
Chapter 1

Overview

The AX53 is a high-performance Pentium[®]-based system board that utilizes the PCI/ISA architecture. It has four single in-line memory module (SIMM) sockets that allow memory expansion up to a maximum of 512 MB. It also comes either with 256-KB or 512-KB pipelined-burst cache.

To further enhance system performance, the board also integrates the Intel 430HX PCIset, a super I/O controller and a PCI mode 4 enhanced IDE controller with bus master support.

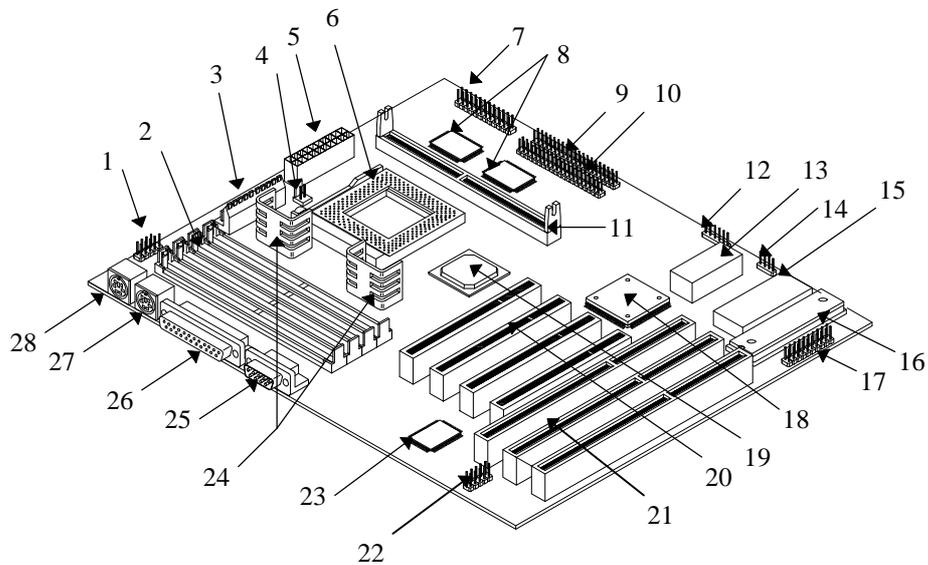
One main feature of AX53 is the green power-management function that extends energy conservation from system components to display monitor. It complies with the power-saving standards of the U.S. Environmental Protection Agency (EPA) Energy Star program.

The AX53 board measures 284 mm x 208 mm (11.2 in. x 8.2 in., mini-ATX form).

Overview

1.1 Board Layout

- | | | | |
|----|---|----|---|
| 1 | COM1 port connector | 16 | Keyboard controller |
| 2 | 72-pin SIMM sockets | 17 | Multifunction connector |
| 3 | PS/2 power connector | 18 | Intel 82371SB ASIC |
| 4 | Two-pin fan connector | 19 | Intel 82439HX ASIC |
| 5 | ATX power connector | 20 | PCI slots |
| 6 | CPU socket | 21 | ISA slots |
| 7 | Floppy drive connector | 22 | Universal Serial Bus (USB)
connector |
| 8 | Pipelined-burst cache | 23 | Super I/O controller |
| 9 | IDE1 connector | 24 | Voltage regulators with heatsink |
| 10 | IDE2 connector | 25 | COM2 port |
| 11 | COAST ¹ cache upgrade socket | 26 | Parallel port |
| 12 | IR connector | 27 | PS/2-mouse port |
| 13 | Real-time clock (RTC) | 28 | PS/2-keyboard port |
| 14 | HDD LED connector | | |
| 15 | System BIOS | | |



¹ Cache module type

1.2 Specifications

Microprocessor	Intel Pentium Processor P54C 75/90/100/120/133/150/166/200 MHz P55C 150/166/200 MHz Cyrix 6x86 series P120+, P133+, P150+ AMD K5 series PR75, PR90, PR100
Memory	512 MB (maximum)
SIMM Sockets	72-pin SIMM x 4
ASICs	Intel 430HX PCIset
Bus Architecture	ISA, PCI
Expansion Slots	Three ISA and four PCI slots
Connectors	One parallel connector (SPP/ECP/EPP) Two serial connectors (UART 16C550) Two dual-channel PCI mode 4 IDE connectors (bus master transfer support) One USB connector that supports two ports One floppy disk drive connector (360 KB/720 KB, 1.2 MB/1.44 MB/2.88 MB)
Secondary Cache	256-KB pipelined-burst cache, upgradable to a maximum of 512-KB via cache upgrade socket
BIOS	AMI Plug-and-Play Flash ROM BIOS
RTC & Battery	Dallas DS12887A
Board Size	284 mm x 108 mm (11.2 in. x 8.2 in.)

Overview

1.3 System Board Parts

1.3.1 Microprocessor

The AX53 system board supports Intel Pentium, AMD K5 and Cyrix 6x86 processors. Chapter 2 tells how to install and upgrade the processor.

1.3.2 ASICs

The application-specific integrated circuits (ASICs) are the Intel 82439HX and Intel 82371SB that belong to the Intel 430HX PCIset. This chipset allows the system to support a higher memory (512 MB) and a pipelined-burst cache. It also offers an error checking and correction (ECC) feature that enables the system to detect, as well as correct the DRAM errors.

The Intel 82439HX that comes in a unique ball-grid array (BGA) packaging, acts as the memory controller data path and the DRAM data bus buffer. The BGA packaging offers better stability than the regular quad-flat packaging (QFP).

The Intel 82371SB operates as the PCI/ISA bridge and IDE controller.

1.3.3 BIOS

The board supports the AMI basic input-output system (BIOS). The BIOS is a program that performs the power-on self test (POST) upon booting. During POST, this program activates the peripheral devices, tests onboard memory and prepares the system for operation. For more information on AMI BIOS, see Chapter 3.

1.3.4 Expansion Slots

The board has two ISA, three PCI and one PCI-/ISA-shared slots. The ISA expansion slots are the black parallel bars on the system board. The PCI slots are those with white color and are shorter than the ISA slots. There are rows of golden pins inside each slot that serve as a clutch to secure the contacts of the expansion board. For information on how to install the expansion boards, see Chapter 2.

1.3.5 DRAM Sockets

The system board has four 72-pin SIMM sockets that allow you to expand system memory to a maximum of 512 MB. These sockets accept both single-density and double-density SIMMs. Chapter 2 tells how to install memory modules and the different memory configurations available.

1.3.6 Second-level Cache

The AX53 motherboard may come with 256-KB or 512-KB pipelined-burst second-level cache. The board with 256-KB second-level cache also comes with a COAST cache upgrade socket. The cache upgrade socket enables you to upgrade cache to 512 KB.

The pipelined-burst cache improves system performance by shortening the DRAM read prefetch time resulting to a faster data transfer rate.

1.3.7 Dual-channel PCI Mode 4 Enhanced IDE Connectors

The AX53 board integrates two dual-channel PCI mode 4 enhanced integrated drive electronics (E-IDE) connectors that allow the system to support four E-IDE devices (including hard disks with more than 528-MB capacity). This feature offers users increased data storage capacity.

1.3.8 Super I/O Controller

The onboard super I/O controller accommodates the following:

- Two UART 16450/16550-compatible fast serial ports
- A parallel port with standard parallel port (SPP), enhanced parallel port (EPP) or extended capabilities port (ECP) support. Both the EPP and ECP comply with the IEEE 1284 standards.
- 3.5-inch floppy disk drives with 720-KB, 1.44-MB or 2.88-MB format.
- 5.25-inch floppy disk drives with 360-KB, 1.2-MB format

Overview

1.3.9 USB Connector

The onboard Universal Serial Bus (USB) connector enables AX53 to support additional peripheral devices. See Chapter 2 for more details.

1.3.10 Keyboard Port

The keyboard port allows you to connect any PS/2-compatible keyboard. See the board layout figure for the location of the keyboard port. Chapter 2 tells how to connect a PS/2 keyboard.

1.3.11 Mouse Port

The board supports a PS/2 mouse port. See Chapter 2 for details on how to connect a PS/2 mouse.

Chapter 2

Hardware Installation

This chapter gives you a step-by-step procedure on how to install your system. Follow each section accordingly.

2.1 ESD Precautions

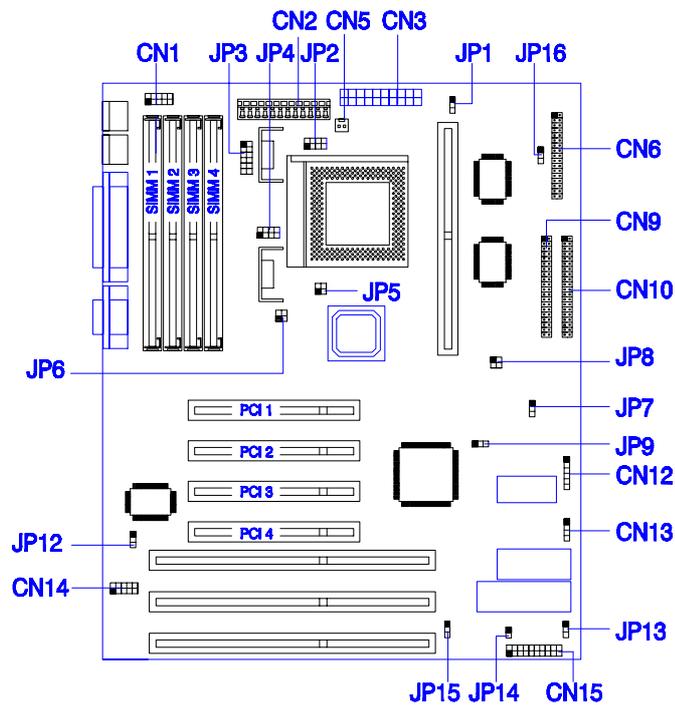
Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a system component.

