# SCSI

(inc CDFS)

# USER GUIDE

for use on all Acorn RISC OS computers

CASTLE TECHNOLOGY

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(inc CDFS)

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# SCSI

# CDFS

# PHOTOVIEW

# Appendix 1

# SCSI USER GUIDE

*(Note: A technical reference manual is available separately)*

## 1    SCSI

## 1.1    Introduction

Thank you for purchasing a Castle Technology SCSI interface and/or a SCSI device. This User Guide covers the installation of interfaces & devices and the associated configuration of your Acorn computer.

## 1.2 Typographical conventions

The following conventions will be used in this guide:

• Applications are referred to using italic type eg:

> *!Edit*

• Items that should be typed in by the user are in monospaced type - eg:

> Press Insert

• Specific keys are represented between square brackets in Sans Serif type eg:

> Press <ENTER>

Chapter references are shown in Sans Serif bold for example:

> See chapter headed **Specifications**

## 1.3 Getting Started

You will need to install a SCSI interface into your computer, then fit and connect your SCSI device(s). Finally before you can use your new SCSI device you will need to set the Configuration options to enable the computer, SCSI interface and SCSI devices to communicate correctly.

Installing a SCSI Interface and SCSI device is relatively simple provided you have the basic tools (a selection of screwdrivers is all that is required). However if you feel unable to fit any of the SCSI Devices please contact your local dealer for assistance (your dealer may ask for a small fitting charge). Alternatively please contact Castle Technology who can provide a full fitting service.

## 2    INTERFACE INSTALLATION

The following sections cover the installation of a SCSI interface into your computer.

## 2.1    Installing an Interface into an Archimedes

1. Turn off the computer and unplug it from the mains
2. Disconnect the monitor and any other peripherals that are connected.
3. Position the computer so that you have ready access to the rear of the computer.
4. Locate the 5 screws that fix the lid of the computer and remove them.

5 lid fixing screws on the Archimedes computer
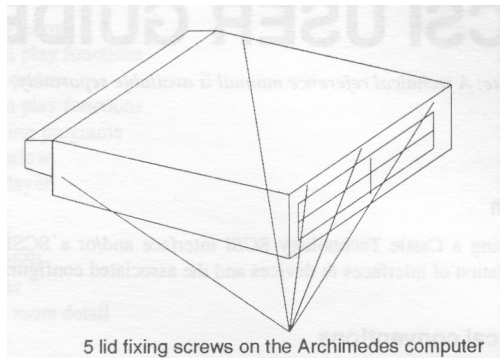
5. Remove the lid by sliding it towards the rear of the computer.

6. Remove a back panel from the rear of the computer to allow the interface to be inserted into the computer from the rear *(Note: If fitting a hard drive at the same time please refer to drive fitting section of this user guide).*

7. Locate the backplane (if there is no backplane fitted please contact your local dealer or Castle Technology).

8. Remove the SCSI interface from is packaging *(Note: To reduce the risk of static damage use the conductive bag that the interface came in to place the interface on).* Insert the SCSI interface from the rear of the computer so that the connector on the interface locates on to the backplane.
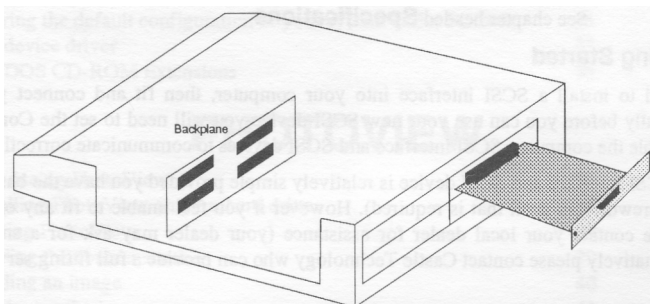


9. Secure the interface into the computer by using the screws provided (if required a ½ width blanking panels are available free from Castle Technology).

10. If fitting an internal SCSI device fit the 50 way ribbon cable to the interface - ensure that the cable is attached the correct way round (pin 1 - the stripe on the ribbon cable - is clearly indicated on the interface card by a 1 and a 'blob').

11. Replace the lid and screws, attach any other peripherals and switch on your computer.

12. The hardware installation is now complete. Please see section headed SCSI software.

## 2.2    Installing a SCSI interface into an A30x0

1. Disconnect your computer from the mains and remove all peripherals inc monitor.

2. Remove the lid by removing the fixing screws. This will expose the interface card sockets.

A3010 & A3020 - locate the 3 fixing screw at the front underside of the computer and lift the lid upwards so that the rear of the lid "snaps" out at the rear.

A3000 - remove the screw located under the A3000 (in the centre in a recessed hole) and then locate and remove the two screws securing the fixing devices to the rear. Press the tags in and lift the lid up slightly from the rear. Free the lid from the three front tags by using a flat screwdriver to prise them apart.

3. Remove the plastic (A3010 & A3020) & metal blanking panels found at the rear of the computer by sliding them upwards (A3010 & A3020) or unscrewing the two screws at each side (A3000).

4. Remove the interface card and 2 metal screws (the A3010 & A3020 need these screws) from the packaging.

*Note: Use the conductive bag that the kit came in to place the interface on. This reduces the risk of static damage.*

5. Place the SCSI interface card over the interface card sockets with the panel facing the rear of the computer. Then with the pins located over the sockets push the interface card firmly downwards so that the pins enter and locate into the sockets.
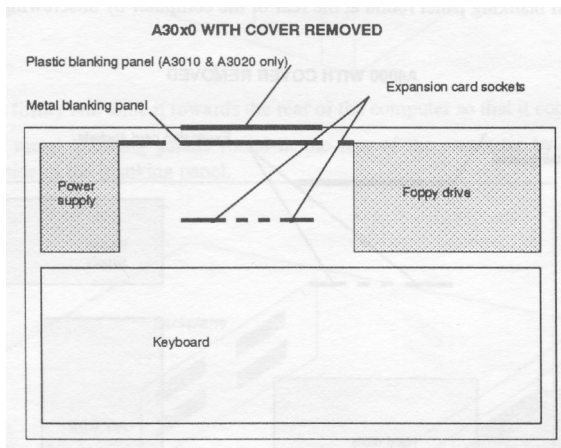


