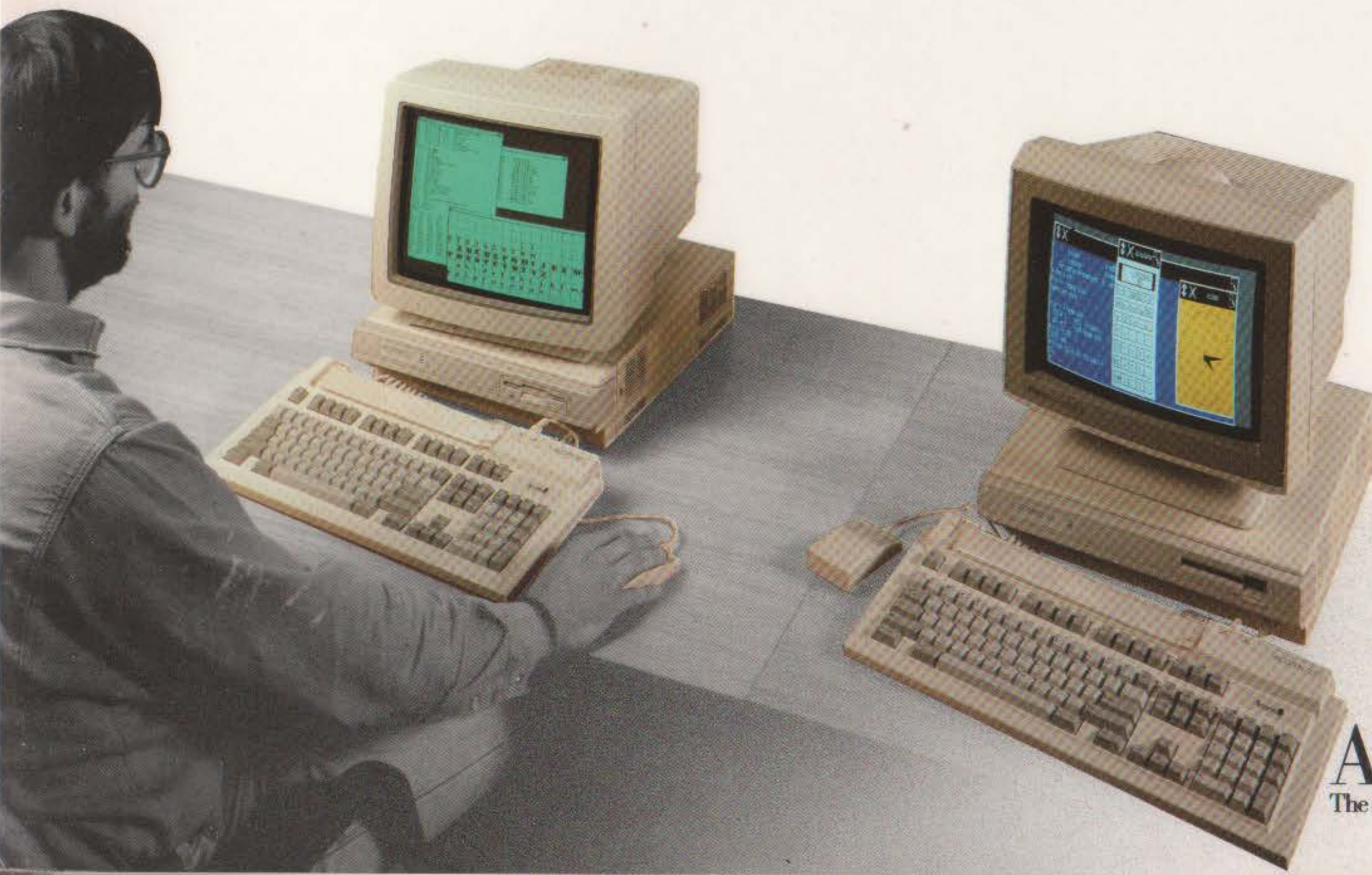


ACORN RI40

OPERATIONS GUIDE



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Part number 0483,710

Warning: This computer must be earthed

Important: The wires in the mains lead for the computer are coloured in accordance with the following code:

Green and yellow: Earth

Blue: Neutral

Brown: Live

For United Kingdom users

The moulded plug must be used with the fuse and fuse carrier firmly in place. The fuse carrier is the same basic colour (though not necessarily the same shade of that colour) as the insert in the base of the plug. Different manufacturers' plugs and fuse carriers are not interchangeable. In the event of loss of the fuse carrier, the moulded plug **MUST NOT** be used. Either replace the moulded plug with another conventional plug wired as described below, or obtain a replacement fuse carrier from an Acorn Computers authorised dealer. In the event of the fuse blowing, it should be replaced, after clearing any faults, with a 5-amp fuse that is ASTA approved to BS1362.

For all users

If the socket outlet available is not suitable for the plug supplied, either a different lead should be obtained or the plug should be cut off and the appropriate plug fitted and wired as noted below. The moulded plug which was cut off must be disposed of as it would be a potential shock hazard if it were to be plugged in with the cut off end of the mains cord exposed.

As the colours of the wires may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked by one of the following: the letter E, the safety earth symbol, the colour green, or the colour green and yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N, or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L, or coloured red.

Guidelines for safe operation

The equipment described in this guide is designed and manufactured to comply with international safety standards IEC65 (BS415) and IEC380 (BS5850), and is intended for use only as a desktop computer. It must not be used for other purposes. It is most important that unpacking and installation is carried out in accordance with the instructions given in this guide.

In the interests of continued safe and reliable operation, observe the following guidelines:

- Keep the machine at a room temperature of 5–35°C (41–95° Fahrenheit) and a relative humidity of 15–90% (non-condensing).
- Avoid sudden extremes in temperature, exposure to direct sunlight, heat sources (such as an electric fan heater) or rain.
- Make sure that the equipment is standing on a suitable rigid horizontal flat surface, allowing enough space for air to circulate when it is in use.
- Ensure that wires and cables are routed sensibly so that they cannot be snagged or tripped over. Don't tug or twist any wires or cables, or use them to hang or lift any of the units.
- Make sure you have read and understood any installation instructions supplied with upgrade kits before attempting to fit them. If you have any doubts, contact your supplier.
- Keep the original packaging in case you need to transport the computer, and avoid bumping or jarring it in transit.
- Switch off and unplug the equipment and any accessories before opening any unit, to install an upgrade, for example. The main computer unit must normally be operated with the cover secured, but it can safely be switched on with the cover removed, provided that care is taken not to short circuit any connections or to allow any fingers or objects in the area of the fan or disc drives when these are running. Be especially careful with jewellery and ties.
- DON'T attempt to open any display or monitor unit, whether supplied with the equipment or not.
- DON'T spill liquids on the machine. If liquid does spill, turn the machine off immediately and take it to your supplier for assessment.
- DON'T drop the equipment or subject it to excessive bumping and jarring.
- DON'T obstruct or poke objects through the ventilation openings in the computer casing.
- DON'T exceed a maximum power consumption of 20 watts from the expansion card backplane supply.
- DON'T balance any objects, or stand equipment weighing more than 15kg (33lbs) on top of this equipment.
- DON'T press the <RESET> button, located on the back of the keyboard (next to the mouse cable socket), or switch the system off without going through the RISC iX close down procedure. Such action could result in the corruption of the filesystem.

About this guide

This guide introduces you to the Acorn R140 Workstation using the RISC iX operating system. RISC iX is Acorn's version of Berkeley 4.3BSD UNIX, with enhancements including NFS (Network File System) and the X Window System. The guide describes how to install, configure and get started with your workstation. You don't need to know much about computers and you don't need to know anything at all about UNIX before you start reading this guide.

This publication is not a tutorial about the RISC iX operating system. To find out more about RISC iX, read the companion guide to this volume, the *RISC iX User Guide*.

Here is a short summary of what you will find in this guide:

Part 1 System Installation

Unpacking – describes and gives a checklist of the components you will find as you unpack the workstation.

Setting up – details how to connect together the components that make up your workstation.

Part 2 System Configuration

Getting started – covers starting up your workstation, beginning a work session, performing some simple tasks using a few RISC iX commands, setting yourself up as a user, and then finishing the work session and closing down your workstation.

Initial configuration – takes you through the steps you should perform to set up the workstation, the first time you switch on.

Using the terminal – details how to set up and use the screen and keyboard.

Configuring the start-up procedure – describes how to alter the way the workstation starts up at switch on.

Part 3 System Reference

System Overview – an overview of the connectors and sockets on the R140 workstation.

Using 3.5" floppy discs – a beginners' guide to the use of 3.5" discs and disc drives.

Configuring the Video Console Interface – a guide to setting up terminal parameters using the Video Console Interface (VCI).

Alternative operating systems – an overview of other operating systems you can use with the R140 workstation.

Expanding the system – details extra items and upgrades that you can add to the workstation.

Looking after the system – describes how to keep the workstation operating properly.

If something goes wrong – offers suggestions to help you solve problems that may arise as you use the system.

Glossary – explains terms used in the guide.

Bibliography – lists documentation referred to throughout this guide.

Index.

How to use this guide

For those new to UNIX

If you have had experience of using a computer but have never used UNIX before:

Read Part 1 – System Installation. Do not try to assemble the workstation without reading the installation instructions first.

Next read Part 2 – System Configuration. This will show you how the workstation is set up, and will take you to the point where you can start to make use of it. It shows you:

- how to start up the workstation and log in
- trying a few RISC iX commands
- how to logout and close down the workstation

- how to set up the system if you are its System Administrator
- how to use the terminal (keyboard, display and mouse).

This guide is not intended as an introduction to RISC iX. When you have the system up and running, turn to the *RISC iX User Guide* which contains such an introduction.

Part 3 – System Reference is a guide to the operation, configuration and maintenance of the workstation – both hardware and software. You will probably want to refer to this only when the need arises. If you get into difficulty, refer to the chapter entitled *If something goes wrong*.

For desktop users

If you have a desktop installed, instead of gaining familiarity by means of the simple commands in part 2, you should follow the introduction in the Guide supplied with the desktop. It is probably a good idea to try the simple commands as well at a later date.

For the UNIX expert

If you are familiar with other implementations of UNIX:

Read Part 1 – System Installation. Do not try to assemble the workstation without reading the installation instructions first.

Next read Part 2 – System Configuration. This will show you how the workstation is set up, and will take you to the point where it is operational. It shows you:

- how to start up the workstation
- how to close down the workstation
- how to set up the system if you are its System Administrator
- how to use the special features of the terminal (special keys, the virtual terminals).

Part 3 – System Reference is a guide to the operation, configuration and maintenance of the workstation – both hardware and software. You may need to refer to parts of this from time to time.

The *RISC iX User Guide* is an introduction to RISC iX and contains details of:

- commands and editors
- networking and communications facilities
- X Window System.

Conventions used in this guide

The following typographical conventions are used throughout this guide to make it easier to distinguish between what you type and what you see on the screen.

Convention	Meaning
<DELETE>	Press the key indicated.
<CTRL-D>	Hold down the first key and press the second.
↵	Press the <RETURN> key.
login:	Text displayed on the screen.
guest	Text that you type in.
<i>filename</i>	A variable, where you should substitute what the word represents.

For example:

```
login: guest ↵
```

This means: At the `login:` prompt, type in the word `guest`, then press the <RETURN> key.

Another example:

```
$ cat filename ↵
```

At the \$ prompt, type `cat`, followed by the name of the file and the <RETURN> key. For example, if the name of the file were `readme1`, you would type:

```
$ cat readme1 ↵
```

Tinted boxes are used for additional or alternative information which would otherwise interrupt the flow of a procedure.

Terms used in this guide

- *User* – the person who is currently using the workstation.
- *Local Administrator* – the person who looks after this particular workstation. This is often the same person as the user.
- *Network Manager* – the person who looks after the network, connecting your workstation to other computers. This is often the same person as the System Administrator.
- *System Administrator* – the manager of the workstation, who may be the manager of several workstations connected via a network. If you are the sole user of your workstation, you may fulfil this role yourself. In this

guide, where there is no need to distinguish between the Local Administrator and Network Manager, the term System Administrator is used.

- *Local Expert* – an experienced UNIX user, or 'guru', to whom other users can turn for help.

Several of these roles may be assumed by the same person.

The following third parties are also referred to in this guide:

- *Supplier* – the company from whom you bought your Acorn R140 Workstation.
- *Support Organisation* – the company with whom you have a maintenance and support contract for the Acorn R140 Workstation.

The first part of the document discusses the importance of understanding the context of the data being analyzed. It emphasizes that without a clear understanding of the background and the specific questions being asked, any analysis is likely to be flawed. This section also touches upon the need for transparency in reporting the results of the analysis, ensuring that the methods used and the limitations of the data are clearly stated.

The second part of the document delves into the technical aspects of data analysis, including the various tools and techniques available. It covers topics such as data cleaning, data visualization, and statistical modeling. The author provides practical advice on how to choose the right tools and methods for a given dataset and how to interpret the results of these analyses. This section is particularly useful for those who are new to data analysis or looking to refresh their skills.

The third part of the document focuses on the application of data analysis in various fields, such as business, healthcare, and social sciences. It provides examples of how data analysis has been used to solve real-world problems and offers insights into the future of data analysis. This section is designed to help readers understand the broader implications of their work and how it can be applied to their own research or professional practice.

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Part 1 - System Installation

Part 1 - System Installation

1.1

Unpacking

Choosing a location for your workstation

Read this chapter as you unpack the computer unit and monitor. Check the contents of the boxes against the instruction sheet 'Read This First' and packing list. If you are missing any item, contact your supplier.

Before you start to unpack your boxes, make sure that you have a sturdy desk or table to place the workstation on. Give yourself enough room to work comfortably. You will need space for typing at the keyboard, moving the mouse and reading the documentation. The workstation will need to be within two metres of a 220/240 volts 50Hz mains socket (unless you use an extension lead). Additional peripheral devices such as printers will need more space and additional mains sockets.

Make sure that:

- air can freely circulate through the ventilation holes in the computer unit and monitor. Leave at least 4" of clearance between the vents and any object that may restrict air flow
- the equipment is kept away from rain, damp and liquid of any sort
- the workstation does not stand in direct sunlight, or in smoky or dusty environments
- you read all the installation instructions before you begin setting up your workstation.

Unpacking

You will have received several boxes, containing the documentation, system unit and monitor, and, possibly, additional items such as expansion cards and printers. To unpack the boxes:

- 1 Make sure the boxes are the right way up.
- 2 Carefully open and unpack each box in turn.
- 3 Unpack all cables, manuals and other items.
- 4 Place each item on your desk or table.

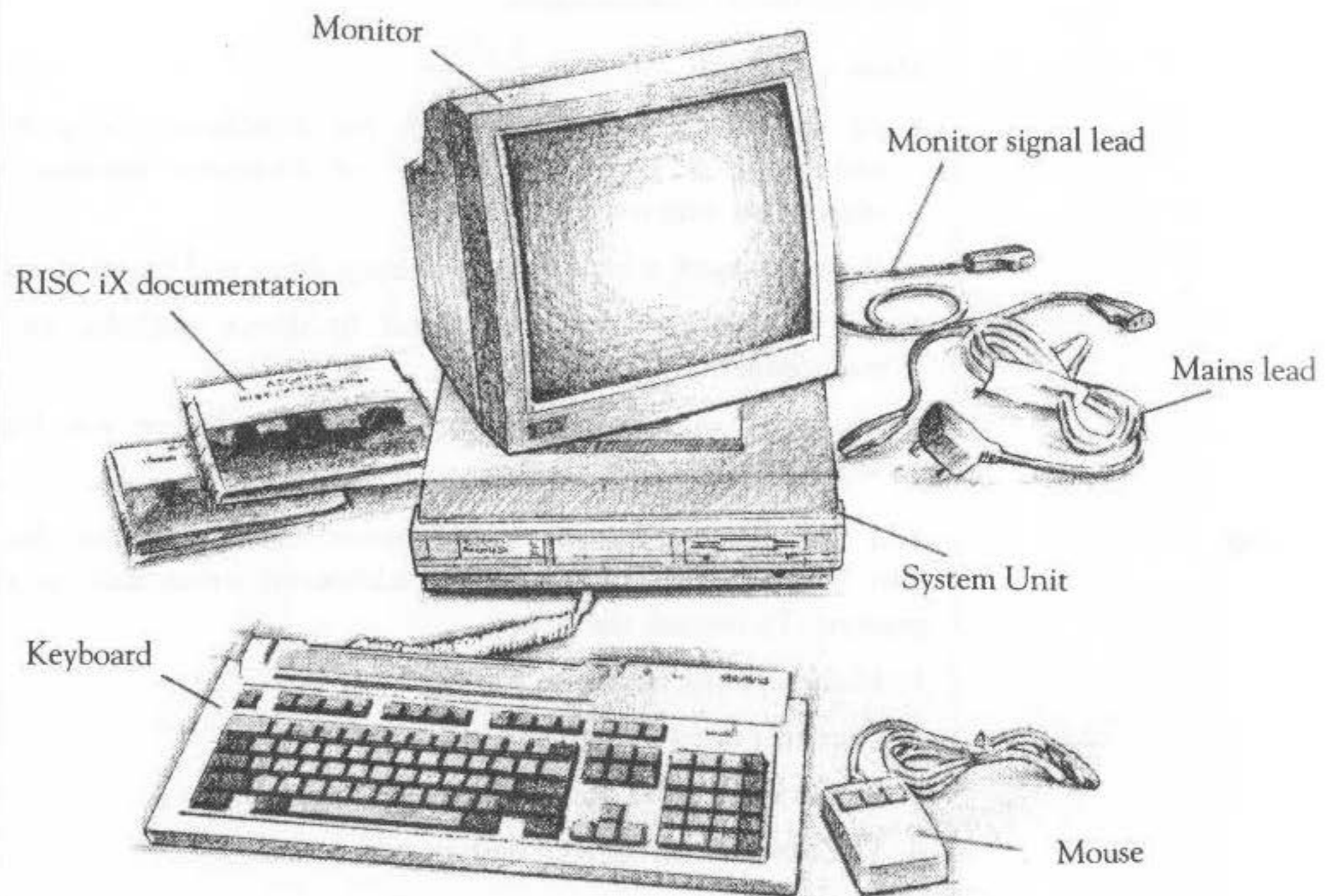
- 5 Check the contents of each box against the instruction sheet 'Read This First' and packing list. If there is anything missing, contact your supplier.
- 6 Check the equipment for obvious damage. Contact your supplier if you notice any.
- 7 Keep all of the packaging. You will need the packaging if you ever move your system to another location or return it to your supplier. It protects the system from rough handling and jarring.

If there are expansion cards installed in your system, you may have unpacked extra cables and connectors that are used to connect these cards. Additional items will be listed in the instruction sheet and packing list.

Don't forget to fill in the owner registration form and licence acceptance card and to return them to Acorn. This will help us ensure that you are kept informed of developments and updates to your workstation.

Checking your delivery

Here are the components of your R140 workstation, (do not place a 19" monitor on top of the system unit):



Documentation package

Your workstation is supplied with two operating systems: the RISC iX operating system and Acorn's proprietary operating system RISC OS.

You will have received sets of documentation for both operating systems, but you only need read the RISC OS documentation (see box below) if you are going to use the RISC OS operating system.

RISC iX documentation

The RISC iX documentation consists of:

- *RISC iX Release Notice* – Read this notice first for details of the latest software release not covered in the main documentation.
- *RI40 Operations Guide* – You are currently reading this document. It tells you all about the operation of the hardware and software of your workstation.
- *RISC iX User Guide* – This is a guide to the RISC iX operating system. Read this to find out more about RISC iX, including the X Window System and the Network File System (NFS).
- If a desktop has been supplied with your system you will also receive relevant desktop documentation.

RISC OS documentation

The RISC OS documentation consists of:

- *Archimedes 400 Series Welcome Guide* – Read this guide only if you intend to use the RISC OS operating system. The *Welcome Guide* is an introduction to RISC OS, and to the Archimedes computer.
- *Archimedes 400 Series User Guide* – Read this to find out about the RISC OS operating system. This guide is a full user guide for the operating system and applications suite.
- *The Archimedes Series BBC Basic Guide* – This is a complete guide to the BBC Basic language running under the RISC OS operating system.

Faint, illegible text, possibly bleed-through from the reverse side of the page. The text is too light to transcribe accurately.

Setting up

Setting up

1. Connect mouse to keyboard

2. Connect keyboard to system unit

Warning: Before you start connecting up the system, please read the *Guidelines for safe operation* in the front of this guide.

