SCSI 4

SCSI 5

SCSI 6

SCSI 7

CD :0

SCSI Tape

Scanner

16 Bit SCSI Controller Card & Hard Disc Drives

OAK

SCSI

16 Bit SCSI Controller Card

Hard Disc Drives

User Guide

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Issue 1.3

WARNING (External Drives):

The winchester drive must be earthed

IMPORTANT

The wires in the mains lead for the winchester drive are coloured in accordance with the following code:

Green & Yellow	Earth
Blue	Neutral
Brown	Live

If the mains socket outlet available does not match the supplied moulded 13A plug, either a different lead must be obtained, or the plug should be cut off, disposed of, and the appropriate plug fitted and wired as described below.

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

The wire coloured Green and Yellow must be connected to the terminal in the plug which is marked by the safety earth symbol ⏚ or the letter E, the colour Green, or Green and Yellow.

The wire coloured Blue must be connected to the terminal marked with the letter N, or coloured Black.

The wire coloured Brown must be connected to the terminal marked with the letter L, or coloured Red.

Guidelines for safe operation

To ensure safe and reliable operation of your SCSI controller card and winchester drive, the following guidelines should be observed.

Internal winchester drives should never be operated without a fan fitted and working inside the Archimedes.

Keep the winchester at a room temperature of 5-35°C (41-95°F) and at a relative humidity of 15-90% (non-condensing).

Avoid sudden changes of temperature, exposure to direct sunlight, heat sources and moisture.

Do not block any ventilation slots in the winchester case, or the fan outlet holes, and make sure that there is enough space around the winchester for air to circulate.

Do not poke any objects through the ventilation holes in the winchester casing.

Route cables sensibly to avoid kinking and tripping. Do not use the cables to lift drives or controller cards.

Make sure you understand the fitting instructions before embarking on installation. If in doubt, contact your dealer or Oak customer support.

Keep the original packing in case you need to transport your equipment.

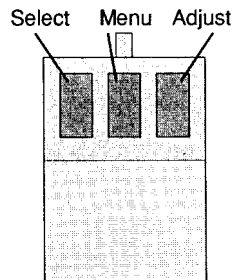Never operate External winchesters with the cover removed.

Bear in mind that winchester drives are extremely fragile, and that bumps and shocks can cause serious damage to the heads and disc surfaces.

Contents

Conventions used in this manual

The mouse buttons are referred to by name using the standard Acorn convention of:

Pressing and releasing a mouse button is known as `clicking'.

Pressing and releasing a mouse button twice in quick succession is known as `double-clicking'.

Pressing and holding down a mouse button whilst moving the mouse is known as `dragging'.

Text to be typed in at the keyboard will be shown in the following font:

```
*help commands
```

Special keys on the keyboard and mouse will be shown in square brackets

eg: [Return]

In descriptions of syntax for *commands, the following conventions will be used.

< ... > indicates that an actual value must be substituted,
e.g. < f ilename> means that an actual filename must be supplied.

[. . .] indicates that the item enclosed in square brackets is optional,
e.g. *WPROT <D> [U] means that the letter U is an optional
parameter to the WPROT command.

| indicates an option.
e.g. 0 | 1   means that the value 0 or 1 must be supplied.

What is SCSI?

The following brief description of SCSI does not set out to fully cover SCSI in depth, but rather deals with SCSI in the context of the Archimedes and the Oak SCSI controller card.

SCSI, (Small Computer Systems Interface) is a high speed interface designed to connect a variety of peripherals to a host system (the initiator - so called because it initiates the SCSI commands). Up to 7 devices may be attached to one host, with each device having a unique SCSI ID number (0 to 7). The default ID for the Oak SCSI controller card is 7, leaving 0-6 free for peripherals. One SCSI device may actually be responsible for controlling more than one peripheral. For example, the Adaptec hard disc controller card can control two ST506 winchesters, but appears as just one SCSI device, with the two drives being differentiated by the Logical Unit Number [LUN]. Thus the first drive may appear to the initiator as SCSI ID 3, LUN 0 and the second drive as SCSI ID 3, LUN 1.

