OWNER'S HANDBOOK  XEN *Pentium 60/66*

apricot

MITSUBISHI ELECTRIC

## Safety and Regulatory Notices

Read the separate *Power Connection Guide* before using the Apricot XEN for the first time. Information in the *Owner's Handbook* relating to connection to the AC power supply may not apply outside the United Kingdom.

The Apricot XEN 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.

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

Turn off the Apricot XEN and unplug all power cords before moving the system unit, cleaning the computer or removing the system unit top cover.

The CD-ROM drive contains a laser system which is harmful to the eyes, and is classified as a CLASS 1 LASER PRODUCT according to IEC 825 *Radiation Safety of Laser Products (Equipment Classification: Requirements & User's Guide)*. Do not attempt to disassemble the CD-ROM drive; if a fault occurs, call an authorized Apricot maintainer. Use the CD-ROM drive only as described in this manual; failure to do so may result in exposure to hazardous radiation.

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

When positioning the Apricot XEN system unit, monitor and keyboard, take into account any local or national regulations relating to ergonomic requirements.
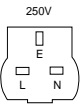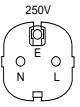
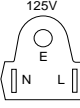The Real Time Clock chip on the motherboard includes a lithium battery. This component may explode if handled incorrectly. Do not attempt to recharge, disassemble or dispose of in fire. Keep away from children.

Do not dispose of the Real Time Clock chip, or any assembly which contains it in domestic waste.

*Safety*

***Power cord*** The power cord packed with the Apricot XEN complies with
***requirements*** the safety standards applicable in the country in which it is sold.
Use only this power cord; do not substitute a power cord from
any other equipment.

If you wish to use the computer in another country, you must
ensure that you use a power cord and plug which complies with
the safety standards of that country.

| Plug | Standard | Countries |
|------|----------|-----------|
| 250V <br> E <br> L   N | BS1363A | United Kingdom |
| 250V <br> E <br> N   L | SHUCO | Austria, Belgium, Finland, France, Germany, Holland, Italy, Norway, Sweden |
| N   250V   L <br> E | SRAF 1962/ DB16/87 | Denmark |
| 125V <br> E <br> N   L | NEMA 5-15P | USA, Canada |
| 250V | ASE 1011 | Switzerland |
| 250V | AS 3112-1981 | Australia |

The power cord fittings must bear the certification mark of the
agency responsible for evaluation.

Refer to your authorized Apricot supplier if you ever require
additional or alternative power cables.

## *UK plug wiring instructions*

# IMPORTANT Power Cable Connections

This appliance is supplied with a mains lead that has a non-removable moulded plug. If the socket outlets are not suitable for the plug supplied with this appliance, it should be cut off and an appropriate three-pin plug fitted.

**Note:** The plug severed from the mains lead must be destroyed, as a plug with the bared flexible cord is hazardous if engaged in a live socket outlet.

The following wiring information should be employed when adding the replacement plug.

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

| | |
|---|---|
| Green and Yellow | Earth |
| Blue | Neutral |
| Brown | Live |

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows.

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked with the letter **E**, or by the earth symbol ⏚ or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter **N** or coloured black. The wire which is coloured brown must be connected to the terminal which is marked with the letter **L** or coloured red.

Use a fuse approved by ASTA to BS1362, i.e. carries the ◇ mark.

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

Replace with same colour fuse cover only. Replacement fuse covers may be obtained from your dealer.

**WARNING - THIS APPLIANCE MUST BE EARTHED**

This diagram shows the wiring inside the moulded plug. Use it as a guideline if you need to re-fit a plug of a similar type to the mains lead.

---
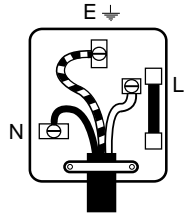
## *Noise levels*   **German Acoustic Noise Regulation**

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

*Die Deutsche Akoustische Lärm-Regulierung*

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

CLASS 1
LASER PRODUCT TO IEC 825

---

LASER KLASSE 1
PRODUKT NACH IEC 825

The CD-ROM drive is classified as a CLASS 1 LASER PRODUCT. The CLASS 1 LASER PRODUCT label is located on the under side of the system unit.

# Safety and Regulatory Notices

Refer to the labels on the rear of your computer to establish which of the following warnings apply.

### FCC Class A

**Warning** - this equipment has been tested and found to comply with the limits for a Class A computing device, pursuant to Subpart J of Part 15 of FCC rules. Only peripherals (computer input/output devices, terminals, printer, etc.) certified to comply with the Class A limits may be attached to this computer. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception requiring the operator to take whatever steps are necessary to correct the interference.

### FCC Class B

**Warning** - this equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules. Only peripherals (computer input/output devices, terminals, printer, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference with radio and TV reception.

*Radio and television interference*

The computer described in this manual generates and uses radio frequency energy for its operation. If it is not installed and used properly, in strict accordance with the manual, it may cause interference with radio and television reception.

The computer has been tested and found to comply with the RF emission limits for an FCC Class B computing device which is intended to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference with radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Move the computer away from the receiver being interfered with.
- Turn the computer with respect to the receiver.
- Turn the receiver with respect to the computer.
- Plug the computer into an outlet that is on a different branch circuit from the receiver.
- Disconnect and remove any I/O cables that are not being used.
- Unplug and remove any expansion cards that are not being used, and replace the relevant blanking plates.
- Make sure that the computer is plugged into a grounded outlet.

If you need additional help, consult your supplier. You may find the following booklet helpful: How to Identify and Resolve Radio-TV Interference Problems. This booklet is available from the US Government Printing Office: Washington DC 20402 - Stock No. 004-000-000345-4.

### DOC Class A

The computer described in this manual complies with: Canadian DOC radio interference regulations CRCc 1374 governing Class A digital devices.

### DOC Class B

The computer described in this manual complies with: Canadian DOC radio interference regulations CRCc 1374 governing Class B digital devices.

# CONTENTS

*Contents*

# Contents

## 7      *Troubleshooting*

## A      *Inside the Apricot XEN*

## B      *Technical Information*

# 1 INTRODUCING THE APRICOT XEN

The Apricot XEN Pentium 60/66, is ideally suited for use as high performance, general-purpose personal computers, networked business workstations and workgroup servers.

**Read the separate *Power Connection Guide* before using the Apricot XEN for the first time.**

*Standard features*  The standard features of the Apricot XEN Pentium 60/66 range include:

- Intel Pentium system processor with OverDrive upgrade capability.

- Two full-length, one half length 16-bit Industry Standard Architecture (ISA) expansion card slots, and one full length PCI slot.

- Standard 8 Mbytes of motherboard random access memory (RAM) upgradable to 128 Mbytes by the use of single in-line memory modules (SIMMs).

- SETUP configuration utility in read-only memory (ROM).

- On-board high performance PCI bus video based on an ATI 68800AX controller. Equipped with at least 1 Mbyte of video RAM.

- 256 Kbyte system memory cache.

- PCI Integrated Drive Electronics (IDE) disk drive system.

- Extended keyboard, two-button mouse, parallel and dual serial ports.

- 1.44 Mbyte 3.5" diskette drive; 3.5" hard disk drive bay with room for two one-inch drives; one 5.25" removable media drive bay.

These standard features can be enhanced by various hard disk and removable media drives, LAN adapter cards, and so on. For an outline of these options, see Chapter 5, "Upgrading the Apricot XEN".

***Unpacking*** On unpacking the computer, you should find:

- Apricot XEN system unit.

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

- Apricot extended keyboard and two-button mouse.

- System unit AC power cord appropriate for the country of sale.

- System documentation.

- Microsoft MS-DOS pack.

- Microsoft Windows pack (if the system has a hard disk).

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

Keep the cartons, boxes and packaging materials; you will need them again if you have to transport the computer elsewhere.

Make a note of the manufacturer's data recorded on the various components (product codes, serial numbers, etc.). You may need this information if the XEN develops a fault.

Instructions for removing the top cover are given in Appendix A, "Inside the Apricot XEN".

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

*Chapter 1*

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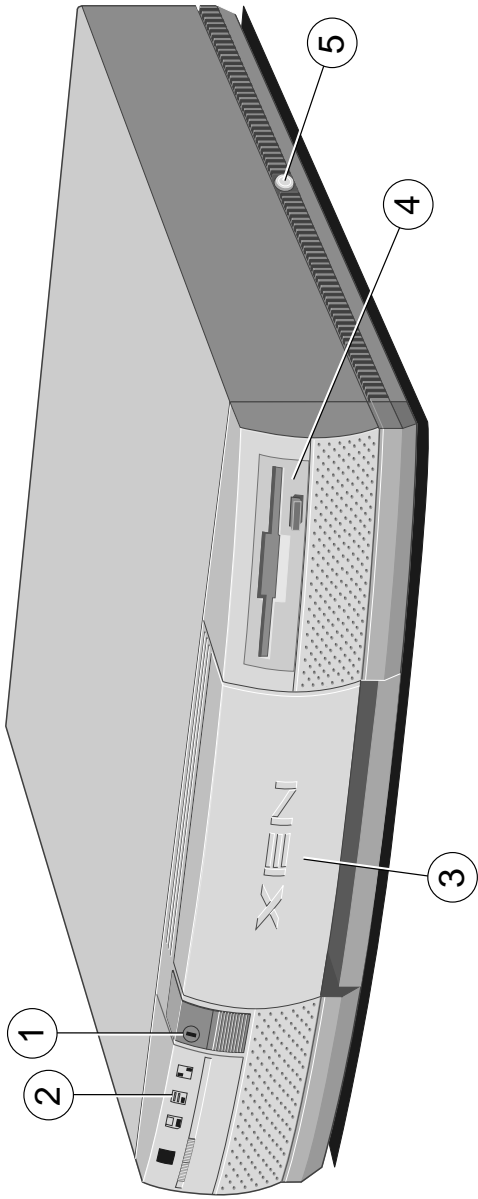
①  **POWER button**: press to turn the system on or off. The green indicator on the button lights when the system unit is powered.

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

⌨ lights when a diskette, floppy disk or Irwin tape drive is accessed (depending on the operating system).

🗎 lights when a hard disk drive is accessed (depending on the operating system).

③  **door** (shown closed): hinges down to reveal the removable-media drive bay.

④  **3.5" diskette drive**: fitted as standard in every Apricot XEN system.

⑤  **system lock**: prevents unauthorized access to the inside of the system unit.

*Chapter 1*
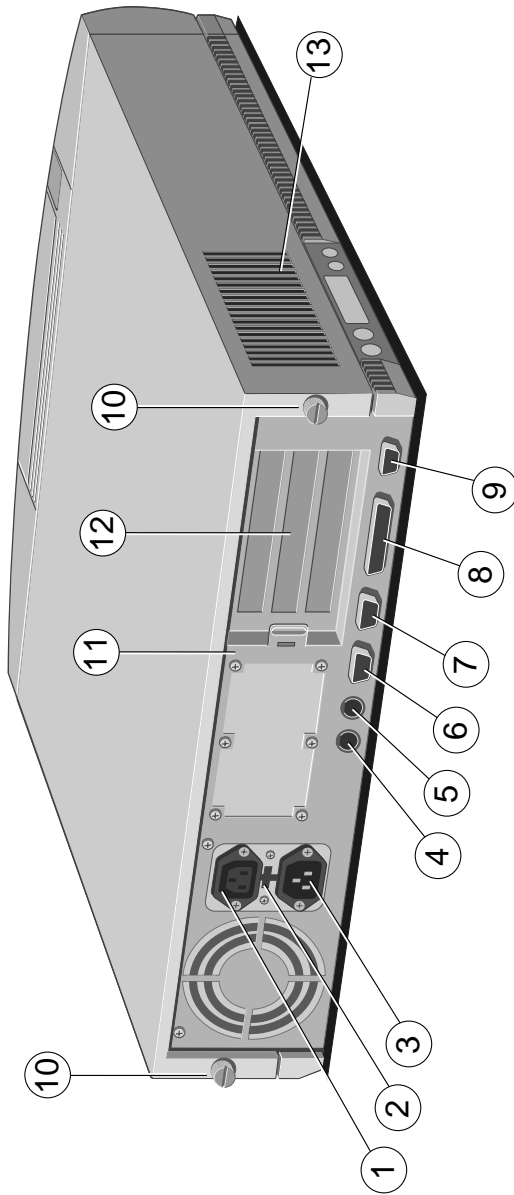
① **AC power outlet**: where the monitor power cord can plug in. Only Apricot-approved monitors should be powered from this outlet.

② **voltage selection switch**: the Apricot XEN can be set to operate with a 100-120 volt or 220-240 volt AC power supply.

③ **AC power inlet**: where the system unit AC power cord plugs in.

④ **keyboard port**: connect the keyboard to this port.

⑤ **mouse port**: connect the (optional) Apricot mouse to this port.

⑥ **serial port 1**: (110 baud to 14.4k baud): typically used for connecting an external modem or a serial printer signal cable.

⑦ **serial port 2**: (110 baud to 14.4k baud): typically used for connecting an external modem or a serial printer signal cable.

⑧ **parallel port that supports EPP and ECP features:** typically used for a printer signal cable.

⑨ **monitor port**: connect the monitor signal cable to this port (if you are using the on-board video controller).

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

⑪ **security loop**: you can feed a security chain or cable through this loop and secure it to prevent theft of the system unit.

⑫ **blanking plates**: for Industry Standard Architecture (ISA) expansion card slots.

⑬ **air vent**: do not block this vent or the system will overheat.

*Chapter 1*
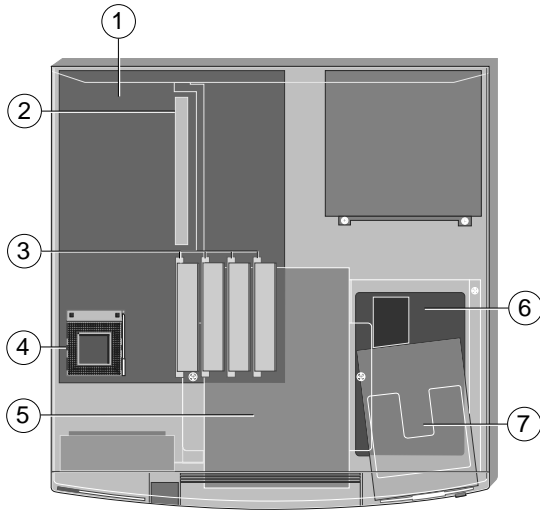
① **motherboard**: see the label inside the system unit lid for up-to-date information on the layout of the motherboard.

② **expansion card slots:** Three expansion slots, one half length and one full length ISA, and one full length slot which can be used by either an ISA or a PCI card. An additional connector is provided on the rear of the backplane, this is an Apricot proprietary connector which may be used in future developments of the XEN range.

③ **SIMM sockets**: every XEN has 8 Mbytes of motherboard memory which can be upgraded to 128 Mbytes by the use of single in-line memory modules.

④ **processor socket**: insert an OverDrive processor here to upgrade the processing power of your Apricot XEN.

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

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

⑦ **3.5" diskette drive**: fitted as standard in every Apricot XEN system.

# 2     GETTING STARTED WITH THE APRICOT XEN

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

If you are familiar with the operation of personal computers, this chapter will probably tell you all you need to know in order to start working with your XEN. Chapter 3, "Operating the Apricot XEN", has more information about the use of the various disk and tape drives with which the XEN may be fitted.

**Read the separate *Power Connection Guide* before using the Apricot XEN for the first time.**

## *General advice*

The Apricot XEN is designed to be used in a normal office environment. Here are a few hints for choosing a suitable site:

- Place the XEN system unit flat on a sturdy, level surface. Unlike some other computers, the system unit is not designed to be stood on its side.

- Site the XEN away from moisture, direct sunlight, and extremes of heat and cold. Avoid situations in which the surrounding temperature or humidity may change rapidly. See Appendix B, "Technical Information", for recommended temperature and humidity ranges.

- When positioning the XEN system unit, monitor and keyboard, take into account any local or national regulations relating to ergonomic requirements. For example, you should ensure that little or no ambient light is reflected off the monitor screen as glare, and that the keyboard is placed in a comfortable position for typing.

- Give the XEN plenty of room so that air can circulate on all sides. Air is drawn into the system unit through the vent on the left-hand side. Ensure that this vent is never obstructed.

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

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

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

## Connecting the components

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

***Checking the AC power supply***

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

Before using your XEN in a country other than which it was originally sold, you must check the voltage and frequency of that country's AC power supply, and the type of power cord required there.