1. Do not remove a component from its protective packaging until you are ready to install it.
2. Wear a wrist ground strap and attach it to a metal part of the system unit before handling a component. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.

Hardware Installation

2.2 Jumper and Connector Locations

The following figure shows the locations of the jumpers and connectors on the system board:



CN1: COM1 connector
CN2: Power connector
CN3: ATX power connector
CN5: Two-pin fan connector
CN6: Floppy drive connector
CN9: IDE2 connector

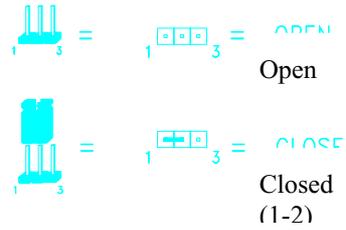
CN10: IDE1 connector
CN12: IR connector
CN13: HDD LED connector
CN14: USB connector
CN15: Multifunction connector

2.3 Setting the Jumper

Set a jumper as follows:

- To open a jumper, remove the jumper cap.
- To close a jumper, insert the plastic jumper cap over two pins of a jumper.

The conventions in the figure are used to represent the proper jumper settings.



Hardware Installation

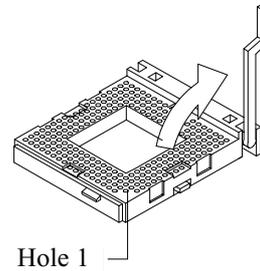
2.4 Installing a Microprocessor

The motherboard comes with a zero-insertion force (ZIF) microprocessor socket that allows you to install a CPU without using any tool. Follow these steps to install a CPU into a ZIF-type CPU socket:

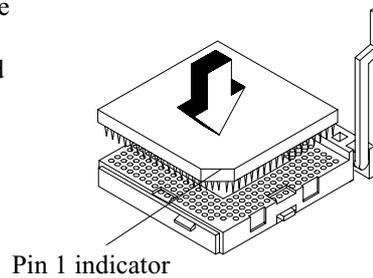


Make sure that the system power is OFF before installing a component.

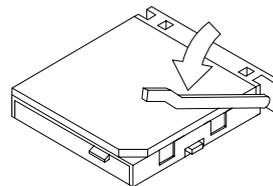
1. Locate the CPU socket on the system board and pull up the socket lever.



2. Gently insert the CPU. Make sure that pin 1 of the CPU aligns with hole 1 of the socket. The notched corner on the CPU indicates the location of pin 1.

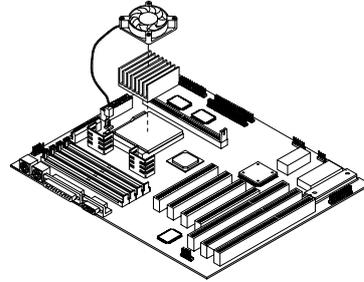


3. Pull down the socket lever to lock the CPU into the socket.

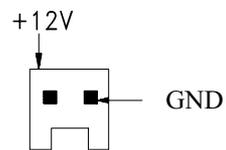


Hardware Installation

4. Attach the heatsink and fan to the CPU.



5. Plug the fan cable to the two-pin fan connector onboard. The fan connector is marked **CN5** on the system board.



Hardware Installation

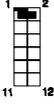
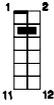
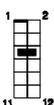
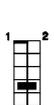
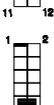
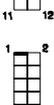
6. Set jumpers **JP2**, **JP3**, **JP4**, **JP5**, and **JP8** according to the CPU type and frequency in use.

Intel Pentium (P54C)	JP2	JP3	JP4	JP5	JP8		Cyrix 6x86	JP2	JP3	JP4	JP5	JP8
75MHz							120+					
90MHz							133+					
100MHz							150+					
120MHz												
133MHz (default)												
150MHz												
166MHz												
200MHz												
Intel Pentium (P55C)	JP2	JP3	JP4	JP5	JP8		AMD K5	JP2	JP3	JP4	JP5	JP8
150MHz							PR75					
166MHz							PR90					
200MHz							PR100					

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- If you are using a CPU that supports a different core voltage rating, reset jumper **JP3**. Refer to the figure for the correct jumper settings.

Voltage JP3

3.52V	
3.43V	
2.9V	
2.8V	
2.7V	
2.5V	
	

Hardware Installation

2.5 Upgrading the Microprocessor

To upgrade a CPU:

1. Turn off the system power and remove the housing cover.
2. Locate the CPU socket on the system board.
3. Pull up the socket lever.
4. Remove the installed CPU, if any.
5. Install the upgrade CPU. Refer to section 2.4 for instructions on how to install a CPU.

2.6 Configuring the System Memory

The system board has four 72-pin SIMM sockets that allow you to expand the system memory to 512 MB. The SIMM sockets accept single-density and double-density SIMMs with 60-ns or 70-ns DRAM speed. See the figure in section 2.2 for the location of the SIMM sockets.

The following table lists the possible SIMM configurations:

Memory Configurations

SIMM 1	SIMM 2	SIMM 3	SIMM 4	Total Memory
2 MB	2 MB			4 MB
2 MB	2 MB	2 MB	2 MB	8 MB
4 MB	4 MB			8 MB
2 MB	2 MB	4 MB	4 MB	12 MB
4 MB	4 MB	4 MB	4 MB	16 MB
8 MB	8 MB			16 MB
2 MB	2 MB	8 MB	8 MB	20 MB
4 MB	4 MB	8 MB	8 MB	24 MB
8 MB	8 MB	8 MB	8 MB	32 MB
16 MB	16 MB			32 MB
2 MB	2 MB	16 MB	16 MB	36 MB
4 MB	4 MB	16 MB	16 MB	40 MB
8 MB	8 MB	16 MB	16 MB	48 MB
16 MB	16 MB	16 MB	16 MB	64 MB
32 MB	32 MB			64 MB
2 MB	2 MB	32 MB	32 MB	68 MB
4 MB	4 MB	32 MB	32 MB	72 MB
8 MB	8 MB	32 MB	32 MB	80 MB
16 MB	16 MB	32 MB	32 MB	96 MB
32 MB	32 MB	32 MB	32 MB	128 MB
64 MB	64 MB			128 MB

Hardware Installation

Memory Configurations (continued)

SIMM 1	SIMM 2	SIMM 3	SIMM 4	Total Memory
4 MB	4 MB	64 MB	64 MB	136 MB
8 MB	8 MB	64 MB	64 MB	144 MB
16 MB	16 MB	64 MB	64 MB	160 MB
64 MB	64 MB	64 MB	64 MB	256 MB
128 MB	128 MB			256 MB
4 MB	4 MB	128 MB	128 MB	264 MB
8 MB	8 MB	128 MB	128 MB	272 MB
16 MB	16 MB	128 MB	128 MB	288 MB
32 MB	32 MB	128 MB	128 MB	320 MB
64 MB	64 MB	128 MB	128 MB	384 MB
128 MB	128 MB	128 MB	128 MB	512 MB

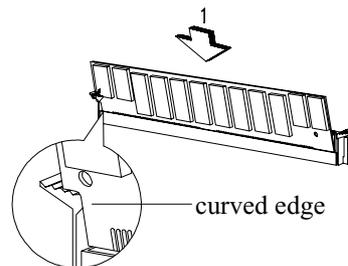
2.6.1 Installing a SIMM



Observe the ESD precautions when installing components.

Follow these steps to install a SIMM:

1. Slip a SIMM at a 45° angle into a socket. If the SIMM does not completely fit into the socket, reverse the SIMM orientation. The SIMM has a curved edge indicating pin 1 that ensures installation in one direction only.

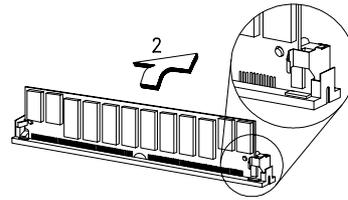


Hardware Installation



Be careful when inserting or removing SIMMs. Forcing a SIMM in or out of a socket can damage the socket or the SIMM (or both).

2. Gently push the SIMM up until the pegs of the socket slip into the holes on the SIMM and the holding clips lock the SIMM into a vertical position.

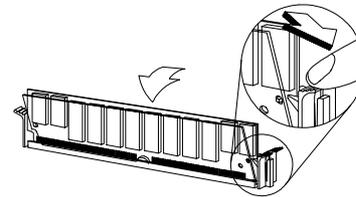


The SIMM should be at a 90° angle when installed.

2.6.2 Removing a SIMM

To remove a SIMM:

1. Press the holding clips on both sides of the SIMM outward to release it.
2. Press the SIMM downward to about a 45° angle.
3. Gently pull the SIMM out of the socket.



Hardware Installation

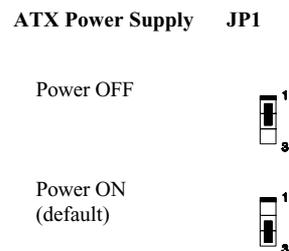
2.7 Customizing your Hardware Setup

You may customize your hardware setup according to the desired system performance. However, doing so requires resetting of several jumpers. The onboard jumpers are normally set to its default setting. See the figure in section 2.2 for the location of the jumpers on the system board.

The following sections tell how to configure the system board to meet the desired performance:

2.7.1 Enabling the ATX Power Supply

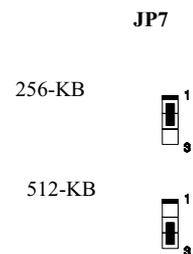
The AX53 board comes with two power connectors to support both PS/2 and ATX power supplies. To use an ATX power supply, set the jumper **JP1** to 2-3. To switch to PS/2 power supply, reset JP1 to 1-2.



