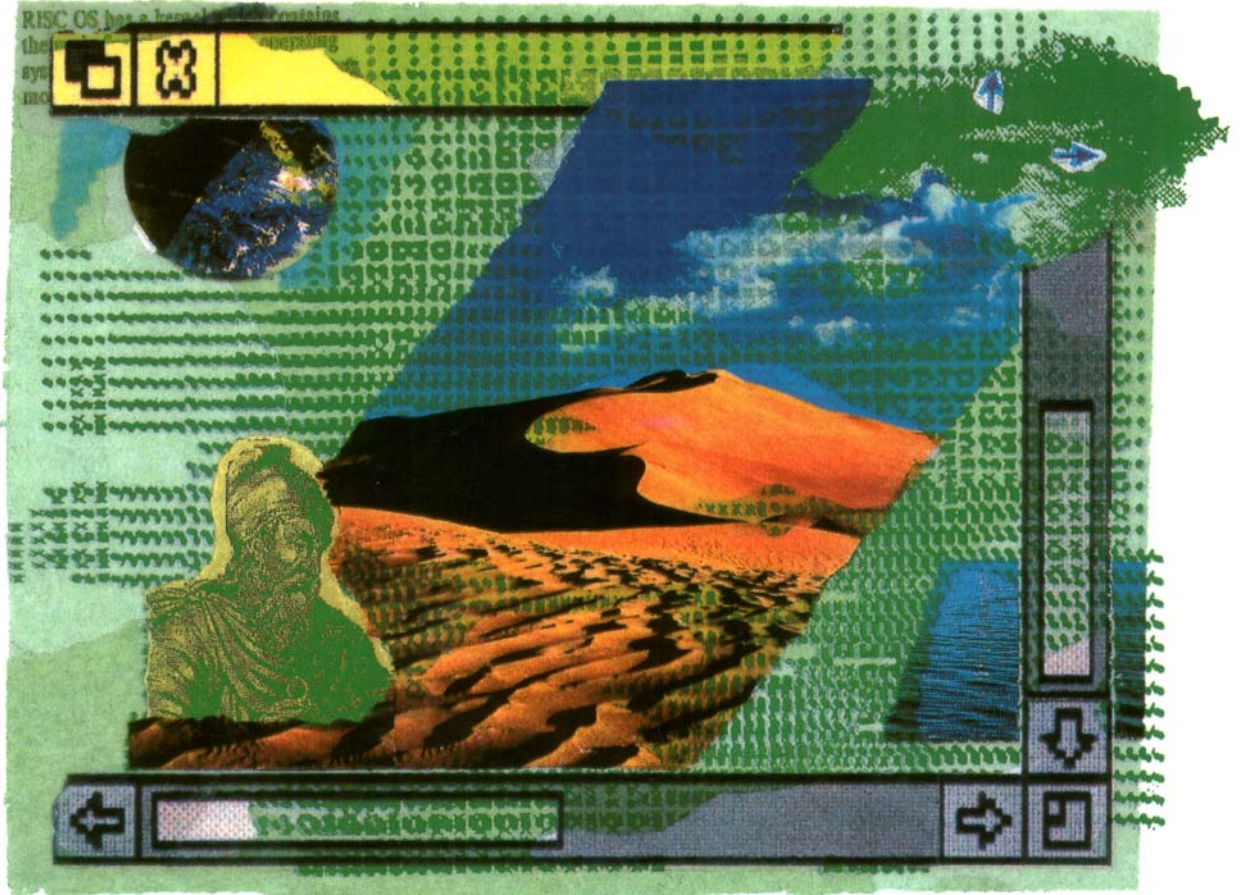


RISC OS Style Guide



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About this guide

About this Guide

This Guide describes the standards of ‘look and feel’ to which you should write a RISC OS application. It covers aspects of designing a new application, and implementing the design:

- The introduction explains why this Guide was written and how to use it. It explains the scope of the Guide, and why a standard look and feel is desirable. It also looks at the issues you need to consider when you begin designing a new application.
- Chapters 2–13 deal with design issues, concentrating on the user interface. This includes the design of menus and dialogue boxes, how to load an application and other issues that are part of the design of an application.
- Chapters 14–16 deal with the implementation of the issues covered in the earlier chapters and of the application’s functionality. They concentrate on programming issues such as the structure of application directories and how to construct the elements of dialogue boxes.
- Finally, there is a glossary of terms used in this Guide.

The first edition of this Guide covered aspects of RISC OS 2 application design.

In the second edition, the guidance was updated to cover the newly introduced 3D look and feel which became standard in RISC OS 3, and implications that had on design.

This is the third edition of the RISC OS *Style Guide*. The Guide has been updated to reflect the developments in application design both within RISC OS and amongst the developer community.

The main aim of the Guide is to help all developers to give their applications a common and consistent look and feel so that users will be able to find their way around new programs easily, and will be able to use applications together when appropriate. There is advice on how to implement this, and detailed descriptions of how to produce the icons you will need to use in your dialogue boxes and windows.

Finding out more

The RISC OS *Programmer's Reference Manual* gives full documentation of RISC OS, and the calls to the operating system that you may need to use in your code. The chapter entitled *The Window Manager* is especially relevant, and tells you how to implement many of the standards defined in this Guide.

1 Introduction

The scope of this Guide

This Guide will help you to specify, plan, and write software to work within the graphical user interface (or GUI) used by RISC OS. It describes the 'look and feel' a user expects from RISC OS applications. Because it is concerned with the design of applications on all levels, you will have to bear in mind many of the points raised here quite early on in development whether you are writing a new application or porting one from another platform.

The Guide is concerned primarily with maintaining consistency and standards in all areas of the style of applications. It describes the standards which we hope you will adhere to so that all developers can move towards a high level of consistency in look and feel, helping users to learn new applications quickly.

By 'style' we mean not only the look of an application on the desktop but also features of its functionality, how well it integrates with other applications and the extent to which it can use common conventions (such as consistency in keyboard shortcuts). These are not issues that can be sorted out at the last moment, but areas you need to consider from the very start of the development process. Some of the points raised are simple rules that are easy to follow – setting the distance between icons in a dialogue box, for example. Others require you to interpret guidelines in the context of your applications.

The scope of this Guide is so large that in places it is necessarily imprecise. Wherever possible and helpful, we have given examples to help make points clearer. Sometimes, the Guide has to enter uncharted waters, and here we can only make recommendations and indicate the direction we expect developments to take. In some areas there may be few or no models to follow, but we hope the guidelines will enable all developers to move towards a common goal. If you follow the guidelines given in this Guide, you should be able to help users learn and make the most of your applications without limiting what your applications can do.

Who should use this Guide?

You should read this Guide if you are involved in the design or writing of applications to run from the RISC OS desktop. This includes designers and writers of games or other applications that may take over the screen completely; there are some guidelines on this in the section entitled *Taking over the screen* on page 34.

The structure of this Guide reflects the process of designing or specifying an application and the implementation of the design in programming the application. Chapters 2–13 will be most useful to the person designing an application. They enable the designer to specify how the menu tree should be structured, what should appear on each dialogue box, how error messages should be worded, and so on. Chapters 14–16 will be most useful to the person or people responsible for writing the program. They cover such details as precise placing of buttons on dialogue boxes and where to put resources.

You should read all the way through the Guide once; we have kept it short so that this is not too time-consuming. You can then use it as a reference work whenever you design or write an application.

Why have a standard?

One of the most important aspects of developing applications to run under RISC OS is to make sure that applications within the desktop world present a consistent and reliable interface to a user. This applies both to how an application looks and to how it behaves. This is to the benefit of all users and developers. If the RISC OS world is a consistent and coherent environment, users will feel confident and at ease even with a new application because it will use a familiar interface and structure. This is to your advantage as well as the user's advantage. A user who has found your package easy to use, following the styles and procedures that are already familiar from other applications and the operating system, will feel happy using your applications and is likely to buy more of them in the future.

Into the future

The requirements set out in this Guide are demanding, and in places require significant effort to implement. Some of the Applications Suite itself does not conform in all respects; as the operating system and Applications Suite change relatively infrequently, they cannot be the main means of introducing change. As new applications are developed or existing applications are updated, we should all aspire to a close match to the current style guidelines.

The standard to which we all aspire will evolve continuously as RISC OS evolves and improves, so 'style' is not static. No doubt future issues of this Guide will be able to be more precise in some recommendations as the developer community discover the standards and conventions that work best.

Future issues of this Guide may need to consider new ways that users interact with their computer, through pointing devices other than the conventional 3 button mouse, such as touch driven interfaces. These all bring new challenges to RISC OS application design.

2

Starting a new application

Thinking about a new application

When you begin to think about developing a new application, you will take many considerations into account. The most important of these will be the functionality you want for your application, and the market you are targetting. At the same time, though, you should begin to think about the style you will give the application. If you begin considering this at the earliest stages of development, it will be fairly easy to make sure your new application fits in with the RISC OS desktop and the applications that use it.

Try to bear the following considerations in mind early on. There is more information on the first two in this chapter, and more on each of the others in later sections of this Guide.

- Your applications should be easy to learn and easy to use.
- Your applications should fit in well with others that use the desktop: aim for consistency by following the design guidelines given in this Guide.
- Use the RISC OS Window Manager module (the programming interface to the RISC OS desktop, commonly known as the *Wimp*) so that your applications will look right and work properly with future releases of the Wimp.
- Use memory efficiently; remember that some users may have only a 4MB machine, and users with larger machines will want to run several applications at once.
- Support all reasonable configurations of hardware and software that a user might have.

It goes without saying that you will decide at an early stage in development what you want your application to do and which language you will use to program it. There are some comments on these issues later in this chapter (see the section entitled *Quality* on page 6 and the section entitled *Choice of programming language* on page 101).

Ease of use

The principal aim of this Guide is to help you produce applications that make the computer easy and pleasant to use, for users with varying levels of experience and different requirements.

A user should find an application:

- easy to learn
- easy to re-learn
- easy to use productively.

You can help the whole developer community to achieve these aims by following the guidelines that work towards consistency and common standards. To help the user to learn, re-learn and use applications you should:

- Make it easy for users to see all the options and actions available within your application.
- Make each user action perform a well-defined task.
A good guideline is whether you can describe the task using a single noun-verb combination, such as 'File-delete'. Typically the user will select something (the noun) and then choose an action (the verb).
- Break down complex tasks so they can be performed as a series of simpler tasks.
- Give your application a clear and logical structure so that users don't have to remember complex sequences or too many details.
- Provide clear feedback to each action, so the user feels in control.
This includes things such as using the hourglass when your application is busy in the foreground, putting status words under icons on the icon bar or changing icons to show the state of a file, application or tool.
- Provide a way for users to undo the mistakes they'll inevitably make.
Usually this will mean offering an Undo function that can reverse either a single action or a sequence of actions. You might also consider providing a Redo function to reverse an Undo.
- Warn and ask for confirmation when an action may be destructive.
It's especially important to do this if you don't provide an Undo function. Issue a warning by default, although you may want to provide a facility for experienced users to turn off such warnings.

Multi-tasking

A multi-tasking interface requires that applications work together for a user of the machine. This means that:

- they co-operate in sharing the machine
- they look harmonious
- their user interfaces are similar

- files are transferable between applications
- the whole is more important than a single application.

A habitual user of the desktop environment and the Applications Suite programs should find your program easy to use and natural to learn.

Data interchange

One of the most elegant features of the RISC OS desktop is that users can easily move files between compatible applications. If your own applications integrate well with others, including the Applications Suite, users will be keen to use them. A primary requirement is that data file formats are compatible or interchangeable. Aim either to use common data file formats (such as CSV files, for example) or make provision for importing from or exporting to different filetypes. There is a list of filetypes in the *RISC OS Programmer's Reference Manual*, and further information on filetypes in the section entitled *Standard icons provided* on page 117.

An advantage for developers of the RISC OS environment is that new applications don't need to duplicate functionality already offered elsewhere. For example, printing should use the standard RISC OS printer drivers. This saves you effort and means that users already know how to set up printing.

Consistency on the desktop

Before users begin to use your application, or even load it, it will have a presence on the desktop as its icon is visible in a directory display. How this icon looks, and the appearance of the icon(s) it uses on the icon bar and to represent its files, should be harmonious with other items on the desktop. Users must be able to load your application by double-clicking on its icon and, if it uses files, to be able to open a file by dragging it to the icon on the icon bar. All these are common desktop activities which users will expect your application to support. The look of the windows, menus, dialogue boxes and error boxes your application uses should also be consistent with those used by other desktop applications so that the user always feels secure and at ease using the familiar interface, even if it is for a new purpose.

If you are writing a game, your application may not usually be run on the desktop, but may take over the whole screen while running. Even so, its icon will be visible in directory displays and on the icon bar and it must be consistent in these respects with other applications. There is more about single-tasking applications in the section entitled *Taking over the screen* on page 34.

The appearance and wording of menus, dialogue boxes, error boxes and the appearance of sprites and windows are described in the following chapters.

Quality

It is much better that you write a small program that does something simple, and does it well, than a sprawling mass that crashes occasionally. In general, a simple program is often an elegant and efficient one; quality and simplicity frequently go hand in hand. Design applications carefully and don't duplicate functionality that is already provided by the Wimp, the operating system or the Applications Suite.

Terminology

You must always bear in mind that your application will mainly be used by the general public, not just by programmers. If you use consistent terminology, and avoid jargon, it will make the application more friendly to them. There is an established vocabulary for referring to parts of the desktop, the mouse buttons and mouse operations. You should use this when communicating with the user. This includes menu and dialogue box text, error messages, help text, manuals or guides and any other user documentation. The names of action buttons, menu items and other very specific items are covered in the appropriate chapters of this Guide.

Versions of RISC OS

There have been several major versions of RISC OS which you need to support:

- RISC OS 2 was the original version of RISC OS, released in May 1989. This has been superseded by RISC OS version 3 and most users are expected to upgrade. It is not required to support any version of RISC OS 2.
- RISC OS 3.00 was supplied with early A5000 systems and has been replaced by RISC OS 3.10. It is not required to support RISC OS 3.00.
- RISC OS 3.10 was the general release of RISC OS 3 for the Archimedes series of computers from Acorn. This is the oldest version that you need consider supporting, unless there is a specific feature that your application requires that was not present in this version - for example 16 bit sound output.
- RISC OS 3.50, 3.60, 3.70, 3.71 were issued for the Risc PC, A7000 and A7000+ family of computers from Acorn. These should all be supported unless there is a specific feature that your application requires that was not present in these versions - for example long filename FileCore discs.
- RISC OS 4.02 and 4.39 were the two ROM based releases from the continued development of RISC OS by RISCOS Limited. There were some minor variants numbered 4.00, 4.01, 4.03 and 4.04 for specific hardware, but from an application programmer's point of view these can be considered identical to version 4.02.

- RISC OS 5 utilises a hardware abstraction layer to allow it to run on many more varied computer models than earlier versions. It also runs exclusively in '32 bit' mode which removes a number of memory limitations imposed previously.

You can assume that all users will have a version of the Universal Boot application installed on their computer. In many cases this will automatically load extra supporting modules from disc in order to bring an older ROM release up to par. For example, the Nested Window Manager is provided and will be loaded automatically when necessary.

3 The desktop

Using the desktop

All applications will need to use the desktop, even if only briefly in the case of some games usually run in full screen mode. It is important that while your application uses the desktop, it looks and behaves in the same way as other desktop applications. This will make your application easy for users to learn and use and will help to maintain the consistency and harmony that we should all be aiming for in developing applications for RISC OS.

If your application usually operates from the desktop, all the guidelines here on designing the user interface will be relevant to you. They cover:

- loading, starting and leaving applications
- using the mouse
- icons
- windows
- menus
- dialogue boxes and toolboxes
- handling input
- selection
- using colour and sound
- editors
- user preferences
- internationalisation.

From this chapter to chapter 13, the Guide deals with the design of these items, not the implementation through programming. There is some guidance on implementation issues in chapters 14–16, but for detailed information on how to create and manipulate desktop items you will need to look in the RISC OS *Programmer's Reference Manual*.

If your application takes over the whole screen, or has an option which users can choose to allow it to do so, it will still need to start up from the desktop and appear on the icon bar as an icon in the same way as applications which operate wholly within the desktop environment. The PC Emulator, which may be run as a single

task replacing the desktop, is an example of an application that does this. Much of this Guide will be relevant to you, even if your application is not normally going to use the desktop while it is running. Some of the advice in the section entitled *Taking over the screen* on page 34 will help you to integrate your application into the RISC OS world.

The pinboard

RISC OS provides a 'pinboard' facility, allowing the icons of open or closed files or directories to be 'pinned' to the backdrop of the desktop. Users can quickly access these files and directories and open a window onto any of them by double-clicking on the icon. This saves time opening sequences of directories, and saves space on the desktop by allowing users to 'iconise' an open file or leave directories accessible without being open. You should provide a sprite that can be used to represent iconised windows from your application. See the section entitled *Sprites for iconised windows* on page 105.

Multi-tasking

Remember that users are likely to want to run your application alongside others. Multi-tasking is one of the most important benefits that RISC OS offers users, so make sure your application does not impair the computer's ability to multi-task and do not reset any configuration options or other settings that will affect other applications.

Terms for desktop items

Consistent use of terminology is important for users. To avoid confusion and difficulty, you must use these terms to refer to parts of the *desktop*:

- The bar at the foot of the screen is the *icon bar*.
- The background to the desktop is called the *pinboard*.
- A *window* may be a main window, a menu, a dialogue box, an error box, an info box or a pane window.
- A *main window* may be a document window, a control window or a directory display.
- A main window showing the contents of a directory is called a *directory display* and **not** a *directory viewer*.

- A *menu* has *menu items*, some of which lead to *submenus* (no hyphen). You may shorten *menu items* to *items*, providing the context is clear. The main menu from which submenus may be accessed is called the *root menu*.
In manuals, menu items and the names of action buttons (see page 54) such as **Save** should be in bold text.
- A menu that appears when you press Menu over an icon on the bar is an *icon bar menu*.
- A menu that appears when you press Menu or Select over a button in a dialogue box is called a *pop-up menu*.
- A chosen menu item is shown *highlighted* (no need to say 'in inverse video').
- A window used for a dialogue between user and computer within an application or on the desktop is a *dialogue box* if there is a delayed effect - that is, the user must click on a button to initiate an action. A dialogue box allows the user to give some details of an action and initiate the action, or close the dialogue box taking no action.
A dialogue box that remains on screen if the user clicks outside it is a *persistent* dialogue box; a dialogue box that disappears if the user clicks outside it is a *transient* dialogue box.
- An *error box* is a special type of dialogue box that gives information to the user, and requires acknowledgement that it's been read.
- An *info box* is a window that displays information for the user to read. It may be transient, in which case it has no control icons. If it is persistent, it may have a control icon allowing the user to display more information, and will have a Close icon or action button to remove it.
- A *pane window* may be a toolbox or a scrolling list of options.

Other special terms are explained as they occur in this Guide; there is also a glossary.

4

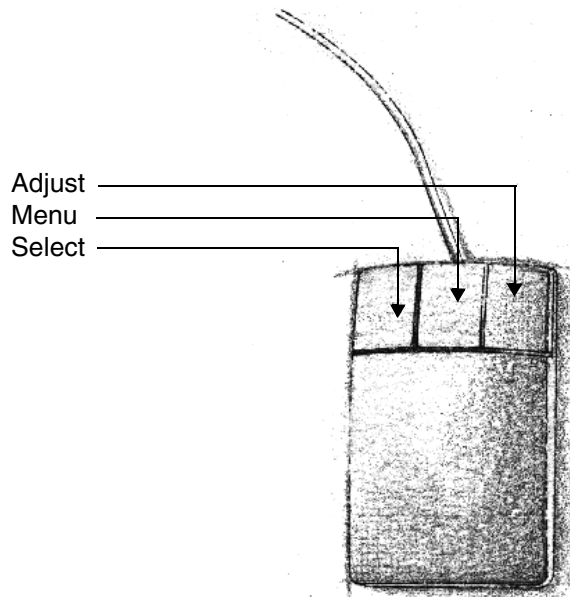
The mouse

Introduction

Although the mice supplied with different systems vary in design, their function and the function of each button is the same across all RISC OS systems. It is important that you support the established standards of mouse activity, and use the established vocabulary when describing the mouse and mouse activity.

Mouse buttons

The mouse has three buttons:



The buttons have these names because of the actions they perform:

- *Select* is used to make an initial selection
- *Adjust* is used to toggle elements in and out of this selection and to add extra selections without cancelling the current ones
- *Menu* is used to call up a menu, and is often incorporated into a scroll wheel by pressing the wheel while it is stationary.

Mouse operations

The mouse moves a *pointer* on the screen.

These are the terms you should use for mouse operations:

<i>Press</i>	press a button down
<i>Release</i>	release a button
<i>Click</i>	press and release a button
<i>Double-click</i>	click twice quickly, without moving the mouse
<i>Triple-click</i>	click three times quickly, without moving the mouse
<i>Drag</i>	press a button and move the mouse, then release the button
<i>Choose</i>	click on a menu item
<i>Select</i>	change an object's state by clicking on it.

Here are some examples of these terms in use:

Type Ctrl-Z or choose **Clear** from the menu.

Triple-click Select to select the whole line of text.

Press Select, drag the icon to a directory display and then release Select.

Select the object you want to delete.

Common faults include confusing *press* and *click*, and talking about *selecting* menu items.

Remember that the mouse speed and double-click speed are configurable; you can't rely on users configuring their mouse to particular settings.