If necessary, the AC voltage setting of the Apricot XEN can be adjusted by the voltage selection switch on the rear of the system unit (see the section on "Using the Apricot XEN abroad" in Chapter 3, "Operating the Apricot XEN"). Note that the monitor's voltage setting will probably also need adjusting; consult the *User's Guide* that accompanies the monitor, or ask your Apricot supplier for help.

The "Safety and Regulatory Notices" section at the start of the *Owner's Handbook* includes advice about suitable power cords.

***Installing add-on options***

If your XEN arrived with uninstalled add-on options, (such expansion cards or memory modules) consult Chapter 5 "Upgrading the Apricot XEN" for step-by-step instructions installing them. Expansion cards may also have their own documentation.

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

Chapter 2

**Connecting the components**

Having assured yourself that the voltage settings and the AC power cords of the computer, the monitor and any other peripherals are correct:

1.   If your AC power outlets have switches, set them to their Off positions.

2.   Ensure that the system unit, the monitor, and any peripherals are turned off.

3.   Connect signal cables and power cords (in that order) to their respective ports and inlets on the XEN system unit, the monitor, and any peripherals. Make sure the cables are connected securely.

When you plug the keyboard cable into the rear of the XEN, be careful not to plug it into the mouse port by mistake. Never plug a keyboard or mouse in with the system powered up.

4.   Connect the system unit and peripheral power cords to nearby, grounded AC power outlets.

5.   If your AC power outlets have switches, set them to their On positions.

Your Apricot XEN is now ready to use. The rest of this chapter tells you how to turn your XEN on and off, and how to configure it using the built-in SETUP utility.

## Turning on and booting the computer

**Turning the power on**

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

Always make sure that the XEN is turned on before turning on any attached peripherals, particularly a printer attached to the parallel port. The computer's parallel port is vulnerable to surges in the AC power supply, which can be passed onto it via the printer's parallel cable.

*Chapter 2*

**Power-on self-test** Whenever the XEN is turned on, the power-on self-test (POST) routine tests various hardware components, including memory, and checks the computer's configuration. During this time, BIOS sign-on and POST messages are displayed.

**The boot sequence** Provided that POST succeeds without discovering any serious errors or configuration discrepancies, the XEN attempts to find an operating system; that is, it attempts to boot. It will look first for a system diskette, then for a bootable hard disk partition.

**Turning the power off** When you have finished using the XEN and want to turn it off, be sure that any information you want to keep is stored on a diskette or on a hard disk. Any information held in the computer's system memory will be lost when you turn off the computer.

Always turn off any attached peripherals first, particularly a printer attached to the parallel port.

If you are logged-in to a network, log out before turning off the computer. Similarly, close down or exit from any software which employs virtual memory or disk-caching (for example, Microsoft Windows v3.1x with SMARTDrive).

Do not turn off the computer if any of the activity indicators on the front panel are lit; this means that the computer is accessing a drive. Wait until that operation is completed before turning off the computer.

To turn off the XEN, simply press the POWER button again. The green indicator on the button goes out. (Remember that the monitor is powered from the system unit.)

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

*Chapter 2*

## Preparing a second hard disk

Some Apricot XEN computers have two hard disk drives, known as master and slave.

Apricot partitions and formats the master drive with Microsoft MS-DOS at the factory. The drive is given a single primary DOS partition, which is the active partition. When you turn the computer on, it will boot (load its operating system) from the master drive, which will appear as MS-DOS drive C.

The slave drive is not partitioned or formatted. You must partition the slave drive with the MS-DOS **Fdisk** program, and format the partitions with the **Format** command. Until you do this, you will be unable to use the slave drive. See your MS-DOS manual for instructions on using **Fdisk** and **Format**.

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

Of course, you may also want to use **Fdisk** to repartition the master drive. If you decide to do this, be sure to make a back up copy of *all* the information on the drive first, including MS-DOS itself, as repartitioning will cause the master drive's existing contents to be lost.

## The software on your computer

Apricot XEN computers with a hard disk drive arrive with Microsoft MS-DOS and Microsoft Windows pre-installed. Other software may be pre-installed by Apricot or your Apricot supplier.

Hard disks also contain a copy of the Windows display driver for the XEN video subsystem, but Windows is not configured to use the driver. For instructions on changing the Windows display setup refer to the **mach32** help file in the Apricot group within Windows.

In addition to a working copy of MS-DOS, Windows and the Windows display driver, your hard disk will contain images of DOS and Windows installation diskettes, and any drivers diskettes for your computer. A Windows utility is provided to allow you to create copies of these diskettes. This utility is run whenever you start Windows.

You will need a copy of the display driver diskettes should you wish to install a display driver for a non-Windows application. Refer to the **mach32** help file in the Apricot group within Windows for information on the drivers and utilities supplied.

Copies of the DOS and Windows diskettes will safeguard against hard disk failure or you accidentally overwriting or deleting files. It is recommended that you use the utility to create copies of the diskettes soon after setting up your system.

## Using the SETUP utility

***What is SETUP?*** SETUP is a configuration utility programmed into the XEN's read-only memory (ROM). Because it is permanently kept in ROM, SETUP does not need an operating system to function and can be invoked whenever you wish to reconfigure your computer.

SETUP's purpose is to allow you to view and alter your computer's configuration. To configure a computer means to declare its hardware components, such as the amount of memory it has or the type of monitor, and to say how you want them to be used. Configuring your computer is often necessary to ensure that the software you use can recognise and exploit the system's capabilities.

The configuration data is kept in a special part of the computer's memory, known as configuration memory or CMOS memory. This memory is sustained by a small battery, so its contents are preserved while the computer is turned off.

*Chapter 2*

Your XEN arrives preconfigured, but may need to be reconfigured after you add or remove add-on options such as memory modules or expansion cards.

**Invoking SETUP** The SETUP utility can be invoked during the power up sequence. It is invoked by pressing the DEL or FI key.

Once you have reconfigured your computer you can exit SETUP. The XEN will then automatically reboot, and the changes come into effect.

A full description of the SETUP utility is given in Chapter 6 "Using the SETUP utility".

## Using Apricot Help

Along with the software preinstalled on your hard disk you will find an Apricot Help file. This explains what software is on your hard disk, and how to install drivers to use the enhanced features of the system.

Apricot Help may be supplied in various forms, according to the target operating system. The two most common forms are ASCII text files and Microsoft Windows help files.

**Viewing text files** ASCII text files, identified by their .txt file extensions, can be read by most text editors and wordprocessing programs. Alternatively they can be displayed, one screenful at a time, using the DOS Type command; for example:

```
type helpfile.txt | more
```

**Viewing Windows help files** Windows help files can be displayed only by the Microsoft Windows Help program (v3.1 or later).

If your computer has a hard disk on which Apricot has pre-installed Microsoft Windows, copies of some Windows help files may already be available as icons in the "Apricot" program group. To view a help file, simply double-click on its icon, or select the icon and press ENTER. For more information about using Help, see your Windows documentation.

If the Windows help file you want to view is not already installed, or if for any other reason you need to view a Windows help file directly from a diskette:

1.  Insert the diskette into a suitable drive.

2.  Use Windows File Manager to view the contents of the diskette.

3.  Choose the help file, identified by its *.hlp* file extension, either by double-clicking on its filename or by selecting the filename with the cursor and then pressing ENTER.

    The Windows Help program starts, displaying the first topic in the help file. For more information about using Help, see your Windows documentation.

Alternatively, you can copy the Windows help file from the diskette to a hard disk or network drive, and create a program item for it using Program Manager. The help file can then be viewed at any time simply by double-clicking on its icon. To do this:

1.  Insert the diskette into a suitable drive. Copy the Windows help file, and also the *diskhelp.ico* icon file, from the diskette to a hard disk or network drive.

2.  Choose **New** from the File menu in Program Manager. Select the **Program Item** option in the New Program Object dialog box, then choose **OK**. The Program Item Properties dialog box appears.

3.  In the Description text box, type the title of the diskette from which the help file was copied.

4.  In the Command Line text box, type the path and filename of the help file (including its *.hlp* extension).

5.  Choose **Change Icon**. The Change Icon dialog box appears. In the File Name text box, type the path and filename of the *diskhelp.ico* icon file. Choose **OK**.

6.  In the Program Item Properties dialog box, choose **OK**. The dialog box closes and the Apricot disk help icon appears in the program group.

*Chapter 2*

All the help files provided by Apricot have a version number so you can tell whether you're looking at the most up-to-date version. You can discover the version number of a Windows help file by viewing it with Help and choosing **About Help** from the Help menu.

# 3    OPERATING THE APRICOT XEN

This chapter contains all you need to know for the day-to-day operation of an Apricot XEN system. Note that the monitor has its own *User's Guide*.

**Read the separate *Power Connection Guide* before using the Apricot XEN for the first time.**

*Chapter 3*

## *Using the front panel controls*

The Apricot XEN has only a few front panel controls and activity indicators, and is very simple to use.
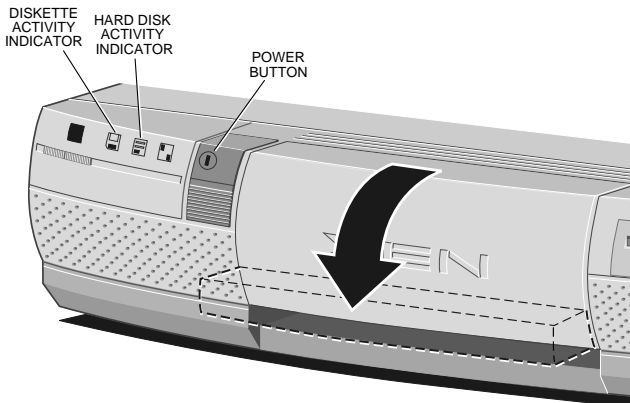


The *POWER button* is used to turn the computer on and off. The green indicator in the button lights when the system is powered. This button also controls the power supply through the AC power outlet to the monitor.

There are two activity indicators on the front panel:

| Inactive | Active | Meaning when active |
|----------|--------|---------------------|
| | | The XEN is using a 3.5" diskette drive, a 5.25" floppy disk drive or an FTD (floppy tape drive). |
| | | The XEN is using a hard disk drive. |

## *Using the 3.5" diskette drive*

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

Each diskette has a rigid plastic cover with a metal shutter that guards the disk surface. The drive automatically moves the shutter aside to read the diskette. Never touch the exposed surface under the shutter.

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

*Inserting a diskette*   Insert the diskette into the slot with the arrowhead on the face of the diskette pointing towards the drive. Push the diskette in until it engages with the drive mechanism.
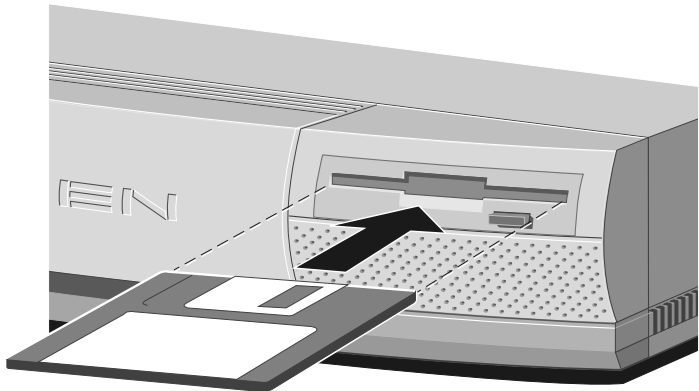
**Removing a diskette**
Before attempting to remove a diskette, ensure that the drive is not currently in use (the diskette activity indicator must be unlit).

Press the EJECT button. The drive mechanism disengages and the diskette is ejected halfway out of the drive.

**Write-protecting a diskette**
A diskette can be write-protected by sliding the small tab toward the edge of the diskette to expose the little hole beneath it (as shown below). With the tab in this position, you can read or print files from the diskette, but you cannot create, rename or delete any files.



PROTECTED

UNPROTECTED
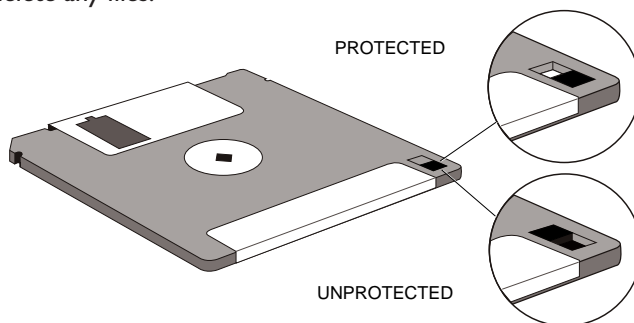
## Using the 5.25" floppy disk drive

Your Apricot XEN may be configured with a 5.25" floppy disk drive. This drive can read and write double-sided disks with a formatted capacity of either 1.2 Mbytes (if marked "HD" or "high density") or 360 Kbytes (if marked "DD" or "double density").

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

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

***Inserting a floppy disk***  Insert the disk into the drive slot with the read/write aperture foremost. When the disk is fully inserted, turn the locking lever one-quarter turn clockwise to engage the drive mechanism.

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

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

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



WRITE-PROTECT NOTCH          WRITE-PROTECT TAB AFFIXED
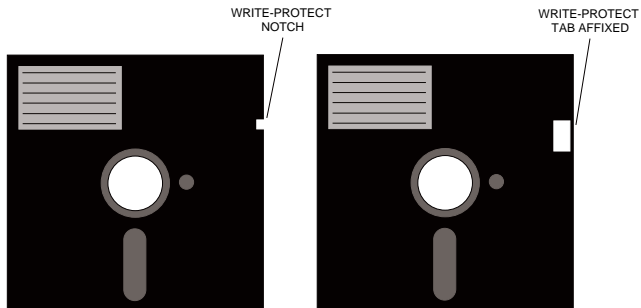
## Using the SLCD CD-ROM drive

Your Apricot XEN may be configured with an SLCD CD-ROM drive. The SLCD drive requires an additional drive controller expansion card.

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

With the appropriate software support, the SLCD drive can retrieve multimedia data from CD-ROM discs and multisession Photo-CD discs. It can also play commercial audio CDs. By default, the drive spins at double normal speed except when reading audio CDs.

*Chapter 3*

The drive has its own headphone jack with associated volume level control.

DISC DRAWER



HEADPHONE JACK AND HEADPHONE LEVEL          BUSY INDICATOR          EMERGENCY EJECT HOLE          EJECT BUTTON
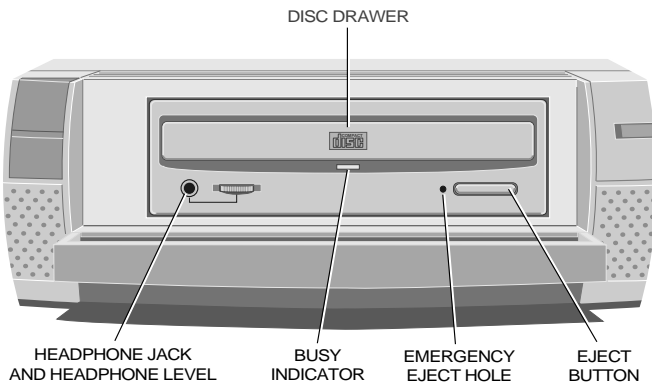
Do not attempt to move the computer while a CD is in the drive, especially if the CD is being played at the time.

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

*Inserting a compact disc*

Press the EJECT button on the front of the drive to eject the platter halfway out of the drive; note that the EJECT button will not work unless the computer is turned on. Pull the platter out to its fullest extent. Place the CD face up on the platter and push the platter in until it engages with the drive mechanism. Wait for the CD to spin up to speed before attempting to read from it.

*Removing a compact disc*

Before attempting to remove a CD, ensure that the drive is not currently in use (the drive's activity indicator must be unlit).

Press the EJECT button. The drive mechanism disengages and the platter is ejected halfway out of the drive.

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

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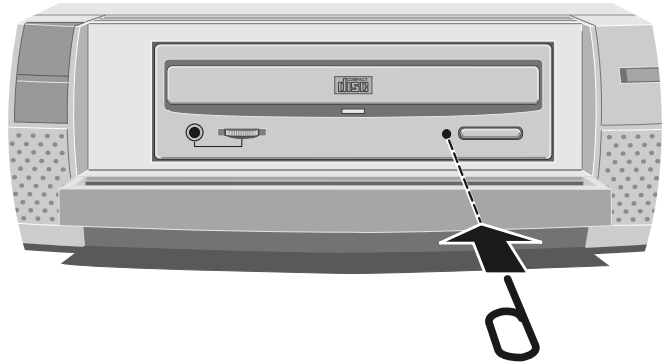


Keep CDs well away from dust and moisture, and avoid touching the surface of the CD. Also, avoid extremes of temperature and exposure to direct sunlight.

