

Installation instructions for the

**Lingenuity SCSI Interface  
card**

Acorn Archimedes

&

BBC A3000

**L I N G E N U I T Y**

**P R O F E S S I O N A L**

# ADDENDUM

Note: Issue 2.00 of the Lingenuity SCSI interface card has the following changes.

1. The rear connector is now a 25-way "D-Type" connector. This new connector is used for the following reasons:

- a. To ensure the interface card conforms to international Radio Frequency Interference (RFI) standards.
- b. To conform to Apple & other computer manufacturers standards.
- c. To enable a round (not ribbon) cable to be used to connect external devices - this is a neater solution.

2. The internal SCSI cable connector mentioned in the manual is retained although the cable socket should be fitted the other way around. Please see page 1-5 and read in place of the first paragraph the following:

"...the hard drive to the internal connector on the SCSI Interface card (see Fig. 4). The notch on the plug should face towards the rear of the Archimedes."

The correct installation is indicated on the board by an arrow to PIN 1 of the connector and a similar arrow will be found on the cable socket. These two arrows should align.

If you have any queries please contact your supplier for further details.

# Installation Instructions for the Lingenuity SCSI Interface Card and Hard Drives.

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# **WARNINGS**

**Before installing your SCSI Interface please make sure that the Mains Power to you Computer is TURNED OFF and that the MAINS LEAD IS UNPLUGGED.**

**Your new Hard Drive is a fragile object. Please treat it with extreme care and always place the drive on something soft, eg. a Mouse Mat.**

## **A3000 Owners**

**Please note that it is extremely dangerous to remove the cover of the A3000 without disconnecting the power. If you are in any doubt at all please ask your dealer to undertake the installation of the A3000 SCSI interface card.**



# Lingenuity SCSI Interface Card

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# Introduction

Thank you for purchasing the Lingenuity SCSI Interface card. The advanced technology that has been used by Lingenuity allows you to connect a wide range of SCSI devices to your A-Series computer.

This manual covers the installation of the SCSI Interface card and Hard Drives. Fitting details for additional devices are supplied with the relevant devices, although you will find brief details in the Chapter headed "Other Devices".

Lingenuity has maintained compatibility with Acorn's IRISCOS SCSI filing system drivers so that future hardware devices and software applications will be able to use the Lingenuity SCSI Interface Card as an alternative to the Acorn SCSI Interface card.

Due to the ever-changing world of computers it may be necessary to upgrade filing system software from time to time. To enable us to carry this out efficiently please be sure to complete and return the enclosed Registration card.

Lastly we hope that the installation of your new card and device goes smoothly. If you encounter any problems please refer first to your supplier for any assistance.

## Conventions used in the Manual

Applications are referred to using an italic font - e.g.:

*!Presenter!*

items that the user is required to type appear as follows:

this is what I might type

Specific key-presses are shown as follows:

<RETURN>

Options from a menu are shown as follows:

menu option

## Getting started

Before you can use your new SCSI device you will need to connect the device and the SCSI Interface card to your computer. You will also need to set at least two 'Configure options.

To Install the SCSI interlace and card successfully you should need no more that a Philips screwdriver although you may need a spot of glue to install the drive access light.

The installation of the device to your computer is relatively simple but if, after reading this manual, you would prefer your supplier to complete the fitting, please ask him to do so. If your supplier does fit the interface or drive he may charge you a lee.

All that remains is the installation. Please follow the Chapter related to your computer followed by the Chapter headed "Software Installation".