Mouse functions

Do not replace the established functions of the mouse buttons with anything new. Use:

- Select to choose items from a menu, select objects, click on window parts or icons to choose or use them, indicate positions in the window, or drag objects.
- Menu to display a menu anywhere within the window or choose an item from a menu. If you are using menu buttons in dialogue boxes, a user must be able to use the Select or Menu button to call up the menu.
- Adjust to alter selections, reverse the direction of movement brought about by clicking on an icon (such as an adjuster arrow) or scroll arrow, choose an item from a menu leaving the menu displayed, open a directory while closing its 'parent', or open a 'parent' directory while closing the 'child'.

Where possible, Select should be used for all the main functions in your application; Adjust should not be needed by new users, but be used for shortcuts and alternatives to other procedures.

In addition, text editors should support the following mouse shortcuts:

- click to position the caret
- double-click to select a word.

If it is appropriate, triple-click should be supported to select a line or paragraph, depending on the context.

5 Icons

Introduction

The first that users see of your application is its icon in a directory display. Make it attractive and intelligible; if you can, give a hint of its function. The Edit and Paint icons are good examples of this. However, you need to bear the following guidelines in mind when designing icons for your application. It is difficult to design good icons; consider enlisting the help of a graphic designer.

There is more precise information on the sizes for icons in the section entitled *Size of sprites* on page 104.

When to use icons

RISC OS uses icons to represent a variety of different objects:

- applications (including editors)
- files (including editors' documents)
- devices (such as discs and printers)
- iconised windows.

For an application, you will certainly need an application icon and may also need a file icon. However, if your application uses files of an existing filetype, use the standard icon for its files.

Appearance of icons

Application icons will appear on the icon bar and should have an irregular shape. Square or rectangular icons look dull on the icon bar and are confusing in directory displays where they tend to look like file icons (see below). You may use any colours you like for application icons. Use a background mask (transparent) rather than a grey background for sprites representing applications.

File icons should be ostensibly square sprites, with a border to match the other file icons in the current theme. If the file is a document that 'belongs' to a particular editor, try to make the editor's icon and the document's icon look related to each other, even though the editor's icon has an irregular shape.

Device icons will often have an irregular outline. They should use colour to match the major foreground colour of other devices in the current theme, for example, the harddisc icon. Device icons with an irregular outline must have a transparent mask.

Large and small icons

Icons that can appear in a directory display will need large and small versions. If you don't define a small icon, RISC OS will display the large icon at half size. As the appearance of a scaled-down icon is unlikely to be as pleasing as a specially designed small version, it is best to design your own large and small icons. Large icons are used on the icon bar and in directory displays that show **Large icons**. Small icons are used in directory displays that show **Small icons** or **Full info**. There is detailed information on the size the icon should be in the section entitled *Size of sprites* on page 104.

Icons and screen resolution

You should provide versions of the icons your application uses for standard (square pixel) resolution and optionally high resolution and rectangular pixel screen modes. There is more about icons for different screen modes in the section entitled *The !Sprites file* on page 116.

Loading an application

When a user double-clicks on an application icon in a directory display, the application must load, installing its icon on the icon bar. The icon on the icon bar may include some text as well as a sprite. This may give details about the state of a device, for example. The section entitled *Positioning icons on the icon bar* on page 104 explains how to position the icon and any text attached to it.

6

Standard operations

Introduction

It is important that all applications behave in the same way when performing standard operations such as starting up and closing down. In addition, there are some common procedures used by many editors which must also be standard.

Starting an application

You must start your application if a user:

- Double-clicks on its icon in a directory display using either Select or Adjust. This should load a new copy of your application, putting its icon on the icon bar.
- Drags your application's icon to the icon bar.
- Double-clicks on a file icon in a directory display using either Select or Adjust, where the file 'belongs' to the application, and the application has not already been started. If the application isn't already loaded, it must start up and open the chosen document. If it is already loaded, it must just load the document.
- Drags a file to a printer icon using either Select or Adjust, where the file 'belongs' to the application, and the application has not already been started. If the application isn't already running, it must start up and print the file. If it is already started, it must print the document.

Applications should put an icon on the icon bar; only very small applications, which may be better described as utilities, do not need to do this.

Providing information about your application

The 'About this program' dialogue box is accessed from the Info item which you must provide at the top of the application's icon bar menu. The dialogue box provides useful information about your application. For example:

About this program	
Name	Edit
Purpose	Text editor
Author	© Acorn Computers Ltd, 1993
Licence	Single User
Version	1.45 (09-Jul-93)

You can make some modifications to this basic design as long as the dialogue box does not become too large. It is a good idea to include a line showing the licence type. This helps a user identify the limits of allowed use.

Access to the application's help should also be provided as described in the section entitled *Icon bar menu* on page 46.

Closing windows

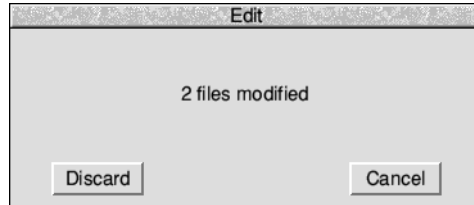
If a user clicks with Select on the Close icon of a window or presses ^F2, the application must

- Close the window immediately if no work will be lost: for example, if it is unmodified, or if a view of the file is still open.
- Display the dialogue box described and illustrated in the section entitled *Closing windows* on page 63 if the information in the window is not safe.

For more information on closing windows, see the section entitled *Closing a window* on page 28.

Quitting applications

The last item in an application's icon bar menu must be **Quit**. If a user chooses this item, the application must first close all windows belonging to it. If any windows contain unsaved data, the application should display a dialogue box like this:



The application may only quit once all the user's information is safe or has been explicitly discarded by the user.

You must follow this procedure even if the user has used another method (such as the Task Manager) to quit the editor, or has used **Shutdown**. Your application must be able to handle `Message_PreQuit` messages from the operating system and warn the user of any unsaved data which will be lost if Shutdown takes place immediately.

Editors

An *editor* is an application which can create, load, display, edit and save *documents* of a particular type. A document is usually stored as a file, with a particular filetype. Most editors can load several documents at once; these are called *multi-document editors*. Examples include Draw, Edit and Paint. Editors must comply with all the rules laid down in other chapters within this Guide; this section gives some extra guidance for designers of editors.

It is important that you consider how data may be transferred between your own application and other applications. Wherever possible, allow the user to save data from the document in a standard file format (such as text, or a Draw file) to allow transfer between editors.

Creating a new document

You must create a new document and open a window on it if a user:

- clicks on the editor icon on the icon bar using Select
- chooses a new document option from the application's icon bar menu (this may be available if you offer several document types, for example).

If your editor needs arguments to create a new document, such as a page size, you may also use a dialogue box during this process. If a style sheet is required (for a DTP program, for example) then you may instead use a persistent dialogue box, and allow the user to drag the style sheet from a directory display.

In a single-document editor, if a user clicks on the editor icon on the icon bar you must create a new, blank document only if a document is not already loaded. If a document is already loaded, you must instead move the editor window to the front of the window stack, in case it has been obscured by other windows.

Loading a document

You must load a document and open a window on it if a user:

- double-clicks on a document icon within a directory display using either Select or Adjust, first starting the editor if necessary
- drags a document icon from a directory display to your editor's icon on the icon bar using either Select or Adjust
- drags a document icon from a Save dialogue box to your editor's icon on the icon bar using either Select or Adjust.

In the last two cases, the editor must already have been started for its icon to be on the icon bar. This way of loading a document allows a user to specify exactly which editor to use. For example, you can drag a PostScript file onto the Edit icon to look at or edit it.

It is normal for a new document to gain the input focus without the need for the user to click in the window. There is more about gaining the input focus in the section entitled *Gaining the caret* on page 69.

If the user tries to load a document which is already open on the desktop, bring the window containing the document to the front rather than opening a new copy of the document. If your application supports multiple views of the same document, this is best offered through a **New view** menu item.

Your editor should be able to load and edit multiple documents concurrently.

As soon as a user makes any changes to a new document or a document that has been loaded, the title bar must show an asterisk to indicate that the document has been modified. This is only removed when the whole document (not a selection) is saved.

Matching documents to editors

Editors use RISC OS filetypes to decide which files ‘belong’ to them.

An editor may only claim filetypes for which it is likely to be the primary editor. This means that it will open a window for a document if the user double-clicks on the file icon in a directory display. Your application may only claim files ‘belonging’ to other editors if it provides a superset of that editor’s functionality; for example, you may only claim Draw files if your editor does all that Draw can, and more besides. If your application is not the primary editor for a filetype, it may still open and process a file of a type it can handle if the user drags the file icon onto your application’s icon on the icon bar.

Your editor must not claim filetypes that are mainly used to exchange information between different editors, such as CSV files.

Inserting one document into another

You must try to insert a document into the one you are editing if a user:

- drags a document icon from a directory display to an open editor window using either Select or Adjust
- drags a document icon from a Save dialogue box to an open editor window using either Select or Adjust.

If the document is not of a type that your editor can import, it should display a suitable error message.

Saving a document

The dialogue box you should use to save a document is described fully in the section entitled *Save* on page 58.

The icon in a Save box should be treated in the same way as an icon in a directory display. So as well as dragging the icon to a directory display to save the document (or part of it), a user can also drag the icon from the save box:

- to the same editor’s icon, which creates a new (cloned) copy of the document
- to a different editor’s icon, which loads a copy of the document into that other editor
- to another document, which inserts your document into the other document
- to a printer driver, which then prints the document.

The writable field you use in a Save dialogue box must be able to accommodate pathnames up to 255 characters long, and have a validation string of 'A~ ', so that spaces cannot be included in the pathname. The field must not accept a pathname longer than 255 characters.

When you save the document, you must:

- Make sure the document's datestamp is unchanged if the document was unmodified; otherwise you must update it with the current date. This ensures that the timestamp reflects when the document was last meaningfully updated.
- Check any return codes and errors from saving the document, and take any appropriate action, such as displaying an error in an error box.
- Mark the document as unmodified, unless the save was to a scrap file.
- Update your stored name for the document and the window title (if necessary).
- Remove the Save dialogue box and the rest of the menu, unless Adjust was used to do the save, in which case they must remain on the screen.

It is becoming increasingly common for applications to save current status information with a document. This may include, for example, the view scale, document-specific choices, and window position.

Holding unsaved documents in memory

Don't allow users to close document windows but retain documents and their unsaved changes in memory; clicking on the close icon must always remove a document from memory. It is very easy for users to lose information in documents that aren't currently displayed if they turn off the computer without first quitting all applications or using **Shutdown**.

The pinboard provides a way for users to keep open documents with unsaved work on the desktop in an iconised form, and this should remove the need for any other method of doing this (see section entitled *Iconising a window* on page 29). If your application needs to provide a way of hiding unsaved documents, supply it by some other method, such as a menu option.

Printing a document

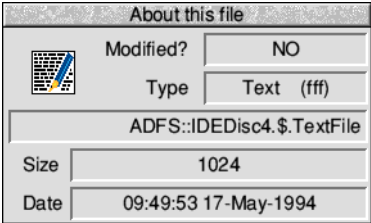
You must print a document if a user:

- chooses **Print** from a menu in your application
- presses the Print Scrn key on the keyboard while your application has the input focus and a suitable document is loaded

- Before printing, your application will need to display a dialogue box for users to set printing options. Sample dialogue boxes and guidelines on designing print dialogue boxes are described in the section entitled *Print* on page 58.

If your application supports printing, the chapter entitled *Printer Drivers* in the *RISC OS Programmer's Reference Manual* gives full details of how the printer drivers work and the protocols involved.

The 'About this file' dialogue box is accessed from the item **Info** in the File menu. The dialogue box provides useful information about a document being edited. It must include the full pathname of the document. For example:



One of the aims of RISC OS is to encourage the free circulation of data between a number of cooperating applications. The following points are all relevant to this:

- 25

- Your editor must support the Scrap Transfer protocol and should implement the RAM Transfer protocol for data transfer between applications. For full details of these protocols, see the *RISC OS Programmer's Reference Manual*.
- Your editor should be able to export the same formats of data that it can include or import, even if that format is normally processed by another editor (such as plain Text, a Sprite or a Draw file).
- Your editor should support the global clipboard, transferring data under the control of the keyboard or the mouse. Supporting the drag-and-drop protocol, as described in the section entitled *Drag and drop* on page 81, is desirable too.
- If you use Draw files you must render them accurately, as Draw itself does. The DrawFile module is provided to help in this regard.
- Draw files should wherever possible be used as the standard form for structured graphic data interchange. Remember that a Draw file can include sprites, and so be used to transfer them.

Think about how users may want to use your own application with others, and try out data transfer between them to make sure you provide the kind of support users will actually need.

7

Windows

Introduction

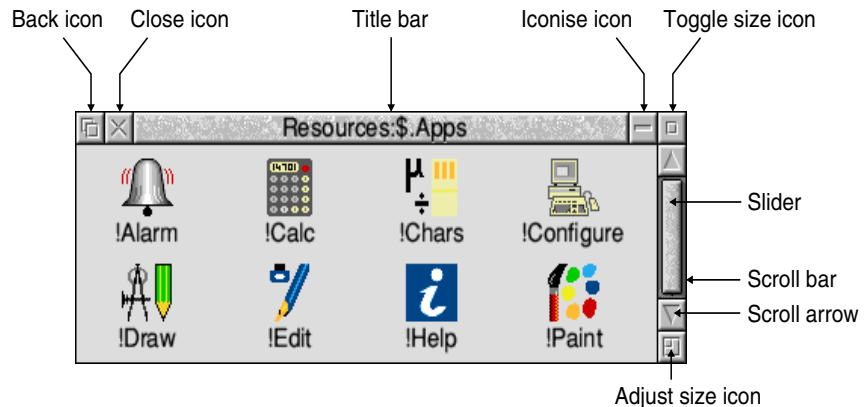
This chapter describes how windows behave on the RISC OS desktop. Much of this behaviour is enforced by the Wimp; the information is provided here for completeness. For more details see the chapter entitled *The Window Manager* in the *RISC OS Programmer's Reference Manual*.

The chapter entitled *Dialogue boxes and toolboxes* on page 49 of this Guide has some extra information that is specific to dialogue boxes; the chapter entitled *Standard operations* on page 19 has some specific recommendations for editors.

The section entitled *Colours* on page 105 describes the standard colours that you must use for windows.

Parts of a window

The icons around a window have the following names:



In running text in manuals and help information, use these names with initial capitals (with the exception of *slider* and *scroll bar*, which should be in lower case throughout).

Title bar

The title information of a window is handled by the Wimp. Ordinarily the title information is centred on the title bar, but when its width is reduced it is instead right-justified such that the leafname is always visible. Windows that represent directories use the full pathname; windows that represent files show just the leafname.

If the document in an editor window has not yet been saved or loaded, its Title bar should show a suitable default document name, such as Textfile. If the document has been modified, you must append a space followed by a * to the title. You may also show the view number (if there are multiple views) and the window scale. Avoid using the Title bar to show other information about documents or files; try to use a pane or other method of showing additional information (such as whether a grid is locked on).

You can set the window's minimum size field so that the title length does not restrict the window's minimum size. If the title will fit in the title bar you should centre it; if it won't fit the window manager will right-justify it, so that at least the end of the title is visible.

Bringing a window to the front

Clicking Select on a window's Title bar brings it to the 'front' of the desktop. This is handled by the Wimp, which reorders the windows in the stack so that your window is in front of any others occupying or overlapping the same area. Resizing a window using Select (see below), or clicking Adjust on a window's Back icon also brings it to the front.

Sending a window to the back

Clicking Select on a window's Back icon sends that window to the 'back' of the desktop, hiding it behind any windows it currently obscures or overlaps. This is handled by the Wimp.

Closing a window

The effect of clicking on the Close icon of a window depends on which mouse button is used and whether the *Shift* key is pressed at the same time:

Mouse button	Without Shift	With Shift
Select	Close the window	Reduce the window to an icon and pin it to the pinboard
Adjust	Close the window; open its parent window at the front of the desktop	Open its parent window; don't close the original window

The functions associated with Select are handled by the Wimp. Your application needs to supply the functions associated with Adjust.

Whenever a window is closed and there is unsaved data, the application must offer the user the chance to save the data before closing the window. For details of what to do with editor windows containing unsaved data, see the section entitled *Closing windows* on page 63.

There is more about the pinboard in the section entitled *The pinboard* on page 10.

Iconising a window

If a user clicks on the Close icon with Select while pressing the Shift key, or clicks with Select or Adjust on the Iconise icon, the window is reduced to an icon stuck on the pinboard. The file name is shown beneath the icon, which looks like this:



The small icon within the border is application-specific.

Double-clicking with Select on the icon on the pinboard must reopen the window, preserving any unsaved edits and displaying the same area of the file as when the window was iconised.

Iconising a window is handled by the Wimp, but your application can respond to a user iconising a window, and may supply an alternative, application-specific iconised sprite. The small icon within the iconised window icon must be application specific. See the section entitled *Sprites for iconised windows* on page 105.

Resizing a window

A window will always open with a standard size. This is some sensible default that you set. Thereafter, window resizing is handled by the Wimp. If the user subsequently resizes the window by dragging the Adjust size icon, this becomes the new 'standard' size.

Dragging the Adjust size icon with either Select or Adjust resizes the window, subject to the constraints of a 'maximum' size. If Select is used, the window is first brought to the front. If possible, the maximum size shows everything over which the window can be scrolled. If this will not fit on the screen, the maximum size fills the screen instead.

Clicking Select or Adjust on a window's Toggle size icon toggles its size between a maximum size and a standard size. If Select is used to toggle the size of the window to its maximum it is also brought to the front, but its old depth is remembered. If the window is subsequently toggled back to its standard size, it resumes this depth.

Clicking on the Toggle size icon with the *Shift* key held down resizes the window so that it occupies the whole of the screen except the icon bar (or as much of the screen as it needs to show its full extent, if it isn't large enough to fill the screen).

If the window reaches the edge of the screen during resizing it grows in the opposite direction if possible – so if the window reaches the right-hand edge of the screen, but there is space on the left, the window grows to the left to increase its width. If your application window has a toolbox attached, it will have to handle repositioning the toolbox itself (see the section entitled *Toolboxes* on page 67).

Moving a window

In RISC OS, a window can be dragged not just to the edge of the screen but almost off the edge of the desktop. The position of the pointer on the Title bar determines how far off the desktop a window can be dragged, as the pointer can't move outside the desktop. Moving a window is handled by the Wimp.

Windows with tool panes attached must move the panes too such that they track the parent to which they are attached.

Scrolling a window

Normally, the Wimp handles window scrolling. This is what happens:

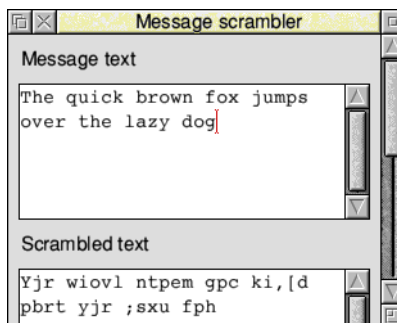
- Clicking Select on a window's scroll arrow scrolls the window (effectively scrolling through the contents of the window) in the direction the arrow points, and by an appropriate amount. For example, text files scroll by one line of text, taking account of the font size in use. Clicking Adjust on a scroll arrow scrolls the window in the opposite direction.
- Clicking Select on a window's scroll bar (not its slider) scrolls the window by approximately the height/width of the window, as appropriate. Again, clicking with Adjust scrolls the window in the opposite direction. There is a small overlap between successive window views, so that it is clear how the new view relates to the previous view. For example, if you scroll a window down over some text, the last line of the old view will be the first line of the new view.
- Dragging a window's slider with Select scrolls the window in the direction of the drag, and by an appropriate amount. The amount reflects the proportion of the whole document visible in the window and how far the slider is dragged. Dragging the slider with Adjust scrolls the window in both dimensions at once (sideways and up and down).

A window cannot scroll past any natural limit, such as paper limits or the end of a file.

The length of the slider represents the proportion of the whole file that is currently visible in the window.

Nesting a window

The *Nested Window Manager* offers enhanced facilities for application design including the ability to place child windows inside a parent window. The following illustration shows an example with two children nested inside one parent.



The Wimp will handle much of the management of the child window position when the parent window is moved or resized using the same events as for a non nested window.

The extra facilities for applications that are enabled by a Nested Window Manager are:

- Nested windows. A parent window may contain any number of child windows within it, and each child exists in an imaginary window stack just as the parent window does in the desktop as a whole.
- Zero sized work areas. Prior to this version, the Wimp would impose a minimum size for a window even if zero was chosen in the Templates file, this was to ensure the scroll bar and scroll arrows could always be seen. The Nested Window Manager will instead shrink the scroll bars when the adjust size icon is moved to accommodate the request until they are too small to show, then the scroll arrows will be similarly reduced.
- Borderless windows. It is possible to turn off the 1 pixel window border and keep the icons from around the window showing, if a floating scroll bar is needed for example.
- Furniture windows. These are child windows that can displace a parent's scroll bars. The window stack is redrawn such that furniture windows are topmost, with the parent's window furniture underneath, then normal (non furniture) child windows at the bottom, clipped by their parent's outline. This can be used to embed a status area or extra custom button icons in the window furniture of the parent.








Applications must not use a large parent window to take over the entire desktop, only to then present smaller child windows within it. Applications must share the desktop and open windows in accordance with the design details stated in the section entitled *Windows* on page 105.

Context-sensitive pointers

You may want to change the shape of the pointer while it is in a window, or over some type of item in a window, to indicate to the user the sort of activity that is available. Examples of this include changing the pointer to a caret in a text window, or to a menu shape when it is over a button that leads to a menu. Used in moderation, context-sensitive pointers can help users to find their way around your application. However, over-use can be confusing and looks messy.