## Using the Irwin FTD tape drive

Your Apricot XEN may be configured with a 120 Mbyte Irwin FTD (floppy tape drive). The Irwin FTD is so called because it uses the on-board diskette/floppy disk interface and so does not require an additional drive controller card like most other tape drives.

The software required to control the tape drive depends on your operating environment; ask your Apricot supplier for details.

Note that, although the drive is intended for use with 120 Mbyte cartridges, it is possible to read data previously recorded on 40 Mbyte cartridges.

The tape drive can be damaged by incorrect insertion or removal of cartridges, so always observe the following procedures:

Chapter 3

**Inserting a cartridge**

1. Remove the cartridge from its plastic holder.

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



ACTIVITY INDICATOR     WRITE-PROTECT TAB     EJECT BUTTON

METAL PLATE
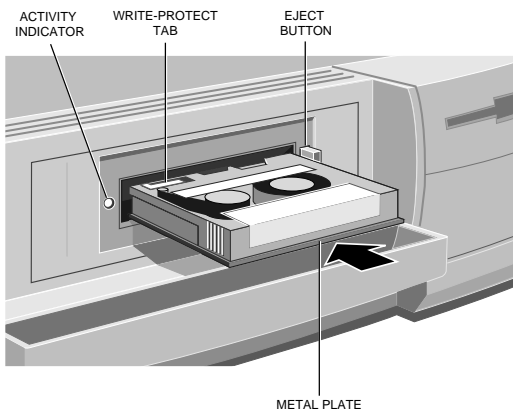
3. Carefully push the cartridge in a bit further until it engages with the drive mechanism.

**Removing a cartridge**

1. Do not attempt to remove a cartridge while it is being accessed by the computer (the drive's activity indicator must be unlit).

2. Press the eject button then, pull the cartridge carefully out of the drive slot, holding it between thumb and forefinger.

3. Return the cartridge to its plastic holder. This protects the cartridge and prevents dust from collecting on the surface of the tape.

**Write-enabling a cartridge**

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

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

*Chapter 3*

## Using the SCSI QIC tape drive

Your Apricot XEN may be configured with a SCSI QIC tape drive for quarter-inch tape cartridges. The software required to control the QIC tape drive depends on your operating environment; ask your Apricot supplier for details.

Apricot currently supplies 150 Mbyte and 525 Mbyte QIC tape drives. However, these capacities depend on the type of cartridge and the recording format used.

- The 525 Mbyte drive can use either DC6320 (600 ft, 320 Mbyte) or DC6525 (1000 ft, 525 Mbyte) cartridges and can read and write in QIC-525, QIC-150 and QIC-120 formats.

- The 150 Mbyte drive can use DC6150 (600 ft, 150 Mbyte) cartridges and can read and write in QIC-150 and QIC-120 formats.

Both drives can also read from (but not write to) a QIC-24 formatted tape.

The drive automatically senses the cartridge type and uses the maximum density QIC format possible for that cartridge (thereby giving its nominal capacity) unless the cartridge has already been used in a lower-density format.

Apricot does not supply, support or recommend the use of 1000 ft, 250 Mbyte cartridges with the 150 Mbyte drive. **If you must use 1000 ft cartridges with the 150 Mbyte drive, do not use 600 ft cartridges on the same drive.** The different cartridges produce different patterns of wear on the read/write heads, resulting in increased error rates and reduced head life. Standardize on one length only (preferably 600 ft) to get the best performance from your drive.

The tape drive can be damaged by incorrect insertion or removal of cartridges, so always observe the following procedures:

*Chapter 3*

*Inserting a cartridge*

1. Check that the green indicator on the tape drive is not lit. This indicates that the drive is ready to accept a cartridge.

2. Remove the cartridge from its plastic holder.

3. Insert the cartridge as shown below. Push the cartridge gently into the drive as far as it will go.
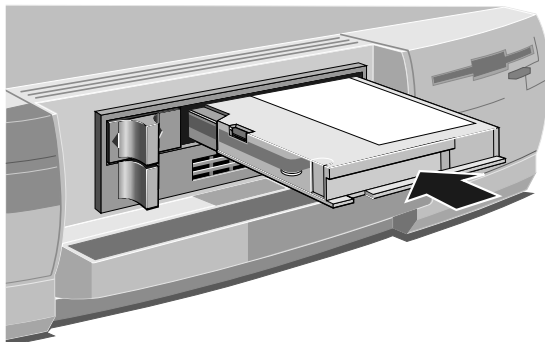


4. Push the control lever to the right to engage the mechanism.
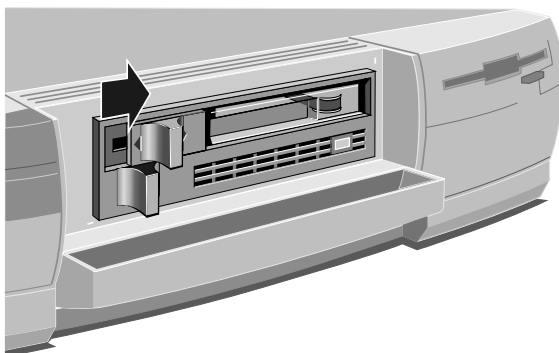


*Removing a cartridge*

1. Do not attempt to remove the cartridge while it is being accessed by the computer (that is, while the green indicator is lit).

2. Push the control lever to the left to release the mechanism.

3.   Push the control lever further to the left (you will feel a slight resistance as you do so) until the cartridge springs a short way out of the drive.
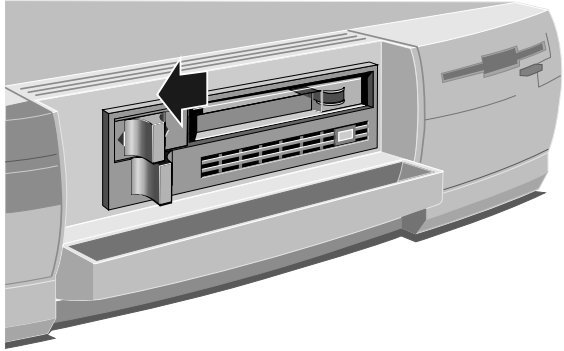


4.   Pull the cartridge out of the drive slot.

5.   Return the cartridge to its plastic holder. This protects the cartridge and prevents dust from collecting on the surface of the tape.

***Write-protecting a cartridge***   A cartridge can be write-protected by turning the circular plastic plug in the top left corner of the cartridge so that it points to SAFE. The plug can be turned with a screwdriver or the edge of a coin.



SAFE
POSITION

UNSAFE
POSITION

With the plug in this position, data can be read from the tape but not written to it.

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

*Chapter 3*

## *Using the SCSI DDS or DDS-DC tape drive*

Your Apricot XEN may be configured with a SCSI DDS (Digital Data Storage) or SCSI DDS-DC (Digital Data Storage with Data Compression) tape drive. The software needed to control the drive depends on your operating environment; ask your Apricot supplier for details.

The DDS-DC drive differs from the DDS drive in that it uses a built-in compression algorithm which can typically double, and in some cases quadruple, tape capacity. Data compression and decompression is transparent to the host software.

The DDS-DC drive is illustrated below; the DDS drive is similar except that the LED indicators and EJECT button are in different positions. The way you use the drive and the meaning of the indicators is the same for both types.

CASSETTE INSERTION SLOT

CASSETTE IN PLACE (GREEN)

DRIVE BUSY (AMBER)

EJECT BUTTON
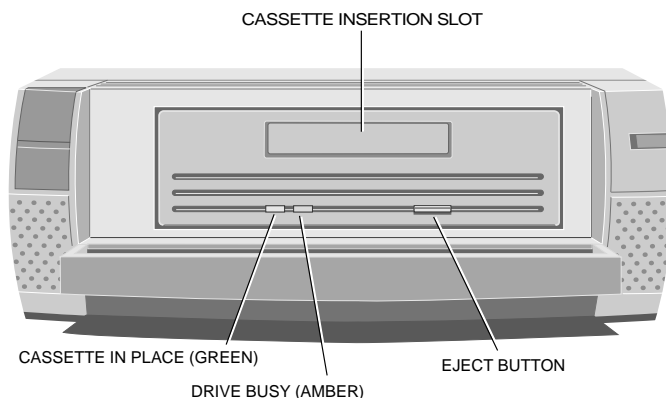
The DDS-DC and DDS drives use standard 60-metre or 90-metre digital cassettes bearing the DDS symbol. The DDS-DC drive writes compressed data by default, unless it finds uncompressed data already on the cassette. The drive can also write uncompressed data under software control. When reading a cassette, the DDS-DC drive automatically distinguishes compressed and uncompressed data and either decompresses it or passes it through unaltered as appropriate.

**Use only cassettes bearing the DDS symbol; you cannot play audio DAT cassettes with these drives.**

The DDS drive has a nominal capacity of 1.3 Gbytes on a 60-metre cassette, with a sustained transfer rate of 183 Kbytes/second.

The DDS-DC drive writing uncompressed data has a nominal capacity of 1.3 Gbytes on a 60-metre cassette or 2.0 Gbytes on a 90-metre cassette, with a sustained transfer rate of 366 Kbytes/second. At a data compression ratio of 4:1 the DDS-DC drive has a nominal maximum capacity of 5.2 Gbytes on a 60-metre cassette or 8.0 Gbytes on a 90-metre cassette; the sustained transfer rate is increased by the same ratio. However, the actual compression ratio and transfer rate achievable in any particular case depend on the characteristics of the data being compressed, and may be higher or lower than these nominal figures.

*Interpreting the LED indicators*

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

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

*Chapter 3*

**Media warning**  A media warning, when the Cassette in Place (green) LED flashes slowly, indicates that the tape may be becoming unreliable, although at this point no data has been lost. First, clean the tape head cylinder with the special cleaning cassette available from Apricot, then try the data cassette again. If the warning persists, copy the data onto a new cassette and discard the old one.

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

### Drive could not write to tape

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

### Hardware error or high humidity

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

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

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

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

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

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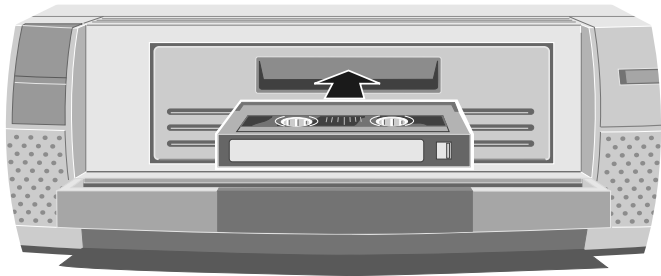


The drive will automatically format a blank tape when data is first written to it. Remember to allow time for the formatting process when you use a new tape.

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

Press the EJECT button on the front of the drive (depending on your operating environment, the EJECT button may be disabled while the drive is in use). If the tape is write-enabled, a copy of the tape log, held in the drive's memory, is written back to tape. The drive rewinds to the beginning of the tape, unthreads it, and ejects the cassette. Several seconds may pass between the button being pressed and the cassette being ejected, so be careful not to turn off the computer before the operation is completed.

*Chapter 3*

**Write-
protecting
a cassette**

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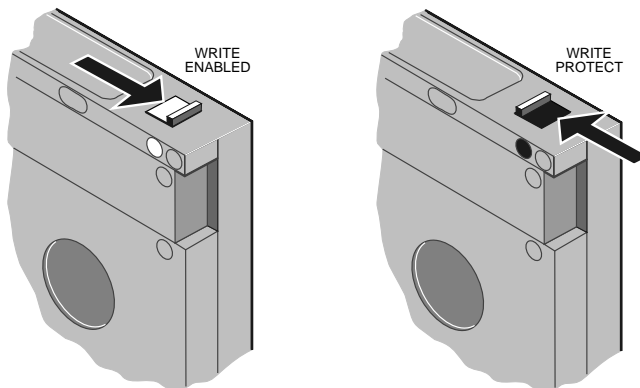


The tape log, which includes a record of data integrity failures, cannot be updated while the cassette is write-protected. It follows that the tape log becomes inaccurate if a cassette is used while write-protected, and the media warning LED status cannot be relied upon to determine if the cassette needs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

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

## Using the SCSI CD-ROM drive

Your Apricot XEN may be configured with a SCSI CD-ROM (Compact Disc ROM) drive. The software required to control the CD-ROM drive depends on the your operating environment; ask your Apricot supplier for details.

With the appropriate software support, the drive can retrieve multimedia data from CD-ROM and Photo-CD (single and multisession) discs. It can also play commercial audio CDs. By default, the drive spins at double normal speed except when reading audio CDs.

*Chapter 3*

The drive has its own headphone jack with associated volume level control.

DISC CADDY SLOT



HEADPHONE JACK
AND HEADPHONE LEVEL

BUSY
INDICATOR

EJECT
BUTTON

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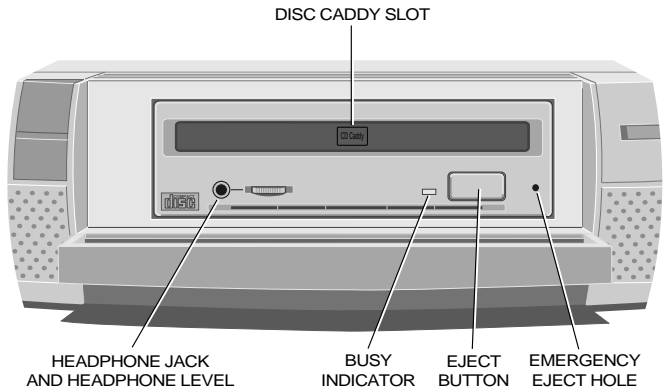
Do not attempt to move the computer while a CD is in the drive, especially if the CD is being played at the time.

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

*Inserting a compact disc* The SCSI CD-ROM drive uses a special removable disc caddy to hold a CD within the drive mechanism. The caddy has a metal shutter that guards the disc's surface; the drive automatically moves the shutter aside to read the disc. One disc caddy is provided free with the drive; more can be obtained from your Apricot supplier. Use only disc caddies supplied by Apricot.

**Do not confuse a CD's storage case with a proper disc caddy; if you attempt to insert a disc storage case you will damage the drive.**

1.   Ensure that the computer is turned on and that the drive is empty (the legend "CD Caddy" should appear on the flap covering of the drive slot).

*Chapter 3*

2.    If there is a protective film on the centre of the caddy lid, remove it before using the caddy.

3.    To open the caddy, press the tabs on both edges at the end opposite the shutter.
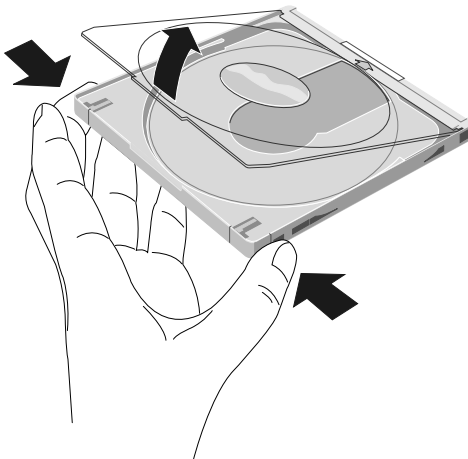


4.    Set the disc, with its label upward, in the caddy. Handle the disc only by its edge.

5.    Close the lid of the caddy firmly.

6.    Insert the caddy into the slot of the drive with the disc's label facing up and the arrow on the caddy pointing towards the drive (that is, shutter end foremost). Push the caddy in until it is completely swallowed up by the drive.

The drive begins reading the disc's table of contents. The drive's activity indicator lights while the table of contents is being read. When the activity indicator goes out, the drive is ready for use.

If the activity indicator remains on, this may indicate that the disc is not properly positioned within the caddy. In this case, press the EJECT button to remove the caddy and try again. If the problem persists, consult your Apricot supplier or an authorized Apricot maintainer.

Note too that the software controlling the CD-ROM drive may be able to prevent the insertion of a disc.

*Chapter 3*

***Removing a compact disc***

1.  Ensure that the computer is turned on (otherwise the EJECT button will not work) and that the drive is not currently in use (the drive's activity indicator must be unlit).

2.  Press the EJECT button. The drive mechanism disengages and the caddy is partially ejected from the drive.

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

To eject the drawer manually (for example, after a power failure) you must first ensure that the computer is turned off. Then insert a thin metal rod (such as an unwound paper clip) into the emergency eject hole and push hard (see below). The rod must be at least 35 mm long.



***Caring for compact discs***  Keep CDs and caddies well away from dust and moisture. Avoid touching the surface of the disc; for example, when the disc is inside a caddy, do not open the shutter manually and touch the disc. Also, avoid extremes of temperature and exposure to direct sunlight.

*Chapter 3*

## Using the Apricot XEN abroad

Your Apricot XEN arrives ready to work with the commercial AC power supply available in the country in which it is first sold.

