AP61

User's Guide

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FCC Statement

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.

About this Manual

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, **Features**, covers the specifications, layout, and components of the system board.

Chapter 2, **Hardware Setup**, tells how to set the jumpers, upgrade the CPU and the system memory, install the system board and add expansion cards.

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

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

About this Manual

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
`message displayed`	Denotes actual messages that appear on screen
a, e, s, 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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Appendix A   Jumper Summary

Features   1

The AP61 is a high-performance system board that utilizes an Intel Pentium® Pro (P6) processor running at 150, 166, 180, 200 MHz or faster. It supports the PCI/ISA architecture and integrates the Intel 450KX PCIset to improve system performance. This feature conforms to the power-saving standards of the U.S. Environmental Protection Agency (EPA) Energy Star program.

The system memory is expandable to 256 MB. It does not have an onboard second-level cache since it is already included in the CPU architecture.

The motherboard also incorporates a super I/O controller and a two-channel PCI mode 4 IDE controller to further enhance system performance. The board measures 220 mm x 330 mm (full baby-AT size).

Features

Specifications

Microprocessor	Intel Pentium Pro (P6) 150/166/180/200 MHz or faster
Memory	256 MB (maximum)
SIMM Sockets	Four 72-pin, 32-bit
ASICs	Intel 450KX 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 One floppy disk drive port (1.2/1.44/2.88 MB)
Secondary Cache	Built in CPU (256 KB or 512 KB)
BIOS	Award
RTC	Dallas 12887A
Board Size	220 mm x 330 mm (full baby-AT size)

Features

Board Layout

1 Serial port (COM2)
2 Serial port (COM1)
3 Parallel port
4 IDE2 connector
5 IDE1 connector
6 FDD connector
7 Power connector
8 72-pin SIMM sockets
9 DRAM buffers
10 Clock generator
11 Intel 82452 ASIC
12 Multifunction connector
13 ZIF-type CPU socket
14 HDD LED connector
15 Two-pin fan connector

16 VRM connector
17 Voltage regulator with heatsink
18 Intel 82453 ASIC
19 Clock buffer
20 Intel 82454 ASIC
21 Intel 82379AB PCI/ISA
    controller
22 ISA slots
23 RTC/battery
24 Keyboard controller
25 Super I/O controller
26 PCI slots
27 PS/2 mouse connector
28 AT-keyboard connector
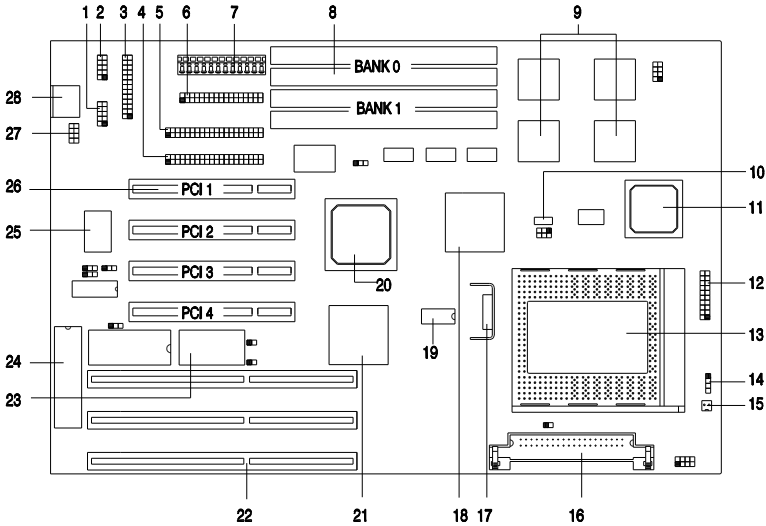
Features

System Board Parts

Microprocessor

The AP61 system board uses an Intel Pentium Pro (P6) processor running at speeds of 150, 166, 180, 200 MHz or faster. Chapter 2 gives details on how to install and upgrade the Pentium processor.

ASICs

The ASICs (application-specific integrated circuits) onboard are the Intel 82454, 82453, 82452, 82451 and Intel 82379. The Intel 82454 acts as the PCI/ISA-bus bridge that translates the PCI bus cycles. It comes in a ball-grid array (BGA) packaging.

The Intel 82453 functions as the memory controller that supports both the one-way and two-way interleave configurations.

The Intel 82452 serves as the memory controller data path that offers 64-bit DRAM and 32-bit PCI bus interfaces. Similar to 82454, this chip also comes in a BGA packaging. It supports the Error Correcting Code (ECC) feature that enables the system to correct the detected data errors.

The Intel 82451 acts as the memory interface and the DRAM data bus buffer.

The Intel 82379 operates as the PCI/ISA I/O controller that allows PCI and ISA master/slave interfaces.

Features

BIOS

The board supports the Award BIOS (basic input-output system) which resides in the flash ROM chip. The BIOS contains the program that performs the power-on self-tests (POST) upon booting. During POST, this program activates the peripheral devices, tests onboard memory, and prepares the system for operation. Chapter 3 gives more information on the Award BIOS.

Expansion Slots

The board expansion slots consist of three ISA-AT and four PCI slots. These expansion slots are the parallel bars on the system board. There are rows of golden pins inside each slot that serve as a clutch to secure the contacts of expansion boards.

The PCI slots accept three bus master (PCI slots 1, 2, 3) and one slave PCI (PCI slot 4) devices. Chapter 2 tells how to install the expansion boards.

DRAM Sockets

The system board has four 72-pin DRAM sockets that expand system memory to a maximum of 256 MB. These sockets accept single- and double-density single in-line memory modules (SIMMs). Chapter 2 discusses the different memory configurations available.

Features

Two-channel PCI Mode 4 IDE Controller

The board utilizes the enhanced integrated drive electronics (IDE) controller that improves data transfer rate. It also allows the system to support four IDE devices, including hard disks with more than 528 MB capacity. This feature offers users increased data storage.

Super I/O Controller

The onboard super I/O controller chip supports two UART 16450/16550-compatible serial ports and a parallel port (SPP, EPP, ECP)[1]. It also accommodates 1.2-MB, 1.44-MB, and 2.88-MB disk drives allowing full-range access to 5.25-inch drives with 360-KB or 1.2-MB format, and 3.5-inch drives with 720-KB, 1.44-MB or 2.88-MB format.

Keyboard Connector

The keyboard connector at the rear of the system board accepts any AT-compatible keyboard. PS/2 keyboard and mouse connectors are optional.

Second-level Cache

The system board does not have an onboard second-level cache since it is already integrated in the Intel Pentium® Pro (P6) processor. The processor comes with either 256-KB or 512-KB L2 cache size.

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[1]   SPP: Standard Parallel Port
EPP: Enhanced Parallel Port (IEEE 1284 compliant)
ECP: Extended Capabilities Port (IEEE 1284 compliant)

Features

Hardware Setup   2

This chapter tells how to install the CPU and other components, set jumpers, configure system memory, install the system board, and add expansion boards.

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 grounding strap and attach it to a metal part of the system unit before handling components. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.

Hardware Setup

Installing a Microprocessor

The motherboard has a zero-insertion force microprocessor socket that allows you to install a CPU without using any tools.

