MITSUBISHI ELECTRIC

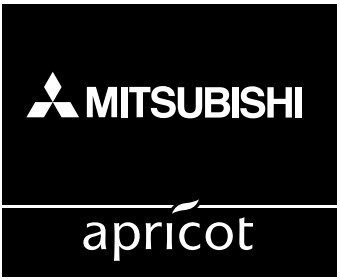
apricot

LS/VS660

Owner's Handbook

OWNER'S HANDBOOK

APRICOT LS/VS660



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CONTENTS

5 Troubleshooting

6 System motherboard

7 System BIOS and setup

Appendix

read the instructions in Chapter 1 and on this page first !

SAFETY AND REGULATORY NOTICES

Electrical

The computer uses a safety ground and must be earthed.

The system unit AC power cord is its 'disconnect device'. Ensure that the system unit is positioned close to the AC power outlet and that the plug is easily accessible. The power cord packed with the computer complies with the safety standards applicable in the country in which it is first sold. Use only this power cord. Do not substitute a power cord from any other equipment.

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

Battery

This product contains a lithium battery:

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

Replace a discharged configuration (CMOS) battery with one of the same type. Dispose of the battery in accordance with the manufacturer's recommended instructions and ***Do not*** attempt to recharge, disassemble or incinerate the discharged battery. Keep away from children.

Laser products

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

It will be in high visibility colours and bear the details shown above.

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.

External Speakers (where supplied)

Always switch off or disconnect the AC supply before disconnecting any of the speaker leads, whether audio or power. Disconnect the AC supply when equipment is not used for a period of time.

To prevent the risk of electric shock, do not remove speaker covers.

Connecting the speaker power cord to any other cords or joining cords together can cause fire and risk of electric shock.

Standards

Safety

This product complies with the European safety standard EN60950 plus amendments 1, 2, 3 and all European country deviations.

Electro-magnetic Compatibility (EMC)

This product complies with the following European EMC standards:

Emissions	EN55022	Class B
Immunity	EN50082	Level 2

German Acoustic Noise Regulation

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

Notes

All interconnecting cables (e.g. Microphone, headphone and speaker) and communication cables should be less than 2 metres in length. If cable extensions are used, ensure adequate earth connections are provided and screened cables are used.

Legalities

This equipment complies with the following European Directives:

Low Voltage Directive	**73/23/EEC**
EMC Directive	**89/336/EEC**
CE Marking Directive	**93/68/EEC**
and where applicable:	
Telecommunications Directive	**91/263/EEC**

Caution

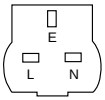
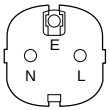
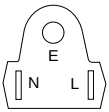
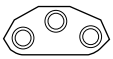
This system complies with the CE marking directive and its strict legal requirements. Use only Apricot tested and approved parts. Failure to do so may result in invalidating both the compliance and your warranty. All expansion cards or upgrade components must carry CE marking.

Thermalcote bonding compound

The thermal bonding compound used between the system processor and its heatsink 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.

Power connection information

Typical AC plugs

250V	250V	125V	250V	250V
				
BS1363A	**SHUCO**	**NEMA 5-15P**	**SRAF 1962/DB16/87**	**ASE 1011**
U. K.	Austria Belgium Finland France Italy Germany Sweden Norway Holland	Taiwan Thailand Japan USA Canada	Denmark	Switzerland

Procedure

Note

Any ancillary equipment using an AC power supply cable should be earthed.

The power supplies in the computer and the monitor are correct for the country in which the system is first sold. Do not alter any switch settings on the rear of the system. If you wish to use the computer in another country it may not be suitable, contact your supplier or an authorised Apricot dealer.

- Before connecting up any parts of the system, ensure that the AC supply is switched off or disconnected.
- First connect up the keyboard, mouse, monitor signal cable, and audio cables as appropriate.
- Connect up **all** AC cables. (System to supply, system to monitor, all related peripherals.) Then switch on or connect the AC supply.
- Switch on the monitor first, then the computer followed by the peripherals, such as printer or speakers.

Power Cable Connections - UK ONLY

This equipment is supplied with an AC power lead that has a moulded, non-removable, 3-pin AC plug.

Always replace the fuse with one of the same type and rating which is BSI or ASTA approved to BS1362.

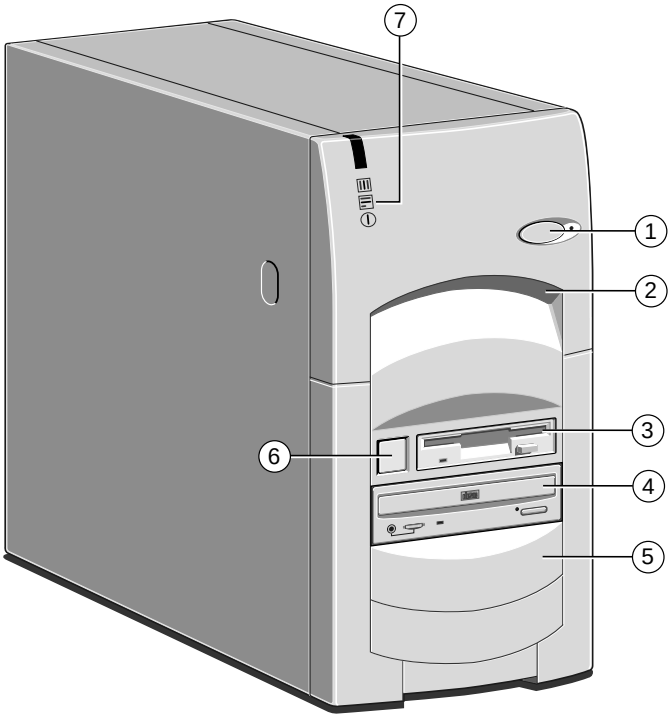
Always refit the fuse cover, never use the plug with the fuse cover omitted.

Never substitute a power cord from any other appliance. If you suspect a fault with the AC power lead, obtain a replacement from your supplier or authorised maintainer.

1 FIRST STEPS

You should read this chapter even if you do not read any other. It provides important basic information to help you in using your computer. It is the minimum you need to know in order to use your computer safely and with ease.

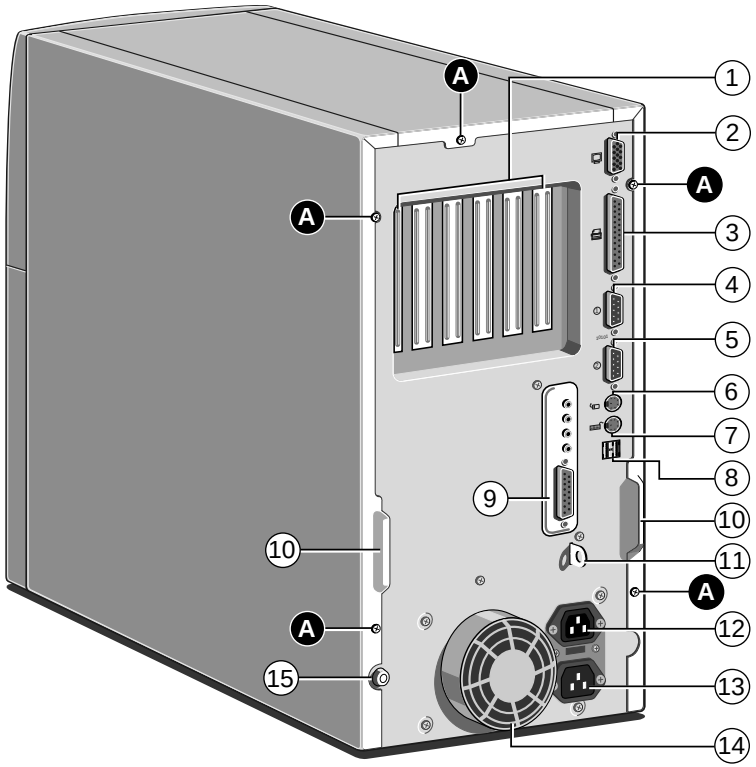
System front



1	Energy saving button and LED	5	Available drive bays
2	Front lifting point *	6	Power button
3	Floppy diskette drive	7	System LEDs: Upper - Not used on this model Middle - Hard disk active Lower - Power-on
4	Optional CD-ROM drive -or optional PD drive		

* **Not to be used on its own**

Rear View



1	Rear of expansion bay	9	Audio (option), see next page for details
2	VGA port for monitor signal cable	10	Handles to assist during side panel removal
3	Parallel or printer port	11	Security loop for cable or padlock
4	Serial port 2	12	AC power output for monitor
5	Serial port 1	13	AC power input from supply
6	PS/2 port for mouse	14	Protection cover for PSU fan *
7	PS/2 port for keyboard	15	Main side panel locking
8	Dual stacked USB port	**A**	**Panel fixing screws**

*** DO NOT use to lift system**

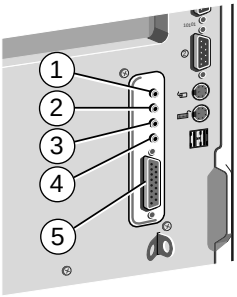
Security

The security case-lock (15), can help prevent unauthorised removal of the cover, while the security loop, (11) above, can be used for either alarmed loop cable or anchoring cable.

Audio subsystem (option)

The optional motherboard sound system is a Creative Labs Vibra16. Audio output from the CD-ROM drive is internally connected to the Vibra sound system. Details of the internal connections are given in the motherboard chapter.

There is a built-in amplifier suitable for driving headphones and passive speakers. Phantom power is provided for microphone types that require this facility (Electret type). Speakers and microphone should be 8 Ohm impedance minimum.

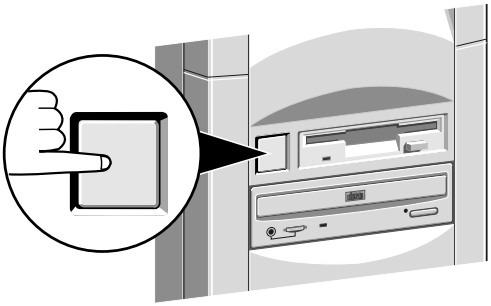


1. Speakers	4. Microphone
2. Line out	5. Joystick/MIDI port
3. Line in	

Turning on and booting the computer

Turning the power on

To turn on the computer, press the POWER button. The POWER-ON LED should come on to show that the system unit is powered. The monitor has its own power control (see the monitor's *User's Guide* for details) it may take a few moments to warm up.