If you want to use context-sensitive pointers, use the following established set of pointer shapes:

-  *Write* for writable icons and text areas.
-  *Hand* for moving objects such as frames and windows – but not for dragging objects such as icons when the precise drop point is important, since icons are obscured by the hand shape.
-  *Auto scroll* show that the pointer is within the auto scrolling zone near the edge of a window. There are also pointer shapes provided for just horizontal and just vertical scrolling - the Filer uses this when extending a selection.
-  *Menu* to emphasise that gadget under the pointer leads to a menu. The use of pop up menus is covered in the section entitled *Pop-up menus* on page 57.
-  *Drop* is associated with the 'drag-and-drop' method of selection which will eventually complement the cut and paste method. Drag and drop is described in the section entitled *Drag and drop* on page 81.

Dragging objects that are within a window

The Wimp's drag operations are specifically for drags that must occur outside all windows. As well as using the cycling dashed box form, you can define your own graphics to drag objects between windows.

If you allow drag operations within your window, check that redraw works correctly when windows move at the same time as the drag is in progress, such as if the window is automatically scrolling beneath the pointer. During a drag operation:

- You can choose whether to allow the user to drag the object out of the window, or to restrict the dragged object to within the window. Normally the context will tell you which is the sensible choice.
- If you restrict the dragged object to within the window, you must automatically scroll the window if the object gets close to the edge of the window's visible area, and if more of the window lies in the direction of the drag (see below).
- If the drag works with the mouse button released then menu selection and scrolling can happen during the drag, which you might find useful.

You may use the Shift key to modify the effect of the drag from a move to a copy, or vice versa. A drag between windows without the Shift key should perform a copy. A drag within a window without the Shift key should perform a move.

The user may regret beginning a drag; pressing Escape during a drag should cancel the drag and restore the object to its original position.

Automatic scrolling

Within an editor window, selection by dragging over text or other objects should cause the document to scroll if the user holds down the Select button and moves the pointer near the edge of the window. So dragging near the right-hand border of the window should move through the document to show objects to the right (unless the window is already at its limit in that direction), and dragging over the lower border should move forwards through the document to display objects lower down (until it meets the end of the document). Dragging with Adjust to increase a selection should also give automatic scrolling.

Once automatic scrolling has started, the user should be able to increase the speed of scrolling by moving the pointer. Scrolling stops when the user releases the mouse button, stops moving the mouse, or meets the natural limits of the document. The pointer is never artificially repositioned.

This mechanism allows users easily to select material that extends over more than one window full of information. It also allows users of the 'drag-and-drop' method of moving and copying selections to move through a document easily to the destination for the selection. Drag and drop is described in the section entitled *Drag and drop* on page 81.

Taking over the screen

You may feel very strongly that your application should be able to take over the entire screen, without any scroll bars or other window paraphernalia. Usually, there is no need for this to be the only method of operation, and you should make it possible to run the application in a window, perhaps with an option to run it as a single task. There is a model of how this can be handled in 'Acorn PC Soft' emulator: single screen operation can be chosen from the application's icon bar menu.

All applications should install an icon on the icon bar, even if they may be run as a single task taking over the screen. The application should start up when the user clicks on the icon on the icon bar. You may allow the user to make any settings specific to your application from an item in the icon bar menu. This may include redefining keys and loading saved data, for example.

The application needs to provide an easy way of returning to the desktop. Pressing either of F12 or Escape should return the user to the desktop, and your application should support both of these unless you have given Escape an application-specific function. If you offer a menu option to return the desktop, this should be called **Return to desktop** and not **Quit** or **Exit**. The application should operate in a window once it has returned to the desktop. The desktop should be in the state in which the user left it. Your application must not alter any configuration settings without first asking the user to confirm that it may, and must **never** change CMOS settings.

If there is insufficient memory available to run your application, it must display a suitable error box and not try to free memory by altering the configuration of the computer or doing anything which may cause the user to lose data. Always give the user the opportunity to save any data which may otherwise be lost.

If you are writing a game, you may want to allow users to save the state of play. It is best to offer this as an option from the icon bar menu, allowing the user to drag the file icon to a directory display in the usual way.

There is an Application Note for games writers, called AN202 - *Writing games for RISC OS* which contains further guidance.

8 Menus

Introduction

When different developers use very different menu structures, it is difficult for users to find their way around new applications. To help overcome this, this Guide suggests a basic, general-purpose structure for main menus which can be adapted to suit many types of application, and offers some guidelines on menu design in general. You should follow these to help users come to grips with your applications.

The Wimp enforces some aspects of menu behaviour, so some of the information included here is provided for completeness. For more details, see the chapter entitled *The Window Manager* in the *RISC OS Programmer's Reference Manual*.

Basic menu operation

Your application must provide a single menu tree for each window type that needs menus, and an icon bar menu. A menu must be displayed when a user presses Menu within one of the application's windows that has a menu tree. This is better than using a collection of short menus, associated with different places in the window: a single menu is easier to learn about than lots of small ones, and users can quickly discover what your program can and can't do without having to search everywhere for hidden menus.

You can, however, make menu items context-sensitive. Context-sensitive menus have one or more items that change according to the object beneath the pointer when the menu is displayed or according to what object(s) are selected when the menu is displayed.

The user must be able to move all menus, submenus and dialogue boxes by dragging them. The Wimp handles the movement of menus.

Displaying menus

A menu must appear at the position of the pointer when the user presses the Menu button. The main menu must appear when a user presses Menu with the pointer inside a window belonging to your application. The icon bar menu must appear when the user presses Menu with the pointer over your application's icon on the icon bar.

Options that lead to submenus are indicated by an arrow to their right. A user must be able to display a submenu by moving the pointer to the right over an item that has an arrow beside it. When automatic menu opening is enabled the Window Manager will instead open the submenu after the pointer hovers over the item for a configurable delay.

If a menu item is not available because of the context in which the user has displayed the menu, it must be greyed out (not omitted). Also, grey out any item that leads to an unavailable dialogue box.

Grey out any items that don't do anything in the current context. Don't grey out a menu item that leads to a submenu but show it in black, even if all items on the submenu are unavailable. This allows users to see quickly all the options your application offers, even if they aren't currently available.

Choosing menu items

A user must be able to press with any mouse button on a menu item to choose that item, unless it leads to a submenu. The application must perform any associated activity, which may be a task, or it may be to open a dialogue box. If the user presses Select or Menu to choose the item, the menu must then disappear. If the user presses Adjust, the menu tree must remain displayed so that the user may choose extra items.

If a user presses any mouse button on a menu item that leads to a submenu, the application should either do nothing, or should do some sensible default available on the item's submenu – for example, clicking on a **Save** item should save a document using its existing pathname (if it has one). The application may display a dialogue box if necessary: for example, if a user clicks on a **Save** item for a document that has not yet been saved, the Save dialogue box may appear.

A menu entry should have an ellipsis rather than an arrow if it leads to a persistent dialogue box (one that remains on screen until explicitly dismissed by the user). This means that the user has to select the item to display the dialogue box. There is more on dialogue boxes in the next chapter. A menu item should never have both an ellipsis and a submenu arrow.

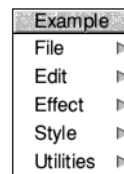
Removing menus

If a user clicks anywhere outside a menu, the menu is removed from the screen and the click is obeyed. The user may also press Escape to remove the menu tree without making a choice; this function is provided by the Wimp.

Menu structure

Very long main menus and submenus are cumbersome and complex for users to deal with. As a general guide, you should strive for a balanced overall structure, with items that are needed frequently not hidden deep within a system of submenus.

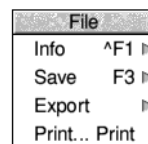
The following example of a main menu structure might be suitable for some applications; it is intended as a guide only, not a set of rules you must follow.



Many applications will need to offer the items **File**, **Edit** and **Utilities**; many will need one or both of **Effect** and **Style**, or suitable application-specific alternatives. The main menu items will probably lead to submenus offering tasks of related type. Some menu items that appear in many applications should be handled in standard ways to increase consistency and ease of use. These are described in the section entitled *Standard menu items* on page 42.

File menu

The File menu will typically look like this:



These are all standard items that are described in the section entitled *Standard menu items*. You may want to include some other options that relate to the whole document. Any options that relate to the application (that is, to all documents) should be included in the icon bar menu and not the File menu.

Edit menu

The Edit menu should contain all the main functions of your application. From it, users should be able to see what the application can do. Obviously the entries will be determined by the functionality of your application; the illustration below is just a guide.

Edit	
Cut	^X
Copy	^C
Paste	^V
Delete	^K

New Header/Footer	
Alter pages...	↑^A
Alter graphic...	^F11

Select all	^A
Clear	^Z

An **Undo** function is very useful to users and you should include this if possible (and appropriate). **Undo** and **Redo** should be the first two entries in the menu.

Effect menu

The Effect menu should offer simple functions to change the appearance of text (or whatever). A typical example is shown below; if you use these items, you should use the same names and give them in the same order as far as possible.

Effect	
Text font	▶
Text size	↑^S ▶
Text colour....	
Line spacing	↑^L ▶
Alignment	▶

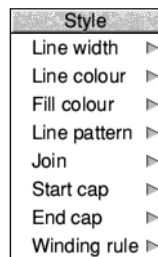
Bold	^B
Italic	^I
Underline	↑^U
Superscript	↑^J
Subscript	↑^K

Paragraph border	▶

If there is a selection current when the user picks an effect, the effect should be applied to the selection. If there isn't a selection, it should be turned on to apply to subsequent input.

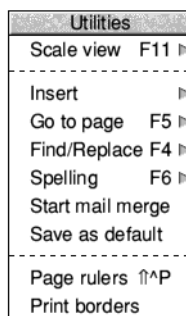
Style menu

The Style menu should offer more complex settings such as combinations of effects and additional features. Typically, it will offer some general operations and some user-defined styles.



Utilities menu

The Utilities menu generally holds items that don't fit naturally elsewhere in the menu structure. However, check carefully that each item you think of putting in Utilities should really be there; don't use it as an alternative to devising a proper, logical menu structure.



Toggling menu items

Sometimes you will want to offer in the menu structure a setting that can be toggled on and off. There are three ways of doing this. In order of preference, they are:

- 1 Have one menu item that is ticked when set on and not ticked when set off (Use Palette, for example).
- 2 Have a context-sensitive menu item that changes to show the state that can be selected (Show graphics when graphics are hidden, and Hide graphics when graphics are shown, for example).

- 3 Have two menu items with opposite functions (Show graphics and Hide graphics, for example) and grey out the option that is currently in use.

It is worth considering whether the option would be better included in a dialogue box. There are guidelines on presenting choices like these in dialogue boxes in the section entitled *Standard components in dialogue boxes* on page 52.

Dialogue boxes and writable fields

Writable fields in menus are not particularly easy to use, especially for users who have difficulty controlling the mouse. Use a small dialogue box in place of a writable field coming from a menu item. Dialogue boxes are easier for the user than writable fields as it is possible to click to place the caret. A small dialogue box should typically have a field for text and an action button, such as **Save** or **Modify**; **OK** is acceptable as long as the context makes its meaning absolutely clear. Where sensible, try to maintain the text that has been previously entered in the text field. There is more detail about the design of dialogue boxes in the next chapter.

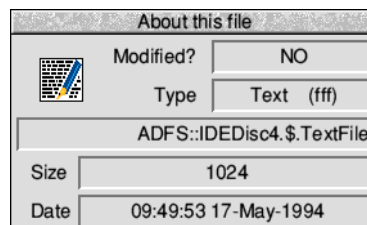
Adapting the menu structure

Even if your application can't use exactly the structure we have outlined here for its menu tree, try to keep close to it, particularly for the main menu and the common features of the File menu. Users will come to expect this as the model for the main menu in all new applications, and they will find your application easy to learn if it follows the model.

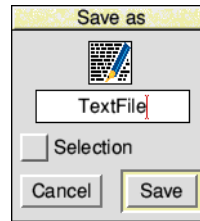
Standard menu items

File menu

Info should lead to a dialogue box showing information about the current file; it should not display application information, which is displayed from **Info** on the application's icon bar menu.

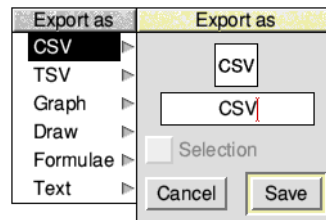


Save should lead to a Save dialogue box which offers saving a selection (if there is one) as an option, and shows a file icon for the application's natural file type. The Selection button is faded if there is no selection, and is always turned off when the dialogue box appears; this prevents users accidentally overwriting the whole file with a selection. Dialogue boxes are described fully in the next chapter. The Save dialogue box with a selection button available should look like this:



Incorporating the selection option into this dialogue box saves space in the menu tree and helps to rationalise the structure of menus. The use of the Selection button avoids the need for a **Save** item in a Selection submenu or a **Select** item in a Save submenu, which was a source of inconsistency in many older applications.

If it is possible to save a file or selection using other filetypes, the menu should include an **Export** item, leading to an Export dialogue box or a submenu if there are several alternative file formats available. A menu of filetypes will typically look something like this:



Each filetype item should lead to an Export dialogue box with the appropriate file icon shown. You should put the more commonly used filetypes at the top of the menu, and any unusual ones at the bottom, separating the two groups with a dotted line if appropriate. Only include a submenu **Other** for more unusual filetypes if your application offers so many file formats that the Export submenu becomes unwieldy.

There is more about the design of Save dialogue boxes in the section entitled *Save* on page 58.

If a user clicks on the **Save** item in the File menu, the file should be saved using the default filetype. If it has been saved in that format previously, it should be saved with the same name; if it has not, display the appropriate Save dialogue box. Some users like to be warned before overwriting an existing version of a file with a new version; others find such warnings irritating. If your application issues warnings, make it an option that users can set on or off as one of the application's choices.

Print should lead to a dialogue box allowing the user to make choices such as how many copies to print. By default, the whole document will be printed, but you can offer options to print the current selection (if there is one) or a page range.

Edit menu

If your application uses the Cut/Copy/Paste method of moving and copying selections, you will need to include each of these items in the Edit menu.

The cut and paste method requires an application to keep a clipboard on which cut or copied items are stored until the user pastes them back in or closes down the application. Instead of a single operation, two stages are needed to cut or copy and then paste a selection.

Cut removes the selection from the document and stores it on the clipboard.

Copy makes a copy of the selection and stores it on the clipboard. The selection in the document remains in place.

Paste pastes the current contents of the clipboard into a document at the position of the caret, or replacing a selection current in the document.

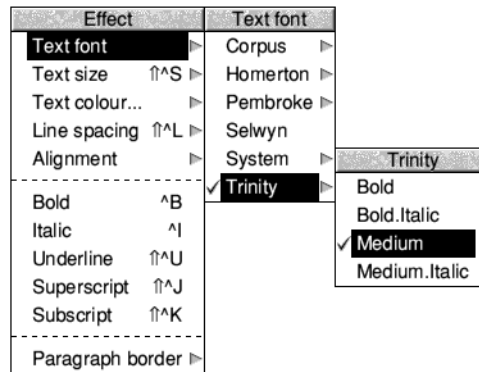
The cut and paste method of copying and moving objects or text has now established itself as the industry standard. You should use it in preference to the model of highlighting text in a block and then positioning the caret at the input point and using a **Copy** or **Move** menu item. The latter model has been replaced because retaining a current caret and a current selection confuses many users.

In the future, cut and paste is likely to evolve into a 'drag-and-drop' method which will allow the user to make a selection and then drag it with the pointer to its destination. This is outlined in the section entitled *Drag and drop* on page 81; there is more about cut and paste in the section entitled *Cut and paste* on page 80.

Effect/Style menu

Font selection makes it easy for users who want to make a change to text in several fonts, perhaps changing it all to italic or all to bold.

The following menu structure gives users the option of changing just the weight or style of the font, or of making a fully controlled font change.



The menu items **Bold** and **Italic** will work over a selection that includes several fonts:

- The menu item **Bold** will be ticked if any of the selected text is in bold, or if there is no selection but bold is turned on at the position of the caret.
- The menu item **Italic** will be ticked if any of the selected text is in italic, or if there is no selection but italic is turned on at the position of the caret.

The menu items have the following effects:

- If **Bold** is not ticked and the user clicks on it, all selected text in any font will be changed to bold (retaining the same typeface(s) and angle(s)); if there is no selected text, bold will be turned on at the position of the caret.
- If **Bold** is ticked and the user clicks on it, all selected text in any font that is currently emboldened will be changed to medium (retaining the same typeface(s) and angle(s)); if there is no selected text, bold will be turned off at the position of the caret.
- If **Italic** is not ticked and the user clicks on it, all selected text in any font will be changed to italic or oblique (retaining the same typeface(s) and weight(s)); if there is no selected text, italic will be turned on at the position of the caret.
- If **Italic** is ticked and the user clicks on it, all selected text in any font that is currently italic or oblique will be changed to upright (retaining the same typeface(s) and weight(s)); if there is no selected text, italic will be turned off at the position of the caret.

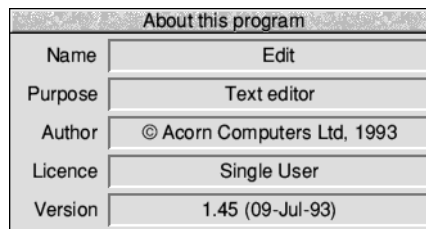
Colour selection may be of two types. Selection of 'true' colours which may be precisely defined and stored and printed with a suitable printer, but not necessarily accurately displayed on screen, should be from a dialogue box. The standard

dialogue box for picking colours is described in the section entitled *Selecting colour* on page 60. Selection of desktop colours for display may be from a dialogue box or a submenu of colours (as Edit's text and background colours are selected).

Icon bar menu

The icon bar menu for your application must have at least two items: **Info** and **Quit**.

Info displays a dialogue box showing information about your application. It should be similar to this, but you can make slight modifications:



Whenever you release a new version of your application, make sure it has a new version number in its Info box for customers to easily refer to, along with a hyphenated release date as shown.

Quit removes your application from memory. It must first check that there are no unsaved documents, and use the dialogue box illustrated in the section entitled *Closing windows* on page 63 if there are.

The icon bar menu should preferably provide a **Help...** entry placed immediately after the **Info** item which should run your application's !Help file. Other icon bar menu items then follow with **Quit** being last.

Appearance of menus

Text in menus

The following rules govern the use of text in menus:

- Items must have an initial capital, with the rest in lower case (ie 'Set type', not 'Set Type').
- Items must be left-justified (except for keyboard shortcuts – see the section entitled *Keyboard shortcuts* on page 70).

- Items must use the current desktop font, which may vary based on the user's preferences. Design your menu first using the system font to ensure that any keyboard shortcuts are right justified appropriately with soft spaces (character 32), then leave the Wimp to justify the menu when the current desktop font uses an outline font.
- Items must (where relevant) use ticks to show they have been selected, whether by the application as a default, or by the user as a conscious choice.
- Items may be split into groups within a menu by separating them with a dotted line.
- A menu entry may be a sprite instead of text where this is appropriate.

Keyboard shortcuts

You may well want to offer keyboard shortcuts for some menu items. Details of the keyboard shortcuts used for various functions are given in the section entitled *Keyboard shortcuts* on page 70.

Pop-up menus

Sometimes you may wish to include a list of alternative choices within a dialogue box, using a pop-up menu. The procedure for including a pop-up menu in a dialogue box is described in the section entitled *Pop-up menus* on page 57. The icon to show a pop-up menu looks like this:



A pop-up menu looks and acts in all respects like an ordinary menu. It has a Title bar, by which it can be dragged around, and uses the same colours as an ordinary menu and may have items greyed out.

Size and position of menus

For the details of the size a menu should be and how it should be positioned when displayed, see the section entitled *Menus* on page 106.

Introduction

Dialogue boxes are an important way in which users communicate with the computer and give instructions to your application. It is vitally important that the wording, function and layout of dialogue boxes is clear and easy to use. This chapter gives guidance on aspects of dialogue box design and tells you how you can make your dialogue boxes consistent and harmonious with other RISC OS dialogue boxes. You will need to give careful consideration to how to present your application's functions and options within the protocol described here.

The dialogue boxes for some standard functions – such as Save, and selecting colours – are described and illustrated. Use these standard dialogue boxes whenever appropriate.

Toolboxes are another method of interaction, but one which has been under-used in the past. They can cover a wide range of functions; the tools in Paint and Draw are examples. Generally, they can remain on screen while an application is being used, and do not disappear until dismissed by the user clicking on a Close icon or choosing a menu item.

The Wimp enforces some of the behaviour of dialogue boxes. For more details of how to construct and use dialogue boxes in your application, see the chapter entitled *The Window Manager* in the *RISC OS Programmer's Reference Manual*.

3D and dialogue boxes

RISC OS uses a 3D look and feel throughout, using a standard set of 'gadget' icons provided by the Window Manager. All new applications must use these standard icons from the Wimp sprite pool, and the 3D look and feel; any that use their own, non-standard icons will look odd. The precise appearance of the gadgets may vary depending on the theme in use, but their size is consistent so one design will suit all versions. The sizes are detailed in the section entitled *Size of dialogue boxes* on page 108.

It is not necessary to provide a 2D version of your template.

Some windows are eligible for 3D borders around the entire window area too, when the window flags in the template permit it and the user has enabled 3D borders in the Window Manager setup. Allow extra space around the edge of the window to prevent the borders from overlapping other elements of your design.

