5MVP3
Ver.4.0$^+$
AT Form Factor
Main Board
User's   Manual

Warning and disclaimer

This manual is designed to provide information about the Pentium® system board. Every effort has been made to make this manual as accurate as possible, but no warranty or fitness is implied. All the information is provided on an 'as is' basis. The author and his corresponding publishing company shall have neither liability nor responsibility to any person or entity with respect to any loss or damages arising from the information contained in this manual or from the use of the system board that accompanies it.

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Chapter 1   Introduction

1-1 Main Board Overview

The main board is a new-generation AGP Pentium® main board with high performance in rendering and texture for 3D Graphics. Based on Apollo MVP3 chipset, the main board has intergrated the latest advances in processor, memory, I/O technologies into an AT form factor. It is also designed for the upcoming 100 MHz F.S.B CPUs, like AMD K6-2/K6-3 series or Cyrix MII CPUs.

The main board utilizes VIA Apollo MVP3 and supports new architects such as high-speed AGP graphic port, SDRAM, Ultra DMA/33, bus master IDE and USB port. It has three Dual In-line Memory Modules (DIMM) which can be installed with SDRAM memory. The memory subsystem supports up to 512Mbyte SDRAM of non-buffered 3.3V using standard 168-pin DIMM sockets.

The main board implements high performance I/O Controller utilizes with fully Plug and Play device which supports 2.88 MB Floppy, Dual 16550 Compatible (with 16 bytes FIFO, up to 460K baud rate) Serial Port, ECP (Enhanced Capabilities Port), EPP (Enhanced Parallel Port) parallel port, Infrared IrDA (HPSIR), and Amplitude Shift Keyed IR. (ASKIR) port.

The main board supports 3*PCI & 3*ISA for highest performance I/O add-on adapter cards. The system board supports three Matrix Independent for complete multiple PCI adapters operation up to 133MB/s data transfer rate on PCI bus compared to 33MB/s on EISA bus, synchronized operation CPU to PCI Interface for best graphical performance, 120MB/s PCI to system DRAM together with utilizing Snoop Ahead Features, and support back to back sequential CPU to PCI Memory writes to PCI Burst Write for full PCI through put.

☞   **MVP3 chipset doesn't support Ultra DMA/66 mode HDD…**

The main board is also strengthened with Power Management Wake up Event such as **"WOL (Wake up on LAN),"** and **"Modem ring on,"** which are the new inventions to enable PCs to be turned on over the network or modem. These are also key benefits in PC operation, asset management, new system setup and power conservation.

In addition to the above features, this main board is a DIP switch design, which offers an easier procedure to set CPU speed compared with present Pentium main boards.

In conclusion, the main board is a combination of the highest in performance, flexibility, efficiency, and ease of use that meets a variety of price/performance levels. The main board is an ideal platform for the increasing requirements of today's and future's desktop application.

1-2 Specifications

- **PCB board size:** 25 cm x 22 cm

- **PCB layer:** 4 layers

- **ZIF Socket 7**
  Support Intel® Pentium, Cyrix 6x86 series/ MII series, IDT WinChip series and AMD K5/K6/K6-2/K6-III CPUs

  CPU is not enclosed in the package

- **Memory DIMM:** 3 of 168-pin 3.3V DIMM
  ! Professional PC
  *100 MHz freq. : PC-100 DIMM

  66MHz DIMM can be used with 100 MHz CPUs, but the user must adjust jumper S1 pin 7 for asynchronous operation.

  * 66 MHz freq.: SDRAM up to 384MB
                  EDO RAM up to 768MB (3.3V only)
  ! Basic PC: 66 MHz freq.
  * SDRAM up to 384MB
  * EDO RAM up to 768MB(3.3V only)

- **Expansion Slot :** 3x ISA slots, 3x PCI slots and 1x A.G.P. slot

- **Chipset :** VIA Apollo MVP3
  ! VIA VT82C586B
  ! VIA VT82C598MVP

- **BIOS**
  licenced Award® full **PnP** (Plug & Play) BIOS, flash ROM BIOS

- **Cache: 512K; 1024K**

- **I/O function**
  - **!** 2 x PCI IDE devices
  - **!** 1 x FDC, 2 x serial ports(16550 fast com)
  - **!** 1x parallel port device /EPP/ECP
  - **!** 2x USB connector
  - **!** IrDA (infrared) connector

- **Green function:** Complied with APM (Advanced Power Management)

- **AT form factor**

- **Electrical--- Typical power supply**
  Below is reference for ATX power supply.

Voltage	Tolerance	Current
+5V	±5%	22 Amperes
+3.3V	±5%	3 Amperes
+12V	± 10%	800 mA
-5V	±5%	150 mA
-12V	±5%	100 mA

WOL (Wake up on LAN) function :
Power supply should offer at least 750mA to the signal "5V trickle voltage" to support.

- **Power supply regulation**
  Onboard switching voltage that support appropriate power to the CPU and future upgraded CPUs.

- **Special features**
  - **!** Wake up on LAN
  - **!** Modem ring on
  - **!** Windows 95 power off
  - ! Auto detection of CPU voltage, temperature, and fan speed

1-3   Notice of Hardware Installation

Before hardware installation, make sure you have checked the following things.

A. Check the package
If any of these items is missing or damaged, contact the dealer from whom you purchase. Leave this main board in its original package until you are ready to install it. In the package, there are:

!   the main board
!   manual
!   cables
!   driver & utility / CD

B. Make sure power is off.

C. Avoid ESD (Electrical Static Discharge).
While working with this main board, wear a grounded wristband or ankle strap to avoid ESD (Electrical Static Discharge).

Chapter 2   Installation

2-1 Layout Reference
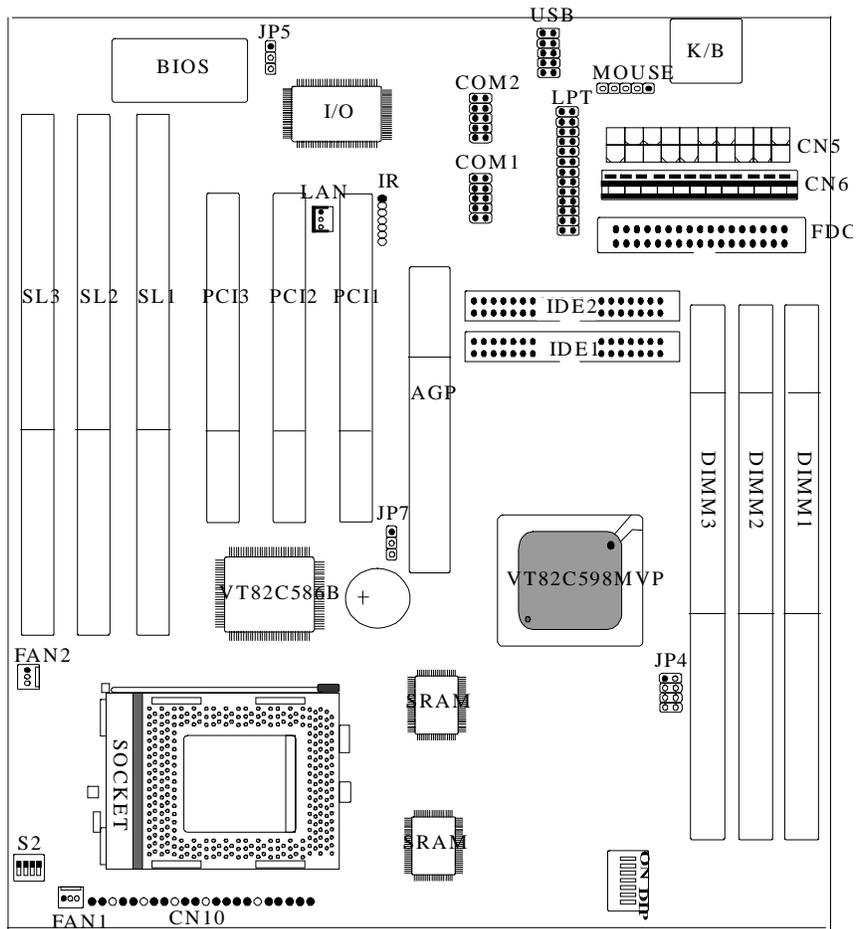
2-2   Quick Reference to CPU Speed Setup

The setup of CPU speed is simplied to a "DIP switch form," which is only related to jumpers S1 and S2. This design is also convenient to recognize those jumpers as below.

S2: CPU voltage selector

Intel Pentium PU Clock	SYS. Clock	CPU Voltage	Ratio	S1						S2			
				1	2	3	4	5	6	1	2	3	4
P54C 100 MHZ	66 MHZ	3.3V	1.5X	off	off	off	off	on	on	on	off	on	on
P54C 120 MHZ	60 MHZ	3.3V	2X	on	off	off	on	on	on	on	off	on	on
P54C 133 MHZ	66 MHZ	3.3V	2X	on	off	off	off	on	on	on	off	on	on
P54C 150 MHZ	60 MHZ	3.3V	2.5X	on	on	off	on	on	on	on	off	on	on
P54C 166 MHZ	66 MHZ	3.3V	2.5X	on	on	off	off	on	on	on	off	on	on
P55C 166 MHZ	66 MHZ	2.8/3.3V	2.5X	on	on	off	off	on	on	off	off	off	on
P54C 180 MHZ	60 MHZ	3.3V	3X	off	on	off	on	on	on	on	off	on	on
P54C 200 MHZ	66 MHZ	3.3V	3X	off	on	off	off	on	on	on	off	on	on
P55C 200 MHZ	66 MHZ	2.8/3.3V	3X	off	on	off	off	on	on	off	off	off	on
P55C 233 MHZ	66 MHZ	2.8/3.3V	3.5X	off	off	off	off	on	on	off	off	off	on

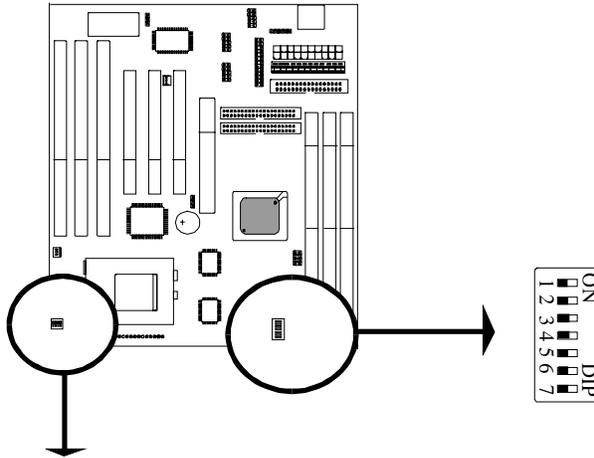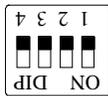| Cyrix CPU Clock	SYS. Clock	CPU Voltage	Ratio	S2						S2			
				1	2	3	4	5	6	1	2	3	4
150+ M1	60 MHZ	3.52V	2X	on	off	off	on	on	on	on	on	on	on
166+ M1	66 MHZ	3.52V	2X	on	off	off	off	on	on	on	on	on	on
6X86L 150	60 MHZ	2.8/3.3V	2X	on	off	off	on	on	on	off	off	off	on
6X86L 166	66 MHZ	2.8/3.3V	2X	on	off	off	off	on	on	off	off	off	on
6X86L 200	75 MHZ	2.8/3.3V	2X	on	off	off	on	on	off	off	off	off	on
6X86MX 166	66 MHZ	2.9/3.3V	2X	on	off	off	off	on	on	on	off	off	on
6X86MX 166	60 MHZ	2.9/3.3V	2.5X	on	on	off	on	on	on	on	off	off	on
6X86MX 200	75 MHZ	2.9/3.3V	2X	on	off	off	on	on	off	on	off	off	on
6X86MX 233	75 MHZ	2.9/3.3V	2.5X	on	on	off	on	on	off	on	off	off	on
6X86MX 266	**83 MHZ**	**2.7/3.3V**	**2.5X**	**on**	**on**	**off**	**off**	**on**	**off**	**on**	**on**	**on**	**off**
6X86MII 300	**66 MHZ**	**2.9/3.3V**	**3.5X**	**off**	**off**	**off**	**off**	**on**	**on**	**on**	**off**	**off**	**on**
6X86MII 333	**83 MHZ**	**2.9/3.3V**	**3X**	**off**	**on**	**off**	**off**	**on**	**off**	**on**	**off**	**off**	**on**