2.7.2 Selecting the Cache Size

The AX53 supports 256-KB and 512-KB pipelined-burst cache. If your board comes with a 256-KB onboard cache, **JP7** is preset by the manufacturer to 1-2. To upgrade your cache to 512 KB via cache upgrade socket, change the setting of JP7 to 2-3.

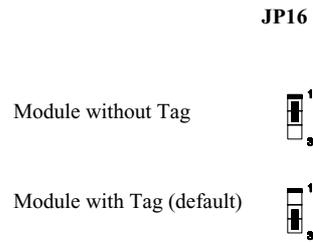
If your board comes with a 256-KB pipelined-burst cache, JP7 presetting is 2-3.



Hardware Installation

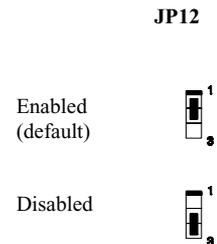
2.7.3 Selecting the Cache Module Type

The onboard cache upgrade socket allows you to upgrade your cache from 256 KB to 512 KB. This cache socket accepts 256-KB cache module with or without Tag RAM. If you install a cache module without Tag, set **JP16** to 1-2. If you install a module with Tag, set JP16 to 2-3.



2.7.4 Disabling the Onboard Super I/O Controller

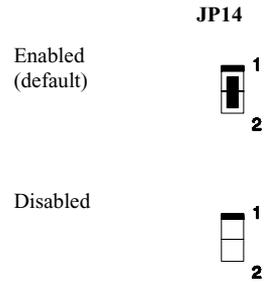
The board is preset by the manufacturer with the onboard I/O controller enabled. In case you wish to use an external I/O controller, you need to disable the onboard I/O before the external I/O card functions. To disable, you need to reset jumper **JP12** to 2-3.



Hardware Installation

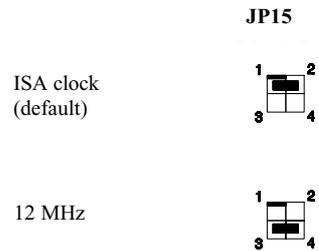
2.7.5 Disabling the PS/2 Mouse Function

The PS/2 mouse function is normally enabled and occupies IRQ12. To reassign IRQ12 to another function, you need to disable the PS/2 mouse function by opening jumper **JP14** and changing the BIOS setup. For detailed information on BIOS, see Chapter 3.



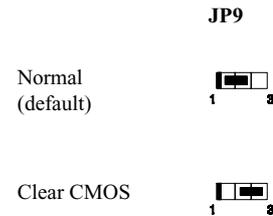
2.7.6 Setting the Keyboard Clock

The jumper **JP15** enables you to set the keyboard clock. The clock selections are ISA clock and 12 MHz. Set JP15 to 1-2 to select the ISA clock. Reset it to 3-4 to set the keyboard clock to 12 MHz.



2.7.7 Clearing the CMOS

You need to clear the CMOS if you forget your system password. To do this, shut off the system power and short pins 2-3 of **JP9** for a few seconds. Reset the jumper to normal setting by shorting pins 1-2. Enter Setup to specify a new password.



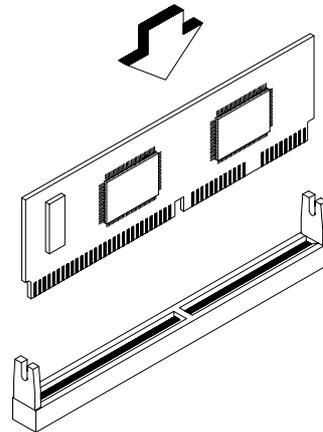
2.8 Upgrading the Second-level Cache



Observe ESD precautions when installing components.

The system board comes with either 256-KB pipelined-burst second-level cache and a cache upgrade socket, or 512-KB pipelined burst cache. The cache upgrade socket accepts a 256-KB pipelined-burst cache module; therefore, allowing you to upgrade the second-level cache to 512 KB. See Figure 1-1 for the location of the cache upgrade socket.

To upgrade, simply insert the cache module into the cache socket.



Hardware Installation

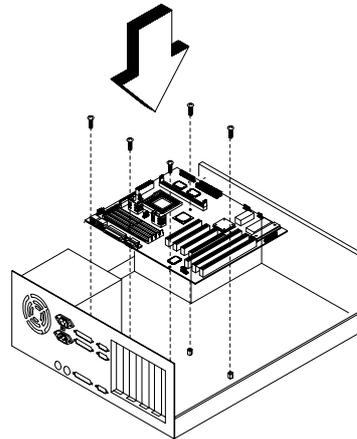
2.9 Installing the System Board



Make sure that you have already installed the system board components like the CPU and memory, and have set the appropriate jumpers before you proceed.

Follow these steps to install a system board into a housing:

1. Open the system housing. Refer to the housing documentation for steps on how to remove the housing cover.
2. Install the board into the housing and secure it with the screws that come with the housing.
3. Attach the cables and install the necessary peripherals. See the following section for information on how to connect the peripherals.

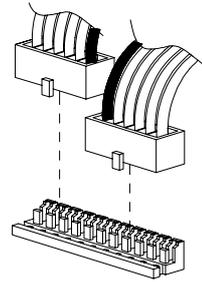


Refer to your housing documentation for more information on system housing.

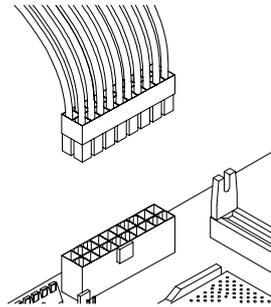
2.10 Connecting Peripherals

2.10.1 Power Cable

The board comes with two different power connectors marked as **CN2** and **CN3**. The **CN2** power connector accepts the PS/2 power supply cables, i.e., two cables with six wires each. When plugging in these cables to the onboard power connector, make sure that all the black wires are in the center. The **CN3** power connector accepts an ATX power supply cable.



CN2 Power Cable Connection (PS/2)



CN3 Power Cable Connection (ATX)

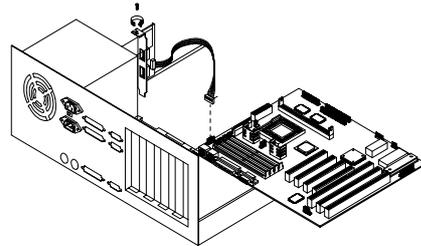


Make sure that the power supply is off before connecting or disconnecting the power cable.

Hardware Installation

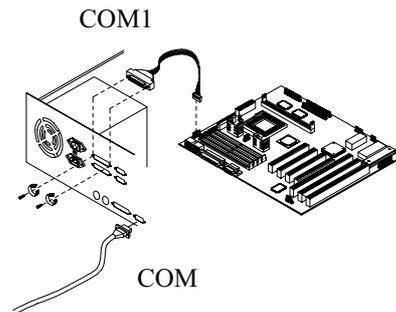
2.10.2 USB Devices

You need a USB bracket to enable your system to support USB device(s). To attach a USB bracket, simply insert the bracket connector to the onboard USB connector marked **CN14**. See section 1.1 for the location of the USB connector.



2.10.3 Serial Devices (COM1/COM2)

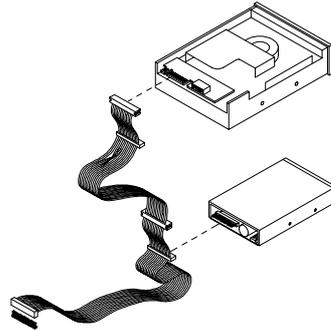
To support serial devices, insert the serial port 1 connector cable to the onboard **COM 1** connector marked **CN1**. Secure the port into its appropriate location in the housing frame with the necessary screws. Then plug in the serial device connector to serial port 1 or to **COM2** port marked **CN11** on the system board.



Hardware Installation

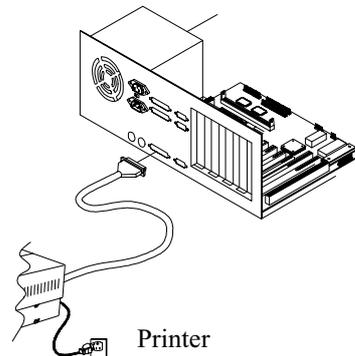
2.10.4 Floppy Drives

Connect the floppy drive cable to the floppy drive connector marked **CN6** on the system board. See section 2.2 for the location of the connector. Refer to the figure on how to connect the cables.



2.10.5 Printer

To connect a printer, plug in the printer cable to the onboard parallel port marked **CN8** on the board. Refer to the figure.

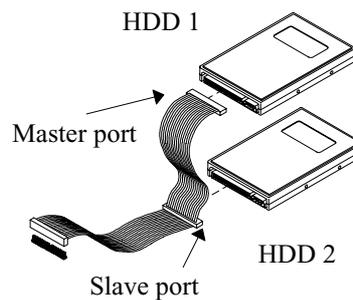


Hardware Installation

2.10.6 IDE Devices

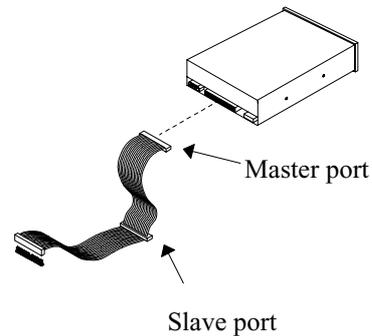
Primary IDE Connector

The primary IDE connector marked **CN10** on the system board supports two IDE devices - one IDE hard disk and one additional IDE device. Connect your IDE HDD to the master port of the primary IDE cable. If you have other IDE device to install in your system, connect it to the slave port.



