

# Acorn Multimedia Expansion Unit User Guide



Acorn 



# Acorn Multimedia Expansion Unit

## User Guide



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## Guidelines for safe operation

The equipment described in this guide (the 'unit') is designed and manufactured to comply with international safety standards EN60950 (BS7002) and is intended for use only as a computer expansion unit. It must not be used for other purposes. It is most important that unpacking and operation 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 unit at a room temperature of +5°C to +35°C (+41° to +95° Fahrenheit) and a relative humidity of 20% to 80% (non-condensing). As a rough guide, if you feel much too hot, cold or humid, the conditions are probably too extreme for the unit as well.
- Avoid sudden extremes in temperature, exposure to direct sunlight, heat sources (e.g. electric fan heater) or rain.
- Make sure that the unit is standing on a suitable rigid horizontal flat surface, allowing enough space for air to circulate when it is in use.
- Ensure that any 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 the unit.
- 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 unit, and avoid bumping, jarring or dropping it in transit.
- Keep the plastic bags contained in the packaging away from children.
- Keep the plastic bags protecting the leads, but do not leave the leads in the plastic bags for long periods of time.
- If you're going to move the unit, make sure you park any hard disc heads first (if fitted).
- Switch off and unplug the unit from the power outlet on the wall at night, or if you're not going to use the unit for a few days.
- Switch off and unplug the unit and any accessories before opening the unit (e.g. to install an upgrade).
- The unit should be operated with the top cover (which also acts as a fire enclosure) secured, to ensure the correct airflow through the unit.
- DON'T attempt to open any display or monitor unit, whether supplied with the unit or not.
- DON'T drop the unit or subject it to excessive bumping and jarring.
- DON'T spill liquids on the unit. If liquid does spill, turn the unit off immediately and take it to your supplier for assessment.
- DON'T obstruct or poke objects through the ventilation openings in the unit casing or the power supply, or cover them with anything.
- DON'T balance any objects, or stand equipment weighing more than 16kg (33lbs) on top of this unit.

## Warning: this equipment must be earthed

If the plug supplied is not suitable for the power supply in your country, please consult your supplier.

### UK information

The mains lead supplied is already fitted with a moulded plug incorporating a 3A fuse. If it does not fit your socket-outlet, the plug should be removed from the mains lead **and safely disposed of**. The flexible cord insulation should then be stripped back as appropriate. A suitable alternative plug should then be fitted. If the replacement plug is intended to take a fuse, then a 3A fuse must be used. If you need to replace the fuse in the mains plug supplied, then you must use a 3A fuse ASTA-approved to BSI 362.

As the colours of the cores in the AC power lead of this unit may not correspond to the coloured markings identifying the terminals in your plug, proceed as follows:

- The core which is coloured green and yellow must be connected to the terminal in the plug which is coloured green and yellow, or is marked by the letter E or by the earth symbol
- The core which is coloured blue must be connected to the terminal that is coloured black or marked with the letter N.
- The core which is coloured brown must be connected to the terminal which is coloured red or marked with the letter L.

Never use mains plugs with the fuse carrier omitted. In the event of the loss of the fuse carrier, either replace with a carrier of the same type and manufacturer or replace the moulded plug with another mains plug, wired as detailed above.

## Guarantee (valid in UK only)

This equipment is guaranteed by Acorn Computers Limited ("ACORN") against mechanical and electrical defects subject to the conditions set out below.

### Note

Items which by their nature or design only have a restricted life are not guaranteed beyond such life.

### Period of validity

This guarantee shall be valid for a period of twelve (12) months from the date of purchase.

### Other conditions

- 1 This guarantee is personal to the original purchaser, is not transferable and shall not be valid unless the equipment was purchased from ACORN or from an approved ACORN supplier.
- 2 This guarantee will be invalidated if the equipment is misused or damaged or is modified in any way without the written consent of ACORN or if any original component or accessory has been replaced by any component or accessory of a type not recommended or approved by ACORN, or if operated other than in accordance with the *Multimedia Expansion Unit User Guide*.
- 3 Any claims made under this guarantee must whenever possible be made through the supplier from whom the equipment was originally purchased. If this is not possible a claim may be made to any other approved ACORN supplier appointed by ACORN to service the equipment (a list of whom can be supplied on application). This guarantee together with proof of the date of purchase must be produced when any claim is made. Any costs of carriage to and from the supplier must be paid by the purchaser.
- 4 If ACORN agrees with the supplier that the equipment should be forwarded to ACORN for repair then ACORN will arrange for collection and return of the equipment at no charge. In all other cases the supplier will be responsible for effecting any necessary repairs in accordance with ACORN's service policy. Any repairs under this guarantee will be carried out at no cost to the original purchaser.
- 5 If any equipment returned is found to comply with its original specification ACORN reserves the right to charge a reasonable fee for testing the equipment and for return carriage.
- 6 The liability of ACORN under this guarantee shall be limited to the cost of repair or complete replacement (at ACORN's discretion) of equipment which proves to be defective.
- 7 ACORN does not accept liability for any loss or damage during transit to or from the supplier or ACORN, but every effort will be made to investigate claims of loss or damage if these arise.

THIS GUARANTEE DOES NOT AFFECT OR PREJUDICE THE PURCHASER'S STATUTORY RIGHTS.

## Guarantee procedure

To claim under this guarantee, proof of date of purchase is required. This is provided by your copy of the invoice from the supplier from whom the equipment was originally purchased. Keep the invoice safe and produce it to support any claim you may make under this guarantee.

You may find it useful to make a note in the box below of the serial number, date of purchase and details of any upgrades fitted, and quote them in any correspondence.

Serial Number \_\_\_\_\_ Date of purchase \_\_\_\_\_

Upgrades \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Contents

## **Contents v**

### **About this Guide vii**

- What you should already know vii
- If you have problems vii
- Conventions vii

### **About the Multimedia Expansion Unit 1**

- Unpacking the Multimedia Expansion Unit 1
- Handling the Multimedia Expansion Unit 2
- Parts identification 2
- Hardware and firmware requirements 4

### **Installing the SCSI expansion card 5**

- Installing the standard expansion card (CAO06) 5
- Installing the mini expansion card (CAO08) 12

### **Configuring the Multimedia Expansion Unit 15**

- Connecting the Multimedia Expansion Unit to your computer 15

### **Configuring the computer 19**

- Configuring your RISC OS computer from the desktop 19
- Setting up PC Soft to read CD-ROM discs 20

### **Using Compact Discs 23**

- Handling Compact Discs 23
- Loading Compact Discs 23
- Ejecting a CD-ROM disc 24

### **Using CD-ROM discs 25**

- Using CDFS 25
- Reading PC-format CD-ROM discs using PC Soft 26

## **CDPlayer 29**

- The main CD Player window 30
- The Keypad window 30
- The Setup window 32
- Quitting CDPlayer 32

## **Expanding your system 33**

- More about SCSI 34
- Adding new SCSI devices 37

## **SCSIMgr 39**

- Security 39
- Installing and running SCSIMgr 40
- The Devices window 42
- The Partitions window 47
- The Drives window 50
- SCSIMgr Menu items 52
- Quitting the SCSIMgr application 54

## **SCSIDiag 55**

### **ChangeFSI 57**

- Using ChangeFSI 57
- ChangeFSI in more detail 58

## **Using the command line 63**

- SCSI \* Commands 63
- CDFS \* Commands 64
- Configuring SCSI drives from the command line 66
- Configuring CD-ROM drives from the command line 67
- Altering the default configuration of your system under PC Soft 68

## **Technical specification 69**

- Power Supply Unit (PSU) 69
- Operating temperature 69
- Audio specifications 69
- SCSI connectors 70

## **Troubleshooting guide 73**

## **Index 75**

# About this Guide

This Guide tells you how to install the Multimedia Expansion Unit, and — having done so — how to use both the unit itself and the software supplied with it. Information is provided in the sequence necessary to quickly get you up and operating.

Later chapters give you help on expanding your system, and on sorting out any problems you may have.

## What you should already know

Before reading this Guide, you should be familiar with the material in your computer's *Welcome Guide*. In particular you should already have a good idea of how the desktop operates, and you should have read the *Guidelines for safe operation* printed near the front of the *Welcome Guide*.

## If you have problems

If your computer starts behaving unexpectedly, or doesn't do anything at all, see both the chapter *If things go wrong* in the *Welcome Guide* (which has solutions to most common problems), and *Appendix C: Troubleshooting guide* on page 73 of this Guide.

## Conventions

### Typefaces

The following conventions are used in this guide:

- Menu names and options are shown in **bold** type; for example:  
Choose **SCSIDirCache** from the **Configure** submenu.
- Example commands are shown in Courier type; for example:  
`*Devices`

Since all characters are the same width in Courier, this makes it easier for you to tell where there should be spaces.

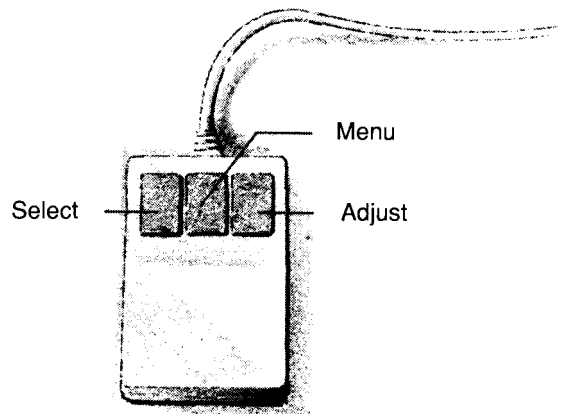
## Command syntax

Special symbols are used when defining the syntax for commands:

- Italics indicate that you must substitute an actual value. For example, *drive* means that you must supply an actual drive number.
- Braces indicate that the item enclosed is optional. For example, [K] shows that you may omit the letter K.
- A bar indicates an option. For example, 0 | 1 means that you must supply the value 0 or 1.

## The mouse

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



# About the Multimedia Expansion Unit

The Multimedia Expansion Unit is an expansion unit that is style-matched to an A4000 or A5000 computer, and that comes fitted with a single CD-ROM drive. CD-ROM discs are gaining popularity throughout the world as computer users in commerce, education and industry discover their potential for vast amounts of data storage, their audio/visual capabilities, and their convenient storage and handling. The combination of thousands of pages of text, images (both moving and still) and audio will help you discover a wealth of study, research and entertainment opportunities.

## Expanding your system

The Multimedia Expansion Unit has been designed to offer you complete flexibility for your future needs — it has built in expandability. You may install a further two SCSI devices in the Multimedia Expansion Unit: for example, a hard drive, a magneto-optical drive or perhaps a second CD-ROM drive. You can also connect additional SCSI devices, either as external cased units (similar to the Multimedia Expansion Unit), or possibly fitted inside your main computer unit. Audio capabilities have been built in, along with provision for installing a stereo power amplifier.

If you intend to expand your system, make sure you don't miss out the chapter *Expanding your system* on page 33, as it contains important advice and instructions.

## Unpacking the Multimedia Expansion Unit

The first thing you should do is to unpack your Multimedia Expansion Unit and check that all the components are present.

To use the Multimedia Expansion Unit your computer must have a compatible SCSI expansion card fitted. The Multimedia Expansion Unit is available with two different SCSI expansion cards, suitable for the two sizes of expansion card slots that Acorn computers have: either a standard sized one, or a mini sized one. Alternatively, should your computer already have a suitable SCSI expansion card fitted, you can purchase the Multimedia Expansion Unit without an expansion card. (However, you may need to upgrade the software fitted to your existing card; see *SCSI expansion cards* on page 4.) If you have any doubts, contact your supplier.

Verify that all of the following items are present:

- one Multimedia Expansion Unit
- one SCSI terminator block
- one CD caddy (which holds and protects the CD in the CD-ROM drive)
- one audio cable (also used to connect the Multimedia Expansion Unit to your computer)
- one mains lead.

Depending on the model you have purchased, you may also have been supplied in separate packaging with:

- one SCSI interface, numbered either CAO06 (a standard expansion card) or CAO08 (a mini expansion card)
- one SCSI interface cable, numbered MAC-50TP (used to connect the Multimedia Expansion Unit to the SCSI interface)
- one floppy disc of support software. If any of these items are missing, please contact your supplier immediately.

It is a good idea to keep the packaging the Multimedia Expansion Unit arrived in, just in case you have to store or ship it in the future.

## **Handling the Multimedia Expansion Unit**

The Multimedia Expansion Unit can be damaged if it is mishandled. You should handle it carefully, as dropping or sharply knocking the unit may result in optical misalignment and unreliable operation. Placing it in very hot, humid conditions may result in overheating and damage.

When moving the unit, always ensure that you have removed any CD caddies from its CD-ROM drive(s), otherwise you may damage the drives. For full safety information, see *Guidelines for safe operation* on page iii.

## **Parts identification**

To familiarise yourself with the Multimedia Expansion Unit, please take a moment to study the diagrams opposite. You will be connecting cables to and perhaps changing settings on the box, so it will be helpful to know where everything is.

Note that some of the parts fitted to the Multimedia Expansion Unit do not have any function on the basic unit, but are fitted ready for use by upgrades. In particular, the CD2 line out phono sockets are only used if you fit a second CD-ROM drive, and the Hard disc drive LED is only used if you fit a drive that does not have its own LED fitted to its front panel (as the standard CD-ROM drive does).



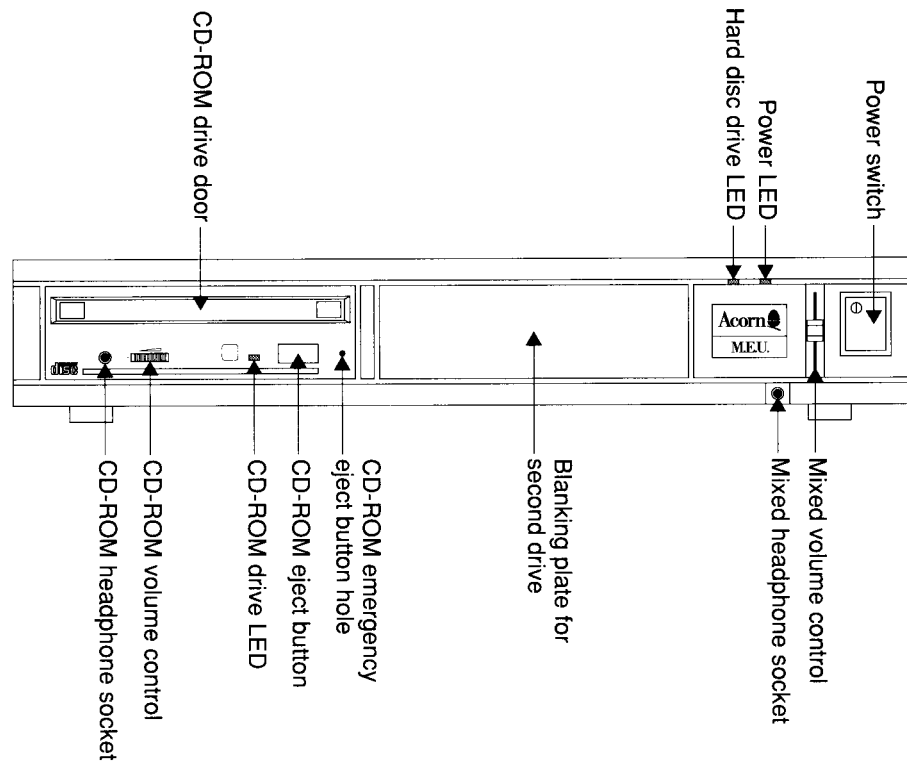


Figure 1.1 Multimedia Expansion Unit front panel

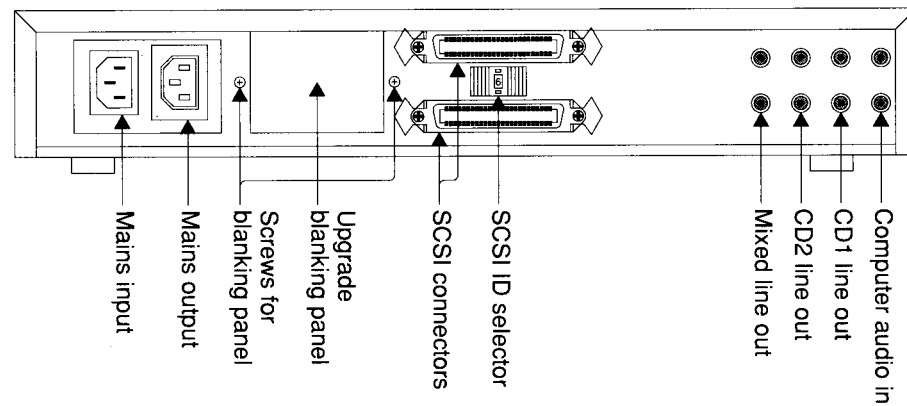


Figure 1.2 Multimedia Expansion Unit rear panel

## Hardware and firmware requirements

### Computers

The Multimedia Expansion Unit will work with any computer that is fitted with RISC OS 3 or later, and that has a SCSI interface. As noted above, expansion cards are available with the unit – both in standard and mini sizes – so you can add a SCSI interface to your computer.

