Delete that line and resave the !Boot file.
(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 overleaf 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.

Letter	Feature controlled	Possible values	Meaning
P	Paper size and format	*n*	Paper size A*n* (eg A4)
		L	Landscape format (if not set, portrait is used)
		S	Show paper limits
G	Grid	*a*x*b*	*a* = spacing, *b* = subdivisions
		I	Isometric (rectangular if not set)
		A	Auto-adjust on
		S	Show grid
		L	Grid lock on
		C	cm units (inches if not set)
Z	Zoom	*a*:*b*	Set zoom to *a*:*b*
		L	Zoom lock on
T	Toolbox display	+ or –	Toolbox on or off
M	Tool/mode selected	One of:	
		L	Line
		l	Closed line
		C	Curve
		c	Closed curve
		R	Rectangle
		E	Ellipse
		T	Text
		S	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. 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 the section *Saving display features* on page 72), adding the `Un` immediately before the double quotes at the end of the line.

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.

Keystroke equivalents in Enter mode

Keystroke	Effect
F3	Save file (calls up the normal **Save as** dialogue box)
Shift-F3	Save selection
Ctrl-F3	Save sprites
Shift-Ctrl-F3	Save text area
F2	Load named file (calls up a dialogue box into which you can type the name of the file you want to load)
Shift-F2	Insert named file (calls up a dialogue box into which you can type the name of the file you want to insert into the Draw file you are working on)
Ctrl-F2	Close window
Print	Print file
F1	Toggles between show and hide grid

Keystroke	Effect
Shift-F1	Toggles **Lock to grid** on and off
Ctrl-F1	Switch Toolbox on or off
Ctrl-Q	Zoom out
Ctrl-W	Zoom in
Ctrl-D	Zoom to 1:1
Ctrl-R	Previous zoom
Ctrl-L	Zoom lock 2
F8	Undo
F9	Redo
F6	Enter Select mode
←, ↓, →, ←	Move pointer one pixel

Keystroke equivalents in Select mode

Keystroke	Effect
F7, Copy, or Ctrl-C	Copy selection
Shift-F8, Delete, or Ctrl-X	Delete selection
Shift-F6 or Ctrl-Z	Clear selection
F5 or Ctrl-A	Select all
Ctrl-F4 or Ctrl-F	Bring to front
Ctrl-Shift-F4 or Ctrl-B	Send to back
F4 or Ctrl-G	Group objects
Shift-F4 or Ctrl-U	Ungroup objects
Shift-F5 or Ctrl-S	Snap to grid
Ctrl-F6 or Ctrl-E	Enter Path edit mode
Ctrl-F5 or Ctrl-J	Justify

Keystroke equivalents for tool selection

Keystroke	Effect
Ctrl-F7 or Tab	Enter text
Ctrl-F9	Enter closed line
Ctrl-F8	Enter closed curve
Return	Complete path
Escape	Abandon

Keystroke equivalents in Path edit mode

Keystroke	Effect
Ctrl-F8	Change to curve
Ctrl-F9	Change to line
F7, Copy or Ctrl-C	Add point
Shift-F8, Delete or Ctrl-X	Delete segment
F5	Enter coordinate
Return	Finish path edit
Shift-F5 or Ctrl-S	Snap to grid

3 Paint

Paint 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.

The pictures produced by Paint are kept in the form of **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 may contain more than one sprite. Sprites and sprite files use a standard format, so you can freely export images produced by Paint to other programs that use sprites (such as Draw and Acorn Desktop Publisher). You can also use Paint to edit sprites produced by other RISC OS applications.

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. Although you can paint regular shapes, you cannot then select them in order to delete, move or resize them.

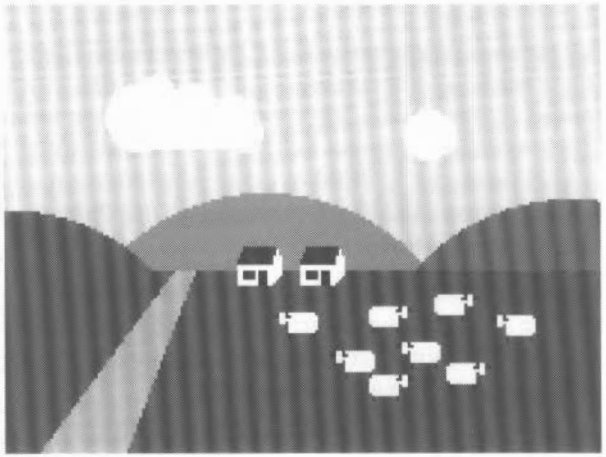
When you export a sprite from Paint into Draw, this remains true: regular shapes forming part of the sprite cannot be edited like Draw objects. The whole sprite becomes a single object in your Draw diagram, and can be moved or resized, but not otherwise edited.

The first part of this chapter is a tutorial section that introduces some of the more common features of Paint and shows how they can be used to create a simple sprite.

Later sections contain more detailed descriptions of all the features of Paint, backed up with examples demonstrating how each feature can be used.

Paint tutorial

This is a tutorial section that shows you how to use Paint to produce a simple picture (shown below). 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.



For the tutorial, you should use a 256-colour screen mode such as 15 (for a normal monitor) or 28 (for a high-resolution monitor). Use the Palette icon bar menu to set the mode.

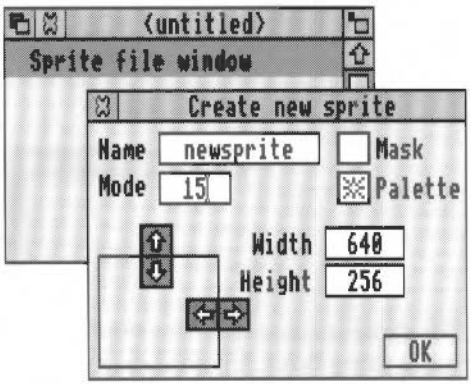
The landscape sprite is built from two types of component: the landscape itself, which you will create from scratch, and the sheep and house shapes which are themselves small sprites that we have provided for you. Towards the end of the tutorial you will learn how to superimpose these on your landscape.

Starting Paint

Open the Apps directory by clicking on the Apps icon on the icon bar. Start Paint by double-clicking on the Paint icon in the directory display. As with other RISC OS applications, Paint indicates it has been loaded by displaying its icon on the icon bar.

Creating a new sprite

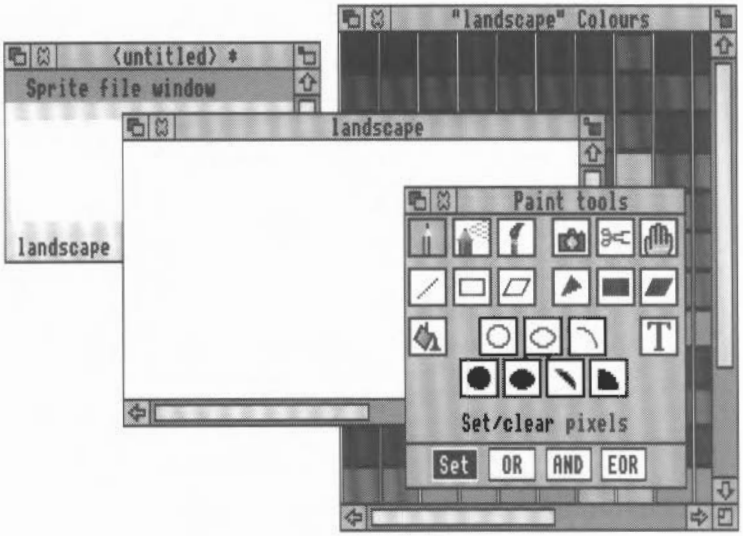
The first step in creating a new sprite is to click on the Paint icon on the icon bar. This displays the **Create new sprite** window with a **Sprite file window** behind it.



The Create new sprite window lets you type in the name you wish to give to your new sprite.

For this tutorial delete the existing name Newsprite (using the Delete key) and type in the name for our sprite, Landscape. Now change the size of the sprite to be created by clicking on the **Width** box and changing the value to be 400 and then clicking on the **Height** box and changing the value to be 150.

Click on the **OK** box and the (blank) sprite is created. The sprite window is displayed together with the **Colours** that you can paint with and the **Paint tools** you can use for painting.



The sprite window is in effect the artist's studio where changes can be made to the sprite using Paint. Any changes made in the sprite window are instantly reflected in the sprite file window.

You should now have four Paint windows on your screen: the sprite file window, the sprite window, the tools window and the colours window. In a 256-colour mode, the colours window is rather large, and you would need to scroll it to see the full range of colours. To display a smaller version, press Menu with the pointer on the sprite window, move to the **Paint** submenu, and click on **Small colours**. The small colours window fits on the screen better, but has the disadvantage that when you select a colour, you cannot see its number. However, for the tutorial, it mostly won't matter exactly which colours you use.

Drag the windows around the screen so that you can see all of them at once.

Zooming in and out

You will be able to see what you are doing more easily if you double the size of the sprite window. Press Menu on the sprite window, and move to the **Zoom** dialogue box. This is the standard magnifier dialogue box, described in the chapter entitled *Introducing the Applications Suite* on page ix. Click on the up arrow on the left to create a magnification of 2:1.

Creating a blue background

To create a blue background which will become the sky, follow these steps:

1 Firstly, make the sprite full size by clicking on the Toggle size icon in the top right hand corner of the window.

2 Click over a suitable sky-blue coloured square in the colours window. The colour square is highlighted when it is selected (if you use the large colours window, the colour's number will appear in the square as well).

3 Click over the **Replace colour** icon in the Paint tools window. The tool indicates it has been selected by the icon being highlighted and the name of the tool appearing in the box at the bottom of the menu.

4 Position the pointer in the sprite window and click Select. The entire window will be filled with the selected colour. This new background colour will also be displayed in the sprite file window.

Saving your work

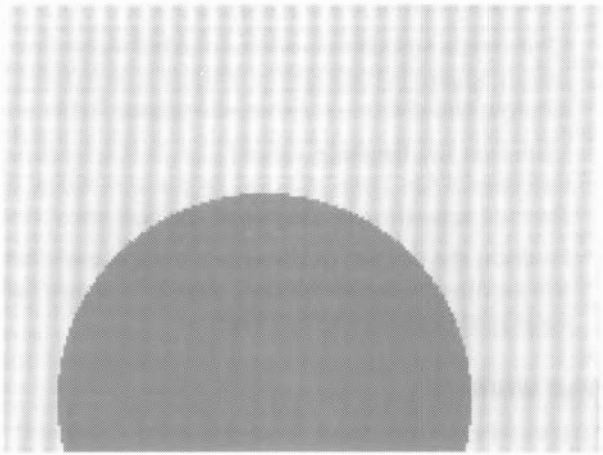
You should save your work frequently as you proceed. You can then return to the last step if you go wrong. This is an especially good idea with Paint, since with some of the tools you can easily make mistakes. Unlike with Draw, you cannot undo your work or move single objects, since Paint does not create objects as such.

To save the whole sprite file, press Menu over the Sprite file window (not the Sprite window). Move to the **Save** submenu and display the **Save as** dialogue box. As with any other application, you should delete the default name that appears and drag the icon to the directory where you want to save the file. For this tutorial, use the name Pictures. The name of the sprite file now appears in the Title bar of the sprite file window.

Creating the landscape

The landscape is made up out of several regular shapes painted partially overlapping one another. The distant hills are painted first. Choose a light grey colour and the **Filled circles** tool. Move the pointer back over the sprite window. Click once near the bottom of the window, a little to the left of centre. This defines

the centre of the circle. Move the pointer upwards; as you do so, a circle shape tracks the position of the mouse. When the circle is the size you want, click Select again. Aim for a circle looking more or less like this:

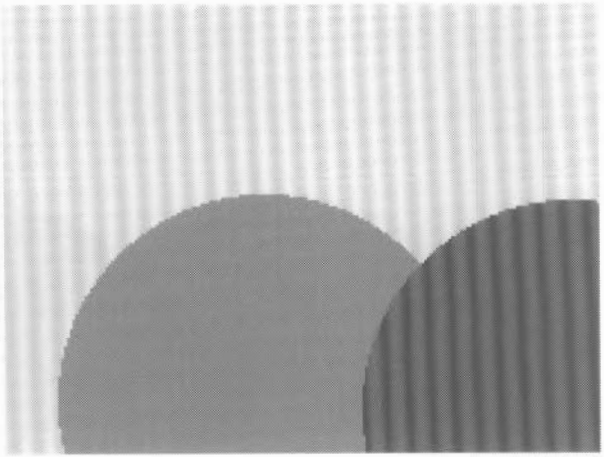


If you realise you have positioned the centre in the wrong place **before** you click a second time, you can make a fresh start by returning the pointer to the Tools window and clicking on the Filled circle icon again. This clears what you have already done.

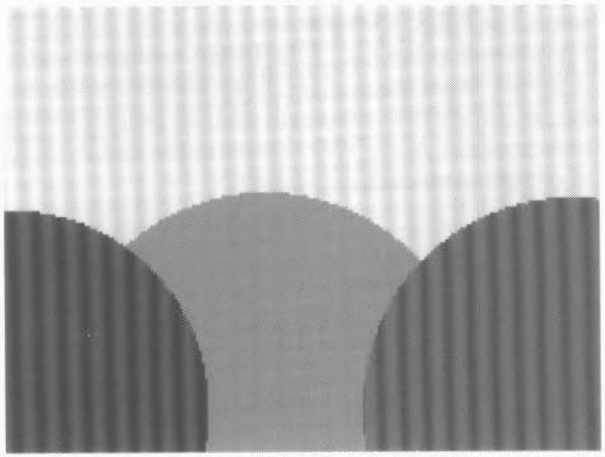
If you don't like your circle once you have finished it, you can remove it by selecting your original sky blue and the **Replace colour** tool again, and clicking in the circle. This will fill the circle with sky blue, effectively erasing it.

Once you are satisfied, save your work again before you go on.

Now choose a bluish-green colour and paint another circle with the centre near the bottom righthand corner of the sprite, and the edge roughly in line with the grey circle:

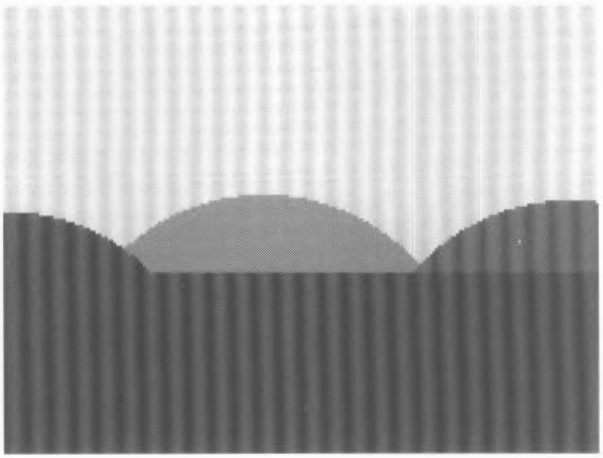


Select a more yellowish green and draw a third circle with its centre near the bottom lefthand corner of the sprite:



Keeping the same colour selected – choose the **Filled rectangles** tool. Place the pointer at the very lefthand edge of the sprite, about halfway down. Click Select. Move the pointer downwards and rightwards to the bottom righthand corner; just move the pointer – there is no need to use a drag. Position the point of the arrow

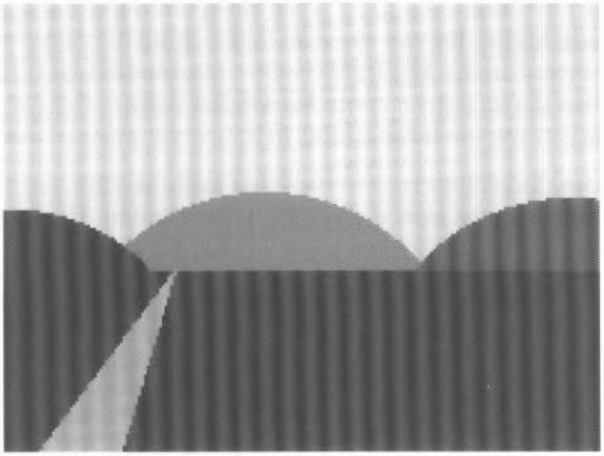
carefully **within** the sprite window, or nothing will happen. Click again. Paint will create a rectangle, which will merge in to the last circle you painted, being the same colour:



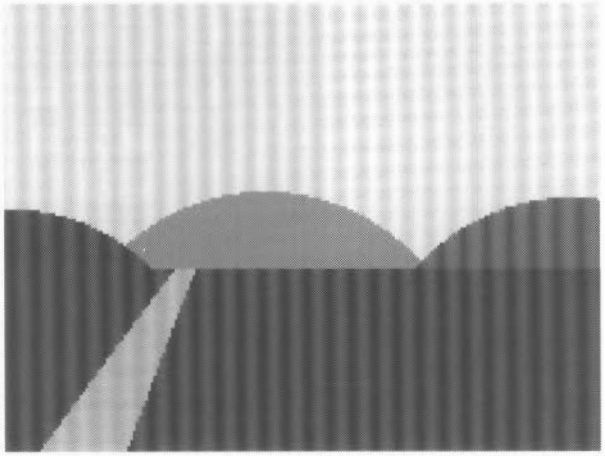
Save your work again at this point.

Now paint the road. Select one of the buff colours in the bottom row of the colours window. To obtain a perspective effect, the road is painted with two filled triangles, so select the **Filled triangles** tool. Move the pointer back onto the sprite window and position it at the top of the foreground green area, just to the right of the hill. Click Select. Move the pointer down and to the left, as far as the bottom of the sprite; as you do this, a line will join the point where you clicked with the current pointer position. At the very bottom of the sprite, click Select again, then move the pointer rightwards and click again.

You should have a triangle like this:



Create a second triangle alongside the first, with its apex meeting the bottom righthand corner of the first triangle. The two triangles should merge to form the road, narrowing into the distance:



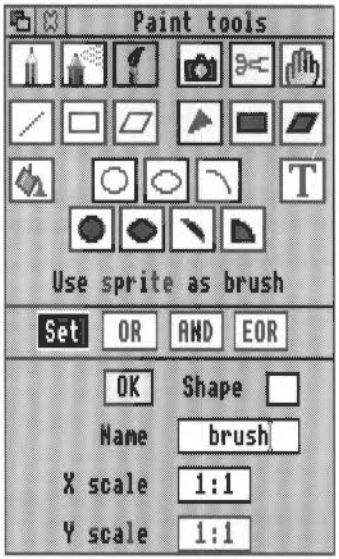
You may find that the triangles have not quite joined up as you intended. You can tidy up using the **Set/clear pixels** tool at the top left of the Tools window. Zoom in on the picture so that you can position the pointer accurately, and look for the places where your road shape needs touching up. Click Select to paint individual pixels in the road colour.

This is another good point to save your work before going on.

Using the sheep and house sprites

The next stage is to paint some sheep onto the landscape. We have created two sheep sprites for you: they are in the sprite file called `Brushes` in the **Tutorials** directory on the Applications disc. Double-click on this file to load it into Paint. When the `Brushes` sprite file window opens, click on its Toggle size icon so that you can see the three sprites in it: `house`, `sheep1` and `sheep2`.

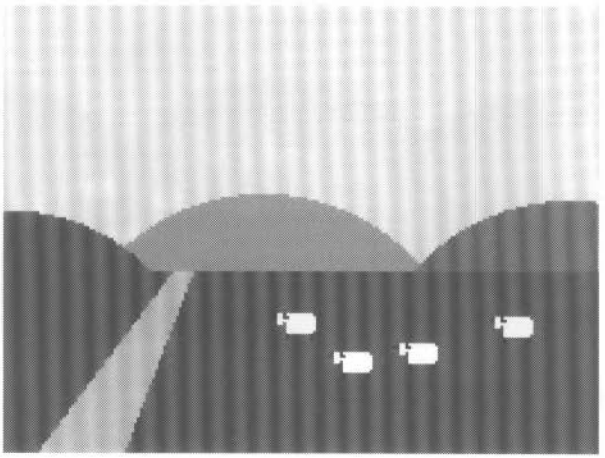
Move the pointer back to the Paint tools window and select the **Use sprite as brush** tool (the icon shaped like a paint brush). The tools window will now look like this:



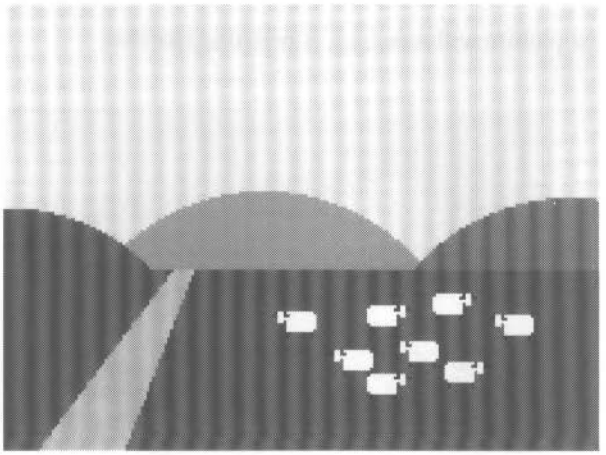
Some of this extended window may be below the bottom edge of your screen; if necessary, drag it upwards so that you can see all of it. The red caret will be in the **Name** box, after the word `brush`. Erase this word and type `sheep1` in its place. Now click on the starred **Shape** box to deselect it and finally click on **OK**. Provided the sprite file containing the sprite named sheep1 is open (and it is, because you have just opened it), it will be loaded so that you can use it in your landscape picture.