If nothing happens 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. See also the chapter on '*Troubleshooting*'.

Power-on self-test

Whenever the computer is turned on, the 'power-on self test' (POST) routine checks the actual set-up of the computer against that recorded in its internal configuration memory.

The boot sequence

Provided that POST succeeds without any serious errors, the computer looks for its operating system to start it going, that is, it attempts to *boot*. By default, the computer will first look for a floppy *system disk*, then for a *bootable hard disk* partition or area.

System disk

A floppy disk bearing at least the rudiments of an operating system. If the computer detects a disk in the floppy drive, it tries to boot from it. If it is a non-system disk, the computer will ask you to replace it.

Bootable hard disk

Most computers with a hard disk containing pre-installed software arrive set up with a suitable 'boot partition'. The operating system is usually already in place or *pre-installed* on this, the **C:** drive. The C: drive is usually made 'active', i.e. *the bootable hard disk*.

Energy Saving features

Energy saving is normally enabled in the Power management section of the system BIOS. If the system is left unattended for more than a predetermined time, energy saving features come into play. The screen will blank, components will slow down, software will still run, but very slowly. The system is still powered, (the 'Power-on' LED will still be lit).

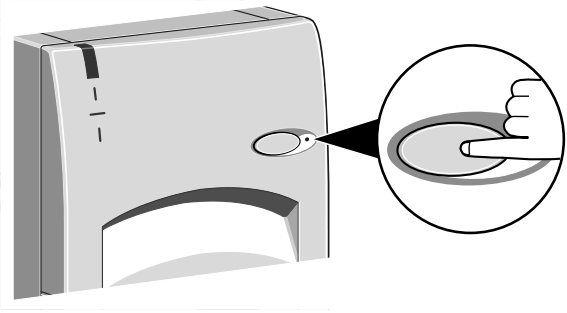
An additional LED is provided near the **purple button** to warn you that 'Low power' mode is operative.

Warning

The energy saving features built into this computer are designed to be used with the monitor supplied with the system. If you wish to use another, or older monitor ***it may not*** *be compatible and* ***permanent damage may be caused****. Check with your Apricot dealer.*

To restart the system, just move the mouse or press a keyboard key. Everything will return to the exact state in which it was left.

You may instead press the purple button to restore the system. This button can also be pressed while you are using the system, to override the time-out and force the system into the low power mode. The power management section of the system BIOS gives access to the control settings of the 'low power' mode.



Turning the power off

Remember these two simple points:

- Close down any applications you are running and save any files you have altered or created. Data held only in the computer's memory **will be lost** when you turn off the computer.
- Always exit from, or 'shut down' Windows. This procedure deletes the temporary operational files it creates and will close down everything in an orderly manner.

You will usually be prompted to save any work you may have forgotten in any 'minimised' applications, for example a spreadsheet working in the background.

To turn off the computer, simply press the POWER button again. If the monitor is powered from the system unit, it will be turned off at the same time. Wait 10 to 20 seconds before turning on again. The computer may not initialise itself properly if you turn it off and on again in quick succession.

It may be advantageous on some occasions to use the 'Energy Saving' features of the computer. Press the purple button on the front panel to switch into the standby mode. This will allow you to start up more quickly when you return to use the system again.

Removing panels

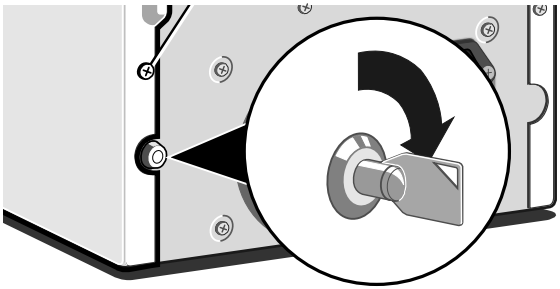
For normal access to the motherboard, only the main side panel requires removing, but for fitting expansion boards the main side panel and the top panel both have to be removed. Both side panels will require removal if any drives are to be fitted into the remaining drive bays.

Warning

Turn off the computer, along with all peripherals, and unplug all power cords before removing any panels. Take suitable antistatic precautions while any of the system panels have been removed.

Main panel

1. Unlock the cover with the special key provided. It can be found on the rear of the system.



2. Release the appropriate panel screws.
3. Slide the panel carefully towards the rear of the system using the handle provided.
4. After about 2 to 3 cm movement it is possible to lift the panel vertically clear of the system.

The motherboard and all of its components are now accessible.

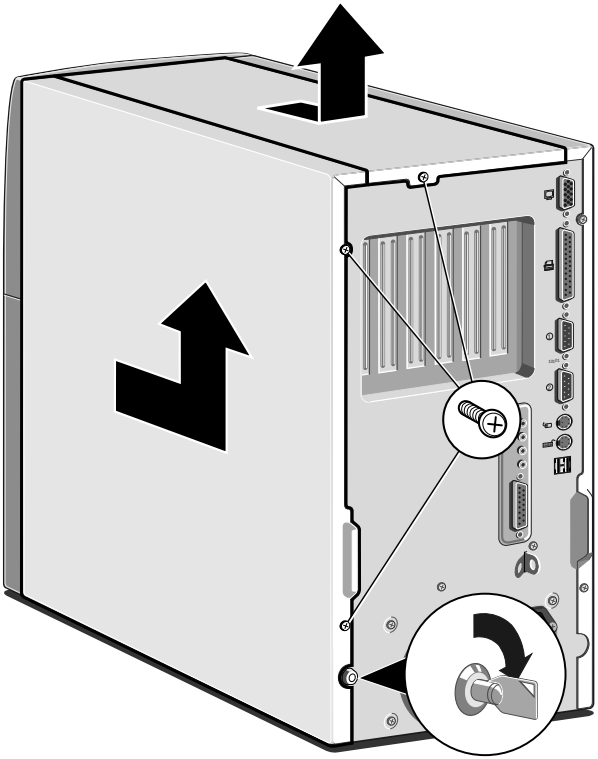
Caution

Exercise care with the removed panels as there are metal fixings and hooks on the inside. These may scratch delicate surfaces.

Top panel

1. First remove the main side panel as detailed above.
2. Remove the top panel retaining screw.
3. Again slide the panel towards the rear of the system.
4. After 2 to 3 cm the panel should be free to lift off.

You can now safely access or fit expansion cards.



Other side panel

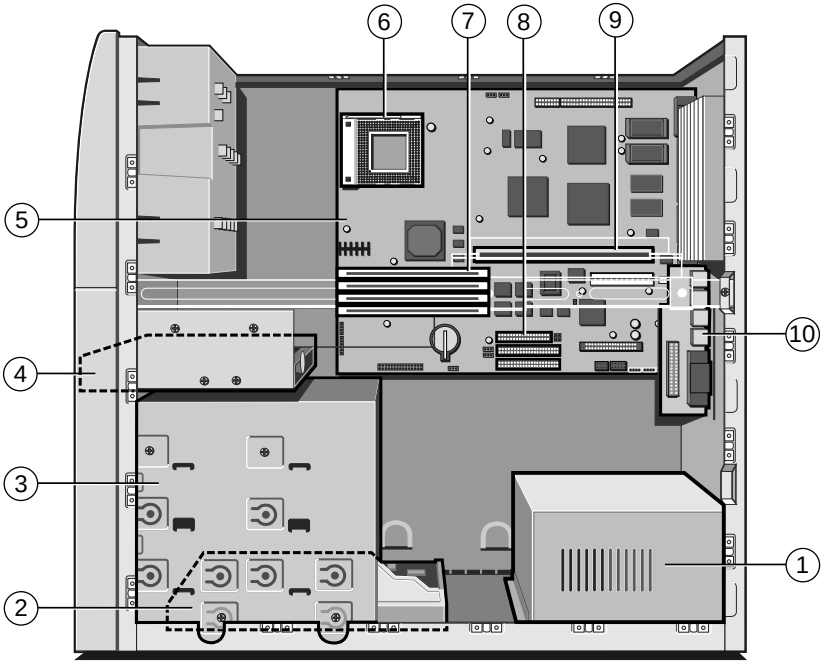
This panel only needs to be removed for access to the drive bay fixing screws. No other components can be reached from this side.

1. Remove the two panel securing screws.
2. Slide the panel carefully towards the rear of the system using the handle provided.
3. After about 2 to 3 cm movement it is possible to lift the panel vertically clear of the system.

The access window to the drive mounting screws is now clearly visible. For instructions on fitting drives see the chapter on upgrading your system.

The internal layout

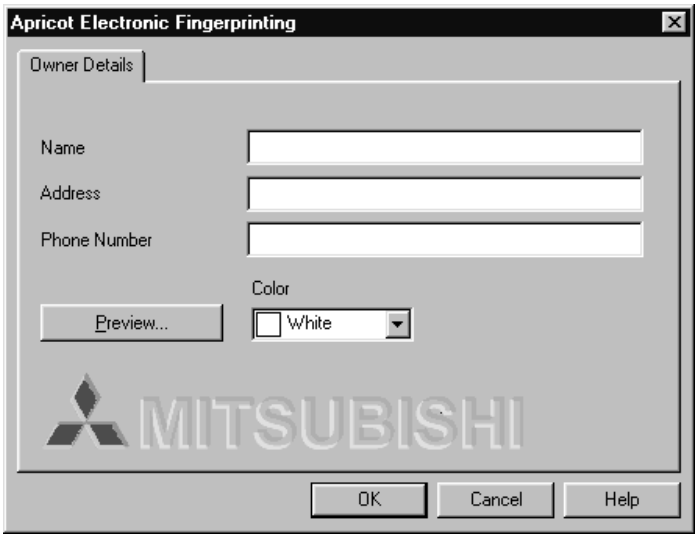
Please note that for clarity, all the internal ribbon and power connections are not shown.