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

1. The voltage and frequency of the commercial AC power supply.

2. The type of plug required for the AC power outlets.

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

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

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

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

Make sure that the Apricot XEN and its monitor are returned to their original voltage settings when you return home.

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

See Chapter 4, "Caring for the Apricot XEN", for more information about transporting the XEN.

# 4 CARING FOR THE APRICOT XEN

This chapter provides information on how to care for your computer. The Apricot XEN requires little physical maintenance other than occasional cleaning. But you must take care when transporting it to avoid damage to its delicate components, particularly the hard disks.

## Cleaning the Apricot XEN

**Turn off the Apricot XEN and unplug all power cords before cleaning the computer.**

If you have any problems with the Apricot XEN which can't be resolved by cleaning it, consult the "Troubleshooting" chapter.

***The system unit***    Do not use sprays, solvents or abrasives that might damage the computer's surface. Do not use cleaning fluids or sprays near air vents, ports, or removable-media drives.

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

- Occasionally wipe the air vents on the rear and sides of the system unit. Dust and fluff can block the vents and limit the airflow.

- Occasionally clean the diskette drive using a proprietary head cleaner.

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

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

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

1.   If the liquid is viscous, unplug the keyboard and call your Apricot supplier or an authorized Apricot maintainer.

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

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

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

1.   Unplug the mouse, turn it upside down and locate the plastic cover that holds the ball in place. Depending on the model, the plastic cover can be removed either by rotating it counter-clockwise or by sliding it forward slightly.

2.   Remove the cover and set it aside.

3.   Cupping one hand over the underside, turn the mouse back the right way up. The ball will drop into your hand.

4.   Blow gently into the mouse to remove any dust that has collected there.

5.   Inside the mouse there are three plastic rollers. Using a cotton swab moistened with a solvent cleaner, gently wipe off any oil or dust that has collected on the rollers, rotating them to reach all surfaces.

6.   Use clear water, or water with a mild detergent, to clean the ball. Then dry it with a clean, lint-free cloth.

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

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

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

The read/write head and the capstan are accessible through the flip-up drive door, as shown below.
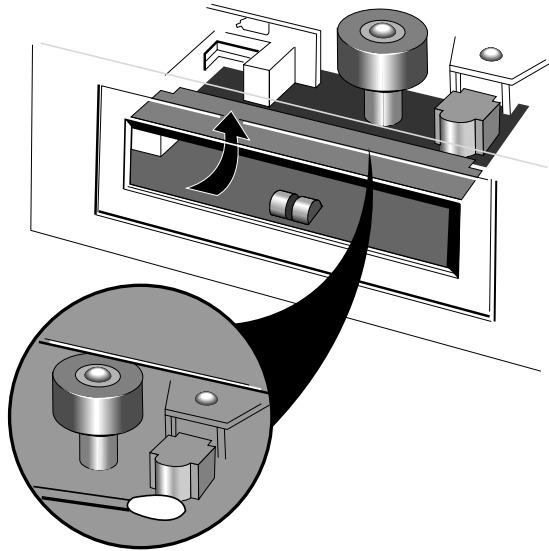
Although it is possible to use special kits to clean the drive, Apricot recommends the use of 90% isopropyl alcohol and several non-abrasive, lint free swabs, as follows:

1. Gently rub an alcohol-dampened swab against the surface of the read/write head. If the swab becomes too discoloured, use additional swabs until there is no further discolouration.

2.  Rub an alcohol-dampened swab against the surface of the capstan using an up and down motion. Gently rotate the capstan and continue rubbing until the entire surface is clean.

3.  Wait for at least one minute before using the tape drive. This allows any residual alcohol to evaporate.

If you clean the read/write head first, and the swab is not too discoloured, you may use the same swab to clean the capstan. But if you clean the capstan first, you must **not** use the same swab to clean the read/write head.

***The SCSI QIC tape drive***

You should clean the SCSI QIC tape drive after every 8 hours' use, using the special cleaning kit available from your Apricot supplier. Full instructions for cleaning are provided with this kit.

It is also advisable to clean the tape drive after the first use of a new tape.

***The SCSI DDS or DDS-DC tape drive***

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

*   Every 25 operating hours.
*   When a media warning status is indicated.

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

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

## *Transporting the Apricot XEN*

**Turn off the Apricot XEN and unplug all power cords before moving the computer.**

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

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

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

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

If you intend to use your Apricot XEN in another country, see Chapter 3, "Operating the Apricot XEN", for some important advice.

# 5 UPGRADING THE APRICOT XEN

This chapter contains instructions on installing add-ons and upgrades in the XEN. The areas covered include:

- expansion cards

- additional memory

- processor upgrades

- video RAM

- additional drives

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

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

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

Appendix A at the rear of this manual provides: a guide to recommended anti-static precautions, instructions on removing the system unit top cover, information on motherboard jumpers and expansion card configuration.

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

*Chapter 5*

**Inside the system unit**   The illustration below identifies the major components inside the XEN system unit that are affected by the installation instructions later in this section.
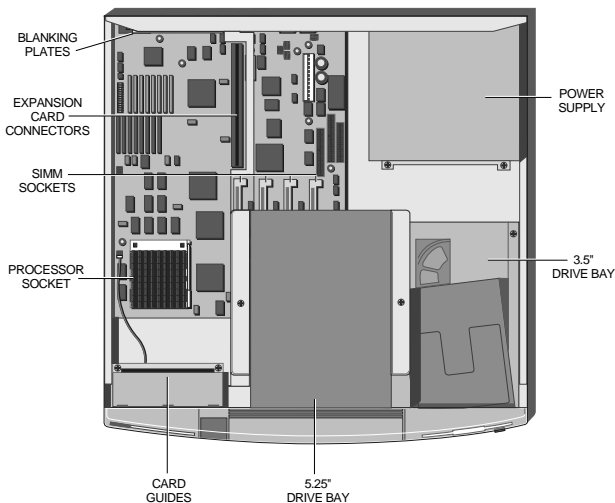
## Expansion cards

Expansion cards, sometimes known as expansion boards, options or adapters, are small self-contained circuit boards which extend the capabilities of your computer. Here are just two examples:

- A graphics card can provide more specialized video functions than those offered by the on-board video sub-system.

- A modem or facsimile card can provide a connection to a telephone line.

The Apricot XEN has three expansion slots, one half length and one full length 16-bit Industry Standard Architecture (ISA) and one full length slot which can be used by either an ISA or a PCI card. An additional connector is provided on the rear of the backplane, this is an Apricot proprietary connector which may be used in future developments of the XEN range. If your computer has a Small Computer Systems Interface (SCSI) device such as a QIC tape drive, one of these slots will be occupied by an SCSI drive controller. Other cards may be pre-installed at the factory or by your Apricot supplier.

Expansion cards are a relatively cheap way of upgrading your system. Moreover, they are usually quite easy to install, requiring no more than a cross-head screwdriver and a steady hand.

*Installation*   Installation of an expansion card in the XEN is a simple process requiring the removal of only the system unit cover and a blanking plate. The following instructions and illustrations describe how to install a card in a simple step-by-step sequence.

1.   Power the system down.

2.   Take suitable anti-static precautions and remove the system unit cover.

    If you are unfamiliar with Apricot's recommended anti-static precautions and/or the process of removing the system unit cover refer to the appendices at the rear of this manual.

3.   With the system unit cover removed, the space for expansion cards will be visible. It is on the left side of the system unit behind the activity indicators. Use the illustration below to help you identify this area.
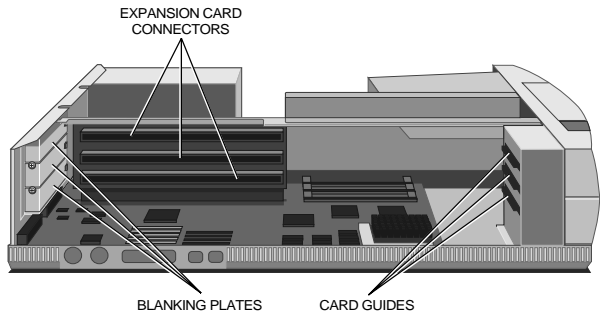


At the rear of the area are three metal blanking plates, one for each expansion card slot. These plates cover slots in the rear of the system unit which will be used by expansion cards.

At the front of the area are three guides. These ensure that the front edge of any full length card is secured.

4.   The blanking plates described above are each secured by a screw. Using the following guidelines decide in which of the available slots you wish to install the card, then remove the appropriate blanking plate.

In general it is easiest to start with the lowest slot and work towards the top, but there a couple of exceptions. If you are installing a card that uses the video feature connector on the motherboard, it is best to install the card in the lowest slot. If you are installing a drive controller card that you want to connect to a drive in the 5.25" drive bay it is easiest to install it in the top slot.

To remove the blanking plate, first unscrew the securing screw, then slide the plate out of its slot. Keep the screw, you will use it later to secure the card.

5.   Your are now ready to install the card. However, before you do so you must first ensure that the card is correctly configured for your system.

Information on configuring cards for use in the XEN is given in the Appendix A at the rear of this manual. Use this information in conjunction with the documentation supplied with your card to configure the card so that it will not clash with any of the features on the XEN motherboard, or any other expansion cards already installed.

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

---

**Note**

*If the card uses the video feature connector on the motherboard, you must plug the video feature cable into the motherboard socket before you install the card.*

---
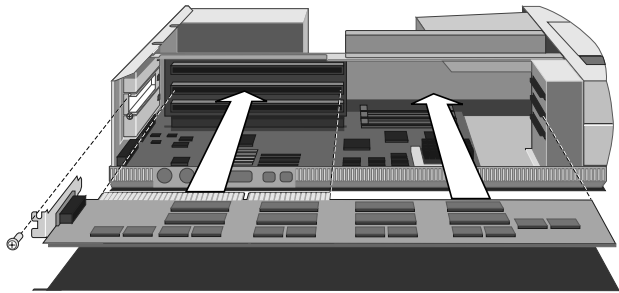
7. Slide the card into the slot ensuring that the card edge connector engages correctly with the backplane.

8. Carefully push the card fully home. Do not apply excessive pressure.

9. Secure the card by replacing the screw that you removed in step 4.

10. Connect any signal cables to the card.

11. Replace the system unit cover.

## Memory upgrades

The XEN motherboard is fitted with sockets for four SIMMs (Single In-line Memory Modules) these allow system RAM to be expanded to up to 128Mbytes using standard 72 pin, 70 nS SIMMs.

The SIMM sockets are located at the front of the motherboard, beneath the 5.25" drive bay.

SIMMs must be installed in pairs. Each pair is called a bank, bank 0 is formed by the pair of sockets nearest the hard disk drive bay, bank 1 is formed by the pair nearest the processor.

Apricot supplies 1 Mbyte (256kx36), 2 Mbyte (512kx36), 4 Mbyte (1Mx36), 8 Mbyte (2Mx36), 16 Mbyte (4Mx36) and 32 Mbyte (8Mx36) SIMMs, giving upgrade capacities of 2, 4, 8, 16, 32 and 64 Mbytes. Any combination of these capacities is possible, using any capacity in either of the two pairs.

*Installation*   In order to install a memory upgrade you must:

1.   Power the system down.

2.   Take suitable anti-static precautions and remove the system unit cover.

     If you are unfamiliar with Apricot's recommended anti-static precautions and/or the process of removing the system unit cover refer to Appendix A.

     The SIMM connectors are located beneath the 5.25" drive bay. In order to install a memory upgrade you must remove the 5.25" drive bay.

3.   If there is a 5.25" drive fitted disconnect the power and signal cables from the rear of the drive.

     If no drive is fitted unclip the power cable from the drive bay.

4.   Remove the two screws that secure the drive bay and slide the bay backwards.

5. Lift the bay out of the system unit and put it down on a safe flat surface.

### Removing SIMMs

If you wish to install an upgrade in a bank which is already occupied you must first remove the existing SIMMs.

1. For the first SIMM, lever the metal clips on each side of the socket gently away from the SIMM using your forefingers.

2. Place your thumbs on the top edge of the SIMM and move it gently towards the vertical.
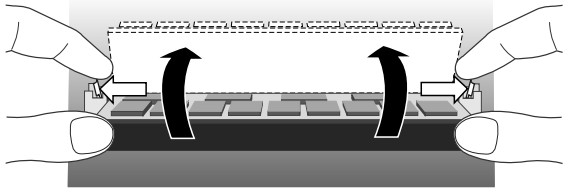


3. When the SIMM has rotated through 20°, taking care to avoid touching any of the components on the SIMM, grip the top corners of the SIMM between thumb and first finger and carefully pull the SIMM out of the socket.

4. Repeat steps 1 to 3 for the second SIMM.

### Inserting SIMMs

Make sure that the pair of SIMMs you intend to install in a bank are matching, then:

1. The SIMMs will only install in one orientation. There is a cutout at one end of the SIMM next to the connector strip.

   Hold the first SIMM with the cutout to the rear and the metal connector strip nearest the motherboard.

2.  Position the SIMM above the socket with the SIMM tilted slightly towards the front of the system unit.
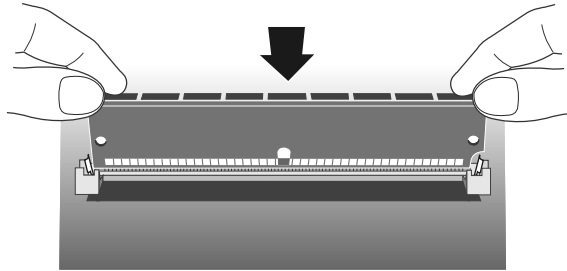


3.  Lower the SIMM into the socket, and ensure that the SIMM is properly located in the connector.

4.  Pushing gently on the top corners rotate the SIMM towards horizontal until it clips into place. Do not use excessive force.

    If the SIMM will not rotate easily remove it and start again.
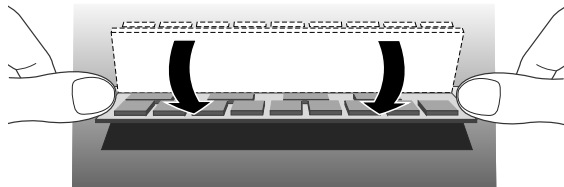


5.  If the SIMM is properly located it should remain in position held by the securing clips, and with a small plastic lugs through the holes on either side of the SIMM.

6.  Repeat steps 1 to 5 for the second SIMM.

If you wish to install SIMMs in the other memory bank repeat the process above. Once you have completed installation you can replace the 5.25" drive bay and reassemble the system.

1.  Replace the 5.25" bay in the system unit.

2.  Slide the bay forward until the two holes in the bay line up with those in the hard drive assembly and the 5.25" bay securing bracket.

3.  Replace the two screws that secure the 5.25" drive bay.

4.  If there is a drive in the bay reconnect its power and signal cables.

5.  Replace the system unit cover.

## Processor upgrades

The XEN motherboard is fitted with a Zero Insertion Force (ZIF) processor socket ready to accept any processor with a Pentium compatible pinout, and an external clock speed of 60 or 66 MHz.

The motherboard includes one jumper to select the processor clock speed (J7A1), and a second jumper to select the voltage supplied to the processor (J13H3).

When shipped, the clock speed is set to match that of the processor. The processor voltage is set to 5V for a 60MHz system and 5.25V for a 66MHz system. It is likely that future upgrade processors will require the jumper to be in the 5V position. Refer to Appendix A for details of the jumpers.

**Removing the processor**

Before installing the upgrade processor you must first remove the existing processor. The processor is at the front left of the motherboard. Instructions on locating the socket and removing a processor are given below.

1.  Power the system down.

2.  Take suitable anti-static precautions and remove the system unit cover.

    If you are unfamiliar with Apricot's recommended anti-static precautions and/or the process of removing the system unit cover refer to the appendices at the rear of this manual.

3. Identify the processor socket.
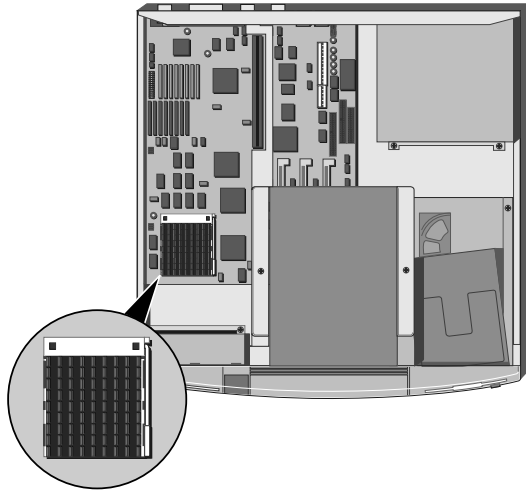


The processor is installed in a ZIF socket. A lever attached to the socket clamps the processor securely in the socket when it is parallel to the motherboard.

