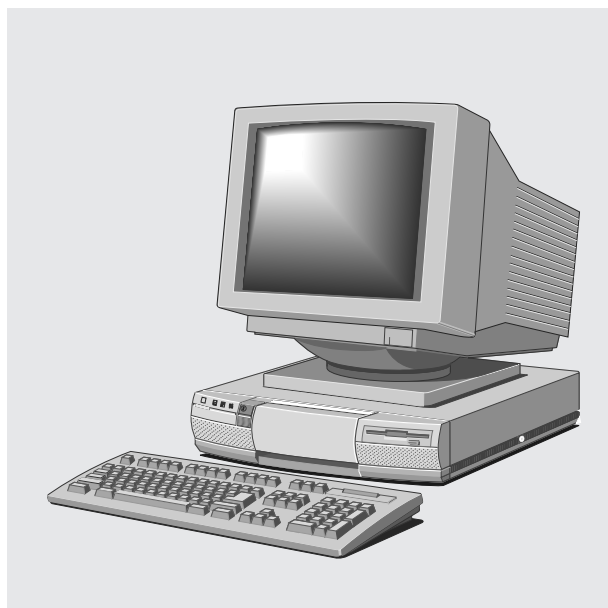


apricot  
**LS340  
VS340**

Owner's Handbook



Designed for



# **APRICOT LS/VS340 OWNER'S HANDBOOK**

**2ND EDITION**

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Apricot Computers Limited

3500 Parkside

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B37 7YS

 **MITSUBISHI ELECTRIC**

Printed in the United Kingdom

## Safety and Regulatory Notices

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### Electrical

The computer uses a safety ground and must be earthed.

The system unit AC power cord is its 'disconnect device'. Ensure that the system unit is positioned close to the AC power outlet and that the plug is easily accessible.

The power cord packed with the computer complies with the safety standards applicable in the country in which it is first sold. Use only this power cord. Do not substitute a power cord from any other equipment.

To prevent fire and electric shock, do not expose any part of the computer to rain or moisture. Turn off the computer and unplug all power cords before moving or cleaning the system unit, or removing the system unit top cover.

### Battery

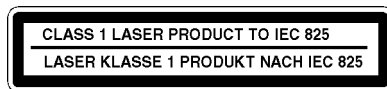
This product contains a lithium battery.

Do not use a metal or other conductive implement to remove the battery. If a short-circuit is made between its positive and negative terminals the battery may explode.

Replace a discharged battery with one of the same type; another type may explode or ignite. Follow the instructions contained in the *Owner's Handbook* to replace the battery. Dispose of a discharged battery promptly and in accordance with the manufacturer's recommended instructions. Do not recharge, disassemble or incinerate the discharged battery. Keep away from children.

### Laser products

Any CD-ROM drive fitted in this system is classified as a CLASS 1 LASER PRODUCT according to IEC825 *Radiation Safety of Laser Products (Equipment Classification: Requirements and User's Guide)*. The CLASS 1 LASER PRODUCT label is located on the underside of the system unit or on the door to the removable-media drive bay.



The CD-ROM drive contains a laser system which is harmful to the eyes if exposed. Do not attempt to disassemble the CD-ROM drive; if a fault occurs, call an authorised maintainer.

Use the CD-ROM drive only as described in this manual. Failure to do so may result in exposure to hazardous radiation.

### Ergonomic

When positioning the system unit, monitor and keyboard, take into account any local or national regulations relating to ergonomic requirements.

# Safety and Regulatory Notices

## Standards

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### Safety

This product complies with the European safety standard **EN60950** which will, when applicable, include the national deviations for the country in which it is sold.

This product complies with the following International safety standards:

**UL1950** (USA)

### Electro-magnetic Compatibility (EMC)

This product complies with the following European EMC standards:

**Emissions** **EN55022 Class B**

**Immunity** **EN50082-2**

The applicable standards for the country of sale are shown on the label fixed to the rear of the system unit.

### Notes

All interconnecting cables (for example, microphone, headphones or external speakers) and communication cables should be less than 2 metres in length. If cable extensions are used, ensure adequate earth connections are provided and screened cables are used.

## Legalities

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This equipment complies with the relevant clauses of the following European Directives:

**Low Voltage Directive** **73/23/EEC**

**EMC Directive** **89/336/EEC**

**Telecommunications Directive** **91/263/EEC**

**CE Marking Directive** **93/68/EEC**

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### Important

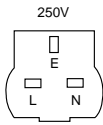
*This system complies with the CE Marking Directive and its strict legal requirements. Use only parts tested and approved by Mitsubishi Electric PC Division. Failure to do so may result in invalidating both the compliance and your warranty. All expansion cards and drives must carry the CE mark to ensure continued compliance.*

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## Power Connection

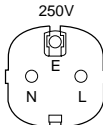
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### Typical AC plugs



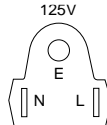
**BS1363A**

U. K.



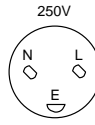
**SHUCO**

Austria Belgium  
Finland France  
Italy Germany  
Sweden Norway  
Holland



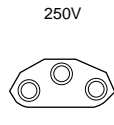
**NEMA 5-15P**

Taiwan  
Thailand  
Japan  
USA  
Canada



**SRAF 1962/DB16/87**

Denmark



**ASE 1011**

Switzerland

### Checking the AC power supply

When the computer is delivered, it is ready for the commercial AC power supply generally available in the country in which it is first sold. It has been set for the correct voltage range, and is supplied with an AC power cord and plug which comply with the relevant safety standards.

Before using the computer in a country other than that in which it was originally sold, you must check the voltage and frequency of that country's AC power supply, and the type of power cord required there. Check the power rating labels on the rear of the computer's system unit and its monitor to ensure that they are compatible with the AC power supply.

The computer can function within two alternative AC power supply ranges, according to the position of the voltage selection switch on the rear of the system unit:

Switch setting	AC power supply (voltage and frequency)
115	100 - 120 volt AC, 50 - 60 Hz
230	220 - 240 volt AC, 50 - 60 Hz

The voltage setting of the monitor must always be the same as the voltage setting of the system unit. See the *User's Guide* that accompanies the monitor or consult your supplier to find out how to change the voltage setting.

It is imperative that the computer is set to the correct voltage range before use. If not, the machine may be irreparably damaged.

# Safety and Regulatory Notices

## Connecting to the AC power supply

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### Important

*Any peripheral equipment that requires an AC power cord must be earthed.*

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Use the procedure below to connect the components together. It is important that you take each step in the order indicated.

1. If your AC power outlets have switches, set them to their Off positions.
2. Ensure that the system unit, the monitor, and any peripherals are turned off.
3. Connect the monitor signal cable between the rear of the monitor and the monitor port on the rear of the system unit.
4. Where appropriate, connect other signal cables between your peripherals and their respective ports on the system unit.
5. Plug the keyboard cable into the keyboard port on the system unit.
6. Plug the mouse into the mouse port on the system unit.
7. Where appropriate, connect the computer to the network.
8. Connect the monitor power cord between the rear of the monitor and the AC power outlet on the rear of the system unit.
9. Connect the system unit power cord between the AC power inlet on the rear of the system unit and a nearby, grounded AC power outlet.
10. Where appropriate, connect power cords between your peripherals and nearby, grounded AC power outlets.
11. If your AC power outlets have switches, set them to their On positions.
12. Turn on the system unit first, then the monitor, then other peripherals.

## Power Cable Connections - UK ONLY

This equipment is supplied with an AC power cord that has a non-removable moulded plug.

Always replace the fuse with one of the same type and rating which is BSI or ASTA approved to BS1362. Always refit the fuse cover, never use the plug with the fuse cover omitted.

## Thermalcote bonding compound

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The thermal bonding compound used between the system processor and its heat sink can cause skin irritation and stain clothing. Avoid prolonged or repeated contact with skin. Wash thoroughly with soap and water after handling. Avoid contact with eyes and inhalation of fumes. Do not ingest.

### **Anti-static precautions**

---

Static electricity can cause permanent damage to electronic components. You should be aware of this risk, and take precautions against the discharge of static electricity into the computer.

Anyone can generate static electricity by moving on a chair, brushing against desks or walls, or simply walking across an ordinary carpet. Items handed from one person to another, or being wrapped or unwrapped, can acquire a static charge. Air conditioning systems can also result in ambient static. Clothing made of synthetic fibres is particularly likely to generate static electricity; this static electricity is often completely unnoticed by the wearer, but can be sufficient to cripple or impair an electronic component.

The computer is at risk from static discharge while the top cover is off. This is because the electronic components of the motherboard are exposed. Memory modules, cache upgrades and OverDrive processors are other examples of electrostatic sensitive devices (ESSDs).

All work that involves removing the cover must be done in an area completely free of static electricity. We recommend using a Special Handling Area (SHA) as defined by EN 100015-1: 1992. This means that working surfaces, floor coverings and chairs must be connected to a common earth reference point, and you should wear an earthed wrist strap and anti-static clothing. It is also a good idea to use an ionizer or humidifier to remove static from the air.

When installing any upgrade, be sure you understand what the installation procedure involves before you start. This will enable you to plan your work, and so minimise the amount of time that sensitive components are exposed.

Do not remove the system unit cover, nor the anti-static bag or wrapping of any upgrade, until you need to.

Handle static-sensitive items with extreme care. Hold expansion cards and add-on components only by their edges, avoiding their electrical contacts. Never touch the components or electrical contacts on the motherboard or on expansion cards. In general, do not handle static-sensitive items unnecessarily.

Keep all conductive material, and food and drink, away from your work area and the open computer.



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# 1 INTRODUCING . . .

This chapter gives you a quick tour of your new Apricot computer. As soon as you've unpacked the components and familiarised yourself with them, you should progress to the next chapter, "Getting Started".

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**Warning**

*Read the Power Connection information in the Safety & Regulatory Notices section at the start of this manual before using the computer for the first time.*

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## Unpacking

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On unpacking the computer, you should find:

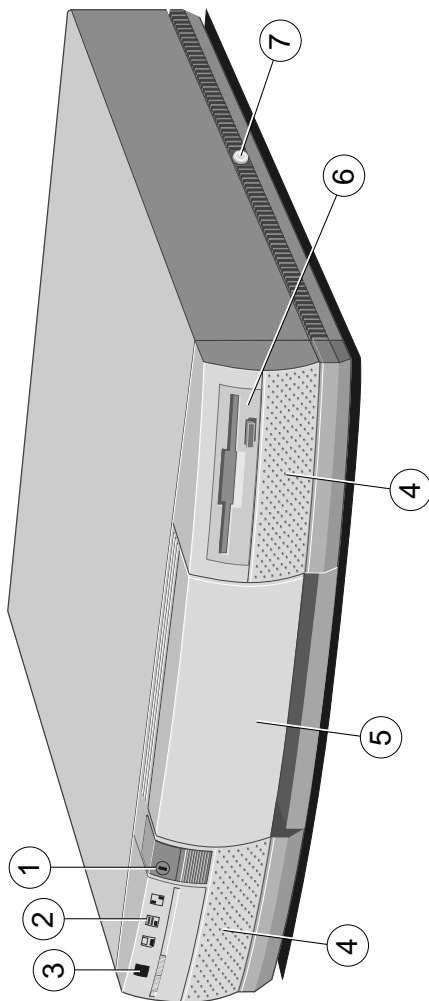
- ◆ Apricot PC system unit.
- ◆ Apricot monitor and accompanying *User's Guide*.
- ◆ Windows 95 keyboard and two-button mouse.
- ◆ System unit AC power cord, and monitor power cord, appropriate for the country of sale.
- ◆ System documentation (this *Owner's Handbook*, etc.)
- ◆ Microsoft Windows 95 or (if requested) Microsoft MS-DOS and Windows for Workgroups documentation.



More elaborate systems may include software or hardware options with accompanying installation diskettes and additional documentation. Some of these options may have been factory-configured, or installed by your supplier.

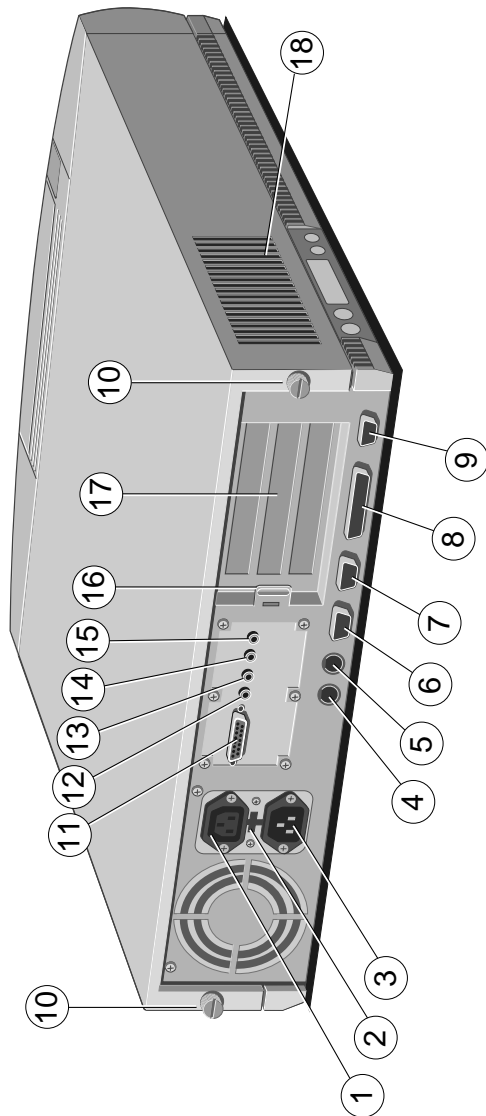
Keep the cartons, boxes and packaging materials; you will need them again if you have to transport the computer elsewhere. Make a note of the manufacturer's data recorded on the various components (product codes, serial numbers, etc.). A service engineer may need this information if the computer develops a fault.

## **Pictorial guide to the system unit**

---



- 1 **POWER button:** press to turn the system on or off. The green indicator on the button lights when the system unit is powered.
- 2 **activity indicators**, from left to right:
  -  lights when a diskette is in use.
  -  lights when a hard disk drive or SCSI tape drive is in use (depending on the operating system).
- 3 **infrared sensor:** fitted only on Apricot LS340 models with a built-in LOC Technology system (i.e. the LS Security Card).
- 4 **speaker grille:** Apricot LS340 models have internal stereo speakers. Apricot VS340 models have a single internal speaker (on the right-hand side).
- 5 **door** (shown closed): hinges down to reveal the removable-media drive bay.
- 6 **3.5" diskette drive.**
- 7 **system lock:** prevents unauthorised access to the inside of the system unit.



- 1    **AC power outlet:** where the monitor power cord can plug in.
- 2    **voltage selection switch:** the system unit can be set to operate with a 100-120 V or 220-240 V AC power supply.
- 3    **AC power inlet:** where the system unit power cord plugs in.
- 4    **keyboard port:** connect the keyboard to this port.
- 5    **mouse port:** connect the mouse to this port.
- 6    **serial port 1:** (110 baud to 115,000 baud): typically used for connecting an external modem.
- 7    **serial port 2:** identical to serial port 1.
- 8    **parallel port** (standard, bi-directional or ECP): typically used for a printer signal cable.
- 9    **monitor port:** connect the monitor signal cable to this port (if you are using the on-board video controller).
- 10   **casing screws:** unfasten these to remove the top cover.
- 11   **joystick/MIDI port:** (LS340 models) intended for either a standard PC analog joystick, or a MIDI In/Out adapter.
- 12   **audio input socket (MIC):** (LS340 models) mainly intended for a microphone. Alternatively, you could attach a personal stereo (tape or CD). The socket provides “phantom power” for electret condenser type microphones.
- 13   **line in socket (IN):** (LS340 models) intended for a line-in signal from a high-fidelity tape deck or CD player.
- 14   **line out socket (OUT):** (LS340 models) intended for a line-out signal to a high-fidelity amplifier or tape deck.
- 15   **audio output socket (SPK):** (LS340 models) intended for headphones or a pair of external self-powered loudspeakers.
- 16   **security loop:** you can feed a security chain through this loop and secure it to prevent theft of the system unit.
- 17   **blanking plates:** for the expansion card slots.
- 18   **air vents:** do not block these vents or the system will overheat.



### **Summary of features**

---

This section is intended mostly for people who already know a bit about computers and want to get an idea of what this one can do.

Don't worry if you're unfamiliar with some of the computer terminology used here. It's provided as a useful "shorthand" for more experienced readers. Be assured, you don't need to understand any jargon to use the computer safely and efficiently. (On the other hand, it can't hurt to learn; introductory books about computers can be found in your local bookshop or library.)

The Apricot 340 range is divided into two series. The economical VS-series (Apricot VS340) and the business-minded LS-series (Apricot LS340).

### **Standard features**

The standard features of the range include:

- ◆ Intel Pentium processor with upgrade capability.
- ◆ At least 8 Mbytes of system random-access memory (RAM), upgradeable to 128 Mbytes by the use of standard 32-bit, 60 nanosecond Extended Data Output (EDO) SIMMs (single in-line memory modules).
- ◆ Pipeline burst 256 Kb cache.
- ◆ BIOS Setup configuration utility in read-only memory (ROM).
- ◆ ATI 264VT or 264GT PCI local bus Enhanced Video Graphics Array (EVGA) controller with at least 1 Mbyte of video memory, upgradeable to 2 Mbytes.
- ◆ Primary and secondary local bus Enhanced Integrated Drive Electronics AT-Attachment (E-IDE/ATA) interfaces for IDE hard disk drives and ATA-PI (ATA Packet Interface) CD-ROM drives respectively.