SCSI devices are `daisy chained' together, i.e. they are all connected together in parallel to one 50 way bus. SCSI devices should therefore provide 2 SCSI connections, effectively a `SCSI in' and a `SCSI out' to allow further devices to be attached to the bus.

SCSI winchester drives include their own `in built' winchester controller which is optimised for that particular drive, and thereby allows the winchester manufacturer to employ a variety of techniques to maximise both the storage capacity and the speed of the drive. Thus SCSI winchesters are generally much faster than their equivalent ST506 counterparts which interface to a standard ST506 controller. Also, because of their on-board `intelligence' SCSI winchesters are much easier to set up and use as they deal with their own defect management, and `know' their own shape (No of heads, cylinders etc).

SCSI has an 8 bit data bus, and is capable of transferring data at a maximum rate of roughly 2Mb/sec in asynchronous mode. This maximum figure is limited in practice by the performance of the peripheral. For example, a fast, modern 20Mb winchester would typically be able to achieve a data transfer rate of 650Kb/sec (compared with a 20Mb ST506 winchester at roughly 300Kb/sec), and a fast 300Mb winchester would achieve close to 1.5Mb/sec. On the bulk of SCSI systems, however, performance is degraded most by the

inability of the initiating system to deal with such high data transfer rates. Using an Archimedes with the Oak SCSI controller card avoids this degradation of performance. The Oak card buffers the 8 bit data from the SCSI bus in order to perform 16 bit memory transfers to and from the Archimedes, thereby vastly reducing the normal handshaking overhead.

SCSI imposes no restrictions on the numbers of any particular type of device (up to a maximum of 7) on the SCSI bus; however, the Filecore module within Risc OS allows a filing system (SCSIFS in the case of the Oak SCSI controller card) to have only 4 winchesters, and also limits the capacity of each winchester to 512Mb. Thus a total of 2 gigabytes of winchester storage is achievable under the SCSIFS filing system.

Non-winchester SCSI devices (e.g. tape streamers, CD ROMs) may also be addressed by the Oak SCSI controller card via SWIs which allow low level access to SCSI commands, or via high level software available separately such as the !OakTape tape backup software from Oak.

Installing the Hard Disc & Podule

Warning

No special skills are required to fit the Hard Disc Drive. However, the suppliers can accept no responsibility for any damage which may result from incorrect installation. If in doubt, contact your supplier.

Tools

The only tools required are a number 2 cross-head screwdriver and a large flat bladed screwdriver (A3000 only). Installation of internal drives may also require a pair of wire cutters or scissors and a blade.

Safety

Ensure that the Archimedes power supply is switched off and that all mains supply cords are disconnected before removing any covers. You are warned that dangerous voltages exist in the Archimedes power supply unit. Do not insert any objects into the ventilation holes of the PSU case.

Installing the Podule (300/400/R140 Series Machines)

Disassembly

Unplug the mains power cord and all peripherals (including the keyboard) from the Archimedes. The cover of the Archimedes is held in place by 5 screws, three on the rear of the case above the podule slots, and one at either side of the case close to the moulded plastic front piece (as shown below). Remove all 5 screws and slide the lid rearwards and off.
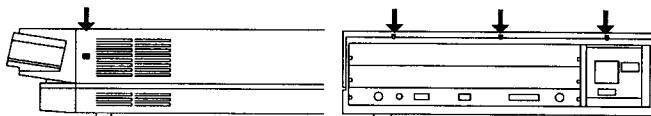
Positioning

The SCSI podule may be fitted in any of the four possible podule positions. Remove the blanking plate related to your chosen podule position from the rear of the Archimedes by undoing the screw at each side. If you have removed a double width blanking plate, use the single width blanking plate, T-Piece and screws supplied with your SCSI card to build the podule backplate up to double width.

Carefully insert the SCSI card (component side up) into the desired backplate socket on the Archimedes, making sure that the SCSI card is held horizontally. The backplane is supported by a stout metal strip; however it is wise to give the backplane additional support with one hand whilst inserting the SCSI card. If there are no other podules fitted in the Archimedes, it may be necessary to loosen the two screws at the ends of the metal strip that reinforces the backplane, and carefully reposition the backplane so that the SCSI card can be mounted flush with the back of the Archimedes. Fasten the podule backplate assembly to the back of the Archimedes with a screw at each end and tighten the screws securing the backplane.