Secondary IDE Connector

The secondary IDE connector is marked **CN9** on the board. This connector also supports two IDE devices. To install an IDE CD-ROM drive into your system, insert master port of the secondary IDE cable into the CD-ROM drive connector. If you have more than two hard disks, connect your third hard disk into the master port. Then connect your CD-ROM drive into the slave port.

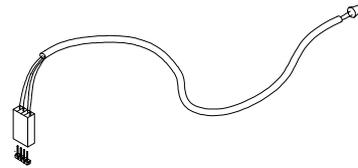


Hardware Installation

2.10.7 Front-panel Switches and LEDs

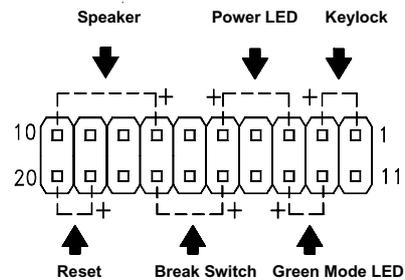
HDD LED

The HDD LED connector is marked **CN13** on the board. To connect the HDD LED, simply plug in the LED cable to this four-pin connector.

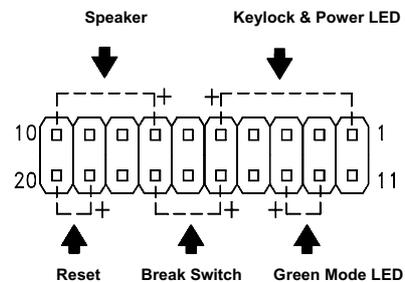


Multifunction Connector

The multifunction connector is a 20-pin connector marked **CN15** on the board. Attach the green mode LED, keylock, reset switch, break switch, and green mode LED connectors to the corresponding pins as shown in the figure.

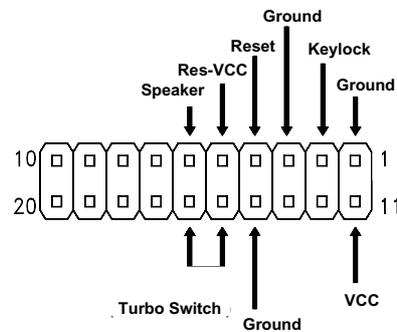


Some housings have a five-pin connector for the keylock and power LED.



Hardware Installation

Other housings may have a 12-pin connector. If your housing has this type of connector, connect it to CN15 as shown in the figure. Make sure that the red wire of the connector connects to pin 11.



Break Switch

The break switch allows you to manually set the system to suspend mode by simply pressing the switch. However, this is possible only if the Power Management function in the BIOS Setup menu is enabled. Refer to section 3.2.4 for more information.



If your housing comes with Turbo switch and Turbo LED connectors, you may use these connectors for Break switch and Green mode LED functions, respectively.

*Although the Multifunction connector does not support the Turbo/De-turbo switch, you can still set the system to Turbo mode by pressing **CTRL** **ALT** **+**. To switch to De-turbo mode, simply press **CTRL** **ALT** **-**.*

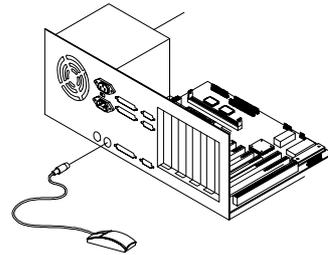
Hardware Installation

2.10.8 Mouse

PS/2 Mouse

To connect a PS/2 mouse, simply plug in the PS/2 mouse cable to the mouse port.

See Figure 1-1 for the location of the PS/2 mouse port.



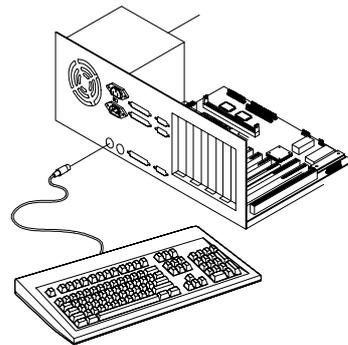
Serial Mouse

To connect a serial mouse, plug in the serial port cable to the **CN1**. Insert the serial mouse cable into the appropriate COM port. See section 2.10.3.

2.10.9 Keyboard

To connect a PS/2 keyboard, simply plug in the PS/2 keyboard cable to the PS/2 keyboard port.

See Figure 1-1 for the location of the PS/2 mouse port.



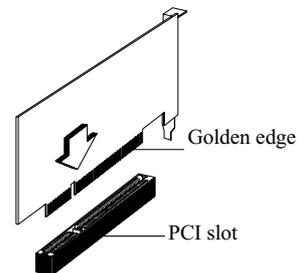
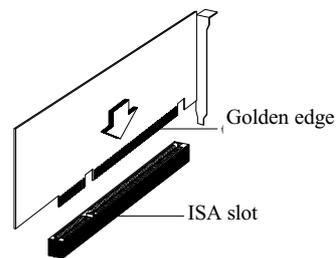
Hardware Installation

2.11 Installing Expansion Boards

Before you install any expansion board, make sure that you have secured the system board in the housing.

Follow these steps to install an expansion board:

1. Observe the ESD precautions before removing the expansion board from its protective packaging.
2. Locate an empty expansion slot on the system board.
3. Remove the bracket opposite the slot that you want to use. Save the cover and screw for future use.
4. Remove the board from its protective packaging.
5. Gently insert the golden edge of the board into the slot until it fits into place.
6. Secure the bracket to the housing with a screw.



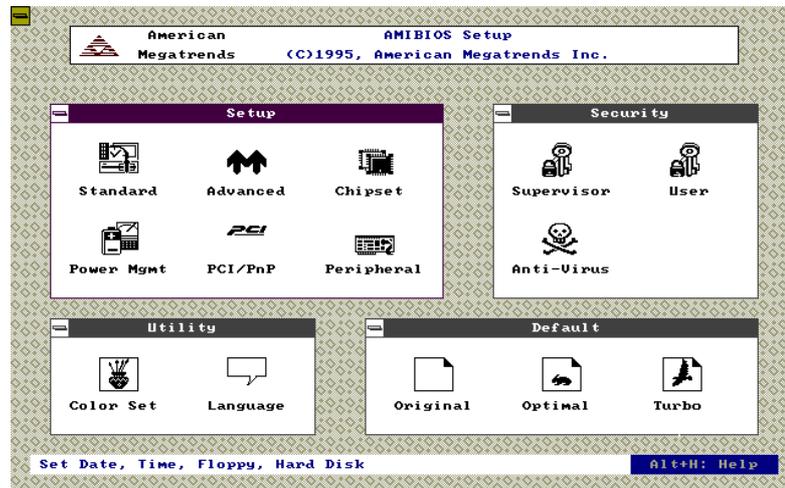
Chapter 3

AMI BIOS Utility

This chapter tells how to configure the system by setting the BIOS parameters.

3.1 Entering the AMI BIOS Setup

To enter the AMI BIOS Setup, press C. The AMI BIOS Setup Main Menu appears as shown below.



The AMI BIOS is in Windows form. You can use either the keyboard or a mouse to move between the items.

To select among the Setup menu groups, use V to highlight the selected group or simply click on the icon of the selected Setup menu.

AMI BIOS Utility

To select among the options, you can either use the arrow keys to move the highlight bar or simply click on the icon of the desired option. After making your selection, press **Enter** or double-click on the icon to open the selected menu option.

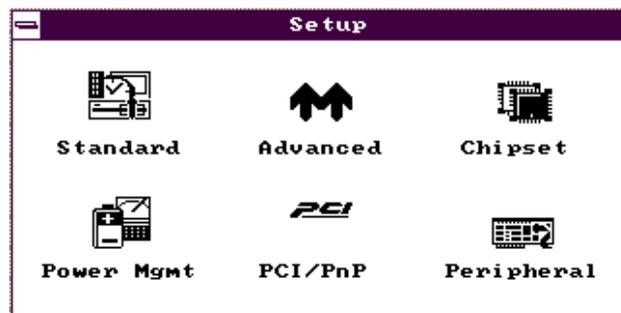


*You can press **h** to enter the BIOS Setup screen. This procedure allows you to do the following::*

- *Resolve an address conflict due to an IRQ address assigned to multiple slots. For more information on IRQ assignment, see the section 3.2.3 (Chipset Features Setup).*
- *Reset to BIOS default settings if the PnP BIOS does not recognize the hardware modifications under Windows 95.*

3.2 Setup Menu

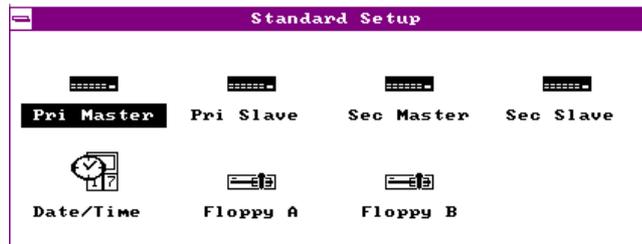
The screen below shows the Setup menu window. Use the arrow keys to highlight an option.



3.2.1 Standard Setup

The following screen appears if you select Standard from the Setup options:

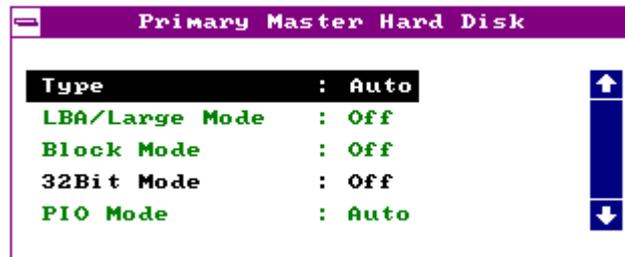
AMI BIOS Utility



This menu allows you to input configuration values such as date, time and disk types.