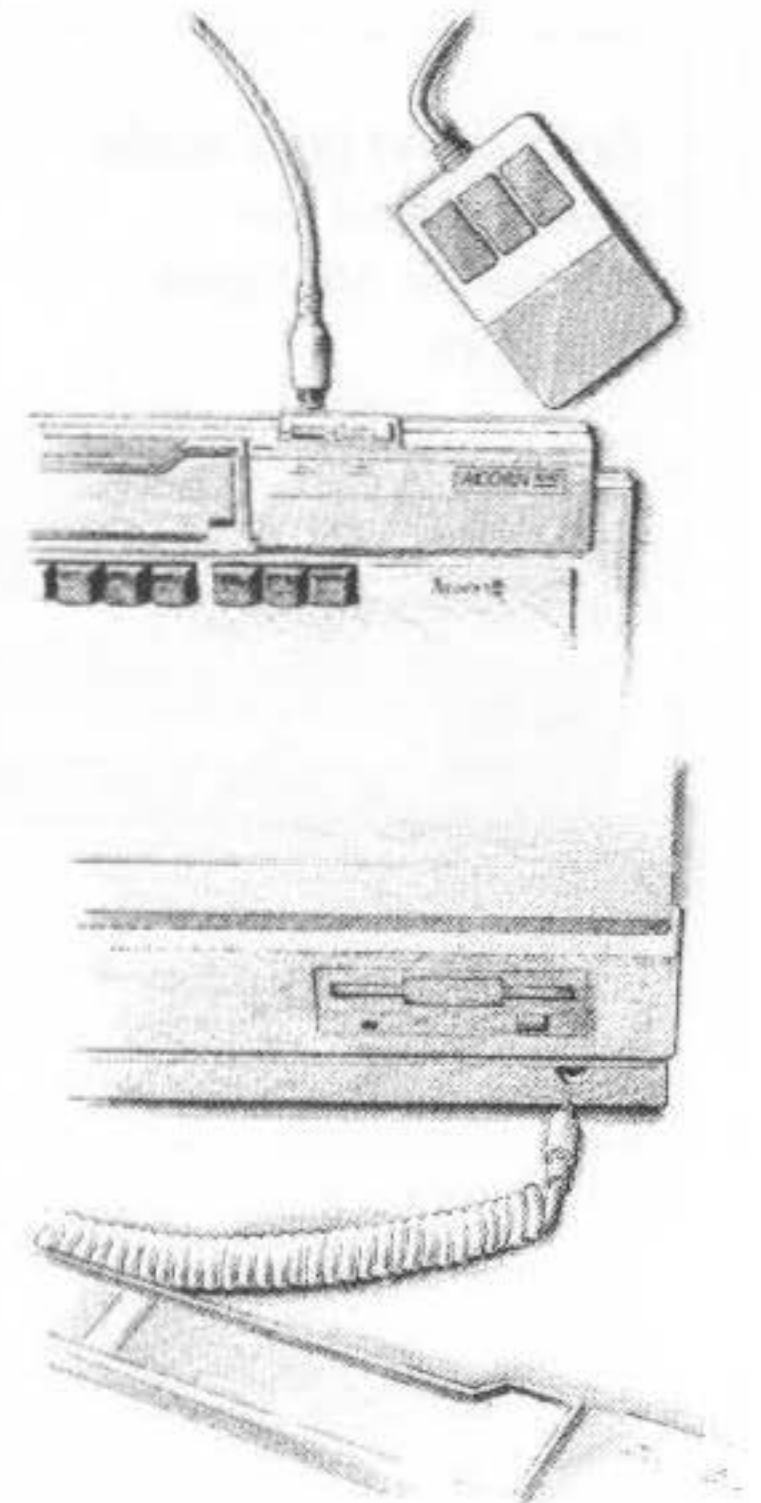
This chapter shows you how to connect together the components of your workstation that you have just unpacked. After following the instructions in this chapter you will be able to switch on and start using your workstation.

Give the system unit plenty of space – so that air can circulate around the sides and pass through the ventilation slots on the sides and back of the unit. The unit must be placed flat on your work area. Standing the unit on its side will cause overheating and eventually damage the unit.

Follow these simple steps to set up your workstation:

The mouse has a straight cable with a plug on the end of it. This goes into the socket at the back of the keyboard. The plug has an arrow moulded into it. This should be uppermost when you push it in. The plug won't go in any other way, so don't try to force it in.

The keyboard has a curly cable with a plug on the end of it. Remove the red cover from the plug and push the plug into the socket on the front righthand side of the system unit (just below the disc drive slot), with the arrow uppermost. Don't force it. Place the keyboard in front of the computer.



Part 2 - System Configuration

Faint, illegible text at the top of the page, possibly a header or introductory paragraph.

Part 2 - System Configuration

1.0

2.0

Getting started

If you have followed the instructions in the previous chapter, you now have a correctly connected workstation on your desk. This chapter shows you how to switch on your workstation, and introduces you to some simple tasks performed using RISC iX commands. Finally it shows you how to create yourself as a user, end your work session and switch the workstation off.

If you are a beginner, read carefully through the whole of this chapter as it introduces you to RISC iX. If you are a UNIX expert you can skip the introductory sections, but you will still need to read the sections on starting up and closing down RISC iX.

If any problems occur while you are following this chapter, find out how to solve your problem by reading the chapter entitled *If something goes wrong*.

For your own safety and the safety of your equipment always take the following precautions. Disconnect the power, by pulling out the mains plug, in the following circumstances:

- whenever you connect or disconnect any of the cables from the back of the system unit
- if anything is spilled into the case
- if your equipment is exposed to rain
- if it has been dropped
- if you suspect your workstation needs servicing or repair
- whenever you clean the case.

Important safety instructions

Starting up

If your workstation was installed by somebody else, it may already be switched on and working. If this is so read this section for information only.

To switch on your workstation:

- 1 Make sure that the mains power lead is plugged into the mains supply and that the mains power is switched on.
- 2 Turn on the workstation by pressing the power switch located on the rear lefthand side of the workstation to ON (1).
- 3 Switch the power switch on the monitor to ON (1). See your monitor manual for details.

Start up procedure

As the workstation starts up, you will notice:

- the POWER lamp in the front panel lights up
- the front panel lamp H/DISC flashes as the hard disc operates
- messages are displayed on the screen.

If need be, you can adjust the contrast and brightness, using the controls on the monitor. See your monitor manual for details.

Note: At this point your workstation is about to start up the RISC iX operating system. If your supplier has installed a third party application on the workstation, your start-up procedure may be different. For more information see the additional documentation packaged by your supplier.

Autoboot

When first shipped, the start-up follows the autoboot procedure (this means that RISC iX starts automatically). Your supplier may have altered the autoboot procedure so that you start up through the RISC OS desktop. To find out more about starting up through the RISC OS desktop, read the chapter *Configuring the start-up procedure*.

After turning on the workstation, the autoboot procedure starts and the following messages are displayed on the screen. (The screen messages may vary slightly from those shown in this guide.)

```
RISC OS 4096K
Acorn ADFS
Supervisor
```

After about 10 seconds the screen clears and the RISC iX start-up screen is displayed:

```
RISC iX Release 1.0
real mem = 4194304
avail mem = 3014656
32 buffers (256 Kbytes)
st0: internal controller
```

The complete start-up procedure takes about three minutes for a workstation connected to NFS and Ethernet. It is slightly quicker for a stand-alone system.

When the system has finished starting up, you will see the `login:` prompt. The `login:` prompt may be within a window if your system has been configured to run a window system. If there is a word before `login:`, then this is the hostname that your System Administrator has chosen to call your system.

```
Multi-user system started - login on other terminals

Acorn RISC iX Release 1.0
login:
```

Checking the date and time

If, when you switch on your workstation, it has not been used for several days (eg when first delivered) you may get the warning message:

Check and reset date

This is a reminder to you to make sure that the date and time are correct. If they need correction, follow the instructions in the chapter entitled *Initial configuration*.

Problems starting up?

If the workstation does not appear to work, go through this checklist to see if you can identify the problem:

- Is the workstation plugged into the mains power socket?
- Is the mains power socket turned on?
- Is the monitor connected to the system unit properly?
- Is the monitor power cable plugged in?
- Is the workstation turned on? (Look for the power light).
- Is the monitor turned on?
- Is the monitor's brightness control correctly adjusted?

If you can't solve the problem, read the chapter entitled *If something goes wrong*. If you then still have difficulties, contact your supplier.

Logging in for the first time

RISC iX is a multi-user system. Several people can use the same workstation, so in order to protect their own work from interference by others, users 'log in' with their own username and password before starting a work session.

Username

Users can log in with several usernames, some of which have already been set up. These are:

- your own username
- desktop
- root
- guest (this is the username you will use to follow the rest of this chapter).

Your own username

If you have been given a personal username by your System Administrator, you should use this whenever you use the system for a work session.

See *Creating usernames and passwords* later in this chapter for information on how to set up your own username.

If you already have your own username, and don't want to follow the examples in this section, follow this procedure to log in with your own username:

your own username
(cont.)

At the login: prompt, type your username. For example if your username were steve:

```
login: steve ↵
```

After typing in your username, the system will prompt you for your password. Type in your password; if you don't have a password the system won't ask this question. For example, if your password were sunshine:

```
login: steve ↵
```

```
Password: sunshine ↵
```

Your password is a secret code that only you know; it is not shown on the screen. The RISC iX system only lets you log in if you know both your username and your password and type them in correctly.

If you logged in correctly the system will present you with a command prompt (\$, or %). On a networked system, the 'hostname' of the workstation may be displayed before the prompt, on a stand-alone system the word unix is displayed.

desktop

You log in with the username `desktop` to enter the desktop supplied with your system. This username lets you follow an example tutorial about using the desktop environment.

You will find information about the `.desktop` environment in the desktop user guide.

To log into the desktop, type:

```
login: desktop ↵
```

The desktop username has no password, so you're not prompted for a password when you log in.

If your log in is successful, you will see the desktop on your display screen. Come back to this guide when you have finished your desktop session.

root

There is one special user, often used to perform system administration and maintenance. This is the Superuser, frequently called 'root' because the Superuser's username is `root`. You have to log in as `root` to perform many system and maintenance operations.

root (cont.)

Information about looking after the system can be found in the *RISC iX System Administrator's Manual*.

The password for root is its protection, and unless you know the root password you cannot carry out these operations. The password is held by the System Administrator. Many commands are protected in this way (for security) so that they cannot be performed by ordinary users.

If you have just installed your workstation, the password for the user root will not have been set. If you are going to be administrating this system, it is very important that you change this to some secret password that only you know. The next chapter *Initial configuration* shows you how to do this.

Logging in as guest

The following sections assume that you are going to log in as guest. User guest is provided so that people without usernames can use the system. You should log in as user guest if you wish to follow the examples in this chapter, and the examples in the *RISC iX User Guide*.

At the login: prompt, type guest, followed by the return key (for the rest of this chapter represented as ↵). For example:

```
login: guest ↵
```

The guest username has no password, so you're not prompted for a password when you log in.

If your log in is successful the following information is displayed:

```
Welcome to the RISC iX workstation  
Todays date is:  
Tue Jan 3 10:02:56 GMT 1989  
$
```

Of course, the date will be the date you logged in on. On the last line is a dollar sign (\$); this is the command prompt. This tells you that RISC iX is ready for you to type in a command.

Now that you have the command prompt on the screen, you can start to use the RISC iX operating system.

Problems logging in?

UNIX is case sensitive (ie it matters whether you type upper-case or lower-case letters), so make sure that you type your username in correctly. If you make a mistake, UNIX will ask you to log in again. For example:

```
login: Guest ↵    (the username should be all lower-case).  
Password: ↵        (asks for a password as it doesn't recognise Guest).  
Login incorrect  
login:
```

Some simple commands

Reading a file using `cat`

Assuming that you have successfully logged in, this section includes some simple commands to introduce you to the RISC iX operating system.

People usually create files using a text editor, but to read a file that has already been created and stored you can use the UNIX command `cat`.

The command `cat` is an abbreviation for *catenate* and *print*, so you can see why it is just known as `cat`!

Interacting with RISC iX

RISC iX is a terse operating system (as are other versions of UNIX). It does not say much and there are few friendly messages or easy to use menus and forms. This is often very suitable for experts, but can be difficult for beginners. A desktop provides a means of overcoming much of this. It can be used to start applications and for all the common file management tasks. However, many users, even if mainly relying on a desktop, will wish to learn to use the basics of the underlying operating system.

If you are not using the desktop, you will interact with one of the command interpreters – called shells. Those supplied with RISC iX are called the C shell (`csh`) and the Bourne shell (`sh`). The examples in this guide use the Bourne shell, but at this level they are very similar.

Many commands have short strange names that do not appear to reflect the work that they do. This is partly a historical throwback to the days when teletype machines were used as workstations, and partly because the original designers of UNIX liked short names that were easy to type.

Interacting with RISC iX (cont.)

To interact with a RISC iX shell:

1. Look for the shell's prompt -
\$ for Bourne shell
% for C shell
if logged in as root
2. Type a command along with any parameters (arguments)
3. Press <RETURN>

The command runs and may interact with you further. Look for the shell's prompt on completion of the command.

RISC iX generally does not tell you if a command has been successful. All you see is the prompt. If you have been unsuccessful, you will get an error message. There is a list of common error messages, encountered in the chapter *If something goes wrong*.

Often you may not recognise that a particular message is in fact an error message. Always check! Common forms of error message are:

Command not found	you have typed the command incorrectly
x: cannot do ...	(in running command x)
usage: x [-abc] pqr	you have typed an incorrect form of command x - the message shows (in an abbreviated fashion) the correct form.

Essential keys

If you make any mistakes or come across any problems in the following sections, these keys will usually help you to put matters right:

<DELETE>	Pressing this key causes the cursor to move one character to the left, deleting the character that was there. Use this key whenever you want to delete characters you have just typed; for example to correct a spelling mistake.
<RETURN>	Pressing this key causes the line you have just typed in to be processed by the computer. The computer performs the command you typed in, usually showing the result on the

Essential keys (*cont.*)

monitor screen. If you are within an application, this key may be used to move the cursor from the end of the current line to the start of the next line.

<SPACEBAR> Pressing this causes a space to be inserted in the line you are typing. In UNIX there should always be a space between the command you type in and the parameters of the command. If you put in the spaces as shown in the examples in this chapter you should have no problems. You don't need a space before pressing the **<RETURN>** key.

<CTRL-C> (This key combination is entered by holding down the **<CTRL>** key while pressing the **C** key.) This key combination attempts to stop whatever command the system is currently performing and returns to the command line. This command can leave behind the results of an unfinished task and therefore should only be used with caution.

Warning: Never press the **<RESET>** key on the rear of the keyboard (next to the mouse connector) while RISC iX is running. Pressing **<RESET>** will power off your workstation and possibly cause damage to your filesystem. If you want to switch off your workstation, use the close down procedure described later in this chapter.

For more information about the keyboard, read the chapter entitled *Configuring the terminal*.

To read the file `readme1`, type:

```
cat readme1 ↵ (the number 1, not the letter l or L)
```

The command is processed and the result displayed on the monitor:

```
This example file is called readme1
```

```
The main programming language used with RISC iX is  
the C language.
```

C is the main UNIX programming language. C is a portable, high-level language that also offers very low-level operations, making it flexible and efficient for both application and system programming. Almost all of RISC iX is written in C.

\$

What you have done is use the command `cat` to look at the text stored in the file `readme1`.

Try doing the same thing with the file `readme2`.

The `cat` command can read more than one file at a time. Try this:

```
cat readme1 readme2 ↵
```

As you can see, this reads both files and displays their contents on the screen. One of the disadvantages of this is that the first file disappears off the top of the screen so that you can't read it. The next command solves this problem.

Reading a file using `more`

If you have a large file that you want to display, it is better to use the command `more`. `more` automatically stops at each full screen and prompts you to tell you that there is more of the file waiting to be seen; that's why it's called `more`. Type in the following command:

```
more glossary ↵
```

As you see, the screen stops scrolling after displaying one screenful, and displays the terse comment `more` and a percentage. The percentage indicates how much of the file you have read. To see the next screen just press the spacebar; the next screen is displayed and the `more` prompt is displayed again.

`more` has many other options, if you want to see a display of all the options you can use press `h` from the `more` prompt. One of the most useful is the quit option, it simply exits the program without you having to look through the entire file. To quit just press `q`.

Listing files using `ls`

In the previous examples you have displayed the contents of several files on your monitor screen. This command lists the names of these files. The command `ls` (`ls` stands for list) displays all of the files stored in your current directory. Type:

```
ls ↵
editing-files  metacharacter-usage  readme2
glossary       readm1                 witticisms
```

This gives you a list of all the files in the home directory of user `guest`. The actual number of files may have changed since other users may have stored practice files here.

Displaying a manual page

Explanations about how to use UNIX commands are contained in the *RISC iX User Guide*. Additionally, many of the manual pages are stored on your workstation can be referenced using the `man` (`man` is short for manual) command. For example, to look at the manual page about the command `cat`, type:

```
man cat ↵
```

If the information takes up more than one screen, pressing the `<spacebar>` displays more information, pressing `q` exits the program.

The information in the manual pages is intended for the experienced user of UNIX. If you want to find out more about the `man` command, try typing:

```
man man ↵
```

Note: Your supplier may have configured your workstation so that the manual pages are not available; contact your supplier for more details.

Where to learn about RISC iX

The companion guide to this one, the *RISC iX User Guide*, is a complete introduction to RISC iX. This is the place to start if you have never used a UNIX system before. In this guide, the *Bibliography* at the end of the guide lists other good sources of information.

Creating usernames and passwords for new users

Use the command `inituser` to set yourself a username and password. Once you have done this you can log in and use the system in your own right.

While using this command you have to type in three names:

- 1 Your actual name (first name and surname).

- 2 Your username (the name computer users will know you by).
- 3 Your password (your secret key to allow you to use the computer).

Additionally, you have to specify which shell environment you wish to use. If you don't know anything about shells, use the one normally used at your site, or the one described in any textbook you are following. This guide illustrates the Bourne shell, although the C shell at this level is very similar.

- 1 Type:

```
inituser ↵
```

The following screen is displayed. Type in your first name and surname, for example, Steve Smith:

```
Please type your full name.  
Full name: Steve Smith ↵
```

- 2 You are prompted for your username. Type in the name you want to log onto the system with. It is also the name other users will use to communicate with you. It should be one word with no spaces or gaps and consist only of lower-case letters, (consult your Network Manager for local practice on naming conventions). For example, ssmith:

```
Please type in your user name.  
User name: ssmith ↵
```

If you choose a username that has already been chosen by somebody else, you will see the following message:

```
Sorry, but the name you have given clashes with an  
existing user name.  
Please try again.  
User name:
```

Try typing in a modified version of your username. When you have successfully entered your username the next step is to enter your password.

- 3 The following screen is displayed, prompting you for your password. Type in your password; it should have at least six characters and be different from your username. For example, sunshine:

You now need to enter a Password for your User name.
Your password should be something you can remember,
and which others are unlikely to guess.

Initial password:**sunshine** ↵

- 4 Type in the password again to confirm that it is correct:

Confirm password: **sunshine** ↵

One way to derive a fairly secure password that you can still remember easily is to combine two or more short words that are meaningful to you into one long word, with parts of the word in upper case and other parts in lower case. You should try to also include at least one number or special character as well.

- 5 The final screen is displayed, prompting you for a shell to use. If you don't know anything about shells, use the one normally used at your site, or the one described in any textbook you are following. This guide illustrates the Bourne shell although the C shell at this level is very similar.

Which login shell would you like to use?

enter 'c' for the cshell

'b' for the bourne shell

Shell required:**b** ↵

If you've done everything correctly you will see the message:

New user sucessfully created.

You have now created a new username and password. To start using this username, log out and then log in using your new username and password. You don't have to restart the workstation to do this, just log in with your new username at the login: prompt.

After finishing your work, it is important to end your current session by logging out. This stops other people sitting at your workstation and using your username to gain access to the workstation.

To finish your work session and log out, type:

exit ↵

(various system messages are displayed)

login:

Logging out

Closing down

The `login:` prompt shows that the system has successfully logged you out and is ready for the next user to log in. There is no need to restart the system before logging in again.

Note: You can also log out by pressing `<CTRL-D>`.

The workstation is capable of running continuously and does not need to be turned off unless you are not going use it for a lengthy period (several days).

If your workstation is shared with other people, you should not turn off your system without consulting local procedures.

If you are a stand-alone user you should use the following procedure to turn off the workstation:

- 1 Finish working and save any files you were working on to disc.
- 2 Log out of RISC iX.
- 3 Log in using the username `halt`. There should be no password. If there is a password and you do not know it, you are not authorised to shut down this system; contact your System Administrator.

The system takes about 30 seconds to close down. It confirms that it has been shut down by displaying the message:

```
Syncing disks... done
halted
```

You can now turn the workstation off.

Note: Your system may be configured to close down to the RISC OS system; if so, you can switch off your workstation after the `star(*)` prompt (or the desktop) is displayed. For more information read the chapter entitled *Configuring the start-up procedure*.

- 4 Switch the system off by turning the power switch on the back of the workstation unit to `OFF(0)`, and the power switch on the monitor to `OFF`.

Refer to the beginning of this chapter to find out how to turn the workstation on again.

Note: If you have a System Administrator, this command may have been disabled so that only the System Administrator can close down the workstation.

Initial configuration

Introduction

This chapter outlines the procedures you should follow directly after you have installed and set up the workstation. After setting these configuration parameters your system will be fully operational. If you are using a workstation that has already been set up correctly by your supplier or your System Administrator, you won't need to perform any of the procedures described in this chapter; skip to the next chapter *Using the terminal*.

This chapter assumes that you or your supplier have installed, and that you have switched on, your workstation. If you have never used a UNIX system before, it also assumes that you have worked through the practice sessions in the previous chapter.

The information in this chapter is in the following sections:

- setting the date and time
- setting the password for the superuser 'root'
- performing a level zero 'dump' backup.

Setting the date and time

If you have just installed your system, you may find that the date and time, displayed when you type in the command `date`, are incorrect. It is important that the date and time are correct, because UNIX uses the date and time as a marker point for backups and communication with other systems.

- 1 Check the date and time by typing:

```
date ↵
```

If the date and time are correct you can skip the rest of this section.

- 2 If you are logged in, log out by typing `exit`.
- 3 Log in as user `root`.

If you have just installed your system, `root` will not have a password. If `root` does have a password, type it in. If you do not know the `root` password

then you should not be performing this command; contact your System Administrator for advice.

4 Type `date` followed by a space and then a 10 (or twelve) digit figure representing the date and time, in the following format:

date *yyymmddhhmmss* ↵

- *yy* represents the last two digits of the year
- *mm* is the number of the month
- *dd* is the number of the day in the month
- *hh* is the hour number (24 hour system)
- *mm* is the number of minutes
- *ss* is the number of seconds (this parameter is optional).

