A3000

USER GUIDE

Acorn
The choice of experience.

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Contents

About this Guide

This Guide describes the software supplied with your Acorn computer: not only RISC OS (the computer's operating system) but also the programs in the Applications Suite.

Part 1 tells you about the desktop, and about how to store and recall different kinds of information.

Part 2 describes the programs supplied in the Applications Suite.

In Part 3 you can find out in detail about the Command Line on the Acorn computer. Alongside the desktop, this provides you with an alternative way of communicating with the computer, one which programmers and experienced users will find especially useful.

Finally, the Appendices contain reference material on subjects such as screen modes and error messages.

Finding out more

For how to set up and maintain your computer, refer to the *Welcome Guide* supplied along with this Guide. The Welcome Guide also contains an introduction to the desktop which new users will find particularly helpful.

If you wish to write BASIC programs on your Acorn computer you will find the *BBC BASIC Guide* useful. Other specialist programming languages available from Acorn suppliers include:

- ANSI C
- Fortran 77
- ISO-Pascal

Programmers and other users who want to get to know their machine at a deeper level of detail than is covered in this Guide will also be interested in the *Programmer's Reference Manual*, which covers the RISC OS operating system and the window environment in greater depth.

Using your computer safely

Before using your Acorn computer, you should read the Guidelines for Safe Operation printed near the front of the Welcome Guide supplied with the computer.

Part 1 – The desktop

Introducing the desktop

This section of the Guide describes the desktop. First, it tells you about the different parts of the screen and how to use them. Then, in the chapter entitled *Filing systems*, it tells you how to save the work you do in an organised way, so that you can retrieve it easily later. Finally come detailed descriptions of the keyboard, the palette, the Task Manager, and the screen fonts.

The desktop screen

The next few chapters describe the features of the desktop and how to use them, including the mouse, windows, menus and the icon bar. This illustration shows a typical screen with an example of each item to be described; you will find it useful to refer to this, especially to start with.

The mouse and the pointer

The mouse should be set on a hard, unpolished surface. On a soft surface the roller ball on the underside of the mouse does not make the contact it needs to move the pointer on the screen.

Hold the mouse with the cable pointing away from you.

The mouse is used to move the arrow-shaped pointer to various parts of the screen. Moving the mouse to the left or right moves the pointer left or right on the screen. Moving the mouse forwards and backwards moves the pointer up and down on the screen.

The pointer does not move when the mouse is lifted off the hard surface. You can therefore pick the mouse up and set it down again if you run out of room while manipulating the pointer with it.

Select, Menu and Adjust buttons

The mouse has three buttons. From left to right they are: Select, Menu and Adjust. The functions they perform depend on the application you are using; for some general principles, see the Welcome Guide supplied with your computer.
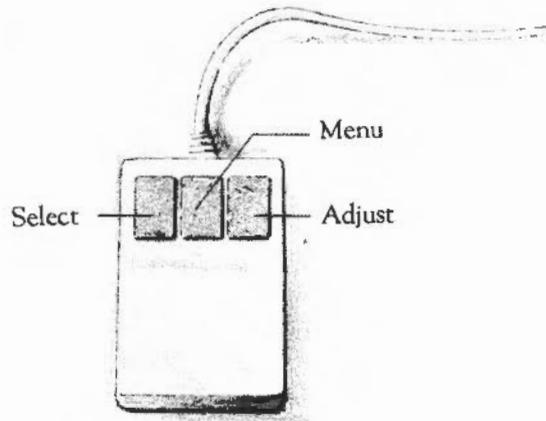
There are several different sorts of operation you can do with the mouse. Some standard terms are used for the operations, as follows:

- Clicking means pressing a mouse button and releasing it. For example, 'click Select' means 'press and release the Select (lefthand) button'. In addition, 'click on' something means 'move the pointer onto it and click Select'.

- Double-clicking means clicking twice in quick succession.

- Dragging means pressing a mouse button and moving the mouse without releasing it. A drag is completed by releasing the mouse button.

Pointer shape

The pointer is usually shown as an arrow. Some applications may change the pointer shape to indicate the kind of operation that is in progress.

If the computer is engaged in some time-consuming operation, the pointer will be replaced by an hourglass, sometimes with an indication of how far the operation has progressed.

During some operations, the pointer will be replaced by a picture of the mouse with one of the buttons highlighted. This means that clicking the marked button will cause the operation to go ahead; clicking one of the other buttons cancels the operation.

Icons and the icon bar

Icons

Icons are small pictures used to represent objects and activities. They are used in several ways on Acorn computers:

- to identify (for the user) different types of file in a directory display – for example, whether it's:

  an application (an icon with no frame)

  something created within an application (an icon with a frame)

  another directory containing more files.

- to identify different parts of windows, enabling you to open and close them, change their size and move them around the screen.
- to indicate – on a special bar at the foot of the screen called the icon bar – which filing systems and printers are present (shown on the left) and which applications and tools are currently available (shown on the right).

The icon bar

At the foot of the desktop screen is a light grey bar called the 'icon bar'. When you first load the desktop it will have one or more icons on the left, each representing a storage unit:

- a floppy disc drive
- a hard disc drive if you have one
- RAMFS if you have configured your computer for it
- an Econet network (if you have Econet hardware installed in your machine).

hard disc drive icon → ... ← RAMFS icon

floppy disc drive icon   Econet icon
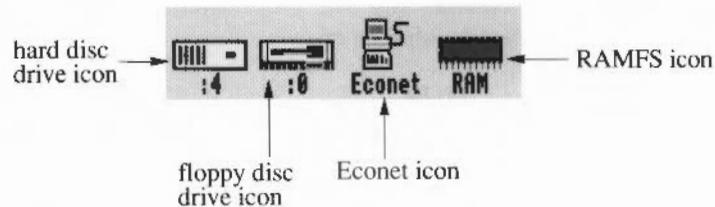
On the right of the icon bar will be two icons, the rightmost representing the Task Manager, and the other representing the palette, which allows you to change the screen mode and colours; they are both described in later chapters. These are applications: the fact that their icons appear in the icon bar means that they are already in the computer's memory and available for instant use; they do not have to be loaded from a disc or other storage unit.

palette icon

Task Manager icon

You can also load other applications you are going to use – such as Edit or Draw – into the computer, so that they are ready when you want them. The chapter *Introducing the Applications Suite* tells you how to do this. When an application has been loaded, its icon also appears on the icon bar; to use it, click on the icon, and a window for the application is opened on the screen.

Windows

A window is an area of the screen displayed by an activity or application. Several windows can be on the screen at the same time: some may be completely or partially hidden by others. You can move windows around the desktop, bring a hidden one to the top, and enlarge or shrink them. With some, you can 'scroll' the information displayed in order to look at different parts of a long document. They are called 'windows' because you can look 'through' them onto a part of a large document or drawing.

The following description relates to the kind of window you will see most often; some, such as those for simple applications like the Calculator, have only a few of these features. Below is a window with the separate areas labelled according to their function.
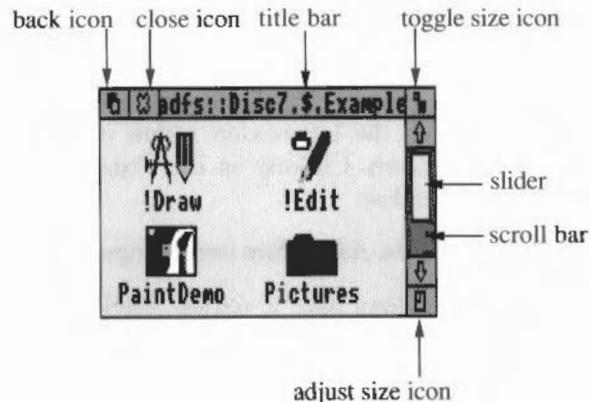
You will see a window like this if you click on the disc drive icon at the bottom left of the screen, provided there is a floppy disc in your drive. (Terms used here for things you do with the mouse are described in the chapter entitled *The mouse and the pointer*.) This particular window is a 'directory display'; it displays the contents of part of your disc (for more information on directories and discs, see the chapter entitled *Filing systems*).

Click on the **Back icon** and the window goes to the 'back of the pile' of windows on your desktop.

Clicking on the **Close icon** closes the window. If you have been doing some work in the window – using Edit to write some text, for instance – and you have not saved what you have done, a dialogue box will appear asking you whether you want to save your work before the window is closed. For information on how to do this, see the chapter *Loading and saving*. If the window is merely displaying a directory, clicking on the Close icon will close the window straight away, as nothing can be lost when you close a directory window.

You can think of the **Title Bar** as the 'title' of the window's contents, in the everyday sense; the structure of the title will be fully explained in the *Filing systems* chapter. Drag the Title Bar to move the window around the screen. If a window is partially hidden by other windows, click on its Title Bar to bring it to the top.

Dragging with Adjust instead of Select moves a window without bringing it to the top.

Clicking on the **Toggle Size icon** enlarges the window to a sufficient size to display all the information within it, up to (of course) a limit of the full size of the screen. Clicking on the Toggle Size icon again restores the previous size of the window.

Dragging the **Adjust Size icon** changes the size of the window.

Most windows have a vertical **Scroll Bar**; some have a horizontal one as well. Use these to view different parts of the contents of the window, by dragging the **Slider** up or down, or to the left or right. The size of the slider indicates what proportion of the contents you can currently see; in the example on the previous page, roughly half is visible.

There are two other ways you can use the scroll bars. You can click Select either side of the slider: this scrolls the display a windowful at a time in the

appropriate direction. You can also use the arrows at each end of the bars: these give you a more finely tuned control over the display. If you are editing text, one click on an arrow scrolls the text by one line. Clicking Adjust (instead of Select) on an arrow, or either side of the slider, scrolls in the opposite direction; this means you can scroll back and forth without moving the mouse: just click Select and Adjust in turn.

In some applications, such as Edit and Draw, the window you are currently using has parts of its frame (all except the scroll bars, in fact) in cream instead of grey. It is in this window that the caret (a red I-shaped bar) or pointer appears, and in which input from the keyboard will be displayed.

Multitasking in RISC OS

Many operating systems only allow you to run one application at a time; although you may be able to open more than one window in, say, a word processing program, you cannot have a word processing program and a graphics program running simultaneously. RISC OS is a multitasking operating system in which you can do just this: you can run an editing program (like Edit) and a drawing program (like Draw) at the same time, each with its own window or windows. If you are a programmer you will find this particularly useful: for example, a program may be compiling in one window while you are editing some text in another.

If you want a break, you can enjoy a game of Patience (in the Applications Suite). There is no need to close down one application before opening another; when you finish your game of Patience or get bored with it, you can simply close its window and go back to whatever you were doing before.

Menus and dialogue boxes

A menu is a list of options, enabling you to choose the action you want the computer to do next. If the pointer is on either a window or an icon on the icon bar, a menu appears when you click Menu (the centre mouse button). Each line of the menu is called a 'menu item'. Note that you get a different menu depending on whether the pointer is on a window or on the icon bar (nothing happens if you click anywhere else).

Clicking Menu on an icon on the icon bar gives you various options concerned with the management of the associated filing system or application. For example, in the case of applications you have installed yourself on the icon bar, you will be given the option to Quit, that is, to delete the application from memory.

Clicking Menu in a directory display, on the other hand, displays a menu called 'Filer', which allows you to carry out file management tasks, such as creating a new directory, examining the size of a file, and deleting, renaming or copying files: these are all described in detail in the chapters entitled *Filing systems*, *The Advanced Disc Filing System*, and *The Network Filing System*.

```
┌─────────────────────────┐
│         Filer           │
├─────────────────────────┤
│ Display               ⇨ │
│ File ''                ⇦ │
│ Select all              │
│ Clear selection         │
│ Options               ⇨ │
│ New directory         ⇨ │
│ Open parent             │
│ Count                   │
└─────────────────────────┘
```
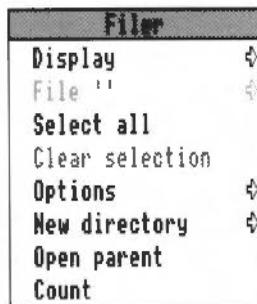
Clicking Menu in a window belonging to an application like Draw or Maestro displays a menu for that application: for those that form part of the Applications Suite, these menus are described in the appropriate chapters of Part 2. For other applications, refer to the documentation that comes with the package.

To choose an option from the menu, position the pointer on it and click Select or Adjust. If you click Select, the requested action happens, and the menu disappears. If you click Adjust, the action happens and the menu remains on the screen. If you decide not to select anything from the menu, you can cancel it by clicking Select or Adjust with the pointer outside the menu window, or by pressing Escape.

If a menu item has an arrow at its righthand end, it means that there is a submenu for that item. Move the mouse pointer until it is over the arrow and the submenu will appear. It will be removed from the screen if you move back to the 'parent' menu. Submenu items can themselves have further submenus. The hierarchy of menus and submenus is called the menu tree.
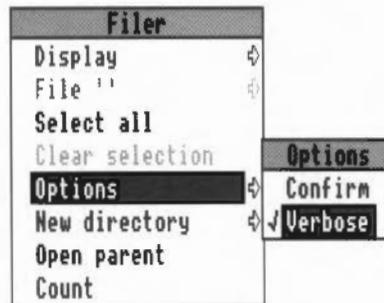
Under some circumstances, not all items on a menu will be available. Such items are shown faded, in grey type rather than black.

Some menu items refer to options or properties that may be on or off. When they are on, these items are marked by a tick on the lefthand side of the menu.

If the menu is in an inconvenient place on the screen, you can move it by moving the mouse pointer onto the menu title bar and dragging the menu to where you want it.

Sometimes a menu item will be used for entering text or numbers from the keyboard. When you move the mouse pointer to an item like this, a box containing a caret (the I-shaped bar indicating where typed text will appear) is displayed. You can then type into the box; when you have finished, click Select or Adjust on the mouse, or Return on the keyboard. Sometimes you will only be able to enter a restricted range of characters; if you type any others, they will be ignored. The illustration below shows the Mode submenu, from the palette; it contains three given options and a fourth where you can enter another value of your own choice.
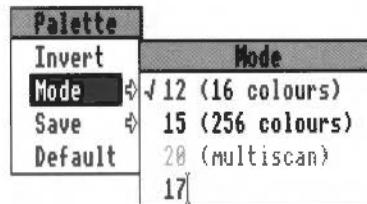
Dialogue boxes

If the options available at some point in a menu tree are more complex than just a simple list of choices, a dialogue box is used. Dialogue boxes can contain several items, including spaces for you to type in your own choice. Some of the choices may be presented in the form of graphics rather than just textual choices. Most dialogue boxes contain an item marked 'OK', which you click when you have set up all the other options and items. There is often a box marked 'Cancel' or 'Abandon' as well; click on this if you change your mind and choose not to go through with the operation. (Pressing Escape on the keyboard has the same effect).

Dialogue boxes can appear anywhere in the menu tree. You can move them around the screen just like menus. Select and Adjust normally have the same relative effects as described above (that is, Adjust causes the menu to remain on the screen when the action is completed).
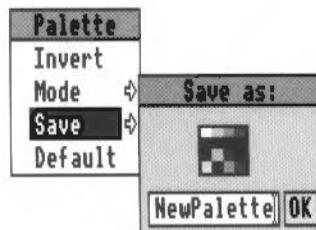
Dialogue boxes may also appear in places other than menus: occasionally, the computer may give you a message in a dialogue box, and you will then need to click on the appropriate item in order to proceed (what the item actually says depends on the application and what the possible next actions are).

An example

To illustrate some of these points, try moving the pointer to the palette icon, which is the second item from the righthand end of the icon bar. Remember that the purpose of the example is to show you how to use menus; a later chapter describes the palette in detail.

Displaying and moving menus

Click Menu to display the palette menu. If you wish, you can move this to a more convenient place on the screen by positioning the pointer over the word 'palette', and dragging with the Select or Adjust buttons.

Choosing a menu item with Select

Move the pointer to **Invert**, and click Select. The screen colours will change (the grey scale will swap round), and the menu disappears.

Choosing a menu item with Adjust

Click menu on the palette again, and move the pointer to **Invert**. This time click Adjust. The screen colours change back, but this time the menu stays on the screen, so that you can choose another option.

Moving to a submenu

Move the pointer to the arrow to the right of the word **Mode**. A submenu appears.

Ticked menu items

Making sure that you do not move the pointer back to the main palette menu, click Adjust on one of the top two entries. The screen mode will change to the value you indicated, and you will see a tick appear by the mode you have chosen.

Items for you to enter

Move the mouse pointer to the last line of the Mode menu. A caret appears, indicating that you should type something. Type in a mode number, such as 16, and press Return. The screen changes to the specified mode.

Restoring the screen

Finally, restore the screen to the mode you find most convenient, by pressing Menu over the palette icon, moving to the Mode menu, and clicking Select over (for example) **Mode 12**.

Filing systems

Acorn computers store information in a **filing system**. The filing system contains **files**, which are used to store information, and **directories**, which are used to organise files. Depending on the configuration of your computer there will be one or more filing systems. The standard filing systems are:

- the Advanced Disc Filing System (ADFS), for data stored on floppy discs and hard discs;

- the Network Filing System (NetFS), for data stored on network file servers;

- the RAM Filing System (RAMFS), for data stored in a special area of memory within the computer.

The filing systems have many properties and operations in common. These will be described first, followed by the details specific to the individual filing systems.

For use with each filing system, there can be one or more separate storage 'units'. For example, you can use several disc drives with ADFS or several file servers with the Network Filing System. For floppy disc drives, you can have more than one disc associated with a single disc drive. Although only one disc at a time can be in the drive, the computer remembers the names of other discs you are using, so that if it needs to refer to a disc that is not physically present in a drive, it will prompt you to insert the disc. You can find out more about this feature in the next chapter, in the section entitled *Floppy discs*.

Files

A file is the basic element of storage in a filing system. There are no restrictions on the kind of data that a file may contain: text, programs, pictures, fonts, and so on. Every file has a name, which must follow certain rules:

- A filename must contain at least one, and at most ten characters.

- A filename may contain any printing character, except space and the following:

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

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

Directories

Files are grouped together using **directories**. Many of the operations that can be carried out on individual files can also be carried out on directories, and when this is the case, this Guide uses the term 'object' to refer to files and directories. Each directory has its own name, following the same rules as filenames. A directory may also contain other directories (which may in turn contain further directories, and so on). The complete set of directories on a storage unit is sometimes called a directory tree. At the base of the tree there is a special directory called the root, which always has the name '$'. Within a directory, all filenames and directory names must be unique. However, there is nothing to stop you from using the same name for objects in two different directories. Directories within another directory are called **subdirectories**.

```
                    $ (root directory)


          letters        designs      databases    !boot


                      flower   tree


     received    replies        staff      accounts


              ToBill    ToMary      sales      purchases
FromBill  FromMary
```
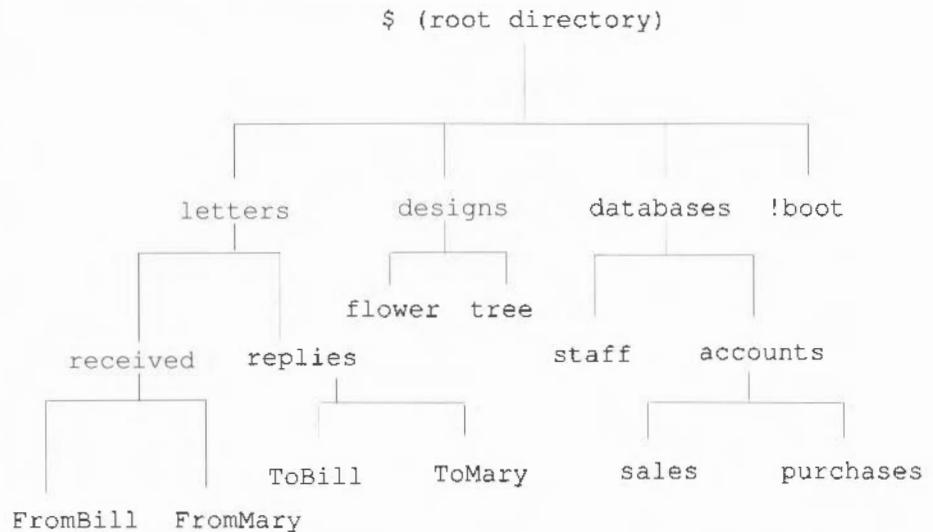
Each file and directory resides on a single disc (or other storage unit); they cannot be split across more than one disc. Each disc has a single root directory. As with files and directories, each disc has a name, again following the same rules. An important use of disc names is for referring to more than one floppy disc using a single floppy disc drive.

Usually, you can refer to a file or a directory by just giving its name or (within the desktop) by pointing to it. Occasionally, however, you need to specify all or part of the sequence of directories that leads to it. This sequence is called a **path** and the sequence of names is called a **pathname**. At its most general, a pathname has the following form:

```
<filing system>::<disc name>.<directory names>.<filename>
```

For example:

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

This pathname is made up as follows:

adfs is the name of the filing system; in this case the Advanced Disc Filing System, ADFS. Note that it is followed by a colon. If this is omitted from a pathname, the current filing system is used. (The concepts of current filing system, current disc and current directory are more applicable to Command Line Mode than to the desktop; however, they do still apply when using the desktop. See the chapter *Filing system commands* in Part 3 of this Guide for details.)

Work is the name of the disc. It may be a hard disc or a floppy disc, and it may be present in the floppy disc drive or not. The filing system will sort this out for you. Note that it is preceded by a second colon. If omitted, the current disc is used.

$ is the name of the root directory. If this, and the filing system name and disc name are omitted, the path is taken relative to the current directory.

letters is the name of a directory contained within the root directory.

replies is the name of a directory contained within the letters directory.

ToBill is the name of a file contained within the replies directory.

Each of the directory names in the path from the root onwards is separated from the next element of the path by a full stop. Pathnames can be used to refer to directories as well as files; the syntax is similar.

Naming files and directories

Whenever possible, use meaningful names for your files and directories. This will help you to identify them later. You can often improve names by using characters such as underline to punctuate them. Using both upper- and lower-case letters will also help make names clearer.

Careful use of directories will help you to keep your files organised; for example, keep groups of related files in one directory. Another common use is to have several sets of files with the same names in a series of directories: for example, in an accounting system, you could have a directory for each week, with each directory containing files called Payroll, Invoices, Totals, and so on. Again, meaningful names are a good idea.

Names starting with a punctuation character can be used to indicate that a file or a directory is in some way special. For example, the filing system will attempt to interpret directories with names beginning ! as application directories.

When using the desktop, avoid very 'deep' directory structures, since the resulting very long pathnames are not only confusing but with some network operations, can give rise to errors.

Application directories

A special sort of directory is used to contain application programs and the resources they use; logically enough, these are called **application directories**, or applications for short. They contain not only the application program itself, but other files needed to run it. The special properties of these directories will be mentioned from time to time in the rest of this section. All application directories have a name starting with an exclamation mark.

In general, you will not need to know about the internals of application directories. One point that you may notice, however, is that directory displays for discs and directories that contain applications take longer to set up than other directory displays. This is because the icons that are used to represent applications and the files they work on are loaded from special files in the application directories. Once the icons have been loaded, the computer does not need to load them again, though the more you load, the less workspace will be left for you to use; for how to check on how the computer is using its memory, see the chapter entitled *The Task Manager*.

Except where noted otherwise, references to directories in the rest of this chapter also apply to applications.

Directory displays

The principal way you manipulate files and directories from the desktop is by means of 'directory displays' (sometimes also called 'directory windows'). Each directory display is a window containing details of each file and

subdirectory contained within a directory. An example is shown below.
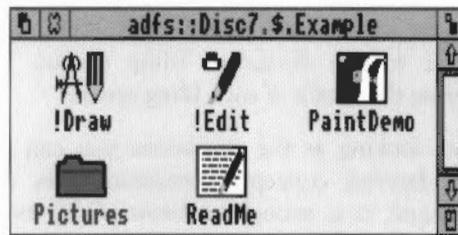
The title bar of the window contains the full pathname of the directory. The directory display has scroll bars, a quit icon, and a back icon, and so on, just like any other window. The files and subdirectories in the directory are shown within the window. You can change the exact format in which they appear, but at the very least, each entry will have a name and an icon. The icon takes the form of a 'folder' if the entry is a directory; for files, the icon gives an indication of what sort of file it is. You can have any number of directory displays on the desktop at a time.

Many operations on files and directories can be carried out by pointing at them and using the mouse. For example, you can copy between directories by pointing at the object you want to copy and dragging it from one directory display to another. Operations available from within directory displays include:

- changing the display format
- copying files and directories
- renaming files and directories
- deleting files and directories
- creating new directories
- counting the files in all directories displayed.

All these topics will be covered in greater detail later in this chapter.

Filing system icons

Each filing system, or each device within a filing system, has an icon on the icon bar. Click Select on these icons to open a directory display of the root directory of the device, and click Menu to obtain a menu of actions that are specific to the device or filing system. These are described in the section covering the details of each filing system.

Files and directories in detail

Before looking at the operations you can carry out with a filing system, some more detailed concepts concerning files and directories must be introduced. In general, it is enough to know of the existence of these concepts rather than necessarily remembering their full details.

Properties of files

Files have the following attributes:

- a *name*, as already described.

- a set of *access flags*. There are five flags, each of which may be set or clear ('unset'), to indicate whether the corresponding form of access is available for the file. The flags are:

    - L (lock) flag: When set the file may not be deleted, written to, overwritten or renamed.

    - W (owner write access): When set, the file may be written to and overwritten by the owner of the file (see *Setting file and directory access* below for information on how to set access). Owner access is indicated before a slash in the directory display.

    - R (owner read access): When set, the file may be read and loaded by the owner of the file.

    - w (public write access): Like owner write access, but applies to other users accessing the file through a network. Public access, if set, is indicated after a slash in the directory display, and on the desktop is also distinguished by being in lower case.

    - r (public read access).

- a *type*. This gives an indication of what kind of information the file contains, for example, text, BASIC program, sprite file, and so on. A list of standard file types is to be found in Appendix B.

- the *date* and *time* at which the file was created or last saved.

- the *size* of the file, in bytes.

- the *load and execute addresses* of the file. Note that these are an alternative to the file type and date; that is, the file may not have both sets of attributes.

Directories have the following attributes:

- A *name*, as already described.
- A *lock flag*, as for files.
- A *type*. For directories, this is just Directory or Application.
- The *date* and *time* at which the directory was created.

There is a limit on the number of objects that can be contained in a directory. The exact value depends on the filing system and disc format, but a typical limit is 77 objects within a directory.

Filing system operations

This section describes in some detail the operations which are common to all the filing systems. The first time you read it, you may find it useful to have one or more directory displays on the screen, so that you can experiment as you work through the chapter.

Several filing system operations are chosen from the Filer menu. If an operation is not available at some point, it will be shown in grey on the menu, and you will not be able to choose it. Some parts of the menu may also change to reflect the kind of object you are working on. To obtain the Filer menu, click Menu over a directory display.

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

Using directory displays

To open a directory display for a device, click Select on the corresponding filing system icon. This will open the root directory of the device, except in the case of the Network Filing System, in which case it opens your user root directory (see below for more details on this).

Subdirectories are shown in a directory display by a 'folder' icon.

You can use the following operations for navigating your way around directories:

- To open a directory display for a subdirectory, double-click Select on the subdirectory's icon. The subdirectory display will then appear on the screen in a new window.

- To open a subdirectory display and simultaneously close the window containing its parent, double-click Adjust on the subdirectory's icon.
- To open a directory display for the parent of a directory, choose **Open parent** from the Filer menu.
- To close a directory display, click Select on the close icon of the window. On any directory except the root, you can simultaneously open the parent by clicking Adjust on the close icon.

If you open a directory display for a directory that is already shown, the window containing the display is moved in front of the other windows on the screen, rather than a new window being opened.

Note that if you double-click on an object other than a folder icon, the effect is to load and/or execute the object. This also applies to application directories. See *Loading and saving files* for more details. If you want to open an application directory as an ordinary directory, hold down Shift and double-click on the icon. You will not generally need to do this.

Instead of clicking or double-clicking on an icon in a directory display, you can click or double-click on the name next to it.

If you change the floppy disc in a drive, you will need to click on the drive icon in order to tell the computer about the new disc (and open its directory window).

Changing the display format

You can change the format of a directory display by moving to the **Display** submenu of the Filer menu. The objects in the directory can be displayed as:

- Large icons:

- Small icons:

🗎 🗙	adfs::Disc7.$.Example	🗋
🖌 !Draw	✏ !Edit	🖼 PaintDemo
📁 Pictures	📝 ReadMe	
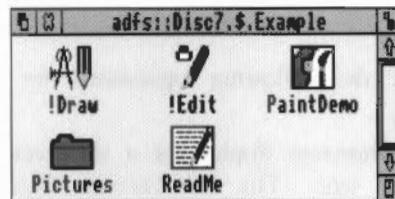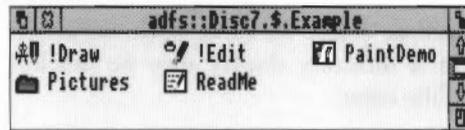
- Full info:

🗎 🗙			adfs::Disc7.$.Example			🗋
🖌 !Draw			Application	12:22:15 07 Feb 1989		
✏ !Edit			Application	12:22:17 07 Feb 1989		
🖼 PaintDemo	WR/	20K	Sprite	13:31:57 22 Nov 1988		
📁 Pictures			Directory	12:23:06 07 Feb 1989		
📝 ReadMe	WR/	1862	Text	11:25:16 08 Dec 1988		

Full info consists of a small icon and the object attributes as described above. For files which have a load and execute address, rather than a type and a date/time entry, the load address precedes the execute address in the display.

The **Display** submenu also allows you to change the order in which the objects are shown in the directory display. The options are:

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

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

Selecting files and directories

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

- To apply an operation to a single object, click Select on it.
- To apply an operation to a group of objects, click Select or Adjust on the first one, and Adjust on each of the others in turn.
- To select all objects in a directory choose **Select all** from the Filer menu.

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

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

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

Copying files and directories

There are two ways of copying files and directories. You can

- make a copy of one or more objects in a different directory, leaving the object name(s) unchanged

- make a copy of a single object in the same directory under a different name.

If you want to copy into a different directory **and** change the name, use the first method of copying and then rename the new copy. You can freely copy between discs and from one filing system to another.

Note that if you attempt to copy an object to another directory where there is already an object of that name, nothing will happen; by default, the copying operation will not overwrite the existing file. It is necessary to delete the object in the destination directory first. However, you can set up your machine so that copying **does** overwrite: refer to the entries in Part 3 of this Guide for the *Copy, *Wipe and *Set commands which enable you to customise copying and deleting.

Copying to a different directory

To copy one or more objects to a different directory:

1 Open displays for the source and destination directories of the copy operation.

2 Select the objects to be copied as described above, in the section entitled *Selecting files and directories*.

3 Drag the mouse whilst holding down Select or Adjust from any of the objects in the selected group, until the pointer lies within the directory display of the destination. This may be combined with step 2, in other words, do not release the mouse button after selecting the last object in the group you want to copy.

4 Release the mouse button.

You can **move** objects, rather than copying them, by holding down Shift while you drag the mouse.

Copying within a directory

This operation is not available if you have more than one object selected. To copy an object within a directory you will have to give it a new name:

1 Open a directory display for the directory containing the object to be copied.

2 Select the object as described above.

3 Move to the second item in the Filer menu – this will be called **File, App, Dir** or **Selection**, depending on the type of object you have selected – and from there to the **Copy** submenu.

4 Ensure that the caret appears (it will do so when you move the pointer into the box).

5 Type in the new name, and press Return or click a mouse button.

Copying an entire directory

Any of the objects you copy may be a directory. All objects within the directory will be copied, as well as the directory itself; if any of these objects are themselves directories, their contents will be copied too.

Renaming files and directories

To rename an object within a directory:

1 Open a directory display for the directory containing the object to be renamed.

2 Select the object as described above.

3 Move to the **File/App./Dir.** submenu of the Filer menu, and from there to the **Rename** submenu.

4 Type in the new name, and press Return or click a mouse button.

This operation is not available if you have more than one object selected. Recall that an object may not be renamed if it is locked; for how to unlock a file, see *Setting file and directory access*, below.

Deleting files and directories

To delete one or more objects:

1 Open a directory display for the directory containing the object(s) to be deleted.

2 Select the objects as described above.

3 Move to the **File/App./Dir.** submenu of the Filer menu, and choose **Delete**.

An object cannot be deleted if it is locked. *Setting file and directory access*, below, tells you how to unlock objects.

When you try to delete a directory, all the objects contained within the directory will also be deleted; if any of these objects are directories, their contents will be deleted as well (and so on). If any of these objects cannot be deleted, the directory will not be deleted; in other words, a directory cannot be deleted until it is empty.

Setting file and directory access

To change the access flags on one or more objects:

1 Open a directory display for the directory containing the object(s) for which the access flags are to be changed.

2 Select the objects as described above.

3 Move to the **File/App./Dir.** submenu of the Filer menu, and from there to the **Access** submenu. This shows the current access state of the selected object (or the first selected object if you are changing a group).

4 Indicate the new access status by clicking on one or more of the boxes on the left of the dialogue box (locked, owner read, owner write, public read, public write). Each click inverts the current state of the box. A star indicates that the access flag will be set.

5 Click on **Update** to set the flags on the objects.

Locking files and turning user write access off are good ways of avoiding damage to files that you have finished changing. On a network, the public read and write access flags mean you can control who can access your files. Often, network files are set so that you (the owner) have read and write access, but others (the public) only have read access.

Information on files and directories

The **Count** option, when applied to an object or group of objects lists the pathname and size of each object, and gives the number and total size of all the objects. For a directory, the counting process is applied to each object in it.

To count a group of objects:

1 Open a directory display for the directory containing the object(s) to be counted.

2 Select the objects as described above.

3 Move to the **Selection** submenu of the Filer menu, and choose **Count**. A count of the selected objects will be shown in a new window.

4 Press the space bar or click a mouse button to remove the window and continue working.

To count all objects in a directory:

1 Open a directory display for the directory containing the object(s) to be counted.

2 Choose **Count** from the Filer menu. A count of all the objects in the directory will be shown in a new window.

Press the space bar or click a mouse button to remove the window and continue working.

Creating a new directory

To create a new directory:

1 Open a directory display for the directory which is to be the parent of the new directory.

2 Move to the **New directory** submenu of the Filer menu. If necessary, delete the name already in the box. Type in the name you want for the new directory and press Return or click a mouse button.

Obtaining 'Help' information about applications

Some applications are provided with an information resource, giving details of how to use the application. If this is available, it will appear as an entry ('Help') on the App. submenu of the Filer menu. Choose this menu item to display the application help information.

Command options

You can set two options to provide finer control over filing system operations. They are set using the **Options** submenu of the Filer menu. The options apply to all directory displays, rather than just the one from which they were set. The options apply only to the Copy, Move and Delete operations.

Confirm

The Confirm option causes the operation to ask you whether you really want to apply the operation before applying it to each object.

The Confirm option is off by default, but to reset it if it has been switched on, move to the **Options** submenu of the Filer menu, and choose **Confirm**. When the Confirm option is set, the menu item will be ticked.

When the Confirm option is set, you will be asked whether you want to apply the operation in question to each object in turn. In reply, you can do one of the following:

- Click Select or type 'y' (yes) to carry out the operation.
- Type 'n' (no), or click Menu or Adjust, to skip this object.
- Type 'q' (quiet) to apply the operation without further confirmation, up to the end of the directory containing this object.
- Type 'a' (abandon) to abandon the operation at this point.

The replies may be in upper or lower case.

The information about the operation and the prompts are displayed in a new window. When the operation is complete, press the space bar or click a mouse button to remove the window and continue working.

Verbose

The Verbose option provides information about the progress of an operation. By default, it is switched off.

To set the Verbose option, move to the **Options** submenu of the Filer menu, and choose **Verbose**. When the Verbose option is set, the menu item will be ticked. The information about the operation will be displayed in a new window. When the operation is complete, press the space bar or click a mouse button to remove the window and continue working.

Other options

Copy and delete operations may be further tailored by setting the system variables Copy$Options and Wipe$Options. See the descriptions of *Copy and *Wipe in Part 3 of this Guide for details.

Interrupting filing system operations

Most filing system operations can be interrupted by pressing the Escape key. This may produce a dialogue box entitled **Error from Filer**. Click in the OK box to return to the desktop.

The Advanced Disc Filing System

The Advanced Disc Filing System (ADFS) is used for storing data on floppy discs and hard discs. Floppy disc drives are identified by icons numbered :0 and (if a second floppy disc drive is fitted) :1. Hard disc drives are identified by icons numbered :4 and (if a second, external, hard disc drive is fitted) :5.

In this section, you should note the distinction between a disc and a disc drive. The disc drive is the hardware built into the computer, and the disc is the storage medium that you use on the drive. (A convenient analogy is a cassette deck and a cassette: the deck is like the drive, and the cassette is like the disc.) In the case of hard disc drives, there is one disc that is permanently mounted; for floppy discs, you may use more than one disc with the same drive.

Naming

The name used for the filing system in paths is `adfs`.

Each ADFS disc may be referred to either by a name, or by the number of the drive on which it is mounted. The former method is recommended, since it means you do not have to worry about where the disc is: the filing system will keep track of this for you.

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

To obtain the menu for a disc drive, click Menu on the appropriate disc drive icon.

Setting and changing disc names

To set or change the name of a disc:

1 In the case of a floppy disc, insert the disc into the disc drive.

2 Move to the **Name disc** submenu of the icon bar menu for the disc drive.

3 Type in the name (it must be at least two characters long).

4 Press Return or click a mouse button.

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

You cannot rename a write-protected floppy disc from the desktop; although no error message will appear, the rename will not take effect.

Floppy discs

Formatting floppy discs

Formatting a disc means setting up information on the disc about its layout and form of the data that will be stored on it. You will need to format a disc in the following circumstances:

- To prepare a new, blank disc for use. (If you try to use a disc that has not been formatted, an error message will be displayed.)

- To erase the entire contents of a disc and bring it to a known, clean state.

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

There are three different formats for floppy discs:

- L format. The floppy disc can store approximately 640K of data. This format is compatible with ADFS on Arthur 1.20 and the Acorn Master Compact. Each directory can contain up to 47 files and subdirectories.

- D format. The floppy disc can store approximately 800K of data. This format is compatible with the Arthur 1.20 operating system. Each directory can contain up to 77 files and subdirectories.

- E format. The floppy disc can store approximately 800K of data. This format can only be used with RISC OS. It is the best format for discs that do not need to be used on older versions of the operating system. Each directory can contain up to 77 files and subdirectories.

When you are using D and L formats, you may occasionally need to 'compact' the disc. This is because the free space may become fragmented, making disc access slower and preventing large files from being saved. A message will appear on the screen when compaction is necessary. See the command *Compact in Part 3 of this Guide for further details.

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

To format a floppy disc:

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

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

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

4 Choose the disc format (L, D or E).

5 You will be asked whether you are sure you want to format the disc. Type 'y' or click Select to go ahead with the operation; type anything else, or click one of the other mouse buttons to abandon the operation. During formatting, an indication of the progress of the operation will be displayed.

6 When formatting is complete, press the space bar or click a mouse button.

The initial name set up for the disc is based on the date and time, for example 11_27_Mon.

Making a backup copy of a floppy disc

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

The backup process copies an entire floppy disc as a single operation, and can be done using either one disc drive or two. **Note that backing up a disc deletes the entire previous contents of the destination disc.** If the destination disc is a new, blank disc, it must be formatted first. The destination disc will be given the same name as the source disc. You cannot back up from a D or E format to an L format disc, nor from an L to a D or E format disc. During a backup, you should, for safety, write-protect the source disc. To do this, slide the small black square at one corner of the disc aside so that a hole appears.

To back up using a single disc drive:

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

2 You will be asked whether you are sure you want to go ahead with the backup operation. Type 'y' or click Select to continue; type anything else, or click one of the other mouse buttons to abandon the operation.

3 When prompted, insert the source disc into the disc drive and press the space bar.

4 Similarly, when prompted, insert the destination disc, and press the space bar.

5 (Repeat steps 3 and 4 as prompted until all of the data has been copied.)

Press the space bar or click a mouse button to conclude the operation.

To back up using two disc drives:

1 Insert the source disc into drive 1.

2 Insert the destination disc into drive 0.

3 Click Menu on the drive 1 icon and choose **Backup** from the menu.

4 You will be asked whether you are sure you want to go ahead with the backup operation. Type 'y' or click Select to continue; type anything else, or click one of the other mouse buttons to abandon the operation.

When all the data has been copied, press the space bar or click a mouse button to conclude the operation.

If you are using your computer a lot, it is good practice to back up the files you have been working on at least once a day, and to back up all your files once a week, or once a month. Whilst working, it may also be useful to back up files to a different directory on the same disc.

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

Checking the free space on a floppy disc

To see how much free space is available on a floppy disc:

1 Insert the floppy disc into the disc drive.

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

The amount of free space on the disc, together with the amount of space that is in use, are shown in both hex (preceded by a &) and decimal. Both quantities are in bytes.

Verifying a floppy disc

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

To verify a floppy disc:

1 Insert the floppy disc into the disc drive.

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

If there are no faults on the disc, the message **Verified OK** appears. Otherwise, a list of disc addresses appears, with one question mark for each attempt the computer made to verify that address. Only if five retries are made at one address will an error be reported: for what to do if this happens, see the *Defect command in Part 3 of this Guide.

Using more than one floppy disc on a drive

You can freely use the same floppy disc drive for more than one disc. Each time you use a floppy disc, the computer makes a note of its name; it can remember up to eight names. It will only forget about a disc if you specifically tell it to, or if you use more than eight discs in a session.

If a specified disc is not present in the drive when the computer needs access to it, for example for a filing system operation or to read or write a file, a dialogue box appears, prompting you to insert the disc. If the disc is already in the drive, just click on **OK**; otherwise insert the required disc into the drive. If you decide not to go through with the operation (for example, if the requested disc is not available), click on **Cancel**. The response to this will depend on the command or application that needed the disc; in general it results in the operation being cancelled. An error message may be displayed as well.

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

You can explicitly tell the computer to forget about a disc as follows:

1 Insert the floppy disc into the disc drive.

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

The disc must be present in the drive so that any changes made to its contents are guaranteed to be up to date.

Note that when you are copying from one floppy disc to another using a single drive (by dragging a group of objects), you will be asked to swap the discs after each object, which becomes tedious when copying many files and

directories. See the chapter entitled *The RAM Filing System* for information on how to speed this up.

Hard discs

A hard disc drive is fitted as standard to some Acorn computers, and may be added as an optional upgrade to other models. Many of the operations that you carry out on hard discs are similar to those you use on floppy discs.

You should take the following precautions when using hard discs:

- Never move the computer or switch it off without first dismounting the hard disc. See *Hard disc commands*, below, for how to do this.
- Avoid sudden jolts to the computer, even when it is switched off.
- Make regular backup copies of all or part of the hard disc, by copying data to floppy discs.

Formatting a hard disc

Hard discs are supplied ready formatted, and you should not need to reformat them. In the unlikely event that a hard disc does have to be reformatted, use the program HFORM, described in Appendix C of this Guide.

HFORM is normally supplied in the library directory on the hard disc. You must make a backup copy of the program onto a floppy disc. Keep this copy in a safe place. If the hard disc should fail and you have to reformat it, it may not be possible to read the original HFORM from the hard disc.

Hard disc commands

There are Free and Verify commands available for hard discs. They work in essentially the same way as the corresponding floppy disc commands described above.

The Dismount command prepares the hard disc so that the computer may be moved safely. To dismount the disc, choose **Dismount** from the icon bar menu for the hard disc drive. The disc remains dismounted until the next time it is accessed, or until the machine is next switched on. It is good practice to dismount the disc before turning the computer off, even if it is not going to be moved.

**What to do if
something goes wrong**

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

Write protection

The message 'Protected disc' indicates that a floppy disc is write-protected. This simply prevents you from accidentally writing to the disc. You can remove the write protection by sliding the small tab at one corner of the disc so that the hole is blocked off.

Disc errors

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

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

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

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

For further information on handling disc errors, see the entry in Part 3 of this Guide on the *Defect command.

The Network Filing System

Econet

The Network Filing System is used with network file servers. This filing system is only available if your computer is fitted with Econet hardware. A network is usually administered by a *network manager* (a person, not a piece of software). Each computer connected to a network (including the file server itself) has a *station number*, and the network manager can assign a *network name* to a network. The network manager allocates each network user a *username*, used to identify them to the network. Each user may, if they wish, set a *password*, which prevents individuals from logging on under someone else's name.

To obtain the file server menu, click Menu on the Econet icon.

Paths and directories

The name used for the filing system in paths is net, optionally followed by a hash symbol (#), and the name or number of the file server; for example net#0.254 or net#Business.

Network commands

Logging on to a network

To log on to a network file server:

1 Move to the **Logon** submenu of the FileServer menu.

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

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

You can also log on from the file server list, as described below.

DS

Seeing which file servers are available

To see which file servers are available, choose **FS list** from the FileServer menu. A list of file servers is shown in a window. **Full info**, reached via the

Display menu in this window, shows the file server net address (a number) as well as its name.

To log on to a file server from the file server list, click Select or Adjust on one of the file servers. The same dialogue box used in step 2 above appears.

Logging off

When you have finished using the network, log off by choosing **Bye** from the file server menu. Any directory displays for the file server will be closed.

Checking the free space on a file server

To see how much space is available on a file server, choose **Free** from the file server menu. This displays the total free and used space on the file server, and the amount of space that is available to you as a user.

Opening the file server root directory

The Network Filing System uses two different kinds of root directory. There is a root directory for the whole filing system, referred to as $, and also a user root directory (URD) for each user. The URD is a directory like any other, but for convenience, it may be referred to by the symbol &. You can also log on without first opening the URD; to do this, hold down Shift while you press Return for the last time when logging on. Note that a file server may have more than one disc, in which case each has a separate root directory. You can specify a disc by using its name, as for ADFS.

You can open the root directory of the file server by choosing **Open $** from the file server menu. If the file server has more than one disc, choose the disc from the **Open $** submenu.

Sending messages to other users

You can send a one line message to another user logged on to the network as follows:

1 Move to the **Notify** submenu of the file server menu.

2 Type in the station number you want to send the message to, and the message itself, pressing Return after each. To find out which station numbers other users have, consult your network manager.

The message is displayed in a dialogue box on the screen at the destination station.

For an alternative way of communicating with other network users, see the description of the Mailman application in Part 2 of this Guide.

Updating of network directory displays

If a file shown in a directory display on your screen is deleted by another user, your display will not be updated as a result. If you then try to open the deleted file, you will get a 'File not found' error message.

What to do if something goes wrong

Probably the most frequent error encountered when attempting to log on to a network is 'No clock'. This means that your machine is physically disconnected from the network, either at the back of the computer or at the socket box at the other end of the cable.

If a new file server has been connected to your network, it will not automatically appear on the FS list. To make it do so, log on to the new file server, and the next time you display the FS list, the new file server will be included.

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

The RAM Filing System

The RAM filing system (RAMFS) uses memory reserved within the computer for storage. Access to RAMFS is much faster than any other filing system. The contents of RAMFS are lost when you turn the computer off.

Before you can use RAMFS, you must allocate memory for it. You can do this in two ways:

- using the desktop Task Manager. The 'bar' for RAMFS is in the third section of the Task Manager window; it is marked RAM Disc. You can change the memory allocated to RAMFS to suit your needs (by dragging the bar in the display), provided that RAMFS is empty before you try to make the change.