# Chapter 1 - Archimedes

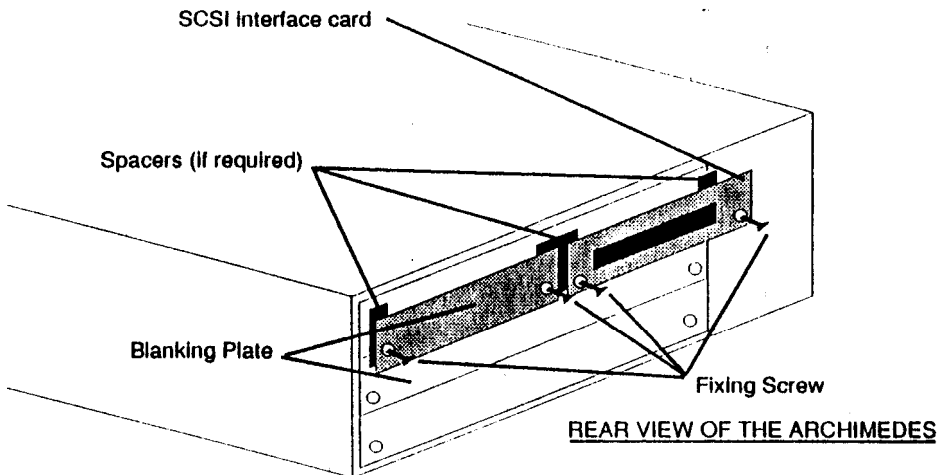
- **Note** Disconnect the mains supply from your Archimedes.

## Preparation of the Archimedes.

Remove the Archimedes top cover. This is done by removing five screws: one on each side behind the plastic fascia and three at the top of the rear panel. The cover will then slide rearwards.

Ensure that the Archimedes is fitted with both a Backplane and a Fan. If either of these items is not present please contact your supplier before you proceed any further.

Remove a complete length of blanking plate from the back of the Archimedes. This can be done by removing the fastening screws at each side of the blanking plate (see Fig 1).



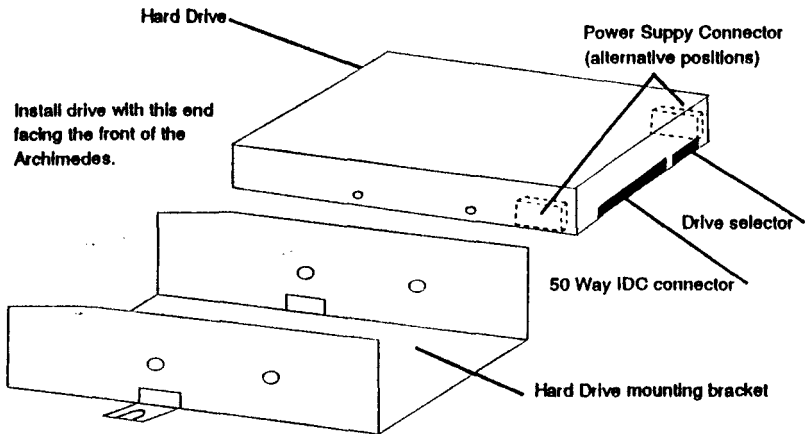
Fitting the SCSI interface into the Archimedes

Fig. 1

## Fitting an Internal Archimedes Hard Drive

Remove the backplane. If you have installed your own backplane please consult the backplane manufacturer's installation Instructions. If you have an Archimedes 400 series machine please see Appendix

If the Hard Drive Is not already mounted in its mounting bracket (see Pg. 2), place the Hard Drive in



Internal Hard Drive Installation

**Fig. 2**

Its mounting bracket and secure it with the 4 screws provided. The electronic components should face downwards but must not touch the metal-work of the mounting bracket. The Power Supply Connector for the cables should face the rear of the mounting bracket (the front of the mounting bracket has the tapered sides).

## Fitting the Hard Drive into the Archimedes (cont.)

Secure the Hard Drive (mounted in its bracket) to the Archimedes bridge, next to the floppy-drive, with either the self-tapping screws or bolts provided (depending on the model of your Archimedes). The tapered edge of the bracket should face towards the front of the Archimedes.

Connect the Power Supply plug for the Hard Drive (this is the plug attached to 4 wires connected to the Archimedes Power Supply Unit - see Fig. 3) into the Hard Drive Power Supply Connector (see Fig 2).

