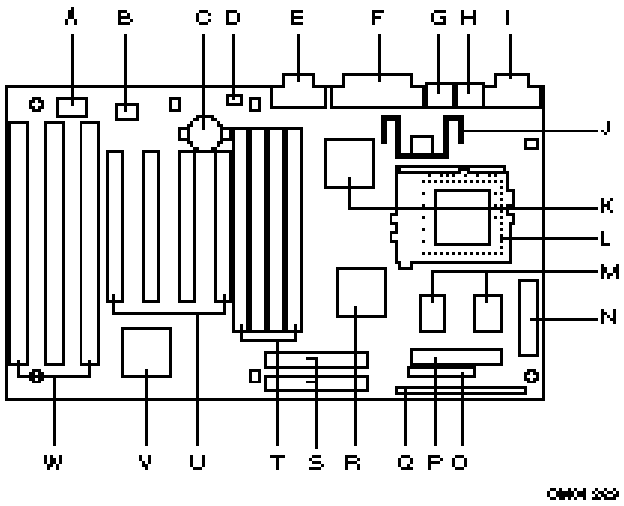
OEM-I HX

Motherboard

Product Guide

Product Description

Figure 1. Motherboard Components



A.	Flash memory device	M.	SRAM sites
B.	1 MB PLCC flash	N.	Primary power connector
C.	Clock battery	O.	Configuration jumper block
D.	Recovery jumper	P.	Floppy connector
E.	COM1 serial port	Q.	Front panel connector
F.	Parallel port connector	R.	BGA 82430HX
G.	PS/2† keyboard connector	S.	IDE connectors
H.	PS/2 mouse connector	T.	SIMM† sockets
I.	COM2 serial port	U.	PCI add-in connectors
J.	Voltage regulator	V.	PIIX3
K.	I/O controller	W.	ISA add-in connectors
L.	Pentium® processor socket		

Feature Summary

- Intel Pentium microprocessor running at 75, 90, 100, 120, 133, 150, and 166 MHz
- ATX form factor motherboard
- Intel 82430HX PCIset
- PC87306B Ultra I/O controller (integrates serial ports, parallel port, floppy disk interface, real time clock, CMOS RAM, keyboard controller, and support for an IrDA†-compatible infrared interface)
- Support for up to 128 MB of DRAM installed in single in-line memory modules (SIMMs)
- AMIBIOS in a flash memory device that supports system setup and PCI auto-configuration
- Expansion slots for up to six add-in boards
  - Three dedicated PCI-bus slots
  - Two dedicated ISA-bus slots
  - One "combination" slot for either a PCI or an ISA add-in board
- Two RS-232C-compatible 9-pin serial connectors
- One multimode, 25-pin Centronics†-compatible parallel port
- PS/2-style keyboard and mouse connectors
- Password protection for system security

Central Processing Unit

The system is designed to operate with the Intel Pentium microprocessor. The Pentium processor, in addition to its expanded data and addressing capabilities, includes the following features:

- Ready for next generation OverDrive® processor
- Backward compatibility with Intel microprocessor architecture
- Onchip numeric coprocessor (compatible with the Intel486™ DX processor and compliant with ANSI/IEEE standard 754-1985)
- Onchip 16 KB cache (8 KB for data, 8 KB for code)
- Burst-mode bus cycles

Chapter 3 tells how to upgrade the CPU.

Memory

The motherboard supports base (conventional) and extended memory. Operating systems such as MS-DOS†, OS/2†, UNIX†, and all application programs use base memory. For better performance, OS/2 and UNIX as well as many MS-DOS applications use extended memory. For the system memory map, see Chapter 5.

The motherboard supports up to 128 MB of DRAM. DRAM is implemented through 72-pin single in-line memory modules (SIMMs). The motherboard contains four SIMM sockets. Chapter 3 describes how much memory and which type of SIMM you can install to get the total amount of DRAM you want.

Cache Memory

The Pentium microprocessor includes 16 KB of cache on the chip. The 82430HX PCIset includes a cache controller that supports direct-mapped cache memory and supports a second level cache that uses up to 512 KB of Synchronous Pipeline Burst SRAM.

IDE Peripheral Interface

The motherboard provides a high speed, 32-bit PCI/IDE interface. The PCI/IDE interface supports:

- Up to four PCI/IDE hard drives on the PCI bus
- PIO Mode 3 and Mode 4 support
- Logical block addressing (LBA) of hard drives larger than 528 MB
- Extended Cylinder Head Sector (ECHS) translation modes
- ATAPI devices (such as CD-ROMs) on both IDE interfaces

System I/O

The I/O controller (PC87306B) integrates the functions for the serial ports, parallel port, diskette drives, and keyboard. This component provides:

- Multimode bi-directional parallel port
  - — Standard mode: Centronics-compatible operation
  - — High-speed mode: support for enhanced capabilities port (ECP) and enhanced parallel port (EPP)
- Two RS-232C 116550A-compatible 9-pin serial ports
- Integrated real time clock with an accuracy of ±13 minutes/year
- A 242-byte battery-backed CMOS RAM
- Integrated 8042 compatible keyboard controller
- Flexible IRQ and DMA mapping to support Windows† 95
- Support for an IrDA-compatible infrared interface. The infrared interface supports data transfer rates of up to 115 Kbaud with either half- or full-duplex operation. In full-duplex mode, both the transmitter and receiver are enabled simultaneously for higher throughput.
- Industry standard diskette drive controller that supports 720 KB, 1.44 MB, and 2.88 MB 3.5-inch drives (at 135 tracks per inch); and 360 KB and 1.2 MB 5.25-inch drives

System BIOS

The system BIOS, from American Megatrends Incorporated (AMI), provides ISA and PCI compatibility. The BIOS is contained in a flash memory device. The BIOS provides the power-on self test (POST), the system Setup program, a PCI and IDE auto-configuration utility, and BIOS recovery code.

The system BIOS is always shadowed. Shadowing allows any BIOS routines to be executed from fast 32-bit onboard DRAM instead of from the slower 8-bit flash device.

PCI Auto-configuration

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

boards use the same interrupt resources as ISA add-in boards, you must specify the interrupts used by ISA boards in the Setup program. Chapter 2 tells how to use the Setup program. The PCI auto-configuration program complies with version 2.1 of the PCI BIOS specification.

IDE Auto-configuration

If you install an IDE drive in the system, the IDE auto-configuration utility automatically detects and configures the drive for operation in the system. This utility eliminates the need to enter the Setup program after you install an IDE drive.

ISA Plug and Play Capability

This provides auto-configuration of Plug and Play ISA cards and resource management for legacy (non Plug and Play) ISA cards when used with the ISA Configuration Utility (ICU) or a Plug and Play compatible operating system like Windows 95.

BIOS Upgrades

Because the BIOS is stored in a flash memory device, you can easily upgrade the BIOS without having to disassemble the system. The flash upgrade process can be done by running a utility from a diskette or hard disk, or over a network.

For information about the latest BIOS update, contact your service representative.

Expansion Slots

The board has two dedicated 16-bit ISA/AT†-compatible and three dedicated PCI-compatible expansion slots. One expansion slot is a "combination" slot and can be used by **either** a PCI or an ISA board, enabling you to install a maximum of six add-in boards.

System Security

The BIOS provides a password option that you can enable through the Setup program (see Chapter 2).

Keyboard/Mouse Controller

The I/O controller stores the keyboard and mouse controller code. The board uses PS/2-style connectors for the keyboard and mouse.

Real-Time Clock and CMOS RAM

The I/O controller provides a real-time clock and CMOS RAM. Chapter 3 provides information about replacing the battery.

You can set the time for the clock and the CMOS values by using the system BIOS Setup program, described in Chapter 2.

Fan Connector

The board contains a connector for a CPU fan. Refer to Chapter 5 for the locations and pinout of the fan connector.

Speaker

The board has a connector for an offboard speaker. Chapter 5 shows the location and pinout for the speaker connector.

Using The Setup Program

This chapter tells how to use the Setup program that is built into the BIOS. The Setup program makes it possible to change configuration information (such as the types of peripherals that are installed) and the boot-up sequence for the system. The Setup information is stored in CMOS random access memory (RAM) and is backed up by a battery when power is off.

If the board does not operate as described here, see Chapter 4 for problem descriptions and error messages.

If you want to go into the Setup program, reboot the board and press <F1> as soon as you see the message “Press <F1> Key if you want to run SETUP.” You have about five seconds to press <F1> to enter Setup before the boot process continues.

Record the Setup Configuration

To make sure you have a reference to the Setup values for your system, we recommend you write down the current settings and keep this record up-to-date.

Setup Menu Overview

The Setup program initially displays the Main menu screen. In each screen there are options for modifying the system configuration. Select a menu screen by pressing the left <←> or right <→> arrow keys. Use the up <↑> or down <↓> arrow keys to select items in a screen. Use the <Enter> key to select an item for modification. For certain items, pressing <Enter> brings up a subscreen. After you have selected an item, use the arrow keys to modify the setting.

