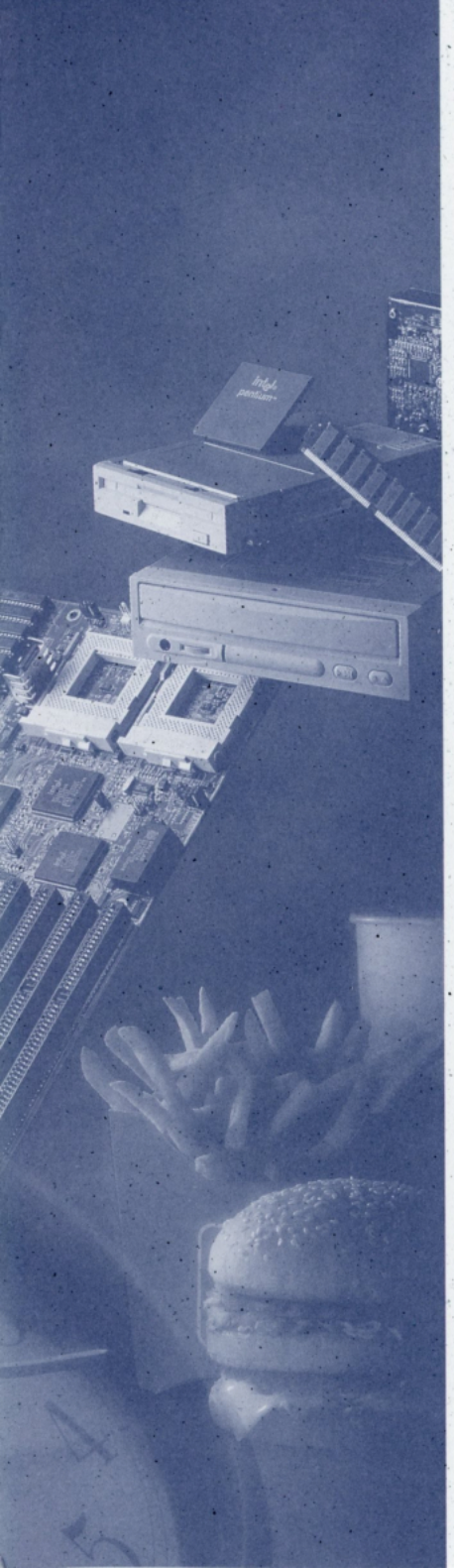

AP5VM

Mainboard

User's Guide

SAVE THE TREES

AP5VM
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FCC Class B Radio Frequency Interference Statement

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.

Conventions

The following conventions are used in this manual:

`Text entered by user, default settings, recommended selections`	Represent text input by the user, default settings and recommended selections
ALT, ENTER, F8, etc	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 AP5VM is a Pentium™ -based system board that utilizes the PCI/ISA architecture. It has three ISA and four PCI slots (including one ISA/PCI-shared slot) for future expansion. It comes with four 72-pin single in-line memory module (SIMM) sockets and one 168-pin dual in-line memory module (DIMM) sockets that allow system memory upgrade to a maximum of 128 MB. The board also supports 256-KB or 512-KB pipelined-burst cache memory.

A super I/O controller and two-channel PCI mode 4 enhanced IDE interfaces are also incorporated in the motherboard to further enhance system performance.

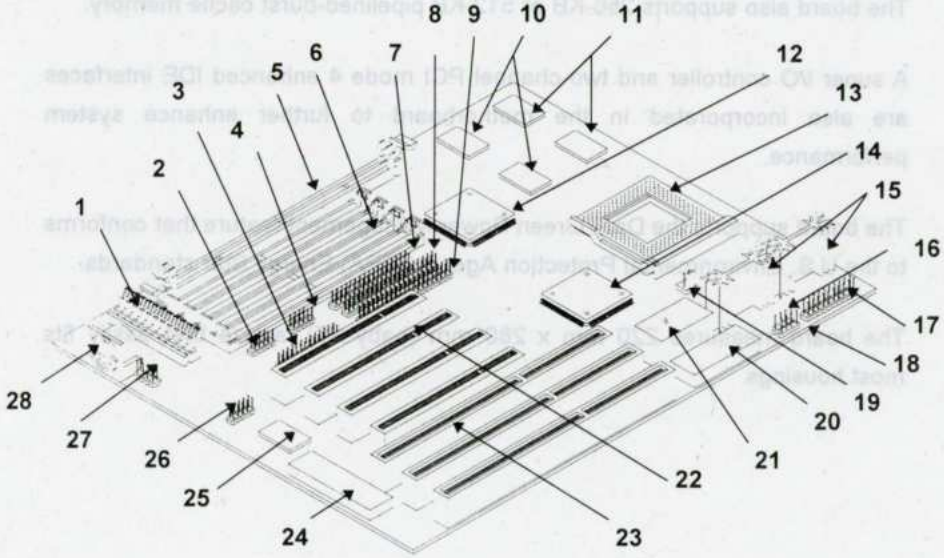
The board supports the Dark Green Power Management feature that conforms to the U.S. Environmental Protection Agency (EPA) Energy Star standards.

The board measures 220 mm x 280 mm (baby-AT), a size that easily fits most housings.

Overview

1.1 Board Layout

1 *Power connector*
2 *COM2 connector*
3 *Parallel connector*
4 *COM1 connector*
5 *168-pin DIMM socket*
6 *72-pin DIMM sockets*
7 *Floppy disk drive connector*
8 *IDE1 connector*
9 *IDE2 connector*
10 *Intel 82438VX ASIC*
11 *Pipelined-burst cache*
12 *Intel 82437VX ASIC*
13 *CPU socket*
14 *Intel 82371SB ASIC*
15 *Voltage regulators with heatsink*
16 *HDD LED connector*
17 *Multifunction connector*
18 *Infrared (IrDA) connector*
19 *Two-pin fan connector*
20 *BIOS chip*
21 *Real-time clock with battery*
22 *PCI slots*
23 *ISA slots*
24 *Keyboard controller*
25 *System I/O controller*
26 *Universal serial bus connector*
27 *PS/2 mouse connector*
28 *AT-keyboard connector*



1.2 Specifications

Microprocessor	Intel Pentium Processor P54C 75/90/100/120/133/150/166/200 MHz PP/MT(P55C) 150/166/200 MHz AMD K5 PR75/PR90/PR100/PR120/PR133 Cyrix 6x86 P120+/P133+/P150+/P166+
Memory	128 MB (maximum)
DRAM Sockets	72-pin SIMM x 4, 168-pin DIMM x 1, 64-bit
Second-level Cache	256-KB or 512-KB pipelined-burst cache
ASICs	Intel 430VX PCIset
Bus Architecture	ISA, PCI
Expansion Slots	Three ISA and Four PCI slots (includes one ISA/PCI-shared slot)
Connectors	One parallel connector (SPP/ECP/EPP) Two serial connectors (UART 16C550) Dual-channel PCI mode 4 IDE connectors (bus master transfer support) One USB connector that supports two ports One floppy disk drive connector (360/720-KB, 1.2/1.44/2.88-MB formats)
BIOS	AMI Plug-and-Play Flash ROM BIOS
RTC	Dallas DS12887A or DS12B887 compatible
Board Size	220 mm x 280 mm (baby AT)

1.3 System Board Parts

1.3.1 Microprocessor

The AP5VM system board supports Intel Pentium P54C & PP/MT(P55C), AMD K5 and Cyrix 6x86 processors. Chapter 2 gives details on how to install and upgrade a processor.

1.3.2 ASICs

The ASICs (application-specific integrated circuits) onboard are the Intel 82437VX, 82438VX, and 82371SB chips. The Intel 82437VX functions as the host/PCI bridge, DRAM and second-level cache controller. The Intel 82438VX serves as the memory controller data path. The Intel 82371SB acts as the ISA/PCI bus bridge that translates the PCI bus cycles into ISA bus cycles or vice-versa. It also functions as the universal serial bus controller and supports Fast IDE and PCI/ISA master/slave interfaces.

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 (includes one ISA/PCI-shared slot). 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 one 168-pin DIMM and four 72-pin SIMM sockets that expand system memory to a maximum of 128 MB. The SIMM sockets accept 5V Fast Page Mode (FPM) and Extended Data Output (EDO) DRAM types, while the DIMM socket accept 3.3V Sychronous, FPM and EDO DRAM types Chapter 2 discusses the different memory configurations available.