4. Carefully rotate the lever from the secure position until it is perpendicular to the motherboard.
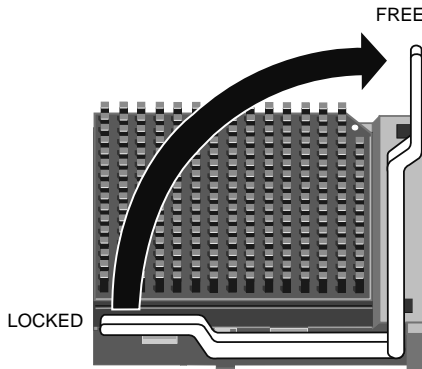


The first and last 15° of movement may require considerable effort. Apply just enough pressure to overcome the resistance offered by the lever.

5. Once the processor is free of its socket lift it out of the system unit and place it on the anti-static foam provided with the upgrade processor.

*Installation*

1. The upgrade processor and socket are keyed to ensure that the processor can only be installed in one orientation. The inside of one corner of the socket has a key hole. The processor has a positioning guide in the form of a small dot of paint.

2. Carefully position the upgrade processor above the socket with the positioning guide on the processor over the keyed corner of the socket and the securing lever in the perpendicular position.

PROCESSOR
IN CENTRE
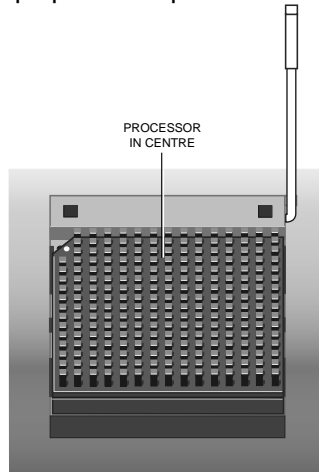
**Warning**

*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.*

3. Gently insert the upgrade processor making sure that it is correctly aligned with the socket and that you do not bend or otherwise damage the pins.

4.   Once you are certain that all the pins on the processor are in the holes in the socket carefully move the securing lever to the locked position.

     The lever may require a considerable amount of force in order to lock the processor in place. Take care to exert no more force than is necessary.

5.   Check that the clock speed and processor voltage jumpers are set correctly for the new processor. Refer to Appendix A and the documentation supplied with the upgrade processor.

6    You may now reassemble the system unit.

## Installing additional video RAM

The XEN motherboard is fitted with eight sockets which allow the video RAM to be expanded from 1 Mbyte to 2 Mbytes using eight 256k x 4 RAM chips.

1.   Power the system down.

2.   Take suitable anti-static precautions and remove the system unit cover.

     If you are unfamiliar with Apricot's recommended anti-static precautions and/or the process of removing the system unit cover refer to Appendix A at the rear of this manual.

The video RAM sockets connectors are located at the left side of the system unit beneath the adapter card slots, towards the rear. In order to install a video RAM upgrade you must remove any adapter cards installed in the system.

3.   If there are adapter cards fitted, disconnect any cables connected to the cards.

4.   Remove the screws that secure the cards to the rear of the system unit.

5.   Remove the cards.

6. Identify the video RAM sockets from the following illustration.
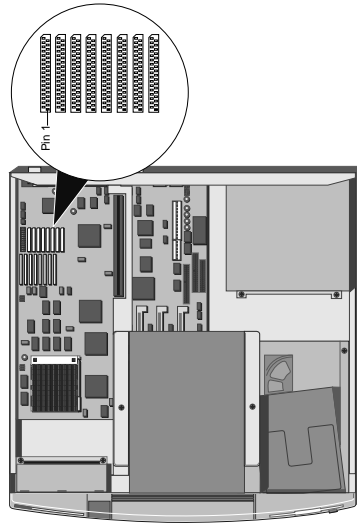
7. One by one, carefully align the video RAM chips over the sockets. Make sure that they are in the correct orientation.

## 5.25" drives

The 5.25" drive tray in the XEN system unit can contain any half height 5.25" device. Apricot supplies a range of tape and CD-ROM drives, and a 5.25" floppy drive, for this bay.

The following instructions describe the installation of a drive in the bay. The *Generic* instructions apply to all drives, and describe the physical installation of a drive.

Instructions specific to each drive type are given after the generic instructions.

*Generic*
1. Power the system down.

2. Take suitable anti-static precautions and remove the system unit cover.

If you are unfamiliar with Apricot's recommended anti-static precautions and/or the process of removing the system unit cover refer to Appendix A.



SECURING SCREWS
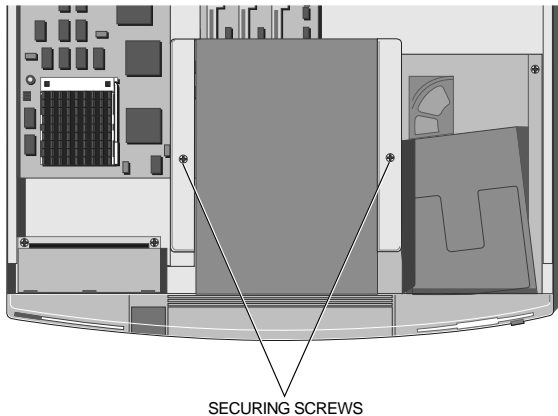
3. Loosen the two screws that secure the drive bay and slide the bay backwards.

4. Lift the bay out of the system unit.

5. The 5.25" drive aperture in the chassis at the front of the drive bay is obscured by a blanking plate. The blanking plate is attached to the top of the chassis and must be removed in order to install a drive in the 5.25" drive bay.

   Open the drive bay door and identify the blanking plate.
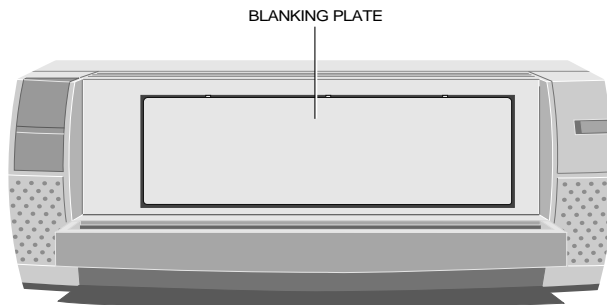
BLANKING PLATE

6.   Break the blanking plate out by bending it backwards and returning it to the vertical several times.

7.   Remove the drive from its packaging. With the drive there should be four screws and a signal cable. Some drives may be supplied with additional items.

8.   If necessary configure the drive. Drives supplied by Apricot will be correctly configured for installation in a XEN.

For information on how Apricot-supplied drives are configured see the drive specific information following these installation instructions.

9.   Identify the top and bottom of the drive.

10.  Rest the drive, top down, on a suitable anti-static surface.

11.  With the drive bay upside-down place it over the drive. The front of the drive must be at the end where the blanking plate was fitted.

12.  Line up the holes in the underside of the drive with those in the base of the drive bay.

SECURING
SCREW
HOLES
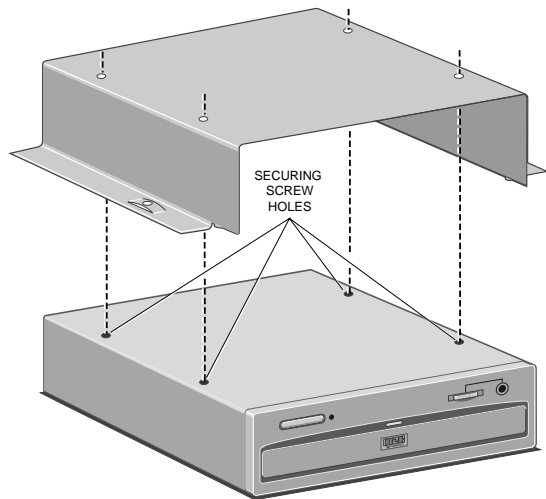
13.  Insert the four drive securing screws, and tighten them until they are finger tight.

SECURING SCREWS
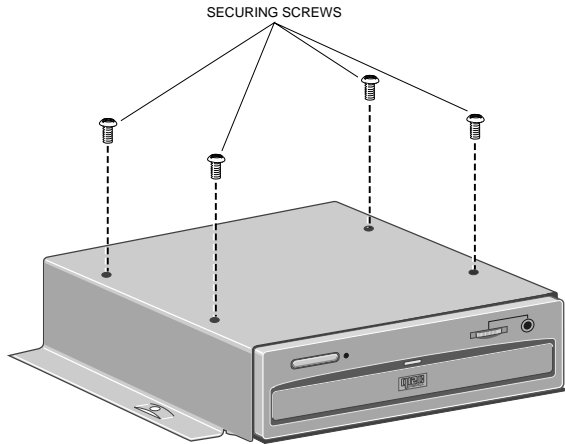
14.  Gently tighten the four screws.

15.  Turn the drive bay over and replace it in the system unit.

16.  Slide the bay forwards until the two holes in the bay line up with those in the hard drive assembly and the system unit brace.

17. Replace the two screws that secure the drive bay.

18. Behind the 5.25" drive bay is an unused power cable from the power supply. Connect this power cable to the power connector on the drive.

5.25" DRIVE
POWER CABLE
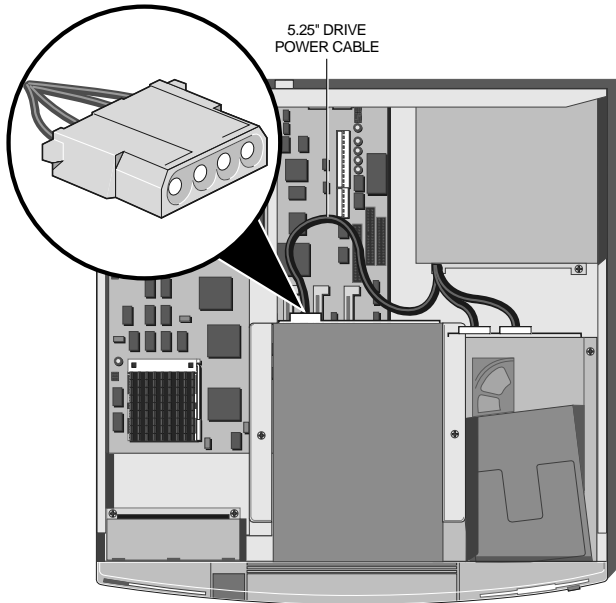
19. The drive has now been installed and connected to a power cable. You must now connect it to a signal cable. Instructions on connecting each of the types of drive to a signal cable is given under the appropriate heading overleaf.

**5.25" *floppy*** **Cabling**
***or Irwin FTD***

The signal cable must be connected between the signal connector on the rear of the 5.25" floppy or Irwin FTD drive, the 3.5" floppy drive and the socket marked FLOPPY on the motherboard.

### Configuration

The only configuration on these drives is via the drive select jumpers at the rear of the drive. The jumpers should be set to drive select 1 (DS1).

***SCSI drives***     ### Cabling

Apricot SCSI drive kits are supplied with a fitting kit. This kit includes a signal cable which is suitable for use with the drive supplied. The cable should be connected between the SCSI card and the rear of the drive.

The following illustration shows the correct routing of the cable.



SCSI CABLE
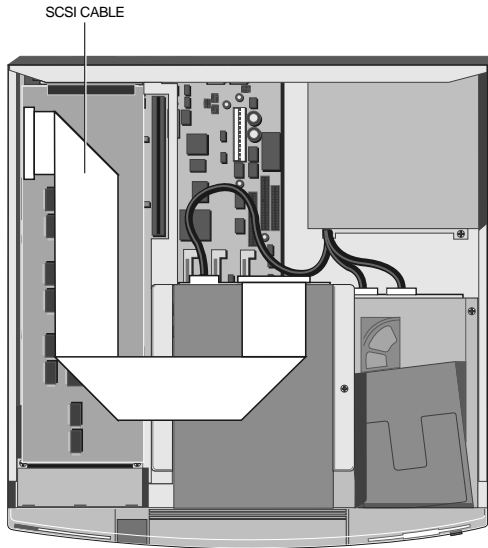
### Configuration

Each SCSI drive is assigned an identity on the SCSI bus, these are known as SCSI IDs. All Apricot SCSI drives for XEN are supplied configured with SCSI ID 2.

All Apricot SCSI drives are supplied with termination resistors fitted.

## 3.5" *hard disk drive*

The XEN supports one 1.6" high or two 1" high, 3.5" hard disk drives.

*Preparation*   To install a hard disk drive you must first remove the 3.5" drive bay:

1. Power the system down.

2. If there is a diskette in the 3.5" floppy drive, remove it.

3. Take suitable anti-static precautions and remove the system unit cover.

   If you are unfamiliar with Apricot's recommended anti-static precautions and/or the process of removing the system unit cover refer to the appendices at the rear of this manual.

In order to remove the 3.5" drive bay you must first remove the 5.25" drive bay.

4. If there is a drive fitted in the 5.25" bay disconnect the power and signal cables from the rear of the drive.

5. Remove the two screws that secure the 5.25" drive bay and slide the bay backwards.

6. Lift the 5.25" bay out of the system unit and put it down on a safe flat surface.

7. Disconnect the cable from the rear of the 3.5" floppy drive.

8. If a 3.5" hard disk is fitted remove the signal and power cables from the rear of the drive.

9. The 3.5" drive bay is secured by two screws and two lugs in the system unit base. Identify the screws and lugs from the following illustration.
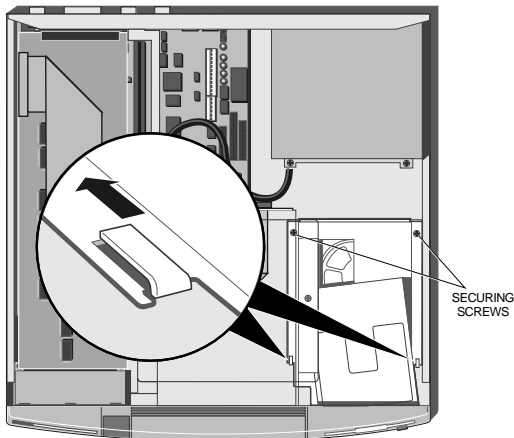


SECURING
SCREWS

10. Remove the two securing screws shown in the illustration above.

11. Slide the 3.5" drive bay backwards and lift it out of the system unit.

***Drive configuration***   The XEN 3.5" drive bay supports two 1" high hard disk drives. In order for the drive or drives to operate they must be correctly configured.

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

IDE drives are normally configured using jumpers on the drive. Configuration details may vary from drive to drive. Apricot drives are supplied with documentation describing how to configure the drive.

If you are uncertain about configuring the drive check with your supplier.

**Installing the drive**

1. Having configured the drive, turn the drive bay upside-down and rest it on a flat surface with the front of the floppy drive towards you.

2. Slide the hard disk drive you are installing into the bay form the front, with the drive circuit board up, and its connectors away from you.
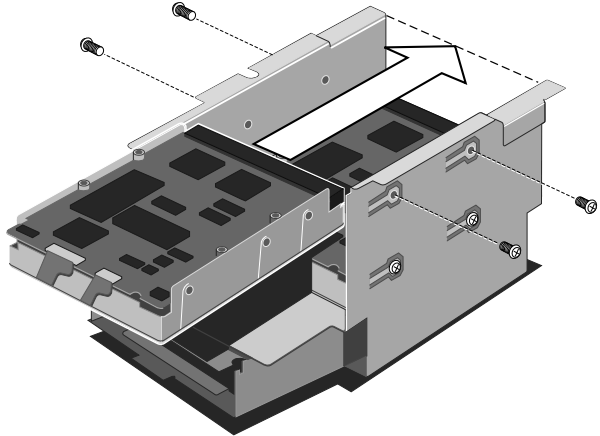


**Warning**

*If there is a drive in the bay already, be careful to ensure that the new drive does not touch it.*

3. Line up the screw holes on the drive with those in the bay, insert the securing screws and tighten them until they are finger tight.

**Note**

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

4. Carefully tighten the screws.

5. Turn the bay over.

***Reassembling the system***

1.  Replace the 3.5" drive bay in the system unit. Making sure that the cutouts in the bay align with the lugs in the base of the system unit.

2.  Carefully slide the 3.5" drive bay forwards. The bay is in position when the floppy drive operating button protrudes through the front bezel and the two screw holes in the bay line up with those in the base of the system unit.

3.  Replace the two securing screws.

4.  Connect the 3.5" hard disk(s) to their signal and power cables.

5.  Reconnect the 3.5" floppy drive cable.

6.  Replace the 5.25" bay in the system unit.

7.  Slide the bay forwards until the two holes in the bay line up with those in the hard drive assembly and the system unit brace.