If you need to upgrade your version of RISC OS, a good time to do so is while fitting the SCSI expansion card, since you need to open your computer to do either.

Computers fitted with a mini expansion card SCSI interface can read or write only 8 bits at a time; this is a restriction imposed by the computer's connector for the expansion card, which does not have enough pins to pass 16 bits of data at a time to the card.

Archimedes 300 or 400 series computers were supplied fitted with a MEMCI memory controller chip. If you have not already upgraded this chip to a MEMC1A, you might like to consider doing so, as you will get much faster data transfer rates. (With a MEMC1, the computer can read or write only 8 bits at a time, whereas with a MEMC1A it can transfer 16 bits at a time.)

### SCSI expansion cards

You may have bought the Multimedia Expansion Unit without a SCSI expansion card, because your computer already has one fitted. To use the CD-ROM drive, your SCSI expansion card must contain version 2.13 or above of the CDFS (Compact Disc Filing System) software. To find out, type at the command line:

```
*Help CDFS
```

You will either get a message giving the version number of CDFS fitted to your SCSI expansion card, or the message 'No help found' if CDFS is not present at all. If you do not have a sufficiently recent version of CDFS, you should contact your computer supplier.

If you already have a SCSI expansion card fitted, you can obviously skip the next chapter (Installing *the SCSI expansion card*), and should move on to *Configuring the Multimedia Expansion Unit* on page 15.

## 2

# Installing the SCSI expansion card

This chapter tells you how to fit the two types of SCSI expansion card that are optionally supplied with the Multimedia Expansion Unit: a standard expansion card (below), or a mini expansion card (page 12).

### Installing the standard expansion card (CAO06)

The CAO06 SCSI expansion card can be used with the Acorn Archimedes 300, 400 and 540 series of computers, with all R-series computers (e.g. the R260), and with the A5000. Using it you can attach a selection of SCSI devices without further modification

In order to fit the expansion card you will have to remove the cover of the computer unit and one of the blanking plates at the rear of the machine. The only tools you will require for this are No. 1 and No. 2 Pozidriv screwdrivers.

If you do not feel confident about carrying out this installation, take the expansion card and your computer to your supplier who will fit the card for you. A charge may be levied by the supplier for installing the expansion card; such a charge shall be entirely at the discretion of the supplier concerned.

### Disassemble the computer



Before removing the top cover of the computer

- 1 switch off the computer
- 2 remove the power lead from the wall socket.

Do not reconnect the power lead to the wall socket until you have replaced the cover of the computer.

Do not make any adjustments inside the computer while the power lead is connected to the wall socket.

**Important!** To protect the expansion card from static electricity

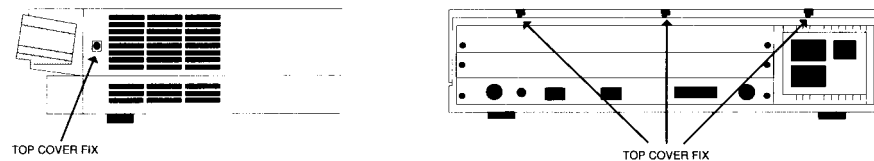
- handle the card as little as possible, preferably by the edges
- avoid touching components or the connector.

## Preparation

For systems fitted with a hard disc drive, make sure that the drive heads are parked before attempting to move or otherwise disturb the unit. To do this, choose **Shutdown** from the Task manager menu.

## Acorn Archimedes and R-series

- 1 Switch off the computer at the rear and disconnect it from the mains supply by unplugging the power supply cable. Unplug any peripherals that are attached and remove them from the computer completely.
- 2 Locate the screws holding the top cover in place (see *Figure 2.1 The screws holding the top case*). Remove the three screws at the top rear of the computer, then remove the single screw located on each side of the unit, towards the front.



*Figure 2.1 The screws holding the top case*

- 3 Once you have removed the three rear screws and the two side screws, slide the cover to the rear of the computer, then remove it completely. Slightly spring the sides of the lid outwards, if necessary, to make it easier to slide.
- 4 Check that a backplane is fitted to the computer. The backplane consists of a small printed circuit board mounted vertically on the main PCB. If the backplane is not fitted, you will have to purchase one and install it, according to the instructions which are supplied with the backplane, before you can continue with the installation of the expansion card.

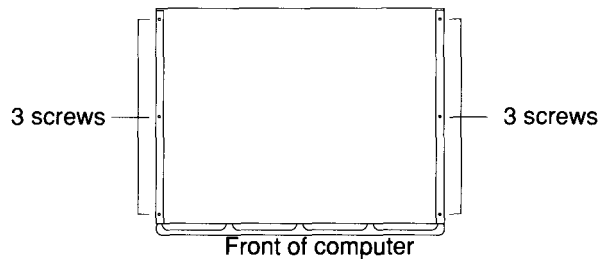
The standard backplane fitted to the Archimedes 400 series and the R140 can take up to four single-width or two double-width expansion cards. The optional backplane fitted to the Archimedes 300 series can take up to two single-width or two double-width expansion cards (provided the latter require no more than one interface connector each).

- 5 If a backplane is fitted, but has no expansion card socket free, you will have to remove one of the expansion cards in order to install a new one.

You can now fit the expansion card; go to *Fit the expansion card* on page 8.

## A5000

- 1 Switch off and disconnect the computer from the mains supply, then switch off and disconnect all peripherals (including the keyboard).
- 2 Place the computer on a work surface with a clean, soft covering like a woollen blanket (**not** synthetic) or a piece of cardboard and turn it over so that it rests on its top cover.
- 3 Remove all six screws holding the metal cover in place (see *Figure 2.2 A 5000 top cover fixing screws*). Store them somewhere safe.
- 4 Rest the computer on its base again and slide the cover back towards the rear of the computer (see *Figure 2.3 Removing the top cover*). Remove the cover completely.
- 5 Some models of the A5000 have an EMC case shield which fits over the inner case (see *Figure 2.4 Removing the EMC shield*). To remove this, unscrew the five fixing screws on the righthand side of the computer, as seen from the rear. The shield has interleaved tabs which fit around the edges of the case. Slide the shield off the computer carefully; there is a hole on the top to help you slide the shield off by inserting a screwdriver.



*Figure 2.2 A 5000 top cover fixing screws*

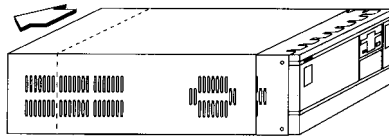


Figure 2.3 Removing the top cover

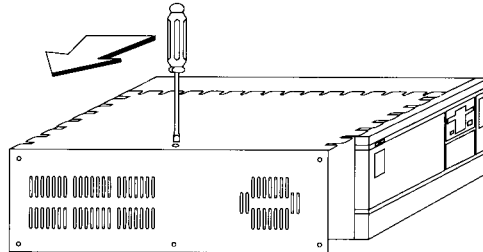


Figure 2.4 Removing the EMC shield

The standard backplane fitted to the A5000 can take up to four single-width or two double-width expansion cards.

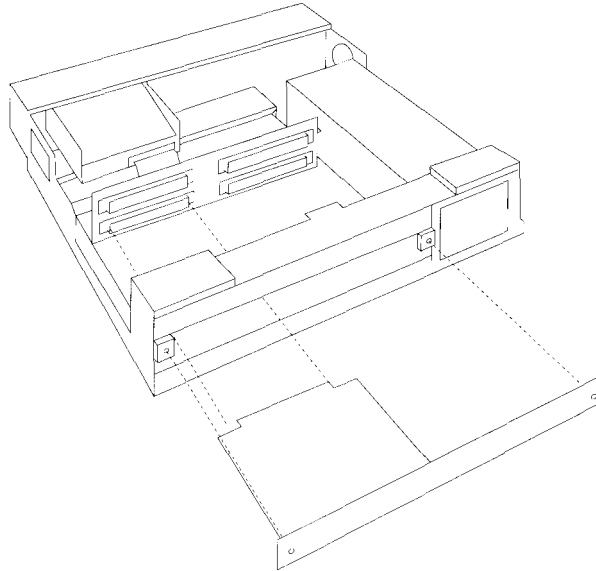
### Fit the expansion card

**Warning:** Some components on expansion cards can be damaged by static electricity. Avoid touching components on the card.

The backplane has upper and lower expansion card slots. These correspond to the two full-width blanking plates fitted to the back of an unexpanded machine. Each blanking plate is held in place by screws, one at each end.

- 1 Choose the expansion card slot you are going to use, and remove the corresponding blanking plate by unscrewing the two screws holding the plate in position.
- 2 Use the supplied blanking plate, T-piece and two screws to make the expansion card up to the full width of the machine (unless of course there is already another expansion card in the computer alongside filling the gap).

- 3 Once you have made the expansion card backplate up to the correct width/ you can install it into the computer. *Figure 2.5 Fitting an expansion card into the lower slot (Archimedes)* shows an expansion card fitting into one of the positions in the computer. The illustration shows an Archimedes computer, but the same principle applies for A5000:



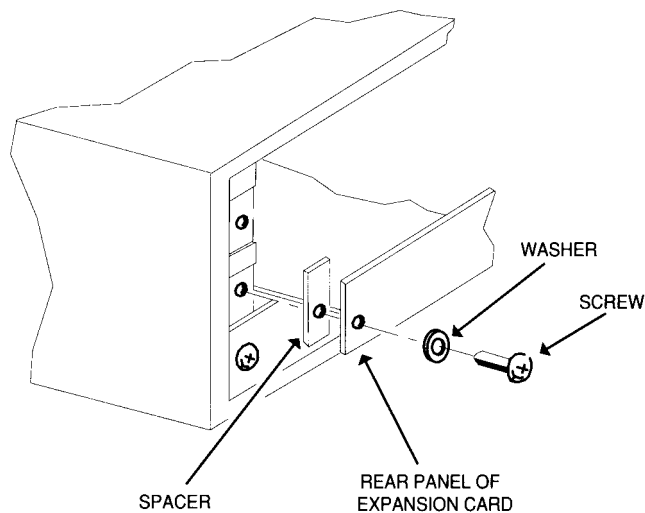
*Figure 2.5 Fitting an expansion card into the lower slot (Archimedes)*

- 4 To fit the expansion card, support the backplane firmly with one hand and push the connector on the card into one of the sockets on the backplane. The connector should be securely seated, i.e. the rear plate of the expansion card should be flush with the rear of the computer case. It is important that you offer the expansion card up to the backplane at right angles to it and that you align the connectors; otherwise, you may bend the pins or break or disconnect the backplane itself. It does not require great force to install the expansion card correctly. If the expansion card will not seat easily, remove the expansion card and try again.

When you have fitted an expansion card to your computer, the backplane should be in a vertical position, assuming that the expansion card is fully inserted and screwed into the rear of the computer.

For some combinations of Archimedes and R-Series machines and expansion cards, however, the top of the backplane may appear to 'lean' towards the front of the machine.

If this is the case, you must insert the two spacers found in this package. Each spacer should be inserted between the internal face of the expansion card backplate and the metal clips on the rear plastic moulding of the machine, so that the fixing screws pass through both the backplate and the spacers (see *Figure 2.6 Fitting spacers to the expansion card backplate*). This should result in the external face of the expansion card backplate panel being flush with the rear plastic moulding.



*Figure 2.6 Fitting spacers to the expansion card backplate*



When you have done this, you may need to straighten the backplane, to ensure that the connectors are correctly mated. To do this, take the following steps:

- 1 Slacken off the two screws fixing the backplane support metalwork to the base metalwork and power supply.
- 2 Holding the expansion card stationary, ease the backplane towards a vertical position until the faces of the interlocking connectors on the expansion card and backplane are touching.
- 3 Retighten the two screws slackened earlier.

[f you do not require the two spacers, simply secure the expansion card to the rear of the computer case by inserting a screw at each end of the expansion card backplate.

### **Reassemble the computer**

Once the expansion card has been correctly installed, replace the top cover of the computer, following the disassembly instructions in the reverse order.

The expansion card has now been installed.

### **Test the card is correctly installed**

When you have completed reassembly, set up the computer as shown in the *Welcome Guide*, and switch on the monitor. When the monitor has warmed up, switch on the computer.

Check that you have correctly installed the upgrade, by pressing F12 to get to the command line, then typing

```
Podules
```

If the card has been correctly installed, the message CDFS & SCSI Expansion Card (or similar) will be displayed. Press Return to get back to the Desktop. If the message did not appear, shut down and switch off the computer, remove the cover and check that the card has been correctly installed. Reassemble and re-test. If the computer still does not acknowledge the presence of the expansion card, switch it off and consult your supplier.

## Installing the mini expansion card (CAO08)

The CAO08 SCSI expansion card can be used with the A3000, A3010, A3020 and A4000 computers. Using it you can attach a selection of SCSI devices without further modification.

### A3000

The CA 008/A SCSI expansion card is intended to be fitted to BBC A3000 computers by an Acorn Authorised Dealer, who will install and test the card. A charge may be levied by the dealer for installing the card; such a charge shall be entirely at the discretion of the dealer concerned. This card and your Acorn A3000 computer (both in their original packaging) should be taken to an Acorn Authorised Dealer for installation.

### A3010, A3020 and A4000

Instructions are included for fitting the expansion card to these computers. If you do not feel confident about fitting it yourself, take the card and your computer (in its original packaging) to an Acorn Authorised Dealer, who will install and test the card. A charge may be levied by the dealer for installing the card; such a charge shall be entirely at the discretion of the dealer concerned.

Acorn Computers Limited cannot accept any liability for damage done to the product during installation of internal upgrades, whether or not carried out in accordance with the instructions in this document.

## Disassemble the computer



Before removing the top plastic cover of the computer

- 1 switch off the computer
- 2 remove the power lead from the wall socket.

Do not reconnect the power lead to the wall socket until you have replaced the cover of the computer.

Do not make any adjustments inside the computer while the power lead is connected to the wall socket.

**Under no circumstances should you separate the top and bottom halves of the internal metal safety case of A3010 and A3020 computers. This case lies underneath the keyboard and contains hazardous voltages.**

To remove the top cover and locate the internal expansion card connector, follow the instructions in *Appendix E: Inside the computer* in the *Welcome Guide*.