AMD CPU Clock	SYS. Clock	CPU Voltage	Ratio	S1						S2			
				1	2	3	4	5	6	1	2	3	4
K5-PR100/PR133	66 MHZ	3.52V	1.5X	off	off	off	off	on	on	on	on	on	on
K5-PR166	66 MHZ	3.52V	2.5X	on	on	off	off	on	on	on	on	on	on
K6-PR166	66 MHZ	2.9/3.3V	2.5X	on	on	off	off	on	on	on	off	off	on
K6-PR200	66 MHZ	2.9/3.3V	3X	off	on	off	off	on	on	on	off	off	on
K6-PR233	66 MHZ	3.2/3.3V	3.5X	off	off	off	off	on	on	off	off	on	on
K6-PR233	66 MHZ	3.3/3.3V	3.5X	off	off	off	off	on	on	on	off	on	on
K6-PR266	66 MHZ	2.2/3.3V	4X	on	off	on	off	on	on	off	on	off	off
K6-PR300	66 MHZ	2.2/3.3V	4.5X	on	on	on	off	on	on	on	off	off	off
K6-2 250	100MHZ	2.2/3.3V	2.5X	on	on	off	off	off	off	off	on	off	off
K6-2 266	66 MHZ	2.2/3.3V	4X	on	off	on	off	on	on	off	on	off	off
K6-2 300	100MHZ	2.2/3.3V	3X	off	on	off	off	off	off	off	on	off	off
K6-2 333	95 MHZ	2.2/3.3V	3.5X	off	off	off	on	off	off	off	on	off	off
K6-2 350	100MHZ	2.2/3.3V	3.5X	off	off	off	off	off	off	off	on	off	off
K6-2 380	95 MHZ	2.2/3.3V	4X	on	off	on	on	off	off	off	on	off	off
K6-2 400	100MHZ	2.2/3.3V	4X	on	off	on	off	off	off	off	on	off	off
K6-2 450	100MHZ	2.4/3.3V	4.5X	on	on	on	off	off	off	off	off	on	off
K6-2 475	95 MHZ	2.4/3.3V	5X	off	on	on	on	off	off	off	off	on	off
K6-3 400	100MHZ	2.4/3.3V	4X	on	off	on	off	off	off	off	off	on	off
K6-3 450	100MHZ	2.4/3.3V	4.5X	on	on	on	off	off	off	off	off	on	off

2-3 Jumper Settings

With a careful design for the CPU speed jumper, this main board has been simplied to a "DIP Switch" form. It is very convenient to set CPU speed under DIP switch.

2-3-1 S1
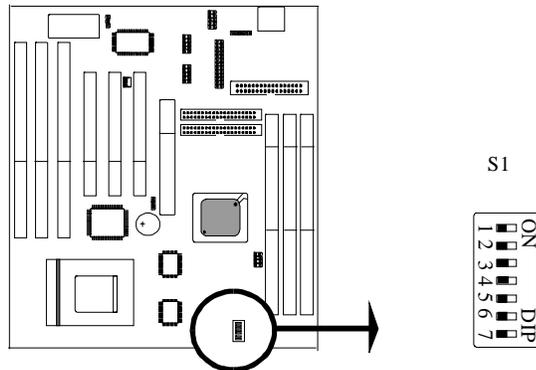
S1 Pin 1 to Pin 3: CPU Ratio Selector

S1			CPU Ratio
Pin 1	Pin 2	Pin 3	
off	off	off	1.5/3.5x
on	off	off	2.0x
on	on	off	2.5x
off	on	off	3.0x
on	off	on	4.0x
on	on	on	4.5x
off	on	on	5.0x
off	off	on	5.5x

S1 Pin 4 to Pin 6: CPU Frequency Selector

S1			CPU Frequency
Pin 4	Pin 5	Pin 6	
on	on	on	60 MHz
off	on	on	66.6 MHz
on	on	off	75 MHz
off	on	off	83.3 MHz
on	off	off	95 MHz
off	off	off	100 MHz

S1 Pin 7: SDRAM Clock Frequency

S1 Pin 7	SDRAM Clock Freq.
on	SDRAM clock is fixed on 66 MHz
off	SDRAM Clock is the same with CPU clock

2-3-2 S2 CPU Voltage Selector

S2: CPU voltage selector
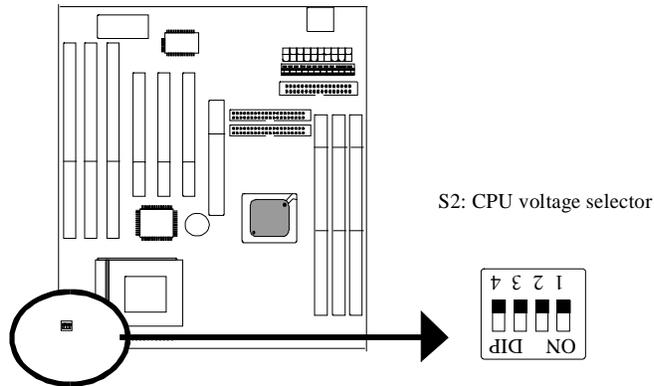
S2				CPU Vcore
Pin 1	Pin 2	Pin 3	Pin 4	
on	off	off	off	2.1V
off	on	off	off	2.2V
off	off	on	off	2.4V
on	on	on	off	2.7V
off	off	off	on	2.8V
on	off	off	on	2.9V
off	off	on	on	3.2V
on	off	on	on	3.3V
on	on	on	on	3.5V

2-3-3 JP4 DIMM Voltage Selector

JP4 is a 4-pin connector to select either 3.3V or 5V DIMM voltage. Select "1-2, 3-4" for 5V DIMM, or "5-6, 7-8" for 3.3V DIMM..

JP4: DIMM voltage selector
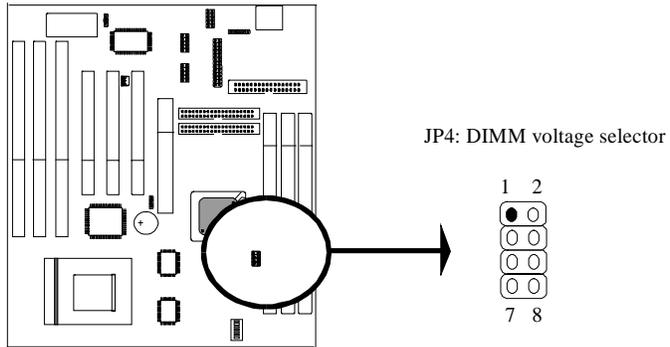
JP4	DIMM Voltage
1-2, 3-4	5V
5-6, 7-8	3.3V

2-3-4 JP5 Flash ROM Voltage Selector

JP5 is a 3-pin connector to select 5V or 12V flash ROM. Select "1-2" for 5V or "2-3" for 12V.

JP5: Flash ROM
voltage selector

● Pin1
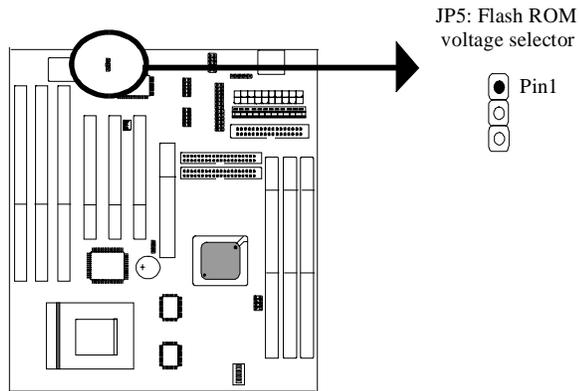
JP5	Flash ROM Voltage
1-2	5V
2-3	12V

2-3-5 JP7 CMOS Status----clearing content of CMOS

JP7: CMOS status

Pin1
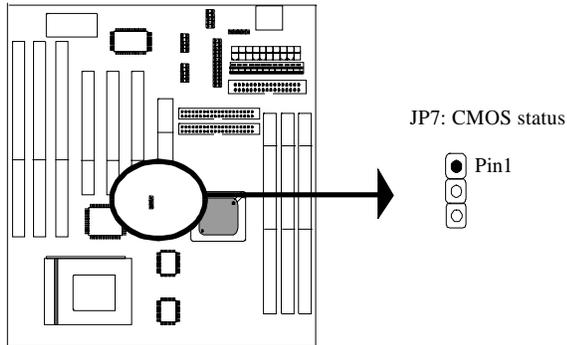
JP7 is a 3-pin connector. Clear CMOS if system password is forgotten. Below is details to show how to clear CMOS.

JP4	CMOS Status
1-2	Normal
2-3	Clear CMOS

Procedure to clear CMOS:
Step 1: Shut down the system and disconnect the power supply from AC power.
Step 2: Pull out the AT cable from AT connector.
Step 3: Short the CMOS jumper by putting jumper cap on Pin 2-3 for a few seconds.
 Step 4: Return to pin 1-2 for normal setup.
Step 5: Link power cable to the connector & connect AC power to power supply.
Step 6: Turn on system power.

if you'd like to set password, press "Del" Key during system bootup to enter CMOS setup and establish a new password.

2-4   Connectors

There are many connectors on this main board.   Refer to the following pages for details.

2-4-1   CN10 Front Panel Connectors

Front panel has connectors as "HDD-LED," "SOFT-PWR," "TB-LED," "SPEAKER," "KEYLOCK," and "POWER-LED." Refer to details as below.

CN10: Front Panel

HDD-LED   RESET   TB-LED   SPEAKER   POWER LED   SOFT-PWR
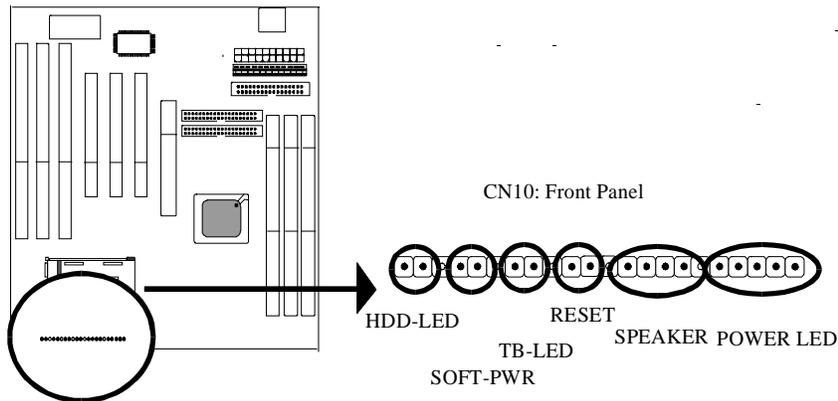
Marked "HDD-LED," Hard Disk activity LED connector is a 2-pin keyed Berg strip. It is used to connect to front panel Hard Disk LED.