The **Shape** option when selected allows the shape of a sprite to be used as a brush; it is used as a filled shape with its colour taken from the Colours box. With the shape option deselected, the sprite is placed with its form and colours intact.

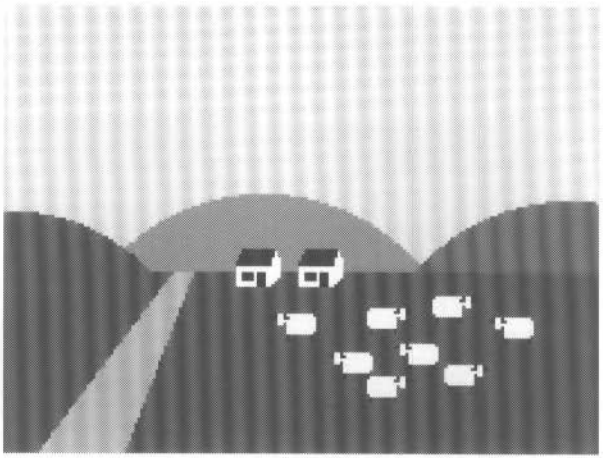
Move the pointer back over the sprite window. A sheep in various exotic colours (depending on where the pointer is) will follow your pointer around the screen. Click Select to paint a sheep. Paint a few to the right of the road:



Sheep2 is the same as `sheep1`, except that it faces the other way. Go through the same process to use `sheep2`, and paint a few of those:



Use the house sprite to paint a house, or several houses.



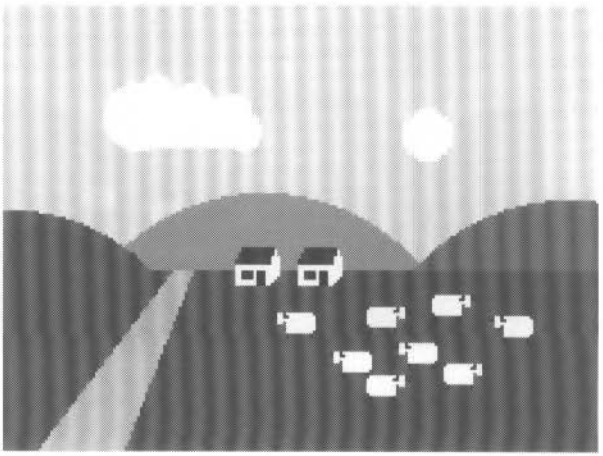
Paint the clouds and the sun

Since white clouds often have a rather flat base, begin by selecting the **Filled rectangles** tool along with the colour white (at the bottom righthand corner of the colours window). Draw a small rectangle towards the left of the sky.

Switch to the **Filled circles** tool and build up the cloud using small circles of varying sizes.

Create the sun by selecting a nice bright yellow and the **Filled circles** tool.

Your picture will now look something like this:



You have now completed the Paint tutorial. 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.

Reference section

This section outlines some of the terms, concepts and basic techniques for creating and editing sprites in Paint.

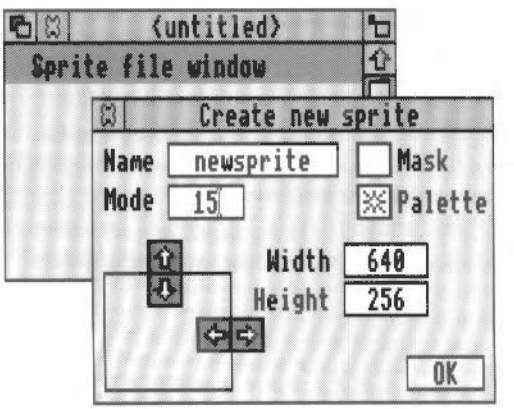
Sprites

Sprites have the following attributes:

- A name used to identify the sprite (sprite names are 1 to 12 characters long).
- A definition mode indicating the screen mode that was set when the sprite was defined.
- A height and a width (these are given in pixels); the default is the size of the current screen mode.
- A palette defining the colours used in the sprite (optional).
- Optionally, a mask (sometimes called a transparency mask).

Within the sprite, each pixel has a colour, chosen either from the sprite's palette, if it has one, or the palette for the screen mode it was defined in. If the sprite has a mask, you can use a special value in place of a colour, which indicates the pixel is transparent. When a sprite is painted, the existing screen display shows through the transparent pixels. By setting transparent pixels on the border of a sprite, you can construct sprites which are effectively non-rectangular.

All of these attributes are defined in the **Create new sprite** window, which is displayed each time you want to create a new sprite (just click on the Paint icon).



Paint windows

Paint has several windows with specialised functions:

Sprite file windows

The sprite file window shows all the sprites which are defined in the file you are working on. If you prefer, you can keep just one sprite in each sprite file, though if you are designing sprites for an application you will need to keep them together. Try looking at the sprite file for the Paint application itself: hold down Shift while double-clicking on the Paint icon in the Apps directory; this will open the application directory. Double-click on the Sprites file to load it into Paint. Scroll through the sprite file window to see the range of sprites used by Paint.

The sprite file window shows the sprites at actual size if possible, or in a scaled-down form if they are large. You can edit more than one sprite file at a time; each has its own sprite file window.

Sprite windows

Sprite windows are used for creating and editing the sprites themselves. You can have any number of sprite windows on the screen, or none. Each window contains one sprite. Open a sprite window for a sprite by double-clicking on its name in the sprite file window.

Sprite colours windows

Sprite colours windows are used for choosing the colour that you are painting with. There is a separate sprite colours window for each sprite, because different sprites may have a different range of colours available.

To open the colours window for a sprite, press Menu on the sprite window, go to the **Paint** submenu and select **Show colours**.

Paint tools window

This menu is used to select and alter the tools you use for painting the picture; display a Tools window by pressing Menu on the sprite window, moving to the **Paint** submenu and selecting **Show tools**. The top section of the window shows the tools. The currently selected one is highlighted and the name of the tool is shown. Below this are buttons used to select 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.

Basic techniques

To edit an existing sprite

To edit an existing sprite, follow these steps:

1. Load a sprite file into Paint by double-clicking on its icon.
2. Open a sprite window for the sprite you want to edit by double-clicking on its image in the sprite file window.
3. Modify the sprite by selecting tools and colours and using them in the sprite window.
4. Save the modified sprite file.

To create a new sprite

Open a Create new sprite window by clicking on the Paint icon on the icon bar.

1. Enter a name for the sprite, and values for its other characteristics (full details of these are given later).
2. Click on **OK**. The new sprite window and its associated sprite file window will open.

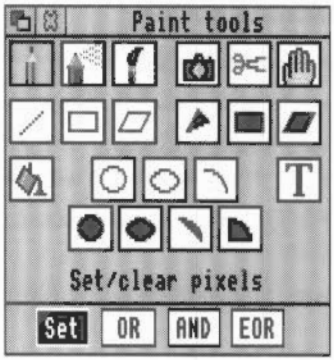
The tools in detail

Using tools

To use a tool to edit a sprite:

1. Click Select on the tool in the Paint tools window.
2. If you wish, set or change any parameters such as the size of the spray or brush to be used.
3. If necessary, change the colour of the 'paint' to be used by clicking on the new colour in the Sprite colours window.

4 Move the mouse to the sprite window, and apply the tool as described below.



There are four different ways in which the tool can apply colour to the sprite, chosen with the **Set**, **OR**, **AND** and **EOR** buttons. The descriptions that follow are given in terms of 'Set'. In this case, the colour applied by the tool replaces the colour which is already present. The four ways of using colours are described in the section entitled *Using colours in Paint* on page 102. The section entitled *Sprite colours window* on page 110 shows you how to choose an Extended Colour Fill for your colour pattern.

For operations such as drawing lines and rectangles, you can click Adjust instead of Select. This moves the nearest previously set point to the current position. For example, in the parallelogram operation described on page 99, clicking Adjust instead of Select at step 3 returns you to step 2, with the first corner taken from the location at which you clicked Adjust.

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.

Set/clear pixels

To set a single pixel to the current colour, click Select over the pixel. To set several pixels, press Select and drag the mouse over the pixels. If you move the mouse slowly, a line will be created, but if you move it faster, the line will be broken. You can use this for shading areas of the picture. If you want to draw lines use one of the other tools instead.

If you use Adjust instead of Select, the pixels are cleared to the first colour in the palette.

Spray can

To 'spray' pixels in an area around the mouse position to the current colour, press Select over the centre of the area. As with Set/Clear pixels, you can drag the mouse as you spray onto the sprite.

If you use Adjust instead of Select, the pixels are cleared to the first colour in the palette.

Parameters:

The spray can has two parameters displayed at the foot of the Paint tools window, which you set by typing in the value you want:

- **Density** controls how many pixels are set or cleared in each spray operation. The higher the density, the more pixels are affected.
- **Radius** controls how far the spray extends from the mouse position.

Use sprite as a brush

This tool takes a sprite (not the one you are working on) and makes it into a 'brush'. Four simple brush shapes are provided:

- A square.
- A triangle.
- A circle.
- A brush.

Type in one of these options in the writable box and click on **OK** to select this simple brush shape.

However, you are more likely to want to use a sprite of your own to paint with. These could be single objects placed with a single click, like the sheep and house used in the tutorial, or patterns that you can drag over an area. Normally, you will want to give the brush sprite a transparent mask so that the shape does not appear with an unwanted surround.

There are two ways of using a sprite as a brush.

With the **Shape** option selected, you can use the sprite as a brush shape; the brush takes on the outline of the sprite. The brush paints in whatever colour you have selected.

With the **Shape** option deselected, you can use the brush to put a sprite into another sprite. The brush paints the sprite in its entirety.

The example below can be created as follows:

1 Open a new sprite file and create a sprite, 300 pixels wide by 200 high, with the name `demo`.

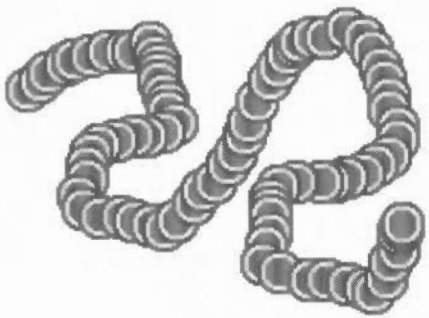
2 In the same sprite file, create a second sprite, with a mask and the name `blob`. Paint it using the filled circles tool, with a red circle first, a yellow circle inside it, and a green circle inside that. Fill the background (with the **Global** option set) with the transparent colour.

3 Open a sprite window for `demo`.

4 In the tools window, select the **Use sprite as brush** tool. Delete the default name `brush`, type the name `blob`, and click on **OK**.

5 Move the pointer back over the sprite window for `demo`. Enlarge it to full size and make it larger using the **Zoom** option if you wish. Starting near the top left, drag a squiggly line across the window. Notice how the sprite outlines merge into a single brush stroke.

6 Now to see the difference, try it again with the Shape option deselected. Notice how this time you plot a series of unconnected sprites.



Parameters:

The toolbox displays a box in which you can set four features:

- **Shape** determines whether just the mask of the sprite is used, or its colours as well. To change the parameter, click on the button. When **Shape** is set, brush fills the pixels in the brush sprite which are not transparent with the current colour. When **Shape** is not set, the brush paints with the coloured sprite image. By default Shape is set.

- **Name** of the sprite to be used for the brush. Enter the name of any sprite within an open sprite file window.
- **X scale, Y scale:** multipliers defining the actual size of the area painted by the brush relative to the size of the sprite. For example, a scale factor of 2:1 means the brush is twice the size of the sprite defining it, and 2:3 means two-thirds the size. Each scale factor consists of two numbers which may be set independently. This can be particularly useful when you want to use the same shape several times in a picture, but not always at the same size.

When you have entered the values you want, click on **OK**.

Copy block

To copy a rectangular block of pixels from one part of a sprite to another:

1 Select **Local** from the new panel that appears at the foot of the Tools window when you select **Copy**.

2 Position the pointer on one corner of the block to be copied.

3 Press Select, drag the mouse to the other corner of the block and release Select.

4 Move the pointer to the destination for the block and click Select.

Step 4 may be repeated to make multiple copies of the selected block. To finish copying, click the **Copy block** icon in the tools window again. Note that the box you mark is actually rounded outwards to the nearest block of pixels that encloses the box.

Copy block can also be used to create a new sprite from a block of an existing sprite. The new sprite can be set up in one of the sprite files you are already editing in Paint, or it can be saved in an entirely new sprite file, either to disc or for importing into another file or application.

To perform either of these operations, first click on the **Export** box in the Tools window. Then follow steps 2 and 3 as above to mark the block. When you release the mouse, a Save dialogue box for the block appears. To save the block as a new sprite in a sprite file, enter a name for the sprite, and drag the icon to a Paint sprite file window.

Move block

To move a rectangular block of pixels from one part of a sprite to another:

1 Position the pointer on one corner of the block to be moved.

2 Press Select, drag the mouse to the other corner of the block to be moved, and release Select.

3 Move the pointer to the destination for the block and click Select.

The area occupied by the source of the move is set to the first colour defined in the palette, so in a 16-colour mode, it will be left as a white rectangle, as in the following example, where a block in the righthand picture has been moved:

As for **Copy block**, the box you mark is actually rounded outwards to the nearest block of pixels that encloses the box.

Move block can be used to export a block of pixels using **Export**. This is identical in use to **Copy block**.

Move whole sprite

To move the entire sprite, press Select within the sprite window, drag the mouse to the new position and release Select. The parts of the sprite image that move outside the limits of the sprite are permanently lost.

Lines

To create a solid line of pixels in the current colour:

1 Click Select at the start point of the line.

2 Move the mouse to the end point of the line.

3 Click Select.

Rectangle outlines

To create a rectangular outline in the current colour:

1 Click Select at one corner of the rectangle.

2 Move the mouse to the other corner and click Select.

Parallelogram outlines

To create a parallelogram outline in the current colour:

1 Click Select at one corner of the parallelogram.
2 Move the mouse to the next corner.
3 Click Select.
4 Move the mouse to the third corner.
5 Click Select.

The position of the fourth corner is derived from the other three.

Filled triangles

To create a filled triangle in the current colour:

1 Click Select at one corner of the triangle.
2 Move the mouse to the second corner.
3 Click Select.
4 Move the mouse to the third corner of the triangle.
5 Click Select.

Filled rectangles

Filled rectangles are created in the same way as outline rectangles.

Filled parallelograms

Filled parallelograms are created in the same way as outline parallelograms.

Replace colour

To replace one colour by another in a sprite (also called **flood fill**):

1 Select the new colour from the sprite colours window (see below for how to display this if it is not already on the screen).
2 Click Select in the area of the sprite to be changed.

Colours can be changed locally or globally. In a local change, the pixels that are changed are the ones you click on, and any others which are connected to it by pixels of the same colour. In a global change, all pixels in the sprite which have the same colour as the one you click on are changed.

To select local or global changes, click Select on the corresponding button in the tools window. The current option is highlighted.

Note that replacing transparent pixels with a colour or a colour with transparent pixels can only be done globally. Global replace colour can take a long time.

Circle outlines

To create a circle outline:

1. Click Select where you wish to place the centre of the circle.
2. Move the mouse until the circle has the required radius.
3. Click Select.

Ellipse outlines

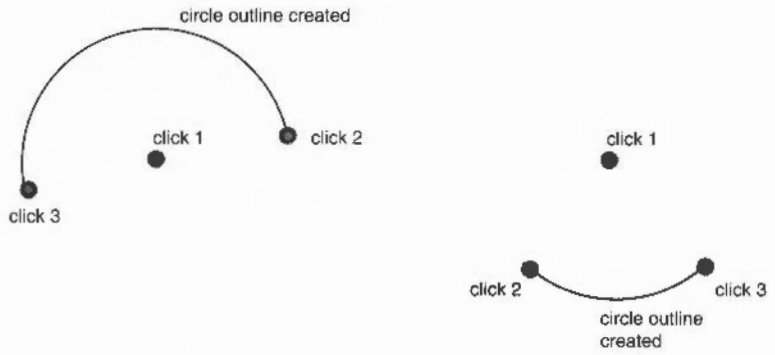
To create an ellipse outline:

1. Click Select where you wish to place the centre of the ellipse.
2. Move the mouse to indicate the width of the ellipse.
3. Click Select.
4. Move the mouse until the ellipse has the required size and orientation.
5. Click Select.

Circle section outlines

To create a section consisting of a circular arc:

1. Click Select where you wish to place the centre of the arc.
2. Move the mouse to one end point of the arc.
3. Click Select.
4. Move the mouse to where you wish the arc to finish.
5. Click Select.



Example 1 Example 2

Insert text

To insert text into the sprite, first select the text tool. The tools window extends to include boxes where you should type in the following:

- The text, in the box containing the caret. The text will scroll in the box if it is too wide to be displayed all at once.
- X and Y character sizes
- Character spacing.

After you have typed in your text, click Select in the sprite window at the position where the centre of the text is to be positioned.

The sizes and spacing are measured in pixels and the text is drawn in the current colour. Only the System font is available in Paint, but if you want to use another font, save the sprite into Draw, superimpose text in the font required, and then take a 'snapshot'.

Filled circles

Filled circles are created in the same way as outline circles.

Filled ellipses

Filled ellipses are created in the same way as outline ellipses.

Filled circle segments

Filled circle segments are created by indicating the end points of an arc, using the same technique as circle outline sections. The area filled is bounded by the arc and by a straight line between the end points of the arc.

Filled circle sectors

Filled circle sectors are created by indicating the end points of an arc, using the same technique as circle outline segments. The area filled is bounded by the arc and by lines running from the end points of the arc to the centre of the circle.

Using colours in Paint

As noted previously, there are four different ways in which you can apply colour to a sprite, chosen using the Set, OR, AND and EOR buttons in the tools window. 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 the colour number selected from the sprite colours window. (The colour number appears in the colours window when the colour is selected.)

For example, if EOR is selected, 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 the logical operations, see the BBC BASIC *Reference Manual*.

You should notice that applying colour to a sprite using OR will tend to set more pixels towards the higher numbered colours in the palette. If AND is used then more pixels will be set to the lower numbered colours in the palette. Painting with EOR tends to maintain a wider variety of colours than either of the previous two styles.

A sprite's palette can be set by dropping a palette file onto the sprite window.

The most interesting effects are achieved when spraying over a range of existing colours, or drawing overlapping filled shapes. Experiment for yourself!

Sprite windows and menus

Each sprite window contains a single sprite. All individual sprite editing actions are carried out in the sprite window. You can have more than one window open for a particular sprite. This enables you to set different magnifications, display a grid in one window but not others, scroll to different parts of the sprite, and so on. Changes made in one window are reflected in the others.

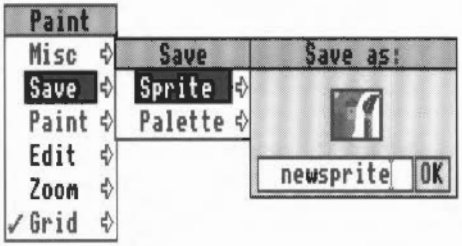
There is a menu associated with sprite windows. Click Menu over a window to obtain it. The menu entries are as follows:

Misc

Misc leads to **Info**, **Sprite** and **Print** options. **Info** and **Sprite** tell you about the application and the sprite. The attributes of the sprite are shown, together with the amount of memory needed to store it. **Print** is described on page 110.

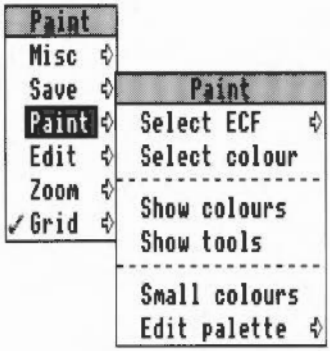
Save

Save leads to a submenu from which you can save the sprite and the sprite palette.



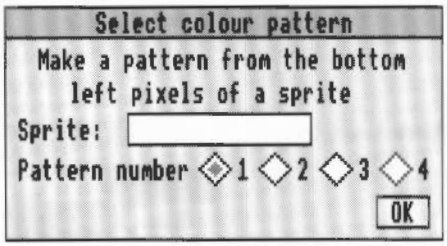
Paint

Paint leads to a submenu used for controlling the available editing facilities. It has the following entries:



Select ECF leads to a dialogue box which you can use to extract the bottom lefthand pixels of a named sprite as an Extended Colour Fill (ECF) pattern. Up to four such patterns may be defined. ECFs consist of patterns that may be used in place of a colour, and will be added to the sprite palette, below the plain colours.

The ECF is taken from a rectangle 8 pixels tall, in the bottom left of the named sprite. The width of the rectangle depends on the number of colours in the sprite the pointer was over when you clicked Menu: 8 pixels wide for 2-colour modes, 4 wide for 4-colour modes, 2 wide for 16-colour modes and 1 wide for 256-colour modes. Extended colour fills are useful for painting large areas in striped, chequerboard or stippled patterns. However, one consequence of the differences in ECF between modes is that you can obtain stippled or chequered patterns for modes with up to 16 colours, but for 256-colour modes, only stripes are possible. You can define up to four ECFs for each sprite.



