MITSUBISHI ELECTRIC

apricot

LS700

Owner's Handbook

OWNER'S HANDBOOK

for the

APRICOT LS700

MITSUBISHI

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ELECTRIC

CONTENTS

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SAFETY AND REGULATORY NOTICES

Electrical

The computer uses a safety ground and must be earthed.

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

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

Battery

This product contains a lithium battery:

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

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

Laser products

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

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CLASS 1 LASER PRODUCT TO IEC 825
LASER KLASSE 1 PRODUKT NACH IEC 825
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It will be in high visibility colours and bear the details shown above.

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

Ergonomic

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

Standards

Safety

EN 60 950 (1992) plus amendments 1 (1993) and 2 (1993). Common modifications, special National Conditions and Deviations.

Electro-magnetic Compatibility (EMC)

This product complies with the following European EMC standards:

Emissions	EN55022	Class B
Immunity	EN50082	Level 1

German Acoustic Noise Regulation

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

Notes

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

Legalities

This equipment complies with the following European Directives:

Low Voltage Directive	**73/23/EEC**
EMC Directive	**89/336/EEC**
CE Marking Directive	**93/68/EEC**

and where applicable:

Telecommunications Directive	**91/263/EEC**

CAUTION

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

Power connection information

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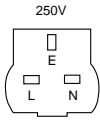
BS1363A	SHUCO	NEMA 5-15P	SRAF 1962/DB16/87	ASE 1011
250V	250V	125V	250V	250V
U. K.	Austria Belgium	Taiwan	Denmark	Switzerland
	Finland France	Thailand		
	Italy Germany	Japan		
	Sweden Norway	USA		
	Holland	Canada		
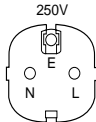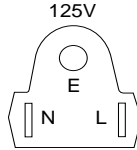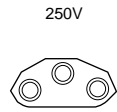
Procedure

CAUTION

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

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

♦ Before connecting up any parts of the system, ensure that the AC supply is switched off or disconnected.

♦ First connect up the keyboard, mouse, monitor signal cable, and audio cables as appropriate.

♦ Connect up **all** AC cables. (System to supply, system to monitor, all related peripherals.) Then switch on or connect the AC supply.

♦ Switch on the monitor first, then the computer followed by the peripherals, such as a printer.

WARNING

The power switch on the front of the computer does not isolate the computer from the supply. You must unplug the AC supply cable from the computer or the wall outlet before attempting to remove any covers.

Power Cable Connections - UK ONLY

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

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

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

Notation conventions

The conventions listed below are used throughout this manual.

<F1>	A letter, number, symbol, or word enclosed in < > represents a key on your keyboard. For example, the instruction 'press <F1>' means press the key labelled 'F1' on your keyboard.
<Enter>	Other manuals refer to <Enter> as RETURN, CARRIAGE RETURN, <CR>, or use an arrow. All of these terms are interchangeable.
<x + y>	Two or three key names, separated by plus signs, indicate multiple-key entries. For example, <Ctrl + Alt + Del> means hold down <Ctrl> and <Alt> and press <Del>.

The special notices listed below are used throughout this manual to emphasise specific information:

WARNING

WARNING indicates a hazard that can *cause personal injury or equipment damage if the hazard is not avoided.*

CAUTION

CAUTION indicates a hazard that might *cause personal injury, damage to hardware, or software if the hazard is not avoided.*

NOTE

Notes provide information and may be used to emphasise a recommended sequence of steps.

1 SYSTEM DESCRIPTION AND INSTALLATION

This chapter provides a basic description of the LS700, along with simple installation information.

Feature Summary

- ♦ A removable carrier with bays that can accommodate one of the following variations:
  - ◊ Three half-height full-width peripherals
  - ◊ One full-height and one half-height full-width peripherals
  - ◊ Two half-height full-width peripherals and one narrow peripheral
- ♦ A removable carrier with bays that can hold one floppy diskette drive and one narrow hard disk drive.
- ♦ A non-removable bay that can hold one narrow hard disk drive.
- ♦ 200 watt (peak) ATX power supply switchable between 115 and 230 volts AC.
- ♦ Seven slots for add-in cards.
- ♦ Padlock hole.

Dimensions

The weight includes the complete chassis assembly with the power supply and the optional fan.

Width	22.7 cm	Height (feet installed)	37.5 cm
Depth	43.2 cm	Weight (chassis only)	7.97 kg

Front Panel Controls and Indicators

Figure 1 Front Panel Controls and Indicators
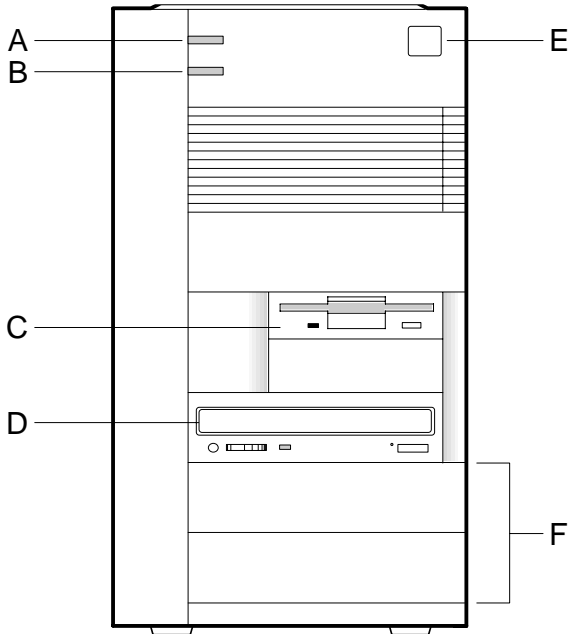
A. Power on/off light. Turns on when the power is on.

B. Hard disk light. Turns on when the computer reads or writes data to an IDE hard disk.

C. Floppy diskette drive.

D. Bay for full-width devices, shown here with an optional CD-ROM drive installed.

E. Power control button. Press to turn on the computer.

F. Bays for other full-width devices, shown with two plastic filler panels in place.

Back Panel Connectors and Features

Figure 2 shows a typical configuration including a power supply and external motherboard I/O connectors.

Figure 2 Back Panel Connectors and Features
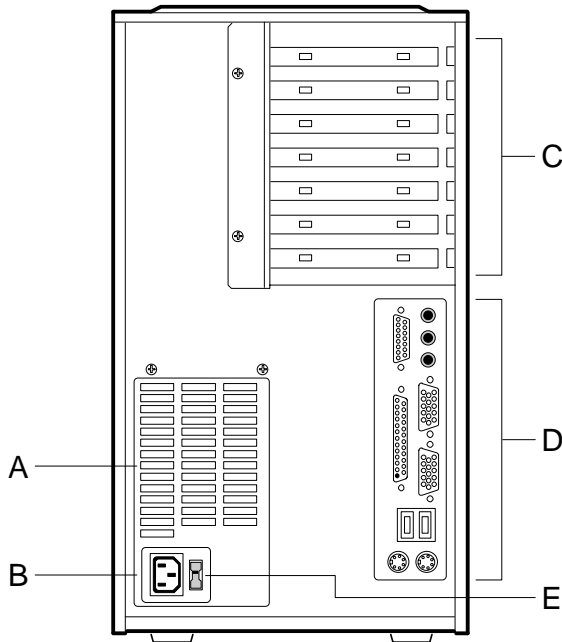
A.   Power supply fan vent holes.

B.   Socket for AC power cord.

C.   Add-in card slots.

D.   Typical motherboard I/O connectors. See the motherboard section for further information.

E.   Input voltage select switch.

Selecting a Site

Choose a site that is:

♦ Clean and as dust free as possible.

♦ Well ventilated and away from sources of heat including direct sunlight.

♦ Well away from sources of water or damp.

♦ Stable and protected from sources of vibration or physical shock.

♦ Isolated from strong electromagnetic fields produced by electrical devices, such as large air-conditioning units.

♦ Equipped with a properly earthed power outlet within easy reach.

♦ In regions that are susceptible to electrical storms, it may also be advisable to plug your system into a surge suppresser.

◊ Disconnect telecommunication lines to any modem during an electrical storm.

Power Supply

Checking the Input Voltage Setting

A 200 watt (peak) power supply is integrated into the chassis to provide power for the motherboard, add-in cards, and peripheral devices. A switch on the back panel can be used to set the power supply to operate at:

♦ 115 V AC (in the range of 90 - 127 V AC), or

♦ 230 V AC (in the range of 180 - 255 V AC)

To verify that your system has the correct setting for your environment, check the input power selection switch. This should already be correctly set for the country of sale.

Figure 3. Select the Input Voltage Setting
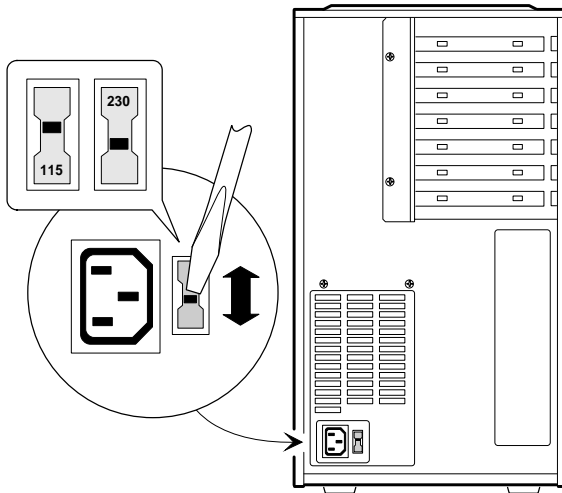
WARNING

The power cable shipped with the system is correct for the country of supply. If you wish to use the computer in another country, it may not be suitable, contact your Apricot dealer for information.

AC Input

Voltage (50/60 Hz)	Current
115 V (90-127 V)	3.5 A
230 V (180-255 V)	2.0 A

WARNING

To avoid damage to the motherboard or power supply, do not exceed a total of 160 watts of continuous power draw, or a 200 watt surge for a maximum of 12 seconds.

Power Supply Output

DC Voltage	Current (Max. continuous)
+12 V	6.0 A
+5 V	18.0 A
+5V Standby	0.01 A
+3.3 V	14.0 A
-5 V	0.3 A
-12 V	0.8 A

NOTE

Due to load sharing among the power supply outputs, the maximum continuous current outputs of all voltages cannot be achieved simultaneously.

Before Installing Optional Items

Before installing other items, such as drives, add-in cards, etc., connect a keyboard and a monitor to the system, switch on and let the power-on self test (POST) run. This will be followed by initialisation of the pre-installed Operating System software, during which you will be asked to enter personal registration details.

Once this has been fully completed, you can shut down the operating software, turn the power off, then install any drives, add-in cards, or upgrades, the instructions for which are given in the following chapters.

This is to allow 'Plug and Play' add-in cards and their special features to be correctly detected and configured.

Secondary Fan Specifications

This chassis has been tested for adherence to thermal specifications using a single system fan and a full complement of typical add-in cards and peripherals. Because the power and cooling requirements for add-in card components vary widely, this testing cannot guarantee that every add-in card will meet its particular thermal requirements in all possible system configurations.

If you integrate the system with add-in cards that draw significant power, it is recommended that you install a front cooling fan. If you add a secondary fan, it must meet these specifications. Full installation information can be found in chapter 2. Suitable fans can be obtained from your Apricot supplier.

Parameter	Specification
Size	80 mm
Voltage	12 V DC
Airflow	26 CFM

Auxiliary Speaker Specifications

Some systems will be supplied with only a simple 'beep' speaker fitted to the motherboard. If you add an auxiliary speaker, it must meet these specifications. Full installation information can be found in chapter 2.

Parameter	Specification
Size	57 mm (approx)
Impedance	8 Ohms

2   CHASSIS AND COMPONENTS

This chapter describes how to take apart and reassemble the chassis and the major components.

Before You Begin

♦ Be sure to do each procedure in the correct order.

♦ Set up an equipment log to record the computer's model and serial numbers, all installed options, and other information about the computer. If you need this information, it will be easier to consult the log than to open up and examine the computer.

♦ Observe antistatic precautions at all times whenever any cover is removed and while handling any components.

    ◊ Information and guidance on antistatic precautions can be found in the appendix at the rear of this handbook.

♦ You will need a Phillips (#2 bit) and a flatblade screwdriver.

♦ Turn the computer power off by pressing the power control button.

♦ Unplug the AC power cord from the back of the chassis.

♦ Turn off and disconnect all peripheral devices connected to the computer, e.g. printer or modem.

WARNING

The power supply in this computer contains no user-serviceable parts. To avoid personal injury or damage to your equipment, refer repair or replacement of the power supply to qualified technical personnel only.

Chassis Covers

Removing the Top Cover

1. Observe the precautions in 'Before You Begin'.

2. If you are removing the cover for the first time, you may need to remove the plastic plug in the padlock hole (see Figure 4). Save it for re-installation.

    ◊ If you installed a padlock on the chassis, unlock the padlock and remove it.

3. Grasp the top cover at the rear of the chassis.

4. Slide the cover towards the rear of the chassis until it stops (just over 1cm).

5. Lift the cover away from the chassis.

Figure 4. Removing the Top Cover
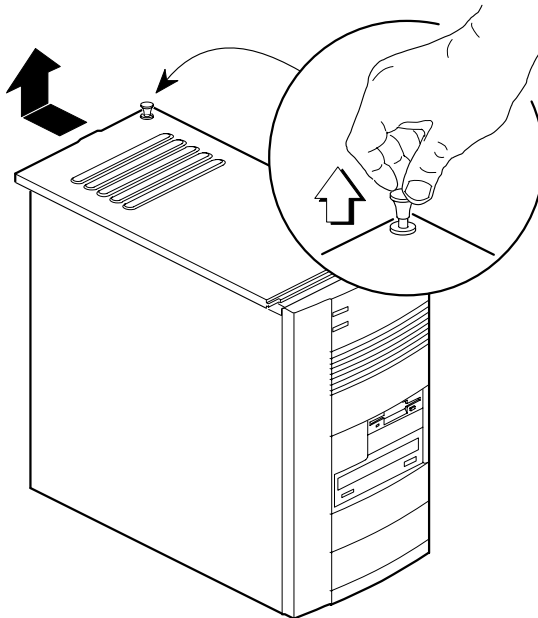
Installing the Top Cover

1. Observe the precautions in 'Before You Begin'.

2. Check that you have not left any tools or loose parts inside the chassis. Check that everything is properly installed and tightened.

3. Lay the cover on top of the chassis so the plastic tabs on the inside of the cover match up with the holes in the top of the chassis.

4. Slide the cover towards the front of the chassis as far as it will go.

5. For security, you can install a padlock to prevent future unauthorised removal of the cover. If you do not install a padlock, reinstall the plastic plug.

6. Reconnect all cables to the computer.

Removing the Access Side Cover

The access side is the right side of the chassis when viewed from the front.

1. Observe the precautions in 'Before You Begin'.

2. Remove the top cover.

3. Slide the two locking tabs at the rear of the chassis up as far as they will go.

4. Grasping the back edge of the side cover, swing it away from the chassis and pull it free.

WARNING

Observe antistatic precautions at all times when the covers are removed.

Figure 5. Removing the Access Side Cover
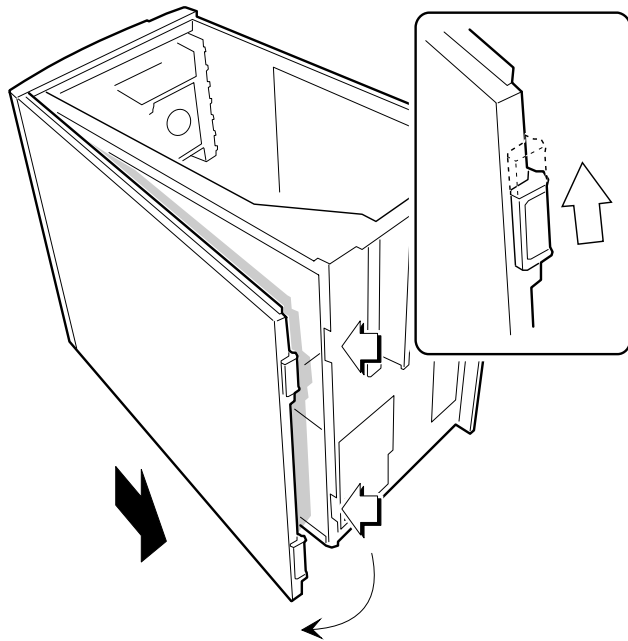
Installing the Access Side Cover

1. Observe the precautions in 'Before You Begin'.

2. Check that you have not left any tools or loose parts inside the chassis. Check that everything is properly installed and tightened.

