apricot

MITSUBISHI ELECTRIC

APRICOT 340 & XEN PC OWNER'S HANDBOOK

APRICOT VS340
APRICOT MS340
APRICOT LS340
APRICOT XEN PC

Safety and Regulatory Notices

Read the separate *Power Connection Guide* and *Health and Comfort Guide* before using the computer for the first time.

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.

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

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 the system unit, cleaning the computer or removing the system unit top cover.

Battery

This product contains a replaceable 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 & 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.

```
CLASS 1 LASER PRODUCT TO IEC 825
LASER KLASS 1 PRODUCT NACH IEC 825
```
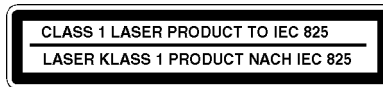
The CD-ROM drive contains a laser system which is harmful to the eyes if exposed. Do not attempt to disassemble the CD-ROM drive; if a fault occurs, call an authorized maintainer.

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.

Acoustic noise

German Acoustic Noise Regulation

Sound power level is less than 70 dB(A) according to DIN 45635 Part 19 (ISO 7779).

Die Deutsche Akoustische Lärm-Regulierung

Der Grad der Klangstärke ist weniger als 70 dB (A) je nach DIN 45635 Teil 19 (ISO 7779).

Safety

This equipment complies with the following European safety standards:

EN60950

Electromagnetic compatibility (EMC)

This product complies with the following European EMC standards:

Emissions   EN55022 Class B

Immunity   EN50082-2

Harmonics   EN60555 Parts 2 and 3

To ensure continued compliance:

♦   All ancillary equipment using an AC power cord must be earthed.

♦   All interconnecting cables (e.g. cables for microphones, headphones or external speakers), and communication cables, must be less than 2 metres in length. If cable extensions are used, ensure that adequate earth connections are provided and that screened cables used.

♦   Use only Apricot tested and approved upgrades.

Failure to observe these requirements cancels Apricot's responsibility for this product's European EMC compliance.

European Directives

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

Low Voltage Directive   73/23/EEC

EMC Directive   89/336/EEC

CE Marking Directive   93/668/EEC

Thermalcote bonding compound

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.

CONTENTS

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".

Warning
Read the separate Power Connection Guide before using the computer for the first time.

Unpacking

On unpacking the computer, you should find:

♦   Apricot PC system unit.

♦   Apricot/Mitsubishi monitor and accompanying *User's Guide*.

♦   Apricot extended 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
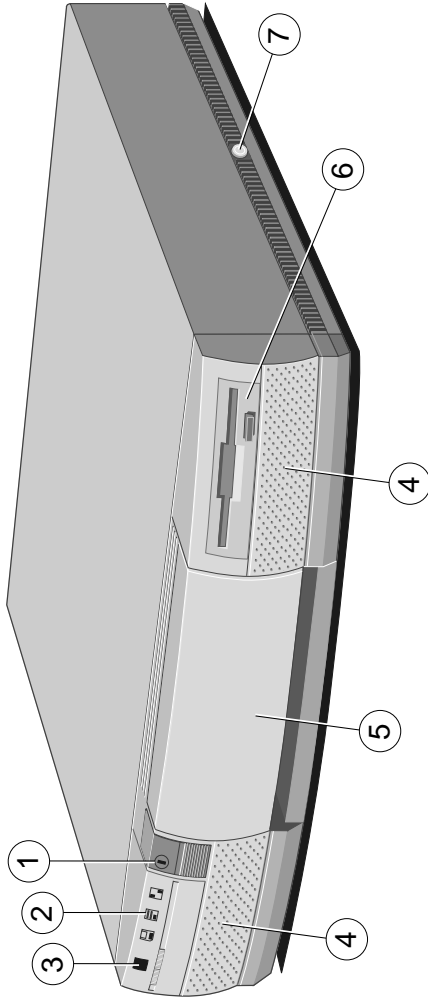
1   **POWER button**: press to turn the system on or off. The green indicator on the button lights when the system unit is powered.

2   **activity indicators**, from left to right:

⌨ lights when a diskette, floppy disk or FTD Travan tape drive is in use (depending on the operating system).

▤ 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.

4   **speaker grille**: Apricot MS340 and LS340 models have internal stereo speakers. Apricot VS340 and XEN PC models have a single internal speaker (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 unauthorized access to the inside of the system unit.
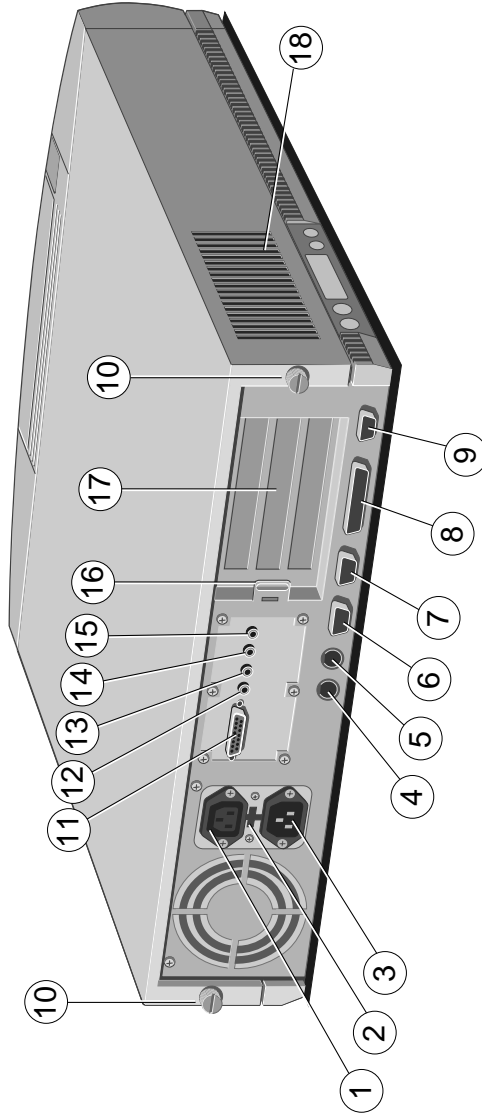
1   **AC power outlet**: where the monitor power cord can plug in.

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 9600 baud): typically used for connecting an external modem or a serial printer signal cable.

7   **serial port 2**: identical to serial port 1.

8   **parallel port** (standard, bi-directional or ECP/EPP): 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 graphics system).

10 **casing screws**: unfasten these to remove the top cover.

11 **joystick/MIDI port**: (MS/LS models) intended for either a standard PC analog joystick, or a MIDI In/Out adapter.

12 **audio input socket (MIC)**: (MS/LS 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)**: (MS/LS models) intended for a line-in signal from a high-fidelity tape deck or CD player.

14 **line out socket (OUT)**: (MS/LS models) intended for a line-out signal to a high-fidelity amplifier or tape deck.

15 **audio output socket (SPK):** (MS/LS 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 three series. The economical VS-series (Apricot VS340 and Apricot XEN PC), the multimedia MS-series (Apricot MS340), and the business-minded LS-series (Apricot LS340 and Apricot LS340E).

Standard features

The standard features of the range include:

♦ Intel Pentium processor with upgrade capability.

♦ 8 Mbytes of system random-access memory (RAM), upgradeable to 128 Mbytes by the use of standard 32-bit, 70 nanosecond SIMMs (single in-line memory modules). Extended Data Output (EDO) SIMMs are supported.

♦ BIOS Setup configuration utility in read-only memory (ROM).

♦ Cirrus Logic CL-GD543x 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 Integrated Drive Electronics AT-Attachment (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 PCI/ISA slot, one full-length ISA slot, and (in cacheless models) one half-length ISA slot.

◆ Parallel port with either standard, EPP (Enhanced Parallel Port) 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.

Warning
Read the separate Power Connection Guide before using the computer for the first time.

General advice

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. Unlike some other computers, the system unit is not designed to be stood on its side.

♦ 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.

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

See Chapter 1, "Introducing...", if you need help identifying the various ports on the system unit.

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.

If necessary, the AC voltage setting of the system unit can be adjusted by the voltage selection switch on the rear of the system unit. Refer to the chapter on "Maintaining and Transporting", for instructions on how to do this. It is likely that the monitor's voltage setting will also need adjusting; consult the *User's Guide* that accompanies the monitor, or ask your supplier for help.

Installing add-on options

If the computer arrived with uninstalled add-on options, (such as expansion cards or memory modules) consult the relevant chapters in this *Owner's Handbook* for step-by-step installation instructions. Expansion cards may also have their own documentation that supplements or overrides the instructions in this manual.

Note that some options for which you have installation guides may have already been installed for you at the factory or by your supplier.

Connecting the components

Having assured yourself that the voltage settings, and the AC power cords of the computer, the monitor and any other peripherals, are correct, use the procedure below to connect these 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 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 test 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 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.

Note

A hard disk may contain more than one operating system, in different partitions, but only one partition can be active at any one time. The computer loads its operating system from the currently active partition.

Starting the computer for the first time

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 F3 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 monitor display goes blank and the processor slows down. The operating system and your programs continue to run, although slowly (and of course you can't see them because 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.