1.3.6 Second-level Cache

The AP5VM motherboard may come with 256-KB or 512-KB pipelined-burst second-level cache. 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 Interfaces

The AP5VM board integrates two dual-channel PCI mode 4 enhanced integrated drive electronics (E-IDE) interfaces that allow the system to support a maximum of 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

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.

The board may also come with or without a PS/2 keyboard connector.

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.

Chapter 2

Hardware Installation

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

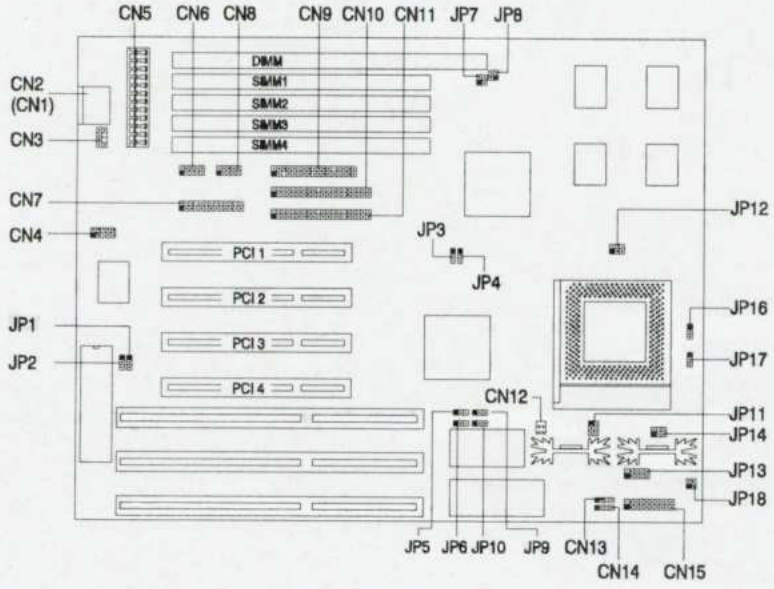
2.1 ESD Precautions

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.

2.2 Jumper and Connector Locations

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

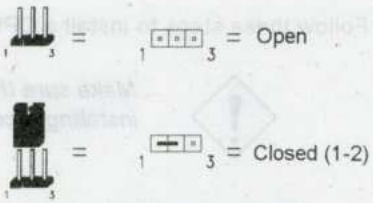


CN1: PS/2 keyboard connector (optional)
CN2: AT keyboard connector
CN3: PS/2 mouse connector
CN4: USB connector
CN5: Power connector
CN6: COM2 connector
CN7: Parallel connector
CN8: COM1 connector
CN9: FDD connector
CN10: IDE1 connector
CN11: IDE2 connector
CN12: Two-pin fan connector
CN13: HDD LED connector
CN14: IrDA connector
CN15: Multifunction connector

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.

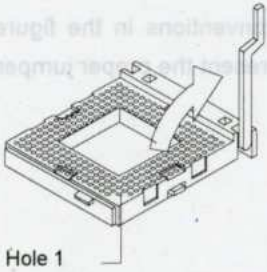
2.4 Installing a Microprocessor

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

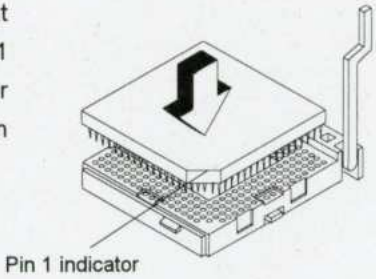
Follow these steps to install a CPU into a ZIF-type CPU socket:

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

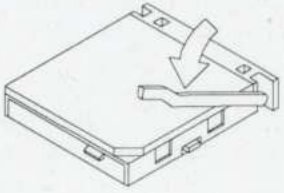
1. Locate the CPU socket on the system board and pull up the socket lever.



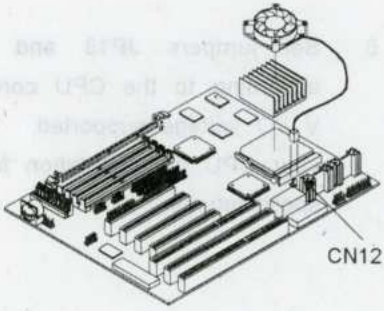
2. Insert the CPU making sure that pin 1 of the CPU aligns with hole 1 of the socket. The notched corner on the CPU indicates the location of pin 1.



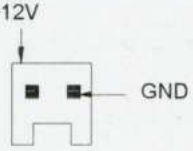
3. Pull down the socket lever to lock the CPU into the socket.



4. Attach the heatsink and fan to the CPU.



5. Plug in the fan cable to the two-pin fan connector onboard. The fan connector is marked **CN12** on the system board.



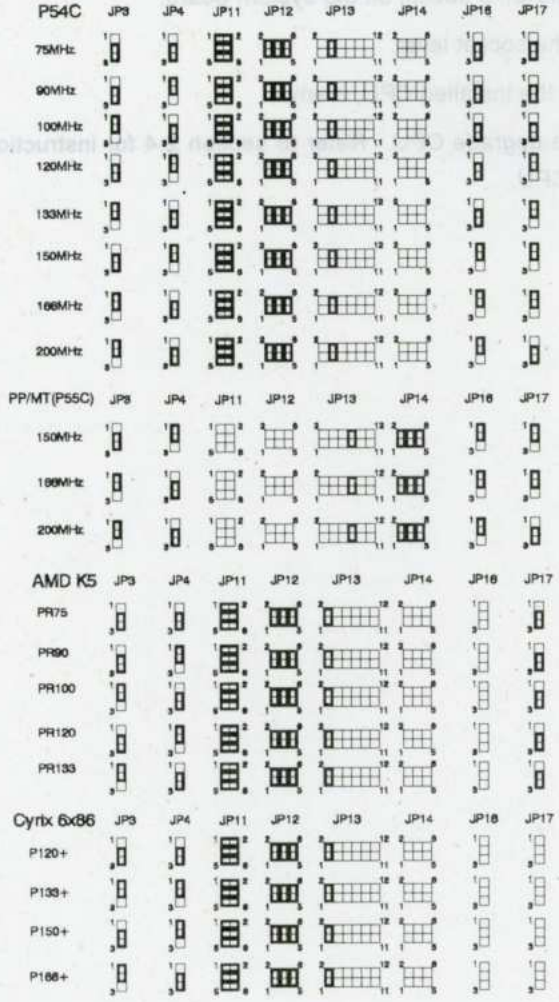
6. Set jumpers **JP13** and **JP18** according to the CPU core and V I/O voltage supported. Check your CPU documentation for the specifications.

CPU VOLTAGE SELECT

V CORE	JP13
3.52V	
3.45V	
2.9V	
2.8V	
2.7V	
2.52V	

V I/O	JP18
3.45V	
3.52V	

7. Set jumpers **JP3, JP4, JP11, JP12, JP13, JP14, JP16,** and **JP17** according to the frequency supported by your CPU.



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 memory is expandable to 128 MB by adding dual in-line memory modules (DIMMs) or single in-line memory modules (SIMMs). The four 72-pin SIMM sockets accommodate 5V FPM/EDO type DRAMs with 4-, 8-, 16-, and 32-MB capacities. The 168-pin DIMM socket accommodates 3.3V SDRAM with 8-, 16-, 32-, or 64-MB capacity.

The following are the possible memory configurations.

Memory Configurations

Bank 1		Bank 0		DIMM 1	Total Memory
SIMM 1	SIMM 2	SIMM 3	SIMM 4		
		4 MB	4 MB	--	8 MB
4 MB	4 MB	4 MB	4 MB	--	16 MB
--	--	8 MB	8 MB	--	16 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
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
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

Memory Configurations (continued)

Bank 1		Bank 0		DIMM 1	Total Memory
SIMM 1	SIMM 2	SIMM 3	SIMM 4		
--	--	--	--	8 MB	8 MB
--	--	--		16 MB	16MB
--	--	--	--	32 MB	32 MB
--	--	--	--	64 MB	64 MB

You must install the same type of SIMMs in each bank.

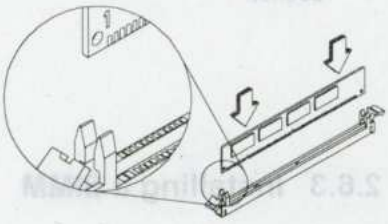
Do not combine SIMMs and DIMM. Doing so may result to system incompatibility. However, if you are sure that the DIMM can support the 5V tolerance, then you may combine the two.