PRIMARY MASTER AND SLAVE/ SECONDARY MASTER AND SLAVE

These parameters allow you to configure the hard disks and the IDE devices connected to your IDE connectors. To configure the hard disk connected to the master port of the primary IDE connector, select **Primary Master** and press **e**. The following screen appears:



To configure the hard disk connected to the slave port of the primary IDE connector, select **Primary Slave**.

The secondary IDE connector also supports two IDE devices. To configure the hard disk or the IDE device connected to the master port, select **Secondary Master**. Choose **Secondary Slave** to configure the device connected to the slave port.

The following are the parameters that you need to set to configure your hard disks or the IDE devices:

Type

This parameter lets you set the IDE device type that your system supports. The options are **User**, **Auto**, **CD-ROM**, **Type 1-46**, and **Not Installed**. Select **Auto** to automatically configure the installed hard

AMI BIOS Utility

disk or IDE device. Select CD-ROM or Auto if you have a CD-ROM installed in your system. If you have an old type HDD installed, you may need to enter the HDD parameters manually. To do this, you must set this parameter to User. Set this to Not Installed to bypass the function.

LBA/Large Mode

This enhanced IDE feature allows the system to use a hard disk with a capacity of more than 528 MB. This is made possible through the Logical Block Address (LBA) mode translation. Set the parameter to Off to disregard the feature.

This parameter becomes non-configurable when the HDD Type parameter is set to Auto.

AMI BIOS Utility

Block Mode

This function enhances disk performance depending on the hard disk in use. If enabled, it allows data transfers in block (multiple sectors) by increasing the data transfer rate to 256 bytes/cycle. However, if your hard disk does not support this function, set this parameter to `Off`.

This parameter becomes non-configurable when the HDD Type parameter is set to `Auto`.

32-bit Mode

Enabling this parameter improves system performance by increasing the hard disk access to 32-bit mode. However, make sure that your hard disk supports this function before you enable the parameter. The default setting is `Off`.

PIO Mode

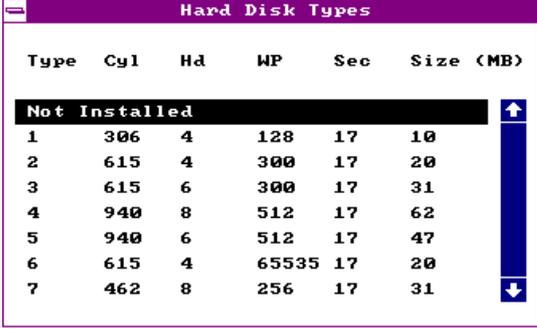
Setting this parameter to `On` allows the system to use a faster hard disk drive. If your hard disk does not support the PIO mode feature, set this parameter to `Off`.

This parameter becomes non-configurable when the HDD Type parameter is set to `Auto`.

AMI BIOS Utility

HARD DISK TYPES

After you have set all the necessary parameters, press **e**. A list of the HDD drive parameters appears:



Type	Cyl	Hd	WP	Sec	Size (MB)
Not Installed					
1	306	4	128	17	10
2	615	4	300	17	20
3	615	6	300	17	31
4	940	8	512	17	62
5	940	6	512	17	47
6	615	4	65535	17	20
7	462	8	256	17	31

Select your hard disk type. Press **W** or **Y** to move among the selections. After you have made your selection, press **e**.

If you cannot find your hard disk drive type on the list, select **User**. This allows you to enter the disk parameters manually.

DATE/TIME

To set the date and time, highlight **Date/Time** and press **e**. The following screen appears:

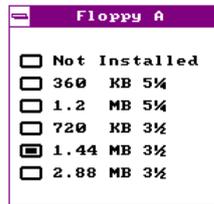


Use the arrow keys to move among the items. Press or click on **+** or **-** to set the current time and date. Press **e** or double-click on the Control menu box in the upper-left corner of the window.

FLOPPY DRIVES A AND B

To configure the first floppy drive, select **Floppy A**. The following values appear on screen:

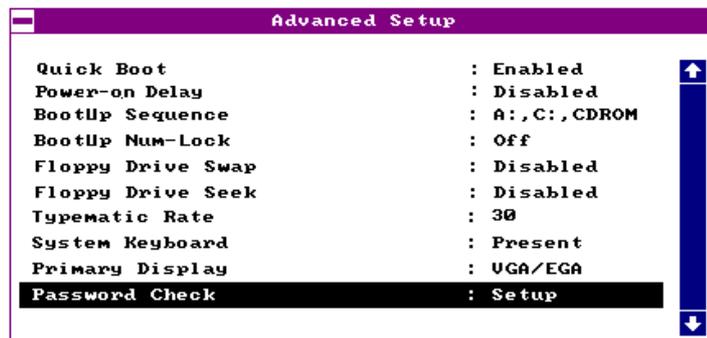
AMI BIOS Utility



After selecting the proper setting, press **␣**.
Select Floppy B and follow the same procedure to configure the second floppy drive.

3.2.2 Advanced CMOS Setup

The following screen appears if you select the option Advanced from the Setup menu:



The first screen does not show all the parameters of the Advanced Configuration menu. To scroll down the rest of the parameters, press **↓**. Press **W** or **Y** to highlight the desired parameter.

AMI BIOS Utility

Advanced Setup	
Password Check	: Setup
Parity Check	: Disabled
OS/2 Compatible Mode	: Disabled
Internal Cache	: Enabled
External Cache	: Enabled
System BIOS Cacheable	: Disabled
C000,16k Shadow	: Cached
C400,16k Shadow	: Cached
C800,16k Shadow	: Disabled
CC00,16k Shadow	: Disabled

Advanced Setup	
External Cache	: Enabled
System BIOS Cacheable	: Disabled
C000,16k Shadow	: Cached
C400,16k Shadow	: Cached
C800,16k Shadow	: Disabled
CC00,16k Shadow	: Disabled
D000,16k Shadow	: Disabled
D400,16k Shadow	: Disabled
D800,16k Shadow	: Disabled
DC00,16k Shadow	: Disabled



Do not change the settings of the Advanced Setup parameters if you are not a qualified technician. Doing so may cause fatal system failure.

Quick Boot

During the system boot process, the system performs power-on self test (POST) routines. Enable the parameter if you want to skip some POST routines during boot-up process. Set this to `Disabled` to let the system perform all the POST routines and follow the specified boot-up sequence.

AMI BIOS Utility

Power-on Delay

This parameter lets you set the POST waiting time for the HDD motor to stabilize before system boot. The settings are from 1 to 15 seconds and Disabled. The default setting is Disabled.

Boot-up Sequence

The boot-up sequence allows you to specify the system search sequence. The selections are C: , A: , CD-ROM / A: , CD-ROM, C: / A: , C: , CD-ROM / C: , CD-ROM, A: / CD-ROM, A: , C: , and CD-ROM, C: , A: . If you have a bootable CD-ROM installed, you may set the CD-ROM as the first priority. The default is A: , C: , CD-ROM.

Boot-up Numlock

Setting this parameter to On enables the numeric function of the numeric keypad. Set this parameter to Off to disregard the function. Disabling the numeric function allows you to use the cursor control numeric keypad. The default setting is Off.

Floppy Drive Swap

This parameter allows you to swap floppy drives. For example, if you have two floppy drives (A and B), you can assign the first drive as drive B and the second drive as drive A or vice-versa. Disable the parameter to bypass the function. The default is Disabled.

Floppy Drive Seek

When enabled, the BIOS detects whether there is a floppy disk drive installed in the system. Disable the parameter to skip the function.

Typematic Rate

This parameter determines the number of characters that can be entered per second. The default is 30.

System Keyboard

Set this parameter to Present if there is a keyboard connected to the system. Otherwise, select Absent.

AMI BIOS Utility

Primary Display

This function detects the type of VGA in use. The selections are *VGA/EGA*, *CGA 40 x 25*, *CGA 80 x 25*, *Mono*, and *Absent*. The default setting is *VGA/EGA*.

Password Check

This parameter lets you set when to check for the password. When set to *Always*, a password prompt appears every time you turn on the computer or when you enter *Setup*. When set to *Setup*, the password prompt appears when you try to enter *setup*. The *Optimal* and *Turbo* default setting is *Setup*.

Parity Check

Set this parameter to *Enabled* if you install SIMMs with parity in your system. Otherwise, set this parameter to *Disabled*. Since the DRAM can still operate without enabling the parity scheme for SIMMs with parity, this function is normally set to *Disabled*.

OS/2 Compatible Mode

Enable the parameter if your system is utilizing an OS/2 operating system and has a memory size of more than 64 MB. Otherwise, set this to *Disabled*. The default setting is *Disabled*.

Internal Cache

This function lets you enable or disable the internal cache.

External Cache

This function lets you enable or disable the external cache.

System BIOS Cacheable

Enabling this parameter allows you to cache the system BIOS to further system performance. Leave the parameter setting to its default (i.e., Disabled), to prevent the system BIOS from being cached.

C000 ~ DC00, 16K Shadow

These parameters are for shadowing expansion cards with ROM. You need to know the specific addresses that ROMs use to shadow the expansion cards before you set any of these parameters. If you do not know this information, enable all the ROM shadow settings. This ensures shadowing of any present ROMs and reduces the available memory. Select **Cached** if the data in the chosen addresses are already copied into RAM. The default setting is **Disabled**.