◆ If you are logged-in to a network, logout before turning off the computer. This gives the network operating system a chance to free up the network resources you've been using.

◆ 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 initialize 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. The hard disk also contains a complete set of Cirrus Logic video display drivers, although initially the computer is configured to use the standard VGA Windows driver. Additional software may be pre-installed by your 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.

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 diagram). 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.
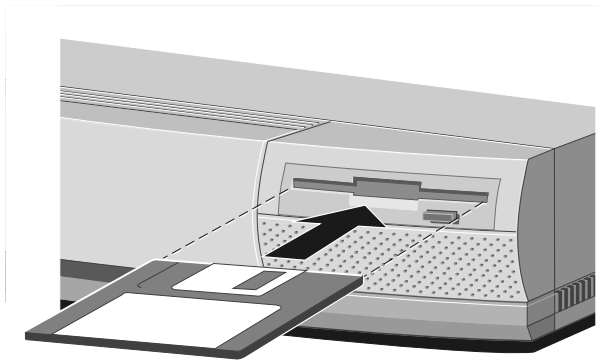
Removing a diskette

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 authorized 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 diagram). 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.
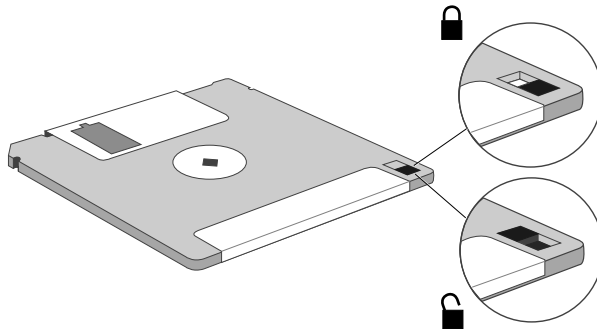
The BIOS Setup utility can completely disable the diskette drive.

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 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 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), and effectively 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 authorized maintainer.

BIOS Setup is a utility programmed into the computer's BIOS ROM. Its main purpose is to allow 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

Not long after turning on your computer, this symbol appears in the top right corner of the screen:

```
~~~~   ~~

~~~~   ~~