- ◆ 1.44 Mbyte 3.5" diskette drive; 3.5" hard disk drive bay with room for two one-inch drives (various capacities); one 5.25" removable-media drive bay.
- ◆ Peripheral Component Interconnect (PCI) and Industry Standard Architecture (ISA) expansion card slots: one full-length shared PCI/ISA slot, one full-length ISA slot, and one half-length ISA slot.
- ◆ Parallel port with either standard, bi-directional or ECP (Extended Capabilities Port) functionality; two serial ports; extended keyboard; two-button mouse.

## Energy-efficient features

All models in the range comply with the requirements of the US Environmental Protection Agency's "Energy Star" programme for energy-efficient computers. These models support:

- ◆ System Management Mode (SMM) of Intel SL Enhanced processors.
- ◆ Operating systems and applications that use the Intel/Microsoft Advanced Power Management (APM) interface standard.
- ◆ VESA BIOS Extensions for Power Management (VBE/PM), for use with energy-efficient monitors that support Display Power Management Signalling (DPMS).

---

### Caution

*Do **not** attempt to use the computer's energy-saving features with a monitor that does not support DPMS; the monitor may be permanently damaged.*

---

## 2

# GETTING STARTED

You should read this chapter even if you do not read any other. It provides important information to help you site, connect, power and configure the computer.

This chapter will tell you all you need to know in order to start work. The chapters after this one deal with the BIOS Setup utility and various removable-media drives.

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**Warning**

*Read the Power Connection information in the Safety & Regulatory Notices section of this manual before using the computer for the first time.*

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**General advice**

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This computer is designed to be used in a normal home or office environment. Here are a few hints for choosing a suitable site:

- ◆ Place the system unit flat on a sturdy, level surface, free from vibration.
- ◆ Site the computer away from moisture, direct sunlight, and extremes of heat and cold. Avoid situations in which the surrounding temperature or humidity may change rapidly. (See Appendix B, “Technical Information”, for recommended temperature and humidity ranges.)
- ◆ When positioning the system unit, monitor and keyboard, take into account any local or national regulations relating to ergonomic requirements. For example, you should ensure that little or no ambient light is reflected off the monitor screen as glare, and that the keyboard is placed in a comfortable position for typing.
- ◆ Give the computer plenty of room so that air can circulate on all sides. Air is drawn into the system unit through vents on the bottom and on the left-hand side, and expelled through the vent on the back. Ensure that these vents are never obstructed.

## Getting Started

Do not allow any cables, particularly power cords, to trail across the floor where they can be snagged by people walking past.

---

### Warning

*The computer uses the system unit AC power cord as its “disconnect device”. Ensure that the system unit is positioned close to the AC power outlet, and that the plug is easily accessible.*

*To prevent fire and electric shock, do not expose any part of the system unit to rain or moisture.*

---

## Connecting the components

---

Use the following procedure to connect the components together. It is important that you take each step in the order indicated. See Chapter 1, “Introducing...”, if you need help identifying the various ports on the system unit.

1. If your AC power outlets have switches, set them to their Off positions.
2. Ensure that the system unit, the monitor, and any peripherals are turned off.
3. Connect the monitor signal cable between the monitor and the monitor port on the rear of the system unit. (If the monitor signal cable is connected after the computer is turned on, the display may appear in monochrome or not at all.)
4. Where appropriate, connect other signal cables between your peripherals and their respective ports on the system unit. Make sure the signal cables are connected securely.
5. Plug the keyboard cable into the keyboard port on the system unit. Be careful not to plug it into the mouse port by mistake.
6. Plug the mouse into the mouse port on the system unit. Never connect either the keyboard or the mouse while the system unit is turned on.
7. Where appropriate, connect the computer to the network.
8. Connect the monitor power cord between the monitor and the AC power outlet on the rear of the system unit.

9. Connect the system unit power cord between the AC power inlet on the rear of the system unit and a nearby, grounded AC power outlet.
10. Where appropriate, connect power cords between your peripherals and nearby, grounded AC power outlets.
11. If your AC power outlets have switches, set them to their On positions.

## **Turning on and booting the computer**

---

### **Turning the power on**

To turn on the computer, simply press the POWER button. The green indicator on the POWER button lights to show that the system unit is powered. Remember that the monitor has its own power button or switch; see the monitor's *User's Guide* for details.

Always make sure that the system unit is turned on before turning on any attached peripherals.

If the computer does not start when the POWER button is pressed, check that the system unit and monitor power cords are securely connected and that the AC power supply is switched on.

### **Power-on self-test**

Whenever the computer is turned on, a power-on self-test (POST) routine tests various hardware components and compares the actual configuration of the computer with that recorded in configuration (CMOS) memory. During this time, BIOS sign-on and POST messages are displayed.

### **The boot sequence**

Provided that POST succeeds without discovering any serious errors or configuration discrepancies, the computer attempts to find an operating system; that is, it attempts to **boot**.

By default, the computer will look first for a system diskette, then for a bootable hard disk, but this sequence can be changed with the BIOS Setup utility.

### **System diskette**

A system diskette is a diskette bearing at least the rudiments of an operating system. If the computer finds such a diskette in the diskette drive, it boots from it. If it finds a non-system diskette, the computer invites you to replace it. If necessary, your operating system manuals should tell you how to create a system diskette.

### **Hard disk**

Apricot computers fitted with a hard disk normally arrive with either Microsoft Windows 95 or the MS-DOS/Windows for Workgroups operating system already in place or **pre-installed**, so that it's there ready for you when you turn on the computer for the first time.

## **Starting the computer for the first time**

### **First time with Windows 95**

The first time you turn on your computer you must tell Windows 95 your name (and the name of the company for which you work, if applicable) and agree to the legal terms and conditions of the Windows 95 Licence Agreement. Windows 95 then spends a few minutes analysing your computer and configuring itself to take full advantage of your computer's components. During this process you are offered the opportunity to install a printer and make backup diskettes of Windows 95 and other pre-installed software. Note that you do not have to install a printer or make back-up diskettes at this time if you don't want to. See the section on "Backing-up the pre-installed software" later in this chapter.

### **First time with Windows for Workgroups**

The first time you turn on your computer a message appears explaining the legal terms and conditions that govern the use of the software pre-installed on the computer's hard disk. Once you have read this message, you can press the F3 key to continue. By doing so you are acknowledging that you have read, understood and accepted the terms and conditions.

## Why your computer may seem to stop working

Your computer has a built-in energy-saving feature. If you leave it for a while without doing anything, it goes into a special low-power **Standby mode**. The processor slows down, and the monitor may go blank. The operating system and your programs continue to run, although slowly (and you may not be able see them if the monitor is blank). The computer is still working, and you haven't lost any of your files.

You can wake the computer again by pressing any keyboard key. See the chapter on "Using the BIOS Setup Utility" for more information.

---

### Caution

*The monitor supplied with your computer is designed to work with these energy-saving features. If you want to use another monitor, make sure that it supports the VESA standard for Display Power Management Signalling; if it doesn't, it may be permanently damaged.*

---

## Turning the power off

Before turning off the computer, run through the following checklist:

- ◆ Quit or exit from the applications you are running; be sure to save any files you have altered. Any unsaved information still held in the computer's memory will be lost when you turn off the computer.
- ◆ Close down or quit any software that employs virtual memory or disk-caching (Windows 95 and Windows for Workgroups do this automatically).
- ◆ Always turn off any attached peripherals first. However, there's no need to turn off the monitor if it's being powered from the system unit.
- ◆ Wait until all the activity indicators on the front bezel are unlit.

To turn off the computer, simply press the POWER button again. The power indicator on the button goes out. If the monitor is powered from the system unit, it will be turned off at the same time.

After you turn the computer off, wait at least 5 seconds before turning it on again. The computer may not initialise itself properly if you turn it off then on again in quick succession.

### **Backing-up the pre-installed software**

---

Apricot computers with a hard disk normally arrive with an operating system pre-installed. Additional software may be pre-installed at the factory or by your Apricot supplier.

We recommend that you copy or **back up** any pre-installed software soon after setting up the system. This is particularly important for systems which are supplied without installation diskettes for the software on the hard disk. A back up copy will safeguard the pre-installed software against loss if the hard disk fails or if you accidentally overwrite or delete files.

- ◆ A disk imaging utility is provided with Windows 95 and Windows for Workgroups. This allows you to create installation diskettes for the operating system, and some other software, from disk images pre-installed on the hard disk. See the utility's on-line help for more information.
- ◆ To back up other pre-installed software (and your own files) use the Backup tool in the System Tools folder (if you have Windows 95) or Backup for Windows (if you have Windows for Workgroups).

Any copy you make of pre-installed software must be used only as a back-up copy, in case the pre-installed version is lost. You are **not** allowed to use installation diskettes created from disk images to install the software onto another computer.



## Customising your display settings

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Your pre-installed copy of Windows 95 or Windows for Workgroups is configured for a standard VGA monitor resolution (640 x 480 pixels), so that Windows is sure to display correctly whatever monitor you have.

However, most modern monitors, and all Apricot monitors, can display in higher resolutions than standard VGA. You can change the setting to one that more closely matches your own monitor, to get the best performance from it.

### Display settings in Windows 95

The monitor setting is changed by using the Change Display Type option in the Display Properties dialog. This offers a list of major monitor manufacturers and models, including all current Apricot monitors. See Windows 95 on-line Help for instructions on changing display settings.

---

#### Tip

*A quick route to changing the monitor type in Windows 95 is to right-click with the mouse while pointing at the background area of the Windows desktop, then select Properties from the pop-up menu. This displays the Display Properties dialog. You will find the Change Display Type option on the Settings tab.*

---

### Display settings in Windows for Workgroups

The monitor setting is changed by using the ATI Desktop utility in the Apricot group. Open ATI Desktop, choose Screen Adjustment, then choose Select Monitor. This offers a list of all current Apricot monitors. Once you have selected the correct monitor, you can select the required resolution. See ATI Desktop's on-line Help for more information.

### **Using the 3.5-inch diskette drive**

---

The 3.5-inch diskette drive can read and write double-sided diskettes with a formatted capacity of either 1.44 Mbytes (if marked “HD” or “high density”) or 720 Kbytes (if unmarked, or marked “DD” or “double density”).

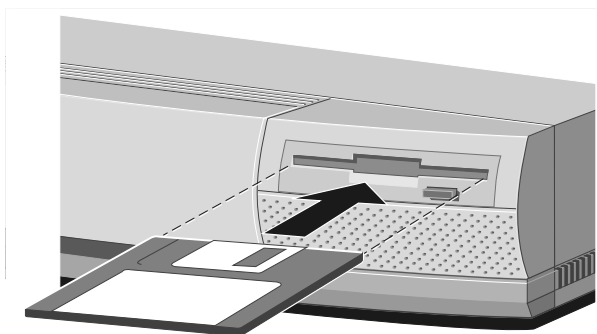
Each diskette has a rigid plastic cover with a metal shutter that guards the disk surface. The drive automatically moves the shutter aside to read the diskette. Never touch the exposed surface under the shutter; you could deform the disk or leave a fingerprint that might make the diskette difficult to read.

Keep diskettes well away from dust, moisture, magnetic objects, and equipment that generates magnetic fields. Also, avoid extremes of temperature and exposure to direct sunlight. Otherwise, data recorded on the diskette may become corrupted.

#### **Inserting a diskette**

A diskette is inserted into the diskette drive slot shutter-foremost, and with its label side facing up (see illustration below). Some diskettes have a small arrow on the face of the diskette; this must point towards the drive when you insert the diskette.

Push the diskette all the way in until it engages with the drive mechanism. When the drive’s EJECT button pops out, the diskette is fully engaged.



### **Removing a diskette**

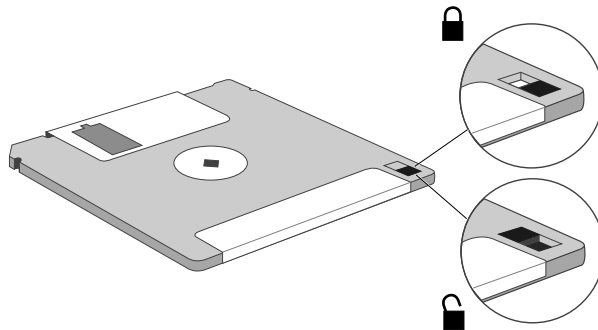
Before attempting to remove a diskette, make sure that the drive is not currently in use (the diskette activity indicator on the computer's front bezel must be unlit).

Press the EJECT button on the drive. The drive mechanism disengages and the diskette is ejected half-way out of the drive.

If a diskette becomes stuck in the drive, perhaps because its label has peeled back, do **not** attempt to remove it with tweezers or any similar implement; you risk damaging the drive. Call an authorised maintainer.

### **Write-protecting a diskette**

A diskette can be write-protected by sliding a small tab towards the edge of the diskette to expose the little hole beneath it (see illustration). With the tab in this position, you can read, copy or print files from the diskette, but you cannot create, rename or delete any files.



The BIOS Setup utility can completely disable the diskette drive.

### Using Help

---

Along with the software pre-installed on your computer's hard disk, you will often find one or more Apricot Help files. These will explain any special features of the system, and tell you how to install the software needed to exploit those features.

Apricot Help may be supplied in various forms, depending on the intended operating system; for the Microsoft Windows 95 and MS-DOS/Windows for Workgroups operating systems, they are usually Windows Help files or README text files.

Apricot's Windows Help files are usually pre-installed in the Apricot folder (Windows 95) or Apricot program group (Windows for Workgroups).

Apricot's README.1ST files, or other ASCII text files identified by their .TXT file extensions, can be read by most text editors and wordprocessing programs. Alternatively they can be displayed, one screenful at a time, using the MS-DOS commands **Type** and **More**; for example:

```
TYPE README.1ST | MORE
```

### 3

## USING THE BIOS SETUP UTILITY

BIOS (pronounced “bye-oss”) stands for **basic input/output system**. The BIOS operates at the boundary between the computer’s hardware (the processor, memory, and so on) and its software (the operating system and your programs). In effect, it mediates between the two. The BIOS is permanently encoded in an area of **read-only memory** (ROM), although it can be modified if necessary by an authorised maintainer.

**BIOS Setup** is a utility that allows you to view and alter the computer’s hardware configuration. It is also used to configure various security and power-saving options. Configuring the computer is necessary to ensure that the software you use can recognise and exploit the hardware’s capabilities.

The current configuration is kept in a special area of memory, called CMOS memory, and maintained by a small battery so that the configuration is preserved even while the computer is switched off.

Your computer arrives already configured, but may need to be configured again after you add or remove add-on options such as memory modules or expansion cards.

## **Starting BIOS Setup**

---

To start the BIOS Setup utility:

1. Turn on or restart your computer.
2. Wait until the Mitsubishi Electric logo appears in the top left corner of the screen.



3. Press the F1 key.

## **If BIOS Setup starts on its own**

---

BIOS Setup might start on its own for three reasons:

- ◆ The power-on self-test (POST) detects a configuration error or fault. This may be signalled by one or more of the POST error messages listed in the “Troubleshooting” chapter. If a persistent fault is indicated, make a note of any error messages and the current configuration settings before calling an authorised maintainer.
- ◆ The CMOS battery may be running down. This may cause spurious POST error messages. If this happens every time you turn on the computer, you may have to change the battery as described in Appendix A.
- ◆ The computer’s configuration may have changed, for example by the addition of more system memory or an expansion card. In this case you may have to define the new configuration.

## **Control keys**

---

A number of keys are used to move around the BIOS Setup utility, select items on the screen, and change the current configuration.

Some items are for information only. Others have fields you may change. Changeable fields are enclosed in square brackets. Most changeable fields allow you to select one of only a few possible values. To select a different value, use the LEFT ARROW and RIGHT ARROW keys. Some changeable fields require you to enter a number. You may type numbers, press the PLUS (+) key to increment the current value or MINUS (–) to decrement it.

<b>Press</b>	<b>To</b>
UP ARROW DOWN ARROW	Move the highlight bar around the screen from one line or one field to another.
LEFT ARROW RIGHT ARROW	Scroll through the possible selections for the currently-highlighted item.
ENTER	Choose the currently-highlighted item.
PAGE UP PAGE DOWN	Move between the pages of the current screen.
F1	View a pop-up help dialog on the currently-highlighted item. Press F1 again to get general help on Setup. Press ESC to close the help dialog.
F9	Restores the previous setting for the currently selected item.
F10	Restores the BIOS default setting for the currently selected item. This setting may not be appropriate for your particular system.
ESC	Exit the current screen. To exit BIOS Setup, press ESC in the main menu screen. When you exit BIOS Setup after saving changes, the computer reboots.

### Main menu screen

---

When you start BIOS Setup a main menu screen appears with the following options:

- **System Summary**
- **Product Data**
- **Devices and I/O Ports**
- **Date and Time**
- **System Security**
- **Start Options**
- **Advanced Setup**
- **Plug and Play**
- **Error Log**
- **Power Management**
- Save Settings**
- Restore Settings**
- Load Default Settings**
- Exit Setup**

Lines with a ● bullet in front of them have further menus or dialog boxes associated with them, and are described later in this chapter.

A ► bullet next to a line indicates that BIOS Setup detected a configuration error and attempted to correct it.

The **Save Settings** option saves any changes that you have made so far.

The **Restore Settings** option restores the settings that were in effect when you started the BIOS Setup utility (with the exception of the Date and Time settings).

The **Load Default Settings** option restores the BIOS default settings.