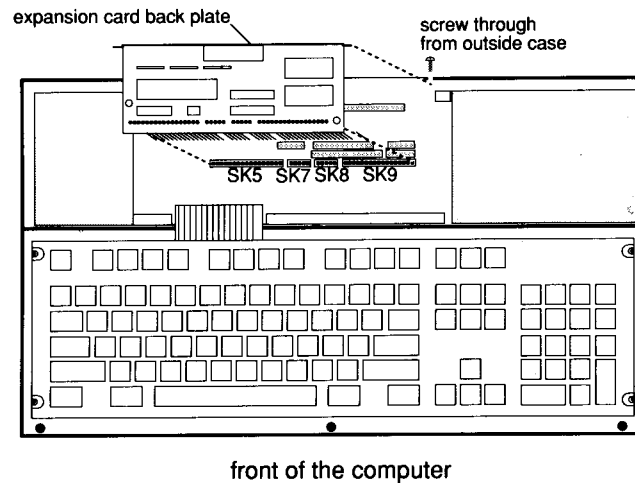


Note that the only screws you need to unscrew to remove the top cover of A3010 and A3020 computers are those marked with the symbol shown here.

Remove the plastic and metal blanking panels shown in the *Welcome Guide*. Keep these safe, in case you want to remove the upgrade in the future.

### Fit the expansion card

- 1 Remove the expansion card from its packaging. Be careful to avoid touching the pins.
- 2 Check that all pins are straight. If any appear crooked or splayed, please contact your supplier.
- 3 Offer the expansion card up to the computer as shown in *Figure 2.1 Fitting the expansion card into an A3010*. The diagram shows an A3010, but the A3020 is very similar in appearance, and the same principle applies to the A4000. The connector pins on the card fit into the sockets SK5 SK7, SK8 and SK9 (the four computer expansion card sockets shown in the *Welcome Guide*).



*Figure 2.1 Fitting the expansion card into an A3010*

The expansion card back plate fits inside both the plastic outer case and the metal lining of the computer, so that the fixing screws will pass through the holes in the case, and screw into the threads on the card back panel.

- 4 Locate the pins on the card carefully in the sockets on the computer, then press the expansion card firmly down to make the connection.
- 5 Secure the card by screwing the two fixing screws through the rear of the computer's case and into the threaded holes in the expansion card.

## Reassemble the computer

Reassembly is explained in *Appendix E: Inside the computer* in the *Welcome Guide*.

## Test the card is correctly installed

When you have completed reassembly, set up the computer as shown in the *Welcome Guide*, and switch on the monitor. When the monitor has warmed up, switch on the computer.

Check that you have correctly installed the upgrade, by pressing F12 to get to the command line, then typing

Podules

If the card has been correctly installed, the message CDFS & SCSI Expansion Card (or similar) will be displayed. Press Return to get back to the Desktop. If the message did not appear, shut down and switch off the computer, remove the cover and check that the card has been correctly installed. Reassemble and re-test. [f the computer still does not acknowledge the presence of the expansion card, switch it off and consult your supplier.

# 3

## Configuring the Multimedia Expansion Unit

This chapter tells you how to connect the Multimedia Expansion Unit to your computer, in its basic configuration with a single CD-ROM drive fitted. The simple instructions below assume that your computer has no SCSI devices fitted to it apart from those (if any) with which it was supplied, such as the internal hard disc fitted to the A540 and R200 series.

You should read the more detailed instructions in *Expanding your system* on page 33 if:

- you wish to configure and connect further SCSI devices, including any that you may have added to the spare drive bays in the Multimedia Expansion Unit
- you have already added SCSI devices to your computer
- you have altered the SCSI ID of any devices supplied as standard with your computer (e.g. by moving jumpers on the internal hard disc fitted to the A540 and 8200 series.)

You should also see the instructions supplied with your other SCSI devices.

### Connecting the Multimedia Expansion Unit to your computer

#### Position the Multimedia Expansion Unit

The Multimedia Expansion Unit is designed to be stacked. **It can support a maximum weight of 16kg**, which should be spread evenly over its top rather than be concentrated in a small area. If you do stack it, ensure that everything is stable.

You don't have to stack the Multimedia Expansion Unit, and can instead place it wherever is convenient in the space you have available. Don't forget you'll need to have access to the CD drive and controls!

Our recommendations are:

### **A5000 and A4000**

Place the Multimedia Expansion Unit and monitor on top of the computer unit (as shown on this guide's cover).

### **Acorn Archimedes and R-series**

Stack the Multimedia Expansion Unit and computer unit in whichever order is most convenient; then place the monitor on top of the stack. Ensure there is no more than 16kg on top of the Multimedia Expansion Unit, and no more than 15kg on top of the computer unit. As a guideline, if you're using a standard 14" colour monitor this shouldn't be a problem, but if you're using a larger monitor its weight may be too much for you to stack all three units.

### **Other computers**

You can use the Multimedia Expansion Unit as a monitor stand, provided again that the monitor weight does not exceed 16kg.

## **Connecting and configuring the Multimedia Expansion Unit**

The first thing you must do is to connect the Multimedia Expansion Unit to your computer, and ensure that it is correctly configured:

- 1 Ensure that power to the computer is turned off.
- 2 Locate the SCSI [D selector on the rear of the Multimedia Expansion Unit and check the number shown is correct; it should be 6. If you need to change the ID, push one of the buttons on the selector: one increases the number, the other decreases it.
- 3 Connect one end of the SCSI interface cable (numbered MAC-50TP) to the external SCSI port on the interface card, and the other end of the cable to either of the SCSI connectors on the back of the Multimedia Expansion Unit.
- 4 Plug the terminator block into the other SCSI connector at the rear of the Multimedia Expansion Unit.

## **Connecting the audio signals**

The Multimedia Expansion Unit has a preamplifier which mixes the sound from its CD-ROM drive(s) with the computer's sound. This mixed sound is output to two sockets: a stereo jack socket on the front of the unit (suitable for use with headphones, mini speakers or speakers in the monitor), and a pair of phono sockets on the rear of the unit (suitable for use with an amplifier or speakers with a built-in amplifier). The slider control on the front panel alters the volume output through both these sockets.

Using these sockets you can easily connect a single pair of headphones and/or a stereo system to the sound from all your equipment:

- 1 Push the 3.5mm stereo jack plug on one end of the audio lead into the headphones 32Ohm socket on the back of the computer. Push the two phono plugs on the other end of the cable into the two Computer Audio In sockets on the rear of the Multimedia Expansion Unit, using the red plug for the Right channel, and the other plug for the Left channel.
- 2 If you are using headphones, mini speakers or speakers in the monitor, plug their connecting lead into the stereo jack socket below the Acorn logo on the front of the Multimedia Expansion Unit.  
  
[If you are using an amplifier or speakers with a built-in amplifier, connect these to the Mixed Line Out (Variable) pair of phono sockets on the rear of the Multimedia Expansion Unit.]

A stereo power amplifier upgrade is available for your Multimedia Expansion Unit, enabling you to connect speakers directly to it. See your supplier for details.

Note that each CD-ROM drive also has an individual headphone socket and volume control on its front panel, and a stereo pair of Line Out phono sockets on the rear panel of the unit.

### **Plugging in and switching on the Multimedia Expansion Unit**

Finally:

- 1 Connect the power lead to the Multimedia Expansion Unit and to a power outlet on the wall.
- 2 Switch on the mains supply for the Multimedia Expansion Unit (at the mains outlet on the wall).
- 3 Turn the Multimedia Expansion Unit on by pressing the ON/OFF switch on the front.
- 4 Turn on the rest of your system as usual. (If you're unsure what's the best order in which to do this, see your computer's *Welcome Guide*.)





# 4 Configuring the computer

The CD-ROM Filing System (CDFS) enables you to access data on a CD-ROM from the RISC OS desktop. It is resident in a ROM on your SCSI expansion card, and is loaded automatically when you power on your computer. The CDFS icon bar menu enables you to configure your computer to suit the CD-ROM system attached to it.

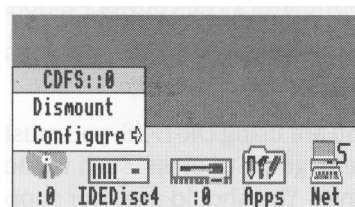
This chapter tells you how to configure your computer so that you can use CD-ROMs; you only need to do so when adding or removing drives.

For details of how to use CDFS once you have configured it, see *Using CD-ROM discs* on page 25.

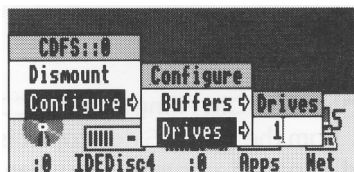
## Configuring your RISC OS computer from the desktop

To ensure the fastest boot up time, the following procedure should be followed:

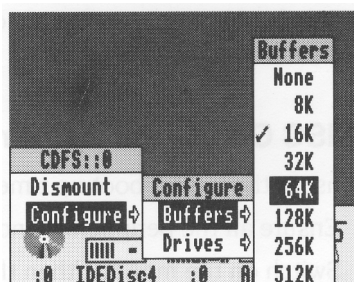
- 1 Ensure all the peripherals and cables are connected.
- 2 Switch on the monitor, then the CD-ROM drive. The CD-ROM drive should always be switched on before the computer.
- 3 Switch on the computer. CDFS will look to see if a CD-ROM drive is connected.
- 4 The CD-ROM icon will be displayed on the Icon Bar.
- 5 To configure the number of CD-ROM drives you have attached to your computer, click Menu on the CD-ROM icon. The CDFS icon bar menu will be displayed:



- 6 Choose **Configure, Drives** then enter the number of drives connected. If only one drive is connected, this step may be left out, but the boot-up time will be slower:



- 7 To configure the CD-ROM buffers, click Menu on the CD-ROM icon. Choose **Configure, Buffers** then click on the required buffer size – 16K is normally sufficient, unless you are swapping discs a lot, in which case 32K or 64K would be better:



- 8 Reset the computer to implement the new configuration.

## Setting up PC Soft to read CD-ROM discs

Many CD-ROM titles are written in PC format, so to get the best out of these, PC Soft should be used in the computer. (PC Soft used to be known as the Acorn PC Emulator.) The copy of PC Soft you use must be version 1.6 or later.

If you are using MS-DOS, you must have version 3.3 or higher, with CD-ROM extensions.

If you are using DR-DOS, you must have a version with CD-ROM extensions. At the time of going to press, such versions were not yet available – but this is likely to change. You should see your supplier for details of DR-DOS compatibility, availability, and installation.

## Loading PC Soft

Load PC Soft as instructed in the *PC Soft Guide* accompanying it.

Set the configuration of the emulated PC, using the **Configure** option from the PC icon bar menu. Choose EGA and ECD for titles using this screen mode, with 128K of memory for computers with 2MB of RAM, and 256K for those with more RAM. Choose VGA for titles using this screen mode. (Versions 1.6 and 1.7 do not support VGA, but you can choose EGA+ for a partial emulation of VGA mode.)

By default, the CD-ROM drive will be configured as drive F. Additional drives will be named G, H and so on. However, if you have four hard disc drives configured (drives C-F) then the CD-ROM drive will install itself as drive G, and additional drives follow on from there.

Now run PC Soft. Switch to **Single task** mode (from the icon bar menu) to be able to display a full screen, and for faster response.

## Loading the MS-DOS CD-ROM support software

PC Soft (version 1.6 or later) when sold with MS-DOS is accompanied by a CD-ROM Support disc. The software on this disc enables you to access the CD-ROM drive while you are running DOS.

The software has its own installation program, to make it easy for you to install it on your computer. This program alters your DOS AUTOEXEC.BAT and CONFIG.SYS files and copies Microsoft MS-DOS CD-ROM extensions and the CD-ROM device driver.

If you usually boot DOS from a floppy disc, you first need to format a new system floppy disc on which to install the software. To do this, put a floppy disc in the drive and type:

```
FORMAT A: /S
```

When the format completes, remove this disc from the drive.

To install the software, put the disc labelled CD-ROM *Support disc* into the drive. Type:

```
A:
INSTALL
```

This starts the installation program. Follow the instructions given on the screen.

When prompted for a drive letter on which to install this software:

- If you boot DOS from a floppy disc, type A. When the installation program prompts for your boot disc, insert the newly-formatted system disc, and press Space. When you are prompted to insert the disc containing MSCDEX.EXE, put the CD-ROM *Support disc* back in the drive.
- If you boot DOS from a hard disc, type the hard disc drive letter (typically C).

When the installation program has finished, reboot DOS from your hard disc, if you have one, or else put your newly-created system disc back in the drive and hold down Ctrl and Alt and press Delete to do this.

During the reboot cycle a message should be displayed on the screen similar to the following:

```
MSCDEX Version 2.20
Copyright © Microsoft Corp. 1986
Drive F: = Driver CDFSEM unit 0
```

This indicates that the driver is loaded and the CD-ROM drive has been allocated the letter F: for access purposes from DOS.

Your computer will now behave like a PC with a CD-ROM drive attached. There is a summary of common PC commands in the *PC Soft Guide*.

### **Recommended changes to configuration files**

We recommend that you check that the following statements exist in the CONFIG.SYS and AUTOEXEC.BAT files and amend or add them as necessary as some DOS formatted CD-ROM discs require these settings before they can be used.

In the CONFIG.SYS file we recommend you add these lines:

```
FILES=20
BUFFERS=20
```

In the AUTOEXEC.BAT file your PATH should include the pathnames below, in the order given:

```
PATH=C:\;C:\DOS;F:\           (Hard drive users.)
PATH=A:\;A:\DOS;F:\           (Floppy drive users.)
```

Of course, your PATH may also include other pathnames you have previously added.

# 5 Using Compact Discs

**B**efore you use Compact Discs (or CDs), you will need to know how to load them into the CD *caddy*. The caddy holds the CDs in the correct position within the CD-ROM drive, and protects them from damage. Extra caddies are available from your supplier.

## Handling Compact Discs

Treat your Compact Discs with as much respect as you would give to a vinyl record. Handle CDs by the edge to avoid fingerprints. A very dirty CD will not operate properly. Generally, you should not have to clean a CD, but if you do, follow the instructions in *Appendix C: Troubleshooting guide* on page 73.

## Loading Compact Discs

To use a Compact Disc with the CD-ROM drive you must first place the CD into the CD caddy. The CD caddy is then inserted into the drive.

- 1 To open the caddy apply pressure as shown in the following diagram and lift the plastic lid. Place the CD into the caddy with the label side up.

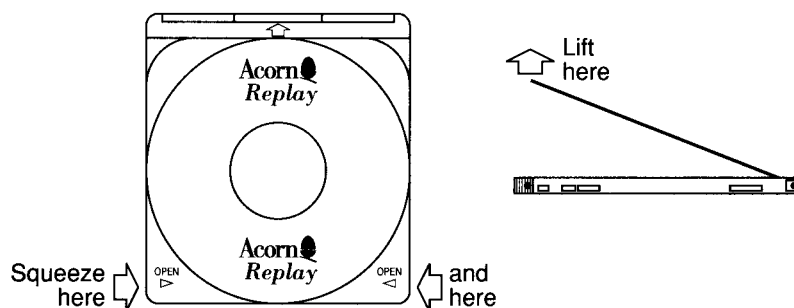


Figure 5.1 Using a disc caddy

When you have inserted a CD into the caddy, close the lid. You will hear and feel it snap into place. When you have closed the lid you should be able to see the CD's label.

- 2 Insert the caddy into the CD-ROM drive, making sure that the caddy is top side up (you can read the CD's label) with the arrow on the caddy pointing towards the drive. As you slowly push the caddy into the drive you will feel a little

resistance about three quarters of the way in. Keep applying pressure until the caddy clicks into the drive (just like pushing a 3 ½" disc into a floppy disc drive).

- 3 When the caddy is inserted you will see an amber light on the front of the drive flicker for a few moments. This indicates that the drive is focusing on the CD. If it fails to recognise the CD the mechanism will automatically eject the caddy.