ATX soft-PWR switch connector is Soft-PWR with 2 pins.

SMI connector is a 2-pin Berg strip, which is also called **"green"** or **"sleep"** connector.   When SMI is turned from open to close and back to open, the system will enter sleep mode immediately.   This function is to make sure power saving is working well. In PC system, it is used to connect to the push button SMI switch located on the case front panel (if there is). The system can be forced to power saving mode by pressing the SMI switch.

SMI	Operation
Open	Normal
Close	System will enter sleep mode

TB-LED with a 2-pin Berg strip on case front panel indicates the current speed status of system.   It is used to connect to the Turbo Led on the front panel of the case (if there is).

Reset connector is a 2 -pin keyed Berg strip, connected to the push button reset switch on the case's front panel. Shorting both pin 1& pin 2 can reset the system, which is similar to the power off and then on again.

Pin	Operation
Open	Normal
Close	Hardware reset

SPEAKER connector is a 4-pin keyed Berg strip. It is used to connect to the case speaker to the main board for sound purpose.

KEYLOCK is a 2-pin connector. It is used to connect the key lock on the case front panel (if there is).   Keyboard may be disconnected with the system through this function.

Pin	Operation
Open	Normal
Close	Short the connector to be disconnected with the system

POWER LED is a 3-pin connector.   It is used to connect to the LED on the case front panel. The LED shows the status of the power.

2-4-2　Back Panel Connectors

There are COM1/ COM2, LPT, USB and keyboard/ mouse on case back panel. Please refer to more details as below.

COM1/COM2

The onboard serial port 1 and port 2 are the 9-pin D-subminature male connector **COM1 and COM2.** COM1 and COM2 can be disabled in BIOS setup. Please refer to Chapter 3 "Integrated Peripherals" for more information.

COM2: Serial port 2

COM1: Serial port 1
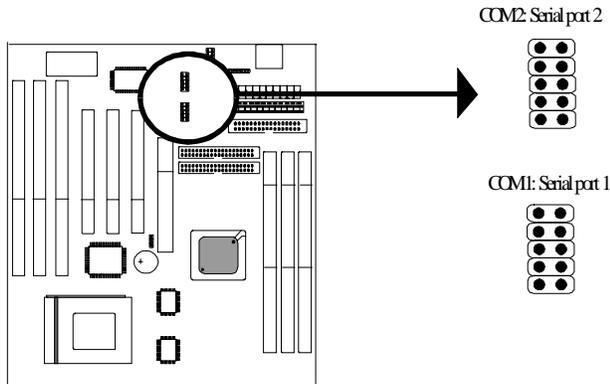
Pin	Signal	Pin	Signal
Pin 1	Carrier detect (CD)	Pin 5	Signal ground
Pin 2	Receive data (RXD)	Pin 6	Data set ready
Pin 3	Transmit data (TXD)	Pin 7	Request to send (RTS)
Pin 4	Data therminal ready (DTR)	Pin 8	Clear to send (CTS)
Pin 9	Ring indicator		

LPT Parallel Port

The onboard parallel port is a 25-pin female connector, marked as **"LPT."**

LPT: Parallel port
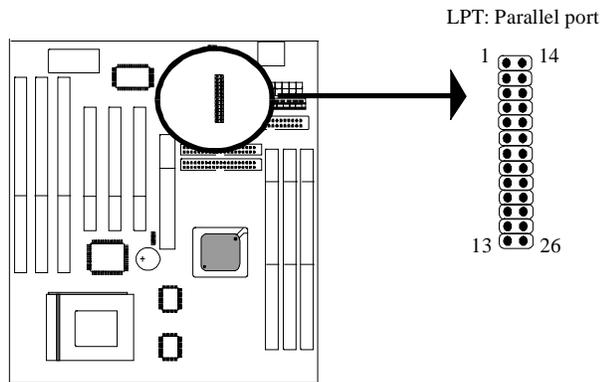
Pin	Signal	Pin	Signal
Pin 1	Strobe	Pin 14	Auto feed
Pin 2	Data bit 0	Pin 15	Error
Pin 3	Data bit 1	Pin 16	Init
Pin 4	Data bit 2	Pin 17	SLCT in
Pin 5	Data bit 3	Pin 18	Ground
Pin 6	Data bit 4	Pin 19	Ground
Pin 7	Data bit 5	Pin 20	Ground
Pin 8	Data bit 6	Pin 21	Ground
Pin 9	Data bit 7	Pin 22	Ground
Pin 10	ACK	Pin 23	Ground
Pin 11	Busy	Pin 24	Ground
Pin 12	PE	Pin 25	Ground
Pin 13	SLCT		

CN8 USB (Universal Serial Bus)
Universal Serial Bus connector, marked **"USB,"** is used to connect USB devices. There are 2 USB connectors on this main board.

USB
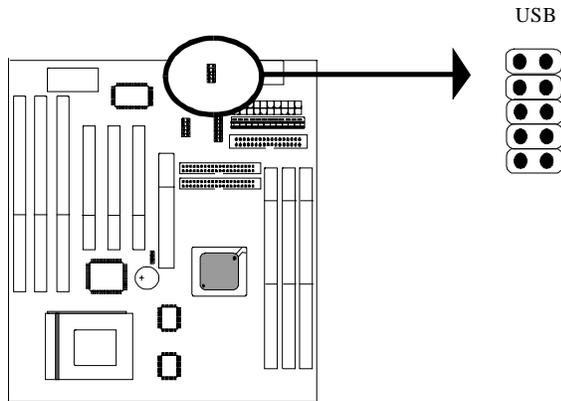
Keyboard
The onboard PS/2 keyboard and mouse connector is 6-pin Mini-Din connectors, marked **"KB."**

KB: Keyboard connector

Pin	Description
Pin 1	Data signal
Pin 2	NC
Pin 3	Ground
Pin 4	+5V DC
Pin 5	Clock signal
Pin 6	NC
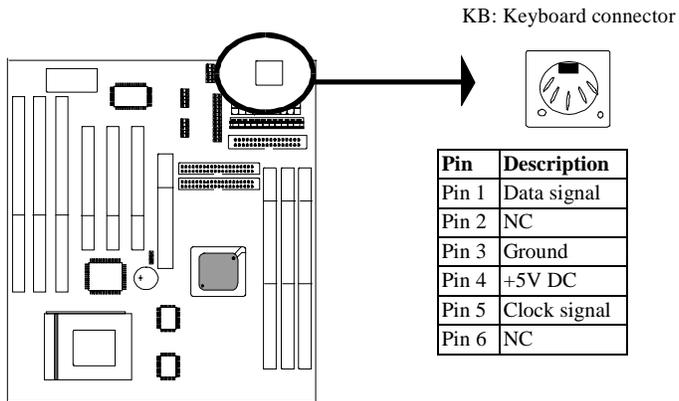
CN4　Mouse

CN4 is a 4-pin connector to connect to mouse connector.

CN4: PS/2 mouse

Pin1
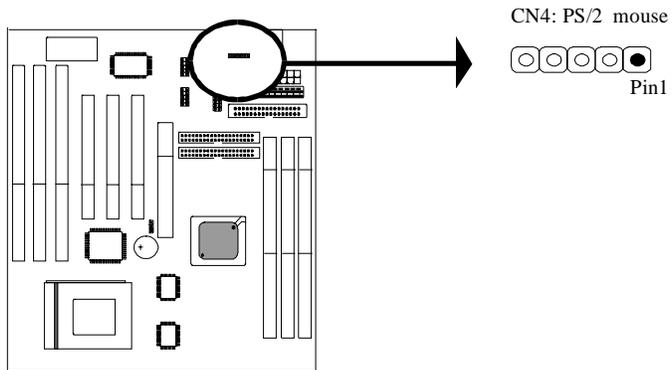
2-4-3 CN5 ATX Power Supply Connector

ATX power supply connector has 20 pins, which is designed for ATX case especially. The ATX power supply supports the function of the **"Soft Power On Momentary switch"** which connects on the front panel switch to the 2-pin **SOFT-PWR** on the system board**.**   While the power switch on the back of ATX power is turned on, the full power will not go into the system board until the front panel switch is momentarily pressed. Push the switch again to turn off the power to the system board.

CN5: ATX power connector
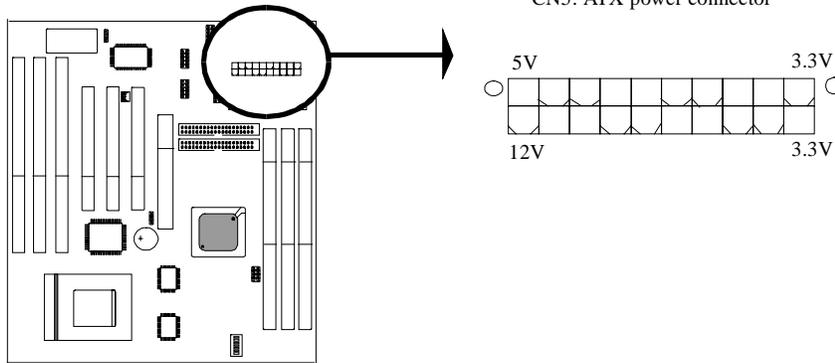
Pin	Signal	Pin	Signal
Pin 1	3.3V	Pin 2	3.3V
Pin 3	3.3V	Pin 4	-12V
Pin 5	GND	Pin 6	GND
Pin 7	5V	Pin 8	SOFT-PWR ON
Pin 9	GND	Pin 10	GND
Pin 11	5V	Pin 12	GND
Pin 13	GND	Pin 14	GND
Pin 15	RAWPOWER	Pin 16	-5V
Pin 17	5V	Pin 18	5V
Pin 19	+12V	Pin 20	5V

2-4-4 CN7 AT Power Supply Connector

CN7: AT power connector
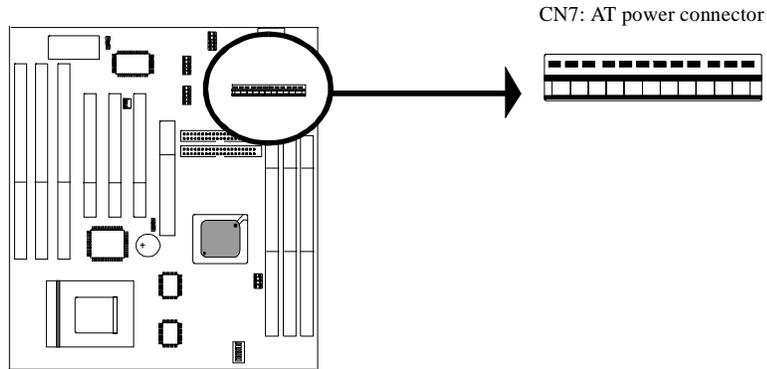
Pin	Signal	Pin	Signal
1	POWER GOOD	7	GROUND
2	+5V DC	8	GROUND
3	+12V DC	9	-5V DC
4	-12V	10	+5V DC
5	GROUND	11	+5V DC
6	GROUND	12	+5V DC

2-4-5   CN8 IR Connector

IR connector supports wireless infrared module. With this module and application software like LAPlink, or WIN95 Direct Cable Connection, user can transfer data to or from laptops, notebooks, PDA and printers. This connector supports **HPSIR**, **ASKIR,** and **Fast IR**.