6. Refit the lid - the opposite to above.

7. The hardware installation is now complete. Please see section headed SCSI software.

## 2.3    Installing an SCSI interface into an A4000

1. Disconnect your computer from the mains and detach all peripherals from the computer.

2. Locate the 4 screws that fix the lid to the base of the A4000 (these are found underneath the computer) and remove the screws.
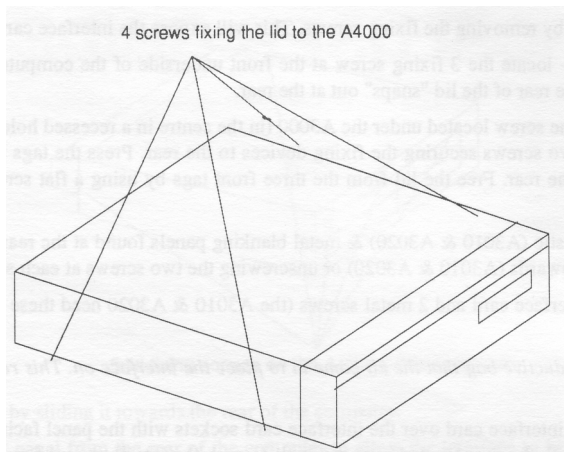
4 screws fixing the lid to the A4000

3. Grasp the lid firmly and slide it towards the rear of the computer so that it comes free.

4. Remove the metal blanking panel found at the rear of the computer by unscrewing the two screws at each side.
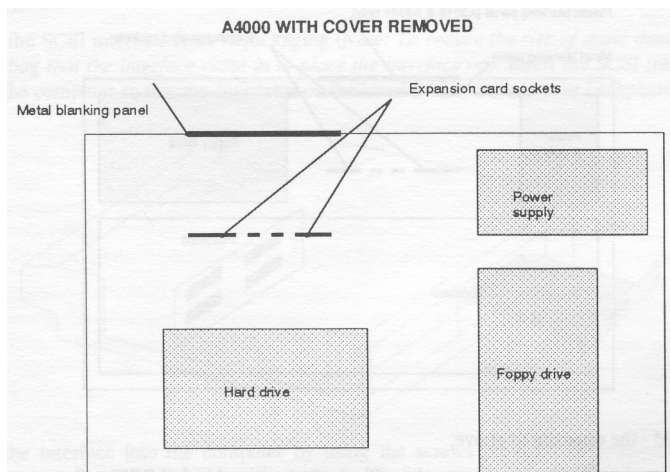


**A4000 WITH COVER REMOVED**

Expansion card sockets

Metal blanking panel

Power supply

Hard drive

Foppy drive

5. Remove the interface card from the packaging. *(Note: Use the conductive bag that the kit came in to place the interface on. This reduces the risk of static damage.)*

6. Place the SCSI interface card over the interface card sockets with the panel facing the rear of the computer. Then with the pins located over the sockets push the interface card firmly downwards so that the pins enter and locate into the sockets.

7. Refit the lid as described in the computer's "Welcome Guide" and switch on the computer.

8. The hardware installation is now complete. Please see section headed SCSI software.

CASTLE TECHNOLOGY

## 2.4    Installing an SCSI interface into an A5000

1. Disconnect your computer from the mains and detach all peripherals from the computer.

2. Locate the 4 screws that fix the lid to the base of the A5000 (these are found underneath the computer) and remove the screws.
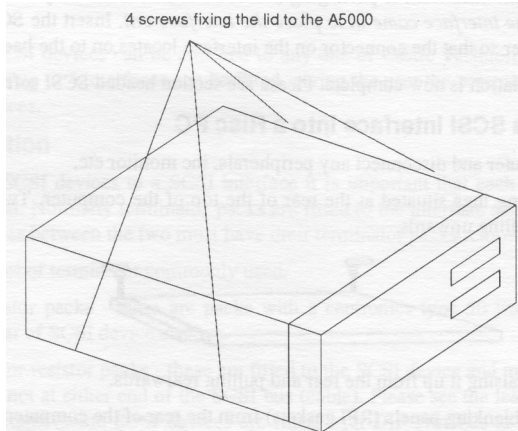
4 screws fixing the lid to the A5000

3. Grasp the lid firmly and slide it towards the rear of the computer so that it comes free.

4. Remove the metal blanking panels found at the rear of the computer by unscrewing the two screws at each side of the blanking panel.
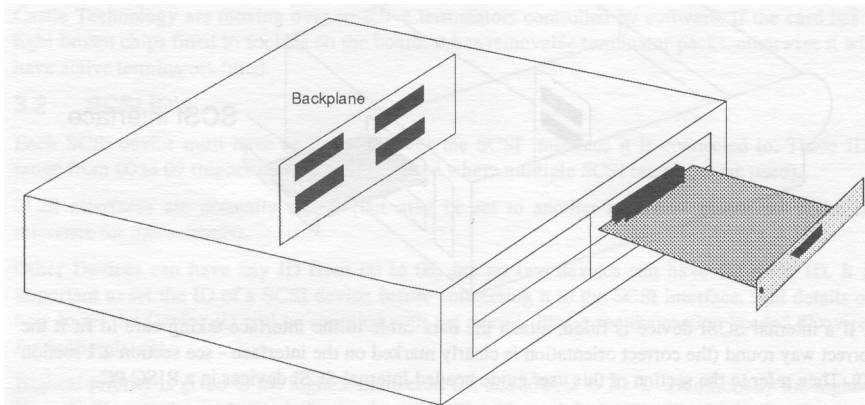
Backplane

5. Remove the interface card from the packaging.

*Note: Use the conductive bag that the kit came in to place the interface on. This reduces the risk of static damage.*

CASTLE TECHNOLOGY

6. Remove a back panel from the rear of the computer to allow the interface to be inserted into the computer from the rear *(Note: If fitting a hard drive at the same time please refer to drive fitting section of this user guide).*

7. Locate the backplane.

8. Remove the SCSI interface from is packaging *(Note: To reduce the risk of static damage use the conductive bag that the interface came in to place the interface on).* Insert the SCSI interface from the rear of the computer so that the connector on the interface locates on to the backplane.

9. The hardware installation is now complete. Please see section headed SCSI software.

## 2.5    Installing a SCSI interface into a Risc PC

1. Switch of the computer and disconnect any peripherals, inc monitor etc.

2. Locate the two fixing lugs situated at the rear of the top of the computer. Twist the lugs to the rear and remove by pulling upwards.
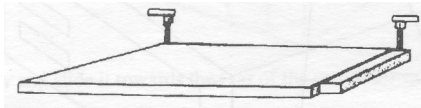


3. Remove the lid by raising it up from the rear and pulling rearwards.
4. Remove one of the blanking panels (RFI gaskets) from the rear of the computer.