~~~~   ~~
```
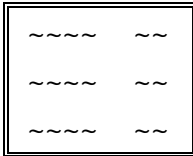
While this symbol is displayed, you can press the F1 key to start the BIOS Setup utility.

If BIOS Setup starts on its own

This can happen for three reasons:

♦ 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 authorized maintainer.

♦ The CMOS battery may be running down. This may be signalled by 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, more cache 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. The two lines at the bottom of the screen indicate what you can do at any given time.

To select a line, press the UP ARROW and DOWN ARROW keys until the line you want is highlighted. If there are more lines than fit on one screen, the screen will scroll. The PAGE UP and PAGE DOWN keys also work. To choose a selected action, press ENTER.

To exit from a screen, press the ESC key. To get help, select a line and press F1.

Some lines 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 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.

To restore the previous setting for a line, press F9. To restore the default setting, press F10.

Press ESC at the main menu to exit from the utility. You are asked whether or not you want to save any changes you have made to the configuration in the computer's CMOS memory. If you save the changes, the computer will reboot on exiting the utility.

The table on the next page summarizes these controls.

Press	To
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`
- `Devices and I/O Ports`
- `Date and Time`
- `Security`
- `Start Options`
- `Advanced Setup`
- `ISA Legacy Resources`
- `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.

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 set the I/O port and interrupt used by the parallel port. You can select Standard or Extended port modes. To get EPP mode you may have to change the I/O port setting.

Parallel port mode		Description
Standard		Used for output only.
Extended	Bi-directional	Simple two-way data.
	EPP	Enhanced Parallel Port mode.
	ECP	Extended Capabilities Port mode.

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 to one of the extended options above.

Diskette Drives 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.

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.

IDE Drives Setup

The motherboard's two IDE/ATA (Integrated Drive Electronics AT-Attachment) interfaces 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.

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
IDE Performance	High Performance mode allows the system to make use of any performance enhancement features the drive may have. You should select Compatible mode for older hard disk drives or drives that do not follow the IDE/ATA specification.
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.

CD-ROM drives

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). You can manually configure the IDE Performance parameter of the CD-ROM drive in the same way as a hard disk drive.

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. You can also control access to the computer's hard disk and diskette drives.

The password options are intended for computers that lack more sophisticated security systems. You should **not** use these options on an Apricot LS340 computer with a built-in LOC Technology security system.

Secure Hard Disk Drives and Diskette Drives

Use these options to disable or enable access to the hard disk drives (including CD-ROMs) and diskette drives (including FTD tape drives).

Caution

Do not disable both hard disk drives and diskette drives, or the computer will be unable to find and load an operating system. Be careful not to disable the startup device(s) specified under the Start Options menu (see below).

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.

2. Type the password once more in the Enter Power-on Password Again box.

   To preserve confidentiality, the password is not displayed as you type it.

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 Set Or 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 authorized 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 boots.

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.

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 selected 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 **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.

See the chapter on "Upgrading" for more information about adding cache memory.

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 reasons: 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 EFFFFh.

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

Note that the two 32 Kbyte areas from E0000h to E7FFFh and E8000h to EFFFFh cannot be shadowed independently of the system BIOS ROM.

Caution

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

PCI Settings

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.

ISA Legacy Resources

After fitting an ISA expansion card in your computer, you should use this option to mark as "Not Available" those system resources that the card uses. This needs to be done because the BIOS 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 "Available" 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. Some items are shown as "Allocated by the system", meaning that they are reserved for use by motherboard devices.

Power Management

These power management features are provided to reduce the average amount of electricity consumed by your computer. Some features will have been 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.

Hard Disk Standby

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

Standby Time-out

If this option is not "Disabled", the computer will go into a low-power **standby** mode after the specified period of inactivity. The processor slows down and, provided that the Monitor Power Management option is also "Enabled", the monitor display goes blank. The operating system and your programs continue to run, although slowly. You can wake the computer again by pressing any keyboard key.

Monitor Power Management

This option is intended to be used only with monitors that support Display Power Management Signalling (DPMS). If "Enabled", the monitor will go blank when the computer enters standby mode (see above).

Another way of saving monitor power is by using the built-in power-saving features of Windows 95, or the Cirrus Logic Display

Power Manager screen saver supplied with Windows for Workgroups. See your Windows Help files 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 DPMS; if it doesn't, it may be permanently damaged.

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4   USING FLOPPY DISK, CD-ROM AND TAPE DRIVES

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

♦   5.25-inch floppy disk drive

♦   CD-ROM drive

♦   FTD Travan tape drive

♦   SCSI QIC quarter-inch cartridge tape drive

♦   SCSI DDS-2 (Digital Data Storage) tape drive

Using a 5.25" floppy disk drive

This drive can read and write double-sided disks with a formatted capacity of either 1.2 Mbytes (if marked "HD" or "high density") or 360 Kbytes (if marked "DD" or "double density").

Each floppy disk is sealed into a flexible plastic envelope with a long, rounded aperture through which the read/write heads of the disk drive can meet the disk surface. You must never touch the exposed surface of the disk yourself.