Attach Infrared module to IR connector and enable BIOS "Infrared function." Be sure to put in the right orientation during attachment.
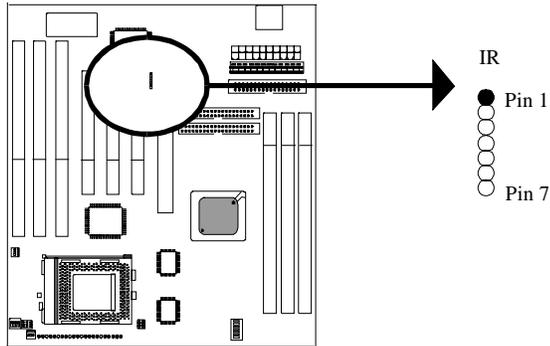
2-4-6 FAN1 /FAN2 Connectors

There are 2 fan connectors on **5MVP3**, and they are marked as **"FAN 1," and "FAN2."** Each fan connector has three pins.
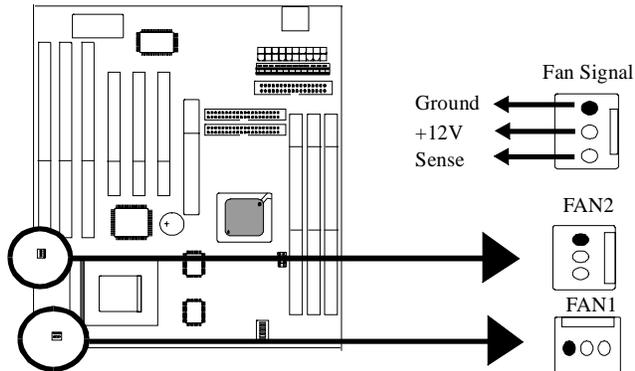
2-4-7 FDC Floppy Interface

Floppy interface connector with 34 pins is used to attach the floppy drive cable.

FDC: Floppy disk connector
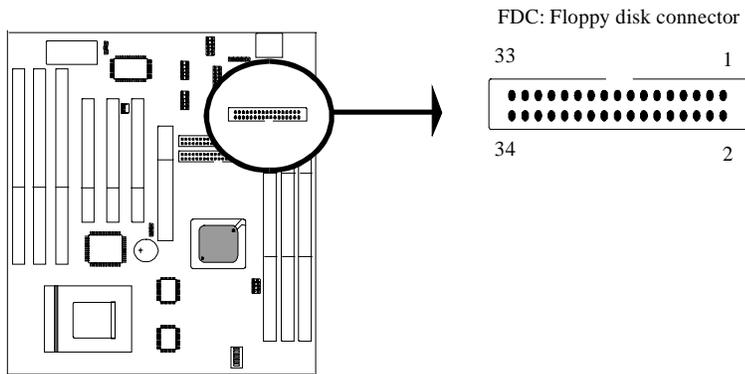
Pin	Signal	Pin	Signal
Pin 1	GND	2	Data rate selection
Pin 3	GND	4	NC
Pin 5	GND	6	NC
Pin 7	GND	8	FDC index
Pin 9	GND	10	FDD Motor A enable
Pin 11	GND	12	FDD Drive B enable
Pin 13	GND	14	FDD drive A enable
Pin 15	GND	16	FDD Motor enable
Pin 17	GND	18	FDC head direction
Pin 19	GND	20	FDC step pulse output to the drive during a SEEK operation
Pin 21	GND	22	FDC write enable serial data to the Drive
Pin 23	GND	24	FDC write enable identify
Pin 25	GND	26	Floppy disk track 0. Indicates that the head of the selected drive is on track zero.
Pin 27	GND	28	FDD write protect. Indicates that the disk of the selected drive is write-protected.
Pin 29	GND	30	Read disk data, serial data input input from the FDD
Pin 31	GND	32	Floppy disk side 1 select
Pin 33	GND	34	Floppy disk change. This is an input pin that senses whether the drive door has been opened or a diskette has been changed.

2-4-8   IDE 1 and IDE2

IDE 1/ IDE 2 both have 40 pins. There are 2 IDE connectors supported on this system board.   IDE1 is primary channel, and IDE2 is secondary channel.   Each channel supports 2 IDE devices, and 4 channels in total for this main board.
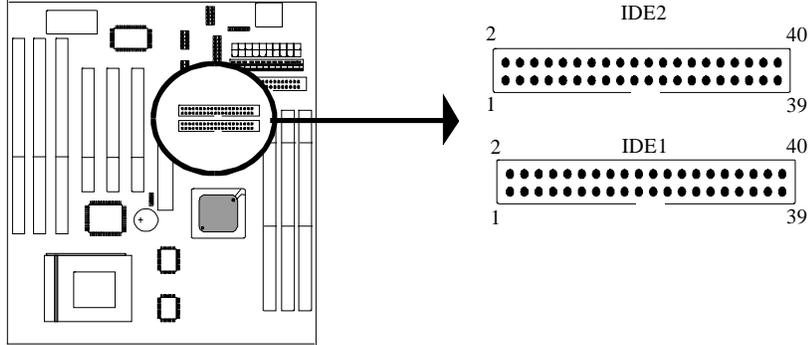
Pin	Signal	Pin	Signal
Pin 1	IDE reset	Pin 2	Ground
Pin 3	Data 7	Pin 4	Data 8
Pin 5	Data 6	Pin 6	Data 9
Pin 7	Data 5	Pin 8	Data 10
Pin 9	Data 4	Pin 10	Data 11
Pin 11	Data 3	Pin 12	Data 12
Pin 13	Data 2	Pin 14	Data 13
Pin 15	Data 1	Pin 16	Data 14
Pin 17	Data 0	Pin 18	Data 15
Pin 19	Ground	Pin 20	Key (NC)
Pin 21	PDREQ	Pin 22	Ground
Pin 23	I/O write	Pin 24	Ground
Pin 25	I/O read	Pin 26	Ground
Pin 27	NC	Pin 28	ALE
Pin 29	NC	Pin 30	Ground
Pin 31	IDE IRQ 14	Pin 32	IOSC15
Pin 33	Address A1	Pin 34	NC
Pin 35	Address A0	Pin 36	Address A2
Pin 37	IDE chip select 0	Pin 38	IDE chip select 1
Pin 39	IDE active	Pin 40	Ground

2-4-9 LAN

Wake up on LAN, marked as **"LAN,"** is a 3-pin connector. To support this feature, a network card is required for the system. More than that, a network management software must be installed too.
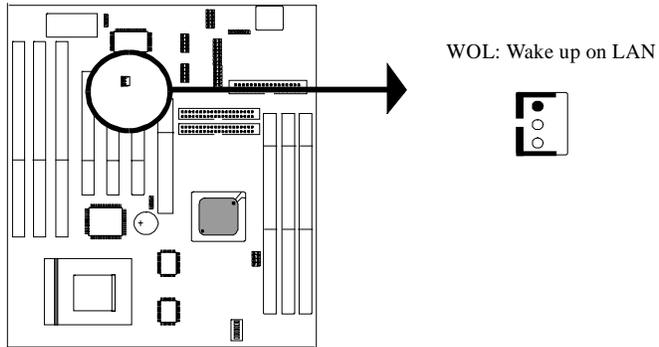
WOL: Wake up on LAN

Wake up on LAN function requirement:
Power should offer at least 750mA to the signal "5V trickle voltage" to support WOL function

2-5 Expansion Slots

Expansion slots contain one A.G.P slot, three PCI slots, and three ISA slots on this main board. Below are details.

Expansion Slots

ISA Slots

PCI Slots

AGP
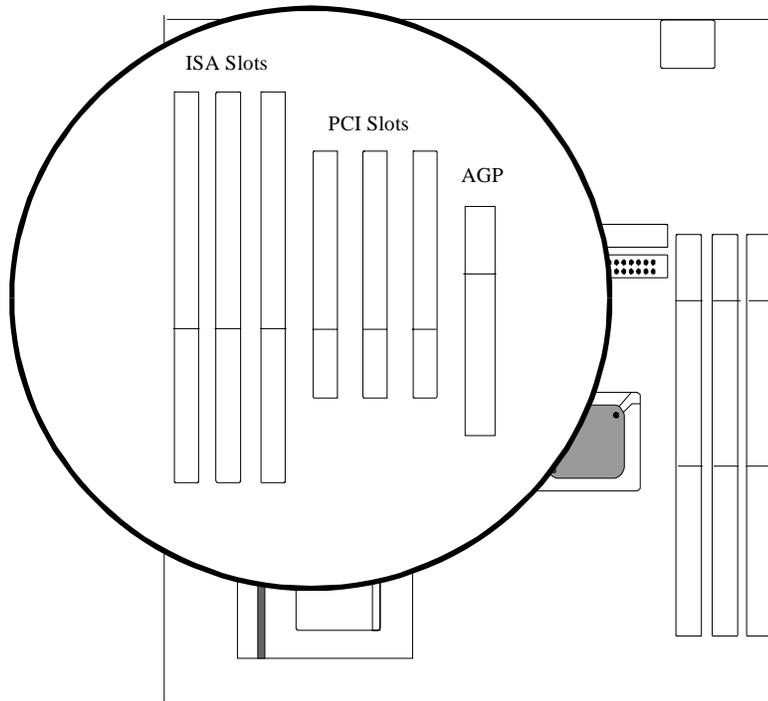
AGP (Accelerated Graphic Port) is the new bus standard that allows the bus speed to run at 66 MHz with up to 133 MHz data transfer capabilities, which is four times as fast as that of the PCI bus. At this speed, the AGP graphic cards can transfer data up to 528MB/second. This high transfer capabilities enables 3D graphic applications, multiple media applications, uncompressed to run smoothly and display in broadcasting quality.

There are three PCI slots on board. 133MB/s data transfer rate on PCI bus can be compared to 33MB/s on EISA bus or 8MB/s on ISA bus. Synchronize Operation CPU to PCI interface for good graphic performance.

There are 3 standard 32-bit ISA slots on board. All of them are bus mastering.

2-6 DIMM Memory Installation

5MVP3 has 3 DIMMs on board. Either DIMM 1, DIMM2, or DIMM3 supports 8 MB, 16 MB, 32 MB, 64 MB, and 128MB. Maximum memory for **SDRAM is up to 384MB; EDO RAM is up to 768 MB.** This main board also supports asynchronous operation for CPU and DIMM data transfer. Set DIP switch **S1 Pin 7** when the system is under asynchronous operation.

DIMM3   DIMM2   DIMM1
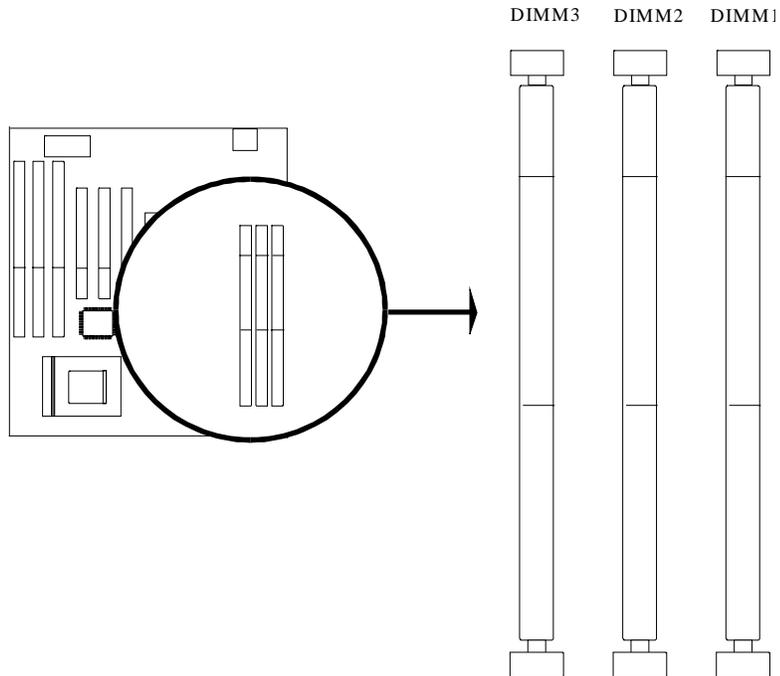
Insert the module as shown.   Due to different number of pins on either side of the breaks, the module will only fit in the orientation as shown.