5. Remove the SCSI interface from its packaging and insert through the rear panel and locate it into the interface socket onto the backplane.
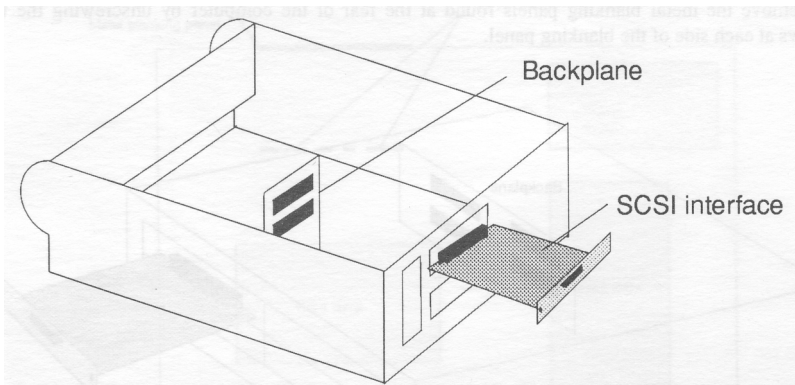


6. If a intemal SCSI device is fitted, attach the data cable to the interface taking care to fit it the correct way round (the correct orientation is clearly marked on the interface - see section 2.1 section 10). Then refer to the section of this user guide headed Internal SCSI devices in a RISC PC.

7. Screw the Interface backpanel to the computer with the screws previously removed.

8. Refit the lid and fixing lugs and reconnect all peripherals and monitor etc.

9. Plug the computer in and switch it on.
10. The hardware installation is now complete. Please see section headed SCSI software.

## 3    ADDING SCSI DEVICES

All Acorn 32-bit RISC computers can have a variety of SCSI devices attached. The A30x0 range are limited to having mostly external devices as there is limited expansion room inside the computer ( except for internal 2½" IDE hard drive). This section looks at connecting a variety of SCSI devices to your computer.

A total of seven SCSI devices can be attached to any one of Castle Technology's SCSI interfaces. Where room allows up to 4 interfaces can be fitted, giving the user the potential to connect up to 28 different SCSI devices.

## 3.1    Termination

When connecting SCSI devices to a SCSI interface it is important that each end of the SCSI bus ( cable) is terminated. Normally terminator packs are fitted to the interface and the last SCSI device on the cable. Devices between the two must have their terminator packs removed.

There are three types of terminator commonly used.
1. External terminator packs - these are packs with a centronics type 50 way plug and are fitted externally to the rear of SCSI device casings.

2. Internal terminator resistor packs - these are fitted to the SCSI device and must be removed when the SCSI device is not at either end of the SCSI bus (cable). Please see the leaflet supplied with the device for more details (some SCSI devices are fitted with DIP switches to power the terminator packs as well as the SCSI IDs).

3. Internal active terminators - these may be fitted to either SCSI device or SCSI interface. They are enabled or disabled either by software control from the computer, or by setting a jumper or switch on the device.

Castle Technology SCSI interfaces have traditionally been fitted with removable terminator packs. Castle Technology are moving over to active terminators controlled by software. If the card has 2 light brown chips fitted to sockets on the board, it has removable terminator packs. otherwise it will have active terminators fitted.

## 3.2    SCSI ID's

Each SCSI device must have an unique ID for the SCSI interface it is connected to. These IDs range from 00 to 07 (higher numbers are reported where multiple SCSI interfaces are used).

SCSI interfaces are normally ID 07 (but may be set to another number - please see technical reference for more details).

Other Devices can have any ID from 00 to 06, but no two devices can have the same ID. It is important to set the ID of a SCSI device before connecting it to the SCSI interface. Full details on how to set the Device ID will be supplied with the device. Please see the section headed *Devices for further details.

Highest priority is given to the highest numbered ID, and lowest to ID 0. Traditionally the highest ID is the Host (computer). Castle Technology SCSI interfaces default to an ID of 7 for the Host, and to there being 1 SCSI drive at ID 0.

## 3.3 External SCSI devices

External SCSI devices such as CD ROMs, hard drives, scanners etc. can be fitted to all Acorn computers. These devices must be fitted in an external case with a suitable power supply, fan and connectors. The SCSI devices should also have a suitable high quality screened connecting SCSI cable. A SCSI interface is required and should be fitted to your computer (please contact Castle Technology if you do not have a SCSI interface).

On the rear panel of the SCSI interface there will be an external connector designed to take an external device.



A3000 with externally connected CD drive
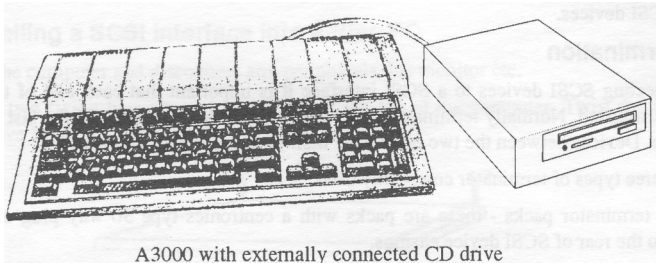
To connect the external SCSI device:

1. Ensure that the Termination and ID of the SCSI device is set correctly - please see paragraphs headed SCSI IDs and Termination above for more details.

2. Switch off your computer and connect one end of the cable to the SCSI interface and the other end to SCSI device. CAUTION: Many Castle Technology interfaces use the same type of socket as the parallel printer port. Connection of a standard printer cable to the **SCSI port WILL CAUSE DAMAGE** to the interface. Please be careful to avoid this.

3. Plug in the mains lead and switch on the SCSI device and then the computer.

## 3.4    Internal SCSI devices in the Archimedes

One internal device can be fitted inside an Archimedes computer (A310, A410, A540). This device can be one 3½" or smaller size and fits beside the floppy disc drive. (Replacement front panels are available for those who wish to have externally accessed devices - such as Syquest removable drives) .

To fit a 3½" device proceed as follows:

1. Remove the lid of the computer as described above.
2. Remove any interfaces etc and then the backplane.
3. Fit the drive into the carrier (supplied with drive) and carefully fit it into the slot between the fan and the floppy drive.