2.6.1 Installing a DIMM

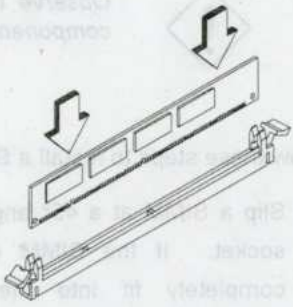
Observe the ESD precautions when installing components.

Follow these steps to install a DIMM:

1. Align pin 1 of the DIMM with pin 1 of the socket. Pin 1 is labeled 1 on both the DIMM and the socket.



2. Gently push the DIMM until the holding clips lock the DIMM into a vertical position.

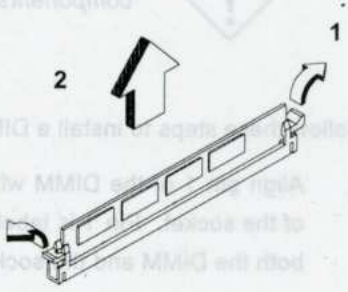


Be careful when inserting DIMMs. Forcing a DIMM in or out of a socket can damage the socket or the DIMM (or both).

2.6.2 Removing a DIMM

To remove a DIMM:

1. Press the holding clips on both sides of the socket outward to release the DIMM.
2. Gently pull the DIMM out of the socket.

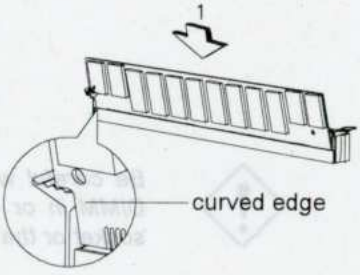


2.6.3 Installing a SIMM

Observe the ESD precautions when installing components.

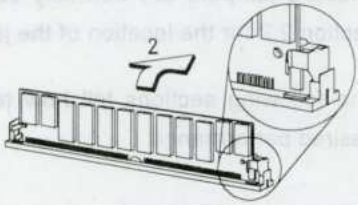
Follow these steps to install a SIMM:

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.

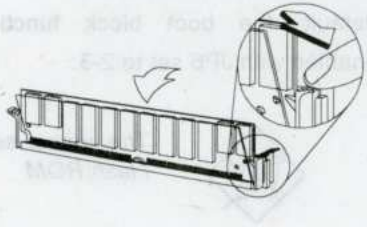


The SIMM should be at a 90° angle when installed.

2.6.4 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 Enabling the Intel Flash ROM Boot Block Programming

The Intel Flash ROM has two areas that can be programmed separately: the 8KB boot block and the 120KB main BIOS area.

JP6

Enabled (default)

1 2 3

The jumper **JP6** allows you to program only the Flash ROM boot block. By default, the boot block function is enabled with JP6 set to 2-3.

The jumper setting shown above applies only for Intel Flash ROM.

Do not change the default setting of JP6. Doing so modifies the main BIOS area but not the boot block, causing the BIOS to become inconsistent. This may result in serious system damage.

2.7.2 Disabling the PS/2 Mouse Function

The PS/2 mouse function is normally enabled and occupies IRQ12. To reassign IRQ12 to another function, disable the PS/2 mouse function by setting jumper **JP9** to 2-3.

JP9

Enabled (default)

Disabled

2.7.3 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 **JP10** to 2-3.

JP10

Enabled (default)

Disabled

2.7.4 Clearing the CMOS

You need to clear the CMOS if you forget your system password. To clear the CMOS, do the following steps:

Before you proceed, check your onboard CMOS chip. The "clearing" procedures vary depending on the CMOS chip type. Read the CMOS chip label to determine the chip type.

For Dallas DS12887A:

JP5

1. Turn off the system power.
2. Locate **JP5** and short pins 2-3 for a few seconds. Check your manual for the correct jumper settings and location of the jumpers.

   Normal (default) 

   Clear CMOS 

3. Reset JP5 to its normal setting by shorting pins 1-2.
4. Turn on the system power.
5. Press [DEL] during bootup to enter the BIOS Setup Utility and specify a new password, if needed.

For Dallas DS12B887, BENCHMARQ bq3287AMT, or SGS ST M48T86 PCI chip:

1. Turn off the system power.
2. Locate **JP5** and short pins 2-3 for a few seconds. Check your manual for the correct jumper settings and location of the jumpers.
3. Turn on the system power.
4. Turn off the system power again.
5. Reset JP5 to its normal setting by shorting pins 1-2.

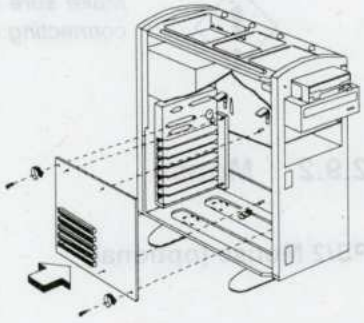
6. Turn on the system power.
7. Press [DEL] during bootup to enter the BIOS Setup Utility and specify a new password, if needed.

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.

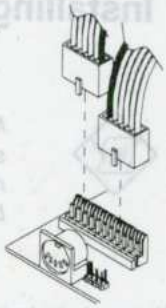


Refer to your housing documentation for more information on the system housing.

2.9 Connecting Peripherals

2.9.1 Power Cable

A standard power supply has two cables with six wires each. Plug in 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 **CN5** on the system board.

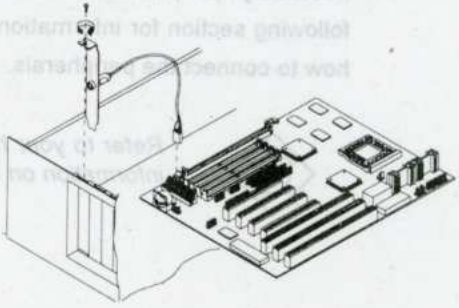


Make sure that the power supply is off before connecting or disconnecting the power cable.

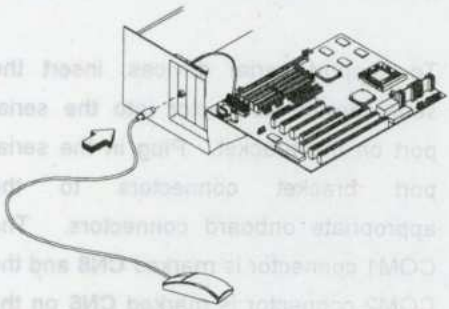
2.9.2 Mouse

PS/2 Mouse (optional)

To connect a PS/2 mouse, simply insert the PS/2 bracket connector to **CN3** on the system board.



Plug in a PS/2 mouse to the mouse port on the bracket.

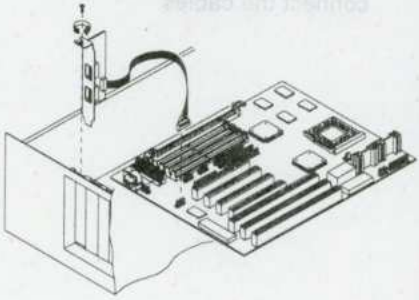


Serial Mouse

To connect a serial mouse, plug in the serial bracket connectors to **CN6** and **CN8**. Insert the serial mouse connector into the appropriate COM port on the bracket. See section 2.9.4.

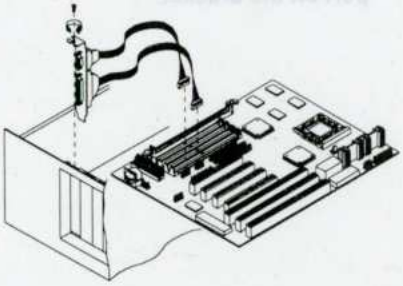
2.9.3 USB Devices

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 **CN4**. See section 2.2 for the location of the USB connector.



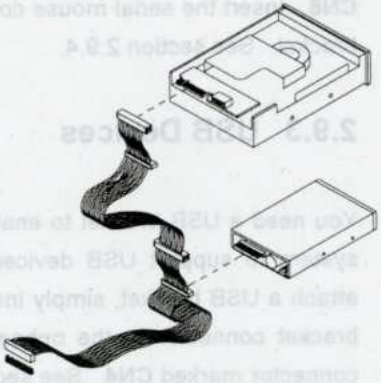
2.9.4 Serial Devices (COM1/COM2)

To support serial devices, insert the serial device connector into the serial port on the bracket. Plug in the serial port bracket connectors to the appropriate onboard connectors. The COM1 connector is marked **CN8** and the COM2 connector is marked **CN6** on the system board.