Setup Menu Overview

Setup Menu Screen	Description
Main	For setting up and modifying basic options, such as time, date, diskette drives, and hard drives.
Advanced	For modifying the more advanced features, such as peripheral configuration and advanced chipset configuration.
Security	For specifying passwords that can be used to limit access to the system.
Exit	For saving or discarding changes.
Floppy Options	For configuring diskette drives.
Primary/ Secondary IDE Master/Slave Configuration	For configuring IDE hard drives.
Boot Options	For modifying options that affect the system boot up, such as the boot sequence.
Peripheral Configuration	For modifying options that affect the serial ports, the parallel port, and the

	disk drive interfaces.
Advanced Chipset Configuration	For modifying options that affect memory and system busses.
Plug and Play Configuration	For modifying options that affect the system's Plug and Play capabilities.

Overview of the Setup Keys

The following keys have special functions in the BIOS Setup program.

Overview of the Setup Keys

Setup Key	Description
<F1>	Pressing the <F1> key brings up a help screen for the current item.
<Esc>	Pressing the <Esc> key takes you back to the previous screen. Pressing <Esc> in the Main, Advanced, Security, or Exit screen allows you to Exit Discarding Changes (see later in this chapter).
<Enter>	Pressing the <Enter> key selects the current item or option.
<↑>	Pressing the up arrow <↑> key changes the selection to the previous item or option.
<↓>	Pressing the down arrow <↓> key changes the selection to the next item or option.
<←> <→>	Pressing the left <←> or right arrow <→> keys in the Main, Advanced, Security, or Exit menu screens changes the menu screen. Pressing either key in a subscreen does nothing.
<F5>	Pressing the <F5> key allows you to Load Setup Defaults (see later in this chapter).
<F6>	Pressing the <F6> key allows you to Discard Changes (see later in this chapter).
<F10>	Pressing the <F10> key allows you to Exit Saving Changes (see later in this chapter).

Main BIOS Setup Screen

This section describes the Setup options found on the main menu screen. If you select certain options from the main screen (e.g., Primary IDE Master), the Setup program switches to a subscreen for the selected option.

System Date

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

System Time

Specifies the current time.

Floppy Options

When selected, this pops up 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. There are no options.

Mouse

Reports if a mouse is installed or not. There are no options.

Base Memory

Reports the amount of base memory. There are no options.

Extended Memory

Reports the amount of extended memory. There are no options.

Floppy Options Subscreen

Floppy A:

Reports if a diskette drive is connected to the system. There are no options.

Floppy B:

Reports if a second diskette drive is connected to the system. There are no options.

Floppy A: Type

Specifies the physical size and capacity of the diskette 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; 2.88 MB, 3.5-inch. The default is 1.44/1.25 MB, 3.5-inch.

Floppy B: Type

Specifies the physical size and capacity of the diskette 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; 2.88 MB, 3.5-inch. The default is Disabled.

Primary/Secondary IDE Master/Slave Configuration Subscreens

There are four subscreens used to enable IDE devices: Primary IDE Master, Primary IDE Slave, Secondary IDE Master, and Secondary IDE Slave. All four subscreens contain the same eight fields described below.

IDE Device Configuration

Used to manually configure the hard drive or have the system auto configure it. The options are Auto Configured, User Definable, and Disabled. The default is Auto Configured. If you select User Definable, the Number of Cylinders, Number of Heads, and Number of Sectors items can be modified. If you select Disabled, the BIOS will not scan for a drive on that interface.

Number of Cylinders

If Hard Disk Type is set to User Definable, you must type the correct number of cylinders for your hard disk. If Hard Disk Type is set to Auto Configured, this reports the number of cylinders for your hard disk and cannot be modified.

Number of Heads

If Hard Disk Type is set to User Definable, you must type the correct number of heads for your hard disk. If Hard Disk Type is set to Auto Configured, this reports the number of heads for your hard disk and cannot be modified.

Number of Sectors

If Hard Disk Type is set to User Definable, you must type the correct number of sectors for your hard disk. If Hard Disk Type is set to Auto Configured, this reports the number of sectors for your hard disk and cannot be modified.

Maximum Capacity

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

IDE Translation Mode

Specifies the IDE translation mode. The options are Standard CHS (standard cylinder head sector — less than 1024 cylinders), Logical Block, Extended CHS (extended cylinder head sector — greater than 1024 cylinders), and Auto Detected (BIOS detects IDE drive support for LBA). The default is Auto Detected.

CAUTION

Do not change this from the option selected when the hard drive was formatted. Changing the option can result in corrupted data.

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, or Auto Detected. The default is Auto Detected. Check the specifications for your hard disk drive to determine which setting provides optimum performance for your drive.

Fast Programmed I/O Modes

Sets how fast transfers on the IDE interface occur. The options are Disabled or Auto Detected. The default is Auto Detected. If set to Disabled, transfers occur at a less than optimized speed. If set to Auto Detected, transfers occur at the drive's maximum speed.

Boot Options Subscreen

This section describes the options available on the Boot Options subscreen.

First Boot Device

Sets which drive the system checks first to find an operating system to boot from. The options are Disabled, Floppy, Hard Disk, CD-ROM, and Network. The default is Floppy.

Second Boot Device

Sets which drive the system checks second to find an operating system to boot from. The options are Disabled, Floppy, Hard Disk, and Network. The default is Hard Disk.

Third Boot Device

Sets which drive the system checks third to find an operating system to boot from. The options are Disabled, Floppy, Hard Disk, and Network. The default is CD-ROM.

Fourth Boot Device

Sets which drive the system checks fourth to find an operating system to boot from. The options are Disabled, Floppy, Hard Disk, and Network. The default is Disabled.

System Cache

Enables or disables both the primary and the secondary cache memory. The options are Enabled or Disabled. The default is Enabled.

Boot Speed

Sets the system's boot speed. The options are Deturbo and Turbo. The default is Turbo. If Turbo is selected, boot-up occurs at full speed. If Deturbo is selected, the board operates at a slower speed.

Num Lock

Sets the beginning state of the Num Lock feature on your keyboard. The options are On and Off. The default is Off.

Setup 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 and Disabled. The default is Enabled.

NOTE

This option has no effect on your ability to access the Setup program. It only toggles the prompt.

Typematic Rate Programming

Sets the typematic rates. The options are Default and Override. The default is Default. Choosing Override enables Typematic Rate Delay and Typematic Rate.

Typematic Rate Delay

Sets how long it takes for the key-repeat function to start when you hold down a key on the keyboard. The options are 250, 500, 750, and 1000 millisecond delays. The default is 250. If Typematic Rate Programming is set to Default, this option will not be visible.

Typematic Rate

Sets the speed 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, 8, 10, 12, 15, 20, 24, and 30 characters per second. The default is 6. If Typematic Rate Programming is set to Default, this option will not be visible.

Advanced Screen

This section describes the Setup options found on the Advanced menu screen. If you select certain options from the Advanced screen (e.g., Peripheral Configuration), the Setup program switches to a

subscreen for the selected option. Subscreens are described in the sections following the description of the Advanced screen options.

Processor Type

Reports the CPU type. There are no options.

Processor Speed

Reports the CPU clock speed. There are no options.

Cache Size

Reports the size of the secondary cache. There are no options.

Peripheral Configuration

When selected, this brings up the Peripheral Configuration subscreen.

Advanced Chipset Configuration

When selected, this brings up the Advanced Chipset Configuration subscreen.

Plug and Play Configuration

When selected, this brings up the Plug and Play Configuration subscreen.

Peripheral Configuration Subscreen

This section describes the screens for the peripheral configuration subscreen.

Configuration Mode

Enables you to choose between setting the peripheral configuration yourself, or having the system do it. The options are Auto and Manual. The default is Auto.

When Auto is selected, the system peripherals are automatically configured during power up. The options below for PCI IDE Interface, Floppy Interface, Serial Port 1 and Serial Port 2 Addresses, Serial Port 2 IR Mode, and the Parallel Port Address cannot be modified. The settings displayed for those options reflect the current state of the hardware.

PCI IDE Interface

Enables or disables the PCI IDE hard disk interface. The options are Enabled and Disabled. The default is Enabled. (If Configuration Mode is set to Auto, this option cannot be modified.)

Floppy Interface

Enables or disables the diskette drive interface. The options are Enabled and Disabled. The default is Enabled. (If Configuration Mode is set to Auto, this option cannot be modified.)

Serial Port 1 Address

Selects the address and IRQ of serial port 1. The options are Disabled; COM1, 3F8h, IRQ4; COM3, 3E8h, IRQ4; and COM4, 2E8h, IRQ3. The default is COM1, 3F8h, IRQ4. If the Configuration Mode is set to Auto, the Setup program assigns the first free COM port (normally COM1, 3F8h, IRQ4) as the serial port 1 address and IRQ, regardless of what is selected under the Serial Port 1 Address option. (If Configuration Mode is set to Auto, this option cannot be modified.)