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

> ⚠ *Make sure that the system power is off before installing any component.*

1. 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 dot on the CPU indicates pin 1. The topmost label indicates the frequency and the cache size that the CPU supports.
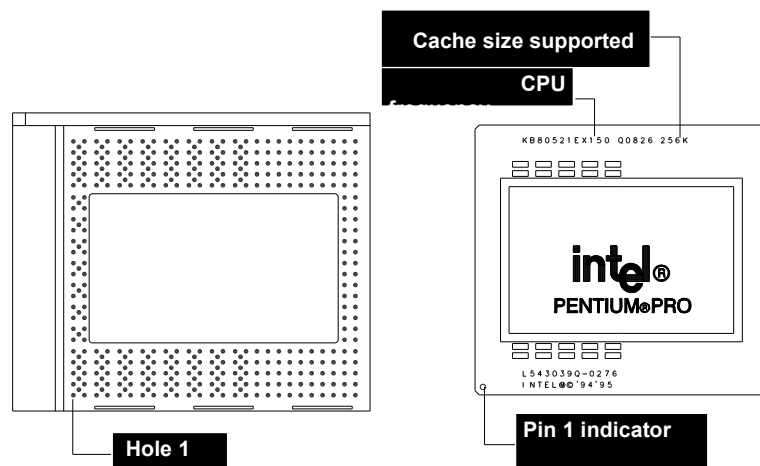
Hardware Setup

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

4. Attach the heatsink and fan to the installed CPU.

Step 1

Step 2

Step 3

Step 4
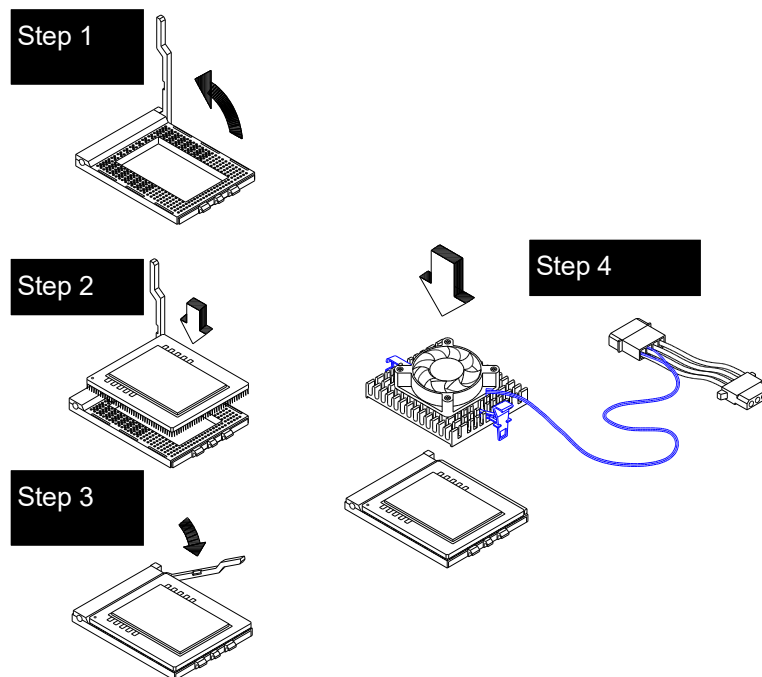
5. Plug the fan cable into the fan connector on the system board. See the section *Fan Connector* for details.

6. Set the jumpers accordingly. See the following sections for the correct jumper settings.

Hardware Setup

Upgrading the Microprocessor

Follow these steps to upgrade the CPU:

1. Turn off the system power.

2. Pull up the socket lever.

3. Remove the installed CPU.

4. Install the upgrade CPU. Refer to the section *Installing a Microprocessor* on how to install the CPU.

Hardware Setup

Jumper Settings

You have to change the jumper settings when you reconfigure your system. This section tells how to reset the jumpers. The figure below shows the jumper locations.
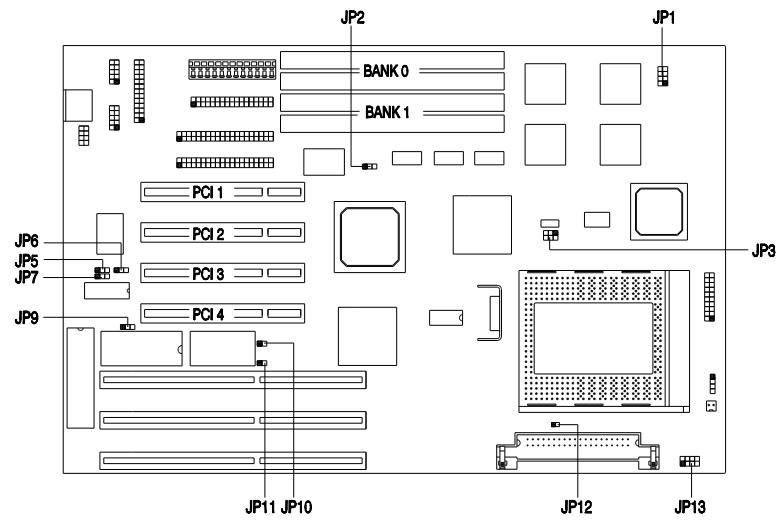
Hardware Setup

Selecting the CPU Type

Set the jumper **JP12** according to the CPU type installed in your system.

JP12

Standard CPU	1 ▢▢ 2	(default)
OverDrive CPU	1 ▣ 2	
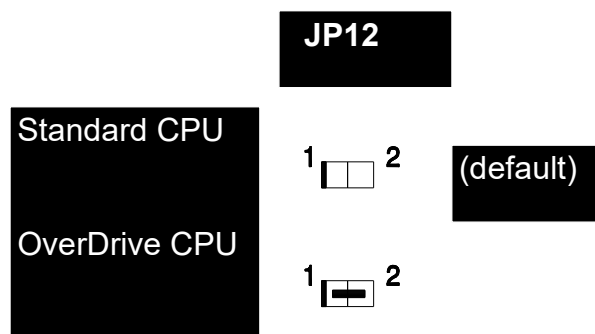
Hardware Setup

Selecting the CPU Frequency

The jumpers **JP1** and **JP3** allow you to select the CPU frequency that you wish to support. See the figure below for the correct settings.
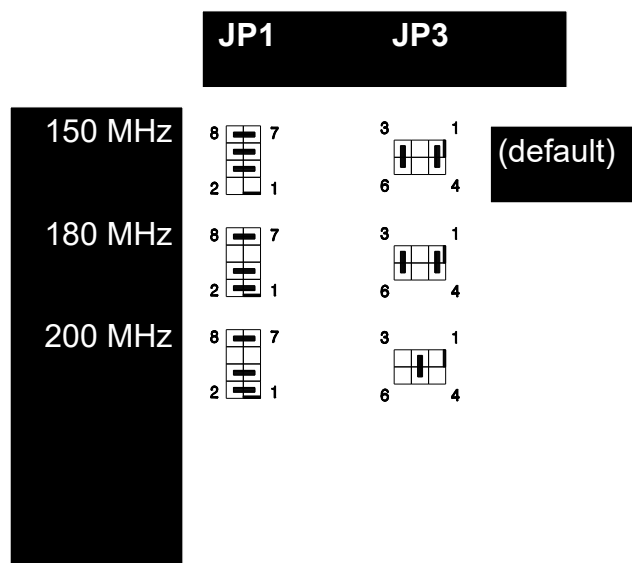
Hardware Setup

Changing the Voltage Regulator Module (VRM) Voltage Setting

To set the VRM voltage, you can either do it manually or use the voltage auto-detect function of the CPU. However, this depends on the type of the CPU installed in your system. If your CPU does not support the voltage auto-detect function, you need to set the onboard jumper **JP13** according to the figure below.

If your CPU supports the voltage auto-detect function, leave JP13 open.