- using the command *configure RamFSSize in Command Line Mode. For details of this, see Part 3 of this Guide.

The name used for the filing system in paths is ram. The RAMFS icon is only present on the icon bar when memory has been allocated for the filing system.

Checking the free space available

To see how much space is available in RAMFS, click Menu on the RAMFS icon, and choose Free. This displays the total free and used space, in both hex and decimal.

Using RAMFS

RAMFS is a convenient way of speeding up many operations, at the cost of using some of the computer's memory. Two examples are given here.

Copying between floppy discs using a single drive

As noted above, when you are copying a group of objects from one floppy disc to another using a single drive, you have to change the disc after each file or directory. This can become tedious. An alternative is to allocate as much space as you can in RAMFS, copy all the files (or as many as will fit) into RAMFS from the source disc, and then copy them from RAMFS to the destination disc. When you have finished, delete the files from RAMFS, and reduce the memory allocated to it as necessary.

Keeping frequently-used files in RAMFS

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

Do not keep files that you are changing in RAMFS: it is too easy to switch off the computer without transferring them to a permanent medium such as a disc or a network file server.

Loading and saving

In this section, the term 'program' is used to denote both programs which are loaded from a file, and applications which are loaded from an application directory. For more information on application directories, see the chapter entitled *Filing systems*.

Loading files and programs

When you double-click on a file or application in a directory display, the computer will attempt to load and/or execute the object. This is how to run programs from the desktop, and also how to load files into programs. You can also load files into programs by dragging them out of a directory viewer and into the program, as described below.

Loading applications

To load a program, double-click on its icon in a directory display. The program may either start running immediately, creating any windows it needs, or it may set itself up on the icon bar. In the latter case, the program is running, in the sense that it has been loaded into memory and is executing, but it is in a passive state, waiting for you to do something, such as loading a file or clicking Menu on the icon.

Loading files by double-clicking

When you double-click on a file which is not a program, this is what happens:

1 The computer examines the file type. If it is not a known type, an error message is displayed ('No run action specified for this file type'), and the file is not loaded. Otherwise, the computer determines which program the file should be loaded into.

2 If the program is not currently running, the computer will load it and start it running. This may also produce an error, if the program is not available.

3 The file is loaded by the program. The exact action now depends on the particular program, but typically a new window will be opened and the contents of the file displayed in it.

A second way of loading a file is by pressing Select or Adjust on it, and dragging until the mouse pointer is over an icon on the icon bar. If possible, the file will be loaded into the program you have dragged it to, normally in a new window.
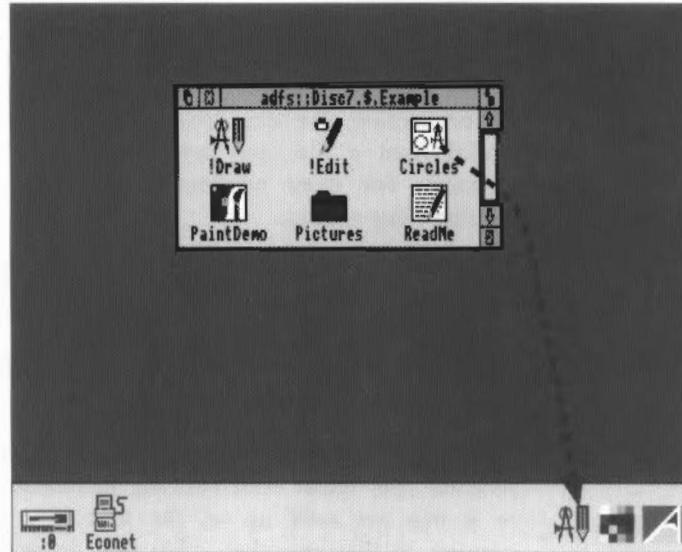
You can also drag a file into an existing window of a program. Depending on the program, this will either open a new window for the file, insert the file into the existing contents of the window (replacing the old contents of the window), or insert the contents of the file at the insertion point.

Note that when you load a file by dragging, it is up to the program whether to accept it. For example, the Applications Suite text editor Edit will allow you to load almost any type of file, whereas Draw only permits a narrow range of file types. The program to which you drag a file can be different from the standard one for the type of file. An example of this is the sprite file type, which by default works with Paint (and hence will be loaded into it on double-clicking), but which may also be dragged into Draw.

Saving files from a program

Many programs use a standard method for saving files. There are two main variants to the method. In both cases, saving is chosen from a sequence of menus that normally lead to a dialogue box containing an icon, an OK button and a box into which you can type the name you want to give the file. The filename will be set up as the name of the file that was originally loaded, or to a standard name for new files.

To save the file, you can either drag the file to where you want to save it, or you can specify a pathname. The first technique is more convenient for saving a new file, and the second for saving a file that you have already loaded.

Saving by dragging

To save a file by dragging:

1 Open a directory display for the destination of the file.

2 Call up the program's Save dialogue box.

3 Press Select or Adjust on the file icon and drag it to the destination directory display.
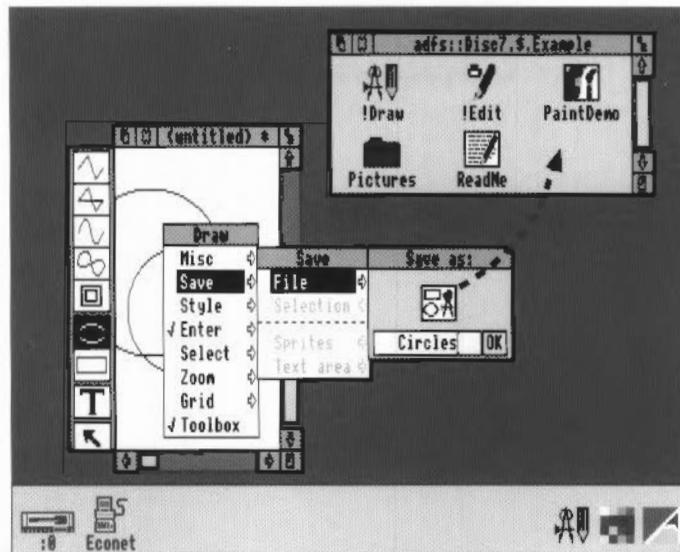
Saving by name

To save a file by name:

1 Call up the program's Save dialogue box.

2 Type in the pathname of the file, if it has changed from the one shown in the dialogue box. The pathname must contain at least one directory name.

3 Press Return or click on the OK button.

Note that you can save a file under its existing name by just pressing Return or clicking OK. Use this method to save a file which you have loaded and modified.

Saving on Exit and closing

When you close a window or quit a program, you may be asked if you want to save any changes you have made. If you do, a Save dialogue box will be displayed. Use it exactly as described above.

Transferring data between programs

The techniques of loading and saving can be used to transfer data between programs, without the need to save the file to a filing system. In this case, call up the program's Save dialogue box. Instead of dragging the icon to a directory display, drag it to the program that it is to be loaded into, just as if you were loading it from a directory viewer.

Not all programs can transfer data by this method. If the direct transfer fails, some programs will attempt to use a temporary disc file for the transfer.

The keyboard

This chapter describes the functions of the different keys on the keyboard.

The keys

The keyboard is shown below. It has most of the keys a typewriter has, plus some extra keys.
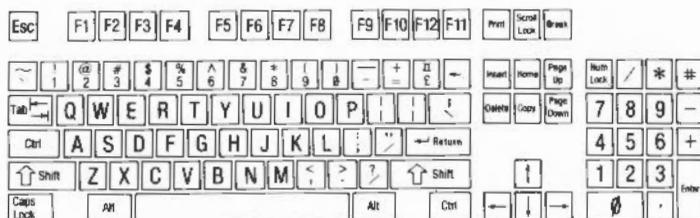
The keys are 'auto-repeat', that is, they continue printing a character when pressed and held. You can change the auto-repeat rate using the Configure program (part of the Applications Suite) or *Configure on the Command Line. See the chapter *Configure* in Part 2 of this Guide, or the chapter *Configuration Commands* in Part 3 for details.

In some applications, the keys may not always behave as described here. If you have any queries, see the instructions accompanying the application.

The keyboard can be divided into four sections:

- typewriter keys
- computer/keyboard control keys
- function keys
- numeric keypad keys.

Typewriter keys

The typewriter keys are located in the centre of the keyboard. When pressed, they produce characters and symbols which appear on the screen just as pressing a key on a typewriter produces a character or symbol on a page.

There are, however, a few differences between how these keys are used on a typewriter and on the computer:

The *space bar* does not just create a blank space as it does on a typewriter. When you press the space bar, all you see on the screen is the movement of the cursor, but the computer recognises the space as it would a character and treats it in the same way.

Be careful to distinguish between the following *pairs of characters*:

- Lower-case L (l) and one (1)
- Upper-case O (O) and zero (0)

On some typewriters, there are no keys for digits 1 and 0, so the letter keys do double duty; this is not the case with the Acorn computers.

Computer/keyboard control keys

The computer/keyboard control keys are darker than the others and perform specific tasks relating to the computer.

Escape	This cancels an operation or may terminate the running of an application.
Tab	This key is similar to the tab key on a typewriter. It moves the cursor forward by a specific amount.
Ctrl	Ctrl generates characters which control various aspects of the machine. It is always used in conjunction with another key. Hold it down while pressing the key or keys required.
Shift	Press Shift to obtain capital alphabetic characters and the upper symbol on keys containing two symbols. There are two Shift keys, one on either side of the keyboard. Some applications use Shift plus one of the keys labelled F1 to F12 at the top of the keyboard to perform certain tasks. The tasks assigned depend on the application you are using.
Caps Lock	This allows you to type upper-case letters without having to use the Shift key. When you press the key, a light on the key top comes on showing Caps Lock is ON. It remains ON until pressed again. When Caps Lock is ON, pressing a key containing an alphabetic character produces an upper-case letter, but for keys carrying two symbols, the **lower** symbol will appear.
Alt	This key is used in conjunction with another key to produce characters not found on the keyboard.
Scroll Lock	Pressing Scroll Lock stops the screen display from scrolling out of sight. It is a toggle key: pressing Scroll Lock again restarts the screen display. Press and hold Ctrl to slow down the rate of scrolling. Alternatively, switch on 'paged mode' by pressing Ctrl N before you type a command; scrolling will stop when a screenful of text has been displayed. To see another page, press Shift. Switch off paged mode by pressing Ctrl O. Note that holding down Ctrl Shift produces the same effect as pressing Scroll Lock. All these controls are relevant only to Command Line mode, not to the desktop.

Break	Pressing Break on its own cancels an operation or stops a BASIC program. Pressing Shift Break (hold down Shift and press and release Break) performs an automatic start-up (auto-boot). For further information on various start-up options, see Appendix A.
↤	This is the backspace key. It is similar to a backspace key on a typewriter. Pressing ↤ moves the cursor one character to the left. In many applications, it also deletes the character to the left. Under RISC OS, its function is identical to that of Delete (this was not the case under Arthur 1.20).
↵ *Return*	This is the Return key. It is similar to the carriage return on a typewriter, signalling the end of a line. Pressing Return advances one line and moves the cursor back to the lefthand side of the screen. In Command Line Mode, it is used to terminate a command and send it to the computer.
Insert, Home, Page Up and Page Down	The tasks these keys perform depend on the software you are using.
Delete	Delete removes the character to the left of the cursor and moves the cursor one space to the left.
←,→,↑,↓	These are the cursor movement keys; they are also called arrow keys. When pressed they move the cursor in the direction indicated by the arrow on the keytop.
Copy	This key copies characters on one line to another line (called the input line). To use Copy, position the cursor under the characters to be copied using the arrow keys, then press Copy. The line being copied appears on the input line.

Some keys are labelled on the front as well as the top: these are used for certain applications and their use is described in the relevant documentation.

Function keys

The function keys are at the top of the keyboard labelled F1 to F12 and Print. Many applications give these keys special functions, which are described in the documentation for each application.
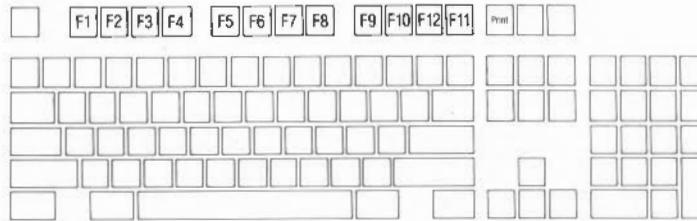
Function key strip holder

At the top of the keyboard is a holder where you can place the cards supplied with some applications labelling the function keys. This takes different forms in different Acorn computers: for example, a ledge where you can rest the cards, or a two-layer plastic strip into which you can insert them.

Numeric keypad

The numeric keypad keys produce numbers, just like the keys 0 to 9 on the main keyboard, plus a few other keys which are often useful when typing numbers. They are grouped together as a 'keypad' for convenience.

On the numeric keypad:

* Enter is normally identical to Return on the main keyboard.
* Num Lock is a toggle key. When pressed, a light appears showing it is on. It remains on until it is pressed again. The effect it has on the numeric keypad depends on the application you are using.

The keyboard   53
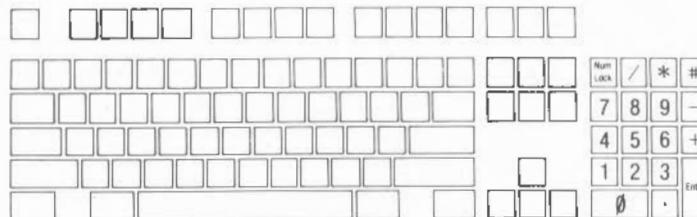
Character codes

Several character sets are available to match the alphabets used in a number of countries. Appendix E lists the following character sets:

- Latin alphabets 1, 2, 3 and 4
- Greek alphabet
- Teletext characters
- BFONT characters.

For more on how to use these, see the entries for the *Alphabet and *Country commands in Part 3 of this Guide.

The palette

The palette icon is located on the right of the icon bar. It is used for:

- Setting the palette (the colours used on the desktop).
- Inverting the screen grey scales.
- Changing to a different screen mode.
- Saving the current palette.
- Setting the palette to default values.

This chapter describes how to do each of these and how to load a palette from a file.

Setting the palette

The palette defines the set of 16 colours that will be used by the desktop, and the colours of the pointer and the screen border. Each colour is defined in terms of the intensity of the red, green and blue colour guns. For example, setting all three guns to zero intensity produces black, and all three fully on produces white.
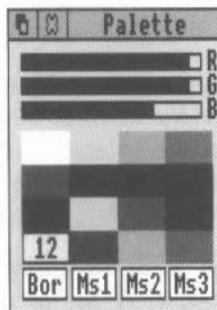
To see the current setting, click Select on the palette icon. The palette window then appears. The 16 desktop colours are shown in the middle section of the window. You can check the precise setting of a colour by positioning the mouse on it and clicking Select. The logical number associated with the colour is displayed, and the sliders at the top of the window show the red, green and blue intensities. To change a setting, position the pointer within one of the sliders, and drag it to the level you want. The colours on the whole screen reflect the changes as you make them.

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

- **Bor** to set the screen border colour
- **Ms1** to set the mouse outer colour
- **Ms2** to set the mouse inner colour
- **Ms3** to set the alternate mouse colour (used for certain special pointers).

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

When you have finished changing the palette, click the quit icon in the palette window. If you want to save the changes permanently, see *Saving the palette* below.

Inverting the grey scale

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

Changing to a different screen mode

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

A full list of screen modes appears in Appendix D of this Guide.

Saving the palette

If you change the palette, you may wish to save it for later use. To do this, click Menu on the palette icon, and move to the **Save** submenu. You can then save the file containing the palette data using the normal method for saving files, for example by dragging the icon to a directory viewer (see the chapter entitled *Loading and Saving* for information on how to do this).

Setting the palette to default values

A default palette is built in to the computer. To set the current palette to this default, click Menu on the palette icon, and then click Select on **Default**.

Loading a palette from a file

The palette may be loaded from a file in two ways. Either double-click on a palette file, or drag the file onto the palette icon in the icon bar. Palette files are indicated by a palette icon in the directory viewer.

The Task Manager

The Task Manager icon – in the shape of an Acorn 'A' – is located at the extreme righthand end of the icon bar. It is used:

- to create a new task
- to control and monitor tasks and the use of the computer's memory
- as a means of access to Command Line Mode
- to leave the desktop.

'Tasks' include anything the computer is doing: running an application, controlling what appears on the screen, managing areas of memory, and running the Task Manager itself. To start a Task Manager function, click Menu on the Task Manager icon, and continue as described below.

Creating a new task

To start a new task, move to the **New Task** submenu of the Task menu. This produces a box into which you can type any Command Line command. If the command causes a task that is not a desktop application to run, any output from the task will be displayed in a new window; other tasks will be suspended until this task has completed. If the task is a desktop application, starting it from the New Task submenu is equivalent to double-clicking on the application. The New Task facility is mainly useful to the specialised Acorn user.

Monitoring and controlling tasks and memory

Clicking on **Task Display** on the Task menu produces a window containing details of the current tasks and the use of the computer's memory. You will need to use scrolling and/or resizing to see all of this display. Memory usage is presented in the form of a number and a bar graph. When the bar is displayed in red, you can alter it by clicking Select within a bar, or by dragging the end of the bar to the value you want. The operating system imposes some restrictions on the amount of memory you can give to each item.
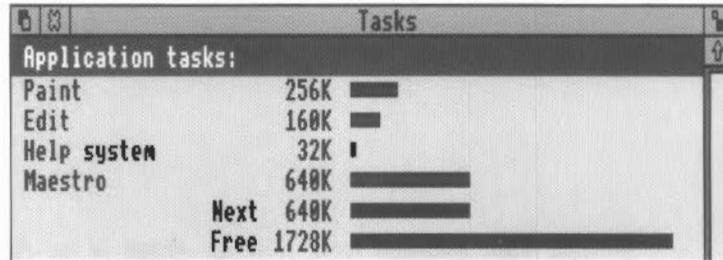
The contents of the display are in several sections. At the top, entitled Application tasks, there is a list of the tasks which are currently running, and how much memory they are using. The areas marked **Next** and **Free** indicate how much memory will be allocated by default to an application when it starts up, and how much free memory is remaining in the system. These two values can be changed: most applications override the values allocated to **Next** and **Free**, giving them the new values they need. You may find it useful to allocate more space to **Next** before opening a new Task window; since the computer does not know what the task is going to be, it cannot automatically transfer space from **Free** to **Next**.

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

```
┌─────────────────────────────────────────────┐ ▐
│ System memory allocation:                    │ │
│ Screen memory        96K  ■                  │ │
│ Cursor/System/Sound  32K  ▮                  │ │
│ System heap/stack    32K  ▮                  │ │
│ Module area         288K  ▬▬▬                │ │
│ Font cache           32K  ▮                  │ │
│ System sprites       32K  ▮                  │ │
│ RAM disc             96K  ■                  │ │
│ Applications (free) 2368K ▬▬▬▬▬▬▬▬▬          │ │
│ Applications (used) 1088K ▬▬▬▬▬▬             │ │
│ System workspace     32K  ▮                  │ │
│        Total        4096K ▬▬▬▬▬▬▬▬▬▬▬▬      │⇩│
├─────────────────────────────────────────────┼─┤
│⇦│                                        │⇨│回│
└─────────────────────────────────────────────┴─┘
```
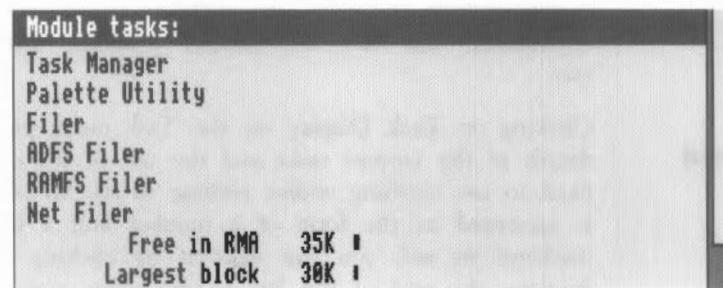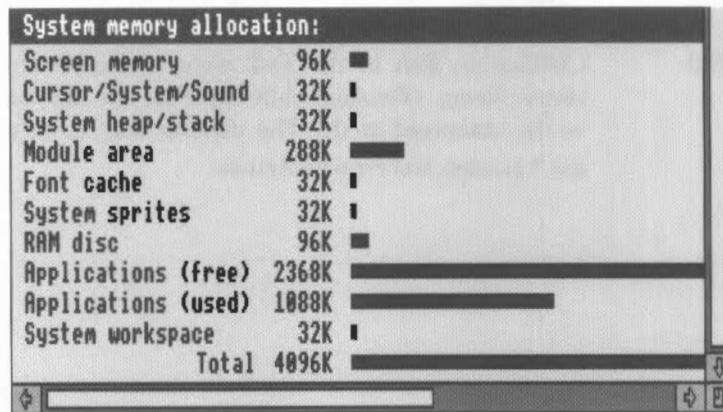
The third section of the display – System memory allocation – shows how the computer's memory is partitioned. Some of the values in this section can usefully be changed. For example, when using a large number of fonts the system may begin to run rather slowly; increasing the area allocated to the font cache will speed things up. However, if you are using any fonts besides the system font, you will not be able to gain space for other tasks by reducing the font cache to zero. (For more information on fonts and the font cache, see the chapter entitled *Fonts*.) A second candidate for reduction is the **System sprites** space, since this is not normally used by the desktop.

Any of the tasks from the first two sections of the display may be forced to stop, as follows. Position the pointer over the entry for the task and click Menu. Move to the submenu entry for the task, and click on **Quit**. The task will halt, and its memory will be made free. Although some programs (including Edit, Draw and Paint) will warn you if there is some work you have not saved, not all programs do so; this command should therefore be used with caution, as a last resort to force termination of a program that has got out of control.

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

Accessing Command Line Mode

By selecting *Commands from the Task menu, you can enter Command Line Mode. A * prompt appears, and you can enter commands as described in Part 3 of this Guide. To return to the desktop, press Return at a * prompt without entering any other characters on the line. Pressing F12 is equivalent to

selecting *Commands from the Task Manager menu, unless the application running in the current window overrides this with its own function key definition.

Leaving the desktop

Clicking on **Exit** in the Task menu will cause the desktop and all tasks to be closed down. (Pressing Shift-Ctrl-F12 has the same effect.) You will be left in the command mode. The desktop may be restarted by typing desktop at the * prompt, and pressing Return.

Fonts

Acorn computers include a facility for displaying text in a variety of different styles. The desktop and most simple applications use the system font, which is built into the computer. In this style, all characters have the same width.

In addition, there is a second kind of text style, which makes use of so-called 'anti-aliased' fonts. The term 'anti-aliased' just means that jagged edges to the definition of the characters have been smoothed out by the addition of extra pixels in intermediate colours. For all practical purposes, you can treat the term 'anti-aliased font' as meaning 'high-quality font'.

Anti-aliased fonts are used when high-quality text is required. They can be used in almost any size (subject to the limits of resolution of the display). Anti-aliased fonts may be proportionally spaced, so that a narrow letter such as 'l' takes up less horizontal space than a wide letter, such as 'M'.

Anti-aliased fonts are loaded from files held in a standard directory. The name of this directory is given by the system variable Font$Prefix. You will not usually need to change this, unless you are using your own fonts, but to do so, you need to enter Command Line mode: the chapter entitled *The Command Line*, at the beginning of Part 3 of this Guide, tells you how to do this. In the Command Line, type the following command:

```
*Set Font$Prefix <name of font directory>
```

For example,

```
*Set Font$Prefix $.MyFonts
```

You can see which anti-aliased fonts are available at any time, with the Command Line command:

```
*fontcat
```

The more complex application programs, such as Edit and Draw, allow you to use anti-aliased fonts. The Applications Suite contains a number of standard anti-aliased fonts, and an application – !Fonts – which will set a suitable

value in the variable Font$Prefix. See the chapter in Part 3 of this Guide entitled *Using system variables* for details.

The font cache

Your computer keeps as many fonts as it can in an area of memory called the font cache. If the font cache is not large enough to hold the definitions of all the fonts that are in use at a given time, any extra fonts are loaded from the filing system as necessary. The computer will attempt to retain in memory the fonts which are in greatest demand.

An effect of this is that there will sometimes be a delay when text is being drawn on the screen, as the font is loaded from the filing system. You may also be prompted to enter the disc which contains the fonts, if it has been removed since the fonts were first loaded.

The size of the font cache may be changed using the Task Manager. If you are using many different fonts, it is advisable to increase the size of the cache, so that the text is drawn more quickly. (The size of the font cache may also be changed more permanently, using the *Configure command. See the chapter entitled *Configuration commands* in Part 3 of this Guide for details.)

Part 2 – The Applications Suite

Introducing the Applications Suite

The Applications Suite is a set of programs that introduces you to some of the capabilities of your Acorn computer (and which are useful and powerful utilities in their own right). Three important **editors** are included:

- *Edit* – a text editor
- *Draw* – a drawing program
- *Paint* – a sprite editor

In addition, Maestro enables you to transcribe and play music in up to eight channels.

Four programs are provided for **entertainment**:

- *Lander* is an animated graphics arcade-style game which allows you to test your skill in flying a spacecraft above a fast moving and constantly changing terrain.
- *Patience* is the familiar one-player card game.
- *Puzzle* is another test of skill and patience.
- *Madness* provides you with more passive amusement.

Four **desk accessories** form part of the Applications Suite:

- *Clock* displays an analogue clock face.
- *Alarm* is a flexible clock and alarm system.
- *Magnifier* enlarges a portion of the screen.
- *Calculator* is…well, a calculator.

Finally, the following useful **tools and utilities** are provided:

- *Configure* gives you an easy way of setting some of the values used when the machine is switched on: how loud the bleep sounds, for instance.

- *Mailman* is a manager for electronic mail sent and received via the Econet network.

- *Usage* enables you to observe the CPU activity of your Acorn computer.

- *PrinterPS* is a printer driver for PostScript printers such as the Apple LaserWriter.

- *PrinterDM* is a printer driver for dot matrix printers.

- *65Host* substantially emulates a BBC B Microcomputer.

- *TinyDirs* allows you to keep directories – including applications – on the icon bar for rapid access.

- The *System, Modules* and *Fonts* directories contain resources shared by various Applications Suite programs; these are also available for use by the user's own programs.

The ReadMe file

On one of the Applications discs you may find a file called ReadMe. If present, this will contain information on any changes that have been made to the Applications Suite programs since this Guide was published. To read this file, load it into Edit, as described below.

Documents and their editors

Four of the programs in the Applications Suite – Edit, Draw, Paint and Maestro – produce 'documents': files containing the text, drawing, sprite or tune you have edited or produced. In each case, the documents have a distinctive framed icon which allows you to relate it visually to the program (or 'editor') which produced it.

Edit icon

Text file icon

Draw icon

Draw file icon

Paint icon

Sprite file icon

Maestro icon

Music file icon

To load an editor, insert your Applications disc and display its directory by clicking Select on the floppy disc drive icon on the icon bar. (If you have a hard disc, you can copy any of the Applications programs onto it following the instructions in the chapter entitled *The Advanced Disc Filing System*; this will make them even easier to load.)

Double-click on the relevant icon in the directory display and a copy of it will appear on the icon bar. Select this icon and a window will open for the editor. Full details of loading and saving files, which apply to all the editors, are given in the chapter entitled *Loading and Saving*.

The Help application

The Help application is a program that displays information about other applications whilst they are working, and about the desktop generally. When you first use an application, you may find it useful to have Help present. To start Help, double-click on its icon in the directory display. A Help icon appears on the icon bar, and an window entitled **Interactive help** is displayed.

This window will contain information about whatever the mouse pointer is over. As you move the mouse, the information changes. Note that not all applications and parts of the desktop make information available. In this case, the interactive help window is left blank.

You can remove the interactive help window by clicking on its close icon. To redisplay the window, click Select on the Help icon on the icon bar. To close down Help choose **Quit** from the Help icon bar menu.

The Fonts application

The Fonts application is used to provide anti-aliased fonts for Applications Suite applications. For an explanation of anti-aliased fonts, see the chapter entitled *Fonts* in Part 1 of this Guide. These fonts are available once the !Fonts directory has appeared on the screen.

Shared features in the Applications Suite

Several Applications Suite programs have features in common: rather than explain these separately for each application, a description follows here. Remember, too, that the procedures for loading and saving files are the same in all the applications.

The colour dialogue box

Draw and Paint (the latter in the Edit Palette facility) both make use of dialogue boxes for selecting colours for the picture being edited. A typical colour dialogue box is shown below.
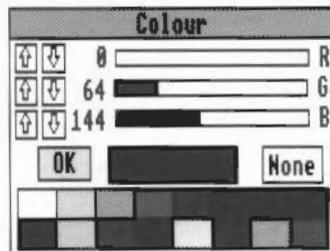
At any time, there is a range of sixteen standard colours. In addition, you can mix new colours. In screen modes which have fewer than 16 colours, some of the colours may be replaced by patterns.

The standard colours are shown in the patches at the bottom of the dialogue box. To choose a standard colour, click on the patch, and then click OK.

To mix your own colour, you must set the intensities of red, green and blue in it. Each intensity is expressed as a number in the range 0 to 255. There are three ways of adjusting these:

- Drag a slider to the level you want.
- Click on the number next to a slider, and type in the new value.
- Click on the up and down arrows.

As you mix a colour, it is shown in the colour mixing box. When you have selected the shade you want, click OK. If you want to adopt the settings used

for a standard colour, click on that colour. This can be useful for fine-tuning a shade from a standard shade.

Note that the colour displayed on the screen is the best approximation available in the current screen mode to the shade you select. The exact colour may be recorded by the application, so that it is displayed more accurately if you change to a screen mode which has more colours. 256-colour modes (such as mode 15) can often provide a good approximation.

Some colour dialogue boxes have a special entry used to specify that no colour is to be used. This takes the form of a box marked 'None' to the right of the colour mixing box. To choose it, click on None, and then on OK.

The magnifier dialogue box

The magnifier dialogue box is used for scaling the size at which a picture is displayed in Draw and Paint. An example magnifier is shown below.
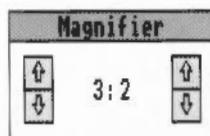
The magnification is expressed as a ratio; for example 2:1 means twice normal size, 3:4 means three-quarters of normal size, and so on. You can change the magnification ratio by either clicking on the up and down arrows, or by clicking on the numbers and typing in a new value.

When you change the magnification, the magnifier dialogue box remains on the screen. To remove it, press Escape or move to a different menu item.

Other shared features

In several applications, an asterisk appears in the title bar of a window when the file in the window has been changed since it was last saved. Although you will be alerted if you try to close the application without saving a file, the asterisk provides a quick visual reminder that you have unsaved work.

In Edit, Draw and Paint you can open more than one window on the file you are editing. This is often convenient if you want to look at widely-separated parts of the document while editing at one point. Although there may be several views of the same document open on the screen, you are still editing a single document: this means that changes made in one window will be made in all the others. To remind you of how many views you have opened, the number of current views appears after the name of the document on the title bar.

Finally, in Edit, Draw and Paint, clicking Adjust on the close box of a window will close the window (provided it has not been modified since you last saved it) and open the parent directory display.

Removing applications from workspace

Remember that for every application (and for every filing system), there are two top-level menus: one that appears when you click Menu on the application's window, and another when you click Menu on the application's icon in the icon bar. The options offered by the icon bar menu depend on the particular application, but one thing they have in common is a Quit option; click on this to remove the application from memory (you will be asked to confirm this if there is any unsaved work in the application). You may need to do this if, for example, you try to load a new application and get a message telling you there is not enough space for it.

Applications and modules

There are some applications which share certain system resources which are not in the ROM; these resources typically reside in the application !System, and are loaded in as relocatable modules when any application needing them is loaded. For instance Edit, Draw, Paint and Configure all use the module SharedCLibrary, allowing a great deal of code to be shared between them.

When these applications are subsequently unloaded the relocatable modules stay, since another program will probably want to use them later on. In some circumstances this may be undesirable: for instance, if all available memory is needed for some other purpose. In such a case you can remove the modules by doing the following.

1 Press F12 or choose * commands from the Task Manager menu

2 Type

```
*RMKill SharedCLibrary (press Return)
```

Repeat this for any other modules that you wish to remove.

3 Press Return to get back to the desktop.

Take care only to do this when the modules are not being used by any applications; the list opposite shows which modules are loaded and used by which applications.

When these modules are 'killed', their space is not necessarily made available again; in order to load the modules space is allocated in the RMA (Relocatable Module Area), as displayed by the Task Manager window. Killing the modules will free some space in the RMA, but may not allow it

to shrink; this depends on whether the RMA has subsequently been used by any other part of the system.

Module usage by application

Module	Used by
SharedCLibrary	Edit, Draw, Paint, Configure
FPEmulator	Draw, Paint (resident in !System)
ColourTrans	Draw, Paint (resident in !System)
TaskWindow	Edit (when you create a Task Window; resident in !Edit)
PDriver	PrinterPS and PrinterDM (two versions)
65Host	persists as a module within the machine, so that it can provide extra * commands used by the emulator.

Edit

Edit is a text editor; you can use it to create and edit plain text, and to generate simple textual documents. It can also be used for editing Basic programs and command scripts.

Edit is controlled from a menu tree, which is described fully in this chapter. (For a description of menu trees in general, see the chapter entitled *Menus and dialogue boxes* in Part 1 of this Guide.) However, many menu choices are available directly from the keyboard; once you are familiar with Edit, you may find that you prefer this method. These keystroke equivalents are listed later in this chapter.

Starting Edit

Edit is loaded in the same way as the other editors: by first installing its icon on the icon bar and then clicking on that icon. This procedure is described in more detail in the section entitled *Documents and their editors* in the preceding chapter.

Typing in text

When you first open a new Edit window, a red I-shaped bar – the caret – appears at the top left of the window. This is where text will appear when you start typing. You can open more Edit windows, but only one of them will have a caret in it: this is called the current window. It is also identified by the fact that parts of its border appear in cream rather than grey. You can type only in the current window.

If you type in some text without putting in any carriage returns, and using the system font (the default font; see the chapter in Part 1 of this Guide entitled *Fonts* for more information), you will find that the window scrolls sideways. This is because the default Edit window is not as wide as the screen. You can break your text into lines by pressing Return, as on a conventional typewriter. Alternatively, click on the Toggle Size icon to extend the window to the full screen and avoid having to scroll sideways. (For more details on scrolling, see the chapter entitled *Windows* in Part 1). There is another way of getting all your text into the window, using the Format command; this is described below.

As you type, you will notice that Edit fills the current line and then carries on to the next line, often breaking words in the middle. Ignore this for the moment, as there is a menu option that will take care of it, and this will be described later.

Inserting and deleting text

If you need to insert or delete text, position the caret where you want to make the alteration by moving the pointer there and pressing Select. You can insert text simply by typing. If you want to delete a character, position the caret immediately after it and press either Backspace or Delete; hold the key down and the auto-repeat will come into effect, deleting more characters.

Edit menus

The top level menu contains the following options:

```
     Edit
  Misc     ⇨
  Save     ⇨
  Select   ⇨
  Edit     ⇨
  Display  ⇨
```

The Misc menu
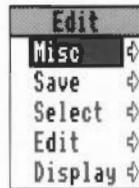
This menu offers three options:

```
     Edit            Misc
  Misc     ⇨      Info       ⇨
  Save     ⇨      File       ⇨
  Select   ⇨      New view
  Edit     ⇨
  Display  ⇨
```
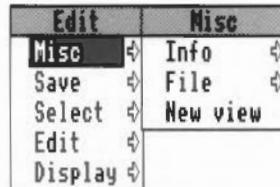
Info tells you about Edit, including the version number of your copy of the program.

File gives information about the file you are working on, in particular:

• whether it has been modified since you last saved it;

• what type of file it is: a text file or a command file, for example (its icon, if it has one, is also shown);

• its name, including the full directory pathname (for pathnames, see the chapter entitled *Filing systems*);

- its size, in number of characters;

- the time and date it was last saved (or if you have not saved it yet, the time and date when it was first created).

New view opens a second window on the same text. This allows you to look at two parts of the same document, and makes many actions such as copying from one part of a document to another much easier. Remember that you are looking at one document, not at two separate copies of it: to illustrate this, try looking at the *same* part of a document in two views (*not* the way you will normally use **New view!**); enter some changes in the first view and you will see the same changes appearing in the second view. This is particularly useful with large documents.

The Save menu allows you to save a complete file; you can also save part of a file using the Select menu, described below.
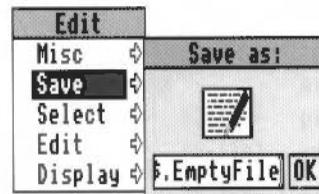
The procedure for saving is common to many applications, including Draw and Paint, and it is described in full in the chapter entitled *Loading and Saving* in Part 1 of this Guide. In order to save a file in the easiest way, you need to have on the screen the directory display for the directory where you want to save the file. Move to **Save**, and a box appears, containing an icon, the current filename, and an OK box. If the file has not been saved before, Edit offers you a default filename of 'TextFile'. If you want a different name, use Backspace or Delete (or press Ctrl U) to delete TextFile, then type in the name you want. Place the pointer on the icon in the menu and drag the icon into the directory display where you want to keep the new file. An icon for the file then appears in the directory window.

This action assigns a full pathname to the file, as you will see from the title bar of the Edit window. When you have made some changes to the text and want to save the file a second time, use the Save menu again, but this time, provided you want to use the same filename, you can save the file by clicking the OK box.

Blocks of text can be 'selected', then manipulated.

The simplest way to select a block is to position the pointer where you want the block to start and, using the Select button, drag the pointer to the end of the block and release the button. The selected block of text appears in inverse colours.

If necessary, you can then use Adjust to 'adjust' the ends of the block. Position the pointer exactly where you want the block to start or finish, click Adjust and the block lengthens or shrinks accordingly.

To select a single word, position the pointer anywhere within the word and double-click Select; select a single line by triple-clicking.

Once selected, text can then be saved, copied, moved, deleted, de-selected ('cleared') or indented by choosing options from the Select menu:

```
    Edit
  Misc    ↔
  Save    ↔      Select
  Select  ↔    Save          ↔
  Edit    ↔    Copy   (ctl-C)
  Display ↔    Move   (ctl-V)
               Delete (ctl-X)
               Clear  (ctl-Z)
               Indent        ↔
```
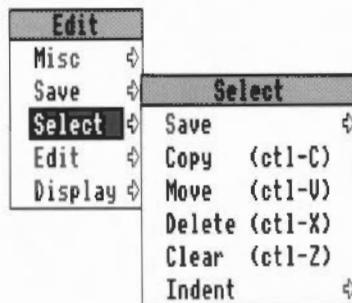
To **Save** a selected block, move to **Save** from the Select menu, and follow the standard saving procedure.

To make a **Copy** of a selected block of text, first position the caret where you want the copy inserted, then call up the **Select** submenu and select and click on **Copy**; the original block remains selected. Keep clicking on **Copy** to make as many copies as you want.

To copy a block of text *to the caret position*, first place the caret where you want the copied block to appear. Next, press and hold Ctrl while making the selection in the usual way. Still holding Ctrl, press C, and the block will be copied to the caret position.

If you copy to a position inside a selected block, both the original and the new copy remain selected. If you then make multiple copies you will get

double the number you indicate. This may happen accidentally if you position the caret immediately to the right of a selected block ending in a carriage return: because the carriage return does not appear on the screen it is not highlighted, but is still part of the selected block.

To **Move** a selected block of text, place the caret where you want the text moved to, then click on **Move**.

To move a block of text to the caret position, first place the caret where you want the clock to end up. Next, press and hold Ctrl while making the selection in the usual way. Still holding Ctrl, press V, and the block will be moved to the caret position.

To **Delete** a selected block of text, click on **Delete**. The marked block then disappears.

Note that Undo – in the Edit menu – allows you to reverse any changes or deletions made in the Select menu.

To **Clear** or 'deselect' a block of text you have previously marked, click on **Clear**. The marked block reverts to the normal display and the block is no longer selected.

Indent allows you to indent a selected block of text. The indent is defined in character spaces. You can also use Indent to add a text prefix to the beginning of a block.

To indent a selected block of text, call up the Indent submenu, then type in a number.

- A positive number gives you an indent of the specified width.

- A negative number, −5, for example, removes the specified number of spaces or characters from the beginning of the block line; use this to cancel an indent.

- You can also type in text: IGNORE, or NB, for example. This will then appear at the beginning of every line in the selected block. You can remove this text by indenting with a negative number.

The Edit menu

At its simplest, **Find** allows you to locate any character(s) in your file. You can also use it to replace text with other text. To make sure that the search is complete, always position the caret at the start of the file before giving the Find command. In the following description, the text being searched for is referred to as a 'string'; it may consist of any sequence of letters, numbers, spaces or other characters.

To use Find without doing anything with the found strings, choose Find in the Edit submenu: the **Find text** dialogue box appears, with the caret in the **Find** box. Type in the string you want to locate and press Return. The caret then moves to the **Replace with** box.

```
 Edit
Misc    ⇨
Save    ⇨
Select  ⇨         Edit                      Find text
Edit    ⇨   Find    (f4) ⇨    Go  Previous  Count
Display ⇨   Goto    (f5) ⇨
            Undo    (f8)          Find:        stone
            Redo    (f9)   Replace with:       rock
            CR<->LF          Case sensitive
            Expand tabs      Magic characters:
            Format text ⇨                      \*=any string
                           \a=any letter or digit  \d=any digit
                           \.=any char  \n=newline  \cX=ctl-X
                           \&=found string    \\=\  \xXX=hex char
```
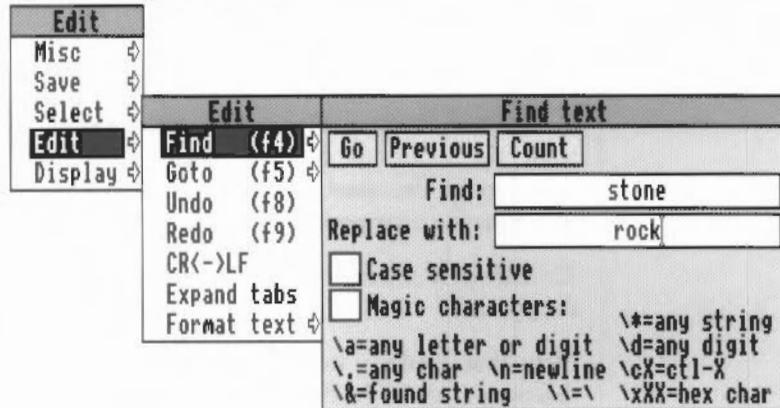
Since on this occasion you do not want to replace the found strings with anything, either select **Go** or press Return.

Edit finds the first occurrence after the caret of the word in your file, then displays the **Text found** dialogue box, indicating the operations available.

```
▣       Text found:
   Stop    Continue    Replace
 Last Replace End of file Replace
    Undo             reDo
          Found
```
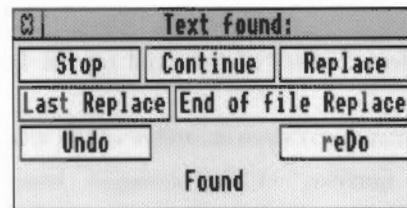
To look for the next occurrence of your string, click on **Continue**. To abandon the search, click on Stop.

To use Find for replacing a string with a new string, go to the **Find text** dialogue box as before, but this time, insert the new string into the **Replace with** box. Then press Return, and the **Text found** dialogue box appears.

Click on **Replace** to substitute the new string for the old string; if you do not want to change this particular occurrence of the old string, click on **Continue** and Edit moves on to the next one.

If you click **Last Replace**, Edit replaces the currently found instance of the string, but does not search for further occurrences.

If you click on **End of file Replace**, Edit finds and replaces all occurrences of the string from the present one forward to the end of the file, without stopping at each one for instructions.

Clicking on **Undo** takes you back to the last string replaced and returns it to the original version; click **reDo** to change it back again.

The display at the bottom of the menu keeps you informed of the state of the search; if Edit cannot find the word you have specified it displays the message **Not Found**.

Besides using the Select button, you can control all these options by pressing keys; the particular keys are indicated by the capital letters in the dialogue box. Press S and Edit stops, press C and it continues, D and it will redo, and so on. Pressing Escape or Return will also stop the search and remove the **Text found** window.

Note that you can use Find to delete strings in a text, by entering nothing in the **Replace with** box, and clicking on **Replace** in the **Text found** dialogue box, thus replacing the found string with nothing: deleting it, in effect.

There are several other useful facilities, accessed in the **Find text** dialogue box:

- You can carry out the last Find and Replace operation again, by clicking **Previous**.

- You can specify a string and ask Edit to count the number of times it occurs in your file (from the caret position to the end of the file) by clicking on **Count**.

- By default, Find makes no distinction between upper and lower case characters – Hello will match to both HELLO and hello, or for that matter, hElLo – you can specifically ask it to match case by clicking the **Case sensitive** 'button'. Hello will then match only Hello. Note that case sensitivity remains selected until you deselect it by clicking again.

- You can also use the Find facility to search for 'magic characters': 'wild card' characters or strings. To activate this feature, click on the **Magic characters** button. They operate as follows:

* matches any string (including a string consisting of no characters at all). This is really only useful in the middle of a search string. For example, jo*n matches jon, johnson, and jonathan.

\a matches any single alphabetic or digit character. So t\ap matches tip, tap, and top, but not trap.

\d matches any digit.

\. matches any character at all, including spaces and non-alphabetic characters.

\n matches the newline character (remember that to the computer, this is a character just like any other).

\cX matches Ctrl-X, where X is any character.

\& is used in the **Replace with** box to represent the 'found string': the string matched in the search. This is particularly useful when you have used magic characters in the Find string. For example, if you have searched for t\ap, and you want to add an s to the end of all the strings found, \&s in the **Replace with** box will replace tip, tap and top by tips, taps and tops.

\\ enables you to search for a string actually containing the backslash character \ while using magic characters. To search for the strings cat\a or cot\a, enter c\at\\a.

\xXX matches characters by their ASCII number, expressed in hexadecimal. Thus \x61 matches lower-case a. This is principally useful for finding characters that are not in the normal printable range.

Returning to the Edit menu:

To send the caret to a specific line of text, use the **Goto** option. Call up the Goto submenu and Edit displays a dialogue box:

```
┌──────────────────────────┐
│      Goto text line      │
├──────────────────────────┤
│ current line: 1          │
│ current char: 0          │
│   Go to line: [      ] [OK]│
└──────────────────────────┘
```

Type in the line number you want to move to, then click on OK. The dialogue box disappears, and the screen displays the caret, positioned at the beginning of the line you have just specified. Note that this option understands 'line' to mean the string of characters between two presses of Return. If you have not formatted your text, a line in this sense may run over more than one display line.

Undo allows you to step backwards through the most recent changes you have made to the text. The number of changes you can reverse in this way varies according to the operations involved.

Redo allows you to remake the changes you reversed with **Undo**.

CR↔LF allows you to convert the line feeds in your text to carriage returns and back again.

If you convert from linefeeds to carriage returns, the file will be converted to one continuous line, with carriage return characters inserted where linefeeds have been removed. Though it is possible to edit a file in this state, you may find that updating the screen takes a long time. This facility is useful when importing text from other text editors, which may use the line feed character where Edit uses carriage return.

Expand Tabs converts tab characters to the equivalent number of spaces, since some printers can interpret spaces more easily than the tab character.