Serial Port 2 Address

Selects the address and IRQ of serial port 2. The options are Disabled; COM2, 2F8h, IRQ3; COM3, 3E8h, IRQ4; and COM4, 2E8h, IRQ3. The default is COM2, 2F8h, IRQ3. If the Configuration Mode is set to Auto, the Setup program assigns the first free COM port (normally COM2, 2F8h, IRQ3) as the serial port 2 address and IRQ, regardless of what is selected under the Serial Port 2 Address option. (If Configuration Mode is set to Auto, this option cannot be modified.)

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, 2E8h, IRQ3 address will not appear in the options dialog box of either serial port.*

Serial Port 2 IR Mode

Makes Serial Port 2 available to infrared applications. The options are Enabled and Disabled. The default is Disabled. (If Configuration Mode is set to Auto, this option cannot be modified.)

Parallel Port Address

Selects the address and IRQ of the parallel port. The options are Disabled; LPT3, 3BCh, IRQ7; LPT1, 378h, IRQ7; LPT1, 378h, IRQ5; and LPT2, 278h, IRQ5. The default is LPT1, 378h, IRQ7. If the Configuration Mode is set to Auto, the setup program assigns LPT1, 378h, IRQ7 as the parallel port address, regardless of what is selected under the Parallel Port Address option. (If Configuration Mode is set to Auto, this option cannot be modified.)

Parallel Port Mode

Selects the mode for the parallel port. The options are Compatible, Bi-directional, EPP, and ECP. The default is Compatible. Compatible means the parallel port operates in AT-compatible mode. Bi-directional means the parallel port operates in bi-directional PS/2-compatible mode. EPP and ECP mean the parallel port operates high-speed, bi-directionally. This option is not affected by the Configuration Mode field above.

Advanced Chipset Configuration Subscreen

This section describes the options available on the Advanced Chipset Configuration Subscreen.

Base Memory Size

Sets the size of the base memory. The options are 512 KB and 640 KB. The default is 640 KB.

ISA LFB Size

Sets the size of the linear frame buffer. The options are Disabled, 1 MB, 2 MB, and 4 MB. The default is Disabled. If this is set to anything other than Disabled, the ISA LFB Base Address field will appear.

ISA LFB Base Address

Reports the base address of the LFB. There are no options. This field will not appear if the ISA LFB Size is set to Disabled.

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 Enabled and Disabled. The default is Disabled.

Latency Timer (PCI Clocks)

Sets the length of time an agent on the PCI bus can hold the bus when another agent has requested the bus. Valid numbers are between 0 and 256. The default is 66.

ECC Support

Reports the presence or absence of ECC support. If parity SIMMs are installed on the system board, the field reports Detected and ECC is enabled. If non-parity SIMMs are installed, the fields reports Not Detected and ECC is not enabled. This field is information only; there are no options.

Plug and Play Configuration Subscreen

This section describes the options found on the Plug and Play configuration subscreen.

Configuration Mode

Sets how the BIOS gets information about ISA cards that do not have Plug and Play capabilities. The options are Use Setup Utility and Use ICU (ISA Configuration Utility). The default is Use Setup Utility.

If Use ICU is selected, the BIOS will depend on run-time software to ensure that there are no conflicts between ISA boards with Plug and Play capabilities and those without. Only Boot With PnP OS will be visible.

Boot with PnP OS

Enables the PC to boot with an operating system capable of managing Plug and Play add-in cards. The options are None, Other, and Windows 95. The default is Windows 95.

ISA Shared Memory Size

Enables you to specify a range of memory addresses that will be directed to the ISA bus rather than on-board memory. The options are Disabled, 16 KB, 32 KB, 48 KB, 64 KB, 80 KB, and 96 KB. The default is Disabled. If this is set to Disabled, the ISA Shared Memory Base Address (described below) will not be visible.

This field should be set to Enabled only when a non Plug and Play ISA card (legacy card) that requires non-ROM memory space is used. LAN cards that have on-board memory buffers are one example of this; video capture cards that have video buffer memory are another.

By default, allocation of upper memory is as follows: memory from C0000-C7FFF is automatically shadowed. (This memory range is typically reserved for video BIOS.) Memory from C8000-DFFFFh is initially unshadowed. The BIOS scans this range for any ISA expansion card BIOSes that may be present and notes their location and size. The BIOS will then autoconfigure 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 expansion 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 expansion card. The ISA Shared Memory Size parameter signifies the autoconfigure routine that this block of memory is reserved and should not be shadowed.

Shadowing is a technique that copies a block of memory from an add-in card's ROM to the same address in system DRAM memory. This provides faster access and achieves higher performance.

ISA Shared Memory Base Address

Sets the base address for the ISA Shared Memory. The options are C8000h, CC000h, D0000h, D4000h, D8000h, and DC000h. The default is C8000h. This setting could affect the ISA Shared Memory Size item. The value entered in the ISA Shared Memory Size item cannot extend to the E0000h address. For example, if a size of 64K was selected, options D4000h, D8000h, and DC000h will not be available.

IRQ 5, 9, 10, 11

Sets the status of the IRQ. The options are Available and Used By ISA Card. The default is Available. The PCI auto-configuration code looks here to see if these interrupts are available for use by a PCI add-in board. If an interrupt is available, the PCI auto-configuration code can assign the interrupt to be used by the system. If your system contains an ISA add-in card that uses one of these interrupts, select Used By ISA Card for that interrupt.

NOTE

IRQs 5, 9, 10, and 11 are the default user available IRQs. Depending on your configuration, this screen might show more interrupts than those listed here. If you have disabled the parallel port or either of the serial ports, or have not installed a PS/2 mouse, more IRQs will be available. See Chapter 5 for information on reserved and available IRQs.

Security Screen

This section describes the two access modes that can be set using the options found on the Security screen, and then describes the Security screen options themselves.

Administrative and User Access Modes

The options on the Security screen menu make it possible to restrict access to the Setup program by enabling you to set passwords for two different access modes: Administrative mode and User mode.

In general, Administrative mode has full access to the Setup options, whereas User mode has restricted access to the options. Thus, by setting separate Administrative and User passwords, a system administrator can limit who can change critical Setup values. The actual limitations depend on

whether either the Administrative or User passwords or both are set. (See the table below for a description of how the passwords actually work together.)

To limit access to who can boot the system, set the User password. This is the password that the system asks for before booting. If only the Administrative password is set, the system boots up without asking for a password. If both passwords are set, you can enter either password to boot the system.

The following table shows the effects of setting the Administrative and User passwords. (The table is for reference only, and is not shown on the Security screen.) In the table, the statement “Can change a limited number of options” means you can change the system date and time, the User password, the security hot key, and unattended start.

Administrative and User Password Functions

Password Set	Administrative mode can . . .	User mode can . . .	Password Required During Boot
Neither	Can change all options*	Can change all options*	None
Administrative only	Can change all options	Can change a limited number of options	None
User only	N/A	Can change all options	User
Both	Can change all options	Can change a limited number of options	Administrative or User

* If no password is set, any user can change all Setup options.

Security Screen Options

User Password is

Reports if there is a User password set. There are no options.

Administrative Password is

Reports if there is an Administrative password set. There are no options.

Set User 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.

Unattended Start

Controls when the security password is requested. The options are Enabled and Disabled. The default is Disabled. The User password must be enabled before you can enable this option. If Enabled is selected, the system 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 the different ways to exit and save or not save changes made in the Setup program.

Exit Saving Changes

Saves the changes to CMOS RAM and exits the Setup program. You can also press the <F10> key anywhere in the Setup program to do this.

Exit Discarding Changes

Exits the Setup program without saving any changes. This means that any changes made while in the Setup program are discarded and **NOT SAVED**. Pressing the <Esc> key in any of the four main screens will do this.

Load Setup Defaults

Resets all of the setup options to their defaults. You can also press the <F5> key anywhere in the Setup program to do this.

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

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 do this.

This selection loads the CMOS RAM values that were present when the system was turned on.

Installing & Configuring Motherboard Options

This chapter describes the following:

- Jumper block locations and functions
- Procedures to remove and install optional components
- Information about replacing the battery

Before You Begin

- Be sure to do each procedure in the correct order.
- Set up an equipment log to record the system model and serial numbers, all installed options, and other information about the system. If you need this information, it will be easier to consult the log than to open up and examine the system.
- You will need a medium flat-bladed screwdriver and a jumper removal tool, such as a pair of fine needle-nosed pliers. We recommend that you use an antistatic wrist strap and a conductive foam pad when working on the board.

WARNING

The procedures in this chapter assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.

Disconnect the system from its power source and from any telecommunications links, networks or modems before doing any of the procedures described in this chapter. Failure to disconnect power, telecommunications links, networks or modems before you open the system or do any procedures can result in personal injury or equipment damage. Some circuitry on the system board may continue to operate even though the front panel power button is off.

CAUTION

Electrostatic discharge (ESD) can damage components. Do the procedures described in this chapter only at an ESD workstation. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis.

Add-in boards can be extremely sensitive to ESD and always require careful handling. After removing the board from its protective wrapper or from the system, place the board flat on a grounded, static-free surface, component-side up. Use a conductive foam pad if available, but not the board wrapper. Do not slide the board over any surface.