3. Holding the side cover at a slight angle, insert the tabs at the front of the cover into their slots. Swing the cover snugly against the chassis.

4. Slide the tabs at the rear of the cover down as far as they will go. It may be necessary to apply pressure against the side cover in order to properly seat the tabs.

Removing the Non-Access Side Cover

The non-access side is the left side of the chassis when viewed from the front.

1. Observe the precautions in 'Before You Begin'.

2. Remove the top cover.

3. Lay the chassis temporarily on the access side.

4. Release the plastic tab on the top of the cover (see Figure 6).

5. Release the two plastic tabs on the bottom of the side cover then carefully pull the rear end of the cover away from the chassis and unhook it from the front bezel.

    ◊ You may have to use a little pressure to overcome snap-in fixings under the side cover.

Figure 6. Removing the Non-Access Side Cover
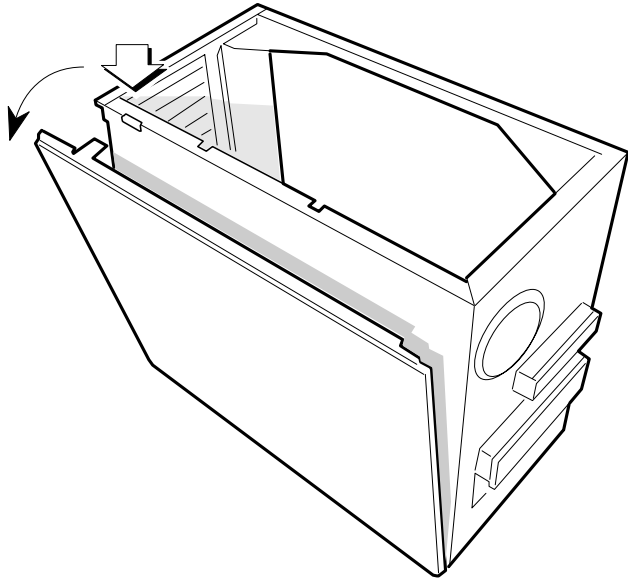
Installing the Non-Access Side Cover

1. Observe the precautions in "Before You Begin."

2. Holding the side cover at a slight angle, insert the tabs at the front of the cover into their slots. Swing the cover snugly against the chassis.

3. Press the top tab into its slot.

4. Press against the middle and bottom of the side cover to properly seat the rest of the tabs.

Removing the Bezel

1. Observe the precautions in 'Before You Begin'.

2. Remove the top cover.

3. Remove the access side cover.

4. Release the fan/card guide module (see Figure 7) by pressing the two tabs on the long edge of the module and pulling until you can swing the module away from the front of the chassis.

    ◊ You may have to remove some add-in cards to move the module.

5. Release the two tabs holding the bezel to the chassis by pressing them outward.

6. Lift the front of the chassis slightly, and pull the bezel away.

7. Press the fan/card guide module back into place.

CAUTION

Do not use excessive force to remove plastic components as it may cause damage to fixing tabs etc.

Figure 7. Removing the Bezel

Installing the Bezel

1. Observe the precautions in 'Before You Begin'.

2. Lift the front of the chassis slightly and align the bezel with the chassis. You may find it easier to place the chassis on its back when aligning the bezel.

3. Press the top of the bezel against the chassis until the tabs click into place.

Add-in Cards

The following procedures tell how to remove and install slot covers and add-in cards.

Removing an Expansion Slot Cover

1. Observe the precautions in 'Before You Begin'.

2. Remove the top cover.

3. Remove the access side cover.

4.   Remove the two screws that hold the slot cover bracket to the chassis (Figure 8, A).

5.   Swing the bracket away from the chassis and remove it (Figure 8, B).

Figure 8. Removing the Expansion Slot Cover Bracket
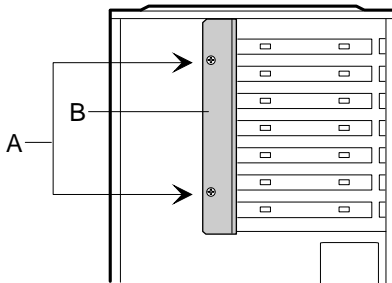
6.   Insert a flat blade screwdriver into a hole of the slot cover you wish to remove.

7.   Move the screwdriver up and down until the slot cover breaks away from the chassis. Lift the slot cover out of the chassis.

Figure 9. Removing an Expansion Slot Cover
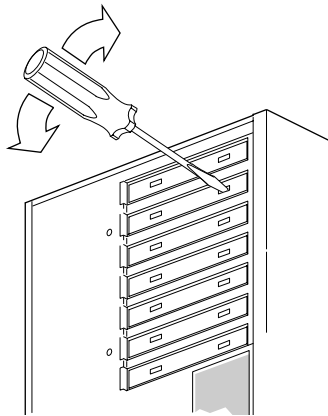
Installing an Expansion Slot Cover

1. Observe the precautions in 'Before You Begin'.

2. Using a standard metal slot cover, insert the cover into the slot.

3. Hold the slot cover bracket at an angle to the chassis and line the holes in the bracket up with the tabs on the chassis.

4. Pivot the bracket so the screw holes in the bracket and the chassis line up (see Figure 8, A).

5. Secure the bracket to the chassis with two screws.

NOTE

Covers must be installed in all vacant slots to maintain the electromagnetic emissions characteristics of the chassis and to ensure proper cooling.

Installing an Add-in Card

NOTE

The bottom slot will not accommodate a full length add-in card

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1. Observe the precautions in 'Before You Begin'.

2. Remove the slot cover from the slot you wish to use.

3. Remove the card from its wrapper and place it on a grounded, static-free surface.

4. Set any jumpers or switches on the card according to the manufacturer's instructions.

5. Hold the card by the edges only and firmly press it into the connector on the motherboard (see Figure 10).

6. Connect cables (if any are needed) to the installed card.

7. Replace the slot cover bracket (see Figure 8).

Figure 10. Installing an Add-in Card
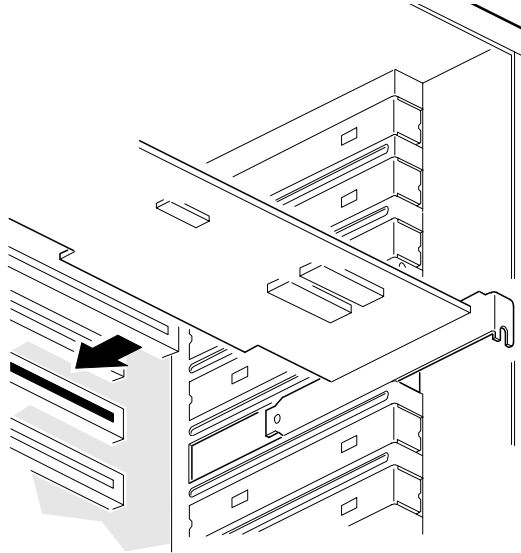
Removing an Add-in Card

1. Observe the precautions in 'Before You Begin'.

2. Disconnect any cables attached to the add-in card you are removing.

3. Remove the two screws that hold the slot cover bracket to the chassis.

4. Swing the slot cover bracket away from the chassis and remove it.

5. Hold the card at each end and carefully rock it back and forth until the edge connectors pull free.

6. Store the card in an antistatic wrapper.

7. If you disconnected cables from the card and you are not reinstalling this card or one like it, remove the cables from the computer.

8. Install an expansion slot cover over the vacant slot.

Peripheral Carriers and Devices

Removing the Floppy Diskette Drive Carrier
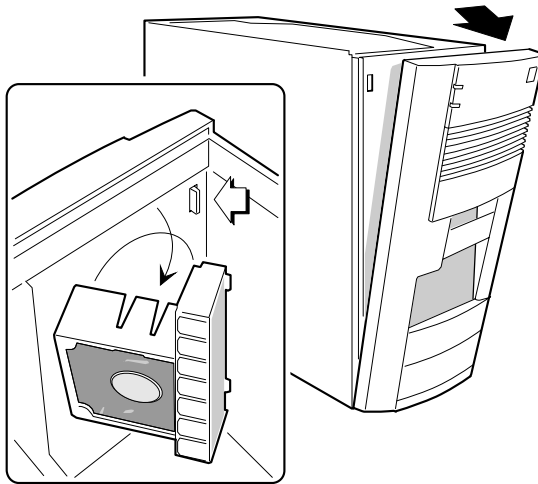
1. Observe the precautions in 'Before You Begin'.

2. Remove the top cover.

3. Remove the access side cover.

4. Disconnect the power cables and the ribbon data cables from any peripherals in the carrier.

5. Remove the screws (see Figure 11) that secures the carrier to the main peripheral carrier.

6. Slide the carrier back until the tabs hit their stops.

7. Lift the carrier up and remove it from the chassis.

Figure 11. Removing the Carrier
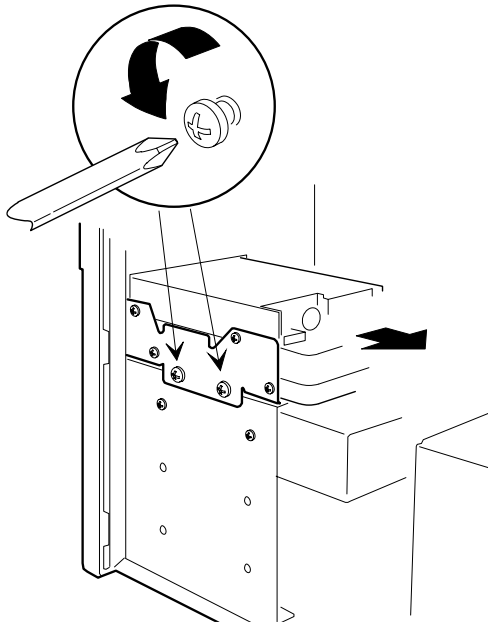
Chassis and components

Installing the Floppy Diskette Drive Carrier

1. Observe the precautions in 'Before You Begin'.

2. Insert the tabs on the carrier into their slots on the main peripheral carrier.

3. Slide the carrier all the way forward until the screw holes in both carriers line up.

4. Insert and tighten the screws that hold the two carriers together.

5. If there is a drive in the carrier, attach the power cable and the ribbon cable to the drive.

Removing the main Peripheral Carrier

1. Observe the precautions in 'Before You Begin'.

2. Remove the top cover.

3. Remove the access side cover.

4. Remove the bezel.

5. Remove the floppy diskette drive carrier.

6. If there is an EMI shield installed for the bottom bay, remove it.

7. Disconnect the power cables and the ribbon data cables from any drives in the carrier.

8. Remove the two screws that secure the carrier to the front of the chassis.

9. Place the chassis on its back and remove the two screws that secure the carrier to the bottom of the chassis.

10. Lift the carrier up and remove it from the chassis.

Figure 12. Removing the main Peripheral Carrier
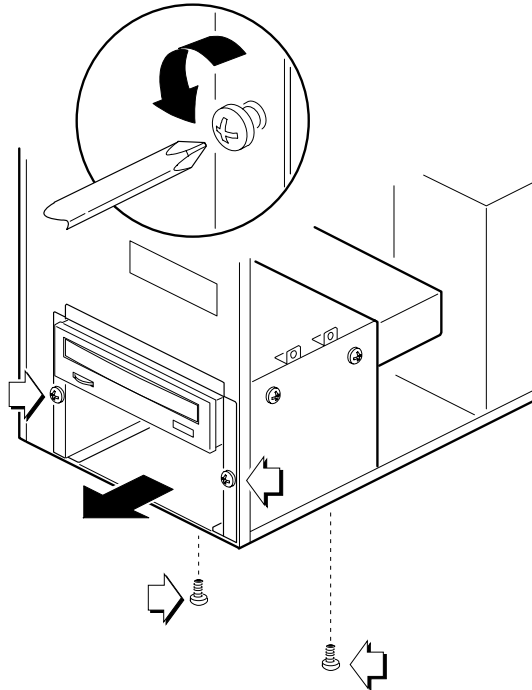
Installing the main Peripheral Carrier

1. Observe the precautions in 'Before You Begin'.

2. Place the chassis on its back.

3. Slide the peripheral carrier into the chassis.

4. Insert and tighten the two screws that secure the carrier to the bottom of the chassis.

5. Place the chassis on its feet.

6. Insert and tighten the two screws that secure the carrier to the front of the chassis.

7. If needed, install an EMI shield in the bottom carrier.

Removing the floppy Diskette Drive

1.   Observe the precautions in 'Before You Begin'.

2.   Remove the drive carrier.

3.   Remove the three screws holding the diskette drive to the carrier (see Figure 13).

4.   Slide the drive out of the carrier.

5.   If you are not replacing the drive you just removed, and there are no other diskette drives on the same data cable, disconnect the cable from the motherboard.

NOTE

A diskette drive or a suitable blanking insert **must** *be installed in this bay to preserve the electromagnetic emissions characteristics of the chassis and to ensure proper cooling of the computer components.*

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6.   Install the drive carrier back into the chassis.

Figure 13. Removing the floppy Diskette Drive
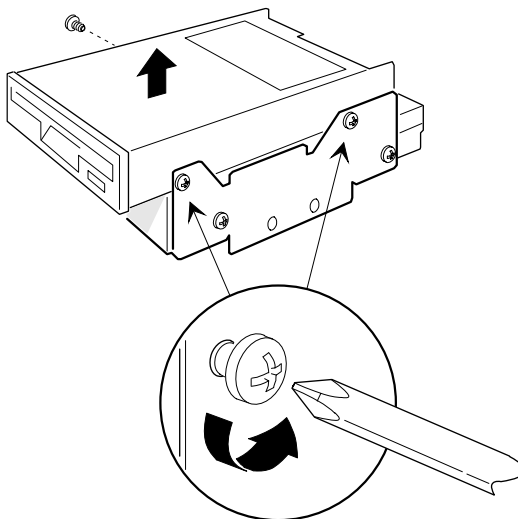
Installing a floppy Diskette Drive

1. Observe the precautions in 'Before You Begin'.

2. Remove the diskette drive carrier.

3. Remove the diskette drive from its protective wrapper and place it on an antistatic surface.

4. Set any jumpers or switches on the drive according to the manufacturer's instructions.

5. Slide the diskette drive into the drive carrier. Line the holes on the carrier up with the screw holes on the drive.

6. Insert and tighten three screws of the appropriate type and length (not supplied).

7. Install the drive carrier back into the chassis.

8. Attach the power cable and the data cable to the drive.

Installing Hard Disk Drives

Installing a hard disk drive in the floppy Drive Carrier

1. Observe the precautions in 'Before You Begin'.

2. Remove the floppy drive carrier.

3. Remove the drive from its protective wrapper and place it on an antistatic surface.

4. Set any jumpers, switches, or terminating resistors on the drive according to the manufacturer's instructions.

5. Slide the drive into the drive carrier. Line the holes on the carrier up with the screw holes on the drive.

6. Insert and tighten three screws of the appropriate type and length (not supplied).

7. Install the drive carrier back into the chassis.

8. Attach the power cable and the data cable to the drive.

Figure 14. Installing a Hard Drive in the Carrier
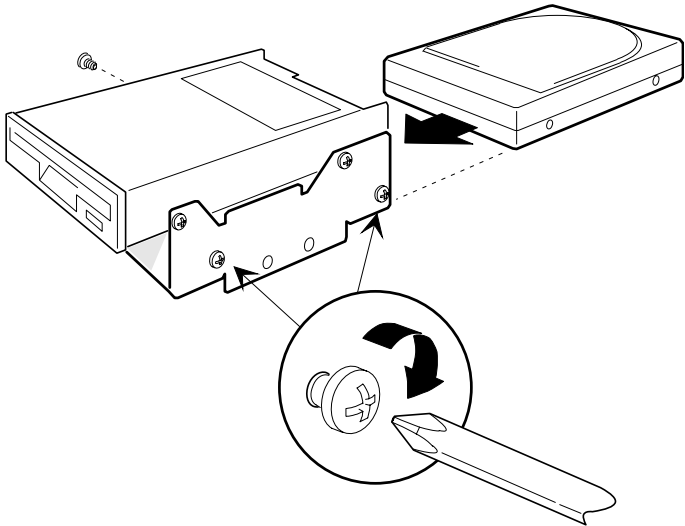
Removing a Hard Drive from the Diskette Drive Carrier

1.   Observe the precautions in 'Before You Begin'.

2.   Remove the floppy diskette drive carrier.

3.   Remove the three screws holding the drive to the carrier.

4.   Slide the drive out of the carrier and place it on an antistatic surface.

5.   Install the drive carrier back into the chassis.

Installing a Hard Drive Behind the Power Supply.