Format text allows you to reformat a paragraph of text – from the caret to the next blank line or line starting with a space – so that the lines fill the screen and break correctly at the ends of words. It is useful for tidying up text after editing. Position the caret at the beginning of the paragraph, choose **Format text** in the Edit menu and enter the number of characters per line you want your text to have in the **Format width** dialogue box. Then move the pointer back over the Edit menu and click on **Format text** to format the paragraph.

The Display menu

Display allows you to change the way your text looks on the screen: you can experiment with fonts, colours, line spacing and margins. However, the features you select do not form part of the text when you save it. For example, if you select **New view** in the Misc menu, you will have a second window on your text. If you wish, the Display features in these two windows can be different; this will not affect the text as such.

```
┌─────────────┐
│    Edit     │
│ Misc     ◇  │
│ Save     ◇  │
│ Select   ◇  ┌──────────────────┐
│ Edit     ◇  │     Display      │
│ Display  ◇  │ Font          ◇  │
└─────────────│ Font size        │
             │ Font height      │
             │ Line spacing  ◇  │
             │ Margin        ◇  │
             │ Invert           │
             │ Wrap             │
             │ Foreground    ◇  │
             │ Background    ◇  │
             └──────────────────┘
```
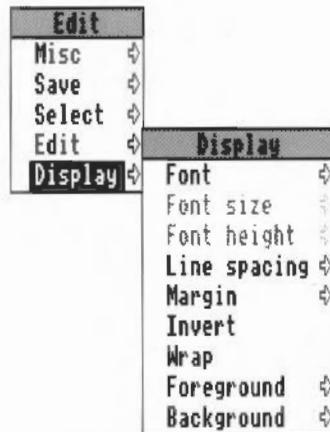
Font offers you a choice of fonts (typefaces). 'System Font' is the default style, and has a fixed character width. For further information on fonts, see the chapter entitled *Fonts* in Part 1 of this Guide.

You can use **Font Size** to set the point size (height and width) of the characters displayed on the screen. Either select one of the sizes indicated or position the pointer on the bottom (blank) line of the menu; you can then type in another size.

Font height allows you to set the height of the characters displayed on the screen leaving their width unchanged.

Line spacing sets the space between lines, in pixels (the smallest unit the screen uses in the current mode).

Margin sets the left margin, again in pixels.

Invert swaps foreground and background colours, so that black text on white becomes white text on black, and so on.

By default, Edit assumes a text width of 76 characters, but the default window is not as wide as the full screen. You can of course change the number of characters per line (by choosing Format text in the Edit menu) or enlarge the window to the full screen by clicking on the Toggle Size icon. Alternatively, clicking **Wrap** makes your text fit the size of the window. When Wrap is on, you can change the window to any size, and the width of the text will change accordingly. You can revert to the default by selecting Wrap again.

Foreground allows you to set the text to any one of the sixteen colours, by clicking on the selected colour square from the palette displayed.

Background allows you to set the window's background colour, as above.

Laying out tables: the Tab key

To set out a table, type in the first line – the column headings, for example – as you want it to appear, using spaces to separate the text in the columns. Then press Return. On the next line, pressing Tab will make the cursor jump to the position underneath the start of the next word in the line above.

Reading in text from another file

If you want to add all the text from another file into the file you are currently editing, position the caret at the point where the inserted text is to appear. Call up the directory display for the incoming file, and drag its icon into the text window. The entire contents of the source file is then copied into the destination file at the caret position.

Keystroke equivalents

On occasions, it can be convenient to use the keyboard instead of the mouse, especially once you are familiar with Edit through its menus.

When editing

←, →, ↑, ↓	Move caret one character left, right, up or down.
Shift ←, Shift →	Move caret one word left or right.
Shift ↑, Shift ↓	Move caret one page up or down.
Ctrl ↑	Move caret to start of file.
Ctrl ↓	Move caret to end of file.
Ctrl ←, Ctrl →	Move caret to start or end of line.
Shift Ctrl ↑, Shift Ctrl ↓	Scroll file without moving caret.
Copy	Delete character to right of caret.
Shift Copy	Delete word at current caret position.
Ctrl Copy	Delete line at caret.
Home	Place caret at top of document.
Insert	Insert space to right of caret.

Page Up/Page Down	Scroll up or down one windowful.
Shift Page Up/Page Down	Move caret up or down one line without scrolling.
Ctrl Page Up/Page Down	Move caret and scroll up or down one line.

Keystroke equivalents in the Select menu

Ctrl Z	Clear selection.
Ctrl X	Delete selection.
Ctrl C	Copy selection to caret.
Ctrl V	Move selection to caret.

Keystroke equivalents in the Edit menu

F4	Display **Find** dialogue box.
Ctrl F4	Indent text block.
F5	Display **GoTo** dialogue box.
F6	If no block is selected, select the single character after the caret. If a block is selected, and the caret is outside it, extend the selection up to the caret. If a block is selected and the caret is inside it, cut the block from the caret position to the nearest end of the block.
Shift F6	Clear the current selection.
F7	Copy the selected block at the current caret position.
Shift F7	Move the current selection to the caret position.
F8	Undo last action.
F9	Redo last action.

Ctrl F6	Format text block.
Ctrl F8	Toggle between CR and LF versions of the file.
Ctrl Shift F1	Expand tabs.

Keystroke equivalents in the Find menu

Note: these keystroke definitions only come into play once the **Find** dialogue box has been displayed (eg by typing F4).

↑, ↓	Find / replace text string.
F1	Display **Text found** dialogue box.
F2	Use previous find and replace strings.
F3	Count occurrences of find string.
F4	Toggle case sensitive switch.
F5	Toggle magic characters switch.

Keystroke File options

F2	Open a dialogue box enabling you to load an existing Edit file into a new window.
Shift F2	Open a dialogue box enabling you to insert an existing Edit file at the caret position.
F3	Save the file in the current window. This is a shortcut to the normal Save dialogue box.

The Edit icon bar menu

Pressing Menu on the Edit icon on the icon bar produces a menu with the following options:

Info gives you some information about the version of Edit you are using.

Create leads to a submenu which enables you to open windows for specific types of file: Text, Data, Command and Obey files. (For more on these, see Appendix B.)

In addition, the **Create** submenu allows you to set up Edit Task windows: these are described in the next section.

Finally, **Quit** stops Edit and removes it from the computer's memory, first presenting you with a dialogue box for confirmation if there are any current files you have not saved.

Note that you can also quit Edit by calling up a Task display, pressing Menu over the bar for Edit, and selecting **Task 'Edit'** and then **Quit**. If you have any unsaved work in Edit, you will be presented with a dialogue box, asking you to confirm that you want to quit without saving your work. However, if you click on **Yes**, you will be returned not to the desktop, but to Command Line mode, so this method is not recommended.

Edit task windows

Edit task windows allow you to use Command Line mode in a window. To open a task window, choose **New Task window** from the Edit icon bar menu. You can have more than one task window open. When you open a task window, you will see a * prompt. You can now enter commands in the window just as if you were using Command Line mode. See Part 3 of this Guide for a full description of Command Line mode.

The major advantages in entering commands in a task window instead of at the Command Line prompt are that:

- Other applications continue to run in their own windows while you run the task (this does mean, though, that the task may run more slowly than it would using other methods of reaching the Command Line).

- Commands that you type, plus the output (if any), appear in a conventional Edit window, and may therefore easily be examined by scrolling up and down in the usual way. When you type into the window, or when a command produces output, the window immediately scrolls to the bottom of the text. Anything you type in is passed to the task, and has the same effect as typing whilst in Command Line mode. You can change this by unlinking the window: in this case, anything you type in alters the contents

of the window in the same way as any other Edit window, even while a task is running. Any output from the task is appended to the end.

You can also supply input to a task window by selecting some text from another text file and choosing **TaskInput** from the task window menu. Note that the selection may be in any Edit window.

You cannot use graphics in a task window. The output of any commands that use graphics will appear as screen control codes in the task window.

The menu for a task window contains the following options:

```
       Task
   Kill
   Reconnect
   Suspend
   Resume
   Unlink
   Link
   TaskInput
 √ Ignore Ctl
   Edit        ◊
```
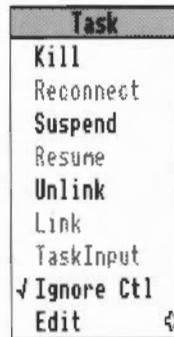
Kill stops and destroys the task running in the window.

Reconnect starts a new task in the window, allocating memory to the task from the Task Manager's **Next** slot.

Suspend temporarily halts the task running in the window.

Resume restarts a suspended task.

Unlink prevents the sending of typed-in characters to the task. Instead, they are processed as if the task window were a normal Edit text window.

Link reverses the effect of **Unlink**.

TaskInput reads task input from the currently selected block.

Ignore Ctl, when selected, prevents any control characters generated by the program from being sent to the screen.

Edit leads to the normal Edit menu.

Some guidelines and suggestions for using task windows

In order to use a task window, you will need to be familiar with Command Line mode. There are some commands which you will find are more useful in a task window than they are directly from the Command Line. In particular:

`*wimpslot <min> [<max>]` can be used to adjust the amount of memory available to the task, which will otherwise start up using the **Next** space allocation. You can examine this using the Task Manager window, described in Part 1 of this Guide. `<min>` and `<max>` indicate how much memory the task is allowed to have. If you want to remove all the memory allocated to a task without closing its window or destroying the task, use the command `*wimpslot 0 0`.

`*filer_opendir <path>` opens a new directory display for the directory with the given path. The path must start with a filing system name, but need not be a full pathname. For example, `adfs::@` will open a display for the current directory.

The command *Spool should not be used from a task window. Because its effect is to write everything that appears on the screen to the spool file, using *Spool from the desktop will produce unusable files full of screen control characters. There is, in any case, no point in using *Spool, since the output from the task appears in the window, and can be saved using Edit as normal.

When you run a command in a task window, the computer divides its time between the task window and other activities running in the desktop. You should note that some time-consuming commands, for example, a *Copy of a large file, may prevent access to the filing system that they use until the command is complete.

Note that Command Line notions such as 'current directory' become relevant when you are using Task Windows. For information on these, see Part 3 of this Guide.

Customising Edit

The description of the Display menu tells you how to change the display features of Edit for the current session. However, you can change these features so that every time you start up Edit, it starts up with the colours, fonts and sizes you choose. To do this, you need to enter a command in Command Line mode. Full details of ways to enter Command Line mode can be found in Part 3 of this Guide. One way, from Edit, is to open a task window, as described above.

The command you need to use is *Set Edit$Options, followed by a string of characters made up of letters, most of which are followed by numbers. The letter indicates the feature being set; the number indicates the font height or width, or the colour (as shown in the **Foreground** or **Background** options in the Display menu), etc, as follows:

Letter	Feature specified	Value assigned by Edit if not changed by user
F	Foreground (text) colour	7
B	Background colour	0
W	Font width	10
H	Font height	10
M	Left margin in pixels	0
L	Extra spacing between lines in pixels (a negative number will produce closer lines)	0
R	Wrap text at window edge	no wrap
N	Font name	system font

Examples

```
*set Edit$Options F13 B1 W8 H12 NPortrhouse.Standard

*set Edit$Options F8 R NCorpus.Medium
```

Notes and tips

- You do not have to set all the features; just change the ones you don't like.

- Experiment using the Display menu within Edit before changing Edit$Options.

- Although changes to Edit$Options will be recorded as soon as you make them, they will not take effect until you remove Edit from the icon bar and re-install it.

- In order to set your preferred options each time you switch on your machine, build them into a !Boot file. For how to do this, see the chapter *Command scripts* in Part 3 of this Guide.

- You cannot change the height or width of the system font.

Draw

Draw is an object-oriented graphics editor; you can use it to draw and edit diagrams and pictures made up from various kinds of graphical objects.

In the *Basic ideas* section of this chapter, you will find an introduction to how to create and edit the different kinds of object which Draw uses. You will probably find that the easiest way of learning Draw is to read through *Basic ideas*, and then experiment with the program for a while, before reading the more detailed sections.

Starting Draw

Draw is loaded in the same way as the other editors: by first installing its icon on the icon bar and then by clicking on that icon. This opens a window in which you can construct a drawing. This procedure is described in more detail in the section *Documents and their editors*, in the chapter entitled *Introducing the Applications Suite*. You can edit existing files by dragging them to the Draw icon on the icon bar or by double-clicking on them.
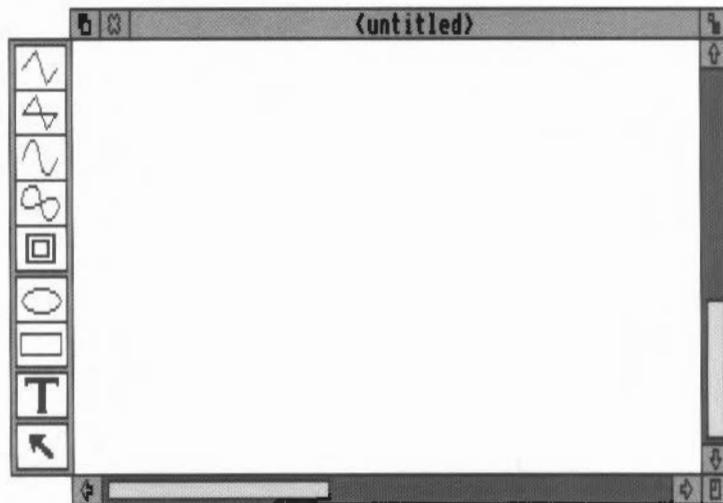
The Draw window

The Draw window looks much the same as other application windows when you first load it, except that down its lefthand side there is a strip of icons called the Toolbox. These allow you to choose what sort of object you wish to draw, or to select objects in order to alter them. All these processes are fully described in the rest of this chapter.

Basic ideas

Objects

A Draw diagram is built up from *objects*. There are a number of different types of object available; these are described below. Draw retains information about each object used to construct the diagram. This means you can subsequently change individual objects – for example moving them, scaling them to a different size, or changing their colour – without affecting the other objects.

The basic object types are:

- *paths* consisting of a sequence of line segments. Each of the line segments may be straight or curved. A path may be closed to form a polygon, or left open.

- *rectangles and ellipses*. These are, in fact, also paths, which means that they may be edited in a very flexible way.

- *lines of text*, in one of a range of fonts and sizes.

- *sprites*: graphic shapes made up of an array of coloured pixels. For an introduction to sprites, see the chapter entitled *Paint*. Sprite objects can only be created by loading sprite files. See *Loading and saving files in Draw* in this chapter for details.

- *text areas*, consisting of several lines of text. Text areas can be used for simple desktop publishing. A section near the end of this chapter tells you how to create and edit text areas.

Objects may be combined together as a group. For most purposes, a group can be manipulated like any other object. Draw records the objects that were used to build the group, so that it may subsequently be 'ungrouped' into its constituents. Groups can themselves be used as components of other groups.

Each object has a style consisting of a number of attributes. Attributes are used to define the colours of the object, line widths, text fonts and sizes, and so on. The exact range of attributes depends on what type of object it is.

You can edit more than one diagram at a time. Each appears in a separate window. If the diagram is larger than the window, use scrolling as described in the *Windows* chapter to move around the diagram.

Draw 'modes'

You can use Draw in three operating modes:

- *Enter mode* is used to create new objects.
- *Select mode* is used to change object attributes, and to move and alter objects on the screen.
- *Path edit mode* is a special mode used to change parts of paths.

Enter mode and *Select mode* are chosen from the main Draw menu or from the toolbox (described below). *Path edit mode* is entered via Enter mode or from the Select menu.

The mouse pointer changes according to which mode you are using: in Enter mode it is shown as a star, and in Select and Path edit mode as an arrow.

Shortcuts

To make it easier to construct a diagram, Draw has a number of tools and shortcuts. Firstly, there is the toolbox attached to the lefthand edge of each Draw window. You can use this to indicate the sort of action you want to carry out, without having to use the menus.

To help you align objects in a diagram, a grid may be displayed. Various different sizes and shapes of grid are available.

Finally, you can construct more than one view of a diagram. Changes made in one view affect the other view as well. The views can have different grid and zoom factor settings.

Simple object creation and editing

This section gives an overview of how you can create and edit objects, and descibres each object type on the toolbox. You will probably find it useful to read the rest of this section and then try drawing a few simple diagrams. When you are in the process of creating any object except text, you will see a 'skeleton' version of it on the screen.

Note that most operations can be cancelled by pressing Escape part way through.

Paths

The top five icons in the toolbox are used for path objects. To construct the first line segment in a path, choose one of the first four icons (their meanings are given below), and click Select at the place in the Draw window where you want the path to start. Move to the end point of the line segment and click

Select again. You can keep on adding line segments to the path by moving to the end point of each new line segment in turn and clicking Select. To finish creating the path, double-click Select or press Return.

creates straight line segments.

also creates straight line segments; when the path is completed, an extra line segment is inserted to join the last point to the first one.

creates curved line segments. A curve is defined by the two end points and two control points. You will find a fuller explanation of control points later in this chapter. When curves are created, they are arranged so that the segments of the path join smoothly.

also creates curved line segments; when the path is completed, an extra curve is inserted to join the last point to the first one.

allows you to move from one point in the diagram to another without inserting a line. The move forms part of the path you are constructing. A path cannot start or end with a move, and cannot contain adjacent moves; that is, move may only be selected when a path is already in progress. Use Move to create an object consisting of subparts that you know you will always want to treat alike.

During the construction of a path, you can freely switch between these types of line; for example, you can construct a path which begins with a straight line, then has a curved line, then moves to another point, and finally closes with a straight line.

Ellipses and rectangles

The next two icons are used to create ellipses and rectangles. Initially these are aligned with the horizontal and vertical axes. See the discussion of Select mode for how to rotate them to other angles. Ellipses and rectangles are in fact just a type of path: once you have created them, you can alter them in the same way as any other path.

creates an ellipse. Ellipses are arranged to fit within a rectangular area. Click Select to mark the centre of this area, then move the mouse to a corner of it and click Select again.

creates a rectangle. Click Select to mark one corner of the rectangle, then move the mouse to the other corner of it and click Select again.

Text

creates one or more text objects. Click Select to place a caret where you want the text to start. While you are entering text, keys such as Delete have their normal effect. Press Return, or double-click Select to complete the text object. Once you have done this, you cannot edit the text; to change it, delete the object and start again.

Select mode

Click on the icon at the bottom of the toolbox to enter select mode. Whilst you are using select mode, you can make changes to objects which are already in the diagram. To return to enter mode, click on one of the other toolbox icons.

To select an object, position the mouse over or within the object and click Select. When an object is selected, a dotted box is drawn round it.
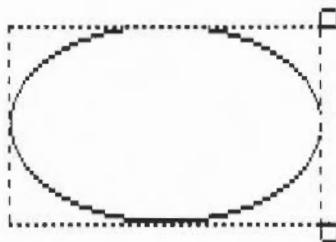
To deselect an object, click elsewhere on the screen. You can select more than one object by clicking Adjust on each additional object. Clicking Adjust on an object that is already selected causes it to be deselected (these procedures are just the same as those in the Filer menu and the text editor, Edit).

Another way of selecting all the objects in an area of the diagram is to construct a *select box* round the area by pressing Select at one corner of the area to be selected and dragging the box out over the area. The position at which

you press Select to start the box must be outside any objects. Release Select when all the objects to be selected are wholly or partly within the select box; the objects will then be selected.

You may find that the object you want to select is obscured by another object. In this case, double-click Select over the object. Keep on doing this to 'tunnel' down to progressively deeper objects.

There are many operations that you can carry out in Select mode. Only the simplest ones are described here; for the others, see the section entitled *Select mode in detail*, below.

To *move* the selected objects press Select over any of the selected objects and drag them to their destination; then release Select.

To *rotate* the selected objects, press Select over the 'ear' at the top righthand corner of a select box, and drag the mouse until the objects are at the angle you want; then release Select. Each object rotates about its own centre. Note that text and sprites cannot be rotated.

To *scale* (or *stretch*) the selected objects, press Select over the 'ear' at the bottom righthand corner of a select box and drag the mouse until the objects are the size you want; then release Select. You can use this to turn objects (except text) upside down, by dragging the mouse above the top of the box.

When you have more than one object selected, move, rotate and scale apply to all selected objects.

Path edit mode

There are two ways to enter Path edit mode.

* From Enter mode, click Adjust on the object you wish to edit.
* From Select mode, first select an object, then choose Edit from the Select submenu.

The end points and control points of the path to be edited will be shown on the screen. To move any of the points, position the mouse pointer over the points and press Adjust. Drag the point to where to you want it to go and release Adjust.

To leave Path edit mode, click Select, or click Adjust when the mouse position is not over a path.

Other Path edit mode operations are described later in this chapter.

Curves in a path object are defined by two end points and two control points. When you are drawing or editing a path, the control points are shown connected to the end points by straight lines. The shape of a curve is determined as follows:

- The direction of the curve at the end point lies along the straight line connecting the end point to the control point (ie this line is a tangent to the curve).

- The degree to which the curve moves away from this straight line depends on the distance of the control point from the end point: the nearer together they are, the sooner the curve turns away.

By moving the control points, you can produce many different shapes of curve. Some examples are shown below. In each case the thick line shows the path itself, and the control points (shown as black squares) are joined to the corresponding end points (shown as open squares) by thin lines.
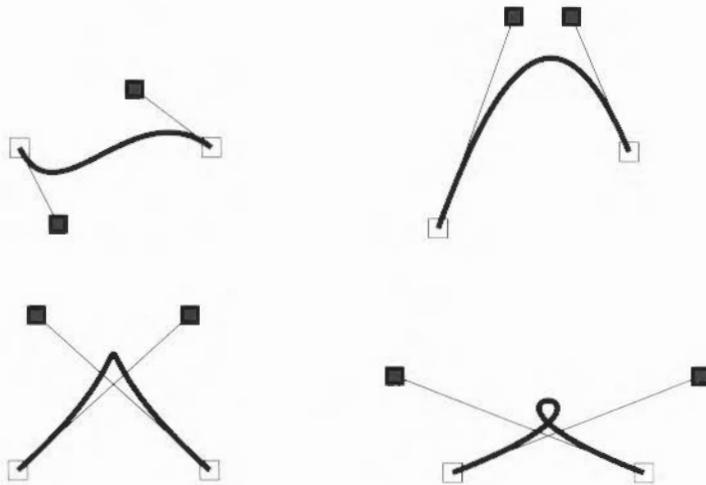
Setting and editing the
object style

Each object has a style consisting of a set of attributes. You can set the style to be applied to each new object you create (the default style), and alter the style of existing objects. In both cases, the style is chosen from the Style submenu of the Draw menu. If you alter the style when you are in Enter mode, the default style is set; if you alter it when in Select mode, the style is applied to the selected objects.

The Style menu contains the following entries. Each entry has a submenu giving the range of values available.

```
Draw
  Misc       ⇨
  Save       ⇨        Style
  Style      ⇨    Line width    ⇨
  Enter      ⇨    Line colour   ⇨
√ Select     ⇨    Fill colour   ⇨
  Zoom       ⇨    Pattern       ⇨
  Grid       ⇨    Join          ⇨
√ Toolbox         Start cap     ⇨
                  End cap       ⇨
                  Winding rule  ⇨
                  - - - - - - - - - -
                  Font name     ⇨
                  Font size     ⇨
                  Font height   ⇨
                  Text colour   ⇨
                  Background    ⇨
```

Line width. You can set the line width to any of a range of predefined values, measured in points (a point is 1/72 inch), or to 'Thin', which means the narrowest width that can be displayed. You can use the last position in the menu to type in a value for the thickness if the one you want is not in the menu. Line width applies to paths.

Line colour and Fill colour are both set using a colour dialogue box. See the chapter entitled *Introducing the Applications Suite* for details, but note the following:

- The fill colour applies to the region within the object.
- For a simple line drawing, with no interior, use None as the fill colour.
- Line and fill colours apply to paths.
- Open paths may be filled.

Pattern is used for dashed and dotted lines. You can set the line pattern to any of a range of patterns, including solid. The pattern applies to paths, rectangles and ellipses.

Join sets how lines are joined together:

A mitred join brings the outer edges of lines together at a point:

A round join rounds off the point where the lines join:

A bevelled join cuts off the corner where the lines join:

The join style only has a significant effect for thick lines.

Start cap and End cap determine what the ends of lines look like. Caps apply only to open paths, and their effect is only significant for thick lines. The cap styles are:

Butt caps square off the line at the end point.

Round caps add a semicircular arc to the end of the line. The diameter of the arc is the same as the width of the line.

Square caps add a square to the end of the line. The square has half the width of the line.

Triangle caps add a triangle to the end of the line. The triangle option has its own submenu allowing you to set the height and width of the triangle independently, these values being multiples of the width of the main line.

In a path, the same style applies to all the line segments.

Winding rule is only used for areas (ie parts of the diagram bounded by lines) of the diagram for which a fill colour has been set. Even-odd winding means (roughly) that an area is filled if it is enclosed by an even number (including zero) of areas. Non-zero winding, on the other hand, fills areas on the basis of the direction in which the paths that surround the area were constructed: if an equal number of paths in each direction surround the area, it is not filled, otherwise it is. Most of the time, the even-odd winding rule is used.

More formally, the two winding rules are defined as follows:

Even-odd: to determine whether an area of a object is to be filled, imagine a line from inside the area to outside the object. Count the number of lines it crosses. If the number is odd, fill the section.

Non-zero: first assign each path a direction, expressed as a number: +1 for one direction and −1 for the other. Then, to see if an area is to be filled, construct

an imaginary line from inside the area to outside the figure. Keep a total of the direction values for each line it crosses. If the total is non-zero, fill the section.

These pictures illustrate the two winding rules:

Even-odd   Non-zero

Note that each of these drawings is a single object, consisting of a single path containing two moves (the first from the outer line to one of the 'eyes', the second from one eye to the other). The arrows show the direction in which each segment of the path was drawn.

Font name applies to text objects. You can set the font either to the system font, or to a anti-aliased font. The list of fonts shows all those that Draw could find when it was loaded. See the chapter *Fonts* for more details about how fonts work.

Font size and **Font height** also apply to text objects. Both values are measured in points (1/72 inch units). You can use the last position in the menu to type in a value if the size or height you want is not already there. Changing the size causes the height to be set to the same value; you can subsequently change the height, leaving the font width set to the size value.

Text colour is used to set the colour of characters in text objects, and the initial text colour of text areas. It is set using a colour dialogue box.

Background is used for setting the intermediate colour used in displaying anti-aliased fonts. By setting the background to the same colour as the part of the diagram that the text appears in, the anti-aliasing will disappear. The background applies to text objects and text areas, and is set using a colour dialogue box.

The grid

Draw can superimpose a rectangular or isometric grid on the diagram. This is often useful for lining up objects and for checking their size. The grid is made up of 'major points', which are marked by a cross, and 'minor points', which are marked by a dot.

You can use the grid either just as a general guide for drawing, or you can lock objects to it, so that they always align with points in the grid. When you are creating objects with grid lock turned on, you will see them attach to the nearest grid point to the mouse position.

The grid is controlled from the grid submenu:
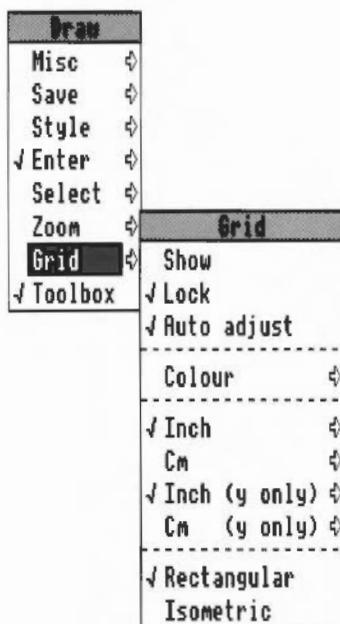
Show switches the grid on or off.

Lock switches grid lock on or off. The grid need not be shown in order to use grid lock. Grid lock causes new objects to align with the grid as you create them. You can make existing objects lock to the grid by choosing **Snap to grid** from the select menu.

Auto-adjust indicates whether Draw may change the grid if it is too dense or too sparse. When auto-adjust is turned on, Draw will insert extra minor points

if the grid is very widely spaced, and remove points if they are very close together. If you turn auto-adjust off and specify a very close spacing, the grid may take some time to draw.

Colour sets the colour of the grid, from a range of values given in a submenu.

Inch and **cm** are used to set the spacing of the grid. Each menu item leads to a submenu, from which you can select one of a range of standard spacings. The standard spacings are expressed in the form M x S: major points are M units (inches or centimetres) apart and divided into S subdivisions; for example, 1 x 4 on the inches menu gives major points one inch apart, and minor points 1/4 inch apart. You can define your own spacing by typing values to the Spacing and Subdivision submenus. Choosing Inch or cm from the Grid submenu (without moving to Inch or cm submenus) uses the last setting you specified in that unit. For rectangular grids, changing the grid settings in this way changes both the X (horizontal) and Y (vertical) settings.

Inch (y only) and **cm (y only)** allow you to set a different grid setting in the Y direction from that in the X direction.

Rectangular sets the grid to a rectangular pattern.
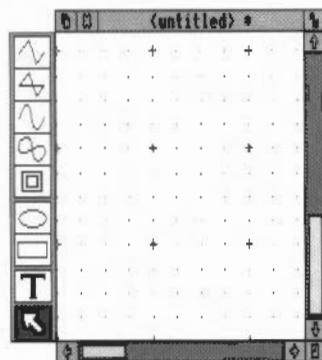

Rectangular grid

Isometric sets the grid to an isometric pattern. In this case, the Y spacing of the grid is not used. For reasons of clarity, only those minor points lying on lines joining major points are shown; however, when grid lock is in use, the drawing still locks to intermediate minor points between them.
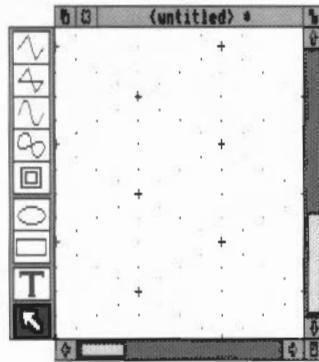
Isometric grid

Enter mode in detail

Enter mode is used to create objects. You can choose the kind of object either from the toolbox, as described above, or from the Enter submenu of the Draw menu. To create an object of the same type as the last object you created, simply choose Enter from the menu. Otherwise, move to the Enter submenu, and choose one of the following:
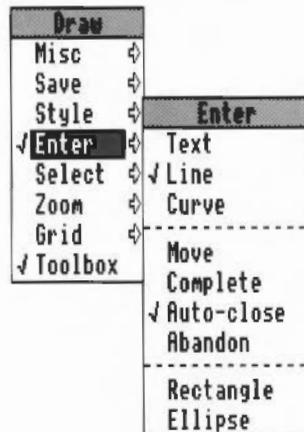
Text, **Rectangle** or **Ellipse** to create objects of the given type in exactly the same way as the toolbox.

Line, **Curve** or **Move** to construct paths, also using the same method as the toolbox.

Complete to finish creating a path. This has the same effect as double-clicking or pressing Return at the end of a path.

Auto-close to set whether the path will be automatically closed when you complete it. If the line or curved line tool is selected, the toolbox will change the selection to the corresponding closed path tool.

Abandon to abandon the path that you are constructing. It has the same effect as pressing Escape.

While you are entered a path, pressing Delete removes the most recently entered point.

Select mode in detail

Select mode is used to alter existing objects. You can enter Select mode from the toolbox as described above, or choose it from the Draw menu. The Select submenu contains a number of operations that you can apply to the currently selected objects:

Select all selects all objects in the diagram.

Clear deselects all selected objects.

Copy makes a copy of the selected objects, slightly offset from the originals.

Delete permanently deletes all the selected objects.

Front moves the selected objects so that they are at the front of the diagram, obscuring any other objects in the same physical position.

Back moves the selected objects so that they are at the back of the diagram, obscured by any other objects in the same physical position.

Group turns the selected objects into a group object.

Ungroup breaks down a group into the objects that make it up. Ungroup only has an effect when there is a single group selected.

Edit provides a means of entering Path edit mode. It applies only when there is a single path object selected. The effect is the same as clicking Adjust on the path object when in Enter mode.

Snap to grid applies only if the grid is locked. It causes the selected objects and each point in them to move to the nearest grid point.

Justify applies to groups. It leads to a submenu from which you can select how the objects forming the group are arranged within the bounding box of the group object: at the left, centred or at the right horizontally, and at the top, positioned in the middle, or at the bottom vertically.

Rotate leads to a submenu into which you can type a rotation angle, measured in degrees. All selected objects are rotated anticlockwise by this angle.

X scale and **Y scale** lead to submenus into which you can type scale factors. All selected objects are scaled in size by this amount, in the given direction (X = horizontal, Y = vertical). The scaling is relative to the current size.

Line scale leads to a box in which you can enter a scale factor for the line widths of the selected paths. The scaling is relative to the current size. Lines of width 'Thin' cannot be scaled.

Magnify applies all three scalings – X, Y and Line – to the selected objects (though Line is left unchanged if its width is set to Thin).

Path edit mode in detail

Path edit mode may be entered in the two ways already described: by clicking Adjust on a path object, or by choosing Edit from the Select submenu. Clicking Adjust over a path that you have already chosen this way will find the next deeper path in the diagram if there is one, in a similar way to tunnelling through objects in selection.

You can change the position of points in a path by dragging them, as already described. There is also a menu of path edit actions.

To select a part of the path click Adjust on an end point or a control point of the path. The selected line segment is shown highlighted. Note that if you select the first point of the path, there is no highlighting. You can now click Menu to show the list of Path edit actions:

```
        Edit
Change to curve
Change to line
Change to move
Add point
Delete segment
Open path
Close path
Enter coordinate ⬦
```
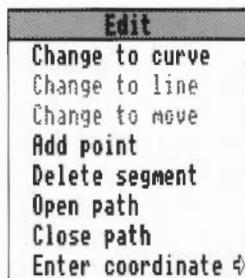
Change to **curve** turns the selected part of the path into a curved line segment. You can use it when the selected segment is a line, or when you have selected a point inserted using the move icon (or Move from the Enter menu).

Change to **line** similarly changes a curved line segment or a move into a straight line segment.

Change to **move** replaces the selected straight or curved line segment with a move, effectively splitting the path into two sections. However, you cannot change a line segment to a move if it appears at an end of the path, or if it is already preceded or followed by a move.

If the path containing the line was closed, extra lines will be inserted to close each of the two sections of the path. The following example illustrates this. First, draw a rectangle, starting at the top lefthand corner, and then enter Path edit mode. Click Adjust at corner 3: this selects side 2-3 for editing.

Click Menu and choose Change to move. Side 2-3 is now replaced by a Move, and corners 1 and 3 are joined.
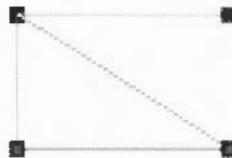
Add point inserts a new point (and hence a new line segment) into the path, of the same type as the selected segment.

Delete segment deletes the selected line segment from the path.

Open path and **Close path** turn open paths into closed ones, and vice-versa. In making a path open, the line segment joining the last point to the first one is not deleted; it is just 'disconnected'. On closing a path, the end point of the last line segment is moved to join up to the first segment.

Enter coordinate leads to a dialogue box which shows the current coordinates of the point. You can select the unit the coordinates are shown in by clicking on the Inches and Centimetres buttons. To change the coordinate, type in the new value and click OK. To leave the coordinate unchanged, click Cancel or press Escape. If the point you have chosen is the start point of the path, only 'Enter coordinate' is available.

To leave Path edit mode, click Select elsewhere in the diagram.

Loading and saving files in Draw

Draw can process four types of file:

- files in Draw's own file format
- sprite files, containing one or more sprite objects
- text files, used to create text area objects as described below
- DXF files, also described below.

All the file types can be loaded by dragging the file to the Draw icon on the icon bar, or by dragging it into a Draw window. Draw files can also be loaded by double-clicking on them in a directory display.

Loading a sprite *file* into Draw will in fact load only the first sprite. A more convenient method is to

1 Load the sprite file into Paint (following the instructions in the chapter on Paint).

2 Open a sprite window for the sprite you wish to transfer.

3 Click Menu and move to the **Edit** submenu. If Palette is not switched on (ie there is no tick beside it), click on Palette to give the sprite its own palette.

4 Choose **Save**, then **Sprite**.

5 Drag the icon in the **Save as** box into a Draw window.

This method also ensures that Draw displays the sprite in the correct colours.

When a file is loaded by dragging it into a window, it is added to the diagram which is already in the window. The file is loaded so that its bottom lefthand corner lies at the mouse position at the instant the mouse button is released. When a file is loaded by dragging it to the icon bar, a new diagram is created in a new window, with the file aligned on the bottom lefthand corner of the diagram.

To save files from Draw, use the **Save** option in the Draw menu. This leads to a submenu with the following entries:

File saves the entire diagram in Draw file format.

Selection saves the currently selected objects as a Draw file.

Sprites saves all selected sprites as a sprite file.

Text area saves the text used to define a text area, as a text file. There must be a single text area selected. For more information about text areas, see below.

The rest of the Draw menu

The Draw menu tree contains the following in addition to those entries and submenus already described.

Misc leads to a submenu containing the following:

```
  Draw          Misc
 Misc    ◊  Info         ◊
 Save    ◊  New view
 Style   ◊  Paper limits ◊
√Enter   ◊  Print        ◊
 Select  ◊
 Zoom    ◊
 Grid    ◊
√Toolbox
```

Info leads to a dialogue box containing information about the version of Draw you are using.

New view creates a new view of the diagram you are editing, in a separate window. Changes made in any view of a diagram affect the other views as well. You can change the zoom on each view independently, use different grids in the separate views, scroll each one independently, and so on. To get rid of a view, close the window containing it.

Paper limits leads to a submenu which you can use to set the size and orientation of the 'paper' you are constructing the drawing on. The orientation is either portrait (longer side vertical) or landscape (shorter side vertical). The size may be any of a range of standard 'A' paper sizes. Choosing **Show** causes a grey rectangle to appear, which indicates the part of the diagram which will be printed. Those areas within the grey border are considered to be part of the margin of the page, and are not printed. The limits of the grey border correspond to the limits of the page. If no printer driver is loaded, the limits default to A4. (See the chapter entitled *PrinterPS and PrinterDM* for information on the printer drivers supplied in the Applications Suite.) When you load a file into Draw, the paper size is set to the value which most closely matches the area defined by the file.

Print leads to a dialogue box which you can use to print the diagram. The printer dialogue box contains the name of the printer driver in use, a slot into which you can enter the number of copies to be printed, and a button to start the printing process.

Zoom leads to a magnifier dialogue box. This can be used to change the size at which objects are displayed relative to their actual size. The magnifier dialogue box is described in the chapter entitled *Introducing the Applications Suite*. You cannot set either part of the zoom ratio to a value greater than 8; if you try to do so, 8 is used instead.

Toolbox switches the toolbox on and off.

Additional features of Draw
Text area objects

A text area is a special sort of object that allows you to do simple 'desktop publishing'. A text area consists of a piece of text divided into one or more rectangular regions called text columns. Draw breaks up the text into lines which are just wide enough to fit into the columns, splitting it (principally) at spaces. A text area may have more than one column: Draw again works out how to divide the text between the columns, filling up each one before moving to the next. You can think of this as being similar to the way a story is printed in a newspaper: text, divided into a number of columns, each column being made up of a number of lines.

Create a text area by using a text editor (such as Edit) to prepare a file containing the text, annotated with special commands (described below). When the text file is loaded into a Draw diagram, the text is formatted into columns. The number of columns is given by an annotation. By using Select mode, you can move the text columns and change their size. As you do this, Draw will reformat the text between the columns.

Text areas can only use anti-aliased fonts: you cannot create a text area in the system font.

Creating and editing text areas

To create a text area object from a text file, drag the file into a Draw window. The columns in the text area are initially set up to standard sizes. If you drag the text file over the top of an existing text area, the old text of the objects is replaced with the contents of the new file. Use this method for altering the text in a text area.

Text area selection works in two slightly different ways, depending on how many text columns there are in the text area:

- When there is a single text column in the text area, select works in the same way as any other object. You can move the text area, scale it, change its style, and so on, as described above.

- When there is more than one text column, selection is a two stage process. When you first click Select (or Adjust, in multiple object selection) over the text area, the entire area is selected. You can move the area, but it cannot be scaled. Double-click Select (or Adjust) to select a column of the text area. The individual columns can be moved and scaled. Their new position and size need not lie within the original text area. When the size of a text column changes, the text is reformatted to fit the new size of the column. At the end of the operation, the bounding box of the text area is changed to reflect any changes made to the column; it is arranged to contain all of the text columns, with a small additional border. To select more than one column of a text area, select the first as described above, and select further ones by first clicking Adjust and then double-clicking Select over the column.

Text areas and text columns cannot be rotated.

Note that some select mode actions cannot be applied to text columns. If there are any text columns selected when you do the action, they are deselected first. An example of this is object deletion: you can delete a text area as a whole, but not a text column from within it.

The following text creates the text area opposite:

```
\! 1
\AD
\D2
\F0 Trinity.Medium 24
\L24
\P24
\0A sample text area
```

```
This  is  an  example  of  a  text  area  containing  two
columns. The text was prepared in Edit, and then saved
directly into Draw. The columns were then stretched to
the  right  size,  using  select  mode,  and  the  rectangles
added.
```

A sample text area	Draw. The
This is an example of a text area containing two columns. The text was prepared in Edit, and then saved directly into	columns were then stretched to the right size, using select mode, and the rectangles added.

The appearance of a text area is determined from commands which are included in the text used to create it. Each command starts with a backslash character. The full list of sequences is given below, but the following is a brief description of the commands used in the example.

- \! 1 tells Draw that this is a text area.

- \AD causes the text to be justified to left and right in its columns.

- \D2 indicates the number of columns to be used.

- \F0 Trinity.Medium 24 specifies font 0 as Trinity.Medium, 24 point.

- \L24 sets the line spacing to 24 points.

- \P24 sets the spacing between paragraphs to 24 point. In this example, this just affects the space after the title.

- \0 selects font 0 for the following text.

Text area commands

The following is a complete list of text area commands. Some commands must be terminated with either a newline or a slash (/) character. Others do not need a terminator (for example, where the command has a fixed number of characters), may optionally end with a slash character. For clarity, it is often useful to include it. All commands are case sensitive.

In the following descriptions,

- Items in angle brackets (for example <code>) indicate a parameter you must supply.

- Items in square brackets are optional (for example `[/]` indicates an optional slash character).
- `<sp0>` is used to mean zero or more spaces, and `<sp1>` one or more spaces.
- `<newline>` means a single newline character, and `<nl>` means newline or /.

The full list of annotations is as follows:

- `\!<sp0><version><nl>`

This is a special line which must appear at the start of any file which is to be used for a text area. `<version>` must be 1. However, it forms part of a default header which is inserted at the start of the text; this is described below.

- `\A<code>[/]`

Set alignment. `<code>` may be L (left aligned), R (right aligned), C (centred) or D (double, ie justified to both margins). An alignment setting forces a line break. The default setting is left aligned.

- `\B<sp0><red><sp1><green><sp1><blue><nl>`

Set the background colour to the given red/green/blue intensity, or the best available approximation. Each intensity is in the range 0 to 255; values outside this range will be limited to it (ie a value set higher than 255 will be realised as 255; a value set to less than 0 will be realised as 0). Background colours are used in the same way as for text objects. The default is the background style attribute of the text area object, normally white (equivalent to \B255 255 255).

- `\C<sp0><red><sp1><green><sp1><blue><nl>`

Set the text colour to the given red/green/blue intensity, or the best available approximation. Each intensity is in the range 0 to 255; values outside this range will be limited to it. The default is the text colour style attribute of the text area object, normally black (equivalent to \C0 0 0).

Draw

* `\D<sp0><columns><nl>`

Indicates that the text area is to contain the indicated number of columns. This must appear before any printing text. The default is 1.

* `\F<sp0><font`
  `number><sp0><name><sp1><size>[<sp1><width>]<nl>`

Defines a font reference. <font number> is either one or two digits. The font number is used to subsequently set the font. <name> is a font name such as Trinity.Medium. <size> and <width> are the height and width of the font in points. If <width> is omitted, the size is used for both height and width. There are no defaults.

* `\<font number>{/]`

Indicates that the text from the point at which the command appears is to appear in the specified font. If the font is not available when the text is being drawn, the effect is undefined. Draw will attempt to check that the font number and the corresponding definition are reasonable. There is no default.

* `\L<sp0><line spacing><nl>`

Sets the line spacing (the distance from the base of the characters in one line to the base of the characters in the next) to the given value, measured in points. Line spacing changes take effect from the end of the output line in which the command appears. The default is 10 points.

* `\M<sp0><left margin><sp1><right margin><nl>`

Sets the left and right margins to the given values, measured in points. If the total size of the margins is greater than the width of the column, no text is output. Margin settings apply from the end of the output line in which the command appears. The default is 1 point at each side.

- `\P<sp0><paragraph spacing><nl>`

Sets the extra space inserted between paragraphs to the given value, measured in points. Paragraph spacing changes take effect from the end of the output paragraph in which they appear. The default is 10 points.

- `\U<sp0><position><sp1><thickness><nl>`

Switches on underlining, at the given position relative to the base of the characters. <position> is limited to the range –128 to 127, and <thickness> to the range 0 to 255. Both values are measured in units of 1/256 of the current font size. Underlining may be turned off by specifying a thickness of 0.

- `\U.[/]`

An alternative way of turning underlining off.

- `\V[-]<vertical move>[/]`

Moves the following text by the given amount, measured in points, relative to the current character position. <vertical move> is a single digit. This is intended for superscripts and subscripts; use positive values for superscripts, negative values for subscripts.

- `\-`

Inserts a soft hyphen. This tells Draw that it may split the word at this point if necessary, inserting a hyphen character in the output. If the word is not split at the soft hyphen, it has no printing effect.

- `\<newline>`

Forces a line break.

- `\\`

Inserts a backslash character.

- \;<text><newline>

Treated as a comment. Characters up to and including the next newline are ignored.

Line splitting

Draw displays text in text areas by splitting it into lines and columns. When working out where to split the text, Draw first tries to split it at the space or soft hyphen that gives the most characters that will fit in the column. If this is not possible, the text is split at the character that gives the longest line that just fits in the column.

Special characters and paragraph formatting

Certain characters have special interpretations:

- All control characters are ignored, except tabs, which are treated as spaces.
- Newline characters appearing before any printing text insert a paragraph spacing.
- A single newline character in the body of the text is treated as being equivalent to a space, unless it is preceded or followed by a space, in which case it is ignored.
- A sequence of n newline characters in the body of the text inserts n–1 paragraph spacings.

For columns other than the first, paragraph spacings at the head of the column are ignored. Lines which protrude vertically beyond the limits of the column are not displayed; however, all commands occurring in them are interpreted. This can occur if the line spacing is significantly smaller than the font height. You should take care (by using the \M command) to ensure that lines do not protrude beyond the limits of the column horizontally, since the text may not be displayed correctly in this case. The only circumstances in which this is likely to happen are when an italic font is used and the margin setting does not allow for it.

Font usage

When a text area is being constructed from a text file, or being loaded as part of a Draw file, checks are made on the fonts contained in it. If a font is not available, a warning message is displayed. Text that should be in this font will appear in the most recently used font. If no valid font has ever been seen, the text is not displayed.

Exporting text from a text area

Text used to construct a text area may be re-exported into a text file, by choosing **Text area** from the Save menu. This can be useful for altering text areas in a Draw file, when the original text file used to create them is no longer available.