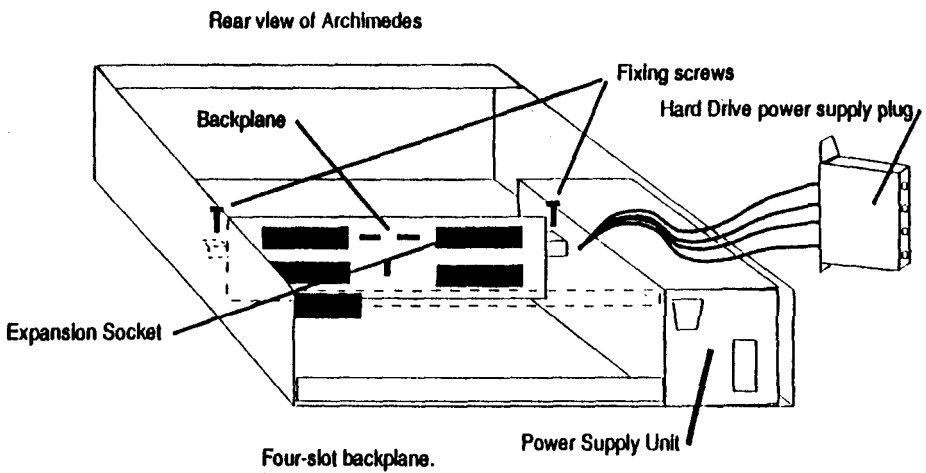


Fig. 3

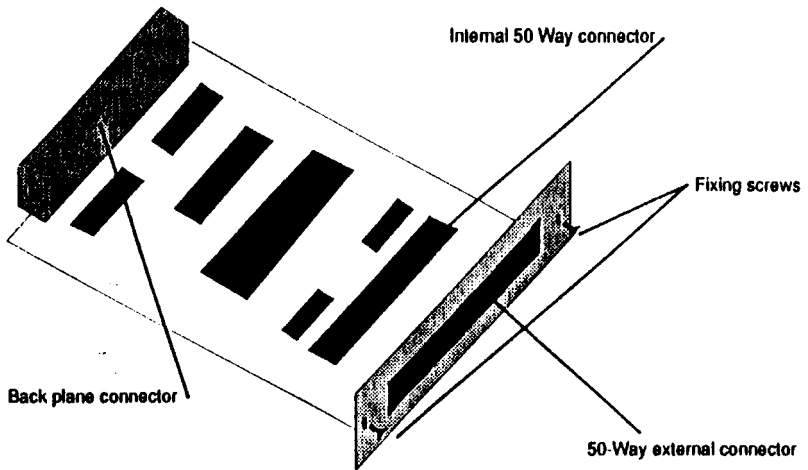
Attach one end of the 50-way IDC cable to the connector on the rear of the Hard Drive (this only fits the correct way).

Refit the backplane - see backplane manufacturer's Instructions/Appendix II.

Refit any expansion cards removed and then fit the SCSI Interface card (see section on fitting SCSI Interface card). For neatness the best expansion slot for the SCSI Interface card to be fitted to is the slot directly behind the Hard Drive.

## Fitting the SCSI Interface card into an Archimedes

If fitting an Internal Hard Drive as well as the SCSI Interface card you will need to install the Hard Drive first. Please see section on installing a Hard Drive. Remove the SCSI Interface card from the static bag and insert the card into the back of the Archimedes, locating the backplane connector of the SCSI Inter-



The LINGENUITY SCSI interface card

Fig. 4

face card (see Fig. 4), onto a backplane expansion socket (see Fig. 3). For neatness the best expansion slot for the SCSI Interface card to be fitted to is the slot directly behind the Hard Drive.

Fit the screws (supplied) to each side of the SCSI Interface card back-plate using the spacers (supplied) if required.

If a full-width blanking plate was removed from the rear, panel of the Archimedes please fit the 1/2 width blanking plate (supplied) next to the SCSI Interface card.

If you have fitted an internal hard drive attach the plug on the free end of the 50-Way IDC cable from

## Fitting the SCSI interface card (cont.)

the hard drive to the internal connector on the SCSI Interface card (see Fig. 4). The notch on the plug should face towards the bout of the Archimedes.

Replace the Archimedes' cover by sliding it on from the rear and refit the five screws (removed in section 1-2) to secure it.

Reconnect the mains lead.

Your Archimedes is now ready to be plugged in and switched on.

### Note

Please switch off your Computer

## External Device.

Position the device in its casing next to your Archimedes or A3000. Make sure that all air vents allow free air circulation into the casing.