WARNING

This procedure should be done only by qualified technical personnel. Unplug the computer before doing the procedures described here.

1. Observe the precautions in 'Before You Begin'.

2. Remove the non-access side panel.

3. Remove the power supply (see later in this chapter).

4. Remove the drive from its protective wrapper and place it on an antistatic surface.

5. Set any jumpers, switches, or terminating resistors on the drive according to the manufacturer's instructions.

6. Slide the drive into position. Line the screw holes on the drive up with the holes on the chassis.

7. Insert and tighten three screws of the appropriate type and length (not supplied).

8. Attach the power cable and the data cable to the drive.

9. Reinstall the power supply.

Figure 15. Installing a Hard Drive Behind the Power Supply
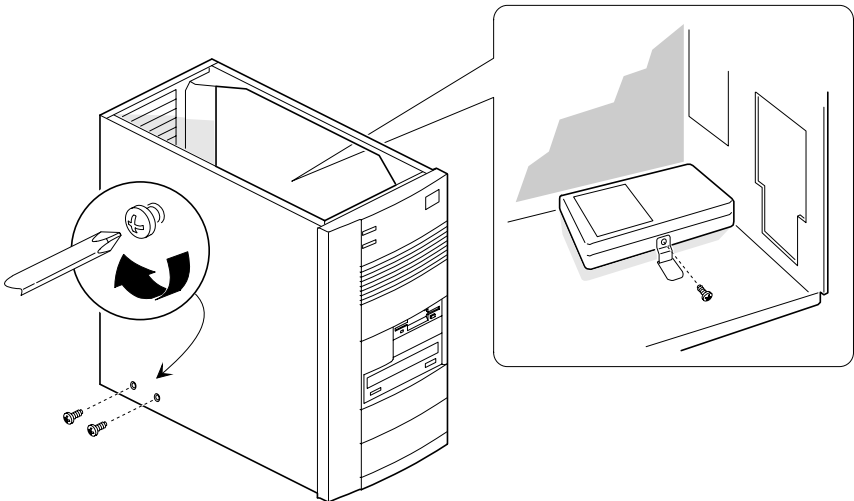
Removing a Hard Drive from Behind the Power Supply

WARNING

This procedure should be done only by qualified technical personnel. Unplug the computer before doing the procedures described here.

---

1. Observe the precautions in 'Before You Begin'.

2. Remove the non-access side panel.

3. Remove the power supply (see later in this chapter).

4. Disconnect the power cables and the ribbon data cables from the drive.

5. Remove the three screws holding the drive to the chassis.

6. Slide the drive out of the chassis and place it on an antistatic surface.

7. Reinstall the power supply.

Installing a narrow Device in the main Peripheral Carrier

1. Observe the precautions in 'Before You Begin'.

2. Remove the main peripheral carrier as previously described.

3. Remove the drive from its protective wrapper and place it on an antistatic surface.

4. Set any jumpers, switches, or terminating resistors on the drive according to the manufacturer's instructions.

5. Slide the drive into position. Line the screw holes on the drive up with the holes on the carrier.

6. Insert and tighten four screws of the appropriate type and length (not supplied).

7. Replace the peripheral carrier back into the chassis.

8. Connect power and data cables to the device.

Figure 16. Installing a Hard Drive in the main Peripheral Carrier
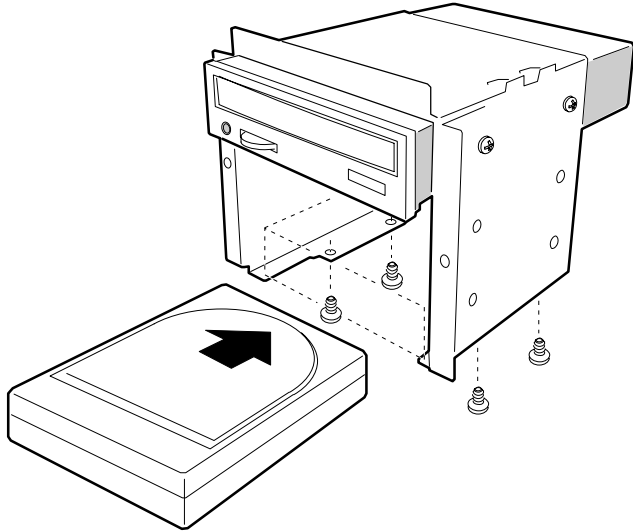
Removing a narrow Device from the main Peripheral Carrier

1. Observe the precautions in 'Before You Begin'.

2. Remove the top cover.

3. Remove the access side cover.

4. Remove the bezel.

5. Remove the main peripheral carrier.

6. Remove the four screws that secure the device to the carrier.

7. Replace the main peripheral carrier back into the chassis.

Installing Full-width Devices

Installing a full-width Device.

NOTE

A **magnetic** *Phillips screwdriver will be useful for this procedure, but keep it well clear of any loose floppy disks or tape cartridges.*

1. Observe the precautions in 'Before You Begin'.

2. Switch off the computer and remove the power cable.

3. Remove the top cover.

4. Remove the access side cover.

5. Remove the non-access side cover.

6. Remove the plastic filler panel from the desired bay.

7. Remove the EMI shield from the desired bay.

8. Remove the device from its protective wrapper and place it on an antistatic surface.

9. Set any jumpers or switches on the device according to the manufacturer's instructions.

10. Connect the data cable to the motherboard (if required) if it is not already connected.

11. Slide the device into the bay and secure it with four screws (not supplied).

12. Connect power and data cables to the device.

13. If you do not need access to the front of the device, replace the EMI shield and the plastic filler panel.

Figure 17. Install/remove a full-width Peripheral Device.
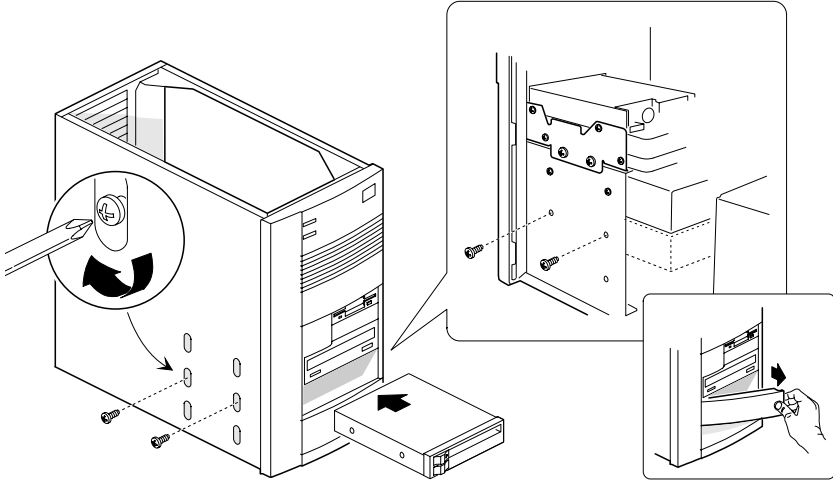
Removing a full-width Device.

1. Observe the precautions in 'Before You Begin'.

2. Switch off the computer and remove the power cable.

3. Remove the top and both side covers.

4. If the device is not accessible from the front, remove the plastic filler panel and EMI shield.

5. Disconnect the data and power cables from the device.

   ◊ If the data cable is no longer required, disconnect the other end and completely remove the cable from the system.

6. Remove the four screws that secure the device to the bay.

7. Slide the device out of the bay.

8. Replace the EMI shield and filler panel.

Other Chassis Components

Removing the Fan/Card Guide Module

1.   Observe the precautions in 'Before You Begin'.

2.   Remove any add-in cards that block the module.

3.   If there is a fan installed in the module, disconnect the fan's power cable from the motherboard.

4.   Swing the module away from the non-access side of the chassis by squeezing the long edge to release the tabs and pulling on it.

5.   Swing the module out until the module comes free from the chassis.

    ◊   Do not use excessive force as it may damage the mounting tabs.

Figure 18. Removing the Fan/Card Guide Module
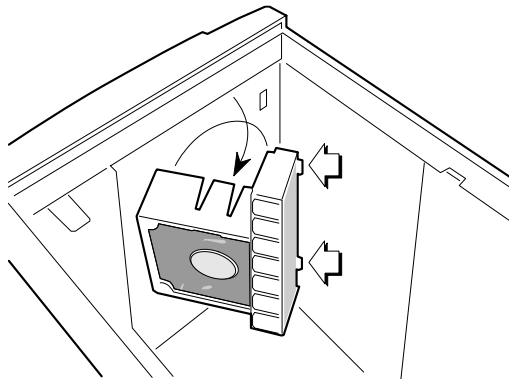
Installing the Fan/Card Guide Module

1.   Observe the precautions in 'Before You Begin'.

2.   Hook the bent plastic tabs on the module in the holes in the front of the chassis.

3. Swing the module against the chassis and secure it by pressing the plastic clips on the module into their slots in the chassis.

Installing an Optional Fan

See Chapter 1 for fan specifications.

1. Observe the precautions in 'Before You Begin'.

2. Remove the fan/card guide module.

3. Remove the plastic filler panel from the module (see Figure 20).

Figure 19. Removing the Plastic Filler Panel
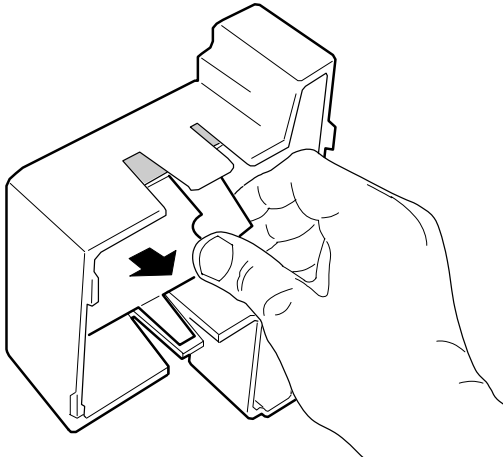
4. Insert the fan into the module (see Figure 21) so that it will blow air into the chassis. The fan is held in the module by two plastic clips on the sides of the module.

5. Dress the fan wires inside the module so the cables won't be pinched when you install the module in the chassis.

6. Install the module in the chassis.

7. Connect the fan's power cable to the power supply or the motherboard according to the manufacturers instructions.

◊ See the motherboard chapter for the fan connector locations.

Figure 20. Installing an Optional Fan
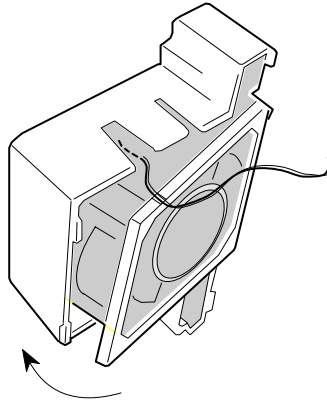
Removing an Optional Fan

1. Observe the precautions in 'Before You Begin'.

2. Disconnect the fan's power cable from the motherboard.

3. Remove the fan/card guide module.

4. Remove the fan from the module by squeezing the two plastic clips outward and pressing the fan free.

5. Install the plastic filler panel into the module.

6. Install the fan/card guide module.

Installing an Optional Speaker

See Chapter 1 for speaker specifications.

1. Observe the precautions in 'Before You Begin'.

2. Remove the top cover.

3. Remove the access side cover.

4. Insert the speaker in the location shown.

5. Connect the speaker wires to the motherboard.

   ◊ See the motherboard chapter for the speaker connector location.

6. Install the access side cover.

7. Install the top cover.

Figure 21. Installing an Optional Speaker
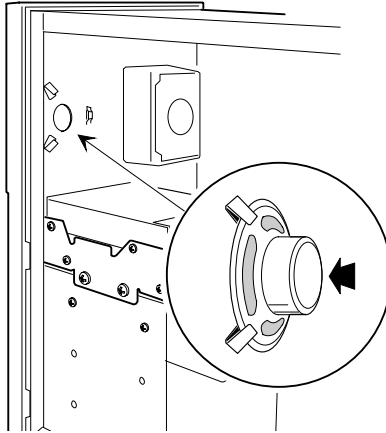
Removing an Optional Speaker

1. Observe the precautions in 'Before You Begin'.

2. Remove the top cover.

3. Remove the access side cover.

4. Disconnect the speaker wires from the motherboard.

5. Remove the speaker.

6. Install the access side cover and top cover.

Removing the Power Supply

WARNING

This procedure should be done only by qualified technical personnel. The power supply in this product contains no user-serviceable parts. Refer servicing only to qualified technical personnel.

---

1. Observe the precautions in 'Before You Begin'.

2. Label and disconnect power cable from the computer and all peripheral devices.

3. Label and disconnect the power cable from the motherboard.

4. Remove the four screws securing the power supply to the chassis.

5. Lift the power supply out of the chassis.

Figure 22. Removing the Power Supply
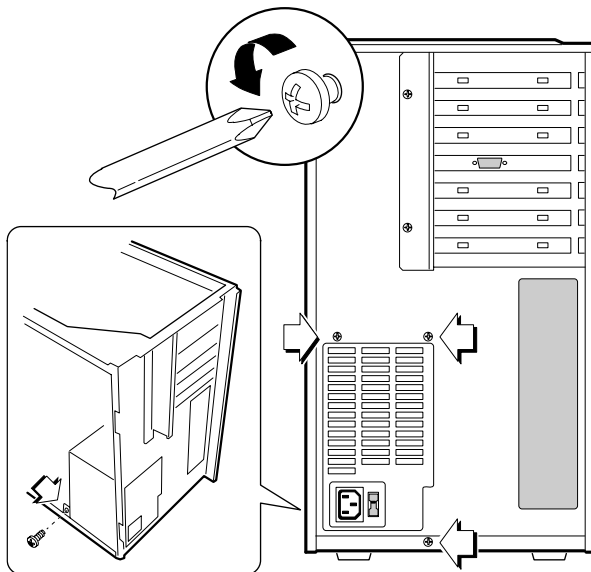
Installing the Power Supply

WARNING

This procedure should be done only by qualified technical personnel. Observe the precautions in 'Before You Begin'.

---

1. Place the power supply in the chassis.

2. Insert and tighten the four screws that secure the power supply to the chassis.

3. Connect the power cable to the motherboard.

4. Connect power cables to any peripheral devices.

Removing the Motherboard

WARNING

This procedure should be done only by qualified technical personnel. Observe the precautions in 'Before You Begin'.

---

1. Switch off the computer and unplug the power cable.

2. Remove the top and access cover.

3. Label and disconnect all internal cables connected to any add-in cards.

4. Remove all add-in cards.

5. Label and disconnect all internal cables attached to the motherboard. Make note of wire colours and positions for later installation.

6. Remove the power supply.

7. Remove the screws holding the motherboard to the chassis. Retain them all for refitting.

8. Lift the motherboard out of the chassis, being careful not to flex the board.

Figure 23. Mounting Screw Holes (shown in black)
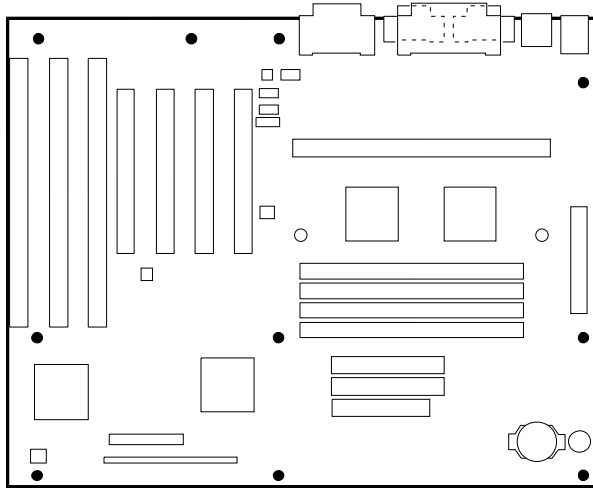
CAUTION

Put the motherboard immediately onto a grounded, static-free surface or place it into an antistatic protective wrapper.

Installing the Motherboard

1. Observe the precautions in 'Before You Begin'.

2. Place the motherboard carefully. Align the I/O connectors with the rear EMI shield.

3. Secure the motherboard to the chassis.

4. Install the power supply.

5. Connect all internal cables to the motherboard.

CAUTION

When fitting the motherboard, ensure it is held by a full complement of screws. This is to ensure complete and even grounding of the board to the chassis metalwork.

