

AP53

Mainboard

User Guide

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Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio/television technician for help.

Notice 1:

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2:

Shielded interface cables, if any, must be used in order to comply with emission limits.

Purpose and Scope

This manual tells how to install and configure the system board.

Organization

This manual consists of three chapters and one appendix:

Chapter 1, **Overview**, covers the specifications, layout, and components of the system board.

Chapter 2, **Hardware Installation**, tells how to install the hardware components, configure the system by resetting the jumpers, install the system board and add expansion cards.

Chapter 3, **AMI BIOS Utility**, explains the system BIOS and tells how to configure the system by setting the BIOS parameters.

Appendix A, **Jumper and Connector Summary**, gives you a tabular summary of the jumper settings and onboard connectors discussed in Chapter 2.

About This Manual

Conventions

The following conventions are used in this manual:

Text entered by user,
default settings,
recommended
selections

a, e, s, etc



Represent text input by the user, default settings and recommended selections

Represent the actual keys that you have to press on the keyboard.

NOTE

Gives bits and pieces of additional information related to the current topic.

WARNING

Alerts you to any damage that might result from doing or not doing specific actions.

CAUTION

Suggests precautionary measures to avoid potential hardware or software problems.

IMPORTANT

Reminds you to take specific action relevant to the accomplishment of the procedure at hand.

TIP

Tells how to accomplish a procedure with minimum steps through little shortcuts.

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Chapter 1

Overview

The AP53 is a high-performance Pentium®-based system board that utilizes the PCI/ISA architecture. It integrates the Intel 430HX PCiset, a super I/O controller, a PCI mode 4 enhanced IDE controller with bus master support and a 256-KB pipelined-burst cache to enhance system performance. It also has four single in-line memory module (SIMM) sockets that allow memory expansion up to a maximum of 512 MB.

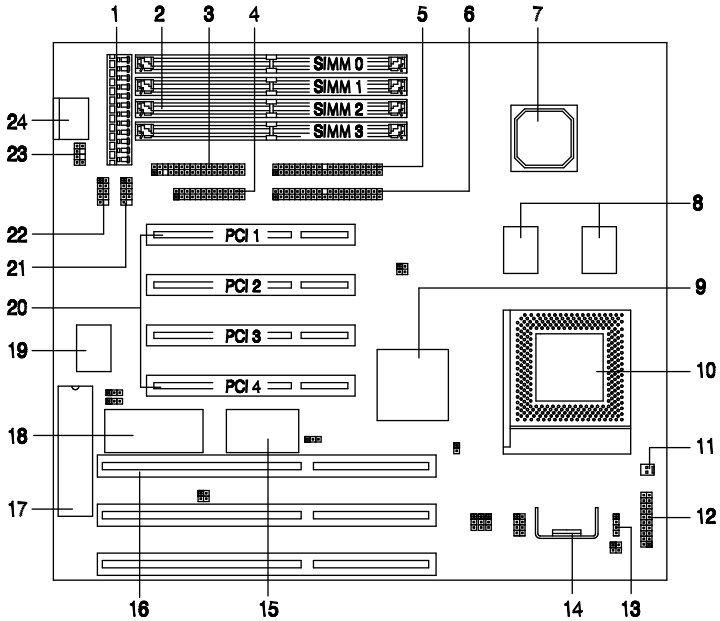
One main feature of AP53 is the green power-management function that extends energy conservation from system components to display monitor. It complies with the power-saving standards of the U.S. Environmental Protection Agency (EPA) Energy Star program.

The AP53 board measures 220 mm x 250 mm and may come with or without a voltage regulator module (VRM). The VRM enables the board to support future 2.5V processors.

Overview

1.1 Board Layout

- | | | | |
|----|-----------------------------|----|---------------------------------|
| 1 | Power connector | 14 | Voltage regulator with heatsink |
| 2 | SIMM sockets | 15 | Real-time clock and battery |
| 3 | Floppy disk drive connector | 16 | ISA slots |
| 4 | Parallel port connector | 17 | Keyboard controller |
| 5 | Primary IDE connector | 18 | BIOS |
| 6 | Secondary IDE connector | 19 | Super I/O controller |
| 7 | Intel 82439 chip | 20 | PCI slots |
| 8 | Pipelined-burst cache | 21 | COM1 connector |
| 9 | Intel 82371 chip | 22 | COM2 connector |
| 10 | CPU socket | 23 | PS/2 mouse connector |
| 11 | Two-pin fan connector | 24 | AT-keyboard connector |
| 12 | Multifunction connector | | |
| 13 | HDD LED connector | | |



1.2 Specifications

Microprocessor	Pentium (3.3V) Processor 75/90/100/120/133/150/166/200 MHz
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
Ports	One parallel port (SPP/ECP/EPP) Two serial ports (UART 16C550) Two-channel PCI mode 4 IDE ports (bus master transfer support) One floppy disk drive port (360/720 K, 1.2/1.44/2.88 MB)
Secondary Cache	256-KB pipelined-burst cache
BIOS	AMI Plug-and-Play Flash ROM BIOS
RTC & Battery	Dallas DS12887A
Board Size	220 mm x 250 mm

Overview

1.3 System Board Parts

1.3.1 Microprocessor

The AP53 system board uses an Intel Pentium (3.3V) processor running at 75, 90, 100, 120, 133, 150, 166, or 200 Hz. Chapter 2 tells how to install and upgrade a Pentium processor.

1.3.2 ASICs

The application-specific integrated circuits (ASICs) are the Intel 82439 and Intel 82371 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 82439 that comes in a unique ball-grid array (BGA) packaging, acts as the memory controller data path and the DRAM data bus buffer. The Intel 82371 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 three ISA and four PCI expansion 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 AP53 motherboard comes with an onboard 256-KB pipelined-burst second-level cache. This pipelined-burst cache improves system performance by shortening the DRAM read prefetch time resulting to a faster data transfer rate.

1.3.7 Two-channel PCI Mode 4 Enhanced IDE Interface

The AP53 board integrates a two-channel PCI mode 4 enhanced integrated drive electronics (E-IDE) interface that allows the system to support four E-IDE devices (including hard disks with more than 528-MB capacity) via two onboard IDE connectors (see section 1.1). This feature offers users increased data storage capacity.

Overview

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

1.3.9 Keyboard Connector

The onboard keyboard connector allows you to connect any AT-compatible keyboard. See the board layout figure for the location of the keyboard connector. Chapter 2 tells how to connect an AT keyboard.

A PS/2 keyboard connector is an option.