---

#### Caution

*The BIOS defaults may not be appropriate for your particular system. Make a note of the current settings before using the Load Default Settings option or pressing F10.*

---



## **System Summary**

---

This page cannot be edited, but gives a summary of the main system settings. Changes made in other pages will be reflected here. Make a note of the information on this page before you make any changes.

## **Product Data**

---

This page cannot be edited. It gives details of the **Machine Type/Model** and the **System Serial Number**. Make a note of the information on this page. A service engineer may need to know it if the computer develops a fault.

## **Devices and I/O Ports**

---

### **Serial Ports A & B (COM1 & COM2)**

This allows you to select the I/O ports and interrupts used by the two serial ports. It is best to leave these at the default settings. Do not disable the serial ports unless you are absolutely sure you are not going to need them.

### **Parallel Port**

This allows you to configure the parallel port. If you choose **Auto-configure**, appropriate settings are selected automatically. Otherwise you can select **Standard**, **Bi-directional** or **ECP** mode and specify the I/O port, interrupt (IRQ7 or IRQ5) and (for ECP mode only) the DMA port (DMA3 or DMA1) used by the port.

<b>Mode</b>	<b>Description</b>
Standard	Used for output only.
Bi-directional	Simple two-way data.
ECP	Extended Capabilities Port.

Any parallel port devices that you may wish to attach, such as a tape streamer or external hard drive, should have full instructions supplied with them that will tell you if the port capabilities need to be altered.

### **Mouse**

This option enables the use of a mouse. The actual presence of a mouse can then be detected by POST. You should not normally disable this option.

### **Diskette Controller**

This option lets you disable the on-board diskette/floppy disk interface controller. As this would disable the 3.5" diskette drive, you should not normally change this setting.

### **Diskette Drive A/B**

This lets you specify what diskette and floppy disk drives are fitted. Diskette drive A, which is fitted by default, is invariably a 1.44 Mbyte 3.5" drive. If a second floppy disk is fitted, it is usually a 1.2 Mbyte 5.25" drive.

### **Video Setup**

This identifies the on-board video controller and the size of the video memory.

### **IDE Controller**

This option lets you disable the on-board IDE controller. As this would disable the computer's hard disk drives, you should not normally change this setting.

### **IDE Drives Setup**

The motherboard has two E-IDE/ATA (Enhanced Integrated Drive Electronics/AT-Attachment) interfaces which support a total of four drives (that is, two drives per interface).

However, the computer itself can accommodate at most two hard disk drives plus one removable-media drive, typically a CD-ROM drive. The hard disk drives should be connected to the primary IDE interface, and the CD-ROM drive connected to the secondary interface. This gives the most efficient use of both interfaces.

### **IDE Translation Mode**

Select **Extended CHS** (cylinder, head, sector) to enable the scheme that allows the BIOS to access hard disk drives of greater than 504 Mbytes capacity. You might need to select **Standard CHS** if your operating system does not support Extended CHS for large drives.

### **Hard disk drives**

Hard disk size and type is auto-detected when the computer is turned on, but two other parameters can be manually set for each drive.

Parameter	Settings
Transfer Mode Determination	You can either select <b>Manual</b> or <b>Automatic</b> . If you select Manual then you will be required to specify the Polled I/O transfer mode of the hard disk drive.
Logical Block Address (LBA) Mode	Select <b>Supported</b> if your hard disk drive is 8 Gbytes or larger as LBA mode offers significant performance benefits.

### **CD-ROM drive**

The BIOS will detect the presence of a CD-ROM drive when the computer is turned on. It will be shown as CD-ROM Drive 2 (allowing for Hard Disk Drives 0 and 1).

## **Date and Time**

---

Use this to adjust the motherboard's Real Time Clock (RTC). This clock is maintained by a battery while the computer is turned off.

### **Time**

The time is in 24-hour format. Use the LEFT ARROW and RIGHT ARROW keys to move from hours to minutes to seconds. To enter new values use the number keys, or the PLUS (+) and MINUS (–) keys to increase or decrease the number.

### Date

The date is in the usual Day/Month/Year format. The procedure for altering the date is the same as for altering the time.

Once the correct date is set you should not need to set it again. The computer accounts for leap years automatically.

## System Security

---

This is to allow you to set, change or delete passwords for either general or administrator use.

The password options are intended for computers that lack more sophisticated security systems. You should **not** use these options on an Apricot LS340 computer fitted with an Apricot LS Security Card.

### Power-on Password

This option allows you to set a password that is required every time the computer is turned on or rebooted. Only people who know the password will be able to use the computer. The password can be up to seven characters long.

To define a power-on password:

1. In the Power-on Password dialog, type the password in the Enter Power-on Password box, then press the DOWN ARROW key.  
  
To preserve confidentiality, the password is not displayed as you type it.
2. Type the password once more in the Enter Power-on Password Again box.
3. If you want the computer to ask for the power-on password, ensure that Password Prompt is set to **On**. If this option is set to **Off**, the computer will still require the password but will *not* ask for it.
4. Choose the Change Power-on Password option.

A dialog asks you to confirm that you want to replace any existing power-on password.

5. Press ENTER to confirm (or ESC otherwise).

Now, when the computer is next turned on or rebooted, the user is required to enter the password. If the Password Prompt option is set **On**, the following prompt is displayed:

**Type your password, then press Enter.**

If the Password Prompt option is set **Off**, the user is not prompted at all. The computer will boot — or if F1 is pressed during start-up the BIOS Setup utility will start — and then wait for the user to type the password and press ENTER. It is important that authorised users of the computer are told to expect this, or they may think that the computer has stopped working.

The user is allowed three attempts to enter the correct password. If she fails, the system is “locked” and must be turned off. Turning the computer on again restarts the sequence.

To delete a power-on password:

1. In the Power-on Password dialog, choose the Delete Power-on Password option.

A dialog asks you to confirm that you want to delete the existing power-on password.

2. Press ENTER to confirm.

### **Administrator Password**

An administrator password works in exactly the same way as a power-on password. If you define both an administrator and a power-on password, the computer accepts only the administrator password.

### **Start Options**

---

Certain features can be set or enabled automatically when the computer starts.

#### **Keyboard NumLock State**

If set to **On**, the keys on the numeric keypad (on the right-hand side of the keyboard) will produce numbers when pressed. If **Off**, these keys provide cursor control functions instead.

#### **Keyboard Speed**

This sets the speed (frequency) at which a pressed key will repeat; either **Fast** (the default) or **Normal**.

#### **Disketteless Operation**

If this option is **Disabled**, POST will look for and test the diskette drive, and report an error if the drive is faulty or missing. If **Enabled**, POST will omit the test and continue, provided that another boot device is available (i.e. the hard disk drive).

#### **Displayless Operation**

If this option is **Disabled**, POST will look for an attached monitor and report an error if it is missing; if **Enabled**, POST will allow the computer to start without a monitor.

#### **Keyboardless Operation**

If this option is **Disabled**, POST will look for an attached keyboard and report an error if it is faulty or missing; if **Enabled**, POST will allow the computer to start without a keyboard.

#### **Startup Devices**

These options allow you to specify where the BIOS looks for an operating system when it boots. If the computer cannot locate an operating system on the First Startup Device, it tries the Second Startup Device, and so on.

Note that if the First Startup Device is set to **Disabled**, the computer will be unable to boot.

The possible settings depend on the number and type of devices that are installed in your computer. For example, **Diskette Drive 1** is not a possible setting if your computer does not include a second floppy disk drive. In order to use the **Network** setting a network interface card must be installed with a remote boot ROM.

By default, the First Startup Device is **Diskette Drive 0** and the Second Startup Device is **Hard Disk 0**. This should not normally need to be changed.

### **Power On Self Test**

The POST can be configured to either run only a **Quick** set of tests or a more thorough (but longer) **Enhanced** set.

### **Virus Detection**

If this option is **Enabled**, each time the computer boots the BIOS will check the startup device to find out if a so-called “boot sector” virus has crept in. This is not an infallible check against the newer types of virus, but it can help.

### **Advanced Setup**

---

Any settings changed here, if incorrect, may cause the system to halt or may cause your software to malfunction. A warning about this appears on the screen when you choose Advanced Setup from the menu.

### **Cache Control**

A simple dialog allows you to enable or disable the computer’s external memory cache (if fitted). Some older software is speed sensitive and on rare occasions you may need to disable the cache.

### **ROM Shadowing**

To “shadow” ROM means to copy its contents into the computer’s system or random-access memory (RAM). This is beneficial for two

## Using the BIOS Setup Utility

reasons: first, ROM has (relatively) long access times and the processor can access RAM faster than ROM; second, the contents of RAM can be cached for even greater performance. All of the computer's system BIOS ROM is shadowed.

The ROM Shadowing option allows you to shadow video BIOS and up to three 32 Kbyte areas of expansion card ROM (that is, ROM fitted on ISA or PCI expansion cards) addressed between C8000h and DFFFFh.

See the chapter entitled “Adding Expansion Cards” for more information about addressing expansion card ROM.

---

### Caution

*Shadowing is only appropriate for expansion card ROM. It must **not** be enabled for expansion card RAM.*

---

## PCI Options

The only configurable PCI setting is Palette Snooping, which can be **Enabled** or **Disabled**. It should be enabled only for PCI video expansion cards that require it.

## Universal Serial Bus (USB)

This option is not used because this model does not have a USB port.

## Plug and Play

---

If your system uses a Plug-and-Play (PnP) compliant operating system, such as Windows 95, you can set the Plug-And-Play Adapter Configuration option to **Disabled**. This allows the operating system to configure PnP devices. If this option is **Enabled**, PnP devices are configured by the BIOS during system start-up. Note that some PnP devices need to participate in the start-up process and these are always configured by the BIOS regardless of the setting of this option.

After fitting an ISA expansion card in your computer, you should mark as **ISA Legacy** those system resources that the card uses. This needs to be done because the system cannot detect their being in



use, but must know about them so as to automatically configure any “Plug and Play” devices and PCI cards to avoid resource conflicts.

There is a separate option for each resource: memory, I/O ports, DMA channels and interrupts. (See the chapter entitled “Adding Expansion Cards” for more information about the resources used by expansion cards.)

Each item shown as **Plug and Play** is assumed not to be in use by any ISA card or device, and will therefore be made available for the PCI auto-configuring process.

### Error Log

---

The last three errors reported during the POST routine are recorded in the error log. You can clear the error log by choosing the Clear Error Logs option.

### Power Management

---

These power management features aim to reduce the average amount of electricity consumed by your computer. Some power management features are enabled in our factory to ensure compliance with the Energy Star programme. For more information about Energy Star, see the Windows Help file pre-installed on your hard disk.

---

#### Caution

*The monitor supplied with your computer is designed to work with these energy-saving features. If you want to use another monitor, make sure that it supports DPMS; if it doesn't, it may be permanently damaged.*

---

### Power Management Feature

Use this option to disable or enable the power management feature.

### Time Till (Automatic) Power Saving

If this option is not **Disabled**, computer will go into a low-power Standby mode after the specified period of inactivity. The processor

## *Using the BIOS Setup Utility*

slows down, but the operating system and your programs continue to run, although slowly. You can wake the computer again by pressing any keyboard key.

### **Hard Disk Power Saving**

If this option is **Enabled**, the hard disk drive will stop spinning after about 20 minutes of inactivity.

### **Standby Switch Monitor Control**

This option is not used because this model does not have a STANDBY switch or button.

---

#### **Note**

*Another way of saving monitor power is by using the built-in power-saving features of Windows 95, or the ATI Desktop utility with Windows for Workgroups.*

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## **4                    USING CD-ROMS AND TAPE DRIVES**

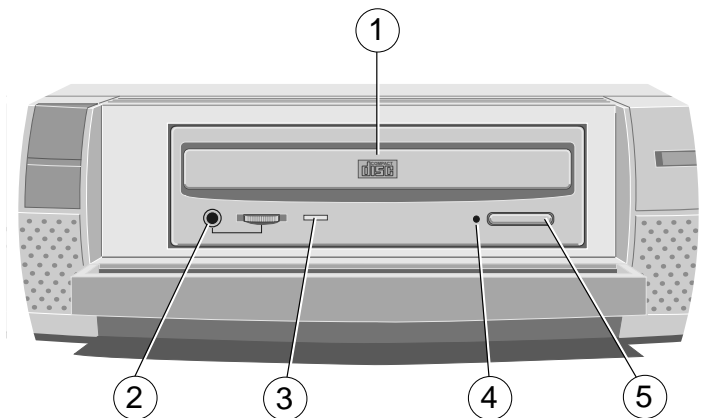
This chapter contains information about the various optional **removable-media** drives that are available. These include:

- ♦    CD-ROM drive
- ♦    PD/CD drive
- ♦    Travan tape drive
- ♦    DDS (Digital Data Storage) tape drive

### Using a CD-ROM drive

---

With the appropriate software support, a CD-ROM drive can retrieve multimedia data from CD-ROM discs and multisession Photo-CD discs. It can also play commercial audio CDs.



- 1 disc drawer or platter
- 2 headphone jack and headphone volume control
- 3 activity indicator (green = powered, amber = busy)
- 4 emergency eject hole
- 5 EJECT button (works only when drive is powered)

The drive has its own headphone jack with associated volume level control. These can be used to listen to music CDs, but not, usually, to the audio on multimedia CDs such as games.

Do not attempt to move the computer while a CD is in the drive, especially if the CD is being played at the time.

---

#### **Warning**

*The laser beam inside the CD-ROM drive is harmful to the eyes if exposed. Do not attempt to disassemble the CD-ROM drive. If a fault occurs, call an authorized maintainer.*

---

### **Inserting a compact disc**

1. Press the EJECT button on the front of the drive.
2. Place the CD face up on the platter.
3. Push the EJECT button again, or gently push the front of the platter, and it will be drawn back into the drive.
4. Wait for the CD to spin up to speed before attempting to read from it.

### **Removing a compact disc**

1. Before attempting to remove a CD, ensure that the computer is turned on (otherwise the EJECT button will not work) and that drive is not currently in use (the drive's activity indicator must be unlit).
2. Press the EJECT button. The drive mechanism disengages and the platter is ejected. (The EJECT button can sometimes be disabled by the software controlling the CD-ROM drive. In this case pressing the EJECT button will have no effect.)
3. Remove the CD from the platter.

To eject the platter manually (for example, during a power failure) you must first ensure that the computer is turned off. Then insert a thin metal rod (such as an unwound paper clip) into the emergency eject hole and push hard.


Keep CDs well away from dust and moisture, and avoid touching the surface of the CD. Also, avoid extremes of temperature and exposure to direct sunlight.

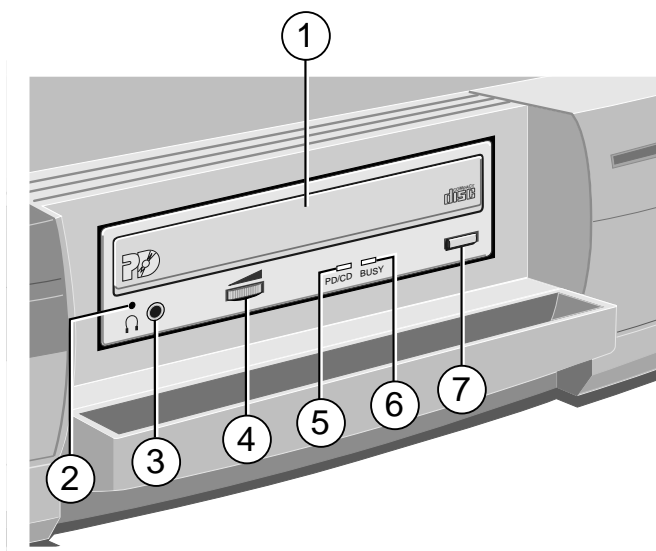
### Using a PD/CD drive

---

The dual-purpose PD/CD drive can read CD-ROM and Photo CD discs, play audio CDs and provide re-writable optical cartridge backup. It can be fitted as an option into any system where both a CD-ROM drive and an efficient re-writable backup device are needed.

The drive appears to the operating system as two separate drives, each with its own drive letter: one for the PD cartridge drive, and another for the CD-ROM drive.

The drive can use any PD cartridge bearing the  logo. If the cartridge is not formatted you will be prompted to format it.



- 1 cartridge/disc drawer or platter
- 2 emergency eject hole
- 3 stereo headphone socket
- 4 volume control for headphones
- 5 PD/CD indicator (amber = PD, green = CD)
- 6 activity indicator (amber = drive in use)
- 7 EJECT button

## Inserting a PD cartridge or compact disc

1. Press the EJECT button on the front of the drive.
2. Place the PD cartridge or compact disc face up on the platter (see diagram).

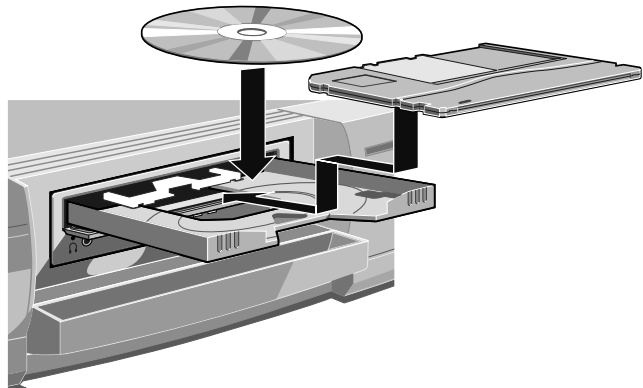
---

### Caution

*The PD/CD drive can only accept one type of disk at any one time. Do **not** try to load both a PD cartridge and a compact disc at the same time as this will severely damage the drive.*

---

3. Push the button again, or gently push the front of the platter to draw it back into the drive.



The PD/CD indicator illuminates to indicate the type of disk which has been inserted (green for CD or amber for PD cartridge).