If your kit contains an internal winchester drive, move on to the section headed installing an internal winchester. If your kit contains an external winchester drive, replace the cover of the Archimedes (don't refit the screws yet) and move on to the section headed installing an external winchester.

Installing the Podule (A3000)

On the A3000, the SCSI card is mounted externally at the rear of the machine. The SCSI card is housed in a metal case with a mounting bracket which bolts to the rear of the A3000. Ensure that the A3000 is disconnected from the mains. Holding the SCSI card horizontally with the angle bracket pointing upwards and towards the A3000, push the card into the socket on the left hand side of the A3000 (when looking from the rear). Check that the card is pushed fully home and then screw the angle bracket to the rear of the A3000 with the 2 screws provided.

Now move on to the section headed Installing an external winchester.

Installing an internal winchester

Take off the plastic front panel of the Archimedes by removing the 3 self tapping screws underneath the front of the Archimedes, and the 1 at each side (normally obscured by the cover). The winchester mounting brackets are supplied already fitted to the winchester. Mount the winchester assembly (with the 50 way socket to the rear of the Archimedes) using the 2 small self tapping screws provided, to the metal bracket inside the Archimedes, next to the floppy disc drive. (Owners of certain early Archimedes machines may find that the 2 holes are actually tapped - if this is the case, do not worry, but use the self tapping screws anyway.)
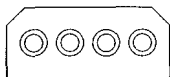
Power Connector (end view)

Attach the power cable (terminated in a white, 4 way plastic connector) from the Archimedes power supply to the winchester. (You may need to carefully cut a nylon cable tie to release this power cable.)

Connect the 50 way ribbon cable between the winchester and the pin connector on the SCSI controller card (making sure that polarising bumps/slots mate correctly at the winchester end, and that the bump on the 50 way cable points to the front of the Archimedes at the SCSI card end -basically, if there is no twist in the ribbon cable, it's correct!).

Carefully remove the Archimedes badge from the Archimedes plastic front panel (prising it off with a blade). Stick the badge supplied with the winchester in its place. A few very early Archimedes machines have a non standard spacing between the LED holes. If this is the case with your machine, you will need to scrape some ink off the back of the badge to allow the LED to be visible. Stick the LED on the trailing lead from the winchester into the vacant hole behind the badge, using bath sealant or any suitable adhesive.

If difficulty is experienced in locating the LED in its hole, the darker coloured plastic front of the assembly may be detached by removing the 2 recessed self tapping screws.

Screw the front panel back onto the Archimedes, and then refit the cover (don't screw the cover to the Archimedes yet). Now move on to the section headed Initial Testing.

Installing an external winchester

Connect the external winchester to the back of the SCSI controller card using the 50 way ribbon cable provided, making sure that the polarising bumps on the cable sockets mate with the slots on the plugs at the rear of the Archimedes and the Winchester. There are two 50 way plugs on the rear of the winchester drive to allow **other** SCSI devices to be daisy chained. These plugs are wired in parallel and so either can be used.

Now move on to the section headed Initial Testing.

Initial testing

Power up the Archimedes. If the Archimedes does not start up correctly, turn everything off and recheck all connections. If the Archimedes still does not start up, refer to the section headed `troubleshooting'. Note that each card and drive has been thoroughly tested at the factory, and so any faults at this stage are most likely to be caused by incorrect installation, a faulty backplane or faulty Archimedes.

If the Archimedes does start up correctly, switch on the external winchester (if fitted). You should hear the drive of the internal or external winchester spin up to speed and make a few `seek' noises as it initialises itself.

The winchester is supplied already formatted, and the SCSI card already initialised, and so the system should now be ready for configuring. DO NOT USE THE SCSIFORM PROGRAM AT THIS STAGE. All the options you can set using SCSIFORM have already been set at the factory! Using SCSIFORM before you are familiar with the system is more likely to undo necessary settings rather than do anything useful - you have been warned!