Voltage	JP13		Voltage	JP13
3.5V			2.7V	
3.4V			2.6V	
3.3V			2.5V	
3.2V			2.4V	
3.1V	(default)		2.3V	
3.0V			2.2V	
2.9V			2.1V	
2.8V			VID	(auto-detect)

Hardware Setup

Selecting the Flash ROM Type

The onboard jumper **JP9** allows you to select the Flash ROM type that you wish to support. If a 5V Flash ROM is in use, you must set JP9 to 1-2. Reset it to 2-3 to support a 12V Flash ROM.

JP9		
5V	1 ▣ 3	(default)
12V	1 ▣ 3	
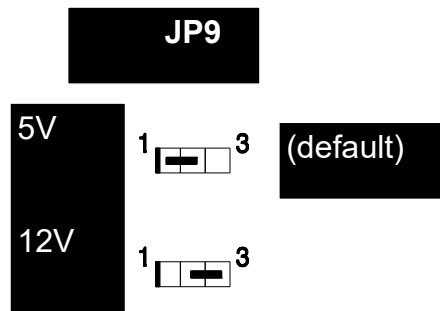
Clearing the CMOS

You need to clear the CMOS if you forget your system password. To do this, shut off the system power and short **JP11** for a few seconds. Then reset the jumper to normal setting by removing the jumper cap and leaving it open. Enter Setup to specify a new password.

JP11		
Normal	1 ▢ 2	(default)
Clear CMOS	1 ▣ 2	
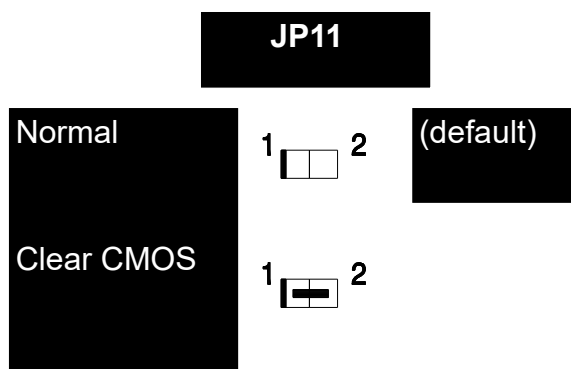
Hardware Setup

Enabling the Enhanced IDE Function

The jumper **JP2** lets you enable or disable the enhanced IDE function. To enable, simply close pins 2-3 of JP2. To disable, reset the jumper to 1-2.

JP2

Enabled	1 ▢▬ 3	(default)
Disabled	1 ▬▢ 3	
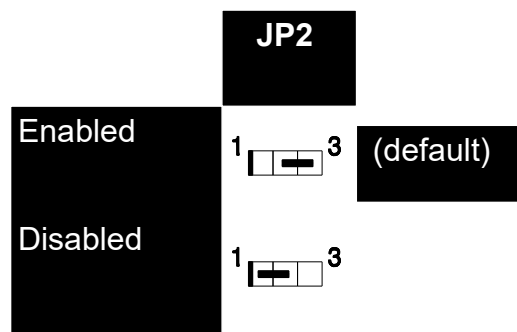
Enabling the Super I/O Chip

Set the jumper **JP6** to 1-2 to enable the super I/O chip controller. If you want to use a separate I/O card, disable the super I/O controller by resetting JP6 to 2-3.

JP6

Enabled	1 ▬▢ 3	(default)
Disabled	1 ▢▬ 3	
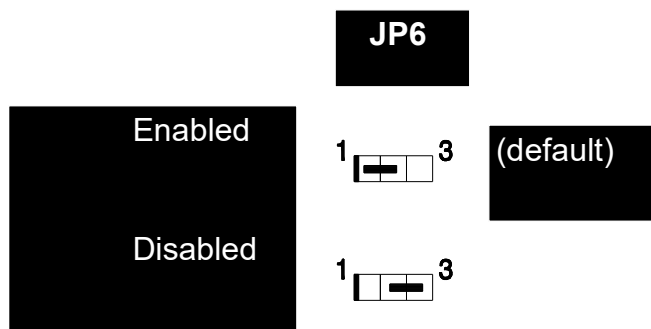
Hardware Setup

Selecting the DMA Channel

The jumpers **JP5** and **JP7** let you select the DMA channel for ECP function. The channel selections are DMA 1 and DMA 3. The following figure shows the correct jumper settings for each channel.

	JP5	JP7	
DMA 1	1 ▭▭ 3	1 ▭▭ 3	(default)
DMA 3	1 ▭▭ 3	1 ▭▭ 3	
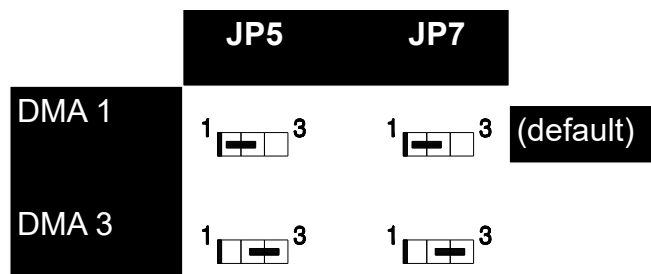
Enabling the PS/2 Mouse (optional)

The system board may or may not have PS/2 keyboard and mouse connectors. If your board comes with a PS/2 mouse connector, you must open jumper **JP10** to enable the function. To disable, simply close the jumper with a jumper cap.

	JP10	
Enabled	1 ▭▭ 2	
Disabled	1 ▭▭ 2	(default)
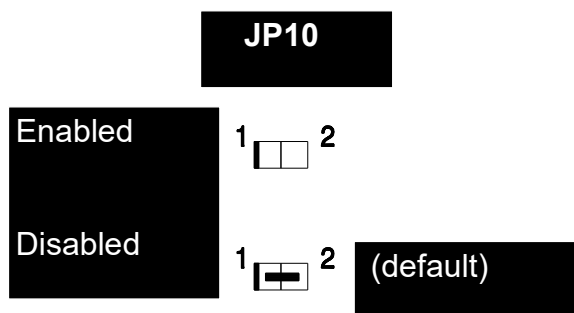
Hardware Setup

Memory Configuration

The system memory is expandable to 256 MB. The four 72-pin SIMM sockets onboard accommodate 2, 4, 8, 16, 32 and 64-MB SIMMs with 60, 70, or 80-ns DRAM speed.

The system board supports the special ECC function that enables the system to detect and correct errors in data. To take advantage of this function, you must install SIMMs with parity into your system. Installing SIMMs without parity automatically disables the function.

The table below lists the supported SIMM types and their corresponding capacity.

SIMM Type	Capacity
512 Kb x 32/36	2 MB
1 Mb x 32/36	4 MB
2 Mb x 32/36	8 MB
4 Mb x 32/36	16 MB
8 Mb x 32/36	32 MB
16 Mb x 32/36	64 MB

The system board accepts two types of memory configuration: one-way interleave (1:1) and two-way interleave (2:1). The one-way interleave mode requires a single-bank configuration containing the same SIMM type. The two-way interleave mode requires a double-bank configuration containing the same SIMM type in one-bank. See the following tables for the possible SIMM configurations:

Hardware Setup

One-way Interleave (1:1)

Bank 0		Bank 1		Total Memory
SIMM 0	SIMM 1	SIMM 2	SIMM 3	
2 MB	2 MB			4 MB
4 MB	4 MB			8 MB
8 MB	8 MB			16 MB
16 MB	16 MB			32 MB
32 MB	32 MB			64 MB
64 MB	64 MB			128 MB

Two-way Interleave (2:1)

Bank 0		Bank 1		Total Memory
SIMM 0	SIMM 1	SIMM 2	SIMM 3	
2 MB	2 MB	2 MB	2 MB	8 MB
4 MB	4 MB	4 MB	4 MB	16 MB
8 MB	8 MB	8 MB	8 MB	32 MB
16 MB	16 MB	16 MB	16 MB	64 MB
32 MB	32 MB	32 MB	32 MB	128 MB
64 MB	64 MB	64 MB	64 MB	256 MB

Hardware Setup

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 with the component side facing down. Always install SIMMs beginning with Bank 0.

