

6512WU/va
Motherboard Reference
(Preliminary)



100% Recycled Paper

Part Number : 5615 6990 0001 R00
(May 1999)

Trademarks

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Note

The information in this guide is subject to change without notice.

Caution Texts Concerning Lithium Batteries

DANISH

ADVARSEL!

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

NORWEGIAN

ADVARSEL:

Eksplosjonsfare ved feilaktig skifte av batteri. Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten. Brukte batterier kasseres i henhold til fabrikantens instruksjoner.

SWEDISH

VARNING:

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

FINNISH

VAROITUS:

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

ENGLISH

CAUTION:

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

DEUTSCH

VORSICHT:

Explosionsgefahr bei unsachgemäßem Austausch der Batterie. Ersatz nur durch denselben oder einen vom Hersteller empfohlenen gleich-wertigen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

FRENCH

ATTENTION:

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

Class B Regulations

U. S. A.

Federal Communications Commission Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the 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:

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

Warning:

Use only shielded cables to connect I/O devices to this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Canada

Canadian Department Of Communications Radio Interference Regulations Class B Compliance Notice

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Important Safety Instructions

- ◆ Read all of these instructions.
- ◆ Follow all warnings and instructions marked on the product.
- ◆ Unplug this product from the wall outlet before installing an add-on card inside this product.
- ◆ Do not use this product near water.
- ◆ Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
- ◆ Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
- ◆ This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- ◆ This product is equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug. We recommend using the power cord supplied with the product. However, if another type of power cord is required, power cord H05VV-F should be used.
- ◆ Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.
- ◆ Except as explained elsewhere in this manual, do not attempt to service this product yourself.
- ◆ Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - When the power cord or plug is damaged or frayed.
 - If liquid has been spilled into the product.
 - If the product has been exposed to rain or water.
 - If the product does not operate normally when the operating instructions are followed.
 - If the product has been dropped or the cabinet has been damaged.
 - If the product exhibits a distinct change in performance, indicating a need for service.

Preface

This manual contains basic information necessary for both the end user and service personnel. Although most of the information you need are contained in this manual, we recommend you to contact an authorized dealer for service purposes. Making personal alterations to the system can violate the effectivity of your warranty.

This manual is divided into five chapters:

- Chapter 1, **Introduction**, lists the specifications and features of the motherboard.
- Chapter 2, **System Components**, describes the functions of the major system components.
- Chapter 3, **Connector and Jumper Defintition**, provides the jumper and connector definitions.
- Chapter 4, **CPU and Memory Installation**, contains the CPU and memory installation information.
- Chapter 5, **The SETUP Program**, explains how you can configure your system by running the SETUP program.

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Chapter 1

Introduction

This chapter introduces the specifications and the features of the motherboard.

Features

- **Intel PPGA370 66/100 microprocessor**
- **Plug and Play support**
For automatic resource assignment, your system is PnP version 1.01a compliant.
- **Audio subsystem**
The audio subsystem allows you to easily record, play, and edit music and voice.
- **Video subsystem**
The video subsystem allows you to easily play video CD, clip files and 3D games.
- ◆ **USB port support**
The Universal Serial Bus standard gives you the benefits of having one single interface for multiple interfaces when low-to-medium speed peripherals are concerned.
- **Power Management**
Your system can reduce power consumption automatically while it is idle. It also supports the Windows 98/Windows NT 5.0 power management standard - ACPI (Advanced Configuration Power Configuration).

Specifications

CPU, Memory, and Main Components

- **CPU**
Intel PPGA370 66/100 CPU
- **System Memory**
Two 168-pin DIMM sockets to support 8/16/32/64/128MB SDRAM memory modules, configurable up to 256MB
- **Video Memory**
On-board 4MB video memory

- **ROM BIOS**
2Mb flash EEPROM, supporting audio, video, security, setup, and power management