2.9.5 Floppy Disk Drives

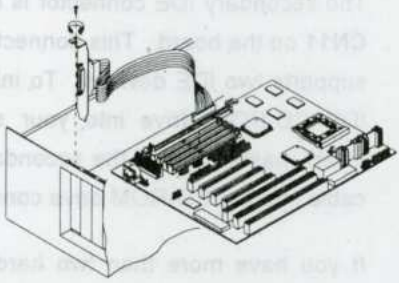
Connect the drive cable to the floppy disk drive connector marked **CN9** on the system board. See section 1.1 or section 2.2 for the location of the connector. Refer to the figure on how to connect the cables.



2.9.6 Printer

Plug in the printer bracket connector to the onboard parallel connector marked **CN7** on the board. Refer to the figure.

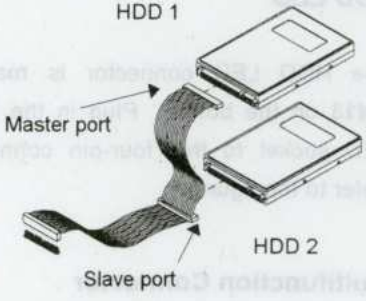
The printer port on the bracket accepts the printer cable.



2.9.7 IDE Devices

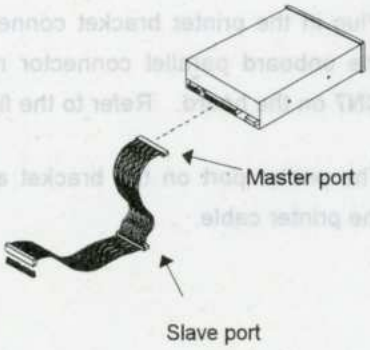
Primary IDE Connector

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 **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.

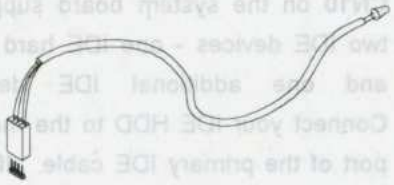


If you have more than two hard disks, connect your third hard disk into the master port. Then connect your CD-ROM drive into the slave port.

2.9.8 Front-panel Switches and LEDs

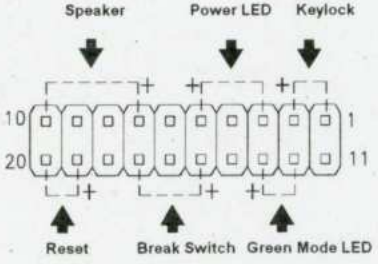
HDD LED

The HDD LED connector is marked **CN13** on the board. Plug in the HDD LED socket to this four-pin connector (refer to the figure).

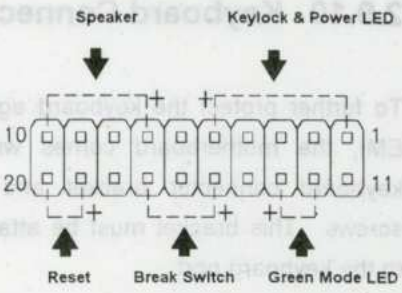


Multifunction Connector

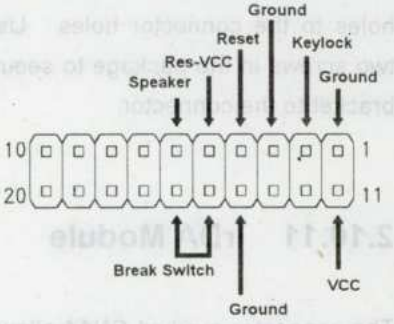
The multifunction connector is a 20-pin connector marked **CN15** on the board. Attach the green mode LED, keylock, reset switch, turbo switch, and turbo LED connectors to the corresponding pins as shown in the figure.



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

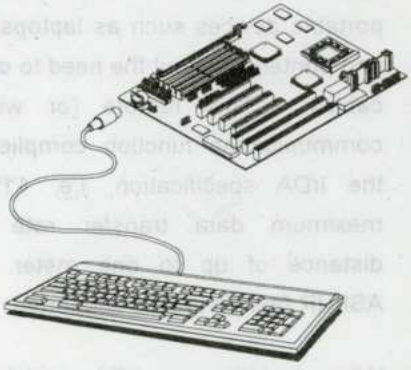


Other housings may have a 12-pin connector. If your housing has this type of connector, plug it to CN15 as shown in the following figure. Make sure that the red wire of the connector connects to pin 11.



2.9.9 Keyboard

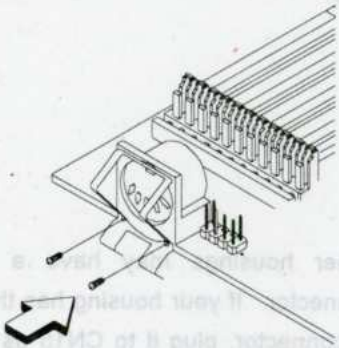
The onboard keyboard connector is a five-pin AT-compatible connector marked **CN2**. Refer to the figure on how to connect an AT keyboard.



The PS/2 keyboard connector is optional.

2.9.10 Keyboard Connector Bracket

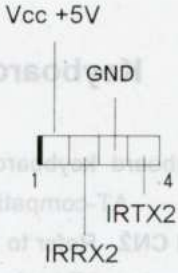
To further protect the keyboard against EMI, the motherboard comes with a keyboard connector bracket and two screws. This bracket must be attached to the keyboard port.



To attach the bracket, align the bracket holes to the connector holes. Use the two screws in the package to secure the bracket to the connector.

2.10.11 IrDA Module

The connector marked **CN14** allows you to install an Infrared (IrDA) module. The IrDA module enables the system to transfer data and communicate with portable devices such as laptops, PDA, and printers, without the need to connect cables. This remote (or wireless) communication function complies with the IrDA specification, i.e, 115 Kbs maximum data transfer rate at a distance of up to one meter. The ASK-IR feature is also supported.



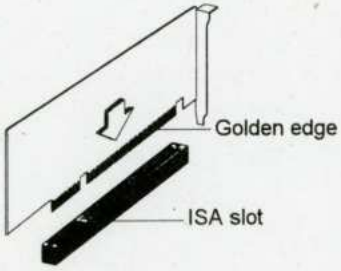
When installing an IrDA module, take note of the pin configuration of CN14 to ensure proper connection

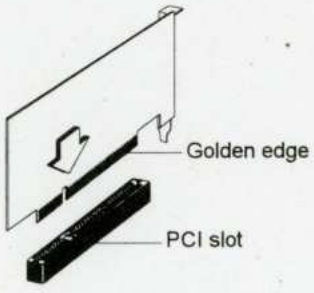
2.10 Installing Expansion Boards

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 onto the slot until it fits into place.
6. Secure the bracket to the housing with a screw.





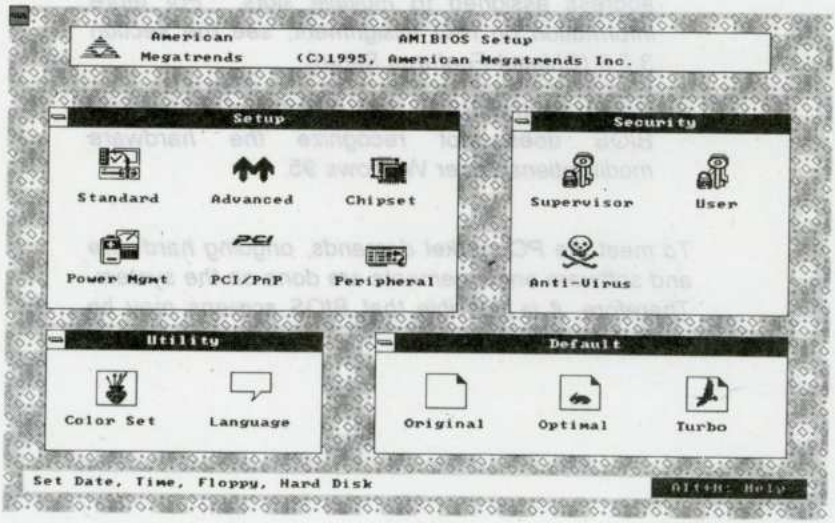
Chapter 3

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 [DEL]. 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.