## **Ejecting a CD-ROM disc**

When you have finished using the CD-ROM and you have quit the CD-ROM, software, simply dismount and eject the CD caddy like a floppy disc by pressing the eject button on the front of the drive. Alternatively you can type `*Eject` from the Command line when in CDFS.

The CD-ROM drive will eject the caddy about one third of the way out, and you can then remove it. The CD should be stored either in the box in which it was supplied, or it should be left in the caddy. If you are transporting the CD please return it to the case in which it was supplied.

If the eject mechanism appears to fail, the drive may have been locked using the `*Lock` command. To cancel this, use the command:

```
*CDFS:Unlock
```

If the disc still won't eject, as a last resort firmly push one end of a large paper clip into the emergency eject button hole on the front of the CD-ROM drive; the caddy will be ejected.

## 6

# Using CD-ROM discs

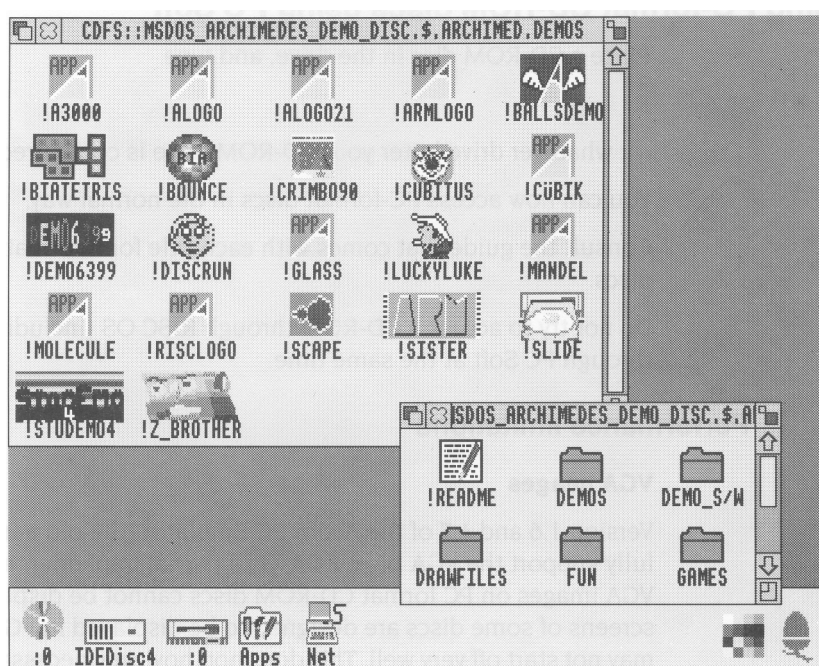


The CD-ROM drive in the Multimedia Expansion Unit can be used with CD-ROM discs formatted for use with RISC OS, or with CD-ROM discs produced to run under MS-DOS. For the latter, you will need a copy of PC Soft to get full benefit.

## Using CDFS

CDFS appears to the user very much like ADFS — all the usual RISC OS Filer commands are available, although you cannot of course **save** to a CD-ROM. If a write command is made to the CD-ROM drive, an error message will be displayed.

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



RISC OS directory displays can be opened for PC CD-ROMs. PC file names are translated to a format compatible with the RISC OS environment. You can view text files using Edit in the same way as usual, and use ChangeFSI (see page 57) to convert a wide range of graphics images to RISC OS sprites, which you can then view using Paint. However, to run the programs included on such discs, you will need to use PC Soft (see *Reading PC-format CD-ROM discs using PC Soft* below).

### If you are not using CDFS

CDFS claims some memory each time you power on your computer. If you are not using CDFS and need this extra memory, you can disable CDFS by typing

```
*Unplug CDFS
*Unplug CDFSDriver
*Unplug CDFSFileer
```

and then resetting your computer. When you need CDFS again, you can reinstall the three modules by using \*RMReInit for each one in a similar way, and then rebooting.

## Reading PC-format CD-ROM discs using PC Soft

Place a CD-ROM disc in the drive, and type

F:

(or whatever drive letter your CD-ROM drive is configured as).

You can now access PC-format discs in the normal way.

Consult the guide that comes with each title for information on playing CD-ROM discs.

Do not try to access a CD-ROM through RISC OS (including via CDPlayer) and through PC Soft at the same time.

### Performance limitations

#### VGA images

Version 1.6 and 1.7 of the Acorn PC Emulator (the old name for PC Soft) do not fully support the VGA Bios. EGA+ is a partial implementation of VGA, but some VGA images on PC format CD-ROM discs cannot be displayed fully. The title screens of some discs are designed to be displayed in VGA mode, so such discs may not start off very well. This does not, however, necessarily mean that the rest of



the disc cannot be read correctly. Often the application will continue of its own accord, or require Space or Return to be pressed. In some cases the lack of VGA support will prevent the disc from running under the emulator at all.

Version 1.8 of PC Soft does support VGA.

### **Sound**

Titles which attempt to play sound through the computer's own sound system can cause program errors, unless you first configure sound in the program to be off. Most titles are able to play CD-quality sound through the CD-ROM drive, so this problem does not often arise.

### **Windows**

Certain CD-ROM applications contain their own version of Windows on the CD-ROM itself. These versions have often been modified in some way, and do not always work correctly. We recommend that you do not use a version of Windows supplied on CD-ROM, but an appropriate Windows application available separately from a PC dealer.

Note that Windows 3.1 will **not** run under PC Soft.

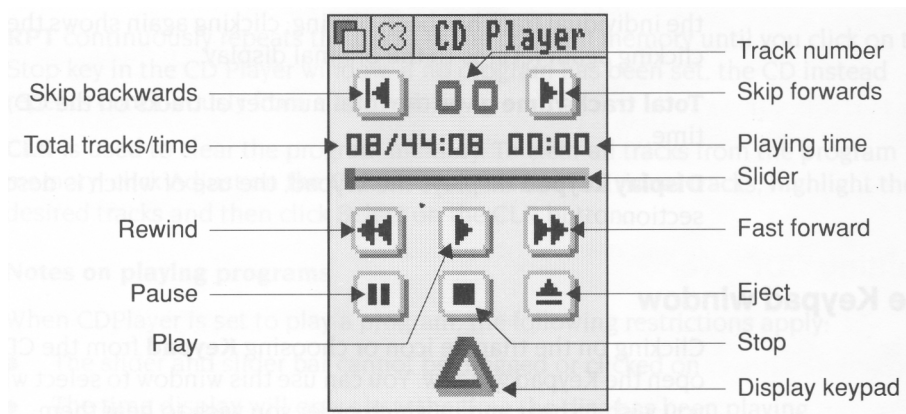




The CDPlayer application allows you to play and control audio CDs using your computer and a CD-ROM drive, such as that in the Multimedia Expansion Unit. CDPlayer is supplied on the Support Disc, and is already set up to use the CD\_ROM drive fitted to the Multimedia Expansion Unit. If you have changed its SCSI ID from the default of 6, or if you wish to use any other CD-ROM drives, you should first read *The Setup window* on page 32.

CDPlayer simulates all the functions of a CD audio player with all the normal functions such as play, stop, track search, cue and review. It also has a very comprehensive programming facility. All the functions, including drive select, are controlled using the mouse.

To start the application, double-click on the CDPlayer icon; this loads the program and displays its icon on the icon bar. Click on its icon to display the main CD Player window, used to control the CD:



## The main CD Player window

The basic set of controls work in the same way as those of a conventional audio CD player.

**Play** starts the audio CD playing.

**Pause** stops the CD playing, but holds it in its current position.

**Stop** stops the CD playing, and returns to the start of the CD.

**Eject** stops the CD and ejects it from the CD player.

**Skip backwards** and **Skip forwards** move to the previous or next tracks respectively.

**Rewind** and **Fast forward** move backwards or forwards through the audio track, speeding up as you hold down the button.

Moving the **Slider** takes you quickly to any point on the CD.

**Track number** shows the number of the track currently playing, or (as above) **00** if nothing is playing.

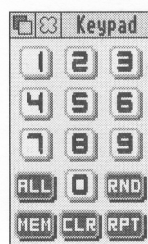
**Playing time** gives you three choices of display. It normally shows the time the disc has been playing. Clicking on this number changes the display to show the time the individual track has been playing; clicking again shows the time left on the disc; clicking again returns to the original display.

**Total tracks/time** gives the total number of tracks on the CD, and its total playing time.

**Display keypad** displays the keypad, the use of which is described in the next section.

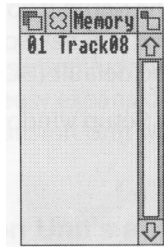
## The Keypad window

Clicking on the triangle icon or choosing **Keypad** from the CD Player menu will open the Keypad window. You can use this window to select which tracks on the CD you wish to hear and in which order you wish to hear them:



### To program the player to play a selection of tracks

- 1 Click on the first track number you wish to hear, and then on MEM. The **Memory** window automatically appears, showing the tracks in the *program memory*:



- 2 Repeat this for any other tracks you wish to add to the program memory.
- 3 Play the tracks by clicking on Play.

### Other program play functions

**ALL** adds a list of all the audio tracks available on the CD to the program memory.

**RND** clears the program memory, and creates a randomly ordered list of all the audio tracks to the program memory.

**RPT** continuously repeats the tracks in the program memory until you click on the Stop key in the CD Player window. If no program has been set, the CD instead repeats continuously from start to finish.

**CLR** is used to clear the program memory. To clear all tracks from the program memory, click Adjust on the CLR button. To clear individual tracks, highlight the desired tracks and then click Select on the CLR button.

### Notes on playing programs

When CDPlayer is set to play a program, the following restrictions apply:

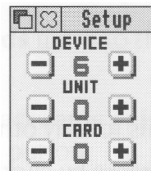
- The slider and slider bar cannot be dragged or clicked on.
- The time display will only show the time the disc has been playing.
- The main CD Player window must be open to allow the programmed tracks to be played.

When playing a mixed mode CD (mixed audio and data tracks), using the **ALL** button guarantees that all the audio tracks will be played, otherwise the drive will normally stop when it encounters a data track, even if there are subsequent audio tracks.

## The Setup window

Each CDPlayer can be used to control a single CD-ROM drive at one time, which is selected using the **Setup** window. However, CDPlayer is supplied already set up to use the Multimedia Expansion Unit in its default configuration, so you'll only need to change the Setup if you are using more than one CD-ROM drive and/or SCSI interface, or if you have changed the configuration of your Multimedia Expansion Unit from the default (SCSI device 6, LUN 0, card number 0).

To open the Setup window, choose **Setup** from CDPlayer's icon bar menu:



Click on the + and - icons until the correct device, unit and card numbers are shown for the CD-ROM drive you wish to use. If you're not sure what the numbers should be for a particular drive, you can find them out using the Devices window of the SCSIMgr application (page 42) or by typing at the command line:

`CDFS:CDDevices` (see page 63).

It is not advisable to keep switching CDPlayer from one drive to another using the Setup window. This operation should only be performed when CDPlayer is first started. If you need to control more than one drive, you should start the CDPlayer application as many times as you require and change each copy's setup individually before use.

## Quitting CDPlayer

To quit the CDPlayer application, choose **Quit** from its icon bar menu.

# 8

## Expanding your system

The Multimedia Expansion Unit is supplied with a CD-ROM drive; however, it has been designed to allow for easy expansion. We recommend that you only fit upgrades to the Multimedia Expansion Unit which are known to be compatible with it.

### Expanding the Multimedia Expansion Unit's audio

You can expand the audio capabilities of the Multimedia Expansion Unit by fitting a stereo power amplifier, allowing the direct connection of speakers to the unit.

### Adding SCSI devices to the Multimedia Expansion Unit

The Multimedia Expansion Unit has a space for a 5¼" or 3½" device to be fitted with front panel access – typically a removable media device such as a magneto-optical drive or a second CD-ROM drive. You can add one further 3½" device inside the unit, such as a SCSI hard disc drive.

### Adding internal SCSI devices to your computer

Furthermore, the standard SCSI expansion card (CAO06) has a connector that you can use to add internal SCSI devices – such as a SCSI hard disc – to your computer.

### Fitting internal devices

If you fit an internal SCSI device – whether to your Multimedia Expansion Unit, or to your computer – you **must** ensure these requirements are met:

- There must be a free drive bay that will hold the SCSI device.
- There must be sufficient power available from the power supply unit (PSU) to meet the maximum power consumption of the device.  
If the PSU is not sufficiently powerful, you will either have to fit a higher specification PSU, or have to use an external PSU.
- The device must not dissipate more heat than can be safely dispersed, even in hot weather.

If you have any doubts over the suitability of a particular device for internal installation, consult your supplier.

You'll find full details of the Multimedia Expansion Unit in *Appendix B: Technical specification* on page 69; these include its maximum operating temperature, and the power available from its PSU. As a rough guideline, you may fit one additional device – including the power amplifier – to the Multimedia Expansion Unit without upgrading its PSU. A cooling fan may be required for devices with a high power consumption

### **Adding external SCSI devices**

As the Multimedia Expansion Unit incorporates SCSI devices, you can add any external SCSI device to your computer system by simply daisy-chaining the devices. This is described below.

## **More about SCSI**

Before you add further SCSI devices to your system, there are two simple – but important – issues you need to understand. These are SCSI IDs, and termination.

### **SCSI IDs**

Each SCSI device must have a unique SCSI ID in the range 0 - 7. The software uses this ID to ensure it is 'talking' with the correct device.

The interface itself counts as a device, and its default ID is 7. This leaves IDs 0 - 6 available for other SCSI devices. There are no rules on which sorts of device should use which IDs, but the scheme below is one that many people use:

- IDs 0 - 3 are used for disc drives
- ID 4 is used for a tape drive
- ID 6 is used for a CD-ROM drive
- ID 5 is used for other devices such as scanners.

The internal disc fitted to the A540 and R200 series has a SCSI ID of 0, and so fits this scheme.

The method used to set SCSI IDs varies. It is typically done either using a selector switch (such as that fitted to the Multimedia Expansion Unit), or a set of switches or jumpers fitted to a circuit board on the device. See your devices' manuals for more information.



## Termination

To work correctly, every SCSI bus must have a set of termination resistors connected to each end, and nowhere else. If the bus isn't correctly terminated, data passing along the bus may be corrupted.

The chapter *Configuring the Multimedia Expansion Unit* on page 15 described how to set up the Multimedia Expansion Unit in its basic default configuration. If you add other SCSI devices to your system, you have two choices:

- Add the new device to one end of the SCSI bus (i.e. the external end, or the internal end).  
In this case you must terminate the new device, and remove the termination from the device that was previously on that end of the bus.
- Add the new device to the middle of the SCSI bus. In this case the new device must not be terminated.

## Internal devices

The standard SCSI expansion card (CAO06) has a connector that you can use to add internal devices — in other words, devices that fit inside your computer's casing, such as an extra hard disc. Before you connect any such devices, you'll need to know the locations both of the connector for internal devices, and of the card's terminating resistor packs (which provide the termination of the internal end of the SCSI bus):

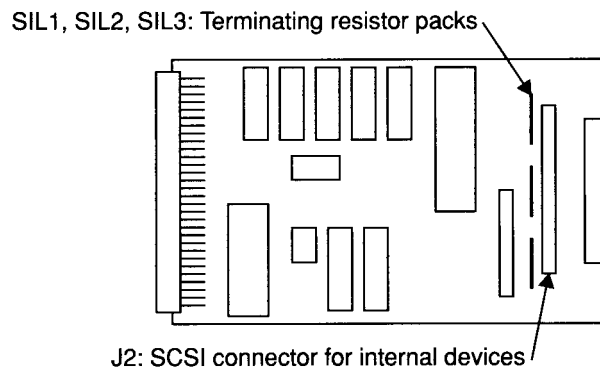


Figure 8.1 CAO06 SCSI expansion card: terminating resistors and SCSI connectors

The mini SCSI expansion card (CAO08) does not have a connector for internal devices, and so we recommend that you do not try to fit them.