Interfaces and Controllers

- **Intel 810 chipset**
The chipset consists of the Intel 82810 Graphics Memory Controller Hub (GMCH) and the Intel 82801 I/O Controller Hub (ICH).
- **Audio Controller**
AC97 2.1 Audio Interface (integrated in Intel 82801) and audio CODEC (STAC9721), compatible with Sound Blaster Pro and Windows Sound System
- **Video Controller**
Integrated in Intel 82810
- **I/O Interfaces**
The PC87366 supports:
 - One standard/ECP/EPP parallel port (DB25-F)
 - One RS-232C serial port (DB9-M)
 - One PS/2 keyboard connector (6-pin mini-DIN)
 - One PS/2 mouse connector (6-pin mini-DIN)
 - One VGA port (DB15-F, 3-rows)
 - One game/MIDI port (DB15-F, 2-rows)
 - Two USB ports
 - Three audio ports for Line-in/Mic-in/Earphone-out (jack)
 - Two PCI-IDE connectors for four IDE devices (jack)
 - One floppy disk drive connector (jack)
- **Expansion Slots**
Three PCI slots

Chapter 2

System Components

This chapter introduces the components of the motherboard.

Major Components

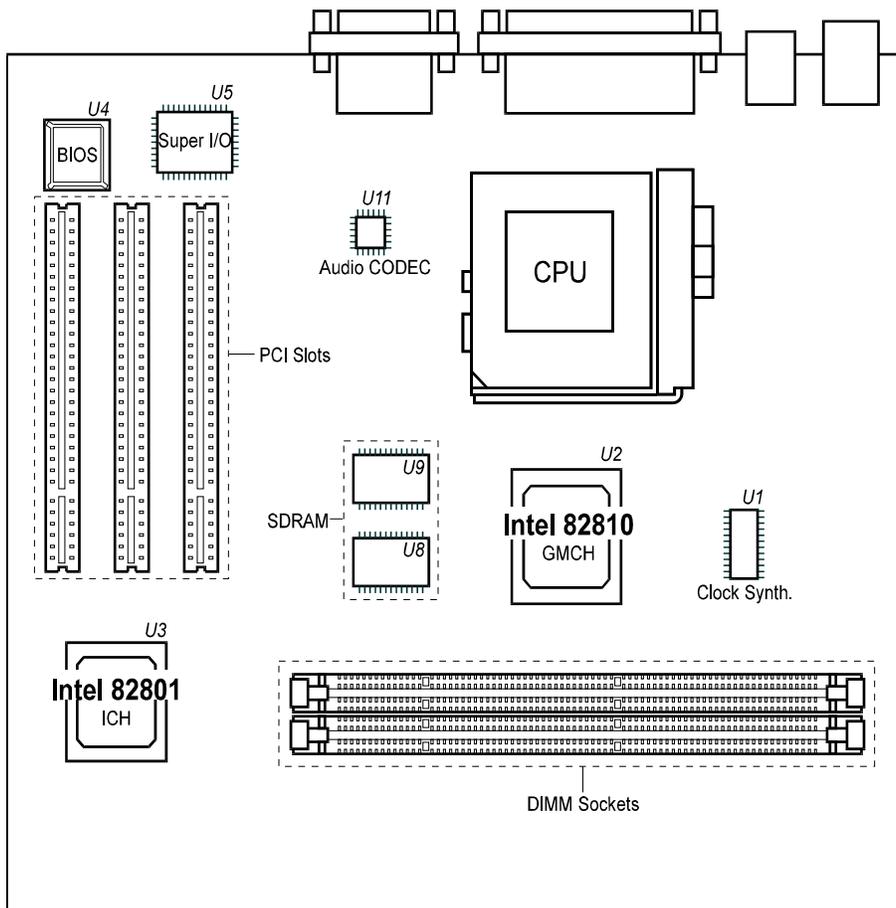


Figure 2-1. Major Components of System Board

Reference	Description	Name
U1	Clock Synthesizer: <ul style="list-style-type: none"> • CK100 + CKBF • Supports 2.5V/3.3V CPU clock swing • Power-on default CPU/SDRAM clock frequencies • Serial data interface 	W195B
U2	Graphics Memory Controller Hub (GMCH) Controller provides: <ul style="list-style-type: none"> • Processor Interface: <ul style="list-style-type: none"> - Supports Mondocino PPVG370 processor configuration at 66/100MHz - GTL+ Compliant host bus • DRAM Interface: <ul style="list-style-type: none"> - Supports SDRAM DRAM - Supports 256MB memory using x8, x16, x32, x64 and x128 16/64-bit SDRAM • Hub Interface: <ul style="list-style-type: none"> - Private connection between GMCH and ICH • Power Management: <ul style="list-style-type: none"> - Suspend to DRAM support - ACPI rev 1.0 & AP rev 1.2 Compliant support • IO Device: <ul style="list-style-type: none"> - 810 ICH 	Intel 82810 (GMCH)
