apricot

MITSUBISHI ELECTRIC

OWNER'S HANDBOOK

Published by
Apricot Computers Limited
3500 Parkside
Birmingham Business Park
Birmingham B37 7YS

MITSUBISHI ELECTRIC

Printed in the United Kingdom

Part No. 15205031

Revision 01

Safety and Regulatory Notices

Read the separate *Power Connection Guide* before using the Apricot XEN-PC 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-PC 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-PC is set to the correct voltage range before use. If not, the machine may be irreparably damaged.

Turn off the Apricot XEN-PC 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.

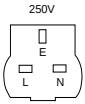
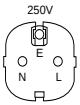
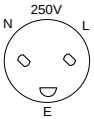
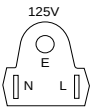
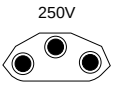
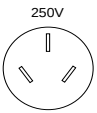
To prevent fire and electric shock, do not expose any part of the system unit to rain or moisture.

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

Power cord requirements

The power cord packed with the Apricot XEN-PC complies with 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
	BS1363A	United Kingdom
	SHUCO	Austria, Belgium, Finland, France, Germany, Holland, Italy, Norway, Sweden
	SRAF 1962/ DB16/87	Denmark
	NEMA 5-15P	USA, Canada
	ASE 1011	Switzerland
	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.

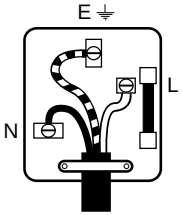
Use a fuse approved by ASTA to BS1362, i.e. carries the ◈ mark.

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.

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.


XEN

CONTENTS

5 Upgrading the Apricot XEN-PC

6 Using the SETUP utility


XEN

1 INTRODUCING THE APRICOT XEN-PC

The Apricot XEN-PC is ideally suited for use as general-purpose personal computers, networked business workstations and workgroup servers.

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

Standard features

The standard features of the Apricot XEN-PC range include:

- Intel486 system processor with OverDrive upgrade capability.
- Three full-length 16-bit Industry Standard Architecture (ISA) expansion card slots.
- Standard 4 Mbytes of motherboard random access memory (RAM), upgradable to 36 Mbytes by the use of single in-line memory modules (SIMMs).
- SETUP configuration utility in read-only memory (ROM).
- Apricot Advanced Graphics system featuring the Apricot CL542x Enhanced Video Graphics Array (EVGA) adapter, fitted with at least 512 kbytes of video RAM, supporting various high-resolution and multicolour display modes. View the Apricot Help provided on your hard disk drive to find out what enhanced modes your system supports.
- 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 more memory, 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-PC".

Advanced features

The following advanced features are fitted on some models in the range:

- 256 Kbyte system memory cache.
- 1 Mbyte video RAM

Unpacking On unpacking the computer, you should find:

- Apricot XEN-PC system unit.
- Apricot/Mitsubishi monitor and accompanying *User's Guide*.
- Apricot extended keyboard and two-button mouse.
- System unit AC power cord and monitor power cord appropriate for the country of sale.
- System documentation (*Owner's Handbook, Warranty Pack*, and so on).
- Microsoft MS-DOS pack.
- Microsoft Windows or Microsoft Windows for Workgroups pack (if the system has a hard disk).

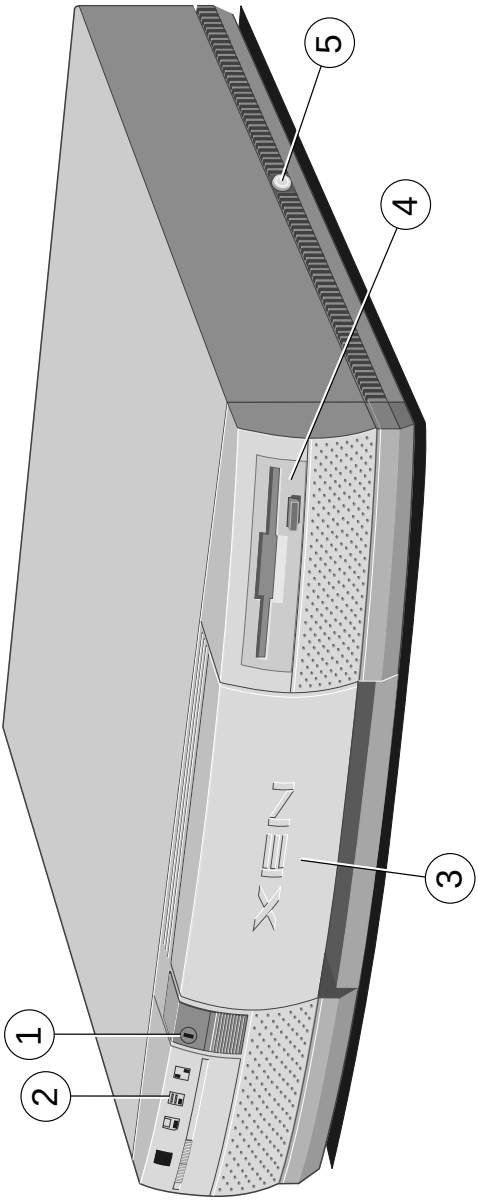
More elaborate systems may include software or hardware options with accompanying installation diskettes and additional documentation. Some of these options may have been factory-configured or installed by your Apricot supplier.

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-PC develops a fault.

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

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


5
4
3
1
2

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:

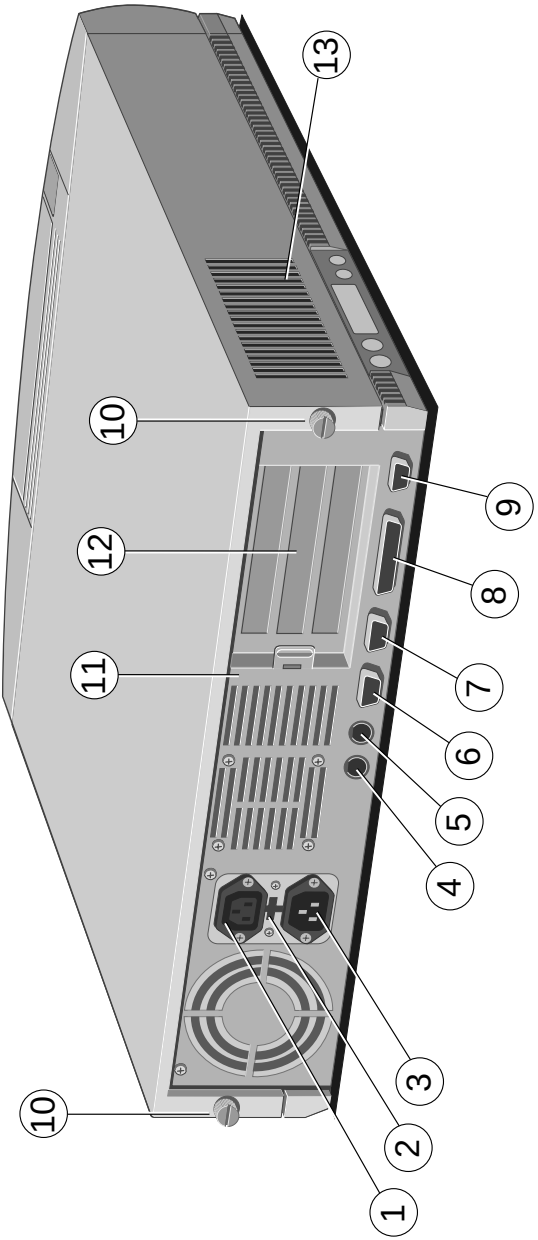
   lights when a diskette, floppy disk or Irwin tape drive is accessed (depending on the operating system).

   lights when a hard disk drive or SCSI tape 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-PC system.

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


13
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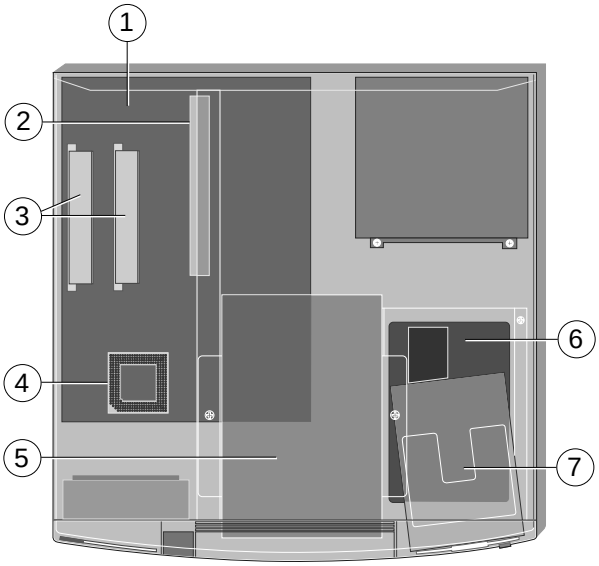
1. **AC power outlet**: where the monitor power cord can plug in. Only Apricot-approved monitors should be powered from this outlet.
2. **voltage selection switch**: the Apricot XEN-PC can be set to operate with a 100-120 volt or 220-240 volt AC power supply.
3. **AC power inlet**: where the system unit 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 9600 baud): typically used for connecting an external modem or a serial printer signal cable.
7. **serial port 2**: (110 baud to 9600 baud): typically used for connecting an external modem or a serial printer signal cable.
8. **parallel port**: 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 Apricot Advanced Graphics system).
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.



1. **motherboard**: see the label inside the system unit lid for up-to-date information on the layout of the motherboard.
2. **Industry Standard Architecture (ISA) expansion card slots**: three slots in total, although one may be occupied by a drive controller card.
3. **SIMM sockets**: every XEN-PC has 4 Mbytes of motherboard memory which can be upgraded to 36 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-PC.
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-PC system.


XEN

2 GETTING STARTED WITH THE APRICOT XEN-PC

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-PC.

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-PC. Chapter 3, "Operating the Apricot XEN-PC", has more information about the use of the various disk and tape drives with which the XEN-PC may be fitted.

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

General advice

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

- Place the XEN-PC 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-PC 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-PC 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-PC 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-PC 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-PC", if you need help indentifying the various ports on the system unit.

Checking the AC power supply

When your Apricot XEN-PC 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-PC 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-PC can be adjusted by the voltage selection switch on the rear of the system unit (see the section on "Using the Apricot XEN-PC abroad" in Chapter 3, "Operating the Apricot XEN-PC"). 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-PC arrived with uninstalled add-on options, (such expansion cards or memory modules) consult Chapter 5 "Upgrading the Apricot XEN-PC" 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.

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-PC 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-PC, be careful not to plug it into the mouse port by mistake.
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-PC is now ready to use. The rest of this chapter tells you how to turn your XEN-PC 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-PC, 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-PC 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.

Power-on self-test

Whenever the XEN-PC 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-PC 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-PC 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 v3.1 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 either a drive or the network. Wait until that operation is completed before turning off the computer.

To turn off the XEN-PC, 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.

Preparing a second hard disk

Some Apricot XEN-PC 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.

Backing up the pre-installed software

All Apricot XEN-PC computers with a hard disk arrive with Microsoft MS-DOS pre-installed. In addition, some XEN-PC systems will also be pre-installed with Microsoft Windows or Windows for Workgroups. Other software may be pre-installed by Apricot or your Apricot supplier.

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

Instructions for backing up files can be found in your MS-DOS manual. It is a good idea to begin by creating a bootable system diskette containing the programs needed to partition and format the hard disk and to restore the backed up copy. In this way, you should be able to recover any programs or data lost by a hard disk failure.

Using the SETUP utility

What is SETUP?

SETUP is a configuration utility programmed into the XEN-PC'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.

Your XEN-PC 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 at any time from the DOS command line. It is invoked by pressing the CTRL+ALT+ESC key combination.