8.  Replace the two screws which secure the 5.25" drive bay.

9.  If there is a drive in the bay reconnect its power and signal cables.

10. Replace the system unit cover.

# 6      USING THE SETUP UTILITY

## *Introduction*

The Apricot XEN motherboard is fitted with a small area of memory which is used to store information about the configuration of the computer. The computer's configuration is modified using a SETUP utility provided in Read Only Memory (ROM) on the motherboard.

A battery on the XEN motherboard maintains the configuration memory when the computer is switched off.

*Invoking*
*SETUP*

To enter SETUP press either the DEL or F1 key after the BIOS signs on, but before the "Please wait ....." prompt appears.

**Using SETUP**   A number of keys are used to move around the SETUP utility and change the configuration. The following list describes the use of each key.

| | |
|---|---|
| Esc | Exits the current screen. |
| ↑↓ ←→ | Moves the highlight to the next/previous option. |
| ← | In the opening screen the enter key invokes the selected option. |
| F1 | Calls context sensitive help when available. |
| F2/F3 | These two keys scroll through the possible colour combinations. |
| F5 | The F5 key restores the values to those that were present when SETUP was loaded. |
| F6 | The F6 key restores the values to the BIOS defaults. |
| F7 | The F7 key restores the values to the power on defaults. |
| F10 | The F10 key saves the changes made to CMOS, exits SETUP and reboots the system. |
| PgUp, PgDn | These two keys scroll through the possible settings for each option. |

## *Opening menu*

The SETUP program initially displays a menu to select three screens of SETUP options, and various actions including setting a password, and saving or discarding changes that you've made.

| SETUP option | Description |
|---|---|
| Standard CMOS SETUP | Sets up and modifies some basic options, such as time, date, floppy drives, hard drives, keyboard. |
| Advanced CMOS SETUP | Modifies more advanced features, such as enabling or disabling parity checking, cache, Num Lock, shadowing, IDE DMA transfer modes, ISA interrupts, and ISA linear frame buffers. |
| Peripheral Management SETUP | Sets up and modifies the peripherals integrated in the SMC37C665 super I/O controller. This utility specifies the serial and parallel port addresses. |
| Configure with BIOS defaults | Reloads the CMOS RAM with default values from the ROM table. |
| Configure with Power-On defaults | Reloads CMOS with settings at power-up. |
| Change Password | Specifies a password required to boot the system. |
| Write to CMOS and exit | After modifying any of the SETUP options, choose this option to save the new configuration to CMOS. |
| Do not write to CMOS and exit | After modifying any of the SETUP options, choose this option to discard any changes made to the configuration and not save it to CMOS. |

*Chapter 6*

## Standard CMOS SETUP

***Date*** Specifies the system date. This is the date used by the operating system. It can also be set from the Windows Control Panel or at the DOS prompt.

***Time*** Specifies the system time. This is the time used by the operating system. It can also be set from the Windows Control Panel or at the DOS prompt.

***Floppy drive A:*** Floppy drive A: is always fitted in this implementation and is always a 1.44 MB, 3.5-inch drive.

***Floppy drive B:*** If a second floppy is present, select the correct size and type. In this implementation if a second floppy is fitted it will normally be a 1.2MB 5.25" drive. The default for this option is not installed.

***Drive C, D, E, F: type*** There are three choices for configuring each IDE hard disk drive. In this implementation only drives C: and D: are supported. The three choices are:

1. Auto Configure: the BIOS automatically interrogates the hard drive and configures it appropriately.

2. User Type 1: allows you to explicitly configure the hard drive if the drive is not supported by Auto Configure.

3. User Type 2: allows you to explicitly configure a second type of hard drive if the drives are not supported by Auto Configure.

For drives of capacity less than 528 Mbytes this option should be set to Auto, and the IDE LBA translation option in Advanced CMOS SETUP must be disabled.

For the Quantum LPS540A drive this option should be set to User Type 1, and configured with 1024 cylinders, 16 heads and 63 sectors per track. The IDE LBA translation option in Advanced CMOS SETUP must be disabled.

For drives of capacity greater than 528 Mbytes (e.g. the 1 Gbyte drive shipped in XEN) this option should be set to Auto, and the IDE LBA translation option in Advanced CMOS SETUP must be enabled.

**Drive C, D, E, F: timeout**  Specifies for the time that the BIOS will spend interrogating the drive for IDE auto-configuration before displaying an error message. The options are 0, 5, 15, or 31 seconds, default is 5 seconds.

If the default returns an error message try the 15 and 31 second timeouts before resorting to manually entering drive type information.

**Keyboard**  The choices are installed or not installed. The default is installed.

**Base Memory**  Reports the amount of base memory.

**Extended Memory**  Reports the amount of extended memory.

## Advanced CMOS SETUP

**Typematic Rate Programming**  This option is either enabled or disabled. The default is disabled. When enabled, the following two typematic options are valid.

1. Typematic Rate Delay (in milliseconds): choose 250, 500, 750, or 1000 millisecond delays. The default is 500. This determines how long it takes for the key-repeat function to start when a key is held down.

2. Typematic Rate (in characters per second): choose 30, 24, 20, 15, 12, 10, 8, or 6 characters per second. The default is 15. This determines the speed at which characters repeat when a key is held down. The higher the number, the faster the characters repeat.

**Hit <F1> Message Display**  Choices are either enabled or disabled. The default is disabled. If you enable this option, the message "Hit <F1> to Enter SETUP" will appear on the screen during the power-up sequence.

*Chapter 6*

**System Boot-up Num Lock** Choices are either On or Off. The default is on. This sets the state of the "Num Lock" key on your keyboard when the system boots.

If you regularly use the numeric keypad on your keyboard to enter numerical data then the default will suit you. If, on the other hand, you use the numeric keypad as cursor control keys then you may prefer to select Off.

**System Boot-up Sequence** This option determines which drive the system checks first to find an operating system to boot from. The following options are available:

- Drive A: before C: (default). The system checks drive A before checking drive C. This selection allows you to boot from a diskette if necessary.

- Drive C: before A: The system checks drive C first.

- Check only C: The system checks drive C and no other drives.

**System Boot Up CPU Speed** The choices are either HIGH or LOW. The default is high. If high is selected, the system boots with the processor running at full speed. If low is selected, the system goes into deturbo mode, which results in slower operation, equivalent to a 10MHz 80286 processor.

**Cache Memory** The choices are either enabled or disabled. The default is enabled. This option enables or disables the cache integrated in the processor and the external cache.

**Network Password Checking** The choices are either enabled or disabled. The default is disabled. If this option is enabled, the user will be prompted for a password when attempting to connect to a network.

**ISA Linear Frame Buffer** This option currently has no effect.

**Set Linear Frame Address To** This option currently has no effect.

*Chapter 6*

**Disable Shadow Memory Size**    Select either Enabled or Disabled. The default is disabled. This selection is tied to the next selection "Disable Shadow Memory Base". If the shadow memory base address is set to either C0000H or D0000H, you can select a shadow memory size of 16, 32, 48, or 64 KB.

**Disable Shadow Memory Base**    This selection allows you to alter the location of the shadow memory base address. The choices are in the C0000H or D0000H range, with several options in each range. For example, within the C0000H range, you can choose C0000H, C4000H, C8000H, or CC000H. This setting affects the previous menu selection. Once you make a selection in this menu, you can alter the previous menu, "Disable Shadow Memory Size." The maximum shadow memory size is 64 KB. You can only achieve 64 KB if you specify the Shadow Memory Base to be at C0000H or D0000H. Selecting the other shadow memory base options causes the shadow memory size to be smaller.

**Base Memory Size**    Select either 640 KB or 512 KB. Default is 640 KB.

**IDE DMA Transfer Mode**    The choices are enabled or disabled. The default is disabled. If you select enabled, you can choose from three types of IDE DMA transfers: Standard (compatible), Type B, or Type F. Type F is the fastest DMA transfer mode. This option has no effect on the primary IDE interface.

**IDE Multiple Sector Mode**    There are several choices for this SETUP option. The default is disabled. The other choices are 1, 2, 4, 8, 16, 32, or 64 S/B (S/B = sectors per burst). This setting programs the IDE DMA cycles to transfer multiple sectors per burst.

**IDE LBA translation**    This option enables or disables IDE LBA (Logical Block Address) translation. LBA supports drives of greater than 528 Mbytes under DOS and can offer significant performance benefits. The 1Gbyte drive shipped in XEN is the first Apricot drive to support LBA. In order to access the full capacity of the drive LBA must be enabled.

*Chapter 6*

| | |
|---|---|
| ***Enhanced ISA Timing*** | This selection is either enabled or disabled. The default is disabled. When this option is enabled, the ISA bus will operate at 10 MHz. This can result in faster system performance if the ISA adapters in the system can tolerate 10 MHz (instead of the standard 8 MHz). |
| ***ISA IRQ 9*** | Select free or used. Select used if your system contains an ISA adapter that uses this interrupt. The PCI auto-configuration code will look here to see if this interrupt is "free". If this interrupt is specified as free, then the PCI auto-configuration code may attempt to use it. |
| ***ISA IRQ 10*** | Select free or used. Select used if there is an ISA adapter in your system that uses this interrupt. The PCI auto-configuration code will look here to see if this interrupt is "free." If this interrupt is specified as free, then the PCI auto-configuration code may attempt to use it. |
| ***ISA IRQ 11*** | Select free or used. Select used if there is an ISA adapter in your system that uses this interrupt. The PCI auto-configuration code will look here to see if this interrupt is "free." If this interrupt is specified as free, then the PCI auto-configuration code may attempt to use it. |

## Peripheral Management SETUP

| | |
|---|---|
| ***Programming Option*** | Select either auto or manual. The default is auto. Auto means that the system peripherals listed (peripherals controlled by the SMC37C665 super I/O controller) are automatically configured during power up. If auto is selected, then the following menu options have no effect.

Manual means that all of the following peripherals must be explicitly specified in this utility. |
| ***Onboard Floppy Drive*** | Enabled or disabled. |

*Chapter 6*

**Onboard IDE drive**     Enabled or disabled.

**First Serial Port Address**     Choices include disabled, or address 2E8H, 3E8H, 2F8H, or 3F8H. If "Programming Option" has been set to auto, this address will display "disabled."

---

**Warning**
*Do not select the 2E8H option. This may adversely affect the operation of the on-board video.*

---

**Second Serial Port Address**     Select Disabled or address 2E8H, 3E8H, 2F8H, or 3F8H. If "Programming Option" has been set to auto, this address will display "disabled."

---

**Warning**
*Do not select the 2E8H option. This may adversely affect the operation of the on-board video.*

---

**Parallel Port Address**     Select Disabled, or address 278H, 378H, or 3BCH. If "Programming Option" has been set to auto, this address will display "disabled."

**IRQ active State**     High or low. The default is high.

**Parallel Port Mode**     Normal or extended. The default is normal. Extended enables the Enhanced Parallel Port (EPP), and Enhanced Capabilities Port (ECP) features of the parallel port.

## Configure with BIOS Defaults

This selection loads the default SETUP values from the ROM table.

## Configure with Power-on Defaults

This selection loads the power-on default values from the ROM table.

*Chapter 6*

## Change Password

Specifying a password in this utility enables the system password function. When a password is specified it must be entered every time the system is booted.

The password can be changed or deleted using this utility. To delete the password or disable the password function, specify the new password to be a carriage return.

Once you specify a password, you cannot enter SETUP without entering the password. If you forget the password, you must move the password jumper on the motherboard to the "disable password" position.

A second jumper on the motherboard allows you to disable SETUP. Information about jumpers is given in Appendix A.

## Write to CMOS and Exit

After making any changes to SETUP, select "Write to CMOS and exit" to save the changes to CMOS and exit the SETUP program.

## Do Not Write to CMOS and Exit

This menu selection exits the SETUP program and discards any changes made.

# 7     TROUBLESHOOTING

This chapter offers advice if you suspect a fault with your Apricot XEN. If in doubt, turn off the computer and unplug all power cords before consulting your Apricot supplier or an authorized Apricot maintainer.

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

*Chapter 7*

## Problems when starting

**Power-on self-test**   Whenever the Apricot XEN is turned on or reset, the power-on self-test (POST) routine tests various hardware components, including memory, and compares the actual configuration of the machine with that recorded in configuration (CMOS) memory.

A configuration discrepancy could arise if you have just installed or removed a hardware option (for example, if you have added or replaced a SIMM).

If POST detects a hardware fault, one or more error messages are displayed. You may also be prompted to "Press the F1 key to continue".

Your first action should be to turn the computer off, wait at least 30 seconds, then turn it on again to see if the error condition is transient or persistent. Persistent POST error messages may indicate a fault in your system. If you press F1, the XEN attempts to boot despite the error indication (for example, if a memory chip fails POST, the computer can continue with less memory). If the problem persists, make a note of the error messages and the conditions under which they occur, and consult your Apricot supplier or an approved Apricot maintainer.

**Beep codes**   The XEN 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 (see above), call your Apricot supplier or an authorized Apricot maintainer.

**Failure to boot**   On the completion of POST, the XEN attempts to boot from a system diskette then a bootable hard disk partition.

> **Note**
> *SETUP allows the drives, and the order in which they are checked to be modified.*

MS-DOS is normally pre-installed on XEN systems with a hard disk.

If necessary, your operating system manuals should tell you how to format a blank diskette as a system diskette (for example, DOS uses the **Format a: /s** command) or how to partition and format a hard disk (DOS uses the **Fdisk** utility and **Format** command).

The rest of this section lists some of the error messages that can be displayed when the XEN fails to boot.

```
Non-system disk or disk error
Press the F1 key to continue
```

The diskette drive contains a non-system diskette. Replace it with a system diskette and press F1.

```
Diskette read failure
Press the F1 key to continue
```

The diskette is either not formatted or defective. Replace it with a system diskette and press F1.

```
No boot sector on fixed disk
Press the F1 key to continue
```

The hard disk has no active, bootable partition or is not formatted. Insert a system diskette, press F1, and format the hard disk as described in your operating system manuals.

```
Fixed disk read failure
Press the F1 key to continue
```

The hard disk may be defective. Press F1 to retry. If the problem persists, insert a system diskette, press F1, back-up the data held on the defective hard disk and try reformatting it.

```
No boot device available
Press the F1 key to continue
```

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. If the problem persists, consult your Apricot supplier or an approved Apricot maintainer.

*Chapter 7*

## Troubleshooting charts

The charts on the following pages should help you diagnose and remedy problems with your Apricot XEN. The charts are organized by hardware component.