Types of dialogue box

There are two types of dialogue box:

- persistent dialogue boxes
- transient dialogue boxes.

Persistent dialogue boxes

A *persistent* dialogue box appears when the user clicks on a menu item that is followed by an ellipsis (...) or performs an equivalent action (such as using a keyboard shortcut). It usually suspends its parent application until it is filled in; this is not an essential feature of persistent dialogue boxes, but it is easier to implement.

A persistent dialogue box has at least one action button (such as **Save** or **Cancel**). It must not have a Close icon, but has a **Cancel** action button instead; it is not clear to a user whether any settings chosen will be implemented if he or she clicks on a Close icon. A persistent dialogue box appears after a user clicks on its parent item in the menu tree, which must have an ellipsis after it – so **Style...** is an example.

A persistent dialogue box is not removed from the screen if a user clicks outside the dialogue box.

Transient dialogue boxes

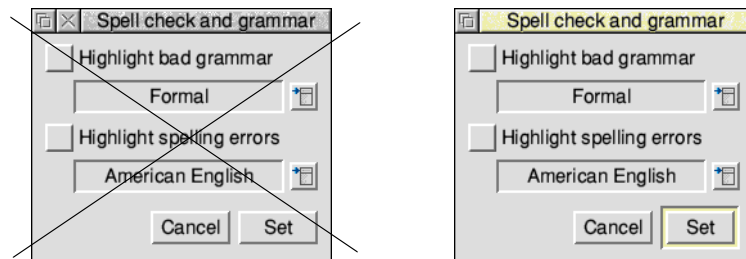
A transient dialogue box appears as a submenu, and functions in the same way – the Save dialogue box is an example. It has at least one action button (such as **Save** or **Cancel**) but no Close icon. It is typically small, to make it easy to browse through the functions an application offers. It is removed from the screen if the user clicks a mouse button or moves the pointer back over the menu tree.

A click outside a transient dialogue box removes the dialogue box without taking any action.

Acting upon choices

Both types of dialogue box should be characterised by delayed action: the user has to make choices and then click on **OK** (or some other appropriately named action button) before the choices take effect. This contrasts with the instant effect of, for instance, dragging a scroll bar. Toolboxes, such as that used by Paint, have an instant effect. Toolboxes are described below in the section entitled *Toolboxes* on page 67.

Where a choice is offered do not include a close icon on the dialogue box as this is confusing for users whether their selection will be cancelled or acted upon. Some of the dialogue boxes in the version of Configure that was supplied with RISC OS 3 didn't conform to this rule.



Deciding which type of dialogue box to use

Whenever possible, use small transient dialogue boxes rather than persistent dialogue boxes.

Sometimes you may need to use a persistent dialogue box because of technical restrictions – for example, you can't use a transient dialogue box if you want the dialogue box:

- to have menus of its own;
- to have panes;
- to have icons dragged onto it, or to remain on screen when any other mouse input is required.

It is also better to use a persistent dialogue box if, displayed from the menu, the dialogue box would be large enough to obscure the menu that called it up.

Dialogue boxes and keyboard shortcuts

A dialogue box must work in exactly the same way whether it is opened from a menu or using a keyboard shortcut.

For full details of using keyboard shortcuts, see the chapter entitled *Handling keyboard input* on page 69.

Default actions

If a dialogue box has a default action it should be clear what this is. The default action should do what the user probably intended as long as this is safe. For example, if a user has edited a file and tries to close it without saving it, the default action should be to save the file before closing it. The file is closed – as intended – but the user doesn't lose the new data.

The default action should be performed if the user presses Return. Escape must perform the same function as clicking on **Cancel**. A dialogue box must take the input focus when opened and whenever the user clicks on its window so that Return and Escape work.

The dialogue box must remain on screen if the user clicks on an action button using Adjust.

Standard components in dialogue boxes

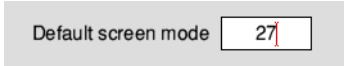
There are various standard components that you may need to use in dialogue boxes:

- writable fields
- display fields
- action buttons
- option buttons
- radio buttons
- adjuster arrows
- sliders
- scrollable lists
- pop-up menus
- standard selectors (for colour, font and view scale).

The sections below explain how and when to use each of these; the chapter entitled *Implementing the design* on page 101 explains how to implement each of them.

Writable fields

Writable fields are used when the user has to type text to give a value or name. Use either validation strings or your own filtering code to make sure the field accepts only legal strings. A writable field looks like this:



The user may want to use any of the following keystrokes within a dialogue box with writable fields, and your application should support all of them:

Key	Function
←	Move the caret to the left one character position.
→	Move the caret to the right one character position.
↓ or Tab	Set the value in the current field and move the caret to the end of the next field (cycling from last to first if necessary).
↑ or Shift-Tab	Set the value in the current field and move the caret to the end of the previous field (cycling from first to last if necessary).
Return	Implement the current settings and remove the dialogue box from the screen. The action button that corresponds to the Return key should have a thicker border than the others.
Escape	Cancel the operation and remove the dialogue box. Data must not be lost, and the environment must revert to the state it was in before the dialogue box was opened. Each dialogue box must have a Cancel button that is equivalent to pressing Escape.

When the user moves to a new writable field, your application should place the caret at the end of any text already in the field. The Wimp will automatically place the caret in this manner if it is managing keyboard navigation between icons in the dialogue box for icons using a validation string 'Ktar' or similar.

Display fields

Display fields are used to show information the user can't change by typing in the field, so the caret doesn't appear in the field. You can use it to show settings that can be altered using other elements in the dialogue box, settings that can't be changed from the dialogue box or settings that are updated automatically.



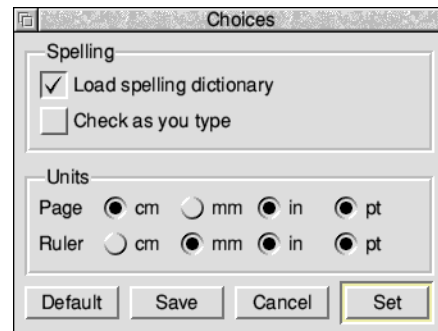
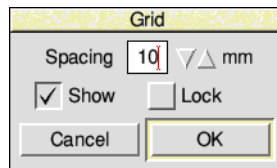
Author © Acorn Computers Ltd, 1993

Action buttons

An action button is a 'button' users click on to cause an action to occur – usually the user will have made some settings in the dialogue box that relate to the action. An example is the **Save** button in a Save dialogue box; the user will have chosen a pathname for the file (which may be its existing name) and clicks on **Save** to save the file.

Try to use simple active verbs to label action buttons – for example, **Save** or **Print**. Don't use **Yes** and **No**. It must be clear from the label and the context within the dialogue box what the result of clicking on the button will be. Make sure the label is never ambiguous.

Most dialogue boxes will have at least two action buttons, one of which will be **Cancel**. The other(s) will offer different actions.

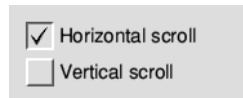


Always put the default action button in the bottom right-hand corner of the dialogue box, and use the thick border to make it prominent. It is usual to line up the other action buttons along the bottom of the dialogue box, but in some cases you may want to align them vertically down the right-hand side of the dialogue box or use some other appropriate arrangement. The action buttons should be evenly spaced along the edge they occupy.

Clicking on any action button with Select removes the dialogue box from the screen and implements the chosen action. Clicking on an action button with Adjust leaves the dialogue box on screen and implements the chosen action.

Option buttons

An option button is a ‘switch’, and can either be on or off. Option buttons look like this:



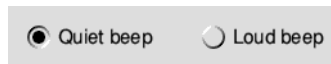
Any associated text must be to the right of an option button. Pressing either Select or Adjust over an option button or its text must toggle its state.

Only use an option button if changing the state of the button won't affect any other settings. If the current settings make an option meaningless or unavailable, its option button must be faded.

You should use option buttons when the user may pick more than one of the options; if the options are mutually exclusive, so that only one can be used at a time, use radio buttons.

Radio buttons

A radio button is one of a group of mutually exclusive buttons: only one may be selected at once, and clicking on one turns off the currently set button. Radio buttons look like this:

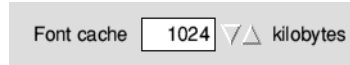


Any text associated with a button must be to the right of the radio button. Pressing either Select or Adjust over a radio button or its text must select it, and deselect any other radio button in the group that was previously selected. If there is an option to turn off all the buttons, give this as a radio button labelled None, as one button must always be on.

If there are only two settings available (such as Hide graphics/Show graphics) and this is the only option set from the dialogue box, a ticked or unticked menu item is simpler for the user than radio buttons in a dialogue box. Ticked menu items are described in the section entitled *Toggling menu items* on page 41.

Adjuster arrows

An adjuster arrow is used to increase or decrease a numeric value; it is used for setting a **Zoom** value in Draw or Paint, for example. It may be used in conjunction with a slider (described below). The up and down adjuster arrows look like this:



The user must be able to click with Select on an up arrow to increase a value and on a down arrow to decrease a value. It must also be possible to reverse the action of the buttons by clicking with Adjust. This means that clicking on an up arrow with Adjust decreases the value and clicking on a down arrow with Adjust increases the value. It is important to support this apparently superfluous option as some users have physical difficulties using the mouse, or may be using an alternative input device that assumes this action is possible.

Sliders

A slider is another method of altering a numeric value. It is particularly useful where a wide range of values is possible, or where the user is unlikely to know the exact number required. The proportions of red, green and blue in a colour would be a typical example.

A simple slider looks like this:



You may want to use a more complex type of slider; you can add a knob or handle to a slider that may be dragged.

Pressing Select must move the slider in one direction and pressing Adjust must move it the opposite way. So if pressing Select on a left button moves a slider to the left, pressing Adjust would instead move the slider to the right.

Standard selectors

Some settings are so commonly made in applications that it is helpful to users to have a standard method of selection. There is a standard selector for colour; this is described in the section entitled *Selecting colour* on page 60.

Scrollable lists and pop-up menus

Sometimes you may wish to include a list of alternative choices within a dialogue box. There are two ways you can do this: scrollable lists, and pop-up menus.

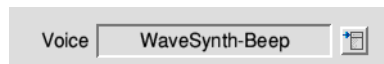
Scrollable lists

A scrollable list shows several of the available choices in a scrolling pane with one or more of the mechanisms for scrolling: scroll arrows, scroll bar and slider. These work in exactly the same way as in an ordinary window (see the section entitled *Scrolling a window* on page 31). The selected choice in the list is highlighted; the current selection must be visible when the window is first displayed. Users can drag the scroll bars to move through the list, find the choice they want, and then click Select to make a choice. If it is possible to choose more than one item at the same time, the user must be able to click with Adjust to add extra items to the selection. Clicking with Adjust on a selected item deselects it.

Pop-up menus

A pop-up menu takes up less space within the dialogue box than a scrollable list.

A pop-up menu is indicated by a button beside the field showing the current selection:



Clicking on the menu button with either Select or Menu brings up the pop-up menu, which then works in the same way as an ordinary menu.

There is more about pop-up menus in the section entitled *Pop-up menus* on page 47; the section entitled *Pop-up menus* on page 107 explains how to position a pop-up menu.

Standard dialogue boxes

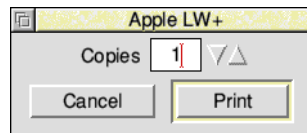
Some options are offered by many applications and we can achieve a greater degree of consistency on the desktop if all developers offering these options use the same dialogue box to make settings.

Use the dialogue boxes or guidelines described below if you need to support these functions:

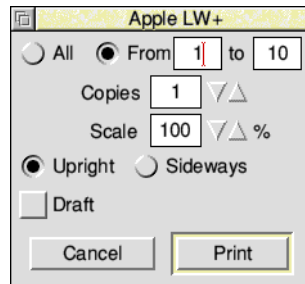
- Print
- Save
- View scale
- Find/replace
- Colour selection
- Font selection
- Closing a window which may contain unsaved information.

Print

Printing may be a simple or a complex operation depending on the type of application. If you are offering a simple screen-dump type print, you will need to show the printer driver loaded and allow the user to set the number of copies to print. If at all possible, include a scale option as well; typically, this will let the user set the print size by giving a percentage of full size. Use a dialogue box like this, showing the name of the configured printer in the Title bar:



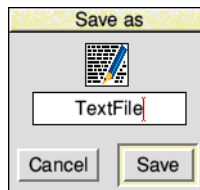
If printing is very important to your application, you will want to let the user set many more options. Here is an example of a more complex dialogue box for **Print**:



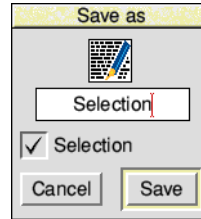
Make it easy for non-expert users to make settings. For example, use the terms 'upright' and 'sideways' instead of 'portrait' and 'landscape' for page orientation, and consider illustrating the options with an icon. (For some products and some markets, this type of simplification may be inappropriate.)

Save

A **Save** dialogue box looks like this:



If there is a selection in effect when the user calls up this dialogue box, and it is possible to save the selection, include a Selection button so that the user may save just the selection.



When there is a selection, change the default pathname to Selection to prevent users accidentally overwriting the whole file with a selection.

The button can be faded when there is nothing selected; the button is always turned off when the dialogue box appears.

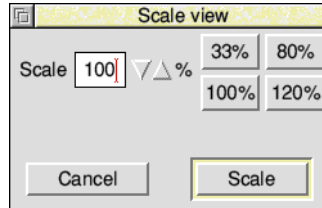
The file icon shown must be the right icon for the filetype being used. If you offer saving as different filetypes, use the appropriate icon for the type the user has chosen. The section entitled *File menu* on page 42 explains how to offer different filetypes for saving.

If the file has already been saved using the filetype displayed in the icon, the full pathname of the file must be displayed in the writable field. This enables the user to click on **Save** or press Return to save the file with the same name, or edit the name in the field to save it with a different name. If the file has not been saved previously, the name in the field should be the same as the default name for the file shown in the Title bar. Providing a default name allows the user to drag the file icon to a directory display immediately without generating an error message. When the file has been saved, the name in the Title bar is updated to the new filename and the * removed until further changes are made to the document.

The writable field in a Save dialogue box must be able to accommodate pathnames up to 255 characters long, and have a validation string of 'A~ ', so that spaces cannot be included in the pathname. The field must not accept a pathname longer than 255 characters.

Scale view

If the user can scale the view, use a dialogue box like this:

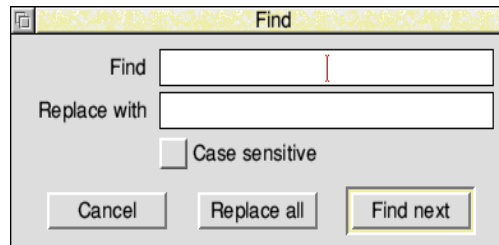


You may offer different scales on the action buttons, and a different number of standard scales, depending upon the requirements of your application. Clicking on one of the buttons offering a value should enter this value in the writable field but **not** add an automatic Return; the user must still click on an action button or press Return to initiate rescaling.

It is useful to users to be able to define a box on screen by dragging with the pointer to show the area of the screen they would like to look at in detail. This area is then rescaled to fit the window.

Find/Replace

The options you want to offer as part of a find/replace facility will depend on your application and how you expect users to use it. The following illustration is a guideline only.



It is a good idea to allow a search to be case sensitive, and to allow users to restrict it to a selection or some other sensible subset of the whole file. However, searches should be case insensitive by default, with case sensitive as an option.

Selecting colour

There are four common ways of defining colours:

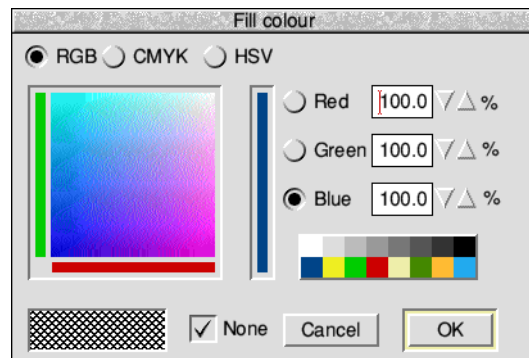
- RGB, or red-green-blue
- HSV, or hue-saturation-value

- CMYK, or cyan-magenta-yellow-key (black)
- Instant selection of desktop colours.

Computer monitors make colour by mixing varying amounts of red, green and blue (RGB). The colour we see is the result of adding proportions of each of these colours. To define colours using this method, we need to specify the proportions of red, green and blue displayed on the screen; this is what the RISC OS palette does.

Most users find the RGB colour selection method easy to use and this is the operating system's own method of defining colours. Using it in your applications increases the consistency of the desktop. If your application needs HSV or CMYK, you can of course use these. If possible, though, offer RGB as an option for users who are not familiar with other methods of colour definition and give full documentation of how to use the others.

A colour picker looks like this:



It offers users four methods of adjusting the value of each colour component:

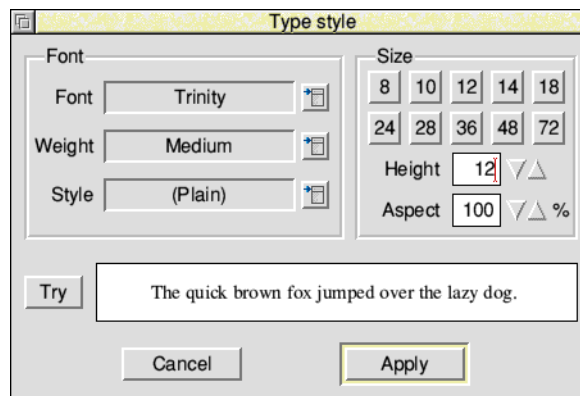
- Sliders
- Writable fields
- Interactively clicking on the colour swatch
- Adjuster arrows.

The values for each colour are shown as percentages, not 256ths, which is much easier for users. It is ideal where simple colour definition is required; you may prefer to offer HSV and/or CMYK if colour selection is particularly important (as it may be in a graphics application, for example) or if it may be relevant for output (if the user may be preparing colour separations, perhaps).

Selecting fonts

Font selection is sometimes of great importance in an application; often it is just a fairly basic setting that is not crucial to the function of the application. Font selection can be intimidating for users, and it is best to provide emboldening and italicisation separately from font selection. For example, a user may decide to set some text in bold. Choosing Homerton.Bold from a long menu listing all the fonts available in the Fonts directory is an unnecessarily technical procedure that may discourage inexperienced users from using different effects. It also doesn't allow the user to set the whole of a piece of text that uses more than one font to be emboldened in a single action. While it is important to retain a mechanism for full control over fonts for experienced users, there is a need to provide a simple way of applying bold and italic effects to help inexperienced users make the most of applications.

There is a suggested menu structure for font selection in the chapter entitled *Menus* and you should use this for font selection through the menu tree. This is suitable for minor changes the user may want to make while typing. Sometimes, though, you may want to offer font selection from a dialogue box. This is more suitable when the user is likely to be making several settings, such as when defining styles. In this case, use this standard selector:



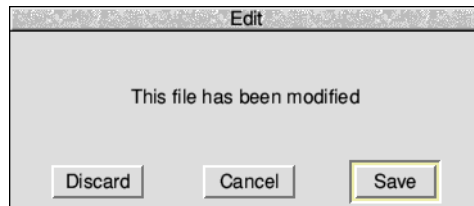
This is quite easy for users to use as bold and italic effects are set after the font has been chosen. A selection of standard sizes is offered and you may like to include a writable field for users to give a different size. Don't offer height and width settings, but use aspect ratio instead to adjust the proportions of text. This uses the fixed height of the chosen point size, but alters the width to give the proportion specified. For example, an aspect ratio of 50% will give characters that are half their normal width.

The **Try** button allows users to check that they have chosen what they really want before applying it to their text. It must show text in the chosen font, effects (if any) and aspect ratio.

When it isn't obvious that the dialogue box is a better means of font selection, use the menu structure suggested.

Closing windows

If your application is an editor of any type, it is possible that a user may click on the Close icon of a window that contains unsaved information. If this happens, your application must not close the window and discard the user's work without warning, but must display a dialogue box like this, giving the user the chance to save the file, discard the work done in the window, or cancel the operation leaving the window open.



There is more about the wording used in this dialogue box in the section entitled *Wording of dialogue boxes* on page 65.

Appearance of dialogue boxes

The chapter entitled *Implementing the design* on page 101 explains how to create and position the elements of a dialogue box.

Size of dialogue boxes

First and foremost, strive to make your dialogue boxes small, simple and comprehensible for first time users. A whole screenful densely packed with controls is likely to discourage and intimidate the user. Think through which operations are easiest to understand and most commonly used and hide the others away or remove them altogether. Don't provide options which, in practice, no one will use.

If you find that a dialogue box has to be very large to include everything that you need to include, you will need to consider dividing it up in some way. The options are to

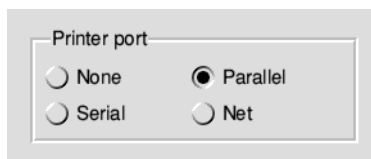
- split up the task the dialogue box performs so that you can use more than one dialogue box;

- use action buttons to lead to further dialogue boxes;
- use a set of radio buttons to switch between different parts of a dialogue box;
- use pop-up menus to replace scrolling panes or radio buttons where appropriate.

If you can't avoid splitting up a dialogue box, action buttons are usually the best method of providing extra options. Make sure that the most frequently needed options or those most likely to be used or understood by a beginner, are at the top level.

