

VIA MVP4 Chipset
AT Form Factor
Main Board
User's Manual

Copyright

Copyright ©1999 by this company. No part of this document may be reproduced, transmitted, transcribed, stored in a retrievable system, or translated into any natural or computer language, in any form or by any means without prior written permission. This manual and the information contained herein are protected by copyright. All rights reserved.

Manual version: 1.0

Ref. No. 3053070

Published in 1999

Warning and disclaimer

This manual is designed to provide information about the Pentium® system board. Meticulous efforts have 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.

Information contained in this manual is subject to change without notice. The manufacturer of the main board will not be held responsible for technical or editorial omissions made herein, nor for the incidental or consequential damages resulting from its furnishing, performance, functionality or use. Subsequent changes to this manual will be incorporated into the next edition. We welcome any suggestion regarding this manual or our computer products.

Trademarks

Intel and Pentium are registered trademarks of Intel Corporation.

IBM is a registered trademark of International Business Machines Corporation.

Microsoft is a registered trademark of Microsoft Corporation.

PCI is a registered trademark of PCI Special Interest Groups.

AWARD is a registered trademark of Award Software Inc.

All other trademarks are the property of their respective owners.

Table of contents

■	Chapter 1 Introduction	1
1-1	The Main Board Overview.....	1
1-2	Specifications.....	3
1-3	System Block Diagram.....	5
1-4	Notice of Hardware Installation.....	6
1-5	Notice of CD Driver Installation.....	7
1-6	Software Driver Installation Procedure.....	8
■	Chapter 2 Installation.....	9
2-1	Layout Reference.....	9
2-2	Quick Reference Setup Table.....	10
2-3	CPU Speed Setup.....	11
2-4	Jumper Settings.....	12
2-4-1	<i>J P 1 : Single CPU Voltage Selector</i>	<i>1 2</i>
2-4-2	<i>JBAT1: CMOS Status.....</i>	<i>13</i>
2-4-3	<i>J P 3 : P S / 2 Mouse Selector</i>	<i>1 4</i>
2-4-4	<i>J P 4 / J P 5 : Audio Function Selector</i>	<i>1 5</i>
2-4-5	<i>SW2: CPU Vcore Selector.....</i>	<i>16</i>
2-4-6	<i>SW2 Pin5 – Pin7: CPU Ratio Selector.....</i>	<i>18</i>
2-4-7	<i>SW1 Pin1 – Pin4: CPU Frequency Selector.....</i>	<i>19</i>
2-5	Connectors	20
2-5-1	<i>F r o n t P a n e l Connectors</i>	<i>2 0</i>
2-5-2	<i>B a c k P a n e l Connectors</i>	<i>22</i>
	<i>COM 1/COM2.....</i>	<i>22</i>
	<i>LPT.....</i>	<i>23</i>

	USB.....	24
	AT Keyboard	25
	PS/2 Mouse.....	26
2-5-3	A T X P o w e r S u p p l y C o n n e c t o r	27
2-5-4	AT Power Supply Connector.....	28
2-5-5	J I R l C o n n e c t o r.....	29
2-5-6	C P U F A N I & F A N 2 C o n n e c t o r	30
2-5-7	FLOPPY1.....	3
	1	
2-5-8	IDE1 and IDE2.....	32
2-5-9	Audio Connectors & Game Port.....	33
2-5-10	V G A C o n n e c t o r.....	34
2-6	DIMM Memory Installation.....	35
■	Chapter 3 BIOS Setup.....	36
3-1	Award BIOS CMOS Setup.....	36
3-2	Standard CMOS Setup.....	37
3-3	BIOS Features Setup.....	39
3-4	Chipset Features Setup.....	43
3-5	Power Management Setup.....	46
3-6	PNP/PCI Configuration Setup.....	49
3-7	Integrated Peripherals.....	51
3-8	Supervisor/User Password.....	56
3-9	IDE HDD Auto Detection.....	59
3-10	Load Setup Defaults	62
3-11	Save and Exit Setup.....	63
3-12	Quit Without Saving.....	64
■	Chapter 4 Appendix.....	65

4-1	Memory Map.....	65
4-2	I/O Map.....	66
4-3	Time & DMA Channels Map.....	67
4-4	Interrupt Map.....	68
4-5	RTC & CMOS RAM Map.....	69
4-6	Award BIOS Hard Disk Type.....	70
4-7	ISA I/O Address Map.....	72
■	Chapter 5 Q & A.....	74
5-1	Error Messages During Power On Self Test	74

Chapter 1 Introduction

1-1 The Main Board Overview

The main board's design is based on VIA chipset, "VT8501 & VT82C686A," which provides a high-performance/cost index desktop solution to the Intel® Pentium® P54C/P55C. AMD® K5/K6/K6-2/K6-III, Cyrix® M1/6x86L/MX/MII/, and other compatible Pentium®processors with 3D A.G.P. VGA system. The integrated H/W 3D VGA controller adopts 64-bit 100MHz host bus speed and shares 2MB, 4MB, or 8MB from frame buffer memory with system which improves the performance eminently.

The main board integrates PCI-mastering dual full-duplex direct-sound AC97-link-compatible sound system. Hardware soundblaster-pro and hardware-assisted FM blocks are included for Windows DOS box and real-mode DOS compatibility. Loopback capability is also implemented for directing mixed audio stream into USB and 1394 speaker for high quality digital audio.

The main board also implements high performance I/O Controller utilizing 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 three 32-bit PCI & two 16-bit ISA for highest performance I/O add-on adapter cards. The system board supports 4 PCI bus-mastering slots (PCI 2.2 compliant) and allows synchronous CPU and PCI bus clock frequency. The main board is also strengthened with Power Management Wake up events like **“Modem ring on,”** which are the new inventions to enable PCs to be turned on via the network or modem. These are also key benefits in PC operation, new system setup and power conservation.

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: 22 cm x 23 cm

PCB layer: 4 layers

ZIF Socket 7

Support Intel® Pentium P54C/P55C, Cyrix 6x86 M1/6X86L/MX/ MII series, AMD K5/K6/K6-2/K6-III

CPUs and other Pentium®compatible processors.



CPU is not enclosed in the package

Chipset : VIA VT8501 & VIA VT82C686A

Memory DIMMs

- 3 of 168-pin double-sided DIMMs
- Maximum up to 768MB
- 3.3V SDRAM only



Chipset supports FP DRAM, EDO-DRAM, SDRAM.



With 95/100 MHz CPUs like K6-2/K6-III, the system MUST be installed with PC-100 100MHz

Expansion Slot : 2x ISA slots, 3x PCI slots, 1x AMR slot

Cache: 512K, maximum up to 1MB

Audio/Sound Function

Hardware controller → AC97-link-compatible sound system

- Microsoft®PC97/PC98 compliant
- Meets WHQL audio requirement

Video/Graphics Function

- Shared system memory area 2MB, 4MB, or 8MB
- 24-bit true color



*User **MUST** use the onboard VGA function that is unable to be disabled. Other graphic cards are not acceptable.*

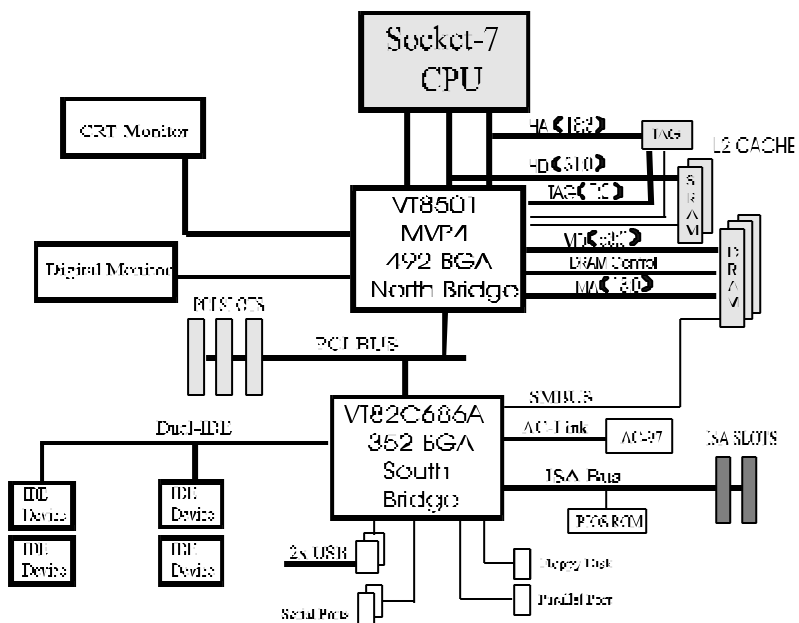
BIOS: flash ROM BIOS

Award®full **PnP** (Plug & Play) BIOS

I/O function

- 2 x PCI IDE devices
 - 1 x FDC, 2 x serial ports(16550 fast COM.)
 - 1x parallel port device /EPP/ECP/SPP
 - 2x USB connectors
 - IrDA (infrared) connector
- **AT form factor:** AT/ATX power supply optional
 - **Green function:** Complied with APM (Advanced Power Management)
 - **Special features**
 - Modem ring on (ATX power supply required)
 - Windows 95 power off (ATX power supply required)

1-3 System Block Diagram



1-4 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 (for VGA, IDE, FDC, RS232, PS/2, Sound(Line-in, MIC, Line-out, Game Port))
- driver & utility / CD

B. Make sure power is off.

During hardware installation, be sure that there is no power connected in this period.