For example:

date 8806131627 ↵

sets the date to June 13 1988, 4:27 pm.

If you made a mistake setting the date and time, you can always correct it by issuing the command again. Don't worry about whether you are on standard or daylight saving time as this is automatically changed by the computer.

The system arrives configured for Greenwich Mean Time (GMT). If you are using this machine in a different timezone, you will need to change the timezone setting; consult the *RISC iX System Administrator's Manual* for more information.

This section explains how to set a password for `root`. Only perform this command if you are (or will be) the System Administrator for this workstation. Once you have set the password you should keep it secret. It is important that you prevent inexperienced or malicious users from accessing the system as `root`. If somebody logs in as `root`, they automatically have superuser privileges. This gives them access to every file and command available, and it is therefore very dangerous to leave this username without a password.

Note: As explained in the previous chapter, `root` should only be used for system administration purposes. In everyday work sessions, you should log in using your own username only. **Never use `root` for your normal work session.**

Setting the password for the superuser 'root'

Only follow this procedure if `root` does not have a password set or if you wish to change the password that `root` is currently assigned.

- 1 If you are logged in, log out by typing `exit`.
- 2 Log in as user `root`.

If you have just installed your system, `root` will not have a password. If `root` does have a password, type it in. If you do not know the `root` password then you should not be performing this command; contact your System Administrator for advice.

The `root` password is set with the `passwd` (short for password) command.

- 3 Type the command:

```
passwd ↵
```

The following text is displayed:

```
Changing password for root
New password:
```

- 4 Type in the password that you want to use for `root`.

Choose a password that you can remember easily, but that others can't easily guess. The best passwords are those that mean something to you but which are meaningless to others. It should be at least six characters long and should consist of both upper and lower-case letters and/or numbers.

- 5 For verification you are prompted to type your password again:

```
Retype new password:
```

Type in the new password again.

`Root` is given the new password and you are returned to the command prompt.

However, if you mistyped the password you will receive the message:

```
Mismatch- password unchanged
```

and be returned to the command prompt. Try again from the beginning.

- 6 Log out of `root` (see the section entitled *Logging out* in the previous chapter), and then log in again as `guest` or as your own username.

Performing a level zero 'dump' backup

It is recommended that at this stage you perform a level zero 'dump' backup of your filesystem. This is a routine precautionary measure; it ensures that you have a backup copy of the original file structure to fall back on in the unlikely event that your filesystem is totally corrupted.

The *RISC iX System Administrator's Manual* describes how to backup your filesystem. However, if you are not experienced in using a UNIX system, you should ask your System Administrator or a UNIX expert to perform the backup.

Using the terminal

Introduction

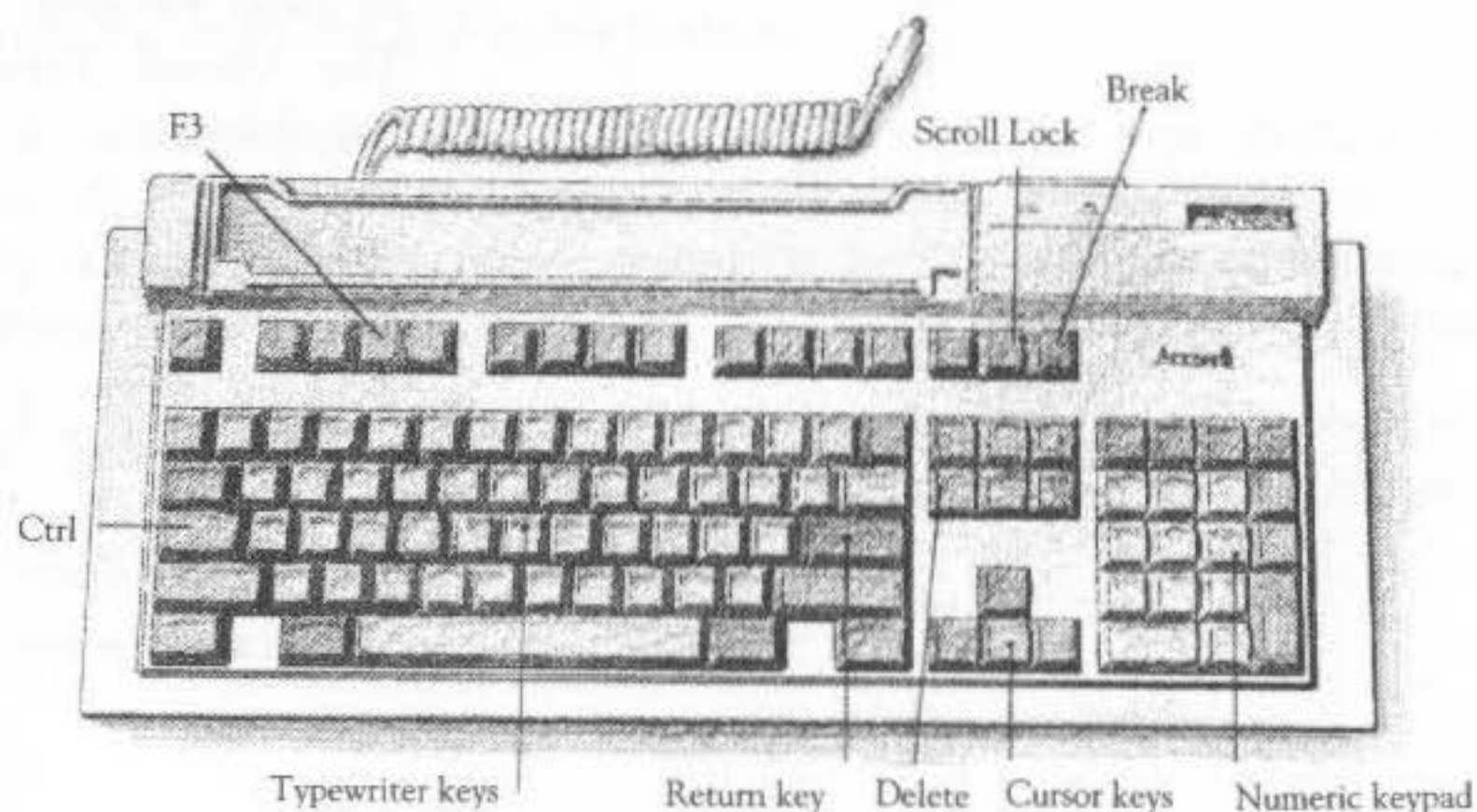
This chapter details the different facets of using the terminal (ie the keyboard, mouse and display screen). After reading this chapter you will be able to customise your terminal so that it operates the way you want it to. You can be logged in with any username to follow this chapter.

The chapter covers these main areas:

- the keyboard – gives the special functions of important RISC iX keys
- the mouse – outlines its operation and how it is used with applications
- the Virtual Terminal Interface (VTI) – explains how to use and swap between the four pseudo or virtual terminals
- the terminal set-up screen – shows you how to customise the behaviour of each virtual terminal.

The keyboard

The keyboard used with your workstation is much like any other computer keyboard. This section does not attempt to teach you about the individual keys on the keyboard; it assumes that you have used a computer keyboard before. Instead it tells you about the keys and key-sequences that have specific meanings when used within the RISC iX operating system.



Keys with special
RISC iX meanings

<RETURN>	Tells the system that the command line you have typed should be interpreted and executed.
<SPACEBAR>	Adds a space (a blank character) into the line you are typing.
<TAB>	Usually adds eight spaces to the command line instead of one. This can be changed to a different value, and the key behaves differently when you're within an application.
<DELETE>	Allows you to move the cursor one space to the left, so erasing the character to the left.
<←→>	(also known as backspace). Can be configured to behave as a backspace or to behave in the same way as the <DELETE> key. Many people prefer it to function as the <DELETE> key. Refer to the section about the terminal set-up screen later in this chapter, to find out how to change the meaning of this key.
<SCROLL LOCK>	When pressed, stops the display from scrolling off the top of the display screen; pressing the key again resumes scrolling.
<COPY>	Can be configured to copy characters from one line to another. Refer to the section about the terminal set-up screen later in this chapter, to find out more about this key.
<F3>	Displays the terminal set-up screen. This screen allows you to change the characteristics of your terminal. This is explained later on in this chapter.
<BREAK>	Activates the Virtual Terminal Interface. This allows you to swap between up to four virtual or pseudo terminals. The Virtual Terminal Interface is discussed later on in this chapter.

Key combinations with
special RISC iX meanings

<CTRL-D>	As in other implementations of UNIX, this key combination signifies an end of file marker when you are working within a file. Unfortunately, when you are not working within a file this command logs you off the system. This can be a potential problem for users.
<CTRL-U>	This erases the entire command line.
<CTRL-W>	This erases the last word on the command line.

<CTRL-C>	This interrupts many programs and shell scripts and returns you to the command prompt.
<CTRL-Z>	This suspends (temporarily stops) a program running. If you do this and then try to log out you will see the error message <code>There are stopped jobs</code> . Suspended programs can be restarted by typing the command <code>fg</code> . (This command is only applicable to the C shell).
<CTRL-S>	This temporarily halts the display of words on the screen. To start the scrolling again, press <CTRL-Q>.

Unused keys

The following keys are not used with the RISC iX operating system command line. They may, however, be used by applications that have been deliberately written to take advantage of them:

<PRINT>
 <INSERT>
 <HOME>
 <PAGE UP>
 <PAGE DOWN>

and /, *, and # on the numeric keypad.

Other considerations

The system has been designed to emulate a DEC VT220 terminal and therefore applications that use this terminal will use the same keyboard keys. In particular the function keys and the numeric keypad keys are often used by applications.

You can also tailor the keyboard to have different characteristics from the defaults. There is a full list of the settings available later on in this chapter.

The functions of keyboard keys may also change when you are using applications running under the X Window System.

The mouse

The mouse is usually used in conjunction with 'windows' type applications running under the X Window System. Learning to use the mouse takes very little time; you will soon become familiar with it while learning to use windowing applications.

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.



The mouse should be held with the cable pointing away from you.

The mouse works in conjunction with the pointer (cursor) on the screen, moving it to various parts of the screen. Moving the mouse to the right and left moves the pointer on the screen to the right and left as well. Moving the mouse up and down moves the pointer between the top and bottom of the screen. Use the mouse with a soft touch and press the mouse buttons gently; try not to move the mouse while pressing the button.

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 it.

The mouse has three buttons. The functions they perform depend on the application you are using. Full details on how to use the mouse will be included with the applications you are using.

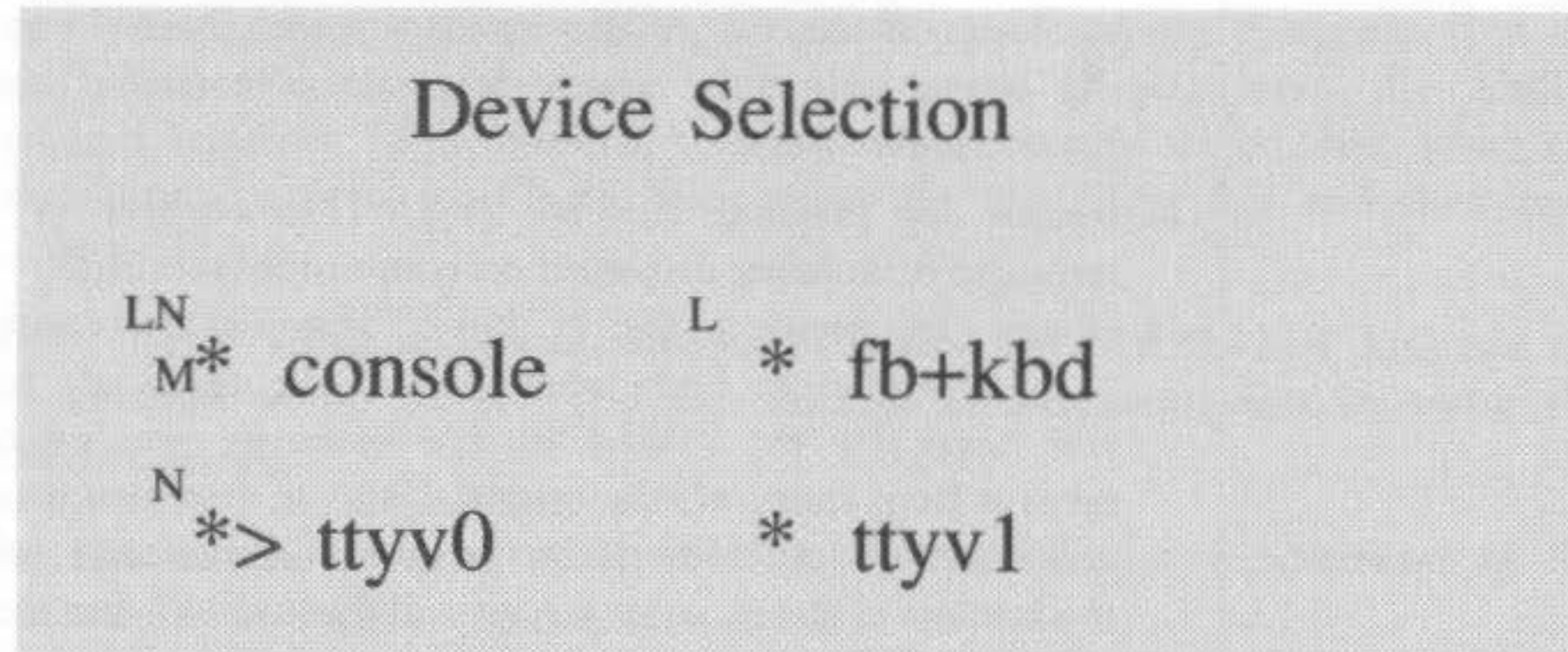
The virtual terminal facility gives you access to the four different virtual terminals available on the workstation. Think of it as if you had four terminals on your desk and that you could log in to any of them or all of them at the same time. If you log in to all the virtual terminals, you can have four separate work sessions at the same time. This is a useful feature, particularly for the more advanced user and if you are not using a window system.

When you press the <BREAK> key, the Device Selection menu is displayed. Use the cursor (arrow) keys to move the highlighted box over the virtual terminal you wish to use. Press the <BREAK> key again to start using the terminal you have chosen. With each virtual terminal you have to log in with a username and password. If you wish you can be logged in with a different username on each terminal.

The Virtual Terminal Interface (VTI)

Swapping between terminal screens

A typical Device Selection menu looks like this:



The virtual terminal devices

Here is a description of the virtual terminals:

- The **console** is a special terminal where all system and network messages are displayed. This terminal is usually used for system administration and for users logging in as user `root`. This is the terminal that is first displayed on your screen at power on (unless the X Window System windowing system is configured to start up and run automatically). So far you have used this terminal as `guest`.
- The terminal **ttyv0** is a 'standard' terminal that you would use for everyday command line work. Standard RISC iX applications can be run from this terminal.
- The terminal **ttyv1** is a second 'standard' terminal that you would also use for everyday work. Standard RISC iX applications can also be run from this terminal.
- The terminal **fb+kbd** is a special terminal used only for running the X Window System. RISC iX applications that support the X Window System are run from this virtual terminal.

Display parameters

Each virtual terminal has several display parameters that can be set to your personal requirements. To set these, first display the Device Selection menu by pressing the `<BREAK>` key, then, with the cursor keys, move the cursor highlight over the terminal you wish to set parameters for. The parameters selected are displayed next to the terminal name. When you have finished changing the parameters, press the `<BREAK>` key again to start using the selected terminal.

L (toggle by pressing the `<SCROLL LOCK>` key). This stops output from scrolling off the top of the monitor screen before you have read it. To read the output enter the appropriate virtual terminal and press the `<SCROLL LOCK>` key.

M (toggle by pressing the `M` key). This enables or disables system status messages from being displayed on your virtual terminal.

N (toggle by pressing the `N` key). This option causes the borders of the monitor screen to flash when one of the terminals has output pending that you have not yet looked at. For example, you might run a program that takes a long time on one terminal and in the meantime carry on working on another terminal. When the program finishes and your output is displayed, the borders of the monitor screen will flash to indicate this to you.

The following symbols are also displayed on the Device Selection menu:

* The star symbol indicates that the virtual terminal is active. This means that it is ready for use.

S The S symbol indicates that a message from the RISC iX operating system has been received but not yet read.

> The > symbol indicates that the virtual terminal contains output that you have not yet looked at.

The X Window System always runs in the virtual terminal `fb+kbd`. Due to the nature of using a bitmapped interface the only feature of the interface that can be set is **L** (toggled by pressing the `<SCROLL LOCK>` key). Furthermore, when the windowing system is activated, the other virtual terminals are limited to a display size of 80 by 20 characters, regardless of the size of the monitor.

For experts only: You can disable the window system by editing the `/etc/ttys` file and commenting out the line that references `ttyvf`. If the windowing system is enabled it will be this virtual terminal that is automatically displayed on power up.

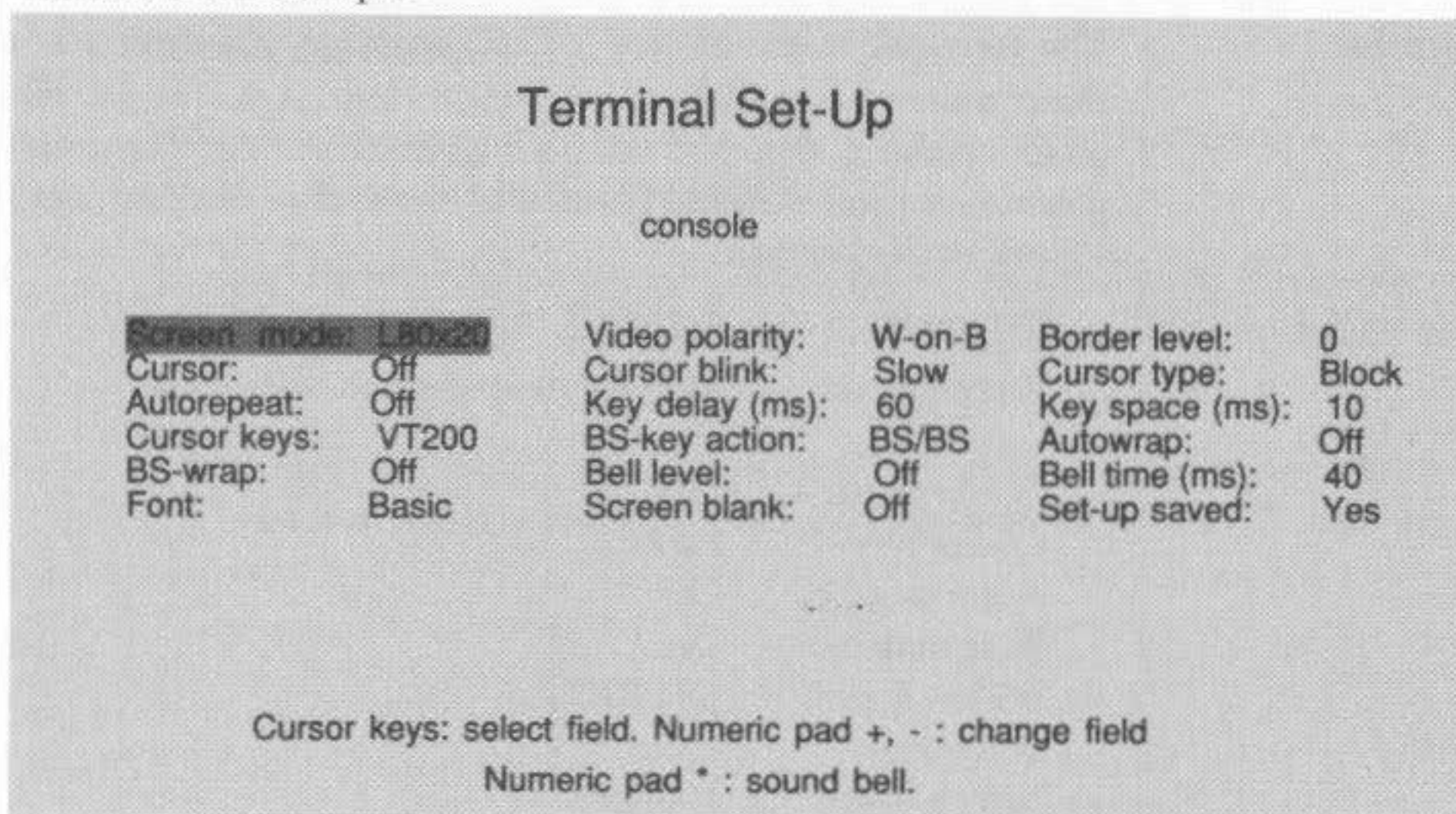
Using the windowing system

The terminal set-up screen

To display the terminal set-up screen, press the <F3> key (located on the top row of the keyboard). The existing contents of the screen disappear (but are saved) and the terminal set-up screen appears. If you have the Virtual Terminal Interface (VTI) Device Selection menu on the screen, first select the terminal you wish to configure, then press the <BREAK> key and then press the <F3> key.

Note: The X Window System running in virtual terminal **fb+kbd** does not use the terminal set-up screen. You can change similar parameters by using the window manager.

The screen consists of a set of fields, each controlling one parameter of the terminal. For example:



Pressing the <F3> key again will return to the original screen display, so that you can observe the effect of any changes. If you then press <F3> again, the set-up screen will reappear as you left it. You can switch between the set-up screen and the main display as often as you wish, until you are satisfied with your set-up.

Selecting a parameter

When the set-up screen is visible, use the cursor keys to move the highlight over the selected field; the field is displayed in inverse video. For example, in the illustration, the **Screen mode** field is currently selected.