To set the ECF, type in the name of the sprite it is to be taken from, click on the number of the ECF to be defined, and click on **OK**. To use the ECF in editing, select it in the colours window.

Create and use an example ECF following these steps:

1 Choose a 16-colour mode such as 12 or 20.

2 Open a sprite file window.

3 Create two sprites within it:

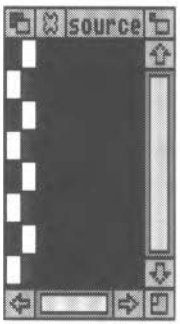
- one called `test`, 300 pixels wide by 200 high.
- another called `source`, 2 pixels wide by 8 high.

4 Open a sprite file window for `source`.

5 Zoom to a large magnification: about 10:1.

6 Select the **Set/clear pixels** tool and a colour of your choice (not white!).

7 Click on alternate pixels in the sprite window to create a chequerboard pattern:



8 Close the `source` sprite window.

9 Open the `test` sprite window, and zoom down again to 1:1. Use the Toggle size icon to enlarge the window to its full size.

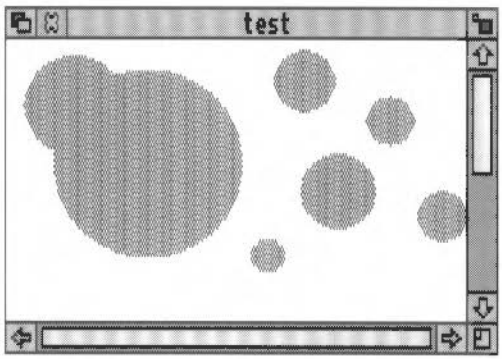
10 Press Menu and move to the **Paint** menu, then to the **Select ECF** dialogue box.

11 Type `source` in the box, and click on **OK**.

12 Select a filled shape tool such as **Filled circles**.

13 Enlarge the colours window for the sprite: the ECF colour will be at the bottom. Select it.

14 Paint circle shapes in the normal way: they will be filled with the chequerboard pattern you designed in `source`, and the result will look something like this:



Select colour: Choosing this sets the colour for future tool window operations to the colour of the pixel the pointer was over when Menu was pressed. It can be used to find out exactly which colour has been used at a point in a sprite.

For example, with the colours window open, position the pointer over the area of the sprite you are interested in and choose **Select colour** from the menu. The entry in the colours window will show the colour.

Show colours displays the sprite colours window, if it is not already on the screen. If the colours window is already open, but is hidden, it is brought to the front of the screen.

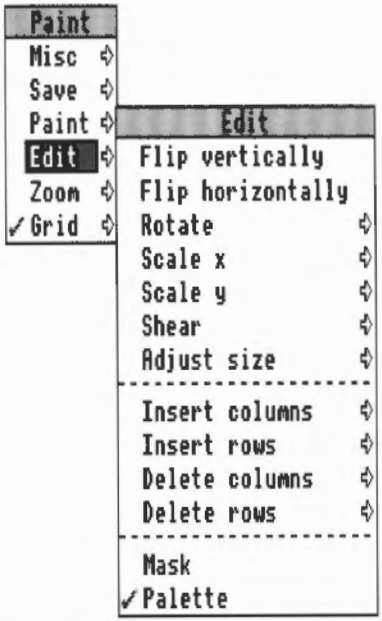
Show tools displays the tools window if it is not already on the screen. If the tools window is already open, it is brought to the front of the screen.

Small colours 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. The menu option is ticked when the small colours window is in use.

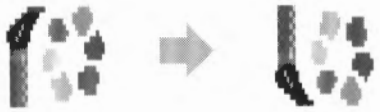
Edit palette is only available for sprites with 16 or fewer colours that have their own palette. The menu option leads to a colour dialogue box which you can use to change the sprite palette. See the section entitled *Shared features in the Applications Suite* on page xvii at the beginning of this guide for a description of how to choose colours. The colour you choose is transferred to the currently selected entry in the palette. To give a sprite its own palette, click on **Palette** in the Edit menu (described overleaf).

Edit

Edit leads to a submenu used for miscellaneous editing actions on the sprite. It has the following entries:



Flip vertically inverts the sprite vertically about its centre:

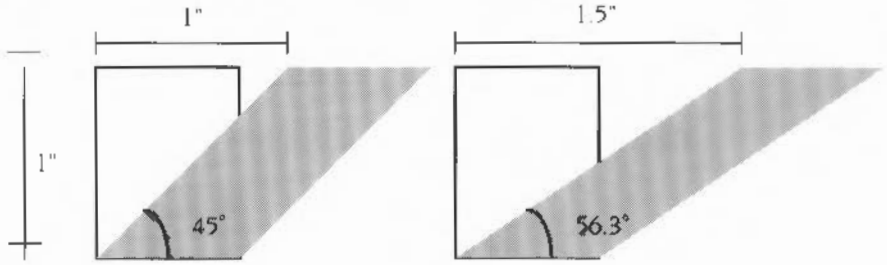


Flip horizontally inverts the sprite horizontally about its centre:

Rotate leads to a box into which you type the rotation angle (expressed in degrees anticlockwise). The sprite size changes if you rotate for angles other than multiples of 90 degrees.

Scale x and **Scale y** lead to boxes into which you type a multiplication factor to enlarge or reduce the sprite on its horizontal or vertical dimension. Negative scale factors are not allowed. A scale of 0.5 halves the sprite size. A scale of two doubles the sprite size.

Shear enables you to slant the sprite. The option leads to a dialogue box into which you type a shear factor. The top row of pixels is moved rightwards by an amount defined by multiplying the height of the sprite by the factor given. The rows in between are moved proportionally. The factor is, in fact, the tangent of the angle you wish to shear by. A factor of 1 slants the sprite 45°.



Shear factor = 1
Angle = 45°

Shear factor = 1.5
Angle = 56.3°

Adjust size leads to a dialogue box which you can use to alter the height and width of the sprite. The values are changed either by typing in new values, or by using the boxes marked with arrows to alter the values. When you have set the size you want, click on **OK**. The arrows allow you to add and delete rows and columns from the top and right sides of the sprite.

Insert columns leads to a box into which you type the number of columns to insert. This extends the width of a sprite by the number of columns specified, filled with the background colour.

This operation and the next three apply at the position the pointer was over when you pressed Menu. This will be shown as a box on the sprite. By moving the pointer into the sprite window (without passing over a menu) you can change the size of the box. The menu option shows the current size of the box; click Select to use the current size.

Insert rows leads to a box into which you type the number of rows to insert. This extends the height of the sprite by the number of rows specified, filled with the background colour.

Delete columns leads to a box into which you type the number of columns to delete.

Delete rows leads to a box into which you type the number of rows to delete.

Mask allows you to choose whether the sprite has a mask or not. The menu option is ticked if the sprite has a mask. See *Sprite colours window*, overleaf, for more about masks.

Note that if you assign a mask for your sprite you can only define three ECF patterns, since the mask takes the place of ECF3.

Palette allows you to choose whether the sprite has its own palette or not. The menu option is ticked if the sprite has its own palette. If you intend to export a sprite to Draw, you should give it a palette, since otherwise it will not retain the colours you gave it. A sprite with no palette of its own uses the current desktop palette. A Sprite's palette can be changed by dropping a palette file icon onto the window displaying the sprite.

Zoom

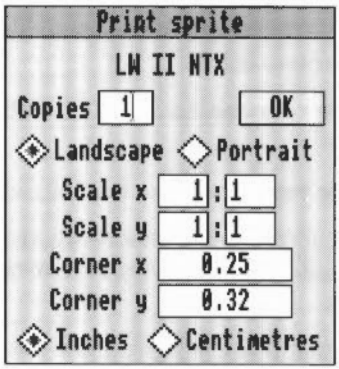
Zoom leads to a magnifier dialogue box which you can use to change the size at which the sprite is displayed. See the chapter entitled *Introducing the Applications Suite* on page ix at the beginning of this guide for a description of how to use the magnifier dialogue box. Note that the magnification only changes the size at which the sprite is displayed in the window, the actual definition, height and width are not affected.

Grid

Grid leads to a submenu of colours. Choose one to display a grid in that colour in the sprite window. The grid shows where the pixel boundaries are; it can be useful for lining up parts of the sprite. If you choose **Grid** directly from the menu (ie without moving to the colour submenu), the grid is turned on or off. The grid is not shown if the displayed size of the sprite is too small (magnification of less than 4:1).

Print

Print, chosen from the **Misc** submenu, leads to a dialogue box which you can use to print the sprite. The exact contents of the dialogue box depends on the printer driver in use, but it typically allows you to choose the orientation (**Portrait** or **Landscape**), scaling, and position on the paper.



The **Scale** option allows you to change the proportions of the printed image. Setting both x and y to 1:2 will produce a half-sized image.

The **Corner** option 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.

Sprite colours window

The sprite colours window is used to select the current colour for the editing you are doing. The current colour is highlighted, 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.

If you have defined any Extended Colour Fill (ECF) patterns for the sprite, they are also shown in the sprite colours window, below the other colours. You may need to enlarge the colours window in order to see them.

If the sprite has a mask, an extra, special colour is shown in the bottom lefthand corner of the sprite colours window, as a grey or shaded square. You can use this colour – in the same way as any other colour – for making pixels transparent; this can be useful if, for example, you wish to design a sprite so that if it is displayed on top of something else, the background can be seen. The pictures below show two

Paint icons on top of one another. On the left, the top sprite has a transparent background, and on the right, it has a white background. Notice how you can see the handle of the paintbrush in the lefthand pair, but not in the pair on the right.

If you close the last window open on a sprite, the corresponding sprite colours window closes as well. However, the sprite colours window can be closed without closing the sprite window.

Sprite file windows and menus

The sprite file window shows all the sprites defined in the file. The sprites in this window are updated as you edit them in a sprite window. You can have more than one sprite file window open at a time. If you close a sprite file window, all the sprite windows that are currently open will close.

To open a sprite window for a sprite, double-click on it in the sprite file window.

There is a menu associated with sprite file windows. Click Menu over the window to obtain it. The menu entries are as follows:

Misc

Misc displays information about the sprite file and the application.

Display

Display leads to a submenu which allows you to select how sprites are shown:

Drawing and name: choose this to display a sprite in the sprite file window as the sprite and its name only. Selecting this switches **Full info** off.

Full info: choose this to display a sprite in the sprite file window as the sprite and its name, together with more detailed information about the sprite. Selecting this switches **Drawing and name** off.

Use desktop colours: choose this to toggle whether the desktop colours, or the BBC microcomputer-compatible set of standard default colours for the sprite mode are used in displaying sprites. Using the desktop colours will show you how the sprite would appear if used as an icon. This option is ignored if the sprite has its own palette.

Save

Save leads to a Save dialogue box for saving the sprite file.

Sprite

Sprite 'pic' leads to a submenu of actions applying to an individual sprite. This is only available if the pointer were over a sprite when you clicked Menu. The submenu contains the following options:

Copy leads to a box where you should type in a new name and press Return to make an exact copy of the sprite under the pointer with the given name. The copy will appear in the sprite file window.

Rename leads to a box where you should type in a new name and press Return to change the name of the sprite.

Delete deletes the selected sprite from the Sprite file window.

Save leads to a standard Save dialogue box for saving an individual sprite.

Info displays a box containing information about the sprite.

Print leads to the same dialogue box as is reached via the menu from the sprite window.

New sprite

New sprite leads to the **Create new sprite** dialogue box, from which you can create a new sprite. See page 81 for more information.

If you double-click on an unused part of the sprite file window the Create new sprite dialogue box is also displayed.

The icon bar menu

There is a further Paint menu, obtained by pressing Menu over the Paint icon on the icon bar.

Info

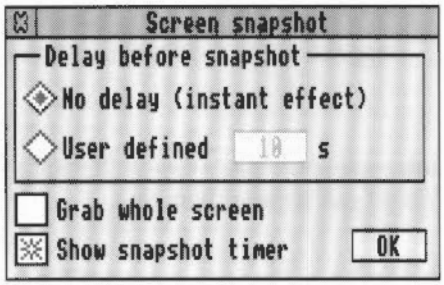
Info leads to a dialogue box containing details about the version of Paint.

Snapshot

Snapshot allows you to save part of the screen as a sprite file.

You start snapshot by choosing **Snapshot** from the icon bar menu; this displays the snapshot dialogue box.

The snapshot dialogue box allows you to alter the parameters involved in saving the screen:



Delay before snapshot allows you to select the time interval between clicking on the Snapshot box and the picture being taken. A time delay can be useful because it allows you to display transient items, like menus, on the screen before the picture is taken.

Grab whole screen does just that; it takes a picture of the whole of the visible screen.

Show snapshot timer shows a timer that gives a countdown of the time left before the picture is taken.

Using Snapshot

1. Open the directory where you want to save the captured sprite. Move this away from the area you want to grab.
2. Choose **Snapshot** from the Paint icon bar menu.
3. Set the parameters of your snapshot – **Delay**, **Grab whole screen**, **Show snapshot timer** etc.
4. Click on the **OK** button.
5. You will see a small icon of a camera with an arrow (unless you selected **Grab whole screen**, in which case the **Save as** dialogue box will appear immediately); move the point of the arrow to one corner of the area you want to capture.
6. Drag the icon and a bounding-box will appear, showing the area which will be captured as a sprite. When the box covers the required area, let go of Select, and the 'snapshot' process will start. If you left the **No delay** button on, the **Save as** dialogue box will immediately appear. If you requested a delay, the box will appear after the requested time lapse.
7. Drag the sprite to the appropriate directory display to save it.

Quit

Quit ends your Paint session; if you have not saved some of your files, Paint will prompt you to save them first.

Saving Paint features in a Desktop boot file

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 save these features by creating a Desktop boot file. Instructions on how to create a Desktop boot file are given in the RISC OS 3 *User Guide* in the chapter *Desktop boot files*.

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, following the instructions above and in the RISC OS 3 *User Guide*.

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 Paint: this will read something like

```
Run Resources:$.Apps.!Paint
```

4 Delete that line and resave the !Boot file.
(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 reading

```
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	Values	Possible Meaning
D	Sprite file window display	D or F	Drawing and name or Full info
		W or B	Desktop colours on (Wimp) or off (use BBC colours)
C	Colours displayed when new sprite window opened	+ or –	Colours window on or off
		L	Small colours off
		S	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 –	Grid on or off (at zoom factors of 4:1 or above); *n* specifies colour for the grid.
		n	

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+ Z1:1G+7
```

- Show drawing and name, use desktop colours.
- Display colours window (normal size) when a sprite is loaded.
- Display toolbox when Paint is loaded.
- Zoom 1:1 (normal size).
- Grid on with black grid lines.

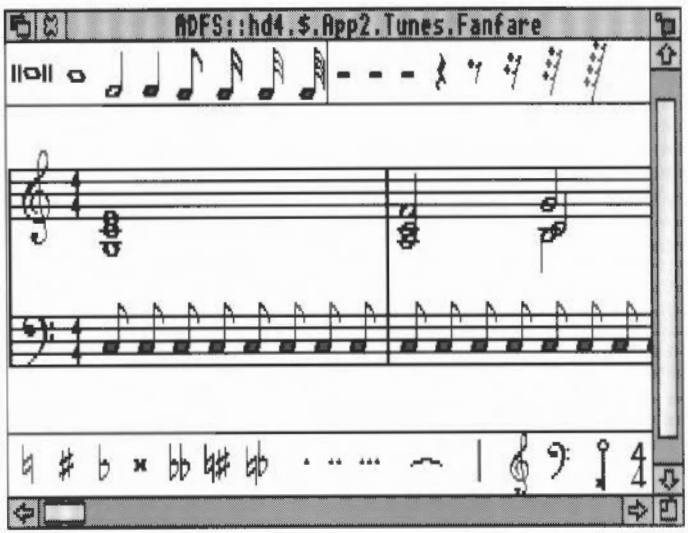
When editing the Desktop boot file, you should make sure that the Paint$Options line is placed before the line the that runs the Paint application.

4 Maestro

Maestro 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. The following description assumes that you are familiar with musical notation.

Install Maestro on the icon bar in the usual way (by double-clicking on its icon in the directory display). Display the Maestro window by clicking on the icon on the icon bar.

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. The window that appears looks like this:



The Maestro window is divided into three horizontal panels, with the stave in the centre. Scrolling affects only the central panel. Above and below the stave are toolboxes containing icons for notes, rests, clefs and other symbols.

To play the tune, click Menu to open the main Maestro menu. Click Select on **Play** to start the music. As the music plays, the score scrolls across the screen. Click **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 pane 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.

Notes may be placed anywhere; above and below each stave 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.

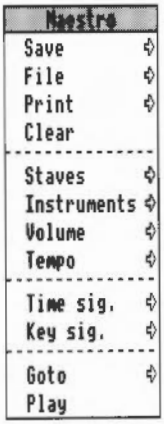
The tie character is of a fixed length, but when placed between notes of the same pitch, a single note will sound, with a duration equal to the two notes added together.

Adding clefs and key and time signatures

Clefs may be selected and placed like other items: they will appear only at the beginning of a bar.

Key and time signatures must be selected before they are positioned on the score. This is done using the Maestro menu, and the process is described in the appropriate section below.

The Maestro menu



As in any application, clicking Menu on the Maestro window will display the top-level menu.

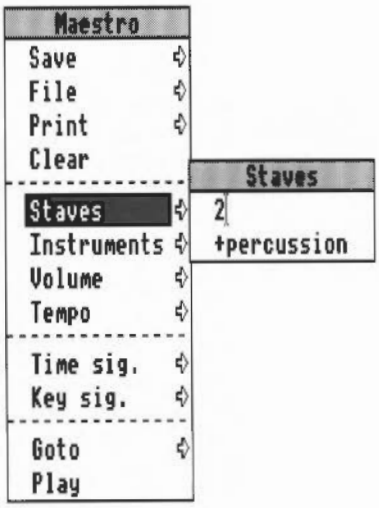
The **Save** procedure is exactly the same as for other applications such as Edit or Draw. Save a score by dragging the Maestro icon into the directory window where you want to save it, or by typing in the full pathname and clicking on **OK**.

File gives you some information about the file you are working on.

Print allows you to print your score on the printer.

Clear removes the current score from the stave but leaves the Maestro window on the screen.

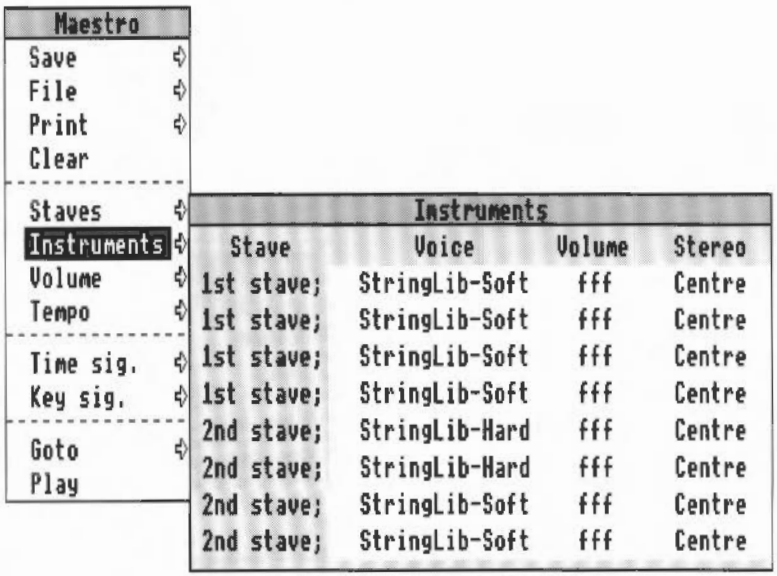
Staves displays a box where you can enter the numbers 1, 2, 3 or 4 (others are not accepted), and an option **+percussion**. Clicking on this option will add a single line percussion stave; when it is selected, the menu item is ticked. Click on it again to remove the percussion stave.



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. The following properties can be set for each voice:

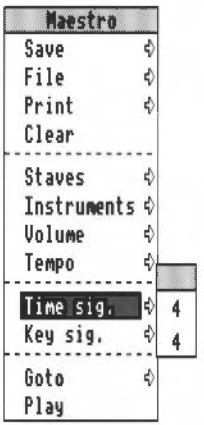
- **Voice** – Repeated clicking of Adjust takes you through the instruments available. Select takes you backwards through the options available.
- **Volume** – The volume of each voice can be set separately. Click Select to reduce the volume by one 'notch' and Adjust to increase it. To set the overall 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.

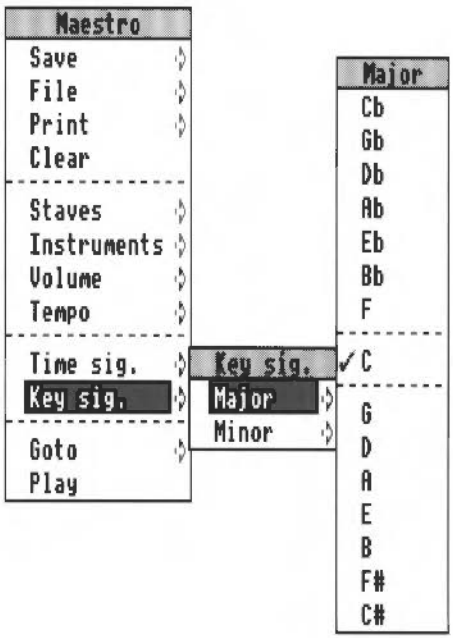
3 Position the pointer where you want the time signature to appear.