AMI BIOS Utility

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 [⇆] to highlight the selected group or simply click on the icon of the selected Setup menu.

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.

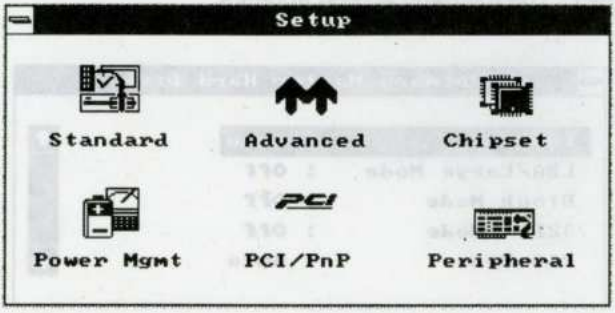
You may press [INS] to perform the following:

- *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.*

To meet the PC market demands, ongoing hardware and software enhancements are done on the system. Therefore, it is possible that BIOS screens may be changed without notice.

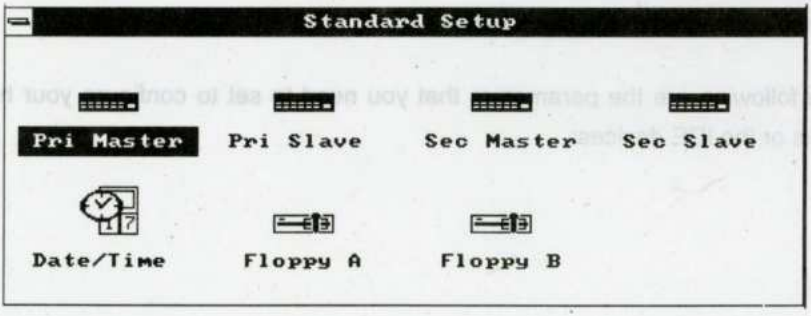
3.2 Setup Menu

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 ENTER. 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 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. Select 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.

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

HARD DISK TYPES

After you have set all the necessary parameters, press [ENTER]. A list of the HDD drive parameters appears:

Hard Disk Types

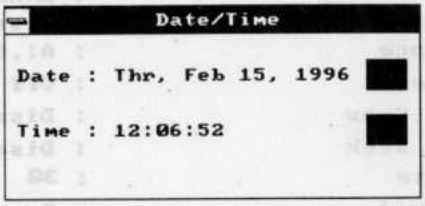
Type	Cyl	Hd	WP	Sec	Size (MB)
Not Installed					
1	306	4	128	17	10
2	615	4	300	17	20
3	615	6	300	17	31
4	940	8	512	17	62
5	940	6	512	17	47
6	615	4	65535	17	20
7	462	8	256	17	31

Select your hard disk type. Press [↑] or [↓] to move among the selections. After you have made your selection, press [ENTER].

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

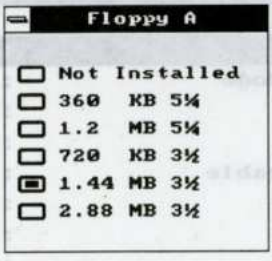
To set the date and time, highlight Date/Time and press ENTER. The following screen appears:



Select the arrow keys to move among the items. Press or click on + or − to set the current time and date. Press ENTER or double-click on the Control menu box at 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:

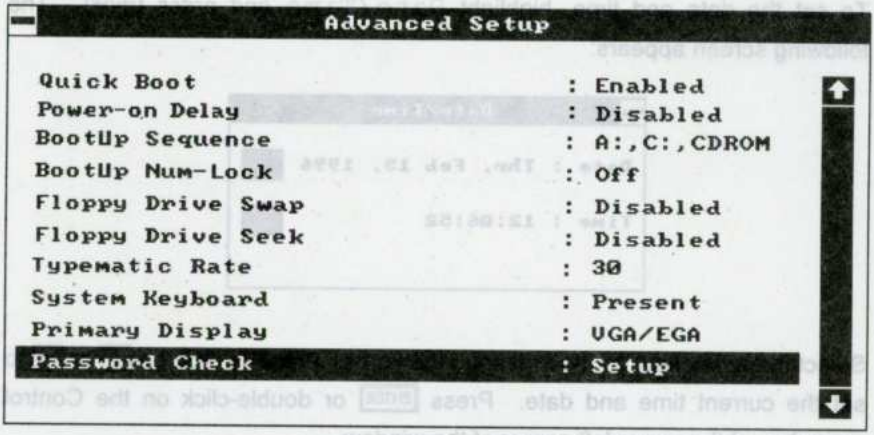


After selecting the proper setting, press ENTER.

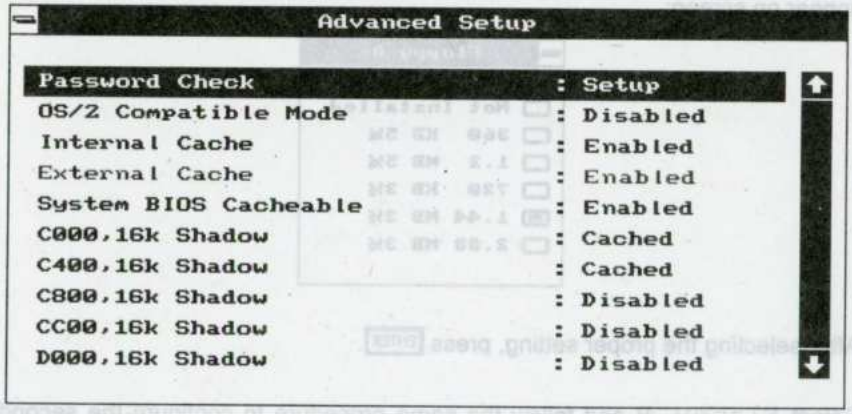
Select Floppy B and follow the same procedure to configure the second floppy drive.

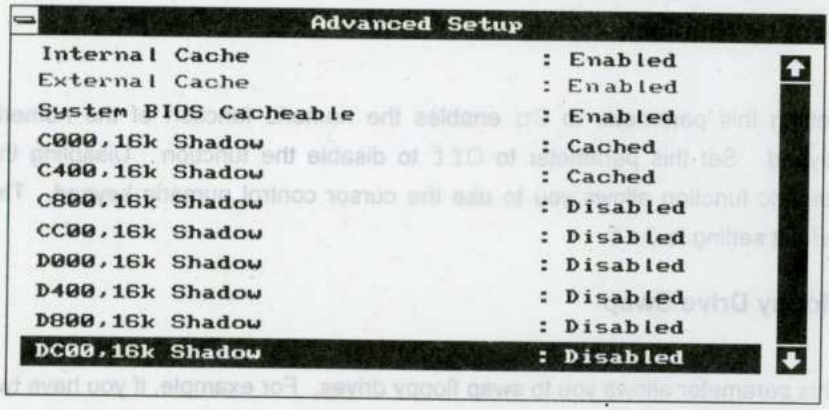
3.2.2 Advanced CMOS Setup

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 PGDN. Press ↑ or ↓ to highlight the desired parameter.





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.

Boot-up Sequence

The boot-up sequence allows you to specify the system search sequence. The selections are `C:, A:, CD-ROM , A:, C:, CD-ROM` and `CD-ROM, A:, C:`. 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 disable 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, BIOS detects whether there is a floppy disk drive installed in the system. Disable the parameter to skip the function.

Typematic Rate

This parameter allows you to control the speed at which the system registers repeated keystrokes.

System Keyboard

Set this parameter to Present if there is a keyboard connected to the system. If none, select Absent.

Primary Display

This function specifies the VGA type 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 and 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.

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. The default settings is `Enabled`.

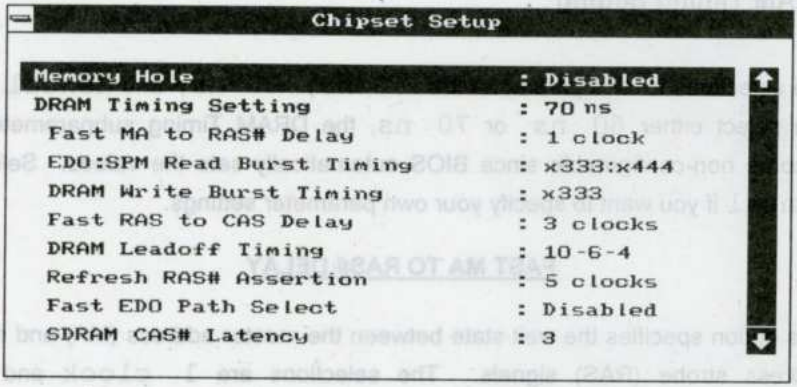
C000 ~ DC00, 16K Shadow

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.

