SAFE Whisper
Fan quietener

* Monitors temperature in TWO places
* Varies speed from 10% to 100% depending on temperature
* Easy to fit - NO SOLDERING
* Automatic test sequence on power-up
* Suitable for the Acorn Archimedes A300 and A400 series
  (please enquire about other computers)

Introduction

Keeping computer equipment cool can be a difficult task. The designer must allow for a-fully expanded system operating at the maximum expected ambient temperature, and choose a fan which provides enough air flow for this worst-case situation.

Most of the time the fan will be working much harder than necessary. Some users have been known to disconnect the fan altogether to reduce noise, but this is likely to lead to expensive damage.

Ian Copestake Software has now introduced Whisper - a safe, low-cost remedy. Two semiconductor temperature sensors control a specially designed switched mode voltage regulator. Temperalure is monitored at two positions and the fan speed adjusted accordingly.

Above a certain temperature the fan operates at full speed. At lower temperatures the fan speed may be reduced to as little as 10% of normal.

The fan will work at full speed for a certain time after you switch the computer on. This ensures a reliable start-up and shows you that the fan is working.

With its switched mode regulator Whisper contributes very little extra dissipation.

Temperature monitoring

Fans are usually fitted to computers to protect temperature-sensitive components, especially hard disc drives. These are precision mechanical devices and could be distorted by two factors related to temperature, resulting in lost or corrupt data.

These factors are (a) the maximum temperature reached, and (b) the rate of increase of temperature (measured in °C per hour).

Different drives come with different recommendations for factor (a). Modern drives may be safe at 55°C, having more advanced technology in manufacturing, materials and mechanics. Most of the older hard discs, such as those used in early Archimedes computers, have a maximum working temperature of 50°C.

Factor (b) is more difficult to cater for. Modern drives specify a maximum temperature rise of 20°C/hour, whereas older drives specify 10°C/hour. The 20°C/hour figure is easily met, even in systems which do not have a fan fitted at all.

However we have not found any desk-top computer fitted with one of the older drives which meets the 10°C/hour specification. Just what this implies is open to debate.

All these matters have been considered in the design of Whisper, and extensive testing has been carried out to determine the best position for temperature monitors.

Fitting Whisper inside an A300 series or A400 series computer

Fitting the voltage regulator

Do a Shutdown if necessary, then switch off the computer at the rear and disconnect it from the mains supply by unplugging the power supply cable.

MAKE CERTAIN THE COMPUTER IS PHYSICALLY DISCONNECTED FROM THE MAINS POWER SUPPLY.

Unplug from the mains any peripherals that are attached, such as a printer or monitor, and physically disconnect them from the computer.

Remove the cover from the computer as described in the computer user guide, or contact a service centre if you do not wish to do this yourself.

Whisper consists of a small circuit board protected by a thick plastic sleeve. This contains the switched mode voltage regulator.

There is a plug on one end of the circuit board. This is the Whisper plug.

Attached to the other end of the circuit board are three leads. Two of these are connected to small black semiconductor temperature sensors (we will just call these `sensors' from now on).

The remaining lead has a socket on the end. This is the ***Whisper*** socket

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Please do not attempt to take Whisper apart or remove the sleeving. This would invalidate your warranty.

Have a look at the fan in the computer. There will be a power lead connecting the fan to a small plug on the main circuit board. Remember where this plug is, then gently separate the plug and socket.

You should now have a lead coming from the fan, with a free socket on the end.

Gently push the **Whisper plug** into this free socket.

Gently push the **Whisper socket** onto the free plug on the main circuit board.

The connectors will only fit correctly one way round. No great force is needed.

The main Whisper unit itself should be fixed to a suitable place inside the computer using the double-sided sticky pad provided.

Fitting the sensors

If you have a single half-height hard disc (about 1.6 inches high), both sensors should be attached to the top outside surface of this disc roughly in the middle. (Do not take the hard disc apart under any circumstances).

Two pieces of `tack' are supplied for the purpose. Rub this between your palms before use to soften it up. Then place each sensor in contact with the hard disc and spread a piece of tack over it. The sensor must make good contact with the disc in order to work properly.

If you have two internal hard discs, attach one sensor to each.

If you have a single one-third-height hard disc (about 1 inch high), which has a low power consumption (less than 6W), then one of the sensors may usefully be placed in contact with the outside of the computer's power supply unit.

Tests have shown that the best position is on the area without ventilation holes. You can feel for the hottest place after the computer has been running for several hours and **after disconnecting from the mains** as mentioned above.

Finishing off

Check the condition of your fan filter. This must be replaced before it becomes clogged with dust. Replacement filters are available from ICS.

> **A blocked filter will probably cause serious damage to your hard discs and other parts of your computer (whether Whisper is fitted or not). At best you may lose some valuable data. At worst you may have a very expensive repair bill. We can accept no liability for damage caused in this way. YOU HAVE BEEN WARNED!**

Check your work before refitting the computer cover, and ensure no wires are trapped as you do this. Two cable ties are provided to keep any surplus lengths of wire out of the way.

Fitting Whisper inside an ICS external hard disc case

Do a Shutdown if necessary, then switch off the power to the external hard disc and the computer. Disconnect the hard disc case from the mains supply by unplugging the power supply cable. Disconnect the hard disc case from the computer.

> **MAKE CERTAIN THE HARD DISC CASE IS PHYSICALLY DISCONNECTED FROM THE MAINS POWER SUPPLY.**

Remove the lid from the hard disc case by undoing the four M3 x 6mm Pozidriv screws.

The fitting procedure is similar to that described above. Tho fan's power lead consists of a red and a black wire plugged in at the front of the housing.

The main Whisper unit itself should be fixed to a suitable place inside the hard disc case using the double-sided sticky pad provided.

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