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.

The **Key signature** menu tree is displayed 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.

4 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 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.

Setting up your own score

The preceding description of the Maestro menu options gives you the information you need to set up your own score. However, for the sake of clarity, the following section sets out the steps to take in their most convenient order (though they can all be changed at any time). The menu options are shown in bold type.

1 Choose the **Staves** you want.

2 Choose your **Instruments**, and their volume and position.

3 Select your **Key signature**, and place it on the score by selecting the key icon and dragging it into place.

4 Select your **Time Signature**, and place it on the score by selecting the 4/4 icon and dragging it into place.

5 Choose the **Volume** and **Tempo** you want.

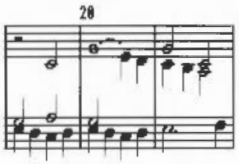
You are now ready to start placing notes on the staves.

Some tips

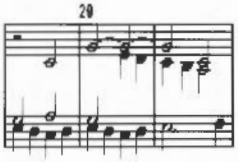
If you copy a piece of music from a written score it will occasionally need some minor modifications to play correctly.

Fugues

In fugues scored for the keyboard, several distinct parts may be written on one stave. In the following example from a Shostakovich fugue, bar 20 contains a semibreve G belonging to the top part, and in the second half of the bar, two crotchets belonging to the middle part, which had started bar 20 in the bass stave.



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 stave, 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.

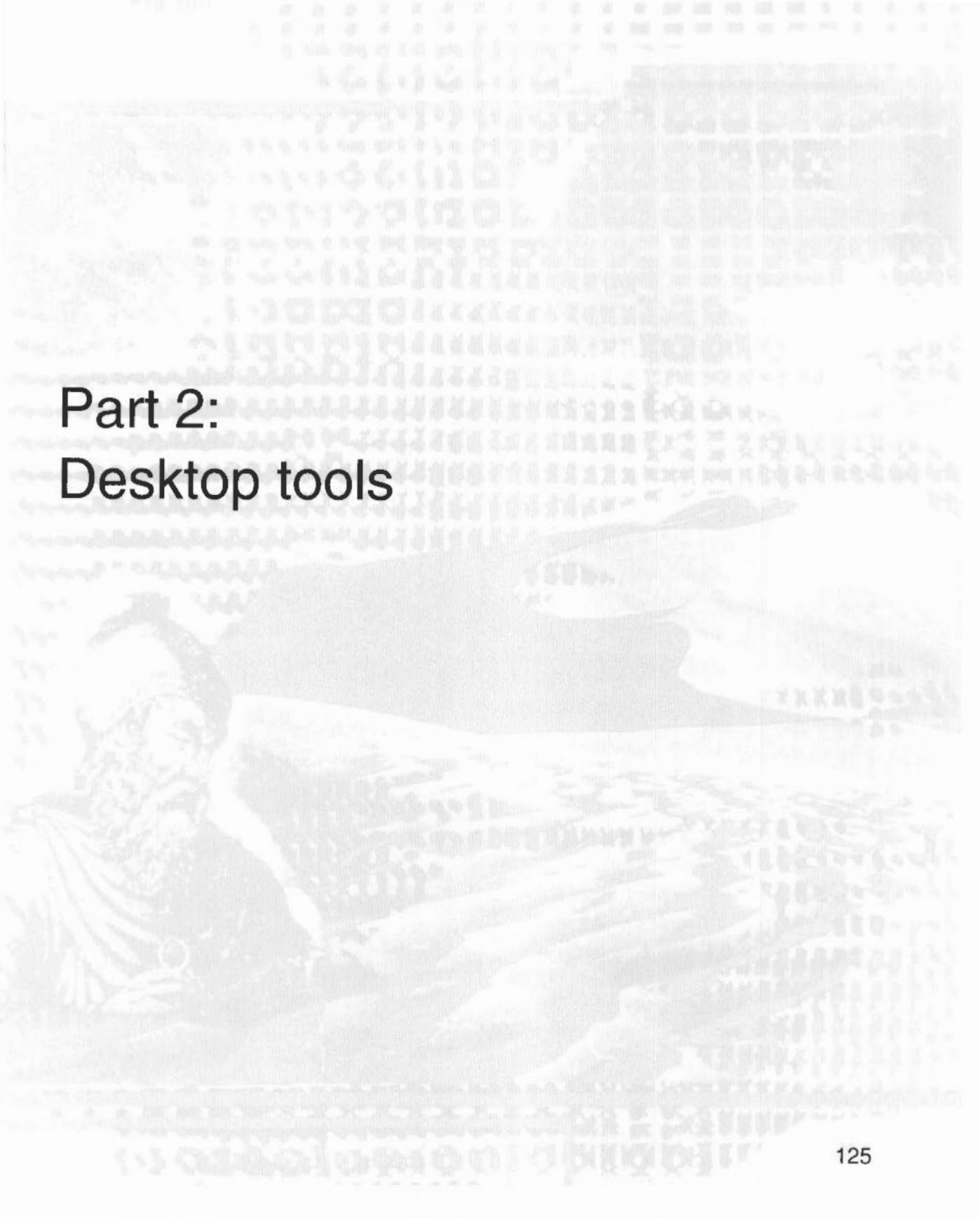
Grace notes and trills

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 the RISC OS 3 *User Guide*) to reduce Next to 256K, before loading Maestro.

Part 2:
Desktop tools



5 Alarm

Alarm, as you might expect, is a sophisticated alarm clock. It can

- display an analogue or digital clock on the icon bar
- set the computer's date and time clock
- set up alarms that can go off at any time in the future
- set up applications so that they are automatically started at a particular time
- set up urgent and repeating alarms.

Starting Alarm

Alarm is supplied as an application, stored in the Apps directory on the icon bar. To start Alarm, click on the Apps icon on the icon bar to display the Apps directory, then double-click on the Alarm icon. When it has finished loading, the Alarm clockface appears on the icon bar.

To display the Alarm menu, press Menu on the Alarm icon on the icon bar. Alarm settings are changed using this menu and associated dialogue boxes.

Alarms can be stored by the alarm application automatically and remembered even if you switch off the computer. However this facility only operates if you save your Alarm files to disc. See page 135 for more details.

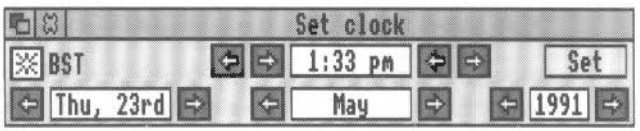
Setting the time

The **Set clock** dialogue box is used to set the clock's time and date.

To display the Set clock dialogue box:

1 Click Menu over the Alarm icon on the icon bar. This displays the icon bar menu.

2 Choose the **Set clock** option.



To change the time and date:

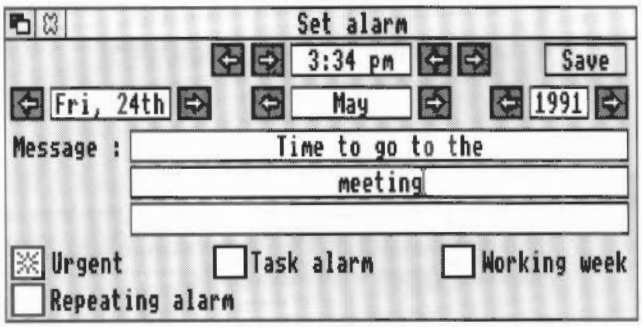
1 With the Set clock dialogue box, set the time and date by clicking on the appropriate arrows. Click on **BST** if British Summer Time is in operation.

2 Click on Set to reset the clock to the new time.

The new time and date applies to the entire RISC OS system, not just to Alarm.

Setting an alarm

This section shows you how to set an alarm. All alarms are set from the **Set alarm** dialogue box. To display the Set alarm dialogue box, simply click Select over the time display icon on the icon bar.



You are presented with a dialogue box in which to set the alarm date and time, and a space in which you can, if you wish, enter some text which will be displayed when the alarm goes off.

To set the time and date of the alarm, click on the arrow boxes. Click on **Save** to set the alarm. When an alarm is set, the box surrounding the time display on the icon bar changes colour.

The following options are available:

Urgent

An alarm may be marked 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.

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

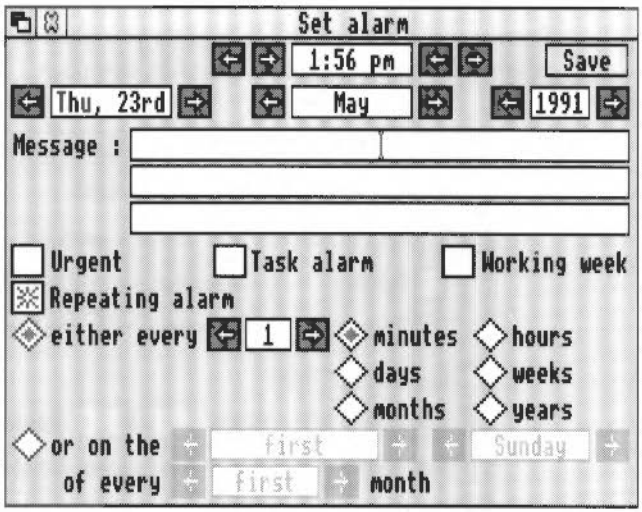
also set up a Task alarm by dragging a file onto the Set alarm window. If you drag an application onto the window, for example, that application will run at the time set for the alarm. If you drag a text file, the text will be displayed in an Edit application window; you might use this option to display, at the start of the day, a list of things you have to do.

Working week

This limits the alarm settings for any new and 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.

Repeating alarm

You can set an alarm to go off more than once by clicking on the box marked Repeating alarm, which displays the repeating alarm options.



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, choose the Repeating alarms option in the setup dialogue box.

You can set more than one alarm by simply repeating the Set alarm procedure.

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 and BST time zone switching.

To change the Setup dialogue box options:

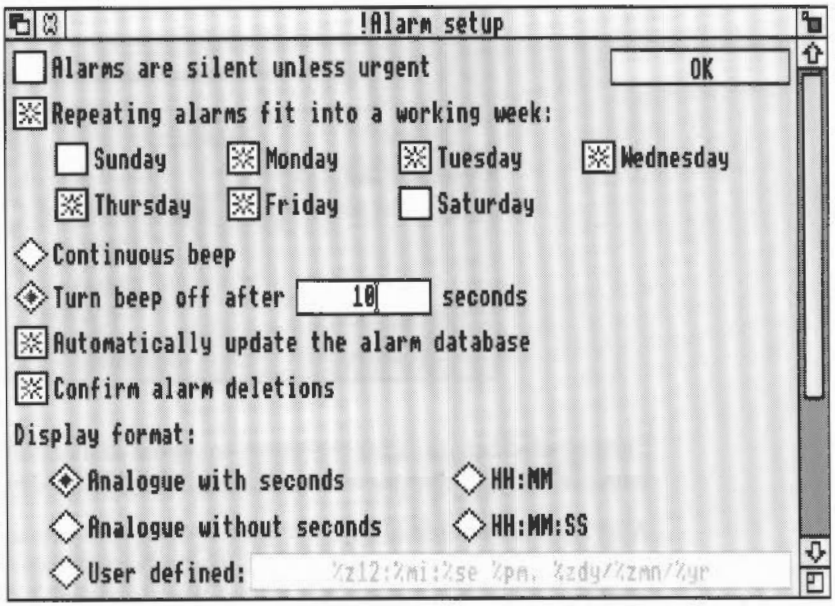
1 Click Menu over the Alarm icon on the icon bar. This displays the icon bar menu.

2 Choose the **Setup** option.

3 Change the dialogue box options you wish to.

4 Click on the OK box. The saves the new options for your current session. However when your computer is reset, these changes will be lost.

To save these changes permanently you must update the Alarm$Options parameter in your Desktop boot file. See page 136 for more information.



The following configuration options can be altered with this dialogue box. Select the alarms by clicking in the empty box. A star in the box denotes that the option is already selected; click on the star to deselect it.

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 the alarm beep off

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

Once you have used the **Save as alarms** option in the browser dialogue box, Alarm knows where to find your alarm database file. Choosing this option lets Alarm automatically update the alarm database file whenever you set or change an alarm.

If you select this option without first setting an Alarms database, you will see an error message and your Alarm file will not be stored in the database. Set an Alarms database by double-clicking on an Alarms file or by using the Save as alarms option on the Alarms browser menu.

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:

- 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 Format** box.

```
%z12:%mi:%se %pm %zdy/%zmn/%zyr
```

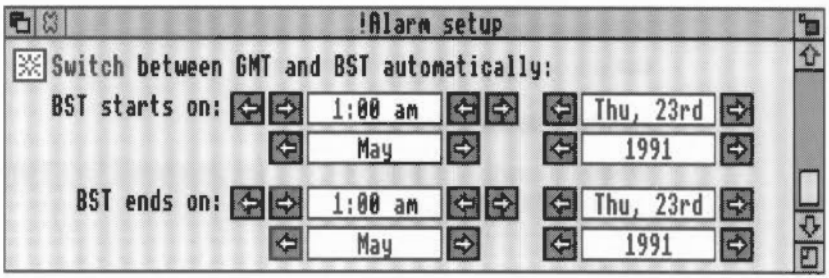
and

```
%we %zdy%st %m3 Week %wk
```

For information on how to set up your own formats, see the section entitled *Time and date display formats* on page 137. 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 the chapter *Desktop Boot files* in the RISC OS 3 *User Guide*.

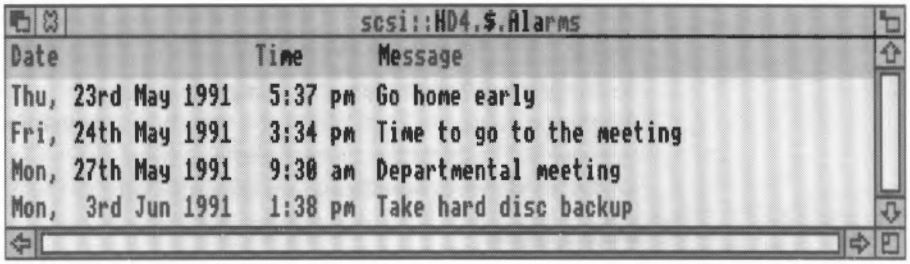
Switch between GMT and BST automatically

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.

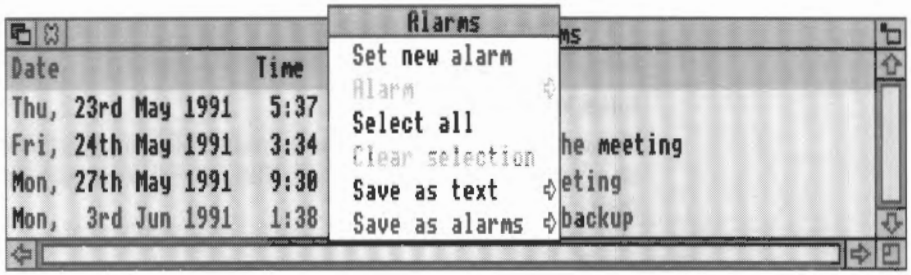


Browsing through your alarms

Clicking on **Alarms...** on 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 first 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. The change alarm box can also be displayed by double-clicking over the appropriate line in the browser.

To choose a different alarm to change, click 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.

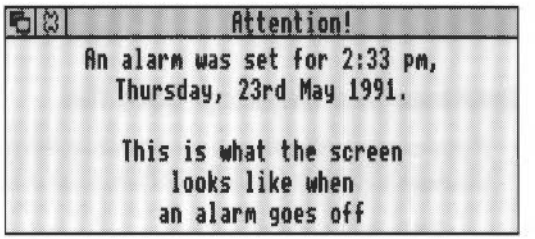
You can load this text file into Edit to display a list of all your currently set Alarms, or, if you have a printer driver installed, drag the icon straight onto the printer driver icon to print the list on paper.

Save as alarms

This option saves the selected alarms as an alarm file. Drag the **Save as** alarms file icon to an appropriate directory. Alarm files can be read back into Alarm at a later date.

When the alarm goes off

When the alarm time is reached, a window similar to the illustration below appears on the screen.



If it is not a repeating alarm, cancel the alarm and remove the window by clicking the Close icon in the alarm display. 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.

Quitting Alarm

To close down Alarm, select **Quit** from the icon bar menu. Alarm will warn you if you have any alarms that have not been saved.

Alarm data files

Alarm data files contain information about the currently held 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.

If you have an alarms file that was saved using a pre-RISC OS 3 Alarm application you will need to convert the file into the new alarm format using the application !AlarmConv. This is described in the section entitled *Converting old Alarm data files* on page 138.

Saving Alarm features in a Desktop boot file

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
```

You can also manually edit your Desktop boot file to incorporate these lines. See the section *Desktop boot files* in the RISC OS 3 *User Guide* for more information.

Alarm$Options

The 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**. By default, it is

```
-format %z12:%mi:%se %pm. %zdy/%zmn/%yr
```

This will produce displays like this:

12:12:32 pm. 23/1/90
1:15:30 am. 1/12/89

For full information on time and date formats, see the next section.

Time and date display formats

The date and time format can be set by giving the system variable Alarm$Options a string made up of time and date variables as listed below.

Name	Value	Example
%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
%0	insert an ASCII 0 zero byte	
%%	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
```

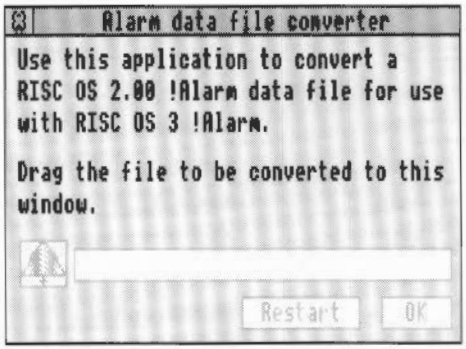
would display in the form:

```
Wednesday the 21st Jan 84
```

Converting old Alarm data files

If you have been using a pre-RISC OS 3 version of Alarm and you have saved some alarms, you will need to use the AlarmConv application to convert these alarms into a new-style alarm file.

1 Start AlarmConv by double clicking on its icon. This displays the conversion window.



2 Go to your old Alarm application and while pressing down the Shift key, double-click on the Alarm application icon. This opens the alarm application directory.

3 Locate the old alarm data file, called !Alarm. Drag this file from the Alarm application directory onto the AlarmConv window.

4 Click on **OK**. This automatically converts the data file into the new format.

5 Drag the Alarm Bell icon from the AlarmConv window into the directory display in which you want to keep your Alarms file.

If you want to convert another old Alarm data file, click on **Restart** to reset the program and then drag the next data file onto the window.

When you have finished using the program, click on the Close icon in the AlarmConv window and Close the old Alarm application window.

You should also remove the old Alarm application from disc so that you are sure that you are always using the new !Alarm.

6 Calculator

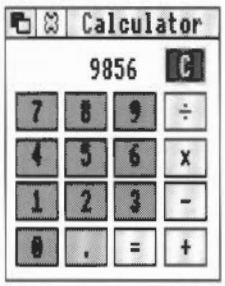
The 'Calculator' allows you to use your computer for simple arithmetic. Double-click on the Calculator icon in the Apps directory display to install the Calculator icon on the icon bar. Click on the icon on the bar to display the calculator.

The screen calculator is like a simple four-function (add, subtract, multiply and divide) electronic desk calculator. 'Press' the number and function keys on the calculator keypad by clicking the mouse on the square you want. The number calculated is displayed in the number window above the keys.

If you prefer, you can also use the numeric keypad on the keyboard to enter numbers. You must have the Num Lock key enabled for the numeric keypad to work. The Enter key corresponds to the Equals button and the Delete key corresponds to the Clear button.

Some operations, such as division by zero, will cause an error message to appear. Clear this by clicking on C (Clear).

Remove the Calculator from the desktop by clicking on the Close icon. The Calculator can be activated again from the icon bar when you need it. To remove it from the icon bar, choose Quit from the Calculator's icon bar menu.



There is a more advanced scientific calculator, SciCalc, also supplied. See page 149 for information about this application.

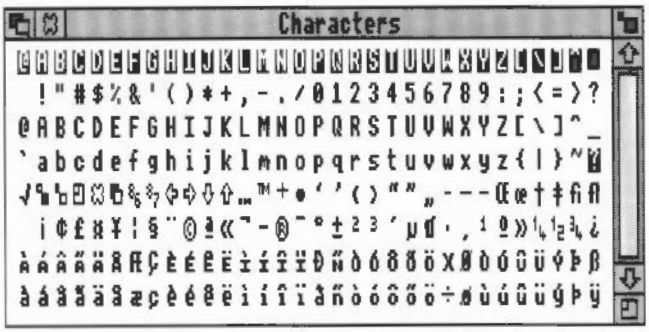
7 Chars

Chars 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.

Double-click on the Chars icon to start the application; its window will open immediately (no icon appears on the icon bar).