4. The activity indicator flashes for a short while. Wait until it stops flashing before attempting to read or write information from the drive.

## Removing a PD cartridge or compact disc

1. Before attempting to remove a PD cartridge or compact disc from the drive, ensure that the drive is not currently active (wait for the activity indicator to stop flashing).

2. Press the EJECT button. The drive mechanism disengages and the platter is ejected.

---

**Caution**

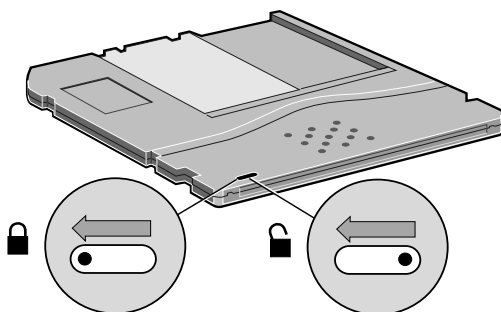
*Do not eject a PD cartridge, or turn off the computer, while the drive's activity indicator is flashing. Your data may not be saved properly, or your data may be corrupted.*

---

To eject the drawer manually (for example, during a power failure) you must ensure that the computer is turned off. Then insert a thin metal rod (such as a unwound paper clip) into the emergency eject hole and push hard.

### Write-protecting a PD cartridge

A PD cartridge can be write-protected by sliding the red switch on the cartridge to the locked position (marked with a closed padlock symbol) as shown below.



### Cleaning the PD/CD drive

You should regularly use a specialist CD cleaning disk to clean the lens in the drive as it may become dusty and fail to operate.

---

**Caution**

*Do not use any other instrument to clean the optical lens as you may damage the drive.*

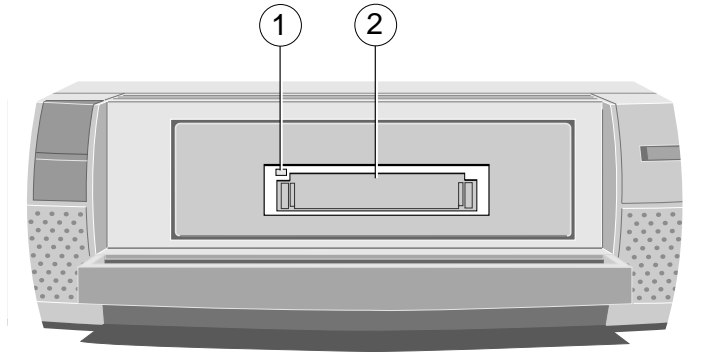
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## Using a Travan tape drive

---

The FTD Travan tape drive uses the on-board diskette/floppy disk interface and so does not require an additional drive controller card like most other tape drives.



- 1 drive activity indicator (green)
- 2 flip-up door

The drive is designed for TR-1 or equivalent minicartridges (750 ft, 400 Mbytes). This nominal capacity can typically be doubled to 800 Mbytes by software data compression. The software required to control the tape drive depends on your operating environment; ask your supplier for details.

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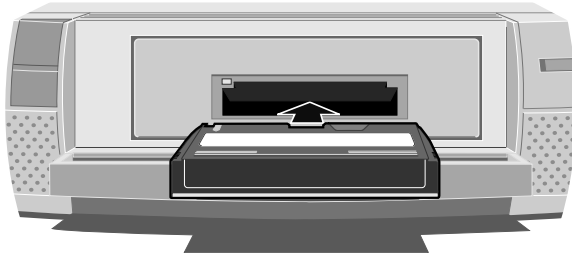
### Note

*This drive can also use QIC-80 Wide cartridges (400 ft, 208 Mbytes) and long-length QIC-80 cartridges (307.5 ft, 124 Mbytes).*

---

## Inserting a cartridge

1. Remove the cartridge from its plastic holder.
2. Hold the cartridge so that the metal plate faces downwards, as shown below. Slide the cartridge into the drive slot until you feel a slight resistance.



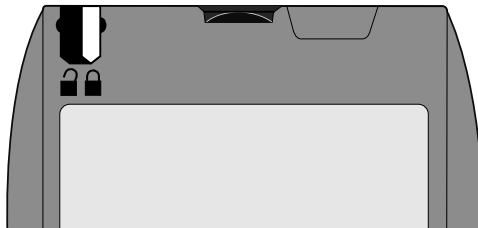
3. Carefully push the cartridge in a bit further until it engages with the drive mechanism. Once the cartridge is correctly loaded, it protrudes about 12 mm from the drive.

### Removing a cartridge

1. Check that the cartridge is not being accessed by the computer (the drive's activity indicator must be unlit).
2. Pull the cartridge carefully out of the drive slot, holding it between thumb and forefinger.
3. Return the cartridge to its plastic holder. This protects the cartridge and prevents dust from collecting on the surface of the tape.

### Write-protecting a cartridge

A cartridge can be write-protected by sliding the red switch on the cartridge to the locked position (marked with a closed padlock symbol) as shown below.



Keep tape cartridges well away from magnetic objects, and equipment that generates magnetic fields (for example, your computer's monitor). Avoid extremes of temperature and exposure to direct sunlight; otherwise, the data recorded on the tape may become corrupted.

### **Cleaning the drive**

You should clean the read/write head and the capstan of the drive frequently to prevent the accumulation of dust and metallic particles.

If you notice read or write errors, or many bad blocks when using the drive, be sure to clean the head and capstan thoroughly before concluding that the drive or your tapes are defective.

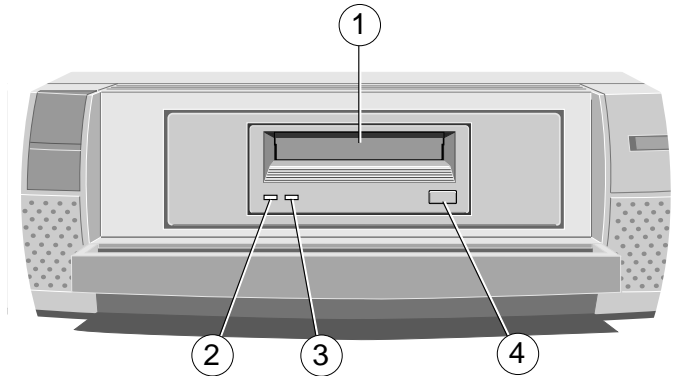
Although it is possible to use special kits to clean the drive, we recommend the use of 90% isopropyl alcohol and several non-abrasive, lint free swabs, as follows:

1. Turn off the system unit and unplug all power cords.
2. The read/write head and the capstan are accessible through the flip-up drive door.
3. Gently rub an alcohol-dampened swab against the surface of the read/write head using a side-to-side motion. If the swab becomes too discoloured, use additional swabs until there is no further discoloration.
4. Rub another, unused, alcohol-dampened swab against the surface of the capstan using an up-and-down motion. Gently rotate the capstan and continue rubbing until the entire surface is clean.
5. Wait for at least three minutes before using the tape drive. This allows any residual alcohol to evaporate.

### Using a DDS tape drive

---

The computer may be configured with either a DDS-2 or a DDS-3 tape drive. The software needed to control the drive depends on your operating environment; ask your supplier for details.



- 1 cartridge insertion slot
- 2 activity indicator (green)
- 3 attention indicator (amber)
- 4 UNLOAD button.

The DDS drive has a built-in compression algorithm which can typically double the capacity of a cartridge. Data compression and decompression is transparent to the host software.

According to its type, the drive uses either 120-metre (DDS-2) or 125-metre (DDS-3) cartridges. In each case earlier DDS formats can also be used (e.g. a DDS-3 drive can read DDS-2 cartridges, but not *vice versa*). The drive automatically detects the format of the cartridge when it is inserted.

---

#### Caution

*Use only cartridges bearing the DDS symbols. You cannot play audio DAT cartridges with these drives, even on Apricot LS340 systems.*

---

## Interpreting the LED indicators

There are two LED (light-emitting diode) indicators on the drive's front panel. The Activity (green) and Attention (amber) LEDs show the status of the drive.

Activity (Green)	Attention (Amber)	Drive status
Flashing	Off	Power-on, or cartridge being loaded or unloaded.
Flashing rapidly	Off	Cartridge being read or written.
On	Off	Cartridge loaded.
Flashing	Flashing	Media Caution
On or Off	On	Fault

### Media Caution

A Media Caution, when the Attention (amber) LED flashes, indicates that the tape may be becoming unreliable, although at this point no data has been lost. First, clean the tape head cylinder with the special cleaning cartridge, then try the data cartridge again. If the caution persists, copy the data onto a new cartridge and discard the old one.

A media caution can also indicate that a pre-recorded audio DAT cartridge has been inserted by mistake.

## Inserting a cartridge

Insert the cartridge into the slot with the triangular arrowhead on the cartridge pointing towards the drive. As the tape is inserted, the drive takes it and automatically loads it into the drive mechanism. A load sequence checks the tape format and data integrity. Unless the tape is blank the tape log, which contains a history of usage of the tape, is read into the drive's memory.

---

### Note

*By default, the drive is configured to recognise DDS Media Recognition System (MRS) cartridges. If a non-MRS cartridge is inserted, you will only be able to read it, not write to it.*

---

### Removing a cartridge

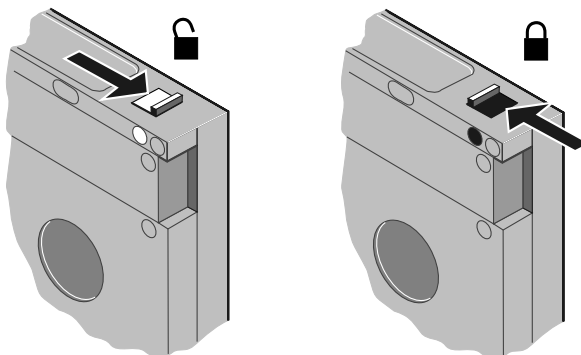
Before attempting to remove a cartridge, ensure that the drive is not currently in use (the green Activity indicator must not be flashing).

Press the UNLOAD button on the front of the drive (depending on your operating system, the UNLOAD button may be disabled while the drive is in use). If the tape is write-enabled, a copy of the tape log, held in the drive's memory, is written back to tape. The drive rewinds to the beginning of the tape, unthreads it, and ejects the cartridge.

Several seconds may pass between the button being pressed and the cartridge being ejected, so be careful not to turn off the computer before the operation is completed. If you need to eject a cartridge urgently, even at the risk of losing data, you can do so by holding down the UNLOAD button for at least 5 seconds.

### Write-protecting a cartridge

A cartridge can be write-protected by sliding the white tab on the cartridge so that the recess is revealed. In this position, data can be read from the tape but not written to it.



The tape log, which includes a record of data integrity failures, cannot be updated while the cartridge is write-protected. It follows that the tape log becomes inaccurate if a cartridge is used while write-protected, and the Media Caution status cannot be relied upon to determine if the cartridge needs to be copied and replaced.

Keep your cartridges well away from magnetic objects, and equipment that generates magnetic fields. Avoid extremes of temperature and exposure to direct sunlight; otherwise, the data recorded on the tape may become corrupted.

To avoid condensation problems, allow a cartridge to stabilise after it has been moved from one temperature and humidity to another for at least two hours before you use it.

### **Cleaning the drive heads**

Clean the tape heads regularly using the guidelines in the table below. Tape heads should also be cleaned when a Media Caution status is indicated. A special cleaning cartridge is available from your supplier.

When you insert the cleaning cartridge, the drive recognises it as a cleaning cartridge, runs it for about 20-30 seconds, then ejects it automatically. Each time the cleaning cartridge is used the tape advances over an unused portion of the tape. If the drive ejects the cleaning cartridge soon after you insert it, this means that the entire tape has been used and a new cleaning cartridge is required. You cannot rewind a cleaning cartridge.

Cleaning interval	Number of DDS cartridges used each day:			
	One or fewer	Two	Three	Four or more
DDS-2 drive	Weekly	Twice a week	Twice a week	Daily
DDS-3 drive	8 weeks	4 weeks	3 weeks	Weekly

## 5 MAINTAINING AND TRANSPORTING

This chapter provides information on how to care for the computer (excluding the removable-media drives). You'll find that it requires little physical maintenance other than occasional cleaning. But you must take care when transporting it to avoid damage to its delicate components, particularly the hard disks.

---

**Warning**

*Turn off the system unit and unplug all power cords before cleaning or moving the computer.*

---

### **Cleaning the computer**

---

#### **The system unit**

Do not use sprays, solvents or abrasives that might damage the system unit surface. Do not use cleaning fluids or sprays near air vents, ports, or the orifices of removable-media drives.

- ◆ Occasionally wipe the system unit with a soft, slightly damp, lint-free cloth.
- ◆ Occasionally wipe over the air vents on the rear and sides of the system unit. Dust and fluff can block the vents and limit the airflow.
- ◆ Occasionally clean the diskette drive using a proprietary head cleaner.

#### **The monitor**

Occasionally wipe the monitor with a soft, slightly damp, lint-free cloth. It is best to use anti-static glass cleaner on the monitor screen, but do not spray glass cleaner directly onto the screen; it could run down inside the case and damage the circuitry.



### **The keyboard**

When necessary, clean the keycaps with a slightly damp cloth and a minimum amount of a non-abrasive cleaning agent.

Take care not to spill any liquid onto the keyboard. Follow these steps if you spill something on the keyboard and it stops working:

- ◆ If the liquid is viscous, unplug the keyboard and call your supplier or an authorised maintainer.
- ◆ If the liquid is thin and clear, try unplugging the keyboard, turning it upside down to let the liquid drain out, and drying it for at least 24 hours at room temperature. If the keyboard still won't work, call your supplier or an authorised maintainer.

If a solid object drops between the keys, turn the keyboard upside down and shake it; do not probe between the keys as this may cause further damage.

### **The mouse**

Dust and dirt may accumulate in the ball tracking mechanism of the mouse. To clean the mouse:

1. Unplug the mouse, turn it upside down and locate the plastic cover that holds the ball in place. Depending on the model, the plastic cover can be removed either by rotating it counter-clockwise or by sliding it forward slightly.
2. Remove the cover and set it aside.
3. Cupping one hand over the underside, turn the mouse back the right way up. The ball will drop into your hand.
4. Blow gently into the mouse to remove any dust that has collected there.
5. Inside the mouse there are three plastic rollers. Using a cotton swab moistened with a solvent cleaner, gently wipe off any oil or dust that has collected on the rollers, rotating them to reach all surfaces.
6. Use clear water, or water with a mild detergent, to clean the ball. Then dry it with a clean, lint-free cloth.

7. Put the ball back in its socket and replace the plastic cover. It should click into place.

### **Transporting the computer**

---

Use common sense when handling the computer; hard disks in particular can be damaged if the computer is dropped or handled roughly. As a precaution, back up (copy) the contents of the hard disks to tape or diskettes before moving the computer.

Don't try to move the computer while it is plugged into the AC power supply or with any other cables, including network cables, still attached.

When lifting and carrying the computer, grip the metal underside of the system unit. Do not lift the unit by the plastic side trims or the front bezel. Never attempt to use the door as a carrying handle. Never attempt to lift the system unit with a monitor on top.

If you need to transport the computer any great distance, use the original packing materials.

If you intend to use the computer in another country, see the next section for some important advice.

### **Using the computer in another country**

---

The computer arrives ready to work with the commercial AC power supply available in the country in which it is first sold.

If you plan to use the computer in another country, you should first check the following facts about your destination:

- ◆ The voltage and frequency of the commercial AC power supply.
- ◆ The type of plug required for the AC power outlets.

#### **AC power supply**

Check the power rating labels on the rear of the computer's system unit and its monitor to ensure that they are compatible with the AC power supply.

---

**Warning**

*It is imperative that the computer is set to the correct voltage range before use. If not, the machine may be irreparably damaged.*

---

The computer can function within two alternative AC power supply ranges, according to the position of the voltage selection switch on the rear of the system unit:

Switch setting	AC power supply (voltage and frequency)
115	100 - 120 volt AC, 50 - 60 Hz
230	220 - 240 volt AC, 50 - 60 Hz

The voltage setting of the monitor must always be the same as the voltage setting of the system unit. See the *User's Guide* that accompanies the monitor or consult your supplier to find out how to change the voltage setting.

Make sure that the system unit and the monitor are returned to their original voltage settings when you return home.

**AC power cord**

The AC power cord and plug supplied with the computer comply with the safety standards applicable in the country in which it is first sold. If you plan to use the computer in another country, you must get a power cord that complies with the safety standards of the destination country. For further details, see the *Power Connection* information in the *Safety and Regulatory Notices* section at the start of this manual.

## **6**

# **ADDING EXPANSION CARDS**

**Expansion cards** (also known as **expansion boards** or **adapter cards**) are small self-contained circuit boards which extend the capabilities of the computer. For example, a graphics card could provide more specialised video functions than those offered by the on-board video system, or a modem card could provide a connection to the Internet via a telephone line.

Your computer can accept two basic types of expansion card:

- ◆ **ISA** or Industry Standard Architecture cards
- ◆ **PCI** or Peripheral Component Interconnect cards

You don't need to understand what these terms mean, but before adding a card to your computer you will need to know whether it is ISA or PCI and possibly its physical dimensions. Inside your computer are three slots for fitting expansion cards: upper, middle and lower (see table on next page). If your computer has a Small Computer Systems Interface (SCSI) removable-media drive, one of these slots will already be occupied by an SCSI adapter card.