---

3   SYSTEM MOTHERBOARD

This chapter describes the features of the system motherboard, setting jumpers and other relevant information.

Microprocessor

This motherboard supports 233 MHz and 266 MHz Intel Pentium® II processors with MMX™ technology and 256 KB or 512 KB secondary (L2) cache.

The Pentium II processor is packaged in a Single Edge Contact (S.E.C.) cartridge that mounts in the Slot 1 processor connector on the motherboard.

Main Memory (DRAM)

The motherboard supports up to 256 MB of DRAM. DRAM is implemented through four 72-pin SIMM sockets. The motherboard contains four SIMM sockets. To add memory to the motherboard, see Chapter 3. For the motherboard's main memory map, see Chapter 5.

Memory error checking and correction is supported with parity or ECC SIMMs. Parity or ECC SIMMs are automatically detected.

However, the user must enter Setup to configure SIMMs for either parity or ECC operation. Parity memory will detect single-bit errors. ECC memory will detect multi-bit errors and correct single-bit errors.

Errors may be generated by a defective memory module, mixing different speed memory modules, or by DMA or memory conflicts.

Motherboard layout

Figure 24. Motherboard Components
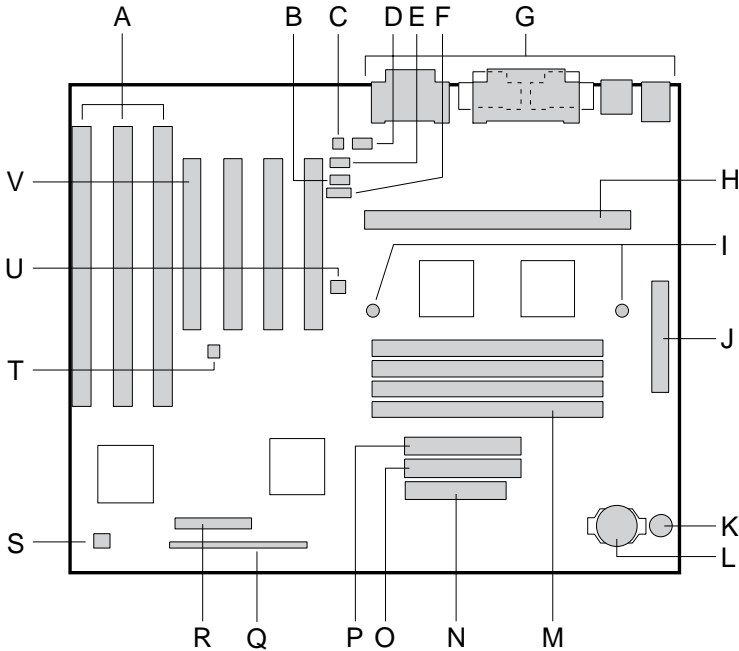
A.	ISA connectors	L.	Battery
B.	CD-ROM audio connector	M.	SIMM sockets
C.	Telephony connector A	N.	Floppy drive connector
D.	Wavetable connector	O.	Primary IDE connector
E.	Telephony connector B	P.	Secondary IDE connector
F.	Audio line in connector	Q.	Front panel connectors
G.	Back panel I/O connectors	R.	Jumper block
H.	Slot 1 processor connector	S.	Fan 1 connector
I.	Heatsink support mounting holes	T.	Chassis security connector
J.	Power connector	U.	Fan 3 connector
K.	Speaker (optional)	V.	PCI connectors

Connectors

Figure 25. Back Panel I/O Connectors
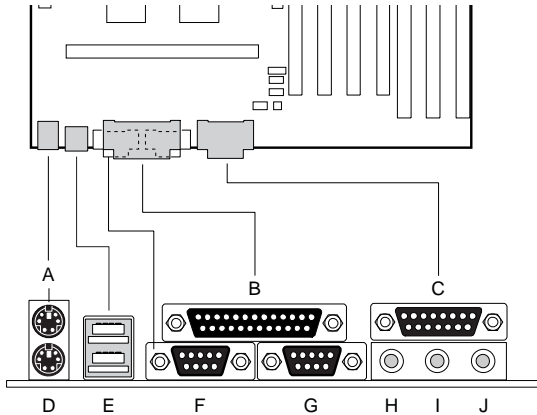
A. PS/2 connector (mouse or keyboard)	F. Serial port 1 connector
B. Parallel port connector	G. Serial port 2 connector
C. MIDI/game port connector	H. Audio line out jack
D. PS/2 connector (mouse or keyboard)	I. Audio line in jack
E. USB connectors	J. Audio mic in jack

Jumpers

CAUTION

To avoid bending or breaking pins, use caution when removing or installing a jumper.

Figure shows the location of the jumper block on the motherboard. The jumpers have been set correctly at the factory. Normally, the only time you will have to change a jumper is if you need to do one of the following:

♦ Clear the user or administrator password

- ♦ Reset CMOS RAM to the default values

- ♦ Disable or enable access to the Setup program

- ♦ Configure the motherboard for a different processor speed

Figure 26. Motherboard Jumper Block
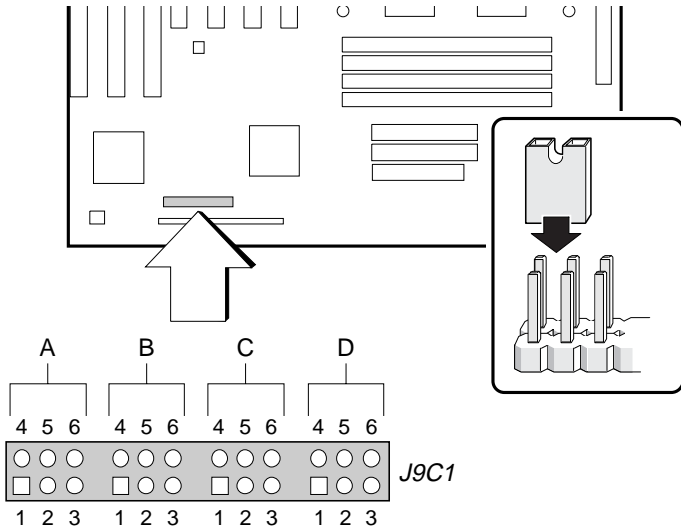
Function	Block	Pins	Description
Setup Program Access	J9C1-D	5-6	Enabled (default)
		4-5	Disabled
BIOS Recovery	J9C1-A	5-6	Normal (default)
		4-5	Recover
CMOS Clear	J9C1-C	5-6	Keep (default)
		4-5	Clear
Password Clear	J9C1-D	2-3	Keep (default)
		1-2	Clear

Jumpers for BIOS Setup Functions

The above table shows jumper settings for Setup program functions and figure 27 shows the location of the jumper block. For each function, see the step-by-step instructions that follow.

How to Disable Access to the Setup Program

1. Observe the precautions in "Before You Begin" (see **page 1 of chapter 2**).

2. Turn off all peripheral devices connected to the computer.

3. Turn off the computer and unplug the power cable.

4. Remove the computer top and access covers.

5. On jumper block J9C1-D, move the jumper from pins 5-6 to pins 4-5 as shown below.
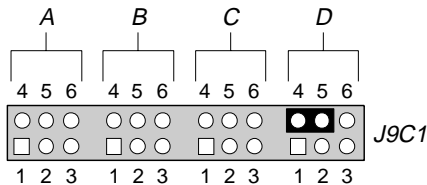
6. Replace the covers and turn on the computer.

How to Enable Access to the Setup Program

1. Observe the precautions in "Before You Begin" (see **page 1 of chapter 2**).

2. Turn off all peripheral devices connected to the computer.

3. Turn off the computer and unplug the power cable.

4. Remove the computer top and access covers.

5. On jumper block J9C1-D, move the jumper from pins 4-5 to pins 5-6 as shown below.

```
     A        B        C        D
   ┌──┐     ┌──┐     ┌──┐     ┌──┐
   4 5 6    4 5 6    4 5 6    4 5 6
```
J9C1
```
   1 2 3    1 2 3    1 2 3    1 2 3
```
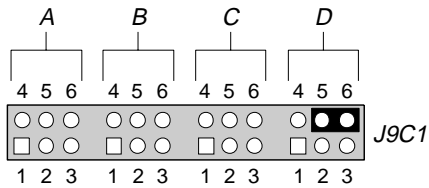
6. Replace the cover and turn on the computer.

How to Clear CMOS RAM

Normally, you should only have to do this procedure after you upgrade the BIOS.

1. Observe the precautions in "Before You Begin" (see **page 1 of chapter 2**).

2. Turn off all peripheral devices connected to the computer.

3. Turn off the computer and unplug the power cable.

4. Remove the computer top and access covers.

5. On jumper block J9C1-C, move the jumper from pins 5-6 to pins 4-5 as shown below.

```
     A        B        C        D
   ┌──┐     ┌──┐     ┌──┐     ┌──┐
   4 5 6    4 5 6    4 5 6    4 5 6
```
J9C1
```
   1 2 3    1 2 3    1 2 3    1 2 3
```
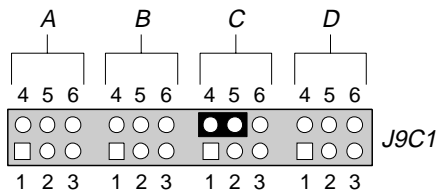
6. Turn on the computer and allow it to boot.

7. Repeat steps 3 and 4.

8. Move the jumper back to pins 5-6 to restore normal operation as shown below.

A   B   C   D

4 5 6   4 5 6   4 5 6   4 5 6
J9C1
1 2 3   1 2 3   1 2 3   1 2 3
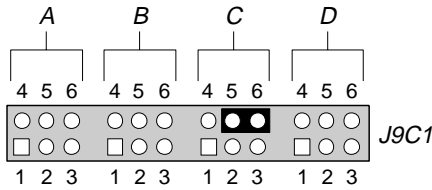
9.   Replace the cover and turn on the computer.

How to Clear the User or Administrator Password

1.   Observe the precautions in "Before You Begin" (see **page 1 of chapter 2**).

2.   Turn off all peripheral devices connected to the computer.

3.   Turn off the computer and unplug the power cable.

4.   Remove the computer top and access covers.

5.   On jumper block J9C1-D, move the jumper from pins 2-3 to pins 1-2 as shown below.

A   B   C   D

4 5 6   4 5 6   4 5 6   4 5 6
J9C1
1 2 3   1 2 3   1 2 3   1 2 3
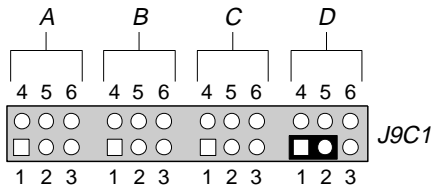
6.   Turn on the computer and allow it to boot.

7.   Repeat steps 3 and 4.

8.   Move the jumper back to pins 2-3 as shown below.

A   B   C   D

4 5 6   4 5 6   4 5 6   4 5 6
J9C1
1 2 3   1 2 3   1 2 3   1 2 3
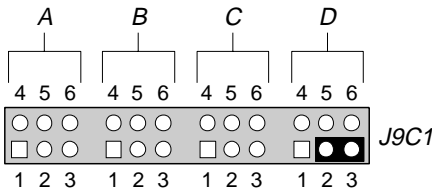
9.   Replace the covers and turn on the power.

PCI/IDE Peripheral Interface

The motherboard has a high-speed, 32-bit PCI/IDE interface that supports the following:

♦ Up to four PCI/IDE hard drives on the PCI bus

♦ PIO Mode 3 and Mode 4 hard drives

♦ Logical block addressing (LBA) of hard drives larger than 528 MB

♦ Extended Cylinder Head Sector (ECHS) translation modes

♦ ATAPI devices (such as CD-ROMs)

I/O Features

The I/O controller integrates the functions for the serial ports, parallel port, diskette drive, and keyboard. This component provides:

♦ Multimode bidirectional parallel port:

◊ Standard mode: Centronics-compatible operation

◊ High-speed mode: support for enhanced capabilities port (ECP) and enhanced parallel port (EPP)

♦ Two RS-232C (16550-compatible) 9-pin serial ports

♦ Integrated real-time clock with an accuracy of ±13 minutes/year at 25 °C and 5 V

♦ Integrated 8042-compatible keyboard controller

♦ Flexible IRQ and DMA mapping to support Windows 95

♦ Support for an IrDA or Consumer IR compatible infrared interface. The infrared interface supports data transfer rates of up to 115 K baud with either half- or full-duplex operation

♦ Industry standard diskette drive controller that supports 720 KB, 1.44 MB, and 2.88 MB floppy drives (at 135 tracks per inch); and the older 360 KB and 1.2 MB drives.

BIOS Features

The BIOS, from American Megatrends Inc. (AMI), provides ISA and PCI compatibility. The BIOS is contained in a Flash memory device soldered to the motherboard. The BIOS provides the POST, the Setup program, a PCI and IDE auto-configuration utility, and BIOS recovery code. For full information see the 'BIOS and Setup' chapter.

PCI Auto-configuration

The PCI auto-configuration utility works in conjunction with the Setup program to support using PCI add-in cards in the computer. When you turn on the power after installing a PCI card, the BIOS automatically configures interrupts, DMA channels, and I/O space.

Since PCI add-in cards use the same interrupt resources as ISA add-in cards, you must specify the interrupts used by ISA cards in the Setup program.

Expansion Slots

The motherboard has two dedicated 16-bit ISA/AT-compatible and three dedicated PCI-compatible expansion slots. Another expansion slot is a combination slot that can be used for either a PCI or an ISA card. This allows you to install a maximum of six add-in cards.

Real-time Clock and CMOS RAM

The I/O controller provides a real-time clock and CMOS RAM. You can set the time for the clock and the CMOS values by using the Setup program described in the BIOS Chapter. This will need to be carried out if there is a requirement to change the CMOS battery, as detailed over.

CMOS Battery

A battery on the motherboard keeps the clock and values in CMOS RAM current when your computer is turned off. The average battery life is between 3 and 5 years.

WARNING

The CMOS battery is a lithium type. Do not use a metal tool to remove the battery. An accidental short circuit may cause the battery to explode. Dispose of the battery according to the battery manufacturers recommendations.

To replace the battery:

1. Observe the precautions in "Before You Begin" (**see page 1 of chapter 2**).

2. Turn off all peripheral devices connected to the computer.

3. Turn off the computer and unplug the power cable.

4. Remove the computer top and access covers.

5. With your fingers, gently pry the battery free from its socket. Note the "+" and "-" orientation of the battery.

Figure 27. Replacing the Battery
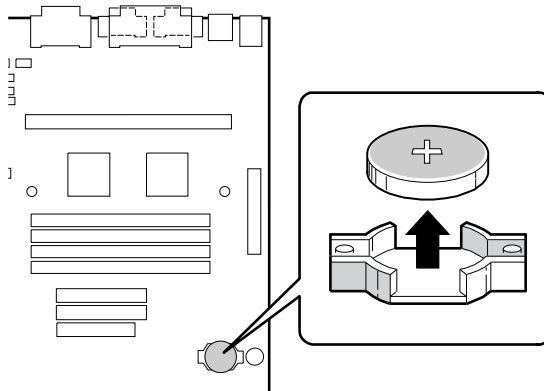
6. Install the new battery in the socket.

7. Replace the computer covers.

Fan Connectors

The motherboard has connectors for two fans. Both connectors have the same pin-outs. See overleaf for details.

Pin	Signal Name
1	Ground
2	+12 V
3	FAN_SEN

Figure 28. Fan 1 Connector
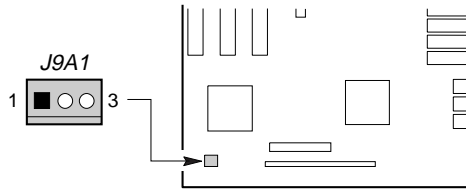
Figure 29. Fan 3 Connector
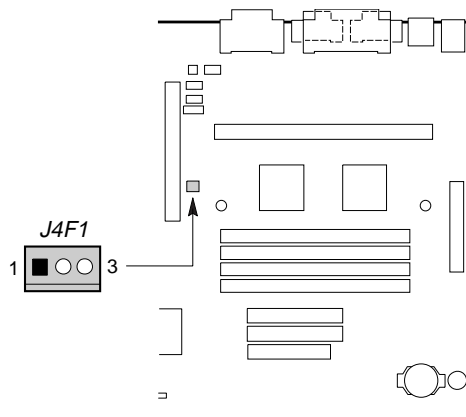
USB Interface Support

The USB ports permit the direct connection of two USB peripherals without an external hub. If more devices are required, an external hub can be connected to either of the built-in ports. The motherboard supports the standard universal host controller interface (UHCI) and uses standard software drivers that are UHCI-compatible.