Jumper Block Overview

The motherboard contains configuration jumpers that make it possible to change the system configuration. For instance, you can prevent access to the system Setup program by moving a jumper. If you forget your system password, you can clear the password by moving a jumper. The

system has been properly configured at the factory. Normally, the only time you will ever change a jumper is if you need to:

- Change the system operating speed
- Clear the User or Administrator password
- Reset the CMOS RAM settings to the default values
- Disable or enable access to the Setup program
- Upgrade the BIOS
- Recover from a corrupted BIOS during a BIOS upgrade

Figure 2 shows the location of the jumper blocks on the system board. Descriptions of how to change the jumpers follow Figure 2.

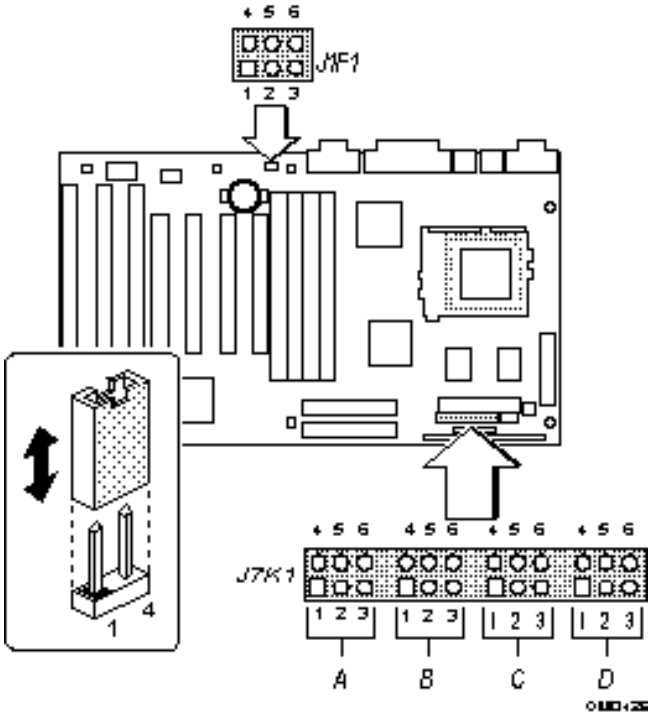
CAUTION

Do not squeeze the pliers or other tool you use to remove a jumper, or you might bend or break the pins.

NOTE

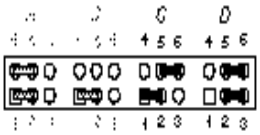
A jumper is a small plastic-encased conductor that slips over jumper pins, as shown in Figure 2. To change a jumper setting, use a pair of fine needle-nosed pliers to remove the jumper from its current location and slide it onto the new pins to obtain the desired setting.

Figure 2. Jumper Block Locations



CPU / Bus Speed / Clock Ratio Jumpers

These jumpers set the CPU, PCI, and ISA bus frequencies and the clock ratio. The jumpers should be changed only when you upgrade the CPU.

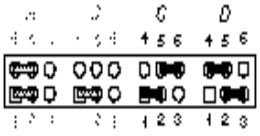


166 MHz CPU

66 MHz Host Bus Freq.

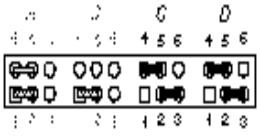
150 MHz CPU

60 MHz Host Bus Freq.



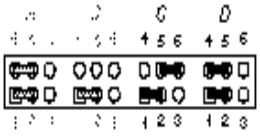
133 MHz CPU

66 MHz Host Bus Freq.



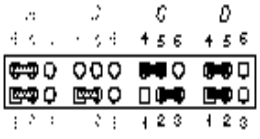
120 MHz CPU

60 MHz Host Bus Freq.



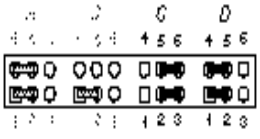
100 MHz CPU

66 MHz Host Bus Freq.



90 MHz CPU

60 MHz Host Bus Freq.



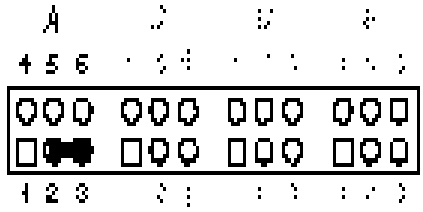
75 MHz CPU

50 MHz Host Bus Freq.

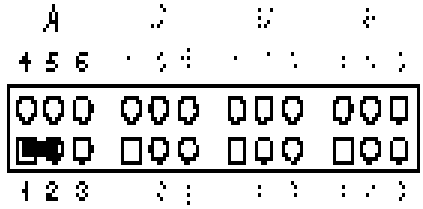
How to Clear the User Password

This procedure should only be done if the user password has been forgotten.

1. Turn off power and remove the system cover.
2. Move the jumper on J7K1-A from pins 1-2 to pins 2-3.



3. Turn on power and allow the system to boot.
4. Turn off power.
5. Move the jumper back to pins 1-2.



6. Replace the system cover and turn the power back on.

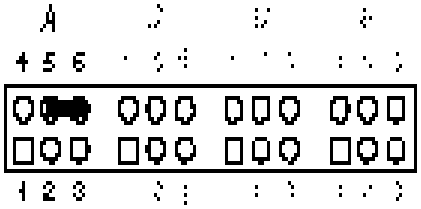
How to Clear CMOS RAM

This procedure should be done after the system BIOS is updated.

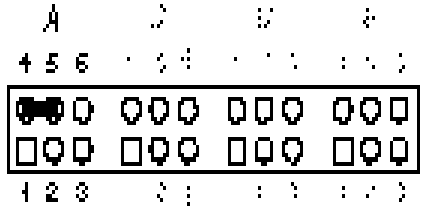
CAUTION

Do not use this procedure if your system is running Windows 95. Clearing CMOS RAM after a BIOS upgrade erases the Plug and Play data in the CMOS RAM. To clear CMOS RAM on a Windows 95 system, press the <F5> key from anywhere in the Setup program. This resets all Setup options to their defaults. See Chapter 2 for information on the Setup program.

1. Turn off power and remove the system cover.
2. Move the jumper on J7K1-A from pins 4-5 to pins 5-6.



3. Turn on power and allow the system to boot.
4. Turn off power.
5. Move the jumper back to the default position shown below to restore normal operation.

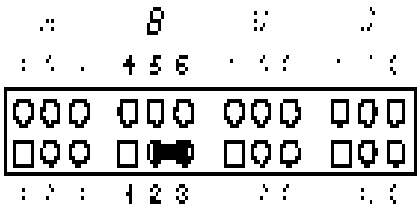


6. Replace the system cover and turn the power back on.

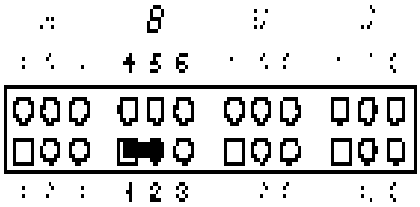
How to Disable Access to the Setup Program

To prevent access to the Setup program, do the following:

1. Turn off power and remove the system cover.
2. Move the jumper to the position shown below.



3. Replace the system cover and turn power back on.
4. To enable access to the setup program, move the jumper to the position shown below.



Recovery Boot Enable and Program Boot Block Enable Jumpers (J1F1)

Figure 2 shows the location of the Program Boot Block Enable and the Recovery Boot Enable jumpers (J1F1). Pins 1,2,3 of J1F1 are for the Recovery Boot Enable jumper. Pins 4,5,6 of J1F1 are for the Program Boot Block Enable jumper. Appendix A tells how to upgrade the BIOS and how to use the Recovery Boot Enable jumper

CAUTION

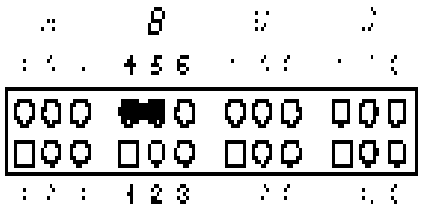
Do not change the Program Boot Block Enable jumper (pins 4-6) from its factory default position. Changing the setting of this jumper and then attempting to upgrade the BIOS could result in damage to the BIOS.

VRE/OVD (J7K1-B, Pins 4,5,6)

This jumper block changes the output of the on-board voltage regulator. Do not change this jumper unless you are changing to a new processor type.

Pins 4-5 should be jumpered for processors that require the VRE specification. To set the jumper for the VRE setting, do the following:

1. Turn off power and remove the system cover.
2. Move the jumper J7K1-B to the VRE setting as shown.

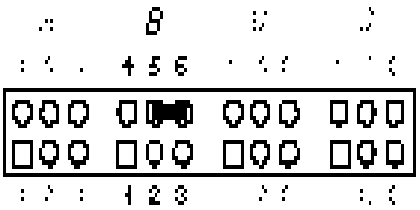


3. Replace the system cover and turn power back on.

If you install an OverDrive processor, set this jumper to pins 5-6 (OVD setting).