1.3.10 Mouse Connector

The board supports both serial and PS/2 mouse connectors. See Chapter 2 for details on how to connect a serial and a PS/2 mouse connector.

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

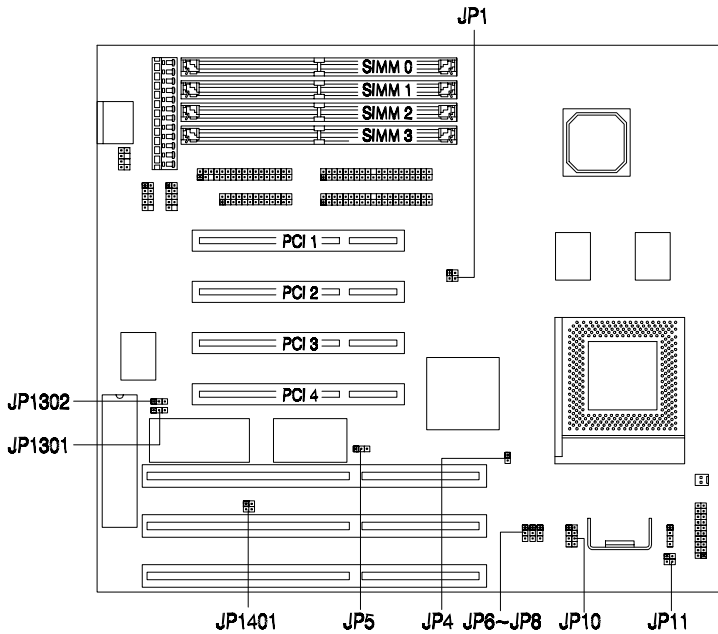
Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a system component.

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 Locations

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

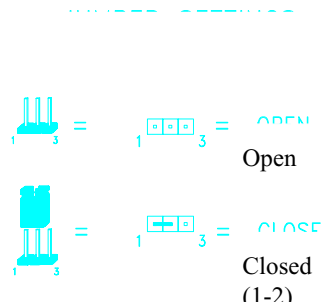


2.3 Setting the Jumper

Set a jumper switch 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

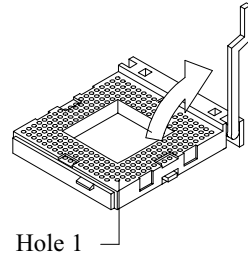
The motherboard comes with a zero-insertion force (ZIF) microprocessor socket that allows you to install a CPU without using any tool.

Follow these steps to install a CPU into a ZIF-type CPU socket:

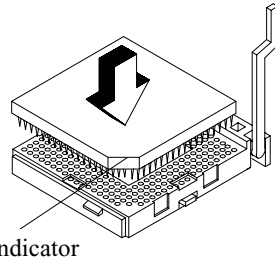


Make sure that the system power is OFF before installing a component.

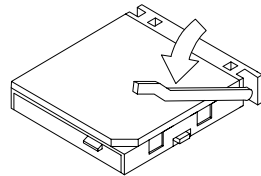
1. Locate the CPU socket on the system board and pull up the socket lever.



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.

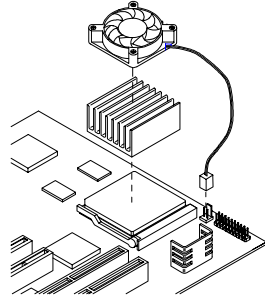


3. Pull down the socket lever to lock the CPU into the socket.

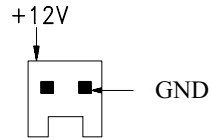


Hardware Installation

4. Attach the heatsink and fan to the CPU.

















5. Plug the fan cable onto the two-pin fan connector onboard. The fan connector is marked **CN15** on the system board.



Hardware Installation



6. Set jumpers **JP1** and **JP10** according to the frequency of the CPU that you install.

CPU FREQUENCY SELECT

	JP1	JP10
75 MHz		
90 MHz		
100 MHz (default)		
120 MHz		
133 MHz		
150 MHz		
166 MHz		

7. Set jumper **JP11** according to the CPU voltage.

CPU VOLTAGE SELECT

	JP11
3.45V (default)	
3.52V	

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 2.3 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 or 70-ns DRAM speed. See the figure in section 1.1 for the location of the SIMM sockets.

The following table lists the possible SIMM configurations:

Memory Configurations

Total Memory	SIMM 0	SIMM 1	SIMM 2	SIMM 3
4 MB	2 MB	2 MB		
8 MB	2 MB	2 MB	2 MB	2 MB
8 MB	4 MB	4 MB		
12 MB	2 MB	2 MB	4 MB	4 MB
16 MB	4 MB	4 MB	4 MB	4 MB

Memory Configurations (continued)

Total Memory	SIMM 0	SIMM 1	SIMM 2	SIMM 3
--------------	--------	--------	--------	--------

Hardware Installation

16 MB	8 MB	8 MB		
20 MB	2 MB	2 MB	8 MB	8 MB
24 MB	4 MB	4 MB	8 MB	8 MB
32 MB	8 MB	8 MB	8 MB	8 MB
32 MB	16 MB	16 MB		
36 MB	2 MB	2 MB	16 MB	16 MB
40 MB	4 MB	4 MB	16 MB	16 MB
48 MB	8 MB	8 MB	16 MB	16 MB
64 MB	16 MB	16 MB	16 MB	16 MB
64 MB	32 MB	32 MB		
68 MB	2 MB	2 MB	32 MB	32 MB
72 MB	4 MB	4 MB	32 MB	32 MB
80 MB	8 MB	8 MB	32 MB	32 MB
96 MB	16 MB	16 MB	32 MB	32 MB
128 MB	32 MB	32 MB	32 MB	32 MB
128 MB	64 MB	64 MB		
136 MB	4 MB	4 MB	64 MB	64 MB
144 MB	8 MB	8 MB	64 MB	64 MB
160 MB	16 MB	16 MB	64 MB	64 MB
256 MB	64 MB	64 MB	64 MB	64 MB
256 MB	128 MB	128 MB		
264 MB	4 MB	4 MB	128 MB	128 MB
272 MB	8 MB	8 MB	128 MB	128 MB
288 MB	16 MB	16 MB	128 MB	128 MB
320 MB	32 MB	32 MB	128 MB	128 MB
384 MB	64 MB	64 MB	128 MB	128 MB
512 MB	128 MB	128 MB	128 MB	128 MB

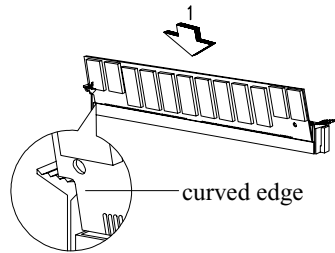
2.6.1 Installing a SIMM



Observe the ESD precautions when installing components.