DIMM
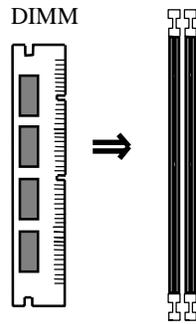
Chapter 3　BIOS Setup

3-1　Award BIOS CMOS Setup

```
                 ROM PCI/ISA BIOS (2A5LEL1B)
                     CMOS SETUP UTILITY
                    AWARD SOFTWARE, INC.
┌─────────────────────────────┬─────────────────────────────┐
│ STANDARD CMOS SETUP          │ INTEGRATED PERIPHERALS       │
│                              │                              │
│ BIOS FEATURES SETUP          │ SUPERVISOR PASSWORD          │
│                              │                              │
│ CHIPSET FEATURES SETUP       │ USER PASSWORD                │
│                              │                              │
│ POWER MANAGEMENT SETUP       │ IDE HDD AUTO DETECTION       │
│                              │                              │
│ PNP/PCI CONFIGURATION        │ SAVE & EXIT SETUP            │
│                              │                              │
│ LOAD SETUP DEFAULTS          │ EXIT WITHOUT SAVING          │
│                              │                              │
├─────────────────────────────┴─────────────────────────────┤
│ Esc : Quit                     ↑ ↓ → ←   : Select Item     │
│ F10 : Save & Exit Setup        (Shift)F2 : Change Color    │
│                                                            │
└────────────────────────────────────────────────────────────┘
```

The menu displays all the major selection items and allow user to select any of shown item. The selection is made by moving cursor (press any direction key) to the item and press **<Enter>** key. An on-line help message is displayed at the bottom of the screen as cursor is moving to various items which provides user better understanding of each function. When a selection is made, the menu of selected item will appear.　So the user can modify associated configuration parameters.

3-2 Standard CMOS Setup

```
                 ROM PCI/ISA BIOS (2A5LELIB)
                    STANDARD CMOS SETUP
                   AWARD SOFTWARE, INC.

   Date (mm:dd:yy) : Mon, Nov 16 1998
   Time (hh:mm:ss) : 19 : 34 : 31

   HARD DISKS         TYPE   SIZE   CYLS HEAD PRECOMP LANDZ SECTOR  MODE

   Primary Master  :    0      0      0    0      0     0      0   AUTO
   Primary Slave   :    0      0      0    0      0     0      0   AUTO
   Secondary Master :   0      0      0    0      0     0      0   AUTO
   Secondary Slave :    0      0      0    0      0     0      0   AUTO

   Drive A : 1.44M, 3.5 in.
   Drive B : None
   Floppy 3 Mode Support : [Disabled]

   Video   : EGA/VGA
   Halt On : All Errors

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

The **"Standard CMOS Setup"** allows user to configure system setting such as **current date** and **time, type of hard disk drive** installed in the system, **floppy drive type,** and the type of **display monitor.** Memory size is auto detected by the BIOS and displayed for your reference. When a field is highlighted (direction keys to move cursor and **<Enter>** key to select). The entries in the field will be changed by pressing **<PageDown>** or **<PageUp>** key or user can enter new data directly from the keyboard.

Hard Disk Configurations

1. TYPE : select from **"1" to "45"** to fill remaining fields with redefined values of disk drives. Select **"USER"** to fill the remaining fields. Select **"AUTO"** to detect the HDD type automatically.

2. SIZE : the hard disk size. The unit is mega byte(MB).

3. CYLS : the cylinder number of the hard disk.

4. HEAD : the read/write head number of hard disk. The range is from **"1" to "16".**

5. PRECOMP: the cylinder number at which the disk drive changes the write timing.

6. LANDZ : the cylinder number that the disk drive heads (read/write) are seated when the disk drive is parked.

7. SECTOR : the sector number of each track defined on the hard disk. The range is from **"1"** to **"64".**

8. MODE :select **"AUTO"** to detect the mode type automatically. If your hard disk supports the **LBA** mode, select **"LBA"** or **"LARGE".** However, if your hard disk cyclinder is more than 1024 and does not support the lba function, you have to set at **"LARGE."** Select **"NORMAL"** if your hard disk supporting cylinder is below 1024.

> **Note 1:** *if hard disk primary master/slave and secondary master/slave were set to* ***"auto,"*** *the hard disk size and model will be auto detected on display during POST.*

> **Note2:** *"**halt on**" is to determine when to halt the system by the BIOS if error occurs during POST.*

3-3   BIOS Features Setup

Menu below shows all of the manufacturer's default values of this main board. Move the cursor by pressing direction keys and **<PageDown>** or **<PageUp>** key to modify the parameters, pressing **[F1]** key to display help message of the selected item. This setup program also provide 2 convenient ways to load the default parameter data from BIOS **[F6]** or CMOS **[F7]** area if shown data is corrupted. This provides the system a capability to recover from any possible error.

```
                  ROM PCI/ISA BIOS (2A5LEL1B)
                     BIOS FEATURES SETUP
                     AWARD SOFTWARE, INC.

 Anti-Virus Protection    : 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 : Enabled    D0000-D3FFF Shadow  : Disabled
 Boot Sequence            : A,C,SCSI   D4000-D7FFF Shadow  : Disabled
 Swap Floppy Drive        : Disabled   D8000-DBFFF Shadow  : Disabled
 Boot Up Floppy Seek      : Disabled   DC000-DFFFF Shadow  : Disabled
 Boot Up NumLock Status   : On
 Gate A20 Option          : Normal
 Typematic Rate Setting   : Disabled
 Typematic Rate (Chars/Sec) : 6
 Typematic Delay (Msec)   : 250
 Security Option          : Setup
 PCI/VGA Palette Snoop    : Disabled
 OS Select For DRAM > 64MB : Non-OS2
                                       ESC : Quit        ↑↓→← : Select Item
                                       F1  : Help        PU/PD/+/- : Modify
                                       F5  : Old Values  (Shift)F2 : Color
                                       F7  : Load Setup Defaults
```

Anti-Virus Protection
:Enabled
:Disabled (default)

CPU Internal Cache
Enabled (default): enable L1 cache
Disabled: disable L1 cache

External Cache
Enabled (default): enable L2 cache
Disabled: disable L2 cache

Quick Power On Self Test
This category speeds up power on self test.
Enabled :   BIOS will shorten or skip some check items.
Disabled: normal speed

Boot sequence
This category determines which drive the system searches first. Take **"A,C,SCSI"** for example. System will search in turn for floppy disk drive; second is hard disk drive, and finally SCSI drive. Default value is **"A,C,SCSI."**. Options are as below:
A,C,SCSI; C,A,SCCI; C,CDROM,A; CDROM,C,A; D,A,SCSI;   E,A,SCSI; F,A,SCSI; SCSI,A,C; SCSI,C,A; C Only; LS/ZIP,C.

Swap Floppy Drive
Enabled: floppy A&B will be swapped.
Disabled(default): floppy A&B will be not swapped.

Boot Up Floppy Seek
BIOS will determine if the floppy disk drive is 40 or 80 tracks. 360k type is 40 tracks while 720K/ 1.2M   and 1.44M are all 80 tracks.   Default value is **"Disabled."**

Boot Up Numlock Status
:On(default)
:Off

Gate A20 Option
:Normal (default)
:Fast

Typematic Rate Setting
This determines the typematic rate.
Enabled: enable typematic rate and typematic delay programming.
Disabled (default): disable typematic rate and typematic delay programming. The system bios will use default value of this 2 items and the default is controlled by keyboard.

Typematic Rate(Chars/Sec)
6: 6 Characters Per Second(default)
8: 8 Characters Per Second
10 : 10 Characters Per Second
12: 12 Characters Per Second
15: 15 Characters Per Second
20: 20 Characters Per Second
24: 24 Characters Per Second
30 : 30 Characters Per Second

Typematic Delay (Msec)
This is the interval between the first and second character displayed.
250   : 250 msec (default)
500   : 500 msec
750   : 750 msec
1000 : 1000 msec

Security Option
:Setup (default)--- security protection in CMOS setup menu
Setting password in BIOS CMOS **"Supervisor Password" or User Password,**" the user needs to key in password if entering BIOS CMOS setup.
:System---security protection in system boot-up & BIOS setup
This function secures the system under system boot-up and BIOS setup.

PCI/VGA Pallette Snoop
Enabled: it allows you to install an enhanced graphics adapter card.
Disabled (default): If your graphics adapter card does not support the pallette snoop function, please set at **Disabled** to avoid system malfunction.

OS Select For DRAM> 64MB
This option is especially set for OS2 operating system. Set **"Non-OS2"** for RAM memory over 64MB and set **"Non-OS2"** for other operating systems like Windows® 95/98 or NT.
Non-OS2 (default)
OS2

Video BIOS Shadow
It determines whether video BIOS will be copied to RAM. However, it is optional from chipset design. Video shadow will increase the video speed.
Enabled : Video Shadow is enabled (default)
Disabled: Video Shadow is disabled

C8000-CBFFF Shadow, CC000-CFFF Shadow, D0000-D3FFF Shadow: D4000-D7FFF Shadow, D8000-DBFFF Shadow, DC000-DFFF Shadow
These are categories determining whether optional ROM will be copied to RAM by 16KB or 32KB per unit and the size depends on chipset.
Enabled
Disabled(default)

3-4 Chipset Features Setup

```
                    ROM PCI/ISA BIOS (2A5LEL1B)
                       CHIPSET FEATURES SETUP
                       AWARD SOFTWARE, INC.

Bank 0/1 DRAM Timing    : FP/EDO 70ns    OnChip USB              : Enabled
Bank 2/3 DRAM Timing    : FP/EDO 70ns    USB Keyboard Support    : Disabled
Bank 4/5 DRAM Timing    : FP/EDO 70ns
SDRAM  Cycle Length     : 3              CPU Warning Temperature : 50°C/122°F
DRAM Read Pipeline      : Enabled        Shutdown Temperature    : 60°C/140°F
Sustained 3T Write      : Enabled        Current CPU Temperature :
Cache Rd+CPU Wt Pipeline : Enabled       Current CPUFAN1 Speed   :
Cache Timing            : Fast           Current CPUFAN2 Speed   :
Video BIOS  Cacheable   : Enabled        Current Vin3(V)         :
System BIOS Cacheable   : Enabled
Memory Hole At 15Mb Addr.: Disabled
PCI Dynamic Bursting    : Enabled
PCI Master 0 WS Write   : Enabled
PCI Master Read Prefetch : Enabled
PCI#2 Access #1 Retry   : Disabled
AGP Aperture Size       : 128M          ESC : Quit         ↑↓→← : Select Item
AGP-2X Mode             : Disable        F1  : Help         PU/PD/+/- : Modify
                                         F5  : Old Values  (Shift)F2 : Color
                                         F7  : Load Setup Defaults
```

Bank 0/1(2/3, 4/5) DRAM Timing
This will determine the timing of SDRAM. The user can separately adjust the
timing of bank 0/1, 2/3, 4/5.
: FP/EDO 70ns (default)
: FP/EDO 70ns, Normal, Medium, Fast, Turbo

SDRAM Cycle Length: control the DRAM page missing and row miss leadoff
timing.
:2
:3 (default)

Video BIOS Cacheable
:Enabled (Default)
:Disabled

Memory Hole at 15Mb Addr.: this field enable a memory hole in main memory space. CPU cycles matching an enabled hole are passed on to PCI bus.
:Disabled (default)
:15M-16M

AGP Aperture Size
To select the size of the Accelerated Graphics Port (AGP) aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.
:128M(default)
:64M, 32M, 16M, 8M, 4M

OnCHip USB
:Enabled (default)
Enabling this function adds the function of **"USB Keyboard Support."**
:Disabled

USB Keyboard Support
:Disabled (default)
:Enabled--- enable this function when using USB keyboard

CPU Warning Temperature
This function is CPU over-heat alarm. Select either of the below temperature will give an alarm when CPU temperature is over-heated.
:Disabled
:50 C/122 F, 53 C/127 F, 56 C/133 F, 60 C/140 F, 63 C/145 F, 66 C/151 F, 70 C/158 F

Shutdown Temperature
System will shut down automatically when CPU temperature is over the appointed temperature. Below is the boundary which system gives alarm
:60^0C/140^0F (default)
:65^0C/149^0F, 70^0C/158^0F, 75^0C/167^0F

Current CPU Temperature, Current CPUFan1 speed/CPUFan2 speed/ Current Vin3(V):
System will automatically detect the above items and show the status.

3-5   Power Management Setup