There is no need to type `*configure harddiscs 1` -this command refers to ST506 winchesters running under ADFS. Only use this command if you also have an ADFS winchester. Also note that the `*configure drive` command refers only to ADFS drives, so this is best left set to `0' unless you have an ADFS winchester.

Various configuration values must now be set. Obtain a command line prompt (e.g. by pressing F12 from the desktop) and type:

`*configure scsifs 1 [Return]`

then hold down [Ctrl]   whilst pressing and releasing [Break]

This enables SCSIFS - the filing system provided by the Oak SCSI controller card. Next, type:

`*configure scsidrive 4 [Return]`

This makes sure that SCSIFS initially logs on to drive 4 when selected.

You will then have to decide how much memory to assign to the SCSI directory cache. The value will depend on the amount of memory available in your machine. A value of 4K is recommended: higher values will allow more directories to be cached in RAM, a lower value will allow fewer directories to be stored in RAM. To configure this value, obtain a command line prompt and type:

```
*configure scsidircache 4K [Return]
```

or replace the 4K with the value you have decided on.

The next decision is whether or not to have the root directory of the winchester set as the current directory at power on (this is equivalent to ADFS's configure dir/nodir, and is effective only if the configured filing system is SCSIFS). If you want the root directory set, type:

```
*configure scsidir [Return]
```

otherwise type:

```
*configure scsinodir [Return]
```

You may want the default filing system of the Archimedes at power up to be SCSIFS (e.g. if you want to run a boot file from your SCSI winchester). If this is the case type:

```
*configure filesystem scsi [Return]
```

To bring these configuration values into effect, hold down [Ctrl] whilst pressing and releasing [Break]

You may now enter the desktop and click on the new SCSI winchester icon. A directory viewer should open. Open up the sprites directory and double click select on one of the files. If a picture is loaded up onto the screen. all is well and you may replace the screws in the Archimedes case.

Using your Oak SCSI winchester

In use, the SCSI filing system behaves as a normal Archimedes filing system, (e.g. ADFS), and is operated from the desktop in exactly the same way. The icon on the icon bar for the SCSI winchester appears as a standard winchester icon with the legend SCSI, and the drive number below.

Clicking menu on the SCSI icon brings up a menu of 4 items:

Name disc

This option allows the name of the winchester to be changed. To change the name of the winchester, wipe across the namedisc option and either edit the current name or delete and retype it. Note that you must not have 2 SCSI winchesters with the same disc name, as this confuses the operating system.

Dismount

This option closes files, unsets directories and parks the heads of the winchester. (N.B. Oak Winchesters have autoparking heads so this option is normally only used for making sure that all files are closed.)

Verify

This option checks that the entire disc is readable.

Free

This option displays the amount of used and unused space on the winchester.

Note that the full path name of any file under SCSIFS will be prefixed SCSI ::

Outside the desktop, *SCSI selects SCSIFS as the current filing system. Note that the floppy drives and the SCSI winchesters are on different filing systems. This may cause some problems with certain pieces of software which make illegal assumptions about filing systems. To get around this problem, the command *KillADFS is available (as documented in the section headed *commands) which attempts to route ADFS calls to the SCSIFS module.

At the end of a session, it is good practice to use the dismount option on the SCSI icon menu, or to type

*shutdown [Return]

to ensure that all files are closed, even though all Oak SCSI winchesters have auto-parking heads.

*Commands

Oak SCSI winchesters work under a 'filecore' type filing system (i.e. like ADFS and RAMFS) and so use all the normal filing system *commands (e.g. *copy). Additional *commands provided by the SCSI system are documented on the following pages.

*SCSIMap

Lists EEProm configuration, showing SCSI ID, LUN, Block size and Write protect status for each SCSI drive.

Syntax   *SCSIMap

Use   This command basically gives the mapping between the SCSI drive numbers (4 to 7) and SCSI device ID / Logical Unit Numbers, and additionally returns the block size (the size of the data blocks specified by the disc format) and whether or not each drive is write protected.

*SCSI

Selects SCSIFS as the current filing system.

Syntax

*SCSI

Use

*SCSI selects the SCSI filing system as the filing system for subsequent operations. Remember that it is not necessary to switch filing systems if you use the full pathnames for objects, e.g. you can refer to a file as SCSI : : 4. $. fred even if the current filing system is ADFS.