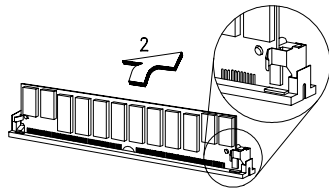
Follow these steps to install a SIMM:

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.



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.



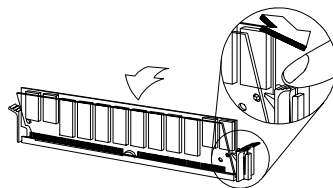
The SIMM should be at a 90° angle when installed.

Hardware Installation

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.



2.7 Customizing your Hardware Setup

You may customize your hardware setup according to your 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:

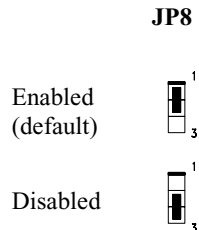
2.7.1 Selecting the Flash ROM Type

The AP53 board supports both the 5V and 12V Flash ROM types. Normally, the board comes with a 5V Flash ROM and with the jumpers **JP1301** and **JP1302** set to 1-2. Reset JP1301 to 2-3 if you want to install a 12V Flash ROM.



2.7.2 Disabling the Onboard Super I/O Controller

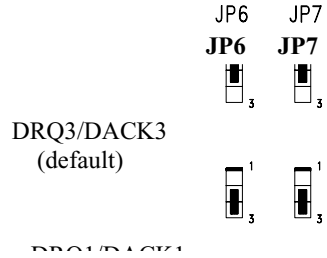
The board is preset by the manufacturer with the onboard I/O controller enabled. In case you wish to use an external I/O controller, you need to disable the onboard I/O before the external I/O card functions. To disable, you need to reset jumper **JP8** to 2-3.



Hardware Installation

2.7.3 Selecting the ECP DMA Channel

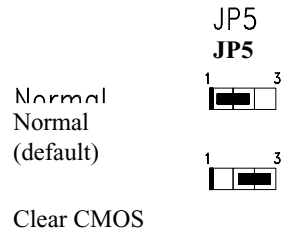
The available ECP DMA channel selections are DRQ3/DACK3 and DRQ1/DACK1. The default is DRQ3/DACK3. To select DRQ1/DACK1, reset jumpers **JP6** and **JP7** to 2-3.



*The onboard I/O controller may either be SMC 665 or SMC 669. If you have **SMC 669**, **JP6** and **JP7** must be set to **open**.*

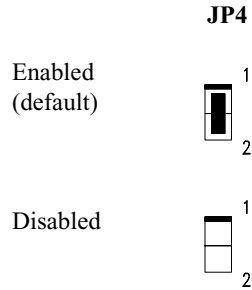
2.7.4 Clearing the CMOS

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 **JP5** for a few seconds. Reset the jumper to normal setting by shorting pins 1-2. Enter Setup to specify a new password.



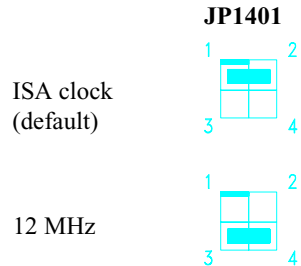
2.7.5 Disabling the PS/2 Mouse Function

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 **JP4** and changing the BIOS setup. For detailed information on BIOS, see Chapter 3.



2.7.6 Setting the Keyboard Clock

The jumper **JP1401** enables you to set the keyboard clock. The clock selections are ISA clock and 12 MHz. Set JP1401 to 1-2 to select the ISA clock. Reset it to 3-4 to set the keyboard clock to 12 MHz.



Hardware Installation

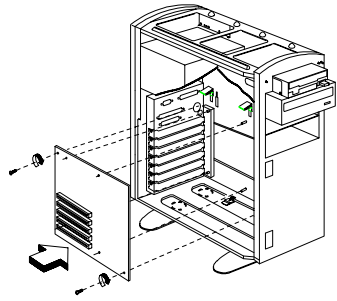
2.8 Installing the System Board



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.

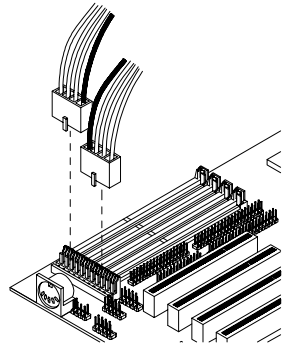


Refer to your housing documentation for more information on the system housing.

2.9 Connecting Peripherals

2.9.1 Power Cable

A standard power supply has two cables with six wires each. Plug these cables to the onboard power connector in such a way that all the black wires are in the center. The power connector is marked **CN3** on the system board.

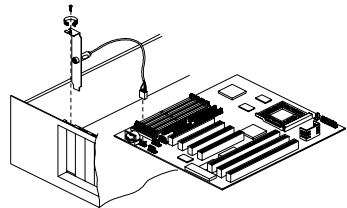


Make sure that the power supply is off before connecting or disconnecting the power cable.

2.9.2 Mouse

PS/2 Mouse

To connect a PS/2 mouse, simply insert the PS/2 bracket connector onto **CN4** on the system board. Plug a PS/2 mouse into the mouse port on the bracket.



Refer to section 3.2.2 for the proper BIOS setting.

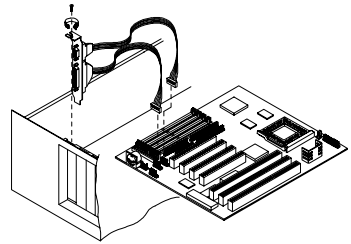
Hardware Installation

Serial Mouse

To connect a serial mouse, plug in the serial bracket connectors onto the **CN6** and **CN7**. Insert the serial mouse connector into the appropriate COM port on the bracket. See section 2.9.3.

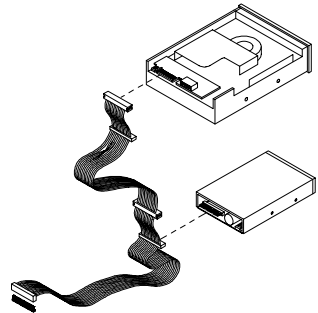
2.9.3 Serial Devices (COM1/COM2)

To support serial devices, insert the serial device connector into the serial port on the bracket. Plug in the serial port bracket connectors onto the appropriate onboard connectors. The COM1 connector is marked **CN7** and the COM2 connector is marked **CN6** on the system board.