The important rules when adding internal SCSI devices to your computer are as follows:

- If you don't add any internal SCSI devices to your computer, the interface is at one end of the SCSI bus, and so its terminating resistors must **remain** fitted.
- If you do add internal SCSI devices, the interface is no longer at the end of the SCSI bus, and so you must **remove** its terminating resistors.

You must then ensure that the only the last device on the internal SCSI bus is terminated. SCSI devices designed for internal fitting are typically terminated by resistor packs fitted to sockets on a circuit board (i.e. just like the SCSI expansion card), but you should check their manuals to be sure.

### External devices

The important rules when adding external SCSI devices are:

- The last device on the external SCSI bus **must** be terminated.  
SCSI devices designed for external use are typically terminated by an external block, such as that supplied with the Multimedia Expansion Unit (which you can use on any SCSI device with the correct type of socket). However, some units (especially older ones) may instead use resistor packs fitted to sockets on a circuit board. Again, you should check your devices' manuals to find out how they are terminated.
- Any other devices connected to the external SCSI bus must **not** be terminated.

In particular, this means that:

- If the Multimedia Expansion Unit is the only external SCSI peripheral attached to your computer it must have its terminator block fitted.
- If you disconnect all external SCSI devices from your machine, the interface must have a terminator block fitted to its external SCSI socket.

Note that the Multimedia Expansion Unit's terminator will not fit this socket; you will need to buy either a terminator that does fit, or an adaptor that allows you to connect the Multimedia Expansion Unit's terminator.

## Adding new SCSI devices

Because there are so many different types of SCSI devices, we can't give precise instructions that cover every possibility. However, if you follow the guidelines below you shouldn't have any problems.

If you have any doubts, you should consult your supplier.

### Read the manuals for your new SCSI device

Before you try to do anything, read the manuals supplied with your new SCSI device. In particular, you should find out how the device is terminated, how to set its SCSI ID, and whether there are any restrictions on what that ID may be. (In some rare cases, software supplied with your device may assume that it has a particular SCSI ID.)

### Decide the SCSI configuration you will use

Using the information from the new SCSI device's manual, and the guidelines above on SCSI IDs and *Termination*, decide to which device(s) you are going to connect the new device (and hence whether it needs to be terminated), and what ID you will give it.

### Check you have the correct cables

There are several different types of sockets in use for SCSI devices. Before you are ready to connect your new device, you must have suitable cables available. When purchasing your cable, ensure that the plugs on each end match the sockets on the devices you are connecting.

Your cables **must** be high quality shielded cables designed for use with SCSI, otherwise you may suffer from data corruption and poor reliability. Your cables must be as short as possible; this improves both data transfer rates and reliability.

The total length of the SCSI bus (including any internal cabling) must not exceed 6m, even with the best quality cabling.

### Install the new SCSI device

When installing your new device, ensure your entire computer system is switched off, otherwise you may damage components on your computer and/or your SCSI devices.

### Check SCSI IDs and termination

Before switching on your system, check that each device has a unique SCSI ID, and that the SCSI bus is correctly terminated (i.e. at each end only).

Once you have switched on, you can use the Devices window of the SCSIMgr application (page 42) or the `*Devices` command (page 63) to double-check the SCSI IDs.

### Switch on your system

Turn the Multimedia Expansion Unit on by pressing the ON/OFF switch on the front. Turn on any other external SCSI units. Then turn on the rest of your system as usual. (If you're unsure what's the best order in which to do this, see your computer's *Welcome Guide*.)

### Configure your computer and software

Depending on the device you have installed, you may then need to change your computer's configuration, or to change the configuration of existing software (such as CDFS), or to install and configure new software.

As well as the manuals supplied with your new SCSI device, you should also consult any relevant parts of this guide: in particular *Configuring the computer* on page 19, and *Appendix A: Using the command line* on page 63.

### Prepare your device

Before you can use a read/write device it has to be formatted, partitioned and mapped to your system. This can all be achieved using the SCSI device management program SCSIMgr, as detailed in the next chapter.

Read-only devices such as CD-ROMs and scanners do not require any formatting etc. prior to use, and are normally supplied with appropriate software for their installation and use.



**S**CSIMgr (short for SCSI Manager) enables you to set up and control the SCSI devices attached to your computer, such as hard disc drives, magneto-optical drives, CD-ROM drives, and the SCSI expansion card itself. Before using such devices with your computer you may need to carry out a number of tasks such as formatting, verifying and partitioning a hard drive, or setting the ID number of your SCSI expansion card. SCSIMgr gives you a desktop interface with on-line help that will do all these tasks and more, and in a far simpler way than using the command line to do so.

## Security

As with any software program which controls the set up of your computer system, e.g. network management software, it is of paramount importance to be able to limit access to those who are authorized. Therefore, SCSIMgr incorporates three levels of security which should deny any unauthorized people from changing the SCSI settings you have on your system.

### Setting an entry password for SCSIMgr

You can set an entry *password* which is required to use the SCSIMgr application itself (see *Installing and running SCSIMgr* on page 40). You can change this password anytime you wish (see Password on page 52).

#### Warning!

This level of security does **not** mean that your SCSI settings cannot be changed; it merely makes secure a **particular** copy of SCSIMgr. Your SCSI settings can still be changed by other copies of SCSIMgr (say one with a different password), or from the command line.

### Disabling \* Commands

If you want to increase security, you can prevent a computer's SCSI settings being altered at the command line (see *The Set Host ID button* on page 46).

### Locking the system

A more secure way of ensuring that the SCSI settings are not changed is to lock the system by setting a *system password* (see *Lock System* on page 52). Once the system is locked you can change the SCSI settings **only if** the entry password for the copy of SCSIMgr you are using **matches** the system password that was used to lock the system.

If you want to alter a locked system, but the entry password for your copy of SCSIMgr doesn't match, you'll need to start SCSIMgr (giving its current entry password), and then change SCSIMgr's entry password so it does match the system password that was used to lock the system (see *Password* on page 52). Of course, anyone else who knows the system password might be able to do the same, so you shouldn't give it to anyone you don't trust.

**Warning!:** If you've locked your system and have forgotten the system password, you cannot bypass the security. The only way to gain access is to return your SCSI expansion card to Cumana (telephone +44 483 503121) to be unlocked. Do not return your copy of SCSIMgr.

### Leaving SCSIMgr unattended

Finally, you should remember not to leave SCSIMgr running on an unattended computer, as **anyone** with access to that computer can then alter its SCSI settings.

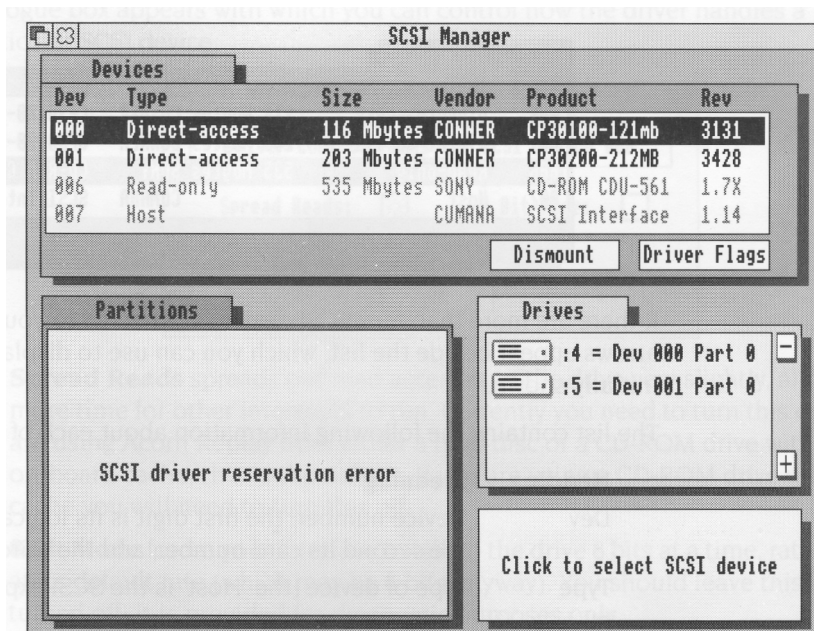
## Installing and running SCSIMgr

SCSIMgr is supplied on the Support Disc. Before using SCSIMgr, you should copy it either to another floppy disc, or to your computer's hard disc – if one is fitted.

To run SCSIMgr, double-click on its icon in the normal way. A password window will be displayed:

- If no entry password has yet been set the message will be **Set New Password**. If you don't wish to set an entry password, just click on **OK**; otherwise type in the entry password you wish to use for this copy of SCSIMgr, and then click on **OK**.
- If an entry password has been set the message will read **Enter Password**. Type the entry password for this copy of SCSIMgr, and click on **OK**.

You will have to wait a few seconds while the computer searches for any SCSI devices attached to your system. The main **SCSI Manager** window then appears. It is split into four subwindows:

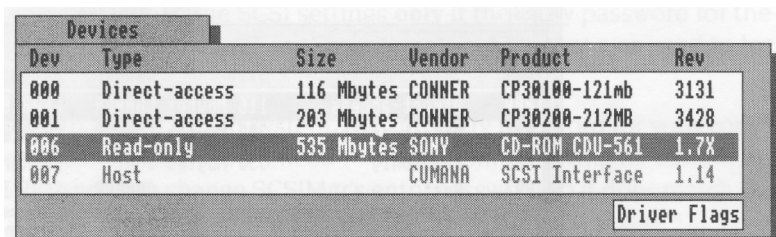


- The **Devices** window shows the devices attached to your SCSI bus, and is used to set them up (e.g. formatting, verifying, and controlling access); see page 42.
- The **Partitions** window is used to show and to set up the partitions into which the currently selected device is divided; see page 47.  
Don't worry if it initially shows an error such as 'SCSI driver reservation error' (as above); this is quite normal, and is explained later.
- The **Drives** window is used to control which partitions of which devices appear as drives on the icon bar; see page 50.
- The fourth window, in the bottom right corner, is a **Help** window, which briefly explains the function of the item beneath the pointer. You can get more detailed help at any-time by selecting the appropriate window heading, or by clicking on the help window itself.

You can close the main SCSI Manager window in the usual way by clicking on its close icon. This does not quit the SCSIMgr program. To re-open the window click SCSIMgr on the icon bar.

## The Devices window

All the SCSI devices attached to your system, including the SCSI expansion card, are listed in this window:



The screenshot shows a window titled 'Devices' containing a table with the following data:

Dev	Type	Size	Vendor	Product	Rev
000	Direct-access	116 Mbytes	CONNER	CP30100-121mb	3131
001	Direct-access	203 Mbytes	CONNER	CP30200-212MB	3428
006	Read-only	535 Mbytes	SONY	CD-ROM CDU-561	1.7X
007	Host		CUMANA	SCSI Interface	1.14

Below the table is a button labeled 'Driver Flags'.

If there are more than four SCSI devices connected to your system, two scroll arrows appear beside the list, which you can use to display those devices not initially shown.

The list contains the following information about each of the devices:

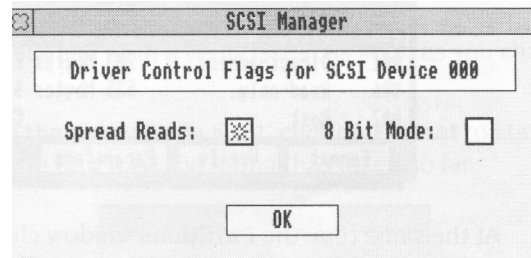
Heading	Meaning
Dev	Device number: the first digit is its logical unit number (LUN), the second its card number, and the third its SCSI ID number
Type	Type of device (the 'Host' is the SCSI expansion card)
Size	Capacity of device, in Megabytes
Vendor	Name of device's manufacturer
Product	Manufacturer's identifying code or name
Rev	Firmware version number

You cannot change any of the information contained in this list. You simply select the device of your choice and relevant options in the form of buttons will appear below the list.



### The Driver Flags button

The **Driver Flags** button is present for all devices except the host. If you click it, a dialogue box appears with which you can control how the driver handles a particular SCSI device:

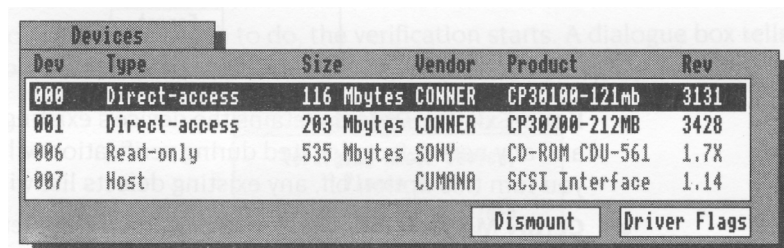


- **Spread Reads** spreads out read accesses to the drive very slightly, allowing more time for other interrupts to run. Currently you need to turn this on if you are using Acorn Replay from either a hard disc or a CD-ROM drive with an on-board cache; this is the default. If you are using a CD-ROM drive without a cache you will need to turn this off.
- **8 Bit Mode** forces your interface to talk to the drive 8 bits at a time, rather than at its default rate (which may be 8 bits anyway). You should leave this option turned off; it is provided for diagnostic purposes only.

Both driver flags are stored in the EEPROM on the SCSI interface to which the selected device is connected. They are stored on a 'per SCSI device' basis — that is, all devices having the same last two digits in their device number share the same driver flags.

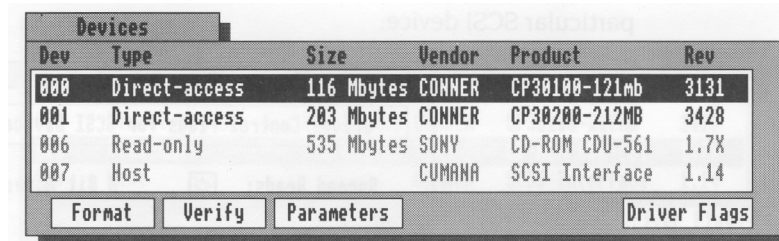
### The Dismount button

The **Dismount** button is shown if the device you have selected is a writable device (e.g. a hard disc) that is currently in use, or *mounted*:



At the same time, the **Partitions** window shows the message 'SCSI driver reservation error', which indicates that you cannot change the device's partitioning because it is in use.

Once you click on the **Dismount** button, several new buttons appear, which you can use to format the device, verify it, and (if you know what you're doing) alter its low-level parameters:



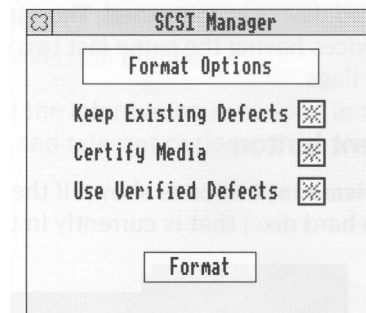
At the same time the **Partitions** window changes to show the device's current partitions, which you can then alter; see *The Partitions window* on page 47.

### The Format button

Click this button if you wish to format the device, e.g. a hard drive.

**Warning!:** When you format a device, any data that was previously stored on it is permanently lost. So, don't reformat a device unless you are certain that you no longer require the data stored on it.

A warning box will tell you this; if you click the **OK** button to continue a **Format Options** window then opens:



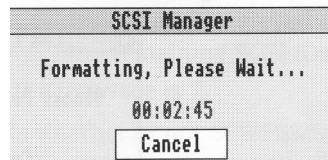
- **Keep Existing Defects** retains the device's existing defects list (a hidden file), and any new defects located during verification will be stored in a new list. If you turn this option off, any existing defects list will instead be deleted.
- **Certify Media** makes the device perform a complete surface analysis of the media during the format process, provided it supports this function (e.g. optical media). You should normally do this for new media, but can avoid

doing so to speed up a re-format process. (For example, certifying a piece of optical media may take up to an hour, whereas re-formatting without using this option will only take a few seconds.)