Features of the USB include:

♦ Support for self-identifying, hot-pluggable peripherals

♦ Automatic device configuration

♦ Support for isochronous and asynchronous transfers over the same set of wires

♦ Support for up to 127 physical devices

♦ Bandwidth and low latencies appropriate for telephony, audio, and other applications

♦ Error handling and fault recovery built into protocol

NOTE

Computers that have an unshielded cable attached to the USB port risk causing radio frequency interference (RFI). Use shielded cable for all devices attached to either USB port.

Speaker

An optional speaker is mounted on the motherboard. The speaker provides audible error code information (beep codes) during the POST if the BIOS cannot use the video interface. For beep code descriptions, see the troubleshooting chapter.

NOTE

*The board has a connector for an optional off-board speaker. When installing an off-board speaker (refer to chapter 2) you **must remove** the jumper that enables the onboard speaker.*

Audio Subsystem

The onboard audio subsystem is based on the Yamaha OPL family of single-chip audio controllers (YM 715). The audio subsystem provides the digital audio and analog mixing functions needed for recording and playing sound on personal computers. The subsystem features:

♦ Line and microphone level inputs

♦ MIDI/Game port

♦ 3-D enhanced stereo

♦ Full digital control of all mixer and volume control functions

♦ Full duplex operation

♦ Sound Blaster Pro, Windows Sound System, Roland MPU-401, AdLib, and Multimedia PC Level 2 (MPCII) compatibility

♦ Onboard Yamaha YM 704 wavetable synthesizer (optional)

♦ Wavetable upgrade connector

♦ CD-ROM audio connector

♦ Telephony connectors

Figure 30. CD-ROM Audio Connector

Pin	Signal Name
1	Ground
2	CD-left
3	Ground
4	CD-right
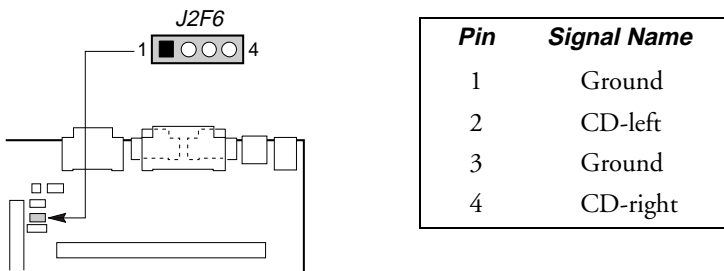
Figure 31. Telephony Connector A
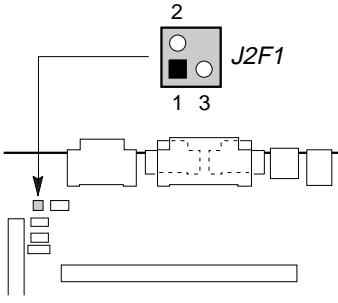
Pin	Signal Name
1	Ground
2	Mono in
3	Mono out
4	Key

Figure 32. Wavetable Connector
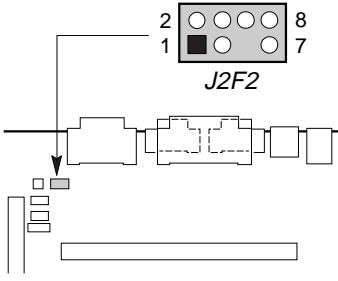
Pin	Signal Name
1	Waveright
2	Ground
3	Waveleft
4	Ground
5	Key
6	Ground
7	No connection
8	MIDI_OUT

Figure 33. Telephony Connector B
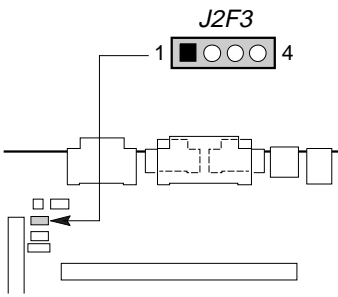
Pin	Signal Name
1	Mono in
2	Ground
3	Ground
4	Mono out

Figure 34. Audio Line In Connector

J3F1
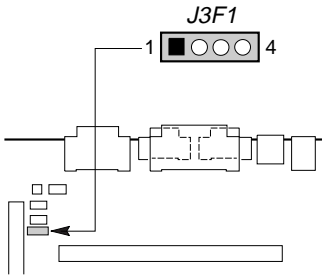
Pin	Signal Name
1	Left Line-in
2	Ground
3	Ground
4	Right line-in (mono)

Hardware Monitor Option

The hardware monitor option features the following:

♦ An integrated temperature sensor

♦ Fan speed sensors

♦ Power supply voltage monitor

♦ POST test result and error code storage

♦ Support for Intel LANDesk® Client Manager

♦ Connector for external chassis security feature

These features are implemented by an integrated hardware monitor device.

Figure 35. Chassis Security Connector

J6C1

1 2
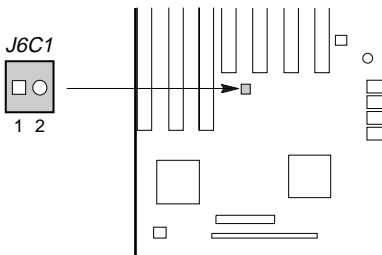
Pin	Signal name
1	Ground
2	CHS_SEC

Front Panel Connections

The motherboard has connectors for controls and indicators typically located on the front panel of the computer. A jumper on pins 26/27 connects the on-board speaker.

Figure 36. Front panel connections
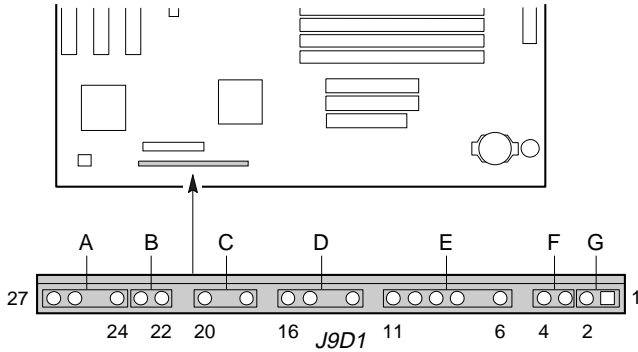
Connector	Pin	Signal Name
A. Speaker*	27	SPKR_HDR
	26	PIEZO_IN
	25	Key
	24	Ground
B. Reset switch	23	SW_RST
	22	Ground
		Key
C. Power LED	20	+5 V
	19	Key
	18	Ground
		Key
D. Hard drive LED	16	+5 V
	15	HD Active#
	14	Key
	13	+5 V

Connector	Pin	Signal Name
		Key
E. Infrared	11	CONIR (consumer IR)
	10	IrTX (transmit)
	9	Ground
	8	IrRX (receive)
	7	Key
	6	+5 V
		Key
F. Sleep switch	4	+5 V
	3	SLEEP
G. Power switch	2	Ground
	1	SW_ON#

Motherboard Resources

Memory Map

Address Range (Decimal)	Address Range (hex)	Size	Description
1024K-262144K	100000-10000000	255M	Extended memory
960K-1024K	F0000-FFFFF	64K	System BIOS
944K-960K	EC000-EFFFF	16K	Boot Block
936K-944K	EA000-EBFFF	8K	ESCD (Plug and Play configuration area)
932K-936K	E9000-E9FFF	4K	Reserved for BIOS
928K-932K	E8000-E8FFF	4K	Logo area
896K-928K	E0000-E7FFF	32K	BIOS reserved
800K-896K	C8000-DFFFF	96K	Available high DOS memory (open to ISA and PCI bus)
640K-800K	A0000-C7FFF	160K	Video memory and BIOS

Address Range (Decimal)	Address Range (hex)	Size	Description
639K-640K	9FC00-9FFFF	1K	Extended BIOS Data (moveable by memory management software)
512K-639K	80000-9FBFF	127K	Extended conventional memory
0K-512K	00000-7FFFF	512K	Conventional memory

I/O Map

Address (hex)	Size	Description
0000 - 000F	16 bytes	PIIX3 - DMA 1
0020 - 0021	2 bytes	PIIX3 - Interrupt Controller 1
002E - 002F	2 bytes	I/O Controller Config. Reg.
0040 - 0043	4 bytes	PIIX3 - Timer 1
0048 - 004B	4 bytes	PIIX3 - Timer 2
0060	1 byte	Keyboard Controller Byte - Reset IRQ
0061	1 byte	PIIX3 - NMI, speaker control
0064	1 byte	Keyboard Controller, CMD/STAT Byte
0070, bit 7	1 bit	PIIX3 - Enable NMI
0070, bits 6:0	7 bits	PIIX3 - Real Time Clock, Address
0071	1 byte	PIIX3 - Real Time Clock, Data
0078	1 byte	Reserved - Brd. Config.
0079	1 byte	Reserved - Brd. Config.
0080 - 008F	16 bytes	PIIX3 - DMA Page Registers
00A0 - 00A1	2 bytes	PIIX3 - Interrupt Controller 2
00B2 - 00B3	2 bytes	APM Control
00C0 - 00DE	31 bytes	PIIX3 - DMA 2
00F0	1 byte	Reset Numeric Error
0170 - 0177	8 bytes	Secondary IDE Channel
01F0 - 01F7	8 bytes	Primary IDE Channel
0200 - 0207	8 bytes	Game Port

Address (hex)	Size	Description
0220 - 022F	16 bytes	Audio
0240 - 024F	16 bytes	Audio
0278 - 027F	8 bytes	Parallel Port 2
0295	1 byte	Hardware monitor
0296	1 byte	Hardware monitor
02E8 - 02EF	8 bytes	Serial Port 4/Video (8514A)
02F8 - 02FF	8 bytes	Serial Port 2
0300 - 0301	2 bytes	MPU-401 (MIDI)
0330 - 0331	2 bytes	MPU-401 (MIDI)
0332 - 0333	2 bytes	MPU-401 (MIDI)
0334 - 0335	2 bytes	MPU-401 (MIDI)
0376	1 byte	Sec. IDE Chan. Cmd. Port
0377	1 byte	Floppy Chan. 2 Cmd.
0377, bit 7	1 bit	Floppy Disk Chg. Chan. 2
0377, bits 6:0	7 bits	Sec. IDE Chan. Status Port
0378 - 037F	8 bytes	Parallel Port 1
0388 - 038D	6 bytes	FM Synthesizer
03B4 - 03B5	2 bytes	VGA
03BA	1 byte	VGA
03BC - 03BF	4 bytes	Parallel Port 3
03C0 - 03CA	2 bytes	VGA
03CC	1 byte	VGA
03CE - 03CF	2 bytes	VGA
03D4 - 03D5	2 bytes	VGA
03DA	1 byte	VGA
03E8 - 03EF	8 bytes	Serial Port 3
03F0 - 03F5	6 bytes	Floppy Channel 1
03F6	1 byte	Pri. IDE Chan. Cmd. Port
03F7 (Write)	1 byte	Floppy Chan.1 Cmd.
03F7, bit 7	1 bit	Floppy Disk Chg. Chan. 1

System motherboard

Address (hex)	Size	Description
03F7, bits 6:0	7 bits	Pri. IDE Chan. Status Port
03F8 - 03FF	8 bytes	Serial Port 1
04D0 - 04D1	2 bytes	Edge/level triggered PIC
0530 - 0537	8 bytes	Windows Sound System
0604 - 060B	8 bytes	Windows Sound System
LPT + 400h	8 bytes	ECP port, LPT + 400h
0CF8 - 0CFB *	4 bytes	PCI Config. Address Reg.
0CF9 **	1 byte	Turbo & Reset Control Reg.
0CFC - 0CFF	4 bytes	PCI Config. Data Reg.
0E80 - 0E87	8 bytes	Windows Sound System
0F40 - 0F47	8 bytes	Windows Sound System
0F86 - 0F87	2 bytes	Yamaha OPL3-SA Config.
FF00 - FF07	8 bytes	IDE Bus Master Reg.
FFA0 - FFA7	8 bytes	Pri. Bus Master IDE Reg.
FFA8 - FFAF	8 bytes	Sec. Bus Master IDE Reg.

* Only by DWORD accesses. ** Only by Byte accesses.

PCI Configuration Space Map

Bus Number (hex)	Device Number (hex)	Function Number (hex)	Description
00	00	00	Intel 82441FX (PMC)
00	07	00	Intel 82371SB (PIIX3) PCI/ISA Bridge
00	07	01	Intel 82371SB (PIIX3) IDE Bus Master
00	07	02	Intel 82371SB (PIIX3) USB
00	0B	00	PCI Expansion Slot 1 (J4E2)
00	0F	00	PCI Expansion Slot 2 (J4E1)
00	01	00	PCI Expansion Slot 3 (J4D1)
00	13	00	PCI Expansion Slot 4 (J4C1)

DMA Channels

DMA	Data Width	System Resource
0	8- or 16-bits	Audio if present, else parallel port
1	8- or 16-bits	Audio if present, else available
2	8- or 16-bits	Floppy drive
3	8- or 16-bits	Audio if present, else parallel port (for ECP/EPP configuration)
4	16-bits	Reserved - Cascade Channel
5	16-bits	Available
6	16-bits	Available
7	16-bits	Available

Interrupts

IRQ	System Resource
NMI	I/O channel check
0	Reserved, interval timer
1	Reserved, keyboard buffer full
2	Reserved, cascade interrupt from slave PIC
3	Serial Port 2
4	Serial Port 1
5	Parallel Port 2
6	Floppy drive
7	Parallel Port 1
8	Real-time clock
9	User available
10	User available
11	Audio if present, else user available
12	Onboard mouse port if present, else user available
13	Reserved, math coprocessor
14	Primary IDE if present, else user available
15	Secondary IDE if present, else user available

4 UPGRADING

Processor

This computer uses the Intel Pentium®II processor, which is supplied as a module complete with heatsink. At the time of writing processors rated at 233Mhz and 266Mhz are available.

Remove the Installed Processor

To remove the installed processor, follow these steps:

1. Observe the precautions in 'Before You Begin' (see **page 1 of chapter 2**).

2. Turn off all peripheral devices connected to the computer.

3. Turn off the computer and unplug the power cable.

4. Remove the computer top and access covers.

5. Remove the motherboard from the computer chassis. See 'How to Remove the Motherboard' in chapter 2.

   ◊ This will mean removing any fitted expansion cards in the motherboard slots.

6. Place the motherboard on a flat work surface and remove any components that block access to the installed processor.

7. Remove the top bar of the heatsink support from the base as shown in figure 37.

8. Press in on the latches (A) to release the top bar.

Figure 37. Removing the Heatsink Support Top Bar and the Processor
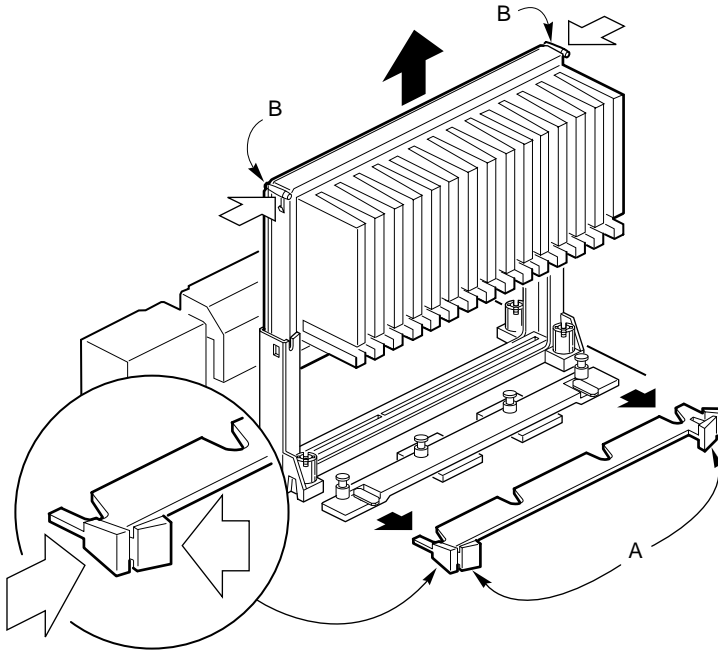
CAUTION

Pressing on the motherboard or components during processor removal can cause damage. If necessary, you can safely press on the motherboard's plastic connectors to gain leverage while removing the processor.

9. Remove the processor by pressing in on the latches (B) and pulling the processor straight up as shown in figure 37.

    ◊ Place the processor module carefully into an antistatic container.