## Adding Expansion Cards

Slot	Type	Description
Slot 3 (upper)	PCI/ISA	<p>This slot can accommodate a full-length PCI or ISA card (a full-length card is one that runs the full length of the computer from front to back).</p> <p>If you are installing a drive controller card that you want to connect to a drive in the removable-media drive bay, it is easiest to install the card in the top slot.</p>
Slot 2 (middle)	ISA	This slot can accommodate a full-length ISA card.
Slot 1 (lower)	ISA	This slot can accommodate a half-length ISA card (only half-length because the processor gets in the way). In Apricot LS340 systems, this slot may be occupied by an Apricot LS Security Card.

### Configuring the card

Part of the installation procedure for ISA expansion cards, and some PCI cards, involves setting up or configuring the card so it works correctly in the computer. To configure, you assign values to various settings, which enable the card to communicate with the computer.

Most PCI cards employ a feature called **Plug and Play** or PnP. This allows Windows 95 (and other PnP-aware operating systems) to configure the card automatically when you turn on the computer. In this case, manual configuration may not be required.

If manual configuration is required, you will probably need to specify at least two of the following:

- ◆ Interrupt request level (IRQ)
- ◆ Direct memory access (DMA) channel
- ◆ Base input/output (I/O) port address
- ◆ Base memory address

The important thing to understand is that the settings used by the card must be different from the settings used by the other hardware

devices in the computer. In other words, the settings must not **conflict**.

The documentation accompanying the card should tell you whether the card supports Plug and Play, or if not, how to configure it. Remember to check any diskettes supplied with the card for README or other help files.

Some cards require you to move jumpers or set switches on the card to configure them. This is best done before installing the card in the computer. Other cards can be configured by running a configuration program after installing the card. Some cards use a mixture of both methods.

Cards often come with pre-configured or default settings. It is best to rely on these settings as much as possible, and change them only if they conflict with other devices.

### **Interrupt request level (IRQ)**

The **interrupt request level** or **IRQ** (the two terms are used interchangeably) is the line over which the expansion card sends a signal to get the attention of, or interrupt, the processor.

Your computer has interrupt levels numbered IRQ0 to IRQ15. Most of these are reserved for components on the computer's motherboard. Some of these interrupts are fixed; others can be re-assigned, or freed by disabling the component with BIOS Setup.

The following table lists the interrupts used by the computer. Interrupts that have no default assignment can be used by expansion cards.

In addition, IRQ3 is available if you disable serial port B with the BIOS Setup utility. Similarly, IRQ4 is available if you disable serial port A. Obviously, you shouldn't disable either one unless you have no intention of using the affected port.

Note that IRQ5 is not used in Apricot VS340 models that lack on-board audio systems.

If you configure the parallel port to Standard mode, its interrupt (IRQ7 or IRQ5) can usually be used by an expansion card without

## Adding Expansion Cards

affecting the operation of the port. This may not be possible if you use the port in Bi-directional or ECP mode.

IRQ	Default assignment
IRQ0	System
IRQ1	Keyboard controller
IRQ2	System
IRQ3	Serial port B
IRQ4	Serial port A
IRQ5	Parallel port (alternative) Audio in Apricot LS340 models
IRQ6	Diskette controller
IRQ7	Parallel port
IRQ8	Real time clock
IRQ9	-
IRQ10	-
IRQ11	-
IRQ12	Mouse
IRQ13	Coprocessor
IRQ14	Primary ATA/IDE interface
IRQ15	Secondary ATA/IDE interface

### Direct memory access (DMA) channel

Some hardware devices can use a **DMA channel** to access system memory without directly burdening the processor. Your computer has DMA channels numbered DMA0 to DMA7.

The following table lists the DMA channels used by the computer. Channels which have no default assignment can be used by expansion cards. Note that DMA3 is free if the parallel port is *not* configured to ECP mode.

DMA	Default assignment
DMA0	-
DMA1	Parallel port in ECP mode (alternate) 8-bit audio (only Apricot LS340 models)
DMA2	Diskette/floppy disk controller
DMA3	Parallel port in ECP mode
DMA4	System
DMA5	16-bit audio (only Apricot LS340 models)
DMA6	-
DMA7	-

### Base input/output (I/O) port address

I/O ports are used by the processor to communicate with hardware devices. Each port appears to the processor as an address low down in its address space.

Some expansion cards are also controlled by I/O ports. The **base I/O port address** specifies where the card's ports begin.

The following table lists addresses used by devices on the motherboard. Any ports between 100h and 3FFh that are *not* listed in the table may be used by an expansion card.

I/O ports	Default assignment
1F0h-1F7h	Hard disk drive controller
200h-207h	Game I/O
220h-22Fh, 230h-23Fh	Audio: SoundBlaster-compatibility
240h-24Fh, 250h-25Fh	Audio: SoundBlaster-compatibility (alternate)
278h-27Fh	Parallel port 2
2B0h-2DFh	Alternate VGA



I/O ports	Default assignment
2F8h-2FFh	Serial port B
300h-301h	Audio: MIDI
330h-331h	Audio: MIDI (alternate)
378h-37Fh	Parallel port 1
388h-38Fh	Audio: FM synthesiser
3B0h-3BFh	Monochrome display and printer adapter
3B4h, 3B5h, 3BAh	Video subsystem
3C0h-3C5h	VGA
3C6h-3C9h	Video DAC
3CAh-3DFh	VGA
3F0h-3F7h	Diskette drive controller
3F8h-3FFh	Serial port A

### Base memory address

Some expansion cards are fitted with memory of their own, usually read-only memory (ROM) containing functional extensions to the computer's BIOS (basic input/output system) ROM. Some cards also have random-access memory (RAM).

In order that this memory can be recognised by the system processor, it must be mapped somewhere within the computer's own address space. By setting the **base memory address** you specify where the card's memory begins within the address space. Typically, an expansion card's memory must be mapped onto the addresses between C8000h and EFFFFh.

The card's documentation should list its possible base memory addresses. You will also need to know how much memory the card has, so that you can leave the right gap between this card's base address and the next. (Some cards allow you to specify the amount of memory you want to map, but usually this is fixed.)

### **More about memory addresses**

Memory *addresses* are always written in base 16 or **hexadecimal** notation. Unlike the ten digits of the decimal system (0-9), hexadecimal uses sixteen digits (0-9 and A-F, where A=10, B=11, C=12 and so on up to F=15).

Hexadecimal numbers are denoted either by the suffix “h” or by the prefix “0x”. The final digit of a five-digit memory address is often omitted, so C8000h may be written as C800h.

Because *amounts* of memory are usually stated as kilobytes (Kbytes) rather than in hexadecimal notation, the following conversion table may be helpful:

4 Kbytes = 1000h	32 Kbytes = 8000h
8 Kbytes = 2000h	64 Kbytes = 10000h
16 Kbytes = 4000h	128 Kbytes = 20000h

### Installing the card

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#### Warning

*Never carry out any work inside the computer with AC power applied. Always turn off the computer and unplug all power cords before starting work.*

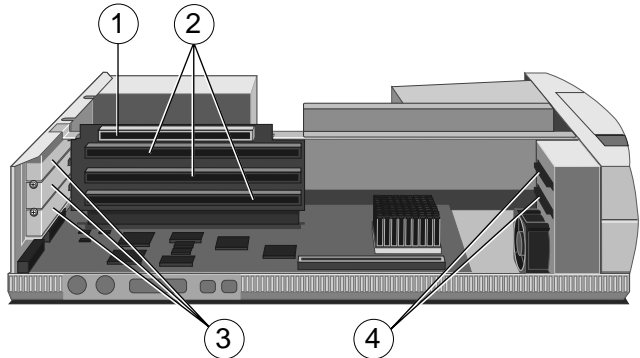
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The only tool required is a small cross-head screwdriver.

1. Turn off the computer and unplug all power cords.
2. Take suitable anti-static precautions and remove the system unit cover.

If you are unfamiliar with the recommended anti-static precautions and/or the process of removing the system unit cover, refer to Appendix A, “Inside the System Unit”.

3. Use the following illustration to locate the expansion card slots.



- |   |                     |   |                         |
|---|---------------------|---|-------------------------|
| 1 | PCI expansion slot  | 3 | blanking plates         |
| 2 | ISA expansion slots | 4 | full-length card guides |

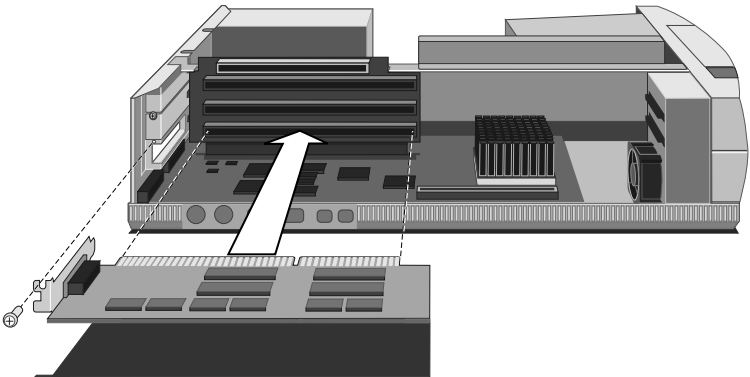
4. Decide in which of the available slots you wish to install the card. In general it is easiest, where possible, to start with the lowest slot (Slot 1) and work upwards.

## *Adding Expansion Cards*

5. Remove the blanking plate of the chosen slot by removing its securing screw, then sliding the plate out of its slot. Keep the screw, you will use it later to secure the card.
6. If the card you are installing is configured by the means of jumpers or switches, check that it is correctly configured before proceeding.
7. When installing a video controller card that uses the **video feature connector** on the motherboard, you are advised to plug the video feature cable into the motherboard before you install the card (otherwise, the card may get in the way of the connector).

Refer to the motherboard layout diagram in Appendix A, “Inside the System Unit”, to locate the video feature connector.

8. Position the expansion card alongside the slot in which you wish to install it. Align the rear of the card with the slot in the rear of the system unit, and, if the card is full length, align the front of the card with the corresponding card guide.



9. Slide the card into the slot ensuring that the card's edge connector engages correctly.
10. Secure the card by replacing the screw that you removed in Step 5.
11. Connect any necessary signal cables to the card.

12. If the card you have just installed is intended to control a removable-media drive, turn to the next chapter for instructions on installing the drive itself. Otherwise, replace the system unit cover.

### **Declaring ISA legacy resources**

---

If you have just installed an ISA card, your first task after turning on the computer is to run the BIOS Setup utility and declare the **legacy resources** (that is, the interrupt, DMA channel, and so on) used by the card. This is necessary so that any PCI card fitted can be configured automatically and won't try to use the same settings.

See the chapter on "Using the BIOS Setup Utility" for more information.

# 7

## UPGRADING

This chapter contains instructions on installing **upgrades** or **add-ons** in the computer (with the exception of expansion cards which are dealt with in the preceding chapter).

Read this chapter before purchasing an upgrade. If, having read the relevant instructions, you are not confident about installing the upgrade, you may wish to have your supplier or service organisation install it for you.

Before you start installing any upgrade you should be thoroughly familiar with all the relevant instructions.

Appendix A, “Inside the System Unit”, provides an overview of anti-static precautions, instructions on removing the system unit top cover, and information on motherboard jumpers.

The only tool required to complete the installation of any of the upgrades is a small cross-head screwdriver.

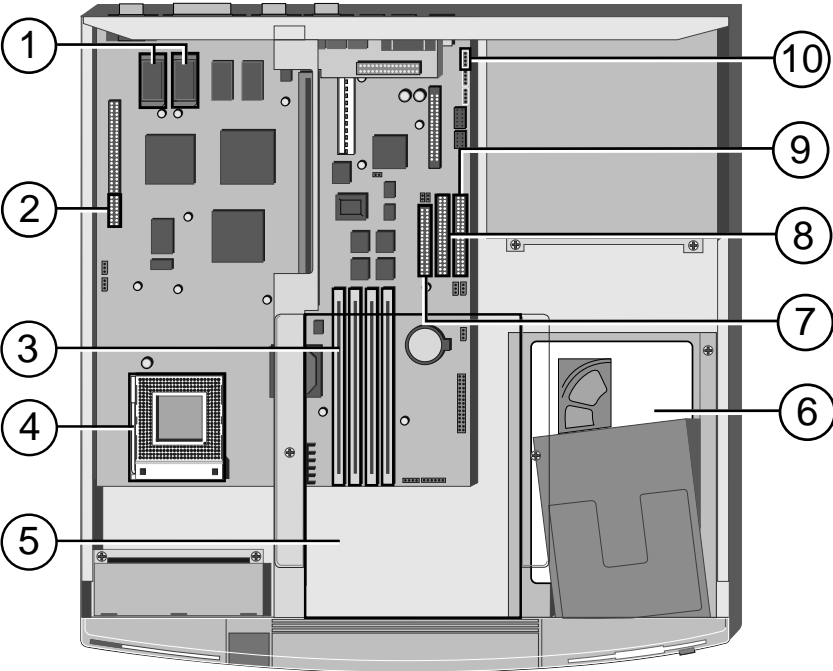
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### **Warning**

*Never carry out any work inside the computer with AC power applied. Always turn off the computer and unplug all power cords before starting work.*

---

Inside the system unit



The illustration opposite identifies the major components inside system unit that are affected by the installation instructions in this chapter.

- 1 **video memory upgrade sockets:** systems with 1 Mbyte of video memory can be upgraded to have 2 Mbytes, providing more colours and/or higher resolutions.
- 2 **processor speed selection jumpers:** these will need changing if you upgrade to a faster Pentium processor. (See Appendix A for more information.)
- 3 **SIMM sockets:** every system can be upgraded to a maximum of 128 Mbytes of system memory.
- 4 **processor socket:** you can upgrade the processor by replacing it with one of higher performance.
- 5 **5.25" removable-media drive bay:** may be occupied by a removable-media drive.
- 6 **3.5" hard-disk drive (HDD) bay:** this bay has room for two one-inch high IDE hard disk drives.
- 7 **Diskette/floppy disk ribbon cable connector.**
- 8 **CD-ROM signal ribbon cable connector.**
- 9 **Hard disk drive signal ribbon cable connector.**
- 10 **CD-ROM audio connector:** this can be used only on Apricot LS340 systems.

See the label inside the system unit lid for up-to-date information on the layout of the motherboard.



### Adding more system memory

---

The computer's motherboard is fitted with sockets for up to four Extended Data Output (EDO) SIMMs (single in-line memory modules). You may need to add more memory if you want to run complex operating systems or large application programs.

The SIMM sockets are located at the front of the motherboard. SIMMs with capacities of 2, 4, 8, 16 or 32 Mbytes are supported, giving a maximum capacity of 128 Mbytes.

There are two pairs or **banks** of sockets. The sockets labelled MM1 and MM2 form Bank 1, the sockets labelled MM3 and MM4 form Bank 2. SIMMs must be fitted in identical pairs. In other words, you cannot have two different SIMMs in the same bank. It is best to fill Bank 1 first, then Bank 2. The table opposite shows all the supported memory configurations.

---

#### Hint

*It is sometimes difficult to install a SIMM in a socket if the socket immediately next to it is occupied. The order in which you install SIMMs can therefore be important. When upgrading, you may find you have to remove a SIMM (temporarily) before you can install one.*

---

### Before installing or removing SIMMs

1. Turn off the computer and unplug all power cords.
2. Take suitable anti-static precautions and remove the system unit cover.

If you are unfamiliar with the recommended anti-static precautions or the process of removing the system unit cover, refer to Appendix A, "Inside the System Unit".

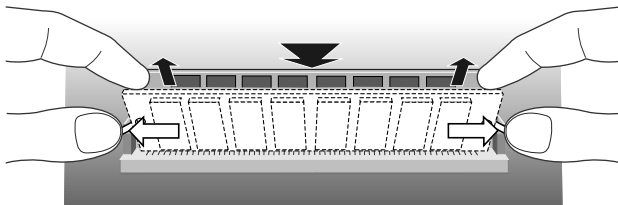
3. If there is a removable-media drive fitted, unplug its power and signal cables from the rear of the drive.
4. Remove the two screws that secure the removable-media drive tray, then slide the tray backwards slightly and lift it out of the system unit. Put it down on a flat, anti-static surface.

- 5. Use the illustration at the beginning of this chapter to identify the SIMM sockets. Depending on how much memory is already fitted, some of the sockets may be occupied.
- 6. Compare the current configuration of SIMMs with the configuration for the memory upgrade you intend to install. If necessary, remove one or more of the existing SIMMs, before going on to install the new SIMMs.

Total memory	Bank 1 sockets		Bank 2 sockets	
	MM1	MM2	MM3	MM4
8 Mb	4 Mb	4 Mb	-	
12 Mb	4 Mb	4 Mb	2 Mb	2 Mb
16 Mb	4 Mb	4 Mb	4 Mb	4 Mb
16 Mb	8 Mb	8 Mb	-	
20 Mb	8 Mb	8 Mb	2 Mb	2 Mb
24 Mb	8 Mb	8 Mb	4 Mb	4 Mb
32 Mb	8 Mb	8 Mb	8 Mb	8 Mb
32 Mb	16 Mb	16 Mb	-	
36 Mb	16 Mb	16 Mb	2 Mb	2 Mb
40 Mb	16 Mb	16 Mb	4 Mb	4 Mb
48 Mb	16 Mb	16 Mb	8 Mb	8 Mb
64 Mb	16 Mb	16 Mb	16 Mb	16 Mb
64 Mb	32 Mb	32 Mb	-	
68 Mb	32 Mb	32 Mb	2 Mb	2 Mb
72 Mb	32 Mb	32 Mb	4 Mb	4 Mb
80 Mb	32 Mb	32 Mb	8 Mb	8 Mb
96 Mb	32 Mb	32 Mb	16 Mb	16 Mb
128 Mb	32 Mb	32 Mb	32 Mb	32 Mb

### To remove a SIMM

1. Disengage the metal holding clips on each side of the socket using your thumbs. Place your forefingers on the top edge of the SIMM and tilt the SIMM forward to about 15° to the vertical.