Default text area header

If the text does not start with a version number line (\! 1), Draw will insert the following standard header:

```
\! 1
\F 0 Trinity.Medium 12
\F 1 Corpus.Medium 12
\0
\AD
\L12
```

This defines two font references, sets the text to be displayed in font 0 (Trinity.Medium), justified to both left and right margins, with a line spacing of 12 points.

If you subsequently export the text, the standard header will be exported as well.

DXF files

Draw can read files in DXF (data interchange) format. This is a file format used by other graphics programs such as AutoSketch. Draw cannot save files in DXF format.

When you load a DXF file into Draw by dragging it into a window or onto the Draw icon, a dialogue box appears, in which you can specify:

- whether coordinates and sizes in the file are to be interpreted as being in inches or centimetres;

- a scaling unit to be applied to all coordinates and sizes;

- the name of the font in which text is to be plotted. If the name you give is blank, or is not the name of a anti-aliased font known to Draw, the text will be plotted in the system font.

To load the file, click on OK. If you click on Abandon, the file is not loaded.

The following restrictions apply to DXF files loaded into Draw:

- The following DXF object types are not implemented: SHAPE, ATTDEF, ATTRIB, 3DLINE, 3DFACE, DIMENSION.

- Line types are ignored: all lines are created as solid.

- Layers are not implemented.
- Text justification may be approximate in anti-aliased fonts.
- Polylines are drawn in a single width and colour.
- Colours are guessed from a set of standard values. Unknown colours are converted to black.
- Text may not be rotated or oblique. The text style table is not used. There is no backwards or upside-down plotting.
- A single font is used for all the text in the file.
- There is no curve fitting.
- Block INSERTs do not use column and row values, attribute entries, rotation, or z scaling.

Paint

An introduction to sprites

Paint is a pixel-based picture editor; you can use it to 'paint' coloured images by applying colours to an area with a variety of brushes and painting tools.

Paint is controlled from a tools window and several menu trees, which are described fully in this chapter. (For a description of menu trees in general, see the chapter entitled *Menus and dialogue boxes* in Part 1 of this Guide.)

Paint pictures are kept in the form of sprites. A sprite is just a graphic shape made up of an array of pixels (the smallest unit the screen uses in the current mode). Sprites are stored in sprite files, which may contain more than one sprite. Sprites and sprite files use a standard format, so you can freely export images produced by Paint to other programs that use sprites; you can also use Paint to edit sprites produced elsewhere.

Sprites have the following attributes:

- a name used to identify the sprite (sprite names are 1 to 10 characters long);
- a definition mode indicating the screen mode that was set when the sprite was defined;
- optionally, a mask (sometimes called a transparency mask);
- optionally, a palette defining the colours used in the sprite;
- a height and a width. In Paint, these are given in pixels.

Within the sprite, each pixel has a colour, chosen either from the sprite's palette, if it has one, or the palette for the screen mode it was defined in. If the sprite has a mask, you can use a special value in place of a colour, which indicates the pixel is transparent. When a sprite is painted, the existing screen display shows through the transparent pixels. By setting transparent pixels on the border of a sprite, you can construct sprites which are effectively non-rectangular.

The size and shape of the pixels in a sprite, and the number of colours available, are derived from the screen mode.

Starting Paint

Paint is loaded in the same way as the other editors: by first installing its icon on the icon bar. You can edit an existing sprite file – such as PaintDemo, provided in the Applications Suite – by dragging a sprite file to the Paint icon on the icon bar, or by double-clicking on the sprite file icon. For how to create a new sprite, see *Basic techniques*, opposite.

Paint has several windows with specialised functions:

Sprite file window

The sprite file window shows all the sprites which are defined in the file you are working on: PaintDemo, for example, contains two sprites. The window shows the sprites at actual size if possible, or in a scaled-down form if they are large. You can edit more than one sprite file at a time; each has its own sprite file window.

Sprite windows

Sprite windows are used for creating and editing the sprites themselves. You can have zero or more sprite windows on the screen. Each window contains one sprite. Open a sprite window for a sprite by double-clicking on it in the sprite file window.

Sprite colour windows

You can also have zero or more sprite colour windows; to open a colour window, press Menu on the sprite window, go to the Paint submenu and select **Show colours**. Each window corresponds to one of the sprites you are working on, although you need not have a colour window on the screen to edit the sprite. Sprite colour windows are used for choosing the colour that you are editing with. There is a separate sprite colour window for each sprite, because different sprites may have a different range of colours available.

Paint tools

This window is used to select and alter the tools you use for painting the picture; display a Tools window by pressing Menu on the sprite window, moving to the Paint submenu and selecting **Show tools**. The top section of the window shows the tools. The currently selected one is highlighted and the name of the tool is shown. Below this are buttons used to select how colour will be applied to the image. When certain tools are selected, an extension may appear at the bottom of the tools window for setting extra parameters.

The sprite file window and the sprite windows each have their own menu. There is a further menu associated with the Paint icon on the icon bar. The tools and menus are described in detail later in this section. First, some basic editing techniques are introduced as an overview of the process of creating and editing a sprite.

Basic techniques

To edit an existing sprite

1 Load a sprite file into Paint by double-clicking on its icon.

2 Open a sprite window for the sprite you want to edit by clicking on its name in the sprite file window.

3 Open the tools window, and the colours window for the sprite.

4 Modify the sprite by selecting tools and colours and applying them in the sprite window.

5 Save the modified sprite file.

To create a new sprite

1 Open a new sprite file window by clicking on the Paint icon on the icon bar.

2 Click Menu on the sprite file window and choose Create.

3 Enter a name for the sprite, and values for its other characteristics (full details of these are given later).

4 Click on OK. The name you have entered will appear below a blank rectangle in the sprite file window.

5 Double-click on this name to open a sprite window for the new sprite.

The tools in detail

To use a tool to edit a sprite:

1 Click Select on the tool in the Paint tools window.

2 If you wish, set or change any parameters (values such as the size of the spray or brush), and the colour of the 'paint' being used.

3 Move the mouse to the sprite window, and apply the tool as described below.
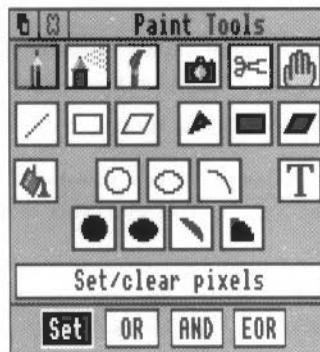
Note that there are four different ways in which the tool can apply colour to the sprite, chosen with the Set, OR, AND and EOR buttons. The descriptions that follow are given in terms of 'Set'. In this case, the colour applied by the tool replaces the colour which is already present. The four ways of applying the tool are described after the details of the tools. See *Sprite colour windows* below for the method of choosing the colour to be applied by the tool.

You can cancel any of the sequences of operations described below by clicking again on the current tool.

Set/Clear pixels

To set a single pixel to the current colour, click Select over the pixel. To set several pixels, press Select and drag the mouse over the pixels.

If you use Adjust instead of Select, the pixels are cleared to the first colour in the palette.

In both cases, if you drag the mouse quickly, the pixels that you set or clear will be scattered along the path of the mouse. You can use this for shading areas of the picture.

Spray can

To 'spray' pixels in an area around the mouse position to the current colour, click Select over the centre of the area. As with Set/Clear pixels, you can drag the mouse as you spray onto the sprite.

If you use Adjust instead of Select, the pixels are cleared to the first colour in the palette.

Parameters:

The spray can has two parameters, which you set by typing in the value you want:

- **Density** controls how many pixels are set or cleared in each spray operation. The higher the density, the more pixels are affected.

- **Radius** controls how far the spray extends from the mouse position.

Use sprite as a brush

To set an entire block of pixels around the mouse position, click Select over the centre of the region. You can also drag the mouse as you paint with the brush.

The brush is itself a sprite. You can use the brush either to fill in a block of pixels in the current colour, using the sprite mask, or to set a block of pixels using the sprite image itself. A standard brush shape with the sprite name 'brush' is provided.

If you drag with Adjust, the brush is used in the current background colour.

Parameters:

The toolbox displays a box in which you can set two parameters:

- **Name** of the sprite to be used for the brush;
- **X scale, Y scale** multipliers defining the actual size of the area painted by the brush relative to the size of the sprite. For example, a scale factor of 2:1 means the brush is twice the size of the sprite defining it, and 2:3 means two-thirds the size. Each scale factor consists of two numbers which may be set independently.

When you have entered the values you want, click on OK.

Shape determines whether just the mask of the sprite is used, or its colours as well. To change the parameter, click on the button. When 'shape' is set the button is highlighted, and the brush fills the pixels in the brush sprite which are not transparent with the current colour. When 'shape' is not set, the brush paints with the sprite image.

Copy block

To copy a rectangular block of pixels from one part of a sprite to another:

1 Select **Local** from the new panel that appears at the foot of the Tools window when you select **Copy**.

2 Position the mouse pointer on one corner of the block to be copied.

3 Press Select, drag the mouse to the other corner of the block and release Select.

4 Move the mouse pointer to the destination for the block and click Select.

Step 3 may be repeated to make multiple copies. To copy another area, click the **Copy block** icon in the tools window again. Note that the box you mark is actually rounded outwards to the nearest block of pixels that encloses the box.

Copy block is also used to create a new sprite from a block of an existing sprite. The new sprite can be set up in one of the sprite files you are already editing in Paint, or it can be saved in an entirely new sprite. To do this, first click on the **Export** box in the Tools window. Then follow steps 2 and 3 as above to mark the block. When you release the mouse, a Save dialogue box for the block appears. To save the block to a new file follow the methods described in the chapter *Loading and saving*. To save the block as a new sprite in a sprite file, enter a name for the sprite, and drag the icon to a Paint sprite file window.

Move block

To move a rectangular block of pixels from one part of a sprite to another:

1 Position the mouse pointer on one corner of the block to be moved.

2 Press Select, drag the mouse to the other corner of the block to be moved, and release Select.

3 Move the mouse pointer to the destination for the block and click Select.

The area occupied by the source of the move is set to the first colour defined in the palette.

As for **Copy block**, the box you mark is actually rounded outwards to the nearest block of pixels that encloses the box.

Move block can be used to export a block of pixels. This is identical in use to **Copy block**.

Move whole sprite

To move the entire sprite, press Select within the sprite window, drag the mouse to the new position and release Select. Note that if you move any part of the sprite image outside the limits of the sprite it is permanently lost.

Lines

To create a solid line of pixels in the current colour:

1 Click Select at the start point of the line.

2 Move the mouse to the end point of the line.

3 Click Select.

Rectangle outlines

To create a rectangle outline in the current colour:

1 Click Select at one corner of the rectangle.

2 Move the mouse to the other corner.

3 Click Select.

Parallelogram outlines

To create a parallelogram outline in the current colour:

1 Click Select at one corner of the parallelogram.

2 Move the mouse to the next corner.

3 Click Select.

4 Move the mouse to the third corner.

5 Click Select.

The position of the fourth corner is derived from the other three.

Filled triangles

To create a filled triangle in the current colour:

1 Click Select at one corner of the triangle.

2 Move the mouse to the second corner.

3 Click Select.

4 Move the mouse to the third corner of the triangle.

5 Click Select.

Filled rectangles

Filled rectangles are created in the same way as outline rectangles.

Filled parallelograms

Filled parallelograms are created in the same way as outline parallelograms.

Replace colour

To replace one colour by another in a sprite:

1 Select the new colour from the sprite colour window (see below for how to display this if it is not already on the screen).

2 Click Select in the area to be changed.

Colours can be changed locally or globally. In a local change, the pixels that are changed are the one you click on, and any others which are connected to it by pixels of the same colour as the one you click on. In a global change, all pixels in the sprite which have the same colour as the one you click on are changed.

To select local or global changes, click Select on the corresponding button in the tools window. The current option is highlighted.

Circle outlines

To create a circle outline:

1 Click Select where you want the centre of the circle to be.

2 Move the mouse until the circle has the required radius.

3 Click Select.

Ellipse outlines

To create an ellipse outline:

1 Click Select at the centre of the ellipse.

2 Move the mouse to indicate the width of the ellipse as described below.

3 Click Select.

4 Move the mouse until the ellipse has the required size and orientation.

5 Click Select.

The ellipse is set up so that its outline crosses the horizontal through the centre of the ellipse at a distance determined by the horizontal offset of the point designated in steps 2 and 3 from the centre.
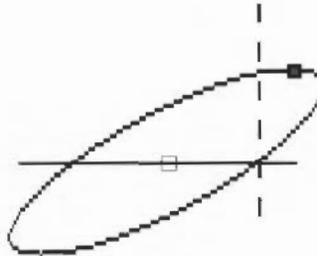
Circle section outlines

To create a section consisting of a circular arc:

1 Click Select at the centre of the arc.

2 Move the mouse to one end point of the arc.

3 Click Select.

4 Move the mouse to the other end of the arc.

5 Click Select.

Insert text

To insert text into the sprite, type in the text, x and y character sizes, and character spacing into the tools window; then click Select in the sprite window at the position where the centre of the text is to be positioned. The sizes and spacing are measured in pixels; only the system font is available. The text is drawn in the current colour.

Filled circles

Filled circles are created in the same way as outline circles.

Filled ellipses

Filled ellipses are created in the same way as outline ellipses.

Filled circle segments

Filled circle segments are created by indicating the end points of an arc, using the same technique as circle outline segments. The area filled is bounded by the arc and by a straight line between the end points of the arc.

Filled circle sectors

Filled circle sectors are created by indicating the end points of an arc, using the same technique as circle outline segments. The area filled is bounded by the arc and by lines running from the end points of the arc to the centre of the circle.

Note that in operations such as drawing lines and rectangles, you can click Adjust instead of Select to move the nearest previously set point to the current position. For example, clicking Adjust instead of Select at step 3 of the parallelogram operation returns you to step 2, with the first corner taken from the location at which you clicked Adjust.

While some operations are in progress, a skeleton line or area is shown.

Applying colour to the sprite

As noted above, there are four different ways in which you can apply colour to a sprite, chosen using the Set, OR, AND and EOR buttons in the tools window. Set causes the colour itself to be painted into the sprite. The remaining three styles cause the indicated logical operation to be applied between the colour number of the pixel on the screen and the colour number selected from the sprite colours window. (The colour number appears in the colour window when the colour is selected.)

For example, if EOR is selected, spraying with colour 11 (binary 1011) onto an area that is currently colour 12 (binary 1100) will produce pixels in colour 7 (binary 0111). The most interesting effects are achieved when spraying over a range of existing colours, or drawing overlapping filled shapes. Experiment for yourself!

For a description of the logical operations, see the *BBC BASIC Guide*.

Sprite windows and the Sprite menu

Each sprite window contains a single sprite. All individual sprite editing actions· are carried out in the sprite window. You can have more than one window open for a particular sprite. This enables you to set different magnifications, display a grid in one window but not others, scroll to different parts of the sprite, and so on. Changes made in one window are reflected in the others.

There is a menu associated with sprite windows. Click Menu over a window to obtain it. The menu entries are as follows:

```
Sprite
Info    ⇩
Save    ⇩
Paint   ⇩
Edit    ⇩
Zoom    ⇩
Grid    ⇩
Print   ⇩
```
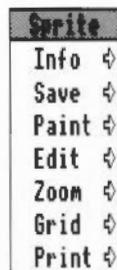
Info tells you about the sprite you are editing. The attributes of the sprite are shown, together with the amount of memory needed to store it.

Save leads to a submenu from which you can save the sprite and the sprite palette. This is done in the standard fashion, described in the chapter *Loading and saving*.

Paint leads to a submenu used for controlling the editing facilities available. It has the following entries:

```
Sprite
Info    ⇩
Save    ⇩          Paint
Paint   ⇩    Select ECF      ⇩
Edit    ⇩    Select colour
Zoom    ⇩    ----------------
Grid    ⇩    Show colours
Print   ⇩    Show tools
             ----------------
             Small colours
             Edit palette
```
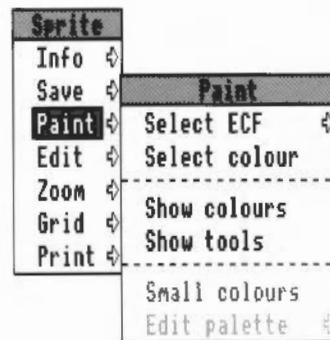
Select ECF leads to a dialogue box which you can use to extract the bottom lefthand pixels of a named sprite as an Extended Colour Fill (ECF) pattern. Up to four such patterns may be defined. ECFs consist of patterns that may be used in place of a colour in a pixel, and will be added to the sprite palette. The ECF is taken from a rectangle 8 pixels tall, in the bottom left of the named sprite. The width of the rectangle depends on the number of colours in the sprite the mouse pointer was over when you clicked Menu: 8 pixels wide for 2-colour modes, 4 wide for 4-colour modes, 2 wide for 16-colour modes and 1 wide for 256-colour modes. You can define up to four ECFs for each sprite. To set the ECF, type in the name of the sprite it is to be taken from, click on the number of the ECF to be defined, and click on OK. To use the ECF in editing, select it in the colour window.

Select Colour: Choosing this sets the colour for future tool window operations to the colour of the pixel the mouse pointer was over when Menu was pressed. It can be used to find out exactly which colour has been used at a point in a sprite.

Show Colours displays the sprite colour window, if it is not already on the screen. If the colour window is already open, but is hidden, it is brought to the front of the screen, appearing at the pointer position.

Show Tools displays the tools window if it is not already on the screen. If the tools window is already open, it is brought to the front of the screen.

Small Colours toggles the size of the sprite colour window; the colour window must be open. The small colour window takes less screen space than the large one. This is particularly valuable in 256-colour modes. The menu item is ticked when the small colour window is in use.

Edit Palette: This option is only available for sprites that have their own palette. The menu item leads to a colour dialogue box which you can use to change the sprite palette. See the chapter entitled *Introducing the Applications Suite* at the beginning of Part 2 of this Guide for a description of how to choose colours. The colour you choose is transferred to the currently selected entry in the palette.

Edit leads to a submenu used for miscellaneous editing actions on the sprite. It has the following entries:

```
┌─────────┐
│ Sprite  │
├─────────┤
│ Info  ◇ │
│ Save  ◇ │
│ Paint ◇├────────────────────────┐
│ Edit  ◇│          Edit          │
│ Zoom  ◇│ Flip vertically         │
│ Grid  ◇│ Flip horizontally       │
│ Print ◇│ Rotate              ◇  │
└────────┤ Adjust size         ◇  │
         │ Insert columns      ◇  │
         │ Insert rows         ◇  │
         ├- - - - - - - - - - - - -┤
         │ Delete columns      ◇  │
         │ Delete rows         ◇  │
         ├- - - - - - - - - - - - -┤
         │ Mask                   │
         │ Palette                │
         └────────────────────────┘
```
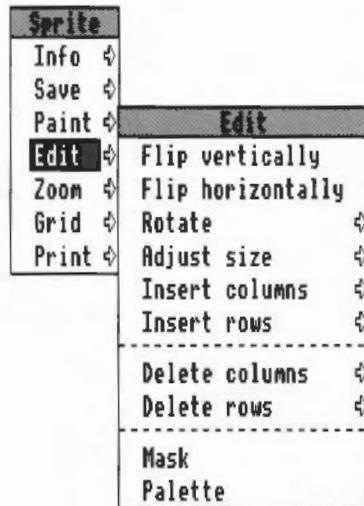
Flip vertically inverts the sprite vertically about its centre.

Flip horizontally inverts the sprite horizontally about its centre.

Rotate leads to a box, into which you type the rotation angle (expressed in degrees anticlockwise).

Adjust Size leads to a dialogue box which you can use to alter the height and width of the sprite. The values are changed either by typing in new values, or by using the boxes marked with arrows to alter the values. When you have set the size you want, click on OK.

Insert Columns leads to a box into which you type the number of columns to insert.

Insert Rows leads to a box into which you type the number of rows to insert.

Delete Columns leads to a box into which you type the number of columns to delete.

Delete Rows leads to a box into which you type the number of rows to delete.

The above four operations apply at the last position you edited in the sprite window. This will be shown as a box on the sprite. By moving the mouse pointer into the sprite window (without passing over a menu) you can change the size of the box. The menu item shows the current size of the box; click Select to use the current size.

Mask: choose to toggle whether the sprite has a mask or not. The menu item is ticked if the palette has a mask. See *Sprite colour windows*, below, for more about masks.

Palette: choose to toggle whether the sprite has its own palette or not. The menu item is ticked if the sprite has its own palette.

Zoom leads to a magnifier dialogue box which you can use to change the size at which the sprite is displayed. See the chapter entitled *Introducing the Applications Suite* at the beginning of Part 2 of this Guide for a description of how to use the magnifier dialogue box. Note that the magnification changes the size at which the sprite is displayed in the window; the definition, height and width are not affected.

Grid leads to a submenu of colours. Choose one to display a grid in the colour in the sprite window. The grid shows where the pixel boundaries are; it can be useful for lining up parts of the sprite. If you choose Grid directly from the menu (ie without moving to the colour submenu), the grid is turned on or off. The grid is not shown if the displayed size of the sprite is too small (magnification of less than 4:1).

Print leads to a dialogue box which you can use to print the sprite. The exact contents of the dialogue box depends on the printer driver in use, but typically allow you to choose the orientation (portrait or landscape), scaling, and position on the paper. If no printer driver is available, the menu item is shaded.

If you choose Print directly from the menu, the sprite is printed using the previous settings.

Sprite colour windows

The sprite colour window is used to select the current colour for the editing you are doing. The current colour is highlighted, and shows the colour number. The colours shown are the shades that can be displayed in the current screen mode. These may be an approximation to the actual palette of the sprite.

If you have defined any Extended Colour Fill (ECF) patterns for the sprite, they are also shown in the sprite colour window.

If the sprite has a mask, an extra, special colour is shown in the bottom lefthand corner of the sprite colour window, as a grey or shaded square. You can use this colour – in the same way as any other colour – for making pixels transparent; this can be useful if, for example, you wish to design a sprite so that if it is displayed on top of another sprite, the 'lower' sprite can be seen. The pictures below show, on the left, the top sprite with a grey background, and on the right, the top sprite with a transparent background.

If you close the last window open on a sprite, the corresponding sprite colour window closes as well. However, the sprite colour window can be closed without closing the sprite window.

Sprite file windows and the Paint menu

The sprite file window shows all sprites defined in the file. The sprites in this window are updated as you edit them in a sprite window. There can be more than one sprite file window open at a time. If you close the sprite file window, all the sprite windows close.

To open a sprite window for a sprite, double-click on it in the sprite file window.

There is a menu associated with sprite file windows. Click Menu over the window to obtain it. The menu entries are as follows:

Paint	
Info	⇨
Save	⇨
Create	⇨
Sprite 'optoff'	⇨
Display	⇨

Info displays information about the sprite file.

Save leads to a Save dialogue box for saving the sprite file. See the chapter *Loading and saving* for details of how to save files.

Create leads to a dialogue box which you can use to create a new sprite. You must specify a name for the new sprite. Default values for the height, width and screen mode are given; these may be altered. You can set whether the sprite has a mask and/or its own palette by clicking on the Mask and Palette boxes. A star appears in the box when the corresponding option is set. When you have set up all the characteristics of the sprite, click on OK. The new sprite is created in the sprite file window.

Sprite '*name*' leads to a submenu of actions applying to an individual sprite. This is only available if the mouse pointer was over a sprite when you clicked Menu. The submenu contains:

Delete deletes the sprite.

Copy leads to a box where you should type in a new name and press Return to make an exact copy of the sprite under the mouse pointer with the given name.

Rename leads to a box where you should type in a new name and press Return to change the name of the sprite.

Save leads to a standard Save dialogue box for saving an individual sprite.

Info displays a box containing information about the sprite.

Print leads to the same dialogue box as is reached via the Sprite menu.

Display leads to a submenu which allows you to select how sprites are shown:

Drawing and name: choose this to display a sprite in the sprite file window as the sprite and its name only. Selecting this switches 'Full info' off.

Full info: choose this to display a sprite in the sprite file window as the sprite and its name, together with more detailed information about the sprite. Selecting this switches 'Drawing and name' off.

Use desktop colours: choose this to toggle whether the desktop colours, or a set of standard default colours for the sprite mode are used in displaying sprites. Using the desktop colours will show you how the sprite would appear if used as an icon. This option is ignored if the sprite has its own palette.

There is a further Paint menu, obtained by pressing Menu over the Paint icon on the icon bar.

Info leads to a dialogue box containing details about the version of Paint.

Get screen area: choose this to take a 'photograph' of part of the screen, as a sprite. When you choose this option, the mouse pointer changes to a camera with an arrow. Proceed as follows:

1 Move the mouse pointer to one corner of the area you wish to capture.

2 Press Select and drag the mouse pointer to the other corner.

3 Release Select. A Save dialogue box appears. Continue as described in the chapter entitled *Loading and saving*, in Part 1 of this Guide.

Quit: choose this to close down Paint; you will be warned if there are any files you have not saved.

Maestro

Maestro enables you to transcribe music in standard musical notation and play it through the computer's own sound system; it also provides some simple editing facilities. The following description assumes that you are familiar with musical notation.

Install Maestro on the icon bar in the usual way (by double-clicking on its icon in the directory display). Display the Maestro window by clicking on the icon in the icon bar.

The best way to get started with Maestro is to load one of the tunes supplied as part of the Applications Suite. To do this, double-click on one of the Tune icons, or drag it onto the Maestro icon on the icon bar. The window that appears looks like this:
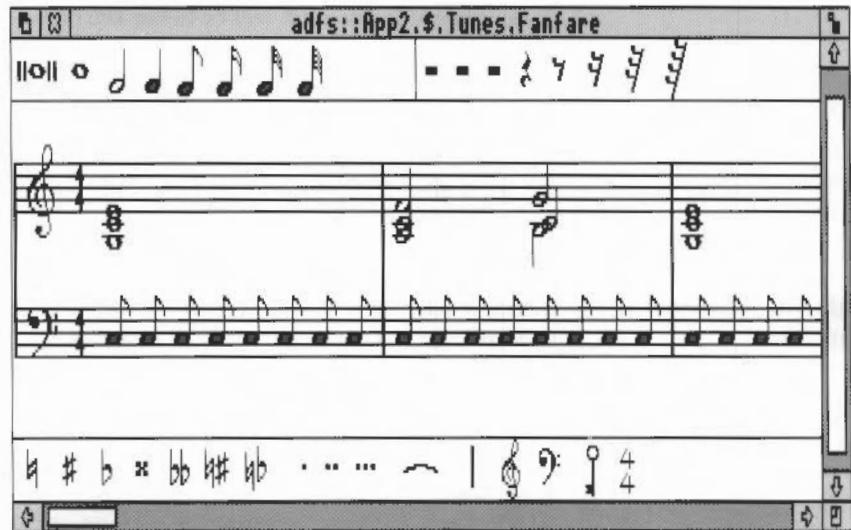
The Maestro window is divided into three horizontal panels, with the stave in the centre. Scrolling affects only the central panel. Above and below the stave are toolboxes containing icons for notes, rests, clefs and other symbols.

To play the tune, click Menu to open the main Maestro menu. Click Select on Play to start the music. As the music plays, the score scrolls across the screen. Click Play again to stop the tune: another bar or so will play before it actually stops. To return to the beginning of the score, use the horizontal scroll bar.

Before setting up your own score, try out the following editing procedures on one of the tunes supplied with the Applications Suite.

Editing the score

Adding and deleting notes and rests

To add a note or rest, select the value you want by clicking on its icon in the pane above or below the score. The selected item will appear with a frame around it, and when you move the pointer onto the score window, a 'trial icon' appears, which moves around as you move the pointer. When the item is in the position you want, click Select. To get rid of the trial icon without adding a note or rest to the score and without selecting an alternative trial icon, press Menu, move the pointer off the Menu and press Select.

Notes may be placed anywhere; above and below each stave they will create their own ledger-lines. In the case of notes with stems, the stem trails behind the trial icon: if the pointer is moved downwards, the stem will be above the note; if upwards, the stem will be below the note.

Rests will appear only in their valid positions, in the centre of the stave.

To delete a note or rest, select the icon for the same value, and position the trial icon exactly over the item you wish to remove (it doesn't matter whether the stem goes the same way or not). When it is in the right place, the trial icon will appear to blot out the original item. Click Select and the item will be deleted.

Adding dots, accidentals, bars and ties

Select a lengthening dot in exactly the same way as a note or rest. Move the pointer over the note you wish to lengthen and click Select. To delete a dotted note, you do not have to delete the dot separately: delete the note and the dot will disappear too.

Select and place accidentals, bars and ties in the same way: like notes and rests, they will appear only in valid positions. A bar will be inserted across all the staves in the score when you click on one of them.

Note that the tie character is of a fixed length, but when placed between notes of the same pitch, a single note will sound, with a duration equal to the two notes added together.

Adding clefs and key and time signatures

Clefs may be selected and placed like other items: they will appear only at the beginning of a bar.

Key and time signatures must be selected before they are positioned on the score. This is done using the Maestro menu, and the process is described in the appropriate section below.

The Maestro menu tree

As in any application, clicking Menu on the Maestro window will display the top-level menu.

```
 Maestro
 Save       ⇨
 File       ⇨
 Clear
 ----------
 Staves     ⇨
 Instruments ⇨
 Volume     ⇨
 Tempo      ⇨
 ----------
 Time sig.  ⇨
 Key sig.   ⇨
 ----------
 Goto       ⇨
 Play
```

The **Save** procedure is exactly the same as for other applications such as Edit or Draw. Save a score by dragging the Maestro icon into the directory window where you want to save it, or by typing in the full pathname and clicking on OK.

File gives you some information about the file you are working on.

Clear removes the current score from the stave but leaves the Maestro window on the screen.

Staves displays a box where you can enter the numbers 1, 2, 3 or 4 (others are not accepted), and an option '+percussion'. Clicking on this option will add a single line percussion stave; when it is selected, the menu item is ticked. Click on it again to remove the percussion stave.
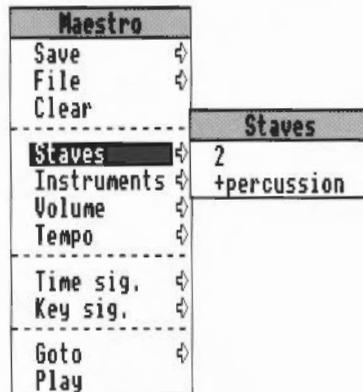
Instruments presents you with a full window containing a line for each voice on each normal stave you have selected, and a single line for the percussion stave (if selected). There is a maximum of eight voices: if you have selected more than two staves, they will be distributed roughly equally between staves. You can scroll this window vertically in the normal way. The following properties can be set for each voice:

- Voice – Repeated clicking of Adjust takes you through the instruments available. Select takes you backwards through the options available.

- Volume – The volume of each voice can be set separately. Click Select to reduce the volume by one 'notch' and Adjust to increase it. To set the overall volume, use the Volume option on the main Maestro menu.

- Stereo – The position of each voice can be changed independently to any one of seven positions, so as to create a spread or stereo image when the music is played through more than one speaker. Click Select to move the voice to the left and Adjust to move it to the right.

Volume enables you to set the overall volume on a scale from ppp to fff.

Tempo allows you to set the tempo on a scale from largissimo to prestissimo.

Time signature presents you with a small box containing a time signature. Position the pointer over the upper number; successive clicks cycle the values from 2 to 16. The lower number can take values of 2, 4, 8 and 16 only.


To assign a time signature to a score (or to add a new time signature in the middle of a score):

1 Make your choice using the Maestro menu.

2 Choose the '4/4' icon from the Maestro window.

3 Position the pointer where you want the time signature to appear.

4 Click Select.

The selected time signature will appear on all staves.

To delete a time signature, select the 4/4 icon, move the pointer onto the time signature and click Select.

The **Key signature** menu tree first asks you to choose between major and minor keys. Taking the major path offers you a set of key signatures with C at the centre, 'flat' key signatures grouped above and 'sharp' signatures below. For minor keys, A is at the centre.
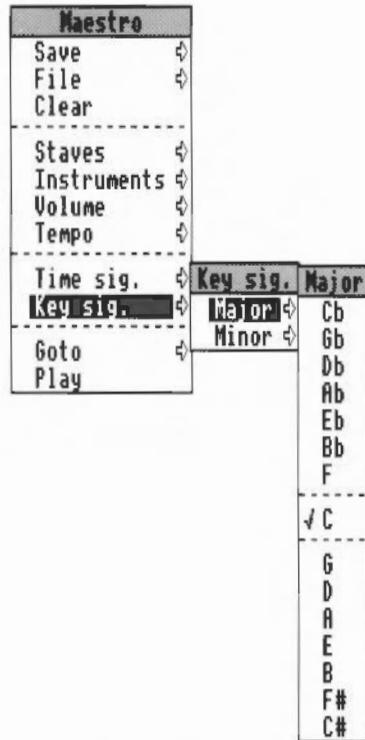
To place a key signature at the beginning of a score, or at the beginning of a bar:

1 Make your choice using the Maestro menu.

2 Choose the 'key' icon from the Maestro window (the trial icon will appear in the form of the selected key signature).

3 Position the pointer where you want the key signature to appear.

4 Click Select.

The selected key signature will appear on all staves.

To delete a key signature, select the key icon, move the pointer onto the key signature and click Select.

Goto presents you with a box into which you type the number of the bar you wish to move to.

Play starts the tune playing from the point displayed on the screen. To stop, click on Play again.

Setting up your own score

The preceding description of the Maestro menu options gives you the information you need to set up your own score. However, for the sake of clarity, the following section sets out the steps to take in their most convenient order (though they can all be changed at any time). The menu options are shown in bold type.

1 Choose the **Staves** you want.

2 Choose your **Instruments**, and their volume and position.

3 Select your **Key signature**, and place it on the score by selecting the key icon and dragging it into place.

4 Select your **Time Signature**, and place it on the score by selecting the 4/4 icon and dragging it into place.

5 Choose the **Volume** and **Tempo** you want.

You are now ready to start placing notes on the staves.

Some tips

If you copy a piece of music from a written score it will occasionally need some minor modifications to play correctly.

Fugues

In fugues scored for the keyboard, several distinct parts may be written on one stave. In the following example from a Shostakovich fugue, bar 20 contains a semibreve G belonging to the top part, and in the second half of the bar, two crotchets belonging to the middle part, which had started bar 20 in the bass stave.

Maestro tries to play these three notes in succession, not understanding that the first crotchet should start half way through the semibreve. Since the semibreve is long enough to complete the bar by itself, the two crotchets are lost. The solution is to write the top line like this:

This indicates to Maestro that the crotchet E starts half way through the bar. Problems of this type can generally be resolved by splitting notes into shorter notes tied together.

Note also that Maestro does not allow two rests in the same time slot on one stave, as is sometimes done in fugues to indicate that two parts are silent.

Staccato

To achieve the effect of staccato, shorten the note value and make up the difference with a rest.

Grace notes and trills

These are not implemented as such, but the effect can be achieved by entering notes of the appropriate small duration, and deducting their value either from the note they would normally be attached to (for an appoggiatura) or from the preceding note (for an acciaccatura). Very effective trills can be produced using an elaborated form of the same method.

Maestro's use of memory

Maestro cannot extend its memory slot once it has started up. It therefore takes at least 256K, to allow for the editing of long transcriptions. However, if the Next slot in the Task Manager is set to more than 256K, Maestro will use up all the space in Next. Since this may be more than you need, you can use the Task Manager (described in Part 1) to reduce Next to 256K, before loading Maestro.

65Host

65Host facilities

65Host substantially emulates a BBC Model B microcomputer, running OS 1.20. It supports direct screen access, and paged sideways ROMs. 65Host uses 128k of memory.

65Host can be used in conjunction with ROM expansion cards. On initialisation, it examines rom:@ and notes the existence of all files of type &BBC ('BBC ROM') in a cache. These files may subsequently be selected as sideways ROMs. An image of BASIC 2 is always available in ROM socket 12.

The emulator provides the following commands at the RISC OS Command Line:

`*ListROMs` lists all sideways ROMs known to the emulator.

`*SwapROMs` *ROM_number ROM_number* swaps the specified cached objects. However, BASIC cannot be swapped out of socket 12.

`*CacheROM` *ROM_number [filename]* with no filename argument ensures that the current name linked to the ROM number is cached. With a filename argument, it loads the specified BBC ROM file into store for use when the emulator is run. The file must be exactly 16k long.

`*LinkROM` *ROM_number [filename]* with no filename argument frees the store allocated for the given ROM number. With a filename argument, it copies the file into the cache for use when the emulator is run.

`*EmulateBBC` starts up the emulator, first cacheing any linked files.

For emulation of a 6502 second processor, use '65Tube' described in the chapter entitled *The modules directory*.

Starting 65Host

To start 65Host, double-click on the 65Host icon. A BBC micro-style screen will appear. You can then use the computer to run BBC Microcomputer programs. To exit from 65Host, type *Quit.

The following restrictions apply to programs running under 65Host. This information should only be needed when using the emulator to run programs that use direct low-level I/O.

FRED (FCxx) and JIM (FDxx) devices

1 MHz bus accesses are trapped and issue OS_Byte calls which are processed by the I/O Expansion card if it is present. If it is not present, reads return &FF, and writes are ignored.

SHEILA (FExx) devices

6845 CRTC	R0–R7 are not implemented. Reads from R16,17 (the light pen position) are ignored.
6850 ACIA	Not implemented. Reads return &00, writes are ignored.
Serial ULA	Reads return &FE. Cassette relay operations have no effect. The transmit and receive baud rates can be set.
Video ULA	Screen cleared on a MODE change. Cannot set the cursor width.
Econet ID	Reads the Econet station number from the value set in CMOS RAM.
Econet IntOn	Not implemented. Read returns &FE.
74LS163 ROMSEL	Writes the corresponding sideways ROM image from the cache into the selected ROM, at addresses &8000...&BFFF. If no ROM is occupying the specified number, then &8000...&800F is written to the ROM number to indicate socket uniqueness, and to indicate that the ROM is invalid. Read returns the current value (unlike the BBC micro, but like the Master 128).
6522 VIA	Reads from most registers echo the current value. Reads from IRB depend on the I/O expansion card to provide ADVAL for FIRE button state. Handles slow I/O bus accesses for BBC keyboard scanning.
6522 VIAB	Depends on I/O expansion card to provide SHEILA handling. If the I/O expansion card is not present, reads return &00 and writes are ignored.

|	
8271 FDC	Not implemented. Reads return &FE; writes are ignored.
6854 ADLC	Not implemented. Reads return &FE; writes are ignored.
U7002 ADC	Depends on I/O expansion card to provide SHEILA handling. If the I/O expansion card is not present, reads return &00, and writes are ignored.
Tube ULA	Not implemented. Reads return &FE; writes are ignored.

Alarm

Alarm displays a clock on the icon bar. You can set alarms which will display messages at specific dates and times. It can also be used to reset the current date and time.

To start Alarm, double-click on the Alarm icon. A clockface appears on the icon bar.

To obtain the Alarm menu, press Menu on the Alarm display on the icon bar. Alarm settings are changed from this menu and its submenus.

```
┌─────────────┐
│   Alarm     │
├─────────────┤
│ Info      ⇨ │
│ Format    ⇨ │
│ Alarm     ⇨ │
│ Set clock   │
│ Silent      │
│ Quit        │
└─────────────┘
```
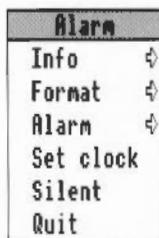
Changing the display format

To change the display format, move to the Format submenu. The formats available are:

- analogue
- hours and minutes
- hours, minutes and seconds
- your own format.

For information on formats, see the chapter entitled *Using variables* in Part 3 of this Guide.

Using the alarm

First note that if you are running Alarm from a floppy disc, the disc must not be write-protected, since Alarm has to store its settings on the disc.

There are two ways to set the alarm. Either click Select on the icon bar icon, or choose the Alarm submenu and select Set. You will be presented with a dialogue box in which to set the alarm date and time, and a space in which you can, if you wish, enter some text which will be displayed when the alarm goes off. An alarm may be marked as urgent by clicking on the Urgent box; for the effect of this, see below.
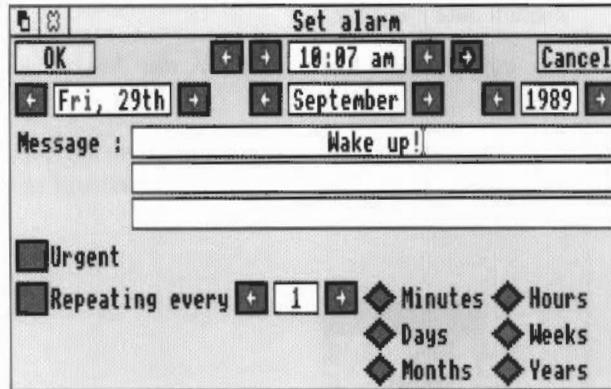
To alter the time and date of the alarm, click on the arrow boxes. Select OK to set the alarm, or Cancel if you change your mind. When an alarm is set, the box surrounding the time display on the icon bar changes colour.

The Alarm menu also allows you to unset and to change the alarm setting.

When the alarm time is reached, a window similar to the illustration opposite appears on the screen. If it is not a repeating alarm, remove the window and cancel the alarm by clicking the Close icon in the alarm display. (For what to do if it *is* a repeating alarm, see below.) Alternatively, click Menu on the window and choose **Accept alarm**. If you wish to defer the alarm (like using a 'Sleep' button on an ordinary bedside alarm clock), choose **Defer alarm**, and select the time interval by which you want to delay the alarm. This then leads to a box into which you can enter the number of minutes, hours, etc.

```
┌─┬─┬────────────────────────────────────┐
│🔲│⊠│            Attention !             │
├─┴─┴────────────────────────────────────┤
│ An alarm was set for 11:50 am,         │
│ Wednesday, 9th November 1988.          │
│                                        │
│ It will repeat at 11:51 am,            │
│ Wednesday, 9th November 1988           │
│              ┌──────────────┐          │
│              │    Alarm     │          │
│              ├──────────────┤          │
│              │ Accept alarm │          │
│              │ Cancel alarm │──────────────────┐
│              │ Defer alarm ▷│ Defer alarm How many? │
│              └──────────────┤ Minutes ▷│  1     │
│                             │ Hours   ▷│        │
│                             │ Days    ▷│        │
│                             │ Weeks   ▷│        │
│                             │ Months  ▷│        │
│                             │ Years   ▷│        │
│                             └──────────┴────────┘
```
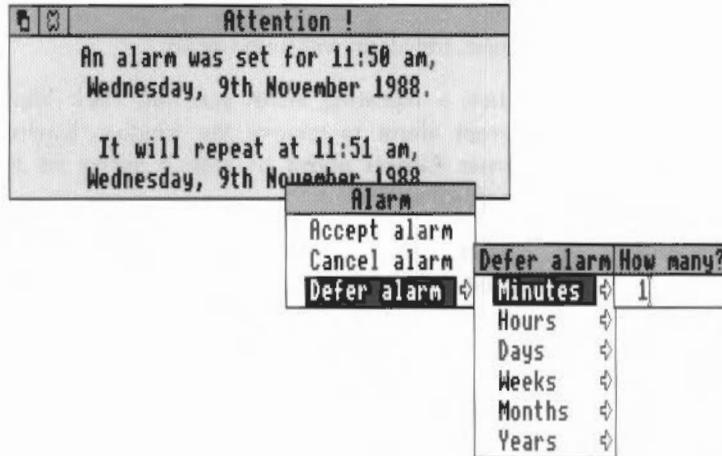
If Alarm is not running when the alarm is due to go off, the alarm will be triggered next time Alarm is started.

Normally, the computer will bleep when the alarm message is being displayed. You can disable this by selecting Silent from the Alarm menu. However, if the message is marked as urgent, the bleep will sound even if Silent is selected.

Multiple alarms

You can set more than one alarm by simply repeating the Set operation described above. When unsetting and changing alarms, clicking Menu allows you to move to a different alarm. Choose Previous alarm or Next alarm to move to the previous or next alarm in time order. Choose Find alarm to locate an alarm by specifying the time and date of the alarm.

Repeating alarms

You can set an alarm to go off more than once by clicking the box marked **Repeating every** in the **Set alarm** window. Alter the repeat interval by clicking on the arrow boxes, and by selecting the unit in which the interval is measured from the buttons shown.

Repeating alarms work by adding the repeat interval to the time when the alarm goes off (rather than the time set for the alarm). Suppose on Friday morning you set an alarm to go off once a day at midday; when midday comes round, the alarm will sound. Suppose that you then remove Alarm from the icon bar and do not put it back there until the following Thursday morning. When you re-install it, a message will appear telling you that the alarm was

set for Saturday morning, but you will not get a message for the alarms that would have gone off from Sunday to Wednesday. At Thursday midday, of course, the alarm will sound again.

When a repeating alarm goes off, click Menu on the alarm window. Choose **Accept alarm** to remove the window, leaving the alarm set for next time, or choose **Cancel alarm** to stop it going off again. The **Defer alarm** option is described above.

Setting the time and date

To set the system time and date, select **Set clock** from the icon bar menu. A dialogue box showing the current date and time appears. Click on the up-arrow and down-arrow boxes to change the time and date. Click OK when you have set the correct values, or on **Cancel** to abandon the operation.

Note that the new time and date apply to the entire system, not just to Alarm.

Quitting Alarm

To close down Alarm, select **Quit** from the menu.

Clock

Clock is an analogue clock face with hour, minute and sweep second hands. To display the clock window, double-click on the Clock icon in the relevant directory display.

The clock may be moved, re-sized and removed like any other window (for how to do this, see the chapter entitled *Windows* in Part 1 of this Guide). To set the time, use Alarm (described in the preceding chapter).
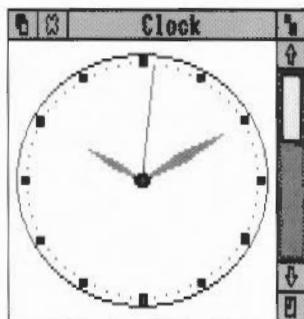
Configure

Configure allows you to change the set-up of your Acorn computer – the values for a range of variables that will be maintained when you switch the machine off.

Starting Configure

To start Configure, double-click on its icon in the directory display. The icon will then appear on the icon bar. To open the Configure window, click on the icon on the icon bar.

Configuration
Mouse speed: [Slow]▮▮[Fast]
Keyboard autorepeat: [Off][Slow]▮▮▮[Fast]
Sound volume: [Off][Quiet]▮▮▮▮▮[Loud]
Sound voice: [WaveSynth-Beep]
Beep volume: [Quiet][**Loud**]
Desktop screen mode: [12]
Econet File Server: [59.254]
Printer port:
◇None   ◇Parallel ◇Serial
◈Econet Printer Server: [white]
▒Printer ignore character: [10]
▒Loudspeaker   ☐Keyboard Caps Lock
▒Auto boot   ▒Directory
▒Instant effect window drags

Changing settings

You can use the Configure window to change the following settings:

Mouse speed controls how fast the pointer moves as you move the mouse.

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

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

These three values are set on a scale; click on the level you want. The keyboard autorepeat and sound volume can also be turned off entirely by clicking the Off box.

Sound voice sets the voice which will be output by the first of the computer's eight sound channels. Since this is the channel used by the beep, you can use this setting to change the quality of the beep to any of the installed voices. Repeated pressing of Select cycles through the voices available.