### Problems with the system unit

| Problem | Diagnosis |
|---------|-----------|
| The XEN will not start when the POWER button is pressed. | The AC power supply is not switched on. |
| | The XEN power cord is loose. |
| | The fuse in the AC plug has blown. |
| | The power cord is broken inside. |
| The power-on LED is unlit, although the XEN is working correctly. | The LED circuitry is faulty. |
| Intermittent problems. | A cable or cord may be loose. |

Note that, within a chart, the possible diagnoses of a problem are listed in order of decreasing likelihood.

| | **Remedy** |
|---|---|
| | Switch on the supply at the AC power outlet. |
| | Push the plugs in firmly at the AC power outlet and at the XEN power inlet. |
| | This may be caused by a AC power surge, but is more often a symptom of problems with the XEN or its peripherals. |
| | Switch the computer off and disconnect the AC power supply. Unplug all peripherals. Try to discover the cause of the fault. Replace the blown fuse with one of the same rating and try again. |
| | If the replacement fuse blows, call an authorized Apricot maintainer. If the replacement fuse does not blow, switch off, reconnect a peripheral and switch on. Repeat this procedure for each peripheral in turn. |
| | If power is lost when you deliberately flex the cable, replace the cord with an identical one obtained from your Apricot supplier or an authorized Apricot maintainer. |
| | The power-on LED should be lit while the XEN is plugged into a working AC power supply and switched on. Call an authorized Apricot maintainer. |
| | Ensure that all cables and cords are tightly connected to the system unit and any peripherals. |

*Chapter 7*

**Problems with expansion cards**

| Problem | Diagnosis |
|---|---|
| A card that was just installed does not seem to work. | The card is installed incorrectly. |
| | The software that drives or uses the card is configured incorrectly. |
| | You may have inadvertently loosened other cards or cables inside the XEN. |
| | The card is faulty. |
| A card that used to work does not work now. | You may have inadvertently loosened the card or its cables inside the XEN. |
| | The card's configuration clashes with that of another card installed later. |
| | The card is faulty. |

| | **Remedy** |
|---|---|
| | Read the installation guide or user's guide that accompanies the card very carefully. Make sure that the card has been configured correctly and that there are no configuration clashes between the card and other cards or XEN components. If a diskette came with the card, look for a "readme" file which might contain up-to-date installation instructions. |
| | Sometimes the software that drives or uses an expansion card needs to know the card's configuration settings. Check the documentation that came with the card or the software. |
| | Isolate the XEN, remove the top cover, and check. |
| | Contact your supplier. |
| | Isolate the XEN, remove the top cover, and check. |
| | Reconfigure one or other of the cards. |
| | Contact your supplier. |

*Chapter 7*

**Problems with the diskette or floppy disk drive**

| Problem | Diagnosis |
|---------|-----------|
| A diskette refuses to load into the disk drive. | You may be inserting the disk incorrectly. |
| | Something is stuck in the drive slot (for example, a disk label). |
| The drive does not seem able to read a disk correctly. | The disk may not have been formatted for your operating system. |
| | The disk may have become corrupted by strong magnetic fields, or subjected to extremes of temperature and humidity. |
| | There may be condensation on the surface of the disk. |
| The drive cannot write to a disk. | The disk may be write-protected. |
| | You are attempting to change a file with a "read-only" attribute or for which you do not have the necessary access permissions. |
| The disk eject lever will not turn. (5$^1/_4$" drive only) | There is no disk in the drive. |
| The drive cannot access the disk. | The disk is not properly loaded. |
| The diskette indicator doesn't light when a disk is accessed. | The LED circuitry is faulty. |
| | The disk drive is faulty. |

*Chapter 7*

| | Remedy |
|---|---|
| | Insert a 3$^1$/$_2$" diskette metal-shutter end first, with the label side facing up. |
| | Insert a 5$^1$/$_4$" disk with the write protect notch near you and to the left. |
| | Do *not* try to remove the object with tweezers or any similar implement: you will damage the drive. Call an authorized Apricot maintainer. |
| | Consult your operating system documentation. |
| | Try a proprietary data recovery utility. Ask your Apricot supplier or an authorized Apricot maintainer for advice. |
| | A cold disk brought into a warm room may collect condensation. Wait until the disk has adjusted to room temperature before using it. |
| | If you are using a 3$^1$/$_2$" floppy disk, slide the small tab on the back of the diskette to cover the hole beneath. Re-insert the diskette and try again. |
| | If you are using a 5$^1$/$_4$" floppy disk, check that the write protect notch on the edge of the disk is uncovered. Remove any write protect sticker and try again. |
| | File attributes and access permissions may be set by your operating system. Consult your operating system documentation. The SETUP utility may also prevent access to the drive. |
| | Do *not* force the lever when there is no disk in the drive as doing so will break the mechanism. |
| | The drive mechanism may not drop downwards properly onto a 3$^1$/$_2$" disk. Try ejecting and reloading the disk. |
| | In a 5$^1$/$_4$" disk drive turning the disk eject lever engages the drive mechanism. Make sure that the disk is fully home and the lever is in the locked position. |
| | Try loading a disk and displaying its directory. If the directory appears, then LED failure is indicated. Call an authorized Apricot maintainer. |
| | If the indicator doesn't light and you cannot display the directory of a disk loaded in the drive, there is probably a fault with the drive |

*Chapter 7*

***Problems with a hard disk drive***

| Problem | Diagnosis |
| --- | --- |
| The hard disk drive LED does not light while a drive is being accessed. | The LED circuitry is faulty. |
| | The hard disk drive is faulty. |
| The drive does not seem able to read data correctly. | The disk may not have been formatted for your operating system. |
| | The disk may have become corrupted by strong magnetic fields, or subjected to extremes of temperature and humidity. |
| | There may be condensation on the surface of the disk. |
| The drive cannot write to a disk. | You are attempting to change a file with a "read-only" attribute or for which you do not have the necessary access permissions. |

| | **Remedy** |
|---|---|
| | Call an authorized Apricot maintainer. |
| | Call an authorized Apricot maintainer. |
| | Consult your operating system documentation. |
| | Try a proprietary data recovery utility. Ask your Apricot supplier or an authorized Apricot maintainer for advice. |
| | A cold system unit brought into a humid room may collect condensation on its hard disks. Wait until the system unit has adjusted to room temperature before using it. |
| | File attributes and access permissions may be set by your operating system. Consult your operating system documentation. The SETUP utility may also prevent access to the drive. |

*Chapter 7*

**Problems with the keyboard**

| Problem | Diagnosis |
|---|---|
| The keyboard does not seem to work. | The keyboard is plugged into the mouse port. |
| | The keyboard signal cable is loose. |
| | The key functions have been "remapped" by software. |
| | Some small object has fallen between the keys. |
| | Liquid has seeped between the keys. |
| | The keyboard was plugged in while the system was powered up. |
| | The keyboard is faulty or the keyboard signal cable is broken inside. |
| The numeric keypad does not seem to work (instead of numbers you get cursor controls). | The keypad has not been enabled. |

| | **Remedy** |
|---|---|
| | This is easily done as the two ports look identical. The keyboard port is the small circular port nearest the power supply. |
| | Push the plug firmly into the keyboard port. |
| | Consult your software documentation. |
| | Unplug the keyboard, turn it upside down and shake it. If you cannot dislodge the object, call an authorized Apricot maintainer. |
| | If the liquid is viscous, unplug the keyboard and call an authorized Apricot maintainer. If the liquid is thin and clear, try unplugging the keyboard, turning it upside down to let the liquid run out, and drying it at room temperature for 24 hours. If it still doesn't work, call an authorized Apricot maintainer. |
| | The keyboard controller is protected by a "Polyswitch" circuit. This acts like a self healing fuse. Turn the system off, wait two minutes, then turn it on again. |
| | Call an authorized Apricot maintainer. |
| | Press the NumLock key (in the top left corner of the keypad). The NumLock LED should light. |

*Chapter 7*

***Problems with the mouse***

| Problem | Diagnosis |
|---------|-----------|
| The mouse does not seem to work, or cursor movement on the screen is erratic. | The mouse is plugged into the keyboard port. |
| | The mouse signal cable is loose. |
| | The mouse is dirty. |
| | The mouse device driver is not loaded. |
| | The mouse was plugged in while the system was powered up. |
| | The mouse is faulty or the mouse signal cable is broken inside. |

***Problems with the monitor***

| Problem | Diagnosis |
|---------|-----------|
| There is no display, or the display is poor. | The monitor is not switched on. |
| | The brightness and/or contrast controls need adjustment. |
| | The monitor screen is dirty. |
| | The monitor power cord is loose. |
| | The signal cable between the monitor and the XEN system unit is loose. |
| | The monitor signal cable or power cord is broken inside. |
| | The monitor is faulty. |
| A VGA colour monitor displays only in monochrome. | The monitor is in the wrong mode. |
| | The monitor signal cable was not connected when the XEN was switched on. |

*Chapter 7*

| | Remedy |
|---|---|
| | This is easily done as the two ports look identical. The keyboard port is the small circular port nearest the power supply. |
| | Push the plug firmly into the mouse port. |
| | Clean the mouse as described in Chapter 4, "Caring for the Apricot XEN". |
| | A mouse device driver is software which mediates between the mouse and your operating system. This driver must be loaded into the computer's memory. Check your operating system documentation to ensure that it is being used correctly. |
| | The keyboard controller is protected by a "Polyswitch" circuit. This acts like a self healing fuse. Turn the system off, wait two minutes, then turn it on again. |
| | Call an authorized Apricot maintainer. |

| | Remedy |
|---|---|
| | Switch on the monitor. |
| | Adjust the controls until an acceptable display appears. Consult the monitor's documentation (if any). |
| | Clean the monitor as described in Chapter 4, "Caring for the Apricot XEN". |
| | Push the plugs in firmly at the AC power outlet and at the monitor power inlet. |
| | Push the plugs firmly into their ports and tighten the securing screws. |
| | Replace the signal cable or power cord with an identical one obtained from your Apricot supplier or an authorized Apricot maintainer. |
| | Call an authorized Apricot maintainer. |
| | If the monitor has a mode selection switch, try switching modes. Consult the monitor's documentation. |
| | Connect the signal cable and then re-boot your computer. |

*Chapter 7*

# A    INSIDE THE APRICOT XEN

This appendix provides step-by-step instructions on obtaining access to the inside of the Apricot XEN system unit. Note that instructions for installing upgrade options are provided in Chapter 5 "Upgrading the Apricot XEN".

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

Also included here is information on configuring expansion cards, and on motherboard jumper settings.

## 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 your computer.

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

Your computer is at risk from static discharge while the top cover is off. This is because the electronic components of the motherboard are exposed. Expansion cards, SIMMs and OverDrive processors are other examples of electrostatic sensitive devices (ESSDs).

All work that involves removing the XEN's top cover must be done in an area completely free of static electricity. Apricot recommends using a Special Handling Area (SHA) as defined by BS CECC 00015:Part 1. 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 add-on, be sure you understand what the installation procedure involves before you start. This will enable you to plan your work, and so minimize the amount of time that sensitive components are exposed.

Do not remove the computer's top cover, nor the anti-static bag or wrapping of any add-on, until you need to.

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

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

## *Removing the top cover*

1. Turn off both the Apricot XEN system unit and the monitor.

2. If your AC power outlets have switches, set them to their Off positions.

3. Unplug all power cords from rear of the system unit.

4. If the system unit has a caselock (on the right-hand side), turn the caselock key to the unlocked position.

5. Loosen the two casing screws.

6. Slide the top cover rearwards slightly, then lift it off.

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



CASING SCREW

CASING SCREW
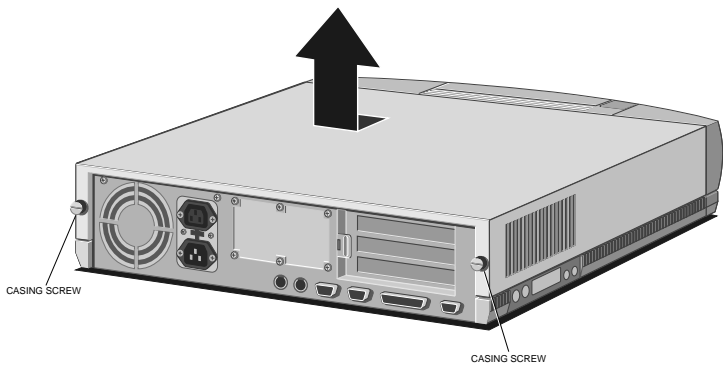
## Configuring expansion cards

Many expansion cards have a number of configurable options. These options can include items such as: the interrupt used, the DMA channel used, where any ROM on the card will appear in the processor's memory map and which I/O ports are used to control the card.

Most ISA cards use jumpers and/or switches to select their configuration options. If this is the case then the card should be configured before you install it. A few cards are configured using a software utility supplied with the card, this can only be done after the card is installed. PCI cards are automatically configured by a utility included in the BIOS.

The SETUP utility includes the facility to indicate to the PCI auto-configuration utility whether or not each of three interrupts (IRQ9, 10 and 11) are used by ISA cards. If you use SETUP to indicate that one of these interrupts is used, then the auto-configuration utility will not attempt to configure a PCI card to use that interrupt.

For ISA cards how configuration options are selected varies from card to card and will be described in documentation supplied with the card. Remember to check any floppy disks supplied with the card for README or Help files.

If you are not familiar with the concepts of interrupts, DMA channels, memory maps and I/O ports the following text attempts to explain what they are, and how to decide which option to select.

For the following explanations it should be understood that a peripheral can be either, a subsystem on the motherboard, or an expansion card.

**Interrupts (IRQ)**   The XEN (like every other ISA compatible PC) supports 15 hardware interrupts. These interrupts are used to alert the processor that a peripheral (e.g. the keyboard controller, or an expansion card) requires a particular piece of software to be executed. This piece of software is known as an interrupt service routine.

Each peripheral has a unique interrupt service routine that is executed in response to the interrupt assigned to that peripheral.

When an interrupt occurs the processor stops executing its current task, executes the interrupt service routine, then returns to its original task. The processor is, literally, interrupted.

A hardware interrupt may be referred to as an IRQ. This is because the motherboard signals used to generate the interrupts are labelled IRQ$x$ where $x$ is a number between 0 and 15, excluding 2.

Some interrupts are assigned to standard functions and are essential for the operation of the board. Examples of these are, IRQ0 which is used to maintain the system time, and IRQ13 which is used by the coprocessor.

*Appendix A*

### Selecting IRQs for cards

The table below lists the interrupts available on the motherboard and their default functions. The notes explain whether the default function can be disabled, if so how, and under what circumstances it is safe to do so.

| Interrupts | Default Function | Notes |
|---|---|---|
| IRQ5, IRQ9 IRQ10, IRQ11 | Not used | These interrupts are not used by the motherboard and are available for expansion cards. |
| IRQ7 | Parallel port | IRQ7 is not normally used, and can be used by expansion cards without affecting the operation of the parallel port. It is possible for software to enable the parallel port's use of IRQ7. This is rare but could cause problems with a card using IRQ7.

If you are not using the parallel port it can be disabled using SETUP, freeing IRQ7 to be used by an expansion card. |
| IRQ15 | Secondary hard disk controller | This interrupt is available for use by an expansion card unless an IDE device is connected to the secondary IDE interface. |
| IRQ3 IRQ4 | Serial port 2 Serial port 1 | Each of the serial ports, can be individually disabled using SETUP. When a port is disabled, the interrupt assigned to it is free and can be used by an expansion card. You should only disable a port if you are certain that you will not be using it. |
| IRQ1 IRQ6

IRQ8

IRQ12 IRQ14 | Keyboard Floppy disk controller Real time clock Mouse Hard disk controller | These interrupts cannot be used by an expansion card under any circumstances. |

Refer to the table above, and the documentation supplied with the card to establish which IRQ, if any, to use and how to select it.

**DMA channels**   ISA compatible PCs are equipped with a seven channel DMA (Direct Memory Access) controller. This DMA subsystem allows peripherals to access motherboard memory directly.

Without the DMA subsystem every memory access would have to involve the processor. Using DMA, peripherals can access memory without stopping the processor executing its current task.

On the XEN motherboard only DMA channel 2 is used, the other six channels are all available for use by expansion cards.

**Expansion card memory**   Some expansion cards are fitted with ROM. Typically expansion card ROM contains extensions to the motherboard BIOS providing additional functionality.

Expansion card ROM (sometimes known as slot ROM) must be addressed somewhere in the processor's memory map. An area of the memory map of an ISA compatible PC is allocated for expansion card ROM.

If you are unfamiliar with the concept of memory maps, and the hexadecimal numbering system the following text attempts to explain them. If you are familiar with the memory map of an ISA PC then continue to *Memory configuration*.

### Numbers and computers

For a variety of reasons, in computer literature and terminology, numbers are sometimes in hexadecimal notation rather than the decimal that we are all familiar with. Hexadecimal is a long word and it is often shortened to hex.

*Appendix A*

If you think of the decimal system using columns:

| 1000 | 100 | 10 | 1 |
|------|-----|----|----|
| (10x10x10) | (10x10) | (10) | (1) |

The number 1019 is:

| 1000 | 100 | 10 | 1 |
|------|-----|----|----|
| 1 | 0 | 1 | 9 |

Each time you add 1 to a column that contains 9, that column goes back to 0 and you add 1 to the column to the left. The columns represent powers of 10: 10x10, 10x10x10 and so on, and the decimal system is said to be *base 10*.

The hex numbering system uses a base of 16. Hex numbering works in exactly the same way as the decimal system, except you must add 1 to a column that contains 15 before you add 1 to the column to the left.

As we have no single character to represent the numbers 10 to 15, we substitute the first six letters of the alphabet, so that:

A represents 10
B represents 11
C represents 12
D represents 13
E represents 14
F represents 15

The example number 1019 can then be represented in hex by:

| 4096 | 256 | 16 | 1 |
|------|-----|----|----|
| (16x16x16) | (16x16) | (16) | (1) |
| 0 | 3 | F | B |

We can demonstrate that 3FB is exactly the same as 1019 by:

(4096x0)+(256x3)+(16xF)+(1xB)=768+240+11=1019

---

**Note**

*A lower case h is often used at the end of a number to ensure that you realise it is in hex format e.g. 3FBh.*

---

A larger hex number and one that you will come across in the *Memory map* description below is A0000h. To see this as a decimal number:

| 16x16x16x16 | 16x16x16 | 16x16 | 16 | 1 |
|---|---|---|---|---|
| A | 0 | 0 | 0 | 0 |

16x16x16x16=65536

So A0000h is 65536x10=655360.

If you have Microsoft Windows 3.x on your XEN you may find it helpful to use the Windows Calculator. In Scientific View the calculator allows you to enter decimal numbers and convert them to hex, and vice versa.