U3	IO Controller Hub (ICH) Controller provides: <ul style="list-style-type: none"> • PCI-to-ISA bridge • Low Pin Count (LPC) I/F • USB interface • IDE/DMA control • 82C59 interrupt control • Power management logic • Enhanced DMA control • 82C54 timer and real-time clock • SMBus 	Intel 82801 (ICH)
U4	Flash ROM: <ul style="list-style-type: none"> • PLCC 256KB EEPROM for system BIOS, VGA BIOS, Plug & Play configuration tables, and power management • Dynamic detect flash type • Applies different code before flashing 	Intel 82802 (FWH)

(To be continued)

Table 2-1. Major Components Description

(Continued)

Reference	Description	Name
U5	<ul style="list-style-type: none">• Super I/O Control:<ul style="list-style-type: none">- An FDD controller for 360KB, 720KB, 1.2MB, 1.44MB and 2.88MB FDD- 3-mode FDD support- Keyboard controller- FIR/SIR support- ECP/EPP mode support- PC97 Compliant- High speed NS16C550 compatible serial port- IrDA 1.1(FIR) & IrDA 1.0 (SIR) Compliant infrared port• Monitoring Function:<ul style="list-style-type: none">- 2 fan speed- 2 programmable PWM control outputs- 7 voltage input- 1 temperature sensor input for CPU	PC87366
U8, U9	4MB Video memory implemented by two 1Mx16 bit 8ns SDRAM	
U11	Audio CODEC: <ul style="list-style-type: none">• AC97 2.1 Compliant• Speaker-out, Line-in, Mic-in support• Internal speakers and microphone support	STAC9721
J1	PPGA370 66/100: <ul style="list-style-type: none">• MMX technology• Dynamic execution microarchitecture• 32K (16K/16K) non-blocking L1 cache• Integrated 128K L2 cache• Plastic Pin Grid Array (PPGA)	Intel CPU
J2, J3	DIMM sockets: <ul style="list-style-type: none">• 64-bit data bus• Two 168-pin 3.3V unbuffered DIMM sockets• Supports PC100 SDRAM module (SPD rev 1.1)• 8, 16, 32, 64 and 128MB DIMMs supported	DIMM