Grouping items

In a large dialogue box, you may like to group together all the items that relate to a particular setting or subject. You can do this using a group box. This is a box that encloses the related items, and has a label overlaying the top of the box:



Don't over-use group boxes, so that everything in your dialogue box is grouped, and don't put just a single item in a group box. Don't nest groups. If an entire group is rarely used, consider making it a separate dialogue box.

Text

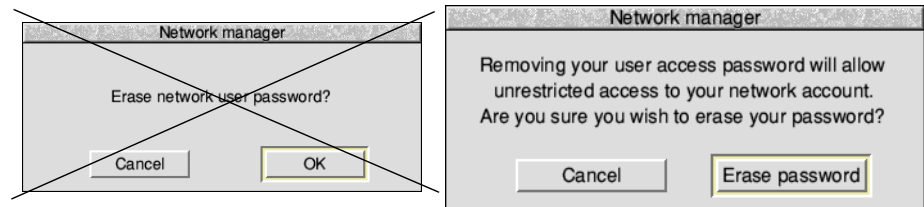
For labels and other text, ensure the bounding box is large enough to accommodate the text when rendered in the system font, with Homerton Medium at 12 point, and (preferably) with Trinity Medium at 12 point. Typically this will require the box to be slightly longer than when using an outline font of the same point size.

Do not use spaces to line up text, as the spacing will change depending on the font the user has selected as their desktop font, use extra text icons to achieve column alignment, as the Filer does.

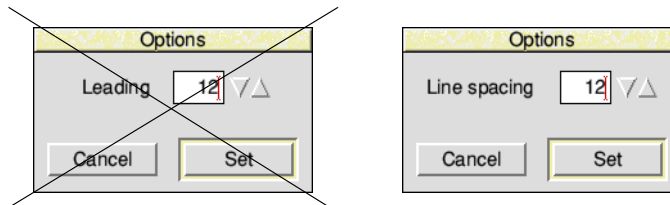
Wording of dialogue boxes

Remember that the point of a dialogue box is to enable users to make choices, perform actions they want to perform and receive any feedback from the computer about what they have done. Using clear, plain English will help users and will make your application easy and pleasant to use.

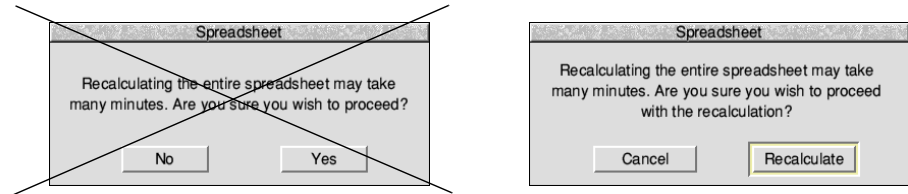
- Don't use ambiguous phraseology or wording on buttons, and make sure the wording on or by any buttons is a valid answer to the question as you have phrased it.



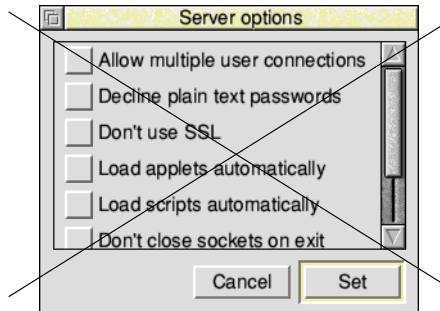
- Use wording the user will understand; avoid jargon unless you know your users will understand it.



- Label the action buttons with an accurate description of their function – don't use **Yes** and **No**. Aim to use active verbs, such as **Print** or **Save**. If a dialogue box has allowed a user to make many settings and a single active verb is not appropriate, use **OK** rather than, for example, **Yes** or **Go**.



- Use the same sense for all options within a dialogue so that users can quickly make their selection without having to work out double negatives.



See the section entitled *Standard dialogue boxes* on page 57 for details of the dialogue box you should use when a user tries to close a document that has not been saved.

There is more information on action buttons in the section entitled *Action buttons* on page 54.

Error messages

One type of dialogue box in which wording is particularly important is error boxes. Your application will need to display an error message if the user attempts an action that isn't allowed, or if the application goes wrong or can't find some resource it needs.

All error messages should use simple, plain English with no jargon. Don't include diagnostic messages of help only to programmers, but tell the user simply what has gone wrong and say what the user can do (if anything) to correct the situation. If your application is reporting a potentially serious problem, make that clear, and don't obscure it with polite phrasing.

Examples of suitable messages are:

Not enough memory to open a new window

No printer driver loaded: load a printer driver before printing

Width must be less than 2.5cm

Please fill in the Value field

You can include a single number in brackets after an error message to help programmers diagnose problems; don't use messages such as 'Illegal object dereference at &00004A23' which are intimidating and meaningless to users. Avoid words such as 'fatal', 'abort', and 'corrupt', which can be very worrying for users. If your application has crashed irretrievably, use a polite message that all users can understand, such as:

Sorry, MyApp has suffered an internal error and must close down immediately.

A short apology is acceptable (as in the last example); put it at the start of the message, not the end. Don't over-use apologies.

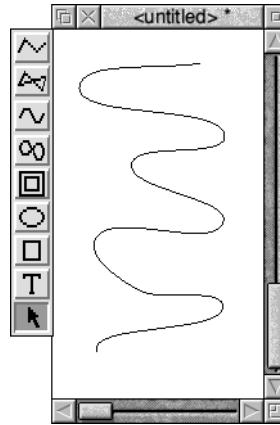
Toolboxes

A toolbox is a useful alternative to a dialogue box as a means of letting users make choices within your application. A toolbox is appropriate if a user is likely to want to make selections repeatedly, as they may from a toolset or palette. Toolboxes have been under-used in the past, but offer a valuable, flexible and easy method for users to make commonly-needed choices.

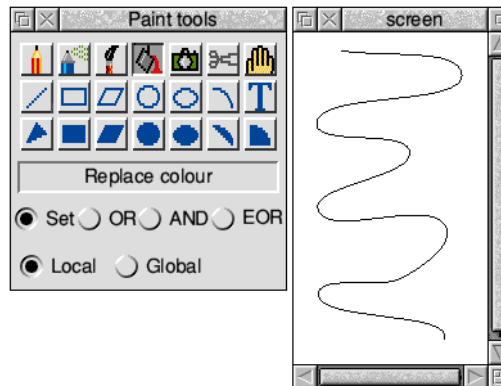
The Colours and Tools windows in Paint and the toolbox in Draw are typical examples of toolboxes. A toolbox may be associated with a particular window – for example Paint's colours – or be shared by several windows, as Paint's tools may be. Toolboxes may be free-standing windows, as Paint's Colours and Tools windows are, or attached to another window, as Draw's toolbox is. There are other alternatives; a toolpane may be included as a row or panel of buttons within a window, for example.

Toolboxes remain on screen until explicitly removed by the user or until the application or window is closed down.

A toolbox in a pane can be turned on or off from a menu item; the menu item is ticked when the pane is displayed. The pane disappears when a user closes the window it is attached to.



A toolbox in an independent window has a Close icon, Back icon and Title bar like any other window and may have scroll arrows, a slider and scroll bar, and an Adjust size icon. A toolbox in its own window must be implemented as a standard RISC OS window. It is displayed when a user calls it up from a menu and closed when the user clicks on its Close icon or when the object it is associated with is closed.



The buttons in a toolbox must be 3D, as in the Paint and Draw toolboxes.

10 Handling keyboard input

Introduction

Many applications will support text input in their windows; even those that don't will often need text input to dialogue boxes. This chapter explains how to handle input from the keyboard, including keyboard shortcuts.

Gaining the caret

The caret is a single, red, I-shaped bar which shows where input from the keyboard will appear. The window containing the caret is said to have the *input focus*. When it first gets the input focus, sometimes called *gaining the caret*, the caret moves from a different window to the new one. Your application may only gain the caret if:

- a user clicks with Select or Adjust inside your window
- a user calls up a menu or dialogue box
- a user clicks on the application's icon on the icon bar to open a new document.

If the user clicks in an application window, the window has the input focus and receives text input until the user clicks in a different window or calls up a dialogue box or menu. The Title bar of a window changes colour when the window gains the input focus. This is handled by the Wimp under the control of the window template.

If the user calls up a dialogue box, the first field in the dialogue box will have the input focus. In dialogue boxes that do not take text input, input is usually from the mouse. However, it may still be from the keyboard, as users can use *Return* to choose the default action icon and possibly other keys to choose other action icons. Your application must surrender the caret when the menu or dialogue box is closed. Normally RISC OS automatically reassigns the input focus. It is often your application's main document window that will regain the caret in these circumstances.

A window should not automatically come to the front of the desktop when it gains the caret. Similarly, if your application brings a window to the front of the desktop, it should not automatically gain the caret. A window should not gain the caret just because the pointer passes over it, but only when the user takes some definite action, such as clicking in the window.

If your application loses the input focus, it doesn't need to remember the position of the caret or the selection. When the application regains the input focus, the action the user takes (such as clicking in the window) may also place the caret. If the user's action doesn't place the caret, the application should claim the input focus but not position the caret in the document.

Unknown keystrokes

If your application receives a keystroke that it doesn't recognise or can't use, it should pass it on to other applications using `Wimp_ProcessKey` rather than claiming it. This allows other windows to provide hot key operations that work anywhere; it also allows the Wimp to interpret function key presses if necessary. If your application doesn't pass on unknown keystrokes, F12 won't work while your application has the input focus.

Keyboard shortcuts

Using a mouse and pointer to choose items from a menu is not always the quickest way to use an application. Many users, particularly experienced ones, like to have keyboard shortcuts to access operations they use frequently. To avoid confusion, common commands should have consistent shortcuts across different applications.

- There is a small set of common function key shortcuts that you should use if your application supports the functions. These are listed in the section entitled *Function keys* on page 72.
- There are some common shortcuts that are alternative methods of choosing menu items offered in many applications.
- Some keys on the keyboard have specific functions (such as the Print Scrn key); your application should support their normal functions.
- There are some standard keys and key combinations to help users move around files.

The tables over the following pages show the keyboard shortcuts you should use. The left columns show the abbreviation for the shortcut – use this in your menus – and the right columns give a description of what each shortcut does.

Whenever you offer a keyboard shortcut for a menu option, you need to show the shortcut to the right of the item in the menu. Function keys must be referred to as F1, F2, etc. following the labels on the key-caps. Unless you are offering only single key-press shortcuts using the function keys, you will need to use these symbols for *Control* and *Shift* in your menus:

- \wedge means hold down the *Control* key while pressing the other key(s) indicated, e.g. $\wedge X$ is *Control-X*.
- \uparrow means hold down the *Shift* key while pressing the other key(s) indicated, e.g. $\uparrow F3$ is *Shift-F3*.
- $\wedge\uparrow$ means hold down the Shift and Control keys while pressing the other key(s) indicated, e.g. $\wedge\uparrow F3$ is *Control-Shift-F3*.

The character code for \wedge is &5E. The character code for \uparrow is &8B, and its equivalent UTF-8 sequence is given in the table on page 97.

Typical menu entries would look like this:

Edit	
Cut	$\wedge X$
Copy	$\wedge C$
Paste	$\wedge V$
Delete	$\wedge K$

Alter pages...	$\uparrow\wedge A$
Alter graphic...	$\uparrow F11$

Select all	$\wedge A$
Clear	$\wedge Z$

Control and Shift

The *Shift* key is the natural modifier for any function key, so use this to provide similar functionality to the unshifted key, but with some subtle modification. Use the *Ctrl* key to provide different functionality. So for a function key F_n :

Key presses	Action
F_n	some function
$\uparrow F_n$	a modified form of F_n
$\wedge F_n$	some other function (probably unrelated to F_n)
$\wedge\uparrow F_n$	a modified form of $\wedge F_n$

Alt

The *Alt* key is used by RISC OS as a shifting key to generate international characters and in the future is likely to be used to support a revised system of keyboard shortcuts more compatible with other non-RISC OS systems. Because of this, you must **not** use the *Alt* key for keyboard shortcuts.

Function keys

The function keys are often used to call up editing and filing operations within applications. The table below shows the function keys you should use for some operations that are common to many applications. Where a function corresponds to one your application provides, you must use the shortcut below rather than any other. If you don't provide one of the functions below, you can use its shortcut for some other function – but don't allocate a different function to F12, *Shift*-F12, *Ctrl*-F12 or *Shift*-*Ctrl*-F12 as these are all used by the operating system.

Abbreviation	Action
F1	Help
F2	Load named document
⇧F2	Insert named document
^F2	Close window
F3	Save document
F4	Find/Search and replace
^F4	Search and replace, unless combined with Find dialogue
F5	Go to...
F8	Undo
F9	Redo
F12	Give access to * Commands using the command line interface – do not use this key for anything else
⇧F12	Bring the icon bar to the front of the desktop
^F12	Open a task window
^⇧F12	Shutdown

Menu shortcuts

There are several functions that many applications provide from their menus. To build up consistency between applications and so help users find their way around new programs quickly, all applications must use the same shortcuts for the same functions. Some of these will be the function key shortcuts listed above, but others use the ordinary keys with the *Control* key. You must use the following shortcuts if you provide a shortcut for the functions listed in the table.

Key combination	Action
^U	Delete line
^C	Copy selection to clipboard
^X	Cut selection to clipboard

Key combination	Action
^V	Paste clipboard contents at cursor position
^K	Delete selection without affecting the clipboard
^D	Insert date
^T	Insert time
^A	Select all
^Z	Clear selection
^B	Change selected text to bold
^I	Change selected text to italic

The final two shortcuts must correspond to the font selection method described in the section entitled *Effect menu* on page 40. There is some advice on keyboard shortcuts and international support in the section entitled *Language* on page 95. Where you need to refer to an arrow key in a keyboard shortcut, you will need to give the name of the direction in full (for example ^Left for *Ctrl-Left arrow*). This is because neither the system fonts nor the fonts used in later versions of the Wimp have characters for the arrow keys.

Named keys

Several keys have their functions shown on the key-caps. It is confusing to users if these keys do not do what they claim to do. Your applications must support the following key-presses:

Key	Action
Esc	Cancel operation
Return	Begin a new line of text in an editor window. In a dialogue box, perform the default action.
Print Scrn	Print document
Tab	Move to the next tab position in a text editor window. In a dialogue box, set the value in the current field and move the caret to the end of the next field (cycling from last to first if necessary)
Shift-Tab	In a dialogue box, set the value in the current field and move the caret to the end of the previous field (cycling from first to last if necessary)
Insert	Paste in the current contents of the clipboard at the position of the caret
Backspace	Delete the character to the left if there is a caret; cut selection if there is no caret (as ^X)

Delete	Delete the character to the right if there is a caret; cut selection if there is no caret (as ^X)
Home	Move to start of the document (as ^↑)
End	Move to end of the document (as ^↓)
PageUp	Scroll the window up (as clicking top of the scroll bar)
PageDown	Scroll the window down (as clicking bottom of the scroll bar)

The table above describes the non-proprietary 102 key IBM PC layout keyboard. Earlier editions of this guide described alternate uses for 3 of the keys when used with the Archimedes layout keyboard, as follows:

Backspace	Delete the character to the left if there is a caret; cut selection to the clipboard if there is no caret (as ^X)
Copy	Delete the character to the right if there is a caret, or copy selection to the clipboard if there is no caret (as ^C)
Delete	Delete the character to the left if there is a caret (as Backspace); cut selection to the clipboard if there is no caret (as ^X)

Auxiliary keys

Some keyboards include additional keys compared with the 102 key IBM PC layout. Typically there will be two “flag” keys adjacent to the *Alt* keys, and a “menu” key next to the right hand *Ctrl* key. These keys are reserved to trigger user defined actions, you must not trap them in your application.

Moving around a document

Besides moving around a document using the scroll bars, users must be able to move around using some standard keypresses. Your application must support those shown in the table below.

Key	Action
← →	Move left/right by a character
↑	Move up a line. In a dialogue box, set the value in the current field and move the caret to the end of the previous field (cycling from first to last if necessary)
↓	Move down a line. In a dialogue box, set the value in the current field and move the caret to the end of the next field (cycling from last to first if necessary)
↑← ↑→	Move left/right by a word
↑↑ ↑↓	Move up/down by a page (like clicking on the scroll bar background)
^← ^→	Move to start/end of a line
^↑ or Home	Move to start/end of the document
^↓ or End	

Applications ported from other systems

If you are porting an existing application from another operating system (or are writing an emulation of one) you may feel there is a strong case for not changing the keystrokes it uses, so that existing users of the package do not need to learn new keystrokes. However, there will be more new users who are already familiar with RISC OS than there will be existing users moving to RISC OS, so use the shortcuts described above rather than the originals. If you wish to supply a compatibility mode, offer it as an option from the menu or allow the user to choose from the Choices dialogue box.

Special needs support

Remember that not all users have full mobility, vision and hearing and may need to use input devices which are not supplied as standard. Any RISC OS compliant application will benefit from supporting input from devices such as concept keyboard, switches, trackerball and touchscreen technology.

11 Handling selection

Introduction

Many applications allow the user to make selections of text or other objects and then do something with the selection. This chapter explains how to handle this.

Selecting text

If your application supports text selection, use this method supporting the following options:

- Clicking Select to set the caret position then dragging Select in any direction to select a range of text.
- Clicking or dragging Adjust to adjust the extent of the selection, either forwards or backwards.
- Clicking Adjust when no selection already exists to create a selection spanning from the caret position to the click location.

Using the following conventions will make your application more powerful and consistent:

- The caret **cannot** appear at the same time as a selection. The caret can be thought of as a zero width selection: if a selection exists the caret cannot, but if a selection is adjusted in extent down to zero size the caret should reappear.
- If the user types when there is a selection, the selected text is cut to the clipboard, the caret placed where the selection was and the new keys processed as normal.
- A double-click when setting/dragging a selection should select words.

At the simplest level, a word should consist of a sequence of alphanumeric characters between spaces. It may also include any following non-alphanumeric characters such as punctuation that come before the next space, but not a newline character.

You may use a more complex model if you wish to provide 'intelligent' delete, copy and move functions to preserve spaces between words, and to retain correct punctuation.

- When a selection has been made, pressing one of the cursor keys on the keyboard deselects the text. For up and left the caret should be positioned at the start of the recently deselected region, for down and right the caret should be positioned at the end of the former selection.

Selecting objects

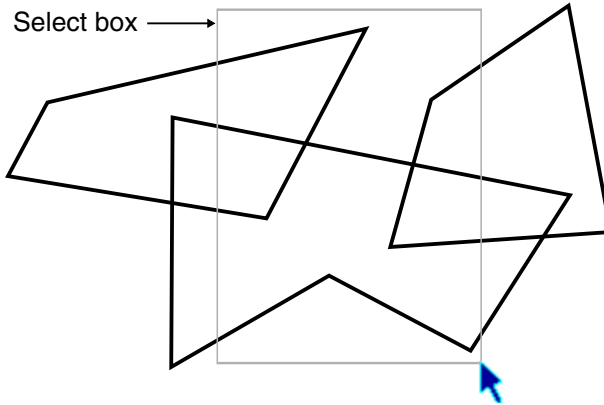
There are several established rules governing the selection of objects. Your application should follow these rules:

Simple selection

- Clicking Select over an object deselects all other objects, and selects that one. If there are several objects beneath the pointer, the 'front' object is selected (if your application recognises this concept).
- If the user clicks Adjust instead of Select, the state of the object clicked on is toggled between selected and deselected.
- If the user clicks with Select outside an existing selection it is deselected, for example clicking in the margin of a word processing document.

Box selection

- Clicking Select outside an object and then dragging in any direction creates a rectangular *select box*. One corner is given by the position in which Select was clicked, the other by the pointer's current position:



Any object that is partly or wholly within the select box is selected. It is also useful to offer an option which allows only objects wholly within the box to be selected. Draw does this if you hold down Shift while dragging. If the user presses Adjust instead of Select, the state of the object clicked on is toggled between selected and deselected.

Selecting from stacked objects

The method for selecting one object from a stack of objects varies between applications. The following describes how Draw handles selection from a stack. This method is appropriate if only graphic objects are involved, but if it is possible for text and graphics to be stacked in your application, double-clicking to select an object hidden behind text won't work.

- When a user double-clicks Select over a stack of objects, the topmost object that is already selected is deselected, and the next one down the stack is selected in its place. This wraps around from the bottom of the stack to the top, so if the lowest object is already selected, the top object becomes selected instead.

Appearance

Once a selection is made it should be rendered in inverse video or with a bounding box, typically in red, as appropriate for the class of object selected.

When a caret or selection is placed in a different drag-and-drop window, the old selection must be redrawn as a shaded selection, not left as is or removed entirely. The caret must be removed entirely, or optionally redrawn as a shadow caret.

Cut and paste

The cut and paste method of copying and moving objects should be adopted for new applications, augmented by drag and drop where appropriate. Do not support other selection models in new applications.

The cut and paste method requires an application to keep a clipboard on which cut or copied items are stored until the user pastes them back in, or closes down the application.

Copying a selection

To copy a selection, the user has to copy the selection to the clipboard and then paste it back into the same document or another document.

- To copy selected text or objects, the user must copy the selection to a clipboard. It will overwrite anything currently stored on the clipboard. The selection must also remain in its original place in the document.
The existing contents of the clipboard are lost when another selection is cut or copied to it.
- The user needs to position the caret and use **Paste** to insert the copy into the same document or a different document.
- Text should be pasted in immediately after the position of the caret. Objects of other types should be pasted in so that the top left-hand corner of the object is at the position of the pointer.

Moving a selection

To move a selection, the user has to cut the selection from one part of the file and paste in to another part (or another file).