Keep floppy disks 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 disk may become corrupted.

Inserting a floppy disk

1.   Insert the disk into the drive slot with the read/write aperture foremost.

2.   When the disk is fully inserted, turn the locking lever one-quarter turn clockwise to engage the drive mechanism.

Removing a floppy disk

1. Before attempting to remove a disk, ensure that the drive is not currently in use (the drive's LED must be unlit).

2. Turn the locking lever one-quarter turn counter-clockwise to disengage the drive mechanism. The diskette is ejected halfway out of the drive.

3. Pull the disk completely out of the drive.

Write-protecting a floppy disk

A floppy disk can be write-protected by covering the small notch in the edge of the disk envelope (A) with a self-adhesive tab (B); such tabs are typically supplied with new floppy disks. With the tab in this position, you can read or print files from the disk, but you cannot create, rename or delete any files.
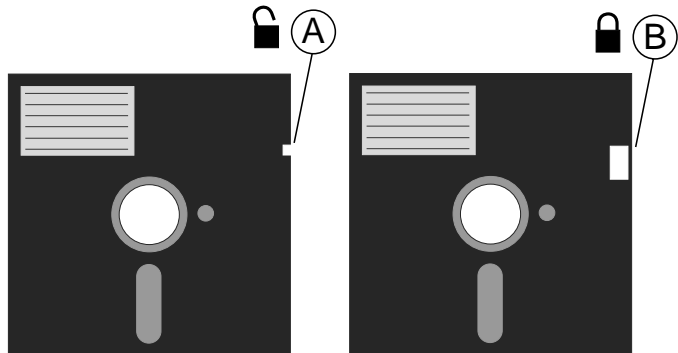
Using a CD-ROM drive

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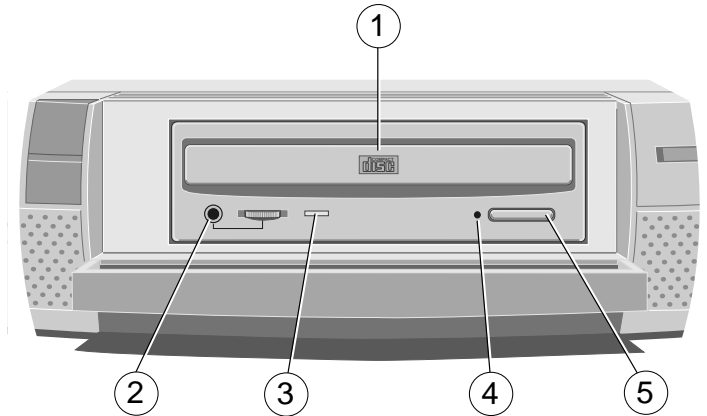
1   disc drawer or platter
2   headphone jack and headphone volume control
3   activity indicator (green = powered, amber = busy)
4   emergency eject hole
5   EJECT button (works only when drive is powered)

The software required to control the drive depends on the type of drive and the operating environment; see the Help provided with the computer or ask your supplier for details.

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. If the platter only ejects halfway out of the drive, pull it out to its fullest extent.

3. Place the CD face up on the platter.

4. If the platter ejected fully, push the EJECT button again, or gently push the front of the platter, and it will be drawn back into the drive. If the platter only ejected halfway, push the platter in until it engages with the drive mechanism.

5. 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 be disabled by the software controlling the CD-ROM drive. In this case pressing the EJECT button will have no effect.)

3. If the platter only ejects halfway out of the drive, pull it out to its fullest extent.

4. 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 an FTD 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.
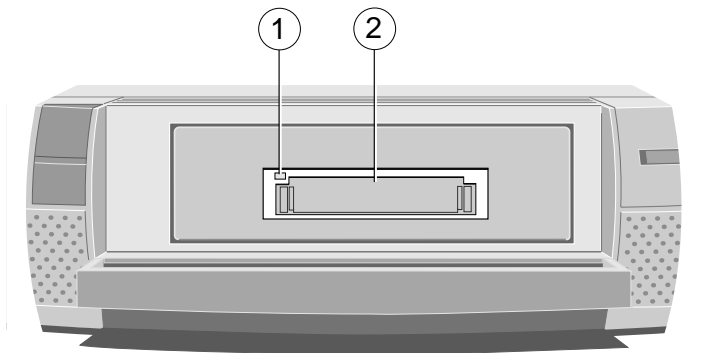
1   drive activity indicator (green)
2   flip-up door

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.

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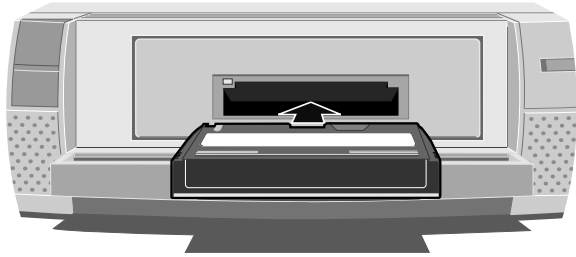
3.   Carefully push the cartridge in a bit further until it engages with the drive mechanism. Once the cartridge is correctly loaded, it protrudes about 12 mm from the drive.

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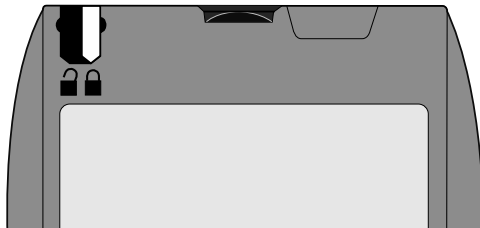
Keep tape cartridges well away from magnetic objects, and equipment that generates magnetic fields (for example, your computer's monitor). Avoid extremes of temperature and exposure to direct sunlight; otherwise, the data recorded on the tape may become corrupted.

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 SCSI QIC tape drive

The SCSI QIC tape drive uses QIC-3080 minicartridges (400 ft, 1.6 Gbytes). This nominal capacity can typically be doubled to 3.2 Gbytes by software data compression. The software required to control the tape drive depends on your operating environment; ask your supplier for details.

Inserting a cartridge

1. Remove the cartridge from its plastic holder.

2. Hold the cartridge so that the metal plate faces downwards. 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.

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 is normally write-protected but can be write-enabled by sliding the tag labelled <**RECORD** in the direction of the arrow (that is, to the left). A cartridge must be write-enabled if you intend to write data onto the tape.

Keep tape 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.

Using a SCSI DDS-2 tape drive

The computer may be configured with a SCSI DDS-2 (Digital Data Storage v2.0) tape drive. The software needed to control the drive depends on your operating environment; ask your supplier for details.
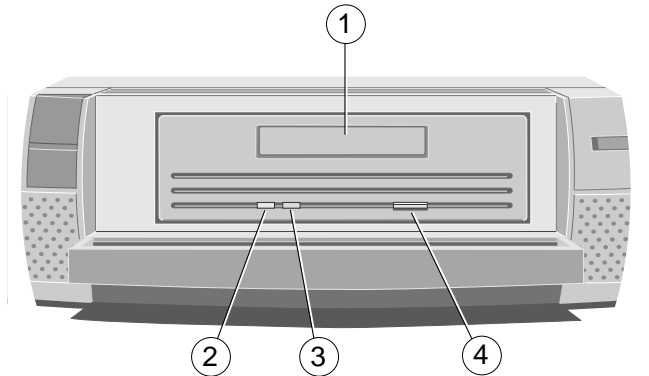
1   cassette insertion slot
2   cassette-in-place indicator (green)
3   drive busy indicator (amber)
4   EJECT button.

The DDS-2 drive has a built-in compression algorithm which can typically double, and in some cases quadruple, tape capacity. Data compression and decompression is transparent to the host software.

The DDS-2 drive uses 120-metre cassettes. The drive automatically detects whether cassettes are DDS-2 format, or the older DDS format. It can read and write both DDS uncompressed and DDS-DC compressed data.

The drive writes compressed data by default, unless it finds uncompressed data already on the cassette. The drive can also write uncompressed data under software control. When reading a cassette, the DDS-2 drive automatically distinguishes compressed and uncompressed data and either decompresses it or passes it through unaltered as appropriate.

Appendix B contains more information about the drive's nominal capacities with compressed and uncompressed data However, the actual compression ratio (and consequent transfer rate) achievable in any particular case depend on the characteristics of the data being compressed, and may be higher or lower than these nominal figures.

Caution

Use only cassettes bearing the DDS-2 or DDS symbols. You cannot play audio DAT cassettes with these drives, even on multimedia systems. Data stored on DDS-2 cassettes cannot be read by some first-generation DDS drives.

Interpreting the LED indicators

There are two LED (light-emitting diode) indicators on the drive's front panel. The Cassette-in-Place (green) and Drive Busy (amber) LEDs show the status of the drive:

Green	Amber	Drive status
On	Off	Cassette inserted.
On	On	Cassette inserted: tape being read or written.
Flashing slowly	On/Off	Media warning.
Flashing rapidly	On	Drive could not write to tape correctly.
On/Off	Flashing rapidly	Hardware error or high humidity.

Media warning

A media warning, when the Cassette-in-Place (green) LED flashes slowly, 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 cassette, then try the data cassette again. If the warning persists, copy the data onto a new cassette and discard the old one.

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

Drive could not write to tape

If the Cassette-in-Place (green) LED flashes rapidly, this means that the drive could not write to the tape correctly, and indicates that the tape has become unreliable. Remove the cassette and use another.

Hardware error or high humidity

If the Drive Busy (amber) LED flashes rapidly, this indicates either a hardware error or dew (high humidity). If this happens soon after powering-up the computer, the drive's diagnostic test may have failed, in which case the drive will not operate. Request help from your supplier or an authorized maintainer.