If you have not connected a SCSI Interface to your computer, please read either section 3 for Archimedes or section 4 for A3000. If the SCSI Interface card has already been fitted to your Archimedes or A3000, connect the 50-way IDC cable to the Hard Drive casing socket and the other end to the SCSI Interface card's external connector (see Fig 4).

Connect the External I-laid Drive to the mains supply and switch the power on.





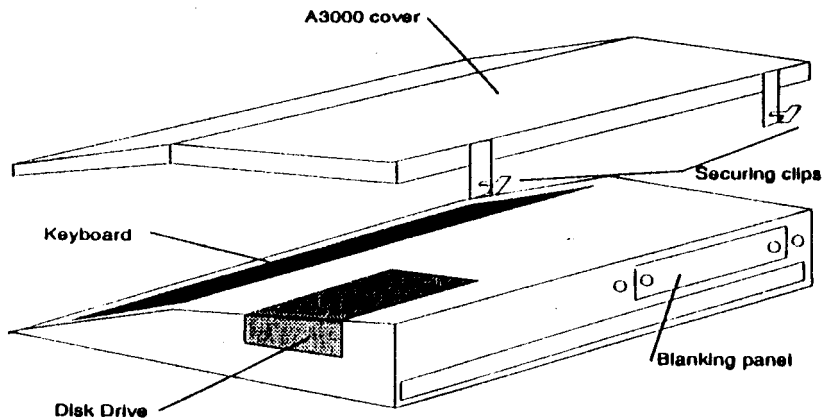
## Chapter 2 - A3000

**Note** Please read the warnings at the front of this manual.

**Note** Pages 2-1 & 2-2 of these instructions are only applicable if you have purchased an Internal A3000 upgrade.

### Preparation of the A3000.

Remove the cover of the A3000 by removing the two screws on the securing clips (see Fig. 5) at the rear of the A3000 and unscrewing the single screw found



**Rear View of the A3000**

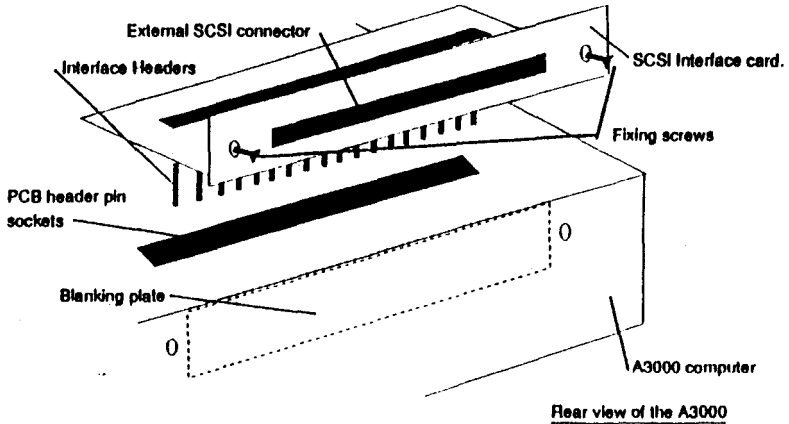
**Fig. 5**

In the centre of the underside the computer. You will then be able to lift off the cover by releasing the 3 latches at the front of the A3000.

Remove the blanking plate found on the rear panel (see Fig. 5) by unscrewing the fixing screws on each side of the blanking plate. Keep these fixing screws as they will be used to secure the SCSI Interface card

## Fitting the SCSI Interface card

Remove the A3000 SCSI Interface from the static bag and Install the card with the rear panel facing towards the rear of the A3000. Locate the header pins (see Fig. 6) In the appropriate sockets on the main PCB and press firmly until the pins are fully located. The back panel of the SCSI Interface card



A3000 SCSI Interface Installation

Fig. 6

should fit neatly into the slot provided in the back panel of the A3000. It can then be secured by inserting the fixing screws to each side of the panel.

Relit the cover and re-assemble the clips and screws removed previously. Finally fix the screw on the underside of the A3000 to secure the cover.

Plug the A3000 into the mains supply and switch the mains power on.