Once you have reconfigured your computer you can exit SETUP. The XEN-PC 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 either Microsoft Windows or Windows for Workgroups, 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.

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.


XEN

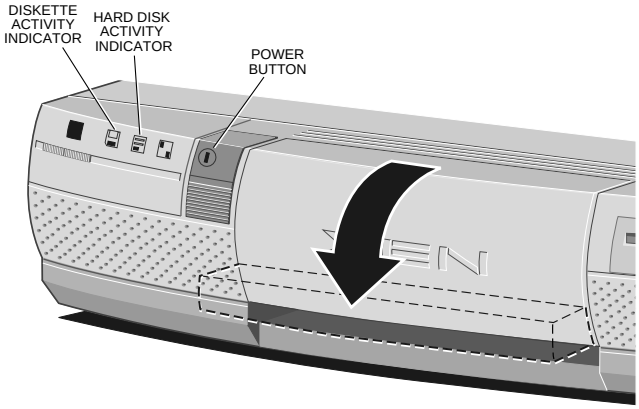
3 OPERATING THE APRICOT XEN-PC

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

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

Using the front panel controls

The Apricot XEN-PC 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-PC is using a 3.5" diskette drive, a 5.25" floppy disk drive or an FTD (floppy tape drive).
		The XEN-PC is using a hard disk drive, a CD-ROM drive or a SCSI QIC or SCSI DDS tape drive.

Using the 3.5" diskette drive

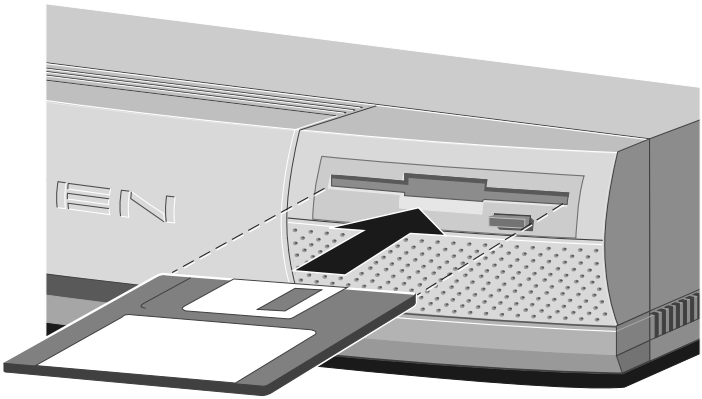
The 3.5" diskette drive can read and write double-sided diskettes with a formatted capacity of either 1.44 Mbytes (if marked "HD" or "high density") or 720 Kbytes (if marked "DD" or "double density").

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.



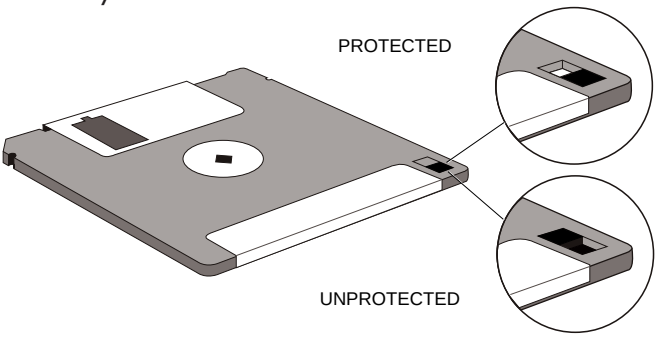
Removing a diskette

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.



Using the 5.25" floppy disk drive

Your Apricot XEN-PC 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.

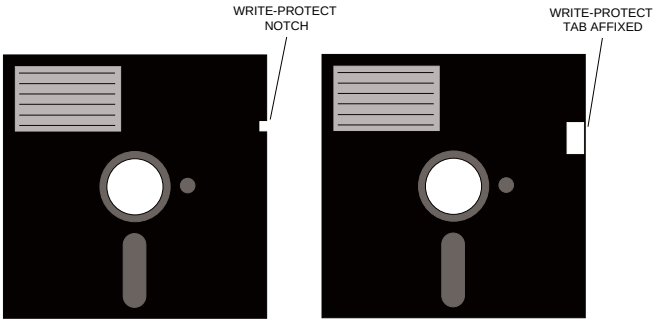
Removing a floppy disk

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.



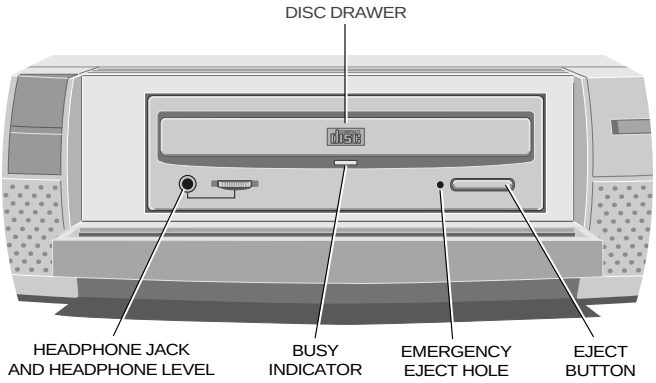
Using the SLCD CD-ROM drive

Your Apricot XEN-PC 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.

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



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.

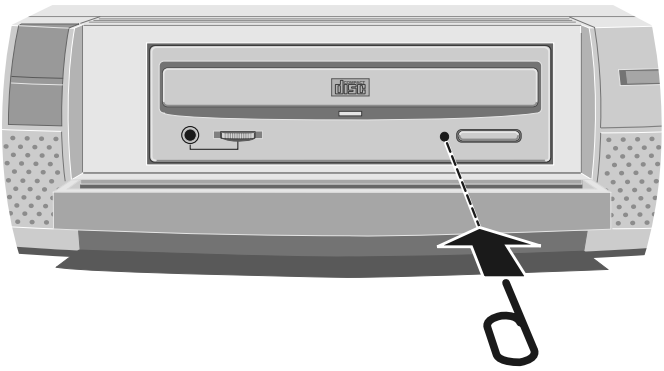
Removing a compact disc

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-PC 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.

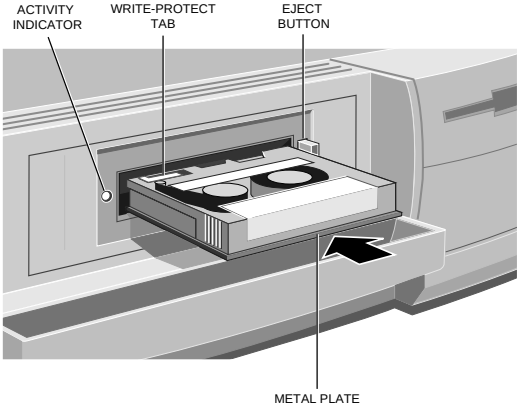
The software required to control the tape drive depends on your operating environment; ask your Apricot supplier for details.

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:

Inserting a cartridge

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



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

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.

Using the SCSI QIC tape drive

Your Apricot XEN-PC 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.

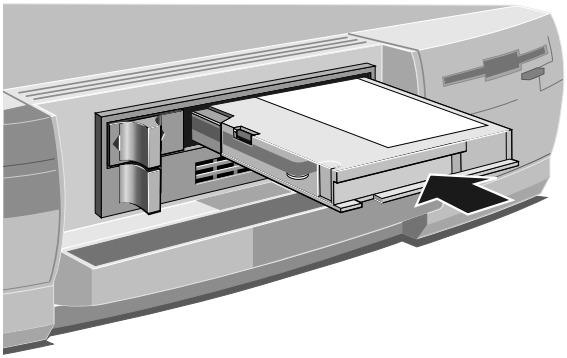
The drive automatically senses the cartridge type and uses the maximum density QIC format possible for that cartridge (thereby giving its nominal capacity) unless the cartridge has already been used in a lower-density format.

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.

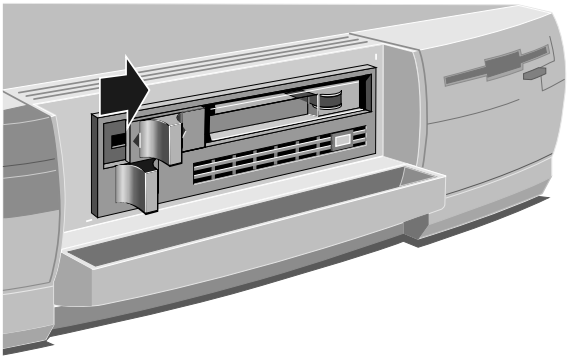
The tape drive can be damaged by incorrect insertion or removal of cartridges, so always observe the following procedures:

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.



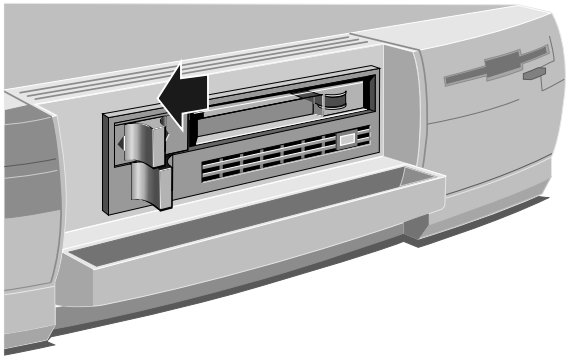
4. Push the control lever to the right to engage the mechanism.



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.

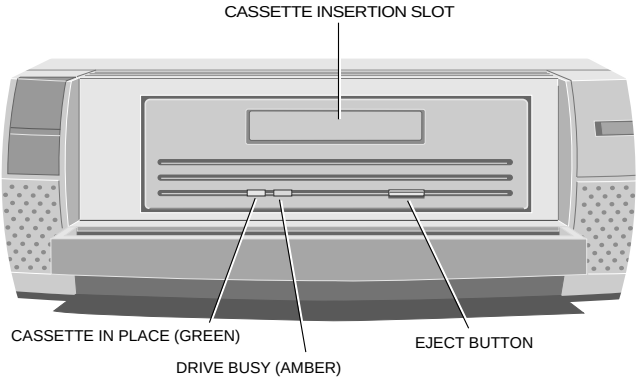
Keep your tape cartridges well away from magnetic objects, and equipment that generates magnetic fields. Avoid extremes of temperature and exposure to direct sunlight; otherwise, the data recorded on the tape may become corrupted.

Using the SCSI DDS or DDS-DC tape drive

Your Apricot XEN-PC 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.



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, even on systems equipped with Apricot Professional Audio.

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

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.

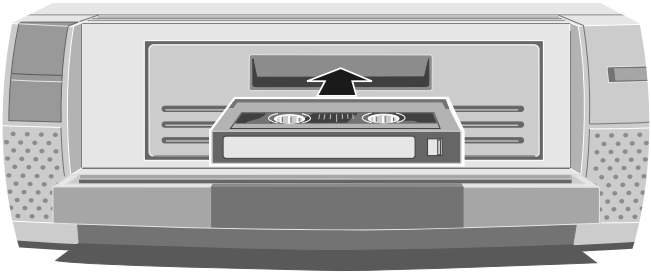
Automatic drive operation

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.

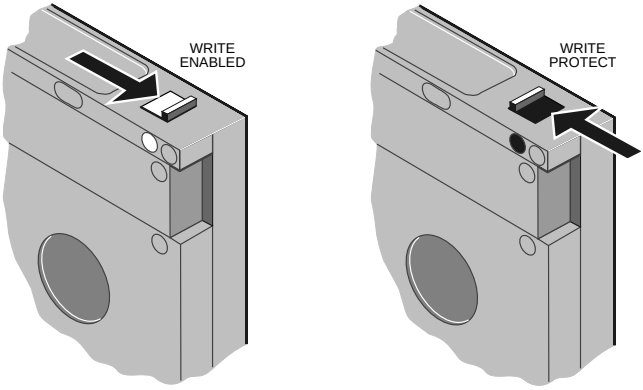
Removing a cassette

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.