If the drive detects high humidity, the tape is automatically ejected. As soon as the drive detects that the humidity is at an acceptable level, it will return to normal operation.

Automatic drive operation

To prolong the life of the tape and the drive mechanism, the drive "relaxes" during periods of inactivity (no read or write operations):

♦   After 30 seconds, the capstan and pinch roller are released and tape tension is removed.

♦   After 90 seconds, the tape is pulled away from the head cylinder, and the cylinder stops rotating.

Inserting a cassette

Insert the cassette into the slot with the triangular arrowhead on the cassette 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 ambient humidity, 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.
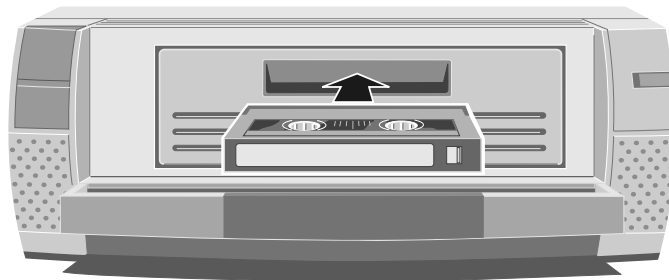
The drive will automatically format a blank tape when data is first written to it. Remember to allow time for the formatting process when you use a new tape.

Removing a cassette

Before attempting to remove a cassette, ensure that the drive is not currently in use (the amber Drive Busy indicator must be unlit).

Press the EJECT button on the front of the drive (depending on your operating system, the EJECT 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 cassette. Several seconds may pass between the button being pressed and the cassette being ejected, so be careful not to turn off the computer before the operation is completed.

Write-protecting a cassette

A cassette can be write-protected by sliding the white tab on the cassette 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 cassette is write-protected. It follows that the tape log becomes inaccurate if a cassette is used while write-protected, and the media warning LED status cannot be relied upon to determine if the cassette needs to be copied and replaced.
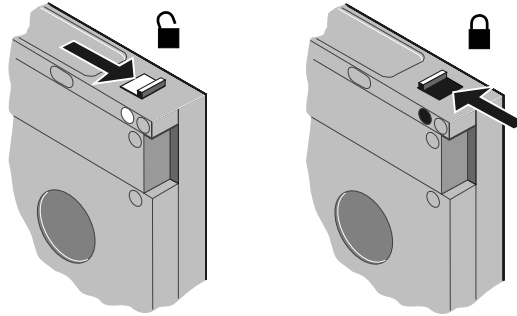
Keep your cassettes well away from magnetic objects, and equipment that generates magnetic fields. Avoid extremes of temperature and exposure to direct sunlight; otherwise, the data recorded on the tape may become corrupted.

Cleaning the drive

The read/write heads in the DDS-2 tape drive are protected during normal operation by a built-in cleaning roller. In addition, a special cleaning cassette is available from your supplier. This cassette should be used:

♦   After the first four hours of tape movement of a new cassette.

♦   Every 25 operating hours.

♦   When a media warning status is indicated.

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

Caution

Do not attempt to use an ordinary audio DAT cleaning cassette. The drive will be unable to recognise it as a cleaning cassette.

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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 removable-media drives.

♦ Occasionally wipe the system unit with a soft, slightly damp, lint-free cloth.

♦ Occasionally wipe 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 authorized 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 authorized 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 Guide*.

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 specialized 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 its type and possibly its size. Inside your computer are three connectors or **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.

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.

Slot	Type	Description
Slot 3 (upper)	PCI/ISA	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).
		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.
Slot 2 (middle)	ISA	This slot can accommodate a full-length ISA card.
Slot 1 (lower)	ISA	In cacheless systems, this is a half-length slot (only half-length because the processor gets in the way).
		If a cache module upgrade is fitted (see the chapter on "Upgrading") this reduces the space even further so that only very short or very thin cards can be accommodated. In Apricot LS340 systems, the lower slot may be occupied by a LOC Technology 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, and 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.

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.

The MS/LS audio system can be assigned an interrupt other than IRQ 5 if necessary, by means of its Windows device driver.

If you configure the parallel port to Standard mode, its interrupt (IRQ7 or IRQ 5) can usually be used by an expansion card without affecting the operation of the port. This may not be possible if you use the port in an Extended mode.

IRQ	Default assignment	IRQ	Default assignment
IRQ0	System	IRQ8	Real time clock
IRQ1	Keyboard controller	IRQ9	-
IRQ2	Slave interrupt controller	IRQ10	-
IRQ3	Serial port B	IRQ11	-
IRQ4	Serial port A	IRQ12	Mouse
IRQ5	Parallel port (alternative) Audio in MS/LS models	IRQ13	Coprocessor
IRQ6	Diskette controller	IRQ14	Primary ATA/IDE interface
IRQ7	Parallel port (default)	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	8-bit audio (MS/LS models)
DMA2	Diskette/floppy disk controller
DMA3	Parallel port in Extended Capabilities Port mode
DMA4	System
DMA5	16-bit audio (MS/LS 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 table on the next page lists addresses used by devices on the motherboard. Any ports between 100h and 3FFh that are **not** listed below may be used by an expansion card.

Motherboard jumper settings determine which I/O ports are used by the SoundBlaster-compatible audio system in Apricot MS340 and LS340 models. See Appendix A, "Inside the System Unit", for more information.

I/O ports	Default assignment
1F0h-1F7h	Hard disk drive controller
200h-207h	Game I/O
220h-22Fh, 230h-23Fh	Audio: SoundBlaster-compatibility (default)
240h-24Fh, 250h-25Fh	Audio: SoundBlaster-compatibility (alternative)
278h-27Fh	Parallel port 2
2B0h-2DFh	Alternate VGA
2F8h-2FFh	Serial port B
300h-301h	Audio: MIDI
330h-331h	Audio: MIDI (alternative)
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

The first megabyte (1024 kilobytes) of the computer's memory is divided into 640 Kbytes of **conventional memory** and 384 Kbytes of **upper memory**.

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 "seen" 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 in upper memory.

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.)

Note

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. Since amounts of memory are usually stated as kilobytes 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

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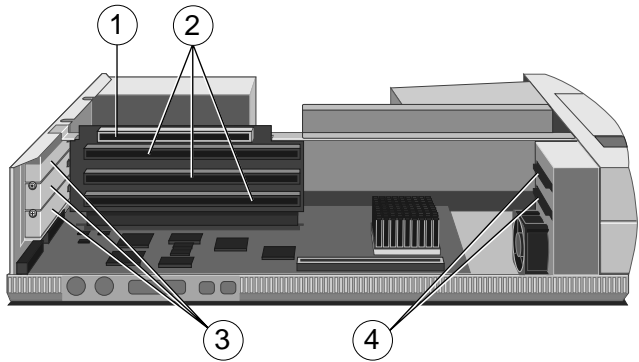
1	PCI expansion slot	**3**	blanking plates
2	ISA expansion slots	**4**	full-length card guides

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.

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. Before installing a video controller card you may have to disable the on-board video controller by moving a **jumper** on the motherboard (check the documentation that came with the card to make sure). If you do not move this jumper, it is possible that neither the card or the motherboard video controller will work correctly.

    In addition, if the card 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 VESA options jumper block and 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.
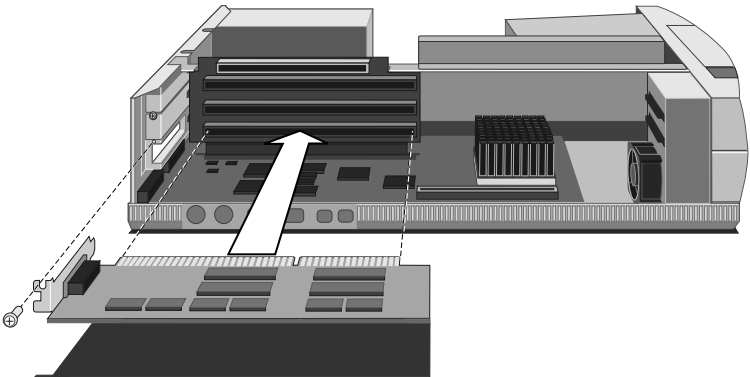