Changing a parameter

Pressing the keys marked + and - on the numeric keypad changes the value of the selected field. Some fields (such as key delay) have values which are shown as numbers. For these, pressing the + key will increase the value, pressing the - key will decrease it. If you press the key after the limit has been reached, the value will start again at the other end of the range.

Other fields have a value which is shown as on or off. In this case pressing either + or - will toggle the value between the alternative conditions.

The remaining fields (apart from the 'Set-up saved' field, see below) display their values as names or symbols, and the + and - keys cycle through the range of values, in forward or reverse order.

Typical parameter settings

The terminal is set up as a VT220 terminal. However you may want to change these values to a different setting. Here is a list of those parameters most often changed, together with a suggested setting. For a full explanation of the parameters and settings available read the chapter entitled *Configuring the Video Console Interface*.

Parameter	Setting
Screen mode	Monitor dependent
Cursor	On
Cursor blink	Fast
Cursor type	Line
Autorepeat	On
Autowrap	On
BS-key action	DEL/DEL
Bell level	Quiet
Screen blank	10 min
Set-up saved	Yes

The last parameter, Set-up saved, will preserve any changes you make, even after you switch off the system. If you don't wish to save your parameters, leave this parameter set to No.

Configuring the start-up procedure

Introduction

This chapter takes you through the alternative start-up procedures that your workstation can be configured with by your supplier.

If you are happy with the way that your system starts up then there is no need to read this chapter.

The default RISC iX start-up procedure

The default start-up procedure has already been described at the beginning of the chapter entitled *Getting Started*.

Starting RISC iX from the RISC OS desktop

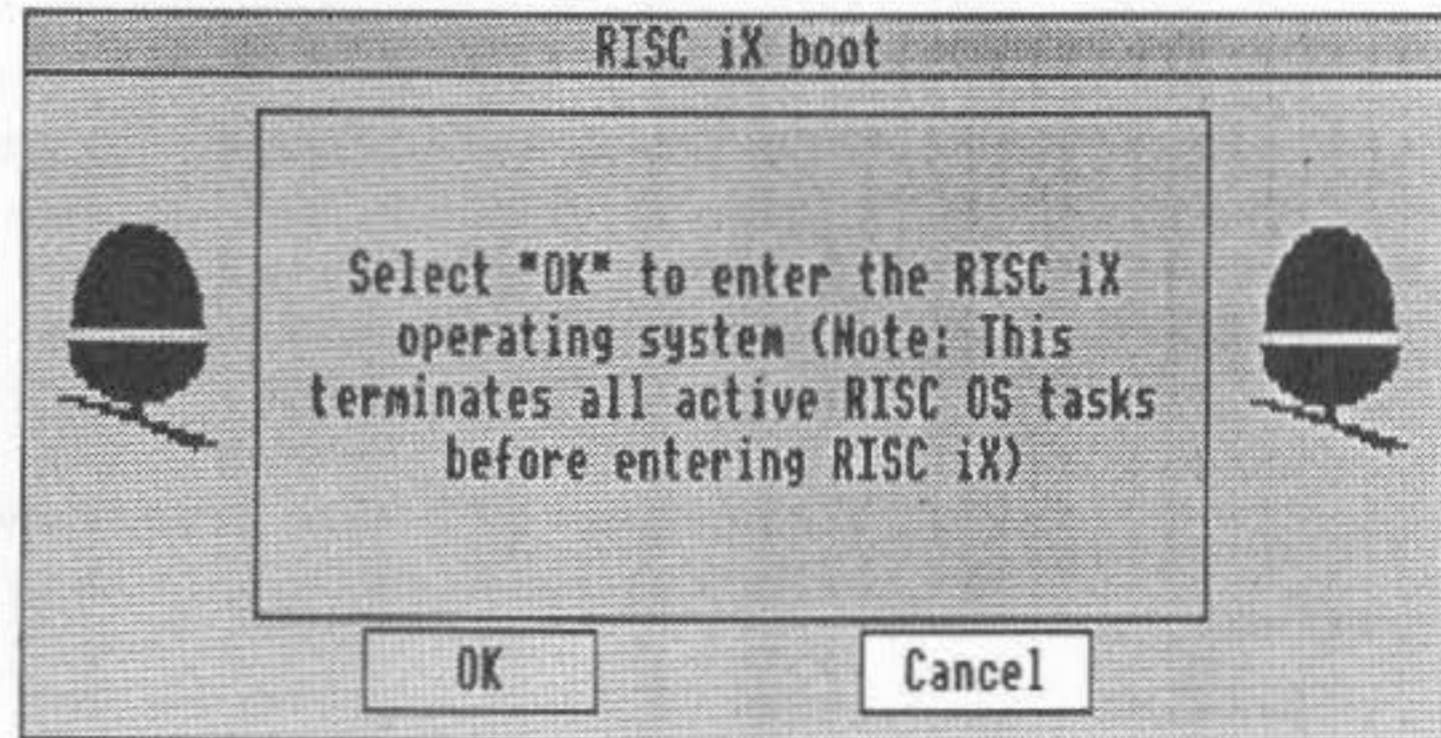
If your System Administrator or supplier has configured your system so that the desktop is first displayed on start-up, follow this procedure to start-up RISC iX:

- 1 Switch on your workstation and monitor. The start-up begins and the monitor displays the RISC OS desktop with the RISC iX icon on the icon bar.



- 2 Use the mouse to click on the RISC iX icon with the left mouse button (select).

A dialog box is displayed saying:



- 3 Use the mouse to click on the OK with the left mouse button (select). This starts RISC iX automatically.
- 4 RISC iX starts and you see these messages displayed on your screen:

```
RISC iX Release 1.0
real mem = 4194304
avail mem = 3014656
32 buffers (256 Kbytes)
st0: internal controller
```

- 5 When the system has finished start-up, the prompt `login:` is displayed on the screen, RISC iX is now operating correctly, and you can log in. The start-up procedure takes several minutes.

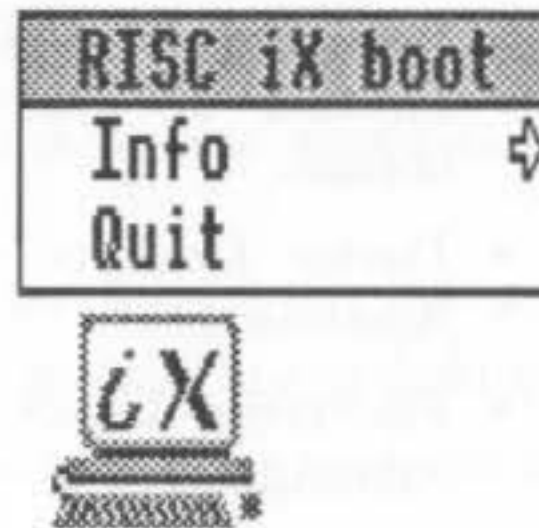
```
Multi-user system started - login on other terminals

Acorn RISC iX Release 1.0
login:
```

If you don't know how to log in, go back and read the chapter entitled *Getting Started*.

Options available from the desktop

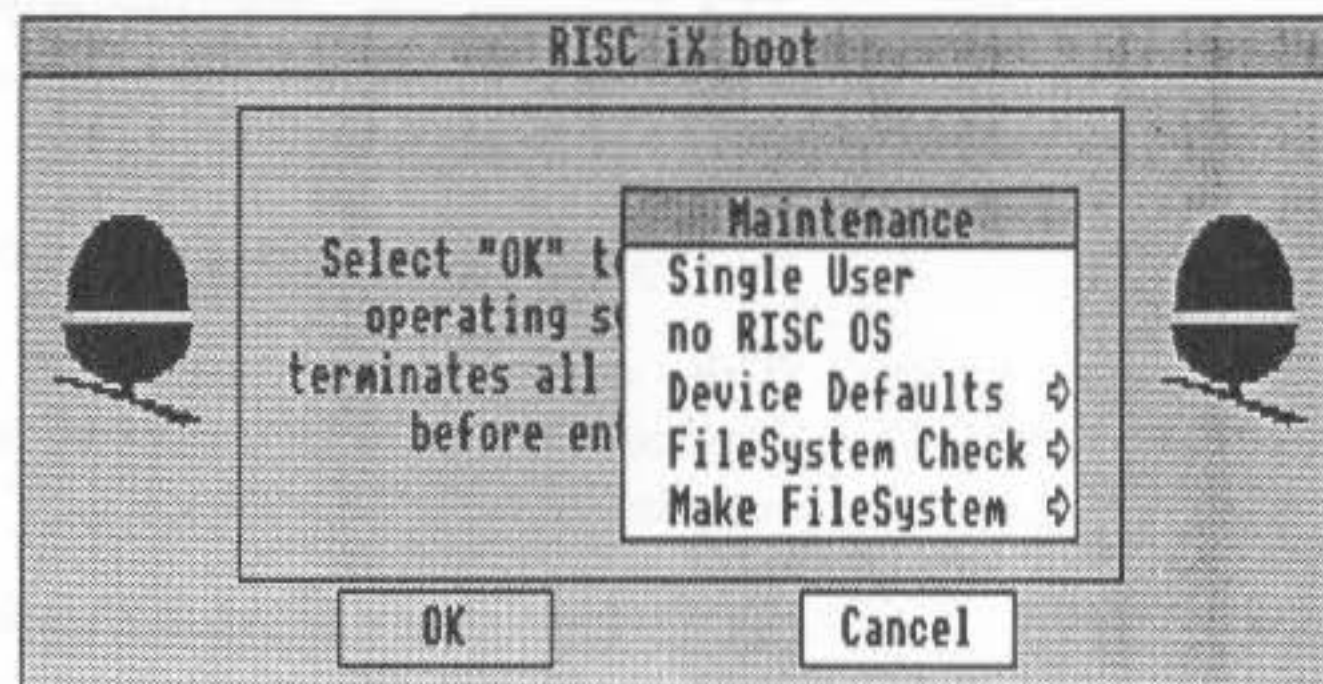
To display more information about the RISC iX icon, position the pointer over the icon and press the middle mouse button. The following menu is then displayed:



- **Info** – This gives you standard information about the RISC iX bootstrap from RISC OS.
- **Quit** – Clicking on this menu item exits the RISC iX start-up application and removes it from memory.

The next section describes a number of specialist options for system administration. Your System Administrator may have removed these options from your system.

With the RISC iX dialogue box displayed, position the pointer over the middle of the box and press the middle mouse button. The maintenance menu is then displayed:



- **Single User** – Clicking on this starts RISC iX. The start-up procedure stops

when 'single-user' mode is achieved. You will then be logged on as root, and can perform system maintenance tasks. To go 'multi-user', type <CTRL-D>.

- **no RISC OS** – When this is selected (a tick mark is shown), RISC OS is bypassed on start-up. The default RISC iX start-up procedure starts as normal.
- **Device Defaults** – This option is for specialist use only by the System Administrator.
- **FileSystem Check** – This option is for specialist use only by the System Administrator.
- **Make FileSystem** – This option is for specialist use only by the System Administrator.

Starting RISC iX from the RISC OS command line

If you want to start RISC iX from the RISC OS command line, type:

```
*boot
```

This will start up RISC iX automatically.

Error messages

There are two error messages that you may see if errors occur in the start-up procedure.

```
RiscixFS Failed to boot last time
```

This error message is displayed at initial start-up if, for any reason, RISC iX did not properly start up last time the workstation was switched on. This is not a serious message and should be ignored unless it is continually displayed.

The message may stop the start-up procedure and display the * prompt. If this happens, restart the system again; the start-up procedure will now proceed normally.

```
RiscixFS: failed to mount ROOT filesystem
```

This error message generally means that one or more of the CMOS parameter memory settings are wrong. Contact your System Administrator or supplier for more information.

Further information

To find out more about how the start-up procedure operates, and in particular how to change the start-up parameters, read the *RISC iX System Administrator's Manual*.

The close down procedure

Alternative close down procedures

The standard close down procedure is described at the end of the chapter entitled *Getting started*.

There are alternative ways of closing down your workstation; however you have to be logged in as `root` to use these commands:

- **reboot** – this closes down the workstation and then automatically starts it up again
- **halt -RISCOS** – this closes down the workstation and explicitly exits you back to the RISC OS command line or desktop
- **shutdown** – this closes down the workstation to single-user mode
- **shutdown -h** – this closes down the workstation in the same way as `halt`, but it allows you to specify the time of the close down in advance and to send other users a warning message.

For more information about close down procedures, read the `halt(8)` and `shutdown(8)` manual pages.

Part 3 - System Reference

Part 1 - Systemic Review

1.1

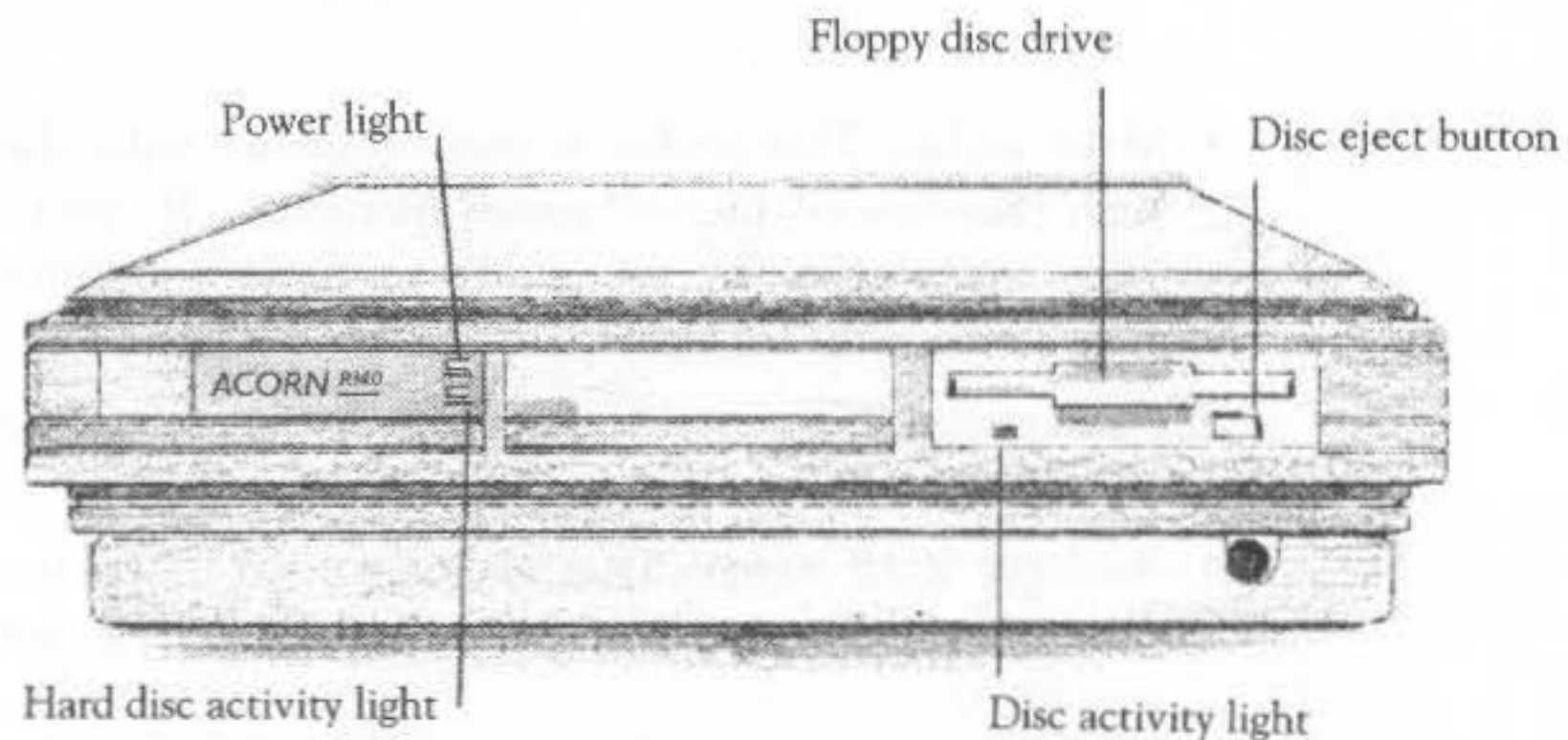
System overview

System unit description

Front of the system unit

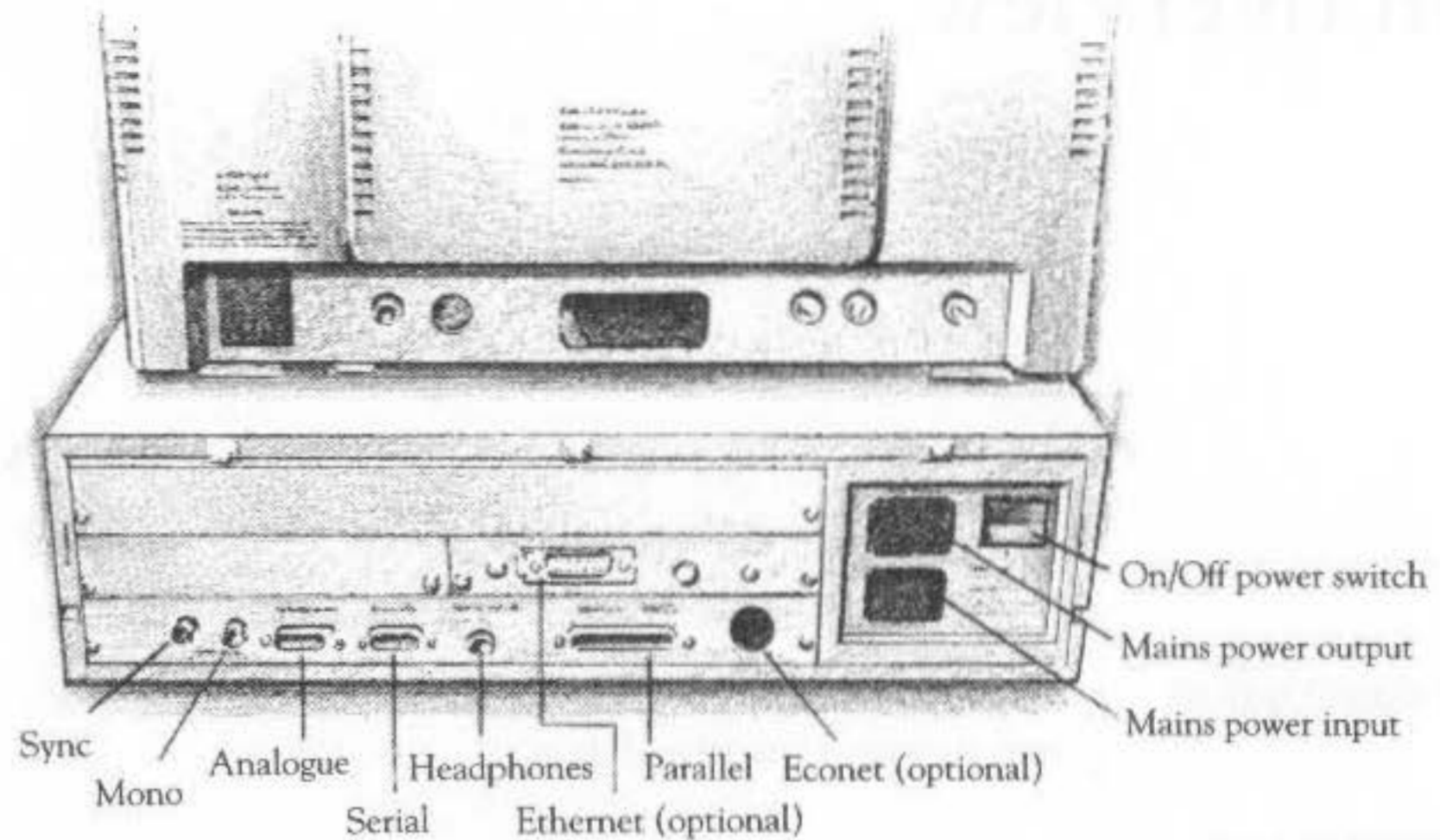
This chapter shows you in detail where each of the warning lights, controls and connectors are located on the system unit.

The system unit is the 'heart' of your workstation, containing the processor, the memory and the disc drives.



- *On/Off indicator light*: This illuminates when the workstation is on.
- *Hard disc drive activity light*: This illuminates when the hard disc is being accessed.
- *3.5" floppy disc drive activity light*: This illuminates when the disc is being accessed.
- *3.5" floppy disc drive*: The 3.5" disc drive uses standard double sided double density 3.5" discs, with a formatted capacity of 800k.
- *Disc eject button*: Pressing the disc eject button partially ejects the 3.5" disc so that it can be removed from the drive.
- *Keyboard connector socket*: The cable from the keyboard connects into this socket.

Back of the system unit



- *Mono socket:* This socket is used, together with the Sync socket, to connect high resolution monochrome monitors. If your supplier has configured your workstation to use a low-resolution monitor, this socket is used to supply the complete signal.
- *Sync socket:* This socket is used to supply the synchronisation pulses for high-resolution monochrome monitors.
- *Analogue RGB socket:* This socket is used to connect an analogue (colour or grey scale) monitor to the system unit (it is not suitable for TTL RGB monitors).
- *Serial port socket:* You can use the serial port to attach a serial device such as a serial printer, modem or dumb terminal.
- *Parallel printer socket:* This socket is used to connect the workstation to a parallel printer.
- *The On/Off power switch:* This is a rocker switch. When the bottom of the switch is pressed the workstation is turned on and when the top of the switch is pressed the workstation is turned off.
Do not turn your workstation off except by following the Close down procedure, see the chapter *Getting Started* for more information.
- *Mains power output:* The mains cable of most monitors can be attached to this outlet. See the instructions accompanying your monitor for information.
- *Mains power input:* This connects the workstation's power lead to the mains power socket.