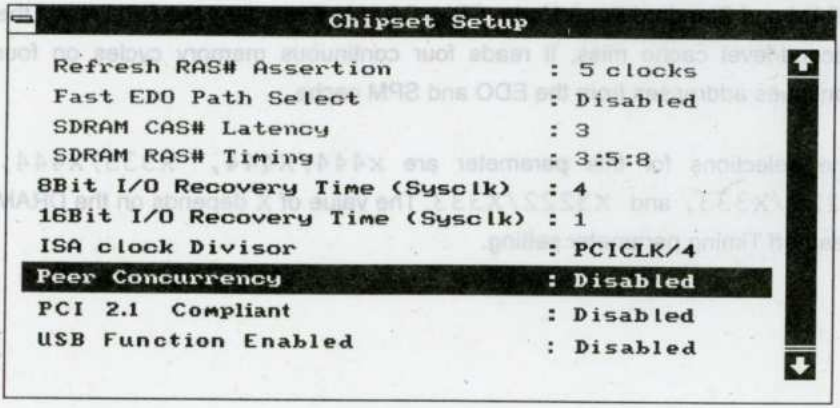
The F000 and E000 addresses are exclusively shadowed for BIOS.

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 PGDN. Use ↑ or ↓ to highlight the desired parameter.



Memory Hole

This option lets you assign the system memory area for ISA cards installed in your system to avoid memory conflicts. The available settings are 512~640K, 15~16M and Disabled.

DRAM Timing Setting

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.

FAST MA TO RAS# DELAY

This option specifies the wait state between the master address (MA) and row address strobe (RAS) signals. The selections are 1 clock and 2 clocks.

EDO:SPM READ BURST TIMING

This parameter adjusts the read wait state for Extended Data Out (EDO) DRAM and Standard Page Mode (SPM) DRAM. Every time the CPU reads the second-level cache miss, it reads four continuous memory cycles on four continues addresses from the EDO and SPM cache.

The selections for this parameter are x444/X444, X333/X444, X222/X333, and X3222/X333. The value of X depends on the DRAM Lead-off Timing parameter setting.

DRAM WRITE BURST TIMING

This parameter adjusts the write wait state between the second-level and the DRAM cache. The second-level cache is processed through write-back method and each cache write process consists of four continuous cache write cycles.

The parameter settings are X444, X333, and X222. Faster DRAMs require shorter wait states. The value of X depends on the DRAM Lead-off Timing parameter setting.

FAST RAS TO CAS DELAY

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

DRAM LEAD-OFF TIMING

This option specifies the DRAM waiting time or the delay before data can be accessed. Some DRAMs may require a longer delay to access data. The selections are 11-7-3, 10-6-3, 11-7-4, and 10-6-4.

REFRESH RAS# ASSERTION

This function controls the number of clocks required to assert RAS# for refresh cycles. The available settings are 4 clocks and 5 clocks.

FAST EDO PATH SELECT

Enable this option to select a fast path for CPU to DRAM read cycles to minimize the lead-off time. This is applicable only for EDO DRAMs. For other DRAM types, we recommend that you set this to Disabled.

SDRAM CAS# LATENCY

This parameter controls the wait state between SDRAM row address strobe and SDRAM CAS signals.

SDRAM RAS# TIMING

This parameter controls the RAS# precharge, RAS# active-to-precharge time, and refresh-to-RAS# active signal delay.

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 1-8 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.

ISA Clock Divisor

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

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.

PCI 2.1 Compliant

This parameter lets you enable or disable the PIIX3 PCI register 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. Select `Disabled` to disregard the functions.

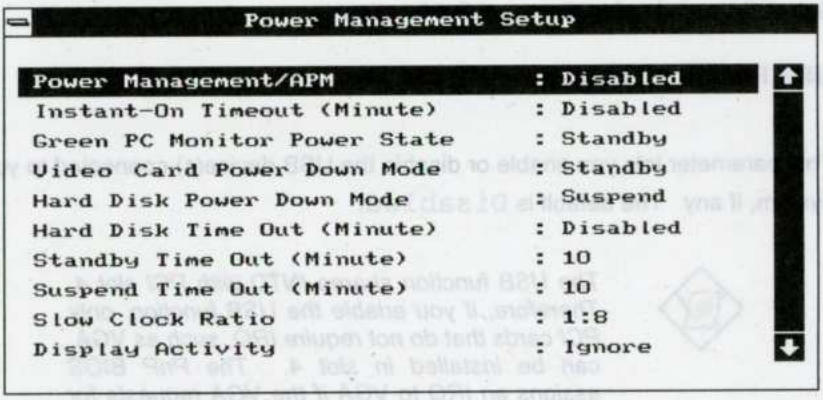
USB Function Enabled

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

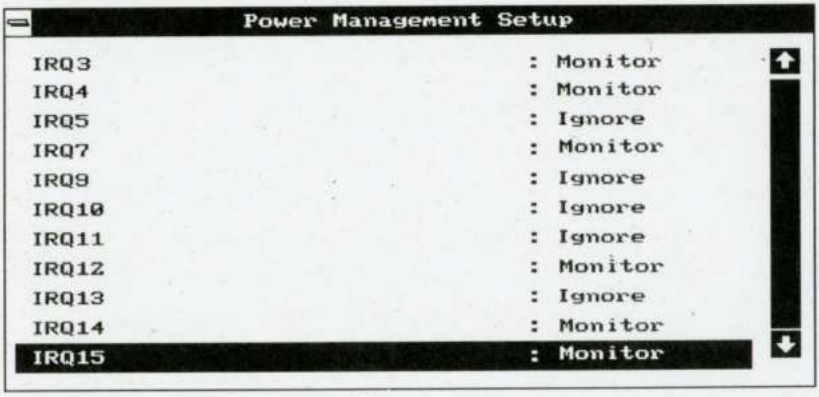
The USB function shares INTD with PCI slot 4. Therefore, if you enable the USB function, only PCI cards that do not require IRQ, such as VGA, can be installed in slot 4. The PnP BIOS assigns an IRQ to VGA if the VGA requests for it.

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:



To scroll down the rest of the parameters, press PGDN. Use ↑ or ↓ to highlight the desired parameter.



Power Management/APM

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

Instant On Time-out (Minutes)

This parameter is configurable only if the Power Management/APM parameter is set to `Instant On`. This option 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 `Off`. The default is `Standby`.

Video 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`.

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 Time-out (Minutes)

This option lets you specify when to set the hard disk to the specified power-down mode. The settings range from 1 ~ 15 Minutes anc Disabled.

Standby Time-out (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 range from 1 ~ 15 Minutes and Disabled.

Suspend Time-out (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 range from 1 ~15 Minutes and Disabled.

Slow Clock Ratio

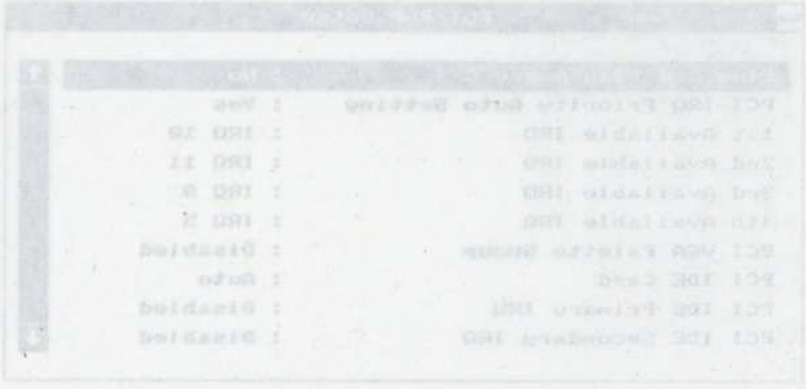
When the system enters the standby mode, the CPU clock starts to slow down. This parameter lets you set the "slow down" clock ratio. The selections are from 1:1, 1:2, 1:4, 1:8, 1:16, 1:32, 1:64, and 1:128.