⚠ *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.*
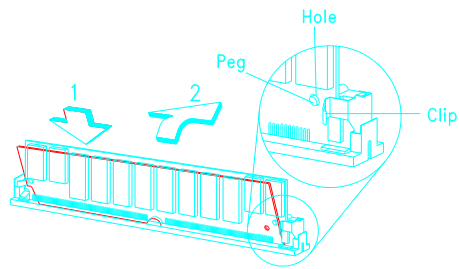
Removing a SIMM

1. Press the holding clips on both sides of the SIMM outward to release it.

2. Press the SIMM downward to about a 45° angle.

3. Gently pull the SIMM out of the socket.
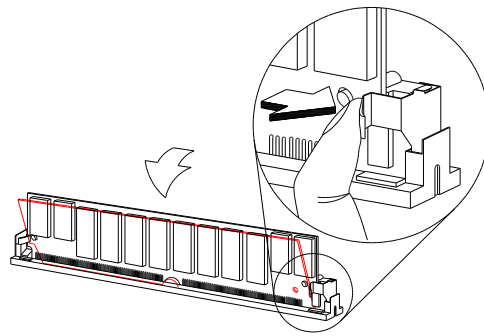
Hardware Setup

Voltage Regulator Module

You must install the CPU first before installing the VRM. See the section Installing a Microprocessor *on how to install a CPU.*

The system board comes with a separate voltage regulator module that enables the system to support the processor's operating voltage ranging from 2.1V to 3.5V. The following sections tell how to install and remove VRM.

Installing a VRM

Observe the ESD precautions when installing components.

Follow these steps to install a VRM:

1. Locate the VRM connector on the system board. See the board layout figure in Chapter 1.

2. Push the holding clips of the connector outward.
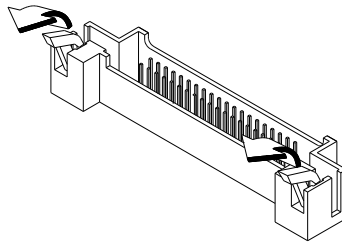
3. Align the VRM socket to the connector pins. The holding clips must be facing on the rear side of the VRM.

4. Press the VRM downward until the holding clips click into place.
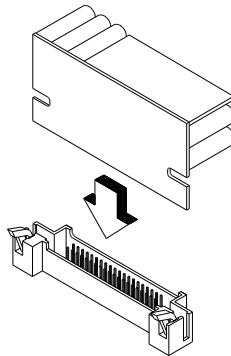
Removing a VRM

1. Push the holding clips outward to release the VRM.

2. Gently pull the VRM to remove it from the connector.

Hardware Setup
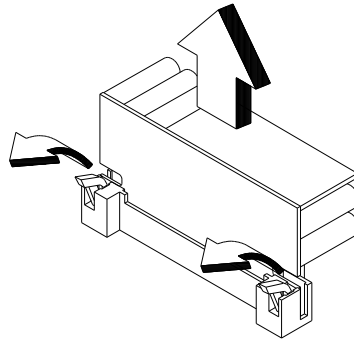
Connectors

Multifunction Connector

This 20-pin connector is marked **CN8** on the system board. It supports a number of system functions: LED, turbo, reset, keylock, and speaker. Attach the front panel connectors to the corresponding pins as in the illustration below.

Speaker   **Power LED**   **Keylock**

Speaker   **Power LED** **Keylock**

```
     ▼                ▼          ▼
   ┌─────┐+  +┌───┐ +┌─┐
10 │□ □ □ □ │□ □ □ │□ □ □│ 1
20 │□ □ □ □ │□ □ □ │□ □ □│ 11
   └┘+      └──┘+  +└─┘
    ▲          ▲          ▲
```

Reset   **Break Switch** **Green Mode LED**

Reset   **Turbo Switch**   **Turbo LED**
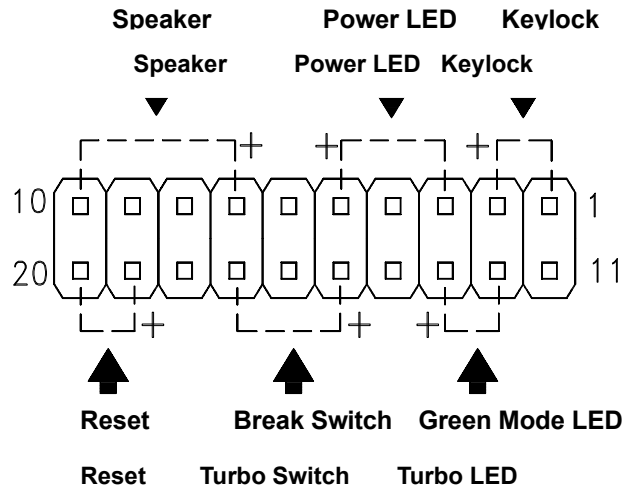
Some housings have a five-pin connector for the keylock and power LED. See the following illustration.

Speaker   **Keylock and Power LED**

Speaker   **Keylock & Power LED**

```
        ▼                ▼
   ┌──────┐+  +┌──────┐
10 │□ □ □ □ │□ □ □ □ □ │ 1
20 │□ □ □ □ │□ □ □ □ □ │ 11
   └┘+      └──┘+  +└┘
    ▲          ▲          ▲
```

Reset   **Turbo Switch** **Turbo LED**
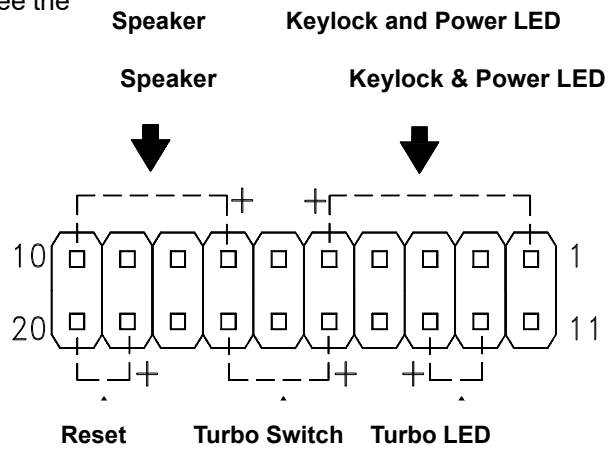
Hardware Setup

Other housings may have a 12-pin connector. If your housing has this type of connector, plug it into CN8 as shown in the following figure. Make sure that the red wire of the connector connects to pin 11.
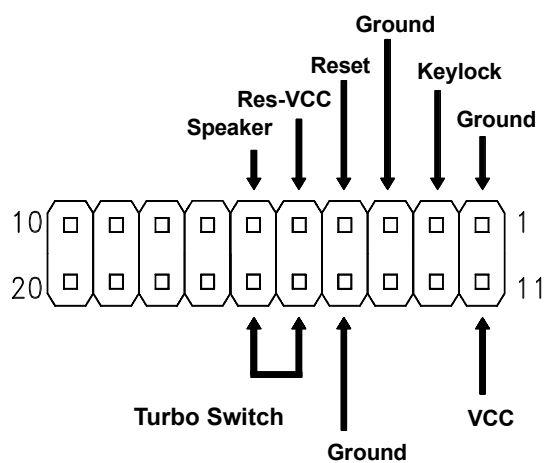
Keyboard Connector

The keyboard connector is a 5-pin, AT-compatible connector. The following figure shows how to connect the keyboard.
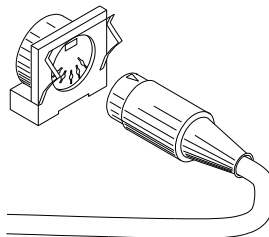
PS/2 keyboard connector is optional.