C. Avoid ESD (Electrical Static Discharge).

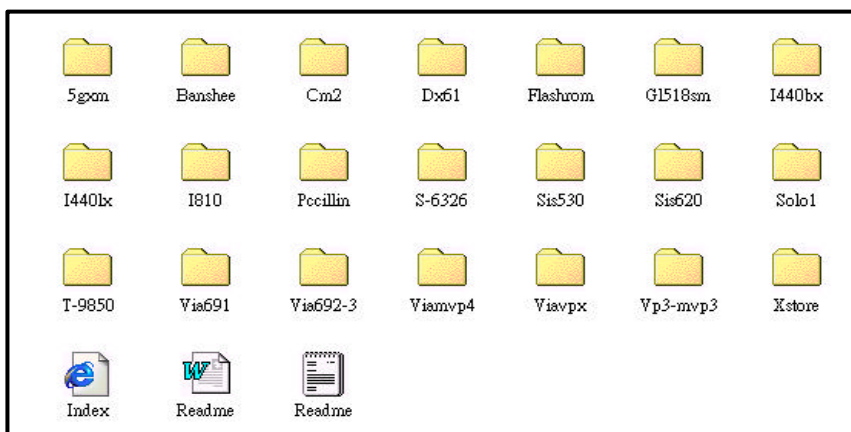
While working with the main board, wear a grounded wristband or ankle strap to avoid ESD (Electrical Static Discharge).

D. Notice item of using PCI3 Slot.

If users have PCI card, users have to put into the PCI3 slot. User needs to install the Audio Driver firstly, then put PCI card into slot and install PCI card Driver.

1-5 Notice of CD Driver Installation

This CD contains below drivers. The user must read “Index” (HTML format) before installing required drivers. Index offers all the information on all the drivers.



CD driver is always updated with the latest version, so the actual CD content may be somewhat different from the above picture.

1. **Main boards:** i440BX, i440EX, i440LX, i430TX, VIA® VPX, VP3, VIAMVP4, SIS®SiS530- chipset based main boards
2. **A.G.P cards:** S- 6326 and T985
3. **Sound:** ESS-solo-1 sound driver
4. **Pccillin:** anti- virus protection software
5. **XStore Pro IDE driver:** new IDE bus master driver for ULTRA DMA 33

1-6 Software Driver Installation Procedure

For Windows 95:

Step 1: Install VIA USB Driver (Path : root:\VIAMVP4\USB95)

Step 2: Install VIA VxD AGP Driver (Path : root:\VIAMVP4\VxD33 For Win95)

Step 3: Install VGA Driver (Path : root:\VIAMVP4\VGA Driver\Win95)

Step 4: Install Audio Driver (Path : root:\VIAMVP4\Audio Driver)

Step 5: Install DirectX Driver (Path : root:\Driver2.5\DX61)

For Windows 98:

Step 1: Install VGA Driver (Path : root:\VIAMVP4\VGA Driver\Win98)

Step 2: Install Audio Driver (Path : root:\VIAMVP4\Audio Driver)

Step 3: Install DirectX Driver (Path : root:\Driver2.5\DX61)

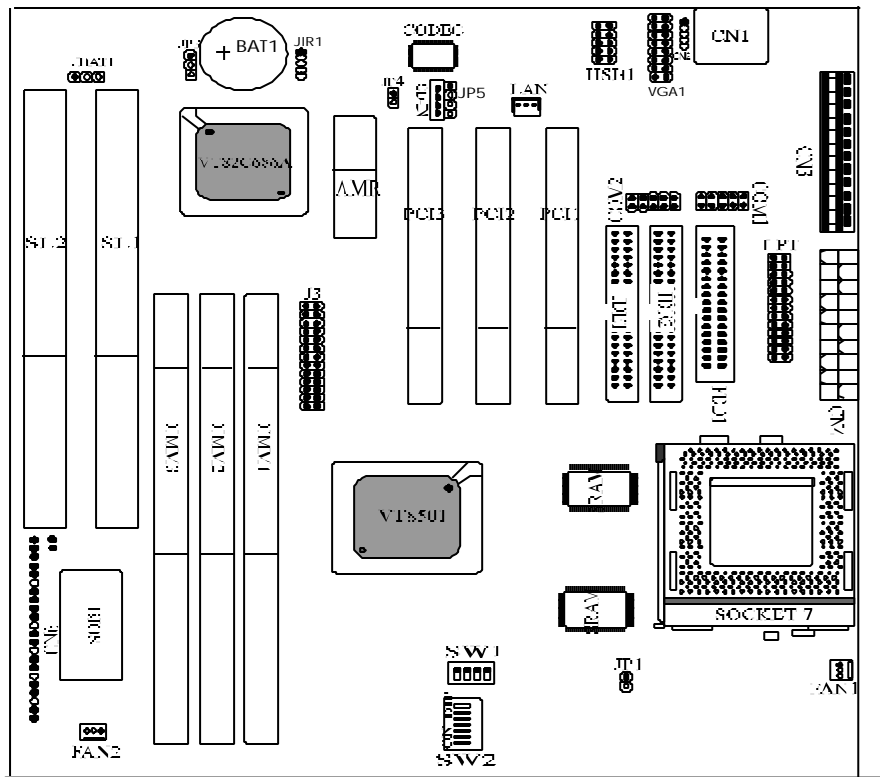
For Windows NT4:

Step 1: Install VGA Driver (Path: root:\VIAMVP4\VGA Driver\Nt40)

Step 2: Install Audio Driver (Path: root:\VIAMVP4\Audio Driver\Winnt40)

Chapter 2 Installation

2-1 Layout Reference



2-2 Quick Reference Setup Table

Intel®Pentium® CPU	SYS. Clock	CPU Voltage	CPU Ratio	JP1	SW1				SW2						
					1	2	3	4	1	2	3	4	5	6	7
P54C 100 MHz	66 MHz	3.3V	1.5X	Off	On	Off	Off	Off	On	Off	On	On	Off	Off	Off
P54C 133 MHz	66 MHz	3.3V	2X	Off	On	Off	Off	Off	On	Off	On	On	On	Off	Off
P54C 166 MHz	66 MHz	3.3V	2.5X	Off	On	Off	Off	Off	On	Off	On	On	On	On	Off
P55C 166 MHz	66 MHz	2.8/3.3V	2.5X	Off	On	Off	Off	Off	Off	Off	Off	On	On	On	Off
P54C 200 MHz	66 MHz	3.3V	3X	Off	On	Off	Off	Off	On	Off	On	On	Off	On	Off
P55C 200 MHz	66 MHz	2.8/3.3V	3X	Off	On	Off	Off	Off	Off	Off	Off	On	Off	On	Off
P55C 233 MHz	66 MHz	2.8/3.3V	3.5X	Off	On	Off	Off	Off	Off	Off	Off	On	Off	Off	Off

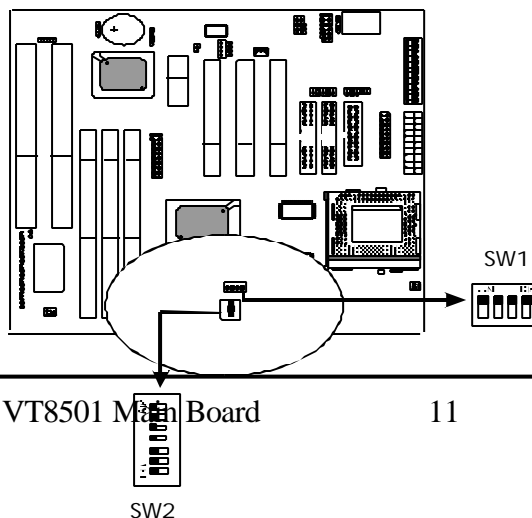
Cyrix®CPU	SYS. Clock	CPU Voltage	CPU Ratio	JP1	SW1				SW2						
					1	2	3	4	1	2	3	4	5	6	7
166+ M1	66 MHz	3.52V	2X	Off	On	Off	Off	Off	On	On	On	On	On	Off	Off
6X86L 166 MHz	66 MHz	2.8/3.3V	2X	Off	On	Off	Off	Off	On	Off	Off	On	On	Off	Off
6X86L 200 MHz	75 MHz	2.8/3.3V	2X	Off	Off	Off	Off	On	Off	Off	Off	On	On	Off	Off
6X86MX 166 MHz	66 MHz	2.9/3.3V	2X	Off	On	Off	Off	Off	On	Off	Off	On	On	Off	Off
6X86MX 200 MHz	75 MHz	2.9/3.3V	2X	Off	Off	Off	Off	On	On	Off	Off	On	On	Off	Off
6X86MX 233 MHz	75 MHz	2.9/3.3V	2.5X	Off	Off	Off	Off	On	On	Off	Off	On	On	On	Off
6X86MX 266 MHz	83 MHz	2.7/3.3V	2.5X	Off	On	Off	On	Off	On	On	On	Off	On	On	Off
6X86MII 300 MHz	66 MHz	2.9/3.3V	3.5X	Off	On	Off	Off	Off	On	Off	Off	On	Off	Off	Off
6X86MII 333 MHz	83 MHz	2.9/3.3V	3X	Off	On	Off	On	Off	On	Off	Off	On	Off	On	Off
6X86MII 366 MHz	100MHz	2.9/3.3V	2.5X	Off	On	On	On	Off	On	Off	Off	On	On	On	Off