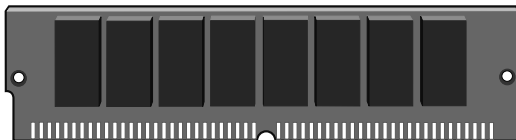


2. Lift the SIMM out of its socket. Hold the SIMM by its edges and avoid touching the metal contacts.
3. Place the SIMM in anti-static packaging.

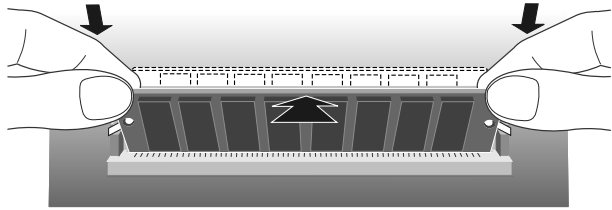
### To install a SIMM

1. Take the SIMM out of its anti-static packaging. Hold it by its edges and avoid touching the metal contacts.

Note that the SIMM is not symmetrical; there is a small cut-out or notch in one end.



2. Place the SIMM in the socket at a 15° angle to the vertical, making sure that the notched edge of the SIMM matches the notched edge of the socket.
3. Pushing gently on its top corners, lean the SIMM upright in the socket until the pegs of the socket engage with the holes on the SIMM, and the metal clips on the socket hold both ends of the SIMM firmly in position.



Do not use excessive force. If the SIMM will not fit easily, remove it and start again.

4. Repeat these steps for each SIMM you want to install.

When you have finished, replace the removable-media drive tray you removed earlier, then replace the system unit cover.

## **Reconfiguring the system**

The first time you turn on the computer after adding or removing SIMMs, the power-on self-test (POST) detects the change in configuration. All you have to do is confirm the new configuration in the BIOS Setup utility (see the chapter on “Using the BIOS Setup Utility” for more information).

### **Adding more video memory**

---

**Video memory** is memory reserved for use by the on-board controller. More video memory can provide more colours or higher resolutions to an extent determined by the capabilities of your monitor.

If your computer has 1 Mbyte of video memory, you can upgrade it to the maximum of 2 Mbytes.

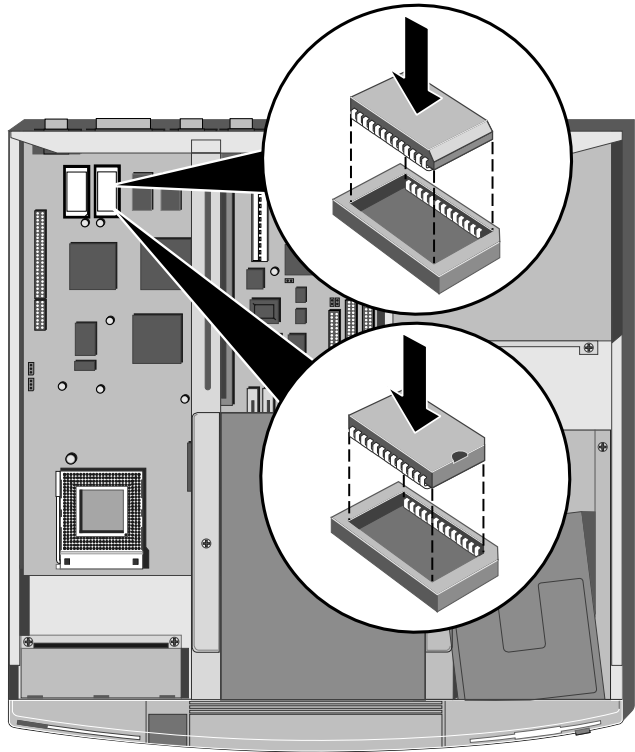
#### **To add video memory**

1. Turn off the computer and unplug all power cords.
2. Take suitable anti-static precautions and remove the system unit cover.

If you are unfamiliar with the recommended anti-static precautions or the process of removing the system unit cover, refer to Appendix A, “Inside the System Unit”.

3. If there are any expansion cards fitted, you will have to remove them: disconnect any cables connected to the cards, remove the screws that secure the cards to the rear of the system unit, then remove the cards from the system unit.
4. Use the illustration at the beginning of this chapter to identify the two video memory upgrade sockets.
5. Unpack the upgrade kit and lay the memory chips out on an anti-static surface. Hold each chip by its edges and be careful not to touch the metal pins.
6. One by one, insert the chips in the sockets.

It is important that the chips are fitted the right way round. Some chips have a single bevelled edge at one end. Others have a small semicircular notch at one end and a bevel at one corner. In either case, the bevelled or notched end must be aligned with the bevelled corner on the socket itself, as shown in the following illustration.



7. If necessary, replace the expansion cards you removed earlier.
8. Replace the system unit cover.

You can now reconfigure your operating system to use the expanded capabilities of the video controller. See your operating system documentation for details.

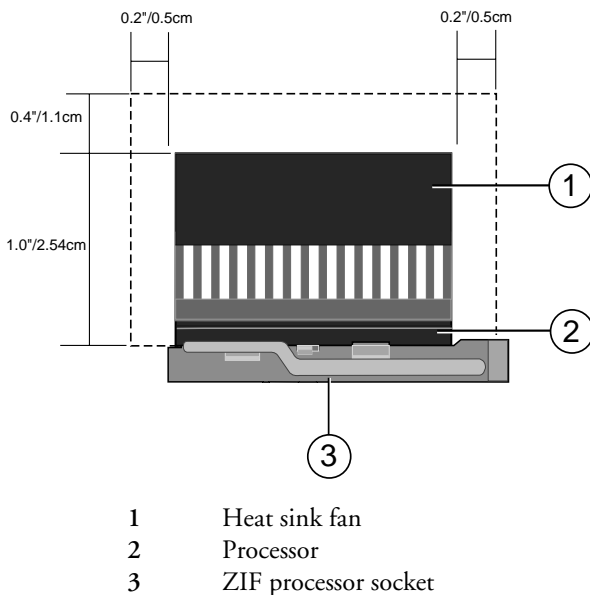
### Upgrading the processor

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The ZIF (zero insertion force) processor socket on the motherboard is designed to accept a variety of Intel Pentium processors with processor speeds from 75 to 200 megahertz (MHz). You can upgrade your processor by replacing it with one of higher performance.

#### Intel Pentium OverDrive

When installing an Intel Pentium OverDrive processor, you must ensure that there is sufficient air space around it. If you do not leave enough air space, the processor may overheat. So, ensure that no obstructions such as cables or expansion cards, intrude upon the open air space shown below:



## Removing the old processor

1. Turn off the computer and unplug all power cords.
2. Take suitable anti-static precautions and remove the system unit cover.

If you are unfamiliar with the recommended anti-static precautions or the procedure for removing the system unit cover, refer to Appendix A, “Inside the System Unit”.

3. Remove any expansion cards that could restrict access to the processor socket: disconnect any cables connected to the cards, remove the screws that secure the cards to the rear of the system unit, then remove the cards from the system unit.
4. If the computer was turned on immediately prior to commencing this procedure, wait for at least 15 minutes for the processor to cool down before proceeding.

---

### Warning

*The processor and its attached heat sink can get very hot. You may burn your fingers if you attempt to remove the processor before it has cooled down. Also, the processor's pins expand slightly when hot and this can prevent it being removed from the socket.*

---

5. Use the illustration at the start of this chapter to locate the ZIF socket containing the processor.

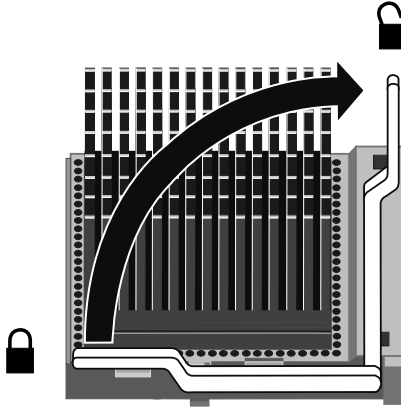
The heat sink is held onto the top of the processor by a metal clip that hooks onto the processor socket.

6. Carefully remove the clip from the heat sink.

A lever attached to the socket secures the processor in place.

7. Lift the lever from the locked position until it is upright (at right-angles to the motherboard). There may be a little stiffness at the beginning and end of the lever's movement; be careful not to use excessive force.





8. Lift the processor and its attached heat sink out of the socket and place it on an anti-static surface outside the system unit. Avoid touching the metal pins of the processor.

---

**Caution**

*If the processor does not lift easily out of the socket, do **not** attempt to force it. Wait for the processor to cool down.*

---

### Removing the heat sink

If your upgrade processor is not supplied with a built-in heat sink or cooling fan, you will have to re-use the heat sink currently attached to your old processor. Between the heat sink and the processor is a thin metal foil in a layer of sticky thermal bonding compound. This makes it difficult to pull the heat sink directly away from the processor.

---

**Warning**

*When you remove the heat sink there will be a residual deposit of thermal bonding compound on the bottom of the heat sink and the top of the processor. This compound can cause skin irritation and stain clothing. Avoid prolonged or repeated contact with skin. Wash your hands thoroughly with soap and water after handling. Avoid contact with eyes and inhalation of fumes. Do not ingest.*

---

Separate the heat sink from the processor by twisting the heat sink back and forth to loosen the grip of the thermal bonding compound, then slide the heat sink off to one side of the processor.

### Fitting the new processor

1. Ensure that the securing lever on the ZIF socket is still in the upright position.
2. Take the upgrade processor out of its anti-static packaging. Hold the processor by its edges and avoid touching the metal pins.

The upgrade processor and the ZIF socket are keyed to ensure that the processor is installed in the correct orientation. One corner of the socket has a key hole. The corresponding corner of the processor is slightly bevelled and has a positioning guide in the form of a coloured dot.

3. Place the processor in the socket, making sure that it is correctly aligned and that you do not bend or otherwise damage the pins.

If the processor is not big enough to occupy the entire socket it should be positioned centrally.

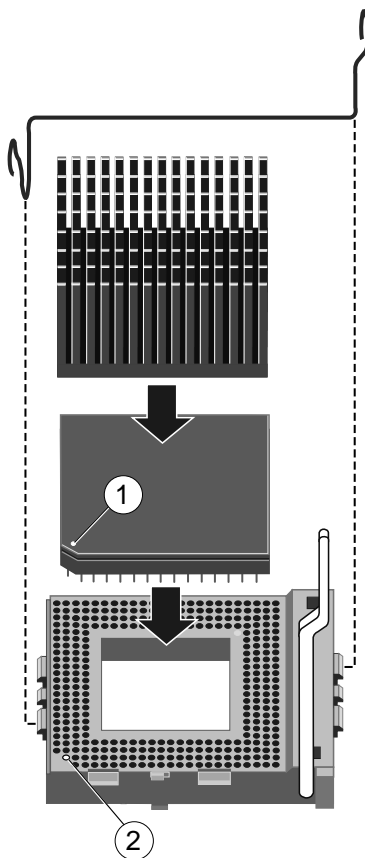
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#### Caution

*If the processor is misaligned it will not go into the socket, and any attempt to force it will damage the processor, or the socket, or both.*

---

4. Move the securing lever to the locked position. Apply just enough pressure to overcome the resistance offered by the lever.
5. If necessary, place the heat sink into position on top of the new processor. The vanes of the heat sink must be aligned with the airflow from the fan in front of the processor. Refit the clip that secures the heat sink to the processor.



1 positioning guide

2 keyed corner

6. You will need to adjust the **processor speed selection** jumpers on the motherboard. See Appendix A, “Inside the System Unit”, for more information about locating and adjusting motherboard jumper settings.
7. If necessary, replace the expansion cards you removed earlier.
8. Replace the system unit cover.

## Adding a removable-media drive

---

The 5.25" drive bay can contain any half height 5.25" device. A range of removable-media drives are available for this bay.

### Configuring the drive

Drives purchased from an authorised supplier should arrive pre-configured and ready for installation. The following table provides some general advice. See the documentation provided with the upgrade kit for more information.

Drive type	Configuration instructions
Travan tape drive (FTD interface)	The only configuration required is to set the drive select jumpers at the rear of the drive. The jumpers should be pre-configured to either Soft Select or Drive Select 1 (DS1).
CD-ROM drive PD/CD drive (ATA-PI interface)	The drive should be configured as the master drive for connection to the motherboard.
DDS tape drive (SCSI interface)	Every SCSI drive must be assigned an identity on the SCSI bus, known as its SCSI ID. All removable-media SCSI drives should be pre-configured with SCSI ID 2, and fitted with termination resistors.

### Installing the drive

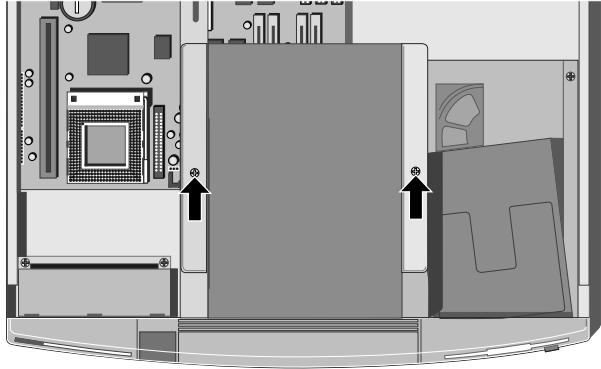
To install a removable-media drive:

1. Turn off the system unit and unplug all power cords.
2. Take suitable anti-static precautions and remove the system unit cover.

If you are unfamiliar with the recommended anti-static precautions or the process of removing the system unit cover, refer to Appendix A, "Inside the System Unit".

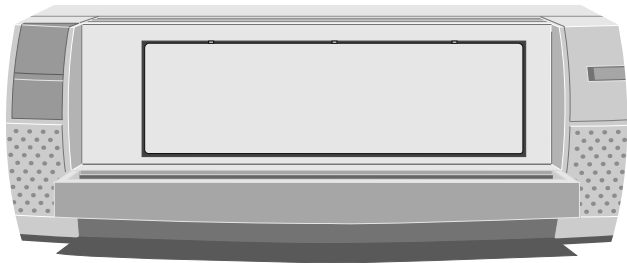
## Upgrading

3. Remove the two screws that secure the removable-media drive tray. Slide the tray backwards slightly and lift it out of the system unit.



4. Open the drive bay door.

The drive bay aperture is initially obscured by a blanking plate attached to the top of the metalwork. The blanking plate must be broken out before you can install a drive in the bay.



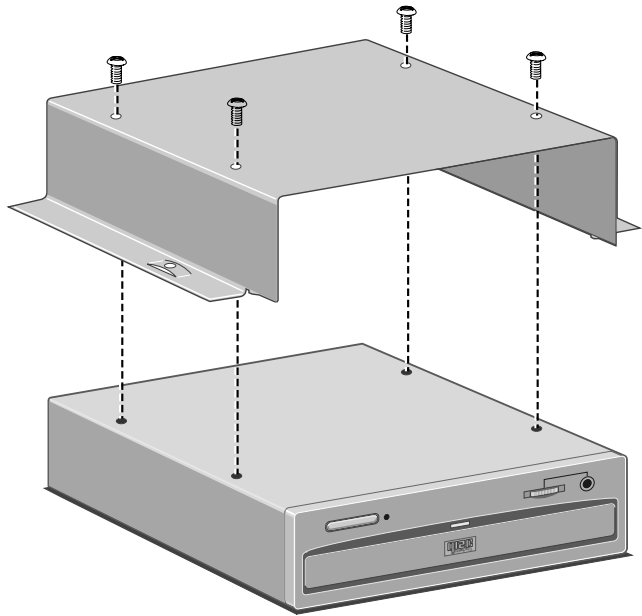
5. Break out the blanking plate by bending it backwards and forwards several times.
6. Remove the new drive from its packaging and ensure that it is correctly configured.

With the drive there should at least be four screws and a ribbon signal cable. Some drives may be supplied with

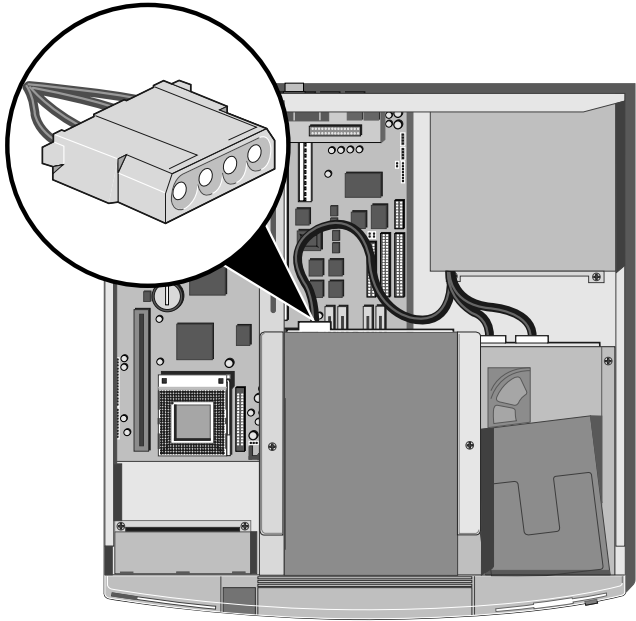
additional screws or cables (some of which may not be required).