10. Secure the card by replacing the screw that you removed in Step 5.

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 organization 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.

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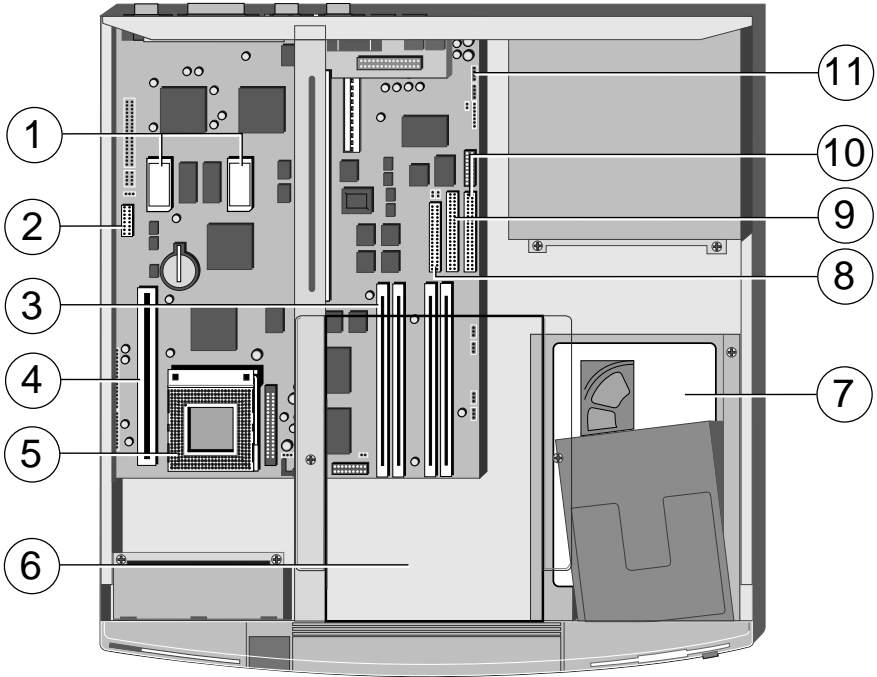
The illustration opposite identifies the major components inside system unit that are affected by the installation instructions in this chapter.

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 by the use of single in-line memory modules.

4   **cache memory upgrade socket**: you can improve the performance of the computer by adding cache memory.

5   **processor socket**: you can upgrade the processor by replacing it with one of higher performance.

6   **5.25" removable-media drive bay**: may be occupied by a removable-media drive.

7   **3.5" hard-disk drive (HDD) bay**: this bay has room for two one-inch high IDE hard disk drives.

8   **Diskette/floppy disk ribbon cable connector**.

9   **CD-ROM signal ribbon cable connector**.

10 **Hard disk drive signal ribbon cable connector**.

11 **CD-ROM audio connector**: this can be used only on Apricot MS340 and 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 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. Extended Data Output (EDO) SIMMs can be used and will give enhanced performance, most noticeably in cacheless systems.

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

You cannot easily install a SIMM in a socket while the socket immediately next to it is occupied. You may therefore need to remove a SIMM before you can install one.

Installing and removing SIMMs

To locate the SIMM sockets:

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.

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

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.

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.
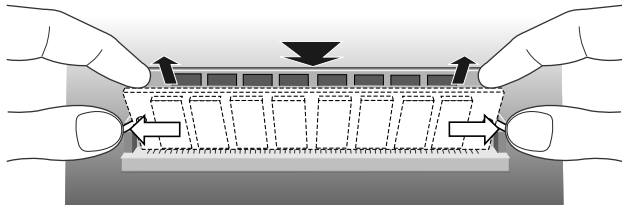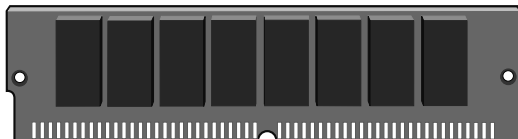

2. Lift the SIMM out of its socket. Hold the SIMM by its edges and avoid touching the metal contacts.

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.

U p g r a d i n g

2.   Place the SIMM in the socket at a 15° angle to the vertical, with the notched edge pointing towards the **front** of the machine.

3.   Pushing gently on its top corners, lean the SIMM upright in the socket until the pegs of the socket engage the holes on the SIMM and the metal clips hold both ends the SIMM in position.
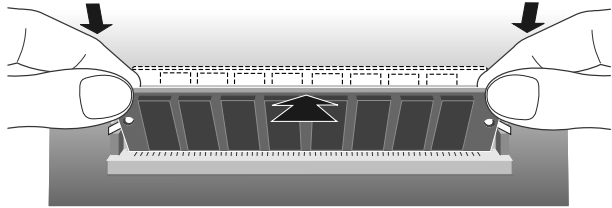
Do not use excessive force. If the SIMM will not fit easily, remove it and start again.

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.

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).

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Adding cache memory

An **external** or **second-level cache** is an area of dedicated memory with significantly faster access times than the computer's **random-access memory** (RAM). A cache controller ensures that the cache always contains a copy of the most recently accessed areas of RAM, so that the processor is able to read it much more quickly.

An external cache is sometimes called a second-level or L2 cache, to distinguish it from the first-level cache contained within the processor itself.

You can improve the performance of the computer significantly by adding cache memory. Note that in Apricot 340 computers only the first 64 Mbytes of RAM can be cached.

To fit cache 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. Remove any expansion cards that could restrict access to the cache 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. Use the illustration at the beginning of this chapter to identify the cache socket.

5. Take the cache SIMM out of its anti-static packaging. Hold it by its edges and avoid touching the metal contacts. Align the SIMM with the slot and carefully press it home. It will only fit one way.
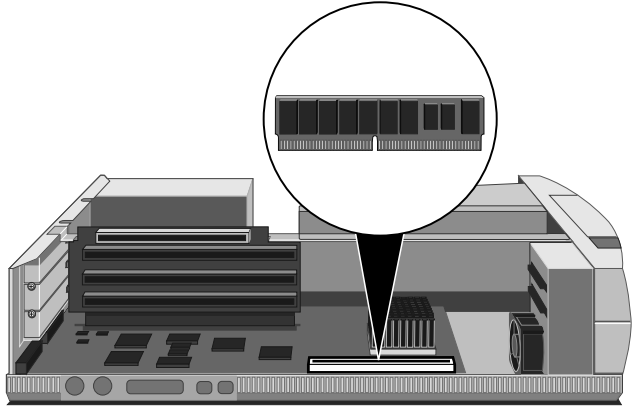
6.   If necessary, replace any expansion cards you removed earlier.

7.   Replace the system unit cover.

The first time you turn on the computer after adding a cache, 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 provides more colours or higher resolutions (provided that your monitor can cope).

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.
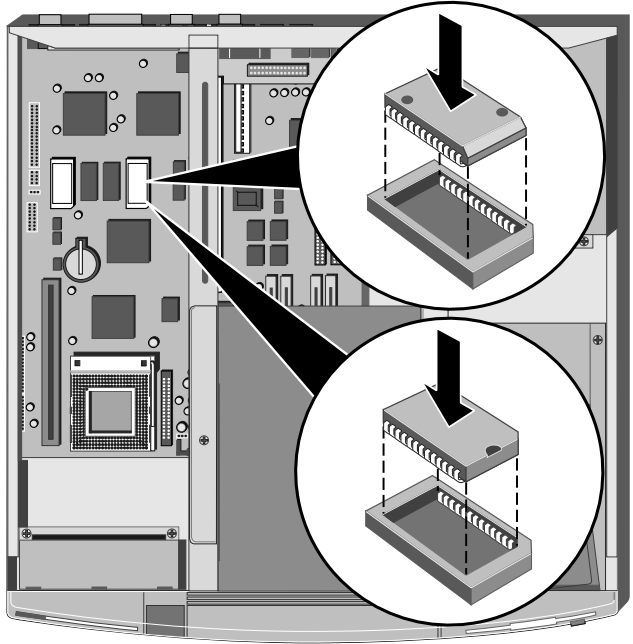
7.   If necessary, replace the expansion cards you removed earlier.

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

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 166 megahertz (MHz). You can upgrade your processor by replacing it with one of higher performance.

Removing the old processor

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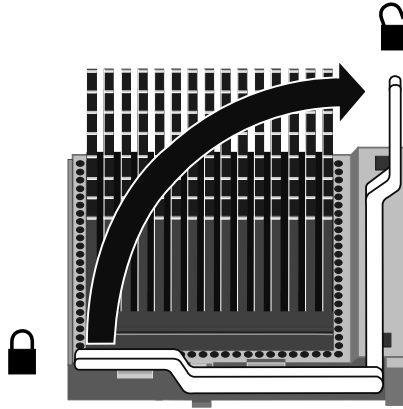
8.   Lift the processor and its attached heat sink out of the socket and place it on an anti-static surface outside the system unit. Avoid touching the metal pins of the processor.

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.

There is a thin metal foil in a layer of sticky thermal bonding compound between the heat sink and the processor. This makes it difficult to pull the heat sink directly away from the processor.

Instead, 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.

Warning

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.

Fitting the new processor

To fit the upgrade 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.

    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.
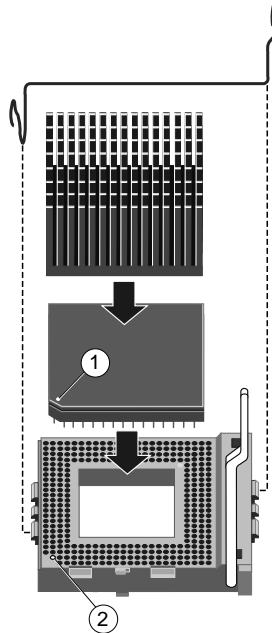
1   positioning guide
2   keyed corner

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 authorized 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
5.25" floppy disk or FTD Travan tape drive	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).
ATA-PI CD-ROM drive	The ATA-PI CD-ROM drive should be configured as the master drive for connection to the motherboard's ATA-PI CD-ROM interface.
SCSI QIC tape or DDS-2 tape drive	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".

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.
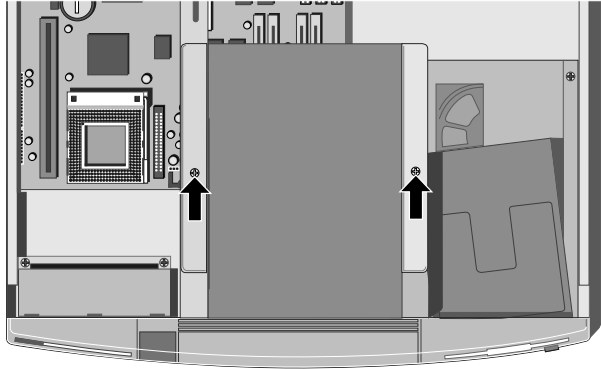
4. Open the drive bay door.

   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 in order to install a drive in the bay.
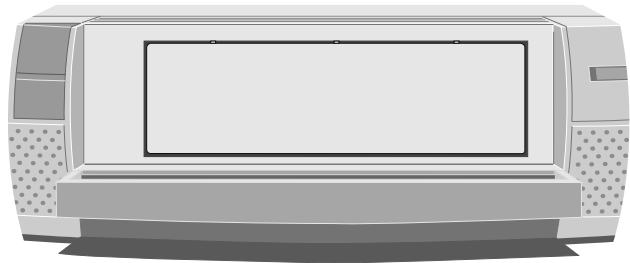
5. Break out the blanking plate by bending it backwards and forwards several times.

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.
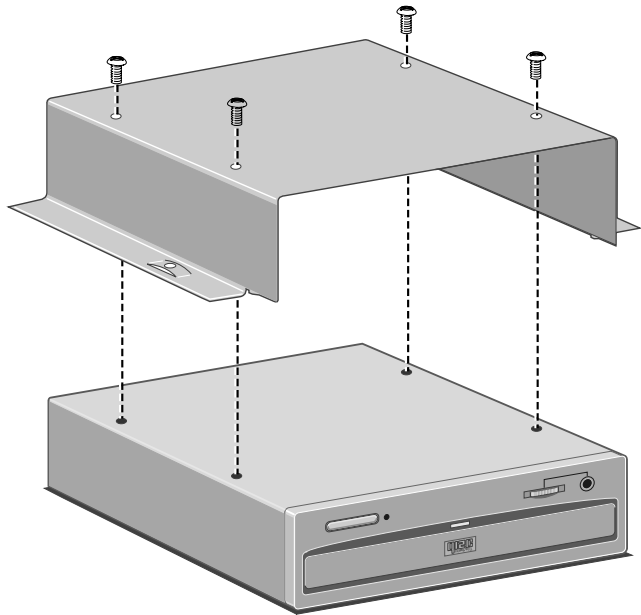
8. Insert the four drive securing screws, and tighten them until they are finger tight.

9. Turn the drive tray over, and replace it in 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 that secure the drive tray.

10. Connect the spare power cable in the loom behind the drive to the drive's power connector.
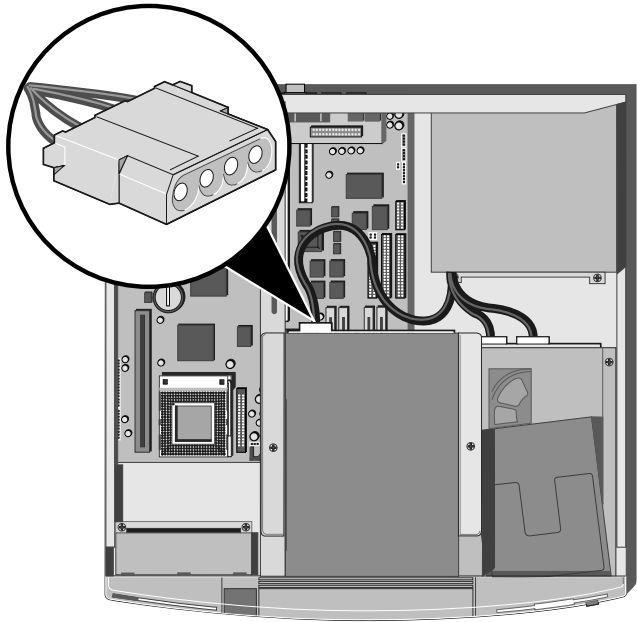
11. Connect the drive's signal cable(s). Use the table on the next page as a guide. See the documentation provided with the upgrade kit for more information.

    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
5.25" floppy disk or FTD Travan tape drive	These drives use a ribbon signal cable with three connectors. This signal cable must be connected between the signal connector on the rear of the floppy or tape drive, the 3.5" diskette drive, and the diskette/floppy disk interface connector on the motherboard (usually marked FLOPPY).