2.9.4 Floppy Drives

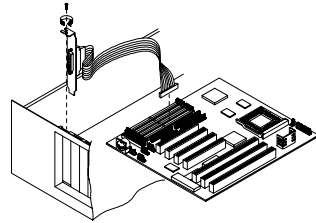
Connect the floppy drive cable onto the floppy drive connector marked **CN8** on the system board. See section 1.1 for the location of the connector. Refer to the figure on how to connect the cables.



2.9.5 Printer

Plug in the printer bracket connector onto the onboard parallel connector marked **CN9** on the board. Refer to the figure.

The printer port on the bracket accepts the printer cable.

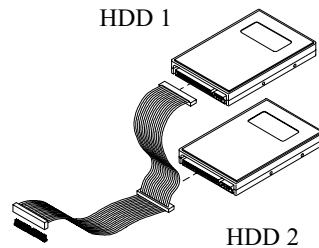


2.9.6 IDE Devices

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.

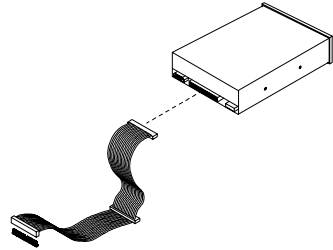
Connect your IDE HDD into the master port of the primary IDE cable. Plug in the slave port into another IDE device, if any.



Hardware Installation

Secondary IDE Connector

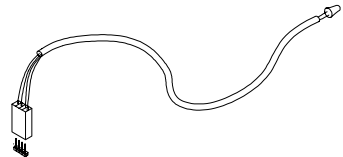
The secondary IDE connector is marked **CN11** on the board. This connector also supports two IDE devices. To install an IDE CD-ROM drive into your system, insert master port of the secondary IDE cable into the CD-ROM drive connector. If you have more than two hard disks, connect your third hard disk into the master port. Connect your CD-ROM drive into the slave port.



2.9.7 Front-panel Switches and LEDs

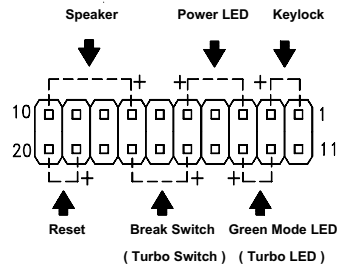
HDD LED

The HDD LED connector is marked **CN12** on the board. Plug the HDD LED socket onto this four-pin connector. See the figure.



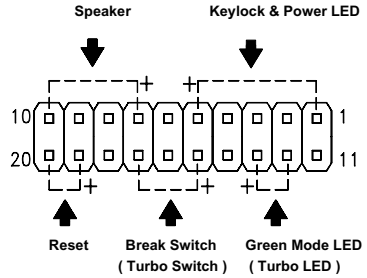
Multifunction Connector

The multifunction connector is a 20-pin connector marked **CN16** on the board. Attach the green mode LED, keylock, reset switch, turbo switch, and turbo LED connectors onto the corresponding pins as shown in the figure.

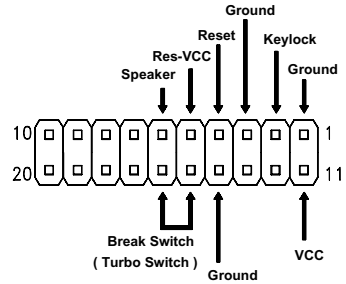


Hardware Installation

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

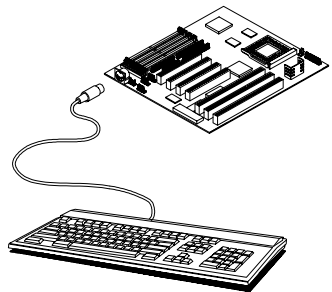


Other housings may have a 12-pin connector. If your housing has this type of connector, plug it onto CN16 as shown in the following figure. Make sure that the red wire of the connector connects to pin 11.



2.9.8 Keyboard

The onboard keyboard connector is a five-pin AT-compatible connector marked **CN2**. Refer to the figure on how to connect an AT keyboard.



The PS/2 keyboard connector is optional.

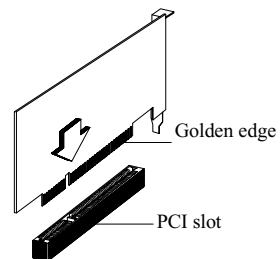
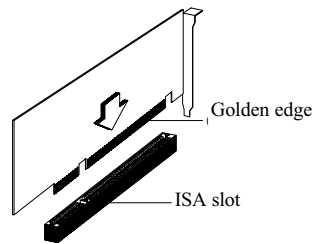
Hardware Installation

2.10 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.



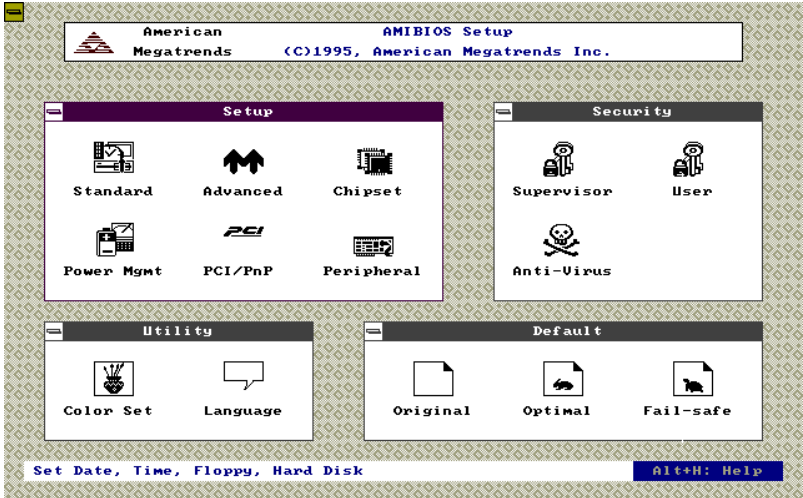
Chapter 3

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 **e** or double-click on the icon to open the selected menu option.