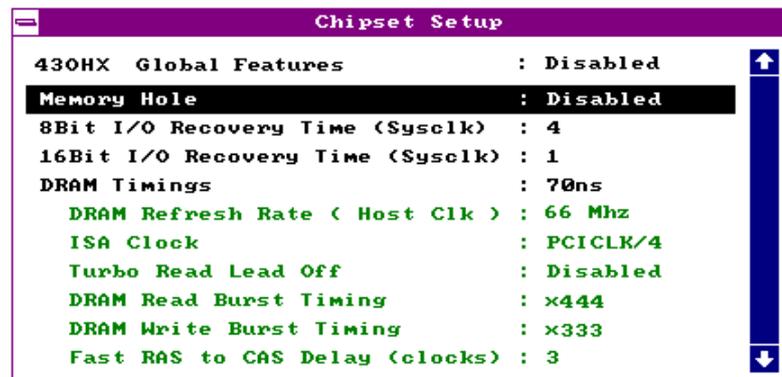
The F000 and E000 addresses are exclusively shadowed for BIOS.

AMI BIOS Utility

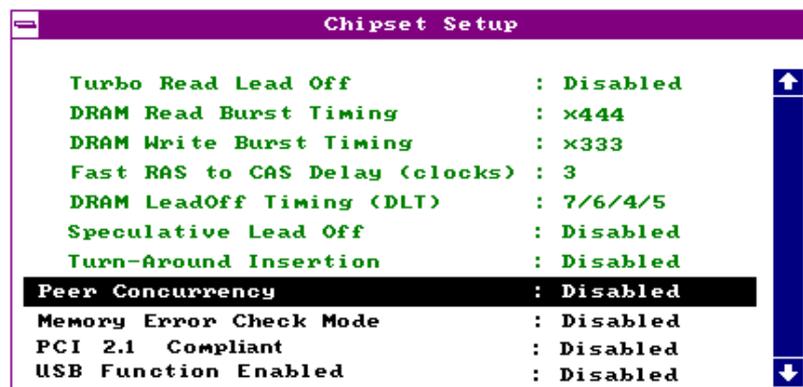
3.2.3 Chipset Features Setup

The Chipset Features Setup controls the board chipset settings. The controls for this menu are the same as for the previous screens.

The Chipset Features Setup screen appears as follows.



To scroll down the rest of the parameters, press `}`. Use `W` or `y` to highlight the desired parameter.



430HX Global Features

This option lets you enable or disable the 430HX chip features. To optimize system performance, set this parameter to **Enabled**. Select **Disabled** to disregard the option.

The default setting is **Disabled**.

Memory Hole

This option lets you reserve system memory area for ISA cards. The settings are **512~640K**, **15~16M**, and **Disabled**.

8-bit I/O Recovery Time (Sysclk)

This parameter allows you to set the response time of the 8-bit I/O devices connected to your system. The settings range from **1-7 SYSCLK** and **Disabled**.

16-bit I/O Recovery Time (Sysclk)

This parameter allows you to set the response time of the 16-bit I/O devices connected to your system. The settings range from **1-4 SYSCLK** and **Disabled**.

DRAM Timing

The selections for this parameter are **60 ns**, **70 ns**, and **Manual**. If you select either **60 ns** or **70 ns**, the DRAM Timing subparameters become non-configurable since BIOS automatically sets the values. Select **Manual** if you want to specify your own parameter settings.

DRAM REFRESH RATE

This option lets you specify the frequency at which the chipset refreshes the DRAM to avoid data lost. The selections are **50 MHz**, **60 MHz**, and **66 MHz**.

ISA CLOCK DIVISOR

This option specifies the ISA clock frequency. The selections are **PCICLK/4** and **PCICLK/3**.

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TURBO READ LEAD OFF

When enabled, BIOS skips the first input register in the DRAM when reading data and therefore, speeds up the data read timings. Disable the option to bypass the feature.

DRAM READ BURST TIMING

This parameter sets the timing for burst mode reads from DRAM. Everytime the CPU reads the second-level cache miss, it reads four continuous memory cycles on four continuous addresses from the DRAM.

The available parameter settings are X-4-4-4, X-3-3-3, and X-2-2-2. Faster DRAMs require shorter wait states. The value of X depends on the DRAM Lead-off Timing parameter setting. The default is X-4-4-4.

DRAM WRITE BURST TIMING

This parameter sets the timing for burst mode writes to DRAM. DRAM burst write requests are generated by the CPU in four continuous addresses.

The available parameter settings are X-4-4-4, X-3-3-3, and X-2-2-2. Faster DRAMs require shorter wait states. The value of X depends on the DRAM Lead-off Timing parameter setting.

FAST RAS TO CAS DELAY (CLOCKS)

This option specifies the wait state between the row address strobe (RAS) and column address strobe (CAS) signals. The available settings are 3 and 2.

DRAM LEAD-OFF TIMING (DLT)

This option specifies the lead-off time before data can be accessed. Some DRAMs may require a longer delay to access data.

SPECULATIVE LEAD OFF

Enable the parameter to speed up the data read action by presenting the DRAM controller read request before the controller chip decodes the data to the final memory target (i.e., cache, DRAM or PCI).

TURN AROUND INSERTION

Enabling this option allows the CPU to insert one turn-around clock cycle to the MD signals after asserting the MWE signal before enabling the MD buffers. Set this to Disabled to select the back-to-back DRAM cycles for asserting MWE signal.

Peer Concurrency

Enable this parameter if you want to activate more than one PCI device. Otherwise, set this to `Disabled`.

Memory Error Check Mode

This parameter allows you to set the DRAM error checking mode. The options are `ECC`, `Parity`, and `Disabled`.

PCI 2.1 Compliant

This parameter lets you enable or disable the PIIX3 PCI register delay transaction and passive release functions. When enabled, the PIIX3 controls the USB operation to make sure that the system complies with the PCI revision 2.1 specification. Disable the parameter to disregard the function. The default is `Disabled`.

USB Function Enabled

This parameter lets you enable or disable the USB device(s) connected to your system, if any. The default is `Disabled`.

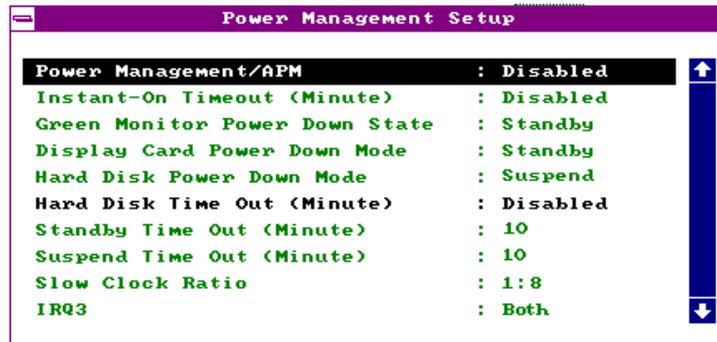


The USB function shares INTD with PCI slot 4. Therefore, if you enable the USB function, only PCI cards that do not require IRQ, such as VGA, can be installed in slot 4. The PnP BIOS assigns an IRQ to VGA only if the VGA requests for it.

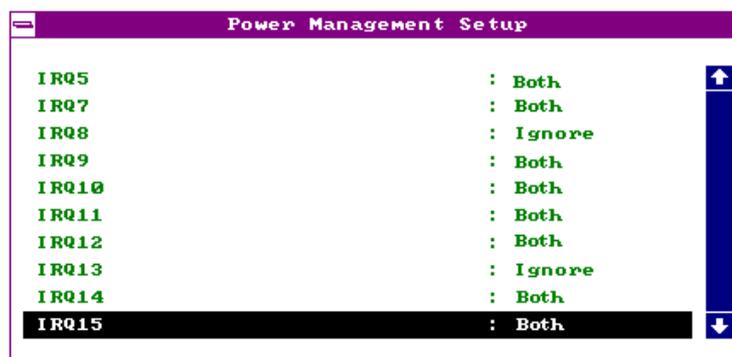
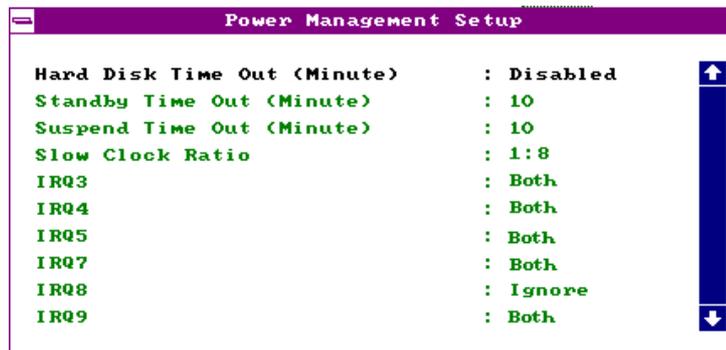
3.2.4 Power Management Setup

To take advantage of the power-management feature, select `Power Management` from the Setup menu. The following screen appears:

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To scroll down the rest of the parameters, press `}`. Use `W` or `y` to highlight the desired parameter.



Power Management/APM

This parameter enables or disables the advanced power-management function.

Instant On Timeout (Minutes)

This parameter is configurable only if the Power Management/APM parameter is set to `Instant On`. This lets you specify when to resume system power after being in power-saving mode for a certain period of time.

Green Monitor Power Down State

This function lets you set when to power down your green PC monitor. The options are `Standby` and `Suspend`.

Display Card Power Down Mode

This option allows you to set when to power down your system display card. The card function returns to full power once the system resumes to normal mode. The selections are `Standby`, `Suspend`, and `Disabled`.

Hard Disk Power Down Mode

This option lets you set when to “spin down” your IDE hard disk. The disk returns to full speed once the system resumes to normal mode. The available settings are `Standby`, `Suspend`, and `Disabled`.