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.

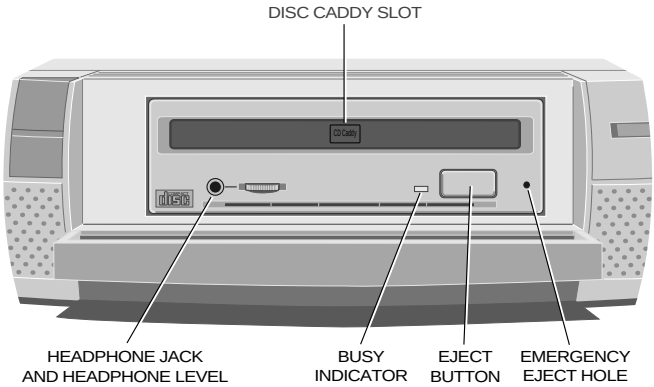
Keep your cassettes well away from magnetic objects, and equipment that generates magnetic fields. Avoid extremes of temperature and exposure to direct sunlight; otherwise, the data recorded on the tape may become corrupted

Using the SCSI CD-ROM drive

Your Apricot XEN-PC 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.

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



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.

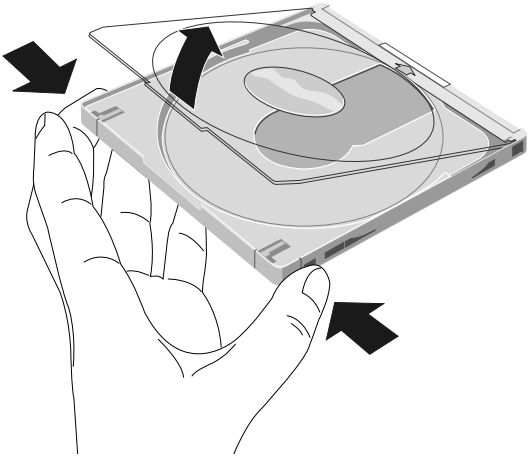
Inserting a compact disc

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).

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.

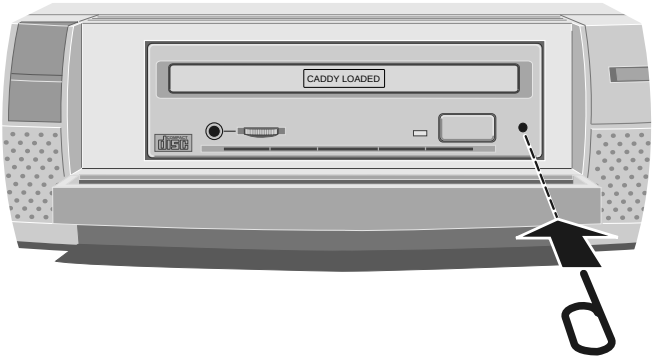
Note too that the software controlling the CD-ROM drive may be able to prevent the insertion of a disc.

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.

Using the Apricot XEN-PC abroad

Your Apricot XEN-PC 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-PC 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-PC 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-PC 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-PC 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-PC 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-PC", for more information about transporting the XEN-PC.


XEN

4 CARING FOR THE APRICOT XEN-PC

This chapter provides information on how to care for your computer. The Apricot XEN-PC 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-PC

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

If you have any problems with the Apricot XEN-PC 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:

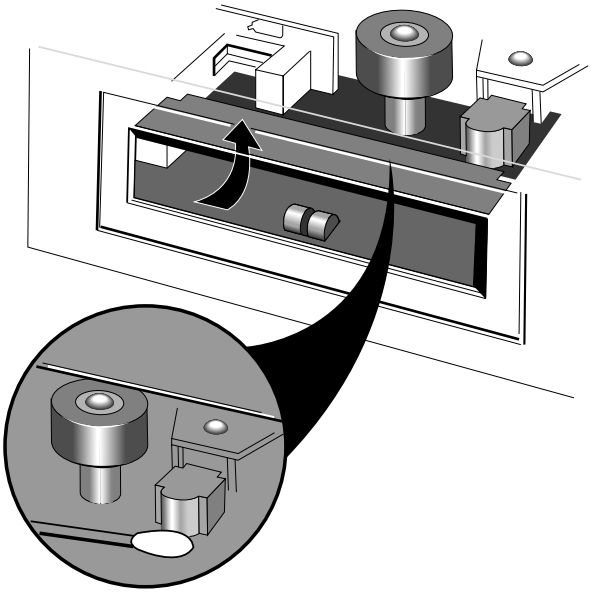
1. Unplug the mouse, turn it upside down and locate the plastic cover that holds the ball in place. Depending on the model, the plastic cover can be removed either by rotating it counter-clockwise or by sliding it forward slightly.
2. Remove the cover and set it aside.
3. Cupping one hand over the underside, 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.

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

Replacing the configuration battery

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

This battery has a life of 3 years, and is user replaceable when discharged.

The XEN-PC uses a 3V lithium battery, these are typically used in calculators and other small, battery powered electronic items. The battery used by in XEN-PC is a CR2032 or equivalent.

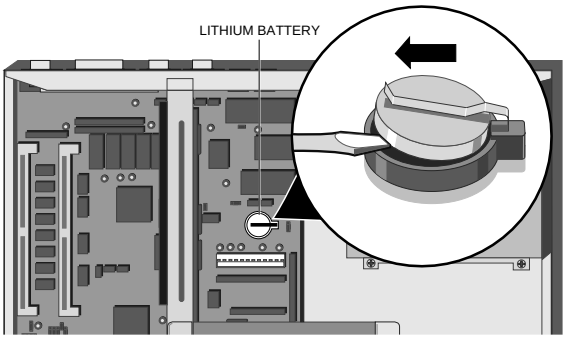
When the battery is discharged the contents of the configuration memory will not be maintained while the XEN-PC is switched off. If you have to reconfigure the computer every time you switch it on, the battery has discharged and needs to be replaced.

Replacing the battery

The battery holder is located on the motherboard behind the 5.25" drive tray.

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.
3. Identify the battery holder from the following illustration.



4. Using a suitable, small blunt tool, lift the left edge of the battery far enough to clear the base of the holder, then slide the battery out.
5. Check that the replacement battery is identical to the battery you have removed.
6. Taking care not to touch the top or bottom surface of the battery, pick up the replacement with the positive (+) terminal upwards.
7. Slide the battery into the holder from the left.

You can now reassemble the computer. The next time you power it up you will have to run the SETUP utility to reconfigure the hardware.

Transporting the Apricot XEN-PC

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

Use common sense when handling the Apricot XEN-PC; 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-PC any great distance, use the original packing materials.

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


XEN

5 UPGRADING THE APRICOT XEN-PC

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

- ISA expansion cards
- additional memory
- processor upgrades
- video and cache 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.

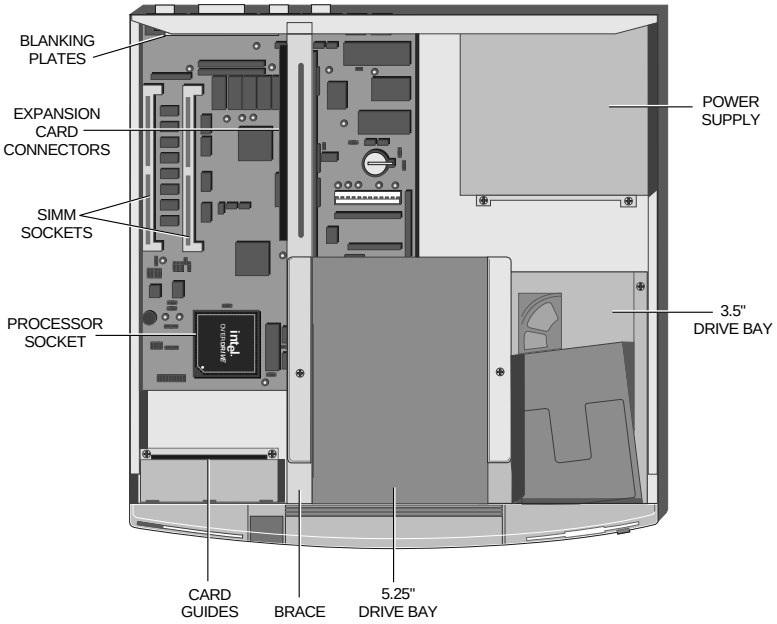
Warning

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.

Inside the system unit The illustration below identifies the major components inside the XEN-PC system unit that are affected by the installation instructions later in this section.



ISA 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 Apricot Advanced Graphics system. When a graphics card is installed, the Apricot Advanced Graphics system is disabled automatically.
- A modem or facsimile card can provide a connection to a telephone line.

The Apricot XEN-PC has three 16-bit Industry Standard Architecture (ISA) expansion card slots. 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.

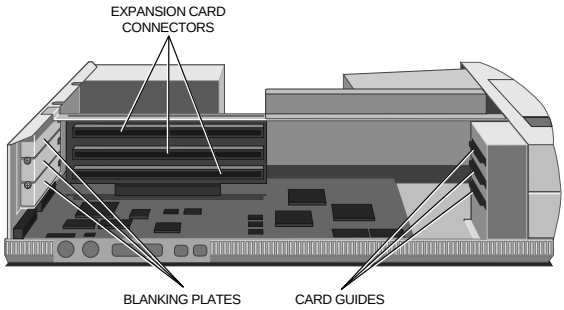
Expansion cards are a relatively cheap way of upgrading your system. Moreover, they are usually quite easy to install, requiring no more than a cross-head screwdriver and a steady hand.

Installation

Installation of an expansion card in the XEN-PC 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.

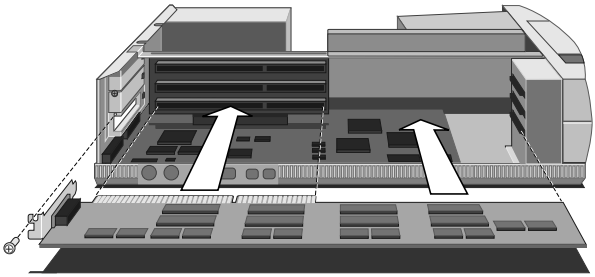
5. Your are now ready to install the card. However, before you do so you must first ensure that the card is correctly configured for your system.

   Information on configuring cards for use in the XEN-PC 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-PC 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.

Note

If you have installed a video display adapter that is CGA, EGA or VGA compatible you must disable the motherboard video adapter by removing a jumper. If you do not remove this jumper, it is unlikely that either the video card or motherboard video adapter will operate correctly. The jumper is identified in Appendix A.

11. Replace the system unit cover.

Memory upgrades

The XEN-PC motherboard is fitted with 4 Mbytes of on-board memory, and sockets for two SIMMs (Single In-line Memory Modules). You may need more memory if you want to run complex operating systems or large application programs.

Each socket can be empty, or fitted with a SIMM. SIMMs with capacities of 4, 8 or 16Mbytes are supported, giving a maximum capacity of 36 Mbytes. The table below identifies the possible memory capacities using the various SIMM combinations.

Total memory	SIMM1 capacity	SIMM2 capacity	Motherboard memory
4	-	-	4
8	4	-	4
12	4	4	4
16	4	8	4
20	16	-	4
24	16	4	4
28	16	8	4
36	16	16	4

Note

In order to use the lowest ISA expansion slot SIMMs installed in XEN-PC must be a maximum of 1" high. The use of SIMMs taller than 1" prevents an expansion card being installed in the lowest slot.

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 the appendices at the rear of this manual.