```
┌──────────────────────────────────────────────────────────────────┐
│              ROM PCI/ISA BIOS (2A5LEL1B)                           │
│                 POWER MANAGEMENT SETUP                             │
│                  AWARD SOFTWARE, INC.                             │
├──────────────────────────────────────────────────────────────────┤
│ ACPI function     : Disabled      Primary INTR    : ON             │
│ Power Management  : User Define   IRQ3  (COM 2)    : Primary       │
│ PM Control by APM : Yes           IRQ4  (COM 1)    : Primary       │
│ Video Off Option  : Suspend -> Off IRQ5  (LPT 2)   : Primary       │
│ Video Off Method  : DPMS Support  IRQ6  (Floppy Disk): Primary     │
│ MODEM Use IRQ     : 3             IRQ7  (LPT 1)    : Primary       │
│ Soft-Off by PWRBTN : Instant-Off  IRQ8  (RTC Alarm) : Disabled     │
│      *** PM Timers ***            IRQ9  (IRQ2 Redir) : Secondary    │
│ HDD Power Down    : Disable       IRQ10 (Reserved)  : Secondary    │
│ Doze Mode         : Disable       IRQ11 (Reserved)  : Secondary    │
│ Suspend Mode      : Disable       IRQ12 (PS/2 Mouse) : Primary      │
│      *** PM Events ***            IRQ13 (Coprocessor): Primary     │
│ VGA               : OFF           IRQ14 (Hard Disk) : Primary      │
│ LPT & COM         : LPT/COM       IRQ15 (Reserved)  : Disabled     │
│ HDD & FDD         : ON          ┌────────────────────────────────┐│
│ DMA/master        : OFF         │ ESC : Quit      ↑↓→← : Select Item││
│ Modem Ring Resume : Disabled    │ F1  : Help      PU/PD/+/- : Modify││
│ RTC Alarm Resume  : Disabled    │ F5  : Old Values (Shift)F2 : Color││
│                                 │ F7  : Load Setup Defaults      ││
│                                 └────────────────────────────────┘│
└──────────────────────────────────────────────────────────────────┘
```

ACPI function
:Disabled (default)
:Enabled

Power Management
:User Define(default)--users can configure their own power management
:Min Saving
:Max Saving
:Disabled

PM Control By APM

No : system BIOS will ignore APM.
Yes (default) **:** system BIOS will wait for APM's prompt before it enter any PM mode, e.g. Doze, standby or suspend.

> *Note 1: if APM is installed, and there is a task running, even if the timer is time out, the APM will not prompt the BIOS to put the system into any power saving mode!*

> *Note2: If APM is not installed, this option has no effect.*

Video Off Method
:DPMS (default), **Blank Screen, V/H Sync+Blank**

MODEM Use IRQ
:3(default), 4, 5, 7, 9,10,11,NA

Soft-Off by PWRBTN
:Instant-off
: Delay 4 sec
This allows the user to set the soft-off power button to turn off the system or set to "4 seconds" holding the power and system will shut down in 4 seconds.

HDD Power Down
:Disabled (default), 1 min--- 15 min.

Doze Mode
:Disabled (default), 1 min --- 1 hour

Suspend mode
:Disabled(default) , 1 min --- 1 hour

Modem Ring Resume
Enabled: modem ring on function--- system can be turned on through modem.
Disable (default)**:** disble this function

> *Note: this function only works when the system is turned off from Windows mode, and Doze mode will not function.*

RTC Alarm Resume: auto power on at the appointed date and time.
Enabled: key in the date of current month and time of the day. System will turn on then.
Disable (default) **:** disble this function.

> *Note: this function only works when the system is turned off in Windows mode, and Doze mode will not function.*

Primary INTR
:on (default)
Select "on," it adds the following functions, **"IRQ3 (COM2)- IRQ15 (Reserved)."**
:off
Select "off," **"IRQ3 (COM2)- IRQ15 (Reserved)"** will not show.

3-6 PNP / PCI Configuration Setup

```
             ROM PCI/ISA BIOS (2A5LEL1B)
                PNP/PCI CONFIGURATION
                AWARD SOFTWARE, INC.

 PNP OS Installed        : No       CPU to PCI Write Buffer  : Enabled
 Resources Controlled By : Manual    PCI Delay Transaction   : Enabled
 Reset Configuration Data : Disabled  AGP Master 1 WS Write   : Enabled
                                      AGP Master 1 WS Read    : Disabled
 IRQ-3  assigned to : PCI/ISA PnP
 IRQ-4  assigned to : PCI/ISA PnP     PCI IRQ Actived By  : Level
 IRQ-5  assigned to : PCI/ISA PnP     Slot 1 Use IRQ No.  : Auto
 IRQ-7  assigned to : PCI/ISA PnP     Slot 2 Use IRQ No.  : Auto
 IRQ-9  assigned to : PCI/ISA PnP     Slot 3 Use IRQ No.  : Auto
 IRQ-10 assigned to : PCI/ISA PnP
 IRQ-11 assigned to : PCI/ISA PnP     Assign IRQ For USB  : Enabled
 IRQ-12 assigned to : PCI/ISA PnP     Assign IRQ For VGA  : Enabled
 IRQ-14 assigned to : PCI/ISA PnP
 IRQ-15 assigned to : PCI/ISA PnP
 DMA-0  assigned to : PCI/ISA PnP
 DMA-1  assigned to : PCI/ISA PnP    ESC : Quit        ↑↓←→ : Select Item
 DMA-3  assigned to : PCI/ISA PnP    F1  : Help        PU/PD/+/- : Modify
 DMA-5  assigned to : PCI/ISA PnP    F5  : Old Values  (Shift)F2 : Color
 DMA-6  assigned to : PCI/ISA PnP    F7  : Load Setup Defaults
 DMA-7  assigned to : PCI/ISA PnP
```

PNP OS Installed
:No(default)
OS will not recognize PnP devices.
:Yes
OS will arrange the setup of PnP devices.

Resources Controlled By
:Manual(default)
The table will show the below items: **"Reset Configuration Data, IRQ-3 assigned to, DMA-0 assigned to."** The user can adjust the shown items as required.
:Auto
The table will not show the above items, and the system will automatically assign the above setup.

Reset Configuration Data
:Disabled(default)
:Enabled--- to reset **"Extended System Configuration Data(ESCD)** when you exit setup if you have installed a new add-on card and the system reconfiguration has caused such a serious conflict that the operating system can not boot up.

IRQ-3 Assigned To---- IRQ-15 Assigned To
: PCI/ISA PnP(default)
: Legacy ISA

DMA-0 Assigned To--- DMA-7 Assigned To
: PCI/ISA PnP(default)
: Legancy ISA

PCI IRQ Actived By
There are 2 modes in activating PCI IRQ.
:Edge
:Level (default)

Assign IRQ for USB
:Enable (default)
:Disable

Assign IRQ for VGA
:Enable (default)
:Disable

3-7   Integrated Peripherals

```
                ROM PCI/ISA BIOS (2A5LEL1B)
                   INTEGRATED PERIPHERALS
                   AWARD SOFTWARE, INC.

 OnChip IDE First Channel :  Enabled    Onboard FDC Controller    : Enabled
 OnChip IDE Second Channel:  Enabled    Onboard Serial Port 1     : 3F8/IRQ4
 IDE Prefetch Mode         : Enabled    Onboard Serial Port 2     : 2F8/IRQ3
 IDE HDD Block Mode        : Enabled    IR Address Select         : Disable
 IDE Primary Master PIO    : Auto
 IDE Primary Slave  PIO    : Auto
 IDE Secondary Master PIO  : Auto
 IDE Secondary Slave  PIO  : Auto       Onboard Parallel Port     : 378/IRQ7
 IDE Primary Master UDMA   : Auto       Parallel Port Mode        : SPP
 IDE Primary Slave  UDMA   : Auto
 IDE Secondary Master UDMA : Auto
 IDE Secondary Slave  UDMA : Auto
 Init Display First        : AGP