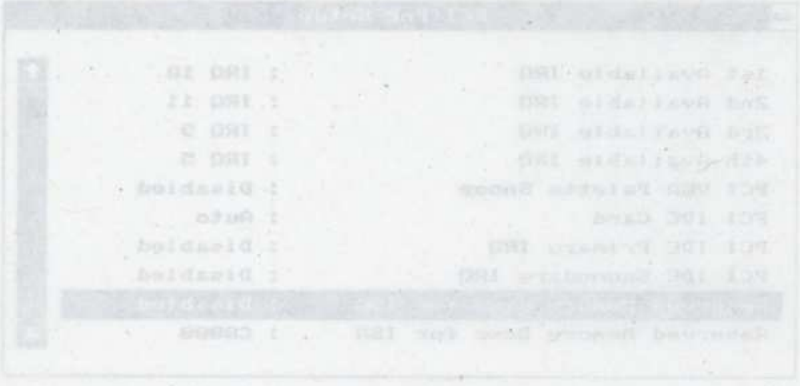
Display Activity

This function lets you check the activity of the monitor. When set to Monitor, any detected activity from the display resumes the system to normal mode. When set to Ignore, the power management function bypasses the display activities detected.

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

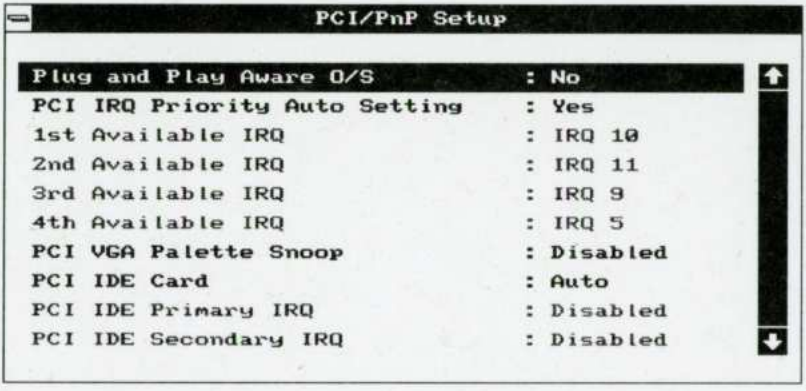
These parameters enable or disable specific I/O devices as wake up events in the power management mode. Any activity detected from the enabled IRQs resets the power-management timers and returns the system to normal mode.



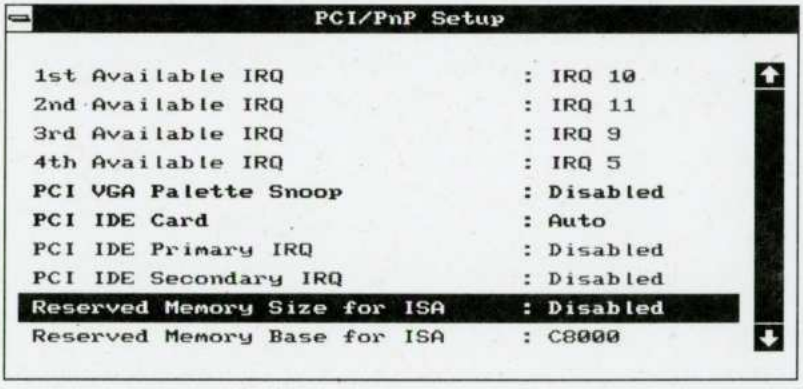


3.2.5 PCI/PnP Setup

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 PGDN. Use ↑ or ↓ to highlight the desired parameter.



Plug-and-Play Aware O/S

Enable this parameter only if you have a Plug-and-Play operating system, such as Windows 95.

PCI IRQ Priority Auto Setting

Set this parameter to `Yes` to automatically set the appropriate available interrupt for each PCI slot. Select `No` if you prefer to manually set the interrupts.

1st, 2nd, 3rd, and 4th Available IRQ

These parameters are configurable only if the PCI IRQ Priority Auto Setting parameter is set to `No`. When configurable, these let you specify the ranking of the interrupts which you can assign to the PCI devices installed in your 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 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 Card

This function allows you to select the PCI slot(s) that you want to enable, if there is 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 options 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 connector. The options are INTA, INTB, INTC, INTD, Hardwired and Disabled. If the PCI IDE Card parameter is set to Auto, this parameter becomes non-configurable.

Reserved Memory Size for ISA

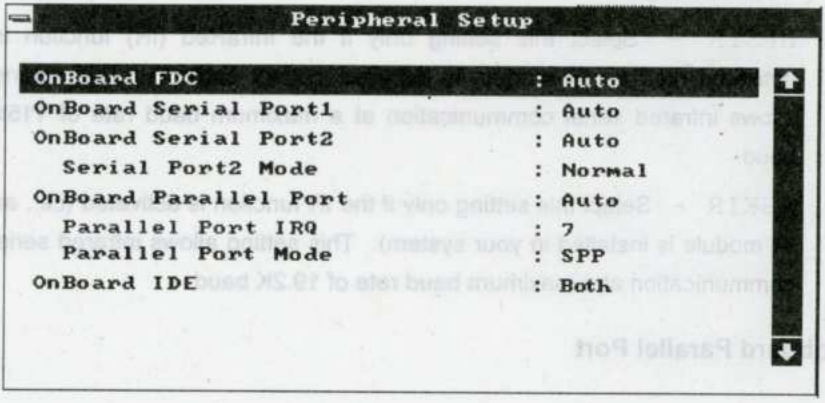
This option lets you specify the memory area reserved for Legacy/ISA devices.

Reserved Memory Base for ISA

This option lets you specify the memory base address reserved for Legacy/ISA devices.

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. The available settings are Auto, 3F8h, 2F8h, 3E8h, 2E8h, and Disabled. Selecting Disabled deactivates the port.

Onboard Serial Port 2

This parameter allows you to select the address for the second serial port. The available settings are Auto, 3F8h, 2F8h, 3E8h, 2E8h, and Disabled. Selecting Disabled deactivates the port.

SERIAL PORT 2 MODE

This parameter 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.
- 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. The available settings are Auto, 378h, 278h, 3BCh, and Disabled. Selecting Disabled deactivates the parallel port.

PARALLEL PORT IRQ

This parameter allows you to set the interrupt for the parallel port. The default setting is 7.

PARALLEL PORT MODE

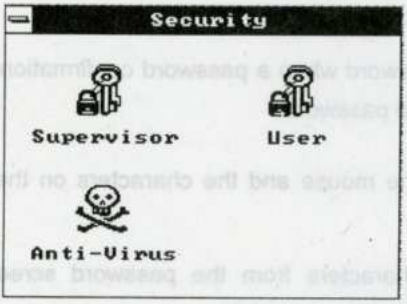
This parameter specifies the parallel port mode. The mode options are SPP, EPP, and ECP. The default is SPP.

Onboard IDE

This parameter enables or disables the IDE device(s) connected to your system. The selections are Primary, Secondary, Both, and Disabled.

3.3 Security Setup

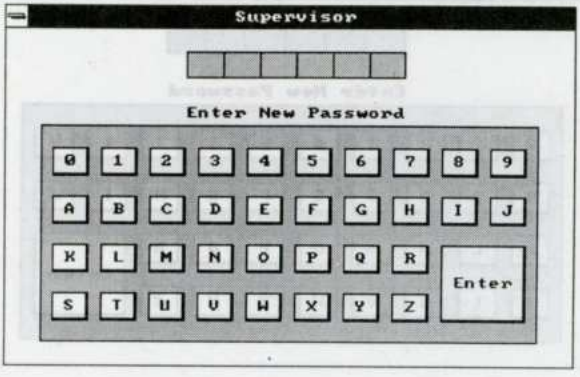
The Security window contains the password and anti-virus features.



3.3.1 Supervisor Password

The use of password prevents unauthorized use of your computer. If you 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.