*WProt

Write protects (or unprotects) a given SCSI drive.

Syntax

```
*WProt <Drive number> [U]
```

Parameters

`<Drive number>` the SCSI winchester drive number (4 to 7) of the drive to be write protected (or unprotected)

[U] if the U is included as a parameter, the drive is unprotected.

Use

Write protects (or unprotects) SCSI drive `<Drive number>`. The protect state is stored in eeprom. The use of this command can be locked out with the format/configure utility, and if this has been done, a `write protect locked' error will result if you try changing the protection on a locked drive. This only protects from SCSI filing system operations, not writes performed with low level SWIs. This command may be useful in a classroom situation, where students need access to information on the winchester, but you do not want the information to be altered either accidentally or otherwise.

Example

```
*WProt 4 U    Unprotects SCSI drive 4
```

*KillADFS

Attempts to cause ADFS hard disk calls to be redirected to SCSIFS and selects SCSIFS as the current filing system.

Syntax

*KillADFS

Use

All calls to ADFS are redirected to SCSIFS but note that as SCSIFS has no floppy drives, access to the floppies (other than via ADFS_Disc0p, as used by PC emulator) will result in a `Bad Drive' error. Note that some ADFS *Commands also will not work.

***UnKillADFS**

Undoes the effects of a *KillADFS

Syntax

*UnKillADFS

Use

Reverses the effects of a *KillADFS and allows calls to ADFS to be processed by the ADFS filing system. This command does not reset the current filing system.

*Configure SCSIDir

Sets the Root directory of the configured SCSIFS winchester at power on. (N.B. for technical reasons this option appears twice in the *status display.)

Syntax

`*configure SCSIDir`

Use

Sets the Root directory of the configured SCSIFS winchester as the current directory at power on if SCSIFS is the configured filing system.

*Configure SCSINoDir

No SCSIFS directory is selected at power on. (N.B. for technical reasons this option appears twice in the *status display.)

Syntax

*Configure SCSINoDir

Use

Leaves SCSIFS with no current directory at power on. This is the default setting.

*Configure SCSIDirCache

Reserves an area of RAM for the SCSIFS directory cache.

Syntax

```
*Configure SCSIDirCache <n>
```

Parameters

`<n>` is the amount of memory reserved in Kbytes.

Use

Reserves an area of memory for the SCSI directory cache. Directories are stored in the cache to speed up disc operations.

Example

`Configure SCSIDirCache 4` reserves 4K for the SCSIFS directory cache.

*Configure SCSIDrive

Sets the SCSI drive selected at power on.

Syntax

```
*Configure SCSIDrive <n>
```

Parameters

<n>   SCSI drive number (4 to 7)

Use

Sets the number of the drive which will automatically be selected at power on (if SCSIFS is the configured filing system) or when SCSIFS is first entered. The most common value for ‹ n › is 4.

Example

`*Configure SCSIDrive 4` sets SCSI drive 4 as the default SCSI drive.

*Configure SCSIFS

Enables or disables SCSIFS after the next hard reset.

Syntax   *Configure SCSIFS [<n>]

Parameters | <n>]   if n = 1 or is not present then enable SCSIFS

                                   if n = 0 then disable SCSIFS

Use   Enables (n=1 or not present) or disables (n=0) SCSIFS after next hard
                    reset.

Example   *Configure SCSIFS 1 enables SCSIFS after the next hard reset.

*Configure FileSystem

Selects the filing system to be used at power on.

Syntax
```
*Configure FileSystem <n> | <name>
```

Parameters
<n> filing system number (26 for SCSIFS)

< name > filing system name (e.g. SCSI)

Use
This command is not provided by the SCSI card, but is included here to show how to configure SCSIFS as the current filing system at power on.

Example
```
*Configure FileSystem SCSI
```

SWIs and technical information

Sec the file SCSI_INFO on the formatter disc for details of SWIs
provided by the SCSI card, and for additional technical information.