4. Connect the 50 way data cable to the drive

5. Locate and fit the archimedes's spare power supply connector to the drive (the power lead is attached to the archimedes's power supply).

Refit the backplane, interfaces and lid and proceed to the section headed Configuring your computer.

## 3.5    Internal devices in the A5000

The A5000 is able to take two extra 3½" devices. One mounted internally and the other also mounted internally but also accessible from the outside *(useful for Syquest removable drives etc)*. These drives are mounted underneath the installed 3½" floppy drive:



Corner section of A5000 showing fitted floppy drive and positioning
of 1st & 2nd 3½" devices
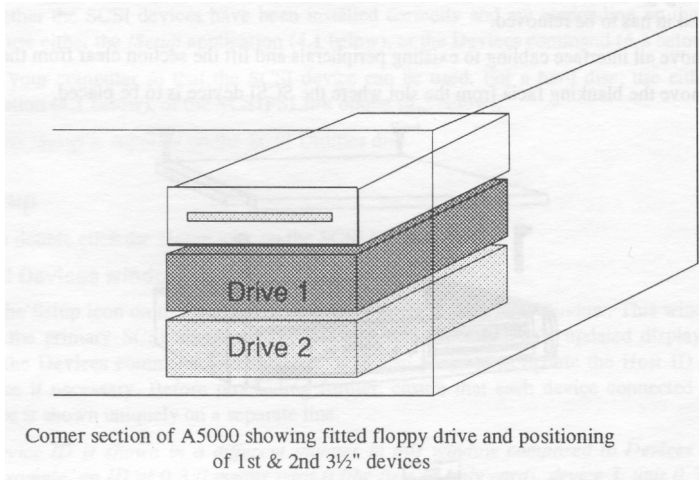
1. To fit a drive into an A5000 remove the lid as detailing in Interface Installation - A5000 above.

2. Remove the backplane and drive carrier bracket by unscrewing the single screw found in the middle of the carrier and lift upward.

3. To fit a drive in position Drive 1, fix it in place with the screw provided

4. To fit a drive in position Drive 2 place the drive over the pre-punched holes in the bottom of the A5000 case and secure the drive with the fixing screws provided.

5. Connect the data cable (supplied with the interface) and power cables (attached to the A5000's power supply).

6. Refit the drive carrier and lid and connect the power.

7. The hardware installation is now complete.

## 3.6    Internal devices in the RISC PC.

The RISC PC is able to take a number of 5¼" and 3½" drives. Gaining access to the inside of the Risc PC is covered in the section headed "Interface installing - Risc PC".

1. Having gained access to the inside of the Risc PC, the section (slice) that the device is to be mounted in has to be removed.

2. Remove all interface cabling to existing peripherals and lift the section clear from the Risc PC.
3. Remove the blanking facia from the slot where the SCSI device is to be placed.



Exploded RISC PC showing CD ROM mounted internally
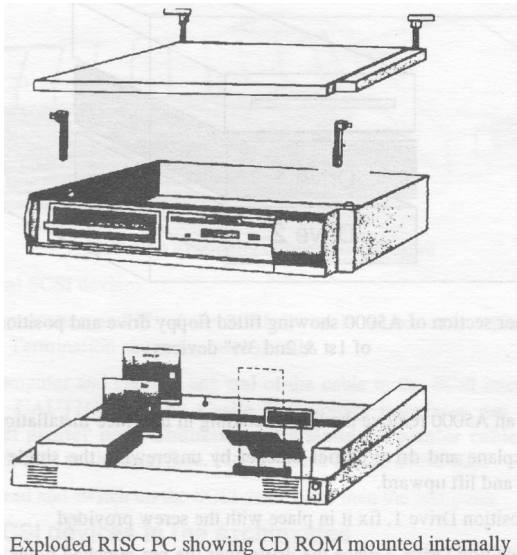
4. Remove the new SCSI device from the packaging.

5. Ensure that the terminators are fitted to the SCSI device (if the SCSI device is at the end of the SCSI cable).

6. Ensure that a suitable ID is chosen and set for the SCSI device - see device leaflet.

7. Turn the Risc PC's "slice" upside down and slide the SCSI device up till the front two mounting holes locate over the nipples provided. Locate the two rear fixing holes and the SCSI devices corresponding fixing threads and secure the SCSI device using the mounting screws provided.

8. Fit the 50 way SCSI cable and 4 pole power cable (from Risc PCs power supply) to the SCSI device.

9. Refit all the cables & interfaces etc to the Risc PC, ensuring that the SCSI interface is placed so that the data cable does not foul.

10. Refit the lid and other peripherals and connect to the mains.
11. The hardware installation is now complete.

# 4    SCSI CONFIGURATION AND SOFTWARE

Having connected any SCSI devices to the SCSI interface the following certain checks should be made before the SCSI devices can be used:

1. Check whether the SCSI devices have been installed correctly and are responding on the SCSI bus. For this, use either the *!Setup* application (4.1 below), or the Devices command (4.2 below).
2. Configure your computer so that the SCSI device can be used. For a hard disc, use either the *!Setup* application (4.1 below), or the SCSIFSLink option (4.3 below).

The application *!Setup* is supplied on the SCSI Utilities disc.

## 4:1    !Setup

To run *!Setup* double click the *!Setup* icon on the SCSI Utilities disc.

### 4.1.1 SCSI Devices window

Clicking on the Setup icon on the icon bar will display the SCSI Devices Window. This window is also used as the primary SCSI diagnostic tool. Within this a continuously updated display from output from the Devices command is displayed; it is also possible to update the Host ID of the SCSI Interface if necessary. Before proceeding further, ensure that each device connected to the SCSI interface is shown uniquely on a separate line.