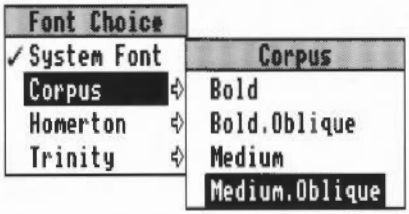
You can use Chars to insert a character at any time when you are typing text: for example, in an Edit window, in a 'menu item' (such as the **New directory** or file **Rename** boxes), or in any text application.

To use a character, click on it. It will appear at the caret position in the current window (the window with the cream-coloured Title bar). You can also insert a character by positioning the pointer over the one you wish to use, and pressing Shift. You will need to 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), since clicking on the Chars window would make the **Save as** box disappear.



Using different fonts with Chars

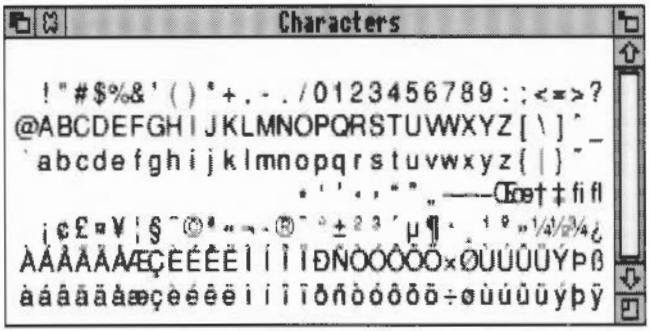
When you first run Chars, the font that appears will be the System font. If you want to use a different font, press Menu on the Chars window to obtain a menu of all the currently-available fonts, and click on the one you want. The characters for that font will appear in the Chars window.



You will also need to select the corresponding font in the application you are using, otherwise the characters you choose will appear in the font in use around the caret. For example, suppose the caret is in the middle of an 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.

Similarly, you can only use System font characters for naming files and directories; if a font such as Selwyn is displayed in the Chars window, the characters you click on will appear as the System font equivalents at the insertion point.

Here is !Chars displaying the Homerton 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.

Advanced notes

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 correspond to letters in the Latin 1 alphabet.

For example, Alt 64 will enter the @ character.

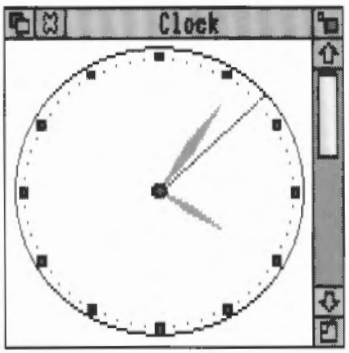
8 Clock

Clock is an analogue clock face with hour, minute and second hands.

To display the clock window, double-click on the Clock icon in the relevant directory display.

The clock may be moved, re-sized and removed like any other window.

To **set** the time, use the Alarm application.



9 Magnifier

Magnifier is a program for detailed examination of the screen.

To run Magnifier, double-click on its icon. A magnifying glass icon will appear on the icon bar. To activate the magnifying glass, click on this icon. The magnifier will appear at the pointer position. Click Menu to revert to the normal pointer.

To increase the magnification, press Adjust; to reduce it, press Select.

Press Menu on the icon bar icon to obtain the Magnifier menu, which allows you to change the way the application behaves:

Info leads to information about the version of Magnifier you are running.

Circular and **Rectangular** allow you to change the shape of the 'lens' to a circle or a rectangle, according to your preference. Click on the option you want.

Size leads to a box into which you can type the width you want for the lens. The units used here are OS units (operating system units), which are 180 to the inch.

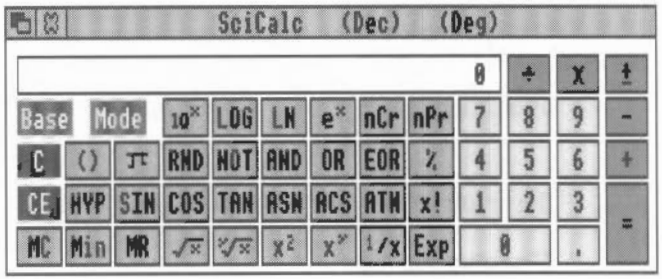
Magnify by leads to a box into which you can type the magnification factor you want. To reduce by a factor of two, type 0.5.

Click on **Default** to restore the default shape, size and magnification factor (circular, 128 OS units wide, magnifying by two).

Click on **Quit** to remove Magnifier from the icon bar.

10 SciCalc

SciCalc is a calculator providing a range of scientific functions in addition to simple arithmetic ones. Load it by double-clicking in the normal way; click on the icon bar icon to display the following 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 function keys in the numeric keypad are also equivalent to those on the calculator keypad.

Simple 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 * 5 = 32 (not 40)

You can change the order of calculation by using brackets:

(2 + 6) * 5 = 40

Simple multiplication

To multiply 2 by 5 and view the result, enter the following in this order:

2 x 5 =

The result will appear in the display.

Changing the sign

The ± 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 x 3 CE 5 =

calculates

2 + 6 x 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.

Using the memory

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.

More advanced mathematical functions

Calculating roots

To calculate the **square root** of x, press $\sqrt{x}$.

To obtain the yth 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.

To raise 10 to the nth power, press 10^x.

To raise e to the nth 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) x 5, press

```
( ) 2 + 3 ( ) x 5 =
```

(There is only one level of brackets available.)

Using π

To use π in a calculation, press π.

Calculating exponents

To express x in exponent form, press Exp followed by y, the exponent. For example,

```
50 E 4 =
```

displays the result 500000.

Trigonometric functions in base 10

Among the more advanced functions available in SciCalc are the standard trigonometric functions:

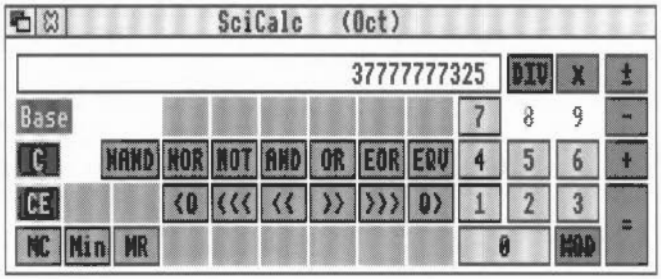
SIN	sine
COS	cosine
TAN	tangent
ASN	arcsine (sine^{-1})
ACS	arccosine (cosine^{-1})
ATN	arctangent (tangent^{-1})

To obtain hyperbolic trigonometric functions, press Hyp before pressing the function button.

Changing the base and mode

As already mentioned, when first loaded SciCalc works to a decimal base. Successive clicks on Base switch 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.

In decimal base, you can also obtain alternative modes by clicking on the `Mode` box. This switches between degrees, radians and gradians; the current unit is shown in the Title bar. For example, to express 50 degrees in radians, switch to decimal base and degree mode, enter 50, and click on `Mode` so that the Title bar shows `(Rad)`. The display changes to show the value 0.87266463.

Note that changing from decimal to a non-decimal base will round 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.

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.

Technical notes

Its 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.

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
nCr		combination
nPr		permutation
()	(,)	brackets (one level only)

Calculator	Keyboard	Function
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^2		square
x^Y	^	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

Alternative keys 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).

unary operators
$y\sqrt{x}$
x^Y
nCr, nPr
*, /, DIV, MOD
+, –
<O, O>, <<, >>, <<<, >>>
AND, NAND
OR, EOR, NOR, EQV

Saving SciCalc 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.

You can set features of this type by setting up SciCalc as you wish to use it, and then save the features by creating a Desktop boot file; instructions on how to create a Desktop boot file are given in the RISC OS 3 *User Guide*.

Customising the Desktop boot file

The SciCalc window can be opened at a chosen place on the screen when SciCalc is run, by editing your Desktop boot file and inserting the system variable SciCalc$Window. For example:

```
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 -	1 Decimal	2 Binary	3 Octal	4 Hexadecimal
Mode -	1 Radians	2 Degrees	3 Gradians	

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.

11 The BBC emulators 65 Host and 65 Tube

An emulator is a piece of computer technology which makes your computer system behave like, or **emulate**, another computer system. You can then run on your system many software and hardware applications that were originally developed for the other system.

What the BBC Model B emulator does

The BBC Model B emulator offers you two different emulators, each of which makes the computer behave like another system:

- **65Host** makes it possible to run many applications on a RISC OS computer that were originally written to run on a BBC Model B.
- **65Tube** makes it possible to run many applications on a RISC OS computer that were originally written for the 65C02 second processor.

The BBC Model B emulator contains a copy of the BBC Model B operating system - including, for full compatibility, any bugs it contains! This helps us provide a particularly good emulation of the BBC Model B:

- Not only can both emulators run programs written in BBC BASIC (including its built-in assembler); they can also run machine code (including programs compiled from high-level languages).
- Both emulators should correctly run programs that use hardware add-ons, providing the programs have been written following our guidelines.

If you've got a different 6502-based Acorn computer (such as a BBC Model B+, Master 128 or Master Compact) you'll still find the BBC Model B emulator useful. This is because many applications for these systems are written to run also on a BBC Model B computer.

More information

This chapter is a shortened version of the User Guide in the BBC *Model B Emulator pack* (SKB10). This pack consists of an expanded User Guide and a number of utility programs to help you port existing 6502-based software to RISC OS. Contact your dealer for more information.

What to read next

The emulators

The section entitled 65H*ost and* 65T*ube* overleaf gives more information about the emulators, and the facilities they provide. It also outlines some of the reasons why they may be unable to run a particular program.

Transferring programs to RISC OS

There are a number of stages in trying to run a program on a RISC OS computer when it was originally written for a 6502-based computer. Successive sections take you through each of these stages:

- Firstly you need to be able to load the program into your RISC OS computer. In many cases this will mean transferring software from a medium that only 6502-based Acorn computers can use (such as a 5 ¼" DFS or ADFS disc) to one that RISC OS computers can use (such as a 3 ½" ADFS disc). The section entitled *Transferring files to* RISC OS on page 165 tells you how to do this.
- Once you've transferred a program to RISC OS, the next thing you've got to do is to make it run. The section entitled *Making a program run* on page 168 explains different ways you can do so; it also tells you when you can use each method, and what are its advantages and disadvantages.
- Finally, you might like to make the program into a RISC OS application with its own icon. This makes it easier to run the program, and integrates it better into RISC OS. This relatively simple process is described in the section entitled *Making a* RISC OS *application from a 6502-based program* on page 171.

65Host and 65Tube

The Applications discs contains the two programs – 65Host and 65Tube; these enable you to run software written for the BBC Model B computer, including (using 65Tube) software designed for the 65C02 second processor. BBC Master 128 or Master Compact software may not run on an emulator if it uses facilities not available on the BBC Model B (such as shadow RAM).

- **65Host** substantially emulates a BBC Model B microcomputer, running version 1.20 of its Machine Operating System (MOS). It supports direct screen access, and paged sideways ROMs.
- **65Tube** emulates a 65C02 second processor environment.

This section gives an overview of the emulators, including the most important technical points.

Software on DFS discs

If you have previously run from an Econet network the software you now wish to run on an emulator, you can still run it in the same way from the emulator. However, much software designed for 6502-based Acorn computers is provided on discs using the DFS (Disc Filing System).

Since you cannot use DFS discs with a standard RISC OS computer (even if you have attached a 5¼" disc drive to it), you must first copy DFS files onto a filing system that is supported, such as ADFS or NetFS. Various third parties provide products that allow you to access DFS discs from a RISC OS computer. For full details see the section entitled *Transferring files to* RISC OS on page 165.

65Host

To start 65Host, double-click on the 65Host icon. A BBC Model B style screen will appear. You can then use the computer to run BBC Model B programs. To exit from 65Host, type `*Quit`.

Commands within 65Host

Selecting filing systems

You may select filing systems with the commands `*ADFS` and `*Net`, or one of the following:

- *ARFS selects the ARFS filing system, which accesses the current RISC OS filing system.

  Note that `*ADFS` and `*Net` set the current RISC OS filing system, and hence the ARFS filing system, to ADFS and NetFS respectively.
- *Disc selects the DFS emulation, using the current RISC OS filing system. You can then use normal DFS commands.
- *ROM selects the ROM filing system.
- *Tape cannot load or save files: it is provided in case an application issues it.

You can also access RISC OS filing systems using the command:

```
*Dir <filing system>:
```

which sets both the current emulated filesystem and the current RISC OS filing system. For example:

```
*Dir RAM:
```

selects the RISC OS RAM filing system.

Other commands

In addition, 65Host provides the following extra * Commands which you can call from within the emulation:

- *Go [*address*] branches the emulated 6502 to the specified hexadecimal address.
- *OS provides a * prompt loop within 65Host.
- *Reset [*number*] emulates a 6502 reset, like `CALL !-4`. If *number* is 1, a power-on reset is emulated.
- *Quit leaves the emulator.

Commands at the RISC OS command line

65Host also provides various commands you can use once you have run it and returned to RISC OS. Most of these are used to control the sideways ROM system.

Sideways RAM

You can if you wish create four banks of sideways RAM when you run 65Host. This is not done by default, as it uses 64KB of workspace which may not be needed. These commands operate in the same way as on the Model B+.

Limitations of 65Host

65Host cannot emulate all BBC features fully, though the limitations afflicting earlier releases have been reduced. In particular:

- Full emulation of the parallel (Centronics) printer port has been added, via the Archimedes parallel printer socket. Printing is enabled and disabled in the normal way, usually via Ctrl-B and Ctrl-C respectively.
- Full sound chip emulation has been added.

The principal limitations that still apply are as follows:

- Although access to the Network Filing System is provided (if an Econet interface is fitted), 65Host does not emulate the BBC Model B hardware, the Econet printer interface or the low level Econet `OSBYTE` and `OSWORD` calls.

  Consequently programs which run equally well from disc or Econet are unlikely to be affected by these restrictions, whereas programs written specifically for the network may well not run.
- No emulation of the serial port is provided.
- Copy-protected programs or those which attempt direct access to DFS directory sectors are unlikely to operate correctly.
- Split screen modes are not supported.

- Some problems may arise from the differing layouts of the keyboards on BBC Model B and RISC OS computers. In particular, programs that attempt to do their own Shift key processing will cause difficulties, since the key labels differ on the two keyboard layouts. Note that when the emulator is running, Break emulates the effect of the Break key on the BBC Model B, but the Reset button resets the RISC OS computer.
- Various * Commands are not provided by 65Host, principally within filing systems. These are generally not used by programs.

  Various other * Commands give slightly different output under 65Host to that they give when run on a BBC Model B. These changes are unlikely to affect the running of programs. The most noticeable differences are in commands which list the contents of directories (ie `*Cat`, `*Ex` and `*Info`) and those which give help (eg `*Help Utils`, `*Help ADFS` and `*Help Net`).
- 65Host will not work with a high resolution monochrome monitor.
- If your `Run$Path` exceeds 245 characters you may have difficulty running the emulators. Reset your `Run$Path` variable and try again.

65Tube

65Tube emulates a 65C02 second processor environment. It may be used to run many 6502 language ROM images. Some of the images are enhanced by the emulator; for example View and ViewSheet can use the Acorn 132 column display modes. However, you cannot use multiple ROM systems such as Acornsoft C, Logo or ISO-Pascal.

The emulator contains a copy of HIBASIC version 4.3, which is copied into RAM whenever `*BASIC` is executed in emulated code.

To start 65Tube, double-click on its icon. From the command line you can use the `*RMRun` command; alternatively, you may load the module with `*RMLoad`, and enter the emulator with the command `*EmulateTube`. The chapter entitled *Star command summaries*, in the RISC OS 3 *User Guide*, describes how to use the `*RMRun` and `*RMLoad` commands.

To exit from 65Tube, type `*Quit`.

Details applying to all versions

Because a 65C02 second processor contains far fewer support chips than a BBC Model B computer, the emulation provided by 65Tube is more complete than that provided by 65Host.

There are a few limitations to note; some of this information is only relevant to programmers. Don't worry if there are things you don't understand!

Extra star commands provided by the emulator

Once you have run the emulator and returned to RISC OS, you can then use the following command:

`*EmulateTube` starts up the emulator.

The emulator also provides the following extra * Command which you can call from within the emulation:

`*Quit` leaves the emulator.

The host computer

The main shortcoming of 65Tube is that there is no emulation of a 6502-based host machine; instead the emulation uses the RISC OS computer on which it is running as a host. It is as if the 65C02 second processor is connected to the RISC OS computer rather than (say) a BBC Model B computer.

This means that any program that assumes the presence of a 6502-based host is unlikely to work: for example, the software for a Level 2 file server.

Some other software may largely work, but have some parts that do not. For example, many programs written for a 6502 processor use a 6502-based host to provide sound; unfortunately the sound system on a RISC OS computer is not directly compatible.

Handling of addresses

65Tube treats addresses differently to a 65C02 second processor:

- A 65C02 second processor treats addresses from &FFFF0000 to &FFFFFFFF as addresses &0000 to &FFFF in the host computer's memory.
- 65Tube ANDs all addresses with &0000FFFF, and hence treats any address as being within the memory of its emulated second processor.

However, this is unlikely to cause you any additional problems. If a program is trying to access the host computer's memory, it's very likely that it expects the host to be 6502-based; as we've already seen, such programs are unlikely to work anyway.

Transferring files to RISC OS

Before you can try to run a 6502-based program on a RISC OS computer, you first need to be able to load the program into your RISC OS computer. In many cases this will mean transferring software from a medium that only 6502-based Acorn computers can use (such as a 5 ¼" DFS or ADFS disc) to one that RISC OS computers can use (such as a 3 ½" ADFS disc).

There are a number of ways you can transfer files, depending on the hardware to which you have access. We outline these below.

DFS discs

DFS discs require special consideration, as they use a different naming convention from standard RISC OS filing systems. If a program running under 65Host tries to access a DFS disc, 65Host translates the filename used to one that is compatible with RISC OS naming conventions. It then uses this translated filename to get the file from the current RISC OS filing system.

Consequently, if you're transferring a DFS file to RISC OS **and intend to use it with 65Host**, you need to change its name to match that which 65Host expects. For some of the methods below this translation is automatically done for you; we tell you when this is the case. For other methods you will need to translate the filename yourself; we tell you how to do this on page 166.

If you have Econet

If you have Econet then things are easy for you. Any file you can read from an Econet file server using a 6502-based computer, you can also read using a RISC OS computer. So, you can use the file server:

- as a common storage medium for both 6502-based and RISC OS computers
- as a 'half-way house' between storage media that can only be used by one of the above types of computer.

Third party products and services

5 ¼" drives for RISC OS computers

A number of third parties have produced 5 ¼" drives for RISC OS computers, together with software to transfer files from their add-on drive to the RISC OS computer's 3 ½" internal drive.

Some such programs will translate DFS filenames to those expected by 65Host; but you should check this by reading the manufacturer's documentation.

Serial kits

Also available from third party suppliers are serial interface kits, which allow you to transfer files from a 6502-based Acorn computer to a RISC OS computer. The kits typically consist of a special cable to connect the two computers via their serial ports, and software to control the transfer of files.

Disc transfer services

There are many companies that will transfer software for you from a 5¼" disc to a 3½" ADFS disc.

If you have a 3½" drive and a 5¼" drive for a 6502-based Acorn computer

If you have a 3½" drive and a 5¼" drive connected to a 6502-based Acorn computer, you can use these to transfer files on a 5¼" disc to a 3½" ADFS disc suitable for use with RISC OS.

In the case of DFS discs that you intend to use with 65Host, you will need to translate the filenames to those expected by 65Host.

Translating DFS filenames

65Host has a limited emulation of the disc filing system (DFS), in order to allow software to run which assumes DFS file naming conventions (ie non-hierarchical, single character qualifiers).

Note that this does not allow the direct use of 5¼" DFS format floppies, even with an appropriate disc drive and interface. Instead it uses the current RISC OS filing system with a translation applied to the filenames, as follows:

A DFS name consists of:

```
:<drive>.<qualifier>.<filename>
```

where:

- *<drive>* is one of 0, 1, 2 or 3
- *<qualifier>* is a single character, default $
- *<filename>* is at most 7 characters long.

65Host passes the name to RISC OS as:

```
<drive>.<qualifier><name>
```

So 65Host would translate a DFS name of `:2.A.Fred` to a RISC OS name of `2.AFred`.

However, certain qualifiers which are allowed on DFS (eg the default `$`), are reserved characters in RISC OS filenames, so these are replaced by other characters, as follows:

DFS character	RISC OS character
$	|
space	'
@	<
|	>
"	|
%	}
&	{
^	)

So 65Host would translate a DFS name of `:1.$.Jim` to a RISC OS name of `1.[Jim`.

Note that this scheme can lead to duplicate filenames; for example a DFS name of `:1.[.Jim` would also be translated to a RISC OS name of `1.[Jim`.

Making the translation yourself

You may have to transfer files from a DFS disc to a RISC OS medium using a method that doesn't automatically translate the filenames for you. If you wish to use the files with 65Host, you'll have to make the translation yourself. Start by setting up an ADFS disc containing directories named `0`, `1`, `2` and `3`. These directories are then used as 'drives' by the DFS emulation.

Read the first DFS file from its disc. Use the above guidelines to translate its filename, changing the character used for the qualifier if necessary. Then save the file to the appropriate directory; again, use:

0	for the first side of a disc you'd normally place in drive 0
1	for the first side of a disc you'd normally place in drive 1
2	for the second side of a disc you'd normally place in drive 0
3	for the second side of a disc you'd normally place in drive 1

Within each of these directories, a name such as `CSheila` represents the DFS file `C.Sheila`.

Accessing files using the DFS emulation

To access the files these directories contain, you must first set the current directory to be the parent of these directories.

- To do so, type `*Dir` *`<parent directory>`* after you have started 65Host, but before you enter the emulated DFS.

- Alternatively, you can make 65Host do this automatically – see the section entitled *Making a* RISC OS *application from a 6502-based program* on page 171.

If you try to access DFS without doing so, you will get the error message `Emulated drive not found`. This means that the emulated DFS looked in the current directory, but was unable to find the relevant subdirectory for the drive you were trying to access.

One other unexpected error you may get under DFS is `Disc not present` when, in fact, you have a disc in the drive. This means that DFS expected to find a different disc in the drive. Typically this occurs as a result of taking a disc out of the drive without first `*Dismount`ing it.

Making a program run

Once you've transferred a program to RISC OS, the next thing you've got to do is to make it run.

BASIC programs

For BASIC programs there are two possibilities you should explore:

- Running it directly under RISC OS (we call this *running native*).
- Running it by using one of the emulators.

It's far better to run native if at all possible, because you'll save yourself all the overheads of using an emulator. In other words, running native

- makes your program run faster
- saves you memory.

Other programs

Any other type of program will not run native; you'll have to use one of the emulators instead.

Alternatively, if you wrote the program yourself in a high-level language (such as C or Pascal), you can try porting the sources and recompiling them using a RISC OS compiler. It's quite likely you'll need to re-write parts of the program, particularly those dealing with input and output. You should consider converting your program to a proper RISC OS application.

Finding out if a program will run unchanged

There are two ways of finding out if a program will run unchanged:

- You can just try to run the program, and see what happens.

  The advantages of this method are that it requires no technical knowledge, and that it is quick to try.

  The disadvantage of this method is that it is hard to be certain that you have exhaustively tested all parts of the program. Even though you might think that the program runs satisfactorily, a user may later discover a particular part of the program or set of circumstances which cause it to fail.

- You can conduct a more exhaustive line-by-line investigation of the program.

  The advantage of this method is that you can be certain the program will run.

  The disadvantages of this method are that it requires technical knowledge, that it can be more time-consuming, and that you need the program's source code to do so (which you're unlikely to have unless you wrote the program yourself, or it's been written in BASIC).

Below we look at these two methods in more detail.

Trying to run an unchanged program

Running a BASIC program under RISC OS

The best way to try to run a BASIC program under RISC OS is from the command line. Because the BASIC program may crash your RISC OS computer, you should first save any other work you have done. Then leave the desktop by choosing **Exit** from the Task Manager's icon bar menu.

At the command line type

```
*BASIC
```

to enter the RISC OS BASIC interpreter. You'll find this environment very similar to the BASIC interpreter on a 6502-based Acorn computer. So, for example:

- You can change directory by typing `*DIR <directory>`.
- You can list a directory by typing `*CAT`.
- You can load a program by typing `LOAD "<program>"`.
- You can run a program you've loaded by typing `RUN`.

Use the commands you're familiar with to load and run the program you want to test.

If the program appears to work

If the program appears to work, make sure you test it thoroughly – try to use all parts of the program. If all still appears well, then you've shown the program will run native.

Now all you need to do is to make the program run from the RISC OS desktop. There are two ways of doing this:

- Set the file's type to BASIC using the command

  `*SetType <filename> BASIC`

- Make the program into a RISC OS application – see the section entitled *Making a* RISC OS *application from a 6502-based program* on page 171.

In both cases the program will run if you double-click on it; however, the latter method is preferable, and easy to do.

If the program doesn't work

If the program doesn't work you can either give up trying to make it run native, or you can modify it until it does run.

One of the most common problems is a program that uses DFS; RISC OS does not support this now obsolete filing system. You have two choices here:

- Convert the program to use another filing system, such as ADFS or NetFS.

  Because DFS uses a different naming convention to the standard RISC OS filing systems, you may find discrepancies between any filenames the program uses, and the names that the files actually have. If this occurs, you will have to make the filenames match each other.

- Give up trying to make the program run native; instead run the program under 65Host, using its emulation of DFS.

  Under RISC OS you can list and edit lines of a BASIC program in the same way as on a 6502-based Acorn computer.

Running any program under one of the emulators

To try running any program under one of the emulators you first need to start the relevant emulator. Because the program may crash your RISC OS computer, you should first save any other work you have done. Then double-click on the emulator's icon from within the RISC OS desktop.

Once the emulator's started you'll find almost everything just as you're used to on a 6502-based Acorn computer. Try running the program in just the way you usually do.

If the program appears to work

If the program appears to work, make sure you test it thoroughly – try to use all parts of the program. If all still appears well, then you've shown the program will run under the emulator.

There are two ways you can run the program in future:

- Run it just as you've done now.
- Make the program into a RISC OS application – see the section entitled *Making a* RISC OS *application from a 6502-based program* on page 171.

In the latter case the program will automatically run under the emulator if you double click on the application's icon.

If the program doesn't work

If the program doesn't work you'll only be able to get it to do so by modifying it. See the next section.

Checking through a program for problems

There are two reasons why you might wish to check through a program for potential problems:

- You know the program won't run, and wish to find out why
- You wish to be methodical in ensuring that the program will run.

How much checking you can do (and how easy it will be to correct any problems) depends largely on how the program was written, and whether you've got the program's source code available:

- If the program wasn't written in BASIC and you haven't got its source code available, you won't be able to do much to check it. All you can do is try to run it, and see what happens. See the previous section, entitled *Running any program under one of the emulators*.
- If the program wasn't written in BASIC but you've got its source code available, you'll be able to check it.
- If the program was written in BASIC you'll be able to check it.

Making a RISC OS application from a 6502-based program

This section tells you how to take a program originally written to run on a 6502-based Acorn computer, and 'bundle' it up to convert it into a RISC OS application. Before you can do this:

- you need to be sure that the program will run, as outlined in the section entitled *Making a program run*.
- you need to know if you can run the program directly under RISC OS (we say it 'runs native'), or if instead you need to use 65Host – again this is outlined in the section entitled *Making a program run*.

By following the relevant process we outline below, you'll end up with an icon that you can treat just like any other RISC OS application. So, for example:

- You can run your application by double-clicking on its icon.
  If the program runs native, then RISC OS will load and run it. If instead the program needs to use 65Host, then RISC OS will automatically start up 65Host before loading and running the program.
- You can copy your application by dragging it from one directory display to another – even if they're on different filing systems.
  You might, for example, use this method to put a copy of your application on an Econet file server.

The structure of a RISC OS application

In order to understand fully how to create a RISC OS application, you'll need to know a little of how one works.

An application is a directory, the name of which starts with a '!' (often pronounced pling) character. Because of this, it's treated differently from a normal directory.

When RISC OS first 'sees' an application

When RISC OS first 'sees' an application (ie when you first open the directory display that contains the application), it looks inside the application for a file called `!Boot`. (Remember, an application is just a special type of directory.) If the file exists, RISC OS runs it.

Typical uses of this file include

- setting up icons for the application, and for any new file types it provides
- letting RISC OS know where the application is stored, and what it can do.

For example, the PrintEdit applications' `!Boot` file

- sets up large and small icons for itself
- tells RISC OS how to get PrintEdit to load a Print definition file if you double-click on one
- defines the name of PrntDfn file type to be FC6.

If there's no `!Boot` file inside the application, RISC OS then looks for a file named `!Sprites`. It's this file that actually holds the application's icons. If the file exists, RISC OS automatically sets up the icons.

If, after all this, there's still no icon set up for the application, RISC OS uses the default application icon – an Archimedes logo with the word `APP` in its top left corner.

When you run an application

When you run an application (ie when you double-click on its icon), RISC OS looks for and runs a file inside the application called `!Run`. This file must be present; if it's not, you'll get an error message. The job of the `!Run` file is to get the application running. This might involve loading modules into memory, declaring how much memory is needed, setting system variables and so on. It could, however, be as simple as a single * Command.

An application's `!Run` file is almost always a special form of command file called an Obey file. When an Obey file is run each of its lines is passed to the Command Line Interpreter, just as if you had typed the line at the * prompt.

Opening an application directory

When you double-click on a directory, RISC OS opens a window to show its contents. To open an application and see the files it contains, you can't just double-click, because this runs the application. Instead you need to hold down the **Shift** key while you double-click on the application's icon. If you try this with the applications supplied with RISC OS (such as 65Host) you will see they contain several files – including the `!Boot`, `!Run` and `!Sprites` files to which we've already referred. Sometimes you will see that an application has subdirectories inside itself.

Using a program that needs to use 65Host

You should now have enough information to create a RISC OS application from a program that needs to use 65Host to run. When you run the application, RISC OS will automatically start up 65Host before loading and running the program. Because such an application is run as if it's on a 6502-based computer, we call it a 6502 application.

The example

In this section we'll take you through the process with a typical example of a DFS disc. The disc contains a simple BASIC program called `HelloW`, and a file called `!Boot` that starts the program running. In common with most DFS discs, a user can start running the program by putting the disc in the drive, holding down the Shift key and pressing Break.

Make 65Host available to the application

Using the RISC OS desktop, format a 3½" disc. Copy 65Host from your applications disc to your new disc's root directory.

Create and open an application directory

Create a new directory in your new disc's root directory. Its name must start with a '!' character to show it's an application. In this example, we'll call the application `!HelloW`. Because there's nothing yet inside the application directory to set up an icon, RISC OS will use its default icon for applications.

Open the application directory by holding down the Shift key while you double-click on its icon.

Create and open a subdirectory to hold the DFS disc's contents

Create a new directory named `6502Disc` in the `!HelloW` application directory (which you just opened). This directory will hold the same files that you'd normally find on a disc for use with a 6502-based Acorn computer.

Open the `6502Disc` directory by double-clicking on it.

Copy the DFS disc's contents to the subdirectory

Open the **HelloWDisc** directory in the **65Examples** directory within the Tutorials directory (on Applications disc 2) which contains a copy of the files on our example DFS disc. Copy the files in this directory to the 6502Disc directory you just created.

Create the application's !Run file

From Edit's icon bar menu move to the Create submenu, and choose **Obey**. Type in the following Obey file:

```
Dir <Obey$Dir>.6502Disc
Run <65Host$Dir>.!Run &B03 !BOOT
```

- The first line sets the current directory to be the `6502Disc` directory, which holds both the program and its associated `!Boot file`.
- The second line starts 65Host by running its `!Run` file. 65Host then uses boot option &B03 to load and run the application's `!Boot` file.

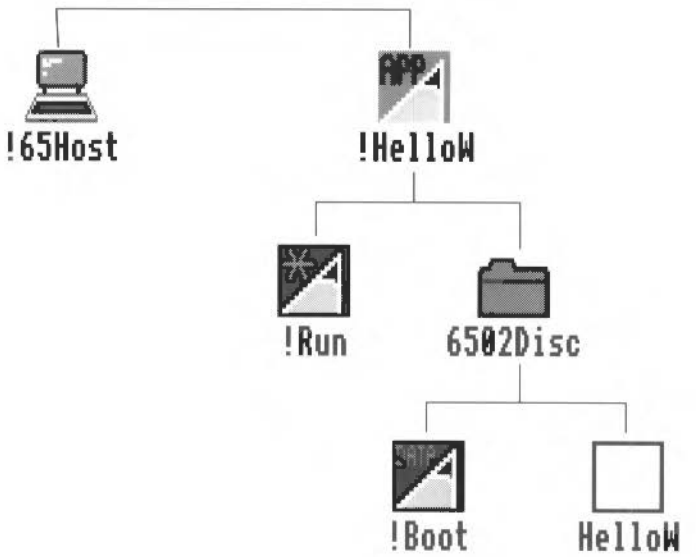
Save the file as `!Run` in the `!HelloW` application directory.

The filing system on which 65Host looks for `!Boot` is controlled by the first hex digit of the boot option. In this case it is 'B', which makes 65Host use the current RISC OS filing system. This is the option you'll normally want to use, so you can freely move the application between filing systems.

The last two hex digits control how 65Host runs !Boot. They exactly correspond to the numbers used with the `*Opt 4` command. In this case they are '03', so 65Host runs `!Boot` using the `*EXEC` command.

Running the application

You should now have the following file structure on your floppy disc:



You've now done enough for the application to run. If you double-click on the `!HelloW` application icon then the BASIC program `HelloW` will be run under 6502 Emulation.

Type `*QUIT` at the emulator's '>' prompt to return to the RISC OS desktop.

Giving the application its own icon

One extra thing you might want to do is to give your application its own icon. You can easily do this using Paint. If you haven't already loaded a copy of Paint, do so now.

Creating the icon

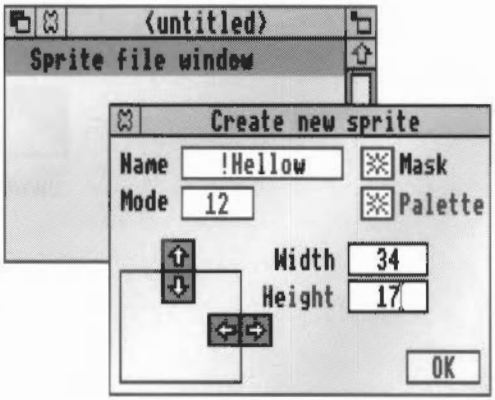
You must create the icon in Mode 12, which you should select using the palette's icon bar menu.

Open a new sprite window by clicking on the Paint icon. Create a new sprite using the Create submenu, as follows:

- The name of the sprite must be the same as that of the application, including the '!', but in lower case throughout. So for `!HelloW` the sprite must be called `!hellow`.

- The sprite **should** be 34 pixels wide (although it can be as wide as 50 pixels if absolutely necessary), and **must** be 17 pixels high.
- The sprite should have a mask.
  This is because applications' icons should have an irregular outline, so they can be easily distinguished from files' icons (which are normally square).

The completed dialogue box will look similar to this:



Now use Paint to design your sprite. When you have finished, save your sprite as a file called `!Sprites` within the `!HelloW` application directory.

An example sprite is available as **!Sprites** in the **65examples** directory.

Adding a !Boot file to the application

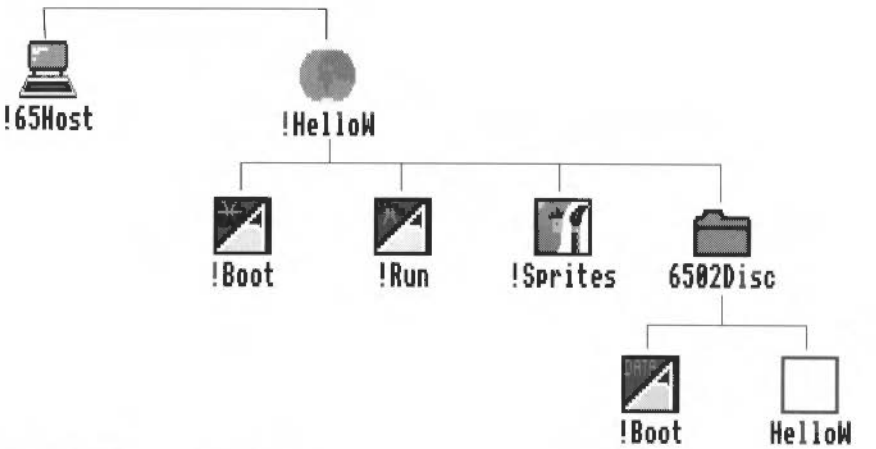
Now when your application is 'seen' on the desktop your sprite will be used for its icon. RISC OS does this automatically; however, to be correct you should create a `!Boot` file for the application that sets up the icon. Like the `!Run` file you created earlier, this should be an Obey file.

From Edit's icon bar menu move to the **Create** submenu, and choose **Obey**. Type in the following Obey file:

```
IconSprites <Obey$Dir>.!Sprites
```

Save it as `!Boot` in the `!HelloW` application directory (ie with the `6502Disc` directory, and the `!Run` and `!Sprites` files):

Of course, your icon for `!HelloW` will differ from that below.



Creating other '6502 applications'

In this section, we'll look at any changes you'll have to make to the above procedure to 'bundle up' the contents of other discs for 6502-based Acorn computers. Assuming that the disc you're transferring is one that auto-boots when you hold down Shift-Break, you'll find that there are few changes, and most of these are common sense.

You may find it quicker to start with a copy of the `!HelloW` disc you just made, and adapt it to what's needed for your new application.

!65Host

The 65Host application must be present for you to run other applications that use it. You may put several applications on one disc, each in their own application directory; if you do so you still only need the one copy of 65Host on that disc.

The application directory

Other applications must obviously have a name other than `!HelloW`. You should never have two applications with the same name; even if it doesn't confuse you, it may confuse RISC OS.

The !Boot and !Sprites files

If you decide to define icons for other applications, you do so just as you did for `!HelloW`. Make sure any sprites you create have the same name as the corresponding application. The accompanying `!Boot` file should be exactly the same as the one we used with HelloW.

The !Run file

The only part of the `!Run` file you're likely to need to change is the boot option (the characters `&B03` in the example). To find out whether you need to change it, find the option setting on your original disc by typing `*CAT`:

Option	Second line of !Run file should be
`00 (Off)`	`Run <65Host$Dir>.!Run &B00`
`01 (Load)`	`Run <65Host$Dir>.!Run &B01 !BOOT`
`02 (Run)`	`Run <65Host$Dir>.!Run &B02 !BOOT`
`03 (Exec)`	`Run <65Host$Dir>.!Run &B03 !BOOT`

The 6502Disc directory

Rather than holding the `HelloW` program and `!Boot` file we created in the earlier example, this directory should contain a copy of all the files you transferred from your 6502 disc or network directory.

Using a BASIC program that runs native

If a BASIC program will run native, it's a little easier to make it into a RISC OS application. The process is very similar to that for a program that needs to use 65Host, but with some omissions.

The example

Again, we'll take you through an example before giving more general notes on how to adapt the example for use with other programs. We'll use the same `HelloW` program as our example so you can easily see the differences between a program that is running native and one that is running under the emulator.

Create and open an application directory

Format a new disc and create a new directory in its root directory. The directory's name must start with a '`!`' character to show it's an application. In this example, we'll call the application `!HelloW2`. Because there's nothing inside the application directory to set up an icon, RISC OS will use its default icon for applications.

Open the application directory by holding down the Shift key while you double-click on its icon.

Copy the BASIC program into the application directory

Open the `HelloWDisc` directory on the distribution disc, which contains the `HelloW` program we're going to use. Copy this to the `!HelloW2` application directory you just created, but rename the program as `!RunImage`. (This is the conventional name for a standard RISC OS application's main program.)

You also have to ensure that the file is set up as a BASIC file. Select the file and use the Filer menu to change the file type to BASIC using the **Set type** option.

Create the application's !Run file

From Edit's icon bar menu move to the **Create** submenu, and choose **Obey**. Type in the following Obey file:

```
Dir <Obey$Dir>
Run <Obey$Dir>.!RunImage
```

- The first line sets the current directory to be the application directory, which holds the program. `<Obey$Dir>` is a system variable which holds the pathname of the Obey file being executed.
- The second line runs the program named `!RunImage`, which is our BASIC program.

Save the file as `!Run` in the `!HelloW2` application directory (ie with the `!RunImage` file).

Running the application

You should now have the following file structure on your floppy disc:

You've now done enough for the application to run. If you double-click on the `!HelloW2` application icon then the BASIC program `!RunImage` will be run.

Giving !HelloW2 its own icon

Make an icon for !HelloW2, as described earlier for the 65Host program !HelloW. Remember to name the sprite after the application, i.e. `HelloW2`.

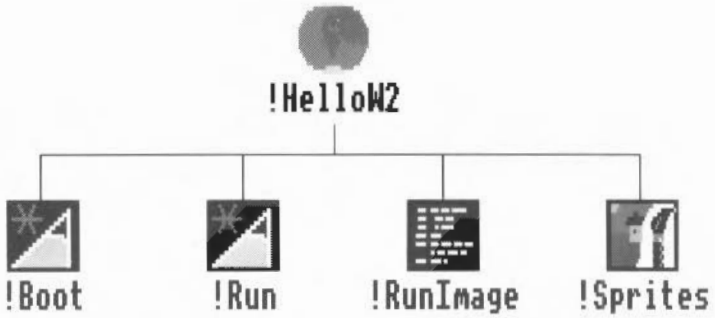
Adding a !Boot file to the application

Now when your application is 'seen' on the desktop your sprite will be used for its icon. RISC OS does this automatically; however, to be absolutely correct you should create a `!Boot` file for the application that sets up the icon. Like the `!Run` file you created earlier, this should be an Obey file.

From Edit's icon bar menu move to the **Create** submenu, and choose **Obey**. Type in the following Obey file:

```
IconSprites <Obey$Dir>.!Sprites
```

Save it as `!Boot` in the `!HelloW2` application directory (ie with the `!Run`, `!RunImage` and `!Sprites` files):



Of course, your icon for `!HelloW2` will differ from that above.

Creating other 'native applications'

In this section, we'll look at any changes you'll have to make to the above procedure to 'bundle up' other BASIC programs that will run native. You'll find that there are few changes, and most of these are common sense.

You may find it quicker to start with a copy of the `!HelloW2` disc you just made, and adapt it to what's needed for your new application.

The application directory

Other applications must obviously have a name other than `!HelloW2`. You should never have two applications with the same name; even if it doesn't confuse you, it may confuse RISC OS.

The !Boot and !Sprites files

If you decide to define icons for other applications, you do so just as you did for `!HelloW2`. Make sure any sprites you create have the same name as the corresponding application. The accompanying `!Boot` file should be exactly the same as the one we used with HelloW2.

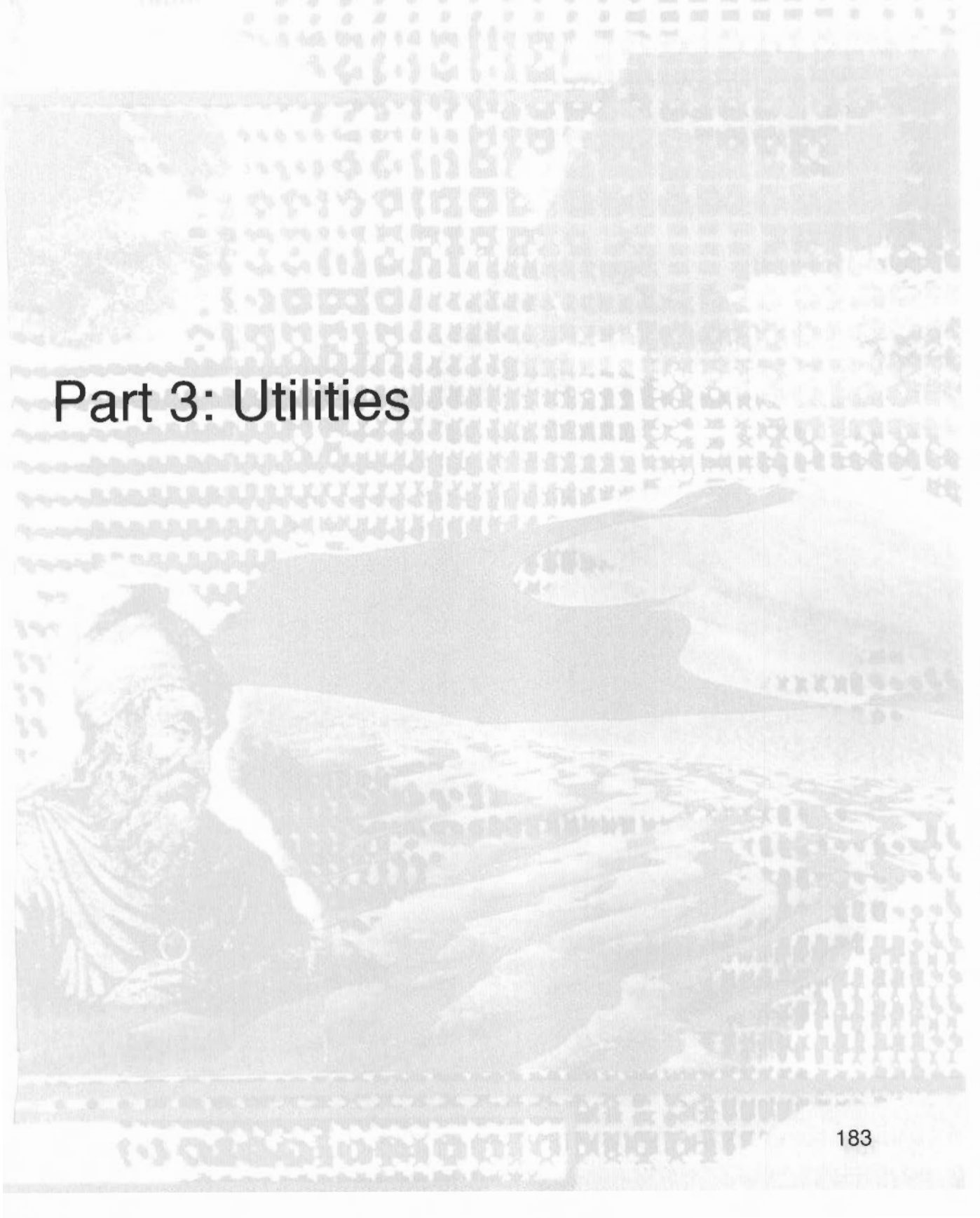
The !Run file

The `!Run` file should be exactly the same as the one we used with HelloW2.

The !RunImage file

Change the `!RunImage` file to be a copy of the file you want to run.

Part 3: Utilities



12 PrintEdit

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. Printer definition files are used by the Printer manager application !Printers.

Less experienced users may wish to modify an existing printer definition file when supplied with step-by-step instructions provided by an expert. Such instructions might be issued, for example, by Acorn or another printer supplier. The instructions should list the exact operations needed to be performed in each PrintEdit window. You will not need a full understanding of the features of PrintEdit.

Creating printer definition files is technically very complex and requires a deep understanding of how printers work. It is beyond the scope of this chapter to provide such an understanding. For more details about creating printer definition files, see the RISC OS *Programmer's Reference Manual*.

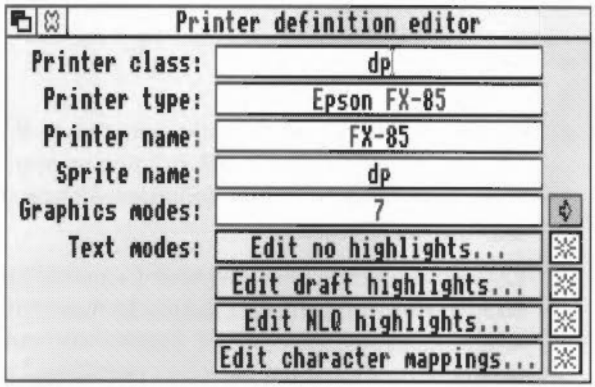
Before you can use PrintEdit you should

- have the user guide and technical manual for your printer
- or have some step-by-step instructions from an expert.

Most people will 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.

Start the application by double-clicking on the PrintEdit icon. This displays the PrintEdit window. Drag an existing printer definition file to this window to load it for alteration. Alternatively you can start PrintEdit with an existing printer driver loaded by double-clicking on one of the printer definition files contained in the Printers directory (on App 2).

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: **dp** for dot matrix and other bit-image printers and **lj** for HP LaserJet compatibles. This application cannot be used for defining PostScript printers.

Printer type is the full name of the printer.

Printer name is the name you want to appear underneath the printer on the icon bar. The name can be up to 10 characters long.

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.

Graphics modes defines the number of graphics modes your printer can use. Find this information out from your printer manual.

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.

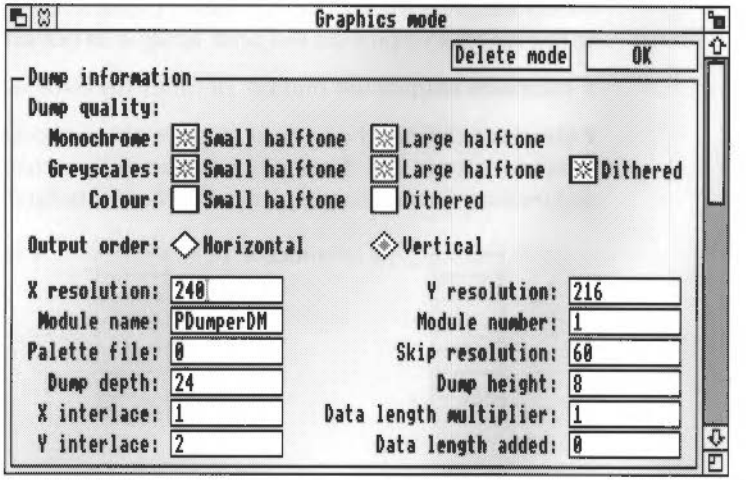
Edit NLQ highlights is the same as Edit draft highlights but for the NLQ (Near Letter Quality) mode.

Edit character mappings allows a character from the Acorn character set to be converted to the same character in the printer's character set.

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 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 240 by 216.



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**.

X and **Y resolution** define the graphics resolution in dots per inch. These will be defined in your printer manual, but may be given in different units.

Module name and **Module number** define the dumper files used by the printer. These are currently two dumper files, although more can be defined if needed.

`PDumperDM` has the Module number 1 and is for dot-matrix and other bit-image printers.

`PDumperLJ` has the Module number 2 and is for HP LaserJet compatible printers.

Palette file defines the Palette file – this is currently always set to zero.

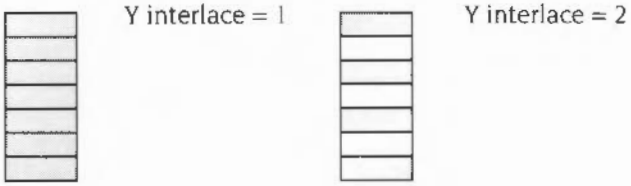
Skip resolution defines the leading zero skip resolution of the dump. This is always 60 for Epson printers and 120 for IBM printers.

Dump depth is the depth of one pass of the head in pixels.

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 times the data is sent to the printer.

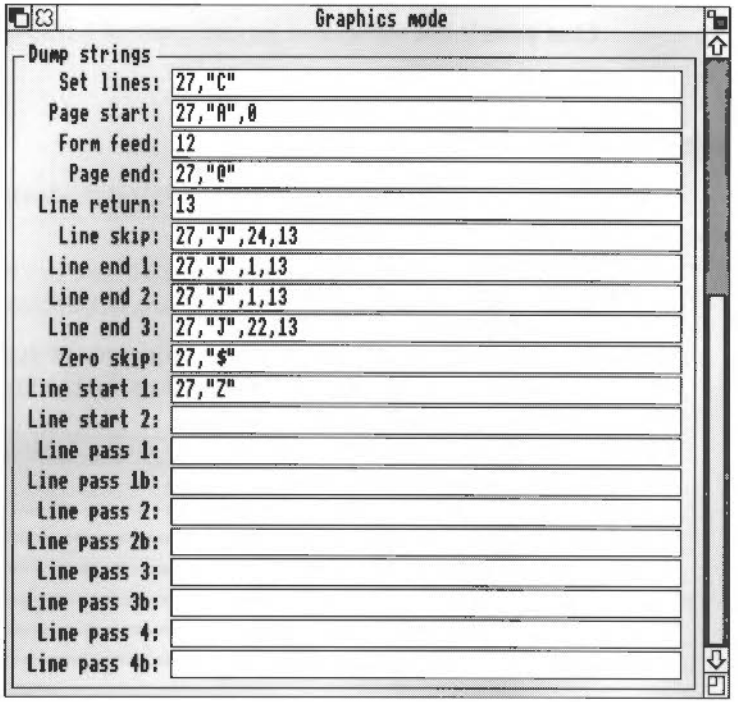
Y interlace defines the vertical step for obtaining data for each line sent by the X interlace loop. The driver scans horizontally across the image, dumping the data and moving down a single pixel until the Y interlace is zero.



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.

Dump strings

The second part of the window gives the Dump strings.



These are the codes sent to the printer that tell the printer 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.

Page end is the string sent at the end of each page.

Line return moves the print head to the beginning of the line.

Line skip moves the print head to the beginning of the next line.

Line end 1 to **Line end 3** are the strings sent at the end of each line pass. There can be up to three passes.

Zero skip is issued to skip leading zeros.

Line start 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'.

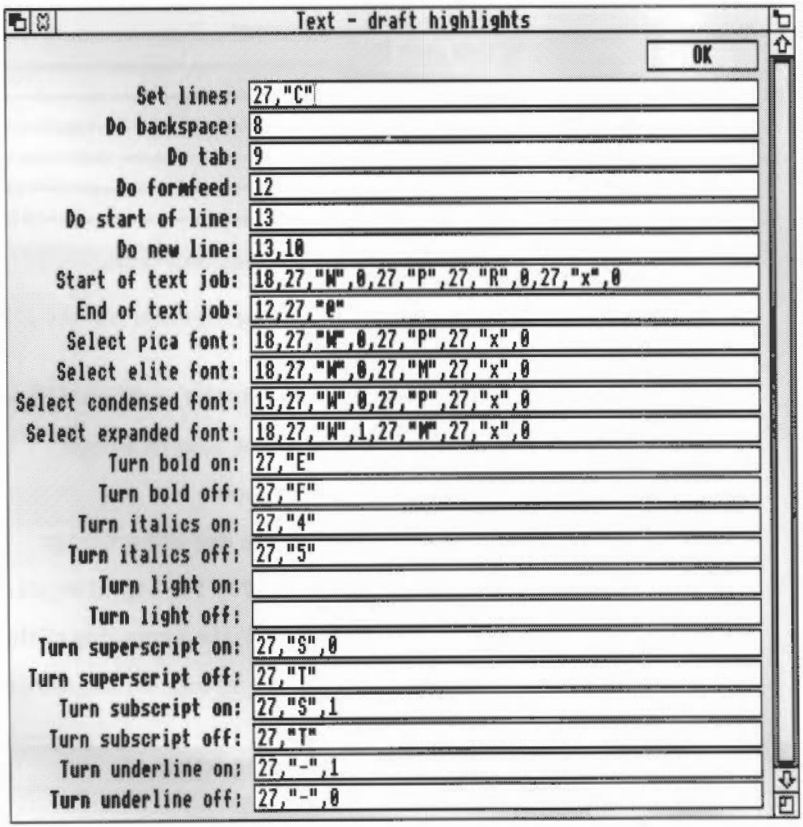
Line pass is the string sent for each pass of a colour graphics dump. There can be up to four passes.

Text modes

Almost all printers can use the first two text modes and many also support an NLQ (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.



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 (10 cpi).

Select elite font sets elite font (12 cpi).

Select condensed font sets condensed font (17cpi).

Select expanded font sets expanded font (6 cpi).

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.

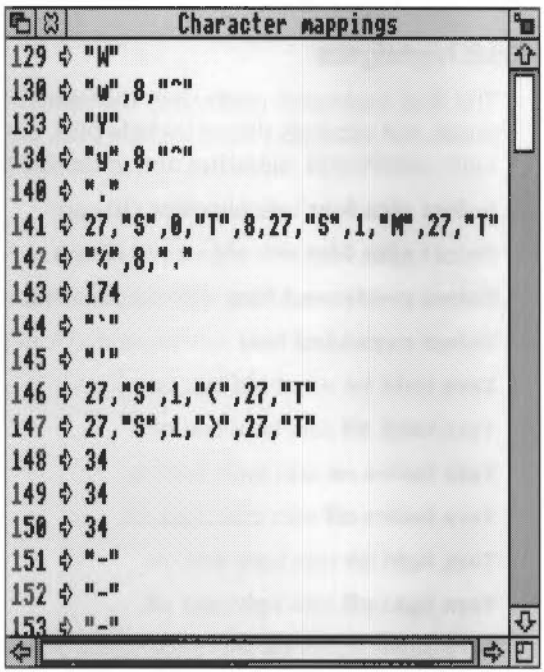
Edit NLQ highlights

The NLQ 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

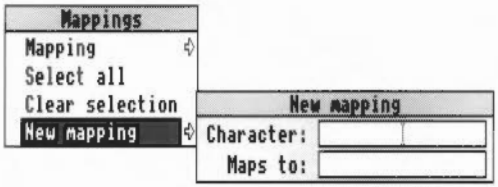
Edit character mappings allows a character from the Acorn character set to be converted to the same character in the printer's character set. Although all the standard characters normally map directly onto the corresponding printer characters, the top-bit-set characters normally need mapping from Acorn's 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.



The number down the left column represents the Acorn character in decimal, while the string to the right of the arrow represents the commands to send to the printer that reproduce the same character.

To enter a mapping, press Menu to display the **Mappings** menu. 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. Type the printer commands that produce the same character in the **Maps to** box. Press Return to add the mapping to the list.



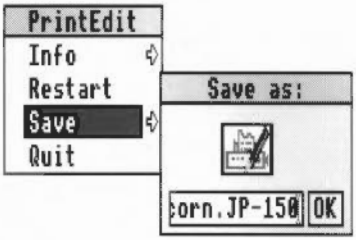
You can edit and delete current mappings in a similar way by using the **Mapping** option.

Saving and quitting

When you have finished making changes to your 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, choose **Quit**.



13 SetIcons

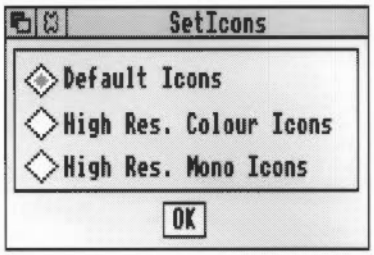
There are, in fact, **three** different sets of icons available. Which ones you can use for your desktop will depend upon your monitor type and the screen modes you use. These are:

- the standard icon set which can be used with all types of monitors
- the high definition colour icon set which is best used with the high-resolution screen modes and VGA, Super-VGA or multi-frequency monitors
- the monochrome icon set that looks best when used with high-resolution monochrome monitors in mode 23.

The application **SetIcons** is used to define which set of icons to display on the desktop.

If you were supplied with a single Applications disc you will find this application in the root directory. If you were supplied with two Applications discs you will find this application on Appl.

Double-click on the SetIcons application and the SetIcons dialogue box is displayed.



To choose an alternative set of icons:

1 Click on the icon type you want to use.

2 Click on the **OK** box. This redraws the screen with the icons you selected.

3 Finish using the application, by clicking on the window's Close icon.

How SetIcons operates

When you click on **OK**, SetIcons automatically generates an internal boot file that tells RISC OS to use the icon set you specified.

When you switch on or reset your computer, the computer uses the standard icon set **until** it sees the !SetIcons application in a directory display. When it sees the application, it changes to the icon set you previously defined. So, for SetIcons to operate it must be in a directory display that is displayed on screen.

Memory usage

SetIcons can use up a significant amount of free memory, up to 60KB. If you need this extra memory for running applications, do not use SetIcons.

14 Squash

Squash 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.

To use Squash, double-click on the **Squash** icon in the directory display. This installs Squash on the icon bar.

Compressing a file

To compress a file, drag the file icon onto the Squash icon on the icon bar. This displays the Squash Save as box.

Drag the icon from the Save as box to the directory display in which you want to save the compressed file.

Alternatively, if you want to replace the original file with the compressed version of the file, just click on the Save as **OK** box instead.

Decompressing a file

To decompress a file, drag the Squashed file onto the Squash icon on the icon bar. This displays the squash Save as box.

Drag the icon from the Save as box to the directory display in which you want to save the decompressed file.

To replace the compressed file with the original file, just double-click on the Squashed file and it will be replaced by the decompressed file.

Compressing directories and applications

To compress a directory or application, 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**.

Clicking on **Squash** will compress the entire contents of the directory or application.

Drag the icon from the Save as box to the directory display in which you want to save the compressed directory or application.

Alternatively, if you want to replace the original directory or application with the compressed version, just click on the Save as **OK** box instead.

Decompressing a directory or application

To decompress a directory or application, 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**.

Clicking on **Unsquash** will decompress the entire contents of the directory or application.

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 double-click on the Squashed file and it will be replaced by the decompressed version.

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

This option toggles the compression of applications. This is Off by default; Squash will not compress applications it finds in subdirectories.

Applications that are dragged to the Squash icon will always be compressed.

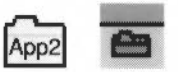
Quit

Quit ends the Squash application, removing the Squash icon from the icon bar.

Checking your archive

As with any archival mechanism, the user should check that they can correctly compress and decompress back to the original size any information which is valuable or difficult to replace.

15 TinyDirs



TinyDirs allows you to keep files and directories – including applications – on the icon bar for rapid access; this is particularly convenient when you are working with several objects but do not want to keep them all on the screen. It works in much the same way as Pinboard; however icons are restricted to the icon bar.

Note: TinyDirs has been superseded by Pinboard, and is included in RISC OS 3 *for backwards compatibility only. Pinboard is described in the* RISC OS 3 *User Guide.*

Starting TinyDirs

To start TinyDirs:

1. Display the directory display that contains !TinyDirs.
2. Double click on !TinyDirs.

A directory icon will appear on the icon bar, the TinyDirs icon.

File manipulations using TinyDirs

Adding TinyDirs icons

You can now drag one or more objects from a directory display to the TinyDirs icon; each object is represented by the appropriate icon with the name of the object beneath it. Further objects can be moved to the icon bar by dragging them onto any TinyDirs icon already there.

Double-clicking

Double-clicking on a TinyDirs icon has the same effect as double-clicking on it in its normal directory display: directories are opened, data files are loaded into the appropriate editor, and applications are run. A double click using Adjust instead of Select carries out the same action, but at the same time removes the TinyDirs icon from the icon bar.

Unlike an application installed on the icon bar in the normal way (which is running even if you are not actually using it), an application placed on the icon bar using TinyDirs is not run until you double-click on it.

Opening an application

As with application directories in a directory display, you can open the application directory by holding down Shift when you double-click on the application.

Loading a file

To load a file onto a TinyDirs application, hold Ctrl and drag the file onto the application's TinyDirs icon; this will run the application and load the file into it.

Dragging TinyDirs icons

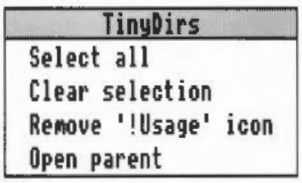
TinyDirs icons can be dragged from the icon bar to the following destinations:

Drag destination	Action
A Filer window	Files are copied to the window
A non-Filer window	Files are inserted in the window if applicable
A non-TinyDirs icon on the icon bar	Selection is loaded into application if applicable
An empty part of the icon bar	Any applications are run; other types are ignored

Displaying the TinyDirs menu options

Pressing Menu on any TinyDirs icon displays a menu with four options. Use the following table to decide which menu option you need to carry out a particular task:

Task	Option
Select all TinyDirs icons	Select all
Deselect icons	Clear selection
Remove a selected icon from TinyDirs	Remove icon
Open the directory display containing the icon	Open parent



Select all

Click on **Select all** to select all the TinyDirs icons currently on the icon bar.

Clear selection

Click on **Clear selection** to deselect any currently selected TinyDirs icons.

Remove icon/Remove selected icons

Click on **Remove icon** to remove the selected TinyDirs icon from the icon bar. If more than one object is selected, this menu option reads **Remove selected icons**.

Open parent

Click on **Open parent** to open a display for a directory's parent directory; if the selected icon is a file, it opens a directory display for the directory containing the file. If more than one object is selected, this option is not available.

Quitting TinyDirs

To quit TinyDirs, remove all the directories and files as described above; this will leave you with a directory icon with no name beneath it. Pressing Menu now produces a directory containing just two options.

Info gives the usual information about the application.

Quit removes the empty TinyDirs icon from the icon bar.

Saving the TinyDirs configuration in a desktop boot file

TinyDirs can use the desktop boot facility in the Task manager. If you have applications loaded onto TinyDirs when you save your boot file, that information will be stored in the boot file, so that not only will TinyDirs be loaded when you run the boot file, but those applications will be loaded onto it too.

If you wish to create your own boot file or to edit an existing boot file, TinyDirs uses the following command:

```
AddTinyDir pathname
```

This adds a TinyDirs icon to the icon bar. For example:

```
AddTinyDir ADFS::4.$.app.!Clock
```

16 Usage

The Usage utility is a tool which displays the proportion of CPU usage (how busy the processor is) with time.

To display CPU usage, double-click on the Usage icon from the appropriate directory display. A window of fixed size appears, displaying a horizontally-scrolling graph indicating the percentage of CPU usage.

When you have finished using the application, click on the window's Close icon.

17 TVTest

TVTest is a small application that helps you set up your monitor or television for use with your computer. TVTest only operates with standard TV type monitors and televisions (type 0), and Multi-frequency monitors (type 1).

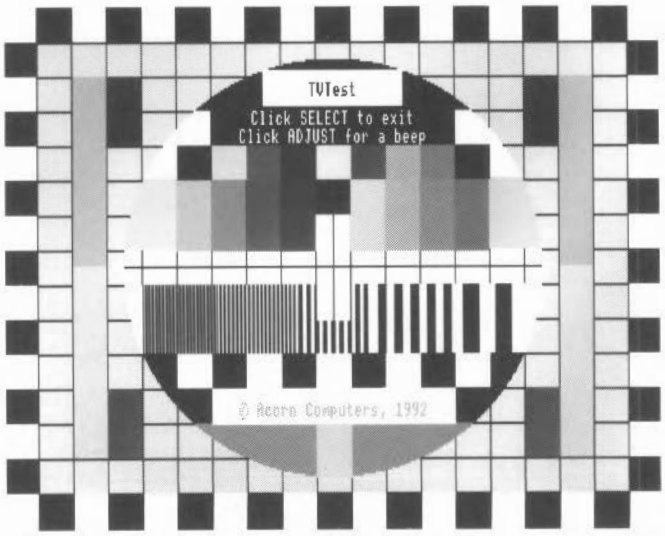
Using TVTest

Start the TVTest application by double-clicking on the TVTest icon in the applications directory display. The screen changes to show the test card. Use the test card to set up your screen correctly by adjusting your monitor or television until the best picture is obtained.

If you are using a television you may need to adjust the channel frequency to tune in the test card correctly.

Testing sound

If you are using a television with a computer which allows sound to be played through the television loudspeaker, you can check whether the sound will interfere with the picture by clicking on Adjust. This plays a beep, and you may need to adjust your television further if it does cause interference.



When you have finished adjusting the picture, click Select to return to the desktop.

18 ChangeFSI

ChangeFSI is a useful program for converting and displaying image files of various formats. These images can then be converted into sprites for viewing with RISC OS applications such as !Paint.

In case you're wondering, 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 provides the ability to read, scale the data to improve the picture, change the x and/or y size, sharpen the picture 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).

Using ChangeFSI

Double click on the application to start ChangeFSI. Its icon will be loaded onto the icon bar. Display the file icon for the image you wish to process, and drag the icon onto the ChangeFSI application on the icon bar. ChangeFSI will attempt to interpret the file to give a RISC OS sprite, displaying the result. You can then save the resultant image as a sprite file.

Picture formats

ChangeFSI will convert many types of images. These include the PC graphics formats TIFF, PCX, PIC and IMG, the Amiga format IFF and the Compuserv GIF format.

For a full list of image formats explained in greater detail, you should read the file FSI*Info* provided inside the application (shift double-click on !ChangeFSI to display the files).

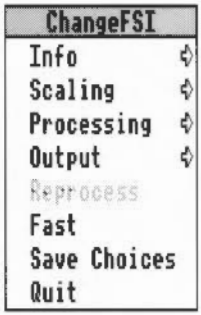
ChangeFSI in more detail

This section describes the ChangeFSI menu trees in detail. Most users won't need to use these options as ChangeFSI is already set up to give good results with most types of image files.

If you want to know how ChangeFSI and its options are used in greater detail you should read the information file, FSII*nfo*, provided inside the application (shift double-click on !ChangeFSI to display the files).

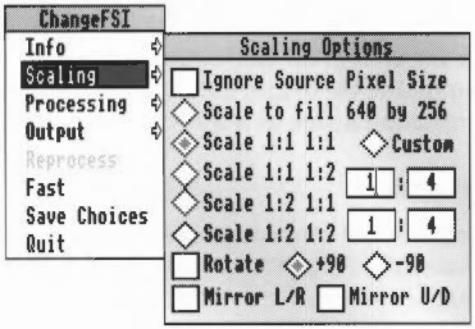
Menu options

Once you have loaded ChangeFSI onto the icon bar, click Menu over the icon to display the main options menu.



Scaling options

The **Scaling** options allow you to choose which scale you wish for your image. You can also transform, rotate or mirror the image.



The option **Scale 1:1 1:1** will give you a full sized image.

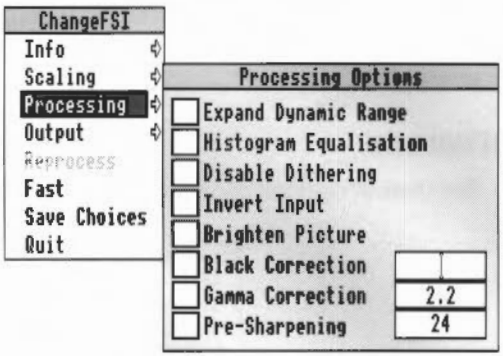
Choosing **Custom** allows you to specify your own scaling options. If you wish the image to 'scale to exact pixel size', fill in the left boxes only and leave the right boxes blank. The **Scale to fill** option allows you to scale the image so that it covers the entire screen area; this may distort the aspect ratio of the image.

The **Ignore Source Pixel Size** box allows you to ignore any source information about the pixel size. This can be useful if you have images that use a non-standard pixel size.

The **Rotate** and **Mirror** options perform rotations and mirror operations on the source image.

Processing options

The Processing options allow you to 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 image are also inverted.

Brighten Picture will produce a picture that is slightly brighter than it should be. Useful if you have dark pictures.

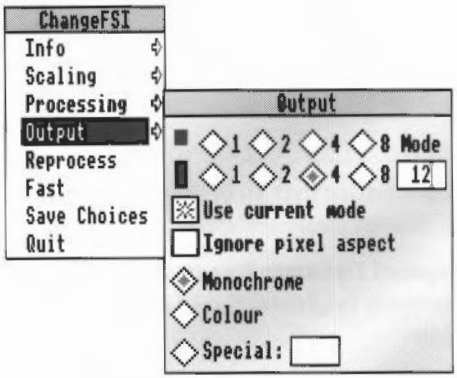
Black Correction is useful if you want to print the image on a laser printer. You should use a number between zero and 128, though values between 32 and 64 usually give the best result; experiment. Images treated in this way will give a poor result when viewed on screen. Only works for 1 bpp (black and 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. This is useful if the dithering process has made the image blurred. A value of 24 will counteract the general dither blurring. A value of 20 is noticably sharp. Values down to nine can be selected.

Output options

The Output options control the screen mode the picture is created for.



The **1, 2, 4, 8** buttons represent the screen colours that you can use. The numbers represent bits per pixel. 8 bits represent 256 colours, 4 bits represent 16 colours, 2 bits represent 4 colours and 1 bit represents 2 colours. The square box represents the square pixel modes and the oblong box represents the non-square modes. The actual output mode chosen is displayed in the mode box.

Use current mode outputs the image for display in the current mode.

Ignore pixel aspect disables all pixel size information and assumes both source and output pixels are square.

Monochrome and **Colour** give an image in black and white or colour.

Special allows the use of special file suffixes. These are explained fully in the on-line documentation file FSII*nfo*.

Reprocess

This option reads the file in again and processes it according to any new options you have set.

Fast

This option speeds up the processing of the image by blanking the screen during processing.

Save Choices

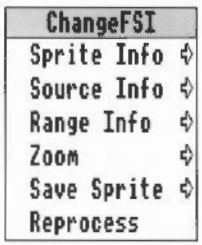
This option will save any changes you have made to the ChangeFSI options so that you can use the options again next time you run ChangeFSI.

Quit

This quits the application, removing it from the icon bar.

Image menu

Once your image has been produced you can click Menu over the image to display a menu of information about the input and output image.



Sprite Info gives the information about the Sprite 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 Sprite allows you to save the image as a Sprite file.

Reprocess allows you to process the image again using any options you have changed on the main menu.

19 T1ToFont

T1ToFont is a program that converts fonts in Adobe Type1 format to the RISC OS outline font format. Once the fonts have been converted they can be used just like any other Acorn outline font.

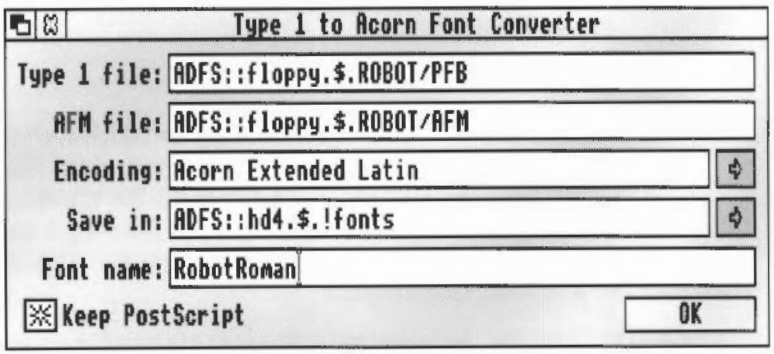
You may only use this application to convert public domain fonts. While it is possible to convert proprietary fonts, it would, most probably, be a breach of copyright to do so without the consent of the copyright holder.

Converting your font

Before you can use the converter you need to have the Type 1 file and the AFM file on a RISC OS disc. The Type 1 file should be given the filetype PoScript and the AFM file given the filetype Text.

Starting the application

Double-click on the T1ToFont icon; this loads the program and displays its icon on the icon bar. Click on the icon to display the Font converter window.



Converting a font

1. Drag the Type 1 file icon from its directory display onto the converter window. The file name is displayed in the **Type 1 file** field.
2. Drag the AFM file from its directory display onto the converter window. The file name is displayed in the **AFM file** field.

3 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.

4 Use the **Save in** field to select a font directory to save the resulting font in. Click on the left arrow to display the alternatives.

5 Select the **Encoding** you need for the font, **Acorn Extended Latin** is nearly always used. Click on the left arrow to display the alternatives.

6 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 use the PostScript font directly.

7 Start the conversion by clicking on **OK**.

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, as the information in it is essential to the conversion process.

Transfer the files

You will need a way to copy files from the Macintosh to your computer. Macintosh Type 1 files usually occupy the 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, as the information in it is essential to the conversion process.

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 disc. Change the filetype of the PFB file to PoScript (&FF4) and the filetype of the AFM file to Text.

Other information

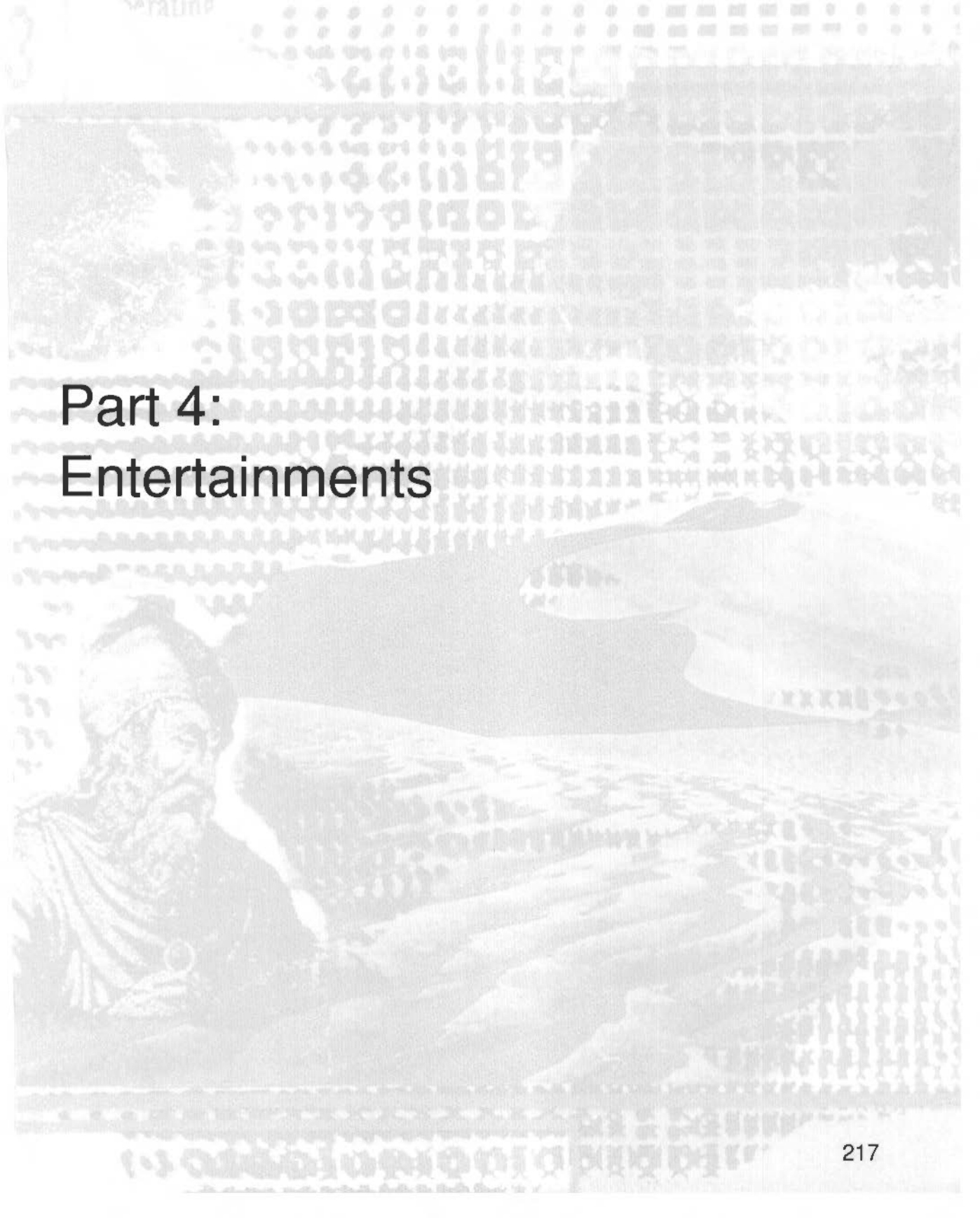
The **Save in** menu selects a font directory to save the resulting font in. The menu is constructed from the contents of the Font$Path system variable, so !Font directories can be added to the menu by installing them on Font$Path (usually achieved by double-clicking them).

The **Encoding** type for most fonts will almost always be Acorn Extended Latin.

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.

The printer module, PDriverPS, will use the original Type1 font for downloading if it is available. If it is not available, it will convert and download the RISC OS outline font. To make the original PostScript available, select the **Keep PostScript** option when converting.

Part 4: Entertainments

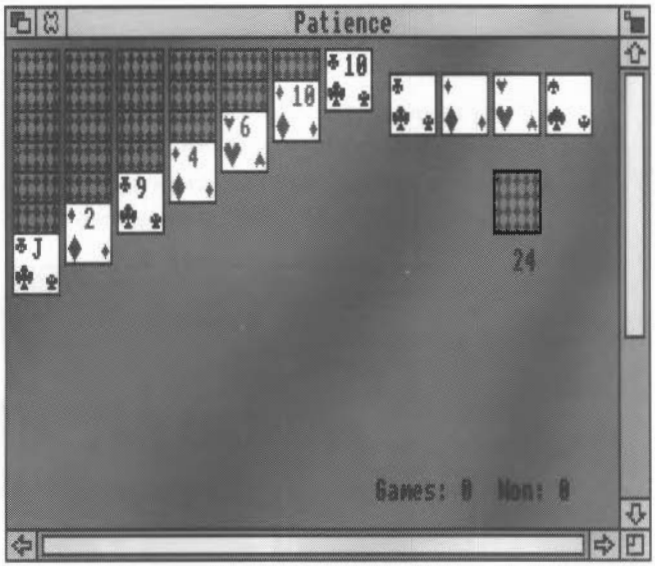


20 Madness

To activate Madness, double-click on the Madness icon. A small window labelled Madness will appear in the bottom lefthand corner of the screen. All the other windows will start to drift around the screen. When you get tired of this, turn Madness off by clicking the Close icon in the Madness window.

21 Patience

This version of Patience is probably the best-known version of the familiar solo card game. To play the game, double-click on the Patience icon in the directory display, then click again on the icon in the menu bar. The Patience window appears on the screen, displaying something like the following:

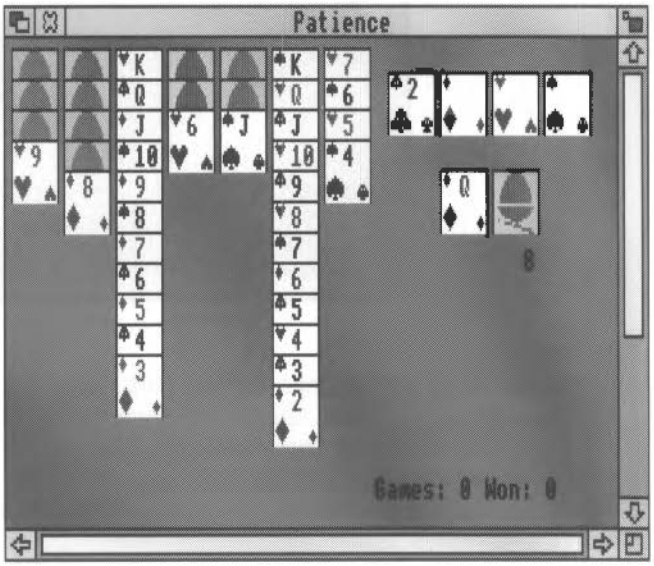


There are seven columns of cards, with the bottom card in each column turned up. The columns range in length from seven cards (on the left) to one (on the right). The rest of the pack is in a face-down 'pile' on the righthand side of the screen. A number below the pile tells you how many cards are face down. At the top righthand corner of the screen are four card outlines, each marked with the symbol for one of the suits.

Rules of Patience

The object of the game is to place all four suits on top of their symbol 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 click on it and 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.

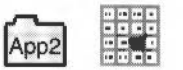
- **Only Kings** means that no cards other than Kings can be placed in empty columns. Switching this off makes the game very much easier; you can now move any card into an empty column.
- **Rev. Cards** refers to the process by which cards are turned over from the pack. The default is that when a group 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.

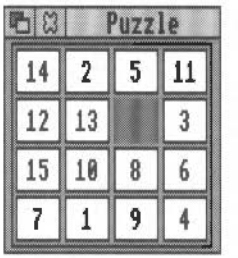
Varying the Pack

You can vary the design on the reverse of the cards by clicking on **New Pack** at any time during the game.

22 Puzzle



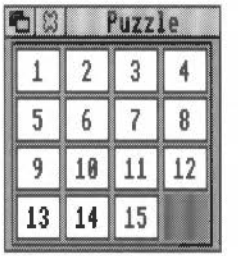
Puzzle is a simple tile puzzle. To play Puzzle, double-click on the Puzzle icon. The Puzzle window appears in the display.



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 grid, press Menu 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.



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Reader's Comment Form

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0496,075

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