AMD®CPU	SYS. Clock	CPU Voltage	CPU Ratio	JP1	SW1				SW2						
					1	2	3	4	1	2	3	4	5	6	7
K5-PR100/PR133	66 MHz	3.52V	1.5X	Off	On	Off	Off	Off	On	On	On	On	On	Off	Off
K5-PR166	66 MHz	3.52V	2.5X	Off	On	Off	Off	Off	On	On	On	On	On	On	Off
K6-PR166	66 MHz	2.9/3.3V	2.5X	Off	On	Off	Off	Off	On	Off	Off	On	On	On	Off
K6-PR200	66 MHz	2.9/3.3V	3X	Off	On	Off	Off	Off	On	Off	Off	On	Off	On	Off
K6-PR233	66 MHz	3.2/3.3V	3.5X	Off	On	Off	Off	Off	Off	Off	On	On	Off	Off	Off
K6-PR233	66 MHz	3.3/3.3V	3.5X	Off	On	Off	Off	Off	On	Off	On	On	Off	Off	Off
K6-PR266	66 MHz	2.2/3.3V	4X	Off	On	Off	Off	Off	Off	On	Off	Off	On	Off	On
K6-PR300	66 MHz	2.2/3.45V	4.5X	1-2	On	Off	Off	Off	Off	On	Off	Off	On	On	On
K6-2 250	100MHz	2.2/3.3V	2.5X	Off	On	On	On	Off	Off	On	Off	Off	On	On	Off
K6-2 266	66 MHz	2.2/3.3V	4X	Off	On	Off	Off	Off	Off	On	Off	Off	On	Off	On
K6-2 300	66 MHz	2.2/3.3V	4.5X	Off	On	Off	Off	Off	Off	On	Off	Off	On	On	On
K6-2 300	100MHz	2.2/3.3V	3X	Off	On	On	On	Off	Off	On	Off	Off	Off	On	Off
K6-2 333	66 MHz	2.2/3.3V	5X	Off	On	Off	Off	Off	Off	On	Off	Off	Off	On	On

K6-2 333	95 MHz	2.2/3.3V	3.5X	Off	Off	On	On	Off	Off	On	Off	Off	Off	Off	Off
K6-2 350	100MHz	2.2/3.3V	3.5X	Off	On	On	On	Off	Off	On	Off	Off	Off	Off	Off
K6-2 366	66 MHz	2.2/3.3V	5.5x	Off	On	Off	Off	Off	Off	On	Off	Off	Off	Off	On
K6-2 380	95 MHz	2.2/3.3V	4X	Off	Off	On	On	Off	Off	On	Off	Off	On	Off	On
K6-2 400	100MHz	2.2/3.3V	4X	Off	On	On	On	Off	Off	On	Off	Off	On	Off	On
K6-2 450	100MHz	2.4/3.3V	4.5X	Off	On	On	On	Off	Off	Off	On	Off	On	On	On
K6-2 500	100MHz	2.4/3.3V	5X	Off	On	On	On	Off	Off	Off	On	Off	Off	On	On
K6-2 550	100MHz	2.3/3.3V	5.5X	Off	On	On	On	Off	On	On	Off	Off	Off	Off	On
K6-III 400	100MHz	2.4/3.3V	4X	Off	On	On	On	Off	Off	Off	On	Off	On	Off	On
K6-III 450	100MHz	2.4/3.3V	4.5X	Off	On	On	On	Off	Off	Off	On	Off	On	On	On
RISE@CPU	SYS. Clock	CPU Voltage	CPU Ratio	JP1	SW1				SW2						
					1	2	3	4	1	2	3	4	5	6	7
MP6 266	100 MHz	2.8/3.3V	2X	On	On	On	On	Off	Off	Off	Off	On	On	Off	Off

2-3 CPU Speed Setup

The setup of CPU speed is designed to a DIP switch form. This helps the users to set CPU speed. The main board supports Intel® P54C/P55C, AMD® K5/K6/K6-2/K6-III, Cyrix® M1/6x86L/MX/MII/, IDT® Pentium® processors.

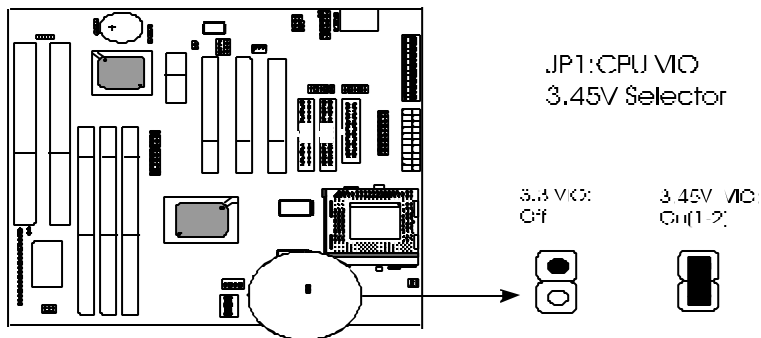


2-4 Jumper Settings

There are 6 jumpers on this main board. Different setups have different functions. The following pages will tell you how to set the jumpers under different circumstances.

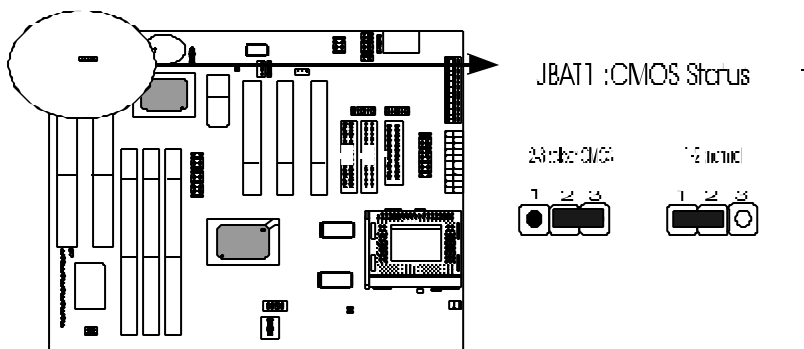
2-4-1 JP1: Single CPU Voltage Selector

JP1 is a 2-pin selector to choose CPU with 3.45V VIO, such as AMD®K6-PR300 2.2/3.45V. Set to “1-2” for 3.45V VIO, and “off” for 3.3V VIOs.



2-4-2 JBAT1: CMOS Status

JBAT1 is a 3-pin connector. Clear CMOS if system password is forgotten. Below is details to show how to clear CMOS.



Procedure to clear CMOS:

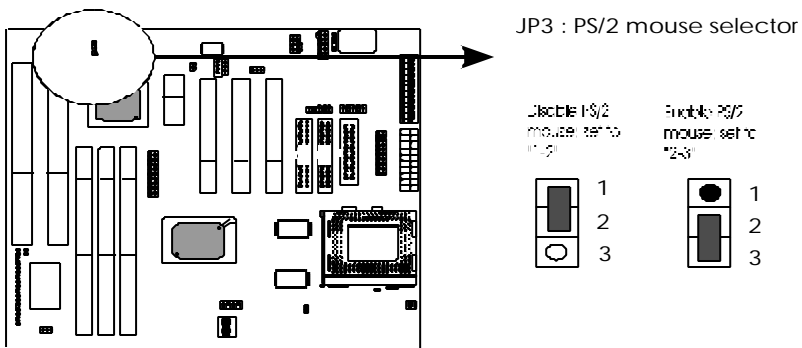
- Step 1: Shut down the system and disconnect the power supply from AC power.
- Step 2: If the system uses AT/ATX power, pull out the AT/ATX cable from power connector.
- Step 3: Short the CMOS jumper by putting jumper cap on Pin 2-3 for a few seconds.
- Step 4: Set JBAT1 to “off” to return normal setup.
- Step 5: Link power cables 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.

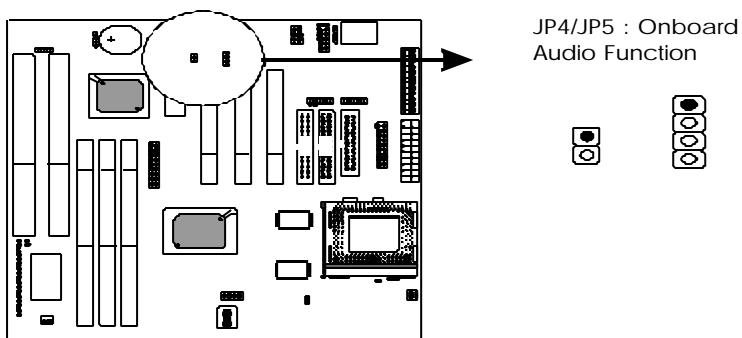
2-4-3 JP3: PS/2 Mouse Selector

JP3 is a 3-pin jumper providing PS/2 mouse function. Set “2-3” if the system uses P/S2 mouse, and “1-2” without PS/2 mouse.



2-4-4 JP4/JP5: Audio Function Selector

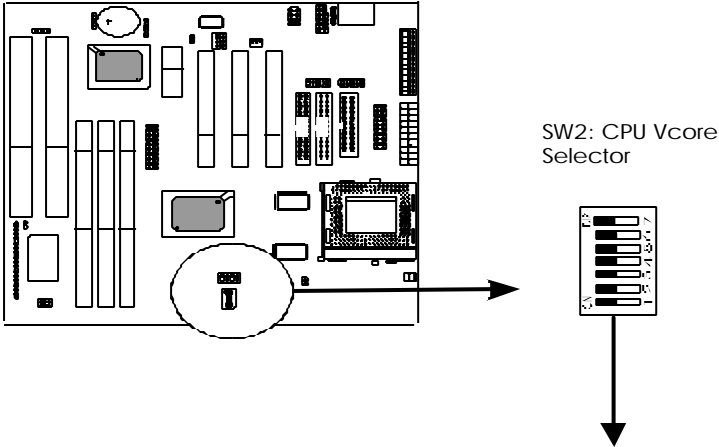
JP4 is a 2-pin selector. JP5 is a 4-pin selector. Please select the right functions as below.