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

Desktop screen mode determines the screen mode in which the desktop starts up; it can be set to any of the values listed in Appendix D, but those you are most likely to find useful are modes 12 (16 colours) and 15 (256 colours).

Econet File Server sets the fileserver (by number or name) that will be selected by default when you press Menu on the Econet icon bar icon, in order to log on to an Econet network.

Most of the remaining features in Configure may be set by clicking either on the relevant diamond or square, or on the text to its right.

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

- *None* tells the computer that no printer is connected.
- *Net* tells the computer to use a printer connected to your Econet network, if

you have one, and allows you to set the Econet Printer Server by its number or name;

- If you have a printer connected directly to your own computer, it should be connected via the serial or parallel port: your printer manual will tell you which to use. The Printer port should then be set to Serial or Parallel accordingly.

Finer control of these printer features is provided by the printer drivers PrinterPS and PrinterDM, described in a later chapter. The settings made in Configure are used only if a printer driver is not in use.

Printer ignore character tells your printer which characters to ignore. This may be necessary because printers differ in whether they expect lines to end with a linefeed character (ASCII 10) or a carriage return. If you find your printer double-spaces all text when enabled using Ctrl B, click on the **Printer ignore character** box and enter 10 in the box on the right. If, on the other hand, your printer produces overprinted lines, switch **Printer ignore character** off (it does not matter that a number remains in the box on the right). For the use of Ctrl B and Ctrl C to enable/disable the printer, see the chapter *VDU Commands* in Part 3 of this Guide.

Loudspeaker switches the computer's own loudspeaker on or off. When switched off, sound may still be output via headphones or an external loudspeaker plugged into the 32Ω socket on the back of the computer.

Keyboard Caps Lock switches on the Caps Lock key, ie it determines whether letter keys produce upper case only, or upper and lower case.

Autoboot, when switched on, causes a predefined sequence of actions to be carried out whenever Ctrl Break is pressed, or when the computer is switched on or reset. Normally, this involves executing the instructions contained in the file with the name !Boot on the current directory of a hard or floppy disc or in your own area of an Econet network file server. For more information on boot files, see the chapter *Command Scripts* in Part 3 of this Guide.

Directory selects the root directory of the current filing system, on the current disc drive, as the current directory. When switched off, no directory is selected when you turn on or reset your machine.

Instant effect window drags, when set, updates the screen as a window is dragged. When it is turned off, only a dotted outline of the window moves until you have finished the drag; this is quicker, but gives a less accurate impression of the new appearance of the screen.

The changes to the configuration are recorded as soon as you make them.

If you make any changes to the configuration using the Command Line, as described in Part 3, these will be reflected in the Configure window next time you open it.

Quitting Configure

To exit from Configure, click Menu over the Configure icon, and select 'Quit'. You can also close the Configure window without exiting from Configure by clicking on the Close icon in the title bar. If you do this, the window can be re-opened by clicking on the Configure icon.

Magnifier

Magnifier is a program for detailed examination of the screen.

To activate the magnifier, double-click on the Magnifier icon. A magnifying glass will appear at the current pointer location. Use the mouse to move it around the screen.

To increase the magnification, press Adjust; to reduce it, press Select. When you have finished using the magnifier, press Menu.
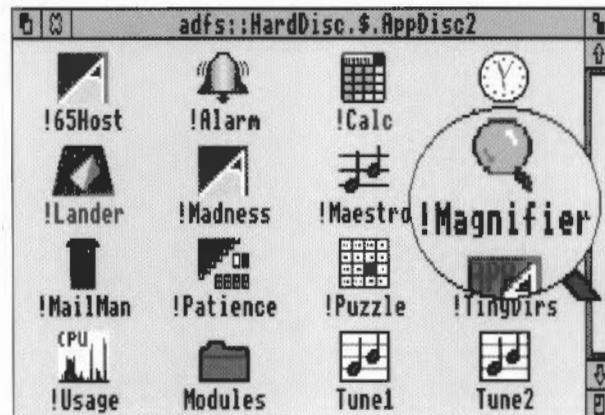
Calculator

The calculator allows you to use your Acorn computer for simple arithmetic. Double-click on the Calculator icon in the relevant directory display to install the Calculator icon on the icon bar. Click on the icon on the bar to display the calculator.

The screen calculator is like a simple four-function (add, subtract, multiply and divide) electronic desk calculator. 'Press' the number and function keys on the calculator keypad by clicking on the square you want. The number calculated is displayed in the number window above the keys.

Some operations, such as division by zero, will cause the message Error to appear. Clear this by clicking on C.

Remove the Calculator from the desktop by clicking on the Close icon. The Calculator can be activated again from the icon bar when you need it. To remove it from the icon bar, choose Quit from the Calculator's icon bar menu.

Mailman

Mailman is a program for sending and receiving electronic mail through the Econet network.

Before starting Mailman, log on to your Econet network. Then start Mailman by double-clicking on the Mailman icon. The icon will then appear on the icon bar. It can take three forms:

- A pillar box indicates that the mail system is working, and there is no mail waiting to be read.
- A pillar box with bulging sides indicates that there is mail waiting to be read.
- A pillar box containing a white question mark indicates that Mailman is unable to communicate with the network mail system (for example, because the network has failed).

To close down Mailman, choose **Quit** from the Mailman menu.

Setting up your computer for Mailman

From the icon bar menu, choose **Set up**; the following window will appear:

```
                    Set up choices
  [  OK  ]                                  [Cancel]
  Current mail file: adfs::HardDisc.$.mail.Current
  Mail log file:     adfs::HardDisc.$.mail.LogFile
  Mail name:         JSmith
  Mail source:       net:&.mail.intray
  Bleep on receiving mail: □
```

- **Current mail file** is where your most recent incoming and outgoing messages are recorded.
- **Mail log file** is where copies of all your incoming and outgoing messages are sent.

- **Mail name** will appear in the 'From' field of messages you send.

- **Mail source** is the name of the network file from which mail is read. This file must have public write access.

- **Bleep on receiving mail**, when set, causes a bleep to sound when mail arrives in your Mail source.

Note the following:

- If you do not enter anything in one or more of the fields, Mailman assigns default values as follows:

  > *Current mail* is created with the filename `Current` in the directory containing the Mailman application.

  > *Mail log file* is created with the filename `LogFile` in the same directory.

  > *Mail source* is set to `net:&.mail.InTray`. If your Econet has a single file server only, your mail source must be set to this.

  > No default value is assigned to *Mail name*.

 > *Bleep* is off by default.

- When you have completed the **Set up choices** box, click on OK; then call up the icon bar menu and select **Save choices**.

- You do not need to create these files first; Mailman creates them for you if necessary. However, if **Mail source** does not already exist, you will be asked whether you want to create it.

- The current mail file, mail log file and mail source must be specified using the full pathname, including the filing system.

- If you define your own current mail file and mail log file, all the directories in the pathname must exist when you enter them in the **Set up choices** box.

- If you have a hard disc, set up your current and log files there.

- If you select a named floppy disc to hold your mail files, Mailman will prompt you to insert it when mail arrives.

- Otherwise, use the network.

Reading mail

To read your mail, either click Select or Adjust on the Mailman icon, or click Menu on the Mailman icon and choose **Fetch mail**. The mail will be read into your current mail file, and also appended to your mail log file. In addition, the mail will be displayed in an Edit window, provided Edit is already running.

Sending mail

If the message you want to send already exists as a file, drag its icon (in a directory display) onto the Mailman icon. If you have just written it in Edit (and not saved it), choose **File** from the **Save** submenu and drag the icon that appears in the **Save as** dialogue box onto the Mailman icon. You will then be presented with a dialogue box:
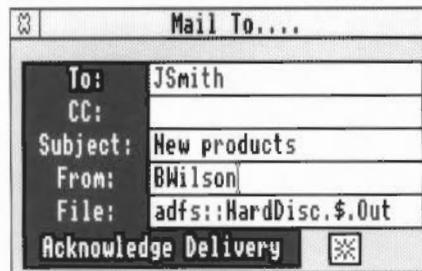
```
┌─────────────────────────────────────────┐
│ ⊠ │          Mail To....                 │
├───┴─────────────────────────────────────┤
│       To:  │JSmith                      ││
│       CC:  │                            ││
│  Subject:  │New products                ││
│     From:  │BWilson│                     ││
│     File:  │adfs::HardDisc.$.Out        ││
│  Acknowledge Delivery        ▨           │
└─────────────────────────────────────────┘
```

Enter the mail name of the user you want the mail to go to, the name of anyone else who is to receive a copy (in the CC field), and the subject of the mail (these two fields may be left blank). Any name you type in the From field will be used in place of the name set using the **Set up choices** dialogue box.

A copy of any mail you send is placed in your log file and your current file.

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Usage

CPU

The Usage utility is a diagnostic tool which displays the proportion of CPU usage (how busy the processor is) with time.

To display CPU usage, double-click on the Usage icon from the appropriate directory display. A window of fixed size appears on the screen, displaying a horizontally scrolling graph indicating the percentage of CPU usage. Cick Select on the close box to remove Usage.
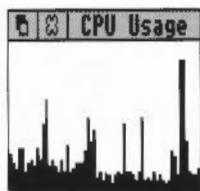
Lander

Lander is a game in which you fly a shuttle around a three-dimensional landscape whilst trying to destroy objects on the ground. To start Lander, double-click on the Lander icon. However, note that Lander needs at least 328K of memory, so if you find your computer runs out of space, use the Task Manager (described in Part 1) to ensure that Screen Memory, Next, and Free add up to at least this.

The game is played as follows:

Launch the shuttle off the pad by pressing Select, and manoeuvre it by moving the mouse to the left or right, towards you or away from you.

Keep the shuttle moving by moving the mouse to tilt it and pressing Select to emit a jet stream which sends it travelling over the landscape. Pressing Menu instead of Select gives you half-thrust.

Destroy objects by shooting at them with bullets fired from the shuttle. Trigger the bullets by pressing Adjust.

Refuel the shuttle by finding your way back to the launching pad and landing for refuelling. The fuel gauge is the red line at the top of the screen.

You begin the game with 500 points, and gain 20 points for every object you destroy. You lose one point for every bullet fired.

You are allowed three chances to fly the shuttle. If you crash, you are returned to the launching pad. The game ends after the third crash.

When you reach 800 points, rocks begin to fall. You must dodge them as you continue to fly the shuttle.

To quit Lander, press Escape, and then press the space bar or click a mouse button.

Lander is in fact just the preliminary part of a sophisticated game called Zarch, available from your Acorn supplier.

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Madness

To activate Madness, double-click on the Madness icon. A small window labelled Madness will appear in the bottom lefthand corner of the screen. All the other windows will start to drift around the screen. When you get tired of this (some people never do), turn Madness off by clicking the Close icon in the Madness window.

Patience

This version of Patience is probably the best-known version of the familiar one-person card game. To play the game, double-click on the Patience icon in the directory display, then click again on the icon in the menu bar. The Patience window appears on the screen, displaying something like the following:
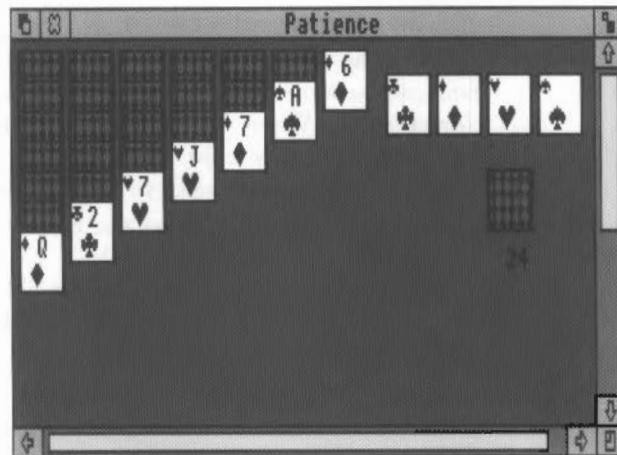
There are seven columns of cards, with the bottom card in each column turned up. The columns range in length from seven cards (on the left) to one (on the right). The rest of the pack is in a face-down 'pile' on the righthand side of the screen. A number below the pile tells you how many cards are face down. At the top righthand corner of the screen are four card outlines, each marked with the symbol for one of the suits.

Rules of Patience

The object of the game is to place all four suits on top of their symbol in ascending order, starting with the ace and finishing with the king. To do this, you must reveal all the hidden cards by going through the pack and building chains of cards. Here are the basic rules:

- The chains you build downwards from each column must be in descending order (king, queen, jack, ten, nine, eight, seven, and so on) and must alternate between red and black suits (ten of hearts, nine of spades, eight of diamonds, seven of spades, for example). If you try to place a card incorrectly, the computer will refuse to move the card.
- When you move the top card from one column to another, the next hidden card is automatically turned up. You can move all or part of a chain to another column.
- There are only seven columns allowed in the game. If you have used up all the cards in one column you can only start a new column with a king.
- Once you have placed a card on one of the suit symbols (in ascending order) at the top righthand corner of the screen it cannot be taken off again.

Playing Patience

To play the game proceed as follows:

1 Look at the cards which are revealed at the bottom of each column. If a card can be moved, use the mouse pointer to click on it and drag it to the correct place. When you release the button the card will be in its new place and the next card turned up in the column where it came from. Continue this procedure until you have no more cards that can be moved.

2 Click on the pile of cards on the right, to reveal the next card (every third card in the pile is turned over). If you can use it, drag the card to the appropriate column. You may now be able to move one or more cards from one column to another. If you can't, click on the pile of cards again. If you can't use a card, continue clicking on the pack until one is revealed that you can use. When you use a card from the pack, the card beneath it is again revealed.

3 As soon as an ace is revealed, drag it to its place at the top righthand corner of the screen (alternatively, clicking Adjust on a card that can be added to one of these stacks automatically moves it to the correct stack). You can then start building (in ascending order from ace to king) as the cards that follow come up.

4 Continue going through the pack and moving cards. The number of cards left in the pack will continue to be indicated by the number below it. A grey rectangle indicates that you have gone through the pack once; click on it to go round again.

5 If you can't go any further and want to see where the hidden cards were, click Menu and choose **Resign**. If you want to start a new game, choose **Deal hand** from the menu. If you do not wish to continue playing Patience, click on the close box on the top lefthand corner of the screen to finish.

Puzzle

To display the tile puzzle, double-click on the Puzzle icon. The Puzzle window appears in the display.

The puzzle comprises fifteen number tiles and one space in a four-by-four grid. The object of the puzzle is to move the tiles into numerical order in four lines from the top left to the bottom right. Rearrange the tiles by clicking on any of the number tiles next to the space to move it into the gap.

To display a new grid, press Menu and choose **New board**.

PrinterPS and PrinterDM

A printer driver is a program that provides an interface between a printer and an editor or word processor. There are two printer drivers in the Applications Suite:

- PrinterPS is a printer driver for PostScript devices such as the Apple LaserWriter.

- PrinterDM is a printer driver for dot matrix printers such as the Epson LQ.

They are used both for printing files, and to provide printer support for applications. To start either printer driver, double-click on its icon. A printer icon will appear on the icon bar.

To close down a printer driver, click Menu over the printer icon and choose **Quit**.

Configuring printer drivers

PrinterPS and PrinterDM can send printed output to different types of printer, or save printer output in a file for later printing. The first time the drivers are loaded, they will be set as follows:

- PrinterPS: to a network printer at station number 0.235.

- PrinterDM: to a parallel printer.

To change the printer setting, choose one of the following from the printer driver icon bar menu:

Parallel for a parallel printer connection.

Serial for a serial printer connection. You can also set the serial printer baud rate, data format and XON/XOFF by moving to the Serial submenu and choosing one of the values listed. To find out what values to assign, consult your printer manual.

Network for a network printer. To change the name of the network printer server, move to the Network submenu and type in the name or station number of the printer to use.

File to send printer output to a file. Type the name of the file into the File submenu. Note that the previous contents of the printer file are lost each time

you print. The file may subsequently be printed by copying it to a printer device.

Save choices stores the values you have given to the previous four options. If you do not save your choices, they will be valid only for the current session; saving them means that they will be set to the values you want next time you load the driver.

You can examine the characteristics of the printer by clicking Select on the printer driver icon; a Printer Driver window appears on the screen.

• For PrinterPS, this shows the type of printer selected, and the paper size: you can toggle the paper size between A4 and B5 by clicking on this window. There are also boxes allowing you to choose between portrait and landscape formats (for Text printing), auto paper feed and manual feed, and a button marked Title: when switched on, a title consisting of the page number, the full pathname of the document being printed, and the date and time, is printed as a heading to each page of text.

• For PrinterDM, the window shows the printer type; successive clicks on the name box cycle through the various printers and resolution levels supported. For Text printing, control is also given over the control sequence to use at the end of each line of text.

To remove the Printer characteristics window, click on its close icon.

Using PrinterPS and PrinterDM

To print a text file, Draw file or Paint file using PrinterPS or PrinterDM, drag the file onto the printer driver icon. In the case of Draw or Paint files, if the application is not already running, it will be loaded before the file is printed. Text files, on the other hand, are printed directly 'in the background' by the printer driver. While a Text file is being printed, **Printing** appears beneath the icon. To interrupt printing, choose **Stop printing** from the icon bar menu.

Paint and Draw files can also be printed by selecting **Print** from the appropriate menu in each application.

When they are loaded, the printer drivers also load a relocatable module, which can be used without the user interface offered by the drivers. You may find it convenient to use this module on its own: for example, when you are printing graphics from Draw (when you are using Edit, the full facilities of PrinterPS or PrinterDM are needed). To do this, install the printer driver in the normal way, and then remove it from the icon bar by selecting **Quit** from the icon bar menu. The printer driver icon will now disappear, but the printer module remains behind.

TinyDirs

TinyDirs is a program which allows you to keep directories and applications on the icon bar for rapid access; this is particularly convenient when you are working with several directories but do not want to keep them all on the screen. To start TinyDirs, double-click on the TinyDirs icon. A directory icon will appear on the icon bar. You can now drag one or more directories from a directory viewer to the TinyDirs icon; each is shown as a separate directory icon with the name of the directory beneath it. Further directories can be moved to the icon bar by dragging them over existing directory icons already there.

You can open a directory which has been placed on the icon bar by clicking on it. To remove a directory from the icon bar, click Menu over it and choose **Remove**. You can remove the icon and simultaneously open the directory by clicking Adjust on it.

Applications may be placed on the icon bar using TinyDirs in exactly the same way. Unlike an application installed on the icon bar (which is running even if you are not actually using it), an application placed on the icon bar using TinyDirs is not run until you click on it. You can start an application and load a file into it by dragging the file to the application icon. Application directories are removed by choosing Remove from the menu. Clicking Adjust removes the application from the icon bar and runs it. As with application directories in a directory display, you can open the directory by holding down Shift when you click on the application.

To quit TinyDirs, remove all the directories and applications as described above; this will leave you with a directory icon with no name beneath it. As before, choose **Remove**; TinyDirs is then closed down.

The system directory

The !System directory contains relocatable modules shared by various Applications Suite programs, held in the directory !System.Modules. You will not need to take any special action to load these modules: they will be loaded as required by applications, provided a directory display containing !System has been opened at some stage.

The modules directory

65Tube

The modules directory contains a number of relocatable modules that you can use in conjunction with your own programs.

65Tube emulates a 6502 second processor environment. It may be used to run many 6502 language ROM images. Some of the images are enhanced by the emulator; for example View and ViewSheet can use the Acorn 132 column display modes. Double ROM systems such as Acornsoft Logo and ISO-Pascal cannot be used. The emulator contains a copy of HIBASIC version 4.3, which is copied into RAM whenever *BASIC is executed in emulated code. The emulator executes codes as if it had a clock rate of about 1.36 MHz.

To start 65Tube, double-click on the 65Tube icon in the modules directory, or use the *RmRun command in Command Line mode. Alternatively, the modules may be loaded with *RmLoad, and entered with the command *EmulateTube. The chapter entitled *Module-related commands*, in Part 3 of this Guide, describes how to use the *RmRun and *RmLoad commands.

To exit from the emulator, enter the command:

```
*Quit
```

BasicEdit

BasicEdit is a screen editor for use with BASIC programs. To load it, double-click on BasicEdit in the modules directory. If you try to enter the editor from BASIC without loading it first, an error message is displayed. See the *BBC BASIC Guide* for a full description of the BASIC editor.

You can also load the BASIC editor from BASIC, or from the command line, by typing:

```
*modules_dir.BasicEdit
```

where *modules_dir* is the pathname of the modules directory (for example `adfs::App2.Modules`).

Note: in Arthur 1.2, the BASIC editor was built into ROM; in RISC OS, it must be loaded as a module.

HardCopy

The HardCopy module provides commands for printing an image of the screen to dot-matrix printers. To load the module, double-click on HardCopy in the modules directory. The module provides three commands:

```
*HardCopyFX
```

```
*HardCopyMX
```

```
*HardCopyRX
```

These dump the screen to Epson FX, MX and RX compatible printers, respectively. Each command may optionally take the following list of parameters:

landscape xscale yscale margin threshold

You need not specify all the parameters; however, if you specify any of them, all parameters preceding it must appear. In addition, if you specify the first four, you must also specify threshold. The meanings of the parameters are:

landscape is a flag: when set to 0 (the default) the image is printed in portrait (upright) format; when set to 1, it is printed in landscape (horizontal) format.

xscale and *yscale* scale the size of the image by the given amount. Only positive values may be used. Their default values are 1.

margin leaves a margin of the given size, in pixels. Its default is 0.

threshold causes all parts of the image which have a logical colour greater than the threshold value to appear in black. Its default depends on the screen mode you are currently using: for example, in 16 colour modes, possible values range from 0 to 15; in 256 colour modes, values range from 0 to 255.

Note: in Arthur 1.2, Hardcopy was built into ROM; in RISC OS, it must be loaded as a module.

Part 3 – The Command Line

The Command Line

RISC OS is a group of programs which comes with the computer and is stored in ROM (Read Only Memory). It controls the hardware: the monitor, keyboard, printer, memory and central processing unit. It keeps track of where all system programs and data are located, and controls the overall operations of the Acorn computer.

You can access the operating system indirectly, through the desktop, in that some actions selected by pointing and clicking are translated into operating system commands. Alternatively, the operating system may be accessed directly, through typed operating system commands, each of which has its own 'rules' or syntax. These commands are entered in Command Line mode. The purpose of this part of the *User Guide* is to tell you what each command does, and how to use it.

Switching between modes

Many users will find that they never need to use the Command Line at all; others with different needs may use the desktop only rarely. However, RISC OS allows you to switch very easily between these two modes, enabling even the confirmed desktop enthusiast to venture into the Command Line occasionally.

Desktop to Command Line

Unless the configuration of your Acorn computer has been changed, it will normally start up in the desktop when switched on. You can leave desktop mode and enter Command Line mode in a number of ways. If you only want to use the Command Line briefly, and then come straight back to the work you were doing on the desktop, use the Task Manager on the bottom right of the screen. Click Menu on the Task Manager icon, and choose *Commands from the menu that appears. (Alternatively, just press F12.) A line will appear at the bottom of the screen, containing a * (the Command Line prompt) and a flashing cursor. You can now type a command: try just typing a full stop, (short for the command *Cat), followed by Return. The lower part of the screen will display a list of the files in your current directory, with the * prompt at the foot of the screen again. Now press Return again: the desktop will reappear, looking just as it did when you saw it last.

Another way of entering commands is through Edit Task windows, which are described in the chapter on Edit in Part 2 of this Guide.

To leave the desktop more 'permanently', press Ctrl Shift F12. Alternatively, click Menu on the Task Manager icon at the bottom right of the screen, and choose **Exit**. In both cases, the screen will go blank and a * prompt will appear. **However, if you do this, any work on the desktop that you have not saved will be lost.** Part 1 of this Guide also tells you how to save your work.

Command Line to desktop

The star (*) prompt indicates that you are in Command Line mode and that the computer is expecting a command to be typed. Note that Command Line mode is referred to as 'Supervisor' on all screen displays.

The commands in this Guide are always preceded by a star. The star is provided as a prompt in Command Line mode, so you do not have to type it (though it does not matter if you do: any extra stars are ignored).

To start the desktop from the Command Line, type desktop at the * prompt.

Command Line to BASIC

Enter BASIC by typing *BASIC from the Command Line. The prompt will change from * to >. To check that you are in BASIC, type in the following one-line program (using capital letters):

```
FOR N=1 TO 20: PRINT "HELLO": NEXT N
```

This will cause the word HELLO to be printed twenty times. Leave BASIC by typing QUIT.

Command Line syntax

The interface to the Command Line is built into the RISC OS operating system and processes valid commands sent as text strings. The text string is normally terminated by Return.

The syntax of each command in the following chapters is desecribed in a standard way, with examples of its use where these are helpful. The symbols used in syntax descriptions are:

<...> indicate that an actual value must be substituted. For example, <filename> means that an actual filename must be supplied.

[...] indicate that the item enclosed in the square brackets is optional.

| indicates alternatives. For example, 0 | 1 means that the value 0 or 1 must be supplied.

What are parameters?

RISC OS commands are sometimes followed by one or more parameters which tell the computer how you want the command to be modified. Ordinary English is not so very different: in the sentence 'Give a dog a bone' the word *give* is like the command, and a *dog* and a *bone* are the parameters. And because it doesn't make much sense just to say 'Give' – you have to say what to give, and who to give it to – these 'parameters' are not optional.

In the following descriptions, parameters are enclosed in angle brackets (which you do not type when you enter them). So the English example would be described like this:

```
give <someone> <something>
```

but you would type, for example,

```
give a dog a bone
```

or

```
give everyone a pay rise
```

Command line parameters may be optional: in this case they are enclosed in square brackets. Often, when a parameter is specified as optional, the operating system will supply a default value; the value of this is specified for each command.

Numeric parameters

Some commands have one or more numeric parameters. These are interpreted as decimal by default (unless the description of the command specifies otherwise), but it is possible to express them to any base by prefacing the parameter itself with the base followed by an underscore, as in the following examples:

```
*Eval 2_1010101    Returns the decimal value of the argument, viz 85.
*Eval 16_FFF        Similarly, returns the value 4095.
```

Decimal and hexadecimal are likely to be the most useful bases.

Wildcards

It is useful in many Command Line operations to specify objects using 'wildcards'. There are two wildcards:

* stands for zero or more characters
\# stands for a single character

Examples

he*	would stand for *he*, *help*, *hello*, or *hencoop*
he\#\#	would stand for *help*, *hens* or *head*, but not *hen* or *health*

Checks on the command

Before a command is executed, the Command Line interface carries out a certain amount of pre-processing on the line:

- stars and spaces are skipped. The Command Line prompt includes a star, so there is no need to type one, but it doesn't matter if you do.

- Comment lines are ignored. Comments may be introduced by typing '|' as the first non-space character on a line.

- Command length is checked. Command lines must be less than or equal to 256 characters, including the terminating character. Lines which are too long produce an error message.

- Redirection (output to a file, or input from a file) is checked.

- Single-character prefixes are checked, such as '/', equivalent to RUN, or '%' which instructs the Command Line interface to skip alias checking.

- Alias commands are checked. (The chapter entitled *Using system variables* gives more information on the use of aliases.)

- The command is passed for execution. Commands offered to the Command Line interface are looked up in the OS table, passed to any other modules, the filing system manager, and finally *Run as a file of the name given, in an attempt to execute the command.

Full details of this checking are given in the *Programmer's Reference Manual*.

File redirection

A powerful feature of RISC OS is the ability to redirect input or output streams (or both) for the duration of the command. By default, output is directed to the screen, but it may be convenient to store the output stream as a file so that it can be examined in more detail or processed further.

The format of a redirection is:

```
command { redirection spec }
```

where the `redirection spec` is at least one of:

`> filename`	Output goes to filename.
`< filename`	Input read from filename.
`>> filename`	Output is appended to filename.

Note the following:

- Spaces in the redirection specification are significant.
- The braces are a literal part of the redirection format.
- There must be at least one space between all the elements for it to be recognised as a redirection.

Example

```
*Cat { > mycat }
```

This sends a list of the contents in the directory to a file called mycat.

The Help system

The *Help command gives brief information about each command in the machine operating system. *Help <keyword> displays a brief explanation of the keyword and, if the keyword is a command name, the syntax of the command.

If you are not sure about the name of a command:

*Help Commands will list all the available utility commands;

*Help FileCommands will list all the commands relating to filing systems;

*Help Modules will list the names of all currently loaded modules, with their version numbers and creation dates;

*Help Syntax explains the format used for syntax messages.

The usual use of *Help is to confirm that a command is appropriate for the job required, and to check on its syntax (the number, type and ordering of parameters that the command requires).

When you issue the *Help command at the normal Command Line prompt, 'paged mode' is switched on: the computer displays a screenful of text, then waits until you press Shift before moving on.

The specification of the keyword can include abbreviations to allow groups of commands to be specified. For example,

*help con.

produces information on *Configure and *Continue.

How examples are presented in Part 3

In this part of the Guide, examples are included for many commands. In these examples, what the user types is presented like this:

*Time

and what the computer displays on its screen (that you *haven't* typed) looks something like this:

Fri,03 Feb 1989.16:26:55

Filing system commands

Before you use this chapter you should have read the chapters on filing systems in Part 1. Those chapters introduce the filing systems and describe how they work, and also explain the terminology used in this chapter.

The commands in this chapter are relevant to the operation of filing systems. They have been divided into those commands which apply to all filing systems and those which apply to ADFS, NetFS, RAMFS and other filing systems.

The following commands are described in this chapter:

*Access	*Lib
*Append	*List
*Build	*Load
*Cat	*Opt 1
*CDir	*Opt 4
*Close	*Print
*Copy	*Rename
*Count	*Remove
*Create	*Run
*Delete	*Save
*Dir	*SetType
*Dump	*Shut
*EnumDir	*ShutDown
*Ex	*Spool
*Exec	*SpoolOn
*FileInfo	*Stamp
*Info	*Type
*LCat	*Up
*LEx	*Wipe

*Access

Controls who can read from and write to specific files.

Syntax

`*Access <object spec> [<attributes>]`

Parameters

`<object spec>`	a valid pathname specifying a file or directory
`<attributes>`	The following attributes are allowed:

L(ock)	Lock object against deletion
R(ead)	Read permission
W(rite)	Write permission
/R, /W, /RW	Public read and write permission (on a network)

Use

*Access changes the attributes of all objects matching the wildcard specification. These attributes control whether you can read from, write to, or delete a file. On all filing systems except the network, these same attributes also control other people's access to your files: their 'public access'.

The Network Filing System uses separate attributes to control public access. By default, files are created without public read and write permission. If you want others on the network to be able to read files that you have created, make sure you have explicitly changed the access status to public read. If you are willing to have other network users work on your files (ie overwrite them), set the access status to public write permission.

The public attributes can be set within any filing system, but will be ignored unless the file is transferred to the Network Filing System.

Examples

`*access myfile l`	Locks myfile
`*access myfile wr/r`	On a network file server, sets owner access to write and read, but public access to read only.

Related commands

*Info

*Append

Adds data to an existing file.

```
*Append <filename>
```

Parameters

```
<filename>              a valid pathname specifying a file
```

Use

*Append opens an existing file so you can type in more data: press Esc to finish.

Example

```
*type thisfile
this line is already in thisfile
*append thisfile
  1 some more text
<Press Esc>
*type thisfile
this line is already in thisfile
some more text
```

Related commands

*Build

*Build

Opens a new file (of type Data) and directs subsequent keyboard input to it.

Syntax

    *Build <filename>

Parameters

    <filename>   a valid pathname specifying a file

Use

*Build opens a new file of type Data so you can enter files; press Esc to finish.

Note that for compatibility with earlier systems the *Build command creates files with lines terminating in the carriage return character (ASCII &0D). The Edit application provides a simple way of changing this into a linefeed character, using the **CR↔LF** function from the Edit submenu.

Example

    *Build testfile
      1 This is the first line of testfile
    <Press Esc>
    *Type testfile
    This is the first line of testfile

Related commands

*Append

*Cat

Lists all the objects in a directory.

Syntax

```
*Cat [<directory>]
```

Parameters

<directory>   a valid pathname specifying a directory

Use

*Cat (short for 'catalogue') lists all the objects in a directory, showing their access attributes and other information on the disc name, options set, etc. If no directory is specified, the contents of the current directory are shown. *Cat can be abbreviated to '*.' (a full stop).

Examples

```
*.
```
catalogue of current directory

```
*cat net#59.254:
```
catalogue of network file server 59.254

```
*.ram:
```
catalogue of RAM filing system

```
*Cat { > printer: }
```
catalogue of current directory redirected to printer

Related commands

*Ex , *Info, *LCat and *LEx

*CDir

Creates a directory.

Syntax

```
*CDir <directory> [<size in entries>]
```

Parameters

`<directory>`   a valid pathname specifying a directory

`<size in entries>`

Use

*CDir creates a directory with the specified pathname. On a network, the size of the directory can also be given.

Examples

`*CDir fred`   creates a directory called `fred` on the current filing system, as a daughter to the current directory

`*CDir ram:fred`   creates a directory called `fred` on the RAM filing system

Related commands   *Cat

*Close

Closes files.

```
*Close
```

None

*Close closes all open files on the current filing system, and is useful when a program crashes, leaving files open.

If preceded by the filing system name, *Close can be used to close files on systems other than the current one. For example:

```
*adfs:Close
```

would close all files on ADFS, where NetFS is the current filing system.

You should not use this command within a program that runs in a multi-tasking environment such as the desktop, as it may close files being used by other programs.

*Shut, *Shutdown, *Bye

*Copy

Copies files and directories.

```
*Copy <source spec> <destination spec> [[~]<options>]
```

`<source spec>`	file pathname
`<destination spec>`	file pathname
`<options>`	upper- or lower-case letter

A set of default options is read from the system variable Copy$Options, which is set by the system as shown below. You can change these default preferences using the *Set command (see the chapter entitled *Using system variables* later in this part of the Guide). The default options are overruled by any given to the command.

A * wildcard can be used in the *Copy command. For example:

```
*Copy data* Dir2.*
```

will copy all the files in the current directory with names beginning data to Dir2.

To copy a group of files that cannot be specified with wildcards, use the desktop directory display to select the group, as described in the chapter *Filing Systems*.

To ensure an option is ON, include it in the list of options; to ensure it is OFF, precede the option by a '~' (eg ~C~R to turn off the C and R options).

- A(ccess)   Force destination access to same as source.
Default ON.
Important when you are copying files from ADFS to NetFS, for example, because it maintains the access rights on the files copied.

- C(onfirm)   Prompt for confirmation of each copy.
Default ON.
Useful as a check when you have used a wildcard, to ensure that you are copying the files you want. Possible replies to the prompt for each file are Y (to copy the file or structure and then proceed to the next item), N (to go on to the next item without making a copy), Q(uiet) (to copy the item and all subsequent items without further prompting, A(bandon) (to stop copying

at the current level – see the R option), or Esc (to stop immediately).

- D(elete)   Delete the source object after copy.
  Default OFF.
  This is useful for moving a file from one disc or other storage unit to another. The source object is copied; if the copy is successful, the source object is then deleted. If you want to move files within the same disc, the *Rename command is quicker, as it does not have to copy the files.

- F(orce)   Force overwriting of existing objects.
  Default OFF.
  Performs the copy, regardless of whether the destination files exist, or what their access rights are. The files can be overwritten even if they are locked or have no write permission.

- L(ook)   Look at destination before loading source file.
  Default OFF.
  Files are normally copied by reading a large amount of data into memory before attempting to save it as a destination file. The L option checks the destination medium for accessibility before reading in the data. Thus L often saves time in copying, except for copies on the same disc.

- N(ewer)   Copy only if source is more recent than destination.
  Default OFF.
  This is useful during backups to prevent copying the same files each time, or for ensuring that you are copying the latest version of a file.

- P(rompt)   Prompt for the disc to be changed as needed in copy.
  Default OFF.
  Useful for copying when you have only one disc drive.

- Q(uick)   Use application workspace to speed file transfer.
  Default OFF.
  The Q option uses the application workspace, so overwrites whatever is there. It should not be used if an application is active. However, when you can use this option it speeds up the copying operation considerably.

- R(ecurse)   Copy subdirectories and contents.
  Default OFF.
  This is useful when copying several levels of directory, since it avoids the need to copy each of the directories one by one.

- S(tamp)   Restamp date-stamped files after copying.
  Default OFF.
  Useful for recording when the particular copy was made.

- (s)T(ructure)   Copy only the directory structure.
  Default OFF.
  Copies the directory structure but not the files. By using this option as a first stage in copying a directory tree, access to the files is faster when they are subsequently copied.

- V(erbose)   Print information on each object copied.
  Default ON.
  This gives full textual commentary on the copy operation.

Use

Copy makes a copy between directories of any object(s) that match the given wildcard specification. Objects may be files or directories. The only wildcard that can be used in the destination is a '' as the leafname (see example below).

Note that it is dangerous to copy a directory into one of its subsidiary directories. This results in an infinite loop, which only comes to an end when the disc is full or Esc is pressed.

Examples

```
*Copy fromfile tofile rfq~c~v
```

```
*Copy :fred.data*  :jim.*   Copies all files beginning data from the
                            disc called fred to the disc called jim.
```

Related commands

*Rename, *Delete, *Access, *Wipe, and the system variable Copy$Options.

*Count

Adds up the size of data held in file objects, and the number of objects.

Syntax

```
*Count <file spec> [<options>]
```

Parameters

```
<file spec>
<options>    C, R and V
```

A set of default options is read from the system variable Count$Options, which is set by the system as shown below. You can change these default preferences using the *Set command (see the chapter entitled *Using system variables* later in this part of the Guide). The default options are overruled by any given to the command.

To ensure an option is ON, include it in the list of options; to ensure it is OFF, precede the option by a '~' (e.g: ~C~r to turn off the C and R options).

- C(onfirm)   Prompt for confirmation of each count.
  Default OFF.

- R(ecurse)   Count subdirectories and contents.
  Default ON.

- V(erbose)   Print information on each object counted, rather than providing summary information.
  Default OFF.

Note that the command returns the amount of data that each object is comprised of, rather than the amount of disc space the data occupies. Since a file normally has space allocated to it that is not used for data, and directories are not counted, any estimates of free disc space should be used with caution.

Use

*Count adds up the size of data held in one or more files that match the given specification.

Example

```
*Count * r~cv
```
                       Counts all files on disc, giving full information on each file object.

Related commands

*Info, *Ex, and the system variable Count$Options

*Create

Reserves space for a new file.

Syntax

```
*Create <filename> [<length> [<exec addr> [<load addr>]]]
```

Parameters

`<filename>`	a pathname specifying a file
`<length>`	the number of bytes to reserve (default 0)
`<exec addr>`	the address to be jumped to after loading, if a program
`<load addr>`	the address at which the file is loaded into RAM.

Use

*Create reserves space for a new file, usually a data file. No data is transferred to the file. You may assign load and execution addresses if you wish. The units of length, load and execution addresses are in hexadecimal by default.

If both load and execution addresses are omitted, the file is created with type FFD (data) and is date and time stamped.

Example

`*Create mydata 1000 0 8000` Creates a file &1000 bytes long, which will be loaded into address &8000.

`*Create newfile 10_4096` Creates a file &1000 bytes long which is date and time stamped.

`*Create bigfile &10000`

Related commands

*Load, *Save

*Delete

Erases a single file or directory.

Syntax

```
*Delete <filename>
```

Parameters

`<filename>`   a pathname specifying a file

Use

*Delete erases the single named file. If the file does not exist, an error message is reported. Wildcards may be used in all the components of the pathname except the last one.

Examples

`*Delete $.dir*.myfile`   Note that wildcards are permitted but pathnames must specify a file unambiguously.

`*Delete myfile`   Deletes my file from the current directory.

Related commands

*Wipe, *Remove

*Dir

Selects a directory.

```
*Dir [<directory>]
```

<directory> a valid pathname specifying a directory

*Dir selects a directory as the current directory (currently selected directory, or CSD. If no directory is specified, the user root directory (URD) is selected.

*Dir	Sets the CSD to the URD.
*Dir mydir	Sets the CSD to mydir.

A CSD may be set for each filing system, for instance, within NetFS, the command:

*Dir ADFS:	sets the CSD on ADFS and current filing system (NetFS)

whereas:

*ADFS:Dir	sets the CSD on ADFS only.

*CDir; *Back

*Dump

Displays the contents of a file, in hexadecimal and ASCII codes.

Syntax

`*Dump <filename> [<file offset> [<start address>]]`

Parameters

`<filename>`	a valid pathname specifying a file
`<file offset>`	offset, in hexadecimal, from the beginning of the file from which to dump the data
`<start address>`	(in hexadecimal) display as if the file were in memory starting at this address

Use

*Dump displays the contents of a file as a hexadecimal and (on the righthand side of the screen) as an ASCII interpretation. See the *Programmer's Reference Manual* for full details of this command.

Example

`*Dump myprog 0 8000` Dumps the file `myprog`, starting from the beginning of the file (offset is 0) but numbering the dump from &8000, as if the file were loaded at that address.

Related commands

*Type, *List, *Configure DumpFormat.

*EnumDir

Creates a file of filenames.

Syntax

```
*EnumDir <directory> <output file> [<pattern>]
```

Parameters

`<directory>`	a valid pathname specifying a directory
`<output file>`	a valid filename
`<pattern>`	a wildcard specification for matching against

Use

*EnumDir creates a file of filenames from a directory that matches the supplied wildcard specification.

The default is *, which will match any file within the current directory. The current directory can be specified by @.

Examples

`*EnumDir $.dir myfile data*`   Creates a file `myfile`, containing a list of all files beginning `data` contained in directory `$.dir`

`*EnumDir @ listall *_doc`   Creates a file `listall`, containing a list of all files in the current directory whose names end in `_doc`.

Related commands

*Cat, *LCat

*Ex

Lists file information within a directory.

Syntax

```
*Ex [<directory>]
```

Parameters

`<directory>`   a valid pathname specifying a directory

Use

*Ex lists all the objects in a directory together with their corresponding file information. The default is the current directory.

Examples

```
*Ex mail
```

Current	**WR**	**Text**	**15:54:37**	**04-Jan-1989**	**60 bytes**
LogFile	**WR**	**Text**	**15:54:37**	**04-Jan-1989**	**314 bytes**

Related commands

*Info, *FileInfo

*Exec

Executes a command file.

Syntax

```
*Exec [<filename>]
```

Parameters

<filename>   a valid pathname specifying a file

Use

*Exec <filename> instructs the operating system to carry out the instructions from the given file. The command is mainly used to execute a list of operating system commands contained in a command file. The file, once open, takes priority over the keyboard or serial port input streams.

*Exec with no filename closes the exec file.

Example

*Exec !Boot   Uses file !Boot as though its contents have been typed in from the keyboard.

Related commands

*Obey

*FileInfo

Displays full file information.

Syntax

```
*FileInfo <object>
```

Parameters

`<object>`   a valid pathname specifying a file

Use

*FileInfo gives the full file information of the specified object; this includes load, length and execution addresses in hexadecimal, and other filing system specific information not given by *Info.

Example

```
*FileInfo current
Current    WR/   Text   15:54:37.40   04-Jan-1989 000003C
                                                   00019D00
```

The above example shows the information displayed by *FileInfo on ADFS. On NetFS, a second date and time are also shown: these are the settings from the file server clock.

Related commands

*Ex, *Info

*Info

Displays information about specified files.

Syntax

```
*Info <object spec>
```

Parameters

`<object spec>`   a valid pathname specifying one or more file objects

Use

*Info lists file information for any object matching the given wildcard specification.

Example

```
*Info myfile
myfile    WR    Text  15:54:37      04-Jan-1989   60 bytes
```

Related commands

*Ex, *FileInfo

*LCat

Displays objects in a library.

Syntax

```
*LCat [<directory>]
```

<directory>   a valid pathname specifying a subdirectory of the current library

Use

*LCat lists all the objects in the named library subdirectory. The default is the current library. *LCat is equivalent to *Cat %.

Related commands

*LEx, *Cat

*LEx

Displays file information for a library.

*Lib

Selects a directory as a library.

Syntax

`*Lib [<directory>]`

Parameters

`<directory>`   a valid pathname specifying a directory

Use

*Lib selects a directory as the current library. If no other directory is named, the action taken will depend on which filing system is currently open: in ADFS the default is '$.Library'; under NetFS there is no default.

Example

`*Library $.mylib`   Sets the directory $.mylib to be the current library.

Related commands

*Configure Library

*List

Displays file contents with line numbers.

Syntax

```
*List [-File] <filename> [-TabExpand]
```

Parameters

-File	may optionally precede <filename> ; it has no effect
<filename>	a valid pathname specifying a file
-TabExpand	causes Tab characters (ASCII 9) to be expanded to spaces

Use

*List displays the contents of a file in the configured GSRead format. The GSRead (General System Read) format allows files with escape combinations and 'magic' characters to be displayed without being first interpreted (and possibly interfering with the screen display). See *Appendix F: GSFormats*. Each line is numbered.

Example

```
*List -file myfile -tabexpand
```

Related commands

*Dump, *Print, *Type

*Load

Loads the named file (usually a program file).

```
*Load <filename> [<load addr>]
```

<filename>   a valid pathname specifying a file

<load addr>   load address in hexadecimal; this overrides any load
                address associated with this file

*Load loads the named file at a load address specified in hexadecimal.

The filename which is supplied with the *Load command is searched for in the directories listed in the system variable File$Path. By default, File$Path is set to ' '. This means that only the current directory is searched.

If no address is specified, the file's type (BASIC, Text etc) is looked for:

- If the file has no file type, it is loaded at its own load address.

- If the file does have a file type, the corresponding Alias$@LoadType variable is looked up to determine how the file is to be loaded. A BASIC file has a file type of &FFB, so the variable Alias$@LoadType_FFB is looked up, and so on. You are unlikely to need to change the default values of these variables; if you need to, see the chapter entitled *Using system variables* later in this part of the Guide.

```
*Load myfile 9000
```

*Create, *Save

*Opt 1

*Opt 1 controls file system messages.

Syntax

*Opt 1 [[,] <n>]

Parameters

<n>   0 to 3

Use

*Opt 1, <n> sets the filing system message level (for Load/Save/Create):

*Opt 1, 0   No filing system messages
*Opt 1, 1   Filename printed
*Opt 1, 2   Filename, hexadecimal addresses and length printed
*Opt 1, 3   Filename, datestamp and length printed

*Opt 1 must be set separately for each filing system.

*Opt 4

*Opt 4 sets the filing system boot action.

Syntax

```
*Opt 4 [[,] <n> ]
```

Parameters

<n>   0 to 3

Use

*Opt 4, <n> sets the boot action for the current filing system. On filing systems with removable media (eg ADFS using floppy discs) the boot action is only set for the current medium (disc).

```
*Opt 4, 0       No boot action
*Opt 4, 1       *Load boot file
*Opt 4, 2       *Run boot file
*Opt 4, 3       *Exec boot file
```

The boot file is named !Boot, except when using the Network Filing System, when it is called !ArmBoot.

Note that a *Exec boot file will override the configured language setting. If you want such a boot file, and want to enter the desktop after executing it, the file should end with the command *desktop, and similarly for other languages.

Example

*Opt 4,2   sets the boot action to *Run for the current filing system.

Related commands

*Configure Boot and *Configure NoBoot

*Print

Displays raw text on the screen.

Syntax

`*Print <filename>`

Parameters

`<filename>`   a valid pathname specifying a file

Use

*Print displays the contents of a file by sending each byte – whether it is a printable character or not – to the VDU. Unless the file is a simple text file, some unwanted screen effects may occur, since control characters are not filtered out.