Install the Processor

To install the processor follow these steps:

1. Insert the processor in the retention mechanism (B) as shown in figure 38.

2. Press down on the processor until it is firmly seated in the Slot 1 connector and the latches (A) on the processor lock into place.

Figure 38. Installing the Processor
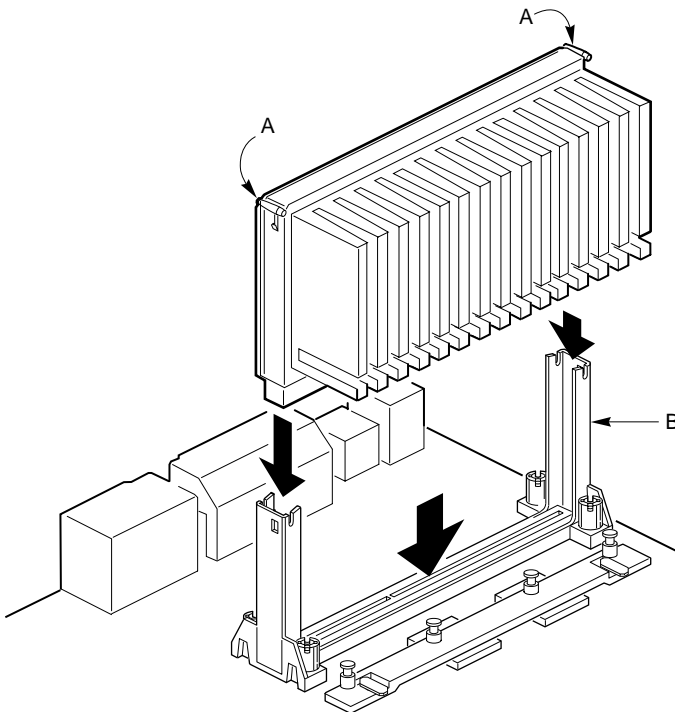
3. Slide the top heatsink support bar (A) onto the retaining pins (B) of the support's base as shown in figure 39.

Figure 39. Installing the Heatsink Support Top Bar

B

A
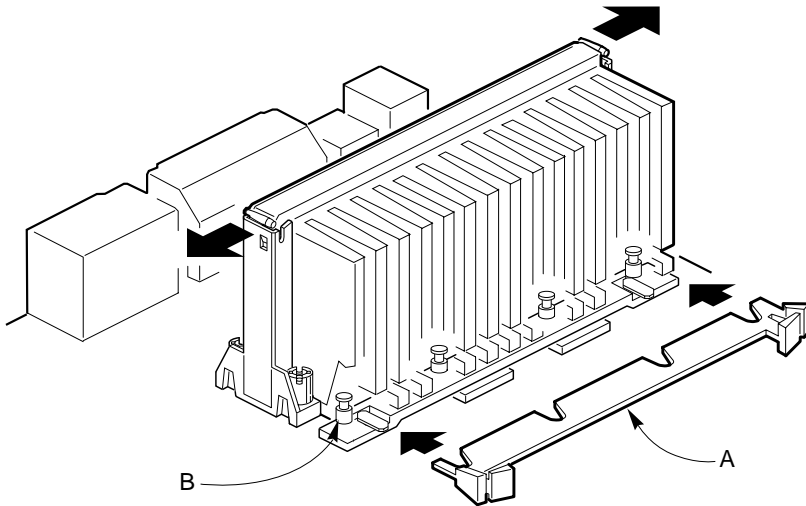
Set the Processor Speed Jumpers

Make sure that motherboard jumpers J9C1-A, J9C1-B, and J9C1-C are set to the correct value for the speed of the processor. The table below lists jumper settings for 233 MHz and 266 MHz processors. Figure 26 in the motherboard chapter shows the location of the jumper block.

Processor	Host Bus	Block J9C1		
Speed*	Speed	A	B	C
233 MHz	66	2-3	2-3, 5-6	2-3
266 MHz	66	1-2	1-2, 4-5	2-3

*See the processor's documentation for the correct speed (MHz).

On jumper block J9C1, place the jumpers on the pins as shown below:

For a 233 MHz processor:
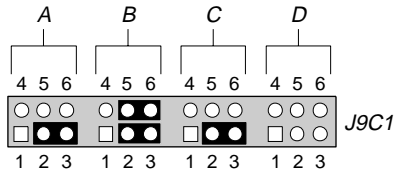
For a 266 MHz processor:
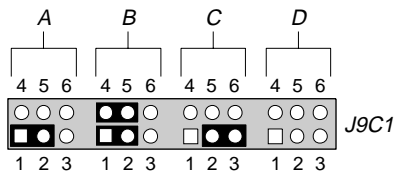
How to Install Memory

The motherboard has four 72-pin, tin-lead SIMM sockets that support from 8 MB to 256 MB of memory. The sockets are arranged as banks 0 and 1. Two sockets make up one bank (see figure 40).

When adding memory, follow these guidelines:

♦   When adding SIMMs, use only tin-lead, 72-pin, 50 or 60 ns EDO DRAM.

◊   Faster devices will not improve system performance.

♦   When you install SIMMs, you must fill both sockets of the bank.

♦   The computer automatically detects the installed memory, so it doesn't matter which bank is used, as long as both sockets in the bank are filled.

◊   Because of limited space on the motherboard, it might be easier to install SIMMs in bank 0 first.

♦ Both SIMMs in one bank must be identical.

◊ For example, do not install a 4 MB SIMM in one socket of bank 0 and an 8 MB SIMM in the second socket of bank 0.

♦ You may use a pair of SIMMs in bank 1 that are of a different value to those in bank 0.

NOTE

The motherboard supports parity (x36) or non-parity (x32) SIMMs. Error checking and correction is supported with parity and ECC SIMMs. There is no error checking and correction with non-parity SIMMs.

Figure 40. Location of SIMM Sockets
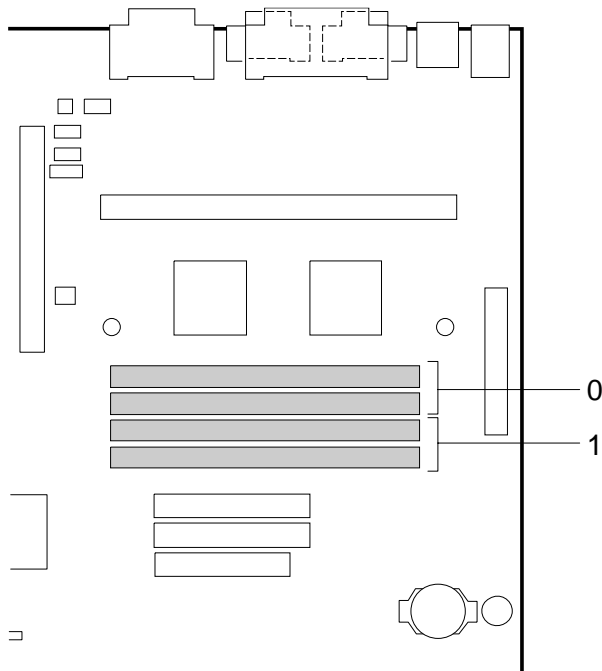
Memory table

For a total system memory of:	Install SIMMs of the following size in both sockets of bank 0	Install SIMMs of the following size in both sockets of bank 1
8 MB	4 MB (8 MB total in socket bank 0)	Empty
16 MB	4 MB (8 MB total in socket bank 0)	4 MB (8 MB total in socket bank 1)
16 MB	8 MB (16 MB total in socket bank 0)	Empty
32 MB	8 MB (16 MB total in socket bank 0)	8 MB (16 MB total in socket bank 1)
32 MB	16 MB (32 MB total in socket bank 0)	Empty
64 MB	16 MB (32 MB total in socket bank 0)	16 MB (32 MB total in socket bank 1)
64 MB	32 MB (64 MB total in socket bank 0)	Empty
128 MB	32 MB (64 MB total in socket bank 0)	32 MB (64 MB total in socket bank 1)
128 MB	64 MB (128 MB total in socket bank 0)	Empty
256 MB	64 MB (128 MB total in socket bank 0)	64 MB (128 MB total in socket bank 1)

To install SIMMs, do the following:

1. Observe the precautions in 'Before You Begin' (see **page 1 of chapter 2**).

2. Turn off the computer and remove the power cable.

3. Remove the computer top and access covers.

CAUTION

Electrostatic discharge (ESD) can destroy components or severely limit their working life. Follow the recommended antistatic precautions as given in the appendix.

---

4. Holding the SIMM only by the edges, remove it from its antistatic package.

Figure 41. Installing a SIMM
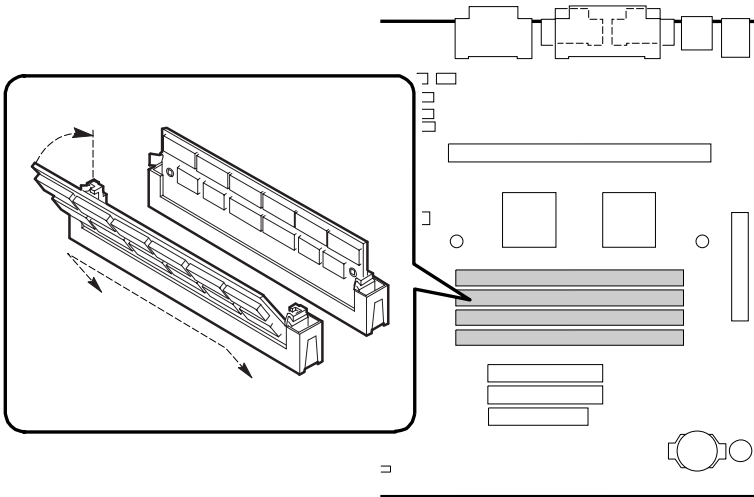
5. Position the SIMM at about a 45° angle relative to the motherboard.

    ◊ Make sure the small notch in the middle of the bottom edge of the SIMM aligns with the notch in the SIMM socket.

6. Insert the bottom edge of the SIMM into the SIMM socket and make sure it is seated firmly.

    ◊ The SIMM is not symmetrical, so will only seat one way in the socket.

7. When the SIMM seats correctly, hold it at each end and gently push the top edge towards the retaining clips of the connector until the SIMM snaps into place.

    ◊ If the SIMM does not install correctly, gently spread the retaining clips just enough so that you can pull away the top edge of the SIMM and try again.

8. Reinstall and reconnect any parts you removed or disconnected to gain access to the SIMM sockets.

9. Replace the computer cover.

Memory detection is mostly automatic, but if you get an error message, check that:

♦ You have used a supported SIMM value.

♦ Both SIMMs in the bank are the same.

How to Remove Memory

To remove a SIMM, do the following:

1. Observe the precautions in 'Before You Begin' (see **page 1 of chapter 2**).

2. Turn off the computer and unplug the power cable.

3. Remove the computer top and access covers.

4. Gently spread the retaining clip at each end of the SIMM socket, just enough to allow you to tilt the top edge of the SIMM to an angle of about 45°.

5. Holding the SIMM only by the edges, lift it away from the socket, and store it in an antistatic package.

6. Reinstall and reconnect any parts you removed or disconnected to gain access to the SIMM sockets.

7. Replace the computer covers.

5   BIOS AND SETUP

This chapter explains how to use the BIOS Setup program. You can use the Setup program to change the computer's configuration information and boot-up sequence.

Setup information is stored in CMOS random access memory (RAM) and is backed up by a battery on the motherboard when power to the computer is off.

Overview of the BIOS Setup Program

To enter the Setup program, turn the computer on and press <F1> when you see the message:

Press <F1> Key if you want to run SETUP

You have about five seconds to press <F1> before the boot process continues.

NOTE

For reference purposes, you should write down the current Setup settings on the space provided at the end of this chapter. When you make changes to the settings, update this record.

When you enter the Setup program, you will see the Main screen. Listed along the top of the display are three other screens: Advanced, Security, and Exit.

Select a screen by pressing the left <←> or right <→> arrow keys. Use the up <↑> or down <↓> arrow keys to select items within a screen. Use the <Enter> key to select an item you want to change. For some items, pressing <Enter> brings up a subscreen. After you have selected an item, use the arrow keys to change the setting.

The following table provides first an overview of function keys in the Setup program, then gives an overview of the menu screens and subscreens in the Setup program.

Setup Key	Description
<F1>	Brings up a help screen for the current item
<Esc>	Backs up to the previous screen
	In the Main, Advanced, Security, or Exit screen causes you to exit, discarding changes
<Enter>	Selects the current item or option
<↑>	Selects the previous item or option
<↓>	Selects the next item or option
<←> <→>	In the Main, Advanced, Security, or Exit menu screens, changes the menu screen
<F5>	Loads Setup defaults
<F6>	Discards current changes
<F10>	Exits while saving changes

Setup Screen	This Screen is Used To
Main	Configure basic features such as time, date, floppy drives, and hard drives
Advanced	Configure advanced features such as peripheral configuration, audio configuration, and advanced chipset configuration
Security	Set passwords
Exit	Save or discard changes
Floppy Options	Configure a floppy drive
Primary/Secondary IDE Master/Slave Configuration	Configure IDE devices
Boot Options	Configure how the computer boots up
Peripheral Configuration	Configure the serial ports, the parallel port, and the hard disk drive interfaces
Advanced Chipset Configuration	Configure the memory and data buses

Setup Subscreen	This Subscreen is Used To
Power Management Configuration	Configure the computer's power management options
Plug and Play Configuration	Configure the computer's Plug and Play capabilities
Event Logging Configuration	Configure the computer's event logging functions
Single Bit ECC Events	Report about logged events
Multiple Bit ECC Events	Report about logged events
Parity Error Events	Report about logged events
Pre-Boot Events	Report about logged events

Main Screen

This section describes the options in the Main screen. If you select some options from the main screen (for example, Primary IDE Master), the Setup program displays a subscreen for the selected option. Many are purely reporting functions and have no selectable options.

System Date

Specifies the current date. Select the month from a pop-up menu and type the date and year.

System Time

Specifies the current time.

Floppy Options

When selected, this displays the Floppy Options subscreen.

Primary IDE Master

Reports if an IDE device is connected to the Primary IDE Master interface. When selected, this brings up the Primary IDE Master Configuration subscreen.

Primary IDE Slave

Reports if an IDE device is connected to the Primary IDE Slave interface. When selected, this brings up the Primary IDE Slave Configuration subscreen.

Secondary IDE Master

Reports if an IDE device is connected to the Secondary IDE Master interface. When selected, this brings up the Secondary IDE Master Configuration subscreen.

Secondary IDE Slave

Reports if an IDE device is connected to the Secondary IDE Slave interface. When selected, this brings up the Secondary IDE Slave Configuration subscreen.

Language

Specifies the language of the text strings used in the Setup program and the BIOS. The options are any installed languages.

Boot Options

When selected, this brings up the Boot Options subscreen.

Video Mode

Reports the video mode.

Mouse

Reports if a PS/2 mouse is installed.

Base Memory

Reports the amount of base memory.

Extended Memory

Reports the amount of extended memory.

BIOS Version

Reports the BIOS version.

Floppy Options Subscreen

Floppy A:

Reports if a floppy drive is connected to the system.

Floppy B:

Reports if a second floppy drive is connected to the system.

Floppy A: Type

Specifies the physical size and capacity of the floppy drive. The options are:

♦   Disabled

♦   360 KB, 5.25-inch

♦   1.2 MB, 5.25-inch

♦   720 KB, 3.5-inch

♦   **1.44/1.25 MB, 3.5-inch (default)**

♦   2.88 MB, 3.5-inch

Floppy B: Type

Specifies the physical size and capacity of the floppy drive. The options are:

♦   **Disabled (default)**

♦   360 KB, 5.25-inch

♦   1.2 MB, 5.25-inch

♦   720 KB, 3.5-inch

♦   1.44/1.25 MB, 3.5-inch

♦   2.88 MB, 3.5-inch

Floppy Access

The BIOS displays this item only if the motherboard supports changing the read/write or read-only access for

floppy drives. The following options change the access for all attached floppy drives:

♦ **Read/Write (default)**

♦ Read Only

Primary/Secondary IDE Master/Slave Configuration Subscreens

There are four subscreens used to enable IDE devices (e.g., hard disks):

♦ Primary IDE Master

♦ Primary IDE Slave

♦ Secondary IDE Master

♦ Secondary IDE Slave

Each of these subscreens contains the following eight fields.