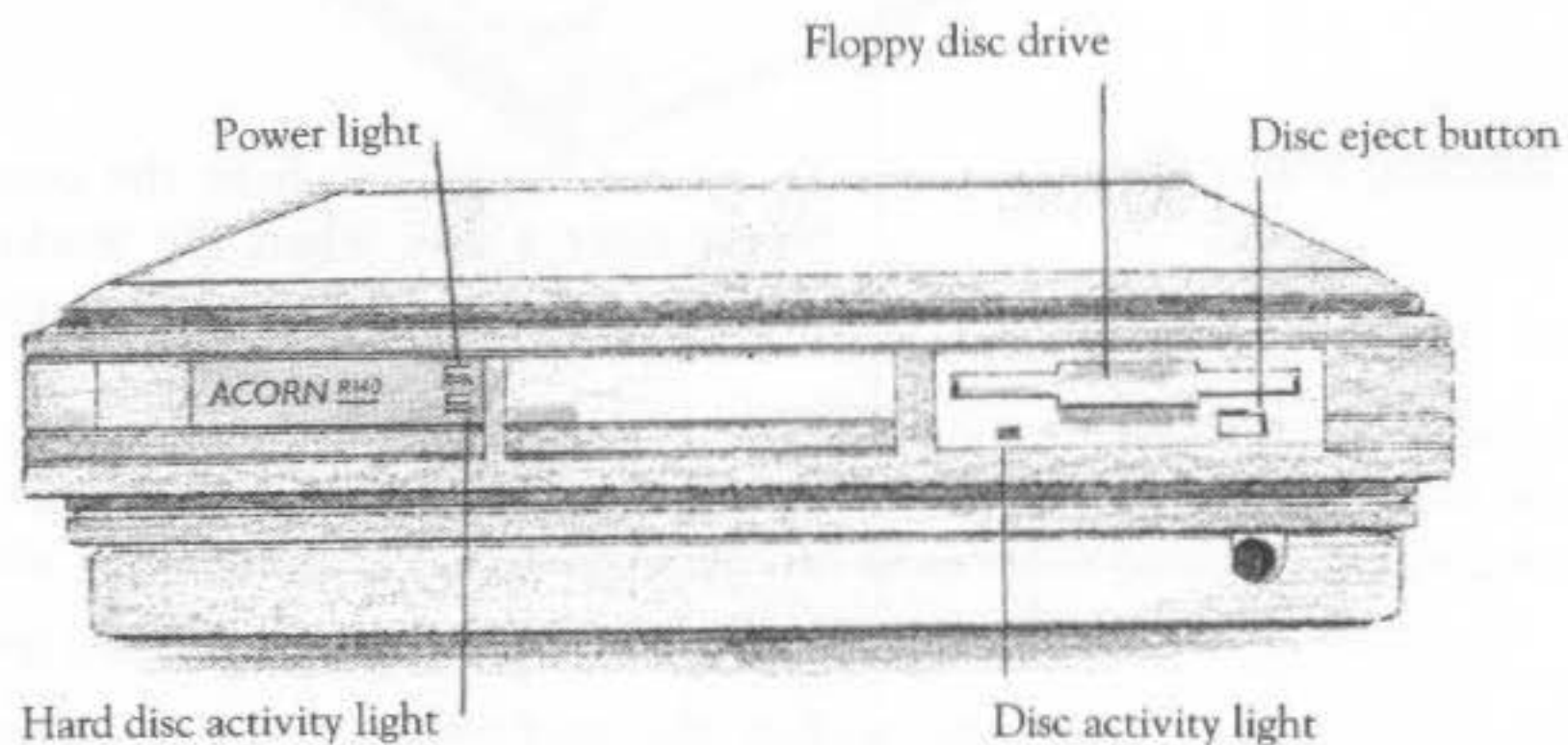
- *Econet socket (optional)*: If you have this option you can use the networking system Econet. If Econet is not fitted, this socket will be blanked out.
- *Headphones socket*: This connects to a pair of headphones or to an external amplifier. The socket connects to a lead with a 3.5mm stereo jack plug. This option is mainly for use with the RISC OS operating system.
- *Expansion card blank panel*: The blank panel covers four expansion card bus sockets, capable of holding four single or two double expansion cards. Your workstation may already have had some expansion cards fitted by your supplier.
- *Ethernet/Thin Ethernet expansion card (optional)*: This expansion card allows your workstation to become part of an Ethernet network of computers.

Using 3.5" floppy discs

Using 3.5" discs

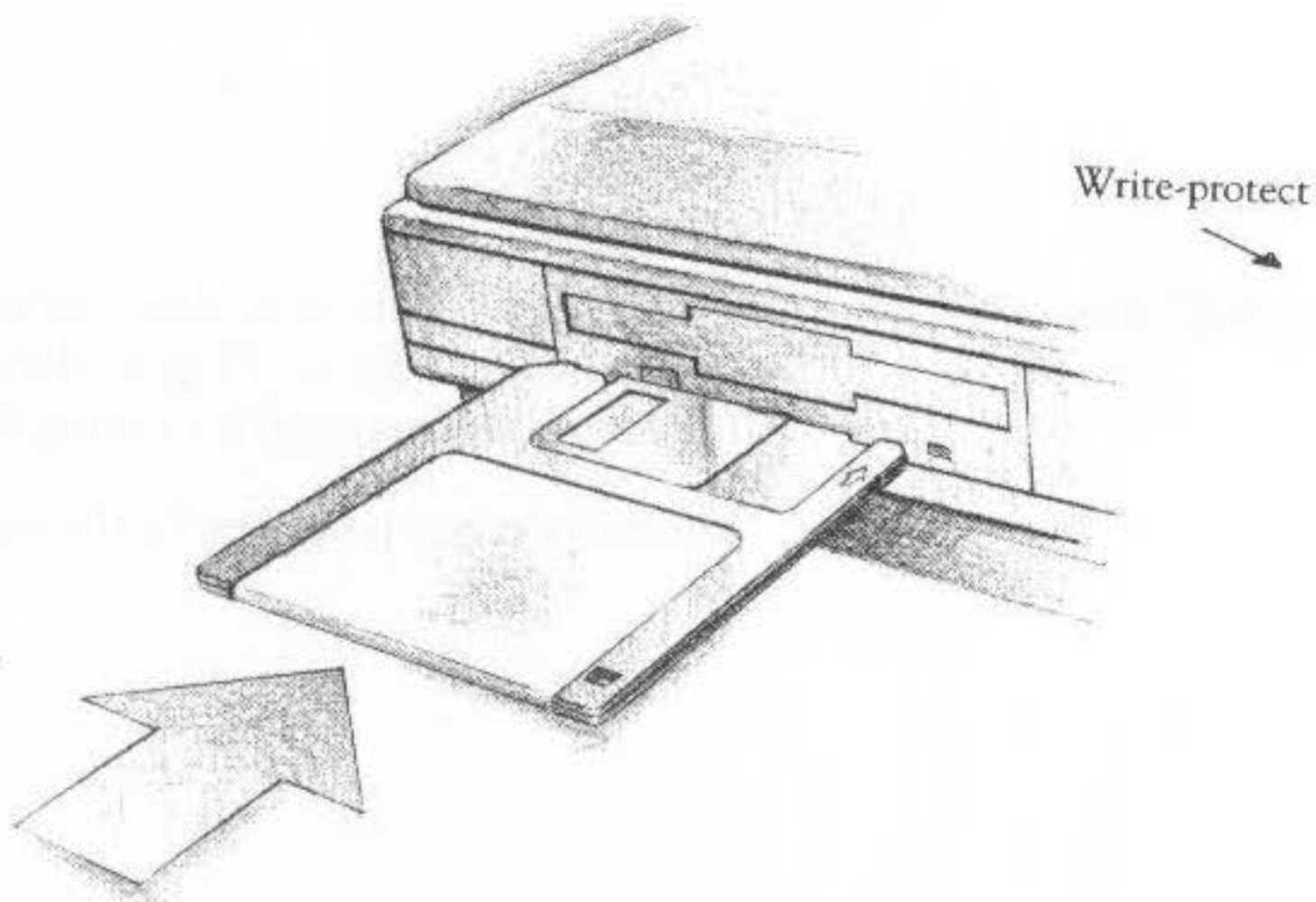
This chapter tells you about using and looking after 3.5" discs, often referred to as floppy discs. Floppy discs are used for transferring files and data between computers and for storing files and backups.

Information and programs for the computer are usually supplied on 3.5" discs.



Inserting 3.5" discs

The floppy disc drive is the slot to the right of the computer unit. Insert discs like this, with the label uppermost. The disc clicks into place when it is fully inserted.

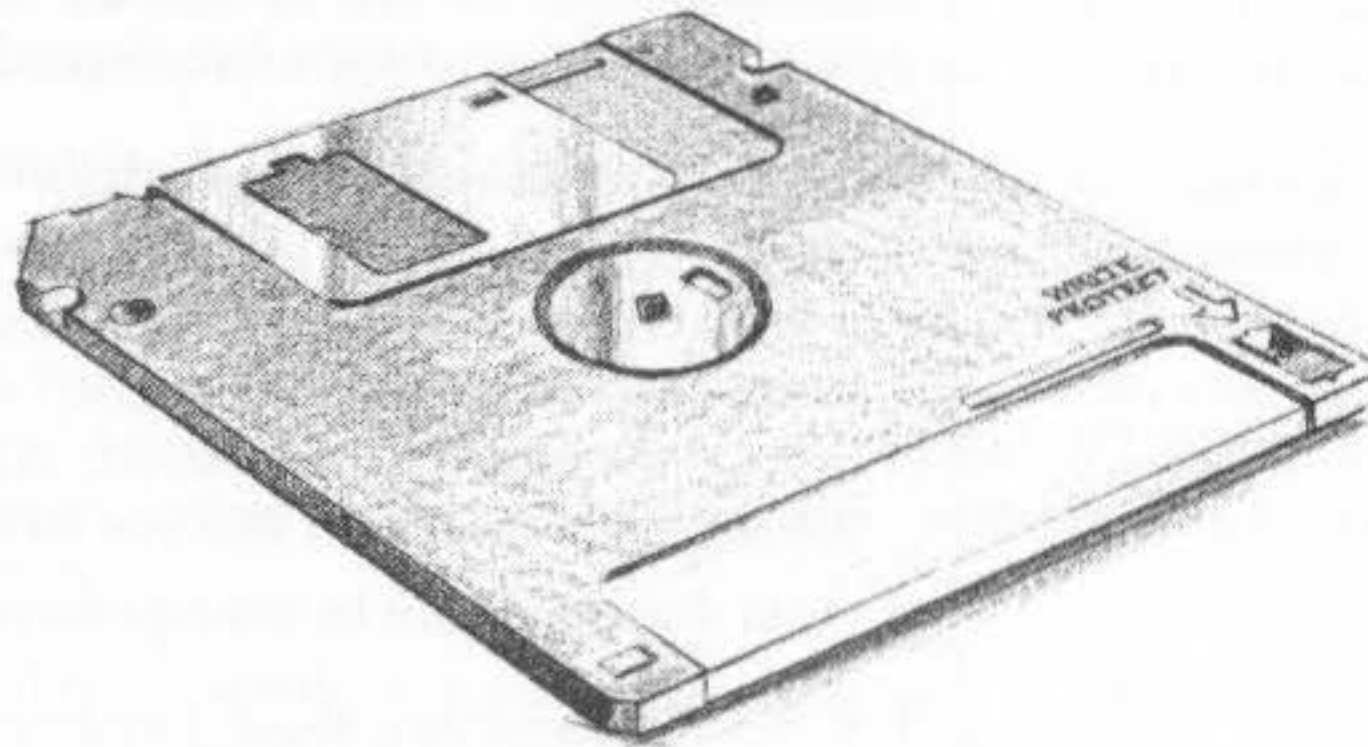


Ejecting floppy disc

To eject a floppy disc from the computer, press the button below the disc slot. **Never eject a disc when the workstation's floppy disc activity light is on, as this shows that the drive is still running.**

Write-protecting discs

You can prevent information on a disc from being changed by sliding the coloured tab towards the edge of the disc (revealing a small hole). This is called write-protecting the disc. This means that you cannot change anything on the disc, delete anything by mistake, or save any new files to the disc. You can, of course, still read information on the disc. To allow the disc to be altered again, slide the tab to cover the hole.



Looking after 3.5" discs

Floppy discs are enclosed in a plastic casing for protection. Nevertheless, they should be handled with care. If a disc becomes damaged you may lose valuable information. A few precautions will ensure that your data is not lost:

- Keep discs dry.
- Keep discs away from direct sunlight and extreme heat or cold.
- Protect the disc from fingerprints, dust and smoke.
- Do not clean the disc with any type of cleaning fluid.
- Never remove a disc from the computer or turn the computer off when the activity light is on. This light indicates that the computer is writing or retrieving data from the disc; removing the disc while the light is on may cause information to be lost.
- Do not move the metal protective cover.

Formatting discs

- Keep discs away from magnetic sources such as permanent magnets and transformers. Even everyday equipment like loudspeakers and televisions contain magnets.

You will build up a collection of discs as time passes. Label them so that you always know which one holds the information you need. Store them in a storage box designed for the purpose.

Before you can use a 3.5" disc, it has to be formatted. Formatting divides up the surface of the disc into sectors. This allows the workstation to store information on the disc in sections that can easily be found again. There are several ways of formatting a disc, depending on how that disc is to be used.

Before you format a disc, note the following points:

- You can format a blank disc or reformat previously formatted discs. **However, if information is already stored on the disc, reformatting it destroys that information.** Be very careful about formatting any disc already containing information. Always make sure you no longer wish to keep the information, or that you have other copies of it.
- Your disc should not be write-protected.

For more information about formatting floppy discs and using floppy discs to transfer files, see the *RISC iX User Guide*.

Configuring the Video Console Interface

The Video Console Interface (VCI)

Introduction

This section introduces the Video Console Interface (VCI), which allows you to tailor the way in which your keyboard and screen interact with the system.

Even though your keyboard and screen are an integral part of your workstation, UNIX treats them as if they were a separate terminal. Your keyboard and screen by default emulate (imitate) the way in which a DEC VT220 terminal operates. This terminal type was chosen because many programs, written to display output on a DEC VT220, will work without modification when they are using the keyboard and screen on your workstation.

This ability to mimic a common terminal type is especially useful when you are accessing remote machines over a network and would like to configure your terminal so that it acts as a dedicated terminal for the remote machine.

Each of the four virtual terminals of your system has its own Video Console Interface set-up associated with it, so you could have each virtual terminal set up differently if required.

Note: The X Window System running in virtual terminal **fb+kbd** does not use the VCI. You can change similar parameters by using the window manager.

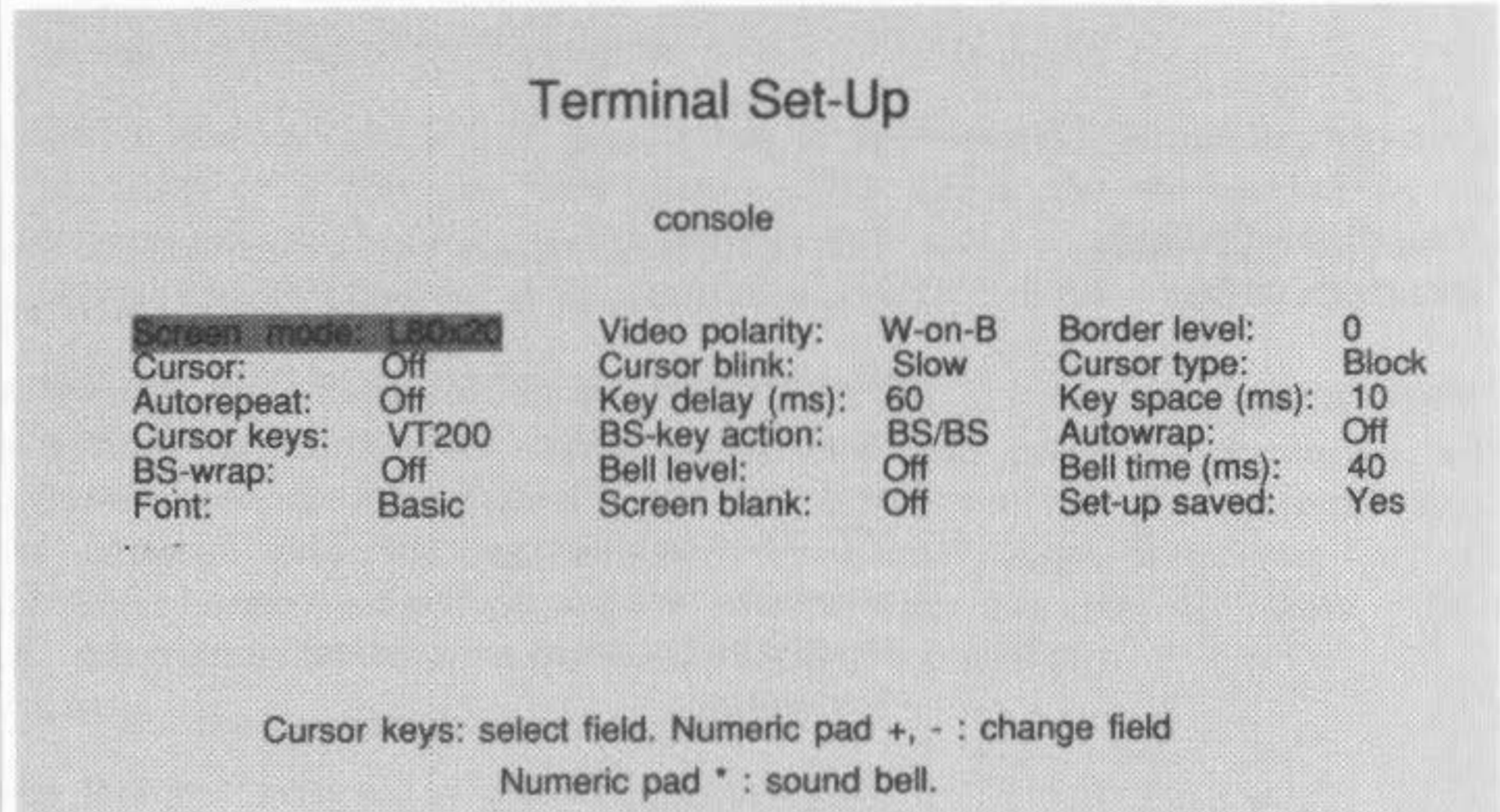
For experts only: There are some slight differences of detail, and limitations between the VCI and the VT220, which you may need to be aware of if you are programming for the interface. For a more detailed discussion of the Video Console Interface and a comprehensive description of the differences between your system and the VT220 terminal, read the chapter entitled *Video Console Interface definition*, in the *RISC iX System Administrator's Manual*.

Displaying the terminal set-up screen

To display the terminal set-up screen, press the <F3> key (located on the top row of the keyboard). The existing contents of the screen disappear (but are saved) and the terminal set-up screen appears. If you have the Virtual Terminal Interface (VTI) Device Selection menu on the screen, first select the

terminal you wish to configure, then press the <BREAK> key and then press the <F3> key.

The screen consists of a set of fields, each controlling one parameter of the VCI. For example:



Pressing the <F3> key again will return to the original screen display, so that you can observe the effect of any changes. If you then press <F3> again, the set-up screen will reappear as you left it. You can switch between the set-up screen and the main display as often as you wish, until you are satisfied with your set-up.

Selecting a parameter

When the set-up screen is visible, use the cursor keys to move the highlight over the selected field; the field is displayed in inverse video. For example, in the illustration, the **Screen mode** field is currently selected.

Changing a parameter

Pressing the keys marked + and - on the numeric keypad changes the value of the selected field. Some fields (such as key delay) have values which are shown as numbers. For these, pressing the + key will increase the value, pressing the - key will decrease it. If you press the key after the limit has been reached, the value will start again at the other end of the range.

Other fields have a value which is either on or off. In this case pressing either + or - will toggle the value between the alternate (alternative) conditions.

The remaining fields (apart from the 'Set-up saved' field, see below) display their values as names or symbols, and the + and - keys cycle through the range of values, in forward or reverse order.

The parameters you can change are described field by field:

Screen mode

The screen mode field allows you to select any one of the modes available for your monitor. As you change this field, the screen mode used for the set-up screen is itself changed to match, so you can see the effect of the different modes on the size of displayed characters and the area of screen occupied by the display. Modes that cannot be displayed with your monitor are not selectable.

The VCI can be operated in different screen modes. These depend upon the type of terminal you are using.

For high-resolution monitors, the available screen modes are:

- 80 rows by 20 columns, high resolution
- 96 rows by 32 columns, high resolution
- 144 rows by 45 columns, high resolution.

For medium-resolution multi-frequency monitors, the available screen modes are:

- 80 rows by 20 columns, medium resolution
- 80 rows by 24 columns, medium resolution
- 80 rows by 20 columns, low resolution
- 80 rows by 24 columns, low resolution
- 80 rows by 30 columns, low resolution.

For low-resolution analogue monitors and low-resolution monochrome monitors, the available screen modes are:

- 80 rows by 20 columns, low resolution
- 80 rows by 24 columns, low resolution
- 80 rows by 30 columns, low resolution.

Note: If you are using the X Window System, all virtual terminals are restricted to a screen mode of 80 rows by 20 columns.

Video polarity

The screen can display either white characters on a black background (or green and black if you have a green phosphor screen), or black characters on a white background. Programs can still send characters to the screen that are displayed in other than the default mode for special effects (such as inverse video). As you adjust the value of this field, the screen changes polarity accordingly.