1	Power supply	6	Processor socket
2	First hard disk	7	Memory, banks 1 and 2
3	Main drive housing -CD-ROM at top	8	Connections for drive ribbon cables
4	Floppy diskette drive	9	Expansion riser
5	Motherboard (see motherboard chapter for details)	10	Audio board (see page 1/3 for connection details)

Electronic Fingerprinting (option)

Electronic Fingerprinting allows information you supply to be stored in part of the computer's permanent memory. This is then displayed every time the computer is switched on. It is intended that this information includes your name, address and phone number so that if your computer is stolen it can be traced back to you.



Extremely important

1. *The first time you use the Electronic Fingerprinting application a unique 'fall-back' password will be displayed. This is a 12-digit number and can be used, in an emergency, if you should forget your password.* ***You must therefore make a note of this number****, this is the only time you will ever see it. A page at the back of the manual is provided for you to note it down. Cut it out and keep it in a safe place.*
2. *If you have not yet 'branded' your computer it is advisable that you do so before somebody else gains access to your computer and sets a branding message and password which could then prevent you having access to your own computer.*

Note

You will be able to change any of the items in your branding details by running the Electronic Fingerprinting application later and entering the correct password. This would be necessary, for example, if you moved office or passed the system over to someone else.

After you have entered your details you will be prompted to set a password. This prevents anybody else from gaining access to your personal details or changing them. Optionally, for extra security Electronic Fingerprinting can be set such that this same password is requested every time the computer is switched on.

Until you have entered your branding details the Electronic Fingerprinting application will automatically run each time the system software starts. Thereafter, Electronic Fingerprinting can be run by selecting its icon which is displayed at the top of the Start bar menu and entering your password.

Please refer to the on-line help file for further details.

Caution

*If you set a **Power On Password** in the system BIOS, this will still be effective and must be entered. It will be requested immediately **AFTER** the fingerprint password has been verified.*

2 THE SYSTEM DRIVES

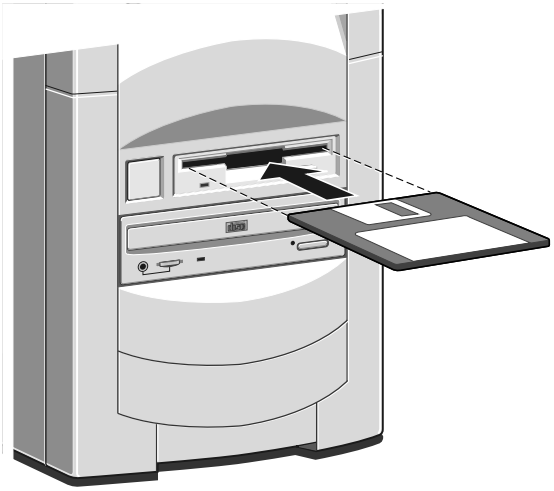
Using the floppy disk drive

The floppy disk drive is usually configured in the system BIOS as drive **A:**, with a capacity of **1.44 Mbytes.**

Floppy disks should be kept away from bright sunlight, dust, moisture and any strong magnetic fields. Avoid opening the metal window on the disk as this exposes the magnetic surface to contamination which could render the disk useless.

Inserting a floppy disk

1. Insert the disk with the metal window first, with the label side uppermost into the drive. This will push open the drive door.



2. Push the disk gently home until it 'clicks' into place. The drive button will also move outwards slightly. The drive door will stay open, leaving the disk just visible
3. The system should now be able to access the disk and the information it may contain. While the system is accessing the disk, the 'drive active' LED, opposite the button, should be lit.

Pressing the drive button will eject the floppy disk, but avoid doing so while the drive active light is on, as this may cause damage to the disk or the drive.

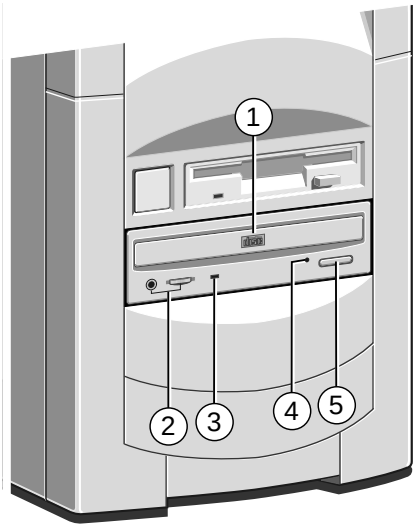
Optional CD-ROM drive

A CD-ROM drive has a wide range of uses. The majority of application and operating system software is currently supplied in the CD-ROM format only. You require a special drive and disk to write to CDs.

The drive can retrieve multimedia data from CD-ROM disks and multi-session Photo-CD disks. It can also play audio CDs.

The CD-ROM LED flashes when the CD-ROM tray is opened, and when it is active (i.e. busy reading information).

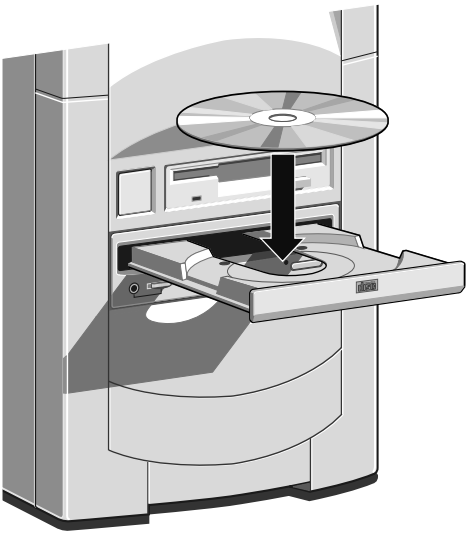
It is important that the computer is not moved while a CD is in the drive, especially if the CD is being played at the time.



1. Disc drawer	4. Emergency eject hole
2. Headphone jack and volume	5. Eject button
3. Activity light	

Inserting a compact disc

1. Press the EJECT button on the front of drive.
2. Place the CD centrally, printed side up, on the platter.
3. 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.
4. Wait a few seconds for the drive to spin up to full speed before either attempting to play audio tracks or read data from the disk.



Warning

The laser beam inside the CD-ROM drive is harmful to the eyes if looked at directly. Do not attempt to remove the drive cover or otherwise disassemble the CD-ROM drive. If a fault occurs, call an authorised maintainer.

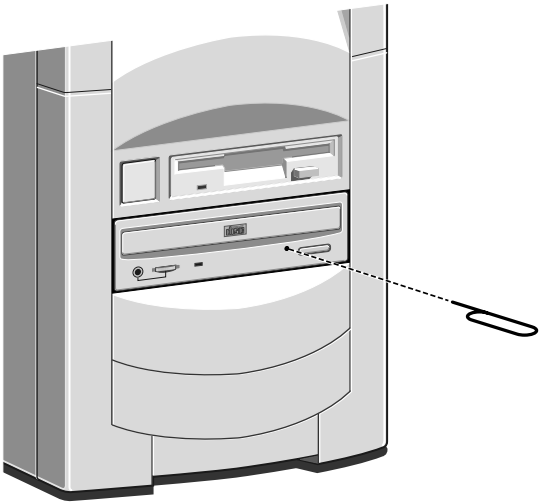
To remove a compact disc, press the eject button and then lift it out by its edges. It is best to close the drawer, to prevent dust getting in, unless you intend to put in a new CD.

Care of CDs

Keep CDs well away from dust and moisture, and avoid touching the surface of the CD. Avoid extremes of temperature and exposure to direct sunlight as these may cause the disk to warp.

Always store CDs in their original cases wherever possible. Replacement cases are readily available in record stores. CD storage racks are useful as you will find the majority of new software is now supplied in CD format.

Emergency CD removal



To remove a CD manually (for example, during a power failure) you must first ensure that the computer is turned off. Insert a thin metal rod (such as an unwound paper clip) into the emergency eject hole. Push carefully and firmly.

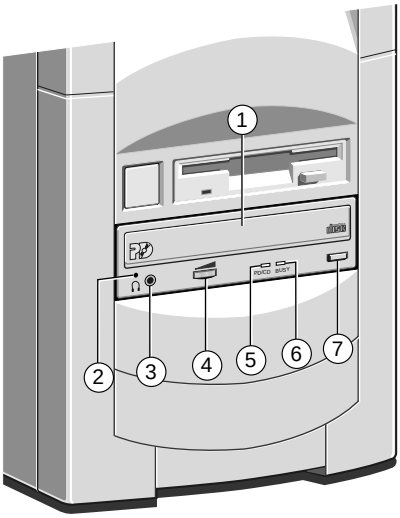
Optional PD drive

This dual purpose drive can be fitted as an option into any system where both a CD-ROM drive and an efficient re-writable backup device is needed.

There is an indicator LED to show the type of media which has been inserted, green for CD and amber for a cartridge. The rest of the controls are very similar to a conventional CD-ROM drive.

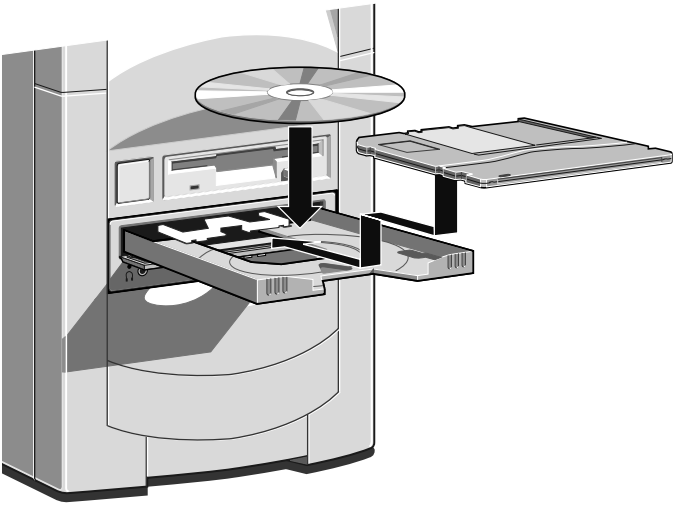
The drive can use any PD cartridges bearing the PD logo. If the cartridge is not formatted you will be prompted to format it. All the standard types of CD can be used in this drive, data, music etc., including the mini-CD.