To set the jumper for the OVD setting, do the following:

1. Turn off power and remove the system cover.
2. Move the jumper J7K1-B to the OVD setting as shown.



3. Replace the system cover and turn power back on.

Installing an OverDrive® Processor

This section tells how to install an OverDrive processor upgrade. The OverDrive processor comes with a heat sink and fan mounted on top.

Installing the Upgrade

To install the upgrade, do the following:

1. Observe the precautions in "Before You Begin." We recommend you take the following steps to reduce the risk of electronic discharge damage to the processor and system board components:
   - Touch the metal chassis before touching the processor or system board. Keep part of your body in contact with the metal chassis to dissipate the static charge while handling the processor.
   - Avoid moving around needlessly.
2. Turn off all peripheral devices connected to the system, and turn off the system.

WARNING

The microprocessor and heat sink will be hot if the system has been running. To avoid the possibility of a burn, if the system has been running let the processor and heat sink cool for 10 minutes before continuing with this procedure.

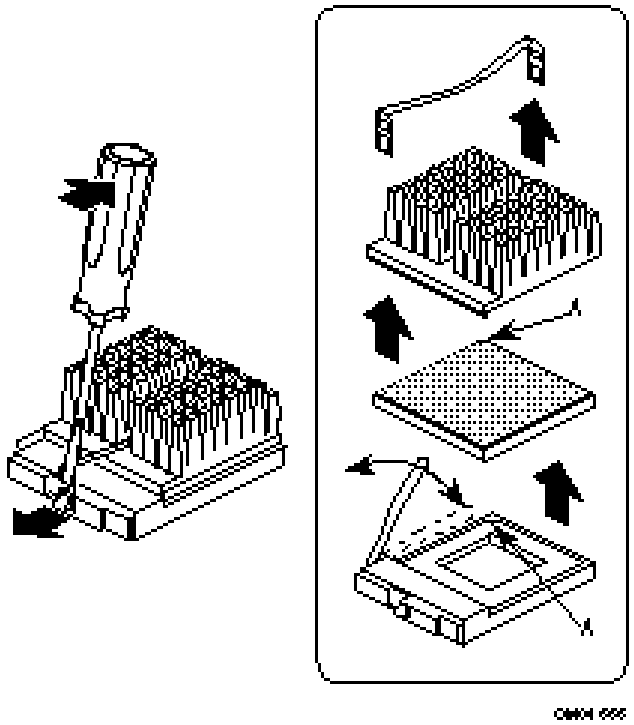
3. Set the VRE/OVD jumper to the OVD position, as described under "VRE/OVD" earlier in this chapter.
4. Figure 1 shows the location of the processor socket. You must first remove the clamp over the heat sink and CPU. Insert a small flat-bladed screwdriver into the slot on the end of the clamp. Release the clamp by pushing outward on the blade of the screwdriver as shown in Figure 3. As you move the clamp away from the socket, ease the clamp up and away from the processor and heat sink. When you remove the clamp, the heat sink will slide off the CPU.

CAUTION

When you remove the CPU clamp, avoid scraping the clamp against any system board components.

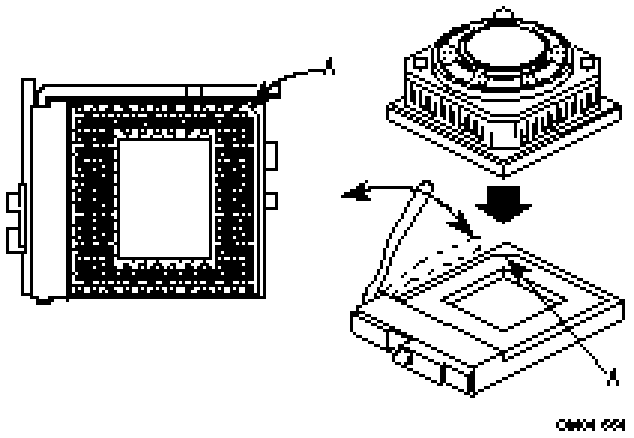
4. Push the lever on the processor socket down and out until it pulls up freely. Lift the lever until it stands straight up. Remove the processor from the socket. Do not touch or bend the pins.
5. Place the processor in a piece of conductive foam and store it in an antistatic package.

Figure 3. Removing the Spring Clamp and CPU



6. Remove the upgrade processor from its antistatic package; do not touch or bend the pins.
7. With the processor in place, lower it gently, being careful not to bend the pins. Push the lever on the ZIF socket forward until it snaps into place.
8. If the upgrade processor has a fan power cord, attach the cord to the CPU fan connector.
9. If for any reason you need to reinstall the original processor, do steps 1 through 8 above.

Figure 4. Installing a Processor Upgrade



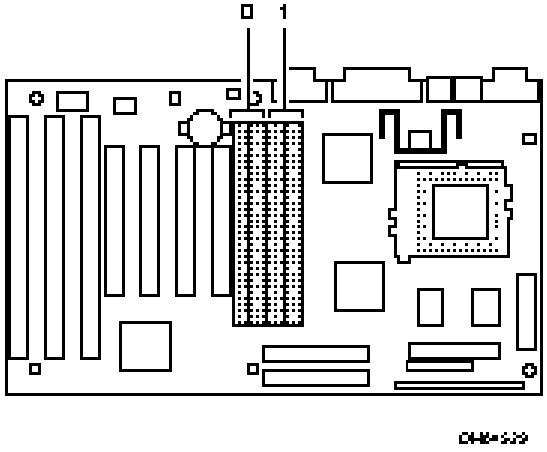
Installing SIMMs

The system board contains four 72-pin, tin lead SIMM sockets. You can configure the system memory from 8 MB to 128 MB. The sockets are arranged as banks 0 and 1 (Figure 5). Two sockets make up one bank.

When adding memory, follow these guidelines:

- When you install SIMMs, you must completely fill at least one bank; that is, you must install SIMMs in both sockets of at least one 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.
- All SIMMs in one bank must be the same size. For example, don't 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, however, use different size SIMMs between banks.
- When adding SIMMs, use only tin lead,
  72-pin, 70 ns fast page SIMMs or, for optimum performance, 60 ns EDO DRAM. If the maximum external CPU clock speed is 60 MHz or slower, 70 ns EDO DRAM may be used. Either parity or non-parity SIMMs are supported. ECC SIMMs are also supported.

Figure 5. Location of SIMM Sockets



The types of SIMMs that can be installed are listed in Table 1. Table 2 lists the possible combinations of SIMM types and the resulting amount of system memory.

Table 1. Supported SIMM Sizes

Total Memory Size of SIMM	SIMM configuration (without parity)	SIMM configuration (with parity)
4 Mbytes	1M x 32	1M x 36
8 Mbytes	2M x 32	2M x 36
16 Mbytes	4M x 32	4M x 36
32 Mbytes	8M x 32	8M x 36

NOTES

The board supports parity (x 36) or non-parity (x32) SIMMs. Error checking and correction (ECC) is supported with parity SIMMs. There is no ECC with non-parity SIMMs.

All SIMM socket sites must contain the same size SIMMs.

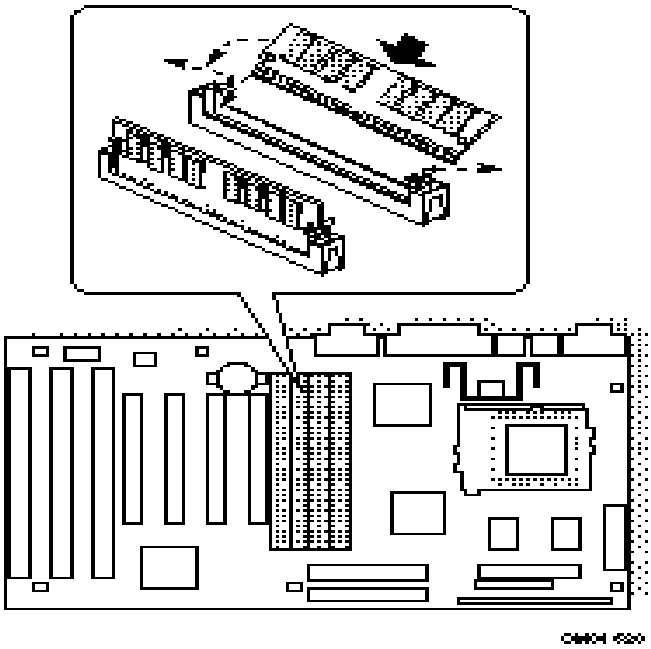
Table 2. Memory Options for SIMM Sockets

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

To install SIMMs, do the following procedure:

1. Holding the SIMM only by the edges, remove it from its antistatic package.
2. Position the SIMM at about a 45° angle relative to the system board. Make sure the small notch in the middle of the bottom edge of the SIMM aligns with the notch in the SIMM socket.
3. Insert the bottom edge of the SIMM into the SIMM socket and make sure it is seated firmly.
4. 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 (Figure 6). 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.