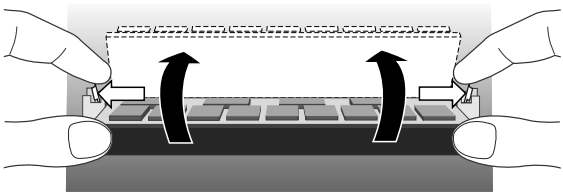
The SIMM connectors are located to the left of the system unit beneath the adapter card slots. In order to install a memory upgrade you must remove any adapter cards installed in the system.

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.

Removing a SIMM

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

1. 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.

Inserting a SIMM

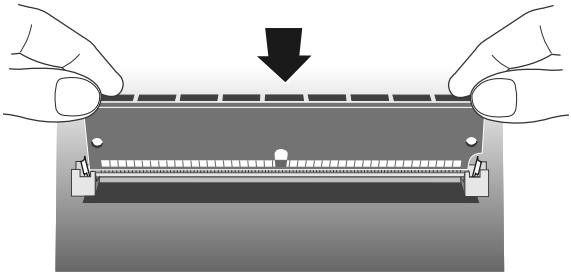
From the table of possible SIMM combinations decide which SIMM capacity will be installed in the socket. Then install the SIMM.

To fit a SIMM:

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

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

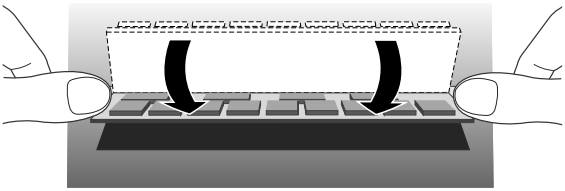
2. Position the SIMM above the socket with the SIMM tilted slightly towards the right of the system unit.



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 the 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 the SIMM should remain in position held by the securing clips, and with a small plastic lug through the holes on either side of the SIMM.

If you want to install a second SIMM repeat the process above. Once you have completed installation you can replace the adapters and the system unit cover.

1. Replace the adapter cards in the system unit.
2. Replace the card securing screws.
3. Reconnect any cables that were connected to the cards.
4. Replace the system unit cover.

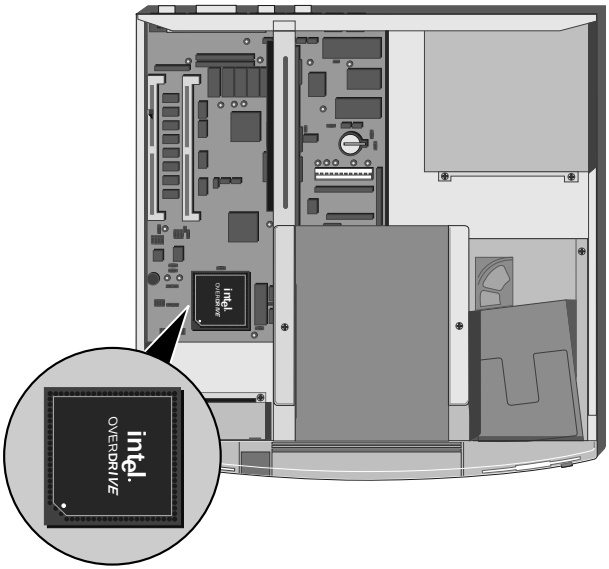
Processor upgrades

The XEN-PC motherboard is fitted with a processor socket that supports any Intel486SX, Intel486DX, Intel486DX2 or OverDrive processor with a maximum external clock speed of 33MHz.

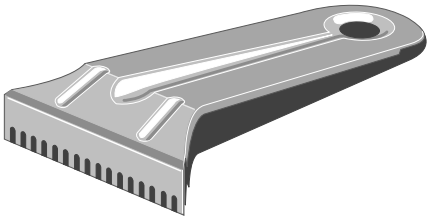
Any other Intel processor using the same pinout as one of these processors could also be installed, subject to the same 33MHz maximum external clock speed restriction.

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

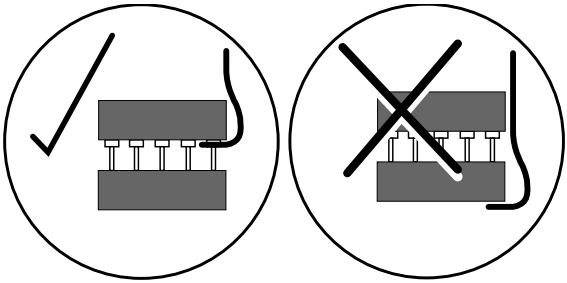
   If you are unfamiliar with ApricotÕs recommended anti-static precautions and/or the process of removing the system unit cover refer to the appendices at the rear of this manual.
3. Identify the processor socket.



4. Your upgrade processor is supplied with an extraction tool which resembles a miniature garden rake.



5. Carefully insert the prongs of the extractor between the bottom of the processor and its socket. You may need to twist the extractor gently from side to side to work the prongs into place.



Be careful to ensure that the prongs do not go between the motherboard and the socket.

6. Ease the processor up slightly by pushing inwards on the extractorÕs handle.

Warning

Do not push hard on the handle. The processor must be removed gradually and evenly by working the tool under each edge in turn. Attempting to lift one edge of the processor too far will damage the processor, or the socket, or both.

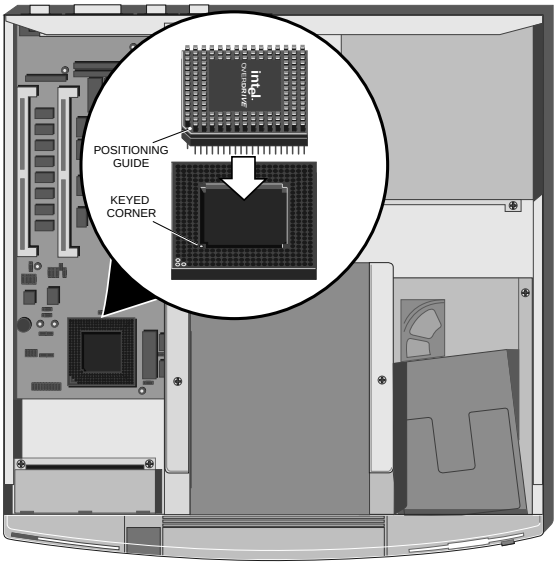
7. Remove the extractor and repeat the process on each edge of the processor, gradually easing the processor out of its socket. If necessary work your way round the processor two or three times.

8. 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

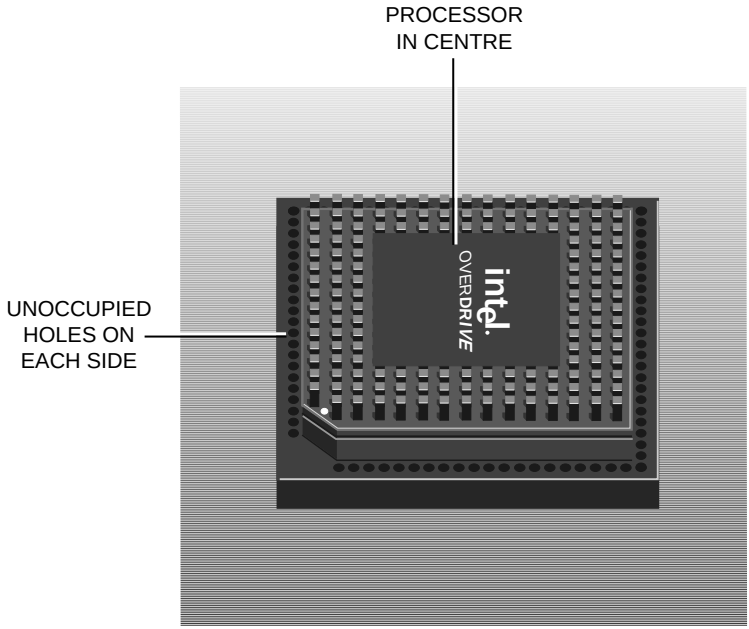
1. The upgrade processor and socket are keyed to ensure that the processor can only be installed in one orientation.

   The inside of one corner of the socket has a key hole, the outside of the same corner is missing three holes. The processor has a positioning guide in the form of a small dot of paint. Use the following illustration to help identify these features.



2. Carefully position the upgrade processor above the socket with the positioning guide on the processor over the keyed corner of the socket.

   If the upgrade processor does not occupy all four rows of holes it should be positioned centrally as shown below.



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 apply firm even pressure to the top of the processor to seat the pins in the socket.

5. With the upgrade processor installed you must now ensure that the motherboard clock speed is correctly set for your new processor.

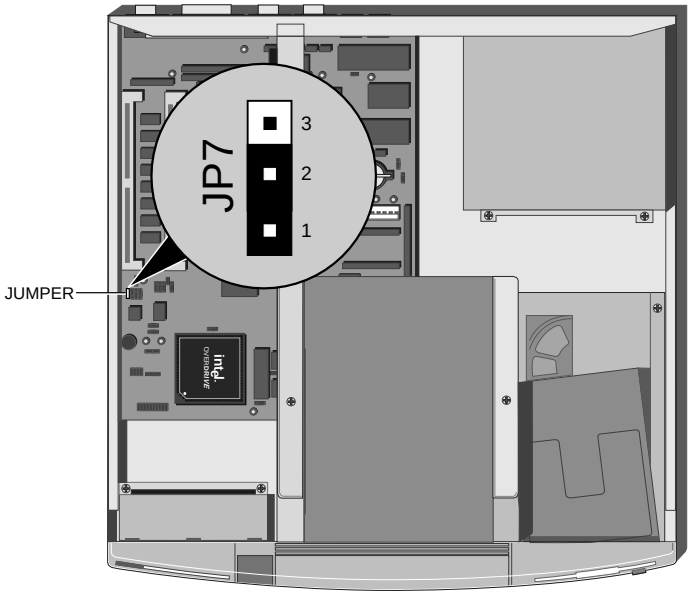
   Configuring the motherboard below describes how to ensure that when you reassemble your system the new processor will work.

Configuring the motherboard

The XEN-PC motherboard supports 25 and 33 MHz motherboard clock speeds. The clock speed is configured using a jumper near the processor socket.

It is vital that the system clock speed, is set correctly. Follow the instructions below to check the jumper setting and adjust it as necessary.

1. Use the following illustration to identify the jumper.



The jumper labelled JP7 is used to select the system clock speed.

2. From the table below, and the label on your upgrade processor, or its packaging decide which system clock speed you need to select.

JP7 position	Clock speed (MHz)
1-2	25
2-3	33

If you have installed an OverDrive processor you should set the system clock speed to match the external interface speed of the processor. OverDrive processors use IntelÕs clock doubling technology and the processor runs at twice the speed of its interface to the motherboard.

The labelling on the OverDrive processor or its packaging should make it clear what its external interface speed is.

5. Having decided which selection you require check the position of JP7, and if necessary move it to the appropriate position.

6. You should by now have: identified the processor socket, removed the processor, installed the new processor, and set the system clock speed. If you are uncertain about having completed any of these steps, go back to the beginning and check the steps you carried out against the installation instructions.

7. Once you are satisfied that you have installed the upgrade and configured the system correctly, reassemble the system.

Installing additional video RAM

The XEN-PC motherboard is fitted with six sockets which allow the video RAM to be expanded from 512 kbytes to 1 Mbyte using four 256k x 4 RAM chips, and from 1 Mbyte to 2 Mbytes using two 256k x 16 RAM chips.