	JP4	JP5	
AC97	1-2	1-2	On board Audio only
AC97 + MC97	1-2	1-2,3-4	On board Audio and AMR Slot only MC97
AMR	OPEN	3-4	On board Audio Disable use AMR Slot

2-4-5 SW2: CPU Vcore Selector

SW2 is a 7-pin DIP switch and Pin1-4 is the CPU Vcore Selector. Please select the right CPU Vcore according to your CPU and set as below.

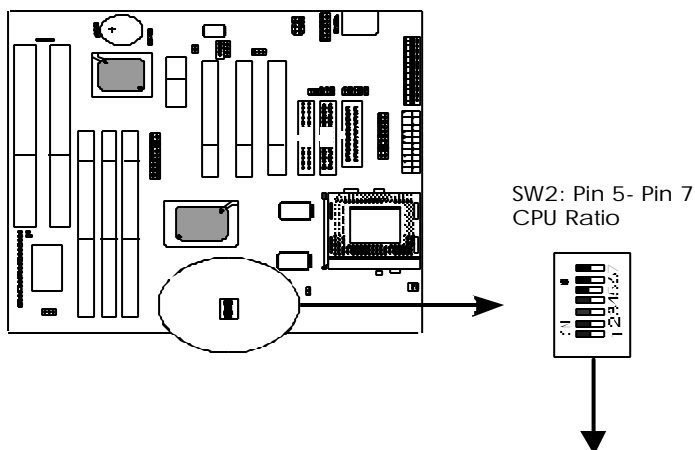


SW2				CPU Vcore
1	2	3	4	
off	off	off	off	2.0V
on	off	off	off	2.1V
off	on	off	off	2.2V

on	on	off	off	2.3V
off	off	on	off	2.4V
off	on	on	Off	2.6V
on	on	on	off	2.7V
off	off	off	on	2.8V
on	off	off	on	2.9V
SW2				CPU Vcore
1	2	3	4	
off	on	off	on	3.0V
on	on	off	on	3.1V
off	off	on	on	3.2V
on	off	on	on	3.3V
off	on	on	on	3.4V
on	on	on	on	3.5V

2-4-6 SW2 Pin5- Pin7: CPU Ratio Selector

SW2 is a 7-pin DIP switch, and Pin5- Pin7 is the CPU ratio selector. Please select the right ratio according to your CPU and set details as below.

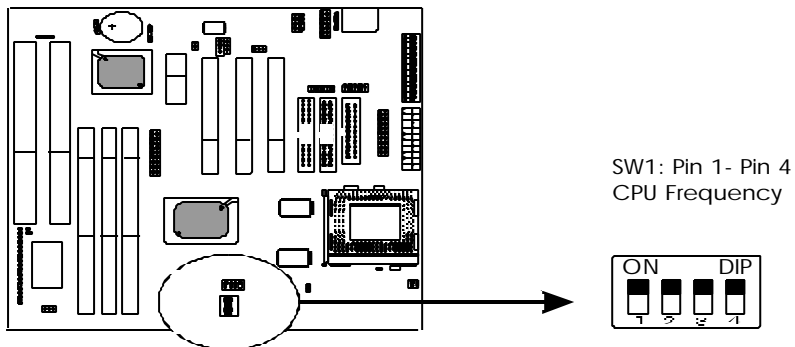


SW2			CPU Ratio
5	6	7	
Off	Off	Off	1.5 and 3.5
On	Off	Off	2.0
On	On	Off	2.5

Off	On	Off	3.0
On	Off	On	4.0
On	On	On	4.5
Off	On	On	5.0
Off	Off	On	5.5

2-4-7 SW1 Pin1- Pin4: CPU Frequency Selector

SW1 is a 4-pin DIP switch, and Pin 1- Pin 4 is the CPU Frequency selector. Select the right frequency according to your CPU, and see details as below.



SW1				CPU Freq.
1	2	3	4	
Off	Off	Off	Off	60.0 MHz
On	Off	Off	Off	66.8 MHz
Off	Off	Off	On	75.0 MHz
On	Off	On	Off	83.3 MHz

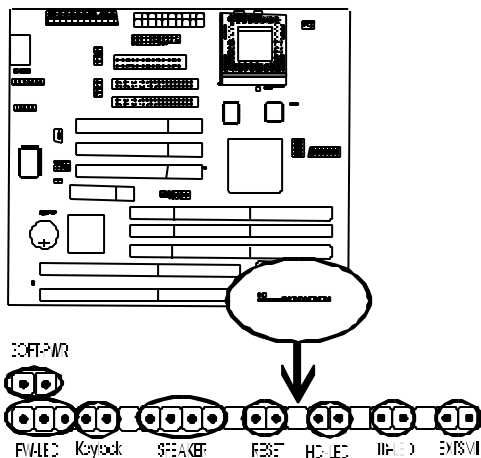
Off	On	On	Off	95 MHz
On	On	On	Off	100 MHz

2-5 Connectors

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

2-5-1 Front Panel Connectors

Front panel has connectors as “SOFT-PWR,” “PW-LED,” “KEYLOCK,” “SPEAKER,” “RESET,” “HD-LED,” and “TB-LED,” and “EXTSMI.” Refer to details as below.



SOFT-PWR is ATX Soft-PWR with 2 pins. SOFT-PWR is for ATX power supply only.

PW-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.

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

RESET 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.

HD-LED (Hard Disk activity LED connector) is a 2-pin keyed Berg strip. It is used to connect to front panel Hard Disk LED.

TB-LED with a 2-pin keyed Berg strip on case front panel indicates the current speed status of system.

EXTSMI is a 2-pin keyed 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.

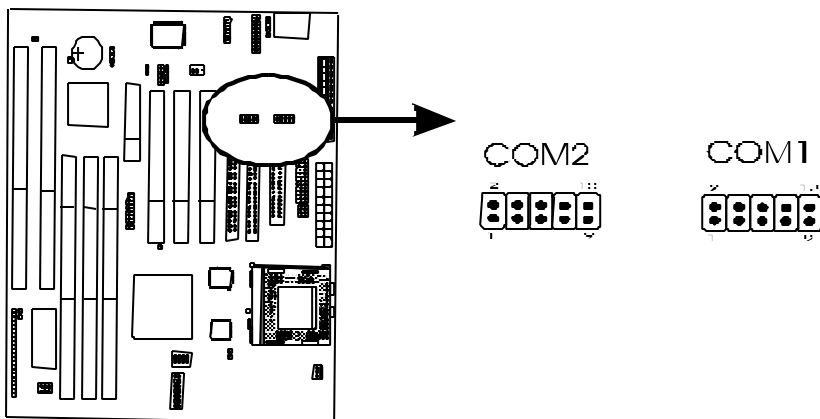
SMI	Operation
Open	Normal
Close	System will enter sleep mode

2-5-2 Back Panel Connectors

There are COM1/ COM2, LPT, USB and AT keyboard, PS/2 mouse on case back panel. Please refer to more details as below.

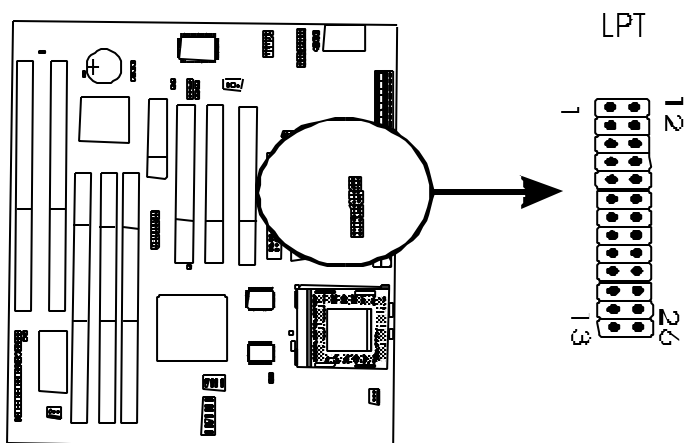
COM1/COM2

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



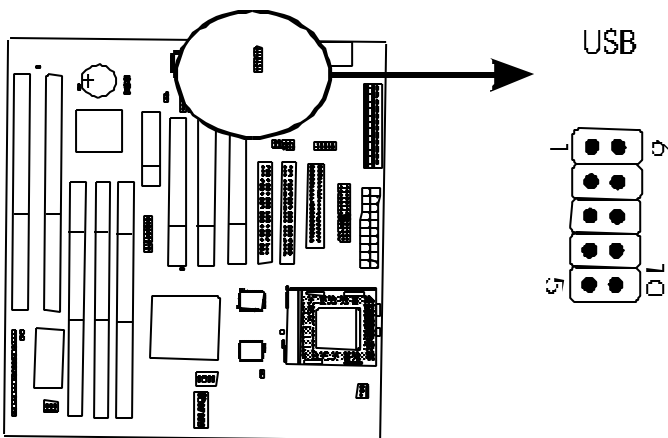
LPT

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



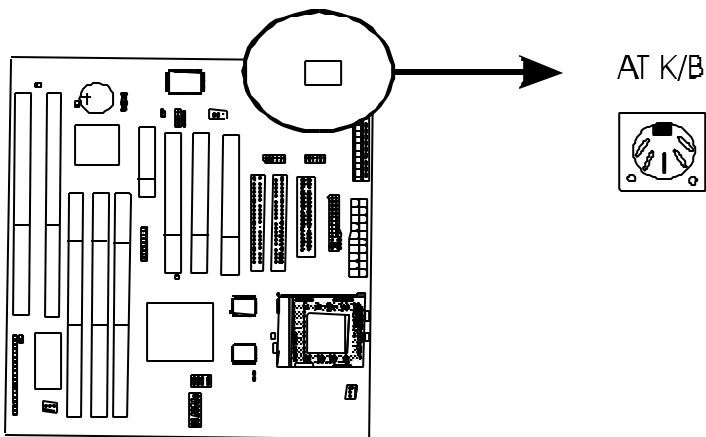
USB (Universal Serial Bus)

Universal Serial Bus connector, marked “**USB,**” is used to connect USB devices. There are 2 USB connectors on this main board.