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:

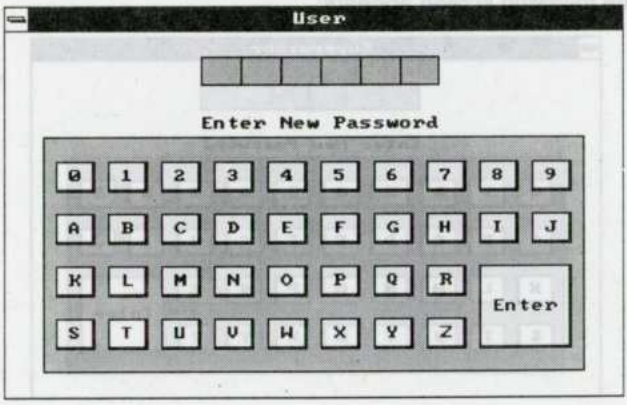
1. Type in a six-character password using letters, numbers, or a combination of both. When you type the characters, they appear as asterisks on the password screen boxes.
2. Press ENTER.
3. Retype the password when a password confirmation box appears asking you to retype the password.

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 ENTER.
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:

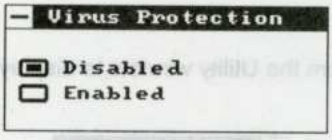


For instructions on how to enter a password, follow the procedures listed in section 3.3.1.

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.

3.3.3 Anti-virus

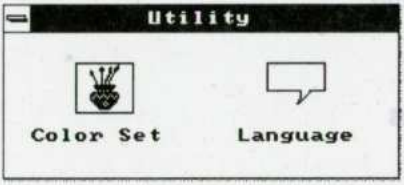
Select Anti-Virus from the Security window to display the following option box.



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

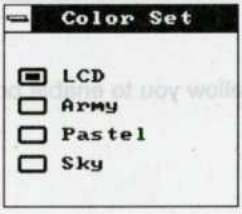
3.4 Utility Setup

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



3.4.1 Color Set

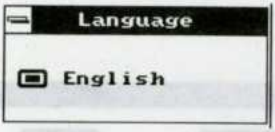
Select `Color Set` from the Utility window to display the following screen.



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.



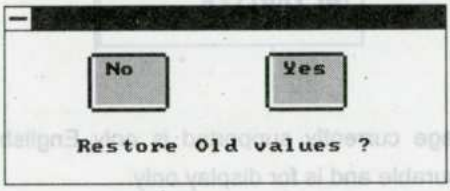
The system language currently supported is only English. Therefore, this option is non-configurable and is for display only.

3.5 Default Setup

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

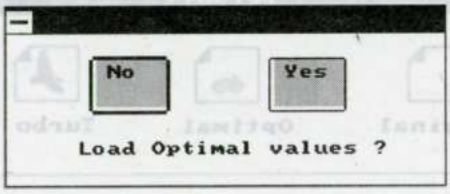
3.5.1 Original

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



3.5.2 Optimal

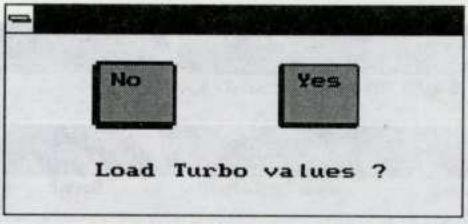
When you select Optimal, a dialog box prompts you to load the values that will help your system deliver optimum performance. Select Yes to load the BIOS optimum values. Select No to keep your current settings.



3.5.3 Turbo

When you select Turbo, a dialog box prompts you to load the Turbo values to further enhance system performance. Select Yes to load the Turbo values. Select No to keep your current settings.

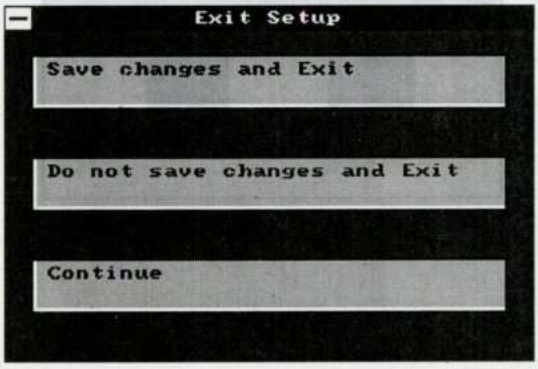
In case your system operation becomes unstable and incompatibility problems occur, unload the Turbo values and



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 [ESC] to display the following screen.



Press [↑] or [↓], then [ENTER] 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.

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 Core Voltage

CPU Voltage	JP13
3.52V	1-2
3.45V *	3-4
2.9V	5-6
2.8V	7-8
2.7V	9-10
2.52V	11-12

V I/O

Voltage	JP18
3.52V	3-4
3.45V	1-2 *

* Default setting

Jumper and Connector Summary

CPU Type and Frequency

CPU Freq.	JP3	JP4	JP11	JP12	JP13	JP14	JP16	JP17
Intel Pentium P54C								
75 MHz	2-3	2-3	1-2, 3-4, 5-6	1-2, 3-4, 5-6	3-4	Open	2-3	2-3
90 MHz	2-3	1-2	1-2, 3-4, 5-6	1-2, 3-4, 5-6	3-4	Open	2-3	2-3
100 MHz	1-2	2-3	1-2, 3-4, 5-6	1-2, 3-4, 5-6	3-4	Open	2-3	2-3
120 MHz	2-3	1-2	1-2, 3-4, 5-6	1-2, 3-4, 5-6	3-4	Open	2-3	1-2
133 MHz *	1-2	2-3	1-2, 3-4, 5-6	1-2, 3-4, 5-6	3-4	Open	2-3	1-2
150 MHz	2-3	1-2	1-2, 3-4, 5-6	1-2, 3-4, 5-6	3-4	Open	1-2	1-2
166 MHz	1-2	2-3	1-2, 3-4, 5-6	1-2, 3-4, 5-6	3-4	Open	1-2	1-2
200 MHz	1-2	2-3	1-2, 3-4, 5-6	1-2, 3-4, 5-6	3-4	Open	1-2	2-3
Intel Pentium PP/MT(P55C)								
150 MHz	2-3	1-2	Open	Open	7-8	1-2, 3-4, 5-6	1-2	1-2
166 MHz	1-2	2-3	Open	Open	7-8	1-2, 3-4, 5-6	1-2	1-2
200 MHz	1-2	2-3	Open	Open	7-8	1-2, 3-4, 5-6	1-2	2-3

CPU Type and Frequency (continued)

CPU Freq.	JP3	JP4	JP11	JP12	JP13	JP14	JP16	JP17
AMD K5								
PR75	2-3	2-3	1-2, 3-4, 5-6	1-2, 3-4, 5-6	1-2	Open	Open	2-3
PR90	2-3	1-2	1-2, 3-4, 5-6	1-2, 3-4, 5-6	1-2	Open	Open	2-3
PR100	1-2	2-3	1-2, 3-4, 5-6	1-2, 3-4, 5-6	1-2	Open	Open	2-3
PR120	2-3	1-2	1-2, 3-4, 5-6	1-2, 3-4, 5-6	1-2	Open	Open	2-3
PR133	1-2	2-3	1-2, 3-4, 5-6	1-2, 3-4, 5-6	1-2	Open	Open	2-3
Cyrix 6x86								
120+	2-3	2-3	1-2, 3-4, 5-6	1-2, 3-4, 5-6	1-2	Open	Open	Open
133+	1-2	1-2	1-2, 3-4, 5-6	1-2, 3-4, 5-6	1-2	Open	Open	Open
150+	2-3	1-2	1-2, 3-4, 5-6	1-2, 3-4, 5-6	1-2	Open	Open	Open
166+	1-2	2-3	1-2, 3-4, 5-6	1-2, 3-4, 5-6	1-2	Open	Open	Open

Intel Flash ROM Boot Block Programming

Type	JP6
Reserved	2-3
Enabled *	1-2

* Default

Jumper and Connector Summary

PS/2 Mouse

Function	JP9
Enabled *	1-2
Disabled	2-3

Onboard I/O

Function	JP10
Enabled *	1-2
Disabled	2-3

CMOS

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

Other Jumpers

Jumper	Function	Default
JP1	Reserved	None
JP2	Reserved	None
JP7	Reserved	1-2, 3-4
JP8	Reserved	None

* Default

Onboard Connectors

Connector	Function
CN1	PS/2 keyboard connector
CN2	AT-keyboard connector
CN3	PS/2 mouse connector
CN4	USB connector
CN5	Power connector
CN6	COM2 connector
CN7	Parallel connector
CN8	COM1 connector
CN9	FDD connector
CN10	IDE1 connector
CN11	IDE2 connector
CN12	Fan power connector
CN13	HDD LED connector
CN14	IrDA connector
CN15	Multifunction connector

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