The Phase-change drive will occupy the same space as the conventional CD-ROM drive, with the minor differences in controls as shown in the illustration.

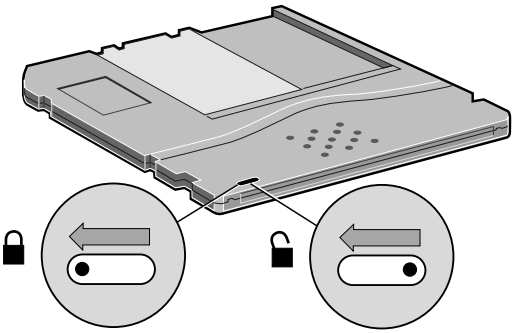


1. Drive tray	5. Media indicator
2. Emergency eject	6. Drive active indicator
3. Headphone socket	7. Tray eject button
4. Headphone volume	

The drive can handle the large and small types of CD-ROM (as well as music CDs), or it will accept the PD recordable cartridge:



These cartridges have a capacity similar to a CD-ROM but with the difference of being re-writable. They have a shelf life of 30 years or more, unlike magnetic material which decays over a relatively short period of time. Like floppy disks they have a write protect switch.



The drive control software provides two icons, each with its own drive letter. These will be found in Windows Explorer, or the drives section in the control panel. One is for use with data cartridges, the other is for CD-ROM and is easily identified as such with a CD symbol. Emergency removal of the media under conditions such as a power failure is similar in method to that of the conventional CD-ROM drive as detailed earlier.

Cleaning your drives

Cleaning a floppy drive

Do not insert cotton buds or other implements into the drive door. If you think the drive needs cleaning, obtain a specialist cleaning kit from a reputable supplier. They are supplied with detailed instructions.

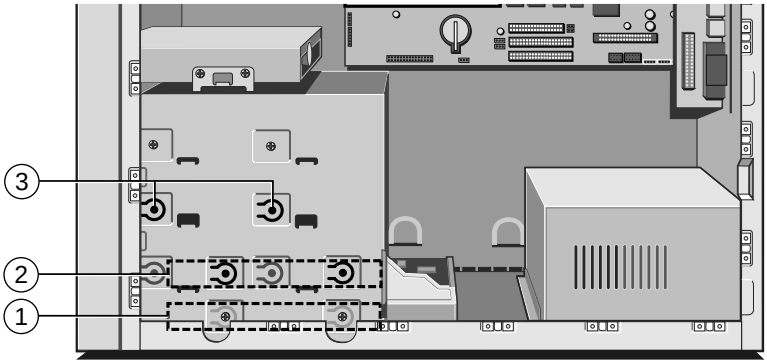
It looks like a floppy disk, but has a special head cleaning surface inside which removes dust and fluff from the reading heads and the mechanism. They should be used only once and then discarded.

Cleaning the CD-ROM or PD drive

It is recommended that you occasionally use a specialist CD cleaning disk to clean the lens in the drive as it may become dusty and fail to operate. Specialist cleaning kits are available from reputable suppliers and come with detailed instructions. They should be used only once and then discarded.

3 ADDING NEW DRIVES

New drive locations



1	First hard disk drive (HDD)	3	Spare drive bay
2	Space for second HDD		

IDE hard drives

Your computer can support more than one IDE hard disk drive. A single drive, or the 'bootable' device in a system, will be configured as 'master'. The second, non-bootable drive in a dual drive system, when fitted, must be configured as a 'slave'. The master drive may be supplied with more than one partition.

Caution

Apricot Computers Ltd tests many types of hard disks from a variety of manufacturers and all of our upgrade parts are guaranteed. The quality or compatibility of drives obtained from any other source cannot be guaranteed. Any damage caused by fitting non approved drives will not be covered by the system warranty.

To install an IDE hard disk drive

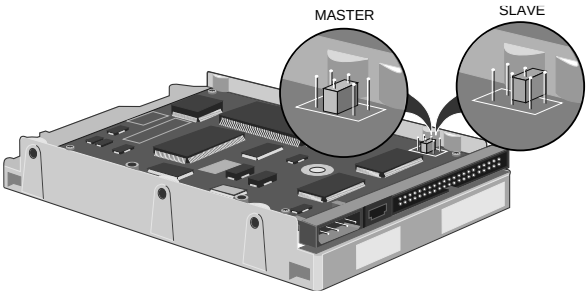
New hard disk drives are available from your Apricot supplier. It is not a difficult procedure, but if you do not feel confident about it,

you could have your supplier or service organisation complete it for you.

1. Turn off the computer and unplug all power cords. Take suitable anti-static precautions and remove the system side panels. Detailed instructions for this are given in chapter 1.

Caution
If you are unfamiliar with the recommended anti-static precautions, refer to the antistatic section at the rear of this handbook.

2. Carefully remove the front bezel blanking insert by pushing it off from the rear with a blunt point. A hole for this is provided inside the system, alongside the metal drive cage.
3. Pull out the blanking plate on the front of the internal drive bay metalwork.
4. Check the master/slave link on the new hard drive is set for 'slave' drive. The link across '**DS**' should be removed but kept for safety by placing it onto one of the pins. A typical drive is illustrated here:



5. Remove the drive mounting plate from its position inside the drive bay and fix it to the new HDD.
6. Slide the assembly into the drive bay from the front and secure it with the screws into the space immediately above the existing hard drive.
7. Connect a power cable from one of the available unused ones.
8. Connect the hard disk ribbon cable to the new drive. The ribbon is striped to indicate pin 1, which usually goes to the end nearest the power connector.

9. Refit the system side panels, metal plate and bezel insert.

It will now be necessary to run the disk preparation utilities to partition and format the disk to your requirements. Your software guide or the operating system HELP should provide information on this topic.

Fitting new drives/accessories

There is sometimes a requirement to fit extra components into the system, such as Tape drives, extra CD-ROM drives etc.

The drive or accessory you are about to install should have fixing and installation instructions with it, making it a fairly simple task. If you do not feel confident about the procedure you could have your supplier or service organisation complete it for you.

1. Turn off the computer and unplug all power cords. Take suitable anti-static precautions and remove both of the system side panels. It may also be necessary to remove the top panel. Detailed instructions for this are given in chapter 1.

Caution
If you are unfamiliar with the recommended anti-static precautions, refer to the antistatic section at the rear of this handbook.

2. Carefully remove the front bezel blanking insert by pushing it off from the rear with a blunt point. A hole for this is provided inside the system, alongside the metal drive cage.
3. Pull out the blanking plate on the front of the internal drive bay metalwork.
4. Check before sliding the device into the system, that any required links have been correctly set, for example, SCSI 'ID'.
5. Carefully slide the new device into the bay and secure it with screws on both sides, as illustrated at the beginning of this chapter. Make sure that the front of the device is aligned as close as possible to the front bezel.
6. Connect a suitable power cable from one of the available unused ones.

7. Install any control card supplied with the drive, by following the detailed information given in chapter 4.
8. Follow any additional instructions provided as regards to signal cable connection etc.
9. After checking that no other cables have become dislodged or trapped, refit the system panels.
10. Follow any further instructions as given in any supplied manuals, such as software or configuration requirements.

4 EXPANSION CARDS

If, having read the following installation instructions, you do not feel confident about installing expansion cards yourself you may wish your supplier or service organisation to fit the card for you.

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

Warning
Never carry out any work on the equipment with power applied. Always switch off at the supply and remove the power lead from the equipment before starting work.

Configuring the card

The documentation accompanying the card should tell you what is required. Remember to check any diskettes supplied with the card for README or other help files, **before** you start. If you are in any doubt consult the supplier or manufacturer.

If manual configuration is required, usually with 'Industry Standard Architecture' (ISA) cards, then 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 in the computer, whether another card or a component on the motherboard, the settings must not **conflict.**

Some settings are done by jumpers and/or switches on the card and are best done **before** installation, others are configured by running installation software after installation. 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.

Caution

This system complies with the CE marking directive and its strict legal requirements. Use only Apricot tested and approved parts. Failure to do so may result in invalidating both the compliance and your warranty. All expansion cards or upgrade components must carry CE marking.

ISA Interrupt request level (IRQ)

The interrupt request level or IRQ is the line over which the expansion card sends a signal to get the attention of, or interrupt, the processor. Many 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, as shown in the following table:

IRQ	*Default assignment*	*Available?*
IRQ0	System timer	No
IRQ1	Keyboard controller	No
IRQ2	System	No
IRQ3	Serial port 2	Optionally
IRQ4	Serial port 1	Optionally
IRQ5	Audio (if fitted)	Yes
IRQ6	Diskette controller	No
IRQ7	Parallel port	Optionally
IRQ8	Real time clock	No
IRQ9		Yes
IRQ10		Yes
IRQ11		Yes
IRQ12	Mouse	No
IRQ13	Coprocessor	No
IRQ14	Primary ATA/IDE interface	Optionally
IRQ15	Secondary ATA/IDE interface	Optionally

IRQ3 is available if you disable serial port 2 with the BIOS Setup utility.

IRQ4 is available if you disable serial port 1.

Do not disable either one unless you have no intention of using the affected port. Similarly, if you have no intention of using the parallel port, you can disable it with the BIOS Setup utility, completely freeing IRQ7 for use by an expansion card.

Direct memory access (DMA) channel

Some hardware devices can use a DMA channel to access system memory without directly burdening the processor. Computers have DMA channels numbered DMA0 to DMA7. The following table gives details of which ones may be available:

DMA	*Default assignment*	*Available?*
DMA0		Yes
DMA1	Default (8 bit) Audio	Optionally
DMA2	Diskette/floppy disk controller	No
DMA3	Enhanced Capabilities Port (default)	Optionally
DMA4	System	No
DMA5	Default (16 bit) Audio	Optionally
DMA6		Yes
DMA7		Yes

Base input/output (I/O) port address

I/O ports are used by the processor to communicate with hardware devices. Some expansion cards are also controlled by I/O ports. The base I/O port address specifies where the card's ports begin. The following table lists the I/O ports used by devices on the motherboard. Any ports not listed below may be available for an expansion card. This extensive list continues on the next page.