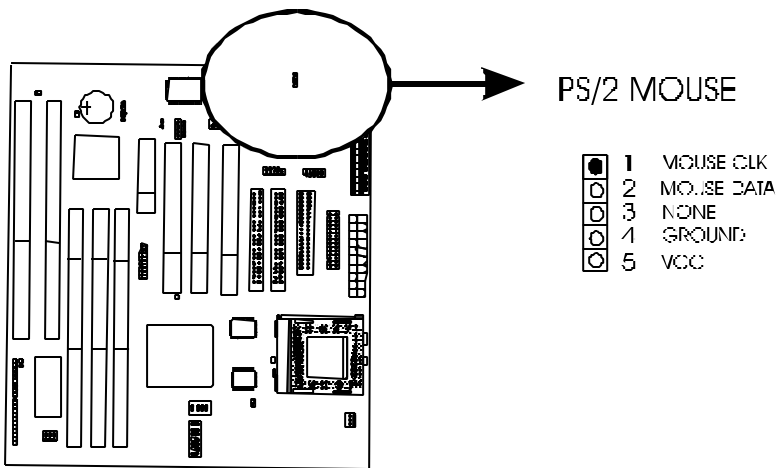
AT Keyboard

AT keyboard is a 5-pin connector.



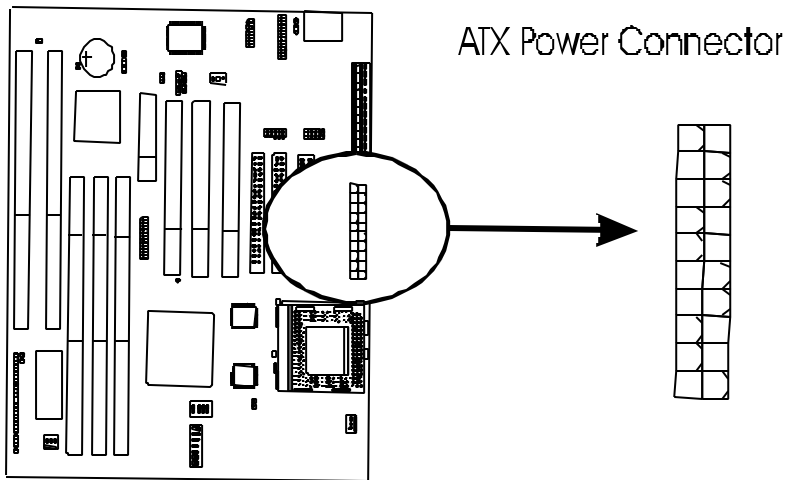
PS/2 Mouse

PS/2 Mouse is a 5-pin connector to connect to mouse connector.



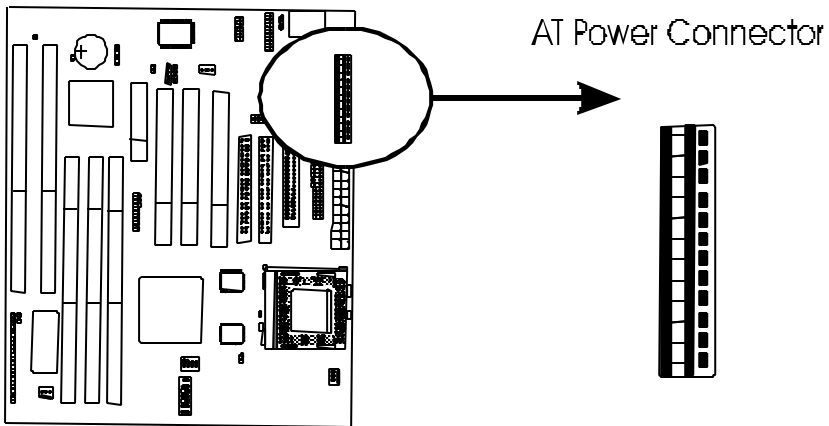
2-5-3 ATX Power Supply Connector

The main board supports standard AT and ATX power supply. **ATX power supply connector** has 20 pins, which is especially designed for ATX case. The ATX power supply supports the function of the “**Soft Power On Momentary switch**” which connects 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.



2-5-4 AT Power Supply Connector

The main board supports standard AT and ATX power supply. AT Power supply has 12



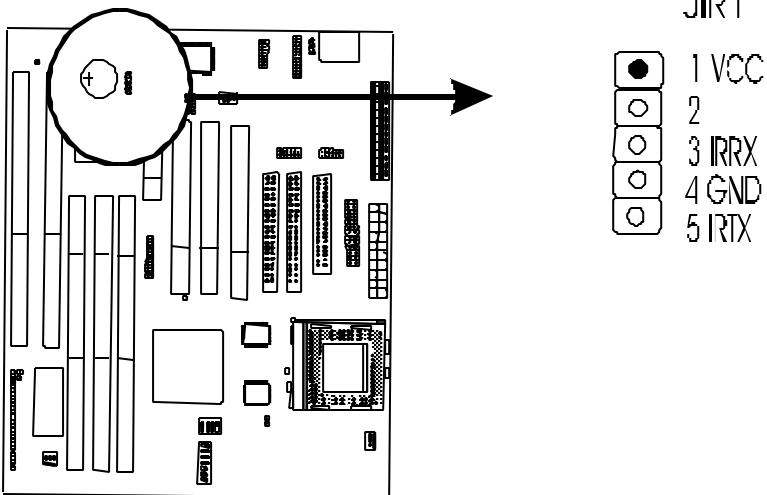
pins.

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

2-5-5 JIR1 Connector

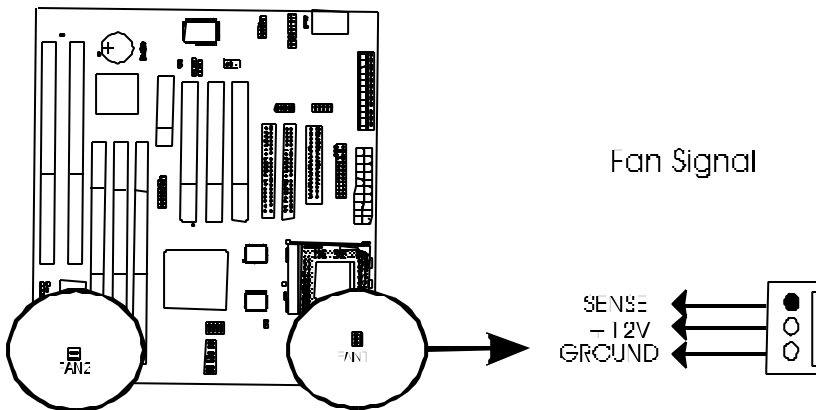
JIR1 connector supports wireless infrared module. With this module and application software like LAPlink, or WIN95 Direct Cable Connection, user can transfer data to or from laptops, notebooks, PDA and printers. This connector supports **HPSIR**, **ASKIR**, and **Fast IR**.

Attach Infrared module to IR connector and enable BIOS “Infrared function.”
Be sure to put in the right direction during installation.



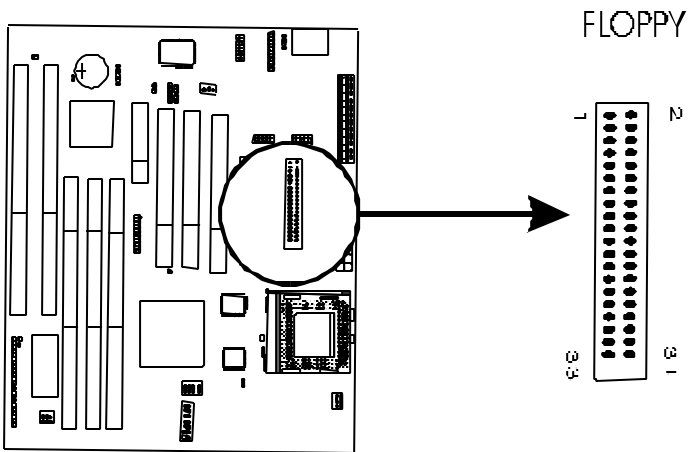
2-5-6 CPU FAN1 & FAN2 Connectors

CPU fan is a 3-pin connector, and the main board supports 2 FAN connectors. As the main board supports hardware monitoring, the system can detect fan speed automatically. The user may refer to Chapter 3 “3-4 Chipset Features Setup” to see the CPU fan speed.