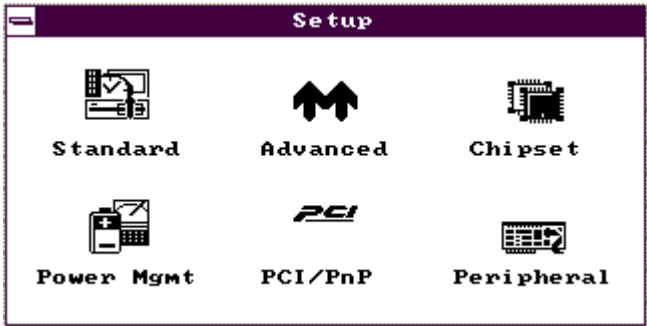


*You can press **h** to enter the BIOS Setup screen. This also enables you to do the following:*

- *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).*
- *Return to the BIOS default settings if the PnP BIOS does not recognize the hardware modifications under Windows 95.*

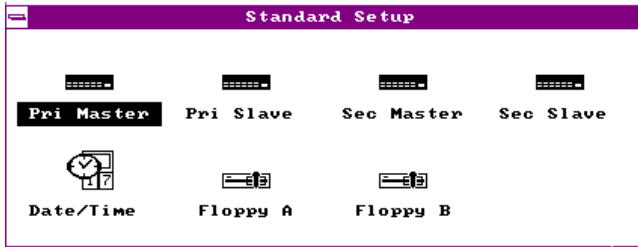
3.2 Setup Menu

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



3.2.1 Standard Setup

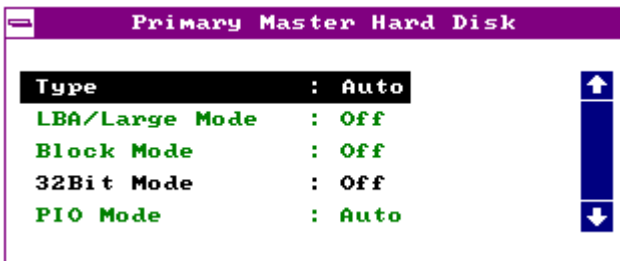
The following screen appears if you select Standard from the Setup options:



You can input configuration values such as date, time and disk types in this menu.

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

AMI BIOS Utility

Installed. Select `Auto` to automatically configure the installed hard disk or IDE device. Select `CD-ROM` 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 504 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 nonconfigurable when the `HDD Type` parameter is set to `Auto`.

Block Mode

This function enhanced 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 nonconfigurable 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. Otherwise, set this parameter to `Off`.

PIO Mode

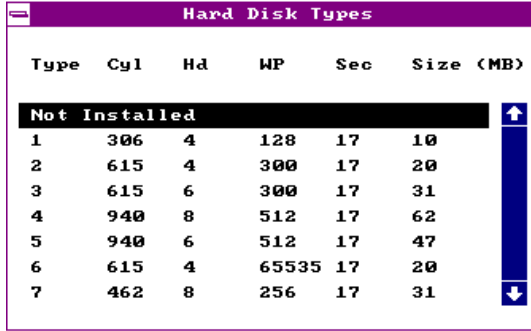
Setting this parameter to `On` allows the system to use a faster hard disk drive. If your hard disk does not support the PIO mode feature, set this parameter to `Off`.

This parameter becomes nonconfigurable 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:



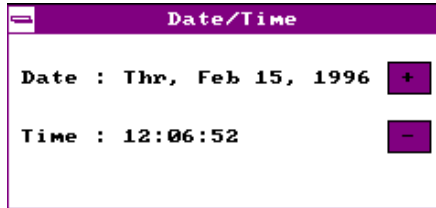
Type	Cyl	Hd	WP	Sec	Size (MB)
Not Installed					
1	306	4	128	17	10
2	615	4	300	17	20
3	615	6	300	17	31
4	940	8	512	17	62
5	940	6	512	17	47
6	615	4	65535	17	20
7	462	8	256	17	31

Select your hard disk type. Press the **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:



Date/Time

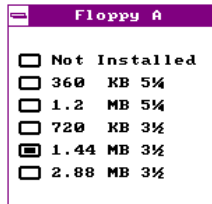
Date : Thu, Feb 15, 1996 **+**

Time : 12:06:52 **-**

Select 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:

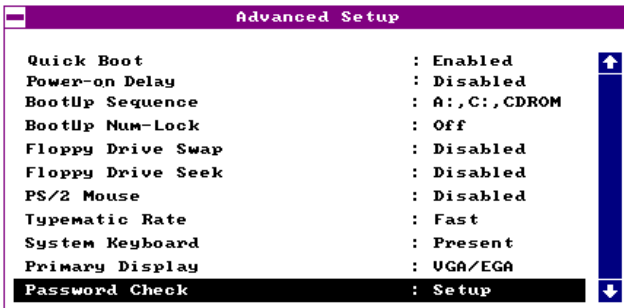


After selecting the proper setting, press **e**.

Select Floppy B and follow the same procedure to configure the second floppy drive.

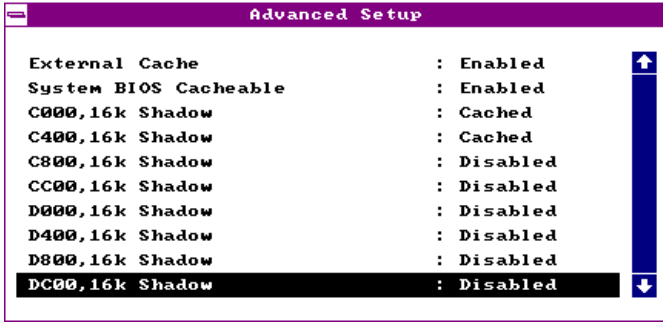
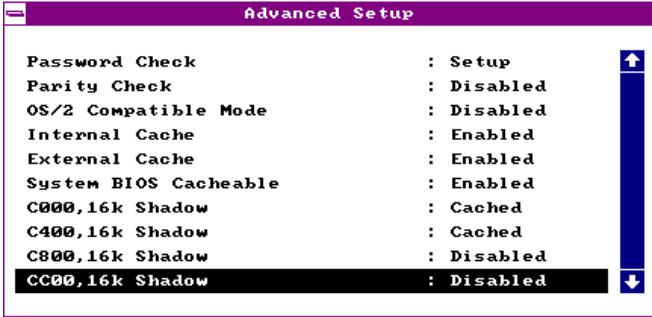
3.2.2 Advanced CMOS Setup

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



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

Power-on Delay

This parameter lets you set the POST waiting time for the HDD motor to stabilize before boot up. 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 `On.`

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.

PS/2 Mouse

Setting this parameter to `Enabled` lets you enable the PS/2 mouse function and assign IRQ12 for the said function. Set this to `Disabled` to bypass the function and to reserve IRQ12 for other functions.

Typematic Rate

This parameter determines the typematic rate. Select `Fast` to increase the typematic rate. Select `Slow` to decrease it.