Figure 6. Installing a 72-Pin SIMM



Removing SIMMs

To remove a SIMM, do the following:

1. Observe the precautions in "Before You Begin."
2. Turn off all peripheral devices connected to the system.
3. Turn off the system.
4. To gain access to the SIMM sockets, remove the system cover.
5. Gently spread the retaining clip at each end of the SIMM, just enough to allow you to rotate the top edge of the SIMM downward to an angle of about 45°.
6. Holding the SIMM only by the edges, lift it away from the socket, and store it in an antistatic package.
7. Reinstall and reconnect any parts you removed or disconnected to gain access to the SIMM sockets.

Replacing the Battery

A lithium battery, installed in a socket on the system board, provides power for the real-time clock and CMOS RAM. Figure 1 shows the location of the battery.

The battery has an estimated life expectancy of three years. When the battery starts to weaken, it loses voltage; when the voltage drops below a certain level, the system settings stored in CMOS RAM (for example, the date and time) may be wrong. If the battery fails, replace it with an equivalent battery.

As long as local ordinance permits, you may dispose of individual batteries as normal trash. Do not expose batteries to excessive heat or fire. Keep all batteries away from children.

CAUTION

Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

ATTENTION

Il y a danger d'explosion s'li y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du méme type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Lithiumbatteri - Eksplosjonsfare. Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten. Brukt batteri returneres apparatleverandøren.

VARNING

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

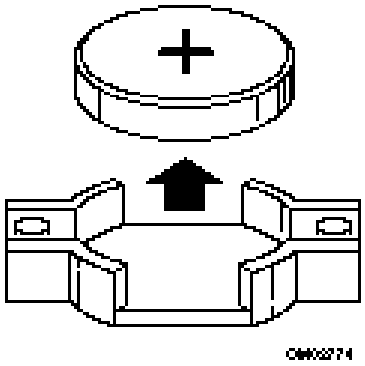
VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käjtetty paristo valmistajan ohjeiden mukaisesti.

To replace the battery, do the following:

1. Observe the precautions in "Before You Begin."
2. Turn off all peripheral devices connected to the system.
3. Turn off the system.
4. Remove any components that are blocking access to the battery.
5. Figure 1 shows the battery location. Gently pry the battery free from its socket, taking care to note the "+" and "-" orientation of the battery (Figure 7).
6. Install the new battery in the socket.

Figure 7. Replacing the Battery



Error and Information Messages

Beep Codes

Beeps	Error Message	Description
1	Refresh Failure	The memory refresh circuitry on the motherboard is faulty.
3	Base 64 KB Memory Failure	Memory failure in the first 64 KB.
4	Timer Not Operational	Memory failure in the first 64 KB of memory, or Timer 1 on the motherboard is not functioning.
5	Processor Error	The CPU generated an error.
6	8042 - Gate A20 Failure	The keyboard controller may be bad. The BIOS cannot switch to protected mode.
7	Processor Exception Interrupt Error	The CPU 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	The 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.
11	Cache Error	The cache is faulty.

Error Messages

Error Message	Explanation
Address Line Short!	Error in the address decoding circuitry on the motherboard.
Cache Memory Failure, Do Not Enable Cache!	Cache memory is defective; the CPU has failed. Call for service.
CMOS Battery Failed	CMOS RAM is powered by a battery. The battery power is low. Replace the battery.

CMOS Checksum Invalid	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 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 Controller Error	Error in the DMA Controller.
Drive Not Ready Error	The BIOS cannot access the floppy drive. Check all the appropriate connections after the system is powered down.
Floppy Disk Controller Failure	The BIOS cannot communicate with the floppy disk drive controller. Check all appropriate connections after the system is powered down.
Floppy Drive A: Failure	The BIOS cannot access Drive A:. Check all the appropriate connections after the system is powered down.
Floppy Drive B: Failure	The BIOS cannot access Drive B:. Check all the appropriate connections after the system is powered down.
Gate - A20 Error	Gate A20 on the keyboard controller is not working. Call for service.
Invalid Boot Diskette	The BIOS can read the disk in floppy drive A:, but cannot boot the system. Use another boot disk.
Keyboard Controller Error	The keyboard controller has failed during POST.
Keyboard is Locked ...Please Unlock It	Some systems have an electronic key that enables the user to lock the keyboard.
Keyboard Stuck Key Detected	There is a key pressed down.
Master DMA Controller Error	Error in the master DMA channel.
Master Interrupt Controller Error	Master Interrupt Controller failed during POST.
Memory Size Decreased	The amount of memory on the system board is less than the amount in CMOS RAM. Check for mismatched SIMM sizes. (All SIMMs must be the same size.) Run Setup.

Off Board Parity Error	Parity error in memory installed in an expansion slot. The format is: OFF BOARD PARITY ERROR ADDR (HEX) = (XXXX) XXXX is the hex address where the error occurred.
Slave DMA Controller Error	Error in the slave DMA channel.
Slave Interrupt Controller Error	Slave Interrupt Controller failed during POST.
System Memory Size Mismatch	The amount of memory on the system board is different than the amount in CMOS RAM. Check for mismatched SIMM sizes. (All SIMMs must be the same size.) Run Setup.
Timer Channel 2 Error	Most systems include two timers. There is an error in timer 2.

PCI Configuration Status and 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 “Clear CMOS” 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.

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, or CD-ROM drive) 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 Board Device Resource Conflict	A non Plug and Play ISA card has requested a resource that is already in use.

Technical Reference

Environmental

Table 3. Environmental Specifications

Parameter	Specification
Temperature	
Non-operating	-40°C to +70°C
Operating	+0°C to +55°C
Vibration	
Unpackaged	5 Hz to 20 Hz : 0.01g² Hz sloping up to 0.02 g² Hz
	20 Hz to 500 Hz : 0.02g² Hz (flat)
Packaged	10 Hz to 40 Hz : 0.015g² Hz (flat)
	40 Hz to 500 Hz : 0.015g² Hz sloping down to 0.00015 g² Hz

Power Consumption

Tables 3 and 4 list the voltage and current specifications for a hypothetical system configured with the motherboard and the following components: a 133 MHz Pentium Processor, 8 MB RAM, 256 KB cache, 3.5-inch floppy drive, 540 MB hard drive. This information is preliminary and is provided only as a guide for calculating **approximate** total system power usage with additional resources added.

Table 4. DC Voltage

DC Voltage	Acceptable Tolerance
+5V	+/- 5%
+5V SB (stand by)	+/- 5%
-5V	+/- 5%
+12V	+/- 5%
-12V	+/- 5%

Table 5. Power Useage

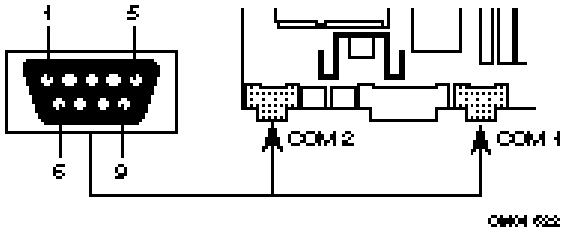
		DC (MA)			
	AC (watts)	+5 V	-5 V	+12 V	-12 V
No APM enabled					
DOS prompt	35	980	0	200	30
APM enabled					

DOS prompt	20				

* (measured with 8 MB DRAM, ISA video, keyboard, 256kb L2, (1) IDE and (1) Floppy drive while sitting at DOS prompt :)

Connector Pinouts

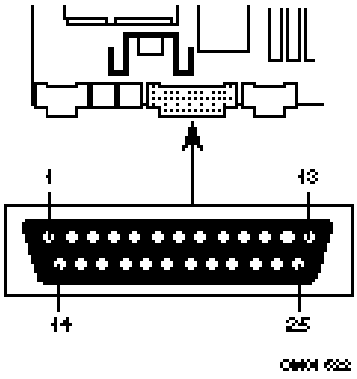
Serial Port Connectors



Serial Port Connector Pinout

Pin	Signal Name
1	DCD
2	Serial In - (SIN)
3	Serial Out - (SOUT)
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

Parallel Port Connector

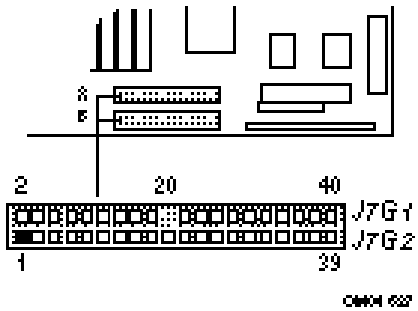


Parallel Port Connector Pinout

Pin	Signal Name	Pin	Signal Name
1	Strobe-	14	Auto Feed--
2	Data Bit 0	15	Fault*
3	Data Bit 1	16	INIT*
4	Data Bit 2	17	SLCT IN*

5	Data Bit 3	18	Ground
6	Data Bit 4	19	Ground
7	Data Bit 5	20	Ground
8	Data Bit 6	21	Ground
9	Data Bit 7	22	Ground
10	ACK*	23	Ground
11	Busy	24	Ground
12	Paper end	25	Ground
13	SLCT		