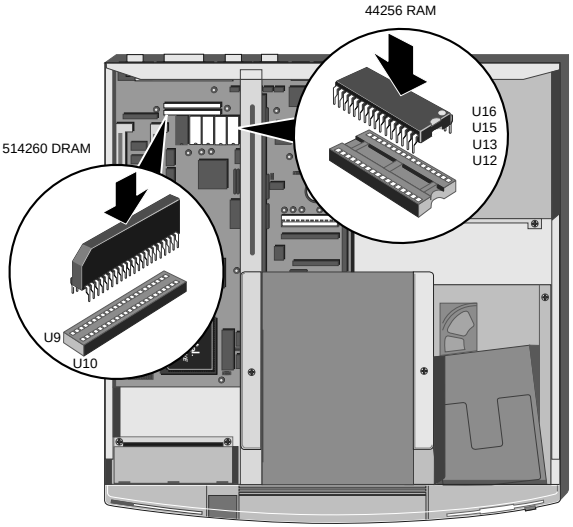
1. Power the system down.
2. Take suitable anti-static precautions and remove the system unit cover.

   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 in the left rear corner of the system unit beneath the adapter card slots. 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.

   The 256k x 4 chips have a cutout at one end, this must line up with similar cutout at the front of the sockets.

   The 256k x 16 chips have pin 1 clearly marked, pin 1 is also marked on the motherboard at the left end of the sockets.

When upgrading from 512 kbyte to 1 Mbyte of video RAM the four sockets marked U12, U13, U15 and U16 must all be occupied by 256k x 4 RAM chips. When upgrading from 1 Mbyte to 2 Mbytes of video RAM the sockets marked U9 and U10 must both be occupied by 256k x 16 RAM chips.

Installing cache RAM

The XEN-PC motherboard is fitted with nine sockets which allow a second level cache to be installed. Three different capacities of cache may be installed: 64k, 128k and 256k. Some models of XEN-PC are shipped with a 256k cache already installed.

To install the cache:

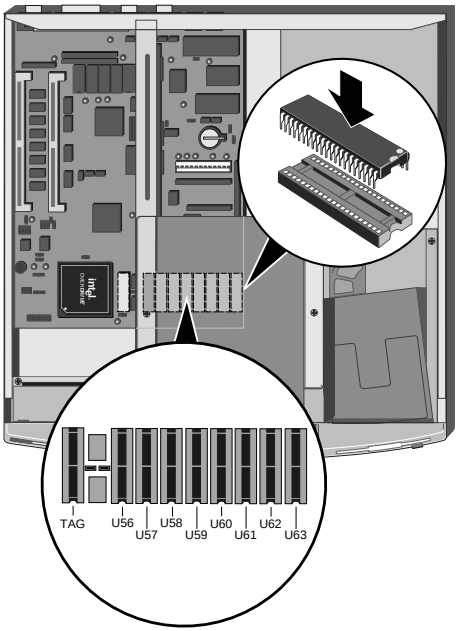
1. Power the system down.
2. Take suitable anti-static precautions and remove the system unit cover.

   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.

The cache sockets are located at the front of the system unit beneath the 5.25" drive bay, and the adapter cards. In order to install cache RAM you must remove the 5.25" drive bay and any adapter cards.

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. Remove the 5.25" drive tray. Instructions on removing the drive tray are given on page 5/25.

7. Identify the cache RAM sockets from the following illustration.



8. One by one, carefully align the cache RAM chips over the sockets. Make sure that they are in the correct orientation.

   The chips have a cutout at one end, this must line up with similar cutout at the front of the sockets.

A 64kbyte cache consists of nine 8Kx8 20ns chips installed in the sockets labelled TAG and U56 to U63.

A 128kbyte cache consists of five 32Kx8 20ns chips installed in the sockets labelled TAG, U56, U58, U60 and U62.

A 256kbyte cache consists of nine 32Kx8 20ns chips installed in the sockets labelled TAG and U56 to U63.

5.25" drives

The 5.25" drive tray in the XEN-PC 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.

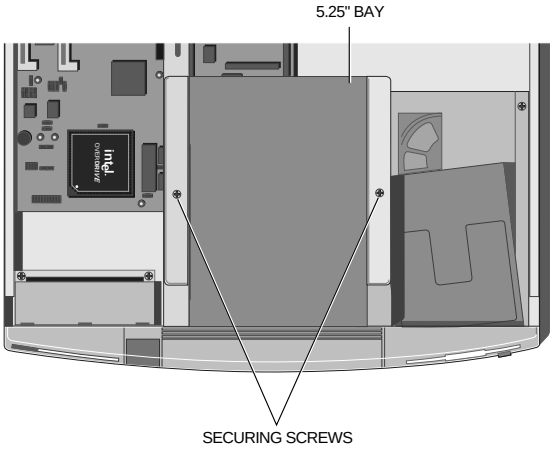
The following instructions describe the installation of a drive in the bay. The *Generic* instructions apply to all drives, and describe the physical installation of a drive.

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

Generic

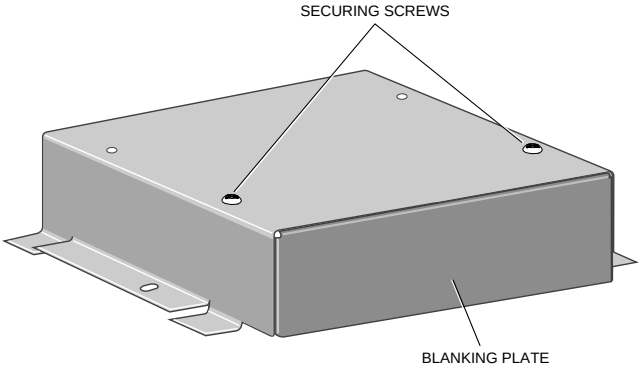
1. Power the system down.
2. Take suitable anti-static precautions and remove the system unit cover.

   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.



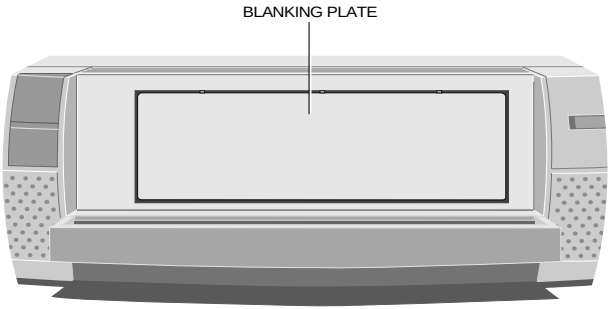
3. Loosen the two screws that secure the drive bay and slide the bay backwards.
4. Lift the bay out of the system unit.

5. The front of the tray may be fitted with a blanking plate. If it is, turn the tray over and remove the two screws that secure the blanking plate. The blanking plate is no longer required, but you may wish to store it somewhere safe in case you wish to remove the drive later.



6. If the drive tray is not fitted with a blanking plate, 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.



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

8. 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.

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

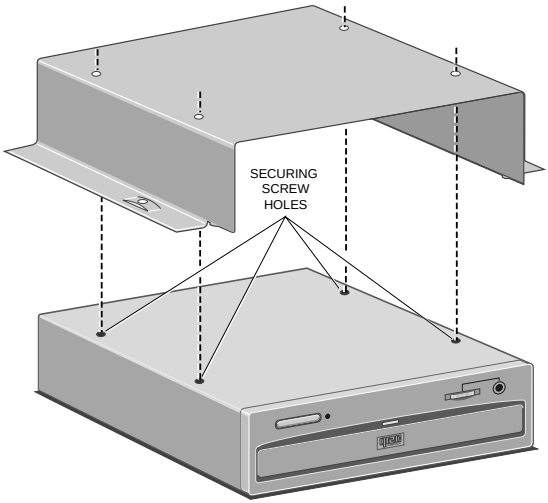
   For information on how Apricot-supplied drives are configured see the drive specific information following these installation instructions.

10. Identify the top and bottom of the drive.

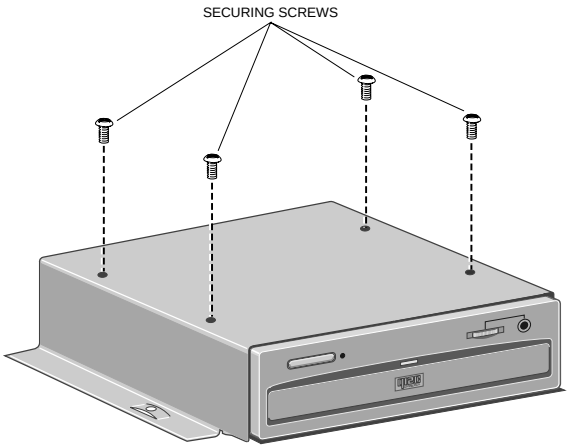
11. Rest the drive, top down, on a suitable anti-static surface.

12. 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.

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

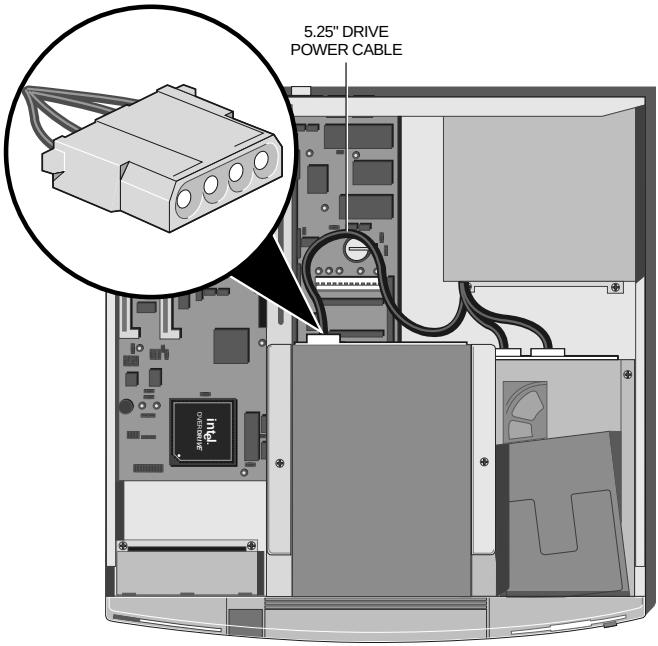


14. Insert the four drive securing screws, and tighten them until they are finger tight.



15. Gently tighten the four screws.
16. Turn the drive bay over and replace it in the system unit.
17. 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.
18. Replace the two screws that secure the drive bay.

19. 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.



20. 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 or Irwin FTD

Cabling

The 5.25" floppy and Irwin FTD drives supplied by Apricot come complete with a suitable signal cable. The signal cable must be connected between the signal connector on the rear of the drive, the 3.5" floppy drive and the socket marked FLOPPY on the motherboard.

Configuration

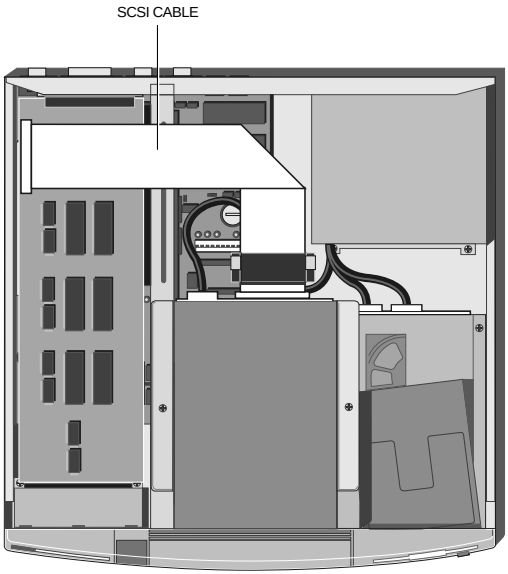
The only configuration on these drives is via the drive select jumpers at the rear of the drive. The jumpers should be set to drive select 1 (DS1).

SCSI drives ***Cabling***

The Apricot SCSI card is supplied with a signal cable which is suit-able for use with any Apricot supplied SCSI drive. The cable should be connected between the SCSI card and the rear of the drive.

The cable is fitted with three connectors: one for the card, and two, close together, to cope with drives which have connectors in different orientations.

The last connector at the drive end should be fitted with a termination assembly. The following illustration shows the suggested routing of the cable.