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System Keyboard

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

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 allows you to use the password feature. When set to `Always`, a user-password prompt appears every time you turn on the computer. When set to `Setup`, the password prompt appears when you try to enter setup. The optimal and fail-safe 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 using the parity scheme for SIMMs with parity, this function is normally set to `Disabled`.

OS/2 Compatible Mode

Enable the parameter if you have an OS/2 operating system installed in your system. 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 change the system BIOS from ROM to RAM. When the system boots, the BIOS routines are copied into the RAM area. This enhances system performance as information access is faster in RAM than in ROM. Disabling the parameter prevents the system BIOS from being cached. The default setting is **Enabled**.

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**.

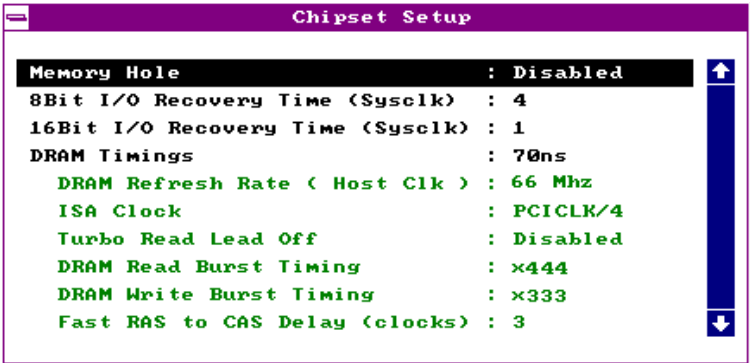


The F000 and E000 addresses are exclusively shadowed for BIOS.

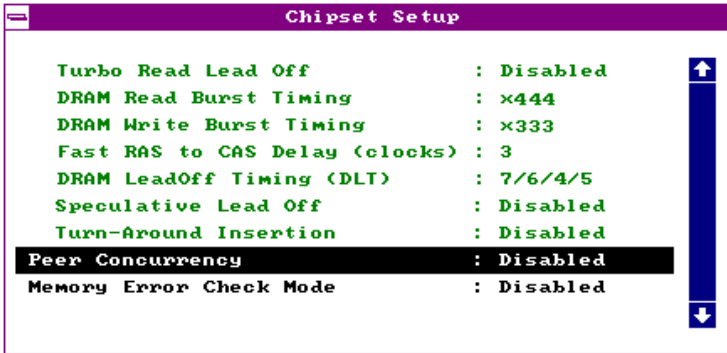
AMI BIOS Utility

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.



Memory Hole

This option lets you assign the system memory area to avoid memory conflicts. 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 nonconfigurable 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 DRAM refresh rate. The selections are 50 MHz, 60 MHz, 66 MHz, and Reserved.

ISA CLOCK DIVISOR

This option specifies the system bus clock divisor. The selections are PCICLK/4 and PCICLK/3.

TURBO READ LEAD OFF

When enabled, the 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 adjusts the read wait state between L2 and DRAM cache. Everytime the CPU reads L2 cache miss, it reads four continuous memory

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cycles on four continues addresses from the DRAM cache. Therefore, it has four settings to adjust.

The 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 adjusts the write wait state between L2 and DRAM cache. The L2 cache is processed through write-back method and each cache write process consists of four continuous cache write cycles. Therefore, it has four settings to adjust.

The 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-3-3-3 .

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 settings are 3 and 2. The default is 3.

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. The default is 7/6/4/5.

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 the parameter to allow the CPU to run secondary DRAM PCI master cycles to target PCI peer devices. Select `Disabled` to hold the CPU bus. The default setting is `Disabled`.

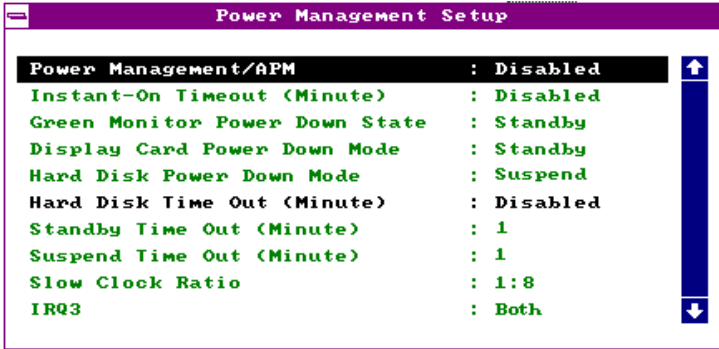
Memory Error Check Mode

BIOS automatically detects the memory error check mode supported by the secondary cache installed in your system. Therefore, this parameter is nonconfigurable and is for display only.

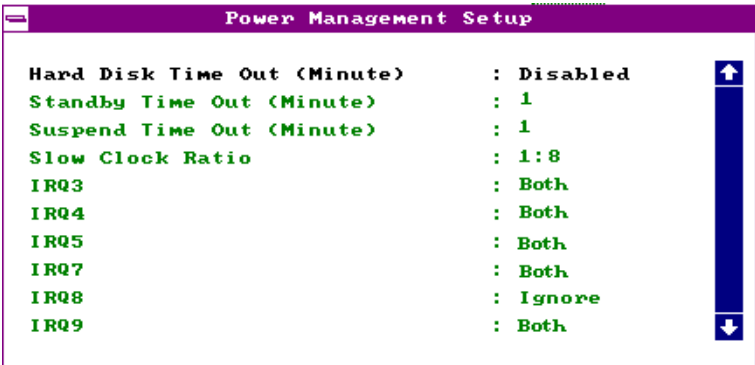
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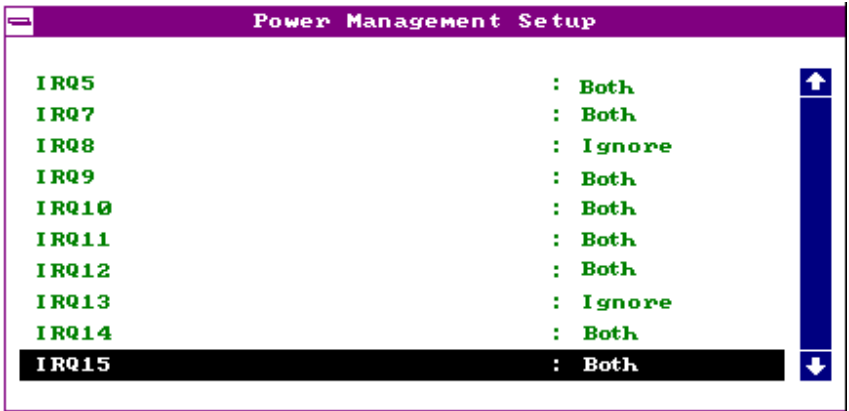
3.2.4 Power Management Setup

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



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*, *Suspend* and *Disabled*. The default is *Standby*.