Using SCSIFORM
Format/Configure Utility

This program should not normally be needed as drives are supplied formatted and initialised. If, however, for some reason the program is needed, for example if you wish to connect a non-Oak drive, simply double click on the program from a directory viewer. The program is menu driven and fairly self explanatory in use to those with a good knowledge of both Rise OS and SCSI.

Users without a sound knowledge of these fields are advised not to use SCSIFORM if possible, as the results of doing something wrong can be quite drastic.

The menu options within SCSIFORM are covered in detail on the following pages. Note that many requests for information from SCSIFORM have default responses which appear on screen in square brackets [...] these may be selected by simply pressing [Return]. For safety reasons, certain responses such as the affirmative response to `Are you sure you want to format drive n' are required to be in upper case.

A Add drive / edit configuration

This option allows a new winchester drive to be added to the SCSI system, or allows details about an existing drive to be changed. Information required by SCSIFORM is as follows:

Drive Number

SCSI drive number of the drive you wish to add or edit the configuration of (4 to 7). Note that drives must be added in ascending order, with drive 4 first.

SCSI Id No.

The SCSI Id number of the device you wish to add (usually `0' for Oak Drives).

LUN

SCSI logical unit number of the unit you wish to add (usually 0 for winchesters, but may be 1 for a second drive on an 'Adaptec' type controller card).

WPROT

Whether or not you wish the drive to be write protected (Y write protected / N unprotected).

WPROT Lock

Whether or not you want the write protect status to be alterable via the *WPROT command (Y   locked / N alterable via *WPROT)

STOP UNIT

Whether or not to issue a SCSI Stop Unit command to the drive when dismounting. With Oak Winchesters you should answer N to this question. The SCSI Stop Unit command parks the heads of the winchester, and also, on some drives, stops the spindle motor. This can be a problem, as the next time the drive is accessed, it will return a not ready error. Only answer Y to this question if the drive you are adding does not have auto-parking heads and does not shut down completely on receipt of the Stop Unit command (test this last feature by experiment - if the drive subsequently returns a `not ready' error, don't issue the Stop Unit command).

R Remove drive

This option removes a SCSI drive from the SCSIFS system. Information required by SCSIFORM is as follows:

Drive Number   SCSI drive number of the drive you wish to remove (4 to 7).

I Initialise EEPROM

This option initialises the EEPROM on the SCSI controller card which stores the information about the connected drives and the drive configurations. All information currently stored on the EEPROM is deleted, so effectively all drives are removed. Note that this does not affect any information stored on the winchester itself.

S Scan SCSI devices

This option scans the SCSI bus for information about all devices currently connected. Information returned for each device includes SCSI Id numbers, device names, storage capacities, block sizes and sector interleave factors.

F Format Drive

This option formats the chosen SCSI drive, and should not normally be required unless you specifically want to erase a winchester or change the sector size or interleave, as SCSI drives are supplied pre-formatted.

> **Warning**   Formatting a winchester completely removes all data from the drive

Information required by SCSIFORM is as follows:

Drive number
or -ID

A positive number gives the SCSIFS drive number (4 to 7) of the drive to be formatted, a negative value gives the SCSI ID x-1 of the drive to be formatted.

Sector Size

Choose between 128, 256, 512 or 1024 bytes per sector by entering 0 to 3 respectively. The recommended value is 512.

Interleave

Sets the sector interleave factor. Normally, enter a value of 1. A value of 2 will give improved speed performance in hi-res colour screen modes such as 21, at the cost of reduced performance in other modes with small drives (<= 70Mb). Larger drives tend to always run faster with an interleave factor of 1.

Are you sure

This gives you a last chance to abort before formatting the drive - think before you answer Y to this one!

The drive will then be formatted, which may take some time. When the format is complete, you will be asked for a value for the large file allocation unit. A value of 512 bytes is the default for 20Mb drives, and 1024 bytes for all other sizes. On very large drives (>=300Mb), it may be sensible to choose a larger value in order to reduce the amount of space taken up by the disc map.

M Initialise map and root

Initialises the map and root directory of a formatted SCSI drive. (Note that the format option does this automatically.) This needs to be done before a new SCSI drive can be used (this option is not required with Oak drives as they are supplied already initialised).