- **Use Verified Defects** uses the list of defects obtained from the last verify. If you reformat using this option, and then verify the disc again, you should get no reported defects.

The error list obtained from a verify is lost as soon as you change the selected device.

When you've set up the options you want, click on **Format** to start the process. A dialogue box tells you how long the format has taken so far:



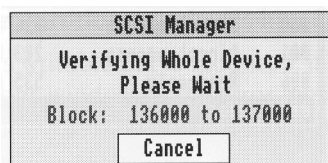
You can **Cancel** the format while it's in progress. However, you'll then be unable to use the device until you can re-run the format uninterrupted from start to finish.

### The Verify button

Click this button if you wish to check the device for faulty blocks. You should do so just after you've formatted a device, but you can do so at any time, even whilst data is stored on the device. If the device has been partitioned you must choose whether to verify either a single **Partition** or the **Whole Device**:



Once you've chosen which to do, the verification starts. A dialogue box tells you which blocks are being checked:



You can **Cancel** the verification mid-way through; this will not corrupt any data, nor will it damage your device.

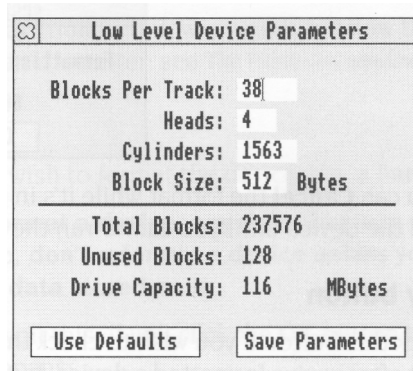
If bad blocks are found this will be reported and you'll be given the option to re-assign them. Re-assigning blocks effectively marks the bad blocks as unusable, and allocates alternative unused blocks in their place.

### The Parameters button

Click this button to change a device's low-level parameters.

**Warning!:** You should only use this option if you are sure that you know what you are doing.

A list of the device's low-level parameters – **Blocks Per Track**, **Heads**, **Cylinders** and **Block Size** are shown in a window:



A dialog box titled "Low Level Device Parameters" with a close button in the top-left corner. It contains the following fields and values:

- Blocks Per Track: 38
- Heads: 4
- Cylinders: 1563
- Block Size: 512 Bytes

---

Summary information:

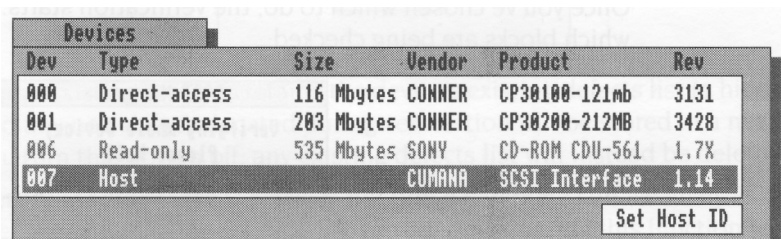
- Total Blocks: 237576
- Unused Blocks: 128
- Drive Capacity: 116 MBytes

At the bottom are two buttons: "Use Defaults" and "Save Parameters".

Normally these are read from the device automatically, but you can alter them if circumstances require this (e.g. to use a non-standard or unsupported device). Once you're satisfied the parameters are correct, save them to the drive by clicking the **Save Parameters** button.

### The Set Host ID button

The **Set Host ID** button appears if the **Host** is the selected device:

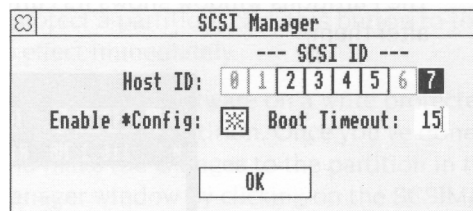


Dev	Type	Size	Vendor	Product	Rev
000	Direct-access	116 Mbytes	CONNER	CP30100-121mb	3131
001	Direct-access	203 Mbytes	CONNER	CP30200-212MB	3428
006	Read-only	535 Mbytes	SONY	CD-ROM CDU-561	1.7X
007	Host		CUMANA	SCSI Interface	1.14

Below the table is a button labeled "Set Host ID".

Click this button to set up the selected SCSI expansion card.

A window appears:



- **Host ID** changes the SCSI ID of your SCSI expansion card. Its current SCSI ID appears as a white digit on a black background (i.e. 7 above); IDs that are already used by other SCSI devices appear greyed out (i.e. 0, 1 and 6 above); you may change it to any of the remaining SCSI IDs (i.e. 2 - 5 above). The default SCSI ID for the interface is 7.
- **Enable \*Config** controls whether or not SCSIFSMap settings can be changed from the command line. When the option is turned on (as above), they can be changed; when it's off, they can't be changed.
- **Boot Timeout** sets a delay for which the computer waits when it is first switched on. This helps accommodate any differences in the power-up times of the computer and attached SCSI devices, caused by such things as internal self-tests. Delays are set in increments of 5 seconds up to a maximum of 75.

When you click the **OK** button the SCSI bus is reset, and any new host ID number takes immediate effect.

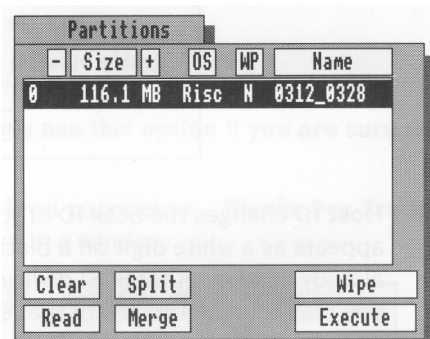
## The Partitions window

The **Partitions** window is used to show, setup and alter partitions on writable SCSI devices such as hard disc drives. Each partition appears and functions like a smaller, separate drive. Each device can have a maximum of 64 partitions.

The initial appearance of the window depends on which SCSI device is selected in the **Devices** window (see above), and whether or not it is mounted:

- If the selected device is not writable (e.g. a CD-ROM drive), it cannot be partitioned, and so the **Partitions** window is blank.
- If the selected device is writable but is mounted, it cannot be partitioned; this is shown in the Partitions window by the error message SCSI Driver Reservation Error'. To partition the drive, you first need to dismount it; see The *Dismount* button on page 43.

- If the selected drive is writable and is dismounted, it is ready to be partitioned. The Partitions window shows its current partitions (if any), and allows you to alter them:



If there are no partitions the window will be blank; see *Creating partitions for the first time* on page 49.

When partitioning devices you should however note that the SCSI filing system only allows a total of 4 partitions to be accessed as RISC OS drives at any one time See The Drives window on page 50 for further details.

### Editing partitions

Select the partition you wish to edit before carrying out any of the editing functions listed below. Please note that with the exception of partitions' write protect status and name, any changes made will not be invoked until you click either the **Execute** or the **Wipe** button.

### The -, Size and + buttons

To change the size of a partition use these three buttons at the top of the window. Use the + and — buttons to increase or decrease the partition size by 1 MB at a time. Alternatively, click the **Size** button and enter the partition size you require.

### The OS button

This button sets up a partition to use a different operating system from RISC OS. At the moment **RISC OS** is the only option, however, in the future other options such as DOS may be available.

### The WP button

If you wish to write protect a partition, click this button to toggle between **Y**(es) and **N**(o). This takes effect immediately.

If you wish to add, delete or edit software on a write protected partition, you need to use SCSIMgr to unprotect the partition. Once you've done so close the SCSI Manager window, and make the changes to the partition in the normal way. Then re-open the SCSI Manager window by clicking on the SCSIMgr icon, and use it to reprotect the partition.

### The Name button

If you wish to change a partition's name, click the **Name** button, enter the new name and then click **OK**. This takes effect immediately.

The name can contain a maximum of ten alphanumeric characters, but no spaces. The default name for the first partition is Part0. If – as in the default – you place a number at the end of the name of the first partition, any subsequent partitions you create will by default use the same name, but with the number incrementing by 1 (so for the default name you would get Part0, Part 1 , Part2 etc.).

### The Clear button

Click this button if you wish to remove all partitions from the list, replacing them with a single partition consisting of the entire disc.

#### Creating partitions for the first time

Use the **Clear** button to display the entire drive as one partition in the list. You can then use the **Split** button (see below) to create further partitions. If, however, you only require one partition, click the **Execute** button at this stage to initialize the device.

### The Read button

By clicking this button you re-list the partition settings currently in operation on the selected device. Any changes you have made to the partition list but not executed are discarded.

### The Split button

If you want to divide a partition into two, click this button. You can then if necessary change the sizes of the new partitions using the –, **Size** and + buttons (see above).

### The Merge button

If you wish to combine two consecutive partitions to create one larger one (e.g. 1 and 2, or 9 and 10), select the first partition of the two to be merged, and then click the **Merge** button.

### The Wipe button

The wipe button re-initialises the currently selected partition, erasing all the data stored in it. Data in other partitions will not be affected.

**Warning!:** When you wipe a partition, any data that was previously stored on it is permanently lost. So, don't wipe a partition unless you are certain that you no longer require the data stored on it.

### The Execute button

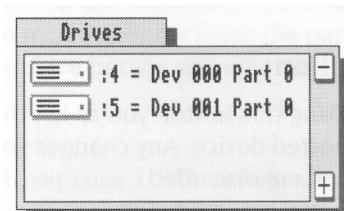
This button is used to execute any changes you have made to the number or size of partitions. Such changes will not take effect until you click this button.

**Warning!:** When you partition a device, any data that was previously stored on it is permanently lost. So, don't repartition a device unless you are certain that you no longer require the data stored on it.

## The Drives window

Although you can have up to 64 partitions on each writable SCSI device, the SCSI filing system only allows a total of 4 partitions to be accessed as RISC OS drives at any one time. These four drives use the numbers 4 - 7.

The **Drives** window controls the mapping between the SCSI partitions and the RISC OS drives:



Unmapped SCSI partitions are inaccessible until you change the setup; this allows you to hide data from unauthorised users.



### The - and + buttons

These buttons are at the right hand edge of the window, and are used to change the number of drives (i.e. partitions) available, from none to four.

### Mapping a partition to a drive

To map a partition to a drive:

- 1 In the **Partitions** window select the partition you wish to map.
- 2 In the **Drives** window select the appropriate drive number—**not** the drive icon. (So in the diagram above, you would select :4 or :5).

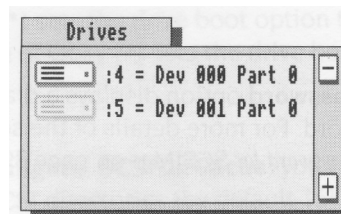
A message appears on screen indicating the choice you have made.

- 3 Click **OK** to confirm the mapping, or **Cancel** to change your selection. The new or changed mappings will not take effect until you quit SCSIMgr.

### Hidden drives

You can assign a partition to a RISC OS drive number without it appearing on the icon bar. However, the drive can still be accessed by programs or at the command line. This facility can be useful for providing system resources that are 'hidden' from desktop users.

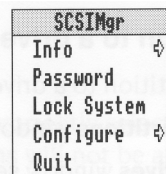
To hide a drive, click on its icon in the **Drives** window. It will become grey:



To make a hidden drive again available on the icon bar, click on the grey icon. Any change will not take effect until you quit SCSIMgr.

## SCSIMgr Menu items

The SCSIMgr menu appears when you click Menu over its icon, or over the main SCSI Manager window:



### Info

The **Info** option gives information about the SCSIMgr application, including its version number:

SCSIMgr	About this program	
Info ⇧	Name:	SCSIMgr
Password	Purpose:	SCSI Manager
Lock System	Author:	© Copyright 1992, Cumana Ltd
Configure ⇧	Version:	V1.35 (02-Nov-92)
Quit		

Your copy may be a later version than that shown above.

### Password

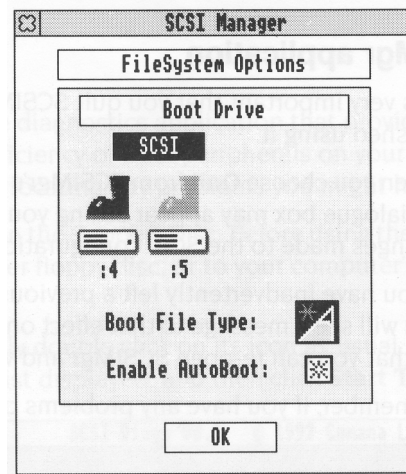
The **Password** option displays a dialogue box to change the SCSIMgr entry password. For more details of the security this password provides, see *Setting an entry password for SCSIMgr* on page 39.

### Lock System

The **Lock System** option displays a dialogue box to set a system password, and then locks the system. For more details of the security this provides, and of how to alter the SCSI settings on a locked system, see *Locking the system* on page 40

## Configure, BootDrive

If you choose **Configure, Boot Drive** a dialogue box appears:

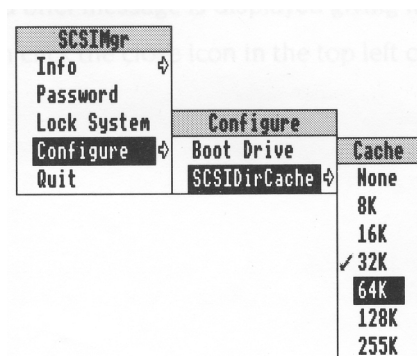


Click on the icons to select whether your computer tries to automatically run a boot file (**Enable Autoboot**), from which drive and file system it will try to boot, and the type of boot file it uses (**Boot File Type**).

The more technically minded amongst you may like to know that choosing a Boot File Type of Command (E\*) sets the drive boot option to 03 (Exec), whereas choosing a Boot File Type of Obey (\*) sets the drive boot option to 02 (Run).

## Configure, SCSI DirCache

If you instead choose **Configure, SCSI DirCache**, you can select the amount of memory used to cache SCSI directories (by default 16K):



## **Quit**

The **Quit** option quits the SCSIMgr application, as detailed below.

## **Quitting the SCSIMgr application**

It is very important that you quit SCSIMgr in the correct way when you have finished using it.

When you choose **Quit** from SCSIMgr's menu, its icon disappears from the icon bar. A dialogue box may appear asking you to confirm that you wish to implement changes made to the SCSI configuration.

If you have inadvertently left a previously write protected partition unprotected, you will see a message to that effect on the screen. Click **OK** to continue, or **Cancel** so that you can re-open SCSIMgr and write protect the partition.

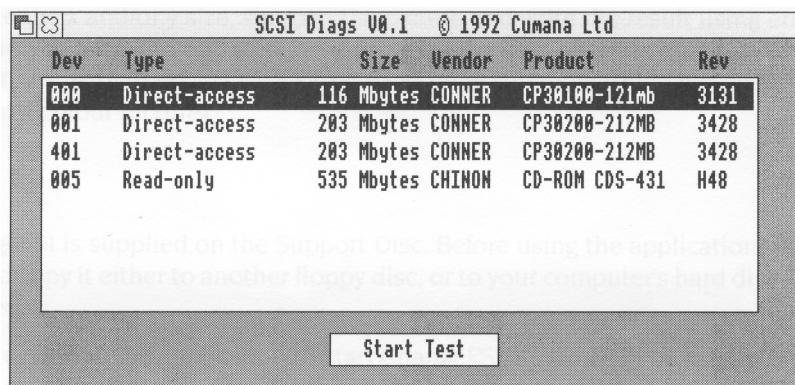
Remember, if you have any problems contact your supplier.



SCSIDiag is a simple diagnostics application that provides a means of monitoring the efficiency of SCSI peripherals on your system, and may also assist your supplier in locating any problems you might have.