- To move a selection, the user removes it from its original position and stores it temporarily on the clipboard. This operation is called **Cut**.
- The user needs to position the caret or pointer and use **Paste** to insert the cut selection into the same document or a different document.
- Text should be pasted in immediately after the position of the caret. Objects of other types should be pasted in so that the top left-hand corner of the object is at the position of the pointer.
- Pasting from the clipboard into an existing selection replaces that selection with the contents of the clipboard. The newly pasted text must then itself be marked as selected.

A clipboard may be shared between applications, allowing a user to copy or cut text or objects from a document using one application and paste it into a document opened with another application.

If no selection is made, and therefore the caret is visible, neither the Cut nor Copy operations affect the clipboard. If these operations are offered in a menu structure they must both be shown faded under these circumstances too.

If the clipboard is empty any Paste option within your application's menu structure must be faded.

These guidelines only apply to moving a selection using the cut and paste method. You can also move a selection within a document by dragging; see the section entitled *Dragging objects that are within a window* on page 33.

The clipboard can also be manipulated using keyboard shortcuts provided the window containing the selection has the input focus. These keys are described in the section entitled *Menu shortcuts* on page 72.

Drag and drop

The drag-and-drop model is somewhat more intuitive than manipulating objects via an imaginary off screen clipboard as the selected region is visible at all times. A single mouse button initiates the **Drag** and completes the operation on release, or the **Drop**.

The operation should be instantly familiar to users as it is very similar to the drag-and-drop model used for copying files with the Filer and saving files from a Save dialogue box.

The selected text or objects to be moved or copied can be within the same document, or to a different document or application. The procedure is as follows:

- The user makes a selection as described in the section entitled *Selecting objects*.
- The user drags the selection using Select from its original position to its destination. The destination may be in the same document or a different document.
- The initial Select click that starts the Select drag does **not** deselect objects within the selection.
- Dragging *within* a window moves the selection by default, or copies it if *Shift* is held down. Dragging *between* windows copies the selection by default, but moves it if *Shift* is held down.

- During dragging, a ghost caret may appear in the destination window to allow the user to position the dragged selection precisely. For text selections, the ghost caret will typically resemble the normal caret. For non-text selections, it may take another shape, such as the bounding box of the dragged selection scaled to the destination window's view scale.
- During dragging the pointer shape should be changed to the Drop shape depicted in the section entitled *Context-sensitive pointers* on page 32. When more than one type of object is included in the selection it may be appropriate to use the 'package' icon from the Wimp pool to illustrate this rather than a bounding box, with the sprite centred on the pointer's active point.



- If the user holds the pointer near the edge of any window while dragging the selection, the window should scroll to show the previously hidden area of the document.
- If the user drags the pointer across the boundary of a window, copying between windows becomes possible.
- When the user releases the mouse button, the selection is dropped into its new position. When the drop occurs on a Filer window a new file is created with a leafname created as described in the section entitled *Save* on page 58.

Details of the Wimp messages involved in the above behaviour are detailed in the application note called *Drag-And-Drop Functional Specification*.

12 Colour and sound

Introduction

Colour and sound are valuable ways of adding meaning to the information used by an application. Used well, colour or sound can add significantly to the value of an application.

Colours and the palette

Users may choose to set their own palette for a number of reasons, ranging from personal preference to impaired vision. Applications can't therefore rely on the default palette being used, but must read and use the current palette and handle changes of palette on the fly. Rather than the old GCOL mechanism of setting colours, use one of the following methods to avoid problems for the application and the user:

- Use the standard desktop palette if you are just using colour to give a contrast between different objects you are drawing.
- Use the validation string 'C' to select from 16M colours in Wimp plotted icons as supported by the Nested Window Manager. The title bar may also be recoloured with this validation string syntax, for example to highlight state other than 'focus' or 'no focus'.
- Use 'true' (RGB triplet) colours if you need to display a particular colour, then use the ColourTrans module to give the closest possible approximation in the current palette. This method doesn't restrict the application to the limitations of any particular hardware.

Even if your program doesn't use many colours, you must check it works correctly in all modes. Take particular care to check that operations like EOR (exclusive OR) work correctly, because the results will differ depending on whether the mode in use has 1, 2, 4, 8, 16 or 32 bits per pixel. Similarly, check two-colour modes carefully; these use ECF patterns (stippling) for different shades of grey, and again using EOR may give unexpected results.

The standard colour selector is described in the section entitled *Standard selectors* on page 56.

Guidelines for using colour

Colour increases the amount of information your application can convey to the user. It can make things stand out, attract attention, and highlight differences and similarities between things. However, it can also cause confusion, obscuring important elements of the screen display if it is used without thought. Remember, too, that greyscale displays show only the luminance component without colour.

The following guidelines will help you use colour successfully:

Test your design in monochrome

Use form and text as the main means of communicating with a user; use colour to *add* meaning, not to be of central importance. For example, you shouldn't use colour as the only difference between two icons. There are several good reasons for this:

- Not all users have colour displays.
- Printing processes have limited colour gamut, or may be only black and white.
- A significant proportion of users can't distinguish between some colours.

The best test is that your design should work on a monochrome or a greyscale display as well as it does on a colour display. The only time you can reasonably justify using colour alone to give meaning is where you are asking the user to select or define a colour. Remember that although it is rare to encounter a simple monochrome monitor in a desktop setting, high contrast display technologies such as electronic ink used in handheld readers, only offer a limited range of greys. Make sure your applications look good and work well in greyscale.

Use colour with restraint

A large number of gaudy colours on the screen looks a mess, distracts users, and so devalues your application. Although the system can display up to 16 million colours on the screen at the same time, research has shown that when colours are being used to convey information, people can only work effectively with a maximum of half a dozen different colours.

Limit the number of colours you use to take account of this, and make them significantly different from each other – though they don't have to be bright. Let users change the colours if they wish; this is particularly helpful for users with impaired colour vision.

Make colours stand out

Any colours you use will stand out best over white or grey backgrounds, rather than over other colours. Blues are easily overlooked by the eye, so you should not use them to convey important information. You can turn this into a benefit, however, if you use blue for gridlines or other guides.

You must always make pointers stand out from their background. You can do this best by using contrasting colours for the background and pointer.

You must highlight text by reversing it out of its background, as you would on a monochrome screen. The text must adopt the colour of the background, and vice versa.

Avoid coloured text

A high contrast between text and its background is necessary to make text legible. You should use black for text, and a colour with a high brightness for the background – such as white, grey or yellow. Reversed-out text – white or grey text on a dark background – has good legibility, but is not a good match for the style of the RISC OS desktop.

Where to use colour, and where not to

Resist the temptation to over-use colour to make your application ‘pretty’. You should only use colour within your application’s work area(s), to show its data.

Other parts of your application’s displays (such as window borders, menus and dialogue boxes) must use the standard colours defined elsewhere in this Guide, to be consistent with other applications. The main exceptions to this are

- where you need to present colours for the user to select one
- where you need to display a file icon
- in the application’s icon bar icon.

You may, if you wish, use non-standard colours in the **Info** dialogue box displayed by your application.

Sound

Like colour, sound provides an additional channel of communication between the computer and the user. Like colour, too, it can add to the meaning of an application, but, if handled badly, can equally well detract from its value.

Sound can be used in two main ways:

- As a warning, to alert the user that something has happened (that mail has been received, for example) or that action needs to be taken – an error message acknowledged, or a choice made in a dialogue box.
- As data within an application that processes sound.

Much of what is said below applies to the first case, but not to the second.

Guidelines for using sound

Sound should be used in much the same way as colour – with restraint and to add meaning.

The design should work with sound turned off

Use sound to **add** meaning to an event, not as the only way of marking an event. There are good reasons for this:

- some users may be away from their machines, or distracted by a phone ringing when the event occurs
- a significant proportion of users have impaired hearing.

If you use sound as a warning, back it up with a visual indication.

Use sound with restraint

A jolly jingle in an application or game might be delightful to the ear the first time it is heard, but can soon become very irritating. Don't overdo the sound, and allow users to turn it off if they wish.

Melodious but not too subtle

You should avoid harsh and raucous sounds – they can be annoying and even frightening to users, and will set a tone for your application which you might not have intended. You may like to give users the option of replacing sounds with alternative modules.

At the same time, if you are giving meaning to your sounds, you should use different voices rather than different notes in order to distinguish between sounds.

- Very few users have perfect pitch and so can remember precisely how a particular note sounds.
- Many users cannot distinguish between similar notes, unless they hear them back to back, but most users will be able to distinguish (say) a 'crash' from a 'beep'.

Controlling volume

You should give users the option of turning off sound altogether. You must instruct your users to use the Configure application to set overall volume levels (and, of course, your application must respond to those settings), rather than providing your own mechanism. Don't include any instructions in your application that turn off sound globally (such as `*Speaker Off`); always allow users control over the sound in their system, and make settings only for your own application.

13 Configurations and user choices

Introduction

It is important that your applications support all possible combinations of hardware and software that a user may wish to use, and that they respect as far as possible the user's choice about configuring their machine. This is becoming increasingly difficult as more types of peripheral become available, but it is essential if your applications are to be accessible to as large a market as possible. Your applications must support:

- the hardware a user has bought and must use
- the software preferences a user has chosen to use (such as screen mode).

If it is appropriate, your application should allow users to set up and save choices about how your application behaves and appears.

Hardware configuration

You will need to bear in mind that a user may have any combination of RISC OS computer, monitor and printer and may have as little as 4MB of RAM.

Monitors

Don't make assumptions about the type of monitor that is in use and therefore about screen size and the screen modes that may be available. RISC OS supports a wide range of display types, from a handheld monochrome LCD to widescreen TV, with varying numbers of colours supported depending on the graphics hardware.

Users will have chosen a screen mode that is suitable for the type of monitor they need or can afford, and will have decided on the resolution they want. Don't try to override that choice by changing the screen mode; make sure your applications can start up in any mode.

Make the application read the current screen mode when it is loaded (and any associated information such as resolution and aspect ratio). If it is impossible to support some screen modes, the application should present an error message if it can't operate in the current mode rather than displaying a corrupted or illegible image.

Make sure your application supports VGA resolution at 640 x 480 square pixels as this is likely to be supported by all monitors commonly available. This corresponds to old style numbered modes 25 to 28 inclusive for 2, 4, 16, and 256 colours respectively,

Screen modes

Remember that users may change screen mode while your application is running, so it must be able to handle changes of screen mode on the fly. It also means you can easily move your application to new and better screens and modes when they become available. The Window Manager sends a message to all applications when the mode changes to allow you to re-read any parameters required and rescale any outline fonts for which you have a font handle.

Screen size

Because users may have different size screens, you can't rely on screen size, so always work in OS graphic units thinking of them as a constant unit of measurement, rather than a fraction of the width of the screen. The standard assumption is that there are 180 OS units to the inch, even though this may in fact vary between physical screens. If your application is to be device-independent, it must be the same size in OS units in any mode, rather than the same fraction of the screen.

Printers

If your application produces output for printing, it must produce output in a standard format that can be handled by the RISC OS printer drivers. Do not assume that users have a particular type of printer, and don't make assumptions that will prevent users adding new types of printer as they become available.

Storage medium

If you write your applications to be independent of the filing system in use, they should run on any underlying medium without difficulty. This may include running from a shared directory on a fileserver over a network, from an image filing system such as a compressed archive, or even embedded in the system ROM.

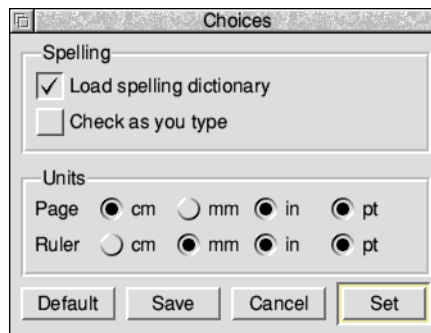
There are a few general points to bear in mind to make your applications easy to use regardless of the medium on which it is supplied:

- Avoid using a large number of small resource files as this makes applications slow to start up over a network or from CD-ROM.
- Never write to files inside the application itself as several users may be using the application at once in a networked environment. Allow these files to be held separate from the application itself so that they can be stored locally.

- Remember that your application may read data from a write-protected location or medium. Do not associate ability to write with a particular filing system as the user may have enabled write protection on that disc, for example by enabling FSLock.
- Be aware that some disc formats have file name limitations, for example an ISO 9660 format CD-ROM can only use upper case letters, numbers, and underscore.
- Use the hourglass for single-tasking operations that are complex or involve a lot of file manipulation. Since initial display of the hourglass is automatically suppressed with a timer it may not be shown on computers with a fast CPU, but gives an important indication of activity for slower situations, for example spinning up a parked disc.

User choices

If it is possible for a user to set choices that will be used each time your application is run, you should offer this as an item called **Choices...** in the icon bar menu. This should display a dialogue box allowing the user to implement and save choices.



Any choices which are not currently available should be faded. The four action buttons are:

- **Default** resets the default values set within the application.
- **Save** saves the choices to be reused in subsequent sessions and additionally implements the new choices immediately.
- **Cancel** resets the choices in use before the dialogue box was displayed.
- **Set** implements the choices for the current session only, without saving them.

In some applications, a single dialogue box for setting all choices may not be appropriate. If there are several mechanisms for setting different groups of choices, your application may instead have a menu item **Save choices** in the icon bar menu

that saves all the choices set within the application. If the user doesn't use **Save choices**, any choices set are used for the current session only. The RISC OS Printers application uses this method for setting and saving choices.

It is recommended to store choices in human readable text form, to make diagnosing problems simpler.

Saving choices

Given the variety set out in the section entitled *Storage medium* on page 90 it is clear that you must not save user choices within the application itself as these would conflict with other users in a multi user environment, or fail if the media is write-protected.

The computer's Universal Boot application, which runs at startup, will have defined a system variable *Choices\$Write* which points to a central directory in which user choices can be saved.

The name of your application, which has been registered, becomes a unique name within the choices directory. Where only a few settings are required this name can be used to formulate the name of a file *<Choices\$Write>.MyApp* in which the choices are saved.

For more complex situations it can be used as the name of a directory instead, though the directory will not initially exist and will need creating. Any number of separate choices files private to your application can then be stored inside.

Never attempt to change the value of the *Choices\$Write* system variable, but you may wish to refuse to proceed if the variable is found to be unset when your application is first run.

Loading choices

The computer's Universal Boot application, which runs at startup, will have defined a system variable *Choices\$Path* which is made up of a set of one or more directories in which user choices can be retrieved.

The same uniqueness applies as for saving choices, so you may formulate the complete path *Choices:MyApp* for a single file, or *Choices:MyApp.FileName* to select from a directory if you save several private choices files.

Bear in mind that the path may be made up from several comma separated locations, for example the network administrator may have set up some company wide settings that everybody must use for one application title but not others. This would be achieved by the ordering of the elements in the path, with the company

wide settings first, then user settings second. It is for this reason that *Choices\$Write* must **never** be read from, and *Choices\$Path* must **never** be written to - they may not be the same location.

Never attempt to change the value of the *Choices\$Path* system variable, but you may wish to refuse to proceed if the variable is found to be unset when your application is first run.

Default choices

When the user first runs your application, there will of course be no settings present within the choices path to load. This might also occur later if the Universal Boot application is reset to the factory defaults.

You must offer default choices in this situation, rather than failing to start.

When *Choices:MyApp* does not exist there are two techniques to deal with this situation

- Generate a set of defaults using code within your application.
- Create an intermediate path variable, and add an entry to the end of it which points to a default set of configuration files. In that way, *Choices:* will be checked first as detailed above, before falling back to the default configuration file location last.

Software configuration

Users will have made choices using *Configure* about the way they want their computer to behave. This may include default screen modes, sound volume and voice, mouse speed, instant effect window drags and so on. They may have based their choices on their own priorities regarding processing speed and use of the computer's resources, on whimsical preference or on some more pressing consideration such as impaired vision or restricted hand movement. You should not make changes to the configuration, but should instead issue a dialogue box asking the user to make changes if the current settings are not suitable for your application.

Other applications

Remember that users will want to use the multi-tasking facility of their computer and may run your application alongside others. Make sure that your application works with as many others as possible, and particularly with very popular applications, and check that there are no conflicts in resource names and so on.

Always register the names of your applications, apply for filetypes and any other resources you need. These precautions avoid conflicts with names used in applications produced by other developers such as overwriting eachother's application sprite in the Filer.

The registered name of your application includes:

- All environment strings prefixed with the registered application name (e.g. *MyApp\$String*).
- The sprite names *!MyApp*, *ic_MyApp* and *sm!MyApp*.
- The choices directory object *Choices:MyApp*.

Please visit <https://www.riscosopen.org/content/allocate> for further details of how to register an allocation.

14 International support

Introduction

It is very important to support users whose first language is not English. RISC OS computers are sold in many non-English-speaking countries and RISC OS documentation is provided in some other languages; more languages are likely to be added in the future. Every step you make towards helping users understand programs in their native language helps your sales in the international market.

RISC OS already provides multiple alphabets/keyboards to support international use. It is also possible to translate ROM messages to another language by providing a Territory application; for example for German or French variants. Other international support facilities are planned for the future.

The following guidelines will help you to accommodate non-English use of your applications.

Language

Remember that English is not the first language of all users.

- Consider translating any mnemonic shortcuts (such as ^D for 'down') which require the user to know the word for the required action, using the first letter of the translated word.
- Avoid using culture-specific icons, or icons that are 'puns' on a name. In English it may be the case that the same verb is used with two different meanings, for example an icon depicting a running man because *to run* a computer program uses the same verb for both meanings, but are unrelated verbs in other languages.
- Use pictorial icons rather than text/picture combinations.

Character sets

International users may have their computers set to a different territory setting and may want to use accented and other characters that are not part of the standard British character set. The following guidelines will help you to write applications that support non-British character sets.

- Don't trap or use the Alt key in your applications.
Different forms of international keyboards have standardised the use of *Alt* for entering accented characters; allow RISC OS to interpret its use. If you don't, users may be unable to type some of the accented characters they need.
- Don't forbid the use of top-bit-set characters in your program.
Again, this may prevent users using accented characters.
- Don't assume that Latin I is the current character set. The Unicode Font Manager may be in use in the desktop, giving access to potentially millions of code points in a font.
- Don't assume the user has a standard British/American keyboard layout.
- Use the operating system facilities for alphabetic sorting, lower/upper case testing and conversion as they handle accented as well as unaccented characters.

Information formats

Some information, such as dates and decimal numbers, is represented differently in countries other than Britain.

- Use system facilities for date and time string conversions. This allows the user to choose the format required (month-day-year, for example). If you use your own mechanism for setting information like this, non-British users may not be able to set the format they are familiar with.
- The format of the version number and date presented in the information about your application from the icon bar menu should not be fixed in the code, as international users may not understand British number or date formats.
- Include an option to recognise comma (,) as a decimal point in values used for calculations and in determining the positioning of text with a decimal tab.

The part on Internationalisation in the RISC OS *Programmer's Reference Manual* deals with internationalisation issues through use of the Territory Manager.

For display of very large numbers use the internationally accepted SI prefixes for standard powers of ten and two.

Prefix	Power of ten	Power of two
k (kilo)	10^3	2^{10}
M (mega)	10^6	2^{20}
G (giga)	10^9	2^{30}
T (tera)	10^{12}	2^{40}
P (peta)	10^{15}	2^{50}
E (exa)	10^{18}	2^{60}

The long hand form, *kilometres* rather than *km*, should be employed where space permits as this will be easier to understand.

Unicode support

International users may need to make use of Unicode fonts because their written language requires characters not in the Latin1 character set.

Font Manager (version 3.41 or later) supports Unicode fonts with potentially millions of code points in them. You can find the version of the Font Manager by calling the *Font_CacheAddr* SWI as documented in the *RISC OS Programmer's Reference Manual*.

UTF-8 alphabet

In the RISC OS desktop there is only one system wide alphabet supported at any one time. In support of Unicode, additional territories will be added in future with the alphabet set to UTF-8. To support this in your application you must:

- Abstract all textual messages into a standard Messages file.
- Use a Templates file or Res file for all your window dialogue designs.

This is good practice anyway, since it permits your application to be translated by people who are not skilled in programming. The Toolbox will automatically load the appropriate Messages or Res file based on the configured territory as detailed in the section entitled *Task initialisation and run-time information* in the *User Interface Toolbox Manual*.

When you come to translate your messages, templates and resource files into UTF-8 the following notes may be useful:

- As with most previous RISC OS alphabets, UTF-8 is a superset of ASCII so any bytes in the range 0-127 map one-to-one and no transform is required.

- Acorn Latin-1 is a superset of ISO Latin-1 (ISO 8859-1); bytes in the range 160-255 have identical meaning. Unicode assigned code points in this range to match ISO Latin-1, so if you are entering text by code point (for example using Chars or Alt-plus-numeric-keypad) then the behaviour in Acorn Latin-1 and UTF-8 alphabets are identical. However, each of the code points in this range are represented in memory by a two byte UTF-8 byte sequence.
- More care must be given to translating Acorn Latin-1 characters in the range 128-159. Because each of the defined characters in this range already have (different) defined code points in Unicode, the Font Manager expects you to use the standard code points for them instead.

Desktop font

If the text is intended to be rendered in the desktop font - because it's part of an icon (including window titles and menus) or passed to SWI *Wimp_TextOp*, rather than passed to the Font Manager directly - then additional rules apply.

The Wimp effectively extended the underlying alphabet by reinterpreting five or six otherwise unused characters and substituting a character from the *WIMPSymbol* font.