Warning Initialising the Map and Root of a winchester removes all file and directory information from the drive - effectively removing all the data.

Information required by SCSIFORM is as follows:

Are you sure   This gives you a last chance to abort before initialising the map and root directory of the drive - think before you answer Y to this one!

File allocation unit   A value of 512 bytes is the default for 20Mb drives, and 1024 bytes for all other sizes. On very large drives (>=300Mb), it may be sensible to choose a larger value in order to reduce the amount of space taken up by the disc map.

T Set retry timeout & other options

Winchester drives take a short time to spin up to speed and initialise themselves (typically about 15 seconds). This option allows the time that SCSIFS allows for drives to spin up to be adjusted. It also allows certain SCSI specific information to be configured. If you do not understand any question asked by SCSIFORM, just take the default answer. Information required by SCSIFORM is as follows:

Timeout period

Time in centiseconds allowed for SCSI drives to spin up to speed. If a drive does not respond to the SCSI card after the specified timeout period, a `drive not ready' error will be generated. (Default 2048)

SCSI Reset on Reset/Break

Whether or not to issue a SCSI reset when a Reset or Break occurs on the Archimedes. (Default Y)

SCSI Reset on Hard Break

Whether or not to issue a SCSI reset when a hard break occurs on the Archimedes. (Default Y)

SCSI Initiator Id. Sets the SCSI Id number of the SCSI controller Card. (Default 7)

C Check SCSI devices against EEPROM

This option checks that the block and map sizes of the devices connected to the SCSI bus match those it `knows' about in the EEPROM, and reports accordingly.

X Transfer speed test

This option tests the average sustained data transfer rate from a given formatted and initialised drive in screen modes 0, 15 and 21. Note that this option requires a large amount of memory for a buffer, and consequently may fail on a 1Mb machine with an `Out of memory' error. This can be avoided by minimising memory allocation to other areas within the wimp task manager, and assigning a large slot size to SCSIFORM, or by running SCSIFORM from outside the desktop with memory sizes configured to minimum values. The speed test requires the Archimedes to enter mode 21, so the configured monitor type must be '1', and there must be at least 320K of screen RAM available.

Information required by SCSIFORM is as follows:

Drive Number   SCSIFS drive number of the drive you wish to test (4 to 7).

When the transfer speed test is complete, the speed in Kbytes/second in each of the 3 screen modes is reported.

Q Quit

This option quits the SCSIFORM application. (Note: upper case Q required)

* *commands

This option allows *commands to be issued from the SCSIFORM
program. Press [Return] when you have finished issuing
*commands to return to the main menu.

Illegal Software

Certain pieces of software make the illegal assumption that the program is running on an ADFS drive. Note, that as SCSI becomes more and more popular, illegal programs are rapidly diminishing in number. However, if you encounter a program of this type, issue a *KillADFS command immediately before running the program - this should make the program work correctly, however, note that floppy discs will no longer work (except via ADFS_DiscOp as used by the PC emulator) once the KillADFS command has been issued.

A similar assumption is sometimes made in HDInstall type programs supplied with certain packages, in that the are designed to copy the relevant files from ADFS drive 0 to ADFS drive 4. If you come across a program of this type, you will need to edit the program so that all references to :0 are changed to ADFS::O and all references to :4 are changed to SCSI::4 (or SCSI::5 etc.).

In general, you are unlikely to encounter problems of this type with software written for the Risc OS desktop environment.

PC emulator

If you have a version of the PC emulator prior to 1.33, load the read_me file in the PC directory on the SCSI formatter disc for information on running the PC emulator on the SCSI drive. Versions from 1.33 onwards'know' about SCSI.

Power up delays

To cope sensibly with drives spinning up, without excessive timeout periods for real errors, the following is done

The first disc operation after a hard reset, which will nearly always be a mount operation on the default drive, will retry for up to a configurable amount of time if any error is reported (e.g. SCSI timeout or not ready errors).

This copes with the differences in response to non-ready drives with all Oak SCSI drives.

The timeout period is held in EEProm, and the default value is 20 seconds. The optimum value is a couple of seconds longer than the spin-up/initialise time of the slowest drive in the system.