7. Place the drive, upside down, on a suitable anti-static surface, then place the drive tray over the drive.

Make sure that the tray and the drive are the same way round. Align the holes in the underside of the drive with those in the base of the drive tray.



8. Insert the four drive securing screws, and tighten them until they are finger tight.
9. Turn the drive tray over, and put it back into the system unit. Slide the tray forwards until the two holes in the tray line up with those in the hard drive assembly (on the right) and the system unit brace (on the left). Replace the two screws that secure the drive tray.
10. Connect the spare power cable in the loom behind the drive to the drive's power connector.

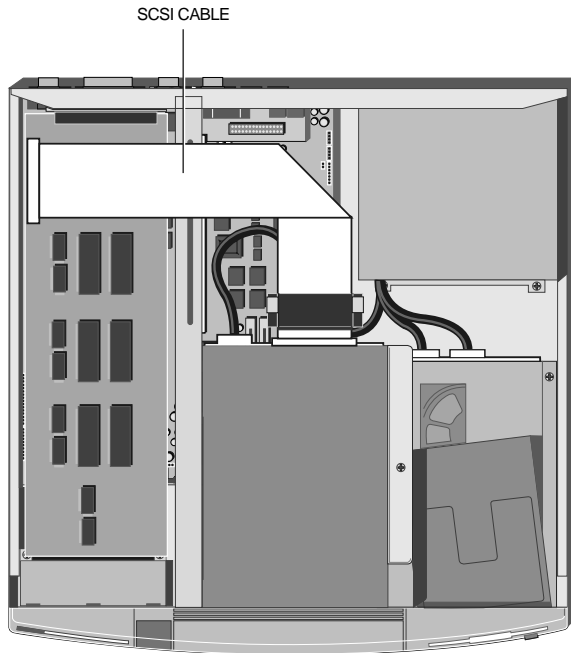


11. Connect the drive's signal cable(s). Use the table on the next page as a guide. See the documentation provided with the upgrade kit for more information.

Before connecting any signal cable to the motherboard, check the label on the inside of the system unit cover to make sure that you are using the correct connector. Failure to do so may damage the drive or the motherboard or both.

12. Replace the system unit cover.

Drive type	Cabling instructions
Travan tape drive (FTD interface)	This drive uses a ribbon signal cable with three connectors. This signal cable must be connected between the signal connector on the rear of the tape drive, the 3.5" diskette drive, and the diskette/floppy disk connector on the motherboard (usually marked FLOPPY).
CD-ROM drive PD/CD drive (ATA-PI interface)	The drive is supplied with two cables: a ribbon signal cable (which connects to the motherboard's secondary ATA/IDE connector, usually marked CDROM) and a CD-audio cable (which connects to the motherboard in an LS340 system).
DDS tape drive (SCSI interface)	SCSI upgrade kits from authorised suppliers include a suitable ribbon signal cable. This cable should be connected between the SCSI adapter card and the rear of the drive. The illustration below shows a typical routing of the cable.





### Adding a hard disk drive

---

The computer's 3.5" hard disk drive bay can accommodate two 1" hard disk drives. Hard disk drives should always be connected to the primary ATA/IDE interface.

### Configuring the drive

The ATA/IDE interface supports a maximum of two drives. These drives are known as **master** and **slave**. A single drive, or the boot device in a dual drive system, must be configured as the master. The second, non-bootable, drive in a dual drive system must be configured as the slave.

IDE drives are normally configured using jumpers on the drive. Configuration details may vary from drive to drive. Most drives are supplied with documentation describing how to configure the drive. If you are uncertain about configuring the drive consult your supplier.

### Installing the drive

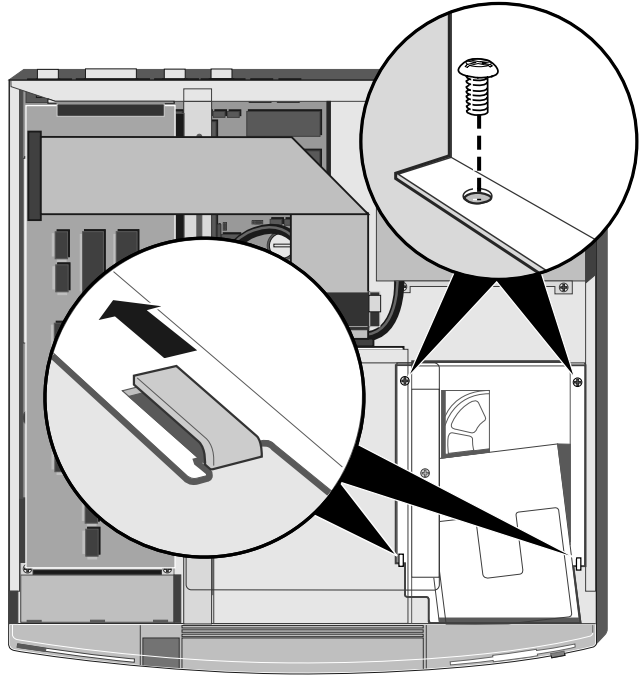
To install the hard disk drive:

1. Turn off the computer and unplug all power cords.
2. If there is a diskette in the diskette drive, remove it.
3. Take suitable anti-static precautions and remove the system unit cover.

If you are unfamiliar with the recommended anti-static precautions or the process of removing the system unit cover, refer to Appendix A, "Inside the System Unit".

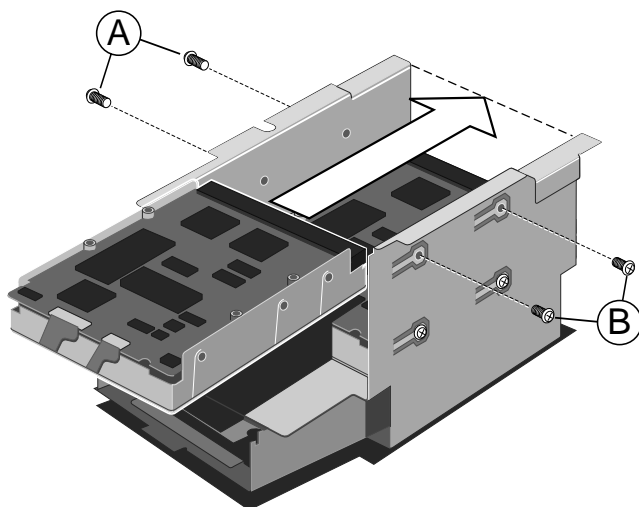
4. If there is a removable-media drive fitted, unplug its power and signal cables from the rear of the drive.
5. Remove the two screws that secure the removable-media drive tray. Slide the tray backwards slightly and lift it out of the system unit. Put it down on a flat, anti-static surface.
6. Unplug the power and signal cables from the rear of the diskette drive.

7. If one hard disk is already fitted, unplug its power and signal cables from the rear of the drive.
8. The hard disk drive bay is secured by two screws and held by two lugs in the base of the system unit. Identify the screws and lugs from the following illustration.



9. Remove the screws. Slide the drive bay backwards and lift it out of the system unit. Turn the drive bay upside-down and rest it on a flat surface with the front of the diskette drive towards you.
10. Ensure that the drive you are adding is properly configured as either master or slave.
11. Slide the hard disk drive into the bay from the front, with the drive's circuit board facing upwards and its power and signal connectors away from you.

12. Line up the mounting holes on the drive with those in the bay, insert the securing screws and tighten them until they are finger tight. Fit pair A first, then pair B.



If you are installing a hard disk drive in a system that previously had only a diskette drive there will be two sets of mounting holes available in the bay. Install the new hard disk drive in the position closest to the diskette drive.

---

**Caution**

*Use only the mounting screws supplied with the drive. If you use any other screws you risk damaging the drive. If there is a drive in the bay already, try to ensure that the new drive does not touch it.*

---

13. Turn the bay upright and replace it in the system unit. Align the flanges on the bay with the lugs in the base of the system unit, then slide the drive bay forwards slightly.

The bay is correctly positioned when the diskette drive EJECT button protrudes through the front bezel and the two screw holes in the bay line up with those in the base of the system unit.

14. Replace the hard disk drive bay's two securing screws.

15. Connect the hard disk(s) to their power cables and attach the signal cable.

The ribbon signal cable has three connectors. One plugs into the (primary) ATA/IDE interface on the motherboard. The other two connectors are for the master and slave hard disk drives. If there is only one (master) hard disk drive, use the connector at the end of the cable.

16. Reconnect the diskette drive's power and signal cables.
17. Put the removable-media drive tray back into the system unit. Slide the tray forwards until the two holes in the tray line up with those in the hard drive assembly and the system unit brace. Replace the two screws which secure the drive tray.
18. If there is a removable-media drive fitted in the tray, reconnect its power and signal cables.
19. Replace the system unit cover.

## **Partitioning and formatting the drive**

The first time you turn on the computer after fitting the new drive, the power-on self-test (POST) detects the change in configuration and starts the BIOS Setup utility automatically. All you have to do is save the new configuration and exit from the BIOS Setup utility (see the chapter on "Using the BIOS Setup Utility" for more information).

The new drive will initially be blank. Before you can use the drive, you must partition and format it.

### **Preparing a drive with Windows 95**

With Windows 95, you do this by using the MS-DOS **Fdisk** program to create partitions on the disk. The **Fdisk** program can be run in an MS-DOS window within Windows 95. Type **Help Fdisk** at the MS-DOS command prompt to find out more. After using **Fdisk**, you are prompted to restart the computer. Once back in Windows 95, you can format the partitions by opening the My Computer folder, selecting the new Drive icon and choosing Format from the File menu.

### Preparing a drive with Windows for Workgroups

With MS-DOS/Windows for Workgroups, you use the MS-DOS **Fdisk** program to partition the disk followed by the MS-DOS **Format** command to format the partitions. Use the MS-DOS **Help** command to find out more about **Fdisk** and **Format**. See your MS-DOS documentation for instructions on using MS-DOS Help.

---

#### Caution

*When you run **Fdisk**, it assumes that you want to work with the first, or master, drive (it says the Current fixed disk drive is 1). To switch attention to the slave drive, choose Select next fixed disk drive (option 5) from the main menu.*

---

## **8 TROUBLESHOOTING**

This chapter offers advice if you suspect a fault with your computer.

If in doubt, turn off the computer and unplug all power cords before consulting your supplier or an authorised maintainer.

This chapter is concerned only with problems caused by the computer itself; remember that problems can also arise from other sources such as your network cabling, operating system or application software.

### **Problems when starting**

---

#### **If you suspect a blown fuse**

In the United Kingdom, and some other countries, AC plugs contain fuses. If the fuse in the system unit's AC plug blows when you turn on the computer, this may be caused by an AC power surge, but is more often a symptom of problems with the computer or its peripherals. Follow these steps:

1. Turn off the computer and unplug all power cords.
2. Unplug all peripherals.
3. Try to discover the cause of the fault. If none is apparent, replace the blown fuse with one of the same rating, reconnect the system unit power cord and try to turn it on again.
4. If the replacement fuse blows, call an authorised maintainer.

If the replacement fuse does not blow, reconnect a peripheral and turn it on. Repeat this step for each peripheral in turn.

### **Power-on self-test**

Whenever the computer is turned on, the power-on self-test (POST) routine tests various hardware components, including memory, and compares the actual configuration of the computer with that recorded in configuration (CMOS) memory.

A configuration discrepancy could arise if you have just installed or removed a hardware option (for example, if you have added or replaced a SIMM). In this case you may be prompted to invoke the BIOS Setup utility.

If POST detects a hardware fault, one or more POST error codes and messages are displayed (see table opposite). You may also be prompted to “Press the F1 key to continue” or “Press any key when ready”. The computer may be able to continue despite the error indication (for example, if a memory chip fails POST, the computer can continue with less memory).

- ◆ Your first action should be to turn off the computer, wait at least 30 seconds, and then turn it on again to see if the error is transient or persistent. Persistent POST errors may indicate a fault in the system.
- ◆ Check that all external cables are securely connected.
- ◆ Try running the BIOS Setup utility to reconfigure the system.
- ◆ Open up the system unit and check that all internal signal and power cables are securely connected.

If the problem persists, call your supplier or authorised maintainer.

Code	Cause	Code	Cause
0	Keyboard locked	301	Keyboard clock line failure
101	Timer tick interrupt failure	301	Keyboard data line failure
102	Timer 2 test failure	301	Keyboard stuck key failure
106	Diskette controller failure	303	Keyboard controller failure
110	System board memory parity interrupt	604	Diskette drive 0 failure
114	Option ROM checksum failure	604	Diskette drive 1 failure
151	Real time clock failure	605	Diskette unlocked problem
161	Real time clock battery failure	662	Diskette drive configuration
162	CMOS RAM checksum failure	762	Coprocessor configuration
162	Invalid configuration information	962	Parallel configuration
163	Time of day not set - preboot	1162	Serial configuration
164	Memory size does not match CMOS	1762	Hard disk configuration
165	Add/Remove MC card	1780	Fixed disk 0 failure
166	Memory configuration change	1781	Fixed disk 1 failure
175	Bad EEPROM CRC #1	1782	Fixed disk 2 failure
176	System tampered	1783	Fixed disk 3 failure
177	Bad PAP checksum	1800	No more IRQs available
178	EEPROM is not functional	1801	No more room for option ROM
183	PAP update required	1802	No more I/O space available
184	Bad POP checksum	1803	No more memory <1Mb available
185	Corrupted Boot sequence	1804	No more memory >1Mb available
186	Hardware problem	1805	Checksum error or 0 size option ROM
187	VPD S/N not set	1962	No bootable device
188	Bad EEPROM CRC #2	2400	Display adapter failed ; using alternate
189	Excessive password attempts	2462	Video configuration
201	System memory error	5962	IDE CD-ROM configuration
229	External cache failure	8603	Pointer device has been removed
301	Keyboard failure		



## Beep codes

The computer uses special audio beep codes to signal certain hardware faults. If you hear a beep code which is not accompanied by a POST error message, call your supplier or authorised maintainer.

Beeps	Meaning
No beeps	If no beeps are heard at all the speaker may be disconnected or there may be a speaker circuitry fault.
One short beep	This is expected. It marks the completion of POST with no functional errors found. (You will also get a single beep if you press an invalid key for a power-on password.)
Two short beeps	Indicates and draws your attention to an error during POST. This should be accompanied by an error message.
Three short beeps	System memory error, normally accompanied by code 201. Beeps are used when the video cannot display the code.
Continuous beeps	Could indicate a serious failure of the system motherboard, or a failure of the speaker circuitry.
Repeating short beeps	Usually indicative of a keyboard key stuck down, but may be due to the keyboard interface failing.
One long and one short beep	POST has detected an error on the video adapter in the system. There may be no display on the screen.
One long and two short beeps	This means that either the video system is faulty, or that a video I/O adapter ROM is not readable.
Two long and two short beeps	The video subsystem cannot be supported by the main system POST. This can occur when the video subsystem is replaced or changed.

**Beep sequences**

Many of the following beep sequences indicate a serious fault. Your computer may halt. Turn off the computer for 30 seconds and then try again. If the fault persists, make a note of it and call your supplier or authorised maintainer.

Beep sequence	Meaning
1-1-3	CMOS write/read test failure
1-1-4	BIOS ROM checksum failure
1-2-1	Programmable Interval Timer test failure
1-2-2	DMA initialisation failure
1-2-3	DMA page register read/write test failure
1-2-4	RAM refresh verification failure
1-3-1	First 64K RAM test failure
1-3-2	First 64K RAM parity test failure
1-3-3	Slave DMA register test failure
1-3-4	Master DMA register test failure
1-4-1	Master interrupt mask register test failure
1-4-2	Slave interrupt mask register test failure
1-4-4	Keyboard controller test failure
2-2-2	Search for video ROM test failure
2-2-3	Screen believed inoperable
2-2-4	Timer tick interrupt test failure
2-3-1	Interval timer channel 2 test failure
2-3-3	Time-of-day clock test failure
2-4-3	CMOS memory size against actual compare failure
2-4-4	Memory size mismatch occurred

### Failure to boot

On completion of POST, the computer attempts to boot from a system diskette or bootable hard disk partition. The table below lists some of the messages that might appear during the boot sequence.

Boot failure message	Explanation
Non-system disk or disk error	The diskette drive contains a non-system diskette. Replace it with a system diskette and press F1.
Diskette read failure	The diskette is either not formatted or defective. Replace it with a system diskette and press F1.
No boot sector on fixed disk	The hard disk has no active, bootable partition or is not formatted. Insert a system diskette, press F1, and format the hard disk as described in your operating system manuals.
Fixed disk read failure	The hard disk may be defective. Press F1 to retry. Make sure that the drive is correctly specified with the BIOS Setup utility. If the problem persists, insert a system diskette, press F1, back-up the data held on the defective hard disk and try reformatting it.
No boot device available	This may indicate a fault in the diskette or hard disk drive, or perhaps a damaged system diskette. Press F1 to retry, using another system diskette if possible. Make sure that the Startup Devices option is correctly specified with the BIOS Setup utility. If the problem persists, consult your supplier or an authorised maintainer.

## **Troubleshooting checklist**

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If you encounter a problem with the computer the following sections suggest checks to make before you alert your dealer, authorised maintainer or support organisation. The checks listed cover the causes of common problems.

### **Connections**

Check that all power and signal cables are securely connected to the correct port on the computer.

The keyboard and mouse are particularly easy to connect into the wrong port. Although the connectors are identical, the keyboard will not work if plugged into the mouse port, and vice versa.

The two serial ports also appear identical; if you have a problem make sure that the cable is connected to the port you are trying to use.