*Note: the Device ID is shown in a different manner in this window compared to Devices in 4.2 below. For example, an ID of 0:3:0 means card 0 (the first or only card), device 3, unit 0. This is equivalent to a value of 03 in 4.2 below.*

*See section 4.6 below for debugging suggestions if each device does not occupy a unique line, or a device reports unexpected information.*

### 4.1.2 SCSI Disc Management window

This window is entered by clicking the menu button anywhere in the SCSI Devices Window, and selecting the "Map Partition to Icon" option. The resulting window is used to control the 'linkage' or 'mapping' between hard disc icons on the icon bar, and SCSI Discs or partitions. It is used to alter the settings of the SCSIFSLink variable in 4.3 below. It provides a continuously updated list of all SCSI disc partitions visible. A typical display might be as follows:

```
ID        Partition     Size     Linkage     Use
0:0:0     0 Castle0     500Mb    none        Acorn
0:0:0     1 Castlel     500Mb    SCSI::5     Acorn
0:4:0     0 Ezl         127Mb    SCSI::4     Acorn
```

The above shows 2 partitions on ID 0 :0 : 0 (or 00), both 500Mb in size and formatted for Acorn use. Partition ! is currently mapped to drive SCSI::5. Additionally there is a device at 0 : 4 :0 (04) of size 127Mb, formatted for Acorn use, and mapped to icon SCSI::4.

Pressing the menu button with the pointer above a partition brings up a window with buttons to link it to any permitted icon. There is also a button to remove the highest numbered icon present (Icons MUST be removed in descending ordet). Changing the linkage will, if needed, change the number of SCSI icons displayed.

### 4.1.3   Harddisc Formatting window

This window is entered by clicking the menu button with the pointer above a hard disc entry in the SCSI Devices Window, and selecting the "Format Disc x:x:x" button (where x:x:x is the ID of the disc to be formatted.). This window is used to modify the format of a hard disc and to adjust the size of any partitions on it. Please note the following warning:

**CHANGES MADE HERE RISK SELECTIVELY ERASING DATA IN THE DISC PARTITIONS MODIFIED, AND ON ANY HIGHER NUMBERED PARTITIONS.**

Menu entries are available to split the disc into separate partitions, merge partitions back together, name partitions prior to formatting, and to define whether a partition is used for Acorn or DOS usage. (Dos usage is only relevant on a RiscPC with a DOS coprocessor, or when using an Aleph1 PC expansion card.) **MAKE CHANGES WITH CARE,** AS MODIFICATIONS, ONCE SELECTED, ARE WRITTEN DIRECTLY TO DISC OVERWRITING ANY **DATA THERE BEFORE.**

*Note: Partition sizes will not be reported correctly until a partition has actually been formatted.*

## 4.2      *Devices

When *Devices is typed at the command line, the computer will report what SCSI interface(s) and SCSI devices are connected to the SCSI bus (cable).

Press the key F12 and type the following:

```
*Devices
```
The computer will respond with the following typical result:

```
Device  Type            Capacity   Vendor    Product         Revision
00      Direct-Access   540.87Mb   Quantum   LPS560          4.56
03      Read only       360.00Mb   NEC       211             0.76
04      Scanner         ??????Mb   Canon     GT9500          2.21
06      Processor       1.00Mb     Castle    SCSI 16bit I/F  2.60
07      Host                       Castle    SCSI 16bit I/F  2.60
```

### Device

This heading shows the SCSI device's ID. If one interface is installed in your computer this will range from 00 to 07 (2nd interface 08 to 0F etc). Typically the SCSI interface will have an ID of 07 although this can be altered (eg in SCSI Disc Share).

Other devices will have other IDs. Ideally the first hard drive should have the ID 00, this is because the SCSI software will default to Configuring device 00 to SCSI:4.

### Type

This heading reports the type of drive under the following headings for example:

| | |
|---|---|
| Direct Access | Hard drive, removable hard drive (Syquest) etc. |
| Read only | CD ROM |
| Scanner | Scanning device |
| Processor | Other SCSI interface installed in another computer |
| Host | Interface installed in users computer |

## Capacity

Indicates the size of the media supplied. Usually formatting will slightly reduce, the available Mega Bytes (Mb). In the case of a CD ROM the capacity reported indicates the amount of data on the CD ROM disc (a capacity of ??????Mb indicates that there is no CD ROM disc in the drive).

## Vendor

Shows the manufacturer, publisher or developer of the SCSI Device.

## Product

Reports the product code or name of the SCSI product.

## Revision

Reports the revision level of the software installed on the SCSI device.

## 4.3 Configuring your computer manually

Configuring your computer is essential so that it knows what SCSI device to talk to. Linking the RISC OS SCSI logical drive to the SCSI ID (see Devices above) allows the computer to address a particular SCSI device. So configuring the computer ensures that the computer talks to the right device at the right time. There are four SCSI configuration settings (or .5 with active terminators):

## SCSIFSLink

SCSIFSLink configures any direct access SCSI device to a known RISC OS logical drive. The' syntax is a follows.

*Configure.SCSIFSlink x y z

Where:        x = the RISC OS drive (4, 5, 6 or 7)
              y = the SCSI device ID (00 to 07)
              z = the partition number (0 to 6)

So if you wish to configure partition 3 of a SCSI device with an ID of 00 to the RISC OS logical drive SCSI::4 then:

Press Fl 2 and type:

```
*Configure SCSIFSlink 4 00 3 <RETURN>
```

To remove an icon, use the above syntax, but use a large ID such as FF instead.

## SCSIFSDirCache

The Acorn filing system keeps a copy of the drive's directory map in memory. This configuration option specifies the amount of memory reserved for this information. On a power-reset this is set to 16k and should not normally need to be reconfigured.

```
Eg:.*Configure SCSIFSDirCache 16k <RETURN>
```

## SCSIFSB uffers

Current versions of the SCSI software do not use this feature. This should always be set to 0K.

## SCSIFSDrive

This option configures the SCSI drive that RISC OS will access by default. This is most useful when setting the drive from which the computer will Boot from.

```
Eg: *Configure SCSIFSDrive 4 <RETURN>
```

### SCSITerm

This option configures the SCSI active termination, when fitted, on or off.

Eg: `*Configure SCSITerm on(off )` <RETURN>

*Note: All the above Configuration settings will be set only after performing a <CTRL><BREAK>. Current settings can be discovered by pressing the key Fl 2 and typing *S tatus*

## 4.4 Formatting and Partitioning devices manually

### 4.4.1 Formatting Devices

Before a SCSI hard drive can be used on an Acorn computer it has to be formatted (all hard drives supplied by Castle Technology are pre-formatted). This can be achieved using SCSIDForm (supplied on the SCSI Utilities disc).

I. Insert the SCSI utilities disc into the computer's floppy drive and click the Select button over the floppy drive Icon.

2. locate SCSIDForm and click twice with Select over it.