PS/2 Mouse Connector

The onboard PS/2 mouse connector enables the system to support a PS/2 mouse. The figure below shows how to connect a PS/2 mouse bracket into the mouse connector on the system board.
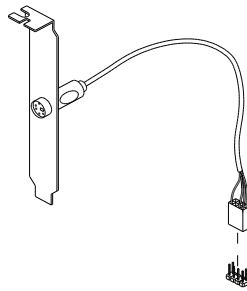
Power Connector

A standard power supply has two cables with six wires each. Attach these cables to the power connector on the board in such a way that all the black wires are in the center.

Hardware Setup
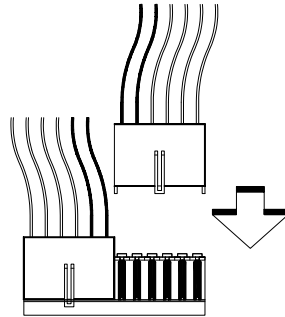
Fan Connector

The two-pin fan connector is marked **J6** on the system board. To connect, plug the connector to its corresponding pin as shown in the following figure.
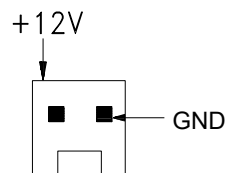
Hardware Setup

Installation

The full baby-AT size of the AP61 system board easily fits most housings. It has mounting holes that conform to the standard system housing.

Some housings may differ slightly in design, requiring additional steps to install the board. Read the documentation that comes with the housing.

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.

Installing the System Board

1. Open the system housing.

2. Use at least two screws that come with the housing to secure the board.

3. Attach the power supply cables to the power connector and the front panel connectors to the multifunction connector. See the section *Connectors*.

4. Install any additional components that you have not yet installed.

Hardware Setup

Installing Expansion Boards

Install expansion boards after you have installed the system board into the housing.

Follow these steps to install an expansion board.

1. Remove the bracket opposite the slot that you want to use. Save the cover for future use. Save the screw to secure the expansion board.

2. Remove the board from its protective packaging.

3. Gently insert the golden edge of the board into the slot until it fits.

GOLDEN EDGE

GOLDEN EDGE

ISA SLOT

PCI SLOT
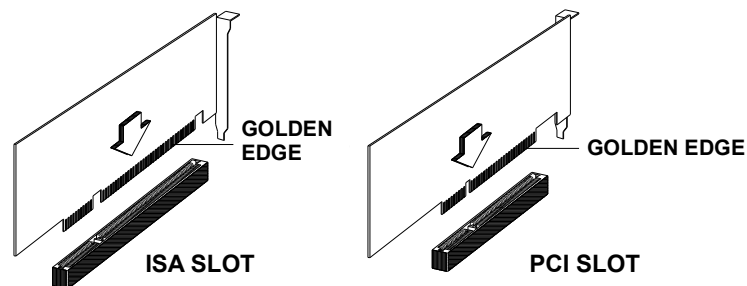
4. Secure the board bracket with the screw.

Award BIOS 3

This chapter discusses the Setup Utility for the Award BIOS and tells how to configure the system by setting the BIOS parameters.

Award BIOS Setup Main Menu

The Award BIOS Utility allows you to reconfigure your system. To enter the system menu, turn on the system. During the power-on self-test (POST), a message telling you how to enter Setup appears at the bottom of the screen. Follow this instruction by pressing c.

The Award BIOS Setup Main Menu appears as follows:

ROM PCI/ISA BIOS (XXXXXXXX)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	PASSWORD SETTING
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	SAVE & EXIT SETUP
POWER MANAGEMENT SETUP	EXIT WITHOUT SAVING
PCI CONFIGURATION SETUP	
LOAD BIOS DEFAULTS	
LOAD SETUP DEFAULTS	

ESC : Quit   ↓→← : Select Item
F10 : Save & Exit Setup   (Shift) F2 : Change Color

Description of each function

> *Choosing* `Load BIOS Defaults` *or* `Load Setup Defaults` *at this point automatically modifies all applicable settings.*

Award BIOS

The section at the bottom of the screen tells how to control the screen. Press the arrow keys to move between items, jɯ to color scheme of the display, ʌ to exit, and u to save the changes before exit. Another section at the bottom of the screen displays a brief description of the highlighted item.

After selecting an item, press e to select or enter a submenu.

Standard CMOS Setup

Standard CMOS Setup sets the basic system parameters such as the date, time, and the hard disk type. Use the arrow keys to highlight an item and { or } to select the value for each item.

```
                 ROM PCI/ISA BIOS (XXXXXXXX)
                    STANDARD CMOS SETUP
                   AWARD SOFTWARE, INC.
```

Date (mm:dd:yy) : Fri, Apr 7, 1995								
Time (hh:mm:ss) : 00:00:00								
HARD DISK	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTORS	MODE
Primary Master	: User	0	0	0	0	0	0	---
Primary Slave	: None	0	0	0	0	0	0	---
Secondary Master	: None	0	0	0	0	0	0	---
Secondary Slave	: None	0	0	0	0	0	0	---

```
Drive A:  1.2M, 5.25in                Base Memory     :      640 K
Drive B:  None                        Extended Memory :     3328 K
Video  :  EGA/VGA                     Other Memory   :      128 K
                                      Total Memory    :     4096 K
Halt On:  All Errors

ESC  :  Quit              ↓→←  :  Select Item         PU/PD/+/-  :  Modify
F1   :  Help              (Shift) F2  :  Change Color
```

Award BIOS

Date

To set the date, highlight the Date parameter. Press { or } to set the current date. The date format is month, date, and year.

Time

To set the time, highlight the Time parameter. Press { or } to set the current time in hour, minute, and second format. The time is based on the 24-hour military clock.

Hard Disks

The four hard disk parameters listed in the menu are Primary Master, Primary Slave, Secondary Master, and Secondary Slave. These parameters allow you to configure the drives that you connect into your IDE connectors.

To configure, press { or } to select a hard disk drive type, or type the number and press e. Select `User` to define your own hard disk type manually. You can use the IDE HDD Auto-detection function in the Main Menu to automatically configure your hard disk drive parameters. Select `None` if your system does not have a hard disk drive.

> *For an IDE hard disk, we recommend that you use the Auto-detection utility to enter the drive specifications automatically. See the section* IDE HDD Auto-detection*.*
>
> *Select* `User` *if you want to enter the specifications manually.*

Award BIOS

Floppy Drive Types

Press { or } to select a floppy disk drive type. The settings are:

- 360 KB, 5.25-inch

- 1.2 MB, 5.25-inch

- 720 KB, 3.5-inch

- 1.44 MB, 3.5-inch

- 2.88 MB, 3.5-inch.

Choose `None` if you have no floppy drive.

Video

This parameter allows you to configure the video display card present in your system. The video settings are：

- EGA/VGA

- CGA 40

- CGA 80

- Mono

Select the adapter type setting that matches your video display card and monitor.