Another commonly used notation is to describe numbers as *x*K or *x*M. Where 1K=1024 and 1M=1048576 (1048576=1024x1024). In this notation 655360 (that is A0000h) is 640K.

### *Memory maps*

All memory, whether it is on the motherboard or an expansion card, is accessed somewhere in the processor's address space.

The processor's address space can be thought of as a list of locations, the locations are each identified by a number. The first, or bottom, location is address 0.

Every address contains 8-bits of data, a byte. Each bit can be thought of as a switch which can be either on or off. A byte is like a bank of 8-switches, where each switch can be on or off.



So 1Mbyte of memory consists of 1048576 (see *Numbers and computers*) locations each containing one byte of data.

When installing expansion cards it is the first (bottom) Mbyte of address space that is of most interest. The following diagram shows how the bottom 1M of address space is used in a XEN. Diagrams like these are called memory maps, and are a convenient way of representing processor address space.

Appendix A
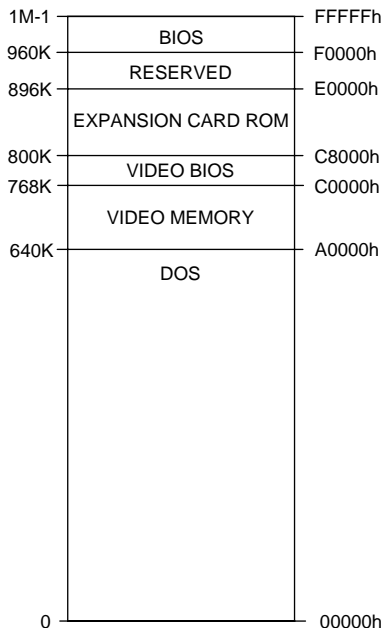
**Note**

*The top location of this first Mbyte is 1M-1 or FFFFFh. This is because in the first Mbyte there are 1M locations, starting at 0. Location 1M is the start of the second Mbyte of address space.*

The memory map above shows the uses of the first Mbyte of address space. The memory map is arranged in this way in order to be compatible with the ISA standard.

The region from 0 to 640k-1 (00000h to 9FFFFh) is used by DOS. The operating system is loaded at the bottom of this area and it uses the remainder to load applications and data.

Motherboard video adapter memory is accessed between 640k and 768k-1 (A0000h to BFFFFh). In the XEN the motherboard video BIOS is addressed between 768k and 800k-1 (C0000h to C7FFFh).

**Note**

*This region is often used by video BIOS on expansion cards. If an expansion card with video BIOS is installed in a XEN the motherboard video adapter must be disabled by removing jumper JP14.*

The region from 800k to 896k-1 (C8000h to DFFFFh) is available for expansion card ROM, other than video BIOS. The region from 896k to 960k-1 (E0000h to EFFFFh) is reserved. While address space from 960k to 1M-1 (F0000h to FFFFFh) is used by the motherboard BIOS.

When installing expansion cards the area of most interest is between 768k and 896k-1 (C0000h to DFFFFh).

### Configuring expansion ROM

Expansion card ROM is addressed in the C0000h to DFFFFh region of processor address space.

*Appendix A*

On the XEN motherboard video BIOS is accessed from C0000h to C7FFFh. If you are installing a video card it should be configured with its BIOS occupying this region.

---

**Note**

*If your video card does not allow you to configure the address range of its BIOS it will be set to the C0000h range.*

---

The region from C8000h to DFFFFh is available for expansion card ROM other than video BIOS. It is recommended that you configure expansion card ROM at the bottom of this region, with the address ranges as close together as possible without any overlapping.

This will leave the maximum amount of memory free for use as UMB space. For information on UMB space refer to your DOS documentation, and the help files supplied with your computer.

*I/O ports*   I/O ports are used by the processor to control the operation of peripherals. Some expansion cards are controlled via an I/O port or group of ports.

Which port or ports the card uses can normally be selected on the card. The following table lists the I/O ports used by the XEN motherboard. Any ports not listed below may be used by an expansion card. Refer to the table, and the documentation supplied with the card to establish which ports, if any, to use and how to select them.

| I/O ports (Hex) | Used by |
|---|---|
| 000 - 00F | DMA controller |
| 020 - 021 | Interrupt controller 1 |
| 040 - 043 | System timer |
| 048 | System timer |
| 060 - 064 | Keyboard controller |
| 070 - 078 | Real time clock, NMI mask |
| 080 - 08F | DMA page register |
| 0A0 - 0BF | Interrupt controller 2 |
| 0C0 - 0DF | DMA controller 2 |
| 0F0 | Math coprocessor |
| 1F0 - 1F7 | Hard disk drive controller |
| 278 - 27F | Parallel port 3 |
| 2F8 - 2FF | Serial port 2 |
| 378 - 37F | Parallel port 2 |
| 3B8 - 3BF | Parallel port 1 |
| 3E8 - 3EF | Serial port 3 |
| 3F0 - 3F7 | Diskette drive controller |
| 3F8 - 3FF | Serial port 1 |
| 0CF8 | PCI configuration space enable |
| 0CF9 | Deturbo mode enable |
| C000 - C3FF | Chipset configuration |

**Note**

*I/O ports are always given in hex notation. If you are unfamiliar with this notation refer to Numbers and computers earlier in this appendix.*

*Appendix A*

## *Motherboard jumper settings*

The XEN motherboard is fitted with a number of jumpers that are used to configure the operation of the system. The following illustration shows the position of the jumpers.
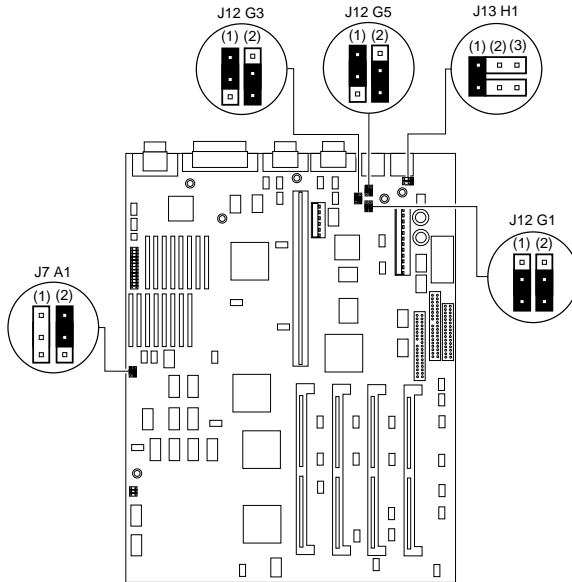


The illustration above shows the location of the jumpers on the motherboard. The table opposite lists the motherboard jumpers by function, tells what each jumper is for, and indicates the settings shown by the dark blocks on the illustration above.

The jumper block numbers (e.g., J7A1, J12H1) are printed on the motherboard.

| Function | System Board Location | Setting Illustrated |
|---|---|---|
| Reserved | J7A1(1) | Not fitted |
| 66MHz/60MHz: CPU clock speed | J7A1(2) | 66MHz |
| Clear/don't clear CMOS: allows CMOS to be reset to factory-default settings. | J12G1(1) | Don't reset CMOS defaults |
| Clear/don't clear password: allows the BIOS password to be overridden. | J12G1(2) | Don't clear password |
| Flash normal/flash recovery: allows recovery of the default BIOS, if the BIOS is corrupted during an upgrade. | J12G3(1) | Flash normal |
| Enable/disable flash updates: allows upgrading the BIOS stored in the flash EEPROM. | J12G3(2) | Disable flash updates |
| Monochrome/colour video mode | J12G5(1) | Colour |
| Enable/disable entry into SETUP program: allows user to disable entry into the SETUP program at boot-up. | J12G5(2) | Enable entry into SETUP |
| 5.25V Processor voltage | J13H1(1) | Fitted |
| Reserved | J13H1(2) | Not fitted |
| 5V Processor voltage | J13H1(3) | Not fitted |

**Note**
*Jumper J13H1 must have a jumper clip fitted either in position 1 or position 3, never both.*

# B TECHNICAL INFORMATION

This appendix provides some technical information about the Apricot XEN. More detailed information is available from your Apricot supplier.

## *Specifications*

| | | |
|---|---|---|
| *System processor* | | Intel Pentium 66<br>Intel Pentium 60 |
| *BIOS ROM* | | 128 Kb 8-bit |
| *Memory* | | Four 36-bit 70ns SIMMs (128 Mb maximum) |
| *Apricot Advanced Graphics* | Controller<br>Video RAM<br>Resolutions | ATI 68800AX<br>1 Mb or 2 Mb<br>EVGA 1280 x 1024<br>EVGA 1024 x 768<br>SVGA 800 x 600<br>VGA 640 x 480 |
| *I/O ports* | Serial<br><br><br>Parallel | dual 9-way male D-type<br>RS-232 supporting baud rates from<br>110 baud to 14.4K baud<br>25-way female D-type supporting<br>ECP and EPP |
| *Keyboard* | | 102 key AT-compatible |
| *Mouse* | | PS/2-compatible two-button |
| *Diskette drive* | Capacity<br>Access time | 1.44 Mb<br>94 ms (average) |
| *Hard disk drive bay* | Interface<br>Form factor<br>Capacity | IDE<br>3.5"<br>One 1.6" drive or Two 1" drives |
| *Removable media drive bay* | Form factor<br>Interfaces | Half-height 5.25"<br>Floppy disk/tape SLCD CD-ROM |

### SLCD CD-ROM drive (CDU33A)

| | | |
|---|---|---|
| *Discs* | Acceptable discs | CD-ROM mode 1 data discs |
| | | CD-ROM mode 2 data discs |
| | | CD audio discs |
| | | Audio-combined CD-ROM |
| | | Multisession Photo-CD |
| | Disc diameter | 12 cm, 8 cm |
| *Transfer rate* | Sustained | 150 Kbyte/s, normal |
| | Burst | 300 Kbyte/s, double |
| *Access time* | Full stroke | 0.65s, typical, normal |
| | | 0.60s, typical, double |
| | Average (random) | 0.40, typical, normal |
| | | 0.35, typical, double |
| *Audio output* | Line | 0.7 V at 47 kOhm |
| | Headphone | 0.5 V at 32 Ohm |
| *Power requirement* | Voltage | +5 V dc + 5% |
| | | +12 V dc + 10% |
| | Ripple | +5 V: 0.05 Vp-p at 250 mA |
| | | +12 V: 0.1 Vp-p at 500 mA |
| | Current (max) | +5 V: 800 mA at Seek |
| | | +12 V: 1300 mA at Seek or Spin up |
| *Laser* | Type | GaAlAs semiconductor |
| | Wavelength | 780 nm |
| | Output power | 0.6 mW |

| | | |
|---|---|---|
| ***SCSI DDS tape drive*** | These specifications apply when a cassette is inserted. Power specifications are measured at the tape drive power connector and are nominal values. | |
| *Nominal capacity* | 60-metre cassette | 1.3 Gbyte |
| *Transfer rate* | Sustained | 183 Kbyte/s (max) |
| *Unrecoverable errors* | Less than 1 in $10^{15}$ data bits | |
| *Recording format* | ANSI Digital Data Storage (DDS) | |
| *Power specification* | Current (max) | 1.35 A @ +12 V dc<br>0.71 A @ +5 V dc |
| ***SCSI DDS-DC tape drive*** | Performance specifications apply when using data compression. Power specifications are measured at the tape drive power connector and are nominal values. | |
| *Nominal capacity* | 60-metre cassette | 1.3 Gbyte (1:1 base)<br>2.6 Gbyte (2:1 typical)<br>5.2 Gbyte (4:1 max[1]) |
| | 90-metre cassette | 2.0 Gbyte (1:1 base)<br>4.0 Gbyte (2:1 typical)<br>8.0 Gbyte (4:1 max[1]) |
| *Transfer rate* | Sustained | 366 Kbyte/s (1:1 base)<br>732 Kbyte/s (2:1 typical)<br>1464 Kbyte/s (4:1 max[1]) |

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

| | |
|---|---|
| *Unrecoverable errors* | Less than 1 in $10^{15}$ data bits |
| *Recording format* | ANSI/ECMA Digital Data Storage with Data Compression (DDS-DC) |

| | | |
|---|---|---|
| *Power specification* | Voltage | +12 V dc + 10%<br>+5 V dc + 7% |
| | Ripple | +12 V: 100 mVp-p<br>+5 V: 100 mVp-p |
| | Current (max) | 1.40 A @ +12 V dc<br>1.30 A @ +5 V dc |

### SCSI CD-ROM drive (CDU561)

| | | |
|---|---|---|
| *Discs* | Acceptable discs | CD-ROM mode 1 data discs<br>CD-ROM mode 2 data discs<br>CD audio discs<br>Audio-combined CD-ROM discs<br>Photo-CD discs |
| | Disc diameter | 12 cm, 8 cm |
| *Transfer rate* | Sustained<br>from media<br>Burst across<br>SCSI bus | 150 Kbyte/s (normal)<br>300 Kbyte/s (double)<br>2.1 Mbyte/s<br>4.0 Mbyte/s (synchronous) |
| *Access time* | Full stroke | 550 ms (typical/normal)<br>520 ms (typical/double) |
| | Average | 350 ms (typical/normal)<br>295 ms (typical/double) |
| *Audio output* | Line<br>Headphone | 0.7 V at 47 kOhm<br>0.55 V at 32 Ohm |
| *Host interface* | SCSI-2 | |
| *Power specification* | Voltage | +5 V dc + 5%<br>+12 V dc + 10% |
| | Ripple | +5 V: 0.05 Vp-p<br>+12 V: 0.1 Vp-p |
| | Current (max) | +5 V: 1.6 A at Spin up<br>+12 V: 1.8 A at Spin up |
| *Laser* | Type<br>Wavelength<br>Output power | GaAlAs semiconductor<br>780 nm<br>0.6 mW |

## *Physical characteristics*

*Weight and dimensions*

| Component | Height | Depth | Width | Mass |
|---|---|---|---|---|
| System unit | 94 mm | 430 mm | 428 mm | 9.5-12 kg [1] |
| Keyboard | 40 mm | 205 mm | 488 mm | 1.4 kg |

[1] depending on configuration

*Temperature and humidity ranges*

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

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

## Electrical characteristics

**Voltage ranges**  The PSU voltage range is initially set to that appropriate for the country in which the computer is first sold.

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

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

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

**Current ratings**  AC power inlet  4.5 A at 100-120 V
3.0 A at 220-240 V

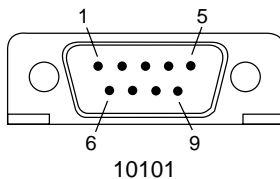AC power outlet  1.5 A at 100-120 V
1.0 A at 220-240 V

Connect only manufacturer-approved monitors to the AC power outlet.

**Expansion slots**  Total available power for all three ISA expansion slots:

8.0 A at 5 V    0.3 A at -5V
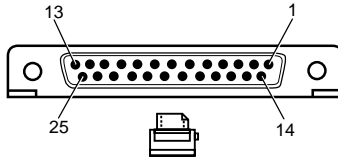1.0 A at 12 V    0.3 A at -12V

## *Port characteristics*

**Serial ports (COM1/COM2)**    *9-way male D-type*



10101

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

***Parallel port (LPT1)***   *25-way female D-type*



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

**Monitor port**   *15-way female D-type*
**(VGA)**
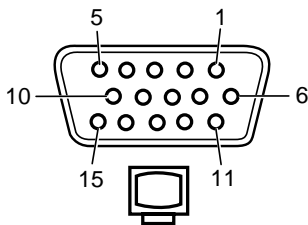


| Pin | I/O | Output | Monochrome | Colour |
|-----|-----|--------|------------|--------|
| 1 | O | Red | No pin | Red |
| 2 | O | Green | Mono | Green |
| 3 | O | Blue | No pin | Blue |
| 4 | NA | Reserved | No pin | No pin |
| 5 | NA | Digital G | Self test | Self test |
| 6 | NA | Red Rtn | Key pin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

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

***Keyboard and mouse ports*** Both the keyboard and mouse ports accept 6-pin miniature DIN connectors. The voltages and signals are the same for both connectors.
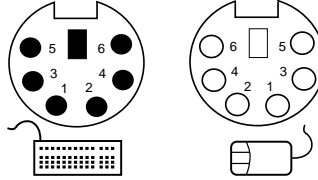


| Pin | I/O | Function |
|-----|-----|----------|
| 1 | I/O | Data |
| 2 | NA | Reserved |
| 3 | NA | Ground |
| 4 | NA | +5 Vdc |
| 5 | I/O | Clock |
| 6 | NA | Reserved |

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

## *Video feature connector*

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

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