Border level

Around the edges of the main display is a narrow border area. This field selects a pattern of pixels which is repeated throughout the border area. The patterns are constructed from four pixels, each of which may be either on (white) or off (black).

Border level 0 means that all the pixels are off, and no border is visible. Level 15 sets all the pixels on, and the border appears white. If the video polarity is black on white, using border level 15 causes the border to merge with the background colour of the main screen area, and the displayed screen area will seem slightly larger; this can help make characters at the edges of the screen easier to read.

If you select intermediate border levels (1 to 14) the border is shown as a striped pattern. You may find some of the patterns give an attractive effect (particularly if you have chosen black on white video polarity).

Cursor

This field controls whether a cursor is visible on the screen. You will probably always want to leave this set to On, but you can turn it Off using this field.

Cursor blink

The cursor can either appear as a steady pattern on the screen, or be made to blink on and off. There are three values to choose from:

- off (the cursor is steady)
- slow blink
- fast blink.

Switch to the main screen to see the effect of changes you make.

Cursor type

You can choose between two types of cursor character. The **Line** cursor appears as a thin horizontal line under characters on the screen, and hence does not obscure them. The **Block** cursor is shown as a solid block which occupies a complete character cell, so it covers any character underneath.

However if the block cursor is displayed blinking, the character will be visible whenever the cursor blinks. The block cursor is more obvious than the line cursor if you are trying to find the cursor position.

Auto-repeat

This field allows you to control whether keys on the keyboard will automatically repeat if you hold them down. Many people find this a useful feature. The following two fields control exactly how this auto-repeat action works, if you choose to turn it On.

Note: Regardless of the setting of this field, the <ESC> key never repeats. Also, auto-repeat is meaningless as far as the <CTRL> <SHIFT> and <ALT> keys are concerned, since these keys are always used in conjunction with other keys and do not generate any characters when pressed by themselves.

Key delay

If you have chosen to have auto-repeat On, adjusting the key delay field controls the length of time which should elapse between a key being pressed and it starting to repeat.

You can select a period in the range 60 to 800ms (milliseconds) for this initial delay. If auto-repeat is Off, this field and the key space field are ignored.

Key space

After auto-repeat starts, you can decide how quickly keys should be repeated (the interval between repeat operations). The available range is from 10ms, repeating 100 times per second (very rapidly), to 500ms, which gives two repeats per second.

Cursor keys

A standard DEC VT220 terminal produces a special sequence of characters (a control sequence) on pressing each of the four cursor keys on the keyboard. The default behaviour of the VCI is that the same sequence is produced when you press a cursor key on the keyboard of your system. However, by adjusting this field you can change the effect produced by pressing the cursor keys.

The four settings from which you may select are:

- VT220 mode

In this mode the cursor keys behave exactly as they do on a DEC VT220 terminal.

- EMACS mode

The EMACS screen editing program uses (by default) a particular set of control sequences to move the editing cursor up, down, left and right. Various sequences can be used to move vertically by single lines, by screenfuls, or to the top or bottom of the buffer within which you are editing, and horizontally by single character positions, whole words, or to either end of the current line.

Normally you would have to type these sequences by pressing various combinations of the <ESC> key, some of the alphabetic keys and the <CTRL> key. For example, to scroll back up the buffer by a screenful of text, you would press <ESC V>. To move forward by one character position you would press <CTRL-F>.

However, when you set the cursor keys to EMACS mode (or BBC/EMACS mode, see below) you can achieve the same moves (the same control sequences are sent) by using the cursor keys on your keyboard, in conjunction with the <SHIFT> or <C> keys for some moves. If you use either of these editors, you may well find this to be more convenient than the standard key sequences. The effects are as follows:

Key	On its own	With <SHIFT>	With <CTRL>
↑	up a line	up a screenful	to top of buffer
↓	down a line	down a screenful	to end of buffer
←	character left	previous word	to start of line
→	character right	next word	to end of line

- BBC mode

Selecting BBC mode gives you access to a very useful mechanism called cursor copy action. This was originally developed for the BBC Microcomputer, which is why it is termed BBC mode.

Cursor copy action allows you to copy text on the screen, as if you were typing it in yourself, but without having to re-type all of the characters. Instead you move a special copy cursor using the cursor keys, until it is over the start of the text you want to copy. Then by pressing the <COPY> key, you can copy characters, words or whole lines as input to whatever command interpreter or program is reading your input at the time.

The copy cursor appears as soon as you press one of the cursor keys, and is shown as an inverse video block. Pressing the cursor keys move the copy cursor in the directions marked on the keys. (When you reach an edge of the screen the copy cursor wraps round to the opposite edge.)

If you press <SHIFT> along with the ↑ or ↓ keys, the cursor will move up or down faster, by four lines rather than one. Pressing <CTRL> with either of the keys ↑ or ↓ causes the copy cursor to jump to the top or bottom of the screen. For the ← and → keys, pressing <SHIFT> with the key makes it move alternately by words (sequences of non-blank characters) or spaces (sequences of blank characters).

You copy text by pressing the <COPY> key. Each time you press it (or it auto-repeats), the space or character under the copy cursor is sent as an input character as if you had typed it (it normally appears wherever the ordinary cursor is) and the copy cursor moves right to the next position.

If you want to copy more than a few characters, a faster method is to press <SHIFT> or <CTRL> along with it. When you press <SHIFT> and <COPY>, all the characters up to the next blank are copied (if the copy cursor started on a non-blank character), or one space is copied and all further blank characters are skipped up to the next non-blank (if it started on a blank character).

Alternatively, pressing <CTRL> and <COPY> causes all characters up to the last non-blank character on the line to be copied.

At any time when the copy cursor is visible on the screen, you can type any other key on the keyboard as normal. You can also move the copy cursor around between presses of the <COPY> key. You can, for example, make a correction to a previous line you have typed by:

- 1 copying the first, correct part of it using <SHIFT> and <COPY> for each word
- 2 typing in the correct word at the point where there was a mistake, skipping the mistake using → or <SHIFT> and →, and
- 3 copying the remainder with <CTRL> and <COPY>.

The copy cursor normally disappears from the screen when you press ↵. This is convenient in many situations where you are entering input a line at a time.

If you would like to remove the copy cursor at any other point, you can do so by pressing the key combination <ALT> and <COPY>. If on the other hand you do not want the copy cursor to be removed when you type ↵, you can hold down the <SHIFT> key while you press ↵. The line you have typed will be entered in the normal way, but the copy cursor will remain at the point where you left it (although if the screen scrolls up, and the line the copy cursor was on disappears off the top, it will move down onto the new top line in the same column).

This explanation of using your system in BBC mode may sound rather complicated! However, it is in fact easier to learn by doing, than it is to explain, and readily becomes a natural extension of one's normal use of the keyboard.

- BBC/EMACS mode

This mode is a combination of the BBC and EMACS modes of cursor key action. EMACS sends a special control sequence to the terminal when it starts, which normally causes it to send a slightly different set of control sequences for the cursor keys. (Technically, this is known as 'application mode' in the VT220.)

When the editor exits (or is paused temporarily) it sends another control sequence to change back to normal mode. By this means the VCI can detect that EMACS (or some other program which handles the keyboard specially) is running. This ability is used in BBC/EMACS mode to cause automatic switching between BBC mode, (for example, when you are typing commands to a shell), and EMACS mode, when the appropriate special control sequence is received.

So, if you find that you use cursor copy action quite a lot, but like to use the cursor keys for moving around when editing with EMACS, setting the cursor keys mode to BBC/EMACS should suit you.

BS-key action

This field controls which control character is sent by the key marked <←→> at the top righthand corner of the main section of your keyboard.

Note: The backspace key (BS) is located at the top righthand side of the typewriter area of the keyboard. (The symbol on the keyboard key is a left arrow with a vertical bar on its righthand side.)

One common use of this key is to transmit the back-space control code (normally abbreviated to BS). However on a VT220 terminal the key in this position actually generates the delete control code (DEL). You can arrange to send either of these codes for this key, or a combination of the two (using <SHIFT> to select the alternate (alternative) one) by setting the BS-key action field.

Note for EMACS users: EMACS normally treats a BS code received from the keyboard as a request to enter its help mode, rather than as a command to delete the character before the cursor, as you might expect.

The four values for this setting, and their meanings, are:

- BS/BS - The <←→> key transmits the BS code whenever it is pressed.
- BS/DEL - The key sends BS when it is pressed by itself, and DEL if it is pressed in conjunction with <SHIFT>.
- DEL/DEL - The key sends the code DEL whenever it is pressed.
- DEL/BS - The key sends DEL when it is pressed by itself; if you type <SHIFT> and <←→>, the code BS is sent.

It may be worth noting that regardless of the setting of the BS-key action field, the key marked <DELETE>, always sends the code DEL.

Auto-wrap

The screen is made up of a number of rows of characters, each of which consists of 80, 96 or 144 character positions (columns), depending on the screen mode you are working in.

If a line of characters is output which is longer than the current screen width, two things can be done:

- the line is truncated and all the excess characters are lost off the side of the screen

- the line is wrapped and any characters which would not fit on the end of one row are displaced down to the start of the next row.

The latter behaviour on the part of the VCI is known as 'auto-wrap'. If you have this field set to ON, auto-wrap happens whenever a line of characters sent to the screen is too long to fit. Otherwise, all characters beyond the end of the row are lost (except for the very last one sent, which will appear in the right most character position) and the cursor will not move down to the next row unless you type the newline character.

You can readily see the difference between these two effects by just typing a very long line of input (to a command interpreter or any other suitable program) and watching what happens as the cursor reaches the righthand edge of the screen. (You will need to switch in and out of set-up to try this.)

BS-wrap

This field controls what happens when a back-space (BS) control character is received by the VCI.

Normally (BS-wrap off), a BS code will cause the cursor to move to the left, towards the start of a screen row, unless it is already at the lefthand edge, when it will do nothing. If you set BS-wrap to on, a BS code received when the cursor is at the start of a row, instead of being ignored, will cause the cursor to wrap back to the end of the previous row.

This is not normally very significant, except when you type a long line of input which wraps round to a second row (assuming you have auto-wrap on) and then attempt to delete back to before the wrap-round point. If you have BS-wrap off, the cursor will stop at the lefthand edge of the screen as you continue deleting characters, although the characters will still be removed from the model of your input line which the system is constructing for you (a program normally only sees the final version of your input line when you press ↵).

Because the model and the screen image are not in step, you may get a bit confused as to what exactly you have typed. You can usually get the system to redraw its current model of your input line by typing <CTRL-R> (C shell users only).

If on the other hand you have BS-wrap turned on, the cursor will not stop at the lefthand edge but will move back to the preceding line; previous characters will be correctly deleted from the screen. Like so many other aspects of the VCI, the easiest way to understand how it works is to try it out.

Bell level

Many computer terminals have a bell or *beep* sound effect which can be used by software to give an audible warning to the user. The emulated terminal provided by the VCI is no exception: a short tone (at a frequency of about 1 kHz) is generated when the bell control character (BEL) is received. You can adjust the effect of this by changing the bell level and bell time fields on the set-up screen. The bell level field has five possible values:

- Off (the bell effect is completely disabled)
- faint
- quiet
- medium
- loud.

As a useful aid to determining what a particular setting sounds like, pressing the key marked * at the top right of the number pad on the keyboard will cause the tone to sound at the currently selected level – nothing will happen if this is set to Off.

Bell time

In addition to setting the level (loudness) of the bell effect, you may alter the length of time for which the tone sounds, by selecting the bell time field and modifying its value. A wide range of times is available, from 40ms (a short blip) to 300ms (3/10ths of a second). As with the bell level field, you can use the * key to test the effect of your changes on the sound produced.

Font

The characters you can see displayed at any one time on the VCI screen are always all in some particular font or style. There are a total of four fonts available when you use the VCI on your system.

Two screen modes (80 columns by 20 rows, and 144 columns by 45 rows) share a set of two fonts, and the other screen mode (96 by 32) uses one of a set of two further fonts. In each set one font is designated *basic* and the other *fine* (although there is no particular significance in these names). The font field allows you to choose between these two possibilities. Note that changing this field affects the font choice in all screen modes; for example, if you select the basic font in 80 by 20 mode, and then change the screen to use 96 by 32 mode, the corresponding basic font for 96 by 32 mode will be used. You

can see the difference between the fonts as you change this value – the characters used in the set-up screen itself will change shape as you press + or –.

Screen blank

The screen blank facility is intended to reduce the wear on the monitor provided with your system. With time, the phosphor coating on the inside of the glass screen is burned away by continual use.

This takes a long time (several years) before the device becomes unserviceable, but the effect can be observed after a while, particularly if the monitor is in use a lot of the time.

The wear can be significantly reduced by switching off the monitor, or more conveniently, by blanking out the picture, whenever the screen is not actively being used. This can be done automatically by the system, which can detect that no new output has appeared on the screen and that no key has been pressed over a substantial period of time.

The screen blank field controls whether this automatic blanking is to happen and, if so, after what period of apparent inactivity. You can choose the value Off which disables the facility, or alternatively select a time period from a set of possible values, by pressing + or – while this field is selected. The time periods are:

- Off
- 1 min
- 3 min
- 10 min.

Set-up saved

All the parameters which you can adjust using the set-up screen remain in force until you either alter them, or switch off your system. However you can arrange that they are preserved, even after switching the machine off and on again (or restarting the system) by saving them in a special battery-powered memory within the machine.

To do this, select the 'Set-up saved' field, and look at the value it shows: if it is displayed as Yes then you have not altered any field since the last time the parameter settings were saved or you started up the system. Otherwise the text *No* will be visible, indicating that you have made some changes since

the parameters were last preserved in the memory. In this case you can cause them to be saved there (and the value to switch to Yes again), by pressing the + key.

Note: If you press the + key and the display already shows Yes, nothing will happen, other than that the bell tone will sound, to indicate that your action has no effect.

After saving the set-up, press the <F3> key to get back to your terminal screen.

Alternative operating systems

Introduction

Although your workstation is intended for use with the RISC iX operating system, you can also use other operating systems.

The RISC OS operating system

RISC OS is the standard operating system for Acorn Archimedes computers, providing a single-user multitasking desktop environment, together with the advanced disc filing system ADFS.

RISC OS is also compatible with earlier Acorn computers via software emulators for the BBC model B computer and 6502 second processor.

You can also use the MS-DOS operating system via an emulator.

Notes:

- Your supplier may have configured your workstation to run only specific software and you may not be able to use RISC OS without modifications from your supplier.
- There is a small RISC OS partition on the hard disc, mostly filled with application suite programs. Due to disc space limitations, large RISC OS applications and data files may have to be stored and run from floppy disc.
- For more information on RISC OS, read the *Archimedes Welcome Guide* and *Archimedes User Guide* supplied with your workstation.

The MS-DOS operating system

Your workstation can also run the MS-DOS operating system via an emulator.

To run MS-DOS you must first start up your workstation running RISC OS, then load the emulator which starts-up the MS-DOS operating system.

The emulator is available from your supplier.

Note: Do not try to create an MS-DOS partition on your hard disc without first contacting your supplier for advice.

File transfer

RISC iX, RISC OS and MS-DOS files can be transferred using the special RISC iX utilities provided. Read the chapter entitled *Communicating with other systems and users* in the *RISC iX User Guide* for more details.

Expanding the system

Introduction

Your workstation has been designed as a compact UNIX workstation, for stand-alone or network use.

This chapter gives you information about the expansion cards and peripherals available for your workstation in order to increase its versatility and performance.

Expansion cards

The workstation is an open system with an internal bus which can support up to three standard expansion cards, plus a floating point card. There are expansion cards, manufactured by Acorn and third parties, to enhance the performance of your workstation.

- **Ethernet/Thin Ethernet expansion card** – enables the workstation to be connected to an Ethernet local area network. A network gives you the ability to communicate with other computers, allowing you to exchange messages, share files and make use of network resources.
- **SCSI expansion card** – this allows up to six additional SCSI (Small Computer Systems Interface) devices to be daisy-chained onto your workstation. This can greatly increase the amount of disc storage, and add tape backup and other facilities to you.
- **Floating point expansion card** – increases the speed at which floating point calculations are performed by adding dedicated floating point hardware to your workstation.

Ethernet

Ethernet is the industry standard network for UNIX that enables any computer with an Ethernet adapter to be connected to a local area network. Your workstation, fitted with the optional combined Ethernet/Thin Ethernet expansion card can use Ethernet to communicate with other computers from a wide range of manufacturers.

The workstation is supplied with TCP/IP and Sun Microsystems' Network File System (NFS) software, both de facto standards. NFS enables you to access information stored on the discs of other computers in exactly the same way as you would information stored on your own disc.

SCSI storage devices

The Small Computer System Interface (SCSI) expansion card will enable you to connect a wide variety of storage devices, such as additional hard discs and tape streamers which meet the SCSI implemented by the card. Contact your supplier for further information.

Printing

Printers can be attached to both the serial port and the parallel port of the workstation, and printing carried out using the usual UNIX print procedures.

In addition, RISC iX includes a PostScript printer text formatter, `psroff`, which is an implementation of `troff` designed to output to a PostScript laser printer.

Monitors

Several different types of monitor may be used with your workstation, including:

- Low-resolution monochrome:
A TV standard monochrome monitor displaying text characters only under RISC iX. When used with RISC OS this monitor can display graphics with a resolution of 640x256 pixels. This monitor is not suitable for use with the X Window System.
- Low-resolution analogue:
A TV standard analogue colour monitor displaying text characters only in colour under RISC iX. When used with RISC OS this monitor can display graphics with a resolution of 640x256 pixels. This monitor is not suitable for use with the X Window System.
- Medium-resolution multi-frequency analogue:
These monitors display at a resolution of 640x480 pixels with colour under RISC iX. It can display the X Window System graphical interface and its associated desktop. When used with RISC OS this monitor can display graphics with a resolution of 640x512 pixels.
- High-resolution monochrome:
These monitors are capable of a resolution of 1152x900 pixels under RISC iX. It is suitable for use with the X Window System graphical interface and its associated desktop. When used with RISC OS this monitor can display graphics with a resolution of 1152x900 pixels.

Looking after the system

UNIX System Administration

Your workstation has been made to the highest standards and is designed to last for many years. However, both hardware and software systems require periodic maintenance to keep them running efficiently and to prevent problems occurring.

UNIX is a complex operating system, and needs someone to act as System Administrator to set up the system and keep it running quickly and efficiently, by maintaining the file system, making backups, and other administrative tasks. Backups, or copies, of all the files on the system should be made regularly, so that work is not lost if something goes wrong.

If you are the only user of your workstation and it is not on a network, then you are probably also going to be the System Administrator. If several people use your workstation, or if it's part of a network, then you may have a System Administrator to look after your system for you.

A guide to the tasks a System Administrator typically has to perform to maintain UNIX is given in the *RISC iX System Administrator's Manual*.

This chapter is concerned with the few things you need to do to keep your system *hardware* running efficiently.

Cleaning the workstation

The workstation case may be cleaned by rubbing gently with a soft, slightly damp cloth. A glass cleaner may be used on the screen, but do not spray the cleaner directly onto it. Instead, spray a small amount onto a soft, clean cloth and wipe the screen gently.

Cleaning the mouse

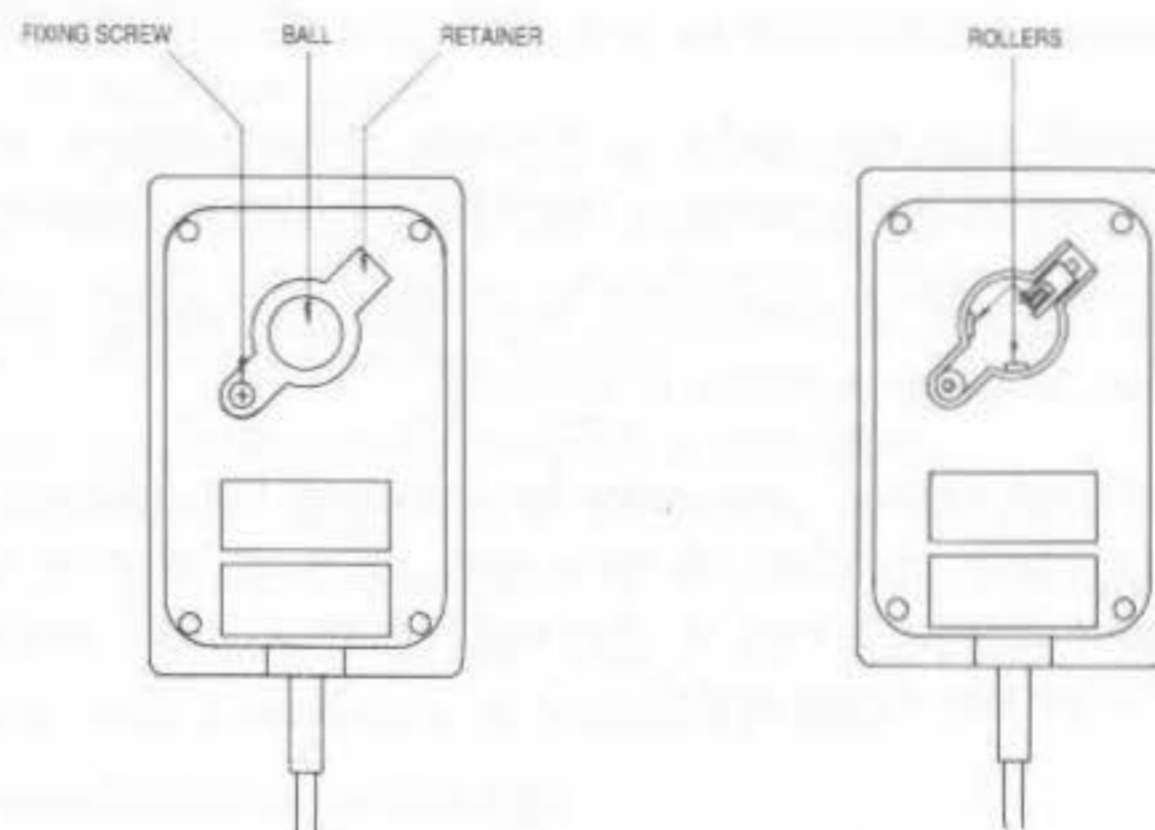
The mouse should be used on a surface that is as clean and as dust-free as possible. Dust, however, does sometimes get caught up in the ball on the underside of the mouse.