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*. The default setting is *Standby*.

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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. The default setting is Suspend.

Hard Disk Timeout (Minutes)

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

Standby Timeout (Minutes)

This function lets you set when to put the system into standby mode. In standby mode, the CPU clock slows down. Any event detected returns the system to full power. The settings are 10 sec, 30 sec, 1 min, 5 min, 10 min, 20 min, 30 min and Disabled.

Suspend Timeout (Minutes)

This function lets you set when to put the system into suspend mode. In suspend mode, the CPU clock stops. Any event detected returns the system to full power. The settings are 10 sec, 30 sec, 1 min, 5 min, 10 min, 20 min, 30 min and Disabled.

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. The settings are 1:2, 1:4, 1:8, 1:16, 1:32, 1:64 and 1:128.

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

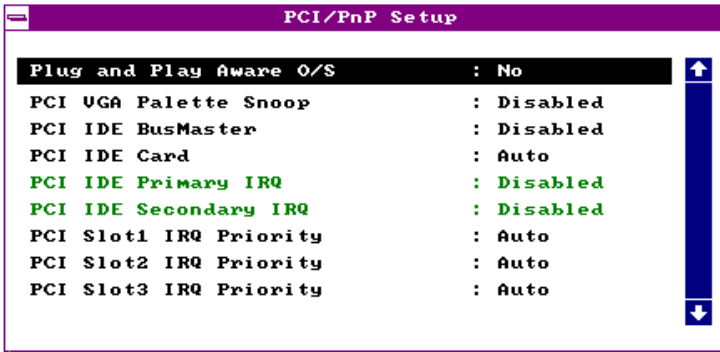
These parameters enable or disable specific I/O devices as wake up events in the power management mode.



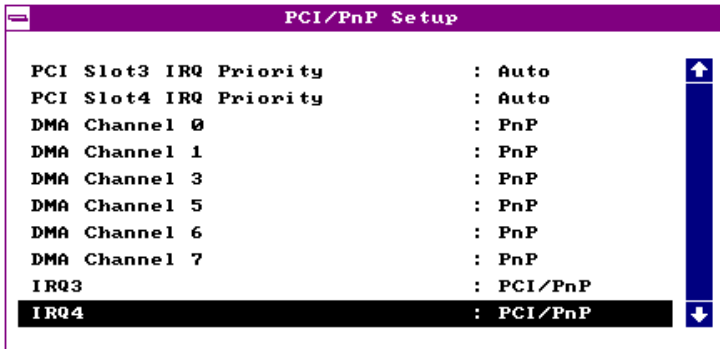
*You must enable at least one IRQ activity.
Otherwise, the system stays in suspend mode.*

3.2.5 PCI/PnP Setup

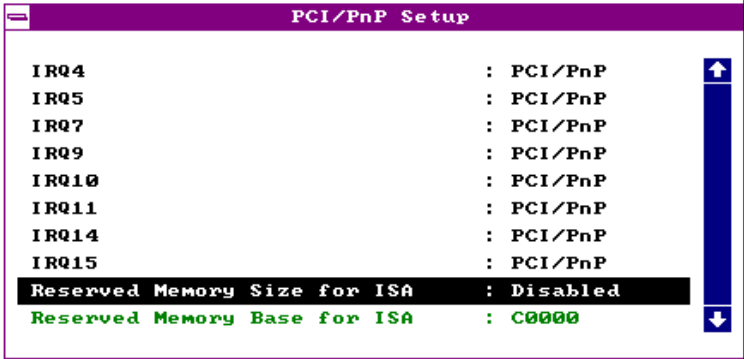
The PCI/PnP Setup allows you to specify the setting for your PCI devices. The screen below appears on screen if you select PCI / PnP from the Setup menu.



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

This parameter lets you enable or disable the Plug and Play feature.

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 to activate the palette snooping function in the PCI VGA devices installed in the system. Check your VGA card manual for more information about his function. The default setting is Disabled.

PCI IDE Bus Master

This option lets you enable or disable the bus master function of the PCI IDE device installed in your system.

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 connector. The settings are INTA, INTB, INTC,

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

PCI IDE Secondary IRQ

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

PCI Slot 1/2/3/4 IRQ Priority

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

DMA Channels 0, 1, 3, 5, 6, 7

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

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

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

Reserved for Memory Size

This option lets you specify the memory area reserved for PCI devices.

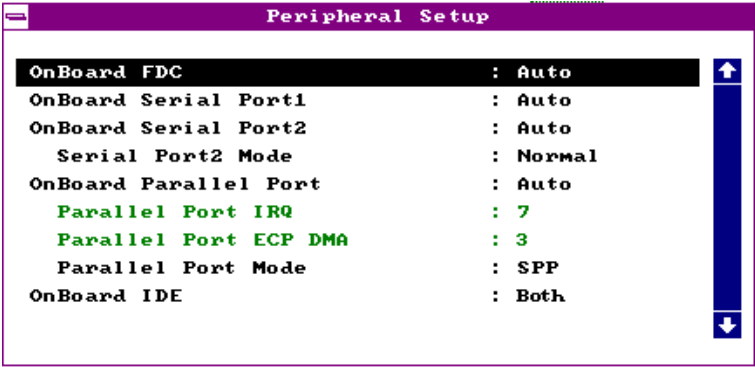
Reserved Memory Address

This option lets you specify the memory address of the specified memory area reserved for PCI devices.

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3.2.6 Peripheral Setup

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



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.

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 ECP DMA

This parameter is configurable only if the Onboard Parallel Port is NOT set to `Auto`, and the Parallel Port Mode is set to `ECP`. This allows you to set an ECP DMA channel for the parallel port function. The selections are 1 and 3.

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 IDE controller.

3.3 Security Setup

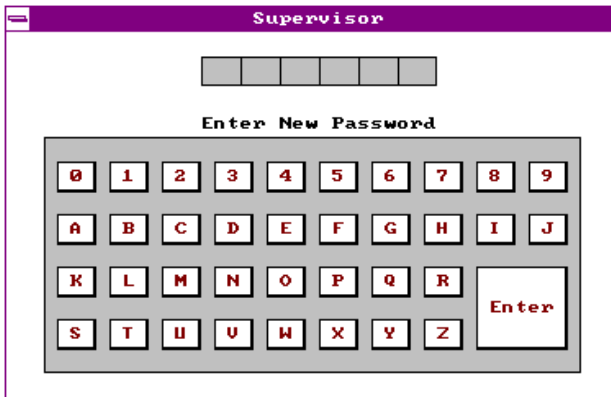
The Security window contains the password and anti-virus features.