IDE Device Configuration

Used to manually configure or autoconfigure the attached IDE device. The options are:

♦ **Auto Configured (default)**

♦ User Definable

♦ Disabled

If you select User Definable, the Cylinders, Heads, Sectors items can be specified. If you select Disabled, the BIOS will not scan for a drive on that interface.

Cylinders

If IDE Device Configuration is set to User Definable, type the correct number of cylinders for the installed hard disk. If IDE Device Configuration is set to Auto Configured, this field reports the number of cylinders for the hard disk.

Heads

If IDE Device Configuration is set to User Definable, type the correct number of heads for the installed hard disk. If IDE Device Configuration is set to Auto Configured, this field reports the number of heads for the hard disk.

Sectors

If IDE Device Configuration is set to User Definable, type the correct number of sectors for the installed hard disk. If IDE Device Configuration is set to Auto Configured, this field reports the number of sectors for the hard disk.

Maximum Capacity

Reports the maximum capacity of the hard disk. Capacity is calculated from the number of cylinders, heads, and sectors. There are no options.

IDE Translation Mode

CAUTION

Do not change the IDE translation mode after the IDE device has been formatted. Changing the option could corrupt data.

Specifies the IDE translation mode. The options are:

♦ Standard CHS (standard cylinder head sector: fewer than 1024 cylinders)

♦ Logical Block

♦ Extended CHS (extended cylinder head sector: more than 1024 cylinders)

♦ **Auto Detected** (**default**) (BIOS detects IDE translation mode)

Multiple Sector Setting

Sets the number of sectors transferred by an IDE drive per interrupt generated. The options are:

♦ Disabled

♦ 4 Sectors/Block

♦ 8 Sectors/Block

♦ **Auto Detected (default)**

Check the specifications for the hard disk to determine which setting provides optimum performance.

Fast Programmed I/O Modes

Sets how fast transfers on the IDE interface occur. The options are:

♦ Disabled

♦ **Auto Detected (default)**

If this option is set to Disabled, transfers occur at a less than optimized speed. If it is set to Auto Detected, transfers occur at maximum speed.

Boot Options Subscreen

This section describes the options in the Boot Options subscreen.

First Boot Device

Sets which drive the computer checks first to find an operating system to boot from. The options are:

♦ Disabled

♦ **Floppy (default)**

♦ Hard Disk

♦ CD-ROM

♦ Network

Second Boot Device

Sets which drive the computer checks second to find an operating system to boot from. The options are:

- ♦ Disabled
- ♦ Floppy
- ♦ **Hard Disk (default)**
- ♦ Network

Third Boot Device

Sets which drive the computer checks third to find an operating system to boot from. The options are:

- ♦ **Disabled (default)**
- ♦ Floppy
- ♦ Hard Disk
- ♦ Network

Fourth Boot Device

Sets which drive the computer checks fourth to find an operating system to boot from. The options are:

- ♦ **Disabled (default)**
- ♦ Floppy
- ♦ Hard Disk
- ♦ Network

System Cache

Enables or disables both primary and secondary cache memory. The options are:

- ♦ Disabled
- ♦ **Enabled (default)**

Boot Speed

Sets the speed at which the motherboard operates at boot-up. The options are:

♦ Deturbo

♦ **Turbo (default)**

If turbo boot speed is enabled, the motherboard operates at full speed. If deturbo boot speed is enabled, the motherboard operates at a slower speed needed to support some legacy add-in cards.

Num Lock

Sets the Num Lock feature on your keyboard at boot-up. The options are:

♦ **Off (default)**

♦ On

Setup Prompt

NOTE

This option does not affect your ability to access the Setup program. It only toggles the prompt.

Turns on (or off) the "Press <F1> Key if you want to run Setup" prompt during the power-up sequence. The options are:

♦ **Enabled (default)**

♦ Disabled

Hard Disk Pre-Delay

Sets the hard disk drive pre-delay. The options are:

♦ **Disabled (default)**

♦ 3 Seconds

♦ 6 Seconds

♦ 9 Seconds

♦ 12 Seconds

♦ 15 Seconds

♦ 21 Seconds

♦ 30 Seconds

When this option is enabled, the BIOS waits the specified time before accessing the first hard drive. If your computer contains a hard drive, and you don't see the drive type displayed during boot-up, the hard drive might need more time before it can communicate with the controller. Setting a pre-delay provides the additional time for the hard drive to initialize.

Typematic Rate Programming

Sets the typematic rates. The options are:

♦ **Default (default)**

♦ Override

Selecting Override enables the Typematic Rate Delay and Typematic Rate fields. If set to default, neither of the two following fields will appear.

Typematic Rate Delay

Sets the delay time (in milliseconds) for the key-repeat function to start when you hold down a key on the keyboard. The options are:

♦ **250 msec (default)**

♦ 500 msec

♦ 750 msec

♦ 1000 msec

Typematic Rate

Sets the speed (in characters per second) at which characters repeat when you hold down a key on the keyboard. The higher the number, the faster the characters repeat. The options are:

♦ **6 char/sec (default)**

♦ 8 char/sec

♦ 10 char/sec

♦ 12 char/sec

♦ 15 char/sec

♦ 20 char/sec

♦ 24 char/sec

♦ 30 char/sec

Scan User Flash Area

NOTE

If an OEM logo is programmed into the user Flash area, the logo will be displayed at bootup regardless of how this option is set.

Enables or disables scanning of user Flash area for ROMs. The options are:

♦ **Disabled (default)**

♦ Enabled (scan occurs during POST)

Power-On COM1 Ring

Enables the computer to power on when a telephony device operating on COM1 receives a call. The options are:

♦ **Disabled (default)**

♦ Enabled

Advanced Screen

This section describes the Setup options in the Advanced menu screen. If you select some options from the Advanced screen (for example, Peripheral Configuration), Setup displays a subscreen for the selected option. Subscreens are described in the sections following the description of the Advanced screen options. Some of the following are reporting only, there are no options available.

Processor Type

Reports the processor type.

Processor Speed

Reports the processor clock speed.

Cache Size

Reports the size of second-level cache memory.

Peripheral Configuration

When selected, this displays the Peripheral Configuration subscreen.

Advanced Chipset Configuration

When selected, this displays the Advanced Chipset Configuration subscreen.

Power Management Configuration

When selected, this displays the Power Management Configuration subscreen.

Plug and Play Configuration

When selected, this displays the Plug and Play Configuration subscreen.

Event Logging Configuration

When selected, this displays the Event Logging Configuration subscreen.

Peripheral Configuration Subscreen

This section describes the Setup options in the Peripheral Configuration subscreen.

When Auto Configured is selected for Primary PCI IDE Interface, Secondary PCI IDE Interface, Floppy Interface, Serial Port 1 Interface, Serial Port 2 Interface, Serial Port 2 IR Mode, or Parallel Port Interface, the computer automatically configures that peripheral during power up. Reported settings for these options reflect the current state of the computer.

Primary PCI IDE Interface

Use to disable or automatically configure the primary PCI IDE interface. The options are:

♦   Disabled

♦   **Auto Configured (default)**

When Auto Configured is selected, the Primary PCI IDE Interface is automatically configured during power up.

Secondary PCI IDE Interface

Use to disable or automatically configure the secondary PCI IDE interface. The options are:

♦   Disabled

♦   **Auto Configured (default)**

When Auto Configured is selected, the Secondary PCI IDE Interface is automatically configured during power up.

Floppy Interface

Enables or disables the floppy drive interface. The options are:

♦ Disabled

♦ Enabled

♦ **Auto Configured (default)**

When Auto Configured is selected, the floppy interface is automatically configured during power up.

Serial Port 1 Interface

Selects the COM port, I/O address, and IRQ of serial port 1. The options are:

♦ Disabled

♦ COM1   3F8   IRQ4

♦ COM2   2F8   IRQ3

♦ COM3   3E8   IRQ4

♦ COM4   2E8   IRQ3

♦ COM1   3F8   IRQ3

♦ COM2   2F8   IRQ4

♦ COM3   3E8   IRQ3

♦ COM4   2E8   IRQ4

♦ **Auto Configured (default)**

When Auto Configured is selected, the Setup program assigns the first free COM port (normally COM1, 3F8, IRQ4) as the serial port 1 address and IRQ.

Serial Port 2 Interface

NOTE

If either serial port address is set, the address it is set to will not appear in the options dialog box of the other serial port. If an ATI mach32 *or an* ATI mach64 *video controller is active, the COM4, 2E8, IRQ3 address will not appear in the options dialog box of either serial port.*

Selects the COM port, I/O address, and IRQ of serial port 2. The options are:

♦   Disabled

♦   COM1   3F8   IRQ4

♦   COM2   2F8   IRQ3

♦   COM3   3E8   IRQ4

♦   COM4   2E8   IRQ3

♦   COM1   3F8   IRQ3

♦   COM2   2F8   IRQ4

♦   COM3   3E8   IRQ3

♦   COM4   2E8   IRQ4

♦   **Auto Configured (default)**

When Auto Configured is selected, the Setup program assigns the first free COM port (normally COM2, 2F8, IRQ3) as the serial port 2 address and IRQ.

Serial Port 2 IR Mode

Makes Serial Port 2 available to infrared applications. The options are:

♦   **Disabled (default)**

♦   Enabled

Parallel Port Interface

Selects the printer port, I/O address, and IRQ of the parallel port. The DMA assignment for the port will be displayed if the Parallel Port Type is set to ECP. The options are:

♦ Disabled

♦ LPT3   3BC   IRQ7

♦ LPT1   378   IRQ7

♦ LPT2   278   IRQ7

♦ LPT3   3BC   IRQ5

♦ LPT1   378   IRQ5

♦ LPT2   278   IRQ5

♦ **Auto Configured (default)**

When Auto Configured is selected, the Setup program assigns LPT1, 378, IRQ7 as the parallel port address and IRQ.

Parallel Port Type

Selects the mode for the parallel port. The options are:

♦ **Compatible (default)**

♦ Bi-directional

♦ ECP

♦ EPP

Compatible means the parallel port operates in AT-compatible mode. Bi-directional means the parallel port operates in bidirectional PS/2-compatible mode. EPP and ECP mean the parallel port operates high-speed, bidirectionally.

USB Interface

Enables or disables the USB interface. The options are:

♦ Disabled

♦ **Enabled (default)**

Audio Interface

Enables or disables the onboard audio subsystem. The options are:

♦ Disabled

♦ **Enabled (default)**

Hardware Monitor Interface

Enables or disables the hardware monitor. The options are:

♦ Disabled

♦ **Enabled (default)**

This option is displayed only if the hardware monitor component is installed on the motherboard.

Primary PCI IDE Status

Reports if the Primary IDE Interface is enabled or disabled.

Secondary PCI IDE Status

Reports if the Secondary IDE Interface is enabled or disabled.

Floppy Status

Reports if the Floppy Interface is enabled or disabled.

Serial Port 1 Status

Reports the COM port, I/O address, and IRQ for serial port 1 (COM1).

Serial Port 2 Status

Reports the COM port, I/O address, and IRQ for serial port 2 (COM2).

Parallel Port Status

Reports the printer port, I/O address, and IRQ for the parallel port.

Advanced Chipset Configuration Subscreen

This section describes the options in the Advanced Chipset Configuration subscreen.

Base Memory Size

Sets the size of the base memory. The options are:

♦ 512 KB

♦ **640 KB (default)**

ISA LFB Size

Sets the size of the linear frame buffer. The options are:

♦ **Disabled (default)**

♦ 1 MB

♦ 2 MB

♦ 4 MB

If this option is set to 1 MB, 2MB, or 4MB, the ISA LFB Base Address field appears.

ISA LFB Base Address

Reports the base address of the LFB.

Video Palette Snoop

Controls the ability of a primary PCI graphics controller to share a common palette with an ISA add-in video card. The options are:

♦ **Disabled (default)**

♦ Enabled

ISA VGA Write Combining

Sets the VGA frame buffer address (B000h - BFFFh) to the processor's Write Combined memory type. The options are:

♦ **Disabled (default)**

♦ Enabled

Latency Timer (PCI Clocks)

Sets the length of time (in PCI clocks) an agent on the PCI bus can hold the bus when another agent has requested the bus. The options are:

♦ **Auto Configured (default)**

♦ Valid numbers between 16 and 128 (in multiples of 8).

Memory Error Detection

Sets the type of memory error detection or correction. The options are:

♦ **Disabled (default)**

♦ ECC

♦ Parity

This option only appears if the memory installed on the motherboard supports error detection.

Bank 0

Reports the size and type of memory installed in bank 0.

Bank 1

Reports the size and type of memory installed in bank 1.

Power Management Configuration Subscreen

This section describes the options in the Power Management Configuration subscreen.

Advanced Power Management

Enables or disables the advanced power management (APM) support in the computer's BIOS. The options are:

♦ Disabled

♦ **Enabled (default)**

APM features require an APM-capable operating system. If this option is set to Disabled, only the Auto Start On AC Loss option will appear. If this option is set to Enabled, all the following options will appear.

IDE Drive Power Down

Sets any IDE drives to spin down when the computer goes into power-managed mode. The options are:

♦   Disabled

♦   **Enabled (default)**

VESA Video Power Down

Sets the command issued to your VESA-compliant graphics add-in card when the computer enters power-managed mode. The options are:

♦   Disabled (the monitor is not under power management)

♦   Standby (minimal power reduction)

♦   Suspend (significant power reduction)

♦   **Sleep (default)** (maximum power reduction)

Inactivity Timer

Sets how long (in minutes) the computer must be inactive before it enters power-managed mode. The range is 0-255 minutes. The default is 10 minutes.

Hot Key

Sets the hot key for power-managed mode. Press the hot key while holding down the <Ctrl> and <Alt> keys to enter power-managed mode. All alphabetic keys are valid entries for this field.

Auto Start On AC Loss

Specifies whether the power supply should resume after AC power interruption. The options are:

♦   Disabled

♦   **Enabled (default)**

Plug and Play Configuration Subscreen

This section describes the options in the Plug and Play Configuration subscreen.

Configuration Mode

Sets how the BIOS gets information about non-Plug and Play ISA add-in cards. The options are:

♦   **Use PnP OS (default)**

♦   Use BIOS Setup

If Use BIOS Setup is selected, specify the IRQ for each non-Plug and Play ISA add-in card you install on the motherboard If Use PnP OS is selected, the BIOS uses run-time software to prevent conflicts between Plug and Play and non-Plug and Play add-in cards. If Use PnP OS is selected, PnP OS is the only option visible in the subscreen.

PnP OS

Enables the computer to boot with an operating system capable of managing Plug and Play add-in cards. The options are:

♦   Disabled

♦   Other PnP OS

♦   **Windows 95 (default)**

This field will only be visible if the Configuration Mode field is set to Use PnP OS.

ISA Shared Memory Size

Enables you to specify a range of memory addresses that will be directed to the ISA bus rather than to onboard memory. The options are:

♦   **Disabled (default)**

♦   16 KB

♦   32 KB

♦   48 KB

♦   64 KB

♦   80 KB

♦   96 KB

If this field is set to Disabled, the ISA Shared Memory Base Address field (described below) will not appear.

This field should be enabled only when you are using a non-Plug and Play ISA add-in card (legacy card) that requires non-ROM memory space. For example, video capture cards that have video buffer memory.

By default, allocation of upper memory is as follows: memory from C0000h-C7FFFh is automatically shadowed. (This memory range is typically reserved for video BIOS.) Memory from C8000h-DFFFFh is initially unshadowed. The BIOS scans this range for any ISA add-in cards that may be present and notes their location and size.

The BIOS will then automatically configure the PCI and Plug and Play devices, shadowing the ROM requirements (other than video) into the area above E0000h until that area is full. It will then assign additional PCI and Plug and Play add-in cards to the area between C8000h and DFFFFh. If an ISA legacy card has non-ROM memory requirements, the autoconfigure routine may write into an area that is needed by the ISA add-in card.

The ISA Shared Memory Size parameter signifies to the autoconfigure routine that this block of memory is reserved and should not be shadowed.

Shadowing copies a block of memory from an add-in card's ROM to the same address in computer DRAM memory. This improves computer performance.

ISA Shared Memory Base Address

Sets the base address for the ISA shared memory. The options are:

♦ **C8000h (default)**

♦ CC000h

♦ D0000h

♦ D4000h

♦ D8000h

♦ DC000h

This setting could affect the ISA Shared Memory Size field. The value entered in the ISA Shared Memory Size field cannot extend to the E0000h address. For example, if a size of 64 KB were selected, options D4000h, D8000h, and DC000h would not appear.

If the ISA Shared Memory Size field is disabled, this field will not appear.