Example

`*Print myfile`

Related commands

*Dump, *List, *Type

*Rename

Changes the name of an object.

Syntax

```
*Rename <object> <new name>
```

Parameters

`<object>`	a valid pathname specifying a file or directory
`<new name>`	a valid pathname specifying a file or directory

Use

*Rename changes the name of an object, within the same storage unit. Locked objects cannot be renamed (unlock them first by using the *Access command with the Lock option clear). It can also be used for moving files from one directory to another, or moving directories within the directory tree.

Example

```
*Rename fred jim
```

```
*Rename $.data.fred $.newdata.fred  Moves  fred  into  directory
                                              newdata.
```

Related commands

To move objects between discs or filing systems, use the *Copy command with the D(elete) option set.

*Remove

Deletes a file.

```
*Remove <filename>
```

`<filename>`　　a valid pathname specifying a file

*Remove deletes a named file. Its action is like that of *Delete, except that no error message is sent if the file named does not exist. This allows a program to remove a file without errors having to be trapped.

*Delete, *Wipe

*Run

Loads and executes a file.

Syntax

```
*Run <filename> [<parameters>]
```

Parameters

<filename>   a valid pathname specifying a file

<parameters>   a Command Line tail (see the *Programmer's Reference Manual* for further details)

Use

*Run loads and executes the named file, together with a list of parameters, if appropriate.

The filename which is supplied with the *Run command is searched for in the directories listed in the system variable Run$Path. By default, Run$Path is set to ',%.'. This means that the current directory is searched first, followed by the library.

The file's type (BASIC, Text etc) is looked for:

- If the file has no file type, it is loaded at its own load address, and execution commences at its execution address.

- If the file does have a file type the corresponding Alias$@RunType variable is looked up to determine how the file is to be run. A BASIC file has a file type of &FFB, so the variable Alias$@RunType_FFB is looked up, and so on. You are unlikely to need to change the default values of these variables, but if you do, refer to the chapter entitled *Using system variables* later in this part of the Guide.

Example

```
*Run my_prog
```

```
*Run my_prog my_data   my_data is passed as a parameter to the
                       program my_prog. The program can then use
                       this filename to look up the data it needs.
```

Related commands

*Load, *Exec. *SetType

*Save

Copies an area of RAM to a file.

Syntax

```
*Save <filename> <start addr> <end addr> [<exec addr>
  [<load addr>]]
```

or

```
*Save <filename> <start addr> + <length> [<exec addr>
  [<load addr>]]
```

Parameters

`<filename>`	a valid pathname specifying a file
`<start addr>`	the address (in hexadecimal) of the first byte to be saved
`<end addr>`	the address (in hexadecimal) of the byte after the last one to be saved
`<length>`	number of bytes to save
`<exec addr>`	execution address (default is start addr)
`<load addr>`	load address (default is start addr)

Use

*Save copies the given area of memory to the named file. Start addr is the address of the first byte to be saved; end addr is the address of the byte after the last one to be saved. Length is the number of bytes to be saved; exec addr is the execution address to be stored with the file (it defaults to the start address). Load is the reload address (and is assumed to be same as start if omitted).

Example

```
*Save myprog 8000 + 3000
```

```
*Save myprog 8000 B000 9300 9000
```

Related commands

*Load

*SetType

Establishes a file type for a file.

Syntax

`*SetType <filename> <file type>`

Parameters

`<filename>`   a valid pathname specifying a file

`<file type>`   a number or text description of the file type to be set. A list of valid file types can be displayed by the command *Show File$Type*.

Use

*SetType sets the file type of the named file. If the file does not have a date stamp, then the current time and date are assigned to the file. Examples of file types are Palette, Font, Sprite and BASIC: a list is given in Appendix B, or can be inspected by typing `*Show File$Type*`.

Example

Build a small file containing a one-line command, set it to be a command type (&FFE), and run it from the Command Line; finally, view it from the desktop:

`*Build x`	the file is given the name `x`
`1 *Echo Hello World`	the line number is supplied by *Build
Press Esc	the Escape character terminates the one-line file
`*SetType x Command`	`*SetType x &FFE` is an alternative
`*Run x`	the text is echoed on the screen

The file has been ascribed the 'command file' type, and can be run by double-clicking on the file icon.

*Shut

Closes all open files.

Syntax

`*Shut`

Parameters

None

Use

*Shut closes all open files on all filing systems. The command may be useful to programmers to ensure that all files are closed if a program crashes without closing files.

You should not use this command within a program running in a multi-tasking environment such as the desktop, as it may close files being used by other programs.

Related commands

*ShutDown, *Bye, *Close

*ShutDown

Closes files, logs off file servers and parks hard discs.

Syntax

`*ShutDown`

Parameters

None

Use

*ShutDown performs all the actions of the *Shut command, and in addition logs off all network file servers and causes hard discs to be parked in a safe state for switching off the computer.

Related commands

*Shut, *Bye, *Close

*Spool

Sends everything appearing on the screen to the named file.

Syntax

`*Spool [<filename>]`

Parameters

`<filename>`   a valid pathname specifying a file

Use

*Spool <filename> opens a new file to receive data which is sent to the VDU.

*Spool with no parameter closes the spool file.

Example

Load a simple BASIC program (called, say Test), type `*Spool x` and LIST the program; switch spooling off with `*Spool`, and examine the spooled file using the desktop, to see its distinctive icon. The spooled file, x, can be read by a text editor. Drag the file icon to the Edit icon on the icon bar, and an editing window opens with the text of the spooled file.

```
*BASIC
>LOAD "Test"
>*Spool x           spool on – to file x
>LIST
   .
   .
>*Spool             spool off
```

Related commands

*Spoolon

*SpoolOn

Add data sent to the screen to the end of an existing file.

`*SpoolOn [<filename>]`

Parameters

`<filename>`   a valid pathname specifying a file

Use

`*SpoolOn <filename>` is similar to *Spool, except that it takes the name of an existing file. Data sent to the screen is also added to the end of the file.

*SpoolOn (or *Spool) with no parameter closes the spool file.

Example

```
*BASIC
>LOAD "Test"
>*SpoolOn myfile        append text to file myfile which already exists
>LIST
    .
    .
>*SpoolOn               close spool file
```

Related commands

*Spool

*Stamp

Date stamps a file.

Syntax

```
*Stamp <filename>
```

Parameters

`<filename>`   a valid pathname specifying a file

Use

*Stamp sets the date stamp on a file to the current time and date. If the file has not previously been date stamped, it is also given file type Data (&FFD).

Example

```
*Stamp myfile
```

Related commands

*SetType, *Info

*Type

Displays the contents of a file.

Syntax

```
*Type [-File] <filename> [-TabExpand]
```

Parameters

-File	may optionally precede <filename>; it has no effect
<filename>	a valid pathname specifying a file
-TabExpand	causes Tab characters (ASCII 9) to be expanded to spaces

Use

*Type displays the contents of the file in the configured GSRead (General System Read) format. Control F is displayed as '|F', for instance. For further details see *Appendix F: GS Formats*.

Example

```
*Type -file myfile -tabexpand
```

Related commands

*Dump, *List, *Print

*Up

Moves the current directory up the directory tree.

Syntax

`*Up [<levels>]`

Parameters

`<levels>`   a positive number in the range 1 to 128

Use

*Up moves the current directory up the directory structure by the specified number of levels. If no number is given, the directory is moved up one level. The command is equivalent to *Dir ^.

Example

`*Up 3`

This is equivalent to `*Dir ^.^.^`, but note that the parent of $ is $, so you cannot go any further up the directory tree than this.

Related commands

*Dir

*Wipe

Deletes one or more files.

Syntax

`*Wipe <file spec> [<options>]`

Parameters

`<file spec>` a valid pathname specifying a file (or, with wildcards, a group of files)

`<options>` C, F, R and V

Use

*Wipe deletes one or more objects that match the given wildcard specification.

A set of default options is read from the system variable Wipe$Options, which is set by the system as shown below. You can change these default preferences using the *Set command (see the chapter entitled *Using system variables* later in this part of the Guide). The default options are overruled by any given to the command.

To ensure an option is ON, include it in the list of options; to ensure it is OFF, precede the option by a '~' (e.g: ~C~R to turn off the C and R options).

C(onfirm) Prompt for confirmation of each deletion.
            Default ON.
F(orce)   Force deletion of locked objects.
            Default OFF.
R(ecurse) Delete subdirectories and contents.
            Default OFF.
V(erbose) Print information on each object deleted.
            Default ON.

Example

`*Wipe Games.*` Deletes all files in the directory Games (but not any of its subdirectories).

Related commands

*Delete

ADFS-specific commands

The Advanced Disc Filing System (ADFS) is the default filing system on Acorn computers, and is supplied with every Acorn system. It controls the local disc storage media (floppy disc, and hard disc if fitted). ADFS is compatible with previous versions of Acorn ADFS.

The following commands are described in this chapter:

*ADFS
*Back
*Backup
*Bye
*CheckMap
*Compact
*Defect
*Dismount
*Drive
*Format
*Free
*Map
*Mount
*NameDisc
*NoDir
*NoLib
*NoURD
*Title
*URD
*Verify

*ADFS

Selects the Advanced Disc Filing System.

Syntax

```
*ADFS
```

Use

*ADFS selects the Advanced Disc Filing System as the filing system for subsequent operations. Remember that it is not necessary to switch filing systems if you use the full pathnames of objects. For example, you can refer to NetFS objects (on a file server, say) when ADFS is the current filing system.

Related commands

*RAM, *Net

*Back

Exchanges current and previous directories.

Syntax

`*Back`

Use

*Back swaps current and previously selected directories. The command is used for switching between two frequently used directories.

Related commands

*Dir, which changes to a specified directory

*Backup

Copies a complete floppy disc.

Syntax

```
*Backup <source drive> <dest drive> [Q]
```

Parameters

<source drive>   the number of the floppy drive (0 to 3)

<dest drive>   as source drive, above

[Q]   speeds up the operation, by using the application work area as a buffer in the backup operation, so fewer disc accesses are needed. You must save any work you have done and quit any applications you are using before using this option.

Use

*Backup copies a whole floppy disc to another, with the exception of free space. If the source drive is the same as the destination (as it is on a single floppy drive system), you will be prompted to swap the disc, as necessary. The command only applies to floppy, not hard discs.

Example

```
*Backup 0 1
```

Related commands

*Copy

*Bye

Ends an ADFS session.

`*Bye`

*Bye ends an ADFS session by closing all files, unsetting all directories and libraries, forgetting all floppy disc names and parking the heads of hard discs to their 'transit position' so that the hard disc unit can be moved without risking damage to the read/write head.

You should check that ADFS is the current filing system before you use this command, as it is also available in NetFS.

*Shutdown, *Shut, *Close

*CheckMap

Checks a floppy disc map for consistency.

Syntax

`*CheckMap [<disc spec>]`

Parameters

`<disc spec>`   the name of the disc or number of the disc drive

Use

*CheckMap checks that the map of an E-format disc has the correct checksums and is consistent with the directory tree. If only one copy is good, it allows you to rewrite the other.

Example

`*CheckMap :Mydisc`

Related commands

*Defect, *Verify

*Compact

Collects free spaces together on L- and D-format discs.

Syntax

```
*Compact [<disc drive spec>]
```

Parameters

`<disc drive spec>`   the name of the disc or number of the disc drive

Use

*Compact collects free spaces together by moving files. If no argument is given, the *Compact command is carried out on the current disc. *Compact works on either hard or floppy discs: the command is not needed on E-format discs since compaction is automatic. Disc formats (E-, D- and L-formats) are described in the chapter entitled *The Advanced Disc Filing System* in Part 1 of this Guide.

Example

```
*Compact :0
```

Related commands

*CheckMap, *Map, *FileInfo.

*Defect

Marks a part of a disc as defective so that it will no longer be used.

`*Defect <disc spec><disc add>`

Parameters

`<disc drive spec>`	the name of the disc or number of the disc drive
`<disc add>`	the address where the defect exists (provided by the *Verify command if the disc is faulty)

Use

If a physical defect occurs in an unallocated part of an E-format disc, *Defect will render that part of the disc inaccessable by altering the 'map' of the disc.

If the defect is in an allocated part of the disc, *Defect tells you what object contains the defect, and the offset of the defect within the object. This may enable you to retrieve most of the information held within the object, using suitable software. You must then delete the object from the defective disc. *Defect may also tell you that some other objects must be moved: you should copy these to another disc, and then delete them from the defective disc. Once you have removed all the objects that the *Defect command listed, that part of the disc is then unallocated, so you can repeat the *Defect command to make the defective part of the disc inaccessable.

Sometimes the disc will be too badly damaged for you to successfully delete objects listed by the *Defect command. In such cases the damage cannot be repaired, and you must restore the objects from a recent backup.

Example

```
*Verify mydisc
Disc error 08 at :0/00010400
*Defect mydisc 10400
$.mydir must be moved
.myfile1 has defect at offset 800
.myfile2 must be moved
```

Related commands

*Verify, *CheckMap

*Dismount

Ensures that it is safe to finish using a disc.

Syntax

```
*Dismount [<disc spec>]
```

Parameters

<disc spec>   the name of the disc or number of the disc drive

Use

*Dismount closes files, unsets directories and parks the read/write head of a given disc. If no disc is specified, the current disc is used as the default. *Dismount is useful before removing a particular floppy disc, (it is essential if the disc is to taken away and modified on another computer), but the *Shutdown command is usually to be preferred, especially when switching off the computer.

Related commands

*Mount.

*Drive

Sets the current drive.

Syntax

```
*Drive <drive>
```

Parameters

`<drive>`   the number of the disc drive, from 0 to 3

Use

Sets the current drive if NoDir is set. Otherwise, *Drive has no meaning. The command is provided for compatibility with earlier version of ADFS.

Example

```
*Drive 3
```

Related commands

*Dir, *NoDir

*Format

Prepares a new floppy disc for use, or erases a used disc for re-use.

Syntax

```
*Format <drive> [L|D|E] [Y]
```

Parameters

`<drive>`   the number of the disc drive, from 0 to 3

`L|D|E`   the type of format required, selected from:

L	640K	47-entry directories	old map	all ADFS
D	800K	77-entry directories	old map	Arthur 1.2
E	800K	77-entry directories	new map	RISC OS

`Y`   no prompt for confirmation

The default is E-format. This format offers improved handling of file fragmentation on the disc and therefore does not need to be periodically compacted (see the *Compact command).

Use

`*Format 0`   Formats to default E-format.

`*Format 0 L` Formats the disc in drive 0 for use with ADFS on the BBC Master range of computers.

Related commands

*Compact

HForm for formatting hard discs: see Appendix C.

*Free

Displays amount of unused disc space.

Syntax

`*Free [<disc spec>]`

Parameters

`<disc spec>`   the name of the disc or number of the disc drive

Use

*Free displays the total free space remaining on a disc. If no disc is specified, the total free space on the current disc is displayed.

Example

```
*Free 0
```
Bytes free &000C1C00= 793600
Bytes used &00006400= 25600

Related commands

*Map

*Map

Displays a disc's free space map.

```
*Map [<disc spec>]
```

Parameters

```
<disc spec>
```
the name of the disc or number of the disc drive

Use

*Map displays a disc's free space map. If no disc is specified, the map of the current disc is displayed. *Map is also available within RAMFS.

Example

```
*Map :Mydisc
```

Related commands

*Free, *Compact

*Mount

Prepares a disc for general use.

Syntax

```
*Mount [<disc spec>]
```

Parameters

<disc spec>   the name of the disc or number of the disc drive

Use

*Mount sets the directory to the disc root directory, sets the library (if applicable) to $.Library, and unsets the URD (User Root Directory). If no disc spec is given, the default drive is used. *Mount is also available within NetFS. The command is preserved for the sake of compatibility with earlier Acorn operating systems.

Related commands

*Dismount

*NameDisc

Changes a disc's name.

```
*NameDisc <disc spec> <disc name>
```

Parameters

<disc spec>   the present name of the disc or number of the disc drive
<disc name>   a text string up to 10 characters long

Use

*NameDisc (or alternatively, *NameDisk) allows you to change a disc's name. *NameDisc is also available within RAMFS.

Example

```
*NameDisc :0 DataDisc
```

*NoDir

Unsets the current directory.

Syntax

```
*NoDir
```

Use

*NoDir unsets the current directory.

Related commands

*NoURD, *NoLib

*NoLib

Unsets the library.

`*NoLib`

*NoLib unsets the library.

*Lib

*NoURD

Unsets the User Root Directory (URD).

Syntax

`*NoURD`

Use

*NoURD unsets the User Root Directory.

Related commands

*NoDir, *URD

*Title

Sets the title of the current directory.

Syntax

```
*Title [<text>]
```

Parameters

<text>   a text string of up to 12 characters

Use

*Title sets the title of the current ADFS directory. *Title is provided for historical reasons; Titles take no place in pathnames and should not be confused with disc names. Spaces are permitted in *Title names.

Related commands

*Cat displays the titles of discs.

*URD

Sets the User Root Directory.

Syntax

```
*URD [<directory>]
```

Parameters

`<directory>`   any valid pathname specifying a directory

Use

*URD sets the User Root Directory. This is shown as an '&' in pathnames.

If no directory is specified, the root directory of the current filing system is selected.

Example

```
*URD adfs::0.$.MyDir
```

Related commands

*NoURD

*Verify

Checks a disc for readability.

Syntax

```
*Verify [<disc spec>]
```

Parameters

<disc spec>   the name of a disc or number of the disc drive, from 0 to 7 (ie, applies to floppy discs and hard discs)

Use

*Verify checks that the whole disc is readable. The default is the current disc.

Use *Verify to check discs which give errors during writing or reading operations.

Example

```
*Verify 4
```

```
*Verify :Mydisc
```

Related commands

*Defect

Network Filing System commands

The Network Filing System is for use with an Econet local area network. For general information on NetFS, see the chapter entitled *The Network Filing System* in Part 1 of this Guide.

The following commands are described in this chapter:

*Net
*Bye
*Free
*FS
*I am
*ListFS
*Logon
*Mount
*Pass
*PS
*SDisc
*SetPS

*Net

Selects the Network Filing System as the current filing system.

Syntax

`*Net`

Related commands

*ADFS, *RAM

*Bye

Logs the user off a file server.

Syntax

```
*Bye [[:]<file server>]
```

Parameters

`<file server>` the file server name or number; defaults to the current file server

Use

*Bye terminates your use of a file server, closing all open files and directories.

Example

```
*Bye 49.254
```

```
*Bye :fs
```

Related commands

*Shutdown, *Shut, *Logon

*Free

Displays file server free space.

```
*Free [:<file server>] [<user name>]
```

`<file server>` file server name or number; defaults to the current file server

`<user name>` issued by the network manager

*Free displays your current remaining free space as well as the total free space for the disc. If a user name is given, the free space belonging to that user name is printed out. If no user is given, then the current user's free space is displayed.

```
*Free :Business William
Disc name        Drive   Bytes free
                         Bytes used

Business           0      3 438 592
                         30 967 808
--------------------------------
User free space            185 007
```

*FS

Restores the file server's previous context.

Syntax

```
*FS [[:]<file server>]
```

Parameters

`<file server>` the file server name or number; defaults to the current file server

Use

*FS changes the currently selected file server, restoring your previous context (for example, the current directory on that file server). If no argument is supplied, your current file server number and name are printed out, followed by any non-current context.

Example

```
*FS 49.254

*FS :myFS

*FS
 59.254 "Business"
 4.254 "Accounts"
```

Related commands

*ListFS

*I am

Identical to *Logon (see below), except that *I am first selects the NetFS. There is therefore no need to type *Net before the *I am command.

*ListFS

Lists available file servers.

```
*ListFS
```

Use

*ListFS displays a list of the file servers which NetFS is able to recognise.

Example

```
*ListFS
1.254   :0   Finance1
1.254   :1   Finance2
6.246   :0   Production
```

Related commands

*FS

*Logon

Logs you on to a network file server.

Syntax

```
*Logon [[:]<station number>|:<file server name>] <user
    name> [[:<CR>] <password>]
```

Parameters

```
<station number>     a number specifying the station you wish to log on to
<file server name>   defaults to the current file server
<user name>          issued by the network manager
<password>           controlled by user
```

Use

*Logon enables you to use the current (or given) file server. Your user name and password are checked by the file server against the password file, to allow access. You must select NetFS before typing *Logon (this is not necessary with the *I am command).

Example

```
*Net
*Logon :fs guest
```

Related commands

*I am

*Mount

Selects the user root directory, the current selected directory and the library.

Syntax

`*Mount [:]<disc spec>`

Parameters

`<disc spec>`   the name of the disc to be mounted

Use

Within NetFS, *Mount enables you to set a user root directory on a specified disc, as well as your currently selected directory and library.

Example

`*Mount fs`

Related commands

*SDisc is a synonym. It is not possible to dismount (*Dismount) a network file server.

*Pass

Allows you to change your password.

Syntax

```
*Pass [<old password> [<new password>]]
```

Parameters

<old password]   the user's existing password (if any)

<new password]   the new password (if any) that the user wishes to assign

Use

*Pass enables you to change the password, knowledge of which allows unrestricted access to your network files. If you enter the command without parameters, the computer will prompt you to enter your old and new passwords, reflecting each character you type as a hyphen. If you do not have one, or wish to remove the one you have without substituting a new one, press Return at either of the prompts. A password may not be more than six characters long.

Examples

```
*Pass
```

Old password: ----   User types pail.

New password: ------   User types bucket.

```
*Pass bucket
```
User enters command again, this time giving existing password as parameter.

New password: User presses Return, leaving himself with no password.

*PS

Changes the printer server to be used.

Syntax

`*PS <printer server>`

Parameters

`<printer server>`   the name or station number of the printer server

Use

*PS changes the currently selected printer server, checking that the new one exists. The new printer server will be used next time you print to the net printer.

Example

`*PS 49.254`

`*PS myPS`

Related commands

*SetPS, *Configure PS

*SDisc

Selects the user root directory, the current selected directory and the library.

Syntax

```
*SDisc [<disc spec>]
```

Parameters

`<disc spec>`   the name or number of the disc to be selected

Use

Within NetFS, *SDisc reselects your user root directory, as well as your currently selected directory and library.

Example

```
*SDisc fs
```

Related commands

*Mount is a synonym. It is not possible to dismount (*Dismount) a network file server

*SetPS

Changes the printer server to be used.

Syntax

```
*SetPS <printer server>
```

Parameters

`<printer server>`   the name or station number of the printer server.

Use

*SetPS changes the currently selected printer server. This command only changes the stored name or number of the current printer server. No check is made that the printer server exists, or is available, until the next time you print to the network printer. It is only then that an error might be generated.

Example

```
*SetPS 49.254
```

```
*SetPS myPS
```

Related commands

*PS, *Configure PS

Other filing systems

The Advanced Disc Filing System (ADFS) and, for network users, the Network Filing System (NetFS) are the most commonly used, but more specialised filing systems – such as the RAM filing system (RAMFS) and the desktop filing system (DeskFS) – have associated commands, and these are described below.

The RAM filing system

The RAM filing system makes an area of RAM behave like an E-format ADFS disc. Carrying out operations with the RAM filing system can produce significant speed increases compared to the same operations using the hard or floppy disc units (under ADFS). Any information in RAMFS is lost when the power is withdrawn from the computer, so make sure you save any files stored in RAMFS to a permanent storage medium before switching off.

The desktop filing system

The desktop filing system is designed for use by the desktop software and is not normally accessed by the user or applications programmer. It contains files used for the operation of the desktop and its contents should not be used, changed, or relied upon, since they are liable to change with successive versions of the operating system.

The following commands are described in this chapter:

*Ram
*DeskFS

*Ram

Selects the RAM filing system if RAMFS is configured.

Syntax

*Ram

Related commands

*ADFS, NetFS

**Other RAMFS
commands**

As well as the commands common to all filing systems, the RAM filing system also provides some of the ADFS commands. See the ADFS section for descriptions of the commands:

*Back

*Free

*Map

*NameDisc

*Title

*URD

*DeskFS

For internal use only; selects the desktop filing system.

Syntax

`*DeskFS`

Use

*DeskFS selects the desktop filing system. This command is for internal use by the desktop manager.

Example

This command is of no use to general users.

Related commands

*RAM, *ADFS, *Net

System devices

The operating system contains a number of useful system devices, which behave like files in some ways. You can use them anywhere you would normally use a file name as a source of input, or as a destination for output. These include:

System devices suitable for input

`kbd:`	the keyboard, reading a line at a time (this allows editing using Delete, Ctrl-U, and other keys)
`rawkbd:`	the keyboard, reading a character at a time
`serial:`	the serial port
`null:`	the 'null device', which effectively gives no input

System devices suitable for output

`vdu:`	the screen, using GSRead format (see *Appendix F: GS formats*)
`rawvdu:`	the screen, via the VDU drivers (see the chapter *VDU commands*)
`serial:`	the serial port
`printer:`	the printer
`netprint:`	the network printer driver
`null:`	the 'null device', which swallows all output

These system devices can be useful with commands such as *Copy, and the redirection operators (> and <):

`*Copy myfile printer:` Send myfile to the printer

`*Cat { > printer: }` List the files in the current directory to the printer

*Cat netprint: Displays the currently selected network printer and a list of available network printers.

The system device null: is useful to suppress unwanted output from a command script or program:

*myprogram { > null: } Runs myprogram with no output

The most useful system devices for the general user are likely to be printer: and netprint:.

Configuration commands

This chapter concerns commands used to configure, or set up, the computer. The main command used is the *Configure command, which has many possible parameters, one for each of the CMOS RAM options you can set with it. CMOS RAM contains values of settings used at startup time; these values are not lost when mains power is switched off, since CMOS RAM is supported by batteries: the memory is therefore known as 'non-volatile'.

The Configure program, run from the desktop and described fully in Part 2 of this Guide, can control the most commonly modified features, such as mouse speed, keyboard auto-repeat, sound volume, printer type, the keyboard Caps Lock, and the type of window dragging. When set using the Configure program, changes to these options have immediate effect. When set with the *Configure command, however, changes are recorded immediately but take effect only **after** power on or a hard reset.

The other difference between the Configure program and the *Configure command is that the latter has many more parameters, offering you an extended range of changes to the configuration.

*Co. can be used as an abbreviation for *Configure.

The *Status command displays a list of the current options and their currently assigned values, the entire collection of settings being known as the configuration status of the machine.

Several ways of resetting the options are provided, so you can return them to their default values. This is especially useful if you ever find your computer is configured so as to be almost unusable.

In this chapter the *Status command is described first; this allows you to examine the present configuration of your computer. Next, the default values at power on are listed, together with information on how to restore them. The remaining configuration commands are discussed in three groups:

User preferences:

*Configure Boot
*Configure Caps
*Configure Delay
*Configure Dir
*Configure DumpFormat
*Configure FileSystem
*Configure Language
*Configure Lib
*Configure Loud
*Configure Mode
*Configure MouseStep
*Configure NoBoot
*Configure NoCaps
*Configure NoDir
*Configure NoScroll
*Configure Quiet
*Configure Repeat
*Configure Scroll
*Configure ShCaps
*Configure SoundDefault
*Configure WimpFlags
*Configure WimpMode

Hardware configuration:

*Configure Baud
*Configure Country
*Configure Data
*Configure Drive
*Configure Floppies
*Configure FS
*Configure HardDiscs
*Configure Ignore
*Configure MonitorType
*Configure Print
*Configure PS
*Configure Step
*Configure Sync
*Configure TV

Memory allocation:

*Configure ADFSbuffers
*Configure ADFSDirCache
*Configure FontSize
*Configure RAMFsSize
*Configure RMASize
*Configure ScreenSize
*Configure SpriteSize
*Configure SystemSize

*Status

Provides information on how the computer is configured.

Syntax

```
*Status [<name>]
```

Parameters

```
<name>              a *Configure option name
```

Use

*Status displays the configuration status of the computer. Because the default values of various parameters are held in non-volatile memory (the battery-backed CMOS RAM), they are preserved even when the computer is switched off, until reset from the desktop (by using Configure) or by using the *Configure command.

`*Status` without a parameter list displays all values.

`*Status <name>` displays the value of the *Configure option `name`.

Example

```
*Status TV
```
TV   0,1

```
*Status Language
```
Language   3

Related commands

*Configure

Restoring default values

It is sometimes useful to restore all the values to their default settings. (For instance, someone else might use your computer and change the configuration, or the batteries that power the CMOS RAM might become flat without your realising it.) To restore the default values, switch the machine on with either the R key or the Delete key held down. Of these, the R key is less severe in its effects.

An 'R power on' preserves the Econet station number, the country code, the number of floppy discs, the number of hard discs and all bytes relating to expansion cards. All other bytes are cleared to zero, and then the following defaults are set:

Baud	4	Serial port set to 1200 baud
NoBoot		Do not run boot file at power on or reset
Caps		Caps lock on at power on
Data	4	Serial port set to 8 bit words, no parity, 2 stop bits
Delay	32	32 centisecond delay before keys auto-repeat
NoDir		No directory selected by ADFS at power on
DumpFormat	4	Control characters printed using GSRead, top-bit characters printed
FontSize	6	6 units of 4K of RAM reserved for Font cache
Ignore	10	ASCII line feed ignored by printers
Language	3	desktop selected at power on
Mode	0	Screen mode 0 selected at power on
MonitorType	0	50Hz analogue RGB monitor selected
MouseStep	1	Slow mouse movement
Print	1	Parallel printer port used
Quiet		Beep set to half volume
RamFsSize	0	No memory reserved for RAMFS
Repeat	8	8 centisecond keyboard auto-repeat rate
RMASize	2	2 pages of RAM reserved for relocatable modules
ScreenSize	0	80K on 512K machines, 160K otherwise
Scroll		Screen scrolls when the end of a line is reached
SpriteSize	1	1 page of RAM reserved for system sprite pool
Sync	1	Composite sync selected
SystemSize	0	No memory reserved for system heap
TV	0,1	Interlace off
FileSystem	8	ADFS selected at power on

ADFSbuffers		Sets default according to size of memory
ADFSDirCache		Sets default according to size of memory
Drive	0	Drive 0 selected at power on or reset
Step	3	3ms floppy disc drive step rate
FS	0.254	Default net file server set to 0.254
Library	1	Network library set to $.ArthurLib
PS	0.235	Default net print server set to 0.235
SoundDefault	1 7 1	Speaker on, maximum volume, voice 1
WimpFlags	0	Windows displayed as outlines when moved
WimpMode	12	Mode 12 used for desktop on entry
Year	1988	Date year reset to 1988

A 'Delete power on' also sets the above defaults, but preserves only the Econet station number. All bytes relating to expansion cards are cleared, and the country code and numbers of drives are set to:

Floppies	1	One floppy disc drive recognised at power on
HardDiscs	0	No hard disc drive recognised at power on
Country	UK	UK keyboard and Latin1 character set selected

Setting the monitor type

Both the above power on resets set the MonitorType to 0 (a 50Hz TV standard monitor with composite sync). If you have a different type of monitor you will then not be able to see the display on your screen, and you will need to follow the original power on reset with a second (different) reset to select the correct monitor type. Switch the machine on with the appropriate key from the numeric pad held down:

0	50Hz TV standard monitor
1	Multiscan colour monitor
2	64Hz high-resolution monochrome monitor
3	60Hz VGA-type monitor

In a few cases you will still not get a display on your monitor, because the monitor has vertical instead of composite sync. In this case, repeat the above process, but use the T or Copy key instead of the R or Del key respectively. The same default values are set as before, except for the vertical sync signal, which will now be correct for your monitor. You may then need to set the monitor type again.

Summary

In summary, you should go through the following steps, stopping as soon as you get a display:

1 Reset the values by switching on while holding down the R or Delete key.

2 Set the monitor type by switching on while holding down the correct numeric key.

3 Reset the values by switching on while holding down the T or Copy key.

4 Set the monitor type by switching on while holding down the correct numeric key.

Once you have restored the default values and got a display, you can use the *Configure command to change any of the defaults to the values you want.

User preferences

This grouping of configuration commands allows you to customise the operation of your Acorn computer to suit your personal working style.

*Configure Boot

Causes a power on, reset or Ctrl Break to run a boot file.

Syntax

`*Configure Boot`

Use

*Configure Boot causes a power on, reset or Ctrl Break to run a boot file. The file `&.!Boot` is looked for, and if found is loaded and run, as set by the *Opt 4 command. You might use a boot file to load a program automatically when the computer is switched on. For information on network boot files, see you network manager.

The Break key always operates as an Escape key after power on. You can use a Shift power on, Shift reset or Shift Break if you do not want to run the !Boot file.

NoBoot is the default setting.

This option can also be set from the desktop, using the Configure application.

See also *Appendix A: Resetting and power on.*

Related commands

*Opt 4, *Configure NoBoot

*Configure Caps

Selects Caps Lock ON.

Syntax

`*Configure Caps`

Use

*Configure Caps sets the Caps Lock on, so that when you switch on you automatically type in capital letters. This is the default setting.

This option can also be set from the desktop, using the Configure application.

Related commands

*Configure NoCaps, *Configure ShCaps

*Configure Delay

Sets the delay before keys start to auto-repeat.

Syntax

`*Configure Delay <n>`

Parameters

`<n>`   0 to 255

Use

*Configure Delay specifies the keyboard auto-repeat delay (in centiseconds, from 0 to 255). A value of 0 disables auto-repeat. The default value is 32.

Example

`*Configure Delay 20`

Related commands

The keyboard auto-repeat delay can be changed temporarily with `*FX 11,n`.

*Configure Dir

Selects the root directory on power on.

`*Configure Dir`

*Configure Dir sets the root directory of the ADFS and the RAMFS as the current directory on power on. NoDir is the default setting.

This option can also be set from the desktop, using the Configure application.

*Configure NoDir , *Configure Drive

*Configure DumpFormat

Selects the layout for *Dump and *List commands.

Syntax

```
*Configure DumpFormat <n>
```

Parameters

<n>   A number in the range 0 to 15. The parameter is treated as a four-bit number, in which the bottom two bits define how control characters are displayed, as follows:

Value	Meaning
0	GSTrans format is used (eg |A for ASCII 1)
1	Full stop '.' is used
2	<n> is used, where n is in decimal
3	<&n> is used, where n is in hexadecimal

Characters which have their top bit set are normally treated as control codes. However, if n has a value between 4 and 7 (ie if bit 2 is clear) they are treated as printable characters. n=5, for example, causes control characters to be printed as full stops.

If bit 3 is set (ie for values of n between 8 and 15), characters are ANDed with &7F before being processed, (ie converted to ordinary characters) otherwise they are left as they are.

Use

*Configure DumpFormat <n> selects the format to be used by the *Dump, *List and *Type commands, and the vdu: output device. The default value is 4 (GSTrans format, characters with the top bit set are printed, all 8 bits considered). See *Appendix F: GS formats* for details of GSTrans format.

Example

```
*Configure DumpFormat 2
```

Related commands

*Dump, *List

*Configure FileSystem

Selects the filing system to be used at power on.

Syntax

`*Configure FileSystem <n> | <name>`

Parameters

`<n>`   filing system number (8 for ADFS, 5 for NetFS)

`<name>`   filing system name (ADFS, Net or Ram)

Example

`*Configure FileSystem Net`

*Configure Language

Selects the language used at power on.

Syntax

```
*Configure Language <n>
```

Parameters

`<n>`   the module number of the language which will be started after power on

The default is n=3 (the desktop).

Use

`*Configure Language` followed by a number sets the module language which is automatically selected on power on. Choose 3 for the desktop, 4 for BASIC or 0 for Command Line mode. Use the *Modules command to check the number of the required language, especially if you have added or removed modules.

Note that the configured language is not entered if a boot file is run at power on using *Exec. Instead, the boot file must select the language.

Example

`*Configure Language 0`   Starts up in Command Line mode, with * prompt

Related commands

*Modules

*Configure Lib

Selects the library used by NetFS at logon.

Syntax

`*Configure Lib [0 | 1]`

Parameters

0 or 1

Use

*Configure Lib defines the library selected after logon.

If 1 is used as the parameter, the library $.ArthurLib is used by NetFS. If 0 is used, the library $.Library is used.

This command does not affect other filing systems.

Example

`*Configure Lib 0`

*Configure Loud

Sets the beep at full volume.

Syntax

`*Configure Loud`

Use

This option can also be set from the desktop, using the Configure application.

Related commands

*Configure Quiet, *FX 212

*Configure Mode

Selects the screen mode used after a reset.

Syntax

```
*Configure Mode <n>
```

Parameters

<n>   screen mode number (see *Appendix D: Screen
                             modes* for the valid mode numbers)

Use

*Configure Mode selects the screen mode used after a reset, or on leaving the
desktop. Mode 0 is the default.

Example

```
*Configure Mode 27
```
selects the startup mode suitable for a VGA-type
monitor, using 16 colours

Related commands

*Configure MonitorType, *Configure WimpMode.

*Configure MouseStep

Selects how fast the pointer moves as you move the mouse.

Syntax

```
*Configure MouseStep <n>
```

Parameters

<n>   a number between 1 and 127

Use

*Configure MouseStep sets how fast the pointer moves as you move the mouse. Useful values are 1, 2 or 3 for slow, medium and fast, respectively. Although values up to 127 are accepted by the command, the highest useful value is around 6 (try higher values and you will see why!).

This option can also be set from the desktop, using the Configure application.

Example

```
*Configure MouseStep 3
```

*Configure NoBoot

Causes a Shift power on, Shift reset or Shift Break to run a boot file.

Syntax

`*Configure NoBoot`

Use

*Configure NoBoot causes a Shift power on, Shift reset or Shift Break to run a boot file. The file `&.!Boot` is looked for, and if found is loaded and run, as set by the *OPT 4 command. You might use a boot file to automatically load a program when the computer is switched on with the Shift key held down. For information about network boot files, consult your network manager.

The Break key always operates as an Escape key after power on. You can use a normal power on, reset or Ctrl Break if you do not want to run the !Boot file.

This is the default setting.

This option can also be set from the desktop, using the Configure application.

See also *Appendix A: Resetting and power on.*

Related commands

*OPT 4, *Configure Boot

*Configure NoCaps

Selects Caps Lock OFF.

Syntax

```
*Configure NoCaps
```

Use

*Configure NoCaps sets the Caps Lock off, so that when you power on you automatically type in lower case. Caps is the default.

This option can also be set from the desktop, using the Configure application.

Related commands

*Configure Caps, *Configure ShCaps

*Configure NoDir

No directory is selected on power on.

Syntax

```
*Configure NoDir
```

Use

*Configure NoDir leaves the ADFS and the RAMFS with no current directory on power on. This is the default setting.

This option can also be set from the desktop, using the Configure application.

Related commands

*Configure Dir , *Configure Drive

*Configure NoScroll

Sets the screen not to scroll upwards at the end of a line.

Syntax

```
*Configure NoScroll
```

Use

*Configure NoScroll prevents a new line from being generated when a character is printed at the end of a line. The default value is Scroll.

Related commands

*Configure Scroll

*Configure Quiet

Sets the beep at half volume.

Syntax

```
*Configure Quiet
```

Use

This option can also be set from the desktop, using the Configure application.

Related commands

*Configure Loud, *FX212

*Configure Repeat

Sets the interval between the generation of auto-repeat keys.

Syntax

```
*Configure Repeat <n>
```

Parameters

`<n>`   0 to 255

Use

*Configure Repeat specifies the keyboard auto-repeat interval (in centiseconds, from 0 to 255). A value of 0 sets an infinite interval, so the character repeats just once, after the configured auto-repeat delay. To completely disable auto-repeat, configure the delay to 0.

The default Repeat value is 8.

This option can also be set from the desktop, using the Configure application.

Example

```
*Configure Repeat 3
```

Related commands

The keyboard auto-repeat interval can be changed temporarily with `*FX 12,n`.

*Configure Scroll

Sets the screen to scroll upwards at the end of a line.

Syntax

`*Configure Scroll`

Use

*Configure Scroll generates a new line automatically whenever a character is printed at the end of a line. This is the default.

Related commands

*Configure NoScroll

*Configure ShCaps

Selects Caps Lock ON, Shift producing lower case letters.

Syntax

```
*Configure ShCaps
```

Use

*Configure ShCaps sets the Caps Lock on, so that when you power on you automatically type in capital letters. Holding down the Shift key will produce lower case letters, which does not happen when Caps is the configured value. Caps is the default value.

Related commands

*Configure Caps, *Configure NoCaps

*Configure SoundDefault

Sets the speaker volume and voice parameters.

`*Configure SoundDefault <spkr> <vol> <voice>`

`<spkr>`	0 disables the internal speaker (leaving headphones working)
	1 enables the internal speaker
`<vol>`	0 to 7; sets the overall volume (0 is softest, 7 is loudest)
`<voice>`	1 to 16; sets the voice which will be assigned to channel 1

This option can also be set from the desktop, using the Configure application.

`*Configure SoundDefault 1 7 4`   Speaker on, maximum volume, voice 4 assigned to channel 1.

*Configure WimpFlags

Selects the way in which dragged windows are displayed.

Syntax

```
*Configure WimpFlags <n>
```

Parameters

<n>   a 5 bit number

Use

*Configure WimpFlags controls the way in which the window is displayed while it is dragged to a new position on the screen, resized, or scrolled. The default is 0, which causes the window or scroll bar to be displayed as a coloured outline until the mouse button is released. The bits have the following meanings when set:

Bit 0 set: continuous window movement
Bit 1 set: continuous window resizing
Bit 2 set: continuous horizontal scroll
Bit 3 set: continuous vertical scroll
Bit 4 set: don't beep when error box appears

Selecting 'Instant effect window drags' using the desktop Configure program sets bits 0 to 3.

Example

```
*Configure WimpFlags 1
```

*Configure WimpMode

Selects the default screen mode for the desktop.

Syntax

`*Configure WimpMode <mode>`

Parameters

`<mode>`   screen mode number (see *Appendix F: Screen modes*)

Use

*Configure Wimpmode sets the screen mode used when the desktop is entered.

This option can also be set from the desktop, using the Configure application.

Related commands

*Configure Mode.

Hardware configuration

The second group of configuration commands allows you to set up your computer to suit its hardware specification and the range of peripherals such as printers that are connected to it.

*Configure Baud

Sets the serial port baud rate.

Syntax

```
*Configure baud <n>
```

Parameters

`<n>`   0 to 8

Use

`*Configure baud <n>` sets the serial port baud rate. The values of 'n' correspond to the following baud rates:

n	baud rate
0	9600
1	75
2	150
3	300
4	1200
5	2400
6	4800
7	9600
8	19200

The default value is 4 (1200 baud).

Example

`*Configure baud 7`   sets the baud rate to 9600

Related commands

*FX 7, *FX 8

*Configure Country

Sets the default alphabet and keyboard.

Syntax

```
*Configure Country <country>
```

Parameters

<country>   valid countries are currently Canada, Canada1, Canada2, Compact, Default, Denmark, Esperanto, Finland, France, Germany, Greece, Iceland, ISO1, Italy, Master, Norway, Portugal, Spain, Sweden, and UK. A list of parameters can be obtained with the *Countries command.

Use

*Configure Country sets the appropriate default alphabet and keyboard layout. For some countries you also need to load a relocatable module to define the keyboard layout. Specifying UK (the default setting) automatically selects Latin1.

Example

```
*Configure Country Italy
```

Related commands

*Countries, *Alphabets

*Configure Data

Sets the data format for serial data transmission.

Syntax

```
*Configure Data <n>
```

Parameters

<n>   0 to 7:

n	Word length	Parity	Stop bits
0	7	even	2
1	7	odd	2
2	7	even	1
3	7	odd	1
4 (the default)	8	none	2
5	8	none	1
6	8	even	1
7	8	odd	1

Use

*Configure Data sets the word length, parity and number of stop bits for serial data transmission.

Example

`*Configure Data 0` (7-bit word, even parity, with two stop bits)

Related commands

*FX 156

*Configure Drive

Sets the drive selected at power on.

Syntax

```
*Configure Drive <n>
```

Parameters

       `<n>`   drive number

Use

*Configure Drive sets the number of the drive which will automatically be selected on power on. 0–3 correspond to floppy disc drives; 4–7 correspond to hard disc drives. Since most Acorn computers have only one floppy disc drive and no more than one hard disc drive, the most common values are 0 or 4.

Example

```
*Configure Drive 0
```

Related commands

*Configure Floppies, *Configure HardDiscs, *Configure FileSystem

*Configure Floppies

Sets the number of floppy disc drives recognised at power on.

Syntax

```
*Configure Floppies <n>
```

Parameters

<n>   0 to 4

Use

*Configure Floppies sets the number of floppy disc drives the computer will recognise. The default value is 1.

Example

```
*Configure Floppies 0
```

Related commands

*Configure HardDiscs

*Configure FS

Sets the default file server for the Network Filing System.

Syntax	`*Configure FS <nnn>.<sss>	<name>`

Parameters

`<nnn>`	network number
`<sss>`	station number
`<name>`	station name

Use

*Configure FS sets the network file server used where none is specified. It is preferable to use the station name, as this is less likely to change. The default value is 0.254.

This option can also be set from the desktop, using the Configure application.

Example

`*Configure FS Server1`

Related commands

*Configure PS, *Configure FileSystem, *I Am, *Logon.

*Configure HardDiscs

Sets the number of hard disc drives recognised at power on.

Syntax

`*Configure HardDiscs <n>`

Parameters

`<n>`   0 to 2

Use

*Configure HardDiscs sets the number of hard disc drives the computer will recognise. The default value depends on the ·model number of the computer (for example, model 305 is not supplied with a hard disc, so the value is 0).

Example

`*Configure HardDiscs 2`

Related commands

*Configure Floppies

*Configure Ignore

Specifies the printer ignore character.

Syntax

`*Configure Ignore [<n>]`

Parameters

`<n>`   ASCII code, from 0 to 255

Use

*Configure Ignore specifies the ASCII code for the printer ignore character, used when printing is enabled by pressing Ctrl B (when a printer driver is installed, its settings take precedence). The default value is 10 (an ASCII linefeed). On some printers you may find this causes lines to overprint each other, in which case you should omit the character code so all characters are sent to the printer.

Example

`*Configure Ignore 10`   Do not print ASCII character 10

`*Configure Ignore`   Print all characters

*Configure MonitorType

Selects the default monitor type.

Syntax

```
*Configure MonitorType <n>
```

Parameters

`<n>`   0 to 3

Use

`*Configure MonitorType` specifies the kind of monitor fitted to your Acorn computer, as follows:

0   50Hz TV standard colour monitor (allows modes 0 to 17, 24)
1   Multiscan colour monitor (allows modes 0 to 21, 24 to 28)
2   Hi-resolution 64Hz monochrome monitor (allows mode 23 only)
3   60Hz VGA-type monitor (allows modes 25 to 28 only)

The monitor type can also be set by holding down the corresponding key from the numeric key pad while the computer is switched on. See the section *Restoring default values* at the beginning of this chapter for further details.

Example

```
*Configure MonitorType 3
```

*Configure Print

Selects the default destination for printed output.

Syntax

```
*Configure Print <n>
```

Parameters

<n>   0 to 7

Use

`*Configure Print` specifies the default destination for printed output, as follows:

0   Sink (no output printed)
1   Printer port (parallel, Centronics) – the default
2   RS423 port (serial)
3   User printer driver
4   Network printer (handled through NetPrint)
5 to 7   User print device (can be used to 'print' to a file)

This option can also be set to 0-4 from the desktop, using the Configure application.