## **Fitting an Archimedes**

Archimedes

### **SCSI Interface card**

The A3000 computer can accept one

style card. The card is placed externally on the backplane slot found on the rear of the computer. The card should always be fitted with a casing to support it. Please contact your supplier for this extra requirement.

**Fitting instructions:** Switch the A3000 off.

Locate the backplane socket - this is the long 64/96-way connector on the right hand side of the rear of the A3000.

Plug the SCSI Interface card into this socket with the casing mentioned above to support it. Please see the manufacturer's Instructions for exact details.

Connect the free end of the ribbon cable to the 50-way connector on the rear of the card.

Switch on your A3000 and proceed with the Instructions in Chapter 3.

## External Devices

Position the Device In Its casing next to your Archimedes or A3000. Make sure that all air vents allow free air circulation into the casing.

### Note

Please switch off your Computer.

If you have not connected a SCSI Interface to your computer, please read the relevant chapter for the installation procedure.

Connect the 50-way IDC cable to the Device casing socket and the free end of the cable to the SCSI Interlace card's external connector (see Fig 6).

Connect the External Device to the mains supply and switch the power on.

## Chapter 3 - Software Installation

Having installed the SCSI Interface card and the SCSI device switch your computer on and you will notice that the SCSI Icon is not present on the Icon bar (assuming that your Archimedes or A3000 is configured to start up in Desktop).

### \*Devices

To check that your Installation has been carried out correctly type \*Devices <RETURN>. The following information will be displayed:

*Devices					
Device	Type	Capacity	Vendor	Product	Revision
00	Direct-Access	100.05Mb	Seagate	ST199H	0.45
07	Host		LIngnty	SCSI Interface	1.25

**Device.** This column shows the Device number. This number will be needed to set the CMOS RAM configuration of your Archimedes.

**Type.** This indicates the type of device. eg. Direct Access (Hard Drive), Host (SCSI Interface), etc.

**Capacity.** An Indication of the capacity of the drive In MegaBytes.

**Vendor.** The name of the manufacturer.

**Product.** Indicates The name or code number of the Device.

**Revision.** This gives the version number of the Device hardware/software.

## Configuration Settings

### SCSIFSLink

Before you can access the Hard Drive you will need to set the four CMOS RAM configurations:

**\*Configure SCSIFSLink** Is used to connect a particular SCSI device (eg a Hard Drive) to a SCSI drive number in the range 4-7. (The naming of the drives Is similar to ADFS - see your computer User Guide.)

### SCSIDirCache

The format Is **\*Configure SCSIFSLink x y** where x Is the drive number (4-7), and y is the SCSI device Identification number (eg 00).

Example:

```
*Configure SCSIFSLink 4 00 <RETURN>.
```

**\*Configure SCSIFSDirCache** sets the amount of memory available for the Directory information required by the Filing system. This option works in an identical way to the ADFS DirCache. A typical setting would be 8K, but if sufficient memory is available setting this option to 16K would be advantageous.

### SCSIFSBuffers

Example

## SCSIFSDrive

\***Configure SCSIFSDrive** sets the default SCSI drive and can be set to 4, 5, 6, or 7. This option works in a similar way to the ADFS drive option.

SCSIDrive4 is normally selected for an internal drive and is configured by the following command:

\*Configure SCSIFSDrive 4 <RETURN>

Finally having set all the Configuration settings these can be permanently set by holding down the <CONTROL> key whilst pressing and releasing the <BREAK> key. When the Desktop reappears on the screen you will notice that the SCSI Icon is present on the icon bar.

## SCSI Icon

By clicking on this new Icon with the left hand button of the mouse you will be able to catalogue the Hard Drive. Clicking the middle mouse button will make a menu appear (see Illustration).

### ► Note

if nothing happens at this stage you will need to check that:

- a) The drive has been formatted - see section on formatting
- b) The Configuration settings are correct for the device.

The options available are:



**Name disc.** This allows the Hard Drive to be given a name. Simply type in your preferred choice and then press <RETURN>.

**Dismount.** Please click the lefthand mouse button on this option when you have finished using the drive - this will park the head and in some cases switch off the device's motor.