Clean the mouse occasionally to keep it running smoothly. To do so, you need the following items:

- a cross-head screwdriver
- a bottle of tape head cleaner
- a cotton swab
- a lint-free, dry cloth.

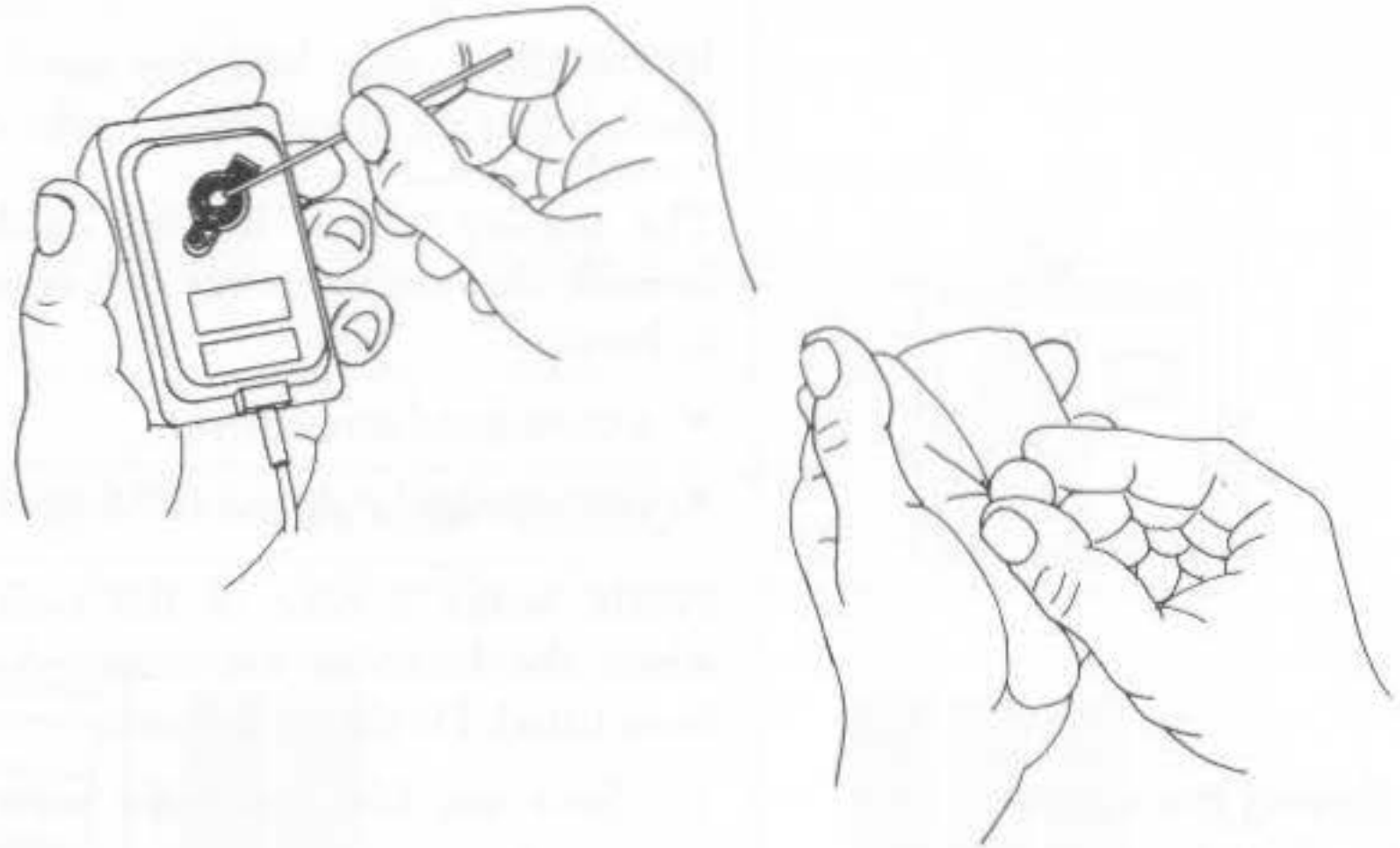
To remove the ball and clean the mouse, take the following steps:

- 1 Unplug the mouse and turn it upside down.
- 2 Using the cross-head screwdriver, remove the fixing screw holding the ball retainer.
- 3 Hold one hand over the ball and retainer and turn the mouse right side up, allowing the ball, screw and retainer to drop into your hand. Set them aside in a safe place.
- 4 Locate the three plastic rollers.



- 5 Lightly moisten the cotton swab with tape head cleaner and apply it gently to the rollers. Rotate the rollers, carefully cleaning off any dust or dirt that may be clinging to them.

- 6 Make sure the inside of the mouse is free from dust.
- 7 Rub the ball on the clean, dry cloth. Do not use a cloth which may leave lint, and do not use cleaning liquid on the ball.



To replace the ball and retainer, take the following steps:

- 8 Turn the mouse upside down and place the ball back in the case.
- 9 Replace the ball retainer, hooking the tab on the square end inside the case of the mouse.
- 10 Replace and tighten the fixing screw.

Replacing the batteries

Inside the workstation are two batteries, which should be changed once a year. These batteries power part of the workstation's internal memory, enabling the clock and calendar to continue keeping the date and time, even when the workstation is turned off. This battery-backed memory also retains the configuration status of the workstation.

If you think your batteries need changing, read through this section first, and then, if you are unsure what to do, contact your support organisation for advice.

The battery nest is located inside the system unit, which means you have to remove the workstation's top cover. Before you begin, have the following items to hand:

- a cross-head screwdriver
- two standard AA-size (LR6 or HP7) alkaline batteries.

Firstly, make a note of the system's configuration settings. These will be lost when the batteries are removed, and must be reset when the new ones have been fitted. Do this as follows:

Saving the system configuration

- 1 Save any files you have been working on, then log out and log in again as root.
- 2 Exit RISC iX, using the `halt -RISCOS` command. The following message will be displayed on the screen:

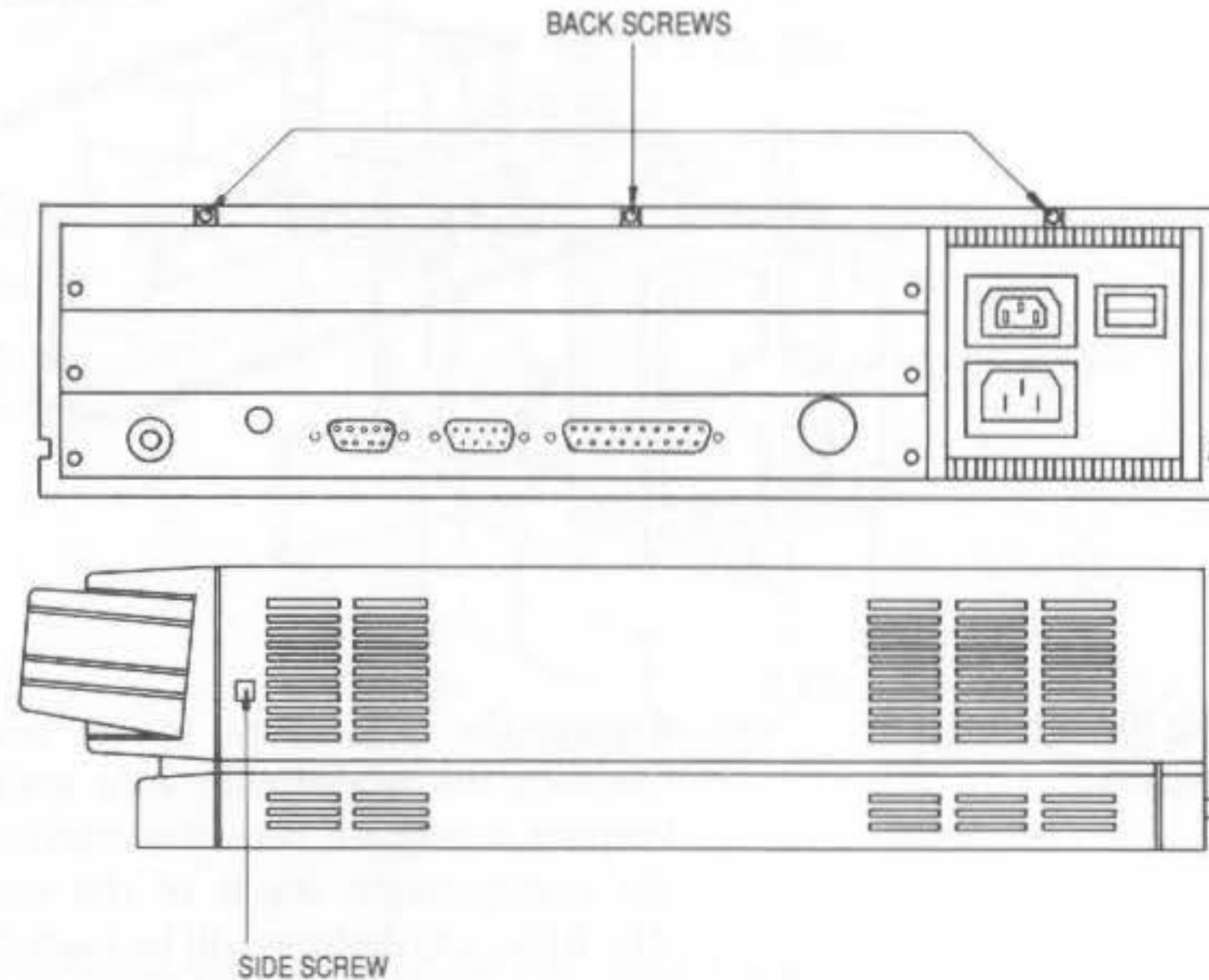
```
RISC OS 4096K  
Acorn ADFS
```

```
Supervisor  
*
```

Alternatively, your computer may exit to the desktop if it is configured in that way. If so press F12, and the RISC OS supervisor prompt will appear at the foot of the screen.

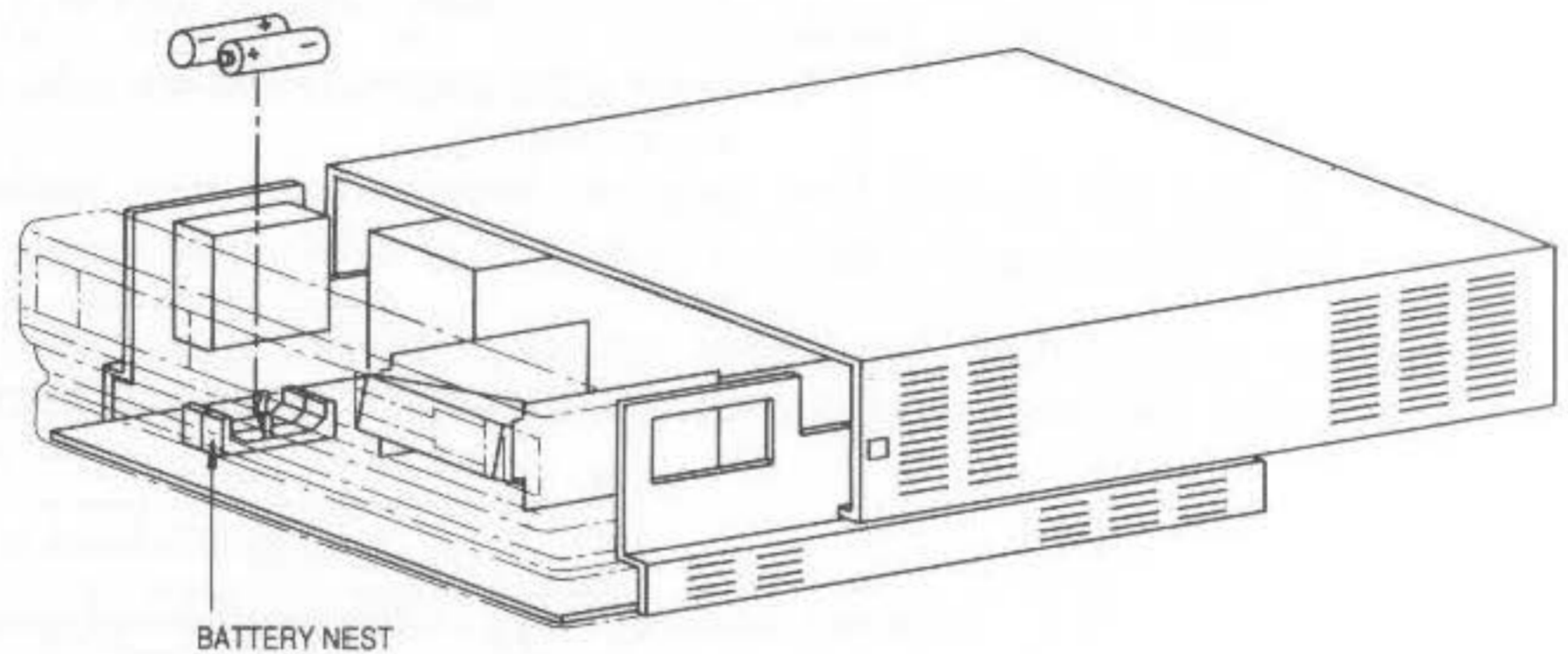
- 3 Type `*status`. The current configuration will be displayed. Write down all of the parameters listed, on a piece of paper. Alternatively you can redirect the status display to a file.
- 4 When you have done this, type `*Shutdown` and press the `<RETURN>` key. This parks the hard disc drive.
- 5 Turn the workstation off and unplug it.

- 6 Position the workstation so that you have easy access to the back of the machine.
- 7 Locate the three screws at the top of the back panel and remove them.
- 8 Locate the screws on either side of the workstation. Unscrew and remove each screw.



- 9 Facing the back of the machine, grasp each side of the workstation's top cover. Pull carefully, sliding the cover until the front half of the inside of the workstation is exposed. Do not remove the cover all the way.
- 10 Locate the battery nest – it is in the front righthand corner of the workstation as you face the machine from the back. Taking care not to unplug the flying lead attaching the battery nest to the printed circuit board, remove the old batteries and dispose of them.
- 11 Insert the new batteries as shown in the drawing, making sure the positive and negative ends are the right way round. At this point you can start to change the fan filter if necessary.

WARNING: It is possible to insert the batteries the wrong way round. Make sure you insert them correctly.

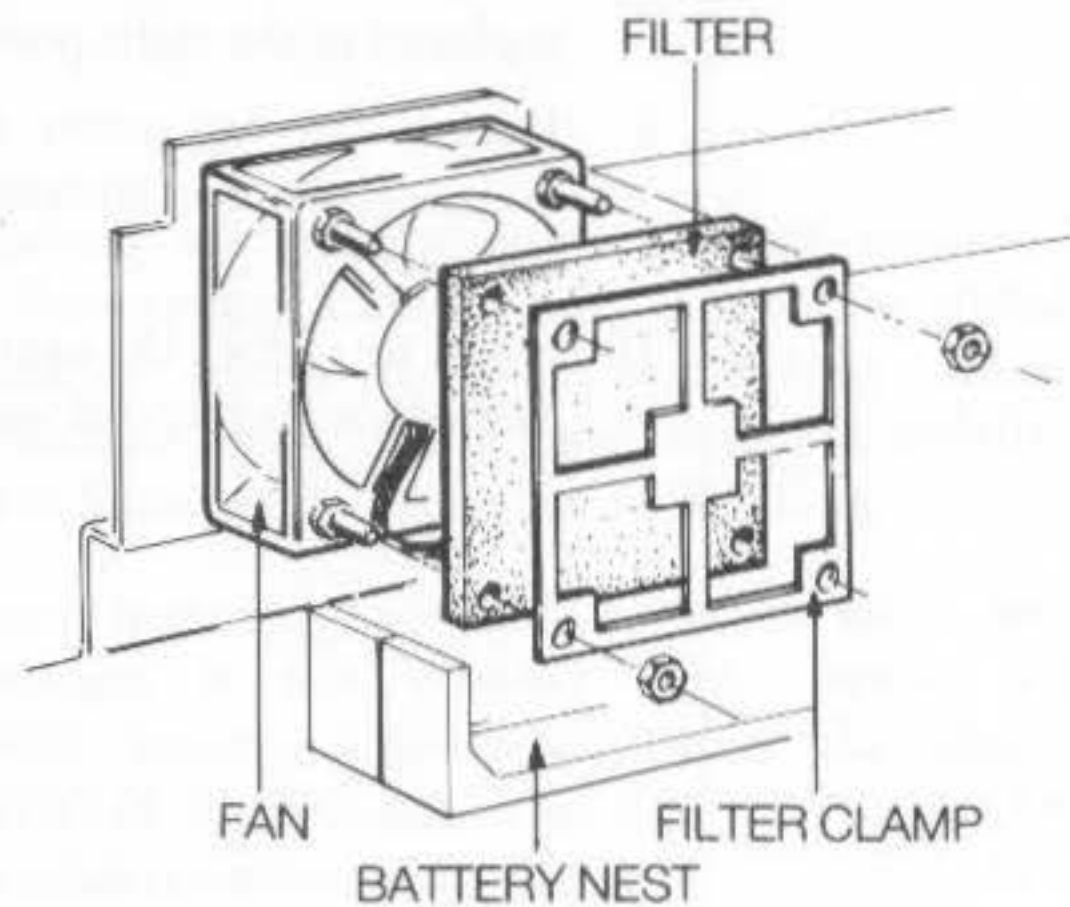


Restoring the system configuration

- 12 Return the top cover to its original position and replace the screws. Connect the workstation to a mains outlet. Press R on the keyboard, and, keeping it pressed, turn the machine on at the power-on switch. This resets the configuration status of the workstation to its original factory settings. The RISC OS desktop will be loaded.
- 13 Press F12, and the RISC OS supervisor prompt will appear at the foot of the screen. Type `*status`. The default configuration will be displayed. Check this with the configuration you noted before you removed the batteries. Change any which are different, using the command `*co.x (y)`, where *x* is the field to be changed and *y* is the (optional) parameter for that field, followed each time by Return. When you have finished, hold down CTRL and press the Reset key. The workstation will power up with your old configuration set.
- 14 You can now start RISC iX in your normal way. Read the chapter *Getting Started* for start-up information.
- 15 Reset the date and time (see *Initial configuration*).

Changing the fan filter

Like the batteries, the workstation's fan filter also needs changing about once a year. A new filter can be obtained from your supplier. If you think your fan filter needs changing, read through this section first, and then, if you are unsure what to do, contact your support organisation for advice. The drawing below shows where the fan, nuts and filter are located:



Before you begin, you will need the following items:

- a cross-head screwdriver
- an M4 open-ended, or small adjustable spanner
- a new fan filter (Acorn part number 0276,034).

To change the filter, take the following steps:

- 1 Save any files you have been working on, then log out and log in again as root.
- 2 Exit RISC iX, using the close down procedure.
- 3 Turn the workstation off and unplug it.
- 4 Remove the top cover of the computer, following the procedure in the previous section.

- 5 Locate the fan: it is in the front righthand corner of the workstation next to the battery nest as you face the machine from the back.
- 6 Undo the two M4 nuts retaining the filter clamp.
- 7 Remove the filter clamp and filter, and replace the filter with a new one.
- 8 Return the filter clamp to its original position. Make sure the nuts are replaced in the right positions and are securely tightened.
- 9 Return the top cover to its original position and replace the screws. Reconnect the workstation to a mains outlet. Turn on the power switch of the computer.
- 10 Start up RISC iX again in your normal way. Read the chapter *Getting Started* for start-up information.

If something goes wrong

Don't panic!

All new pieces of equipment are puzzling until you get used to them, and many problems that at first appear serious, turn out to be trivial. This is particularly true of a complex system like your workstation. This chapter is intended to help you overcome some of the most common pitfalls which you may run into until you get to know more about your workstation.

Note: This chapter is not intended to enable users to solve serious system problems. If your problem is not covered here, contact your System Administrator or a UNIX expert. Alternatively read the chapter entitled *Trouble-shooting* in the *RISC iX User Guide*. The *RISC iX System Administrator's Manual* may also help you solve troublesome problems.

If the computer does not work after you have just installed it, contact your supplier if you can't remedy the situation using this chapter.

If the computer fails to operate correctly during everyday operations, contact your support organisation if you can't remedy the situation using this chapter.

The problems covered by this chapter are divided up into categories:

- when the workstation is powered on
- when the UNIX operating system starts up
- when the operating system or applications program session is underway.

This section is mainly concerned with the problems that occur during power on and operating system start-up.

Before contacting your support organisation, write down any error messages that may be on the screen and a short description of what you were doing when the problem occurred. This information is important because your support organisation will want to know all about your problem.

Problems at power on

If absolutely nothing happens when you power on your workstation (no power or hard disc light), it could be because:

Your mains supply is not functioning:

- 1 Turn off all externally attached devices (monitor, printer etc).
- 2 Turn off the workstation.
- 3 Unplug all power cables from the mains power outlets.
- 4 Check the mains power outlet works by plugging a light or other device known to work into the power outlet.
- 5 Plug the power cables from the workstation (and monitor if necessary) into the mains power sockets. You may have to change the fuse in the mains plug.