I/O ports	*Default assignment*
000h-01Fh	DMA controller 1
020h-021h	Interrupt controller 1
034h, 038h, 03Ch	Alternate Local bus ATA/IDE
040h-05Fh	System timer
060h-06Fh	Keyboard controller
070h-07Fh	Real-time clock, NMI mask

I/O ports	Default assignment
080h-09Fh	DMA page register
0A0h-0A1h	Interrupt controller 2
0B4h, 0B8h, 0BCh	Local bus ATA/IDE
0C0h-0DFh	DMA controller 2
0F0h, 0F1h	Math coprocessor busy (clear/reset)
0F8h-0FFh	Math coprocessor
1F0h-1F7h	Hard disk drive controller
200h-207h	Game I/O (disable)
220h-22Fh, 230h-233Fh	Sound blaster system
240h-24Fh, 250h-253Fh	Alternate Sound blaster system
278h-27Fh	Parallel port 2
2B0h-2DFh	Alternate VGA
2F8h-2FFh	Serial port 2
300h-301Fh	Alternate MIDI (disable)
330h-331Fh	MIDI
378h-37Fh	Parallel port 1
388h-38Fh	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 1

Base memory address

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

In order that this memory can be recognised by the system processor, it must be mapped somewhere within the computer's own address space. By setting the base memory address you specify

where the card's memory begins within the address space. Typically, an expansion card's memory must be mapped onto the addresses between C8000h and DFFFF in upper memory. With most modern expansion cards this is fully automatic.

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.

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.

Installing a card

Installing expansion cards can be one of the most difficult operations you may ever perform within your computer. If you are in any doubt, or come into difficulties you are unable to resolve, contact the supplier of the expansion card or ask your Apricot dealer for advice or assistance.

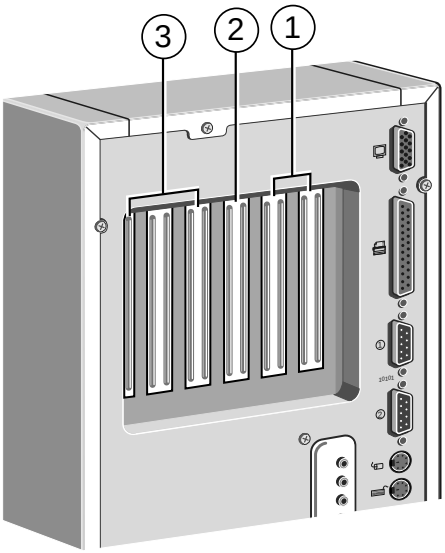
1. Turn off the computer and unplug all power cords. Take suitable anti-static precautions and remove the system side and top panels, detailed information is given in chapter 1.

Caution
If you are unfamiliar with the recommended anti-static precautions, refer to the antistatic section at the rear of this handbook.

2. At the rear of the system unit are metal blanking plates, one for each expansion card slot. To ensure the front edge of a full length card is securely supported you will find card guides on the front of the machine, on the back of the fan assembly.

3. First decide in which of the available slots you wish to install the card. Not all slots will accept the same type of card.

4. Remove the blanking plate of the chosen slot by removing its securing screw, then sliding the blanking plate out of its slot. Keep the screw, it will be needed later to secure the card.

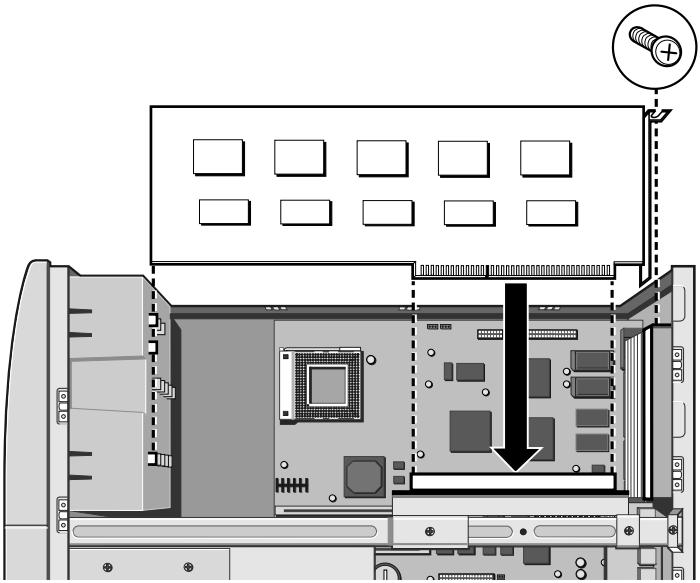


1	Full PCI	3	Full ISA
2	Full PCI/ISA shared slot		

5. If the card you are installing is configured by the means of jumpers or switches, check that it is correctly configured before proceeding.

Note
If the card uses the video feature connector (VFC) on the motherboard, or any separately installed video board, you may need to connect this ***before*** *you install the card.*

6. Position the expansion card alongside the slot in which you wish to install it. If it is a full length card, align the end with the slot in the rear of the fan assembly,



7. Slide the card into the slot ensuring that the card edge connector engages correctly with the socket on the riser board. **Do not** use excessive force.
8. Secure the card by replacing the screw that you removed in Step 5.
9. Connect any necessary signal cables to the card. See the documentation for the card for information.
10. Check to ensure no other cables or connectors have become dislodged and replace the system panels.
11. Read the manuals supplied with the card and follow any other installation requirements, such as software etc.

5 TROUBLESHOOTING

This chapter offers advice if you suspect a fault with your computer. It is concerned mainly with problems caused by the computer itself, problems more often arise from other sources such as your operating system or application software.

It must also be remembered that it can be very easy to leave off or dislodge cables and connectors inside the computer when fitting expansion cards, or upgrading the motherboard, or indeed anything that may require temporary removal of the system cover.

If in doubt

Turn off the computer and unplug the power cord before consulting your supplier or maintenance provider. Make a note of any of the symptoms, error codes, display messages etc., before calling.

Problems when starting

If you suspect a blown fuse

In the United Kingdom, and some other countries, AC plugs contain fuses. Your Apricot computer is initially supplied and fitted with the correct fuse for operation in the country in which it is sold. If the fuse in the system's unit 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 your supplier or maintenance provider.
5. If the replacement fuse does not blow, reconnect one peripheral at a time and switch it on. Repeat this step for each peripheral in turn.

Power-on self-test (POST)

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

If POST detects a hardware fault, one or more POST error codes and messages are displayed. A full list of these is given at the end of '*System BIOS and Setup'*. You may also be prompted to "Press the F1 key to continue" or "Press any key when ready".

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 transitory or persistent. Persistent POST errors may indicate a fault in the system.

- Check that all external cables are securely connected.
- Try running the BIOS Setup utility to reconfigure the system.
- Open up the system unit and check that all internal signal and power cables are securely connected.

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

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

Boot failure message	Explanation
	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 the drive is correctly specified in the BIOS setup utility. If the problem persists, insert a system diskette, press F1, backup 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 contact your supplier or authorised maintainer.

Beep Codes

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

The system may halt completely with some of the errors and the beep code will keep repeating after a brief pause.

Number of beeps	Explanation
No beeps	If no beeps are heard at all the speaker may be disconnected or there may be a speaker circuitry fault.
One short beep	Marks the completion of POST and no functional errors found. You will also get a single beep if you press an invalid key for a power-on password.
Two short beeps	Indicates and draws your attention to an error during POST. This should be accompanied by an error message.
Three short beeps	System memory error, normally accompanied by code 201. Beeps are used when the video cannot display the code.
Continuous beep	Could indicate a serious failure of the system motherboard, or a failure of the speaker circuitry.
Repeating short beeps	Usually indicative of a keyboard key stuck down, but may be due to the keyboard interface failing.
One long and one short beep	POST has detected an error on the video adapter in the system. There may be no display on the screen.

Number of beeps	Explanation
One long and two short beeps	This means that either the video system is faulty, or that a video I/O adapter ROM is not readable.
Two long and two short beeps	The video subsystem cannot be supported by the main system POST. This can occur when the video subsystem is replaced or changed on site.

Many of these following codes indicate a more serious fault in which the BIOS stops. Switch off for 20-30 seconds and try again. If the fault persists, make a note of it and call your maintenance provider.

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

Troubleshooting checklist

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

Connections

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

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

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

Power

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

Monitor

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

If you have fitted a new video controller expansion card and subsequently encounter problems try disabling the on-board video controller by removing a jumper from the motherboard. See the chapter '*System motherboard*' for more information.

Expansion cards

If an expansion card does not work, check that all internal cables are securely connected, 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. Check in the chapter, *'Expansion Cards'* for information, and in '*System BIOS and Setup'* to see whether your chosen settings are useable.

System BIOS

Check finally the system BIOS to ensure that it has not been disturbed from the original settings. a **Notes** area is provided within the '*System BIOS and Setup'* chapter to make a note of your current or original BIOS settings.

If the settings appear to have altered, there may be a fault with the CMOS battery. See *'System motherboard'* and '*System BIOS and Setup'*.

The system's disk drives

Refer also to Chapter 2, '*Using your computer'.*

Floppy disk drive

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 BIOS allow the intended access.

Some application software also may not allow you to read or write to floppy disks during certain other operations, or until you are about to exit the programme.

Optional CD-ROM drive

If you have problems accessing a CD, check that you have allowed a few seconds for the disk to spin up to full speed, that the disk is the correct way up in the drive, printed side upwards, and that it is a data CD.

Remember that with a conventional CD-ROM drive you cannot write to a CD.

Optional PD drive

Check the type of media in the drive, CD or PD disk cartridge. Remember that the PD cartridge needs the disk inside to be formatted to allow it to be written to. Check, as with a floppy drive, that the cartridge is not write protected.

Make sure that you are trying to access the drive by the correct icon for the media in use.

Hard disk drive

If you encounter problems accessing any IDE 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 permission assigned by the operating system allow the intended access.