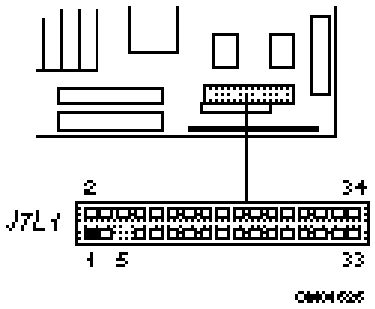
IDE Connector



IDE Connector Pinout

Pin	Signal Name	Pin	Signal Name
1	Reset IDE	2	Ground
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	Ground	20	Key
21	DRQ3	22	Ground
23	I/O Write-	24	Ground
25	I/O Read-	26	Ground
27	IOCHRDY	28	BALE
29	DACK3-	30	Ground
31	IRQ14	32	IOCS16-
33	Addr 1	34	Ground
35	Addr 0	32	Addr 2
37	Chip Select 0-	38	Chip Select 1-
39	Activity	40	Ground

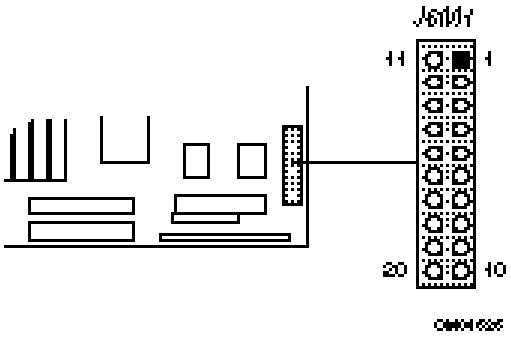
Diskette Drive Connector



Diskette Drive Connector Pinout

Pin	Signal Name	Pin	Signal Name
1	Ground	2	FDHDIN
3	Ground	4	Reserved
5	Key	6	FDEDIN
7	Ground	8	Index-
9	Ground	10	Motor Enable A-
11	Ground	12	Drive Select B-
13	Ground	14	Drive Select A-
15	Ground	16	Motor Enable B-
17	Ground	18	DIR-
19	Ground	20	STEP-
21	Ground	22	Write Data-
23	Ground	24	Write Gate-
25	Ground	26	Track 00-
27	Ground	28	Write Protect-
29	Ground	30	Read Data-
31	Ground	32	Side 1 Select-
33	Ground	34	Diskette Change-

Power Connector

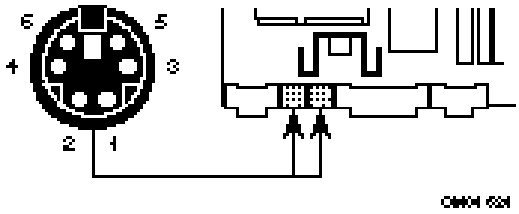


Power Connector Pinout

Pin	Name	Function
1	3.3V	3.3V

2	3.3V	3.3V
3	GND	Ground
4	+5 V	+ 5 volts Vcc
5	GND	Ground
6	+5 V	+ 5 volts Vcc
7	GND	Ground
8	PWRGD	Power Good
9	5VSB	standby 5v
10	+12 V	+ 12 volts
11	3.3V	3.3V
12	-12 V	- 12 volts
13	GND	Ground
14	PS_ON*	soft-off control
15	GND	Ground
16	GND	Ground
17	GND	Ground
18	-5 V	- 5 volts
19	+5 V	+ 5 volts Vcc
20	+5 V	+ 5 volts Vcc

Keyboard and Mouse Connectors

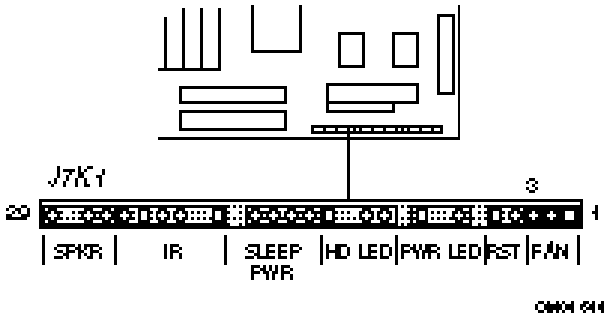


Keyboard and Mouse Connector Pinouts

Pin	Signal Name
1	Data
2	No connect
3	Ground
4	+5 V (fused)
5	Clock
6	No Connect

CPU Fan Connector

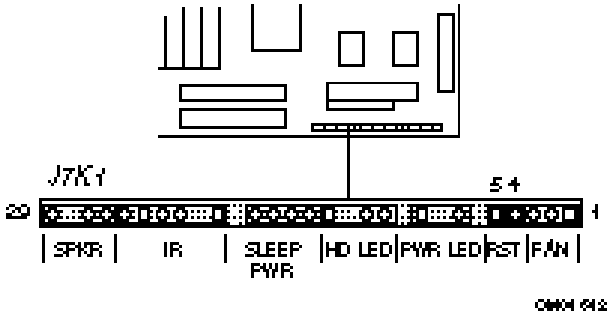
Connector on the end of the wires attached to the system board.



CPU Fan Connector Pinout

Pin	Signal Name
1	Ground
2	+12 V
3	Ground

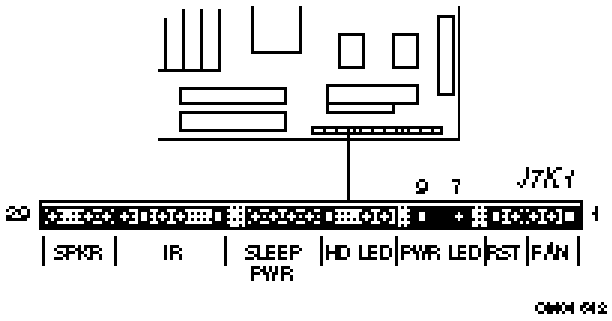
Reset Connector



Reset Connector Pinout

Pin	Signal Name
4	Ground
5	SW_RST

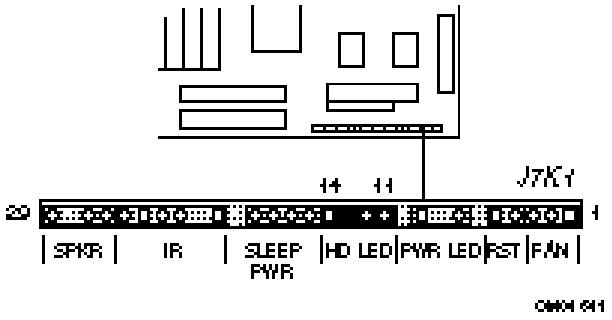
Power LED Connector



Power LED Connector Pinout

Pin	Signal Name
7	+5 V
8	+5 V
9	PWR_LED_DRV
10	PWR_LED_DRV

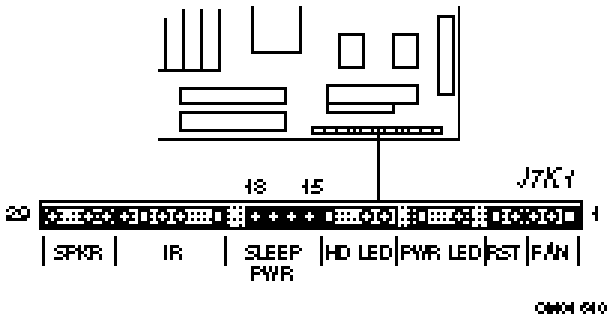
Hard Drive LED Connector



Hard Drive LED Connector Pinout

Pin	Signal Name
11	+5 V
12	HDA*
13	PWR_LED_DRV
14	+5 V

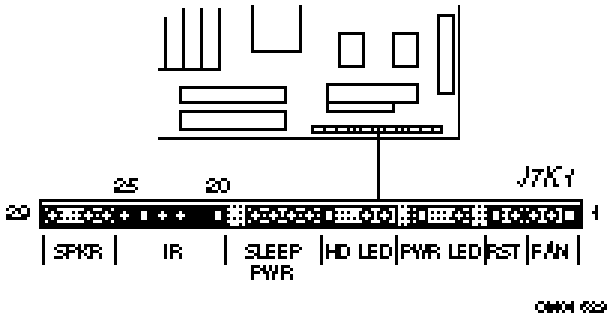
Sleep Power Connector



Sleep/Power Connector Pinout

Pin	Signal Name
15	SW_ON*
16	Ground
17	COMATOSE *
18	+5 V

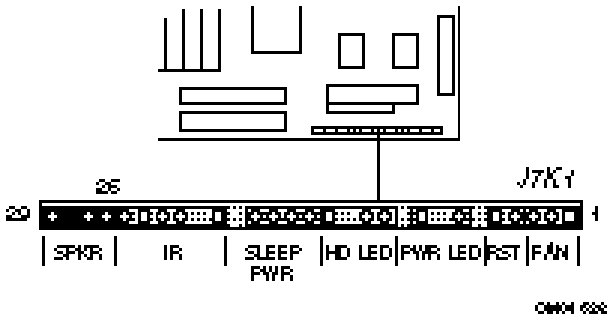
Infrared Connector



Infrared Connector Pinout

Pin	Signal Name
20	+5 V
21	no connect
22	IRRX
23	Ground
24	IRTX
25	no connect

Speaker Connector



Speaker Connector Pinout

Pin	Signal Name
26	SPKR_DAT
27	SPKR_DAT
28	Key
29	Ground

Regulatory Compliance

This printed circuit assembly complies with the following safety and EMI regulations when correctly installed in a compatible host system.