The illustration above shows the drive connected to the first of the two possible connectors. If the orientation of the connector on the drive requires the connector at the end of the cable connect the cable to the drive complete with the termination assembly.

Configuration

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

All Apricot SCSI drives are supplied with termination resistors fitted.

3.5" hard disk drive

The XEN-PC 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:

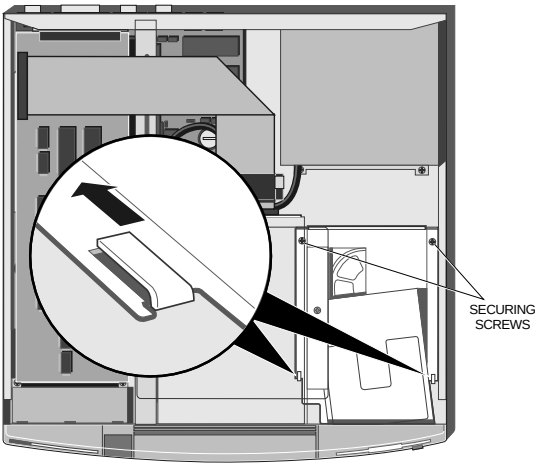
1. Power the system down.
2. If there is a diskette in the 3.5" floppy drive, remove it.
3. Take suitable anti-static precautions and remove the system unit cover.

   If you are unfamiliar with ApricotÕs 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.



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-PC 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.

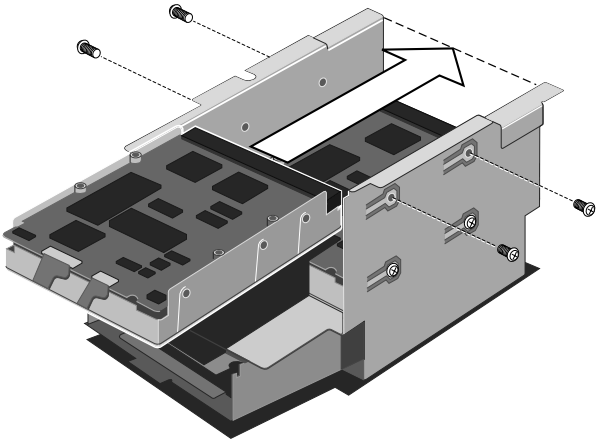
The IDE interface supports a maximum of two drives. These drives are known as Master and Slave. A single drive, or the boot device in a dual drive system, must be configured as Master. The second, non-bootable, drive in a dual drive system must be configured as Slave.

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.


XIEN

6 USING THE SETUP UTILITY

Introduction

The Apricot XEN-PC 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-PC motherboard maintains the configuration memory when the computer is switched off.

Invoking SETUP

The SETUP utility can be invoked at any time using the CTRL+ALT+ESC key combination. You must always ensure that you have closed all files and quit all application programs before entering SETUP. Leaving SETUP automatically reboots the system.

Using SETUP

A number of keys are used to move around the SETUP utility, select screens and change the configuration. Some of the keys only work on certain screens, the keys available in each screen are listed at the bottom of the screen.

If a key works on the current screen, but not for the currently highlighted item, its entry at the bottom of the screen is grey.

The following list describes the use of each key.

The up and down arrow keys move the highlight bar around the screen. Use these two keys to move the highlight bar to the field you want to change.

The return key selects the item currently highlighted. Once the highlight bar is at the item you want, use the return key to select it.

The left and right arrow keys scroll through the possible settings for the current field. Use these two keys to change the configuration.

PgUp/PgDn — The PgUp and PgDn keys move up and down pages within the current SETUP screen. Use these two keys to view all the options on the current screen.

Esc — The escape key exits the current screen. You will be prompted to confirm whether you wish to save any changes you have made. From the initial screen use the escape key to exit the SETUP utility. Every time you exit SETUP the system reboots.

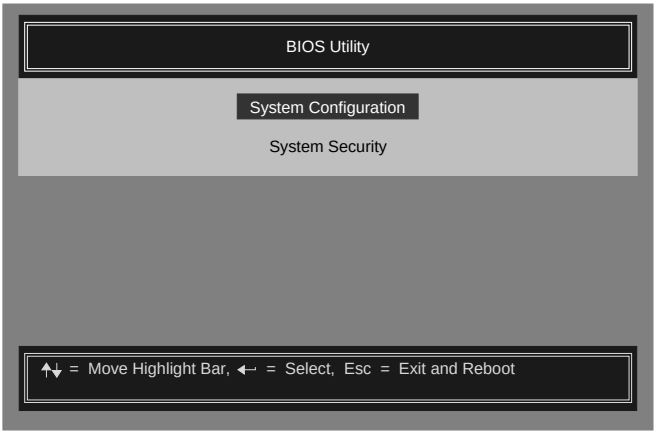
F1 — The F1 key enables a context sensitive help window. Pressing F1 again disables the window.

F9 — In the Advanced System Configuration screen the F9 key resets the configuration options to their default values. Further information is given in the description of the Advanced System Configuration screen.

F10 — In the Advanced System Configuration screen the F10 key sets the configuration options to the combination which is most likely to boot with older, speed sensitive, software, or expansion cards designed for previous generations of personal computers. Further information is given in the description of the Advanced System Configuration screen.

Initial menu

When you invoke SETUP the initial menu contains two choices as shown below:

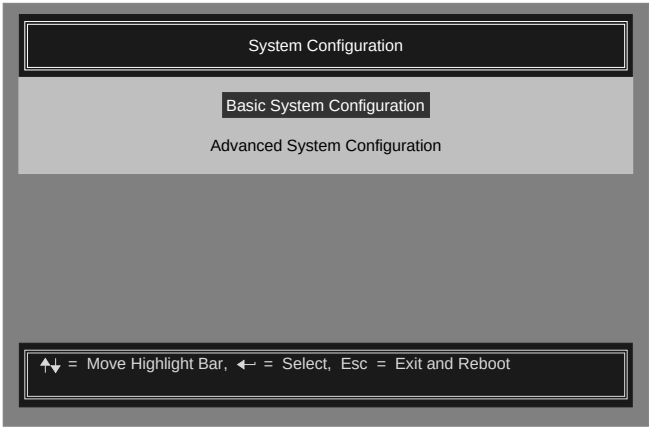


Use the Up and Down arrow keys to move the highlight bar to the item of your choice, and the return key to select that item.

System Configuration allows you to modify the hardware configuration settings. You should only need to use this when you make some change to the hardware, for example upgrade the processor, or add an expansion card.

System Security allows you to configure the motherboard security features. These include: setting passwords, restricting access to floppy and hard disk drives, and configuring the serial and parallel ports. A full description of the System Security screen is given later in this chapter.

System configuration If you select System Configuration another screen with two items will appear.



Just like the initial menu, use the Up and Down arrow keys to move the highlight bar to the item of your choice, and the return key to select that item.

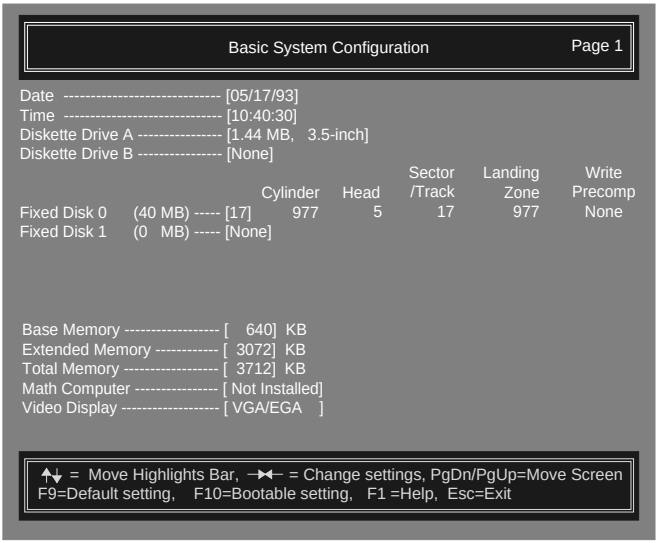
Basic System Configuration uses a two page screen that allows you to modify settings for things like: date and time, drive types, serial port 1. It also displays information on system memory, system processor and display type.

Advanced System Configuration uses a one page screen that allows you modify settings for shadow RAM, cache, system speed, system memory between 15 and 16 Mbytes and fixed disk power saving

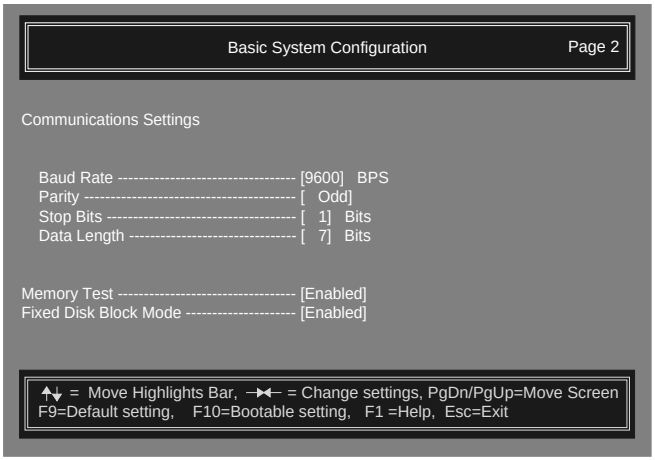
Full descriptions of the Basic and Advanced System Configuration screen follow.

Basic System Configuration

If you select Basic System Configuration the following screen will appear.



Use the up and down arrow keys to move around the screen, and the left and right arrow keys to alter the settings. There is a second page of Basic System Configuration, which is accessed using the PgDn key and is shown below.



Date The SETUP utility shows the system date in month, day, year format. Use the up and down arrow keys to select the parameter you want to change, then use the left and right arrow keys to scroll through the possible values until you reach the correct one.

Once the correct date is set you should not need to set it again.

Time The SETUP utility shows the system date in hour, minute, second format. Use the up and down arrow keys to select the parameter you want to change, then use the left and right arrow keys to scroll through the possible values until you reach the correct one.

Once the correct time is set you should not need to set it again, except when the clocks change at the beginning and end of summer time.

Diskette Drives

Each of the two diskette drives have five possible settings. These are:

- not present
- 360KB, 5.25 inch
- 1.2MB, 5.25 inch
- 720KB, 3.5 inch
- 1.44MB, 3.5 inch

Use the up and down arrow keys to select the parameter you want to change, then use the left and right arrow keys to scroll through the possible values until you reach the correct one.

In XEN-PC diskette drive A is always a 1.44MB, 3.5 inch drive.

In XEN-PC diskette drive B is normally not present, if a second drive is fitted it will usually be a 1.2MB, 5.25 inch drive.

Fixed Disk Drives

It is important that you select the correct drive type for your hard disk drive(s). The SETUP utility provides a number of methods of entering drive type information.

The simplest method for a single hard disk drive system is to select drive type 255 then press F8. SETUP then interrogates the drive and automatically sets the drive type information.

Warning

If pressing F8 results in a drive type with more than 1024 cylinders you must change the drive type as described below, and select drive type 80.

Alternatively if you know the drive type use the up and down arrow keys to scroll through the list of drive types until you find the correct one.

A table of drive types for drives supplied by Apricot is given in Appendix A.

If you wish, you can manually enter parameters by selecting drive type 255 then pressing return. Use the return key, or the left and right arrow keys, to move along the line of parameters entering the numbers as you go. When you have finished press Esc.

Warnings

1. *Selecting the wrong drive type may result in losing capacity, or, if drive is already formatted, data.*
2. *It is recommended that the first time you power up your XEN-PC you invoke SETUP and make a note of the drive type parameters. This will ensure that you can always reconfigure the drive type correctly.*

For dual drive systems unless both drives are the same you must know the drive type of at least one drive. Select the correct drive type for one drive, then use any of the methods given earlier to configure the second drive correctly.