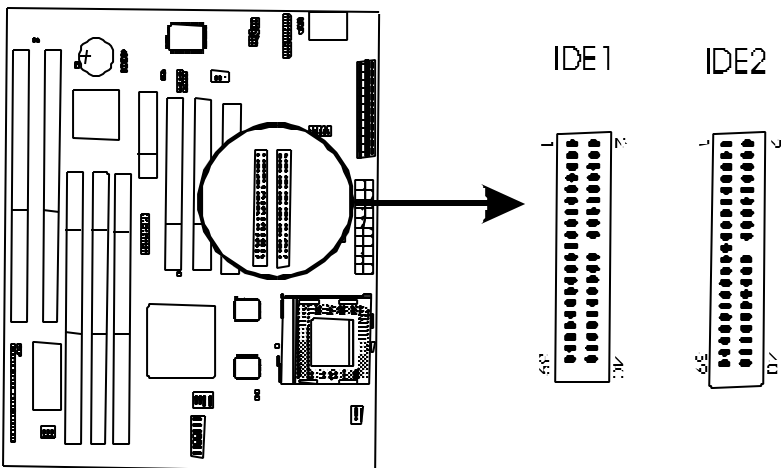
2-5-7 FLOPPY1

FLOPPY1 has 34 pins and is used to attach the floppy drive cable.



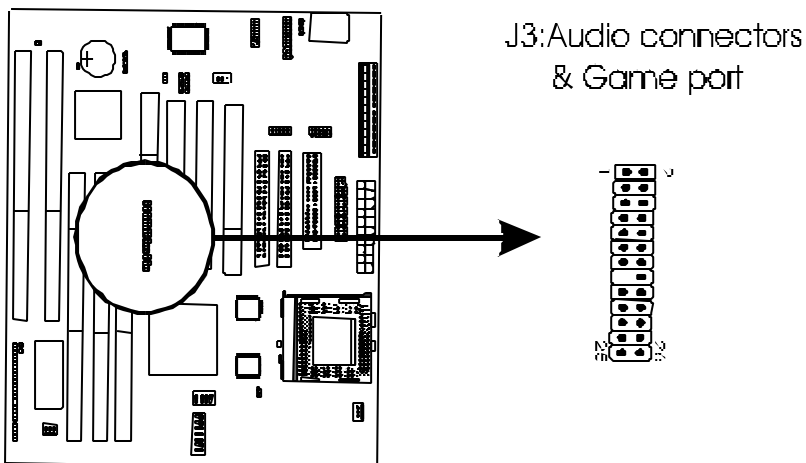
2-5-8 IDE1 and IDE2

The main board supports 2 IDE connectors: IDE1 and IDE2. IDE connectors have 40 pins. IDE1 is the primary channel, and IDE2 is the secondary. Each channel supports 2 IDE devices, and 4 channels in total for this main board.



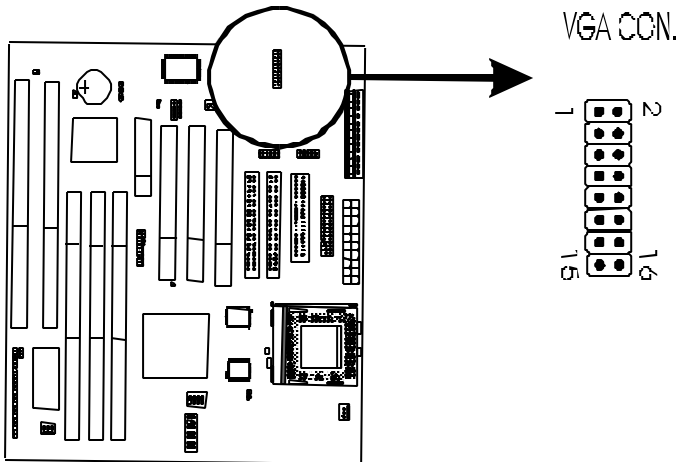
2-5-9 J3 - Audio Connectors & Game Port

J3 is a 26-pin connector connecting to the enclosed cable for Game, MIC, Line-in, Line-out.



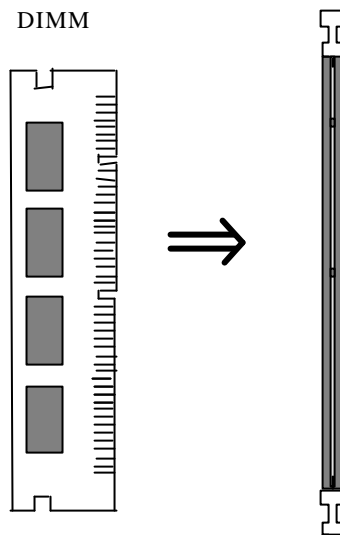
2-5-10 VGA Connector

VGA connector is a 16-pin connector providing video functions. In the package, there is a back panel VGA cable connecting to this connector.



2-6 DIMM Memory Installation

The main board has 3 DIMMs on board. Only SDRAM memory is supported and DIMM1 must be installed with DIMM module. Chipset can support maximum memory up to 768M Bytes. 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.



Chipset *SUPPORTS* FP DRAM. EDO-DRAM. SDRAM.

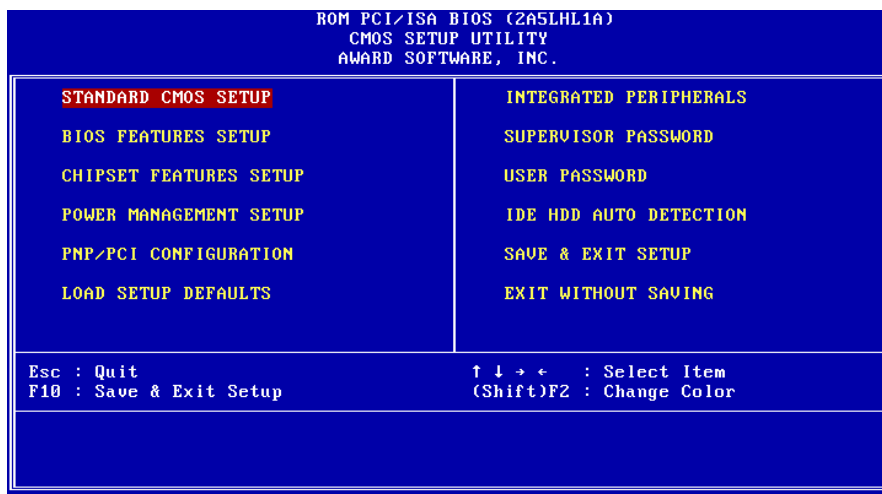


With 95/100 MHz CPUs like K6-2, the system *MUST* be installed with PC-100 100MHz SDRAM module.

Chapter 3 BIOS Setup

3-1 Award BIOS CMOS Setup

The menu displays all the major selection items and allows 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 moves to various items which provides user better understanding of each function. When a selection is made, the menu of the selected item will appear. So the user can modify associated configuration parameters.



3-2 Standard CMOS Setup

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.

```

ROM PCI/ISA BIOS (2A5LHL1A)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Mon, Apr 19 1999
Time (hh:mm:ss) : 13 : 44 : 31

HARD DISKS          TYPE      SIZE    CYLS HEAD PRECOMP LANDZ SECTOR  MODE
-----
Primary Master   :      0      0      0  0      0      0      0  NORMAL
Primary Slave    :      0      0      0  0      0      0      0  NORMAL
Secondary Master :      0      0      0  0      0      0      0  NORMAL
Secondary Slave  :      0      0      0  0      0      0      0  NORMAL

Drive A : None
Drive B : None

Video : EGA/UGA
Halt On : All Errors

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

```

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 cylinder 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.



Note 2: "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 (2A5LHL1A) 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	: 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	Cyrix 6x86/MII CPUID	: Enabled
Gate A20 Option	: Normal		
Memory Parity/ECC Check	: Disabled		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup		
PCI/UGA Palette Snoop	: Disabled		
OS Select For DRAM > 64MB	: Non-OS2		
		ESC : Quit	F4+ : 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 (default): 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; then hard disk drive, and finally SCSI drive. Default value is “**A,C,SCSI.**”. Options are as below:

A,C,SCSI; C,A,SCSI; 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 not be 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

Memory Parity/ECC Check

This item allows memory parity check function.

:Enabled

:Disabled (default)

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

It sets password in BIOS CMOS “**Supervisor Password**” or **User Password**,” the user needs to key in password to enter 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 Palette Snoop

Enabled: it allows you to install an enhanced graphics adapter card.

Disabled (default): If your graphics adapter card does not support the palette 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 “**OS2**” for RAM memory over 64MB and set “**Non-OS2**” for other operating systems like Windows@95/98 or Windows 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)

Cyrix 6X86/MII CPUID

:Enabled(default)

:Disabled

3-4 Chipset Features Setup

ROM PCI/ISA BIOS (2A5LHL1A)			
CHIPSET FEATURES SETUP			
AWARD SOFTWARE, INC.			
Bank 0/1 DRAM Timing	:	SDRAM 10ns	Current CPU Temp. :
Bank 2/3 DRAM Timing	:	SDRAM 10ns	Current System Temp. :
Bank 4/5 DRAM Timing	:	SDRAM 10ns	Current CPUFAN1 Speed :
SDRAM Cycle Length	:	3	Current CPUFAN2 Speed :
SDRAM Bank Interleave	:	Disabled	Vcore : 2.50 :
DRAM Read Pipeline	:	Disabled	3.3V : 5V :
Sustained 3T Write	:	Enabled	12V :
Cache R/CPU W Pipeline	:	Enabled	
Cache Timing	:	Fast	
Video BIOS Cacheable	:	Enabled	
System BIOS Cacheable	:	Enabled	
Memory Hole	:	Disabled	
Delay DRAM Read Latch	:	Disabled	
Init Display First	:	AGP	
Frame Buffer Size	:	8M	
AGP Aperture Size	:	128M	ESC : Quit
OnChip USB	:	Enabled	F1 : Help
USB Keyboard Support	:	Disabled	F5 : Old Values
OnChip Sound	:	Enabled	F7 : Load Setup Defaults
OnChip Modem	:	Disabled	
			tl++ : Select Item
			PU/PD/+/- : Modify
			(Shift)F2 : Color

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.