IRQ 3, 4, 5, 7, 9, 10, 11, 14, 15

Sets the status of the IRQ. The options are:

♦ **Available (default)**

♦ Used By ISA Card

The PCI auto-configuration code looks here to see if these IRQs are available for PCI add-in cards. If an IRQ is available, the PCI auto-configuration code can assign the IRQ to be used by the computer. If your computer has an ISA add-in card, select Used By ISA Card for one of these IRQs.

NOTE

IRQs 5, 9, 10, and 11 are the default user available IRQs. Depending on the configuration of your computer, other IRQs could be listed. If you have disabled the parallel port or either of the serial ports, more IRQs will be available

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Event Logging Configuration Subscreen

This section describes the options in the Event Logging Configuration subscreen.

Event Log Capacity

Reports whether or not the log is full.

Event Log Count Granularity

Reports the number of log events that must occur before the event log is updated.

Event Time Granularity

Reports the amount of time (in minutes) that must pass before the event log is updated.

Event Log Control

Enables or disables event logging. The options are:

- ♦ **All Events Enabled (default)**
- ♦ ECC Events Disabled
- ♦ All Events Disabled

Clear Event Log

Clears the event log on the next pass through POST. The options are:

- ♦ **Keep (default)**
- ♦ On Next Boot

NOTE

If set to On Next Boot, this option reverts to the default on the next pass through POST.

Mark Existing Events as Read

Marks all events already in the log as having been not read (Do Not Mark) or read (Mark). The options are:

♦ **Do Not Mark (default)**

♦ Mark

Single Bit ECC Events

When selected, this displays the Single Bit ECC Events subscreen.

Multiple Bit ECC Events

When selected, this displays the Multiple Bit ECC Events subscreen.

Parity Error Events

When selected, this displays the Parity Error Events subscreen.

Pre-Boot Events

When selected, this displays the Pre-Boot Events subscreen.

Single Bit ECC Events Subscreen

If Clear Event Log is set to On Next Boot (see page 5/25), the following fields report information for the last single-bit ECC error to occur since the last pass through POST.

Date of Last Occurrence

Reports the date when the last single-bit ECC error occurred.

Time of Last Occurrence

Reports the time when the last single-bit ECC error occurred.

Total Count of Events/Errors

Reports the total number of single-bit ECC errors in the log.

Memory Bank with Errors

Reports the memory bank that contained the last single-bit ECC error.

Multiple Bit ECC Events Subscreen

If Clear Event Log is set to On Next Boot (see page 5/25), the following fields report information for the last multiple-bit ECC error to occur since the last pass through POST.

Date of Last Occurrence

Reports the date when the last multiple-bit ECC error occurred.

Time of Last Occurrence

Reports the time when the last multiple-bit ECC error occurred.

Total Count of Events/Errors

Reports the total number of multiple-bit ECC errors in the log.

Memory Bank with Errors

Reports the memory bank that contained the last multiple-bit ECC error.

Parity Error Events Subscreen

If Clear Event Log is set to On Next Boot (see page 5/25), the following fields report information for the last parity error to occur since the last pass through POST.

Date of Last Occurrence

Reports the date when the last parity error occurred.

Time of Last Occurrence

Reports the time when the last parity error occurred.

Total Count of Events/Errors

Reports the total number of parity errors in the log.

Memory Bank with Errors

Reports the memory bank that contained the last parity error.

Pre-Boot Events Subscreen

If Clear Event Log is set to On Next Boot (see page 5/25), the following fields report information for the last pre-boot event to occur since the last pass through POST.

Date of Last Occurrence

Reports the date when the last pre-boot event occurred.

Time of Last Occurrence

Reports the time when the last pre-boot event occurred.

Total Count of Events/Errors

Reports the total number of pre-boot events in the log.

Security Screen

The Security screen enables you to set passwords for two access modes: administrative and user.

Administrative mode allows the administrative user to view and change all Setup program options while user mode limits access to Setup program options. User mode access to the Setup program is set in administrative mode by the Enter Password and User Privilege Level options. Setting a user privilege level enables system administrators to restrict who can view or change options in the Setup program. If you set the administrative password only, you can gain user mode access to the Setup program by pressing the <Enter> key at the password prompt.

To restrict who can boot the computer, set the user password. The computer will prompt the user for this password before booting. If you set the administrative password only, the computer will boot without prompting the user for a password. If both passwords are set, a user can enter either the administrative or user password to boot the computer.

The following table shows how the passwords work together.

Password Set	Administrative Mode	User Mode	Password Needed to Boot
Neither	Can change all options	Can change all options	None
Administrative only	Can change all options	Access controlled by user privilege level setting	None
User only	N/A	Can change all options	User
Both	Can change all options	Access controlled by user privilege level setting	Administrative or user

Descriptions of the options in the Security screen follow.

User Password

Reports if there is a user password set.

Administrative Password

Reports if there is an administrative password set.

Enter Password

Sets the user password. The password can be up to seven alphanumeric characters.

Set Administrative Password

Sets the administrative password. The password can be up to seven alphanumeric characters.

User Privilege Level

This option appears when an administrative password is set. User Privilege Level sets the level of user mode access to the Setup program. This option can only be set in administrative mode. The options are:

♦ **Limited Access (default)**

♦ No Access

♦ View Only

♦ Full Access

Privilege Level	*User Mode Access to Setup Program*
Limited Access	Can access the Setup program and change: System Date, System Time, User Password, Unattended Start, and Security Hot-Key
No Access	Cannot access the Setup program
View Only	Can access the Setup program and view options, but not change them
Full Access	Can access the Setup program and change all options except User Privilege Level and Set Administrative Password

Clear User Password

This option appears when both an administrative and user password are set. Press the <Enter> key to clear the user password.

Unattended Start

Controls when the user password is requested. The options are:

♦ Enabled

♦ **Disabled (default)**

The user password must be set before you can enable this option. If Enabled is selected, the computer boots, but the keyboard will be locked until the user password is entered.

Security Hot Key (CTRL-ALT-)

Sets a hot key that, when pressed, locks the keyboard until the user password is entered. The keyboard LEDs flash to indicate that the keyboard is locked. When you enter the user password, you do not have to press the <Enter> key.

Exit Screen

This section describes how to exit and save (or discard) changes to the Setup program.

Exit Saving Changes

Exits and saves changes made to the Setup program. You can also press the <F10> key anywhere in the Setup program to exit and save changes.

Exit Discarding Changes

Exits without saving changes made to the Setup program. This means that any changes you made to the Setup program are discarded and **not saved**. You can also press the <Esc> key in the four main screens to exit the Setup program without saving changes.

Load Setup Defaults

CAUTION

The default settings may not be the same as the settings entered during test and system build at the factory.

Returns all Setup program options to their defaults. You can also press the <F5> key anywhere in the Setup program to load the Setup defaults.

Discard Changes

Discards any changes you made during the current Setup session without exiting the program. You can also press the

<F6> key anywhere in the Setup program to discard any changes to Setup without exiting the program.

This option loads the CMOS RAM values that were present when the computer was turned on.

Note down your settings for reference

Use this area to make a note of your BIOS settings as they are when you first use the system.

6 TROUBLESHOOTING

This chapter offers advice if you suspect a fault with your computer. It is concerned mainly with problems caused by the computer itself, if there are problems with software, read the software guide or contact the software supplier.

Make a note of any symptoms, error codes, or display messages before calling your supplier or maintenance provider

Problems when starting

If you suspect a blown fuse

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

1. Turn off the computer and unplug all power cables and unplug and disconnect all peripherals.

2. If no cause is apparent, replace the blown fuse with one of the same rating, reconnect the system unit power cable and try to turn it on again.

3. If the replacement fuse blows, call your supplier or maintenance provider.

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

Power-on self-test (POST)

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

If POST detects a hardware fault, one or more POST error codes and messages are displayed. Your first action should be to turn off the computer, wait at least 30 seconds, and then turn it on again to see if the error is transitory or persistent. Persistent POST errors may indicate a fault in the system.

♦ Check that all external cables are securely connected.

♦ Try running the BIOS Setup utility to reconfigure the system.

♦ Open up the system unit and check that all internal signal and power cables are securely connected.

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

Failure to boot

On completion of POST, the computer attempts to boot from a system diskette or bootable hard disk. Some of the messages that might appear during the boot sequence:

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

Beep Codes

The computer uses special audio beep codes to signal certain hardware faults.

One long beep followed by several short beeps indicates a video problem. There may be no display on the screen.

Beeps	Error Message	Description
1	Refresh Failure	The memory refresh circuitry on the motherboard is faulty.
2	Parity Error	A parity error occurred in system memory.
3	First Bank Memory Failure	Memory failure in the first bank of memory.
4	Timer Not Operational	Memory failure in the first bank of memory or Timer 1 on the motherboard is not functioning.
5	Processor Error	The processor generated an error.
6	Keyboard Controller Failure	The keyboard controller may be bad. The BIOS cannot switch to protected mode.
7	Processor Exception Interrupt Error	The processor generated an exception interrupt.
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty. This is not a fatal error.
9	ROM Checksum Error	ROM checksum value does not match the value encoded in the BIOS.
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM failed.

Troubleshooting checklist

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

Connections

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

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

Power

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

Monitor

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

Expansion cards

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

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

System BIOS

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

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

The system's disk drives

Floppy disk drive

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

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

Optional CD-ROM drive

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

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

Hard disk drive

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

SCSI drives

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

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

Error Messages

Some of these messages may indicate a serious fault with the system and may cause the POST to halt. If the message persists, make a note of it and call your supplier or authorised maintainer.

PCI Configuration Error Messages

The following PCI messages are displayed as a group with bus, device and function information.

Message	*Explanation*
Bad PnP Serial ID Checksum	The Serial ID checksum of a Plug and Play card was invalid.
Floppy Disk Controller Resource Conflict	The floppy disk controller has requested a resource that is already in use.
NVRAM Checksum Error, NVRAM Cleared	The ESCD data was reinitialized because of an NVRAM checksum error. Try rerunning the ICU.
NVRAM Cleared By Jumper	The "CMOS Clear" jumper has been moved to the "Clear" position and CMOS RAM has been cleared.
NVRAM Data Invalid, NVRAM Cleared	Invalid entry in the ESCD.
Parallel Port Resource Conflict	The parallel port has requested a resource that is already in use.
PCI Error Log is Full	This message is displayed when more than 15 PCI conflict errors are detected. No additional PCI errors can be logged.
PCI I/O Port Conflict	Two devices requested the same resource, resulting in a conflict.
PCI IRQ Conflict	Two devices requested the same resource, resulting in a conflict.

Message	Explanation
PCI Memory Conflict	Two devices requested the same resource, resulting in a conflict.
Primary Boot Device Not Found	The designated primary boot device (hard disk drive, diskette drive, CD-ROM drive, or network) could not be found.
Primary IDE Controller Resource Conflict	The primary IDE controller has requested a resource that is already in use.
Primary Input Device Not Found	The designated primary input device (keyboard, mouse, or other, if input is redirected) could not be found.
Secondary IDE Controller Resource Conflict	The secondary IDE controller has requested a resource that is already in use.
Serial Port 1 Resource Conflict	Serial port 1 has requested a resource that is already in use.
Serial Port 2 Resource Conflict	Serial port 2 has requested a resource that is already in use.
Static Device Resource Conflict	A non Plug and Play ISA card has requested a resource that is already in use.
System Device Resource Conflict	A non Plug and Play ISA card has requested a resource that is already in use.

BIOS Error Messages

Error Message	Explanation
A20 Error	Gate A20 on the keyboard controller is not working.
Address Line Short!	Error in the address decoding circuitry on the baseboard.
CH-2 Timer Error	Most systems include two timers. There is an error in timer 2.
CMOS Battery State Low	The battery power is low. Replace the battery.

Error Message	Explanation
CMOS Checksum Failure	After CMOS RAM values are saved, a checksum value is generated for error checking. The previous value is different from the current value. Run Setup.
CMOS Display Type Mismatch	The video type in CMOS RAM does not match the type detected by the BIOS. Run Setup.
CMOS Memory Size Mismatch	The amount of memory on the motherboard is different than the amount indicated in CMOS RAM. Run Setup.
CMOS System Options Not Set	The values stored in CMOS RAM are either corrupt or nonexistent. Run Setup.
CMOS Time and Date Not Set	Run Setup to set the date and time in CMOS RAM.
Diskette Boot Failure	The boot disk in floppy drive A is corrupt. It cannot be used to boot the system. Use another boot disk and follow the screen instructions.
DMA Error	Error in the DMA controller.
DMA #1 Error	Error in the first DMA channel.
DMA #2 Error	Error in the second DMA channel.
FDD Controller Failure	The BIOS cannot communicate with the floppy disk drive controller. Check all appropriate connections after the system is powered down.
HDD Controller Failure	The BIOS cannot communicate with the hard disk drive controller. Check all appropriate connections after the system is powered down.
INTR #1 Error	Interrupt channel 1 failed POST.
INTR #2 Error	Interrupt channel 2 failed POST.
Invalid Boot Diskette	The BIOS can read the disk in floppy drive A, but cannot boot the system. Use another boot disk.
Keyboard Is Locked...Unlock It	The keyboard lock on the computer is engaged. Unlock the computer to continue.
Keyboard Error	There is a timing problem with the keyboard.

Error Message	Explanation
KB/Interface Error	There is an error in the keyboard controller
Off Board Parity Error	Parity error in memory installed in an expansion slot. The format is: OFF BOARD PARITY ERROR ADDR (HEX) = xxxx) where xxxx is the address where the error occurred.
On Board Parity Error	Parity error detected in system memory.
Parity Error	Parity error in system memory at an unknown address.

ISA NMI Messages

ISA NMI Message	Explanation
Memory Parity Error at xxxxx	Memory failed. If the memory location can be determined, it is displayed as xxxx. If the memory location cannot be determined, the message is: Memory Parity Error ????.
I/O Card Parity Error at xxxxx	An expansion card failed. If the address can be determined, it is displayed as xxxxx. If the address cannot be determined the message is: I/O Card Parity Error ????.
DMA Bus Time-out	A device has driven the bus signal for more than 7.8 microseconds.

ANTISTATIC PRECAUTIONS

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

Static electricity can be generated by moving on a chair, brushing against desks or walls, or simply walking across an ordinary carpet. Items handed from one person to another, or being wrapped or unwrapped, can acquire a static charge. Air conditioning systems can also result in very high levels of static.

Clothing made of synthetic fibres is particularly likely to generate static electricity. This static electricity is often completely unnoticed by the wearer, but can be sufficient to cripple or destroy sensitive electronic components in computers.

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

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

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

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

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

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

- ♦ Keep all conductive material, foodstuffs and especially liquids, away from your work area and the open computer.

CLEANING AND TRANSPORTING

Cleaning the computer

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

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

WARNING

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

The system unit

♦ Occasionally wipe the outside of the system unit with a soft, slightly damp, clean cloth.

♦ Occasionally check the air vents on the rear and sides of the system unit. Dust and fluff can block the vents and limit the airflow. A small, clean, soft brush may be useful.

♦ Occasionally clean the removable media drives using a special disk cleaning kit. These are available from many sources including your Apricot dealer.

The monitor

Occasionally wipe the monitor with a soft, slightly damp, clean cloth. It is best to use antistatic glass cleaner on the monitor screen to help prevent dust adhesion. **Do not** spray glass cleaner directly onto the screen, it could run down inside the case and damage the circuitry.

The keyboard

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

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

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

1. Switch off and unplug the keyboard.

2. If the liquid is sticky or viscous, unplug the keyboard and call your supplier or an authorised maintainer.

3. If the liquid is thin and clear, try unplugging the keyboard, turning it upside down to let the liquid drain out, and drying it for at least 24 hours at room temperature. If the keyboard does not work, call your supplier or an authorised maintainer.

4. If a solid object drops between the keys, turn the keyboard upside down and shake it gently. **Do not** probe between the keys as this may cause serious damage.

The mouse

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

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

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

2. Remove the cover and set it aside. Then cupping one hand over the underside, turn the mouse back the right way up. The ball should drop into your hand.

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

4. Inside the mouse there are three small rollers. Using a cotton swab moistened with a solvent cleaner, gently wipe off any oil

or dust that has collected on the rollers, rotating them to reach all of their surfaces.

5.   Use clear water, or water with a mild detergent, to clean the ball. Then dry it with a clean, soft cloth.

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

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

Transporting the computer

Use common sense when handling the computer. Hard disks in particular can be damaged if the computer is dropped or handled roughly.

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

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

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

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

WARNING

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

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