These characters already have code points assigned to them when the alphabet is UTF-8, so with similar rationale to the Font Manager's treatment of characters 128-159, the Wimp expects you to use the standard code points instead - although it will still automatically switch font handle for you mid-string if the desktop font doesn't define glyphs for those characters.

For reference, the characters affected are as follows:.

Latin1 Code	Unicode code point	UTF-8 sequence
✓ (Ⓔ80)	U+2714 (Heavy check mark)	ⒺE2 Ⓔ9C Ⓔ94
€ (Ⓔ80)	U+20AC (Euro sign)	ⒺE2 Ⓔ82 ⒺAC
✕ (Ⓔ84)	U+2718 (Heavy ballot X)	ⒺE2 Ⓔ9C Ⓔ98
⇐ (Ⓔ88)	U+21D0 (Leftwards double arrow)	ⒺE2 Ⓔ87 Ⓔ90
⇒ (Ⓔ89)	U+21D2 (Rightwards double arrow)	ⒺE2 Ⓔ87 Ⓔ92
⇓ (Ⓔ8A)	U+21D3 (Downwards double arrow)	ⒺE2 Ⓔ87 Ⓔ93
⇑ (Ⓔ8B)	U+21D1 (Upwards double arrow)	ⒺE2 Ⓔ87 Ⓔ91

Note that the Wimp doesn't use a Euro symbol itself, but as it clashes with a previous use by the Wimp for character Ⓔ80 it is listed for reference purposes.

Text input

There are some additional requirements if your application accepts text input itself, such as a text editor, when the system wide alphabet is UTF-8. You must:

- Treat key codes delivered by the Wimp as UTF-8 byte sequences, not equating them to Latin1 characters.
- Navigate the caret forwards and backwards through the text taking its encoding into account, as one character on screen may be represented by several bytes in UTF-8 encoding in memory.
- Handle backspace and delete by removing the appropriate number of bytes from the encoding in memory such that one character is removed from the screen, as the user expects.

Applications that use the Wimp exclusively to collect any text input using a Writable field, or menu containing one, can ignore this section as the Wimp will handle moving the caret and insertion and deletion automatically.

15 Implementing the design

Introduction

Once you have designed a new application, you will begin to write code for it. This Guide does not offer any advice on structuring or writing your program; you will find all the detailed advice you need about writing the program in the *Programmer's Reference Manual*.

This chapter and the next give advice on

- precisely how to position and create the elements of the user interface described in earlier chapters of the Guide
- building the application directory for your application.

It is assumed that this chapter and the next will be used by programmers and so more technical language has been used in some places than in the other chapters of the Guide. Technical terms are included in the glossary.

Choice of programming language

We strongly urge you to program using C. We believe that you'll find large applications easier to maintain if they're written in C rather than (say) BASIC or Assembler.

You may feel that applications developed using C will be larger and slower than those developed using the ARM assembler. However, there need not be a significant difference if you're careful to write efficient code. You can incorporate chunks of assembly language in C programs for parts where speed is critical. Even so, BASIC or assembly language may be more suitable for a few tasks, particularly if speed or code size is very important. It is up to you to balance the benefits of speed and code size on the one hand against development time, ease of maintenance and ease of porting your code between environments.

If you wish to write BASIC programs on your RISC OS computer you need the BBC BASIC *Reference Manual*.

If you wish to write your applications using the desktop assembler, you will find the *Acorn Assembler Manual* provided with the Desktop Development Environment useful.

Use of the Toolbox from C

It is recommended, but not required, that applications use the Toolbox as detailed in the *User Interface Toolbox Manual* provided with the Desktop Development Environment. Using the Toolbox means that many of the interactions with standard gadget icons are handled automatically by the Toolbox and require no code to be written in your application at all. This greatly simplifies application development and ensures all applications using the Toolbox follow the style set out in this guide.

The Toolbox communicates with your application via events, for example when a selection is made from a pop up menu, allowing the programmer to think more in terms of the problem to be solved rather than the detailed mechanics of how to achieve a solution.

There is more information on dealing with events in the chapter describing *eventlib* in the *Acorn C/C++ Manual* and if it is necessary to bypass the Toolbox to call the Wimp directly the *wimplib* is also described.

Calling the Wimp directly from C

The Desktop Development Environment also supports using template files and calling the Wimp SWIs directly, though this method does not take advantage of the type checking facilities of the C programming language. Consider using a library of C functions to help as this will be less error prone than trying to call the SWIs manually, and will often come supplied with C structure definitions that map directly to the data structures that the Wimp expects to receive.

Using legal operations

To make sure your applications will work well on computers released in the future, only use legal methods in your programs:

- do not bypass operating system interfaces or access hardware devices directly
- do not read and write page zero locations (the hardware vectors, etc) or kernel workspace
- do not use illegal interface operations.

RISC OS is improved and expanded on a continuous basis, and such tricks may well not work on future machine and operating system upgrades.

Responsiveness

The system software has been written very carefully so that all of this performance is delivered to be used by applications, rather than being swallowed up within the operating system. Fast, smooth scrolling and redrawing are worth striving for as they make it easier for a user to make effective and productive use of your application.

Redrawing speed

All applications must concentrate on making redraw fast. One technique you can use for a window that is difficult to redraw quickly is to store its image as a sprite – of course you can only do this if it won't change. Another important technique for speeding up redraw is the use of source-level clipping. During redraw and update, the Wimp will always inform your application of the current clipping rectangle. Don't waste processor time redrawing bits of your window if you don't need to. (For an example of how to use this technique, see the Patience application from the Applications Suite.)

If you make extensive use of the standard gadget icons within dialogue boxes, this means that RISC OS does most of their redrawing for you. You should only need to process redraw events for dialogue boxes when they contain complex user graphics.

When implementing operations such as dragging or scrolling be sure to use a timer to set the rate at which the operation is performed rather than relying on the CPU speed, otherwise when the CPU speed is increased on a new computer the operation will be difficult to control with a mouse.

Units of measurement

Sizes and positions are given in this chapter in OS units where possible; you should work in OS units rather than pixels whenever you can so that you don't restrict your applications to particular monitor types and screen modes.

Sprites

Design sprites to use as little valuable system resources as possible. Sprites for icons should be defined in a numbered mode where possible with the least number of colours required by the design. Recall that numbered modes must be used for a sprite to be accepted by versions of RISC OS prior to 3.5. Rectangular sprites do not need a transparency mask; those with irregular outlines do.

Check the appearance of your sprites in one, two, four, eight, 16 and 24 bit screen modes; the Wimp will translate the colours used to the nearest one available.

Don't forget to include sprites for other resolutions as described in the section entitled *The !Sprites file* on page 116.

Size of sprites

Sprites that can appear in a directory display will need large and small versions in each resolution. If you don't define a small sprite, RISC OS will display the large sprite at half size, but this is unlikely to look as good as a specially designed small sprite.

Large icons

A large icon must be 68 OS units high. Try to use a square sprite for file icons with a border to match the other file icons present in that theme, and an irregular outline for application icons so it is easier to distinguish when alongside other files. The square (or bounding box for an irregular outline) will obviously be 68 OS units wide. If you **have** to make your large sprite wider, you can make it:

- up to 160 OS units wide if it will be used in directory displays – although 100 OS units is a more practical limitation if you want the small icon to have the same proportions
- as wide as necessary if it will only be used on the icon bar.

Small icons

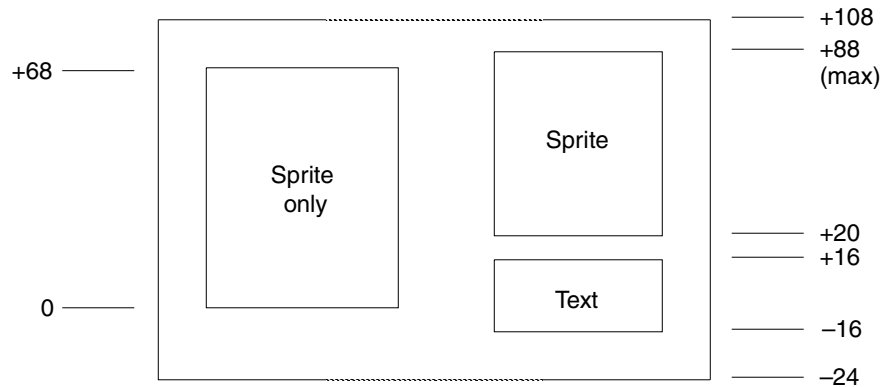
A small icon must be half the size of a large icon – that is, 34 OS units high. Again, it should preferably be square if it is a file icon (i.e. 34 OS units wide), or have a square bounding box if it has an irregular outline. As 34 is not divisible by 4, for reference the rectangular pixel dimensions are 17 pixels wide by 9 pixels high (rounding up halves). If you **have** to, you can make a small icon up to 50 OS units wide but avoid using non-standard sizes as it makes the directory display untidy.

There is information on how icons are 'made known' to RISC OS in the section entitled *Application resource files* on page 115.

Positioning icons on the icon bar

When you place an icon on the icon bar, put icons relating to physical devices and resources such as filing systems on the left, and others on the right. RISC OS uses the icon's width to position it horizontally, but it is your responsibility to position the icon vertically.

There are two main types of icon which you can put onto the icon bar: those consisting simply of a sprite, and those consisting of a sprite with text written underneath. The diagram below shows you how to position icons vertically on the icon bar:



In the diagram, y coordinates are given in terms of the icon bar work area origin; lower coordinates are inclusive, and upper co-ordinates are exclusive.

Your application must position icons with text underneath them 16 OS units below the icon bar's work area origin, and those without text level with it.

Sprites for iconised windows

The sprites used for iconised windows should be the same size as large icons. You can look at the iconised window icons in the ROM if you want to see an example.

Windows

The first window your application opens must be horizontally and vertically centred on the screen, whatever the current screen mode. It should occupy no more than a quarter of the screen, to emphasise that your application does not replace the existing desktop world, but is merely added to it. Open any subsequent new windows at an offset of 48 OS units moving down the screen, unless there is a good reason not to do so. The initial size and position of windows may be user-configurable and saved as a preference.

Colours

Standard colours you must use for the application window are:

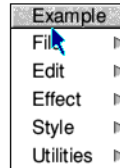
- black (Wimp colour 7) on a grey background (Wimp colour 2) for the title when it is not highlighted (that is, when the application doesn't have the input focus)
- black (7) on a cream (12) background for the title when it is highlighted (when the application does have the input focus)
- dark grey (3) for the outer colour of the scroll bar
- light grey (1) for the inner colour of the scroll bar.

Menus

Each menu item must be 44 OS units high. Try to keep the width of submenus as small as possible; this reduces the amount of mouse movement users need to reach an item, so making it faster and easier for them to use the menu.

You must open a menu 64 OS units to the left of the pointer's position when Menu was pressed. This reduces further the amount of mouse movement users need to make.

The bottom of the menu title must normally align with the pointer:



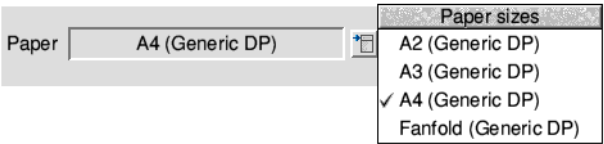
Icon bar menus

For icon bar menus, the base of the menu must be 96 OS units from the bottom of the screen. This stops the menu obscuring the icon bar sprites.



Pop-up menus

When a pop-up menu appears, it must appear immediately to the right of the button the user clicked on to display it.



Menu colours

The standard colours you must use for a menu are:

- black (Wimp colour 7) on a grey background (Wimp colour 2) for the title
- black (7) on a white (0) background for unshaded menu items
- light grey (2) on a white (0) background for shaded menu items.

Interactive help

Provide help to users for every item in the menu when asked via messages from the Help application. The Help application provides tokens that call out the preferred *Terms for desktop items* on page 10 which should be used where possible to make the phrasing consistent and easy to understand, these tokens are listed in the table on page 113.

UTF-8 shortcuts

When the system alphabet is UTF-8, care is needed to correctly translate the keyboard shortcut character for shift (upwards double arrow) from their original Latin1 to equivalent Unicode code points. Details of the code point can be found in the table given in the section entitled *Unicode support* on page 97.

Dialogue boxes

Use a template editor such as WinEdit to prepare dialogue boxes when your program calls Wimp SWIs directly, or a resource file editor such as ResEd when using the Toolbox.

It is important to prepare dialogue boxes to be resolution independent. Check that they work in both high resolution modes (such as mode 28) and a TV-resolution screen mode (such as mode 12) afterwards.

Size of dialogue boxes

The size of a dialogue box will depend on what it has to include; there is some advice on considering size when designing a dialogue box in the section entitled *Size of dialogue boxes* on page 63. However, it should not be larger than 800 by 600 OS units. The proportions of an A4 page (1:1.414) can be used to give a shape that is pleasing to the eye. When working out how large to make your dialogue box, you will need to bear in mind the sizes of the standard components set out in the table below.

Component	Vertical size	Horizontal size
Action button	52 OS units	text +10 OS units each side
Default action button	68 OS units	text +18 OS units each side
Radio button	44 OS units	as needed
Option button	44 OS units	as needed
Writable field	52 OS units	as needed
Display field	52 OS units	as needed
Slider	40 OS units	as needed
Adjuster arrow	32 OS units	32 OS units
Text label	40 OS units max per line	as needed
3D window border	2 OS units	2 OS units

Leave 8 OS units clear space between components.

Creating elements of dialogue boxes

To create the controls and fields you may need to include in a dialogue box, use the following instructions.

Default action button

This is a text icon of click button type, with black foreground (Wimp colour 7) and grey background (Wimp colour 1). It is vertically and horizontally centred and has a verify string 'R6,3'.

A default action button is 68 OS units tall; its width is large enough to hold the text, plus 6 OS units clear each side within the button, plus a further 12 OS units each side for the remainder of the icon.

Where possible, use a single word for the text label, preferably an imperative verb such as **Print** or **Save**. You can use **OK** if there is no sensible alternative; don't use **Yes** or **Go**.

There must be only one default action button on each dialogue box.

Action button

This is a text icon of click button type, with black foreground (7) and grey background (1). It is vertically and horizontally centred and has a verify string 'R5,3'.

An action button is 52 OS units tall, with 12 OS units below the baseline of the text and 40 above. Its width is large enough to hold the text, plus 6 OS units clear each side within the button, plus a further 4 OS units each side for the remainder of the icon. All action buttons in a set in a dialogue box should be the same width.

Where possible, use a single word for the text label, preferably an imperative verb such as **Cancel**. If the action button leads to a further dialogue box, the label must end with an ellipsis (...).

Display field

This is a text icon, with black foreground (7) and grey background (1). It has a validation string 'R2'.

A display field is 52 OS units tall, with 12 OS units below the baseline of the text and 40 above. Its width is large enough to hold the longest likely text, plus 6 OS units each side.

A display field can't be directly edited by the user, but the value it shows may change as a result of making other settings.

Writable field

This is a text icon of writable button type, with black foreground (7) and white background (0). It has a validation string 'Ktar;Pptr_write'.

A writable field is 52 OS units tall, with 12 OS units below the baseline of the text and 40 above. Its width is large enough to hold the likely text, plus 6 OS units clear each side within the field.

Pressing Return after giving input to a writable field should activate the default action button, not move the caret to the next field. The section entitled *Writable fields* on page 53 describes the keystrokes that can be used in a dialogue box.

Option button

This icon has text and a sprite; it is button type Radio. It has a black foreground (7); the background is not filled; the border is turned off. It has a validation string 'Soptoff,opton'.

You will need to create the icon and fill in the text. The option button must be vertically centred, but not horizontally centred.

Radio button

This icon has text and a sprite; it is button type Action. It has a black foreground (7); the background is not filled; the border is turned off. It has a validation string 'Sradiooff,radioon'.

You will need to create the icon and fill in the text. The radio button must be vertically centred, but not horizontally centred.

Set the ESG (Exclusive Selection Group) value to a non-zero figure to match the other icons in the same group.

Adjuster arrows

These are always presented in pairs. Each icon consists of text and a sprite and has button type auto-repeat. The background is not filled, the border is not set, and the text string is empty. The down arrow has a validation string 'R5;Sdown,pdown'; the up arrow has a validation string 'R5;Sup,pup'.

Each sprite is 32 OS units square; each icon is just large enough to hold the sprite.

The two arrows are usually positioned side by side. When they are, there is no space between them, and the down arrow is always to the left of the up arrow. The adjuster arrows should be to the right of the item they control, with 8 OS units space between it and the down arrow.

If the adjuster arrows increment a value in a display or writable field, they must be aligned horizontally with the field, with their lower edge 4 OS units below the baseline of the text in the field. If the field has an associated text label showing the units or a % symbol, the adjuster arrows should be right next to the field, with the label 8 OS units to the right of the arrows.

If the adjuster arrows are separated by a line or graphic (as they may be if you are using them to adjust the dimensions of a square, for example), leave 8 OS units between the line and each arrow.

You may occasionally want to use a left/right pair of adjust arrows; they are created in much the same way as up/down arrows.

Slider

A slider comprises three icons: the well, the background and the value. These must be numbered in the order given so that they stack correctly. The instructions below are for a simple horizontal slider.

The well is an icon with no text. It has a validation string 'R2'. The background is unfilled. It is 40 OS units tall and as long as the slider.

The background is an icon with no text. It has a white background (0); the border is not set. It is 16 OS units tall and 24 OS units shorter than the well. It is centred inside the well.

The value is an icon with no text. It has a grey background (5); the border is not set. It is 16 OS units tall; its width is sufficient to display the value of the slider. It is vertically aligned with the background, and the left end is coincident with the left end of the background.

For a vertical slider, the well is 40 OS units wide, the background and value are 16 OS units wide and the background is 24 OS units shorter than the well and centred within it.

You may design more complex sliders if appropriate.

Pop-up menu icon

This is an icon made up from text and sprite, with button type click and with a validation string 'R5;Sgright,pgright'. The border is not set and the background not filled.

The icon is 44 OS units square, the size of the sprite.

The pop-up menu icon is centred vertically and set to the right of the value it relates to.

If an item has both adjuster arrows and a pop-up menu, the pop-up menu icon is set to the right of the adjuster arrows. However, this combination can look cluttered and is best avoided if possible.

Text label

This is a text icon, with black foreground (7) and the background unfilled. It is vertically centred; if it abuts an item on the right, it is right-justified.

A text label is 36 OS units tall, with 8 OS units below the baseline of the text and 28 above; leave 4 OS units between lines of text. If the line contains any other items, such as a writable field, the height of the line will be dictated by the tallest element in it. The width of a text label is sufficient to hold the text.

Don't terminate a label with a colon (:). The text associated with a radio or option button is created as part of that button and not as a separate text label.

Group box

This comprises two icons: the box itself, and a label. The box must have a lower icon number than the label and any items inside the box.

The box is a large icon surrounding all the contents of the box. It has an indirection string 'R4'. It has no text; the background is not filled.

The label is the same as a text label described above. Create the label from an indirected text and sprite icon to cause the Wimp to use a rubout box only as large as the text label needs. It is positioned to overlay the top face of the box at the left, leaving 32 OS units of the top face visible at the left. It has a black foreground (7) and grey background (1).

Leave 16 OS units horizontally and vertically, for clearance inside and outside the box. For very large boxes, increase the clearance slightly.

Scrolling pane

Use a real pane window for a scrolling pane. Don't include a Title bar, but label it with an ordinary text label. Don't put a group box around the pane.

Set the size appropriately, but remember that a very short scroll bar makes the pane look cluttered. Allow some variation in the size of the scroll bar.

Dialogue box colours

Use these standard colours for a dialogue box:

- Black (Wimp colour 7) on a grey background (Wimp colour 2) for the title.
- Black (7) on a grey (1) background for the body.
- The title bar changes to cream (12) when the window has the input focus.

Dialogue boxes match the colouring of menus, to show that they are part of the menu tree. If the dialogue box is large and has writable fields then use colour 1 rather than 0 as the window background. Large expanses of white background can make writable fields harder to see.

Positions of dialogue boxes

Open a dialogue box called from a menu so that it is centred on the mouse pointer (subject to screen boundary constraints).

All error boxes must be centrally positioned on the screen.

Interactive help

Provide help to users for every icon in the dialogue box when asked via Wimp messages from the Help application.

The Help application provides tokens that call out the preferred *Terms for desktop items* on page 10 which should be used where possible to make the phrasing consistent and easy to understand.

Token	Text inserted by the Help application
\S	Click SELECT to
\R	Move the pointer right to
\A	Click ADJUST to
\T	This is the
\G	This option is greyed out because
\W	This window is
\D	Drag SELECT to
\d	Drag ADJUST to
\w	window
\s	SELECT
\a	ADJUST
\M	↵

Where possible the help for elements of a dialogue box should use these tokens in the form given here replacing the question marks with a description applicable to your dialogue.

Element	Standard phrase
Work area	This window allows you to ???.
Labels (pre)	This is the ???.
Labels (post)	The ??? is measured in ???.
Writable field	You can enter the ??? here.
Display field	For fixed fields see <i>Labels (pre)</i> , for user adjustable fields see <i>Adjuster arrows</i> .
Action button	Click SELECT to ???↵ Click ADJUST to ???.
Option button	This indicates if ???↵ Click SELECT to select or deselect this option.
Radio buttons	This indicates if ???↵ Click SELECT to select this alternative.
Adjuster arrows	You can adjust the ??? using the arrows.
Sliders	You can adjust the ??? using the slider.
Scrollable lists	This list allows you to ???.
Pop-up menus	You can choose a ??? from the menu.

When describing jargon avoid using the term in the interactive help description, for example an option button labelled “Act as an IP router” might say “Click SELECT to make your computer forward packets between networks” which explains its function without using the jargon “IP router”.