3. The program is now running - follow the steps one by one.

4. When the program has finished remove the SCSI Utilities disc and use your new hard drive.

### 4.4.2 Partitioning devices

SCSIDForm allows the Hard drive to be partitioned with up to 8 partitions. Having run SCSIDForm you will be prompted with the following:

*Note: Partitioning the hard drive may cause data on other partitions to be deleted. Proceed with caution.*

```
Partitions found on the disc
Number        Size
0             120.43
S - split partition 0
K - kill partition 0
Z - finished
```

To add a partition to the hard drive type

`s` <RETURN>

Then type in the new partition size eg:

`40` <RETURN>

This can be repeated up to 8 times or until there is now space remaining to be allocated to partitions.

## 4.5 SCSI from the desktop

Once the configuration and formatting have been completed a SCSI Icon will appear on the Icon bar. Each Icon will represent a hard drive or partition of a hard drive. Clicking on any of the Icons will bring up the Directory viewer for that drive. Files, directories and applications can be used, copied, deleted etc in the normal way.

## 4.6 Debugging

This section contains a series of commonly asked questions with relevant answers.

*Q. I do not have any SCSI discs, but there is a SCSI disc icon present: how do I remove it?*
A. Use *!Setup* to remove icon SCSI::4,

*Q. *Devices shows 1 device at all IDs.*

A. That device has the same ID as the Host ID. Change the Host ID or the offending device ID to an unused ID.

*Q. I get an error: SW! &403C3 Unknown'.*

A. The SCSIHandler module has died. Try typing '`*rmreinit scs i handler` <RETURN>' at the * command line. Either the problem will disappear, or a message '`SCSI Bus Unterminated`' will be reported. See the section on SCSI bus termination if this occurs.

*Q. The computer now takes a very long time to boot.*

A. If you do not have a CDROM, type '`*unplug cdfsdriver` <RETURN>' at the F12 command line.

*Q. I have an internal SCSI hard drive, and an external SCSI scanner/drive/cdrom. They work OK connected separately, but not when all connected at the same time.*

A. See section 3.1 on SCSI Termination.

*Q. How do I get my computer to boot from the SCSI drive?*

A. Press the F12 key and then type the following:

```
*configure filesystem scsi <RETURN>
*configure boot <RETURN>
*configure scsifsdrive 4 <RETURN>
*scsi <RETURN>
*dir :4 <RETURN>
*opt 4,2 <RETURN>
```

The changes will take effect from next time the computer is switched on or a Control Break is performed.

# THE CD-ROM FILING SYSTEM USER GUIDE

The product described in this manual is subject to continuous development and improvement. All information of a technical nature and particulars of the product and its use (including the information and particulars in this manual) are given by Acorn Computers Limited in good faith. However, Acorn Computers Limited cannot accept any liability for any loss or damage arising from the use of any information or particulars in this manual.

# CDFS

*(Note: A technical reference manua/ is available separately)*

## 5    INTRODUCTION

Thank you for purchasing your new CD ROM drive from Castle Technology.

Your CD Drive needs to be fitted to your computer (see sections above for fitting instructions) and requires CDFS (Compact Disc Filing System) software to make it usable.

CDFS is licensed from Acorn Computers Ltd and the bulk of this chapter describes CDFS and how to us the CD ROM once it is connected.

The CDFS sections of this manual were originally created by Acorn but is published by Castle Technology for use by its customers.

## 6    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 usually 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 section 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 10

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 CDFS CD-ROM icon will be displayed on the Icon Bar. Click on this icon to determine which type of CD-ROM is currently held in the drive drawer - CD-ROM, Photo CD or Audio CD.

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:
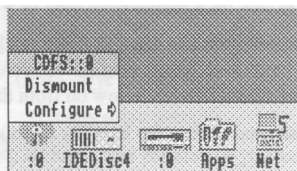


6 Choose Configure, Drives then enter the number of drives connected. If only one drive is connected, this step may be left out, but the boot-up time will be slower:
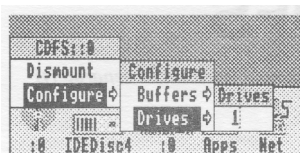
7 To configure the CD-ROM buffers, click Menu on the CD-ROM icon. Choose Configure, Buffers then click on the required buffer size - 16K is normally sufficient, unless you are swapping discs a lot, in which case 32K or 64K would be better:
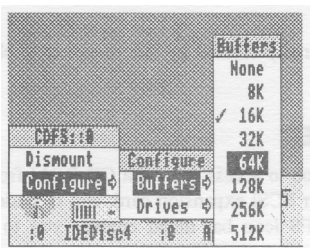


8 Reset the computer to implement the new configuration.

## 6.1 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.

### 6.1.1 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 drive 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.

### 6.1.2 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 drive, type the hard drive drive letter (typically C).

When the installation program has finished, reboot DOS from your hard drive, 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.

## 6.1.3 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

# 7 USING CD-ROM DISCS

You can use CD-ROM drives either 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.

## 7.1.1 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 18) 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).