:SDRAM 10ns(default)

:SDRAM 10ns, SDRAM 8ns, Normal, Medium, Fast, Turbo

SDRAM Cycle Length: It controls the DRAM page missing and row miss leadoff timing.

:2

:3(default)

Video BIOS cacheable: It defines whether video BIOS area cacheable or not.

:Enabled (default)

:Disabled

System BIOS cacheable

It defines whether system BIOS area cacheable or not.

:Enabled (default)

:Disabled

Memory Hole:this field enables a memory hole in main memory space. CPU cycles matching an enabled hold are passed on to PCI note that a selection can not be changed while the L2 cache is enabled.

:Disabled (default)

:Enabled

Init Display First

It decides which function (AGP or PCI) to detect first.

:AGP(default)

The system will detect the onboard "AGP" function first

:PCI slot

The system will detect PCI-interface VGA card.

Frame Buffer Size

:8M(default)

:4M

AGP Aperture Size

It selects the size of the Accelerated Graphics Port (AGP) aperture which 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.

:128MB (default)

:128MB, 64MB, 32MB, 16MB, 8MB, 4MB

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

Onchip Sound

On board AC97 sound function support

:Enabled(default)

:Disabled

Onchip Modem

On board AC97 modem support

:Disabled(default)

:Enabled

3-5 Power Management Setup

ROM PCI/ISA BIOS (2A5LHL1A)		
POWER MANAGEMENT SETUP		
AWARD SOFTWARE, INC.		
ACPI function	: Disabled	Primary INTR : ON
Power Management	: User Define	IRQ3 (COM2) : Primary
PM Control by APM	: Yes	IRQ4 (COM1) : Primary
Video Off Method	: U/H SYNC+Blank	IRQ5 (LPT2) : Primary
Video Off After	: Suspend	IRQ6 (FDD) : Primary
MODEM Use IRQ	: 3	IRQ7 (LPT1) : Primary
Doze Mode	: Disable	IRQ8 (Alarm) : Disabled
Suspend Mode	: Disable	IRQ9 (Rsv) : Secondary
HDD Power Down	: Disable	IRQ10 (Rsv) : Secondary
Soft-Off by PWRBTN	: Instant-Off	IRQ11 (Rsv) : Secondary
** PM Events **		IRQ12 (PS/2) : Primary
UGA	: OFF	IRQ13 (CoPro) : Primary
LPT & COM	: LPT/COM	IRQ14 (HDD) : Primary
HDD & FDD	: ON	IRQ15 (Rsv) : Disabled
DMA/master	: OFF	
RTC Alarm Resume	: Disabled	ESC : Quit ↑↓→← : Select Item
		F1 : Help PU/PD/+/- : Modify
Modem Ring Resume	: Disabled	F5 : Old Values (Shift)F2 : Color
		F7 : Load Setup Defaults

ACPI Function

:Disabled(default)

:Enabled

Power Management

Choosing “User Define,” users can configure their own power management

Item	Doze Mode	Standby Mode	Suspend Mode
User Define	Disable	Disable	Disable
Max Saving	10 Sec	10 Sec	10 Sec
Min Saving	1 Hour	1 Hour	1 Hour

Video Off Method

: V/H Sync+Blank (default)

: DPMS Supported

: Blank Screen

Video Off After

: NA

: Suspend

: Doze

MODEM Use IRQ

: 3 (default)

: 4, 5, 7, 9,10,11,NA

Doze Mode

:Disabled (default)

:10Sec, 20Sec, 30Sec, 40Sec, 1Min, 2Min, 4Min, 6Min, 8Min, 10Min, 20Min, 30Min, 40Min, 1Hour

Suspend Mode

:Disabled (default)

:10 Sec, 20Sec, 30Sec, 40Sec, 1Min, 2Min, 4Min, 6Min, 8Min, 10Min, 20Min, 30Min, 40Min, 1Hour

HDD Power Mode

:Disabled (default)

:1-15Min

Soft-off by PWRBTN

:Delay 4 sec

:Instant-off(default)

RTC Alarm Resume (ATX Power supply only)

:Disabled(default)

:Enabled – Key in the date of current month and time of the day. System will turn on then.

Modem Ring Resume(ATX Power supply only)

:Disabled(default)

:Enabled – modem ring on function – system can be turned on via modem.



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

3-6 PNP / PCI Configuration Setup

ROM PCI/ISA BIOS (2A5LHL1A) PNP/PCI CONFIGURATION AWARD SOFTWARE, INC.	
PNP OS Installed : No	CPU to PCI Write Buffer: Enabled
Resources Controlled By : Manual	PCI Dynamic Bursting : Enabled
Reset Configuration Data : Disabled	PCI Master 0 WS Write : Enabled
	PCI Delay Transaction : Enabled
IRQ-3 assigned to : PCI/ISA PnP	PCI#2 Access #1 Retry : Disabled
IRQ-4 assigned to : PCI/ISA PnP	AGP Master 1 WS Write : Enabled
IRQ-5 assigned to : PCI/ISA PnP	AGP Master 1 WS Read : Disabled
IRQ-7 assigned to : PCI/ISA PnP	
IRQ-9 assigned to : PCI/ISA PnP	Assign IRQ For USB : Enabled
IRQ-10 assigned to : PCI/ISA PnP	Assign IRQ For VGA : Enabled
IRQ-11 assigned to : PCI/ISA PnP	Slot 1 Use IRQ No. : Auto
IRQ-12 assigned to : PCI/ISA PnP	Slot 2 Use IRQ No. : Auto
IRQ-14 assigned to : PCI/ISA PnP	Slot 3 Use IRQ No. : Auto
IRQ-15 assigned to : PCI/ISA PnP	
DMA-0 assigned to : PCI/ISA PnP	
DMA-1 assigned to : PCI/ISA PnP	ESC : Quit F1++ : 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-3/4/5/9/10/11/12 Assigned To----

: PCI/ISA PnP(default)

: Legacy ISA

IRQ-7/14/15 Assigned To----

: PCI/ISA PnP(default)

: Legacy ISA

DMA-0 Assigned To--- DMA-7 Assigned To

: PCI/ISA PnP(default)

: Legacy ISA

Assigned IRQ for USB

: Enabled (default)

: Disabled

3-7 Integrated Peripherals

ROM PCI/ISA BIOS (2A5LHL1A) INTEGRATED PERIPHERALS AWARD SOFTWARE, INC.	
OnChip IDE Channel0 : Enabled OnChip IDE Channel1 : Enabled IDE Prefetch Mode : Enabled IDE HDD Block Mode : Enabled Primary Master PIO: Auto Primary Slave PIO: Auto Secondary Master PIO: Auto Secondary Slave PIO: Auto Primary Master UDMA: Auto Primary Slave UDMA: Auto Secondary MasterUDMA: Auto Secondary Slave UDMA: Auto Onboard FDD Controller: Enabled Onboard Serial Port 1 : Auto Onboard Serial Port 2 : Auto UART 2 Mode : Standard	Onboard Parallel Port : 378/IRQ7 Onboard Parallel Mode : Normal Onboard Legacy Audio : Enabled Sound Blaster : Enabled SB I/O Base Address : 220H SB IRQ Select : IRQ 9 SB DMA Select : DMA 1 MPU-401 : Enabled MPU-401 I/O Address : 330-333H FM Port (388-38BH) : Enabled Game Port (200-207H) : Enabled ESC : Quit ↑↓→← : Select Item F1 : Help PU/PD/+/− : Modify F5 : Old Values (Shift)F2 : Color F7 : Load Setup Defaults

Onchip IDE Channel 0

:Disabled---Disable Primary Master PIO/Primary Slave PIO/Primary Master
UDMA/Primary Slave UDMA

:Enabled---Enable Primary Master PIO/Primary Slave PIO/Primary Master
UDMA/Primary Slave UDMA

Onchip IDE Channel 1

:Disabled---Disable Secondary Master PIO/Secondary Slave PIO/Secondary
Master UDMA/Secondary Slave UDMA

:Enabled---Enable Secondary Master PIO/Secondary Slave PIO/Secondary Master
UDMA/Secondary Slave UDMA

Primary Master PIO

: Auto (default)

: Mode 0

: Mode 1

: Mode 2

: Mode 3

: Mode 4

Primary Slave PIO

: Auto (default)

: Mode 0

: Mode 1

: Mode 2

: Mode 3

: Mode 4

Secondary Master PIO

- : Auto (default)**
- : Mode 0**
- : Mode 1**
- : Mode 2**
- : Mode 3**
- : Mode 4**

Secondary Slave PIO

- : Auto (default)**
- : Mode 0**
- : Mode 1**
- : Mode 2**
- : Mode 3**
- : Mode 4**