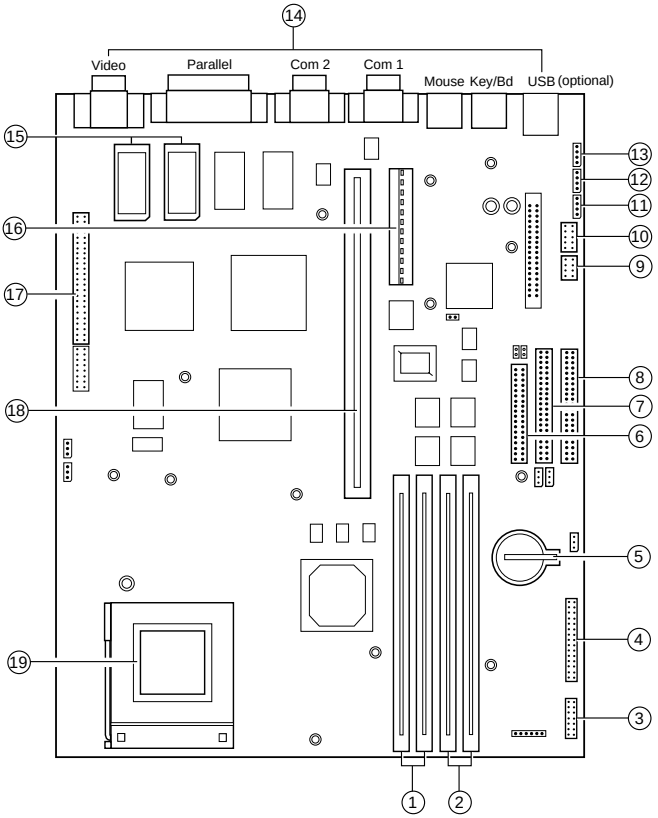
SCSI drives

If you have just fitted a new SCSI drive, or device, check that you have used a valid 'ID' that does not conflict with other SCSI drives or devices is the system. Look in any documentation for information.

On boot up, just after POST, a list is displayed of the devices attached to the SCSI interface, which shows the device, its parameters and the set 'ID'.

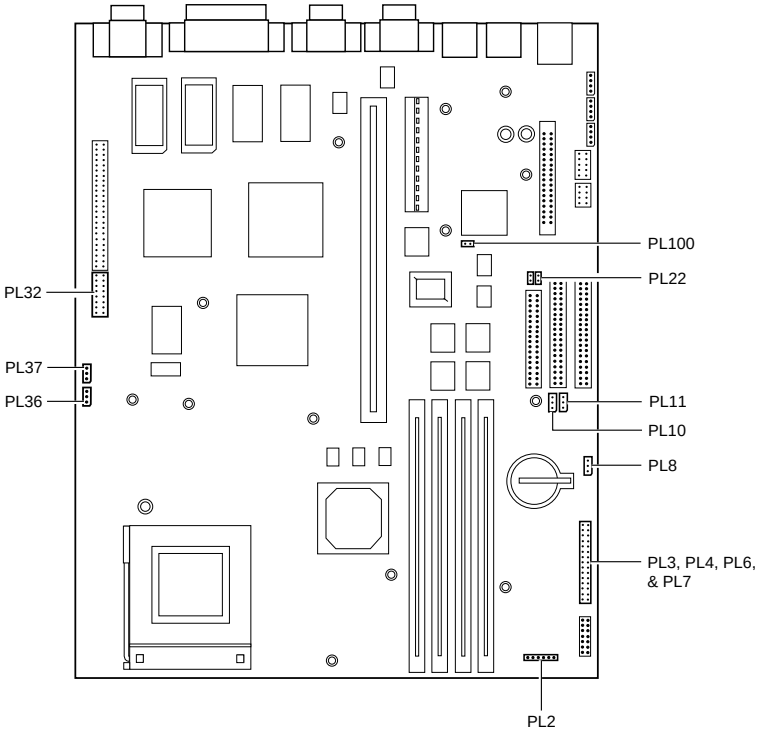
6 SYSTEM MOTHERBOARD

Principal features



1	Memory sockets 1, 2 (SIMMs)	11	Radio card audio connector
2	Memory sockets 3, 4 (SIMMs)	12	TV card audio connector
3	PL20, Front panel connector	13	CD audio connector
4	Pls 3, 4, 6, 7 Case feature connectors	14	External ports
5	CMOS Battery (type CR2032)	15	Video memory sockets
6	Floppy drive ribbon connector	16	Power supply connections
7	Secondary IDE connector (CD-ROMs)	17	Video feature connection (VFC)
8	Primary IDE connector (HDDs)	18	Expansion riser board socket
9	Wave table connection	19	Processor ZIF socket
10	Modem audio connector		

Jumpers and connections



Caution

Do not alter any jumper settings under normal operation. You may cause permanent damage to the motherboard or its components.

All jumpers are set at the factory and should not be changed.

'1-2' = jumpers should be fitted across pins 1 and 2.

'2-3' = jumpers should be fitted across pins 2 and 3, etc.

'Open' or 'O' = no jumpers should be fitted.

'Closed' or 'X' = jumpers should be fitted

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

Clear BIOS settings, PL8

Moving the link to pins 2-3, from the default position 1-2, disconnects the battery from the CMOS and will erase all the system settings. This should only be used as a last resort in the event of a password being totally lost and the link should be immediately returned to its original position. All the BIOS settings will need to be re-entered, see the chapter 'System BIOS and setup'.

Clearing CMOS	*PL8*
CMOS battery connected (default)	1-2
CMOS erase, >1 second to discharge	2-3

BIOS re-program, PL10, PL11

These links are for an official upgrade to the motherboard BIOS. They must not be moved for any other reason. Special software is required and the task should be carried out by authorised engineers.

Recovery, PL10	*Re-program, PL11*
1-2, normal	1-2, enable
2-3, recovery	2-3, normal

Floppy disk control mode, PL22

Floppy disk mode, PL22	*Link pins*
Full 3-mode operation	1-3
3rd mode, 1.2 Mb operation available in Japan only	

System Fan

Pins	*CPU Fansink PL37*	*Pins*	*Main fan PL36*
1	Ground	1	Ground
2	+12 volt supply	2	Controlled supply
3	Fan Fail	3	Ground

Soundblaster enable, PL100

Normal link 1-2, remove to disable sound.

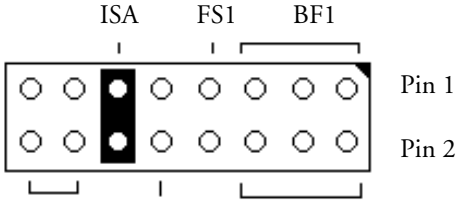
Internal speaker connections, PL2 (if fitted)

Pins	Function	Connection PL2
1	Stereo - Left	Left (stereo) speaker = pins 1 and 2
2	Audio ground	
3	Mono	Mono = pins 3 and 2
4	Link	Link 4 and 5 for mono
5	Stereo - Right	Right (stereo) speaker = pins 5 and 6
6	Audio ground	

Processor and BUS clock, PL32

Warning

Do not alter these links under normal circumstances as it could destroy the processor or other vital components on the board.



The 'ISA' link on 11-12 must be fitted on all processors above 100Mhz. Any links fitted on 13-14 or 15-16 are reserved and must not be moved.

Processor	Jumper block PL32			
	Multiplier		Bus frequency	
Pentium	BF1	BF0	FS1	FS0
100 MHz	1-3	2-4	7-8	O
120 MHz	1-3	4-6	O	9-10
133 MHz	1-3	4-6	7-8	O
150 MHz	3-5	4-6	O	9-10
166 MHz	3-5	4-6	7-8	O
200 MHz	3-5	2-4	7-8	O

System Connectors

The following system connectors are used to connect various features to the motherboard. You should not normally need to disturb these connections but they may become dislodged during work inside the system casing.

PL3	Pins	Pins	PL4
Power switch PSU control)	1	1	Standby switch
return	2	2	Standby switch return
PL6		3	Vcc
(Connected to pin 6)	1	4	Keyed
Keyed	2	5	IRDA input
Hard disk LED signal	3	6	Ground
Hard disk LED return	4	7	IRDA output
Ground	5	8	Ground
Keylock switch	6	9	Not used
Keylock switch return	7	10	Not used
Power ON LED signal	8	11	Speaker out (BEEP)
Power ON LED return	9	12	Message LED
Standby LED signal	10	13	Message LED return
Standby LED return	11	**PL7**	
Reset switch return	12	1	Not used
Reset switch	13	2	Not used

Front panel connector, PL20

Analogue ground	1	2	KEYED
No connection	3	4	No connection
No connection	5	6	No connection
Message LED (control 2)	7	8	No connection
Message LED (control 1)	9	10	5 V supply (fused)
IR transmit	11	12	RTS
IR receive	13	14	Digital ground

Replacing the CMOS battery

The battery has an average life of 3-5 years. If you have to reconfigure the computer every time you turn it on, the battery has discharged and needs replacing. The battery is a 3 volt lithium type CR2032 (or equivalent).

To replace the battery

1. Turn off the computer and unplug the power cord. Take suitable anti-static precautions and remove the system main side panel.
2. Identify the battery and holder (No5 on the diagram at the front of this chapter) on the motherboard.

Warning

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

2. Lift the edge of the battery far enough to clear the base of the holder, then slide the battery from under the contact spring.
3. Check the replacement battery is identical to the old battery.
4. Taking care not to touch the top or bottom surface of the battery, pick up the replacement with the positive (+) terminal upwards.
5. Slide the battery into the holder from the same side the old battery was removed.
6. Refit the system side panel.
7. Dispose of the old battery according to the maker's instructions.

When you turn on the computer you will have to run the BIOS Setup utility to re-enter the hardware configuration. If in any doubt refer to '*System BIOS and Setup'.*

Adding more 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 SIMMs 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), 60nS SIMMs **must** be used. SIMMs **must** be fitted in matching pairs, i.e., fill either **bank**:

- There are two pairs or banks of sockets. The sockets labelled MM1 and MM2 form Bank 1, and the sockets labelled MM3 and MM4 form Bank 2.