                                        ESC : Quit        ↑↓→← : Select Item
                                        F1  : Help        PU/PD/+/- : Modify
                                        F5  : Old Values  (Shift)F2 : Color
                                        F7  : Load Setup Defaults
```

OnChip IDE First Channel 1
:Enabled (default)--- it allows to adjust the items **"IDE Primary Master PIO, IDE Primary Slave PIO, IDE Primary Master UDMA and IDE Primary Slave UDMA."**
:Disabled--- the items **"IDE Primary Master PIO, IDE Primary Slave PIO, IDE Primary Master UDMA and IDE Primary Slave UDMA"** will not be available.

OnChip IDE Second Channel 1
:Enabled (default)--- it allows to adjust the 4 items "**IDE Secondary Master PIO, IDE Secondary Slave PIO, IDE Secondary Master UDMA and IDE Secondary Slave UDMA."**
:Disabled--- the 4 items "**IDE Secondary Master PIO, IDE Secondary Slave PIO, IDE Secondary Master UDMA and IDE Secondary Slave UDMA"** will not be available.

IDE Primary Master PIO/ IDE Primary Slave PIO
This feature detects your primary master hard disk device.
:Auto (default)
:Mode 0,1,2,3,4

IDE Secondary Master PIO/IDE Secondary Slave PIO
This feature detects your secondary master hard disk device.
:**Auto** (default)
:Mode 0,1,2,3,4

Onboard FDC Controller
: Enabled (default)
: Disabled

Onboard Serial Port 1
: 3F8/IRQ4 (default)
: 2F8/IRQ3
: 3E8/IRQ4
: 2E8/IRQ3
: Auto
: Disabled

Onboard Serial Port 2
: 3F8/IRQ4
: 2F8/IRQ3 (default)
: 3E8/IRQ4
: 2E8/IRQ3
: Auto
: Disabled

IR Address Select

Disabled (default)	Select "Disabled" to disable IR function.
3F8H	IR Mode: HP SIR, ASKIR
	IRQ Mode: IRQ10, IRQ11, IRQ3, IRQ4
2F8H	IR Mode: HP SIR, ASKIR
	IRQ Mode: IRQ10, IRQ11, IRQ3, IRQ4
3E8H	IR Mode: HP SIR, ASKIR
	IRQ Mode: IRQ10, IRQ11, IRQ3, IRQ4
2E8H	IR Mode: HP SIR, ASKIR
	IRQ Mode: IRQ10, IRQ11, IRQ3, IRQ4

Onboard Parallel Port
: 378/IRQ7 (default)
: 3BC/IRQ7
: 278H/IRQ5
: Disabled

Parallel Port Mode
: SPP (Default)
: EPP
: ECP
Choosing this item, there is another line shown:
ECP Mode Use DMA: 3(default) **/ 1**
: ECP+EPP
Choosing this item, another line is shown:
ECP Mode Use DMA: 3(default) **/ 1**

3-8   Supervisor/User Password

The **"Supervisor/User Password setting"** utility sets the security protection. There are two kinds of password functions in the setup menu : one is "**Supervisor Password**," and the other is **"User Password."** Their difference is**:**

Supervisor Password**: this function allows you the right to change the options of setup menu.**

User Password**: this function only allows you to enter the setup menu but not to change the options of the setup menu except "**USER PASSWORD," "SAVE & EXIT SETUP," **and** "EXIT WITHOUT SAVING."

1. How to set "Supervisor Password" & "User Password"

The setup of **"Supervisor Password"** and   **"User Password"** have the same steps.

Step 1: **Enter Password**
Press **<Enter>** after appointing the password.
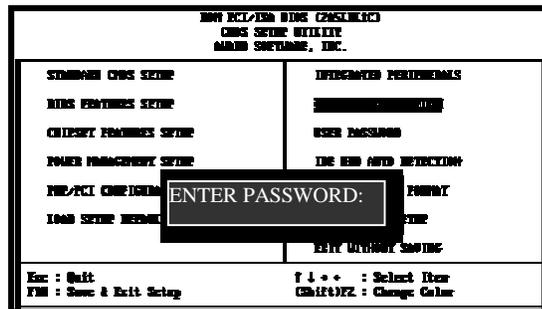
Step 2: **Confirm Password**
Typing the password again and pressing **<Enter>** .
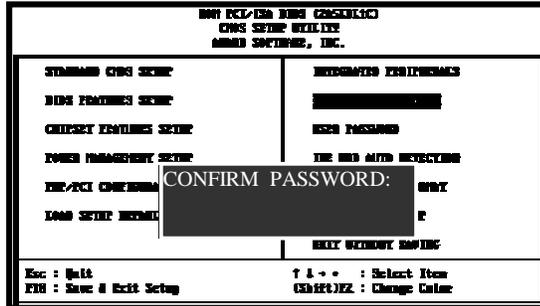
> **Note:** If you forget password, please clear CMOS.
> (refer to jumper JP7 CMOS status)

Step 3: Set **"Security Option"** in **"BIOS Features Setup"**

After setting password, enter **"Security Option"** in **"BIOS Features Setup."**
There are 2 options **"Setup"** & **"System."**   "**Setup"** secures CMOS setup.
"System" secures PC sytem and password is required during system boot- up and
CMOS setup..

 2. How to Disable "Supervisor Password" & "User Password"

Step 1: **Go to CMOS Setup Menu** (need to key in password first)

Step 2: **Enter "Supervisor Password" or "User Password"**
After enter, it shows "Enter Password." Press the **<Enter>** key instead of entering a new password when **"ENTER PASSWORD"** appears. It will inform **"PASSWORD DISABLED PRESS ANY KEY TO CONTINUNE."** Pess any key as instructed to disable password.
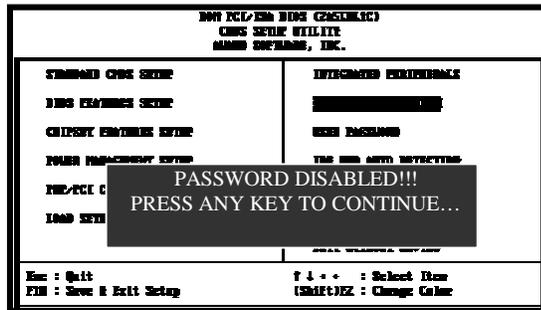
3-9   IDE HDD Auto Detection

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

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

Select Primary Master Option (N: Skip): N							
OPTIONS	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
2 (Y)	4302	523	255	0	8893	63	LBA
1	4303	8894	15	65535	8893	63	NORMAL
3	429	6555	2405	65535	8893	63	LARGE

Note: Some OSes (like SCO-UNIX) must use "NORMAL" for installation.

The **"IDE HDD AUTO DETECTION"** utility is a very useful tool especially when you do not know which kind of hard disk type you are using. You can use this utility to detect the correct disk type installed in the system automatically or you can set hard disk type to auto in the standard CMOS setup. You don't need the **"IDE HDD Aauto Detection"** utility. The BIOS will auto-detect the hard disk size and model on display during post.

The Award® BIOS supports 3 HDD modes: **NORMAL, LBA & LARGE.**

1. Normal mode
Generic access mode in which neither the BIOS nor the IDE controller will make any transformations during accessing.

The maximum number of cylinders, head & sectors for normal mode are **1024, 16 & 63.**

```
No. Cylinder         (1024)
X   No. Head           (16)
X   No. Sector         (63)
X   No. Per Sector    (512)
                   528 MB
```

If user set this HDD to normal mode, the maximum accessible HDD size will be 528 MB even though its physical size may be greater than that!

2. LBA (Logical Block Addressing) Mode
A new HDD accessing method to overcome the 528 MB bottleneck. The number of cylinders, heads & sectors shown in setup may not be the number physically contained in the HDD. During HDD accessing, the ide controller will transform the logical address described by sector, head & cylinder into its own physical address inside the HDD.

The maximum HDD size supported by LBA mode is 8.4 GB which is obtained by the following formula:

```
    No. Cylinder              (1024)
X    No. Head                  (255)
X    No. Sector                 (63)
X    No. Bytes Per Sector      (512)
                            8.4 GB
```

3. Large Mode

Extended HDD access mode supported by Award® software. Some IDE HDDs contain more than 1024 cylinder without LBA support (in some cases, user do not want LBA). The Award® BIOS provides another alternative to support these kinds of large mode:

Cyls.	Head	Sector	Mode
1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS (or other OS) that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside int 12h in order to access the right HDD address the right HDD address!

4. Maximum HDD Size:

	No. Cylinder	(1024)
X	No. Head	(32)
X	No. Sector	(63)
X	No. Bytes Per Sector	(512)
		1 GB

To support LBA or large mode of HDDs, there must be some softwares involved. All these softwares are located in the Award® HDD service routine (int 13h). It may be failed to access a HDD with LBA (large) mode selected if you are running under an perating system which replaces the whole int 13h. Unix operating systems do not support either LBA or large and must utility the standard mode. Unix can support drives larger than 528MB.

3-10   Load Setup Defaults

```
                ROM PCI/ISA BIOS (ZA5LEL1B)
                     CMOS SETUP UTILITY
                    AWARD SOFTWARE, INC.

    STANDARD CMOS SETUP             INTEGRATED PERIPHERALS

    BIOS FEATURES SETUP             SUPERVISOR PASSWORD

    CHIPSET FEATURES SETUP          USER PASSWORD

    POWER MANAGEMENT SETUP          IDE HDD AUTO DETECTION

    PNP/PCI CONFIGURA                                ETUP

                                                     SAVING


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

```
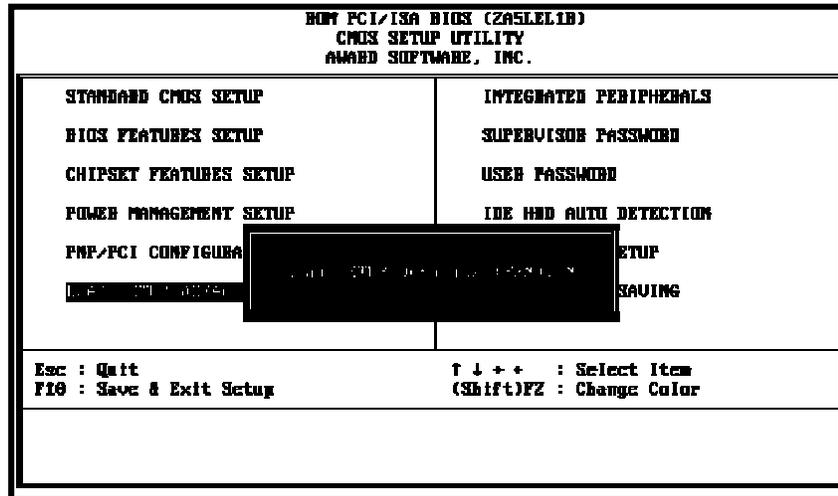
"Load Setup Defaults" loads optimized settings which are stored in the BIOS ROM.   The auto-configured settings only affect "**BIOS Features Setup"** and **"Chipset Features Setup"** screens.   There is no effect on the standard CMOS setup. To use this feature, highlight it on the main screen and press the **<Enter>** key. A line will appear on screen asking if you want to load the setup default values. Press the **<Y>** key and then press the **<Enter>** key . The setup defaults will then load. Press **<N>** if you don't want to

3-11   Save & Exit Setup

The **"Save & Exit Setup"** option will bring you back to boot up procedure with all the changes, you have made which are recorded in the CMOS RAM.

```
                    ROM PCI/ISA BIOS (2A5LEL1B)
                        CMOS SETUP UTILITY
                      AWARD SOFTWARE, INC.

   STANDARD CMOS SETUP              INTEGRATED PERIPHERALS

   BIOS FEATURES SETUP             SUPERVISOR PASSWORD

   CHIPSET FEATURES SETUP          USER PASSWORD

   POWER MANAGEMENT SETUP          IDE HDD AUTO DETECTION

   PNP/PCI CONFIGURA                              ING

   LOAD SETUP DEFAUL                           SAVING


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

3-12 Quit Without Saving

```
                 ROM PCI/ISA BIOS (2A5LEL1B)
                     CMOS SETUP UTILITY
                   AWARD SOFTWARE, INC.
┌────────────────────────────────┬────────────────────────────────┐
│  STANDARD CMOS SETUP            │  INTEGRATED PERIPHERALS         │
│                                 │                                 │
│  BIOS FEATURES SETUP            │  SUPERVISOR PASSWORD            │
│                                 │                                 │
│  CHIPSET FEATURES SETUP         │  USER PASSWORD                  │
│                                 │                                 │
│  POWER MANAGEMENT SETUP         │  IDE HDD AUTO DETECTION         │
│                                 │                                 │
│  PNP/PCI CONFIGURA              │              SETUP              │
│                                 │                                 │
│  LOAD SETUP DEFAUL              │            SAVING               │
│                                 │                                 │
├────────────────────────────────┴────────────────────────────────┤
│  Esc : Quit                     ↑ ↓ → ←  : Select Item           │
│  F10 : Save & Exit Setup        (Shift)F2 : Change Color          │
├──────────────────────────────────────────────────────────────────┤
│                                                                    │
└──────────────────────────────────────────────────────────────────┘
```
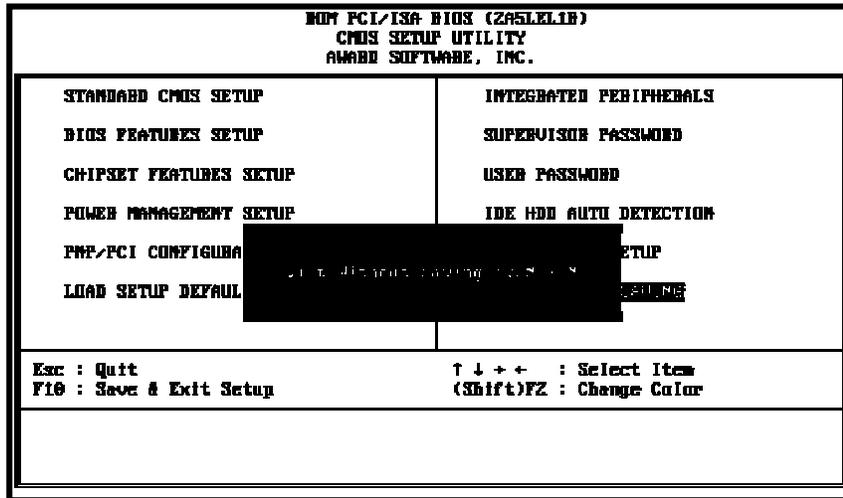
The **"Quit Without Saving"** option will bring you back to normal boot up procedure without saving any data into CMOS RAM. All of the old data in the CMOS will not be destroyed.