3.3.1 Supervisor Password

The use of password prevents unauthorized use of your computer. If you enabled the Supervisor password, the system prompts for the correct password before granting access to Setup.

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`.

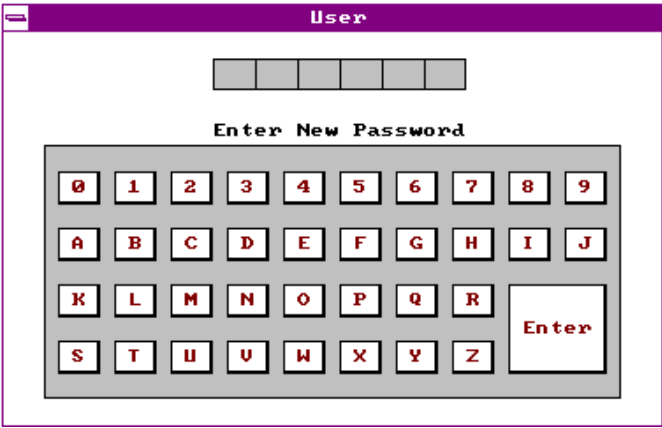
AMI BIOS Utility

- 3. Enter the password when a confirmation box appears.

3.3.2 User Password

If you enabled the User password, it is impossible to boot the computer and enter Setup without entering the correct password.

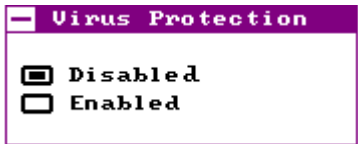
To set a User password, select `User` from the Security window. The following screen appears:



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

3.3.3 Anti-virus

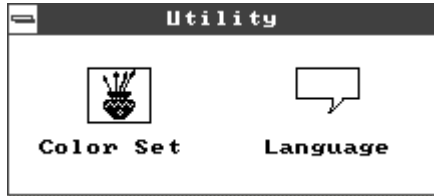
Select `Anti-Virus` from the Security window to display the following option box.



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.



AMI BIOS Utility

3.4.1 Color Set

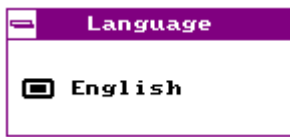
Select **Color Set** from the Utility window to display the following screen.



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.

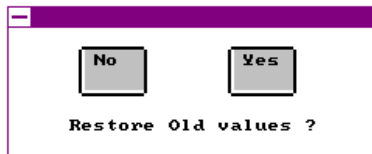
3.5 Default Setup

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



3.5.1 Original

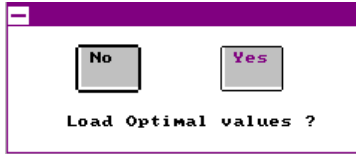
When you select **Original**, a dialog box prompts you restore the old values. Select **No** to keep your current settings or **Yes** to restore the original values.



AMI BIOS Utility

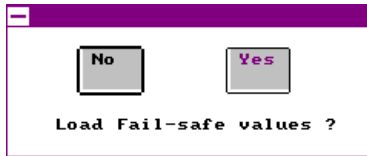
3.5.2 Optimal

When you select `Optimal`, a dialog box prompts you load the optimal values. Select `NO` to keep your current settings or `Yes` to load the optimal values.



3.5.3 Fail-safe

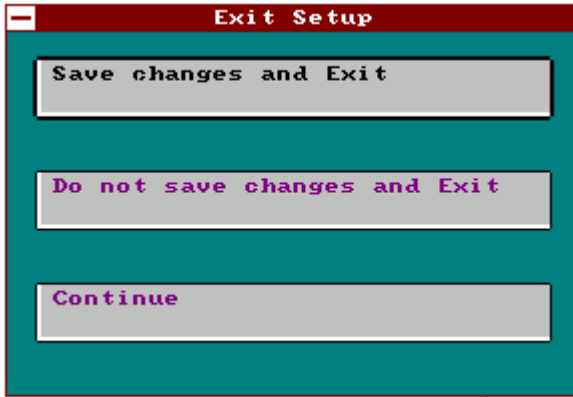
When you select `Fail-safe`, a dialog box prompts you load the fail-safe values. Select `NO` to keep your current settings or `Yes` to load the fail-safe values.



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.



Use the **y** or **w** key then press **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 on the same flash memory chip as the system BIOS. To use the onboard NCR BIOS, you need to 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 Frequency

CPU Frequency	JP1	JP10
75 MHz	1-2, 3-4	1-2, 3-4
90 MHz	1-2	1-2, 3-4
100 MHz	3-4 *	1-2, 3-4 *
120 MHz	1-2	3-4, 5-6
133 MHz	3-4	3-4, 5-6
150 MHz	1-2	5-6, 7-8
166 MHz	3-4	5-6, 7-8

CPU Voltage

CPU Voltage	JP11
3.45V	1-2 *
3.52V	3-4

* Default setting

Jumper and Connector Summary

Flash ROM Type

Flash ROM Type	JP1301	JP1302
5V	1-2 *	1-2 *
12V	2-3	2-3

Super I/O Controller

Super I/O Controller		JP8
SMC665	Enabled	1-2
	Disabled	2-3
SMC669	Enabled	1-2
	Disabled	2-3

ECP DMA Channel

Super I/O Controller	ECP/DMA Channel	JP6	JP7
SMC665	DRQ3/DACK3	1-2 *	1-2 *
	DRQ1/DACK1	2-3	2-3
SMC669	Auto-configured	Open	Open

CMOS

Function	JP5
Normal	1-2 *
Clear CMOS	2-3

* Default setting

Jumper and Connector Summary

PS/2 Mouse

Function	JP4
Enabled	Closed *
Disabled	Open

Keyboard Clock

Clock	JP1401
ISA clock	1-2 *
12 MHz	3-4

Onboard Connectors

Connector	Function
CN1	PS/2 keyboard (optional)
CN2	AT keyboard
CN3	Power
CN4	PS/2 mouse header
CN6	COM2
CN7	COM1
CN8	FDC
CN9	Printer/Parallel
CN10	IDE1
CN11	IDE2
CN12	HDD LED
CN13	VRM (optional)
CN14	IR (optional)
CN15	Fan
CN16	Multifunction

* Default setting