**Verify.** By clicking on this option you can check the integrity of your Hard Drive.

**Free.** Click the Left hand button of the mouse here to find out how much space is left on the Hard Drive.

**Shutdown.** This option will close all filing systems down and park all the heads of the drives attached to your computer. It will also, in some cases, switch off the device's motor.

## scsiFORM

To enable you to get the most out of your SCSI Interlace and its various devices we have supplied a range of Utilities on a Floppy Disc enclosed with the SCSI Interface. To access the Utilities place the SCSI software floppy-disc into a floppy disc-drive and click on the relevant floppy-drive icon on the icon bar.

**scsiFORM.** This is a program to Format and Initialise a SCSI Device by laying down a new empty directory structure. Whilst the program provides an option to initialise the Device, it is not always necessary to do this, apart from when you install the Device or wish to alter the Interleave value. scsiFORM will Interrogate the Device to find its capacity and will then set up a suitable directory structure for the Device's capacity.

To run the scsiFORM program double click on the scsiFORM file icon in the floppy-drive window.

Follow the instructions as they appear on the screen using the default settings.

You may need to initialise as well as format the Hard Drive if running the Hard Drive for the first time.

All drives sent out from Lingenuity are pre-formatted. If your drive is not formatted the Interleave setting can remain at the default of 0, however some devices

### !SPEED

require an Interleave of 1, 2 or 3. Use the !SPEED to see whether the drive will work at a faster speed with different Interleave settings.



When the program has finished formatting the Hard Drive press the space bar to take you back to the Desktop.

At this stage you will be able to treat the newly-formatted drive in the same way as any other storage device.

## PC Emulator

The latest version of the Acorn PC emulator will run satisfactorily on the Lingenuity SCSI Interface. Please check that the version of the PC-Emulator that you have is 1.33 or higher.

If you have an older version of the PC-Emulator, then we can provide you with an updated version, provided you send us:

- a) A blank disc.
- b) A self-addressed postage-paid envelope.
- c) The registration number of your MS-DOS system disc.

### Use

On the disc you will find two Icons: one referring to ADFS use and another for SCSI. By selecting the SCSI icon, the PC emulator will create an MS DOS partition on SCSI drive 4. The user can then select the size of the partition.

Follow the instructions on the screen to copy the MS-DOS system software across.

Please consult the *Readme* files if you want to install the software on, for example, a second SCSI drive, or if you wish to create several partitions on one of your drives.

# Hints and Tips

## RISC OS applications

installation of RISC OS applications: Follow the instructions given by the software company on how to install the software onto a hard disc system. Usually it involves:

- a) Selecting the floppy drive on the icon bar.
- b) Opening the directory on your SCSI drive into which you want to install the application.
- c) Selecting the items from your floppy-drive and dragging them across into the subdirectory on the hard disc.

When copying directories which already exist on the destination disc, only the files which don't exist in the destination directory are copied. So there is no danger that you will lose any files!

You are advised to have only one *System* directory on your SCSI drive, as applications often rely on its presence to load relocatable modules.

If you copy from a disc which contains */System*, copy it to the existing *!System* on the hard drive.

The best location is the 'root' directory as the operating system can find the modules before accessing other directories to load applications.

## Non RISC OS applications.

Many programs come with their dedicated hard disc installation program. These programs need some minor modification - as a hard disc is usually referred to as "ADFS::4". "ADFS" refers to the filing system used and the '4' refers to the drive number available. To install the program on a SCSI drive however it should read "SCSI::4" as the filing system is SCSI.

## ADFS->SCSI

We have provided a utility called *ADFS->SCSI* which modifies all references to the ADFS filing system into a SCSI reference.

For example a *!Boot* file on a hard disc has the full name:

ADFS::4.\$.!BOOT,

the corresponding name on SCSI will be: SCSI::4.  
\$.!BOOT.

To use the utility, you have to enter the full name of the file which you want to modify.

It is, however, always advisable to 'have a version which runs under RISC OS. Many software houses have included the necessary modifications on the Acorn 'Support' disc.

After this change, you usually can proceed as if it was a RISC OS application, so you can follow the procedure as mentioned above.