Safety

UL 1950 - CSA 950-95, 3rd edition
Dated 3-28-95

The Standard for Safety of Information Technology Equipment including Electrical Business Equipment. (USA & Canada).

CSA C22.2 No. 950-93, 3rd Edition

The Standard for Safety of Information Technology Equipment including Electrical Business Equipment. (Canada)

EN 60 950, 2nd Edition, 1992 (with Amendments. 1, 2 & 3)

The Standard for Safety of Information Technology Equipment including Electrical Business Equipment. (European Union)

IEC 950, 2nd edition, 1991
(with Amendments 1, 2 & 3)

The Standard for Safety of Information Technology Equipment including Electrical Business Equipment. (International)

EMKO-TSE (74-SEC) 207/94

Summary of Nordic deviations to EN 60 950. (Norway, Sweden, Denmark & Finland)

EMI

FCC Class B

Title 47 of the Code of Federal Regulations, Parts 2 & 15, Subpart B, pertaining to unintentional radiators. (USA)

CISPR 22, 2nd Edition, 1993

Limits and methods of measurement of Radio Interference Characteristics of Information Technology Equipment. (International)

EN 55 022, 1995

Limits and methods of measurement of Radio Interference Characteristics of Information Technology Equipment. (Europe)

EN 50 082-1 (1992)

Generic Immunity Standard; Currently compliance is determined via testing to IEC 801-2, -3 and -4. (Europe)

VCCI Class 2 (ITE)

Implementation Regulations for Voluntary Control of Radio Interference by Data Processing Equipment and Electronic Office Machines. (Japan)

ICES-003, Issue 2

Interference-Causing Equipment Standard, Digital Appartus. (Canada)

Product Certification Markings

This printed circuit assembly has the following product certification markings:

- European CE Marking
  - Marking on the board or shipping container.
- UL Recognition Mark
  - UL Recognition Marking consists of the UL File No. E139761 on the component side of the board and the PBA No. on the solder side of the board. Board material flammability is 94V-1 or -0.
- Canadian Compliance
  - Marking consists of small c followed by a stylized backward UR on component side of board.

Follow Installation Instructions

CAUTION

To maintain compliance with safety and regulatory requirement, when installing this board assembly, follow these guidelines.

Be sure to read and adhere to all of these instructions, and the instructions supplied with the host system and associated modules. If the instructions of the host system appear to be incompatible with these instructions or the instructions of any associated modules, contact the suppliers' technical support organizations for the products involved to determine the appropriate action for continued safety and regulatory compliance of the resultant system. Failure to read and follow instructions provided by host system and module suppliers may result in increased safety risk and non-compliance with regional laws and regulations.

Assure Host System Compatibility

For electromagnetic compatibility, the host system enclosure and power supply should have passed electromagnetic compatibility testing using a board with a microprocessor from the same family as the microprocessor on this board, and which operated at the same or higher microprocessor speed.

Also, pay particular attention to the installation instructions of the host system and other modules, particularly concerning certifications, external I/O cable shielding and filtering, mounting, grounding and bonding requirements to assure appropriate shielding effectiveness. Otherwise electromagnetic compatibility testing must be repeated on a representative sample of the complete system.

For safety, if mismating of connectors could result in a hazard, assure that all connectors are sufficiently keyed to prevent mismating.

Use Only for Intended Applications

This product was evaluated for use in systems that will be installed in offices, homes, schools, computer rooms or similar applications. Other applications, such as medical, industrial, alarm systems and test equipment may necessitate a re-evaluation of the product suitability.

Assure Host System and Accessory Certifications

Assure that the host system, any added subassembly, such as a board or drive assembly, and internal or external wiring, are properly certified for the region(s) the end-product will be used in. Proof of certification can be determined by the marks on the product. For example:

Europe

The CE Marking signifies compliance with all relevant European requirements. If the host system does not bear the CE Marking, obtain a supplier's Declaration of Conformity to the appropriate standards required by the European EMC Directive and Low Voltage Directive. Other Directives, such as the Machinery and Telecommunications Directives, may also apply depending on the type of product. No regulatory assessment is necessary for low voltage DC wiring used internally, or wiring used externally when provided with appropriate overcurrent protection. Appropriate protection is achieved by a max. 8 Amp current limiting circuit or a
max. 5 Amp fuse or Positive Temperature Coefficient Resistor (PTC). All Intel motherboards presently have PTC's on all external ports which provide DC power externally.

US

For safety, a certification mark by a Nationally Recognized Testing Laboratory (NRTL) such as UL, CSA or ETL. External wiring must be UL Listed and suitable for the use. Internal wiring must be UL Listed or Recognized and rated appropriately for the voltages and temperatures involved. For electromagnetic interference, the FCC mark: Class A for commercial or industrial only; or Class B for all applications other than described in Item 1.14.3.3 above.

Canada

For safety, a nationally recognized certification mark such as CSA or cUL. No regulatory assessment is necessary for low voltage DC wiring used internally, or wiring used externally when provided with appropriate overcurrent protection. Appropriate protection is achieved by max. 8 Amp current limiting circuit or a max. 5 Amp fuse or Positive Temperature Coefficient Resistor (PTC). All Intel motherboards presently have PTC's on all external ports which provide DC power externally.

Installation Precautions

During installation and initial test, use caution to avoid personal injury and damage to wiring due to sharp pins on connectors and printed circuit assemblies, rough chassis edges and corners, and hot components. Adhere to warnings and limitations regarding accessibility into areas designated only for authorized technical personnel.

Battery Marking

There is insufficient space on this board product to provide the required replacement and disposal instructions for the battery. The following Caution must be placed permanently and legibly on the host system as near as possible to the battery:

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace with only the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Overload Protection

Unless the power supply is provided with inherent overcurrent protection, use caution to avoid overloading the power supply output. This can be accomplished by assuring that the calculated total current load of all the modules within the system is less than the output current rating of the power supply. Failure to accomplish this could result in overheating in the power supply, which could result in a fire or could cause damage to insulation separating hazardous AC line circuitry from low-voltage user accessible circuitry. If the load drawn by a particular module cannot be determined by the markings and instructions supplied with the module, contact the module supplier's technical support organization.

Bios Update and Recovery

BIOS Update

The system BIOS resides on a flash component. You can upgrade a flash BIOS through software, without taking the system apart or replacing the flash component. This appendix tells how to upgrade your system BIOS from a diskette. The appendix also tells how to recover from an interrupted upgrade. Your service representative can provide you with the latest BIOS upgrade for your system.

Using the Upgrade Utility

1. Write down the Setup selections currently set on your system (Chapter 2).
2. Insert the upgrade diskette in your system's diskette drive.
3. Reboot the system.
4. When the flash upgrade menu appears, choose "Update Flash Memory Area from a file."
5. When the menu asks you to enter a path/filename, use the arrow keys to select the .bio file, and press <Enter>.
6. The utility asks for a confirmation that you want to load the new flash into memory. Select "Continue with Programming."
7. After the upgrade completes, remove the upgrade disk.
8. Reboot the system and start the Setup program. Press <F5> to reset the BIOS defaults. Then, use the copy of the Setup selections you made at the beginning of this procedure to set the options.

BIOS Recovery

It is unlikely that anything will interrupt the Flash upgrade process. However, if an interruption occurs that prevents continuing with the upgrade, it is possible the BIOS could be left in an unusable state. The steps below tell how to recover from this kind of problem.

NOTE

Because of the small amount of code available in the non-erasable boot block area, no video is available to direct the procedure. You must monitor the flash recovery by listening to the speaker.

1. Turn off power and remove the system cover.
2. Move the Recovery Boot Enable jumper from pins 1-2 to pins 2-3 (see Chapter 3 for the location of the jumper).
3. Install the bootable upgrade diskette into diskette drive A.
4. Reboot the system.
5. Listen to the speaker. You should hear beeps in the following sequence:
   a. After you reboot the system, the speaker beeps once. This beep marks the beginning of the power on self test (POST).
   b. After a short delay (less than 10 seconds), the speaker beeps again, but at a higher frequency. This marks the beginning of the recovery process. At this point, the system is copying the recovery code into the flash device.

c. After about 30 seconds, the speaker beeps twice (again at the higher frequency), marking the end of the recovery process.

6. Turn the system off.
7. Move the Recovery Boot Enable jumper back to pins 1-2.
8. Replace the system cover.
9. Leave the upgrade floppy in drive A, and turn the system on.
10. Continue with the original upgrade.