ATA-PI CD-ROM drive	The drive is supplied with two cables: a ribbon signal cable (which connects to the motherboard's secondary ATA/IDE interface, usually marked CDROM) and a CD-audio cable (which connects to the motherboard in an MS or LS system).
SCSI QIC tape or DDS-2 tape drive	SCSI upgrade kits from authorized 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.

SCSI CABLE
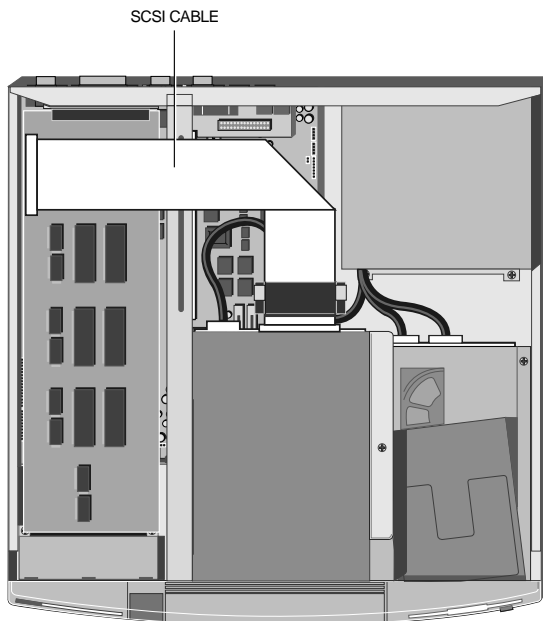
Adding a hard disk drive

The computer's 3.5" hard disk drive bay can accommodate one 1.6" high, or two 1" high, 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 master. The second, non-bootable, drive in a dual drive system must be configured as 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.
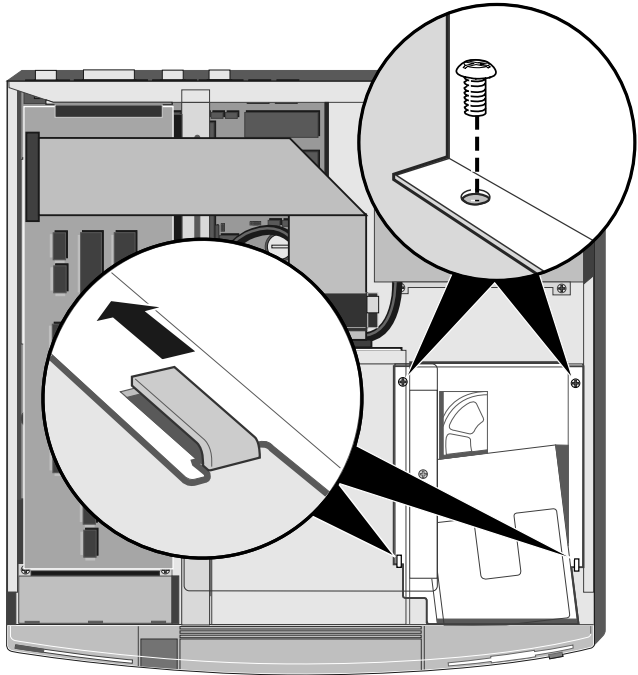
9. Remove the screws. Slide the drive bay backwards and lift it out of the system unit. Turn the drive bay upside-down and rest it on a flat surface with the front of the diskette drive towards you.

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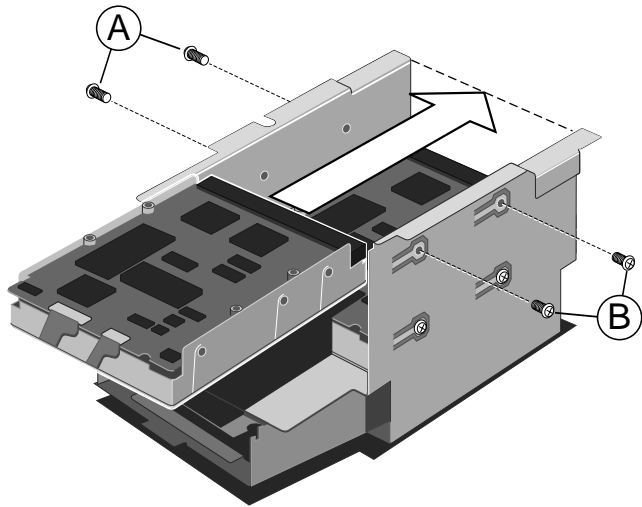
If you are installing a hard disk drive in a system that previously had only a diskette drive there will be two sets of mounting holes available in the bay. Install the new hard disk drive in the position closest to the diskette drive.

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 (where appropriate) slave hard disk drives. In a single-drive system, use the connector at the end of the cable.

16. Reconnect the diskette drive's power and signal cables.

17. Replace the removable-media drive tray in 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 the 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.

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.

With MS-DOS/Windows, 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/Windows 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.*

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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 authorized 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 authorized 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 test various hardware components, including memory, 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.

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 authorized maintainer.

Code	Cause	Code	Cause
101	Timer tick interrupt failure	301	Keyboard clock line failure
102	Timer 2 test failure	301	Keyboard data line failure
106	Diskette controller failure	301	Keyboard stuck key 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	1762	Hard disk configuration
163	Time of day not set - preboot	1780	Fixed disk 0 failure
164	Memory size does not match CMOS	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
189	Excessive password attempts	1962	No bootable device
201	Base memory error	2400	Display adapter failed ; using alternate
229	External cache failure	2462	Video configuration
303	Keyboard controller failure	5962	IDE CD-ROM configuration
301	Keyboard failure	8603	Pointer device has been removed

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 authorized maintainer.

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 authorized maintainer.

Troubleshooting checklist

If you encounter a problem with the computer the following sections suggest checks to make before you alert your dealer, authorized 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 that the software which drives or uses the card is correctly configured.

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.

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

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 minimize 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

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.
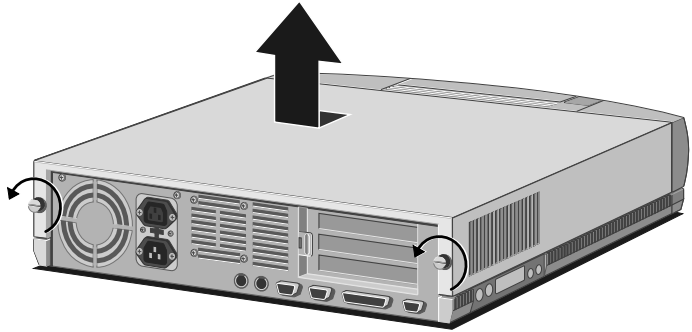
Motherboard layout
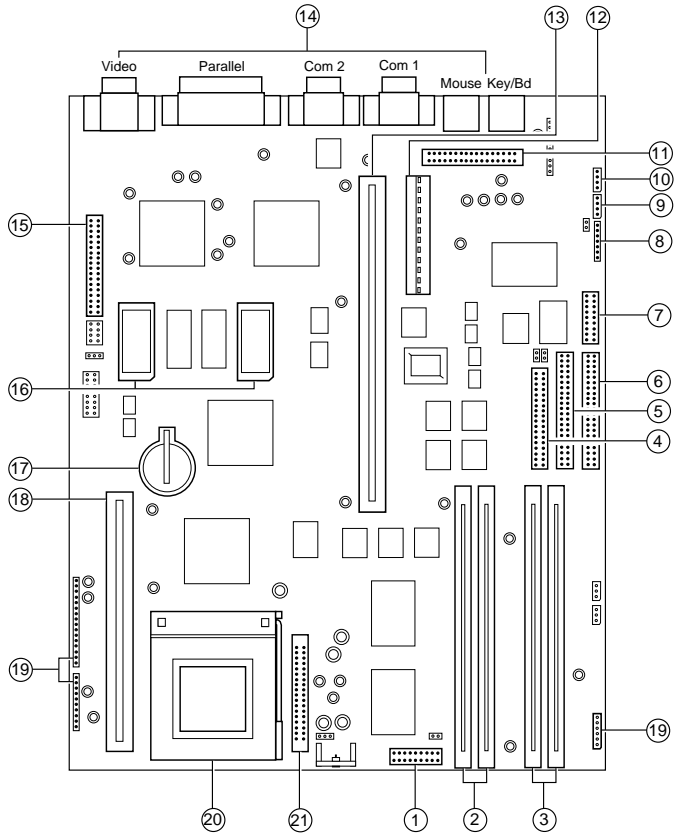
1	Front panel audio connector	**12**	Power connector
2	SIMM sockets 3&4 (Bank 2)	**13**	ISA/PCI backplane socket
3	SIMM sockets 1&2 (Bank 1)	**14**	External ports
4	FDD ribbon cable connector	**15**	Video (VESA) feature connector
5	CD ribbon cable connector	**16**	Video memory upgrade sockets
6	HDD ribbon cable connector	**17**	CMOS lithium battery
7	Wavetable connector	**18**	Cache memory socket
8	Voice modem audio connector	**19**	System connectors (see overleaf)
9	TV audio connector	**20**	Processor ZIFF socket
10	CD audio connector	**21**	VRM socket (optional)
11	Rear panel audio connector		

System connectors

There are three system connectors 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. The following table shows how these connectors are used in an Apricot 340 computer.

Connector	Pins	Function
PL24	3 & 4	HDD activity LED
	5 to 13	Unused
PL28	1 to 7	Unused
	8 to 10	System fan, slow mode
	11 to 13	System fan, full speed mode
	14 & 17	Mono speaker (VS models)
PL2	1 & 2	Left stereo speaker (MS/LS models)
	5 & 6	Right stereo speaker (MS/LS models)

Changing jumper settings
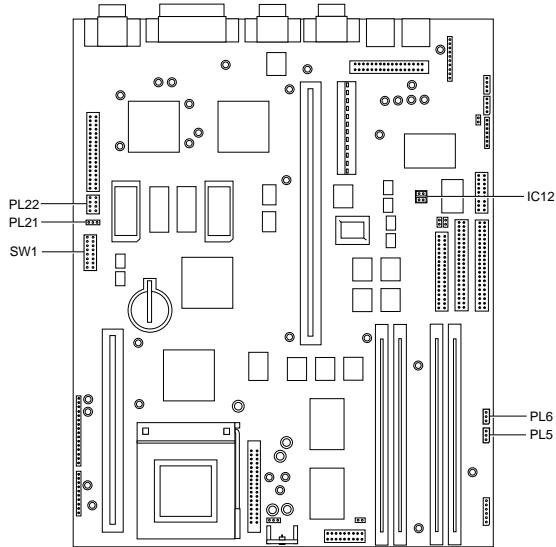
Caution

Do not alter any jumpers or switch settings other than those identified here, unless told to by your supplier or an authorized 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 triangle marking.

Processor speed selection

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

Processor speed	Jumper block SW1				
	FS1	FS0	BF	BF1	ISA
Pentium 75 MHz	1-2	3-4			
Pentium 90 MHz		3-4			9-10
Pentium 100 MHz	1-2				9-10
Pentium 120 MHz		3-4	5-6		9-10
Pentium 133 MHz	1-2		5-6		9-10
Pentium 150 MHz		3-4	5-6	7-8	9-10
Pentium 166 MHz	1-2		5-6	7-8	9-10

Disabling the on-board video controller

You may need to disable the motherboard EVGA video controller and video BIOS if you add a video adapter expansion card (check the documentation that came with the card to make sure). You do this by removing the jumper from PL22, the VESA options jumper block.

On-board EVGA	PL22
Enabled (default)	1-2
Disabled	Open

SoundBlaster I/O port address

The on-board SoundBlaster-compatible audio system can be configured to use I/O base address 220h or 240h.

SoundBlaster I/O base address	IC12
220h (default)	Closed
240h	Open

BIOS upgrade and recovery

These jumpers should not normally be changed except by a service engineer or at the direction of a service engineer. However, you may need to enable BIOS reprogramming to use the optional LOC Technology system in an Apricot LS340 system.

Clearing CMOS	PL21
CMOS battery connected (default)	1-2
CMOS battery disconnected	2-3
BIOS image selection	**PL5**
Boot using normal BIOS (default)	1-2
Boot using recovery BIOS	2-3
BIOS reprogramming	**PL6**
Enabled	1-2
Disabled (default)	2-3

Replacing the configuration battery

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.   Identify the battery holder from the following illustration.
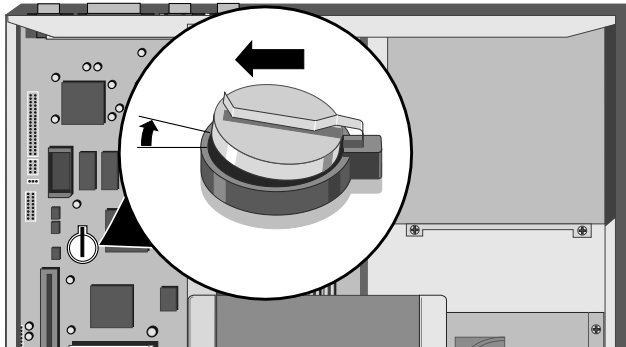
4.   Lift the front edge of the battery far enough to clear the base of the holder, then slide the battery out.

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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5. Check that the replacement battery is identical to the battery you have removed.

6. Taking care not to touch the top or bottom surface of the battery, pick up the replacement with the positive (+) terminal upwards.