## Trouble shooting

**SCSI time out** - On accessing the SCSI Icon the hourglass remains on screen for more than two seconds and the \$ directory does not appear.

Nothing happens if you select the SCSI Icon  
- Check with ""Devices" if the Configuration of SCSIFSLInk matches your attached device.

Do I have the latest Information on my SCSI?  
- Make sure you have filled in your registration form and have returned it to Lingenuity.

Can I improve the performance of my system?  
- Increasing your SCSIFSDirCache to 16K gives a fair buffer to keep a record of directory Information on disc.

- The *scsiFORM* formatting utility tries to optimise your disc performance, but it may be worthwhile before you fill up your disc to experiment with the Interleave factor using the '*initialise*' option of the programme, followed by the '*!Speed*' programme which shows disc performance.

- On very large drives (200 Mb and over), you may want to experiment with a different block size whilst formatting your drive.



# Appendix I

## Item Count

### SCSI Interface for Archimedes

#### Padded box containing the following:

1. 1 x SCSI Interface card (1/2 width Eurocard).
2. 1 x Blanking plate.
3. 2 x Spacers.
4. 1 x Joining plate.
5. 2 x Bolts.
6. 1 x Set of instructions.
7. 1 x Ribbon cable (50-way IDC to 50-way IDC ).
8. 4 x 6/32" Screws to attach Hard Drive to bracket.
9. 2 x Self tapping screws for Current Archimedes.
10. 2 x Screws (alternative to 9) for earlier Archimedes.
11. 1 x Floppy disc with SCSI software Utilities
12. 1 x Registration card.

### SCSI Interface for the A3000

#### Static bag containing the following:

- A3000 SCSI Interface card.

### Internal Drive for the Archimedes.

#### Box containing the following:

- 1 x Hard Drive mounting bracket.

### External drive.

#### Box containing the following:

1. 1 x Hard Drive.
2. 1 x Mains Lead.
3. 1 x 50-way IDC to 50-way IDC cable

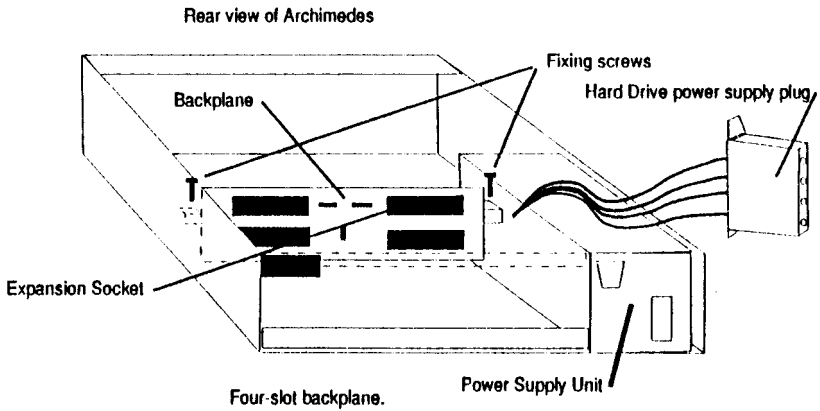


# Appendix II

## Removing an Archimedes Backplane

**NOTE:** This appendix is only applicable if you have purchased an Archimedes 400 series.

- ◆ Having removed the cover of your Archimedes you will find the backplane plugged into the Archimedes main Printed Circuit Board with two screws holding it at each side - one onto a bracket on the Power Supply Unit (righthand side), the other onto the chassis (lefthand side) - see Fig.5 .
- ◆ Remove these screws and wiggle the backplane gently upwards so that it parts from the mother board.
- ◆ Remove the three wires connecting the backplane to the Power Supply Unit and note the colours of the wires and connections for reassembly.



- ◆ Replacing the backplane is simply the reverse of the above.





## **Appendix III**

### **Lingenuity - End User Licence Conditions**

Definitions:-

"Lindis" either the owner of the intellectual property rights In the Software or having the right to grant licences of the Software;

"Documentation" the printed user manual supplied with the Software;

"Software" the program contained In object code form on the disc(s) or other material supplied with these conditions;

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