Hard Disk Timeout (Minutes)

This option lets you set when to put the hard disk to the specified power-down mode.

Standby Timeout (Minutes)

This function lets you set when to put the system to standby mode. In standby mode, the CPU clock slows down. Any event detected returns the system to full power. The settings range from 1~15 min.

Suspend Timeout (Minutes)

This function lets you set when to put the system to suspend mode. In suspend mode, the CPU clock stops. Any event detected returns the system to full power. The settings range from 1~15 min..

Slow Clock Ratio

When the system enters the standby mode, the CPU clock starts to slow down. This parameter lets you set the “slow down” clock ratio.

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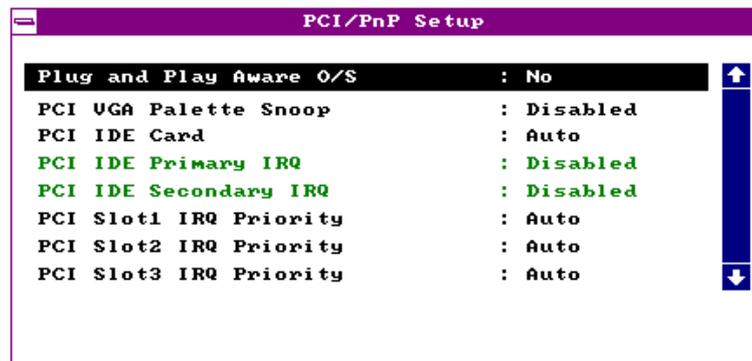
IRQ 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, and 15

If you set any of these parameters to Monitor, the chipset checks the activity of the selected IRQs. Any activity detected prevents the system from entering the power-saving mode.

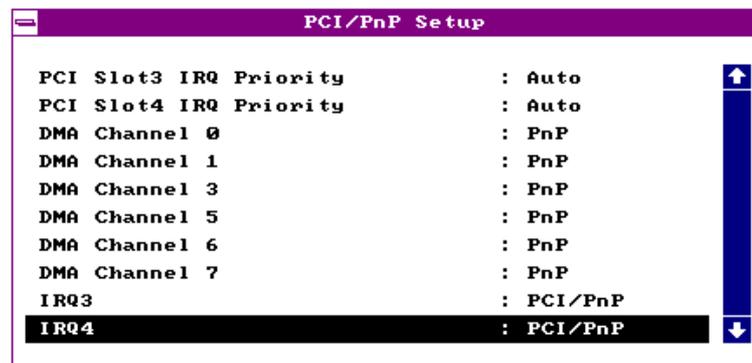
If you set any of these parameters to Wake up, any activity detected from the selected IRQs wakes the system from power-saving mode.

3.2.5 PCI/PnP Setup

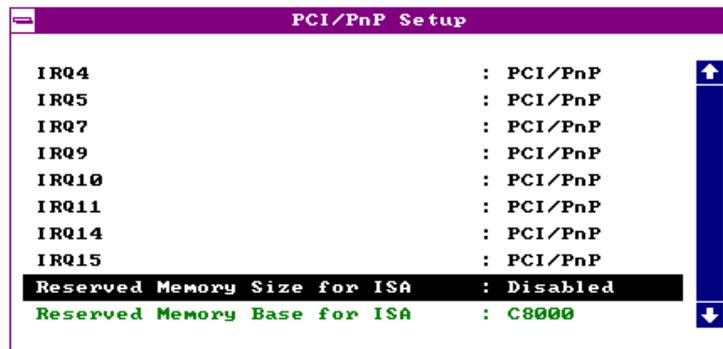
The PCI/PnP Setup allows you to specify the setting for your PCI devices. The screen below appears if you select PCI / PnP from the Setup menu.



To scroll down the rest of the parameters, press }. Use W or y to highlight the desired parameter.



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Plug-and-Play Aware O/S

Enable this parameter only if you have a Plug-and-Play operating system such as Windows 95. This is to ensure that the PnP cards are initialized during POST and proper resources are allocated to each card by the Plug-and-Play operating system.

PCI VGA Palette Snoop

PCI devices support the palette snooping technique that enables the device to control access to their palette registers. Enable this parameter activates the palette snooping function in the PCI VGA devices. Check your VGA card manual for more information about this function. The default setting is Disabled.

PCI IDE Card

This function allows you to select the PCI slots that you want to enable, if there are any offboard PCI IDE card present. Set this parameter to Auto to automatically configure the installed PCI card.

PCI IDE Primary IRQ

This parameter lets you assign an IRQ for the IDE device connected to your primary IDE card connector. The settings are INTA, INTB, INTC,

INTD, Hardwired, and Disabled. If the PCI IDE Card parameter is set to Auto, this parameter becomes non-configurable.

PCI IDE Secondary IRQ

This parameter lets you assign an IRQ for the IDE device connected to your secondary IDE card connector. The settings are INTA, INTB, INTC, INTD, Hardwired, and Disabled. If the PCI IDE Card parameter is set to Auto, this parameter becomes non-configurable.

PCI Slot 1, 2, 3, and 4 IRQ Priority

These parameters let you specify the appropriate interrupt for each occupied PCI slots.

DMA Channel 0, 1, 3, 5, 6, and 7

These lines allow you to assign the available DMA channels to either PnP device or Legacy/ISA functions.

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

These lines allow you to assign the available IRQs to either PCI/PnP or Legacy/ISA devices.

Reserved Memory Size for ISA

This option lets you specify the memory area reserved for Legacy/ISA devices to avoid conflict.

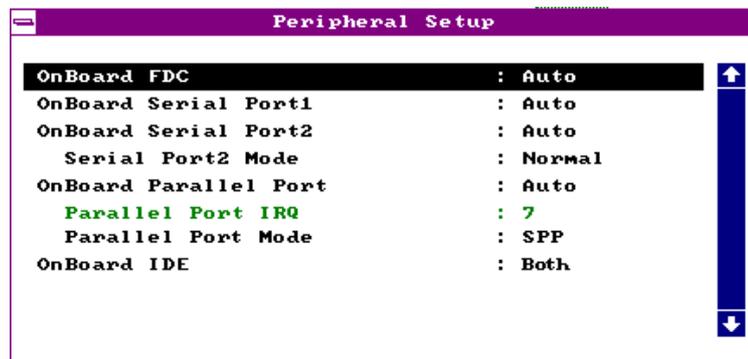
Reserved Memory Base for ISA

This option lets you specify the memory base of the specified memory area reserved for Legacy/ISA devices to avoid conflict.

3.2.6 Peripheral Setup

Select `Peripheral` from the Setup menu and the following screen appears.

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Onboard FDC

This parameter enables or disables the floppy drive controller.

Onboard Serial Port 1

This parameter allows you to select the address for the first serial port. Selecting `Disabled` deactivates the port.

Onboard Serial Port 2

This parameter allows you to select the address for the second serial port. Selecting `Disabled` deactivates the port.

SERIAL PORT 2 MODE

This parameter is configurable only if the Onboard Serial Port 2 parameter is enabled. This allows you to specify the serial port 2 mode. The available mode selections are:

- `Normal` – Sets serial port 2 to operate in normal mode. This is the default setting.
- `HPSIR` – Select this setting only if the InfraRed (IR) function is activated (i.e., an IR module is installed in your system). This setting allows infrared serial communication at a maximum baud rate of 115K baud.

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- **AskIR** – Select this setting only if the IR function is activated (i.e., an IR module is installed in your system). This setting allows infrared serial communication at a maximum baud rate of 19.2K baud.

Onboard Parallel Port

This parameter allows you to select the address for the parallel port. Selecting **Disabled** deactivates the parallel port.

PARALLEL PORT IRQ

This parameter is configurable only if the Onboard Parallel Port is NOT set to **Auto**. This allows you to set an IRQ for the parallel port function. The available IRQ selections are 5 and 7.

PARALLEL PORT MODE

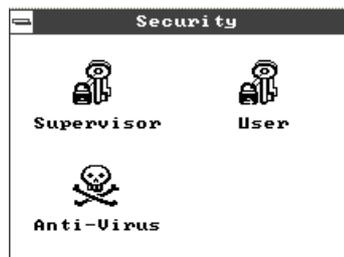
This parameter specifies the parallel port mode. The mode options are **SPP**, **EPP** and **ECP**.

Onboard IDE

This parameter enables or disables the onboard IDE controller.

3.3 Security Setup

The Security window contains the password and anti-virus features.

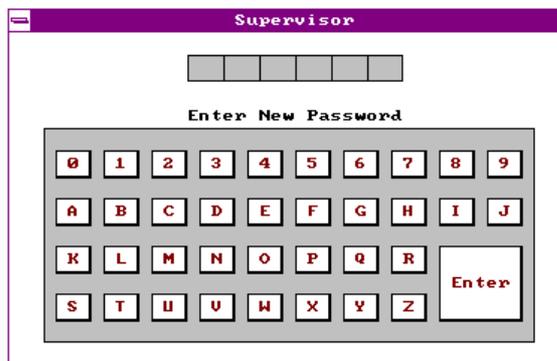


AMI BIOS Utility

3.3.1 Supervisor Password

The use of password prevents unauthorized use of your computer. If you set a Supervisor password, the system prompts for this password before granting access to Setup or system boot, depending on the Password Check setting in the Advanced CMOS Setup menu (refer to section 3.2.2).