Table 2-1. Major Components Description

System Operations

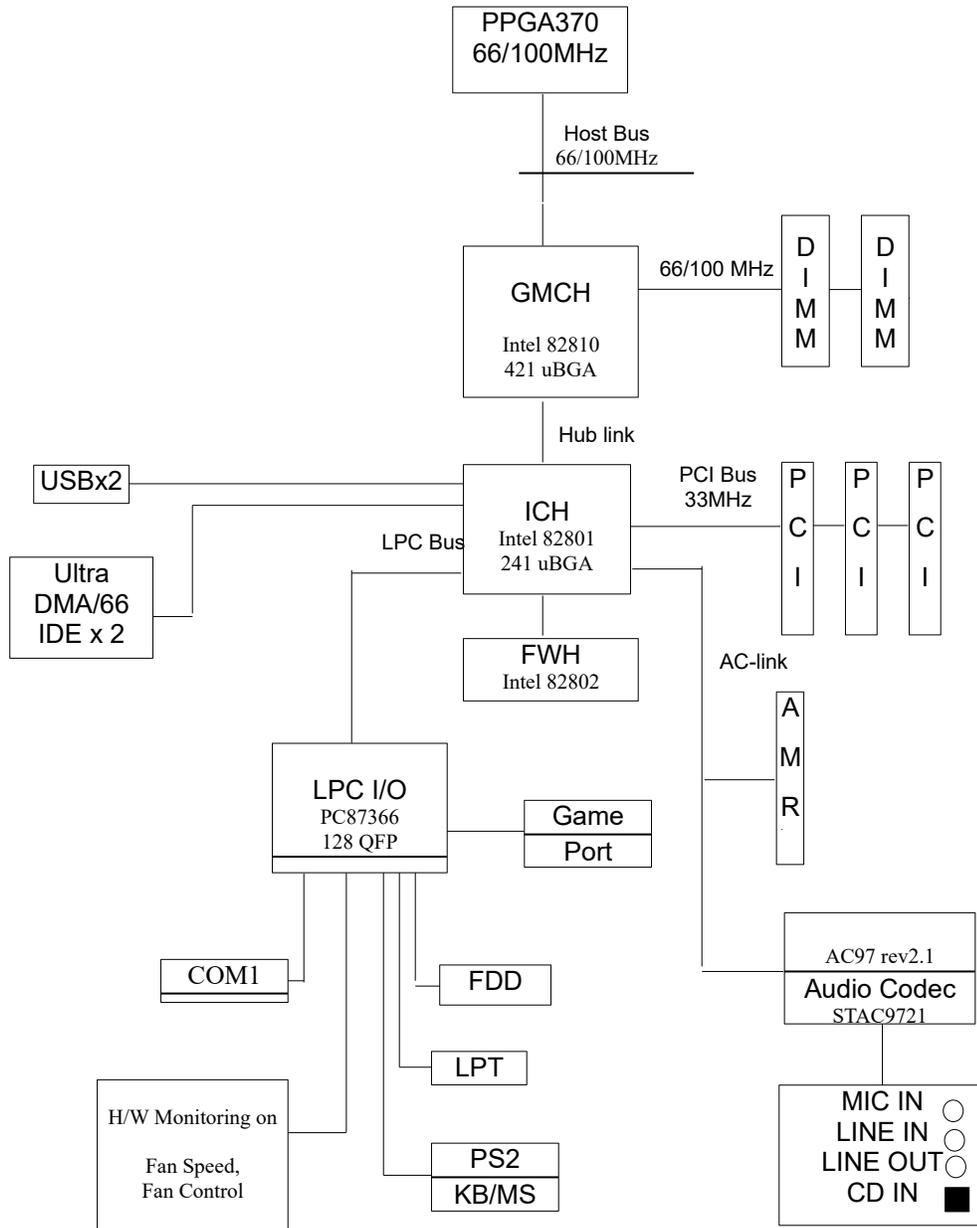


Figure 2-2. Block Diagram of the Motherboard System

Chapter 3

Connector and Jumper Definition

This chapter defines the connectors and jumpers on the motherboard.