System Memory The system automatically detects the total amount of onboard memory and sets the corresponding value in the SETUP program. The three system memory parameters are displayed for information only and are not user adjustable.

Math Coprocessor The system automatically detects the presence of a coprocessor and sets the corresponding value in the SETUP program. This parameter is displayed for information only and is not user adjustable.

Video display The system automatically detects the video mode of your primary display and sets the corresponding value in the SETUP program. This parameter is displayed for information only and is not user adjustable.

Serial port 1 settings These parameters allow you to set the baud rate, parity, stop bit and data length for serial port 1.

Use the up and down arrow keys to select the parameter you want to change, then use the left and right arrow keys to scroll through the possible values until you reach the correct one.

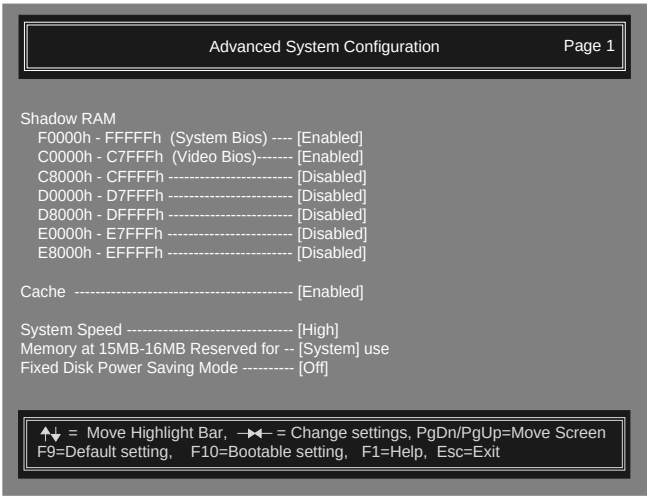
The default values for the port are 9600 baud, odd parity, 1 stop bit and 7 bit data.

Memory Test The system performs a RAM test during Power On Self Test (POST). Setting this parameter to disable bypasses the RAM test.

Fixed Disk Block Mode This option can enhance fixed disk drive performance, depending on the fixed disk used in the system.

Advanced System Configuration

If you select Advanced System Configuration the following screen will appear.



Use the up and down arrow keys to move around the screen, and the left and right arrow keys to alter the settings.

In this screen the F9 key can be used to return all configuration options, except Memory at 15MB-16MB, to the factory defaults. The default values are those shown in the screen above.

The F10 key can be used to disable all shadow RAM and the cache, to set system speed to low and turn fixed disk power saving off. These settings are the least likely to cause problems with older, speed sensitive, software, or expansion cards designed for previous generations of personal computers.

Shadow RAM ***System and video BIOS***

The system and video BIOS on the motherboard is stored in ROM which has long access times. Enabling shadow RAM enhances the performance of the system by copying the system and/or video BIOS into RAM.

By copying the BIOS into RAM the system takes advantage of the shorter access times of RAM. An additional benefit is that shadowed ROM spaces are cached gaining a further performance advantage.

ISA bus (C8000h - EFFFFh)

BIOS on any expansion cards is stored in ROM which has long access times. Enabling BIOS shadowing enhances performance by copying the contents of the ROM into RAM.

By copying the BIOS into RAM the system takes advantage of the shorter access times of RAM. Only enable shadow RAM for ISA bus address ranges that contain adapter BIOS.

Warning
Shadowing is only appropriate for adapter ROM. It must never be enabled for adapter card RAM in these regions.

Cache Enabling this option disables the processor internal cache, and, if fitted, the external cache. There should normally be no reason to disable this cache, it will result in a performance decrease.

Some old software which is speed sensitive may not work properly with the cache enabled. This problem is uncommon, and this option is provided as a safety net.

System Speed This parameter allows you to slow the ISA bus to 8MHz.

This may be useful if you have an old expansion card that will not operate with the ISA bus running at higher speed.

Only select low if you have a problem with an expansion card.

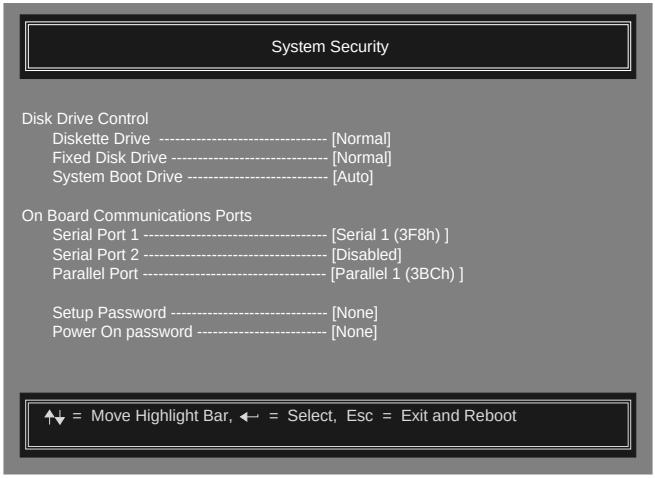
You can also use the CTRL+ALT++ key combination to toggle between high and low speed.

Memory at 15MB-16MB This parameter allows the memory address range from 15MB to 16MB to be reserved for use by memory on an ISA expansion card.

Fixed Disk Power Saving Mode This option allows you to set the hard disk drive to switch to standby mode after a period of inactivity. The period of inactivity is adjustable from 1 to 18 minutes.

System Security

If you select System Security the following screen will appear.



Use the up and down arrow keys to move around the screen, and the left and right arrow keys to alter the settings.

Disk drive control

The disk drive parameters allow you to independently control access to hard and floppy disk drives, and to restrict which drives are bootable.

Diskette drive/Fixed disk drive

These parameters can be set to normal, write protect or disable. In normal mode the affected drive can perform both read and write operations. Write protect blocks all attempts to write to the drive, only read operations are permitted. If disable is selected both read and write operations are inhibited.

Warning

Write protect inhibits write accesses through the BIOS. Therefore write protect only works for operating systems which use the BIOS to access the drives, specifically DOS. Write protect mode will not work for operating systems which do not use the BIOS calls to access the drives.

System boot drive

This parameter can be set to Auto, C: or A:. In Auto mode the system looks for a diskette in drive A: and, if a system diskette is present, boots from that. If drive A: is empty the system boots from drive C: (first hard disk drive).

If A: is selected the system will only boot from a system diskette in drive A:, if C: is selected the system will only boot from drive C:.

I/O Ports ***Serial Ports***

These options allow each of the 2 serial ports to be disabled, or to configured as COM1, COM2, COM3 or COM4 with the corresponding address given below.

Port	Start Address
COM1	3F8h
COM2	2F8h
COM3	3E8h
COM4	2E8h

Note

The two serial ports must be set to different COM ports. Attempting to configure both serial ports to the same COM port will result in one port being disabled.

Parallel Port

This option allows the parallel port to be disabled, or to configured as parallel port 1, 2, or 3 with the corresponding address given below.

Parallel Port	Start Address
1	3BCh
2	378h
3	278h

Passwords ***SETUP Password***

This option allows you to set a password for the SETUP utility. When this option is in operation only people who know the password can run the SETUP utility and reconfigure the system.

To enable the SETUP Password move the highlight bar to Setup Password, and press the left or right arrow key. You will then be requested to enter a password of up to seven characters, once you have keyed the password and pressed the return key you will be asked to retype the password to ensure accuracy.

Power-On Password

This option allows you to set a system password. When this option is in operation only people who know the password can use the system.

To enable the power-on password move the highlight bar to Power-On Password, and press the left or right arrow key. You will then be requested to enter a password of up to seven characters, once you have keyed the password and pressed the return key you will be asked to retype the password to ensure accuracy.

When the power-on password is enabled you are prompted to enter it every time the system boots.

To disable the password, at the prompt, enter the current password followed by a forward slash (/). To change the existing password enter the current password followed by a forward slash (/) and the new password.


XEN

7 TROUBLESHOOTING

This chapter offers advice if you suspect a fault with your Apricot XEN-PC. 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-PC itself; remember that problems can also arise from other sources such as your network cabling, operating system or application software.

Problems when starting

Power-on self-test

Whenever the Apricot XEN-PC 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). In this case you are prompted to invoke the SETUP utility.

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-PC 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-PC 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-PC attempts to boot from a system diskette then a bootable hard disk partition.

MS-DOS is normally pre-installed on XEN-PC 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-PC 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.

Troubleshooting charts

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

Problems with the system unit

Problem	Diagnosis
The XEN-PC will not start when the POWER button is pressed.	The AC power supply is not switched on.
	The XEN-PC 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-PC 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-PC power inlet.
	This may be caused by a AC power surge, but is more often a symptom of problems with the XEN-PC 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-PC 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.

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-PC.
	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-PC.
	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-PC 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-PC, remove the top cover, and check.
	Contact your supplier.
	Isolate the XEN-PC, remove the top cover, and check.
	Reconfigure one or other of the cards.
	Contact your supplier.

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. (5¼" 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.

	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

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.

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 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.

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 is faulty or the mouse signal cable is broken inside.

	Remedy
	This is easily done as the two ports look identical. The keyboard port is the small circular port nearest the back of the system unit.
	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.
	Call an authorized Apricot maintainer.
	Press the NUMLOCK key (in the top left corner of the keypad). The NumLock LED should light.

	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-PC".
	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.
	Call an authorized Apricot maintainer.

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-PC 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-PC was switched on.

	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-PC".
	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.


XEN

A INSIDE THE APRICOT XEN-PC

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

Turn off the Apricot XEN-PC 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-PC'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.

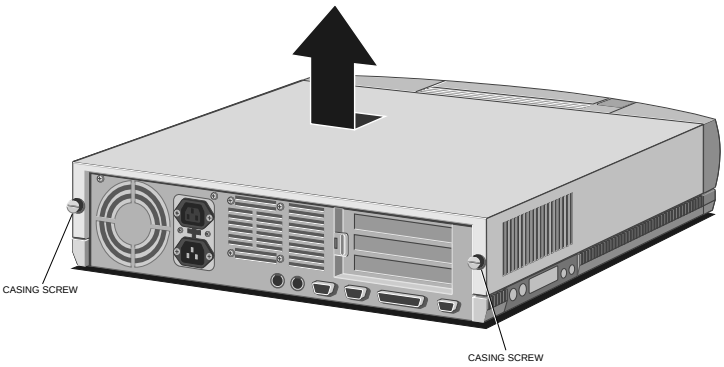
Handle static-sensitive items with extreme care. Hold expansion cards and add-on components only by their edges, avoiding their electrical contacts. Never touch the components or electrical contacts on the motherboard or on expansion cards. In general, do not handle static-sensitive items unnecessarily.

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-PC 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.



Configuring expansion cards

Many ISA 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.

How to select options like this 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.

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.

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-PC (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.

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.
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-PC 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.

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 3.1 on your XEN-PC 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.

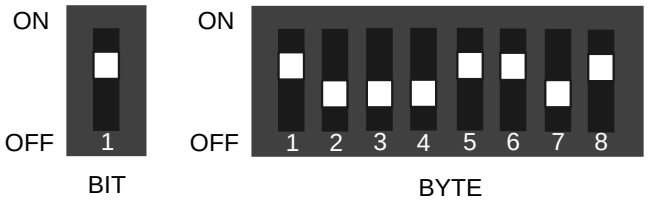
Another commonly used notation is to describe numbers as *x*K or *x*M. Where 1K=1024 and 1M=1048576 (1048576=1024x1024). In this notation 655360 (that is A0000h) is 640K.