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

1. Turn off the computer and unplug all power cords. Take suitable anti-static precautions and remove the system main side panel, as detailed in the first chapter.

Caution

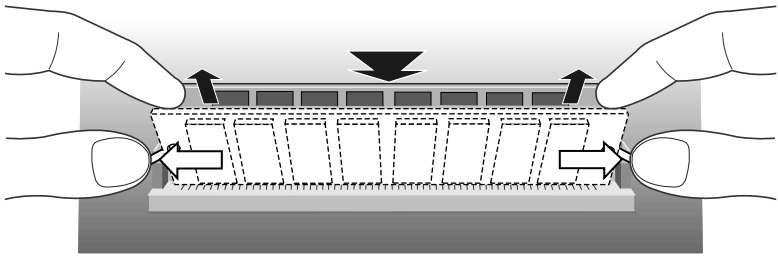
If you are unfamiliar with the recommended anti-static precautions, refer to the antistatic section at the rear of this handbook.

2. Use the illustration at the beginning of this chapter to identify the SIMM sockets. Some or all of the sockets will be occupied.
3. Compare the current configuration of SIMMs with the configuration for the memory upgrade you intend to install.
   - The following table details the supported memory configurations.

Total Memory	Bank 1 sockets		Bank 2 sockets	
	MM1	MM2	MM3	MM4
8 Mb	4 Mb	4 Mb	-	-
16 Mb	4 Mb	4 Mb	4 Mb	4 Mb
16 Mb	8 Mb	8 Mb	-	
24 Mb	8 Mb	8 Mb	4 Mb	4 Mb
32 Mb	16 Mb	16 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	-	-
72 Mb	32 Mb	32 Mb	4 Mb	4 Mb
80 Mb	32 Mb	32 Mb	8 Mb	8 Mb
96 Mb	32 Mb	32 Mb	16 Mb	16 Mb
128 Mb	32 Mb	32 Mb	32 Mb	32 Mb

To remove a SIMM

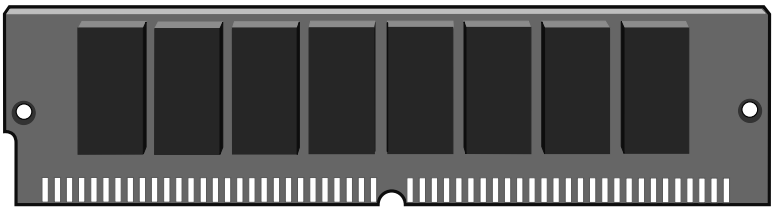
1. Gently disengage the metal holding clips on each side of the socket using your thumbs, while placing your forefingers on the top edge of the SIMM. Then tilt the SIMM forward to about 15° to the vertical.



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 a suitable anti-static packaging.

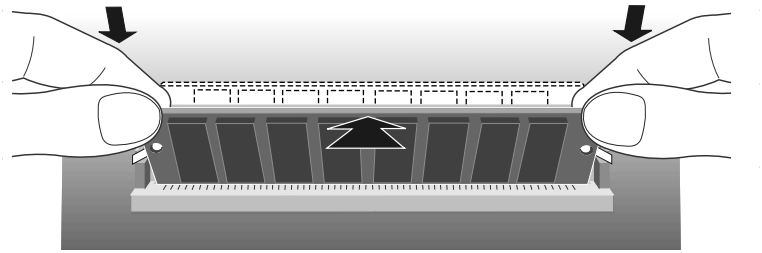
To install a SIMM

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



Note

The SIMM is not symmetrical. There are small notches in one end and also slightly off centre along the connection edge, as shown above. It will only fit into the socket one way.



2. Place the SIMM in the socket at a 15° angle to the vertical.
3. Pushing gently on its top corners, stand 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 of the SIMM firmly in position. ***Do not use excessive force***.
4. If the SIMM will not fit easily, remove it and start again.
5. Repeat these steps for each SIMM you want to install.

Reconfiguring the system

The first time you turn on the computer after adding or removing SIMMs the memory change will be automatically detected by the power-on self-test (POST). All you have to do is confirm the new configuration in the BIOS Setup utility (refer to *'System BIOS and Setup'* for more information).

If an error message occurs check that you have:

- Installed a configuration supported in the list above.
- Correctly fitted the SIMMs in their slots.
- Used SIMMs of the correct type.

It may be necessary to refit the original memory SIMMs to check if there is a problem with your new SIMMs. If in any doubt contact your supplier.

Upgrading the processor

The computer is supplied with a Pentium processor. The ZIF (zero insertion force) processor socket on the motherboard is designed to accept a variety of Intel Pentium processors.

You can upgrade your processor by replacing it with one of higher performance. The motherboard supports the full range of OverDrive processors known at the time of writing.

The system also supports a range of external clock speeds of 50, 60 and 66 megahertz (MHz). The clock speed is set by adjusting jumpers on the motherboard. Note that the external clock speed is lower than the processor's internal clock speed, which is usually the one advertised. The ratio of the internal and external clock speeds is known as the 'processor clock multiple'.

Removing the old processor

1. Turn off the computer and unplug all power cords. Take suitable anti-static precautions and remove the system main side panel and top panel. Detailed instructions for this are given in chapter 1.

Caution

If you are unfamiliar with the recommended anti-static precautions, refer to the antistatic section at the rear of this handbook.

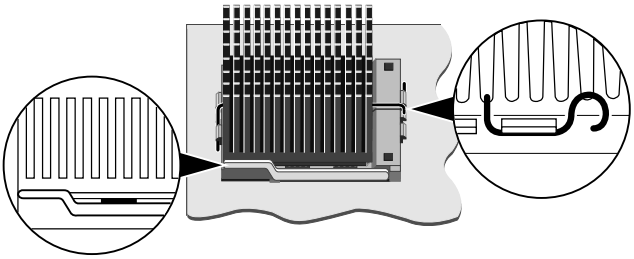
2. If the computer was turned on prior to commencing this procedure, ***wait at least 15 minutes*** for the processor to cool down before proceeding.

3. Use the illustration at the beginning of the chapter to locate the ZIF processor socket. The lever attached to the socket secures the processor in the socket.

4. You will need to remove the heatsink retaining clip *before* you attempt to lift the lever which secures the processor into the socket.

   ◊ 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.

5. Lift this lever (shown below) from its locked position until it is upright (at right-angles to the motherboard). The first and last 15° of movement may require significant effort. Apply just enough pressure to overcome the resistance offered by the lever.



6. Lift the processor out of the socket and place it on an anti-static surface outside the system unit. Hold the processor by its edges and avoid touching the metal pins.

Caution

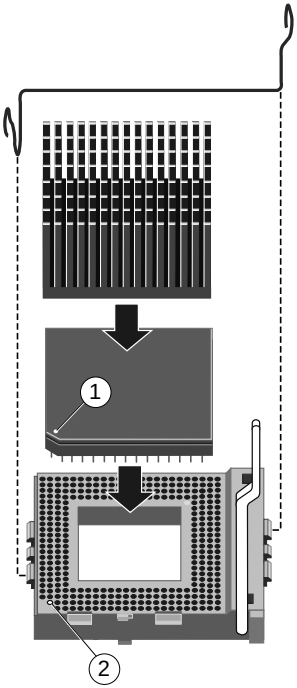
If the processor does not lift easily out of the socket, do not attempt to force it. Wait for the processor to cool down.

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 (see below). The corresponding corner of the processor is slightly bevelled and has a positioning guide in the form of a coloured dot.



1	Keyed corner	2	Positioning guide

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.

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.
6. You will need to adjust the processor speed selection jumpers on the motherboard. See the chapter '*System motherboard*' for more information about locating and adjusting jumper settings.
7. If necessary replace the expansion cards you removed earlier.
8. Replace the system panels.

7 SYSTEM BIOS AND SETUP

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 program), 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 authorised maintainer. This does require very specialist software.

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.

Caution

The BIOS has been set in our factory for the optimum system performance and operation. It is not advisable to alter any settings under normal use.

For your safety, you should make a note of your current BIOS settings as given on the ' System summary'. A space for this is provided on page 14 of this chapter.

Entering Setup

Immediately after switching on the Mitsubishi logo is displayed at the top right hand corner of the screen:

While this is visible you can press the **F1** key to start the BIOS Setup utility.

You cannot enter the BIOS setup at any other time or by any other method.

If Setup runs 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 at the end of this chapter. If a persistent fault is indicated, make a note of any new error messages and the current configuration settings before calling an authorised 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, instructions for this are given in the chapter: *'System motherboard'*.
- The computer's configuration may have been changed, for example by the addition of more system memory, or an expansion card. In this case you may have to define the new configuration.

Control keys

A number of keys are used to move around the BIOS Setup utility, select items on the screen and change the current configuration. The two lines at the bottom of the screen indicate what you can do at any given time. The following control keys can be used in the BIOS Setup utility:

Keys to use	*Function*
	Provides help on the highlighted topic, pressing it again transfers you to the general help pages.
	Exit either the setup, or go back a page if in a sub-menu.
	Scroll through a menu list.
	To toggle values or settings.
	The enter key, to select the highlighted item.
	Numbers, used in places where values are to be entered.
	Used when required, similar to numbers.
	Restores the original settings in force when you entered BIOS setup.
	To restore the original default settings. (Note: this does not restore date or time)

Main menu screen

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

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

Save Settings

Restore Settings

Load Default Settings

Exit Setup

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

A ▶ bullet next to a line indicates that BIOS setup detected a configuration error and attempted to correct it. This will be seen if Setup launches automatically on switch on, to indicate a contentious area or a change to be investigated.

The Save Settings options 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 system main settings. Changes made in other pages will be reflected here. Make a note (**on page 13**) of the information on this page before you progress any further or make any changes.

Product Data

This page cannot be edited, it gives details of the Machine Type/Model and the System Serial Number.

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.

Port B will be greyed out on those systems which are provided with an infra-red remote receiver.

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 etc., 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.

Mouse

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

Diskette Controller

This option enables the use of the floppy diskette drives. You should not normally disable this setting.

Diskette Drive A/B

This lets you specify what diskette and floppy disk drives are fitted. Diskette drive A is fitted by default, and is invariably a 1.44 Mbytes 3.5" drive. You will not be required to change this setting.