Award BIOS

Error Halt

This parameter enables you to control the system stops in case of error. The available settings are:

- No Errors

- All Errors

- All, But Keyboard

- All, But Diskette

- All, But Disk/Key

The default setting is `All Errors.`

Memory

The Memory parameters are for display only. These are determined by the BIOS POST.

Base Memory

The POST detects the amount of base (or conventional) memory installed in the system. The value of the base memory is 640 KB for systems with 640 KB or more memory installed on the mainboard.

Extended Memory

The BIOS detects the amount of extended memory present during the POST. This is the amount of memory located above 1 MB in the CPU memory address map.

Award BIOS

Expanded Memory

Expanded memory is the memory defined by the Lotus/Intel/Microsoft (LIM) standard as EMS. Since a number of standard DOS applications cannot utilize memory above 640 KB, the Expanded Memory Specification (EMS) swaps the memory which is not utilized by DOS with a section, or frame. This allows access to the total system memory. The memory range that can be swapped by EMS depends on the chipset design.

An expanded memory device is required to use memory as expanded memory.

Other Memory

This refers to the memory located in the 640 KB to 1024 KB address space. This is the memory that can be used for different applications. DOS uses this area to load device drivers to keep as much base memory free for application programs.

BIOS Features Setup

This screen appears when you select `BIOS Features Setup` from the Main Menu.

```
                  ROM PCI/ISA BIOS (XXXXXXXX)
                     BIOS FEATURES SETUP
                    AWARD SOFTWARE, INC.

Virus Warning            : Disabled    Video BIOS Shadow        : Enabled
CPU Internal Cache       : Enabled     C8000-CBFFF Shadow       : Disabled
External Cache           : Enabled     CC000-CFFFF Shadow       : Disabled
Quick Power On Self Test : Disabled    D0000-D3FFF Shadow       : Disabled
Boot Sequence            : A, C        D4000-D7FFF Shadow       : Disabled
Swap Floppy Drive        : Disabled    D8000-DBFFF Shadow       : Disabled
Boot Up Floppy Seek      : Enabled     DC000-DFFFF Shadow       : Disabled
Boot Up NumLock Status   : On
Boot Up System Speed     : High
IDE HDD Block Mode       : Disabled
Gate A20 Option          : Fast
Typematic Rate Setting   : Disabled
Typematic Rate (Chars/Sec) : 6
Typematic Delay (Msec)   : 250         ESC : Quit        ↓ → ← : Select Item
Security Option          : Setup       F1  : Help        PU/PD/+/- : Modify
                                       F5  : Old Values  (Shift) F2 : Color
IDE Second Channel Control : Enabled   F6  : Load BIOS Defaults
PCI/VGA Palette Snoop    : Disabled    F7  : Load Setup Defaults
```

Virus Warning

Set this parameter to `Enabled` to activate the warning message. This feature protects the boot sector and partition table of your hard disk from virus intrusion. Set it to `Disabled` to disregard the message.

Any attempt during boot-up to write to the boot sector of the hard disk drive stops the system and the following warning message appears on the screen. Run an anti-virus program to locate the problem.

Award BIOS

```
! WARNING !
Disk Boot Sector is to be modified
Type "Y" to accept write, or "N" to abort write
Award Software, Inc.
```

CPU Internal Cache/External Cache

The CPU Internal Cache/External Cache default setting is `Enabled`. Turning the cache off slows down the system. Leave it enabled unless you are troubleshooting a problem.

Quick Power-on Self-test

This parameter speeds up the power-on self-test by skipping some items that are normally checked. The default setting is `Disabled`.

Boot Sequence

The settings are C,A and A,C to specify the system search sequence. The default setting is `A,C`.

Swap Floppy Drive

Enabling this parameter tells your system to read the current floppy disk drive in use regardless of the drive designation. The system may read drive A as drive B or vice-versa. The default setting is `Disabled`.

Award BIOS

Boot-up Floppy Seek

Set this parameter to `Enabled` to detect the type of floppy disk drive by tracks. Set it to `Disabled` to disregard searching. Note that in the Disabled setting, no warning message appears if the drive installed is 360 KB. The default setting is `Enabled`.

Boot-up NumLock Status

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 numeric keypad for cursor control.   The default setting is `On`.

Boot-up System Speed

Set the system speed to High or Low with this parameter.   `High` is the default setting.

IDE HDD Block Mode

This feature enhances hard disk performance by allowing multisector transfers.   Most IDE drives, except those with old designs, can support this feature. The default setting is `Disabled`.

Gate A20 Option

The settings for this parameter are Normal and Fast.   Set this parameter to `Normal` if the keyboard controller or the chipset hardware controls the A20 signal. Set it to `Fast` to transfer the signal control to the ASICs using the chipset specific method. The default setting is `Fast`.

Award BIOS

Typematic Rate Setting

Set this parameter to `Enabled` to determine the typematic rate. Set it to `Disabled` to disregard the rate setting. The default setting is `Disabled.`

Typematic Rate

This parameter allows you to control the speed at which the system registers repeated keystrokes. The typematic rate settings are 6, 8, 10, 12, 15, 20, 24, and 30 chars/sec. The default setting is `6 chars/sec.`

Typematic Delay

This parameter allows you to control the display time between the first and the second characters. The typematic delay settings are 250, 500, 750, and 1000 msec. The default setting is `250 msec.`

Security Option

The security option settings are System and Setup. The System option limits access to both the system and setup. A prompt asking you to enter your password appears on the screen everytime you boot the system. The Setup option limits access only to setup. The default setting for this parameter is `Setup.`

To disable the security option, select `Password Setting` from the Main Menu and press e.

Award BIOS

IDE Second Channel Control

This parameter allows you to enable or disable the second channel of your IDE card. The default setting is `Enabled.`

PCI/VGA Palette Snoop

Some PCI VGA cards support the VGA palette snooping function to further enhance the VGA performance. Enable this parameter only if the PCI VGA card supports the palette snooping function. Otherwise, set it to `Disabled.` The default setting is `Disabled.`

Video BIOS Shadow

If enabled, this copies the video display card BIOS into the system DRAM to improve system performance. The default setting for this parameter is `Enabled.`

C8000-CBFFF Shadow to DC000-DFFFF Shadow

These six lines are for shadowing other expansion cards with ROMs. The default setting for these areas is `Disabled.` You need to know the specific addresses that ROMs use to shadow the expansion cards. If you do not know this information, enable all the ROM shadow settings. This ensures shadowing of any present ROMs. Also, enabling all the settings reduces the available memory by 640 KB to 1024 KB.

Award BIOS

Chipset Features Setup

This screen appears when you select `Chipset Features Setup` from the Main Menu.