Chapter 4   Appendix

4-1   Memory Map

Address range	Size	Description
00000-7FFFF	512K	Conventional memory
80000-9FBFF	127K	Extended conventional memory
9FC00-9FFFF	1K	Extended BIOS data area if PS/2 mouse is installed
A0000-C7FFF	160K	Available for hi DOS memory
C8000-DFFFF	96K	Available for hi DOS memory and adapter ROMs
E0000-EEFFF	60K	Available for UMB
EF000-EFFFF	4K	Video service routine for monochrome & CGA adapter
F0000-F7FFF	32K	BIOS CMOS setup utility
F8000-FCFFF	20K	BIOS runtime service routine (2)
FD000-FDFFF	4K	Plug and play escd data area
FE000-FFFFF	8K	BIOS runtime service routine (1)

4-2   I/O Map

000-01F	DMA controller (master)
020-021	Interrupt controller (master)
022-023	Chipset control registers. I/o posts
040-05F	Timer control registers
060-06F	Keyboard interface controller (8042)
070-07F	RTC ports & CMOS I/O ports
080-09F	DMA register
0A0-0BF	Interrupt controller (slave)
0C0-0DF	DMA controller (slave)
0F0-0FF	Math coprocessor
1F0-1FB	Hard disk controller
278-27F	Parallel port 2
2B0-2DF	Graphics adapter controller
2F8-2FF	Serial port 2
360-36F	Network ports
378-37F	Parallel port 1
3B0-3BF	Monochrome & parallel port adapter
3C0-3CF	EGA adapter
3D0-CDF	CGA adapter
3F0-3F7	Floppy disk controller
3F8-3FF	Serial port-1

4-3   Time & DMA Channels Map

Time map: Timer channel 0 system timer interrupt
Timer channel 1 DRAM refresh request
Timer channel 2 speaker tone generator

Dma channels: DMA channel 0 available
DMA channel 1 onboard ecp (option)
DMA channel 2 floppy disk (smc chip)
DMA channel 3 onboard ECP (default)
DMA channel 4 cascade for dma controller 1
DMA channel 5 available
DMA channel 6 available
DMA channel 7 available

4-4　Interrupt Map

NIMI:　non-maskable interrupt

IRQ(H/W):
0 system timer interrupt from timer 0
1 keyboard output buffer full
2 cascade for IRQ 8-15
3 serial port2
4 serial port1
5 parallel port 2
6 floppy disk (smc chip)
7 parallel port 1
8 RTC clock
9 available
10 available
11 available
12 PS/2 mouse
13 math coprocessor
14 onboard hard disk (ide1) channel
15 onboard hard disk (ide2) channel

4-5 RTC & CMOS RAM Map

RTC & CMOS :
00   seconds
01   second alarm
02   minutes
03   minutes alarm
04   hours
05   hours alarm
06   day of week
07   day of month
08   month
09   year
0a   status register a
0b   status register b
0c   status register c
0d   status register d
0e   diagnostic status byte
0f   shutdown byte
10   floppy disk drive type byte
12   hard disk type byte
13   reserve
14   equipment type
15   base memory low byte
16   base memory high byte
17   extension memory low byte
18   extension memory high byte
19-2d
2e-2f
30   Reserved for extension memory low byte
31   reserved for extension memory high byte
32   date century byte
33   information flag
34-3f reserve
40-7f reserved for chipset setting data

4-6   Award BIOS Hard Disk Type

Type	Cylinder	Heads	Write Pre-comp	Landing Zone	Sectors	Size
1	306	4	128	305	17	10MB
2	615	4	300	615	17	21MB
3	615	6	300	615	17	32MB
4	940	8	512	940	17	65MB
5	940	6	512	940	17	49MB
6	615	4	65535	615	17	21MB
7	462	8	256	511	17	32MB
8	733	5	65535	733	17	31MB
9	900	15	65535	901	17	117MB
10	820	3	65535	820	17	21MB
11	855	5	65535	855	17	37MB
12	855	7	65535	855	17	52MB
13	306	8	128	319	17	21MB
14	733	7	65535	733	17	44MB
16	612	4	0	663	17	21MB
17	977	5	300	977	17	42MB
18	977	7	65535	977	17	59MB
19	1024	7	512	1023	17	62MB
20	733	5	300	732	17	31MB
21	733	7	300	732	17	44MB
22	733	5	300	733	17	31MB
23	306	4	0	336	17	10MB
24	977	5	0	925	17	42MB
25	1024	9	65535	925	17	80MB
26	1224	7	65535	754	17	74MB
27	1224	11	65535	754	17	117MB
28	1224	15	65535	699	17	159MB
29	1024	8	65535	823	17	71MB
30	1024	11	65535	1023	17	98MB

Type	Cylinder	Heads	Write Pre-comp	Landing Zone	Sectors	Size
31	918	11	65535	1023	17	87MB
32	925	9	65535	926	17	72MB
33	1024	10	65535	1023	17	89MB
34	1024	12	65535	1023	17	106MB
35	1024	13	65535	1023	17	115MB
36	1024	14	65535	1023	17	124MB
37	1024	2	65535	1023	17	17MB
38	1024	16	65535	1023	17	142MB
39	918	15	65535	1023	17	119MB
40	820	6	65535	820	17	42MB
41	1024	5	65535	1023	17	44MB
42	1024	8	65535	1023	17	68MB
43	809	6	65535	852	17	42MB
44	809	9	65535	852	17	64MB
45	776	8	65535	775	17	104MB
46	AUTO	0	0	0	0	
47	USER'S	TYPE				

4-7   ISA I/O Address Map

I/O Address (HEX)	I/O device
000 - 01F	DMA Controller 1, 8237A-5
020 - 03F	Interrupt Controller 1, 8259A
040 - 05F	System Timer, 8254-2
060 - 06F	8742 Keyboard Controller
070 - 07F	real-time Clock/CMOS and NMI Mask
080 - 09F	DMA Page Register, 74LS612
0A0 - 0BF	Interrupt Controller 2, 8259A
0C0 - 0DF	DMA Controller 2, 8237A-5
0F0 - 0FF	i486 Math Coprocessor
1F0 - 1F8	Fixed Disk Drive Adapter
200 - 207	Game I/O
20C - 20D	Reserved
21F	Reserved
278 - 27F	Parallel Printer Port 2
2B0 - 2DF	Alternate Enhanced Graphic Adapter
2E1	GPIB Adapter 0
2E2 - 2E3	Data Acquisition Adapter 0
2F8 - 2FF	Serial Port 2 (RS-232-C)
300 - 31F	Prototype Card
360 - 363	PC Network (Low Address)
364 - 367	Reserved
368 - 36B	PC Network (High Address)
36C - 36F	Reserved
378 - 37F	Parallel Printer Port 1
380 - 38F	SDLC, Bisynchronous 2
390 - 393	Cluster
3A0 - 3AF	Bisynchronous 1
3B0 - 3BF	Monochrome Display and Printer Adapter

I/O Address (HEX)	I/O device
3C0 - 3CF	Enhanced Graphics Adapter
3D0 - 3DF	Color/Graphics Monitor Adapter
3F0 - 3F7	Diskette Drive Controller
3F8 - 3FF	Serial Port 1 (RS-232-C)
6E2 - 6E3	Data Acquisition Adapter 1
790 - 793	Cluster Adapter 1
AE2 - AE3	Data Acquisition Adapter 2
B90 - B93	Cluster Adapter 2
EE2 - EE3	Data Acquisition Adapter 3
1390 - 1393	Cluster Adapter 3
22E1	GPIB Adapter 1
2390 - 2393	Cluster Adapter 4
42E1	GPIB Adapter 2
62E1	GPIB Adapter 3
82E1	GPIB Adapter 4
A2E1	GPIB Adapter 5
C2E1	GPIB Adapter 6
E2E1	GPIB Adapter 7

Chapter 5   Q & A

5-1   Errors Messages During Power On Self Test

During **power on self test (post)**, BIOS will automatically detect the system devices. Below is the questions that users may always meet.   The user may press **"Esc"** key to skip the full memory test.

1. *Beep sound*
   On power on, the system make beep sound to offer different messages. If the system is configured correctly, it prompts a short beep to show correct the devices configuration is done correctly. When VGA card and DIMM modules are not plugged well, the system makes longer and constant beep sounds.

2. *BIOS ROM checksum error*
   It indicates the checksum of the BIOS code is not right and system will always halt on power on screen.   Contact the dealer to exchange a new BIOS.

3. *CMOS battery fails*
   It indicates the CMOS battery does not work. Contact the dealer to exchange a new BIOS.

4. *CMOS checksum error*
   It indicates the CMOS checksum is incorrect. Load the default values in BIOS to solve this problem. This error may result from a weak BIOS, so exchange a new BIOS if necessary.

5. *Hard disk initialize*
   Please wait a moment…
   Some hard drives require more time to initialize.

6. *Hard disk install failure*
The system can not find or initialize the hard drive controller or the drive. Check if the controller is set correctly. If no hard disk is installed, **"Hard drive selection"** must be set to **"none."**

7. *Keyboard error or no keyboard present*
This means the system can not initialize the keyboard. Check if the keyboard is plugged well and be sure no keys are pressed during POST.

8. *Keyboard is lock out- Unlock the key*
Normally when this message comes out, check if there is anything mis-placed on the keyboard. Be sure nothing touches the keys.

9. *Memory test fails*
There will be more information to specify the type and location of the memory error.

10. *Primary master hard disk fail*
The BIOS find an error in the primary master hard disk drive.

11. *Primary slave hard disk fail*
The BIOS finds an error in the primary slave hard disk drive.

12. *Secondary master hard disk fail*
The BIOS finds an error in the secondary slave master hard disk drive.

13. *Secondary slave hard disk fail*
The BIOS finds an error in the secondary slave IDE hard disk drive.

5-2   Frequently Asked Questions

Below is questions users always come out with. **Q** is for question. **A** is for answer.

Q: Why can't my AGP card work under Win 95?
A: Windows 95 OSR2.0 does not support AGP function.   You must install "USB support" file to enable this function. After installing, choose "enable for **"ASSIGN IRQ FOR USB" in BIOS PNP/PCI configuration setup.**

Q: Why can't the CPU frequency be adjusted to 100 MHz ?
A: The BIOS will automatically detect the CPU frequency (66MHz or 100 MHz). Therefore, if your CPU frequency cannot be adjusted to 100 MHz, then your CPU may be 66 MHz. In BIOS "speed setup," there are other frequencies, like 75 MHz, 83 MHz, 103 MHz, 102 MHz, 112 MHz, 133MHz. These are for internal test only. No guarantee is provided since this is not included in chipset specification.

Q: Why is my system not stable with 100 MHz CPU?
A: There are many reasons for this condition. One of the most common is that SDRAM does not match PC-100 specification. When system is operated under 100 MHz, in addition to 100 MHz CPU, SDRAM must be PC-100 DIMM too.

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