SCSIDiag is supplied on the Support Disc. Before using the application, you should copy it either to another floppy disc, or to your computer's hard disc — if one is fitted.

To run SCSIDiag, simply double click on its icon as usual. Select the device you wish to test from the list displayed, and then click **Start Test**:



At the end of the test a brief message is displayed giving its result.

To quit the application click the close icon in the top left corner of the window.





**C**hangeFSI is a useful program for converting and displaying image files of various formats. These images can then be converted into sprites for viewing with RISC OS applications such as Paint.

In case you're wondering, ChangeFSI stands for 'Change Floyd Steinberg Integer' (ChangeFSI performs Floyd Steinberg error diffusion dithering).

You should make sure that your conversion and subsequent use of an image does not infringe on any copyright that the image may be under.

ChangeFSI provides the ability to read, scale the data to improve the picture, change the x and/or y size, sharpen the picture and write the result using error diffusion dithering in one step (so it provides the best possible quality). All operations are carried out with 32-bit fixed point numbers (three per pixel in the case of a colour picture).

## Using ChangeFSI

ChangeFSI is supplied on the Support Disc. Before using the application, you should copy it either to another floppy disc, or to your computer's hard disc — if one is fitted.

Double click on the application to start ChangeFSI. Its icon will be loaded onto the icon bar. Display the file icon for the image you wish to process, and drag the icon onto the ChangeFSI application on the icon bar. ChangeFSI will attempt to interpret the file to give a RISC OS sprite, displaying the result. You can then save the resultant image as a sprite file.

### Picture formats

ChangeFSI will convert many types of images. These include the PC graphics formats TIFF, PCX, PIC and IMG, the Amiga format IFF, the Compuserve GIF format and the JPEG JFIF file interchange format.

For a full list of image formats explained in greater detail, you should read the file FSInfo provided inside the application (shift double-click on !ChangeFSI to display the files).

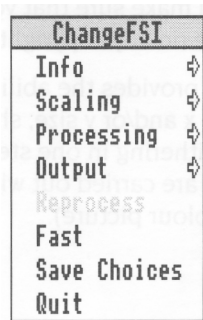
ChangeFSI in more detail

This section describes the ChangeFSI menu trees in detail. Most users won't need to use these options as ChangeFSI is already set up to give good results with most types of image files.

If you want to know how ChangeFSI and its options are used in greater detail you should read the information file, FSIIInfo, provided inside the application (shift double-click on !ChangeFSI to display the files).

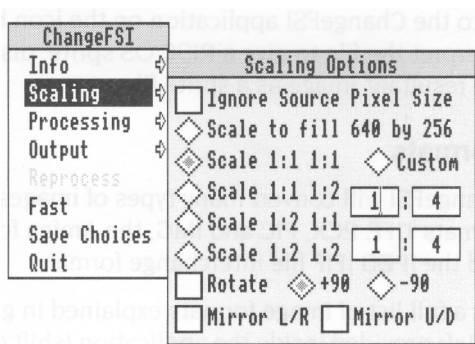
Menu options

Once you have loaded ChangeFSI onto the icon bar, click Menu over the icon to display the main options menu.



Scaling options

The **Scaling** options allow you to choose which scale you wish for your image. You can also transform, rotate or mirror the image.





The option **Scale 1 : 1 1:1** will give you a full sized image.

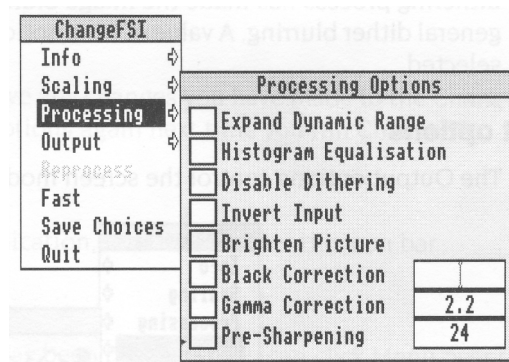
Choosing **Custom** allows you to specify your own scaling options. If you wish the image to 'scale to exact pixel size', fill in the left boxes only and leave the right boxes blank. The **Scale to fill** option allows you to scale the image so that it covers the entire screen area; this may distort the aspect ratio of the image.

The **Ignore Source Pixel Size** box allows you to ignore any source information about the pixel size. This can be useful if you have images that use a non-standard pixel size.

The **Rotate** and **Mirror** options perform rotations and mirror operations on the source image.

## Processing options

The Processing options allow you to control the image processing used in the conversion and display of the image.



You'll notice that all of these options are 'off' by default; you will not normally need to change these settings.

**Expand Dynamic Range** will expand the range of colours in the image. This normally brightens the image. It expands the dynamic range of a picture to full scale.

**Histogram Equalisation** will most often result in a worse picture but it can be used to recover detail from an otherwise useless image. Alternatively you can use it to look at information locked in a small part of the input scale.

**Disable Dithering** will disable Floyd-Steinberg dithering. This will usually result in an inferior image.

**Invert Input** will result in your colour images having their colours inverted. Black and white image are also inverted.

**Brighten Picture** will produce a picture that is slightly brighter than it should be. Useful if you have dark pictures.

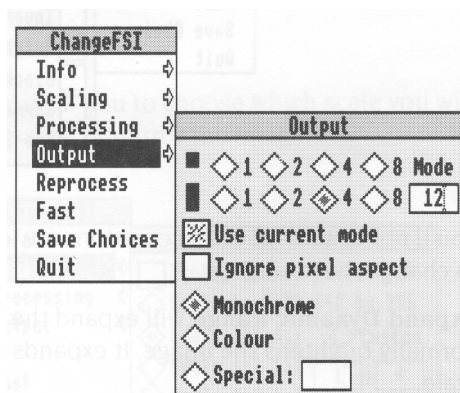
**Black Correction** is useful if you want to print the image on a laser printer. You should use a number between zero and 128, though values between 32 and 64 usually give the best result; experiment. Images treated in this way will give a poor result when viewed on screen. Only works for 1 bpp (black and white) output.

**Gamma Correction** is used to correct the image quality as displayed on your monitor. Low values of gamma (0 to 1) make colours darker and high values (above 1) make them lighter. Gamma correction is most often used to correct images that have been scanned in with a scanner. Different monitors may need different Gamma Corrections. A standard value is 2.2 (TV industry standard).

**Pre-sharpening** is used to sharpen the edges of objects. This is useful if the dithering process has made the image blurred. A value of 24 will counteract the general dither blurring. A value of 20 is noticeably sharp. Values down to nine can be selected.

## Output options

The Output options control the screen mode the picture is created for.



The **1, 2, 4, 8** buttons represent the screen colours that you can use. The numbers represent bits per pixel. 8 bits represent 256 colours, 4 bits represent 16 colours, 2 bits represent 4 colours and 1 bit represents 2 colours. The square box represents the square pixel modes and the oblong box represents the non-square modes. The actual output mode chosen is displayed in the mode box.

Use **current mode** outputs the image for display in the current mode.

**Ignore pixel aspect** disables all pixel size information and assumes both source and output pixels are square.

**Monochrome** and **Colour** give an image in black and white or colour.

**Special** allows the use of special file suffixes. These are explained fully in the on-line documentation file FSInfo.

### Reprocess

This option reads the file in again and processes it according to any new options you have set.

### Fast

This option speeds up the processing of the image by blanking the screen during processing.

### Save Choices

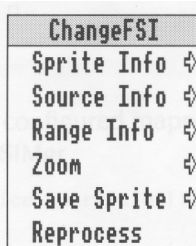
This option will save any changes you have made to the ChangeFSI options so that you can use the options again next time you run ChangeFSI.

### Quit

This quits the application, removing it from the icon bar.

### Image menu

Once your image has been produced you can click Menu over the image to display a menu of information about the input and output image.



**Sprite Info** gives the information about the Sprite output file.

**Source Info** gives the information about the source file.

**Range Info** gives you information about the dynamic range of the image.

**Zoom** allows you to change the magnification of the image. This is not the same as scaling the source image.

**Save Sprite** allows you to save the image as a Sprite file.

**Reprocess** allows you to process the image again using any options you have changed on the main menu.

# Appendix A. Using the command line

## SCSI \* Commands

SCSIFS supports all standard RISC OS filing system \* Commands; for details of these, see your RISC OS 3 *User Guide*. The SCSI modules also provide some new commands of their own, detailed below.

### \*Configure SCSIFSDirCache

\*Configure SCSIFSDirCache sets the configured amount of memory reserved for the SCSIFS directory cache. A value of 0 sets a default value appropriate to the computer's RAM size.

\*Configure SCSIFSDirCache *size[K]*

### \*Configure SCSIFSDiscs

\*Configure SCSIFSDiscs sets the configured number of SCSI hard disc drives recognised at power on.

\*Configure SCSIFSDiscs *n*

### \*Configure SCSIFSDrive

\*Configure SCSIFSDrive sets the configured number of the SCSI drive that is selected at power on.

\*Configure SCSIFSDrive *n*

### \*Configure SCSIFSMap

\*Configure SCSIFSMap sets the configured mapping between SCSIFS drives and disc partitions created using SCSIMgr.

\*Configure SCSIFSMap *drive=device[,partition]|drive=. Hhost\_number=host\_device*

### \*Devices

\*Devices displays all the SCSI devices connected, their product name, capacity, SCSI ID and firmware revision.

\*Devices

### **\*SCSI**

\*SCSI selects the SCSI filing system as the current filing system.

\*SCSI

## **CDFS \* Commands**

CDFS supports all standard RISC OS filing system \* Commands that do not try to write to disc; for details of these, see your RISC OS 3 User *Guide*. CDFS also provides some new commands of its own, detailed below. Many of these commands require an optional drive parameter; if you omit this, CDFS defaults to using its current drive (initially drive 0).

### **\*CDDevices**

\*CDDevices displays all the CD devices connected, their product name, capacity, SCSI ID (displayed as device, LUN, and card) and firmware revision.

\*CDDevices

### **\*CDFS**

\*CDFS selects the CD-ROM filing system as the current filing system.

\*CDFS

### **\*CDSpeed**

\*CDSpeed displays or sets the read speed of the given CD-ROM drive.

\*CDSpeed *[drive] [speed]*

### **\*Configure CDROMBuffers**

\*Configure CDROMBuffers sets the configured amount of memory reserved for CD-ROM buffering (maximum 512K).

\*Configure CDROMBuffers *sizeK*

### **\*Configure CDROMDrives**

\*Configure CDROMDrives sets the configured number of CD-ROM drives recognised at power on.

\*Configure CDROMDrives *n*

### **\*Eject**

\*Eject ejects the disc from the given CD-ROM drive.

`*Eject [drive]`

### **\*Lock**

\*Lock locks the disc in the given CD-ROM drive, disabling the Eject button.

`*Lock [drive]`

### **\*Play**

\*Play plays from the specified audio track to the end of the disc in the given CD-ROM drive.

`*Play track [drive]`

### **\*PlayList**

\*PlayList lists the tracks — whether audio or data — on the disc in the given CD-ROM drive, together with their start time and the total CD time.

`*PlayList [drive]`

### **\*PlayMSF**

\*PlayMSF plays a piece of audio from the disc in the given CD-ROM drive. The start and stop times are specified in minutes, seconds and frames from the start of the disc.

`*PlayMSF mins: secs:frames mins:secs:frames [drive]`

### **\*Stop**

\*Stop stops playing the disc in the given CD-ROM drive.

`*Stop [drive]`

### **\*Supported**

\*Supported lists the drive types recognised by CDFS.

`*Supported`

### **\*Unlock**

\*Unlock re-enables the Eject button on the given CD-ROM drive, reversing the effect of any earlier \*Lock command.

\*Unlock *[drive]*

### **\*WhichDisc**

\*WhichDisc displays the unique ID number for the current CD-ROM drive.

\*WhichDisc

## **Configuring SCSI drives from the command line**

To configure the number of SCSI drives, type:

\*Configure SCSIIFSDiscs *n*

where *n* is the number of SCSI drives or partitions you wish to be made available at this time (from 0 to 4).

SCSI devices used with RISC OS are given drive numbers starting from four. Therefore, the first SCSI drive's RISC OS name will be SCSI::4. To set the default SCSI drive number used by SCSIIFS at power-on use the command:

\*Configure SCSIIFSDrive *n*

where *n* is the drive number to be selected.

You can set the directory cache size in SCSIIFS just as you can in ADFS, using the command:

\*Configure SCSIIFSDirCache *n*

where *n* is the size of the cache you want, in Kilobytes. 16 KB is a typical setting. You can display details of the SCSI devices connected to the system by typing:

\*Devices

A table similar to that shown below is displayed:

Device	Type	Size	Vendor	Product	Rev
000	Direct-access	116 Mbytes	CONNER	CP30100-121mb	3131
001	Direct-access	203 Mbytes	CONNER	CP30200-212MB	3428
005	Read-only	535 Mbytes	CHINON	CD-ROM CDS-431	H48
007	Host		CUMANA	SCSI Interface	1.14



The three digit device number is made up as follows:

1st digit	logical unit number (LUN)
2nd digit	card number (if more than one SCSI card is present)
3rd digit	SCSI ID number.

You can map each SCSI device (or partitions on that device) using:

```
*Configure SCSIFSMap drive=device[,partition]|drive,. Hhost_number=host_device
```

For example, using the table of devices above and assuming that there are twelve or more partitions on the SCSI device 001:

```
*Configure SCSIFSMap 4=000 5=001,11 H0=007
```

To cancel a mapped drive use the *drive=.* syntax, e.g. 5=.

You may need to reboot your computer before these changes take effect.

Once installed, a SCSI disc can be used just like any other disc.

To select the SCSIFS filing system as the current filing system in place of any other (e.g. ADFS), type:

```
*SCSI
```

You can also set it as the default filing system at power-on using:

```
*Configure FileSystem SCSI
```

## Configuring CD-ROM drives from the command line

To configure the number of CD-ROM drives, type:

```
*Configure CDROMDrives n
```

where *n* is the number of drives (from 0 to 28). You can set *n* to 0, which obviously sets the configuration to 0 CD-ROM drives.

You may want to configure the size of the CD-ROM buffers, especially if you expect to be using a variety of CDs. Type:

```
*Configure CDROMBuffers sizeK
```

where *size* represents the size of the buffers in KB, a number in the range 0-512.

The configuration chosen will be stored in the CMOS RAM; reset the computer to implement it. The computer should boot up into the desktop. A 'CD-ROM' icon should appear in the icon bar, the number of icons representing the number of CD-ROM drives attached.

**Important:** Incorrectly setting the number of drives causes the boot up procedure to take longer.

## Altering the default configuration of your system under PC Soft

### The device driver

The DOS device driver `CDFS_DRV.SYS` is configured by entering a statement such as this in `CONFIG.SYS`:

```
DEVICE = C:\DRIVERS\CDFS_DRV.SYS /D:MSCD001 /N:1
```

Parameter switches are:

#### Parameter Use

- |     |   |
|-----|---|
| /N: | This restricts the number of drives that can be used from PC Soft, for example, if you have 4 CD-ROM drives and you use the switch /N:2, then only the first two drives will be usable from PC Soft. If this switch is not specified then all of the drives will be accessible. |
| /D: | This switch allows the device driver name to be changed. You are advised not to change this switch as it must then also be changed for <code>MSCDEX.EXE</code> :  |

### MS-DOS CD-ROM Extensions

The file containing the MS-DOS CD-ROM extensions is called `MSCDEX.EXE`: This is configured by entering a statement such as this in `AUTOEXEC.BAT`:

```
C:\DRIVERS\MSCDEX /D:MSCD001 /L:F
```

Parameter switches are:

- | Parameter | Use   |
|-----------|---|
| /D:       | Specifies the CD-ROM device driver name – for example <code>MSCD001</code> ] – which must match that used in <code>CONFIG.SYS</code> .                        |
| /L:       | Specifies the drive letter of the first CD-ROM drive  |
| /M:       | Specifies the number of cache buffers for <code>MSCDEX.EXE</code> (8 - 15), the default being 8.  |
| /V:       | Displays verbose message during boot-up, detailing memory usage and diagnostic information.   |
| /S:       | Instructs <code>MSCDEX.EXE</code> to patch DOS to allow CD-ROM drive sharing on an MS-NET based network server.<br><br>This parameter is not used by PC Soft. |
| /E:       | Instructs <code>MSCDEX.EXE</code> to use extended memory if available.  |

# Appendix B: Technical specification

## Power Supply Unit (PSU)

Figures quoted are those available on a standard unit with no upgrades fitted (i.e. one that is fitted with only one CD\_ROM drive and one pre-amplifier.