Memory maps

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

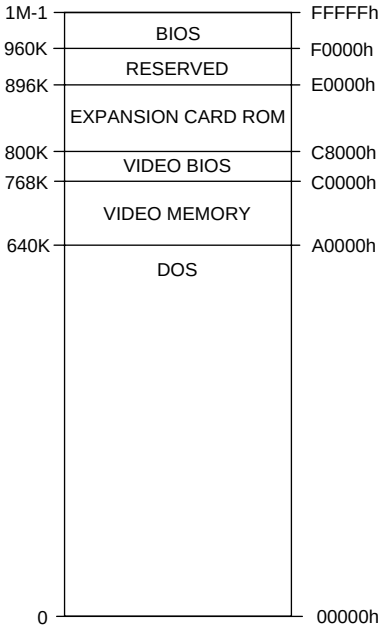
The processor's address space can be thought of as a list of locations, the locations are each identified by a number. The first, or bottom, location is address 0.

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-PC. Diagrams like these are called memory maps, and are a convenient way of representing processor address space.



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-PC 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-PC 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.

On the XEN-PC 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, and the motherboard video adapter must be disabled by removing jumper JP14.

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-PC 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.

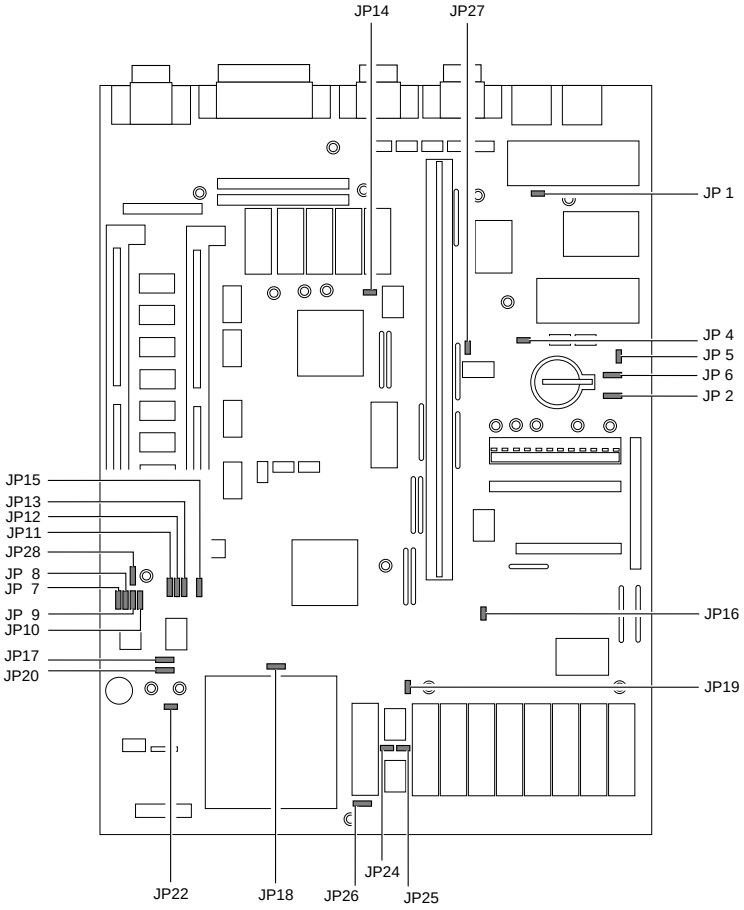
I/O ports (Hex)	Used by
000 - 01F	DMA controller 1
020 - 027	Interrupt controller 1
030 - 037	Interrupt controller 1
040 - 047	System timer
050 - 057	System timer
060 - 06F	Keyboard controller
070 - 07F	Real time clock, NMI mask
080 - 09F	DMA page register
0A0 - 0BF	Interrupt controller 2
0C0 - 0DF	DMA controller 2
0F0, 0F1	Math coprocessor
0F8 - 0FF	Math coprocessor
1F0 - 1F8	Hard disk drive controller
178, 17A	Power-saving port
278 - 27F	Parallel port 2
2F8 - 2FF	Serial port 2
35F, 36F	Power-saving port
37F	Reserved
378 - 37F	Parallel port 1
3F0 - 3F7	Diskette drive controller
3F8 - 3FF	Serial port 1

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.*

Motherboard jumper settings

The XEN-PC 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.



A few of the jumpers are two pin jumpers, these are either open or closed. Open means that there is no clip fitted, or if a clip is fitted, it is in contact with only one of the jumper pins.

The majority of the jumpers are three pin. These can be configured with a jumper clip connecting either pins 1 and 2, or pins 2 and 3. For the jumpers which run front to rear, pin 1 is at the front. For the jumpers which run left to right, pin 1 is on the left, when viewed from the front.

JP1

In this implementation JP1 must always be closed.

JP2

JP2 is used to enable or disable the motherboard security features. When pins 1 and 2 are connected the security features are controlled by SETUP, when pins 2 and 3 are connected security cannot be enabled by SETUP.

JP4

In this implementation pins 2 and 3 must always be connected.

JP5

JP2 is used to indicate the type of 3.5" floppy drive installed in the system. Pins 1 and 2 connected indicate that a normal high density drive is installed, pins 2 and 3 connected indicats that a three mode floppy is fitted. In this implementation a normal high density drive is always used.

JP6

JP2 is used to configure the I/O address range of the ADI2 chip, if one is fitted. When pins 1 and 2 are connected the ADI2 chip is addressed in the 03Xh range, when pins 2 and 3 are connected the chip is addressed in the 0BXh range.

JP7

JP7 is used to control the clock frequency generated on the motherboard. When pins 1 and 2 are connected a 25MHz clock frequency is generated, when pins 2 and 3 are connected a 33MHz clock frequency is generated.

JP8, 9, 10, 17

These jumpers are used in conjunction with JP7 to control the clock frequency generated on the motherboard. In this implementation there is normally no need to adjust the settings.

Frequency (MHz)	JP7	JP8	JP9	JP10	JP17
25	2-3	2-3	1-2	2-3	2-3
33	1-2	2-3	1-2	2-3	2-3
40	1-2	1-2	2-3	1-2	1-2
50	2-3	2-3	1-2	1-2	1-2

JP11, 12, 13, 15, 18, 20, 27

This group of jumpers are used to configure the motherboard for the type of processor installed. In this implementation there is normally no need to adjust the settings.

Processor	JP11	JP12	JP13	JP15	JP18	JP20	JP27
486	1-2	1-2	1-2	1-2	2-3	2-3	OPEN
P24T	1-2	2-3	1-2	2-3	1-2	2-3	OPEN

JP14

This jumper is used to disable the motherboard VGA. When JP14 is open the motherboard VGA is disabled, when closed motherboard VGA is enabled.

The motherboard VGA should only be disabled if a video adapter card is installed in the system.

JP16

JP2 is used to enable the ADI2 chip, if one is fitted. When JP16 is open the ADI2 chip is enabled, when closed the ADI2 chip is disabled.

JP19

JP19 must always be closed.

JP22

JP22 must always be open.

JP24, 25, 26

These three jumpers are used to indicate the size of external cache installed on the motherboard.

Cache size	JP24	JP25	JP26
64k	OPEN	OPEN	2-3
128k	OPEN	CLOSE	1-2
256k	CLOSE	CLOSE	2-3

JP28

JP28 is used to enable the 4Mbytes of RAM soldered to the motherboard. When pins 1 and 2 are connected the RAM is enabled, when pins 2 and 3 are connected the RAM is disabled.

There should never be any need to disable the motherboard RAM.

Hard disk drive types

Drive	Type
ELS85A	45
ELS170A	52
LPS240A	53
LPS525A	58
Generic	80

The generic drive type 80 should be used for drives with more than 1024 cylinders. It defines a drive with 1024 cylinders, 16 heads and 63 sectors/track giving a capacity of 528 million bytes.


XEN

B TECHNICAL INFORMATION

This appendix provides some technical information about the Apricot XEN-PC. More detailed information is available in the *Hardware Technical Reference*, which can be purchased from your Apricot supplier.

Specifications

System processor	Intel486 SX-25	Intel486 DX2-50 Intel486 DX2-66
BIOS ROM	128 Kb 8-bit	
Memory	Motherboard	4 Mb 36-bit 70ns
	Expansion	Two 36-bit 70ns SIMMs (36 Mb maximum)
Apricot Advanced Graphics	Controller	Cirrus Logic GD5428
	Video RAM	512 Kb, 1 Mb or 2 Mb
	Resolutions	EVGA 1024 x 768 SVGA 800 x 600 VGA 640 x 480
I/O ports	Serial	dual 9-way male D-type RS-232
	Parallel	25-way female D-type
Keyboard	102 key AT-compatible	
Mouse	PS/2-compatible two-button	
Diskette drive	Capacity	1.44 Mb
	Access time	94 ms (average)
Hard disk drive bay	Interface	IDE
	Form factor	3.5"
	Capacity	One 1.6" drive or Two 1" drives
Removable media drive bay	Form factor	Half-height 5.25"
	Interfaces	Floppy disk/tape SLCD CD-ROM

SLCD CD-ROM drive (CDU31A)

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
	Burst	2.1 Mbyte/s
Access time	Full stroke	0.95 s (typical)
	Average (random)	0.49 s (typical)
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	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 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) 2.6 Gbyte (2:1 typical) 5.2 Gbyte (4:1 max[1])
	90-metre cassette	2.0 Gbyte (1:1 base) 4.0 Gbyte (2:1 typical) 8.0 Gbyte (4:1 max[1])
Transfer rate	Sustained	366 Kbyte/s (1:1 base) 732 Kbyte/s (2:1 typical) 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% +5 V dc + 7%
	Ripple	+12 V: 100 mVp-p +5 V: 100 mVp-p
	Current (max)	1.40 A @ +12 V dc 1.30 A @ +5 V dc

SCSI CD-ROM drive (CDU561)

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

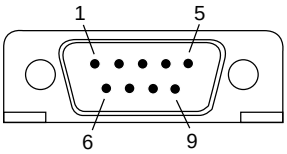
Expansion slots

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*



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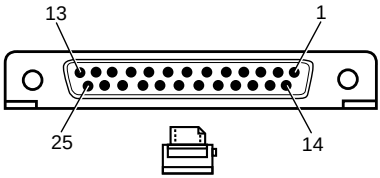
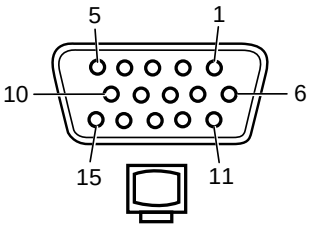
Pin	I/O	Function
1	I	Data carrier detect
2	I	Receive data
3	O	Transmit data
4	O	Data terminal ready
5	NA	Signal ground
6	I	Data set ready
7	O	Request to send
8	I	Clear to send
9	I	Ring indicate

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

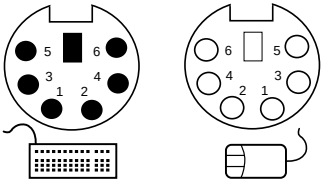


Pin	I/O	Output	Monochrome	Colour
1	O	Red	No pin	Red
2	O	Green	Mono	Green
3	O	Blue	No pin	Blue
4	NA	Reserved	No pin	No pin
5	NA	Digital G	Self test	Self test
6	NA	Red Rtn	Key pin	Red Rtn
7	NA	Green Rtn	Mono Rtn	Green Rtn
8	NA	Blue Rtn	No pin	Blue Rtn
9	NA	Plug	No pin	No pin
10	NA	Digital G	Digital G	Digital 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-PC motherboard video adapter provides a video feature connector. The connector on the motherboard uses a standard pinout and a standard cable may be used to connect the feature connector to an expansion card. In case you have difficulty obtaining a cable the pinout of the motherboard connector is given in the following table.

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

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BIRMINGHAM BUSINESS PARK
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Part No 15205031
Revision No 01