ROM PCI/ISA BIOS (XXXXXXX)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

CPU-to-PCI Write Posting	: Disabled	PCI Mem Line Prefetch	: Disabled
Read Multiple Prefetch	: Disabled	PCI Mem Line Read	: Disabled
CPU Line Read Multiple	: Disabled	PCI Posted Write Buffer	: Disabled
CPU Line Read	: Disabled	8 bit I/O Recovery Time	: 11
CPU Burst Write Assembly	: Disabled	16 bit I/O Recovery Time	: 7
PCI-to-CPU Write Posting	: Disabled	DRAM Page Open Policy	: Closed
VGA Performance Mode	: Disabled	Extended Read-Around-Write	: Disabled
Video Buffer Cacheable	: Disabled	Read-Around-Write	: Disabled
In Order Queue Depth	: 8	DRAM Refresh Stagger By	: 7
DRAM Last Write to CAS#	: 2		
DRAM RAS# Pulse Width	: 6		
CAS Address Hold Time	: 2		
Read CAS# Pulse Width	: 3		
Write CAS# Pulse Width	: 2		
CAS# Precharge Time	: 1		
RAS# to CAS Address Delay	: 2	ESC : Quit ↓ → ← : Select Item	
RAS# to CAS delay	: 3	F1 : Help PU/PD/+/- : Modify	
RAS# Precharge Time:	: 5	F5 : Old Values (Shift) F2 : Color	
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Auto-configuration Function

This parameter automatically enters and locks the optimum settings for the chipset. If enabled, the entries on the left side of the screen are automatically set for the mainboard's optimum performance. The Disabled setting unlocks the settings without changing them. The default setting is `Enabled.`

Award BIOS

Do not change the values of the Chipset parameters unless you are a qualified technician. To configure, simply set the Auto-configuration function to `Enabled.`

Power Management Setup

The Power Management Setup screen enables you to control the mainboard's green features. See the following screen.

```
ROM PCI/ISA BIOS (XXXXXXXX)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.
```

Power Management	: Max. Saving	IRQ4	(COM1)	: Enabled
PM Control by APM	: Yes	IRQ5	(LPT2)	: Enabled
Video Off Option	: Susp, Stdby→Off	IRQ6	(Floppy Disk)	: Enabled
Video Off Method	: V/H SYNC+Blank	IRQ7	(LPT1)	: Enabled
Suspend Switch	: Enabled	IRQ8	(RTC Alarm)	: Disabled
		IRQ9	(IRQ2 Redir)	: Enabled
PM Timers		IRQ10	(Reserved)	: Enabled
HDD Off After	: Disabled	IRQ11	(Reserved)	: Enabled
Doze Mode	: 10 sec	IRQ12	(PS/2 Mouse)	: Enabled
Standby Mode	: 10 sec	IRQ13	(Coprocessor)	: Enabled
Suspend Mode	: 10 sec	IRQ14	(Hard Disk)	: Enabled
		IRQ15	(Reserved)	: Enabled
PM Events				
PCI Master Activity	: Enabled			
COM Ports Activity	: Enabled			
LPT Ports Activity	: Enabled	ESC : Quit	↓→← : Select Item
HDD Ports Activity	: Enabled	F1 : Help	PU/PD/+/- : Modify
DMA Ports Activity	: Enabled	F5 : Old Values	(Shift) F2 : Color
VGA Activity	: Disabled	F6 : Load BIOS Defaults
IRQ3(COM2)	: Enabled	F7 : Load Setup Defaults

Award BIOS

Power Management

This function enables you to control the power-saving modes, display turn off and HDD power down. The four settings are as follows:

Setting	Description
Max Saving	Maximize energy conservation by putting the system into power-saving mode after a brief period of system inactivity.
Min Saving	A power-saving assignment which activate after a moderate period of system inactivity.
Disabled	Turns off power-saving.
User Defined	Allows you to set the power-saving options according to your requirements.

PM Control by APM

If your system supports the Advanced Power Management (APM) feature, set this parameter to Yes.

Video Off Option

This parameter determines when the video off feature activates. The settings are:

- Always On   Disregards the Video Off option

- Suspend®Off   Turns off the screen when the system enters the Suspend mode

- Susp, Stby®Off   Turns off the screen when the system enters the Standby or Suspend mode

- All Modes®Off   Turns off the screen when the system enters any of the power-saving modes

The default is `Susp, Stdby®Off`.

Video Off Method

If your video display adapter supports the green features, set this parameter to its default setting which is `V/H SYNC+Blank`. If not, then set this to `Blank Setting`.

The default setting saves more power since it turns off the CRT vertical and horizontal scanning once the monitor screen blanks. However, with non-green monitors, CRT scanning does not stop even if the monitor screen blanks.

> *Screen-saver software does not work with this feature. It is used only to prevent burning in a static image on the CRT while the monitor is on. A screen saver cannot display while the monitor is shut down to save both energy and the screen.*

Suspend Switch

This parameter allows you to enable or disable the external suspend switch. The default setting is `Enabled`.

Award BIOS

PM Timers

These parameters enable you to control the time-out settings for the Power Management Scheme.

HDD Off After

This time-out setting indicates when to shut down the IDE hard disk. The settings are from 1 Min to 15 Min or Disabled.

> *HDD Power Down does not affect SCSI hard disks.*

Doze Mode, Standby Mode, Suspend Mode

These modes set the period of time after which each of these modes activates.

PM Events

This function allows you to monitor system activities. Enabling the items under this function resumes system to full power.

IRQ3 to IRQ15

These lines allow you to monitor the IRQs individually. An activity from any enabled IRQ resumes the system to normal mode if the IRQ3 (COM 2) item in the PM Events is enabled.

Award BIOS

PCI Configuration Setup

This screen enables you to configure the PCI devices installed in your system.

```
                    ROM PCI/ISA BIOS (XXXXXXXX)
                      PCI CONFIGURATION SETUP
                       AWARD SOFTWARE, INC.

┌─────────────────────────────────┬───────────────────────────────────┐
│ Slot 1 Using INT#      : AUTO    │                                   │
│ Slot 2 Using INT#      : AUTO    │                                   │
│ Slot 3 Using INT#      : AUTO    │                                   │
│ Slot 4 Using INT#      : AUTO    │                                   │
│                                  │                                   │
│ 1st Available IRQ    :  9  *     │                                   │
│ 2nd Available IRQ    : 10  *     │                                   │
│ 3rd Available IRQ    : 11  *     │                                   │
│ 4th Available IRQ    : 12  *     │                                   │
│ PCI IRQ Activated By : Edge      │                                   │
│ PCI IDE 2nd Channel: : Enabled   │                                   │
│ PCI IDE IRQ Map To   : PCI-AUTO  ├───────────────────────────────────┤
│ Primary    IDE INT#  : A         │ ESC : Quit     ↓ → ← : Select Item│
│ Secondary  IDE INT#  : B         │ F1  : Help     PU/PD/+/- : Modify │
│                                  │ F5  : Old Values (Shift) F2 : Color│
│                                  │ F6  : Load BIOS Defaults          │
│                                  │ F7  : Load Setup Defaults         │
│                                  │                                   │
└─────────────────────────────────┴───────────────────────────────────┘
```

Award BIOS

Slots 1, 2, 3 and 4 Using INT#

Each PCI slot supports four interrupt pins. These parameters let you select which interrupt pin to use. The selections are interrupt pins A, B, C, D and Auto. However, you must always start with interrupt pin A. The INTA pin is automatically reserved for master function of the PCI device. The remaining interrupt pins (INTB, INTC, and INTD) are reserved for multifunction cards.

The default setting for these parameters is `Auto`. This automatically sets the system IRQ for the PCI slot.

Available IRQs

These parameters let you assign a system IRQ to each PCI slot. The available settings are 3, 4, 5, 7, 9, 10, 11, 12, 14, 15 and NA. The NA setting means no IRQ is assigned to the slot. When assigning, make sure that the IRQs do not conflict.

PCI IRQ Activated By

This option allows you to set when to activate the PCI IRQ. The available settings are Edge and Level. The Edge is the start of the signal and Level is the point at which the signal is high. The default setting for this parameter is `Edge`.

PCI IDE 2nd Channel

This parameter lets you enable or disable the second channel of the PCI/IDE card (including the I/O port (170H ~ 177H) and the assigned IRQ). The default setting is `Enabled`.