Continuous power available: 12W

Surge power available: 19W

These are total power levels available at 5V, 12V, or any mix thereof.

## Operating temperature

Maximum internal temperature: 50°C

## Audio specifications

### Front panel

CD-ROM drive headphone socket: 3.5mm stereo jack, maximum output 0.55V RMS into 32Q load.

Mixed (variable) headphone socket: 3.5mm stereo jack, maximum output IV peak to peak info 3.2Ohm load.

### Rear panel

CD1 Line Out sockets: twin phono stereo, 0.7V RMS into 471(Q load.

CD2 Line Out sockets: twin phono stereo, 0.7V RMS into 47kOhm load (only available if second CD-ROM drive fitted).

Mixed Line Out (Variable) sockets, giving combined signals from Computer Audio In, CD1, and CD2 (if second CD-ROM drive fitted), and varied using volume control on front panel: twin phono stereo, maximum output 0.7V RMS into 471(Q load.

SCSI connectors

Multimedia Expansion Unit

The Multimedia Expansion Unit SCSI connector is a 50 pin Centronics female socket. Its pin numbering is:

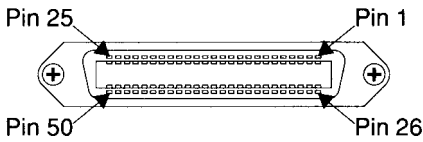


Figure 11.1 Pin numbering of a 50 pin Centronics socket

The following pins carry signals:

Pin	Name	Description	Logic
26	$\overline{DB(0)}$	Data bit 0	Active low
27	$\overline{DB(1)}$	Data bit 1	Active low
28	$\overline{DB(2)}$	Data bit 2	Active low
29	$\overline{DB(3)}$	Data bit 3	Active low
30	$\overline{DB(4)}$	Data bit 4	Active low
31	$\overline{DB(5)}$	Data bit 5	Active low
32	$\overline{DB(6)}$	Data bit 6	Active low
33	$\overline{DB(7)}$	Data bit 7	Active low
34	$\overline{DBP}$	Data parity	Active low
38	TPWR	Terminator power	—
41	$\overline{ATN}$	Attention	Active low
43	$\overline{BSY}$	Busy	Active low
44	$\overline{ACK}$	Acknowledge	Active low
45	$\overline{RST}$	SCSI bus reset	Active low
46	$\overline{MSG}$	Message	Active low
47	$\overline{SEL}$	Select	Active low
48	$\overline{C/D}$	Command/Data	Active low
49	$\overline{REQ}$	Request	Active low
50	$\overline{I/O}$	Input/Output	Active low

All other pins are connected to ground (0V), except pin 13 which is open, and pins 12 and 14 which are reserved.

## SCSI expansion cards

Both the standard expansion card and the mini expansion card SCSI interfaces use the same DB-25 female socket. Its pin numbering is:

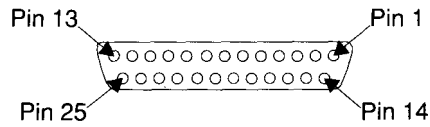


Figure 11.2 Pin numbering of a DB-25 socket

The following pins carry signals:

Pin	Name	Description	Logic
1	$\overline{REQ}$	Request	Active low
2	$\overline{MSG}$	Message	Active low
3	$\overline{I/O}$	Input/Output	Active low
4	$\overline{RST}$	SCSI bus reset	Active low
5	$\overline{ACK}$	Acknowledge	Active low
6	$\overline{BSY}$	Busy	Active low
8	$\overline{DB(0)}$	Data bit 0	Active low
10	$\overline{DB(3)}$	Data bit 3	Active low
11	$\overline{DB(5)}$	Data bit 5	Active low
12	$\overline{DB(6)}$	Data bit 6	Active low
13	$\overline{DB(7)}$	Data bit 7	Active low
15	$\overline{C/D}$	Command/Data	Active low
17	$\overline{ATN}$	Attention	Active low
19	$\overline{SEL}$	Select	Active low
20	$\overline{DBP}$	Data parity	Active low
21	$\overline{DB(1)}$	Data bit 1	Active low
22	$\overline{DB(2)}$	Data bit 2	Active low
23	$\overline{DB(4)}$	Data bit 4	Active low
25	TPWR	Terminator power	—

All other pins are connected to ground (0V).

Connector for internal SCSI devices

The standard sized SCSI expansion card (CAO06) has a pin header (J2) for a 50-way IDC, used to add internal SCSI devices to the host computer. Its pin numbering is:

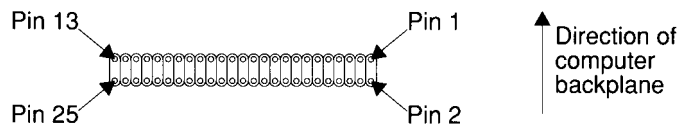


Figure 11.3 Pin numbering of J2 pin header on CAO 06 card, viewed from above

The following pins carry signals:

Pin	Name	Description	Logic
2	$\overline{DB(0)}$	Data bit 0	Active low
4	$\overline{DB(1)}$	Data bit 1	Active low
6	$\overline{DB(2)}$	Data bit 2	Active low
8	$\overline{DB(3)}$	Data bit 3	Active low
10	$\overline{DB(4)}$	Data bit 4	Active low
12	$\overline{DB(5)}$	Data bit 5	Active low
14	$\overline{DB(6)}$	Data bit 6	Active low
16	$\overline{DB(7)}$	Data bit 7	Active low
18	$\overline{DBP}$	Data parity	Active low
26	TPWR	Terminator power	—
32	$\overline{ATN}$	Attention	Active low
36	$\overline{BSY}$	Busy	Active low
38	$\overline{ACK}$	Acknowledge	Active low
40	$\overline{RST}$	SCSI bus reset	Active low
42	$\overline{MSG}$	Message	Active low
44	$\overline{SEL}$	Select	Active low
46	$\overline{C/D}$	Command/Data	Active low
48	$\overline{REQ}$	Request	Active low
50	$\overline{I/O}$	Input/Output	Active low

All other pins are connected to ground (0V), except pin 25 which is open.

# Appendix C: Troubleshooting guide

Condition	Possible cause	Corrective action
CD will not play	Power not on	Check the power switch and power supply.
	No CD inserted	Insert CD.
	CD is very dirty	Wash the disc in warm water and a little mild washing up liquid. Rub the CD with your finger tips in straight lines from the centre to the outside edge. Let it dry.
	Drive lens is dirty	Clean lens using a CD lens cleaning kit.
	Pause button in effect	Release the CD player pause button.
	If temperature in the room is cold, there may be condensation on the lens	Leave the power to the unit on and try again in about an hour.
No audio, or only one channel plays	Speaker or headphone connections loose	Tighten connections.
	Volume turned down	Check the volume control.
	Setup not correct	Check Setup panel data is set correctly.
Sound quality is poor	CD is dirty	Clean disc (see above).
	CD is scratched	Replace disc.
	CD is vibrating	Place unit on solid surface.
	CD is warped	Replace disc.
	Drive lens is dirty	Clean lens (see above).
	Faulty caddy	Replace caddy.

Condition	Possible cause	Corrective action
Computer will not recognise the CD-ROM drive	Bad SCSI connections	Check cable connections.
	SCSI ID conflict	Check SCSI ID numbers of all devices for conflict.
	CDFS icon not present	Check interface installed correctly.
	Incorrect termination	Make sure that only the first and last SCSI devices have termination resistors installed.
	The Multimedia Expansion Unit was not turned on before the computer	Turn the Multimedia Expansion Unit on and then reboot the computer.
Computer will not start up after turning on the power switch	SCSI ID conflict	Check SCSI ID numbers of all devices for conflict.
	Incorrect termination	Make sure that only the first and last SCSI devices have termination resistors installed.
CD caddy will not eject when the Eject button is pressed	Mechanism failure	Locate the Emergency Eject button hole, and firmly push one end of a large paper clip into it.
	Button is disabled by *Lock command	Unlock with *Unlock command.
CD caddy is continually ejected from the drive	CD is a non-playable sample disc	Remove disc and insert a valid one.
	No disc in the caddy	Insert a disc.
	Disc is upside down	Turn disc over.
	Faulty caddy	Replace caddy.
DOS disc fails to run	Insufficient files and/or buffers	Set/amend files and/or buffers accordingly; see page 22.
	screen Incorrect mode	Check emulator configuration and adjust as necessary.
	Insufficient memory available to DOS	Check emulator configuration and adjust as necessary.
DOS mouse not working	Mouse driver not installed	Install AMOUSE.COM as detailed in PC Emulator Guide.
	Mouse not connected in DOS window	Use the <b>Connect mouse</b> option on the Emulator window menu.
	DOS application does not support a mouse	Use keyboard as detailed in the DoS application's manual.



# Index

## A

- A3000 12
- A3010 12-14
- A3020 12-14
- A4000 12-14, 16
- A5000 7-11, 16
- amplifier *see* power amplifier
- Archimedes 300 series 4, 6, 8-11, 16
- Archimedes 400 series 4, 6, 8-11, 16
- Archimedes 400/1 series 6, 8-11, 16
- Archimedes 540 series 6, 8-11, 16
- audio 16-17, 29-32, 69, 73
- AUTOEXEC.BAT file 21-22

## B

- block size 46
- blocks per track 46
- booting 47, 53
- buffers 20
- BUFFERS (DOS variable) 22

## C

- cables 37
  - maximum length 37
- CD caddies 2, 23-24
- CD1 Line Out sockets 17, 69
- CD2 Line Out sockets 2, 17, 69
- \*CDDevices 64
- \*CDFS 64
- CDFS 25-26
  - \* Commands 64-66
  - configuring 19-20

- disabling 26
- version required 4
- CDPlayer 29-32
  - controls *see* CDPlayer (main window)
  - Keypad window 30-31
  - main window 29-30
  - programs 31
  - quitting 32
  - Setup window 32
- CD-ROM drives
  - adding 19-20
  - caches 43
  - configuring from command line 67
  - emergency eject button hole 24
  - headphone socket 17, 69
  - LED 24
  - removing 19-20
  - unlocking 24
  - volume control 17
- CDs 23-24
  - cleaning 73
  - ejecting 24
  - handling 23
  - loading 23-24
  - playing audio *see* CDPlayer
  - using 25-27
- \*CDSpeed 64
- certifying *see* SCSI devices (certifying)
- ChangeFSI 26, 57-62
  - menu 58
  - output options 60
  - picture formats 57
  - processing options 59
  - scaling options 58
- Compact Discs *see* CDs
- Computer Audio In sockets 17
- CONFIG.SYS file 21-22

- \*Configure CDROMBuffers 64
- \*Configure CDROMDrives 64
- \*Configure SCSIFSDirCache 63
- \*Configure SCSIFSDiscs 63
- \*Configure SCSIFSDrive 63
- \*Configure SCSIFSMap 63
  - disabling 39, 47
- configuring 15-17
- connecting 15-17
- conventions vii
- Cumana – telephone number 40
- cylinders 46

## D

- data transfer width 4, 43
- defects list 44-46
- \* Devices 63
- diagram *see* parts identification
- discs *see* SCSI devices
- dismounting *see* SCSI devices (dismounting)
- DR-DOS
  - version required 20

## E

- Edit 26
- \*Eject 65
- ejecting *see* CDs (ejecting)
- expanding 1, 33-38

## F

- FILES (DOS variable) 22
- formatting *see* SCSI devices (formatting)

## G

- GIF files 57

## H

- handling 2
- hard disc drive LED 2
- headphone sockets *see* Mixed headphone socket
  - and CD-ROM drives (headphone socket) heads 46
- hidden drives 51

## I

- IFF files 57
- IMG files 57
  - internal SCSI devices *see* SCSI devices (internal)

## J

- JFIF files 57
- JPEG *see* JFIF
- files

## L

- loading *see* CDs (loading)
- \*Lock 65

## M

- magneto-optical drives 1, 33
  - see also* SCSI devices
- memory controller 4
- Mixed headphone socket 16, 69
- Mixed Line Out (Variable) sockets 16-17, 69
- mounting *see* SCSI devices (mounting)
- mouse viii
  - buttons viii
- MS-DOS
  - version required 20

## O

ON/OFF switch 17

## P

packing list 2  
 Paint 26  
 partitioning *see* SCSI devices (partitioning)  
 parts identification 2-3  
 PATH (DOS variable) 22  
 PC Emulator *see* PC Soft  
 PC Soft 26-27  
     configuring 20-22, 68  
 PCX files 57  
 PIC files 57  
 \*Play 65  
 \*PlayList 65  
 \*PlayMSF 65  
 power 17  
 power amplifier 1, 17, 33  
 power supply unit *see* PSU  
 PSU 33, 69

## R

Replay 43  
 RISC OS  
     upgrading 4  
     version required 4  
 R-series 6, 8-11

## S

safety standards iii, 15, 33, 69  
 \*SCSI 64  
 SCSI connector pin-outs 70-72  
 SCSI devices  
     adding 37-38  
     certifying 44  
     configuring from command line 66-67

    dismounting 43-44  
     external 34  
     formatting 44-45  
     internal 15, 33-34  
     low-level parameters 46  
     mounting 43-44  
     partitioning 47-50  
     spreading reads 43  
     testing 55  
     verifying 45-46  
     wiping 50  
     write protecting 49  
 SCSI Driver Reservation Error 47  
 SCSI expansion cards 4, 5-14  
     installing 5-14  
     mini (CAO08) 4, 12-14, 35  
     setting up 46-47  
     standard (CAO06) 5-11, 33, 35  
 SCSI IDs 16, 34  
     expansion cards 47  
     selector 16  
 SCSIDiag 55  
 SCSIFS  
     \* Commands 63-64  
 directory caches 53  
 SCSIMgr 39-54  
     Devices window 41, 42-47  
     Dismount button 43-44  
     Driver Flags button 43  
     Drives window 41, 50-51  
     entry password 39, 40, 52  
     Format button 44-45  
     Format Options window 44-45  
     Help window 41 installing 40  
     main window 41 menu 52-54  
     Parameters button 46  
     Partitions window 41, 43-44, 47-50  
     quitting 54  
     running 40-41  
     SCSI Manager window *see* SCSIMgr (main window)

- Set Host ID button 46-47
- system password 40, 52
- Verify button 45-46
- security 39-40
- stacking 15
- \*Stop 65
- \*Supported 65
- surface analysis *see* SCSI devices (certifying)

## T

- technical specification 69-72
- termination 35-36
- TIFF files 57
- troubleshooting 73-74

## U

- \*Unlock 66
- unpacking 1-2
- upgrades *see* expanding

## V

- verifying *see* SCSI devices (verifying)
- VGA 26-27
- volume control 16

## W

- weight supported 15
- \*WhichDisc 66
- Windows 27
- wiping *see* SCSI devices (wiping)
- write protecting *see* SCSI devices (write protecting)

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