## 7.1.2 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 CDFSFiler
```

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.

## 7.1.3 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.

## 7.2    Performance limitations

### 7.2.1  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.

### 7.2.2  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 a CD-ROM drive, so this problem does not often arise.

Titles which attempt to mute one audio channel (left or right), whilst playing the other channel, can cause program errors.

### 7.2.3  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.

# 8     CDPLAYER

The CDPlayer application allows you to play and control audio CDs using your computer and a CD-ROM drive. 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.

CDPlayer is supplied on floppy disc. It is already set up to use a CD-ROM drive that has a SCSI ID of 6, and that is connected to the first SCSI expansion card fitted to your computer. If you wish to use a drive with a different SCSI ID, or if you have fitted multiple SCSI expansion cards to your. computer, you should first read The Setup window on page 17.

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:
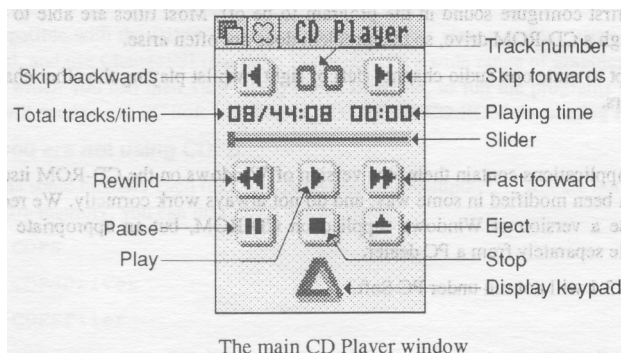


The main CD Player window

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.

## 8.1 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:
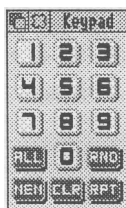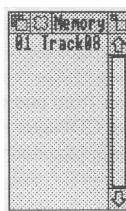


To program the player to play a selection of tracks

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.

### 8.1.1 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.

### 8.1.2 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.

## 8.2 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. CDPlayer is supplied already set up to use a CD-ROM drive that has a SCSI ID of 6, and that is connected to the first SCSI expansion card fitted to your computer. You'll only need to change the Setup if you wish to use a drive with a different SCSI ID, or if you have fitted multiple SCSI expansion cards to your computer.

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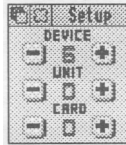


Click on the + and - icons until the correct device, unit and card numbers are shown for the CD-ROM drive you wish to use. If you're not sure what the numbers should be for a particular drive, you can find them out by typing at the command line:

`CDFS:CDDevices` (see page 25).

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.

## 8.3    Quitting CDPlayer

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

# 9    CHANGEFSI

ChangeFSl 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, ChangeFSl stands for 'Change Floyd Steinberg Integer' (ChangeFSl 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.

ChangeFSl 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).

## 9.1 Using ChangeFSI

ChangeFSl is supplied on floppy disc. Before using the application, you should copy it either to another floppy disc, or to your computer's hard drive - if one is fitted.

Double click on the application to start ChangeFSl. 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 ChangeFSl application on the icon bar. ChangeFSl 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.

### 9.1.1 Picture formats

ChangeFSl will convert many types of images. These include the PC graphics formats TIFF, PCX, PIC and IMG, the Amiga format IFF, the Compusery 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 FSIInfo provided inside the application (shift double-click on !ChangeFSl to display the files).

## 9.2 ChangeFSI in more detail

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

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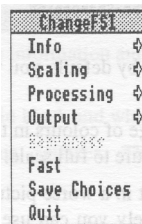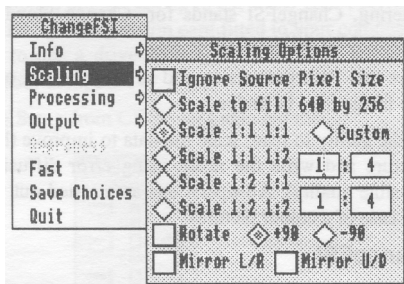
### 9.2.1 Menu options

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

## 9.2.2 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.

## 9.2.3 Processing options

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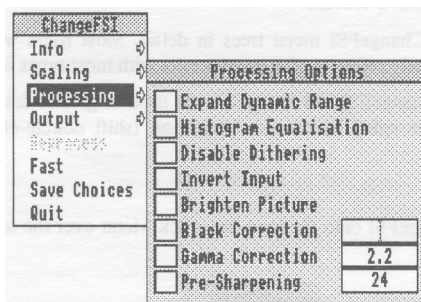


You'll notice that all of these options are 'off by default; you will not normally need to change these settings.

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.

## 9.2.4 Output options

The Output options control the screen mode the picture is created for:
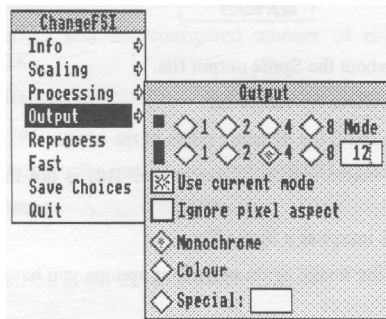
The 1, 2, 4, 8 buttons represent the screen colours that you can use. The numbers represent bits per pixel. 8 bits represent 256 colours, 4 bits represent 16 colours, 2 bits represent 4 colours and 1 bit represents 2 colours. The square box represents the square pixel modes and the oblong box represents 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 FSIInfo.

### 9.2.5 Reprocess

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

### 9.2.6 Fast

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

### 9.2.7 Save Choices

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

### 9.2.8 Quit

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

## 9.3 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:

```
ChangeFSI
Sprite Info  ⇨
Source Info  ⇨
Range Info   ⇨
Zoom         ⇨
Save Sprite  ⇨
Reprocess
```
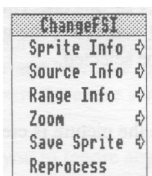
Sprite Info gives the information about the Sprite output file.

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.

# 10   USING THE COMMAND LINE

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]

*PIayMSF

*PIayMSF 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.

*PIayMSF 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

## 10.1   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 s iz ex 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.*

CASTLE TECHNOLOGY

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

## 11.1 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 MSCDEX.EXE.

## 11.2 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 MSCD001 - which must match that used in CONFIG.SYS.

Specifies the drive letter of the first CD-ROM drive

/M:

Specifies the number of cache buffers for MSCDEX.EXE (8 - 15), the default being 8.

/V:

Displays verbose message during boot-up, detailing memory usage and diagnostic information.

/S:

Instructs MSCDEX.EXE to patch DOS to allow CD-ROM drive sharing on an MS-NET based network server.

This parameter is not used by PC Soft.

/E: Instructs MSCDEX.EXE to use extended memory if available.

# PHOTOVIEW

## Acorn PhotoCD Sample Application

Acorn PhotoCD Sample Application

# PHOTOVIEW

## 12    Introducing PhotoView

PhotoView is a PhotoCD sample application which allows you to access the images on a PhotoCD disc. Using PhotoView to view and manipulate an image you can

-    choose the display resolution of the selected image
-    rotate the image through 0, 90, 180 and 270
-    flip the image in the vertical plane prior to rotation
-     export the image in a choice of image formats
-     save the image, or a selected area or the image, in a choice of image
formats.

## 12.1 Installing PhotoView on your hard drive

To install PhotoView on your hard drive:

1. Create a new directory called SampleApp on your hard drive, and open it by double-clicking on it.

2. Place the SCSI and CD-ROM Utilities disc in your floppy disc drive. (This disc is supplied with both the Acorn SCSI Card and the Acorn CDFS upgrade kits.)

3. Click on the floppy disc drive icon on the icon bar to display the root directory of the Utilities disc.

4. Drag the !PhotoView icon into the SampleApp directory on your hard drive.

5. Remove the floppy disc from the drive.

You can now run PhotoView from your hard drive.

## 12.2 Starting PhotoView

To run PhotoView from your hard drive, double-click on the !PhotoView icon in your hard drive SampleApp directory.

The PhotoView icon will appear on the icon bar.



## 12.3 Loading the contact sheet

The contact sheet is a PhotoCD directory display which contains a number of thumbnail images. A thumbnail is a small representation of an image; there is one thumbnail for each image stored on the PhotoCD disc. Thumbnails are numbered in order corresponding to the number of the stored image on the PhotoCD disc.

To open the contact sheet, click on the PhotoView icon on the icon bar. Alternatively, if you have more than one PhotoCD available, press Menu over the PhotoView icon bar icon, and choose the directory you want from the Source submenu:
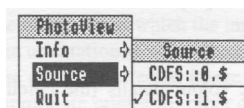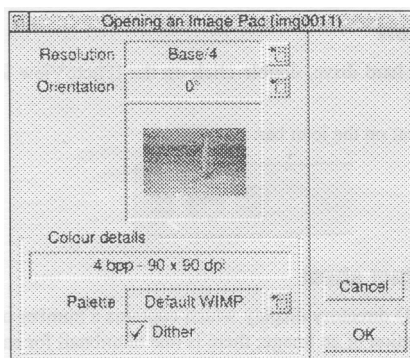
The contact sheet for the selected PhotoCD is opened on the desktop.
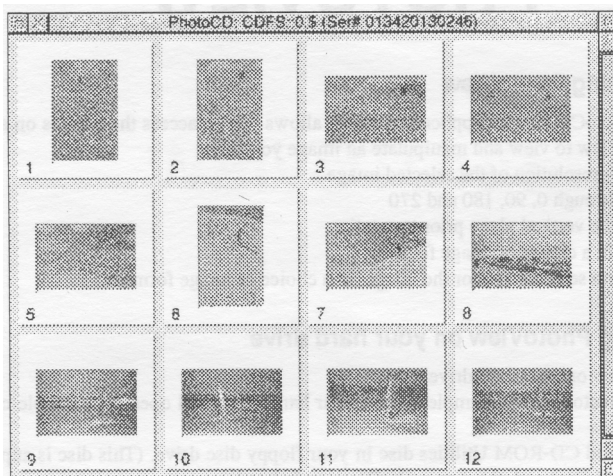


## 12.4  Loading an image

Choose the image you wish to load by clicking on its thumbnail. This opens a control window containing the same thumbnail.



You use the control window to choose image display settings prior to displaying the image itself. Within the control window you can set the
- resolution at which the image will be displayed
-  orientation in which the image will be displayed
- palette to be used to generate the image
- use of dithering in the image generation.

The control window also displays the colour details (the colour depth in bpp, and the display resolution in dpi) of the current display mode.

Note that you cannot alter the current display mode within the control window.

* Changing the image's resolution
It is a good idea to work with a low resolution image in the desktop, and then export at a higher resolution if required. The higher the resolution of an image, the larger the size of that image, and the longer it takes to load and manipulate.

To change the resolution at which the image will be displayed, click on the menu icon to the right of the box containing the current resolution setting. Choose the new resolution from the list displayed.

* Changing the image's orientation
By default, orientation is set to 0 for a landscape image, and 90 or 270 for a portrait image. To change the orientation at which the image will be displayed, click on the menu icon to the right of the box containing the current orientation setting. The list of orientations displayed includes four options with which you can flip the image in the vertical plane prior to rotation. Choose the new orientation from this list.

* Changing the default palette
By default, the palette used to generate the image is the default WIMP palette for the current display mode. To change the palette, click on the menu icon to the right of the box containing the current palette details, and choose another palette from the list displayed.

* Enabling and disabling dithering
By default, dithering during image generation is enabled. If you wish to change this setting, simply click on the button displaying the current setting. The legend on this button will toggle between a tick and a cross to indicate whether dithering is enabled or disabled.

## 12.5  Displaying the image

Set the display options you wish to use, bearing in mind that the higher the resolution setting, the larger the size of the image, and the longer it will take to load and manipulate.

You can then display the image. If at this point you do not wish to continue, click on the control window's Cancel button.

To display the image, click on the OK button.

Once you have displayed the image, further options become available via the Image menu. To display the Image menu, click Menu anywhere within the displayed image window. The menu has the following options:

- Image info gives image details extracted from information pressed on the PhotoCD disc at the point at which the disc was pressed.

If the disc was pressed in a single session, the Last Modified box contains a dash, otherwise it contains the date when the last session was written.

If a copyright file is contained on the disc, the copyright filename is shown in the appropriate box. You can view the copyright information by clicking in the Read Rights button at the bottom of the window. If no copyright file is present, the Read Rights button is greyed out.

- Save displays a Save box which allows you to save the image as a sprite file appropriate to the current display mode.

- Export displays the Export menu which offers you a choice of formats in which to export the current image.

- Resolution allows you to define the resolution at which the image is to be saved to disc.

- Orientation allows you to define the orientation at which the image is to be saved to disc.

- 24 bit sprite allows you to save the currently selected image as a 24 bit sprite. 24 bit sprites give professional quality output on an appropriate printer (or other output device); This output is the best you can get.

**-** Scale view displays the Scale view control panel which allows you to specify the scale of the image view. You can choose from the six pre-defined scale options or type in your preferred scale. You can click on the arrowheads to make fine adjustments to the scale.

## 12.6   Quitting PhotoView

To quit PhotoView, press Menu over the PhotoView icon on the icon, bar and choose Quit.

## 12.7   Troubleshooting

You may encounter loading and display difficulties if you do not have enough free memory for the display. You need, for example, a colour card with 24MB of free memory to display an image at 16 base and 24bbp colour depth.

Warning messages are displayed when insufficient memory is available, and PhotoView will adjust the screen display accordingly:

- If you are loading the contact sheet, PhotoView will display as many thumbnails as it is able. Those images which could not be displayed are marked N/A.

- If you are attempting to display an image, PhotoView will offer you a scrolling partial image.
If you are warned that you are short of memory, you are advised to quit PhotoView, and then to quit further running applications in order to free up more memory, before restarting PhotoView.

## Appendix 1 - Castle Technology's end-user licence conditions
## Definitions

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