Award BIOS

PCI IDE IRQ Map To

This feature enables BIOS to scan and determine the location of the PCI IDE add-on cards present in your system. The available options are ISA, PCI-Slot 1, PCI-Slot 2, PCI-Slot 3, PCI-Slot 4 and PCI-Auto. The default is `PCI-Auto.`

Primary and Secondary IDE INT#

These options let you specify the interrupt pins assigned for the PCI IDE card functions.

Award BIOS

Load BIOS Defaults

This option loads the default values permanently stored in the BIOS ROM. If the values specified in the Setup utility become corrupted, these defaults load automatically when you turn on the system power. These settings are non-optimal and bypass all high-performance features. This is useful if you are having problems with your current system configuration and need to determine the cause.

The defaults loaded only affect the BIOS Features Setup and Chipset Features Setup screens. There is no effect on the Standard CMOS Setup. To use this feature, highlight this option on the main menu and press e. A line appears on the screen asking if you want to load the BIOS default values. To load, press Y then e. Press N to disregard. See the following screen.

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	PASSWORD SETTING
BIOS FEATURES SETUP	IDE HDD AUTO DETECTION
CHIPSET FEATURES SETUP	SAVE & EXIT SETUP
POWER MANAGEMENT SETUP	EXIT WITHOUT SAVING
PCI CONFIGURATION SETUP	
LOAD BIOS DEFAULTS	
LOAD SETUP DEFAULTS	

ESC : Quit	↓→← : Select Item
F10 : Save & Exit Setup	(Shift) F2 :
Change Color	

Loads BIOS Defaults except Standard CMOS SETUP

Load Setup Defaults

The Load Setup Defaults option loads optimized settings from the BIOS ROM. Use this option to load the default settings for normal use.

The auto-configured settings only affect the BIOS Features Setup, Chipset Features Setup and PCI Configuration Setup. There is no effect on the Standard CMOS Setup. To use this feature, highlight this option on the main screen and press e. A line appears on the screen asking if you want to load the Setup default values. To load, press Y then e. Press N to disregard. See the screen below.

```
                        ROM PCI/ISA BIOS
                        CMOS SETUP UTILITY
                       AWARD SOFTWARE, INC.

┌─────────────────────────────────┬────────────────────────────────┐
│                                  │                                │
│   STANDARD CMOS SETUP            │   PASSWORD SETTING             │
│   BIOS FEATURES SETUP            │   IDE HDD AUTO DETECTION       │
│   CHIPSET FEATURES SETUP         │   SAVE & EXIT SETUP            │
│   POWER MANAGEMENT SETUP         │   EXIT WITHOUT SAVING          │
│   PCI CONFIGURATION SETUP        │                                │
│   LOAD BIOS DEFAULTS             │                                │
│   LOAD SETUP DEFAULTS            │                                │
├─────────────────────────────────┴────────────────────────────────┤
│  ESC  :  Quit                          ↓→←  :  Select Item        │
│  F10  :  Save & Exit Setup                   (Shift) F2  :         │
│  Change Color                                                     │
├───────────────────────────────────────────────────────────────────┤
│         Load SETUP Defaults except Standard CMOS SETUP            │
└───────────────────────────────────────────────────────────────────┘
```

Award BIOS

Password Setting

This option lets you set a password. Password prevents unauthorized use of your computer.

```
                        ROM PCI/ISA BIOS
                       CMOS SETUP UTILITY
                      AWARD SOFTWARE, INC.
┌─────────────────────────────────────────────────────────────────┐
│                                    │                             │
│    STANDARD CMOS SETUP             │   PASSWORD SETTING          │
│    BIOS FEATURES SETUP             │   IDE HDD AUTO DETECTION     │
│    CHIPSET FEATURES SETUP          │   SAVE & EXIT SETUP          │
│    POWER MANAGEMENT SETUP          │   EXIT WITHOUT SAVING        │
│    PCI CONFIGURATION SETUP         │                             │
│    LOAD BIOS DEFAULTS              │                             │
│    LOAD SETUP DEFAULTS             │                             │
├────────────────────────────────────┴─────────────────────────────┤
│  ESC  :  Quit                          ↓→←  :  Select Item        │
│  F10  :  Save & Exit Setup                 (Shift) F2  :          │
│ Change Color                                                      │
├───────────────────────────────────────────────────────────────────┤
│                   Change/Set/Disable Password                     │
└───────────────────────────────────────────────────────────────────┘
```

To set a password, highlight the password type that you want and press e. At the prompt, type your password. Your password can be up to 8 alphanumeric characters. Press e to enter your password. At the next prompt, re-type your password and press e again to confirm the new password. After the password entry, the screen automatically reverts to the main screen.

To disable the password, press e when prompted to enter the password. The screen displays a message confirming that the password has been disabled.


Award BIOS

> *If you use the Password features, the Security Option line in the BIOS Features Setup determines when to enter the password.*

IDE HDD Auto-detection

If your system has an IDE hard drive, you can use this utility to detect its parameters and enter them into the Standard CMOS Setup automatically.

ROM PCI/ISA BIOS (XXXXXXXX)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

HARD DISK	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master								

Select Primary Master   Option (N=Skip) : N

OPTIONS	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
1 (Y)	426	826	16	65535	825	63	NORMAL

Award BIOS

This utility detects only one set of parameters for your IDE hard drive. Some IDE drives can use more than one set of parameters. If your hard disk is formatted using different parameters than those detected, you have to enter the parameters manually. If the parameters listed don't match the ones used to format the disk, the information on that disk will not be accessible. If the auto-detected parameters displayed do not match those that used for your drive, ignore them. Press N to reject the values and enter the correct ones manually in the Standard CMOS Setup screen.

Save & Exit Setup

This function automatically saves all CMOS values before leaving Setup.

Exit without Saving

Use this function to exit Setup without saving the CMOS value changes. Do not use this option if you want to save the new configuration.

Jumper Summary   A

CPU Type

CPU Type	JP12
Standard CPU	Open *
OverDrive CPU	Closed

CPU Frequency

CPU Frequency	JP1	JP3
150 MHz	3-4, 5-6, 7-8	1-4, 3-6 *
180 MHz	1-2, 3-4, 7-8	1-4, 3-6
200 MHz	1-2, 3-4, 7-8	2-5

---

*   Default setting

Jumper Summary

VRM Voltage Setting

Voltage	JP13
3.5V	1-2, 3-4, 5-6, 7-8
3.4V	3-4, 5-6, 7-8
3.3V	1-2, 5-6, 7-8
3.2V	5-6, 7-8
3.1V *	1-2, 3-4, 7-8
3.0V	3-4, 7-8
2.9V	1-2, 7-8
2.8V	7-8
2.7V	1-2, 3-4, 5-6
2.6V	3-4, 5-6
2.5V	1-2, 5-6
2.4V	5-6
2.3V	1-2, 3-4
2.2V	3-4
2.1V	1-2
VID (auto-detect)	Open

Flash ROM BIOS

Mode	JP9
5V	1-2 *
12V	2-3

---

*   Default setting

Jumper Summary

CMOS

Function	JP11
Normal	Open *
Clear CMOS	Closed

Enhanced IDE Function

Function	JP2
Enabled	2-3 *
Disabled	1-2

Super I/O Controller

Function	JP2
Enabled	1-2 *
Disabled	2-3

DMA Channel

Channel	JP5	JP7
DMA 1	1-2 *	1-2 *
DMA 2	2-3	2-3

PS/2 Mouse (optional)

Function	JP10
Enabled	Open
Disabled	Closed *

---

*   Default setting

Jumper Summary