Primary Master UltraDMA

- : Auto (default)**
- : Disable**

Primary Slave UltraDMA

- : Auto (default)**
- : Disable**

Secondary Master UltraDMA

- : Auto (default)**
- : Disable**

Secondary Slave UltraDMA

: Auto (default)

: Disable

Onboard FDC Controller

: Enabled (default)

: Disabled

Onboard Serial Port 1

: 3F8/IRQ4

: 2F8/IRQ3

: 3E8/IRQ4

: 2E8/IRQ3

: Auto (default)

: Disabled

Onboard Serial Port 2

: 3F8/IRQ4

: 2F8/IRQ3

: 3E8/IRQ4

: 2E8/IRQ3

: Auto (default)

: Disabled

UART 2 Mode

: Standard (default)

: HPSIR

: ASKIR

Onboard Parallel Port

: **378/IRQ7** (default)

: **3BC/IRQ7**

: **278H/IRQ5**

: **Disabled**

Parallel Port Mode

Normal (Default)	
EPP	Choosing this item, another line is shown: Parallel Port EPP Type:EPP1.9
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 Parallel Port EPP Type:EPP1.9

Onboard Legacy Audio

:**Enabled**(default)

:**Disabled**

3-8 Password Setting

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:

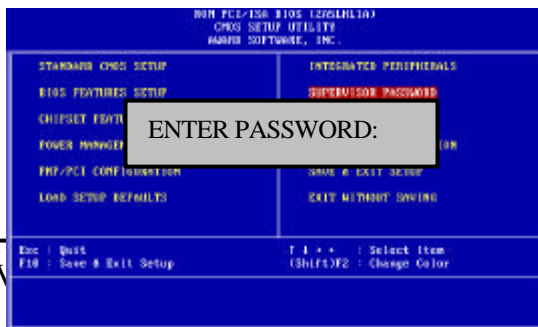
Supervisor Password: this function allows you the right to change the options of setup menu.

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"

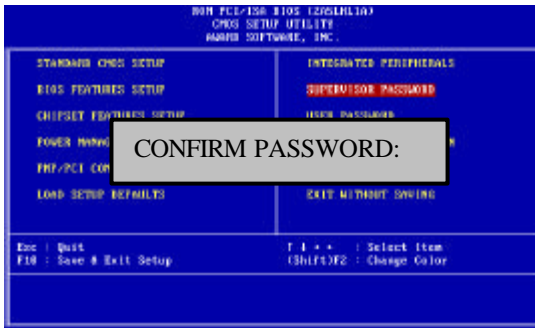
Step 1: Enter Password

Press <Enter> after appointing the password.



Step 2: Confirm Password

Type the password again and press <Enter>.



Note: If you forget password, please clear CMOS.
(refer to JBAT1 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”

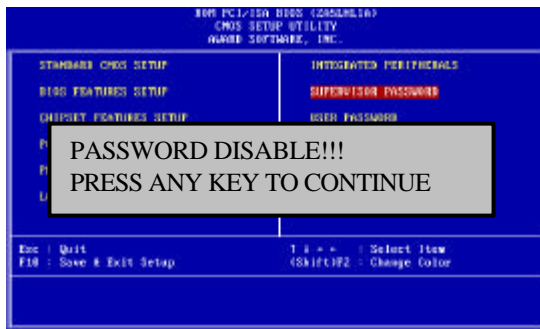
secures PC system and password is required during system boot-up and CMOS setup..

2. How to disable Password Setting

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

Step 2: **Enter Password Setting**

When 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 CONTINUE.”** Press any key as instructed to disable password.



3-9 IDE HDD Auto Detection

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. The BIOS will auto-detect the hard disk size and model on display during post.

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: Master Option (N: Skip): N

OPTIONS	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR
<u>MODE</u>						
2 (Y)	4302	523	255	0	8893	63
<u>LBA</u>						
1	4303	8894	15	65535	8893	63
<u>NORMAL</u>						
3	429	6 555	2405	65535	8893	63

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)
<u>X No. Per Sector</u>	<u>(512)</u>
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:

$$\begin{array}{rcl} & \text{No. Cylinder} & (1024) \\ \text{X} & \text{No. Head} & (255) \\ \text{X} & \text{No. Sector} & (63) \\ \hline \text{X} & \text{No. Bytes Per Sector} & (512) \\ & & 8.4 \text{ GB} \end{array}$$

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:

<u>Cyls.</u>	<u>Head</u>	<u>Sector</u>	<u>Mode</u>
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:

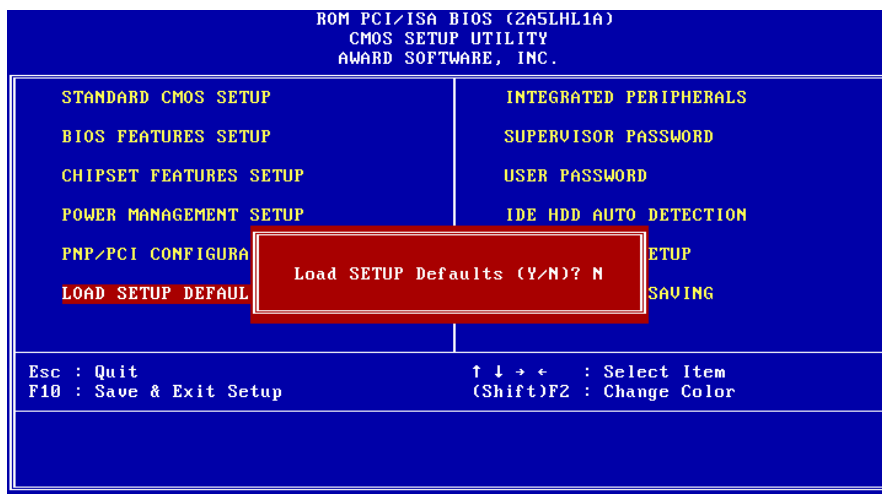
$$\begin{array}{rcl} & \text{No. Cylinder} & (1024) \\ \text{X} & \text{No. Head} & (32) \\ \text{X} & \text{No. Sector} & (63) \\ \hline \text{X} & \text{No. Bytes Per Sector} & (512) \\ & & 1 \text{ GB} \end{array}$$



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 operating 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.

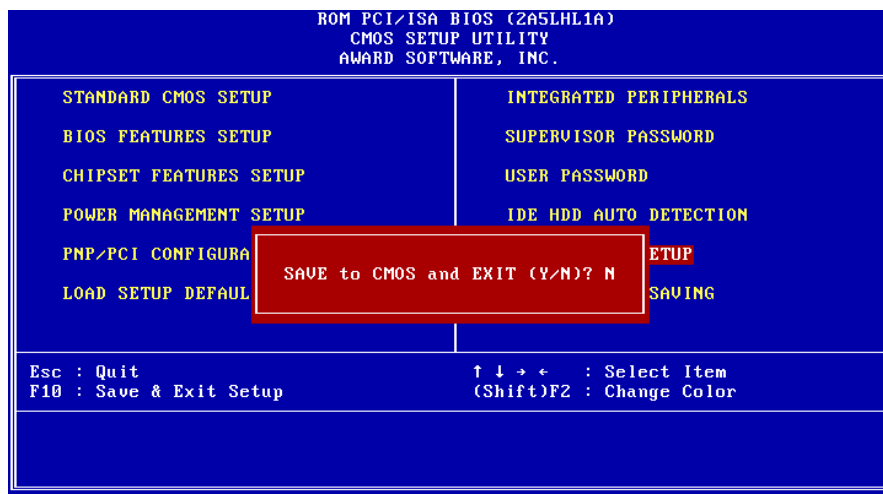
3-10 Load Setup Defaults

"**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



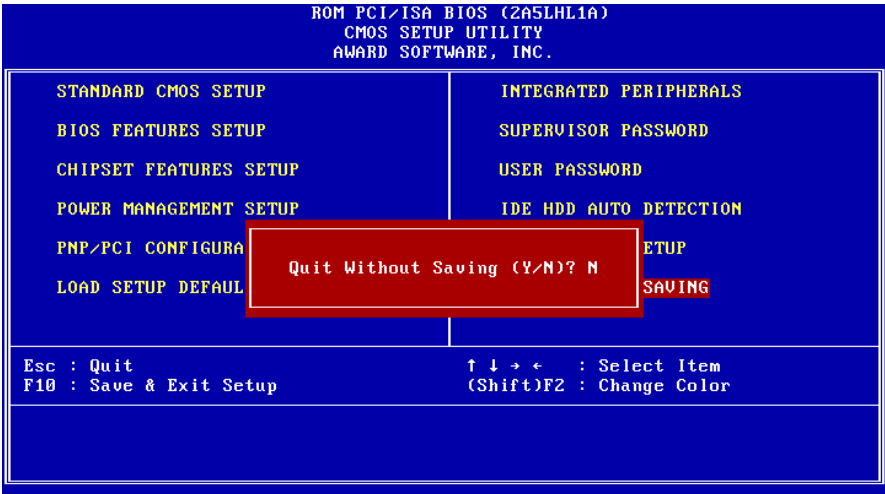
3-11 Save & Exit Setup

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.



3-12 Quit Without Saving

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 ports
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

NMI: 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 seconds 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

Type	Cylinder	Heads	Write Pre-comp	Landing Zone	Sectors	Size
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
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	8042 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	GPIO 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
3B0 - 3BF	Monochrome Display and Printer Adapter

I/O Address (HEX)	I/O device
390 - 393	Cluster
3A0 - 3AF	Bisynchronous 1
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 most often 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 device 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 battery.

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 power on self test.

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.