This avoids delays in reporting subsequent errors, or attempts to mount non-existent additional drives, in particular when doing *Bye, as FileCore Mounts drives before parking them (as it has to find the park address from the disc record).

The only possible problem with this strategy is where there are secondary drives which take longer to spin up than the default drive - attempts to access them whilst spinning up will result in errors, and as FileCore remembers errors when mounting drives, any subsequent attempt to access the drive will return the same error (e.g. drive not ready) that was obtained from the initial attempt to mount, despite the fact that the drive is now ready. The only way round this is to either do a hard reset, or *RMReinit SCSI.

Booting from the SCSI drive

For a boot file to be run from a SCSI drive on power up, the following conditions must be met:

The Archimedes must be configured to boot.
```
(*configure boot)
```

The configured filing system should be SCSIFS.
```
(*configure filesystem SCSI)
```

The configured SCSIDrive should be the one on which your !boot file exists.
```
(e.g. *configure SCSIDrive 4)
```

The Configured SCSI drive must contain a program, obey or exec file called $.!boot

The OPT 4 <N> setting of the configured SCSI drive should be set to 3 for an exec file or 2 for a program or obey file.
```
(e.g. *opt 4 2)
```

Trouble Shooting

Your card and winchester have been comprehensively tested at our
factory, and so if the card/drive does not work when you install it,
unless the packaging looks damaged, the likelihood is that you have
not installed it correctly! The following points should help clear up any
trouble you may experience.

SCSI card installed, but does not appear to work

Check all connections.
Is the SCSI card pushed completely onto the backplane socket?
Have you done a *configure SCSIFS 1 ?
Is the `podule' module unplugged? (check by doing a *rommodules.
If the podule module is unplugged, remedy by doing a
*rmreinit podule.
N.B. certain games unplug the podule module when they are run!

Card installed correctly but no response from drive

Check power connections to winchester.
Check that 50 way cable is firmly connected at each end.
If you have ignored earlier warnings about running the SCSIFORM
program, and have upset the card's configuration, run SCSIFORM,
select the add drive option and enter sensible answers to prompts (refer
to the SCSIFORM section of this manual. Quit SCSIFORM and
[Ctrl] [Break].

In use, the error `bad drive' occurs

This error most commonly occurs when SCSIFS is the current filing
system and an attempt is made to access the floppy drive as `:0'
instead of `ADFS::O'. Either use the full pathname (ADFS::O.) or
change filing systems to ADFS. Also, note that some users have
mistakenly thought that the *configure scsifs 1 configures
scsifs as the current filing system. This is not the case,
*configure filesystem SCSI must be used to configure
SCSIFS as the current filing system at power up.

In use, the error `SCSI Phase error' or `SCSI bus not free'occurs.

These errors are usually caused by either damaged 50 way cables, or by having 2 or more devices on the SCSI bus with the same ID. Visually inspect cables, and check ID numbers of connected SCSI devices (if you don't know how to do this, you are unlikely to generate the error by adding devices with the same ID number). These errors can also be caused by an unterminated SCSI bus, or a SCSI bus with too many termination resistors. The SCSI bus should have terminating resistors in the devices at each end (typically the controller card and the last drive), but not on any devices in between.

These are the most common errors that occur according to user feedback. Further help may be found in the Read Me file on the formatter disc. If you experience any difficulties, please let us know so that we can include any additional helpful material in the Read –Me file.

Termination

orange

blue

┤ link
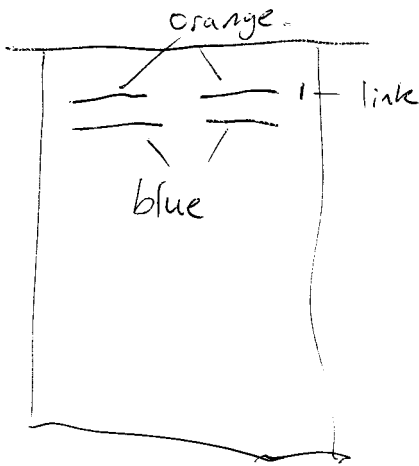
NB writing on resistor packs
faces the external connector
end (N when in computer)