16 Application directories

Introduction

You must place your RISC OS applications in a directory whose name begins with '!', such as !Draw. When you refer to the application in documentation or help text, however, you should leave the '!' off the name. The Filer module provides various mechanisms to help such applications. For example, the Filer will run its boot file, load its sprites and make its help information available.

There is also provision for handling shared resources – ones that may be of use to other applications. This is explained in the section entitled *Shared resources* on page 120.

Application resource files

You can hold any form of resource within an application directory. There are several standard ones; for those your application uses, it must use the filename(s) given below. An application may not need all of these resources.

File name	Purpose
!Boot	*Run by the Filer when it first displays the application directory
!Sprites[A][nn]	Passed to *IconSprites by the !Boot file, or the Filer, the files contain the application's sprites for different screen resolutions
!Run	*Run by the Filer when a user double-clicks on the application directory
!RunImage	The application's executable code
Templates	The application's window template file
Res	The application's Toolbox resource file
Sprites[A][nn]	The application's private sprite file
Messages	The application's text messages
!Help	Information about the application; it is run by the Filer when the user chooses Help from the Filer menu

In addition, many applications will have an accompanying ReadMe file to give release notes. This should not be held within the application directory.

Most of these resources are discussed in more detail below.

The !Boot file

A file called !Boot inside your application directory will be executed when the application directory is first ‘seen’ by the Filer. It is usually an Obey file – a list of commands to be passed to the command line interpreter. (The *Obey command is documented in the *RISC OS User Guide* and the *RISC OS Programmer's Reference Manual*.)

You will probably use a !Boot file to set up the icons, filetypes and corresponding system variables that RISC OS needs so that it can show your application in a directory display and run it when you double-click on its icon. If your application is called MyApp, this might involve:

- setting Alias\$@RunType_ttt, Alias\$@PrintType_ttt and File\$Type_ttt variables
- loading !myapp, sm!myapp, file_ttt and small_ttt sprites from the !MyApp.!Sprites file (see below).

However, an application should only grab filetypes on start-up if filetypes are not currently set. This means that instructions such as *Set File\$Type, Alias\$@RunType and Alias\$@PrintType should only be executed if File\$Type, RunType or PrintType are not set at all (null) when the user starts that application.

The Filer only runs the !Boot file if an application with this full pathname has not been ‘seen’ before. This prevents repeated delays from re-executing !Boot files, or even re-examining application directories. However, it relies on the various applications seen by the Filer having unique names – so, for example, if you have more than one System directory, only the first one ‘seen’ will be used.

The !Sprites file

Your application directory must as a minimum contain a single sprite file called !Sprites (e.g. !MyApp.!Sprites) which contain the sprites for the Filer to use to represent your application's directory.

Alternative versions may be provided for other screen resolutions, named using the suffixes [A][nn] where:

- ‘nn’ encodes the horizontal and vertical resolutions in two digits ranging from 180dpi (as ‘1’), through 90dpi (as ‘2’), to 45 dpi (as ‘4’).
- ‘A’ denotes sprites with alpha transparency for use with versions of the Window Manager that support them. Alpha sprites typically have the same horizontal and vertical resolution, so ‘nn’ is reduced to a single digit.

The most complete set of sprites would require more than 10 separate sprite files to cover all the possible combinations. In practice most of the rectangular pixel mode combinations aren't used (the modes built into RISC OS are all 90 by 45dpi) so you can leave the Wimp to create these for you which it does by scaling the nearest matching square pixel resolution.

Consider supplying

- !Sprites as 90 by 45 dpi, these will be selected last only if no other appropriately suffixed file can be found.
- !Sprites22 which are 90 by 90 dpi.
- !Sprites11 which are 180 by 180 dpi.

If you require alpha transparency

- !SpritesA !SpritesA2 !SpritesA1 are the corresponding names.

Each sprite file should contain both large and small versions of the application's sprite plus a sprite which will be used to represent iconised windows from the application on the pinboard. For an application !MyApp the large and small sprites must be named !myapp and sm!myapp respectively, and ic_myapp for the iconised window. (The names of the sprites must be in lower case.) The !myapp sprite is also used when the application is installed on the icon bar. There is more about the design and size of these sprites in the section entitled *Sprites* on page 103.

!Sprites (and the other sprite files) can also provide sprites for filetypes that your application 'owns'. Again, you will need sprites in both large and small form. These sprites must be named file_!t and small_!t, with !t being the hex identity of the file type. For example, the sprites used for a Maestro file are called file_af1 and small_af1.

All the sprites in !Sprites are merged into the Wimp's shared sprite pool using *IconSprites. If your application uses any private sprites, you must keep them in the Sprites resource file inside your application, and your application must load them into a private sprite area. If there is a standard sprite available from the Wimp's sprite pool, use this as users will already be familiar with it. For example, icons for many standard filetypes are available from the sprite pool (see below). Your application must not redefine sprites in the pool automatically.

Standard icons provided

If your application creates or uses one of the following standard filetypes, you must not provide a file_!t icon for it but use the standard icons. Many of these are provided in the Wimp sprite ROM area, for example:

Sprite	Type
file_ae9	Alarm
file_aff	DrawFile
file_c85	JPEG
file_fae	Resource
file_faf	HTML
file_fc6	PrntDefn
file_fc8	DOSDisc
file_fcc	Device
file_fca	Squash
file_fd6	TaskExec
file_fd7	TaskObey
file_fe4	DOS
file_fea	Desktop
file_feb	Obey
file_fec	Template
file_fed	Palette
file_ff2	Config
file_ff4	Printout
file_ff5	PoScript
file_ff6	Font
file_ff7	BBC Font
file_ff8	Absolute
file_ff9	Sprite
file_ffa	Module
file_ffb	BASIC
file_ffc	Utility
file_ffd	Data
file_ffe	Command
file_fff	Text

There are also two sprites named `application` and `small_app`, which are used for applications which fail to provide an application sprite at all.

Multiple themes

A theme defines which window furniture the Window Manager will display, which style of icons the Filer will display, and similar visual aspects of the RISC OS desktop.

Users may choose a visual theme that differs to the one on your own computer, but your application should support the possibility of changing the theme, even if by default only one is provided. This is a similar concept to ensuring displayed text is looked up via a Messages file, while only providing English ones by default.

After the computer's Boot application has run the name of the current theme is defined in the system variable *Wimp\$IcnTheme* with a period appended, this allows it to be used as an extra element inserted into a path name.

The Window Manager will automatically check to see if themed sprites exist when it encounters a **IconSprites <MyApp\$Dir>.!Sprites* command, before falling back to *<MyApp\$Dir>.!Sprites* if the variable is unset, or the particular theme chosen doesn't have a corresponding set of resources provided.

Loading your application's private sprite file should be similarly accommodating of alternative themes. For applications using the Toolbox this is handled automatically by the Toolbox module (version 1.52 or later) in the *Toolbox_Initialise* SWI, any custom resource loader should follow the Wimp's behaviour of first trying to find the resource with *<Wimp\$IcnTheme>* inserted before the leaf name.

The !Run file

The !Run file is *Run when a user double-clicks on the application directory. It is usually an Obey file. It is common to duplicate much of the !Run file within the !Boot file to make sure Boot actions are taken even if the application is run using a command (perhaps as part of a desktop boot file, for example). Don't execute !Boot from within !Run.

Although the presence of more than one application with the same name should be thought of as an unusual case, it should not cause anything to crash. Your application should issue an explanatory error message and should not crash if it can no longer find its resources after program startup.

The Messages file

A text file called Messages must be used to store all an application's textual messages, including menus, help text, etc. It is easy to replace your application's messages with a set in a different language if you decide to supply your application on the international market, simply by switching the Messages file. This technique also allows the application to be seamlessly transitioned to a Unicode desktop by re-encoding the messages in UTF-8.

Try to make your application read in every textual message when it starts up. It must not read them only as they are needed, as this forces a user of a floppy disc-based system to have your application disc permanently in the drive. Make

sure all error messages are read in when the application starts up, so that an error message can be displayed immediately when required without the need first to display a request for the disc holding the messages.

The Templates or Res file

This file contains the design of the windows used for dialogues in your application. Those applications based around the Toolbox will use a resource file, those calling the Wimp SWIs directly will use a template file.

By holding the design of all your dialogues in a Templates or Res file, rather than generating them at runtime with code, your application can be supplied to an international audience by replacing the respective file. This technique also allows the application to be seamlessly transitioned to a Unicode desktop by re-encoding the messages in UTF-8.

The !Help file

The !Help file is used to store plain text that provides brief help about your application and its function. If this file is present, the Filer adds a Help entry to its menu so a user can display the help text.

If more complex layout or illustrations are required for the help, consider supplying the help as a set of HTML pages and graphics. Replace the !Help file with an obey file which launches these in preference if the run type alias for HTML is set, or falls back to a textual equivalent when no web browser is available.

Shared resources

Some resources are of general interest to more than one program. Typical examples include fonts, patches to RISC OS, and modules that provide general facilities.

Your application will be slightly harder to install if you use shared resources. Make sure that your application checks that the resources are available and gives helpful error messages if it can't find them.

The System application

The System application is used to hold shared extension modules. The resources in the System application can be shared amongst many users, and are typically only needed when a program is loading. Consequently:

- On a network, only a single copy of the System application is needed.

- On a single-floppy based computer, only a single master copy of the System. application is needed. The user may have to insert this when starting an application, but should not subsequently have to.
- Its !Boot file sets a system variable named System\$Path giving its full pathname.

If your application requires a more recent version of an extension module than most users are likely to have, you must distribute it within an updated version of System along with details of how to install the update using the system merge feature of Configure.

Ensure that any licence conditions are met when redistributing extension modules that you have not written yourself. It may be necessary to pay the original author a fee, or meet some other terms of redistribution such as providing a disclaimer.

The Scrap application

The Scrap application is used as a location to store temporary files, you may freely distribute this if your application needs to store temporary files. Its !Boot file sets a system variable named Wimp\$ScrapDir so you should encourage users of single-floppy based computers to have a copy of the Scrap application on every floppy disc, and to double-click on it when first viewing a new disc.

An application may create its own directory to hold temporary files. The directory must be called <Wimp\$ScrapDir>.MyApp. Your application must create this only when it is needed, and not on start up.

Large applications

The rules above may break down for large applications. Some applications occupy more than one floppy disc, with swapping required during operation. It is difficult to give precise guidelines for such programs, because their requirements vary so widely. The rules above, however, will be used for many smaller programs and so will be reasonably familiar to users. Larger programs should be designed and organised to fit within the same general philosophy, so that users find them easy to install, understand and operate.

On the whole, though, it is better to aim to make an application compact and precise in its functionality. Always bear in mind that some users only have a 4MB machine and may want to run your application alongside others. Indeed, they may have to run it alongside some (such as a printer driver). If your application can't be used with a 4MB machine, state this clearly, preferably on the packaging so that users don't buy it if they can't use it. You will be able to sell to more users if you

can keep within the requirements of a 4MB machine, of course. Even users with more than 4MB will prefer to use the extra memory for multi-tasking than running a single memory-hungry application.

Distribution

If your application is to be distributed and run from CD-ROM, remember that the access time for CD-ROM is slower than for disc and that performance will be affected by the CPU speed. The following guidelines will help you to write software that works well from CD-ROM:

- Don't include any applications other than your main application in the root directory of the CD-ROM; other directories beginning with the character ! in the root directory increase the application start up time and use up memory.
- Don't use a Scrap directory on the CD-ROM as the medium can't be written to.
- Read data in large chunks if possible as reading data involves considerable delays to spin up the disc before data start to flow.
- It is best to include all data and applications needed by the CD-ROM on the CD-ROM itself. You may also like to include extra material, such as curriculum materials, on the disc.

Appendix A: Significant changes

The major changes since the last issue of this Guide are as follows:

- The minimum suggested configuration to support is a 4MB machine running RISC OS 3.10 or later.
- Colour selection now uses the ColourPicker module, supporting different colour models from a 16M entry palette.
- Cut and paste has become the standard method of cutting, copying and moving selections. Drag and drop is introduced as a new method for cutting, copying and moving selections, and can exist alongside cut and paste.
- The mechanism to store user choices and settings via the Choices variables is described.
- Alongside the default !Sprites file, authors can now provide other resolutions and even those with alpha transparency which the Window Manager will automatically select if supported. The monochrome !Sprites23 is obsolete.
- Unicode can now be employed in applications, providing a much wider character set than the previous 256 characters using ASCII encoding.
- Recommendations are given for providing easy access to help through new entries in the icon bar menu, as well as standard phrases to use in interactive help.
- Use of the User Interface Toolbox is now widespread, allowing applications to be built rapidly that will conform to this style with little or no programming effort.
- Richer dialogue box layouts are possible through careful use of the Nested Window Manager, with windows appearing as 'children' inside a parent window.
- Several desktop themes can be simultaneously supported by one application through the use of the Wimp's icon theme variable. Providing extra sets of icons to match the users' preferred theme will help it to sit alongside other applications on the many and varied versions of RISC OS in use.



Glossary

action button

A 'button' in a *dialogue box* on which the user can click in order to cause some event to occur.

Adjust

The right-hand button of the mouse.

Adjust size icon

An *icon* at the bottom right corner of a *window*, which the user can drag to adjust the size of the window.

Adjuster arrow

An *icon* used in a *dialogue box* to increase or decrease an associated value, often shown in an adjacent *writable field*.

application

A set of programs and accompanying resources having a specific purpose, and represented by a single *icon* in the Filer display.

application directory

A directory holding the programs and resources that form an *application*.

Applications Suite

A set of *applications* supplied with every RISC OS-based computer.

ARM

The name of the processor used to run RISC OS. It is now developed by **A**dvanced **R**ISC **M**achines Limited.

ASCII

The **A**merican **S**tandard **C**ode for **I**nformation **I**nterchange is a 7 bit character encoding scheme.

Back icon

An *icon* at the top left corner of a *window*, which the user can click to send the window to the back of the *desktop*.

caret

A single red I-shaped bar which shows where input from the keyboard will appear.

CLI

The **C**ommand **L**ine **I**nterpreter, which gives users control of the computer using a traditional command line.

Close icon

An *icon* at the top left of a *window*, which the user can click to close the window.

default action

The action taken if a user presses the Return key when a *dialogue box* is displayed. This should do what the user originally intended, in as 'safe' a way as possible.

desktop

The GUI supplied as a part of RISC OS.

dialogue box

A *window* used for a dialogue with an *application* or the *desktop*.

directory display

A *window* showing the contents of a directory.

document

A data file that an *editor* can load, edit, save and print.

editor

An *application* that presents files of a particular format as abstract objects which a user can load, edit, save and print.

editor window

A window used to display a *document* that is being edited.

environment string

A string used to store environment settings: these might typically be start-up options for an *application*.

error box

A special type of *dialogue box* that gives information to the user, and requires acknowledgement that it's been read.

Filer

The part of RISC OS that provides facilities for the user to control filing systems from within the *desktop*.

filetype

A value associated with every file, that specifies the type of data that it contains.

gaining the caret

The time when a window first has the *input focus*, and hence contains the *caret*.

GUI

A **G**raphical **U**ser **I**nterface, such as the RISC OS *desktop*.

hourglass

A *sprite* displayed to show that an *application* running under the *desktop* is itself temporarily busy in a processor intensive activity, such as resizing an image.

HTML

Hyper **T**ext **M**arkup **L**anguage is a means of marking up text content for a web browser to render, such as might be useful for providing an online copy of a user manual.

icon

A small graphic object (usually a *sprite*) used symbolically by the *desktop*. Amongst the things an icon might typically represent are: an option or action within a *dialogue box*, a file, an *application*, or a physical device.

icon bar

The bar at the bottom of the screen used by the *desktop* to hold *icons*. These usually represent *applications* or physical devices.

icon bar menu

A *menu* produced as a result of the user clicking *Menu* over an *icon* on the *icon bar*.

Iconise icon

An *icon* at the top right of a *window*, which the user can click to minimise the window to *pinboard*.

input focus

What the *window* containing the *caret* is said to have, shown by changing the border colour of the window.

Nested Window Manager

A version of the *Window Manager* that allows windows to apply recursively, so that a child window may appear within a parent. Wimp 3.98 is the first general release of this version.

kernel

The main part of RISC OS.

leafname

The last part of a *pathname*.

Menu

The middle button of the mouse.

menu

A set of options from which the user can choose, typically having a tree structure.

menu item

One available option or choice on a menu.

modified flag

A flag used by an *editor* to record, for each *document* currently being edited, whether it has been modified.

multi-document editor

An *editor* that can edit several *documents* of the same type concurrently. The opposite is a *single-document editor*.

multi-tasking

The ability to run multiple tasks or *applications* at the same time. RISC OS is a multi-tasking operating system.

Obey file

A file of commands for execution by RISC OS.

option button

A 'button' representing a switch, that can either be on or off.

OS graphic unit

A unit used for defining graphics under RISC OS, so that they are independent of the current *screen mode*. There are nominally 180 OS graphic units (or just 'OS units') to the inch.

palette

A file or data that maps between the colours that are to be displayed on the screen and the much larger number of potential colours.

pane

A *dialogue box* that is attached to a particular *window*.

parent

The precursor of an object: so for a file its parent is the directory that holds it, and for a *window* its parent is the window from which it was opened.

pathname

A complete specification of where a file is stored, including the filing system, all *parent* directories, and the file's own name (or *leafname*).

persistent dialogue box

A *dialogue box* that appears when the user chooses a menu item followed by an ellipsis. It remains on screen when the parent menu has been closed, and may suspend its *parent application* until it is filled in.

pointer

An *icon* on the *desktop* the movement of which is linked to the mouse.

pop-up menu

A *menu* within a *dialogue box* that normally just shows the currently selected option, but that the user can make 'pop up' to choose an alternative option.

printer driver

A RISC OS *application* used to print *documents*: several are supplied as part of the *Applications Suite*.

radio button

One of a group of 'buttons', only one of which may be selected at once.

RISC

Reduced Instruction Set Computer: a design philosophy used in the ARM which implements only the most frequently used processor instructions, and concentrates on making them execute at great speed.

RISC OS

The operating system and GUI, supplied in ROM or other non volatile storage. It is pronounced as 'RISC-OH-ESS'.

RISC_OSLib

A library supplied with Acorn C/C++ development environment, designed to help program *applications* to run under the *desktop*.

ROM

Read Only Memory is a type of storage medium that can contain software programs. Its contents are retained when the power is removed.

screen mode

A number that defines the appearance of the display: its resolution, and the number of available colours.

scroll arrow

An *icon* on the right-hand side of a *window* and/or the bottom, used to scroll the contents of the window by a small amount.

scroll bar

An area on the right-hand side of a *window* and/or the bottom, used to scroll the contents of the window, by approximately the height/width of the window.

scrollable list

A *window* within a *dialogue box* that shows a set of available options, and has *icons* with which the user can scroll through the options before choosing one.

Select

The left-hand button of the mouse.

select box

A rectangular box used to outline an area within which any objects will be selected.

selection

A portion of a *document* selected by a user, and on which operations may be performed.

SI

The most widely used international system of units for measurement of physical quantities, from the French *Le Système International d'Unités*.

single-document editor

An *editor* that can edit only one *document* at a time. The opposite is a *multi-document editor*.

slider

A bar on the right-hand side of a *window* and/or the bottom, used to scroll the contents of the window.

sprite

A graphic object that is pixel-based (i.e. one that is defined as a bit-map).

sprite pool

An area of memory used and maintained by RISC OS for storing *sprites*.

style

Indicates a stylistic variation in the letters of a font (for example *Italic*, *Oblique* or *Shadow*). See also *typeface* and *weight*.

submenu

A *menu* reached from another menu (its *parent*).

Task Manager

An *application* that is a standard part of the RISC OS *desktop*, with which the user can control and monitor *applications* and the use of the computer's memory.

template editor

An *application* used to interactively design and create *windows* and *dialogue boxes* for use within an *application*.

Title bar

A bar across the top of a *window*, used to display its title and (sometimes) *status words*.

Toggle size icon

An *icon* at the top right corner of a *window*, which the user can click to toggle the size of the window between a 'standard' size and a 'maximum' size.

toolbox

Window or pane of tool icons from which a user may select a tool to use in an application. A toolbox may be free-standing or attached to another window.

transient dialogue box

A *dialogue box* that appears as a *submenu*, and functions in the same way, disappearing when the parent menu is closed.

transparency mask

An optional part of a *sprite* that defines which pixels of that sprite are transparent.

typeface

A name used for all similar looking fonts (e.g. Homerton). This may also include a component specifying a variation on the standard font (e.g. HomNarrow). See also *style* and *weight*.

User Interface Toolbox

A set of support modules to assist in writing Style Guide compliant applications easily.

UTF-8

A means of encoding Unicode code points efficiently in a byte stream.
Abbreviation for **U**niversal Character Set and **T**ransformation **F**ormat **8**-bit.

validation string

A string associated with a *writable field* that specifies what characters may be legally typed.

weight

Indicates the density of the letters of a font (for example Medium or Bold). See also *style* and *typeface*.

Wimp

The part of RISC OS that manages *windows* within the *desktop*, incidentally providing much of its functionality. It is an acronym of **W**indows **I**cons **M**enus and **P**ointer.

window

A rectangular area of the desktop devoted to a particular function, such as a *dialogue box*, *directory display*, *editor window* or *error box*.

Window Manager

The formal name for the *Wimp*.

writable field

A field in a dialogue box or displayed from a menu item within which the user can type text.

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RISC OS Style Guide, Issue 3

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