To set a Supervisor password, select **Supervisor** from the Security window. The following screen appears:



Follow these steps to set up a password using the keyboard:

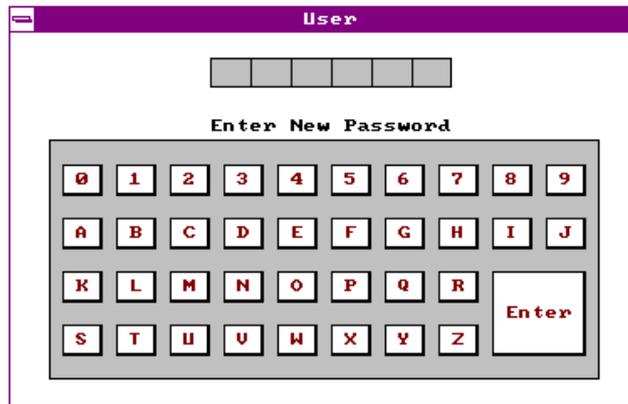
1. Type in a six-character password using letters, numbers, or a combination of both. When you type the characters, they appear as asterisks on the password screen boxes.
2. Press **e**.
3. Retype the password when a password confirmation box appears asking you to retype the password.

You may also use the mouse and the characters on the screen to set up a password.

1. Click on six characters from the password screen. The characters appear on the boxes as asterisks.
2. Click on **e**.
3. Enter the password when a confirmation box appears.

3.3.2 User Password

To set a User password, select `User` from the Security window. The following screen appears:



For instructions on how to enter a password, follow the procedures listed in section 3.3.1.

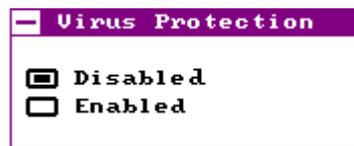


If you set a Supervisor and a User password, you can enter either of the two entries when prompted for a password before system boot or entering Setup.

AMI BIOS Utility

3.3.3 Anti-virus

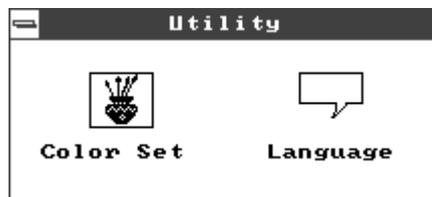
Select **Anti-Virus** from the Security window to display the following option box.



The virus protection options allow you to enable or disable the virus protection feature.

3.4 Utility Setup

The Utility window lets you change WinBIOS Setup colors and language setting.



3.4.1 Color Set

Select **Color Set** from the Utility window to display the following screen.



Use the arrow keys or simply click an option to select your desired background color for WinBIOS.

3.4.2 Language

Select **Language** from the Utility window to display the following screen.



The system language currently supported is only English. Therefore, this option is non-configurable and is for display only.

AMI BIOS Utility

3.5 Default Setup

The Default window allows you to select a group of settings for all WinBIOS Setup options.



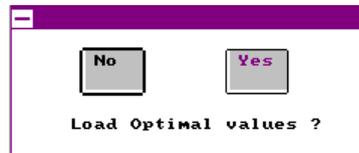
3.5.1 Original

When you select *Original*, a dialog box prompts you to restore the old values. Select *No* to keep your current settings or *Yes* to restore the original values.



3.5.2 Optimal

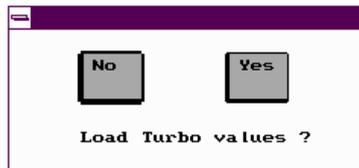
When you select `Optimal`, a dialog box prompts you to load the optimal values. Select `No` to keep your current settings or `Yes` to load the optimal values. We recommend that you select `Yes` to ensure stable system performance.



3.5.3 Turbo

When you select `Turbo`, a dialog box prompts you to load the Turbo values, such as setting the DRAM speed to 60 ns. Select `No` to keep your current settings or `Yes` to load the Turbo values.

Loading the Turbo values enhance system performance. However, if instability problem occurs during system operation, we recommend that you load the `Optimal` values.

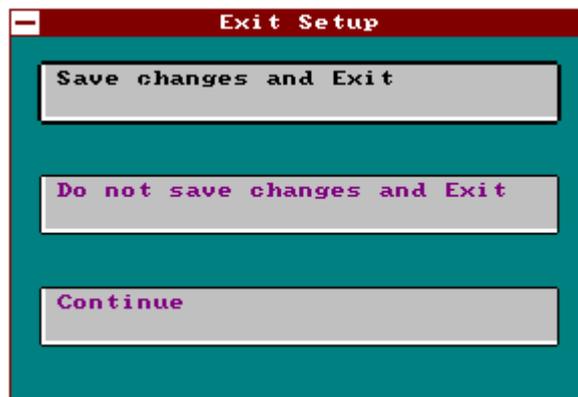


3.6 Exiting Setup

Carefully check your new settings when you have finished configuring the system. If correct, write them down and keep the recorded values in a safe place. If in the future, the battery loses power or the CMOS chip is damaged, you will know what values to enter when you rerun setup.

Press `^` to display the following screen.

AMI BIOS Utility



Press **y** or **w** key then **e** or simply click on an option to select. Select **Save changes and Exit** to save the changes that you made. Select **Do not save changes and Exit** to leave setup without saving your changes. Select **Continue** if you want to make any more configuration changes.

3.7 NCR SCSI BIOS and Drivers

The NCR 53C810 SCSI BIOS resides in the same flash memory chip as the system BIOS. To use the onboard NCR BIOS, install an NCR 53C810 SCSI controller card in your system.

All SCSI devices that you install in your system require software drivers. The NCR SCSI BIOS directly supports SCSI hard disks under DOS, Windows and OS/2. It also uses DOS-format and SCO UNIX-format support floppy disk device drivers that come with the NCR 53C810 SCSI controller card. The DOS-format device drivers are for SCSI devices used with DOS, Windows NT, Novell NetWare and OS/2. The SCO UNIX-format device drivers are for SCSI devices used with SCO UNIX. These drivers offer higher performance than the direct BIOS support.

To use the device drivers, you must install them in your system hard disk drive and add them to your system configuration files. For detailed installation instructions, see the README files that come with the drivers.

AMI BIOS Utility



The system board also supports the AMI Flash Memory Writer Utility that allows you to upgrade the system BIOS. For more information on this utility, contact your local distributor.

Appendix A

Jumper and Connector Summary

CPU Type and Frequency

CPU Freq.	JP2	JP3 ⁺	JP4	JP5	JP8
Intel Pentium (P54C)					
75 MHz	1-2, 3-4	3-4	1-2, 3-4, 5-6	Open	1-2, 3-4
90 MHz	1-2, 3-4	3-4	1-2, 3-4, 5-6	Open	1-2
100 MHz	1-2, 3-4	3-4	1-2, 3-4, 5-6	Open	3-4
120 MHz	3-4, 5-6	3-4	1-2, 3-4, 5-6	Open	1-2
133 MHz	3-4, 5-6*	3-4	1-2, 3-4, 5-6	Open	3-4*
150 MHz	5-6, 7-8	3-4	1-2, 3-4, 5-6	Open	1-2
166 MHz	5-6, 7-8	3-4	1-2, 3-4, 5-6	Open	3-4
200 MHz	1-2, 7-8	3-4	1-2, 3-4, 5-6	Open	3-4
Intel Pentium (P55C)					
150 MHz	5-6, 7-8	7-8	Open	1-2, 3-4	1-2
166 MHz	5-6, 7-8	7-8	Open	1-2, 3-4	3-4
200 MHz	1-2, 7-8	7-8	Open	1-2, 3-4	3-4
Cyrix 6x86					
120+	Open	1-2	1-2, 3-4, 5-6	Open	1-2, 3-4
133+	Open	1-2	1-2, 3-4, 5-6	Open	Open
150+	Open	1-2	1-2, 3-4, 5-6	Open	1-2
AMD K5					
PR75	1-2	3-4	1-2, 3-4, 5-6	Open	1-2, 3-4
PR90	1-2	3-4	1-2, 3-4, 5-6	Open	1-2
PR100	1-2	3-4	1-2, 3-4, 5-6	Open	3-4

⁺ Refer to the CPU voltage jumper settings

* Default setting

Jumper and Connector Summary

CPU Core Voltage

Core Voltage	JP3
3.52V	1-2
3.43V	3-4 *
2.9V	5-6
2.8V	7-8
2.7V	9-10
2.5V	11-12

VI/O Voltage

Core Voltage	JP6 #
3.52V	3-4
3.45V	1-2 *

ATX Power Supply

Power	JP1
Off	1-2
On	3-4 *

Cache Size

Size	JP7
256 KB	1-2 *
512 KB	3-4

* Default setting

This jumper is preset by the manufacturer to 1-2. We recommend you NOT to change the setting.

Jumper and Connector Summary

Cache Module Type

Type	JP16
Module without Tag	1-2
Module with Tag	2-3 *

Super I/O Controller

Super I/O Controller	JP12
SMC669 Enabled	1-2 *
SMC669 Disabled	2-3

PS/2 Mouse

Function	JP14
Enabled	Closed *
Disabled	Open

Keyboard Clock

Clock	JP15
ISA clock	1-2 *
12 MHz	3-4

* Default setting

Jumper and Connector Summary

CMOS

Function	JP9
Normal	1-2 *
Clear CMOS	2-3

Onboard Connectors

Connector	Function
CN1	COM1 connector
CN2	Power connector
CN3	ATX power connector
CN4	PS/2 keyboard connector
CN5	Two-pin fan connector
CN6	Floppy drive connector
CN7	PS/2 mouse connector
CN8	Printer/parallel port
CN9	IDE2 connector
CN10	IDE1 connector
CN11	COM2 port
CN12	IR connector (optional)
CN13	HDD LED connector
CN14	USB connector (optional)
CN15	Multifunction connector
JP13	Reserved for manufacturer use

* Default setting