Your signal cables may be incorrectly connected:

- 1 Turn off the workstation.
- 2 Unplug all power cables from the mains power outlets.
- 3 Disconnect and re-connect each cable from the computer unit to ensure proper electrical connection. Refer back to the chapter *Setting up* for instructions.
- 4 Check that all the cables are properly connected at the monitor, keyboard and mouse. Refer back to the chapter *Setting up* for instructions.
- 5 Turn the workstation and monitor ON.

If only one of your units is causing trouble, it may be that its connection to the mains power supply or to another unit is faulty. Go through the above procedure, paying special attention to the cables going to or from the faulty unit.

Problems with the monitor

If your workstation appears to power on correctly, the lights on the keyboard and monitor light up, but you do not see anything on your display, then you may have one of the following problems:

- The monitor may not be plugged in correctly.
- The monitor may not be adjusted properly.
- The monitor is faulty.

Check that the cables from the monitor to the computer unit are connected correctly. Refer back to the chapter entitled *Setting up* for instructions.

Adjust the brightness and contrast controls on the monitor to see if you can find a picture.

If after trying these suggestions your monitor still appears to be faulty, then contact your support organisation.

If you are installing a low-resolution text only monitor, your supplier may have forgotten to adjust the internal links in the computer.

If your workstation appears to power-on correctly, the lights on the keyboard and monitor light up, but your display is fuzzy or jumpy, then you may have the following problems:

- The `monitorType` is configured wrongly.
- The display is not correctly adjusted for vertical and horizontal alignment.
- The monitor signal cable is not tightly secured – tighten the cable connectors.

Among the possible causes are:

If you are installing a low-resolution text-only monitor, your supplier may have forgotten to adjust the internal links in the computer.

After checking that the `monitorType` is correct, look in the manual that came with your monitor to find out how to adjust the vertical and horizontal size and position.

The screensave option on the set up screen is enabled. This shuts off your monitor after a predetermined time. Press any key to start the display again.

The keyboard does not appear to respond to key presses:

- The keyboard may not be connected.
- The keyboard may be broken.
- Your workstation has 'crashed' (stopped working).
- The network is not functioning.
- The `<SCROLL LOCK>` key is on (the light in the keytop is lit) – press the key again to turn it off.

Wait for a short while (about a minute) to see if the problem clears up. Check the keyboard connections. If this does not help, try restarting your

workstation to see if the problem goes away. If you still have a problem, contact your support organisation.

If you spill any liquid on the keyboard, stop working immediately, and then shutdown and switch off the workstation.

- If the liquid you spilt is sweet or sticky, take the keyboard to your support organisation for repair or replacement.
- If the liquid is clear and thin, try turning the keyboard upside down to let the liquid drain out. Dry it for 24 hours at room temperature and then try using the keyboard again. If it still doesn't work, take it to your support organisation.

The pointer on the screen does not move when you move the mouse (or it moves erratically):

- The mouse may not be connected.
- The keyboard may not be connected.
- The surface you are using may be too smooth; use a mouse mat.
- The mouse may not be working properly or may need cleaning.

Check the mouse and keyboard connections and then clean the mouse. You may need to practise to acquire the skills needed to move, point and click with the mouse.

Your workstation appears to power on correctly but then nothing happens:

- Check that your monitor is working and the screen brightness and contrast are correctly adjusted.
- If nothing appears on the monitor, check that the H/DISC light on the front panel flashes intermittently.

It is possible that the CMOS ram settings have become corrupted; consult the *RISC iX System Administrator's Manual* for more information.

Your workstation starts to boot RISC iX but stops before the **login:** prompt.

Try restarting the workstation; the error may not be repeated. If the problem persists it is likely that the filesystem has been corrupted. Call your support organisation.

You spill a drink on the keyboard.

Problems with the mouse

Problems during start-up

Other workstation problems

The computer shuts down without warning

- It was remotely shutdown by your System Administrator.
- The power supply failed.
- The fuse in the plug failed.

Try restarting your workstation and see what happens. If it fails to start again then it is likely that the fuse or power supply has failed. Contact your support organisation.

Problems during your UNIX session

During your RISC iX session you may get error messages appearing on your screen from several sources. You will get error messages from commands you use incorrectly, from the operating system and from the hardware.

None of these are likely to be serious, but if you get errors that you don't understand you should seek advice from your System Administrator or UNIX expert.

Software problems

Error messages from RISC iX are sometimes quite helpful but often they are not. This section tells you about the RISC iX error messages you are most likely to see when you start to use RISC iX for the first time.

This section assumes that you are the beginner and that there is a System Administrator looking after the system for you. This may not be so, in which case you will have to perform the system administration tasks outlined here. You should read the *RISC iX System Administrator's Manual* and find yourself a friendly UNIX expert to help you.

It's worth noting that as a beginner you cannot do any real harm to your workstation by typing in some gibberish. The worst thing you could do is delete a few of your own files (unless you are logged in as `root`, of course).

When you try a command and, instead of what you were expecting to see, you see an error message, stop and think. Try and work out what you were trying to do when the problem occurred. Note all this down so that if you can't solve it, you can go and ask someone with more UNIX knowledge than you have.

Here are the most common sources of problems:

- You were typing in upper-case. UNIX is case-sensitive: most commands use lowercase only, although filenames are often a mixture.
- You have made a spelling mistake, or forgotten a space or left out a parameter.
- You have confused the number 1 with the letter l.
- You have confused the number 0 with the letter O.
- You are in the wrong directory, which may mean that the command has no effect.
- You are not logged in as yourself (your username), which means that your files are not accessible.

If can't solve the problem, note down the error message word for word, and what you were doing when it occurred, then consult your local UNIX expert.

If all this fails to solve the problem, then contact your support organisation for help.

Problems with logging in

You can't log in:

If you can't log in then there isn't much you can do except contact your System Administrator. If you've already been assigned a username but it doesn't appear to work, contact your System Administrator.

You can't remember your password:

Once you forget your password you can't log in. You will have to ask your System Administrator to reset your password.

Error messages at log in:

`Login incorrect`

Try to log in again; you may have made a typing mistake. If you can't log in repeatedly, there may be something wrong with your account. Contact your System Administrator.

Common error messages

Each command has one or more particular error messages. This section explains the more general error messages that may occur with many commands.

File exists

You attempted to overwrite an already existing file. Delete or move the existing file.

File not found

The file you attempted to look up or get access to, is not in the directory or your path.

Is a directory

You attempted to read or write a directory as if it were just a file.

No such file or directory

This occurs when a named file does not exist, or when one of the directory names in a path does not exist.

Not a directory

The command you gave expects a directory name, not a file name.

Permission denied

You attempted to read, write or execute a file for which you don't have the necessary permissions.

... write failed, file system is full

There is no more room in the named filesystem. This message is not always really true, since it can come up when temporary files (such as spooling files) are created.

out of swap

If you see this message, you will have to restart your system. Contact your System Administrator.

Common error
messages with selected
commands

This section lists error messages that could occur with common commands.

cat

cat: can't open filename

Either you are in the wrong directory, the file does not exist, or you do not have permission to read it.

cat: input *filename* is output

You cannot cat the contents of *filename* to itself.

cd

pathname: bad directory

You do not have permission to change to *pathname*.

cp

cp: cannot open filename

The file specified by *filename* either does not exist, or you do not have read permission.

cp: cannot copy file to itself

The two filename arguments to cp must be different filenames.

cp: cannot create filename

This usually indicates that you are in a directory which you don't own, or you are trying to create a file in a directory for which you don't have write permission.

date

date: no permission

You must be the superuser 'root' in order to set the date.

ls

directory unreadable

You do not have read permission for *directory*.

man

No entry for *item* ...

There is no entry for the item you asked for in the on-line manual pages, or in the section you specified. Check your spelling and case of the command you wanted information for.

Glossary

↵	This is the symbol for the <RETURN> key. When you press this key the command that you have typed in is interpreted and acted upon by the computer. Within an application such as a text editor, it is used to signal the end of a line of text.
analogue monitor	An analogue monitor is connected to the ANALOGUE RGB output on the system unit. This type of monitor can display different shades of colour and grey-scale.
append	To add text or data onto the end of a file.
application	Computer program which enables you to perform a particular task., such as a word processor or a drawing program. See also system software.
Berkeley Software Distribution (BSD)	A version of UNIX that was developed at the University of California at Berkeley. RISC iX is based on the 4.3BSD version.
boot	To start the RISC iX operating system, first loading it into memory.
Caps Lock key	A key that, when engaged, causes subsequently typed letters to appear in upper case. It works like a shift key except that it doesn't affect numbers or symbols.
command	A word or phrase describing an action for the workstation to perform.
Command Line Interpreter (CLI)	A program, in UNIX the C shell or Bourne shell, that acts on commands.
console	The main terminal (virtual terminal) of your system. The console receives log and error messages from the operating system that are not seen on the other terminals (virtual terminals).
contents	The text or data contained in a file.

cursor	The mark on the screen that indicates the position at which characters will appear on the screen. The cursor is usually a small block or underscore and it may blink.
default	An assumed value, or an action taken when you omit an argument, command or value.
delete key	A key that moves the insertion point backward, removing the previously typed character.
desktop	The desktop is a utility program that gives you an easy-to-use user interface. The desktop used with RISC iX runs under the X Window System. This style of interaction uses mouse selections, menus and windows. The username <code>desktop</code> can be used by anybody for learning about the desktop system.
device	Typically a hardware peripheral supported by the system, and the software that controls it. May also be a specialised software program. RISC iX treats a device as if it were a file. The special files that allow access to peripheral devices reside in the directory <code>/dev</code> .
device driver	A piece of software that oversees the transfer of data between the workstation and a peripheral device.
directory	A type of file that contains names and access information about other files. Directories are organised in a hierarchy, the top of which is named <code>root</code> , written as <code>'/</code> .
disc	The magnetic medium on which the computer stores information. Your workstation uses 3.5" floppy discs and a hard disc.
disc drive	The mechanism that holds the disc, retrieves information from it and saves information on it. The hard disc drive has the disc permanently enclosed, while the 3.5" floppy drive uses removable 3.5" discs.
Econet	A network of linked computers; information can be passed electronically between the computers on an Econet. Econet is a proprietary local area network principally to transfer information between computers made by Acorn.
Ethernet	A standard network communications specification for connecting computers of similar or different types. It usually uses a type of coaxial cable to connect computers in a local area network.

environment	The extent that your workstation and programs can be customised. The values of various options, settings and variables that are currently in effect.
expansion cards	Expansion cards attach to the expansion cards inside the workstation and allow you to add extra computing functionality to your workstation.
expansion slots	Connectors inside the back of the workstation that take expansion cards.
file	A collection of information stored on a disc, under a specific name.
filename	The name of a file, directory, or device.
filesystem	The layout in which the files are stored. In the case of UNIX, a tree-structured network of files and directories, through which you can move to access the files and directories contained in it.
floppy disc	Removable disc for storing information for use with a computer. The R140 workstation uses 3.5" floppy discs.
guest	The username <code>guest</code> can be used by anybody to log in to your system. However if you wish to do any serious work you should use your own username and password.
hard disc	Disc used for storing information for use by a computer. A hard disc unit is normally enclosed within the computer unit and is not physically accessible to or removable by the user. It has considerably greater storage capacity than a floppy disc. A hard disc is often known as a Winchester disc.
hardware	Anything about the computer that you can touch!
high-resolution monitors	Your workstation can use high-resolution monochrome monitors (typically 16" to 19" diagonal size). These are ideal for displaying several windows at once.
home directory	The directory you are in when you first log in to the system, which is also your personal 'root' directory to all the files and directories you create in your own area.
kilobyte	A unit of measurement consisting of 1024 bytes. In this usage, <i>kilo</i> stands for 1024, ie $2^{10}=1024$ (because computers use powers of 2).
local area network (LAN)	A group of computers linked physically by communication cables. They are usually located within a single building or section of a building.

log in	To gain access to the system, usually by typing a username and password, so that you can begin a work session on the workstation.
log out	To end access to the system, when you finish your work session and you don't want another person to have access to your username.
megabyte (Mb)	A unit of measurement equal to 1024 kilobytes, or 1 048 567 bytes.
memory	The place in the computer that stores information while you are working with it.
modem	Device which allows one computer to communicate with another by means of the telephone network. Information is transmitted as a series of electronic signals which are interpreted by the computer receiving the information.
MS-DOS	The industry standard operating system used by IBM PC-compatible computers.
multitasking	The ability of your workstation to handle the work of several different activities from one or several users simultaneously.
multiuser	A mode or ability of an operating system to support several people using the same computer simultaneously.
network	A group of machines connected together so they can transmit information to one another.
Network File System (NFS)	A protocol suite developed and licenced by Sun Microsystems that allows different makes of computers running different operating systems to share files and disc storage.
on-line documentation	Your workstation has a series of manual pages stored on its hard disc. These allow you to access information about commands while you are logged in to the system.
operating system	A collection of programs that monitors the use of the machine and supervisors the other programs executed by it.
password	A character string that you type at the password prompt to gain access to the system. Keep your password secret, and change it if you think that somebody else knows what it is.

PC-DOS	The IBM version of the industry standard operating system used by IBM and PC compatibles – MS-DOS.
peripheral	An additional piece of equipment – such as a printer – which you may connect to the computer. Peripherals are usually physically separate from the workstation and connected to it by cables.
podule	See expansion card.
pointer	Arrow displayed on the desktop screen, used to point at objects on screen, such as menu tasks or options, and to move or adjust items in the display. The pointer moves when the mouse is moved.
program	See software.
prompt	A character or characters on the screen, usually followed by a cursor, indicating that the computer is ready to accept a command from the keyboard. The default Bourne shell prompt is the dollar sign (\$), the C shell is (%) and root is (#).
RAM	Random Access Memory – part of the computer information storage system which is accessible for storing or retrieving information without using discs. Information in the RAM is lost when the workstation is turned off.
return key	A key that makes the cursor move to the beginning of the next line. It's sometimes used to confirm or terminate an entry or command.
RISC iX	The operating system used by the Acorn R140 Workstation. A version of 4.3BSD UNIX with enhancements including NFS, TCP/IP and the X Window System.
RISC OS	The operating system used by the Acorn Archimedes computer.
ROM	Read only memory – part of the computer information storage system which is accessible for storing or retrieving information without using discs. Information in ROM is not lost when the workstation is turned off.
root directory	The first directory in the tree structure of the UNIX file system. It is written as a slash (/), and it is the first element of an absolute pathname. The user with unlimited system privileges is also know as root or superuser.
SCSI	Small Computer System Interface. An industry standard that provides high-speed access to peripheral devices.

serial port	A port on the back of the workstation through which information is transmitted sequentially, a bit at a time, over a single wire or channel.
shell	A utility that accepts your commands, interprets them, and passes them on to the appropriate programs for execution. RISC iX provides the Bourne shell and C shell.
single-user	A special state in which the system can only be accessed by one user, usually the System Administrator. Single-user mode is used to perform special maintenance tasks that can only be performed when other users are excluded from using the system.
software	Instructions for the computer to carry out. The computer reads these instructions from discs inserted into the disc drive or from a hard disc or ROM.
superuser	The user with unlimited system privileges. Also called root.
System Administrator	A person who looks after the computer system.
system software	The instructions that the computer uses to run its internal process and systems.
system unit	The main unit containing the disc drives, processor unit and power supply.
TCP/IP	A suite of networking protocols.
3.5" discs	The size of removable discs used with your workstation, also known as floppy discs.
tree structure	The way that people normally describe the UNIX file system hierarchy. As with a tree, the file system starts with the root directory and branches out with subdirectories.
user	A person who can log in, issue commands and create files.
username	The name with which you identify yourself to the computer. This name is usually assigned by the System Administrator.
UNIX	A portable operating system. Acorn's implementation is called RISC iX. UNIX is used in this manual when referring to UNIX in general, not to RISC iX in particular.
Video Console Interface	The Video Console Interface (VCI) allows you to change the default parameters that control the display on your monitor screen.

Virtual Terminal Interface	The Virtual Terminal Interface (VTI) gives you access to four virtual terminals which you can swap between using the <BREAK> key.
wide area network (WAN)	A system of interconnected local area networks that span a wide geographical area.
WIMP system	Window, icon, mouse and pull down menu system. A visual interface system, which uses the mouse and pointer as the basis of the interface between the user and the computer.
window	Area of the screen designated for a particular activity or display – for example, a notepad window used to write a document, or a directory window used to display the contents of a disc. Windows can be moved, resized, hidden and closed. If the contents of the window are too large to display at once, you can move through the contents making different parts visible using the scroll arrows and scroll bars.
window manager	A program that allows you to move, resize and scroll and perform other operations upon windows produced by the X Window System.
window system	A set of programs that allows you to divide up your screen into portions so that you can run more than one program at the same time.
X Window System	The window system supplied with RISC iX on your R140 workstation.

1. <i>Adaptation</i>	... the process by which an organism becomes better suited to its environment.
2. <i>Acclimation</i>	... a short-term physiological adjustment to a change in environment.
3. <i>Acclimatization</i>	... a long-term physiological adjustment to a change in environment.
4. <i>Adaptability</i>	... the ability of an organism to adjust to its environment.
5. <i>Adaptation level</i>	... the degree to which an organism is adapted to its environment.
6. <i>Adaptation strategy</i>	... the way in which an organism adjusts to its environment.
7. <i>Adaptation mechanism</i>	... the physiological or behavioral process by which an organism adapts.
8. <i>Adaptation response</i>	... the change in an organism's physiology or behavior in response to its environment.
9. <i>Adaptation capacity</i>	... the range of environmental conditions to which an organism can adapt.
10. <i>Adaptation limit</i>	... the point at which an organism can no longer adapt to its environment.
11. <i>Adaptation threshold</i>	... the level of environmental stress beyond which an organism cannot adapt.
12. <i>Adaptation time</i>	... the duration of the adaptation process.
13. <i>Adaptation rate</i>	... the speed at which an organism adapts to its environment.
14. <i>Adaptation cost</i>	... the energy or resources expended by an organism during adaptation.
15. <i>Adaptation benefit</i>	... the advantage gained by an organism through adaptation.
16. <i>Adaptation trade-off</i>	... the compromise between different adaptation strategies.
17. <i>Adaptation plasticity</i>	... the ability of an organism to change its phenotype in response to its environment.
18. <i>Adaptation flexibility</i>	... the ability of an organism to switch between different adaptation strategies.
19. <i>Adaptation robustness</i>	... the ability of an organism to maintain its fitness despite environmental changes.
20. <i>Adaptation resilience</i>	... the ability of an organism to recover from environmental stress.
21. <i>Adaptation resistance</i>	... the ability of an organism to avoid environmental stress.
22. <i>Adaptation tolerance</i>	... the ability of an organism to withstand environmental stress.
23. <i>Adaptation sensitivity</i>	... the ability of an organism to detect environmental changes.
24. <i>Adaptation awareness</i>	... the ability of an organism to respond to environmental changes.
25. <i>Adaptation motivation</i>	... the drive for an organism to adapt to its environment.
26. <i>Adaptation intention</i>	... the decision to adapt to one's environment.
27. <i>Adaptation behavior</i>	... the actions taken by an organism to adapt to its environment.
28. <i>Adaptation strategy selection</i>	... the process of choosing the most effective adaptation strategy.
29. <i>Adaptation strategy evaluation</i>	... the process of assessing the effectiveness of an adaptation strategy.
30. <i>Adaptation strategy optimization</i>	... the process of refining an adaptation strategy for better performance.
31. <i>Adaptation strategy innovation</i>	... the development of new adaptation strategies.
32. <i>Adaptation strategy diffusion</i>	... the spread of an adaptation strategy through a population.
33. <i>Adaptation strategy adoption</i>	... the process of taking up a new adaptation strategy.
34. <i>Adaptation strategy abandonment</i>	... the process of giving up an adaptation strategy.
35. <i>Adaptation strategy persistence</i>	... the duration of an adaptation strategy's use.
36. <i>Adaptation strategy stability</i>	... the ability of an adaptation strategy to remain effective over time.
37. <i>Adaptation strategy variability</i>	... the differences between different adaptation strategies.
38. <i>Adaptation strategy diversity</i>	... the range of different adaptation strategies available.
39. <i>Adaptation strategy complexity</i>	... the number of components or steps in an adaptation strategy.
40. <i>Adaptation strategy simplicity</i>	... the ease of understanding and implementing an adaptation strategy.
41. <i>Adaptation strategy effectiveness</i>	... the ability of an adaptation strategy to achieve its goal.
42. <i>Adaptation strategy efficiency</i>	... the ability of an adaptation strategy to use resources wisely.
43. <i>Adaptation strategy reliability</i>	... the ability of an adaptation strategy to work consistently.
44. <i>Adaptation strategy robustness</i>	... the ability of an adaptation strategy to withstand errors or setbacks.
45. <i>Adaptation strategy flexibility</i>	... the ability of an adaptation strategy to be modified as needed.
46. <i>Adaptation strategy scalability</i>	... the ability of an adaptation strategy to be applied to different situations.
47. <i>Adaptation strategy transferability</i>	... the ability of an adaptation strategy to be used in different contexts.
48. <i>Adaptation strategy replicability</i>	... the ability of an adaptation strategy to be repeated by others.
49. <i>Adaptation strategy sustainability</i>	... the ability of an adaptation strategy to be maintained over time.
50. <i>Adaptation strategy viability</i>	... the ability of an adaptation strategy to be successful in the long run.

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There are, of course, many other good UNIX books available.

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