7. Slide the battery into the holder.

8. Replace the system unit cover.

9. 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

General

Processor	Types	Intel Pentium
	Bus speeds	50, 60 or 66 MHz
	Socket	ZIF Socket 5 or Socket 7
BIOS	SurePath v1.3	1 Mb Flash programmable
Memory		Four 32-bit 70 ns 5 volt SIMMs (128 Mb maximum) EDO support, no parity
Cache (optional)		256 Kbyte SIMM, asynchronous write-back and pipeline burst
Video	Chipset	Cirrus Logic CL-GD543x PCI local bus
	Video RAM	1 or 2 Mb DRAM (CL-GD5434) 1 or 2 Mb EDO DRAM (CL-GD5436)
	Resolutions	EVGA 1280 x 1024, 1024 x 768 SVGA 800 x 600 VGA 640 x 480
Audio (optional)	Type	SoundBlaster Vibra 16 Yamaha OPL3 synthesizer
	External interfaces	Line in, Line out, microphone, external speakers/headphones, MIDI/joystick
	Internal interfaces	CD audio, TV audio, voice modem audio

I/O ports	Serial	Two 9-way male D-type RS-232
	Parallel	25-way female D-type IEEE 1284: EPP/ECP-compatible
Keyboard		102 key AT-compatible
Mouse		PS/2-compatible two-button
Diskette	Capacity	1.44 Mbytes
	Access time	94 ms (average)
HDD/CD-ROM interfaces		Dual AT-Attachment/Enhanced IDE PCI local bus
HDD drive bay	Capacity	One 1.6" drive or Two 1" drives
	Form factor	3.5"
Removable-media drive bay	Form factor	Half-height 5.25"

ATA-PI CD-ROM drive

Manufacturer	Sony	CDU77E-10
Discs	Acceptable discs	CD-ROM mode 1 data discs
		CD-ROM mode 2 data discs
		CD audio discs
		Audio-combined CD-ROM
		Multisession Photo-CD
	Disc diameter	120 mm
Transfer rate	Sustained	600 Kbyte/s (Mode 1)
		682 Kbytes (Mode 2)
	Burst	5.22 Mbyte/s (maximum)
Access time	Full stroke	400 ms (typical)
	Average (random)	190 ms (typical)
Audio output	CD audio	0.75 ± 0.15 Vrms @ 47 kOhm
	Headphones	0.55 +0.1/-0.15 Vrms @ 32 Ohm
Host interface		ATA-PI
Power specification	Voltage	+5 V dc ± 5%
		+12 V dc ± 10%
	Ripple	+5 V: <= 100 mVp-p
		+12 V: <= 200 mVp-p
	Current (maximum)	+5 V: 1.0 A (seeking/continuous read)
		+12 V: 1.5 A (seeking/continuous read)
Reliability	MTBF	100,000 power-on hours

DDS-2 tape drive

Performance specifications apply when using data compression. Power specifications are measured at the tape drive power connector and are nominal values.

Manufacturer	Connor	CTD8000R-S
Nominal capacity	60-metre cassette (DDS)	1.3 Gbyte (1:1 base) 2.6 Gbyte (2:1 typical) 5.2 Gbyte (4:1 max[1])
	90-metre cassette (DDS)	2.0 Gbyte (1:1 base) 4.0 Gbyte (2:1 typical) 8.0 Gbyte (4:1 max[1])
	120-metre cassette (DDS-2)	4.0 Gbyte (1:1 base) 8.0 Gbyte (2:1 typical) 16.0 Gbyte (4:1 max[1])
Transfer rates	DDS	366 Kbyte/s (1:1 base) 732 Kbyte/s (2:1 typical) 1464 Kbyte/s (4:1 max[1])
	DDS-2	400 Kbyte/s (1:1 base) 800 Kbyte/s (2:1 typical) 1608 Kbyte/s (4:1 max[1])
Unrecoverable errors		Less than 1 in 10^{15} data bits
Recording format		ANSI/ECMA (DDS-DC, DDS-2)
Power specification	Voltage	+12 V dc ± 10% +5 V dc ± 7%
	Ripple	+12 V: <= 100 mVp-p +5 V: <= 50 mVp-p
	Current (operational) Current (peak)	0.4 A @ +12 V dc, 0.8 A @ +5 V dc 0.9 A @ +12 V dc, 1.0 A @ +5 V dc

[1] *Nominal maximum only; can be exceeded for highly-compressible data.*

FTD Travan tape drive

Manufacturer	Connor	CTT800R-F
Tape formats		QIC-80 Wide
		QIC-80 and AccuTrak-80
		QIC-40 and AccuTrak-40 (read only)
Host interface		TriState floppy
Data transfer rate		500 kilobits/s (kbps)
		1 megabit/s (Mbps)
Tape capacity	Travan TR-1 (750 ft)	430.6 Mbytes (without ECC)
		390.2 Mbytes (with ECC)
	QIC-80 Wide (400 ft)	230 Mbytes (without ECC)
		208.5 Mbytes (with ECC)
	QIC-80 long-length (307.5 ft)	137.7 Mbytes (without ECC)
		124.7 Mbytes (with ECC)
Power specification	Voltage	+5 V dc ± 5%
		+12 V dc ± 10%
	Current (idle)	+5 V: 200 mA nominal, 250 mA max.
		+12 V: < 30 mA nominal, 200 mA max.
	Current (operational)	+5 V: 500 mA nominal, 700 mA max.
		+12 V: 0.67 mA nominal, 1.2 A max.
	Current (peak)	+5 V: 800 mA
		+12 V: 1.8 A
Unrecoverable errors		Less than 1 in 10^{14} data bits
Reliability	MTBF	> 100,000 power-on hours

Physical characteristics

Weight and dimensions

Component	Height	Depth	Width	Mass
System unit	94 mm	40 mm	428 mm	9.5-12 kg [1]
Keyboard	45 mm	107 mm	465 mm	1.4 kg

[1] *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

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.
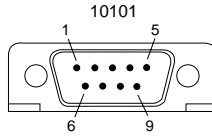
PSU current ratings

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.
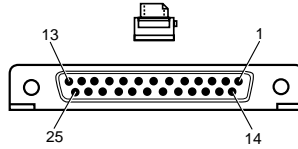
Port characteristics

Serial ports

9-way male D-type (COM1/COM2)

Pin	I/O	Function
1	I	Data carrier detect
2	I	Receive data
3	O	Transmit data
4	O	Data terminal ready
5	-	Signal ground
6	I	Data set ready
7	O	Request to send
8	I	Clear to send
9	I	Ring indicate

Parallel port

25-way female D-type

Pin	I/O	Function	Pin	I/O	Function
1	I/O	-STROBE	14	O	-AUTO FEED
2	I/O	Data bit 0	15	I	-ERROR
3	I/O	Data bit 1	16	O	-INIT
4	I/O	Data bit 2	17	O	-SLCT IN
5	I/O	Data bit 3	18	-	Ground
6	I/O	Data bit 4	19	-	Ground
7	I/O	Data bit 5	20	-	Ground
8	I/O	Data bit 6	21	-	Ground
9	I/O	Data bit 7	22	-	Ground
10	I	-ACK	23	-	Ground
11	I	BUSY	24	-	Ground
12	I	PE	25	-	Ground
13	I	SLCT			

Monitor port

15-way female D-type (VGA)
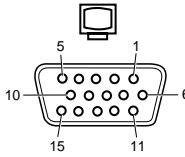
Pin	I/O	Output	Monochrome	Colour
1	O	Red	No pin	Red
2	O	Green	Mono	Green
3	O	Blue	No pin	Blue
4	-	Reserved	No pin	No pin
5	-	Digital G	Self test	Self test
6	-	Red Rtn	Key pin	Red Rtn
7	-	Green Rtn	Mono Rtn	Green Rtn
8	-	Blue Rtn	No pin	Blue Rtn
9	-	Plug	No pin	No pin
10	-	Digital G	Digital G	Digital G
11	-	Reserved	No pin	Digital G
12	-	Reserved	Digital G	No pin
13	O	Hsync	Hsync	Hsync
14	O	Vsync	Vsync	Vsync
15	-	Reserved	No pin	No pin

Red Rtn, Green Rtn, Blue Rtn = Analog grounds
Digital G = Digital ground for sync returns and self test.

Keyboard and mouse ports

Both the keyboard and mouse ports accept 6-pin miniature DIN connectors. The voltages and signals are the same for both connectors.
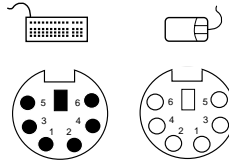
Pin	I/O	Function
1	I/O	Data
2	-	Reserved
3	-	Ground
4	-	+5 Vdc
5	I/O	Clock
6	-	Reserved

Although the keyboard and mouse ports are physically and electrically compatible, neither the keyboard nor the mouse will operate if plugged into the other's socket.

Joystick/MIDI port

15-way female D-type

This port is available only with Apricot MS340 and LS340 models.

Pin	I/O	Function
1	-	+ 5 V dc
2	I	GP4 Joystick/A right button
3	I	GP0 Joystick/A x-coordinate
4	-	Ground
5	-	Ground
6	I	GP1 Joystick/A y-coordinate
7	I	GP5 Joystick/A left button
8	-	+ 5 V dc
9	-	+ 5 V dc
10	I	GP6 Joystick/B right button
11	I	GP2 Joystick/B x-coordinate
12	O	MIDI Out
13	I	GP3 Joystick/B y-coordinate
14	I	GP7 Joystick/B left button
15	I	MIDI In

Video feature connector

The motherboard video adapter provides a video feature connector. The connector on the motherboard uses a standard pinout and a standard cable may be used to connect the feature connector to an expansion card. In case you have difficulty obtaining a cable the pinout of the motherboard connector is given in the following table.

Pin	Function	Pin	Function
1	Ground	2	P0
3	Ground	4	P1
5	Ground	6	P2
7	-EVIDEO	8	P3
9	-ESYNC	10	P4
11	-EDCLK	12	P5
13	No connect	14	P6
15	Ground	16	P7
17	Ground	18	DCLK
19	Ground	20	-BLNK
21	Ground	22	HSYNC
23	Ground	24	VSYNC
25	Ground	26	Ground

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