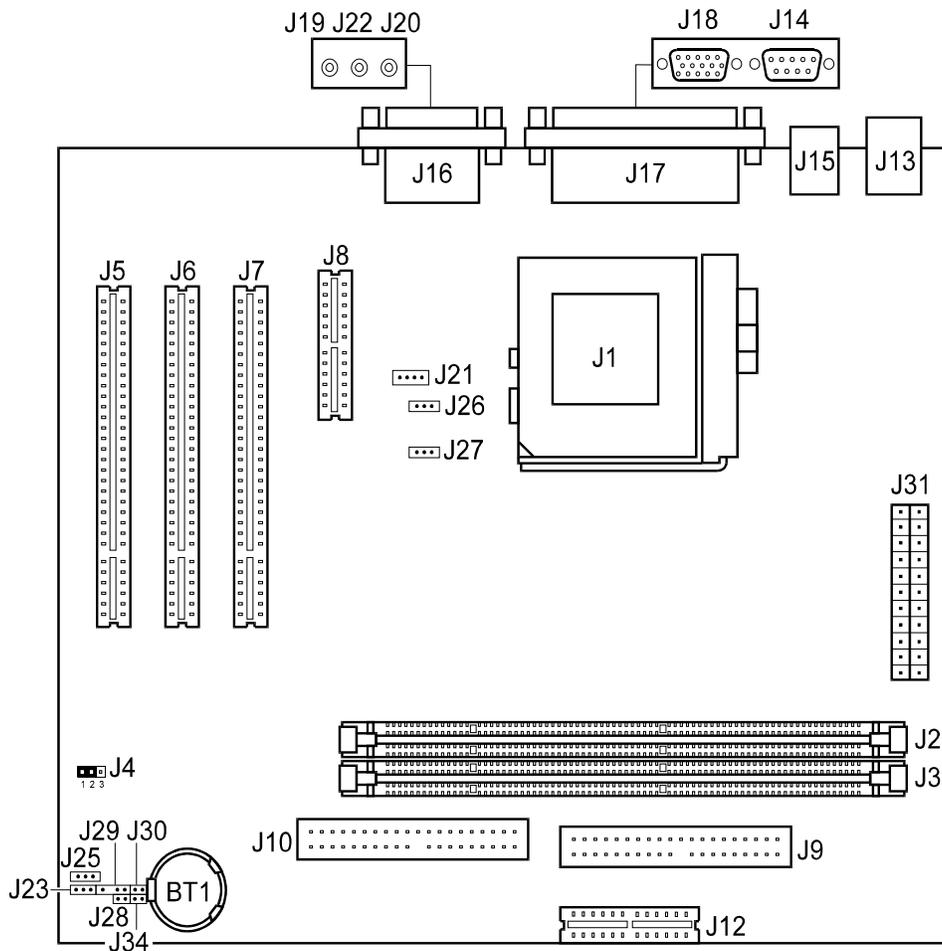


Figure 3-1. Connector and Jumper Locations

Connector Definitions

Internal Connectors

Connector	Definition
J1	CPU socket
J2, J3	DIMM sockets
J5, J6, J7	PCI slots
J8	AMR slot
J9	1 st IDE
J10	2 nd IDE
J12	FDD
J23	Power LED
J24	Wake_on_LAN
J25	Wake_on_Ring
J26	CPU fan
J27	System fan
J28	Power button
J29	Speaker
J30	HDD LED
J31	Power supply
BT1	Battery

Table 3-1. Internal Connector Definition

External Connectors

Connector	Definition
J13	PS/2 keyboard/mouse
J14	COM1
J15	USB
J16	Game/MIDI port
J17	PIO port
J18	VGA
J19	Line-in
J20	Mic-in
J21	CD-in
J22	Headphone-out

Table 3-2. External Connector Definition

Jumper Settings

NOTE: Jumpers not described in this chapter are reserved for factory use only. Do not change the default settings.

Jumper	Definition	Setting
J4	CMOS setting	1-2: Normal 2-3: Clear CMOS *

* To clear the RTC and CMOS RAM, set J4 to 2-3 for one second, and set it back to 1-2 again.

Table 3-3. Jumper Settings

Chapter 4

CPU and Memory Installation

NOTE: To avoid damage during installation, you are advised to ask your dealer for help.

NOTE: Static electricity can destroy electronic devices. Whenever you handle any option outside of its protective packaging, first discharge any static electricity from your body by touching a protective grounding device or unpainted metal on the rear panel of the system unit.

CPU Installation

To install CPU in a ZIF socket:

1. Find the ZIF socket (J1) on the motherboard. (See p.2-1.)
2. Lift the ZIF socket arm up to the vertical position.
3. Align the CPU so its Pin 1 corner (beveled corner) is at the Pin 1 corner of the ZIF socket. Then insert the CPU's pins into the corresponding holes in the socket.

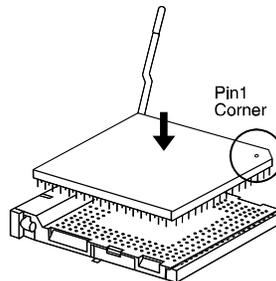


Figure 4-1. Inserting CPU

NOTE:
You are suggested to install a cooling fan to cool the CPU.