Example

```
*Configure Print 1
```

*Configure PS

Selects the network printer server number or name at power on.

Syntax

```
*Configure PS <nnn>.<sss> | <name>
```

Parameters

`<nnn>`	network number
`<sss>`	station number
`<name>`	station name

Use

`*Configure PS` selects the number or name of the printer server within the NetFS.

It is not necessary to be logged on to a file server to use a printer server.

Example

```
*Configure PS Laser1
```

*Configure Step

Sets the step rate of the floppy disc drive.

Syntax

```
*Configure Step <n> [<drive>]
```

Parameters

<n>	step time in milliseconds
<drive>	0 to 3

Use

*Configure Step sets the floppy disc drive step rate to <n>, the step time in milliseconds. If the parameter <drive> number is omitted, the step rate is set for all floppy disc drives. This command should only be used with non-Acorn disc drives.

The setting of this value affects disc performance. The optimum setting will vary, and is not necessarily the shortest step time. The default value is 3 milliseconds. It is possible to set values of 2, 3, 6 and 12 milliseconds: if other numbers are supplied, the request will be rounded up to the nearest step available.

Example

```
*Configure Step 3
```

*Configure Sync

Selects the type of synchronization for vertical sync output.

Syntax

`*Configure Sync <0|1>`

Parameters

0 or 1

Use

*Configure Sync selects vertical sync (n=0) or composite sync (n=1) on the vertical sync output of the video connector. For any monitor supplied for use with Acorn computers, the default should not be changed from 1.

Example

`*Configure Sync 1`

*Configure TV

Adjusts screen alignment and screen interlace.

Syntax

```
*Configure TV [<vert align> [[,] <interlace>]]
```

Parameters

<vert align>   adjusts the vertical screen alignment. The parameter
can take values from 0 to 3 (0 to 3 lines up) or from
255 down to 252 (1 to 4 lines down).

<interlace>   switches screen interlace on (with a value of 0) or off
(with a value of 1).

Use

*Configure TV sets the vertical alignment and interlace option. The default values are TV 0, 1 (no vertical alignment offset with interlace option off).

Example

```
*Configure TV 0,1    (the default value)
```

Related commands

*TV

Memory allocation

The third group of configuration commands allows you to optimize the use of memory. The default memory allocations take into account the model number of your Acorn computer (and hence the overall size of memory), so these values should not be changed for general use.

For many of these commands you can specify the amount of memory to reserve either in kilobytes or in pages of memory. It is preferable to use kilobytes, as the page size could change on future versions of the hardware. For reference, the current page sizes are:

1/2 and 1Mbyte machines:	8Kbytes
2Mbyte machines:	16Kbytes
4Mbyte machines:	32Kbytes

You can see how memory is allocated and make temporary changes by using the Task Manager from the desktop.

*Configure ADFSbuffers

Sets the number of ADFS file buffers.

Syntax

`*Configure ADFSbuffers <n>`

Parameters

`<n>`   number of buffers

Use

*Configure ADFSBuffers sets the number of 1024 byte file buffers reserved for ADFS in order to speed up operations on open files. A value of n=1 reserves the default number of buffers appropriate to the RAM size supplied; a value of n=0 disables fast buffering on open files.

Example

`*Configure ADFSbuffers 8`

*Configure ADFSDirCache

Reserves an area of RAM for the directory cache.

Syntax

```
*Configure ADFSDirCache <n>|<m>K
```

Parameters

`<n>`	number of pages of memory; $n \leq 255$
`<m>K`	kilobytes of memory reserved

Use

*Configure ADFSDirCache reserves an area of memory for the directory cache. Directories are stored in the cache to save reading them from the disc; this speeds up disc operations, and reduces disc wear. A value of 0 selects a default value which depends on RAM size.

Example

```
*Configure ADFSDirCache 16K
```

*Configure FontSize

Reserves an area of RAM for the font cache.

Syntax

```
*Configure FontSize <n>|<m>K
```

Parameters

`<n>`	number of pages of memory; n ≤ 255
`<m>K`	kilobytes of memory reserved

Use

*Configure FontSize is used to reserve an area of memory for the font cache. Fonts are stored in the cache to save reading them from a filing system; they can then be displayed much more quickly. If n=0, no space is reserved for fonts. The default value is 24K.

Example

```
*Configure FontSize 64K
```

*Configure RamFsSize

Reserves an area of memory for the RAM filing system.

Syntax

```
*Configure RamFSSize <n>|<m>K
```

Parameters

<n>	number of pages of memory; n ≤ 127
<m>K	kilobytes of memory reserved

Use

*Configure RamFSSize is used to reserve an area of memory for the RAM Filing System (when the RAMFS module is present). The default value is 0, which disables the RAM filing system.

Example

```
*Configure RamFSSize 128K
```

*Configure RMASize

Reserves an extra area of memory for relocatable modules.

Syntax

`*Configure RMASize <n>|<m>K`

Parameters

`<n>`	number of pages of memory; $n \leq 255$
`<m>K`	kilobytes of memory reserved

Use

*Configure RMASize is used to reserve an extra area of memory in the relocatable module area (RMA) after all modules have been initialised. If $<n> = 0$, no extra memory is reserved. The default is to reserve 2 extra pages.

Example

`*Configure RMASize 128K`

*Configure ScreenSize

Reserves an area of memory for screen display.

Syntax

```
*Configure ScreenSize <n>|<m>K
```

Parameters

<n>	number of pages of memory; n ≤ 127
<m>K	kilobytes of memory reserved

Use

*Configure ScreenSize reserves an area of memory for screen display. The default value is 80Kbytes on a 1/2Mbyte machine, and 160Kbytes for all other machines.

Example

```
*Configure ScreenSize 160K
```

*Configure SpriteSize

Reserve an area of memory for the sprite system.

```
*Configure SpriteSize <n>|<m>K
```

Parameters

<n>	number of pages of memory; n ≤ 127
<m>K	kilobytes of memory reserved

Use

*Configure SpriteSize is used to reserve an area of memory for the sprite system. If n=0, no space is reserved for sprites. The default value is 1 page of memory.

Example

```
*Configure SpriteSize 20K
```

*Configure SystemSize

Reserves an extra area of RAM for the system heap.

Syntax

```
*Configure SystemSize <n>|<m>K
```

Parameters

<n>	number of pages of memory; n ≤ 63
<m>K	kilobytes of memory reserved

Use

*Configure SystemSize reserves an extra area of memory for the system heap after all modules have been initialised. The default value is 0.

Example

```
*Configure SystemSize 32K
```

Using system variables

The chapter entitled *Configuration commands* describes how the Acorn computer stores settings used at startup time in the CMOS RAM. As well as these, there are other settings RISC OS needs to store, such as how you like the time and date to be printed, how you like the *Copy command to work, and what prompt you like. These are stored in system variables.

When the computer is switched on or reset, it always gives the same default values to a standard set of system variables. You can see these default values by typing *Show just after switching on your computer.

If the default values are not the ones you want, you can change them using the *Set command. Unlike values stored in the CMOS RAM by *Configure, system variables are not remembered between sessions, so if you want different default values you must change the variable each time you use your computer. This is commonly done by including the *Set commands in a boot file (a file that is run each time you use the computer).

Each variable is accessed by its name, which can contain any character which is neither a space nor a control character. As with filenames the case of characters is remembered, but is ignored when the names are looked up. A simple example of how to use a system variable is to change the operating system prompt – normally * – by setting the variable CLI$Prompt to the character #:

```
*Set CLI$Prompt #
```

You can also set one variable to the value of another:

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

This sets the prompt to the system time, but only does so once, when the command is given. However, it would clearly be more useful if the prompt always showed the current time. To do this, change CLI$Prompt from a

variable into a macro. A macro is similar to a variable, but is evaluated every time it is used, instead of just once when it is set. Therefore, type the following:

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

Each time Return is pressed at the Command Line prompt a new prompt is given; the current time is worked out and displayed, followed by a space character and an asterisk:

12:59:06 *

12:59:07 *

12:59:07 *

12:59:08 *

Some standard variables

There are many different system variables provided and used by RISC OS. You can see them all by typing *Show; use Shift to display each successive screenful.

The variables in the list below are those that you are most likely to need. The list also explains the function of each variable. Some of the descriptions apply to a group of variables whose function is similar.

Variable	Use
File$Type_XXX	name of file type XXX, where XXX is a 3 digit hexadecimal number
Alias$@LoadType_XXX	action for file type XXX when a *Load command is given
Alias$@RunType_XXX	action for file type XXX when a *Run command is given
Alias$@PrintType_XXX	action for file type XXX when an application tries to print it
File$Path	directory(s) to search when a *Load command is given
Run$Path	directory(s) to search when a *Run command is given

Printer$Temp	temporary printer file used by the PrinterDM and PrinterPS applications
Alias$...	used for renaming a command, or defining a new one using existing commands
CLI$Prompt	prompt used in Command Line mode
...$Options	default action for a command
Font$Prefix	root of directory tree containing fonts
Key$<n>	string assigned to function key <n>, as used by *Key
...$Dir	home directory for an application
Sys$DateFormat	date display format
Sys$Time	time in form 14:05:36
Sys$Date	date in form Tue,25 Oct
Sys$Year	year in form 1988
Sys$RCLimit	maximum permitted return code
Sys$ReturnCode	most recent return code

The last five variables are special because they cannot be deleted, although you can assign new values to them just as you can to any other variable.

Setting the date and time format

The date format can be set by altering the system variable Sys$DateFormat. The text of this variable is printed as set, except when a % appears. In this case, the next two characters are treated as a special field name which is replaced by a component of the current time. The field names, which may use upper or lower case, are:

Name	Value	Example
CS	centiseconds	99
SE	seconds	59
MI	minutes	05
12	hours in 12 hour format	07
24	hours in 24 hour format	23

Name	Value	Example
AM or PM	'AM' or 'PM'	pm
WE	weekday, in full	Thursday
W3	weekday, in three characters	Thu
WN	weekday, as a number	5
DY	day of the month	01
ST	'st', 'nd', 'rd' or 'th'	st
MO	month name, in full	September
M3	month name, in three characters	Sep
MN	month as a number	09
CE	century	19
YR	year within century	87
WK	week of the year, Mon to Sun	52
DN	day of the year	364
0	insert an ASCII 0 zero byte	
%	insert a %	

To cause leading zeros to be omitted, prefix the field with the letter Z. For example, %zmn means the month number without leading zeros. %0 may be used to split the output into several zero-terminated strings.

Example

Begin by typing

```
*Info !ArmBoot
```
where !ArmBoot is a file in your current directory. The information displayed includes the time when the file was last altered.

```
!ArmBoot   WR/r   Obey   18:53:39 26-Oct-1988   848   bytes
```

Change the date format, and get the information again, showing the time in the new format:

```
*Set Sys$DateFormat %we %zdy%st %mo %ce%yr (%z12:%mi %am)
*Info !ArmBoot
```

```
!ArmBoot  WR/r  Obey  Wednesday  26th  October  1988  (6:53
pm)     848   bytes
```

Practical uses

One practical use of system variables is to set default options for the *Copy and *Wipe commands, or for setting the *Dump or *Time formats to suit your personal working style.

The names of commands may be changed using the *Set command with variables whose name starts Alias$... This allows you to add new commands, to change the meaning of existing commands, to combine commands together, and to add your own parameters to a command.

Programmers can use system variables to pass values between programs. One program can create and write to a variable which another program can then read. Such variables should have names starting '<name>$', where <name> is your program; this will avoid problems caused by programmers using the same system variable names.

The *Show command, which displays the list of system variables, is described first, since this command allows you to see the format of system variables and how they are used in practice.

*Show

Displays the list of system variables.

Syntax

`*Show [<variablespec>]`

Parameters

`<variablespec>`   a variable name or a wildcard specification for a set of variable names

Use

`*Show <name>` displays the name, type and current value of any system variables matching the name given as a parameter. These include the 'special' system variables, which may be altered, but which cannot be deleted, as listed above.

If no name is given, all system variables are displayed.

Example

`*Show`   lists all system variables

`*Show CLI$Prompt`

`*Show Alias$*`   lists all aliases

Related commands

*Set, *SetEval and *SetMacro, which may be used to set system variables.

*Set

Assigns a string value to a system variable.

Syntax

```
*Set <varname> <value>
```

Parameters

<varname> a variable name or a wildcard specification for a set of variable names

<value>   this parameter depends on the system variable referred to in the <varname> specification

Use

*Set assigns a string value to a system variable, like an assignment statement in a programming language. For example:

```
*Set varname text
```

assigns the string 'text' to the variable varname.

Another use for the *Set command is to change the name of a command to one which is more convenient for the user:

```
*Set Alias$<name> <cname>
```

establishes <name> as an alternative name for the command <cname>; for example after:

```
*Set Alias$Aid Help
```

the command *Aid is now a synonym for *Help; both commands access the help system.

The command *Show Alias$* lists all aliases. Another example is:

```
*Set Alias$Mode Echo |<22>|<%0>
*Mode 12
```

The command implements a new command Mode, which sets the screen to mode 12 (in the above case). The Echo command reflects the string which follows it; |<22> generates the ASCII character 22, Ctrl V, which is equivalent to the VDU command to change mode. |<%0> reads the first parameter from the command line, and generates the corresponding ASCII code.

Example

```
*Set Sys$Year 1988
```

Related commands

*SetEval, *SetMacro and *Unset. Further information on the *Set command is given in the *Programmer's Reference Manual*.

*SetEval

Evaluates an expression, assigning it to a system variable.

Syntax

```
*SetEval <varname> <expression>
```

Parameters

<varname>   a valid variable name
<expression>   a valid Command Line expression

Use

*SetEval evaluates an expression and assigns the value to a system variable.

Example

```
*Set rate 12

*SetEval rate rate + 1

*Show rate
rate (Number) : 13
```

Related commands

*Set, *SetMacro, *Unset.

*Help Eval describes the way in which expressions are analysed.

*SetMacro

Assigns a macro value.

Syntax

```
*SetMacro <varname> <expression>
```

Parameters

`<varname>`	a valid variable name
`<expression>`	a valid Command Line expression

Use

*SetMacro assigns an expression to a system variable. The parameters making up the expression are not evaluated when the command is given, but each time the variable is used.

Example

```
*SetMacro CLI$Prompt <Sys$Time>
13:43:17                              system time replaces existing prompt
13:43:19                              Return pressed two seconds later
```

This resets the Command Line prompt, which appears as the first item on each line, to be the current time whenever the prompt is given. Compare this with using the *Set command:

```
*Set fred <Sys$Time>

*Show fred
FRED   :   13:43:59
```

the *Show command issued five minutes later will produce:

```
*Show fred
FRED   :   13:43:59
```

Notice that the time is fixed at the time the *Set command is last used, in contrast to the *SetMacro command.

Related commands

*Set, *SetEval, *Unset.

*Unset

Deletes a system variable.

```
*Unset <varname>
```

<varname>   any currently Set system variable, which may be specified using wildcards.

```
*Unset My_var
```

*Set, *SetEval, *SetMacro.

Module-related commands

Relocatable modules

A relocatable module is a piece of software which, when loaded into the machine, behaves like a normal application program or as an extension to the operating system. Modules can contain programming languages or filing systems; they can be used to add new * commands.

Relocatable modules run in an area of memory known as the Relocatable Module Area (RMA) which is maintained by the system. They are 'relocatable' because they can be loaded at any particular location in memory.

RISC OS provides facilities for integrating modules in such a way that, to the user, they appear to be a full part of the system. For instance, the operating system responds to the *Help command, extracting automatically any relevant help text.

Several * commands are provided by the operating system for handling modules, including one for loading a module file from the filing system, and these are described in this chapter.

Activating and removing system ROMs

The following module-related commands may be divided into those involved with adding or activating modules, those for removing or deactivating modules, and the utility commands related to modules.

- *RMLoad, *RMRun, *RMReInit and *RMFaster are for adding or activating relocatable modules.

- *RMClear, *RMKill and *Unplug are for removing or deactivating modules.

- *Modules, *ROMModules, *RMTidy and *RMEnsure are other commands for the management of relocatable modules.

*Modules

Displays information about all installed relocatable modules.

Syntax

```
*Modules
```

Use

*Modules displays the number allocated to each installed module (this may change as other modules are installed and removed), its position in memory, the address of its workspace, and its name.

Example

```
*Modules
No.  Position   Workspace   Name
  1  0380873C   00000000    UtilityModule
  2  0381FB94   01800014    FileSwitch
     .
     .
 38  01819034   00000000    SharedCLibrary
 39  0182CD74   01817304    ColourTrans
```

Related commands

*ROMModules

*RMClear

Deletes relocatable modules from the relocatable module area of memory.

Syntax

```
*RMClear
```

Use

*RMClear deletes relocatable modules that you have specifically loaded into the RMA. ROM resident modules are not deleted.

Related commands

*RMTidy

*RMEnsure

Checks the presence and version of a module.

`*RMEnsure <moduletitle> <version number> [<*command>]`

`<moduletitle>`   the title of any currently installed module

`<version number>`   number against which the version number will be checked

`<*command>`   a Command Line command

*RMEnsure checks that a module is present and is the given version (or a more recent one). A command, optionally given as a third parameter, is executed if the version is too old. This command is usually used in command scripts or programs to ensure that modules they need are loaded.

`*RMEnsure WindowManager 2`

*RMFaster

Makes a module faster by copying it from ROM to RAM.

Syntax

`*RMFaster <moduletitle>`

Parameters

`<moduletitle>`   the title of any ROM resident module

Use

*RMFaster makes a copy of the relocatable module and places it in RAM. The module will run faster because RAM can be accessed faster than ROM.

Example

`*RMFaster BASIC`

*RMKill

Deactivates and deletes a relocatable module.

Syntax

`*RMKill <moduletitle>`

Parameters

`<moduletitle>`   the title of any currently installed module

Use

*RMKill deactivates a relocatable module. If located in RAM, it is also deleted.

Example

`*RmKill Debugger`

Related commands

*RMLoad, *ROMModules, *Unplug, *RMReInit

*RMLoad

Loads and initialises a relocatable module.

Syntax

*RMLoad <filename>

Parameters

<filename>   the pathname to a file containing a valid module

Use

*RMLoad loads and initialises a relocatable module. It is then available to the help system, and can provide * commands.

Example

*RMLoad My_Module

Related commands

*RMKill, *ROMModules, *Unplug, *RMReInit, *RMRun

*RMReInit

Reinitialises a relocatable module.

Syntax

`*RMReInit <moduletitle>`

Parameters

`<moduletitle>` the title of any currently installed module, active or otherwise

Use

*RMReInit reinitialises a relocatable module, reversing the action of *Unplug on a ROM resident module.

Example

`*RMReInit Debugger`

Related commands

*Unplug, *RMLoad, *ROMModules

*RMRun

Runs a relocatable module.

Syntax

`*RMRun <filename>`

Parameters

`<filename>`

Use

*RMRun loads and initialises a relocatable module. It is available to the help system, and can provide * commands. The module is then run, if it can be.

If a module cannot be run, then this command is equivalent to a *RMLoad command.

Example

`*RMRun My_Module`

Related commands

*RMKill, *ROMModules, *Unplug, *RMReInit, *RMLoad

*RMTidy

Compacts and reinitialises the RMA.

Syntax

```
*RMTidy
```

Use

*RMTidy compacts the RMA (Relocatable Module Area), reinitialising all the modules. All the modules will be in the same state as if you had just turned the computer on; the only difference is that any extra modules you have loaded will still be present. This command must be used with extreme caution, as it is so drastic in its effects.

Related commands

*RMClear

*ROMModules

Provides information about relocatable modules currently in ROM.

```
*ROMModules
```

*ROMModules lists the relocatable modules which are currently in ROM, whether part of the system or in expansion cards ('podules'), along with their status: active, dormant or unplugged.

```
*RomModules
No. Position     Module Name    Status
  1 System ROM UtilityModule  Active
  2 System ROM FileSwitch      Active
  3 System ROM Desktop         Active
           .

           .
  1 Podule 0    MailBleep       Dormant
  2 Podule 0    ROMBoard        Dormant
           .

           .
```

*Modules

*Unplug

Disables a module

```
*Unplug [<moduletitle>]
```

<moduletitle>   the title of any currently installed module

The *Unplug command prevents the named ROM module from being initialised (and hence available for use). This setting is stored in the CMOS RAM, and is therefore permanent in its effects. You should use this command with caution, otherwise you may find programs stop working because you have unplugged a module that the program needs to use.

*Unplug without a module title displays a list of the unplugged ROM modules.

*Unplug RAMFSFiler   disables the RAMFSFiler module

*RMReInit

Sound system commands

The Acorn computer contains a sound synthesizer which allows up to eight 'instruments' to be played at once, with mono or stereo sound production for each instrument. The sound system can be controlled with great subtlety, the details of which are outside the scope of this Guide. Individual sound commands are briefly described below; for further information, refer to the chapter on Sound in the *Programmer's Reference Manual*.

The Maestro program is included in the Applications Suite and provides a powerful way of composing and replaying music.

The following commands are described in this chapter:

*Audio
*ChannelVoice
*QSound
*Sound
*Speaker
*Stereo
*Tempo
*Tuning
*Voices
*Volume

*Audio

Sets the sound system on or off.

Syntax	*Audio ON|OFF
Arguments	On or Off
Related commands	*Speaker, *Volume

*ChannelVoice

Assigns a voice to a channel.

```
*ChannelVoice <channel> <voice index>|<voice name>
```

Parameters

`<channel>`   from 1 to 8, no default

`<voice index>` from 1 to the number of voices installed (as given by the *Voices command)

`<voice name>`   the text name equivalent to the voice index number

It is better to specify the voice by name rather than by number since the name is independent of the order in which the voices are loaded. Note that upper- and lower-case letters must be entered exactly as given.

Use

The Acorn computer has eight independent channels for sound output. Each channel can play a different voice (sound). *ChannelVoice attaches a Voice to a particular sound channel.

By default, only the first of the eight channels will be available. To make others available, enter BASIC and type

```
>*VOICES <n>
```

where n is 2, 4, or 8. This enables 2, 4 or 8 sound channels. Do not, however, confuse the VOICES command in BASIC with *Voices, the command described in this Guide.

Example

`*ChannelVoice 1 StringLib-Soft`   sets sound channel 1 to use the StringLib-Soft voice

`*ChannelVoice 1 3`   sets sound channel 1 to the third voice on the list provided by *Voices

Related commands

*Stereo, *Voices

*QSound

Queues a sound for a specified time.

Syntax

Syntax

`*Qsound <channel> <amplitude> <pitch> <duration> <nTicks>`

Parameters

<channel>   the channel number to be used, in the range 1 to 8.

<amplitude>   an integer in the range 256 (&100) to 383 (&17F). This is a logarithmic volume range, a difference of 16 doubling or halving the volume.

<pitch>   an integer in one of two ranges, from 0 to 255 (&FF) or from 256 (&100) to 32767 (&7FFF). Middle C is represented as 53 and &4000 respectively.

<duration>   an integer in the range 1 to 255; it gives the duration of the note in 1/20th second. A value of 255 gives a note of infinite duration (limited by the envelope, if present).

<nTicks>   the number of beats before the sound is made. The beat counter is used for synchronising channels. See the *BBC BASIC Guide* for further details.

Use

*QSound queues a sound for a specified number of beats.

The parameters are the same as those of the *Sound command, with the addition of one parameter which indicates the number of tempo ticks (or beats). The number of beats is relative to the time the command is issued.

Example

`*QSound 1 &17F &4000 10 200`   Channel 1, maximum volume, middle C, duration 0.5seconds, in 200 beats time

Related commands

*Sound, *Tempo. The chapter on Sound in the *BBC BASIC Guide* gives an explanation of how this command can be used effectively.

*Sound

Creates an immediate foreground sound.

```
*Sound <channel> <amplitude> <pitch> <duration>
```

The command is directly equivalent to the BASIC SOUND command, with four parameters: channel, amplitude (ie volume), pitch, and duration. The parameters must be separated by spaces, not commas, and the amplitude parameter cannot have a sign.

<channel>   the channel number to be used, in the range 1 to 8.

<amplitude>   an integer in the range 256 (&100) to 383 (&17F). This is a logarithmic volume range, a difference of 16 doubling or halving the volume.

<pitch>   an integer in one of two ranges, from 0 to 255 (&FF) or from 256 (&100) to 32767 (&7FFF). Middle C is represented as 53 and &4000 respectively.

<duration>   an integer in the range 1 to 255; it gives the duration of the note in 1/20th second. A value of 255 gives a note of infinite duration (limited by the envelope, if present).

The *Sound command makes an immediate (foreground) sound.

```
*Sound 1 &FFF1 &4000 10
```

```
*Sound 1 383 53 10
```

Both these examples use channel 1 to play a 0.5second-long middle C at maximum volume.

*Speaker

Turns the speaker on or off.

Syntax

`*Speaker ON|OFF`

Parameters

ON or OFF. The default value is on.

Use

*Speaker turns the internal speaker on or off. When disabled, the speaker is prevented from making any sound, although the 3.5mm stereo jack socket may still be used to play the sound through headphones or an amplifier.

Related commands

*Audio, *Volume

*Stereo

Sets the stereo channel parameters.

`*Stereo <channel> <position>`

`<channel>`   indicates which channel's stereo position is to be set (from channel 1 to 8).

`<position>`   sets the stereo position. The range is from –127 (full left) to 127 (full right)

`*Stereo 2 100` sets channel 2 output to come predominantly from the right channel.

*Voices, *ChannelVoice

*Tempo

Sets the sound system tempo.

Syntax

`*Tempo <n>`

Parameters

`<n>` is a number between 0 and &FFFF, with a default value of &1000. It has the same meaning as BASIC V's TEMPO parameter.

Use

The *Tempo command sets the sound system tempo: the rate of the beat counter.

Example

`*Tempo &2000` sets the sound system tempo to 2 beats per centisecond.

Related commands

*QSound

*Tuning

Controls the overall sound system tuning.

`*Tuning <n>`

The single parameter, `<n>`, is a number in the range from –16383 to +16383. (This corresponds to the hexadecimal range `-&offf` to `+&offf`, where `o` is octave and `fff` is fraction of an octave.)

*Tuning alters the relative system tuning. *Tuning 0 resets the system tuning to the default value.

*Sound, *QSound

*Voices

Displays a list of the installed voices.

```
*Voices
```

*Voices displays a list of the installed sound voices by name and number, and shows which voice is attached to each of the eight sound channels.

```
*Voices
          Voice   Name
12            1   WaveSynth-Beep
   34         2   StringLib-Soft
              3   StringLib-Pluck
              4   StringLib-Steel
              5   StringLib-Hard
      56      6   Percussion-Soft
              7   Percussion-Medium
         78   8   Percussion-Snare
              9   Percussion-Noise
^^^^^^^^ Channel Allocation Map
```

This shows that the WaveSynth-Beep voice is attached to channels 1 and 2, the StringLib-Soft voice is attached to channels 3 and 4, and so on.

*ChannelVoice, *Stereo

*Volume

Sets the overall volume for the sound system.

Syntax

```
*Volume <n>
```

Parameters

`<n>`   an integer in the range 1 to 127 (quietest to loudest)

Use

*Volume sets the overall volume for the sound system.

Example

```
*Volume 65
```

Related commands

*Speaker, *Audio. The default volume is set by the *Configure SoundDefault command.

*FX commands

*FX commands access the operating system OS_Byte routines and require from one to three parameters. Like many of the operating system commands, many *FX actions can be carried out from the desktop. In addition, most *FX commands have now been replaced by better, RISC OS operations; *FX commands have been retained for reasons of backwards compatibility.

Only those commands the user is likely to find most useful are described in this chapter (there is a complete list in the *Programmer's Reference Manual*). Those covered here are:

*FX 0
*FX 5
*FX 6
*FX 7
*FX 8
*FX 11
*FX 12
*FX 156
*FX 211
*FX 212
*FX 213
*FX 214

*FX 0

Displays information about the operating system.

Syntax

`*FX 0`

Use

*FX 0 displays the title of the operating system and the version number, with the date the version was finalised.

*FX 5

Selects the printer output port.

Syntax

```
*FX 5,<printer dest>
```

Parameters

`<printer dest>` can take the values 0 to 8:

`*FX 5,0`	selects the printer sink. No output is sent to the printer
`*FX 5,1`	selects the parallel (Centronics-type) printer.
`*FX 5,2`	selects the serial printer.
`*FX 5,4`	selects the network printer.
`*FX 5,5 to *FX 5,8`	select file(s) to print to, the name(s) of which are held in the system variables PrinterType$<5|6|7|8>

Use

*FX 5 selects the output port used for printer output. A typical use is to (temporarily) override the 'Printer type' established from the desktop using the Configure program.

If you have a program which always outputs to a printer and the screen, you can temporarily disable the printed output with `*FX 5,0`. This is useful if the printer is not available for some reason, as output is still directed to the screen. Turn the printer back on by typing `*FX 5,n` where n takes the value 1, 2 or 4.

Examples

`*FX 5,0`	Turns off configured printer type.
`*Copy myfile printer:`	Driver does not print the contents of myfile.
`*FX 5,2`	Uses the serial printer instead of the parallel printer normally used.
`*Copy myfile printer:`	Prints the contents of myfile.

Related commands

*Print, *Configure Print, *PS, *Configure PS

*FX 6

Selects the printer ignore character.

Syntax

`*FX 6,<ignore char>`

Parameters

`<ignore char>` any valid ASCII code, so can take values from 0 to 255.

Use

`*FX 6,<ignore char>` instructs the computer to ignore (ie to filter out every occurrence) of the character ASCII n. A frequent setting of n is 10 – ASCII LF (linefeed) – since some printers automatically generate the LF character when they encounter the ASCII CR (carriage return) character. This is evident if you get double line spacing when you expect single spaced printing. This command gives you software control over effects which are sometimes provided by DIP switch settings in the printer.

A common mistake is to use `*FX 6,0` in an attempt to stop any characters being stripped. `*FX 6,0` is interpreted as filtering out character zero (ASCII NULL), which could cause problems in attempting to print out graphics. Ensure that no characters are filtered by using the *Ignore or *Configure Ignore commands.

Example

`*FX 6,10`

Related commands

*Ignore, *Configure Ignore

Selects the serial baud rate for receiving data at the serial port.

Syntax

`*FX 7,<rate>`

Parameters

The parameter `<rate>` can take the values 0 to 15, which correspond to the following baud rates (bits per second):

*FX 7,0	the configured default value
*FX 7,1	75
*FX 7,2	150
*FX 7,3	300
*FX 7,4	1200
*FX 7,5	2400
*FX 7,6	4800
*FX 7,7	9600
*FX 7,8	19200
*FX 7,9	50
*FX 7,10	110
*FX 7,11	134.5
*FX 7,12	600
*FX 7,13	1800
*FX 7,14	3600
*FX 7,15	7200

Use

*FX 7 is used to select the serial baud rate for receiving data at the serial port.

The serial port is often used to connect the Acorn computer to a modem, to another computer back-to-back (as a way of transferring data using file transfer software), or to another computer (using the Acorn computer as a graphics terminal emulator). In each case, care should be taken that the baud rate for receiving data is matched to the rate at which data is transmitted by the other device, otherwise the machine will 'hang up' and require restarting.

Related commands

*FX 8, *FX 156, *Configure Baud

*FX 8

Selects the serial baud rate for transmitting data at the serial port.

Syntax

`*FX 8,<rate>`

Parameters

The parameter `<rate>` can take the values 0 to 15, which correspond to the following baud rates (bits per second):

*FX 8,0	the configured default value
*FX 8,1	75
*FX 8,2	150
*FX 8,3	300
*FX 8,4	1200
*FX 8,5	2400
*FX 8,6	4800
*FX 8,7	9600
*FX 8,8	19200
*FX 8,9	50
*FX 8,10	110
*FX 8,11	134.5
*FX 8,12	600
*FX 8,13	1800
*FX 8,14	3600
*FX 8,15	7200

Use

*FX 8 is used to select the serial baud rate for transmitting data at the serial port.

The serial port is often used to connect the Acorn computer to a printer driven from a serial interface. Other uses include connecting the Acorn computer to a modem, to another computer back-to-back (as a way of transferring data using file transfer software), or to another computer (using the Acorn computer as a graphics terminal emulator). In each case, care should be taken that the baud rate for transmitted data is matched to the rate data is set up to be received by the other device, otherwise the machine will 'hang up' and require restarting.

Related commands

*FX 7, *FX 156, *Configure Baud

*FX 11

Selects the keyboard auto-repeat delay.

`*FX 11,<delay>`

`<delay>`   sets the auto-repeat delay in centiseconds. Note that `*FX 11,0` turns auto-repeat off.

*FX 11 selects the keyboard auto-repeat delay: the time before a held-down key sends a second character to the screen.

`*FX 11,32`   characters are repeated when a key is pressed for 32 centiseconds or more.

`*FX 11,16`   this generates characters after 16 centiseconds, a shorter delay than the normal default.

*FX 12, *Configure Delay

*FX 12

Selects the interval between keyboard auto-repeats.

Syntax
`*FX 12,<repeat>`

Parameters
`<repeat>`   sets the interval between each auto-repeat in centiseconds. Note that `*FX 12,0` sets the keyboard auto-repeat delay and the interval between keyboard auto-repeats to their configured values.

Use
*FX 12 selects the keyboard auto-repeat rate. This is the rate at which keys are repeated, once the auto-repeat has started.

Example
`*FX 12, 8`   the usually configured value; this generates multiple characters with an 8 centisecond delay between them.

`*FX 12,3`   the auto-repeat delay is set to three centisecond delay; this is faster than the normal default.

Related commands
*FX 11, *Configure Repeat

*FX 156

Controls the use of the serial port.

`*FX 156,<n>`

<n> can take values from 0 to 255.

*FX 156 controls the use of the serial port.

This command controls the serial port. In the command `*FX 156,n`, you may regard n as an eight-bit number. The meanings of the bits are as follows:

Bit	7	6	5	4	3	2	1	0
	0	0	0	0	1	0	0	0

Receive interrupt (default 0)

Transmission control (default 0)

Word length
Parity
Stop bit
(controlled by *Configure Data)

Effect (default 0)
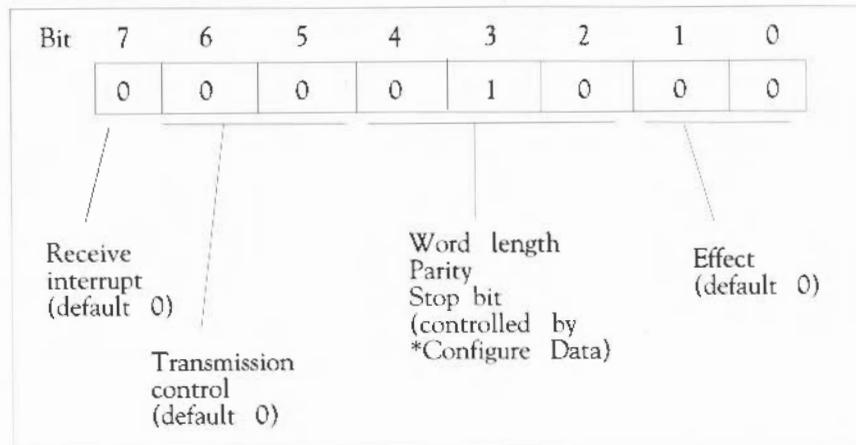
The eight-bit number in the above diagram corresponds to `*FX 156,16`. This sets the read/write asynchronous communications state to 8 bits, no parity, two stop bits. It sets RTS low and disables transmit and receive interrupts. This setting will work for many models of serial printer.

Any command with bits 0 and 1 both set cause the serial port to be reset. Any other combination of bits 0 and 1 is ignored. The default setting is 0, which means that the reset transmit, receive and control registers are unchanged.

Bits 2 to 4 form a three bit number which controls the data format used by the serial port. The settings are given in the table overleaf.

'Data' setting	bit 4	bit 3	bit 2	Word length	Parity	Stop bits
0	0	0	0	7	even	2
1	0	0	1	7	odd	2
2	0	1	0	7	even	1
3	0	1	1	7	odd	1
4	1	0	0	8	none	2
5	1	0	1	8	none	1
6	1	1	0	8	even	1
7	1	1	1	8	odd	1

The first column ('Data' setting) gives the settings which correspond to the parameter for *Configure Data.

Bits 5 and 6 control the serial transmitter:

bit 6	bit 5	
0	0	RTS low, transmit interrupt disabled (the default)
0	1	RTS low, transmit interrupt enabled
1	0	RTS high, transmit interrupt disabled
1	1	RTS at break level, transmit interrupt disabled

Bit 7 controls the receiver interrupt:

bit 7	
0	Disabled (the default)
1	Enabled

Example

*FX 156,16   This is the default value; it is equivalent to *Configure Data 4 and leaves the other components of this command with their default values.

Related commands

The *Configure Data command controls the data format used by the serial port in a similar way to bits 2, 3 and 4 of the *FX 156 command.

*FX 211

Selects the bell channel number.

`*FX 211,<channel>`

Parameters

`<channel>`   can take a value from 1 to 8, corresponding to channel 1 to channel 8.

Use

*FX 211 selects the bell (the beep issued by the system or by pressing Ctrl G) channel number. The default channel is 1 (ie `*FX 211,1`). The default voice attached to channel 1 is WaveSynth, which issues a standard 'beep' tone.

Example

`*FX 211,7`   Use channel 7 for the bell sound.

Related commands

*ChannelVoice. For further information, see the chapter on sound in the *Programmer's Reference Manual*.

*FX 212

Sets volume of the bell.

Syntax

`*FX 212,<amplitude>`

Parameters

`<amplitude>`   can take values from 128 (the loudest setting) to 248 (the quietest) in steps of 8.

Use

*FX 212 selects the bell amplitude (or loudness). The default setting depends on the *Configure Loud/Quiet setting (Loud=144 and Quiet=208).

Example

`*FX 212,128`

Related commands

*Configure Quiet, *Configure Loud

*FX 213

Sets the bell pitch.

`*FX 213,<pitch>`

`<pitch>` can take a value between 0 and 255, with a default setting of 100.

Sets the bell pitch. For further information, refer to the SOUND command in the BBC BASIC Guide (*FX 213 relates to the third sound parameter, pitch).

`*FX 213,200`

*FX 214

Sets the duration of the bell.

Syntax

`*FX 214,<duration>`

Parameters

`<duration>`   in units of 0.05seconds. The range is 1 to 254; 255 gives a bell tone of infinite duration, limited by the decay characteristics of the voice channel. The default value is 6 (ie 0.3seconds).

Use

Sets the bell duration.

Example

`*FX 214,12`   Sets a bell duration of 0.6seconds.

Miscellaneous * commands

These commands control the behaviour of the keyboard, VDU and printer ports, including customising the Acorn computer for international use. In addition, there are commands of interest to programmers and those who wish to prepare Obey files or startup scripts (for more information, see the chapter entitled *Command Scripts*).

The following commands are described in this chapter:

*Alphabet   *PoduleSave
*Alphabets   *Pointer
*Basic   *Quit
*Country   *ScreenLoad
*Countries   *ScreenSave
*Desktop   *Shadow
*Echo   *Time
*Error   *TV
*Eval   *WimpPalette
*FontCat   *WimpSlot
*FontList
*Go
*Gos
*If
*Ignore
*Key
*Keyboard
*Obey
*Podules
*PoduleLoad

*Alphabet

Selects an alphabet.

Syntax

`*Alphabet [<country name> | <alphabet name>]`

Parameters

`<country name>`   See the *Countries command for a list of countries available

`<alphabet name>`   See the *Alphabets command for a list of alphabets available

Use

*Alphabet sets the alphabetical set of characters according to the country name or alphabet name.

The *Alphabet command with no parameter displays the currently selected alphabet.

Example

`*Alphabet Latin3`

Related commands

*Alphabets

*Alphabets

Lists all the alphabets installed.

Syntax

```
*Alphabets
```

Use

*Alphabets lists all the alphabets currently supported by your Acorn computer. Use the *Alphabet command to change the alphabetical set of characters.

Related commands

*Alphabet

*Basic

Enters the BBC BASIC V interpreter.

`*Basic [-help | -chain | -load | -quit] [<filename>]`

Parameters

`-help, -chain, -load, -quit` are all optional literal keywords.

`<filename>`   any valid pathname specifying a file object, normally a BASIC program

Use

*Basic enters the Acorn BBC BASIC V interpreter. The version number and the number of free bytes are displayed unless the –quit option is used. The BASIC prompt '>' is displayed unless a program is run.

The BBC BASIC V interpreter is fully documented in the *BBC BASIC Guide*.

Example

`*BASIC -load progname`

Related commands

Leave the BASIC V interpreter by typing the BASIC keyword QUIT (in upper case).

*Country

Sets the appropriate alphabet and keyboard layout for a given country.

`*Country [<country name>]`

Parameters

`<country name>` See the *Countries command for a list of countries available.

Use

*Country sets both the appropriate alphabet and keyboard layout for a particular country; for example, `*Country UK` selects the Latin1 alphabet and the UK keyboard layout. *Alphabet and *Keyboard can, however, be used to set the alphabet and keyboard layout independently, leaving the setting for country unchanged.

The *Country command without a parameter displays the currently selected country.

Example

`*Country Italy`

Related commands

*Countries, *Alphabet, *Alphabets, *Keyboard and *Configure Country

*Countries

Lists the available countries.

`*Countries`

*Country, *Keyboard, *Alphabet and *Alphabets

*Desktop

Initialises all desktop facilities, then starts the desktop.

Syntax

```
*Desktop [<*command>] | -File <filename>]
```

Parameters

```
<*command>
-File           a literal keyword
<filename>      a valid pathname specifying a file
```

Use

*Desktop initialises all desktop facilities, then starts the desktop.

You can run an optional * command or each line of a file of * commands as the desktop is started. This is typically used to load applications such as Edit as the desktop is started. Any * commands using files must specify them by their full pathname.

If you do run a file of * commands when you start the desktop, its first line should run the file !System.!Boot, provided with your computer. This is needed by most desktop applications. If you want to start an application that uses fonts, the next line of the startup file should run !Fonts.!Boot, again provided with your computer. Applications can then be started on the following lines.

Example

```
*Desktop -file !DeskBoot
```

*Echo

Sends a string of characters to the VDU.

Syntax

`*Echo <string>`

Parameters

`<string>`   up to 255 characters, terminated with a carriage return

Use

*Echo sends a string of characters to the VDU. The characters are specified in GSRead format, so control characters can be sent to the VDU drivers. See the chapter entitled *VDU commands*, and *Appendix F: GS Formats*.

The main use for *Echo is in command scripts, where the command provides a useful way of checking the progress of a script, especially when debugging a faulty script, or if you want to monitor the progress of a series of operations.

Example

```
*Echo Starting script now
                                    (script of commands here)
*Echo Half way through
                                    (more commands here)
*Echo Finished!
```

*Error

Generates errors.

```
*Error <number> <text>
```

```
<number>        a number
<text>          a string of printable characters
```

*Error generates an error with the specified error number and the explanatory text. This is normally then printed on the screen. Programmers will find this command useful for reporting errors after trapping them within a command script.

Errors are also generated by the system error handler.

```
*Error 100 No such file     will print 'No such file'
```

*Eval

Evaluates an integer, logical or string expression.

```
*Eval <expression>
```

`<expression>`   any combination of the operations listed below

The operating system expression analyser recognises the following operators:

Arithmetic operators

+	Add two integers
–	Subtract two integers
*	Multiply two integers
/	Integer part of division
MOD	Remainder of division

Logical operators

=	Equal to
<>	Not equal to
>=	Greater than or equal to
<=	Less than or equal to
<	Less than
>	Greater than

Bit operators

>>	Arithmetic shift right
>>>	Logical shift right
<<	Arithmetic shift left
AND	Logical AND
OR	Logical OR
EOR	Exclusive OR
NOT	Logical NOT

String operators

+	Concatenate two strings (eg "Hel" + "lo" = "Hello")
RIGHT n	Take "n" characters from the right (eg "Hello"RIGHT2 = "lo")
LEFT n	Take "n" characters from the left (eg "Hello"LEFT3 = "Hel")
LEN	Return the length of the string (eg LEN"Hello" = 5)

Conversions

STR   Convert a number to a string (eg STR 42 = "42")
VAL   Take the arithmetic value from a string (eg VAL "123" = 123)

The operators are evaluated in the same order as in BASIC (ie * is evaluated before +, which is evaluated before >, etc). Brackets can be used to make an expression unambiguous.

Use

*Eval evaluates an integer, logical, bit or string expression, carrying out type conversions where necessary, in a similar way to the BASIC EVAL command. It will not handle floating point numbers. You can use *Eval to do simple arithmetic (although the desktop Calculator is easier to use for four-function arithmetic), or to evaluate more complex expressions. Programmers may find the command useful for doing 'offline' calculations (checking on space left, for example).

Where appropriate, type conversions are performed automatically. For example, if an integer is extracted from a string, the string is evaluated and an integer result is produced (ie '2' − 1 gives the result 1). Similarly, integers are converted to strings if necessary: the expression 1234 LEFT 2 will yield '12'.

Example   `*Eval 127 * 23 >> 2`

Related commands   `*If`

*FontCat

Lists the fonts available in a directory.

Syntax

```
*FontCat [<directory>]
```

Parameters

```
<directory>
```

Use

*FontCat lists the fonts available in the given directory. If no directory is given, then the directory specified in the system variable Font$Prefix is used.

Example

```
*FontCat !Fonts
```
Corpus.Medium
Portrhouse.Standard
Trinity.Medium

*FontList

Displays the fonts in the font cache.

```
*FontList
```

*FontList displays the fonts currently in the font cache store. The size of the cache and the amount of free space (in K) is also given.

```
*FontList
      Name              Size        Dots/inch    Use    Memory
      ----              ----        ---------    ---    ------
 1.Trinity.Medium  12 point        90x45         1     160bytes
Cache size:        32KBytes
       free:       31KBytes
```

*Go

Calls machine code at a given address.

Syntax

```
*Go [<hexadecimal address>] [ ; environment]
```

Parameters

`<hexadecimal address>`	address of machine code to call
`; environment`	string to pass to machine code

Use

This command is followed by the address of the machine code to call. If the address is omitted, it defaults to &8000, which is where application programs (such as the C compiler) are loaded.

If an environment is given, it is passed on to the machine code. How it is used depends on the machine code itself; it might typically be used to pass a filename to a machine code program. For details, see the *Programmer's Reference Manual*.

Example

```
*Go 9000 ; SrcList
```
call machine code at &9000, passing it the string 'SrcList'.

*Gos

Calls Command Line mode and allows you to type * commands.

`*Gos`

*Gos calls the RISC OS Command Line from, for example, BASIC. This is useful for entering simple commands for immediate execution, or for testing longer sequences of commands – while building command line scripts – on a line-by-line basis.

From the desktop, pressing F12 has a similar effect. To return to the desktop, press Return at the start of a line with the Supervisor prompt (*). If you do not have this prompt, you will first have to type *Quit to leave the application you are using.

*Desktop

*If

Allows you to execute * commands conditionally.

Syntax

```
*If <expression> Then <command> [Else <command>]
```

Parameters

```
<expression>
<command>
```

Use

The *If command allows you to execute * commands conditionally. <expression> can be any integer expression, including variable names enclosed in angled brackets. The expression is evaluated by the operating system's expression evaluation; see *Eval for a list of the operators allowed in an expression. If the If-expression evaluates to a non-zero value, the Then-clause is executed. If the If-expression evaluates to zero, and there is an Else-clause, the Else-clause is evaluated.