### **Power**

Check that the AC power supply is switched on, and that the fuse in the AC plug (if any) has not blown. If the system still does not seem to be getting power, obtain another power cord from your supplier.

### **Monitor**

If there is no display, check that the monitor is turned on, and the brightness and contrast controls are not too low.

If you have fitted a new video controller expansion card and subsequently encounter problems, try disabling the on-board video controller by removing a jumper from the motherboard. See Appendix A, "Inside the System Unit", for more information.

### **Expansion cards**

If an expansion card does not work, check that all cables are securely connected to the card, that the card is configured correctly, that its use of system resources does not conflict another card or motherboard component, and that legacy resources (if it is an ISA card) are properly declared in the BIOS Setup utility. Check also

## *Troubleshooting*

that the software which drives or uses the card is correctly configured.

### **System BIOS**

Use the BIOS Setup utility to ensure that the settings are correct. See Chapter 3, “Using the BIOS Setup Utility”. If the settings appear to have altered, there may be a fault with the CMOS battery which may need to be replaced. See Appendix A, “Inside the System Unit” for instructions on replacing the battery.

### **Diskette and floppy disk drives**

If you have problems accessing a diskette or floppy disk, check that it is inserted correctly, that it has been correctly formatted, that it is not write-protected, and that the permissions assigned by the operating system allow the intended access.

### **Hard disk drives**

If you have problems accessing a hard disk drive, use the BIOS Setup utility to check that the drive is correctly specified, and that the drive's controller is enabled. Check also that the disk has been correctly formatted, and that the permissions assigned by the operating system allow the intended access.

# A **INSIDE THE SYSTEM UNIT**

This appendix provides step-by-step instructions on obtaining access to the inside of the system unit for the purposes of maintaining or upgrading the system. Details of all relevant motherboard jumper settings are included.

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**Warning**

*Turn off the computer and unplug all power cords before removing the top cover.*

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## **Anti-static precautions**

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Static electricity can cause permanent damage to electronic components. You should be aware of this risk, and take precautions against the discharge of static electricity into the computer.

Anyone can generate static electricity by moving on a chair, brushing against desks or walls, or simply walking across an ordinary carpet. Items handed from one person to another, or being wrapped or unwrapped, can acquire a static charge. Air conditioning systems can also result in ambient static. Clothing made of synthetic fibres is particularly likely to generate static electricity; this static electricity is often completely unnoticed by the wearer, but can be sufficient to cripple or impair an electronic component.

The computer is at risk from static discharge while the top cover is off. This is because the electronic components of the motherboard are exposed. Memory modules, cache upgrades and OverDrive processors are other examples of electrostatic sensitive devices (ESSDs).

All work that involves removing the cover must be done in an area completely free of static electricity. We recommend using a Special Handling Area (SHA) as defined by EN 100015-1: 1992. This means that working surfaces, floor coverings and chairs must be connected to a common earth reference point, and you should wear an earthed wrist strap and anti-static clothing. It is also a good idea to use an ionizer or humidifier to remove static from the air.

## *Inside the System Unit*

When installing any upgrade, be sure you understand what the installation procedure involves before you start. This will enable you to plan your work, and so minimise the amount of time that sensitive components are exposed.

Do not remove the system unit cover, nor the anti-static bag or wrapping of any upgrade, until you need to.

Handle static-sensitive items with extreme care. Hold expansion cards and add-on components only by their edges, avoiding their electrical contacts. Never touch the components or electrical contacts on the motherboard or on expansion cards. In general, do not handle static-sensitive items unnecessarily.

Keep all conductive material, and food and drink, away from your work area and the open computer.

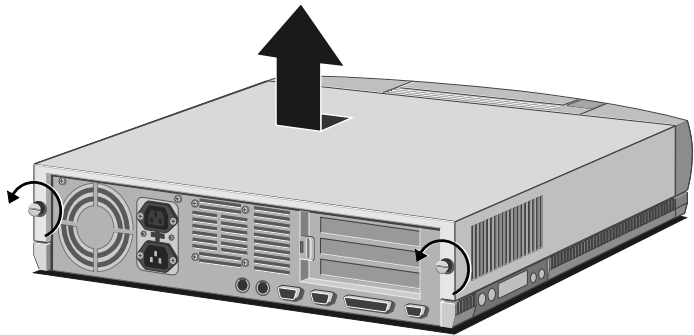
## **Opening the system unit**

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To remove the system unit cover:

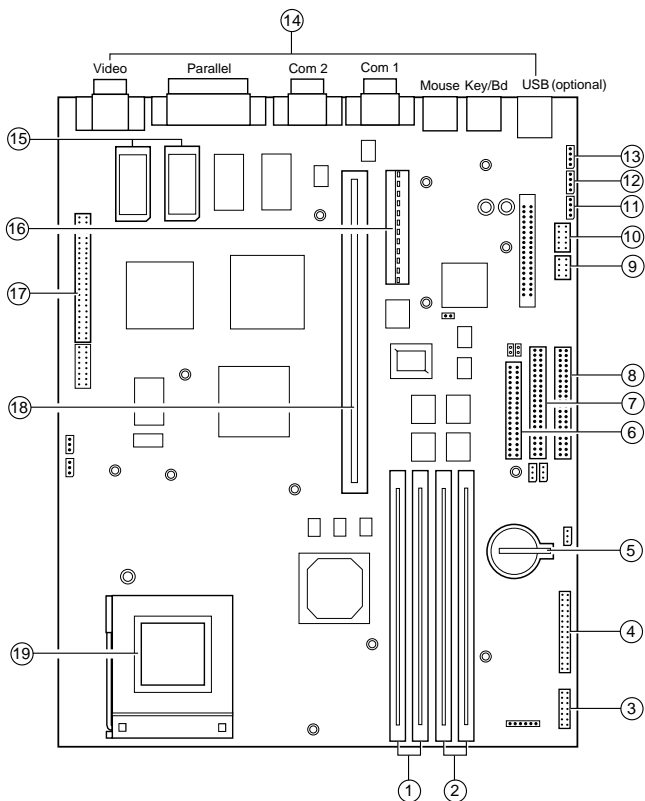
1. Turn off both the system unit and the monitor.
2. If your AC power outlets have switches, set them to their Off positions.
3. Unplug all power cords from rear of the system unit.
4. If the system unit has a caselock (on the right-hand side), turn the caselock key to the unlocked position.
5. Unfasten the two casing screws.
6. Slide the top cover rearwards slightly, then lift it off.

Refitting the cover is the reverse of removal. Take effective anti-static precautions while the top cover is off.





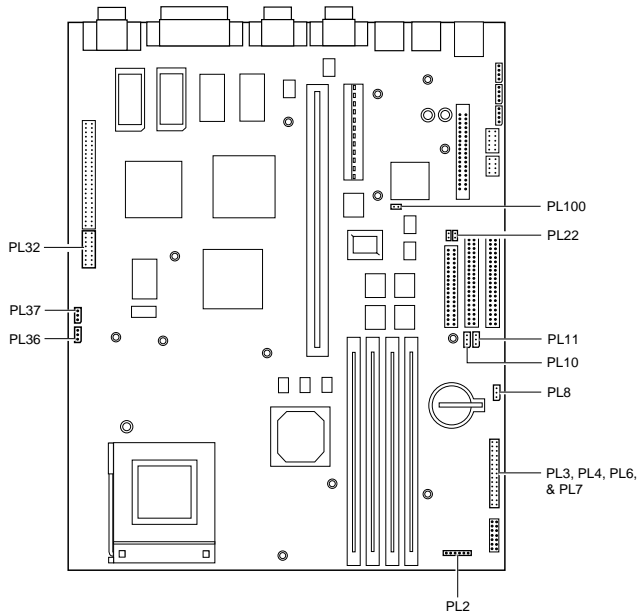
## **Motherboard layout**



- |    |                         |    |                          |
|----|-------------------------|----|--------------------------|
| 1  | SIMMs sockets 3 and 4   | 11 | Radio card connector     |
| 2  | SIMMs sockets 1 and 2   | 12 | TV audio connector       |
| 3  | Front panel connectors  | 13 | CD audio connector       |
| 4  | System connectors       | 14 | External ports           |
| 5  | CMOS Battery            | 15 | Video upgrade sockets    |
| 6  | Floppy ribbon connector | 16 | Power connections        |
| 7  | CD ribbon connector     | 17 | Video feature connection |
| 8  | HDD ribbon connector    | 18 | Riser board socket       |
| 9  | Wave table connection   | 19 | Processor ZIF socket     |
| 10 | Modem audio connector   |    |                          |

## Changing jumper settings

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### Caution

*Do not alter any jumpers or switch settings other than those identified here, unless told to by your supplier or an authorised maintainer. Otherwise, you may damage the system processor, the motherboard, or both.*

---

There are only a few jumpers on the motherboard that you may need to alter. All others are set at the factory and should not be changed.

In this section, “1-2” means the jumper should be fitted across pins 1 and 2, “2-3” means the jumper should be fitted across pins 2 and 3, and so on. “Open” means that no jumper should be fitted; “Closed” means that all jumpers should be fitted.

On the motherboard, pin 1 of each jumper block is indicated by a small triangular marking.

### Processor and bus speed selection

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#### Caution

*Do not change these jumpers unless you have upgraded the processor. Otherwise the processor and other vital motherboard components could be destroyed.*

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These settings need to be changed after a Pentium processor upgrade. They must **not** be changed otherwise.

Processor speed	Jumper block PL32				
	BF0	BF1	FS1	FS0	ISA
Pentium 100 MHz	2-4	1-3	7-8		11-12
Pentium 120 MHz	4-6	1-3		9-10	11-12
Pentium 133 MHz	4-6	1-3	7-8		11-12
Pentium 150 MHz	4-6	3-5		9-10	11-12
Pentium 166 MHz	4-6	3-5	7-8		11-12
Pentium 200 MHz	2-4	3-5	7-8		11-12

### On-board video disabling

If you install a video adapter expansion card, the computer should automatically detect this and disable the on-board video adapter. If for some reason this does not happen, and you experience problems with a newly-fitted card, you can manually disable the on-board video adapter by removing the **VGA** jumper from jumper block **PL32**.

### SoundBlaster disabling

The on-board SoundBlaster-compatible audio system can be disabled if necessary.

SoundBlaster	PL100
Enabled (default)	1-2
Disabled	2-3

**BIOS upgrade and recovery**

These jumpers should not normally be changed except by a service engineer or at the direction of a service engineer.

CMOS is cleared by moving the **PL8** jumper to the 2-3 position for a few moments while the system is turned off, then returning it to the normal 1-2 position.

If an error occurs during reprogramming of the BIOS to the extent that the BIOS becomes corrupt, the **PL10** jumper can be moved to the 2-3 position to switch to a recovery BIOS. A recovery system diskette will be required when the system is restarted.

You may need to ensure that BIOS reprogramming is enabled if you want to use the optional Apricot LS Security Card (LOC Technology) system.

<b>Clearing CMOS</b>	<b>PL8</b>
CMOS battery connected (default)	1-2
CMOS battery disconnected	2-3
<b>BIOS image selection</b>	<b>PL10</b>
Boot using normal BIOS (default)	1-2
Boot using recovery BIOS	2-3
<b>BIOS reprogramming</b>	<b>PL11</b>
Enabled (default)	1-2
Disabled	2-3

## **System connectors**

---

The following system connectors are used to connect various features to the motherboard. You should not normally need to disturb these connections but if they become loose you may need to re-attach them.

Connector	Pins	Function
PL2	1 & 2	Left stereo speaker
	5 & 6	Right stereo speaker
PL4	1 & 2	System standby restore switch
	3 to 7	Infra-red controller
	8 to 11	Mono speaker
	12 & 13	Message LED
PL6	1 to 4	HDD active light
	5 to 9	Keylock (not fitted)
	10 & 11	System in 'power standby' light
	12 & 13	System hardware reset (not fitted)
PL36	n/a	System fan, slow mode
PL37	n/a	System fan, full speed mode

## **Replacing the configuration battery**

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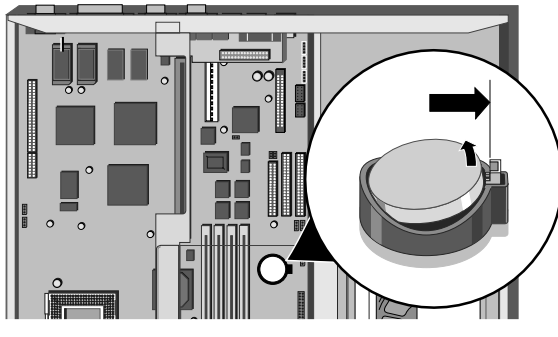
The computer keeps a record of its current hardware configuration in a CMOS memory chip which is sustained by a small battery.

This battery has a life of up to 5 years. When the battery is discharged the contents of the configuration memory will not be maintained while the computer is turned off. If you find that you have to reconfigure the computer every time you turn it on, the battery is probably failing and needs to be replaced.

The battery is a 3 volt lithium type (CR2032 or equivalent) typically used in calculators and other small, battery-powered electronic items.

### **To replace the battery**

1. Turn off the computer and unplug all power cords.
2. Take suitable anti-static precautions and remove the system unit cover.
3. If there is a removable-media drive fitted, unplug its power and signal cables from the rear of the drive.
4. Remove the two screws that secure the removable-media drive tray, then slide the tray backwards slightly and lift it out of the system unit. Put it down on a flat, anti-static surface.
5. Identify the battery holder from the following illustration.



6. Using a non-conductive implement, release the latch that holds the battery in place. The battery will pop up allowing you to lift it out of the holder.

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**Warning**

*You must not use a metal or other conductive implement to remove the battery. If a short-circuit is accidentally made between the battery's positive and negative terminals, the battery may explode.*

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7. Check that the replacement battery is identical to the battery you have removed.
8. Taking care not to touch the top or bottom surface of the battery, pick up the replacement with the positive (+) terminal upwards.
9. Press the battery into the holder using a non-conductive implement.
10. Replace the removable-media drive tray.
11. Replace the system unit cover.
12. Dispose of the discharged battery in accordance with the manufacturer's instructions.

The next time you turn on the computer you will have to run the BIOS Setup utility to reset the hardware configuration. See the chapter on "Using the BIOS Setup Utility".

# B TECHNICAL INFORMATION

This appendix provides some technical information about your computer. More detailed information is available from your supplier.

## Specifications

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### General

<i>Processor</i>	Types	Intel Pentium 100 MHz upwards
	Bus speeds	50, 60 or 66 MHz
	Chipset	Intel Triton II
<i>BIOS</i>	SurePath v2.0	2 Mb Flash programmable
<i>Memory</i>		32-bit 60 ns 5 volt EDO SIMMs fitted in pairs (128 Mb maximum)
<i>Cache</i>	Onboard	Pipeline burst 256 Kb
<i>Video</i>	Chipset	ATI 264VT or 264GT PCI local bus
	Video RAM	1 Mb on-board upgradeable to 2 Mb
	Resolutions	EVGA 1280 x 1024, 1024 x 768 SVGA 800 x 600 VGA 640 x 480
<i>Audio (optional)</i>	Type	SoundBlaster Vibra 16 Internal FM synthesizer
	External interfaces	Line in, Line out, microphone, external speakers/headphones, MIDI/joystick
	Internal interfaces	CD audio, TV audio, voice modem audio



## *Technical Information*

<i>I/O ports</i>	Serial	Two 9-way male D-type RS-232
	Parallel	25-way female D-type IEEE 1284: EPP/ECP-compatible
<i>Keyboard</i>		Windows 95 keyboard, AT-compatible
<i>Mouse</i>		PS/2-compatible two-button
<i>Diskette</i>	Capacity	1.44 Mbytes
	Access time	94 ms (average)
<i>Expansion bus</i>	Riser card (backplane)	1 full-length shared ISA/PCI slot
		1 full-length ISA slot
		1 half-length ISA slot
<i>HDD/CD-ROM interfaces</i>		Dual Enhanced IDE/AT-Attachment
		PCI local bus
<i>HDD drive bay</i>	Capacity	Two 1" drives
	Form factor	3.5"
<i>Removable-media drive bay</i>	Form factor	Half-height 5.25"

## Physical characteristics

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### Weight and dimensions

Component	Height	Depth	Width	Mass
System unit	94 mm	40 mm	428 mm	9.5-12 kg <sup>1</sup>
Keyboard	45 mm	107 mm	465 mm	1.4 kg

<sup>1</sup> Depending on configuration

### Temperature and humidity ranges

The computer is designed to operate in a normal office environment, but during storage and transportation the system is more tolerant of environmental factors.

Range	Temperature	Relative humidity with no condensation
Operational	+10 to +35°C	20% to 80%
Storage/Transport	0 to +55°C	20% to 80%

## Electrical characteristics

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### Voltage range

The PSU voltage range is initially set to that appropriate for the county in which the computer is first sold.

Setting	AC Voltage	Frequency
115 V	100 to 120 V	50 to 60 Hz
230 V	220 to 240 V	50 to 60 Hz

The voltage range setting of the monitor must always agree with that of the system unit PSU.

If you wish to use the computer in another country, you must ensure that it is set to the correct voltage range.

**Power cords**

The power cord supplied with the computer complies with the safety standards applicable in the country in which it is first sold. If you wish to use the computer in another country, you must ensure that you use a power cord which complies with the safety standards of that country.

**PSU current ratings**

PSU AC power inlet	4.5 A at 100-120 V
	3.0 A at 220-240 V
PSU AC power outlet	1.5 A at 100-120 V
	1.0 A at 220-240 V

Connect only manufacturer-approved monitors to the power supply unit's AC power outlet.



15822531



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