Video Setup

This details the video controller and details the size of the video memory.

IDE Controller

This option enables the use of the hard drives connected to the onboard controller. It should not be disabled.

IDE Drives Setup

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

IDE Translation Mode

Select **Extended CHS** (cylinder, head, sector) to enable the scheme that allows the BIOS to access hard disk drives of greater than 504

Mbytes capacity. You might need to select **Standard CHS** if your operating system does not support Extended CHS for large drives.

Hard Disk Drives

Hard disk size and type is auto-detected when the computer is turned on, but other parameters can be manually set for each drive should it be required. **Do not** alter any settings once your hard drive is partitioned and formatted as you risk losing all the data on the drive. CD-ROM drives are also auto-detected.

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

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 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 current setting.

Date

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

Power-on Password

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

To define a power-on password:

1. In the Power-on Password dialog, type the password in the 'Enter Power-on Password' box, then press the DOWN ARROW key.
   - ◊ To preserve confidentiality, the password is not displayed as you type it.
2. Type the password once more in the 'Enter Power-on Password Again' box.
3. If you want the computer to ask for the power-on password, ensure that Password Prompt is set to "On". If this option is set to "Off", the computer will still require the password but will **not** ask for it.
4. Choose the Set or Change Power-on Password option.
5. A dialog asks you to confirm that you want to replace any existing power-on password.
6. 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 is set "On", the following prompt is displayed:

Type your password, then press Enter.

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

The user is allowed three attempts to enter the correct password. If they fail the computer is "locked" and must be switched 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

The 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 only allows you to enter Setup if you enter the Administrator's password.

Start Options

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

Keyboard Numlock State

If set to "On" (default), 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" (default) or "Normal".

Disketteless Operation

If this 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 an error if it is faulty or 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.

Start-up 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 without 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 if a boot sector virus has crept in. This is not an infallible check against the newer types of viruses, 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 memory cache. Some older software is speed sensitive and on rare occasions you may need to disable the cache.

ROM Shadowing

To shadow ROM means to copy its contents into the computer's system or random-access memory (RAM). This is beneficial for two 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 Kbytes areas of expansion card ROM (that is, ROM fitted on ISA or PCI expansion cards) addressed between C8000h and DFFFFh.

See the chapter entitled, *'Expansion'* for more information about addressing expansion card ROM.

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

PCI Options

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

Universal Serial Bus (USB)

This is available for future use with USB compatible peripherals and is set to 'enabled'.

Plug and Play

Enabling the Plug and Play adapter configuration will auto-configure any Plug and Play cards but any ISA adapters which do not support Plug and Play will require the system resources to be registered.

There is a separate option for each resource; memory, I/O ports, DMA and interrupts. Some areas not shown are system allocated.

Each resource can be set to either **Plug and Play** or **ISA Legacy.** If shown as *Plug and Play*, it is assumed by the system not to be in use by any ISA card or device and therefore will be made available for the PCI auto-configure process.

Although many ISA cards are very simple to configure, the resources they use, if any, **must** be registered in the BIOS. See the chapter entitled '*Expansion*' for more information about the resources used by expansion cards.

Error Log

Any errors reported during the POST routine will be logged in the Error log. It will contain the last three errors detected and can be cleared.

Power Management

The Power Management is ON as default to enable the system to comply with the Energy Star program. But it may be disabled, or overridden by the Power Manager Software in Windows95 when that is installed. See the chapter '*Multimedia applications'* for further details on power management. A simple menu is available:

Menu option	Choices
Power Management	'On' or 'Off'
Time Till (auto) Power Saving	'Disable', or range of times ***(in minutes)***
Hard disk Power Saving	'Disable', 'Enable' ***(timing fixed at 20mins)***
Standby Switch Monitor Control	'Disable', 'Enable' ***(see warning below)***

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 not, it may be permanently damaged.

Error Messages

If you get an error which is not listed or the problem persists, call your supplier or authorised maintainer.

Code	Cause	Code	Cause
0	Keyboard locked	301	Keyboard clock line failure
062	Boot failure (default values loaded)	301	Keyboard data line failure
101	Timer tick interrupt failure	301	Keyboard stuck key failure
102	Timer 2 test failure	303	Keyboard controller failure
106	Diskette controller failure	604	Diskette drive 0 failure
110	System board memory parity interrupt	604	Diskette drive 1 failure
114	Option ROM checksum failure	605	Diskette unlocked problem
151	Real time clock failure	662	Diskette drive configuration
161	Real time clock battery failure	762	Coprocessor configuration
162	CMOS RAM checksum failure	962	Parallel configuration
162	Invalid configuration information	1162	Serial configuration
163	Time of day not set -preboot	1762	Hard disk configuration
164	Memory size does not match CMOS	1780	Fixed disk 0 failure
165	Add/remove MC card	1781	Fixed disk 1 failure
166	Memory configuration change	1782	Fixed disk 2 failure
175	Bad EEPROM CRC #1	1783	Fixed disk 3 failure
176	System tampered	1800	No more IRQ available
177	Bad PAP checksum	1801	No more room for option ROM
178	EEPROM is not functional	1802	No more I/O space available
183	PAP update required	1803	No more memory <1Mb available
184	Bad POP checksum	1804	No more memory >1MB available
185	Corrupted Boot sequence	1805	Checksum error or 0 size option ROM
186	Hardware problem	1806	PCI-PCI bridge error
187	VPD S/N not set	1962	No bootable device
188	Bad EEPROM CRC #2	2400	Display adapter failed ; using alternate
189	Excessive password attempts	2462	Video configuration
201	Base memory error	5962	IDE CD-ROM configuration
229	External cache failure	8601	Pointer device failure
301	Keyboard failure	8603	Pointer device has been removed

Notes

Note down your BIOS settings for reference.

APPENDIX

Suitable antistatic precautions

Cleaning and transporting

Fall-back password cut-out page

A1 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.

Static electricity can be generated 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 very high levels of 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 destroy sensitive electronic components in computers.

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

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

It is also a good idea to use an ionizer or humidifier to remove static from the air.

- When installing any upgrade, be sure you understand what the installation procedure involves before you start. This will enable you to plan your work, and so minimise the amount of time that sensitive components are exposed.
- Do not remove the system unit cover, nor the anti-static bag or wrapping of any upgrade, until you need to.

- Handle static-sensitive items with extreme care. Hold expansion cards and add-on components only by their edges, avoiding their electrical contacts. Never touch the components or electrical contacts on the motherboard or on expansion cards. In general, do not handle static sensitive items unnecessarily.
- Keep all conductive material, foodstuffs and especially liquids, away from your work area and the open computer.

A2 CLEANING AND TRANSPORTING

Cleaning the computer

Do not use solvents or abrasives, they might damage the system unit surfaces.

Do not use aerosols or sprays near any part of the system, *in particular*, air vents or grills, ports, or removable-media drives, as microscopic droplets can remain in the air for some time and then be sucked in when you switch on and cause irreparable damage.

Warning

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

The system unit

- Occasionally wipe the outside of the system unit with a soft, slightly damp, clean cloth.
- Occasionally check the air vents on the rear and sides of the system unit. Dust and fluff can block the vents and limit the airflow. A small, clean, soft brush may be useful.
- Occasionally clean the removable media drives using a special disk cleaning kit. These are available from many sources including your Apricot dealer.

The monitor

Occasionally wipe the monitor with a soft, slightly damp, clean cloth. It is best to use antistatic glass cleaner on the monitor screen to help prevent dust adhesion. **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 clean cloth and a minimum amount of a non-abrasive cleaning agent.

Regularly check the keyboard cable for wear and tear, particularly near table or shelf edges.

Take care not to spill any liquid or drop small objects, e.g. paper clips or staples, onto the keyboard. Follow these steps if this should happen to the keyboard and it stops working:

1. Switch off and unplug the keyboard.
2. If the liquid is sticky or viscous, unplug the keyboard and call your supplier or an authorised maintainer.
3. 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 does not work, call your supplier or an authorised maintainer.
4. If a solid object drops between the keys, turn the keyboard upside down and shake it gently. **Do not** probe between the keys as this may cause serious damage.

The mouse

The mouse tends to be used heavily and so is susceptible to damage, but a little care should minimise this.

Dust and fluff often accumulates in the ball tracking mechanism of the mouse and should be checked for regularly. To clean the mouse follow this procedure:

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. Then cupping one hand over the underside, turn the mouse back the right way up. The ball should drop into your hand.
3. Blow gently into the mouse to remove any dust that has collected there.

4. Inside the mouse there are three small 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 of their surfaces.
5. Use clear water, or water with a mild detergent, to clean the ball. Then dry it with a clean, soft cloth.
6. Put the ball back in its socket and replace the plastic cover. It should click into place.

The mouse cable should also be regularly checked for wear and tear, especially near table or shelf edges.

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.

Do not transport the computer with either a floppy disk or a CD-ROM left in the drives, as they may cause damage both to the media and to the drive.

Do not attempt to pick up the computer using either of the drives as a lifting point.

Do not try to move the computer while it is plugged into the AC power supply or with any other cables, (network, printer etc.), still attached and **especially** with the monitor on top.

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

Warning

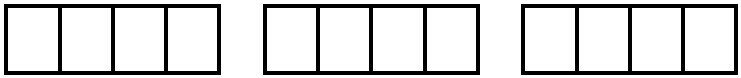
The computer is correctly set up to operate with the AC supply in the country in which it first sold. If you wish to use the computer in another country it may not be suitable. Consult your supplier or an authorised Apricot dealer.

A3 FALL-BACK PASSWORD

The fall-back password is a 12-digit number, unique to your computer, that is indelibly encoded in your computer's read-only memory. It is intended for use with your computer's anti-theft features (described in Chapter 1, of this manual).

If you ever forget your usual password, you can use the fall-back password instead. To keep the fall-back password secure, it is displayed only once, the first time that you use the anti-theft features. That is why you must make a note of the fall-back password and keep it safe.

You should record the password in the space provided below, then store this page (or the whole manual) in a safe place.



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