If you wish to compare a variable to a string both must be enclosed in double quotes to ensure a string comparison is performed; see the first example.

Example

```
*IF "<name>" = "Michael" THEN echo Hi Mike! ELSE echo
Hello <name>!
```

```
*IF <Sys$Year>=1988 THEN RUN Calendar
```

Related commands

*Eval

*Ignore

Sets the printer ignore character to the given ASCII code.

Syntax

```
*Ignore [<number>]
```

Parameters

`<number>`   an ASCII code, a number from 0 to 255

Use

`*Ignore <number>` instructs the computer to ignore (ie to filter out every occurrence) of the character ASCII n. A frequent setting of n is 10 – ASCII LF (linefeed) – since some printers automatically generate the LF character when they encounter the ASCII CR (carriage return) character. This is evident if you get double line spacing when you expect single spaced printing. This command gives you software control over effects which are sometimes provided by DIP switch settings in the printer.

A common mistake is to use `*Ignore 0` in an attempt to stop any characters being stripped. `*Ignore 0` is interpreted as filtering out character zero (ASCII NULL), which could cause problems in attempting to print out graphics. Ensure that no characters are filtered by omitting the character code, so all characters are sent to the printer.

Example

`*Ignore 10`   Do not print ASCII character 10.

`*Ignore`   Print all characters.

Related commands

*Configure Ignore

*Key

Assigns a string to a function key.

Syntax

```
*Key <keynumber> [<value>]
```

Parameters

<keynumber>   number from 0 to 15, corresponding to the number engraved on the function key

<value>   any GSTrans-compatible string

Use

The *Key command assigns a string to a function key. *Key provides a very simple way of setting up function keys so that repetitive or error-prone strings (such as complex commands) can be initiated with a single keystroke. Up to 255 characters can be issued in this way.

You can represent Return in your string using the characters '|M' or '|m', as in the example below. This is because the string is given in GSTrans format; see *Appendix F: GS Formats* for full details.

The string is stored in the system variable Key$<keynumber>, for example Key$1 for function key 1.

Example

```
*Key 8 *Audio On|m *Speaker On|m *Volume 127|m
```
F8 turns on the sound system and speaker, and sets the overall volume to the maximum.

*Keyboard

Selects the keyboard driver for a given country.

Syntax

`*Keyboard [<country name>]`

Parameters

`<country name>`   the name of an available country (see *Countries)

Use

Selects a keyboard driver for a particular country. *Keyboard without a parameter displays the currently set keyboard.

Related commands

*Countries

*Obey

Executes a file of *commands.

Syntax	`*Obey [<filename> [<parameters>]]`
Parameters	`<filename>` a valid pathname, specifying a file
	`<parameters>` strings separated by spaces
Use	*Obey executes a file of * commands. Argument substitution is performed on each line, using parameters passed in the command.
	For full details, see the chapter entitled *Command scripts* later in this part of the Guide.
Example	`*Obey !commands myfile1 12` Run the file `!commands`, passing `myfile1` as the first parameter, and `12` as the second one.
Related commands	*Exec, *Run, *Opt 4

*Podules

Tells you which expansion cards are installed.

Syntax

`*Podules`

Use

This command tells you which expansion cards are installed using the description that each one holds internally. Some expansion cards, such as one that is still being designed, will not have a description; in this case, an identification number is printed.

Expansion cards used to be known as podules, and are sometimes still referred to as such.

Example

```
*Podules
Podule 0: Midi and BBC I/O podule
```
A finished commercial expansion card
```
Podule 1: Simple podule &8A
```
An expansion card under development
```
Podule 2: No installed podule

Podule 3: No installed podule
```

*PoduleLoad

Copies a file into the RAM area of an expansion card.

Syntax

*PoduleLoad <podule number> <filename> [<offset>]

Parameters

<podule number>	the expansion card's number, as given by *Podules
<filename>	a valid pathname, specifying a file
<offset>	offset into space accessed by loader

Use

*PoduleLoad copies the contents of a file into the RAM area of an installed expansion card, starting at the specified offset. If no offset is given, then a default value of 0 is used.

*PoduleSave

Copies the contents of an expansion card's ROM into a file.

```
*PoduleSave <expansion card number> <filename> <size>
[<offset>]
```

```
<expansion card number>
<filename>      a valid pathname, specifying a file
<size>          in bytes
<offset>        offset into space accessed by loader
```

*PoduleSave copies the given number of bytes of an installed expansion card's ROM into a file. If no offset is given, then a default value of 0 is used.

*Pointer

Turns the mouse pointer on or off.

Syntax

`*Pointer [0|1 ]`

Parameters

0 or 1

Use

This command is provided by the Wimp manager. If the command is used without any parameters (or with the value 1), mouse pointer 1 is set to a blue arrow and enabled. *Pointer 0 disables the pointer.

This command cannot be used with Mode 7, which is for use with Teletext systems.

*Quit

Exits from the current application or command script, or returns to an application after you have typed *Gos.

Syntax

`*Quit`

*ScreenLoad

Copies a file into the graphics window.

Syntax

`*ScreenLoad <filename>`

Parameters

`<filename>`   a valid pathname, specifying a file

Use

*ScreenLoad copies the contents of a file (previously saved with the *ScreenSave command) into the graphics window, which is typically the whole screen.

Example

`*ScreenLoad My.Pic`

Related commands

*ScreenSave

*ScreenSave

Copies graphics to a file.

Syntax

`*ScreenSave <filename>`

Parameters

`<filename>`   a valid pathname, specifying a file

Use

*ScreenSave copies the contents of the graphics window (typically the whole screen) and its palette to a file, which is saved as a sprite. This file can then be used by Paint or Draw.

Example

`*ScreenSave MyPicture`   Save the screen to `MyPicture`.

Related commands

*ScreenLoad

*Shadow

Causes the alternate bank of screen memory to be used.

Syntax

`*Shadow [0 | 1]`

Parameters

`0` or `1`

Use

*Shadow makes subsequent changes to the screen mode use the alternate bank of memory (the 'shadow' memory).

The command *Shadow (or `*Shadow  0`) causes the shadow bank (bank 2) to be used on the next mode change;

`*Shadow  1` causes the non-shadow bank of screen memory (bank 1) to be used on the next mode change.

For the shadow bank to be used, there must be at least double the memory for the selected screen mode available in the screen area of memory. To use shadow memory in screen mode 8 (a mode which requires 40K), at least 80K of screen memory must be configured.

Example

`*Shadow 1`

Related commands

*Configure ScreenSize

*Time

Displays the day, date and time.

```
*Time
```

*Time displays the day, date and time of day.

*TV

Establishes the vertical screen alignment and interlace parameters.

Syntax

`*TV [<vertical position>] [[,] <interlace>]]`

Parameters

`<vertical position>` a number from 0 to 3 (0 to 3 lines up), or 255 down to 252 (1 to 4 lines down)

`<interlace>` 0 or 1

Use

The *TV command specifies the position of the display on the screen, by establishing the vertical screen alignment and interlace parameters.

`*TV n,0`

adjusts the position of the display vertically by n lines and turns interlacing on.

`*TV n,1`

adjusts vertically by n lines and turns interlace off.

Other values of `<vertical position>` may be used successfully with some monitors.

This command takes effect at the next mode change.

Example

`*TV 0,1`

Related commands

*Configure TV

*WimpPalette

Specifies a palette file.

Syntax

`*WimpPalette <filename>`

Parameters

`<filename>`   a valid pathname, specifying a file

Use

The *WimpPalette command specifies a Wimp palette file, which defines the colours used by the desktop module.

Example

`*WimpPalette My_Palette`

*WimpSlot

Changes the memory allocation for a Wimp application.

Syntax

`*WimpSlot [-min] <size>[K] [[-max] <size>[K]]`

Parameters

-min	a literal keyword
<size>	size of RAM to assign
-max	a literal keyword

Use

The *WimpSlot command changes the memory allocation for a Wimp application.

Example

`*WimpSlot 0 100K`   Allocates between 0 and 100K for a Wimp application.

VDU commands

The VDU (Visual Display Unit) driver is a part of the operating system which provides a set of routines used to display all text and graphical output. Any bytes sent to the VDU driver are treated either as characters to be displayed or as VDU commands (instructions which tell the driver to perform a specific function). How each byte is interpreted depends on its ASCII value as follows:

ASCII value	Interpretation
0-31	VDU commands
32-126	Characters to be displayed
127	Delete
128-159	Characters to be displayed / Teletext control codes
160-255	International characters to be displayed

A list of the VDU commands is given in the table below. Some VDU commands require extra bytes to be sent as parameters; for example, VDU 22 (select screen mode) needs one extra byte to specify the mode. The number of extra bytes needed is also given in the table:

VDU code	Ctrl plus	Extra bytes	Meaning
0	2 or @	0	Do nothing
1	A	1	Send next character to printer only
2	B	0	Enable printer
3	C	0	Disable printer
4	D	0	Write text at text cursor
5	E	0	Write text at graphics cursor
6	F	0	Enable VDU driver
7	G	0	Generate bell sound

VDU code	Ctrl plus	Extra bytes	Meaning
8	H	0	Move cursor back one character
9	I	0	Move cursor on one space
10	J	0	Move cursor down one line
11	K	0	Move cursor up one line
12	L	0	Clear text window
13	M	0	Move cursor to start of current line
14	N	0	Turn on page mode
15	O	0	Turn off page mode
16	P	0	Clear graphics window
17	Q	1	Define text colour
18	R	2	Define graphics colour
19	S	5	Define logical colour
20	T	0	Restore default logical colours
21	U	0	Disable VDU drivers
22	V	1	Select screen mode
23	W	9	Multi-purpose command
24	X	8	Define graphics window
25	Y	5	PLOT
26	Z	0	Restore default windows
27	[	0	Do nothing
28	\	4	Define text window
29	]	4	Define graphics origin
30	6 or ^	0	Home text cursor
31	– or _	2	Move text cursor

There are several different ways of issuing each VDU command, as follows:

Direct from the keyboard

VDU commands can be given direct from the keyboard by holding down Ctrl and one further key as shown in the table above. Thus to clear the text window (VDU 12), hold down Ctrl and press the L key. This method is not really practical for VDU commands needing parameters.

The text and graphic windows are the areas of the screen to which text and graphics respectively may be written. They are usually set to be the whole screen.

From a command line or script

VDU commands can also be given from the Command Line or in command scripts by using the *Echo command to send bytes to the VDU driver. Each byte is specified using GSRead format (see *Appendix F: GS Formats*). For

example, to clear the text window you need to send ASCII code 12 (Ctrl L) to the VDU driver. You can either represent this as '|L':

```
*echo |L
```

or as the number 12 in angle brackets:

```
*echo <12>
```

If you need to send further bytes you will probably find it easiest to do so using angle brackets. To select mode 16 you need the VDU 22 command (select screen mode) followed by one byte giving the screen mode. Compare this:

```
*echo <22><16>
```

with the equivalent but less comprehensible command:

```
*echo |V|P
```

A few commands take parameters that are two bytes long; an example is VDU 29 (define graphics origin) where each coordinate of the new origin is two bytes long. The bytes must be given in the order <low byte><high byte>. Thus to set the graphics origin to 300,700 you would type:

```
*echo <29><44><1><188><2>
```

(since 300 = 44 + 1x256 , and 700 = 188 + 2x256).

Using aliases

You can use the *Set command with variables called Alias$... to set up names for VDU commands. Thus if you wanted the command *Clear to clear the text window you could set this up by typing:

```
*Set Alias$Clear Echo |<12>
```

A more detailed description and further examples are in the chapter entitled *Using system variables* in this Guide.

From BASIC

The commands can also be given from BASIC using the VDU commands; they are described in full in the *BBC BASIC Guide*, but a summary follows here of those that are most likely to be useful to readers of this Guide.

VDU 1

Sends the next character to the printer and not to the screen, provided the printer has been enabled (with VDU 2, for example).

VDU 2

Causes all subsequent printable characters, and certain control characters, to be sent to the printer as well as to the screen.

VDU 3

Cancels the effects of VDU 2 so that all subsequent printable characters are sent to the screen only.

VDU 4

Causes all subsequent printable characters to be printed at the current text cursor position using the current text foreground and background colours. Cursor control characters (eg carriage return and linefeed) affect the text cursor and not the graphics cursor.

VDU 5

Links the text and graphics cursors and causes all subsequent printable characters to be printed at the current graphics cursor position using the current graphics foreground colour and action. Cursor control characters (eg carriage return and linefeed) affect the graphics cursor and not the text cursor.

VDU 6

Restores the functions of the VDU driver after it has been disabled (using VDU 21). Hence, this command causes all subsequent printable characters to be sent to the screen.

VDU 7

Generates a bell sound.

VDU 8

Causes either the text cursor (by default or after a VDU 4 command) or the graphics cursor (after a VDU 5 command) to be moved back one character position. It does not cause the last character to be deleted. Note that during command input, Ctrl H acts as the Delete key, so the last character will be deleted.

VDU 9

Causes either the text cursor (by default or after a VDU 4 command) or the graphics cursor (after a VDU 5 command) to be moved on one character position.

VDU 10

Causes either the text cursor (by default or after a VDU 4 command) or the graphics cursor (after a VDU 5 command) to be moved on one line.

VDU 11

Causes either the text cursor (by default or after a VDU 4 command) or the graphics cursor (after a VDU 5 command) to be moved back one line.

VDU 12	Clears either the current text window (by default or after a VDU 4 command) or the current graphics window (after a VDU 5 command) to the current text or graphics background colour respectively. In addition the text or graphics cursor is moved to its home position (see VDU 30).
VDU 13	Causes the text cursor (by default or after a VDU 4 command) or the graphics cursor (after a VDU 5 command) to be moved to the start of the current line.
VDU 14	Enters paged mode, and so makes the screen display wait for Shift to be pressed, or for Scroll Lock to be pressed twice, before displaying the next page.
VDU 15	Cancels the effect of VDU 14 so that scrolling is unrestricted.
VDU 16	Clears the current graphics window using the current graphics background colour and action. It does not affect the position of the graphics cursor.
VDU 17,n	Sets either the text foreground (n<128) or background (n 128) colours to the value (n MOD c) where c is the number of colours in the current screen mode.
VDU 18,k,c	Defines either the graphics foreground or background colour and the way in which it is to be applied to the screen.
VDU 19,l,p,r,g,b	Defines the physical colours associated with the logical colour l.
	If $p \leq 15$ & p 0, r, g and b are ignored, and one of the standard colour settings is used.
	If $p = 16$, the palette is set up to contain the levels of red, green and blue dictated by r, g and b.
	If $p = 24$, the border is given colour components according to r, g and b. If $p = 25$, the mouse logical colour l is given colour components according to r, g and b.
VDU 20	Restores the default palette for the current mode and so cancels the effect of all VDU 19 commands. It also sets the default text and graphics foreground and background colours.
VDU 21	Stops all further text and graphics output to the screen until a VDU 6 command is received. However, during command input Ctrl U deletes the current line of input, and does not get passed to the VDU driver.

VDU 22,n	Used to change mode. See *Appendix D: Screen modes* for full details of the modes available.
VDU 30	Moves the text cursor to its home position.
VDU 31,x,y	Moves the text cursor to a specified position on the screen.

Command scripts

Introduction

Command scripts are files of commands that you would normally type in at the Command Line prompt. There are two common reasons for using such a file:

- To set up the computer to the state you want, either when you switch on or when you start an application.

- To save typing in a set of commands you find yourself frequently using.

In the first case the file of commands is commonly known as a boot file.

You may find using an Alias$... variable to be better in some cases; see the chapter entitled *Using system variables* in this part of the Guide for details. The main advantage of these variables is that they are held in memory and so are quicker in execution; however, they are only really suitable for short commands.

Incidentally, if you use these variables you are still likely to need to use a command file to set them up initially.

Command and Obey file types

There are two types of file available for writing command scripts: Command files, and Obey files. The differences between these two file types are:

- An Obey file is always passed to the Command Line interpreter, whereas a Command file is passed to the current input.

- An Obey file is read directly, whereas a Command file is treated as if it were typed at the keyboard (and hence usually appears on the screen).

- An Obey file sets the system variable Obey$Dir to the directory it is in.

- An Obey file can be passed parameters.

Creating a command script

A command script can be created using any text or word processor. Normally you then have to use the command *SetType to set the type of the file to Command or Obey. If you are using Edit from the desktop, then you can instead choose the type of file you are creating by pressing the Menu button over the Edit icon.

When you save the file you should consider in which directory you will save it. By default, files are looked for in the current directory, and in the library. Therefore, if you want to avoid having to type the full pathname of the file every time you run it you should save it in one of the following:

- the directory from which the command script will be run (typically your root directory, or an application directory)

- the library (typically $.Library, but may be $.ArthurLib on a network; see *Configure Lib in the chapter entitled *Configuration commands*).

Running the script

Provided that you have set the file to have a filetype of Command or Obey it can then be run in the same ways as any other file:

- Type its name at the * prompt.

- Type its name preceded by a * at any other prompt (some applications may not support this).

- Double-click on its icon from the desktop.

The same restrictions apply as with any other file. If the file is not in either your current directory or the library, it will not be found if you just give the filename; you must give its full pathname. (This assumes you have not changed the value of the system variable Run$Path.)

Making a script run automatically

You can make scripts run automatically:

- From the network when you first log on;

- From a disc when you first switch the computer on;

- From an application directory when the application is run.

To do this, your file must be called !Boot, except in the first case (the network at logon) when the file must be called !ArmBoot. (This is to distinguish a boot file for a machine running Arthur or RISC OS from an existing !Boot file already on the network for the use of BBC computers.)

In the first two cases you will need to use the *Opt command as well; see the chapter entitled *Filing system commands* in this part of the Guide.

For an example of the last case, you can look in any of the application directories in the Applications Suite. If you are using the desktop, you will need to hold down the Shift key while you open the application directory, otherwise the application will run.

An Obey file can have parameters passed to it, which can then be used by the command script. A Command file cannot have parameters passed to it. The first parameter is referred to as %0, the second as %1, and so on. You can refer to all the parameters after a particular one by putting a * after the %, so %*1 would refer to the all parameters from the second one onwards.

These parameters are substituted before the line is passed to the Command Line interpreter. Thus if an Obey file called Display contained:

```
FileInfo %0
Type %0
```

then the command *Display MyFile would do this:

FileInfo MyFile
Type MyFile

Sometimes you do not want parameter substitution. For example, suppose you wish to include a *Set Alias$.. command in your file, such as:

```
Set Alias$Mode echo |<22>|<%0>    Desired command
```

The effect of this is to create a new command 'Mode'. If you include the *Set Alias command in an Obey file, when you run the file the %0 will be replaced by the first parameter passed to the file. To prevent the substitution you need to change the % to %%:

```
Set Alias$Mode echo |<22>|<%%0> Command needed in file
```

Now when the file is run, the '%%0' is changed to '%0'. No other substitution occurs at this stage, and the desired command is issued. See the *Set command in the chapter entitled *Using system variables* for further discussion of this example.

Examples

These example files illustrate several of the important differences between Command and Obey files:

Example 1

```
*BASIC
AUTO
FOR I = 1 TO 10
  PRINT "Hello"
NEXT I
END
```

If this were a command file, it would enter the BASIC interpreter, and input the file shown. The command script will end with the BASIC interpreter waiting for another line of input. You can then press Esc to get a prompt, type RUN to run the program, and then type QUIT to leave BASIC. This script shows how a command file is passed to the input, and can change what is accepting its input (in this case to the BASIC interpreter).

In contrast, if this were an Obey file it would be passed to the Command Line interpreter, and an attempt would be made to run these commands:

```
*BASIC
*AUTO
*FOR I = 1 TO 10
*   PRINT "Hello"
*NEXT I
*END
```

Only the first command is valid, and so as an Obey file all this does is to leave you in the BASIC interpreter. Type QUIT to leave BASIC; you will then get an error message saying File 'AUTO' not found, generated by the second line in the file.

Example 2

The next example illustrates how control characters are handled:

```
echo <7>
echo |<7>
```

The control characters are represented in GSTrans format (see *Appendix F: GS Formats*). These are not interpreted until the echo command is run, and are only interpreted then because echo expects GSTrans format.

The first line sends an ASCII 7 to the VDU drivers, sounding a beep; see the chapter entitled *VDU commands*. In the second line, the | preceding the < changes it from the start of a GSTrans sequence to just representing the character <, so the overall effect is:

```
echo <7>              Send ASCII 7 to VDU drivers – beeps
echo |<7>             Send <7> to the screen
```

Example 3

The last examples are a Command file:

```
*Set Alias$more %echo |<14>|m %type -tabexpand %*0|m
      %echo |<15>
```

and an Obey file that has the same effect:

```
Set Alias$more %echo |<14>|m %type -tabexpand %%*0|m
     %echo |<15>
```

The only differences between the two examples are that the Command file has a preceding * added, to ensure that the command is passed to the Command Line interpreter; and that the Obey file has the %*0 changed to %%*0 to delay the substitution of parameters.

The file creates a new command called 'more' – taking its name from the Unix 'more' command – by setting the variable Alias$more:

- The % characters that precede echo and type ensure that the actual commands are used, rather than an aliased version of them.

- The sequence |m represents a carriage return in GSTrans format (see *Appendix F: GS Formats*) and is used to separate the commands, just as Return would if you were typing the commands.

- The two echo commands turn scroll mode on, then off, by sending the control characters ASCII 14 and 15 respectively to the VDU drivers (see the chapter entitled *VDU commands*).

- The | before each < prevents the control characters from being interpreted until the aliased command 'more' is run.

The command turns scroll mode on, types a file to the screen expanding tabs as it does so, and then turns scroll mode off.

Appendix A: Resetting and power on

An Acorn computer using RISC OS always runs under a 'configuration', which 'tells' the computer about the following types of things:

- What hardware you have in your system: for example, what type of monitor, printer (if any), disc drives or Econet network hardware.
- What language you wish the computer to run when it is switched on. 'Language' here includes the desktop.
- How loud you want the bleep or bell to sound.

You can set some of these using the Configure application from the desktop; all of them can be set with the *Configure command in the command line. The variables are stored in non-volatile memory supported by batteries (which retains its contents even when the mains power is turned off), so that you do not have to set them every time you use the computer. However, it is sometimes useful to be able to get back to a standard configuration. For this reason, methods of setting some or all of the configuration parameters to default values are provided.

Power on

You can reset the configuration by holding down the following keys as you switch on:

R   causes some of the operating system's CMOS RAM to be reset.

Delete   causes all the machine's CMOS RAM to be reset to its initial factory values.

When upgrading the computer (for example, when changing the hardware or the operating system) use R Power on. The exact effect of these alternatives, together with others you may never or only rarely need, are described in the chapter entitled *Configuration commands*, in Part 3 of this Guide.

Reset button

For the position of the Reset button on your computer, refer to the *Welcome Guide* supplied with it. The following variations in reset states are available:

Reset	Causes a standard reset.
Shift Reset	Causes an autoboot operation, ie a file of standard startup instructions is carried out (provided the computer and filing system have been configured for this).
Ctrl Reset	Causes more of the machine to be reset (a 'hard reset').
* on numeric keypad Reset	Causes Command Line mode to be entered, rather than the configured language (such as the desktop or BASIC).

Note also that some applications are started using Ctrl Shift Reset.

Break key

The Break key (to the right of the twelve function keys) can act like Escape in interrupting a program or, in combination with other keys, like the Reset button.

Shift Break	Causes an autoboot to be performed (unless Boot is configured).
Ctrl Break	Causes more of the machine to be reset.
keypad * Ctrl Break	Causes the machine to be started up in Command Line mode, rather than the configured language.

Appendix B: File types

File types are three-digit hexadecimal numbers. They are divided into three ranges:

E00 to FFF	reserved for use by Acorn
800 to DFF	may be allocated to software houses (A00 to AFF are used
	for Acornsoft files, 800 to 80C for BBC uniform files)
000 to 7FF	free for users

For each type, there may be a default action on loading and running the file. These actions may change, depending on whether the desktop is in use, and which applications have been seen. The system variables Alias$@LoadType_XXX and Alias$@RunType_XXX give the actions (XXX = file type). Some types have a textual equivalent, which may be used instead of the hexadecimal code. The textual equivalent is given by the system variable File$Type_XXX, where XXX is the file type.

The following types are currently used or reserved by Acorn. Not all file types used by software houses are shown. This list may be extended from time to time:

Type	Description	Textual equivalent
FFF	Plain ASCII text	Text
FFE	Command	Command
FFD	Data	Data
FFC	Position independent code	Utility
FFB	Tokenised BASIC program	BASIC
FFA	Relocatable module	Module
FF9	Sprite	Sprite
FF8	Absolute code	Absolute
FF7	BBC font	BBC font
FF6	Fancy font	Font
FF5	PostScript	PoScript
FEF	Diary	

Type	Description	Textual equivalent
FEE	NotePad	
FED	Palette	Palette
FEC	Template file	Template
FEB	Obey	Obey
FEO	Desktop accessory	
FDD	Master utilities	
F0E	BBC Econet utilities	
F09	BBC Winchester utilities	
BBC	BBC ROM file (ROMFS)	BBC ROM
AFF	Draw file	
AFE	Mouse event record	
AFD	GCAL source file	
AFC	GCODE intermediate file	
AFA	DTP style	
AF9	DTP documents	
AF8	First Word Plus file	
AF7	Help file	
AF6	ASim trace file	
AF5	Mail setup	
AF4	Mail 'Filed'	
AF3	Mail Postbox	
AF2	Mail InTray	
AF1	Maestro file	
AF0	ArcWriter file	
80C	Stationery pad	
80B	Videotex file	
80A	Database form file	
809	Database file	
808	PostScript file	
807	Graphs and charts file	
806	Graphics file	
805	Drawing file	
804	Picture file	
803	Spreadsheet file	
802	Text only file	
801	Wordprocessor file	
800	BBC uniform file	

Appendix C: HFORM – A hard disc formatting program

Hard discs fitted to Acorn computers such as the Archimedes 440, and hard discs supplied as upgrades, are supplied ready formatted and it is not necessary to reformat them. However, you may want to reformat your hard disc at a later date. For this purpose, a BASIC program called HFORM is supplied on the hard disc in the Library directory, and is also distributed along with the Applications Suite on floppy discs. (You should in any case make a backup copy of HFORM onto a floppy disc for possible future use.)

During the formatting, HFORM will prompt you for the specifications or parameters of the hard disc. This is necessary because your Acorn computer could be fitted with one of several types of hard disc. The parameters used by HFORM will normally be read automatically from the hard disc drive and you can work through the program accepting each parameter as it is displayed on the screen by pressing Return; you do not need to know the manufacturer of your hard disc nor do you need to type anything in.

There may, however, be some occasions when it is necessary to enter the specifications of the hard disc (the hard disc shape). For example:

- If you are adding a new hard disc.
- If the hard disc has not yet been formatted.
- If the information on the hard disc has been corrupted or is incorrect.

If you need to alter the shape of the hard disc you should consult the manual accompanying your hard disc for its precise specifications.

How to format a hard disc

WARNING: Reformatting your hard disc will permanently remove all data stored on the disc. It is essential that data you wish to keep is copied to a floppy disc (or otherwise backed up) before the disc is reformatted.

In the following instructions, it is assumed that you have to reformat your hard disc because of repeated hard disc errors. In order to carry out the reformatting successfully you should have a record of the disc errors which have occurred and their addresses.

For the purpose of this example it is assumed that your computer is fitted with a 53Mbyte Rodime hard disc. However, you do not need to know the manufacturer of your hard disc or its specifications.

There are two stages to formatting the hard disc:

- Entering the specifications of the hard disc (known collectively as the hard disc shape)
- Entering the list of defects on the hard disc.

Stage 1 – Entering the hard disc shape

1 Open the Library directory.

2 Double-click on the file HFORM.

3 HFORM will then prompt you as follows:

Format which drive (4 or 5)? 4 (press Return)

The internally fitted hard disc drive is numbered 4, while an external (second) hard disc drive (if fitted) is numbered 5. If you want to accept the default drive number 4, press Return, otherwise type 5 and press Return.

4 Once you have told HFORM which hard disc you want to format, HFORM checks the type of hard disc and displays the following or a similar message:

The shape written on the disc matches that of a 53 Mb Rodime disc. Do you wish to retain this shape (Y/N)?

To continue with the formatting, type Y.

5 At the following prompts, accept each option as it is displayed on the screen by pressing Return:

Old or new map format (O/N)? N	(Press Return)
Sectors per track? 32	(Press Return)
Heads? 7	(Press Return)
Cylinders? 872	(Press Return)
Low current cylinder? 1023	(Press Return)
Precompensation cylinder? 650	(Press Return)
Parking cylinder? 871	(Press Return)

Stage 2 – Recording a list of hard disc defects

After you press Return at the last option, HFORM will list the current defects (if any) on the hard disc and invite you to change the list by adding any new defects that you may have discovered. You may wish to add a new defect because ADFS has previously returned an error message, such as:

Disc error 10 at :00831E00

1 To record a single defect on the defect list, select option C. If you have more than one defect to record, see the following section, *Recording more than one disc error*.

2 Type in the defect address exactly as it appeared in the disc error message.

3 When you have entered the defect, select option A.

4 At this stage you will be asked if you want to carry out a soak test. Soak testing repeatedly formats and checks the disc. It can be used to check that the state of the defects on the disc is stable. If you want to carry out a soak test, type Y and press Return at the prompt:

Do you want to soak test the hard disc for defects (Y/N)?

This is followed by a further prompt:

Are you certain you want to format drive <drive number> (Y/N)?

Type Y and press Return to start the soak test. The prompt also appears if you decide not to carry out the soak test; in this case, the disc is formatted and checked once.

The soak test continues until you press the space bar. It is recommended that you carry out the soak test for at least 24 hours.

5 If you do not perform a soak test, and if the verification process detects any additional defects, HFORM will then repeat the formatting and verification process in order to include the new defects.

The formatting process is now complete.

Recording more than one disc error

This section applies only to old map discs, ie those prepared in formats other than E.

If you have more than one disc error to add to the defect list, you must add them in descending order of magnitude, giving the hexadecimal values of the

addresses as shown in the disc error message. When you have listed the disc errors, follow steps 1 to 4, as described in the previous section.

Formatting a previously unformatted hard disc

Formatting a brand new, previously unformatted hard disc is different from reformatting a hard disc which had already been formatted. This is because you need to record the defects on the hard disc by (physical) cylinder, head and section address rather than by logical address (the hexadecimal address given in disc error messages). There are only two circumstances which may require this. These are when you need to:

- Establish an initial defect list on a brand new, previously unformatted disc.
- Reestablish the defect list in the unlikely event that it has become corrupted, for example due to a power failure during a previous format operation.

The information on the cylinder, head and section address is kept on a written defect list which the manufacturer attaches to the body of the hard disc drive. To gain access to the written defect list you have to remove the top cover of the computer. Instructions on how to remove it and basic safety precautions are given in the documentation which accompanies your hard disc.

1 If there are no initial defects, select option A. Otherwise, to record the initial defect list, select option B.

Note for advanced users: If you wish to add any defects by logical addresses (option C) you must do this before entering the defects by (physical) cylinder, head and section address, ie by option B. This applies only to old map discs, ie those prepared in formats other than E.

2 Type in the defect addresses exactly as they appear on the list.

3 When you have entered the defects, select option A.

4 Confirm your intention to format the disc by typing Y and pressing Return when prompted. You can also request a soak text at this stage. See above for details of this.

HFORM will now format the hard disc. Once the hard disc is formatted, HFORM checks that all areas of the hard disc are able to store data.

5 If the verification process detects any additional defects, HFORM will repeat the formatting and verification process in order to include the new defects.

The formatting process is now complete.

Appendix D: Screen modes

Mode	Text col x row	Graphics resolution horiz x vert	Colours	Memory used	Monitor types
0	80 x 32	640 x 256	2	20K	
1	40 x 32	320 x 256	4	20K	
2	20 x 32	160 x 256	16	40K	
3	80 x 25	Text only	2	40K	
4	40 x 32	320 x 256	2	20K	
5	20 x 32	160 x 256	4	20K	
6	40 x 25	Text only	2	20K	
7	40 x 25	Teletext	16	80K	
8	80 x 32	640 x 256	4	40K	
9	40 x 32	320 x 256	16	40K	
10	20 x 32	160 x 256	256	80K	
11	80 x 25	640 x 256	4	40K	
12	80 x 32	640 x 256	16	80K	
13	40 x 32	320 x 256	256	80K	
14	80 x 25	640 x 256	16	80K	
15	80 x 32	640 x 256	256	160K	
16	132 x 32	1056 x 256	16	132K	
17	132 x 25	1056 x 256	16	132K	
18	80 x 64	640 x 512	2	40K	Multi
19	80 x 64	640 x 512	4	80K	Multi
20	80 x 64	640 x 512	16	160K	Multi
21	80 x 64	640 x 512	256	320K	Multi
23	144 x 56	1152 x 896	2	126K	HRM
24	132 x 32	1056 x 256	256	264K	
25	80 x 50	640 x 480	2	37.5K	VGA
26	80 x 50	640 x 480	4	75K	VGA
27	80 x 50	640 x 480	16	150K	VGA
28	80 x 50	640 x 480	256	300K	VGA

Notes:

1 Where a monitor type is shown, the mode only generates a useable picture if the computer is connected to a monitor of that type. The types are:

- Multi: multiple scan-rate
- HRM: high-resolution mono (if supported by your computer)
- VGA: includes some VGA monitors with suitable sync connections. Modes suitable for this type can also be used with multiple scan-rate monitors.

If a monitor type is not shown, the mode will work with a standard monitor.

2 Mode 22 is not defined.

3 In 256 colour modes, there are some restrictions on the control of the colours. Only 64 base colours may be selected; 4 levels of tinting turn the base colours into 256 shades. Also, the selection from the colour palette of 4096 shades is only possible in groups of 16.

Recommended modes for the desktop

Of the modes available, the following are the most suitable for a given combination of monitor and number of colours required.

Monitor type	Number of colours	Mode
Standard	16	12
	256	15
Multiscan	16	20
	256	21
VGA	16	27
	256	28
132-column display	16	16
(any monitor)	256	24

Appendix E: Character codes

This Appendix includes tables for the eight alphabet sets available on your Acorn computer. Most are based on the International Standards Organisation ISO 8859 document.

The description of the *Country command in the chapter *Miscellaneous * commands* in Part 2 explained the relationship between *country*, *alphabet* and *keyboard*. There are some useful keyboard shortcuts which you can use to switch between alphabets while you are working. You can use these wherever you can use the keyboard: for example, in the Command Line, in Edit, or when entering a filename to save a file. The first two keystroke combinations allow you to switch easily between alphabets.

Alt Ctrl F1	Selects the keyboard layout appropriate to the country UK.
Alt Ctrl F2	Selects the keyboard layout appropriate to the country for which the computer is configured (if available).
Alt <ASCII code typed on numeric keypad>	Enters the character corresponding to the decimal ASCII number typed.

The following sequence also switches the keyboard layout:

1 Press and hold Alt and Ctrl together; press F12.

2 Release Ctrl.

3 Still holding Alt, type on the numeric keypad the international telephone dialling code for the country you want (eg 044 for Germany, 039 for Italy, 033 for France).

4 Release Alt.

Latin1 alphabet (ISO 8859/1)

This is the default alphabet used by Acorn computers.

	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
			SP	0	@	P	`	p			NBSP	°	À	Ð	à	ð
+1			!	1	A	Q	a	q			¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r			¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
10			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
11			+	;	K	[	k	{			«	»	Ë	Û	ë	û
12			,	<	L	\	l					¬	¼	Ì	Ü	ì	ü
13			-	=	M	]	m	}			SHY	½	Í	Ý	í	ý
14			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
15			/	?	O	_	o				¯	¿	Ï	ß	ï	ÿ

Latin2 alphabet (ISO 8859/2)

	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
			SP	0	@	P	`	p			NBSP	°	Ř	Đ	ŕ	đ
+1			!	1	A	Q	a	q			Ą	ą	Á	Ń	á	ń
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Latin3 alphabet (ISO 8859/3)

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	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
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+1			!	1	A	Q	a	q			ʻ	±	Α	Ρ	α	ρ
2			"	2	B	R	b	r			ʼ	²	Β		β	ς
3			#	3	C	S	c	s			£	³	Γ	Σ	γ	σ
4			$	4	D	T	d	t				΄	Δ	Τ	δ	τ
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15			/	?	O	_	o				—	Ώ	Ο	ί	o	

Teletext characters
Teletext alphanumeric

	0	10	20	30	40	50	60	70	80	90	100	110	120
0	Nothing	Down	Nothing	Move cursor to 00									
1	Next to printer	Up	Disable VDU	Move cursor									
2	Start printer	Clear screen	Select mode										
3	Stop printer	Start of line	Reprogram characters	!									
4	Nothing	Paged mode	Nothing										
5	Nothing	Scroll mode	Nothing	#									
6	Enable VDU	Nothing	Nothing										
7	Beep	Nothing	Nothing										Back space and delete
8	Back	Nothing	Nothing	&									Nothing
9	Forward	Nothing	Nothing										Alpha red

	130	140	150	160	170	180	190	200	210	220	230	240	250
0	Alpha green	Normal * height	Graphic cyan										
1	Alpha yellow	Double height	Graphic white										
2	Alpha blue	Nothing	Conceal display										
3	Alpha magenta	Nothing	Contiguous graphics *										
4	Alpha cyan	Nothing	Separated graphics										
5	Alpha * white	Graphic red	Nothing										
6	Flash	Graphic green	Black * background										
7	Steady *	Graphic yellow	New background										
8	Nothing	Graphic blue	Hold graphics										
9	Nothing	Graphic magenta	Release * graphics										

* every line starts with these options

	0	10	20	30	40	50	60	70	80	90	100	110	120
0	Nothing	Down	Nothing	Move cursor to 00									
1	Next to printer	Up	Disable VDU	Move cursor									
2	Start printer	Clear screen	Select mode										
3	Stop printer	Start of line	Reprogram characters										
4	Nothing	Paged mode	Nothing										
5	Nothing	Scroll mode	Nothing										
6	Enable VDU	Nothing	Nothing										
7	Beep	Nothing	Nothing										Back space and delete
8	Back	Nothing	Nothing										Nothing
9	Forward	Nothing	Nothing										Alpha red

Appendix E: Character codes

	130	140	150	160	170	180	190	200	210	220	230	240	250
0	Alpha green	Normal * height	Graphic cyan										
1	Alpha yellow	Double height	Graphic white										
2	Alpha blue	Nothing	Conceal display										
3	Alpha magenta	Nothing	Contiguous graphics *										
4	Alpha cyan	Nothing	Separated graphics										
5	Alpha * white	Graphic red	Nothing										
6	Flash	Graphic green	Black * background										
7	Steady *	Graphic yellow	New background										
8	Nothing	Graphic blue	Hold graphics										
9	Nothing	Graphic magenta	Release * graphics										

* every line starts with these options

This character set is used in the BBC Master microcomputers. It is retained for the sake of compatibility, but should not be used for new applications.

	0	10	20	30
0	Nothing	Down	Default logical colours	Move text cursor to 00
1	Next to printer	Up	Disable VDU	Move text cursor
2	Start printer	Clear screen	Select mode	
3	Stop printer	Start of line	Reprogram characters	
4	Separate cursors	Paged mode	Define graphics area	
5	Join cursors	Scroll mode	Plot	
6	Enable VDU	Clear graphics	Default text/graphics areas	
7	Beep	Define text colour	Nothing	
8	Back	Define graphics colour	Define text area	
9	Forward	Define logical colours	Define graphics origin	

The remaining columns (40 through 250) and the lower rows contain the Bfont graphics characters. Column 120, row 8 is labelled "Back space and delete".

Appendix F: GS Formats

The GSTrans and GSRead formats are used by a number of commands that need to be able to handle control characters, and characters whose top bit is set. They enable you to use these characters, which would otherwise cause unpredictable output from your monitor or printer, and which would be difficult to enter directly from the keyboard. The two formats are identical.

Conventions

The GSRead or GSTrans format is used by some commands to read characters that you type in. The characters are interpreted using the following conventions:

- A character preceded by a | is converted into the relevant control code: |C would become ASCII 3 (which is Ctrl C).

- An integer within angle brackets is converted into the equivalent ASCII code: <7> would become ASCII 7.

- A variable name within angle brackets is replaced by the value held in the variable, or is ignored if the variable does not exist.

- All other characters are unchanged.

A full list of ASCII codes and how to obtain them is given below. Of course, any ASCII code may be obtained by enclosing it in angle brackets as described above, and this may be easier to remember than the symbol encoding.

ASCII code	Symbols used
0	|@
1 – 26	|<letter> eg |A (or |a) = ASCII 1, |M (or |m) = ASCII 13
27	|| or |
28	|
29	|] or |
30	|^ or |~

ASCII code	Symbols used
31	∟ or |`
32 – 126	keyboard character, except for:
"	|"
|	||
<	|<
127	|?
128 – 255	|!<coded symbol> eg ASCII 128 = |!|@ ASCII 129 =
	|!|A etc

Note that you must use |< to prevent the < from being interpreted as the start of a number or variable name enclosed in angled brackets.

To include leading spaces in a definition, the string must be in double quotation marks, ", which are not included in the definition. To include a literal " character in the string, use |" or "".

Appendix G: Error messages

Introduction

There are many possible error messages. This appendix lists some of the more common ones you might see when using Command Line mode. It also tells you what the more likely causes of the error message are, and what you can do about it.

There are other less common causes for some of the errors listed here, and the suggested cures may not always put the problem right. If you still do not understand why you are getting an error message, read the relevant parts of any manuals you have.

If the computer appears to ignore you, try the following:

- Move the mouse. If the pointer does not move on the screen, then the computer needs resetting.
- Try clicking something harmless, such as Menu, over any applications. If some applications are still working, use the Task Manager to remove those that have 'died'. If no applications respond you should reset the computer.

Error messages

Abort on data transfer

This error is caused by a bug in the application you are using.

Address exception

This error is caused by a bug in the application you are using.

Bad wimp mode

You can't change to this screen mode.

Branch through zero

This error is caused by a bug in the application you are using.

Code runs too low

You have tried to run a load/exec file that is not meant to be run.

Data lost

There is a delay on the Econet: try repeating the command that caused it. If the error happens repeatedly, ask your system administrator for help.

Data lost can also come from the floppy disc drive if there is an error during writing. Check for a protected disc. Use *Verify to check there are no defects on the disc.

Disc modified or has been see before…	You either have two floppy discs with the same name, or a single floppy disc has been 'seen' by this machine, taken out and modified on another machine, and then returned to this one. Click on OK to tell the computer to regard the current disc as the right one.
File open	An operation was interrupted by an error, a reset, or similar; on the net, this error can also be caused by other people accessing the same file. Try *Close or *Net:close to close the open file, and then repeat the command that caused the error. If the error persists on the net, try logging off and logging on again.
FileCore in use	One application tried to access a file at the same time as another. Repeat your command, if possible waiting for the other application to finish. If this error is given repeatedly you will have to reset the computer.
Font cache full	The space reserved for fonts has been used up. Use the Task Manager application to reserve more space for the Font cache. Allow about 12K for each 12-point font.
Free space map full	The data on your disc has become fragmented, and you should compact the disc. See Part 3 of this Guide for the *Compact command.
Heap full	The area of memory reserved for relocatable modules (the RMA) has all been claimed. Use the Task Manager application to reserve more space for the module area. Note that the screen/RMA can grab automatically from Free but not from Next slots.
Line jammed	The Econet is seriously overloaded. Inform your network manager, but in the meantime, keep trying.
Locked	You tried to do something forbidden to a locked file, such as delete it. You need to unlock it if you really want to do this.
Message block is too big/ not a multiple of 4	This error is sometimes erroneously produced when filenames are too long.
Net error	There is a delay on the Econet – try repeating the command that caused it. If the error happens repeatedly, ask your system administrator for help.
No clock	The Econet is not plugged in. Check the cable running from the socket at the back of the computer to the network socket.
No free printer server of this type	This can sometimes be caused by network broadcasts going wrong. Repeat the command you used. If the error occurs again, the command *RMReinit NetPrint will sometimes cure the problem.

No run action specified for this file type	Before a file belonging to an application can be loaded, its application must have been 'seen' (shown on a directory display) at some time in your session. This error message appears when this has not happened. To prevent this error occurring, keep your applications in the root directory of your disc(s), or include statements in your !Boot file that will cause !Boot files in the relevant subdirectories to be run when you power on.
No more font handles	You are using more than 255 fonts of separate sizes and styles. Before using any new fonts, you must stop using some of the old ones.
No reply	There is a delay on the Econet; try repeating the command that caused it. If the error happens repeatedly, ask your system administrator for help.
No room for variable	The area of memory reserved for the system heap has all been used. Use the Task Manager application to reserve more space for the System heap/stack.
No room in RMA	The area of memory reserved for relocatable modules (the RMA) has all been claimed. Use the Task Manager application to reserve more space for the module area. Note that the screen/RMA can grab automatically from Free but not from Next slots.
No room to run transient	The area of memory reserved for relocatable modules (the RMA) has all been claimed. Use the Task Manager application to reserve more space for the module area. Note that the screen/RMA can grab automatically from Free but not from Next slots.
Not enough memory to start application	You need to free more memory before the application will run. You can do this by:

- quitting other applications and modules;
- using the Task Manager application to reduce the amount of memory used by other things, such as the font cache and system sprite pool;
- changing to a lower resolution/mode screen colour;
- discarding the RAMFS.

Not listening	There is a delay on the Econet; try repeating the command that caused it. If the error happens repeatedly, ask your system administrator for help.
Printer busy	The printer is not responding. Check that it is plugged in. If you are using the network printer server, try again later when it may be free; if this error occurs repeatedly, consult your system manager.

Printer: in use	You are trying to print from more than one application at once. Wait for the first application to finish before printing from the other one.
Printer jammed	The printer is not responding. Check that it is plugged in. If you are using the network printer server, try again later when it may be free; if this error occurs repeatedly, consult your system manager.
Printer timeout	The printer is not responding. Check that it is plugged in. If you are using the network printer server, try again later when it may be free; if this error occurs repeatedly, consult your system manager.
Rectangle area full	A window operation needs more workspace than the window manager has available. Redraw the screen by pressing F12, then Return.
Station name not found	The network is too busy to find the named file server. Try repeating your command. Alternatively, the file server itself may be out of action. Check with your system administrator.
System heap full	The area of memory reserved for the system heap has all been used. Use the Task Manager application to reserve more space for the System heap/stack.
System resources cannot be found	The file !System (provided in the Applications suite) cannot be found. Run the file and repeat your command.
Template file not found	An application directory is missing a template file. Check that it has not been accidentally renamed or moved. If necessary, replace the application from your master copy.
Too many windows	You are trying to open more than 64 windows. Before opening any new windows, you must close some of the old ones. You may also see this message if there is simply not enough memory to run an application. In this case, remove an application that you do not need from memory.
Unable to claim FileSwitch workspace	The area of memory reserved for relocatable modules (the RMA) has all been claimed. Use the Task Manager application to reserve more space for the module area. Note that the screen/RMA can grab automatically from Free but not from Next slots.
Undefined instruction	This error is caused by a bug in the application you are using.
Wimp unable to claim work area	The area of memory reserved for relocatable modules (the RMA) has all been claimed. Use the Task Manager application to reserve more space for the module area. Note that the screen/RMA can grab automatically from Free but not from Next slots.

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*. *see* *Cat

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A3000 Welcome Guide

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