4. Press the arm downwards to the horizontal position. You will feel some resistance while doing so. This is normal as the pressure starts to secure the CPU in place.

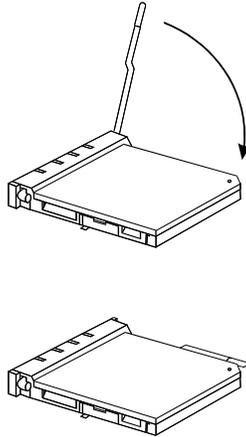


Figure 4-2. Installing CPU

System Memory Installation

1. Locate the DIMM sockets (J2, J3) on the motherboard.
2. Align the DIMM module with the socket and firmly insert the DIMM into the socket. Then, push the plastic clips to snap it into place.

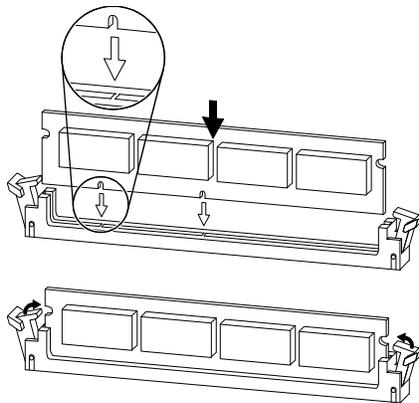


Figure 4-3. Installing DIMM Module

Chapter 5

The SETUP Program

This chapter tells you how to configure your system using the SETUP program.

Introduction

The SETUP program allows you to enter the system configuration information. This information is needed by the system to identify the type of devices installed and to set up special features. Typical configuration information includes the date and time, the type of disk drives, and the amount of memory; special features include security and power savings.

The configuration information is stored in a special kind of memory called CMOS (Complementary Metal Oxide Semiconductor) RAM. CMOS RAM data are backed up by a RTC backup battery.

You may need to run SETUP when:

- You see an error message on the screen requesting you to run SETUP.
- You change factory default settings for some special features.
- You want to modify the configuration information.

Running SETUP and Moving Around

The SETUP program is built into the system board. To run SETUP program, press **[F2]** during system startup.

NOTE:

The SETUP program may have been updated after this manual was published.

The SETUP program contains six options:

- Main - Basic system configuration
- Advanced - Detailed configuration besides basic system configuration, including the configuration of internal chipset
- Security - Security settings
- Power - Power management settings
- Boot - Boot sequence settings
- Exit - Exiting the SETUP program

A brief description of keyboard usage is listed below:

Key	Description
[↑], [↓]	Move the highlight to the previous or the next item.
[←], [→]	Move the highlight to the previous or next option.
[+], [-]	Cycle through the pre-defined values for the selected item. Pressing [+] brings up the next value; pressing [-] brings up the previous one.
Enter	Select a sub-menu.
[Esc]	1) From the SETUP menu, exit SETUP without saving. 2) From a sub-menu, return to the previous menu.
F9	Load the SETUP default values for the current page.
F10	Save the changes and exit SETUP.
[F1]	General help information

Table 5-1. Keyboard Usage in the SETUP Program

In general, you use the [←]/[→] arrow keys to highlight options, the [↑]/[↓] arrow keys to highlight items, and the [+]/[-] keys to change values.

Main

The **Ⓜ**Main” option contains the basic configuration settings of the system. The followings describe in sequence all the items of this option.

Date/Time

The date and time might be incorrect when you start up your system for the first time. Enter the correct value for each field. Note that the time is based on a 24-hour format.

BIOS Version

This item is not user-definable. It shows the version of BIOS.

Diskette A/B

These items set the type of floppy disk drives in your system.

Floppy 3 Mode Support

This item sets if your system has the 3 Mode (NEC/Fujitsu/Toshiba) floppy disk drive for 1.2MB diskettes used in Japan.

Primary/Secondary Master/Slave

These items set the storage device information including *IDE HDD Auto-Detection, Type, Cylinder, Head, Sector, Capacity, Access Mode, PIO Mode, and Ultra DMA Mode*. You can press **[Enter]** to go to the sub-menus for settings.

Keyboard Features

This item selects the keyboard features, such as *Numlock, Keyboard Auto-Repeat Rate* and *Keyboard Auto-Repeat Delay*. Press **[Enter]** to go to the sub-menus for settings.

CPU Type/Speed, Cache RAM, Base/Extended Memory

These items are not user-definable. They show the CPU type, CPU speed, capacity of cache/system/extended memory.

Advanced

The **Advanced** option contains all the items of your system special enhanced features. The followings describe in sequence all the items of this option.

Plug & Play O/S

Select *Yes* if you are using operation system that supports Plug and Play, such as Windows 95, 98 and 2000. Otherwise, select *No*.

Reset Configuration Data

This item allows you to clear the system configuration data.

On-Chip Primary/Secondary IDE

These items enable the integrated local bus Primary/Secondary IDE adapter.

Memory Hole At 15M-16M

This item, when enabled, turns system RAM off to free address space for use with an option card. 1MB extended memory gap, starting at 15MB, will be created in system RAM.

Standard Applications

This feature applies to Year 2000 transition. Select *No* only if your applications interface directly with the Real Time Clock hardware, bypassing the BIOS and the OS. It will slightly affects the PC performance. Keep *Yes* otherwise. Windows NT Pcs and those stopped during Year 2000 transition are not concerned.

Processor Serial Number

This item allows you to identify your system by this electronic number which is incorporated into latest processors such as the Pentium III.

PCI/PNP ISA IRQ Resource Exclusion

This item allows you to reserve specific IRQs for use by legacy ISA devices. You can press **[Enter]** to go to the sub-menus for settings.

I/O Device Configuration

This item allows you to configure the I/O devices and information, such as *Serial port A*, *Parallel port* and *Floppy disk controller*. Press **[Enter]** to go to the sub-menus for settings.

Security

The **ⓈSecurity** option allows you to limit the access to the system/SETUP and set the hard disk boot sector.

<p>NOTE: If you forget your password and wish to cancel it, ask your dealer to reset the CMOS RAM for you.</p>

Set Supervisor/User Password

When a password has been enabled, you will be prompted to enter it every time you try to enter SETUP or system. This prevents an unauthorized person from changing your system configuration and computer.

These two items allow you to limit the access to SETUP items. A **ⓈSupervisor** can access more items than an **ⓊUser** does.

Password on Boot

This item allows you to enable or disable the access to system at boot.

When this item is enabled, you will be prompted to enter a password every time your system is rebooted. This would prevent unauthorized use of your computer.

Power

The **Power** option allows you to configure your system to save energy. The followings describe in sequence all the items of this category.

GENERAL POWER SETTING Section

Auto Suspend Timeout

This item sets the time-out period for the system to enter Suspend mode if the system has been idle for the set period.

State After a Power Failure

This item sets the state that your PC returns to after a power failure. If set to *off*, the PC will not boot after a power failure. If set to *On*, the PC will restart after a power failure. If set to *Auto*, the system uses the same power state before power failure.

POWER-UP EVENTS Section

On External Activity

Serial Port

This item, when it is set to *on*, powers up your system after receiving a signal on the serial port. This item is usually used to power up your system with an external modem.

PCI Bus

This item, when it is set to *on*, powers up your system after receiving a signal on the PCI bus. This item is usually used to power up your system with an external modem or LAN card.

Boot

Boot Device Priority

This item sets the search order of the boot devices like *Floppy*, *CD-ROM*, *HDD* and *LAN*. Press **[Enter]** to go to the sub-menus for settings.

Exit

To exit the SETUP program, you can choose *Exit Saving Changes*, *Exit Discarding Changes*, *Load Default Values for all Settings* from the **ⓈExit** option.

Exit Saving Changes

After finished with your settings, you must save and exit SETUP so that the settings can take effect.

Exit Discarding Changes

After finished with your settings, you can exit SETUP without saving so that the settings will not take effect.

Load Default Values for all Settings

After finished with your settings, you can still reload the default SETUP values.