6ZX
AT Form Factor
Main Board
User's Manual

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Chapter 1 Introduction

1-1 6ZX Main Board Overview

6ZX is a new-generation Pentium® II main board which integrates the latest advances in processor, memory, I/O technologies into an AT form factor. **6ZX** utilizes Intel® i440ZX chipsets and supports new architects such as high-speed AGP graphic Port, SDRAM, Ultra DMA/33, bus master IDE and USB port.

6ZX accepts Intel® Celeron™ PPGA processors at 66MHz/100MHz which is plugged into ZIF socket 370. Celeron™ PPGA processor is based on P6 core but is made in a Plastic Pin Grid Array (PPGA) package. Celeron™ PPGA processor is ranked as one of the P6 family to meet low cost of basic PC market. The processor is built in 128K L2 cache, so there is no cache necessary in this main board. PPGA packaging technology is similar to the Pentium® CPU package. Coming the advantages of ZIF socket 370, it saves time and cost in hardware installation.

6ZX also implements ITE I/O controller utilizing with fully Plug and Play devices and .keyboard password setup. It 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.

6ZX contains 3*PCI & 2*ISA for highest performance I/O add-on adapter cards. The main board supports Three Bus Mastering Slots for high-performance I/O add-on cards. It supports Matrix Independent PCI Routing for optimal multiple PCI adapter operations. 133MB/s data transfer rate can be compared to 33MB/s on EISA bus, or 8MB/s on ISA bus. It support back to back sequential CPU to PCI Memory writes to PCI Burst Write for full PCI throughput.

6ZX has 2 dual in-line memory modules (DIMM) which can be installed with SDRAM memory . The memory subsystem supports up to 256MB SDRAM of non-buffered 3.3V using standard 168-pin DIMM sockets.

6ZX is strengthened with Power Management Wake up Event such as **"WOL (Wake up on LAN)," "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 hardware features, this main board is jumperless design which allows user to set CPU frequency through BIOS. No jumper or hardware DIP switch is needed. With this design, the disadvantages of setting hardware CPU jumpers are improved to a better and easier procedure through BIOS.

In conclusion, the system chipset and design make **6ZX** a high performance, cost-effective, and energy efficient main board which meets a variety of price/performance levels. **6ZX** main board is an ideal platform for the increasing requirements of today's and future's desktop application.

1-2 Specifications

- **PCB Board size:** 22.00 cm x 22.00 cm

- **PCB layer:** 4 layers

- **Socket 370:**

Socket 370 has 370 pins and supports 66MHz /100 MHz F.S.B Celeron™ PPGA processors.

CPU is not enclosed in the package

- **Memory** : 2 of 168-pin 3.3V DIMM
  - **66 MHz CPU**
    System can supports either 66 MHz or 100 MHz SDRAM/EDO RAM

- **Expansion Slot :** 2x ISA slots, 3x PCI slots and 1x A.G.P. slot (1 shared slot)

- **Chipset : Intel® i440ZX 66/100** chipset-----
  - FW82443ZX
  - FW82371EB

- **Flash ROM BIOS:**
  Award® full **PnP** (plug & play) BIOS

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

- **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
- Power Management Wake up

- Wake Up On LAN

To support functions such as "Wake up on LAN," we suggest that Pin 17 signal 5VSB on ATX Power supply should be able to offer at least 750 mA driving ability.

- **Special features**
  - Jumperless design
  - Modem ring on (ATX power supply is required)
  - Creative PCI sound Blaster SB-link PC/PCI
  - Windows 95/98 power off (ATX power supply is required)
  - ATX & AT power supply support

1-3 Notice of Hardware Installation

Before hardware installing the main board, note the following things.

1. Check the package

If any of the below 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:

- **6ZX** main board
- manual
- cables
- driver & utility / CD

B. Make sure power is off.

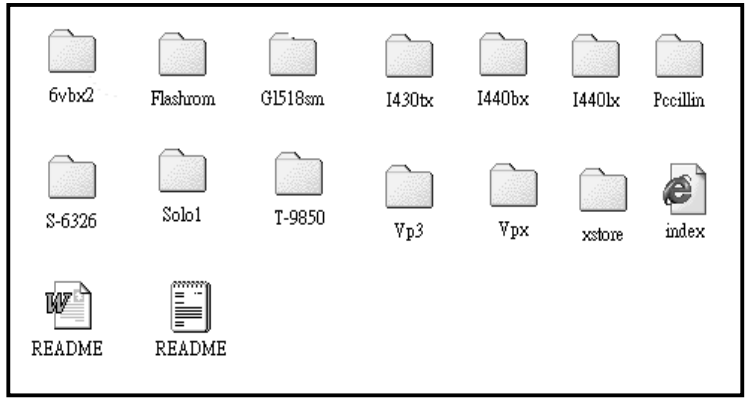
During hardware installation, be sure there is no power connected at this period.

C. Avoid ESD (Electrical Static Discharge)

While working with **6ZX** main board, always wear a grounded wristband or ankle strap to avoid ESD (Electrical Static Discharge).

1-4 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, and the actual CD content may have some difference with the above picture.

1. **Main boards:** i440ZX, i440BX, i440EX, i440LX, i430TX, VIA® VPX, VP3- based main boards (i440ZX-based main board has the same driver as i440BX-based main board)
2. **Sound:** ESS-solo-1 sound driver
3. **Hardware monitoring (GL518SM):** CPU voltage/temperature and fan speed detection software
4. **Pccillin:** anti- virus protection software
5. **XStore Pro IDE driver:** new IDE bus master driver for ULTRA DMA 33

1-5 XStore Pro IDE driver

Lucky Star has integrated High Point's new-invented software technology, **"XStore Pro,"** to our valued customers as a free service. Developing the technique of "read ahead caching after seeking," **XStore Pro** increases hard disk performance. More concretely, when working with hard disk of large block sizes, it effectively enhances 50% hard disk performance, and 10% system performance.

System requirement
Under the below environments, the driver will perform its best in your system. No extra computer components are required.

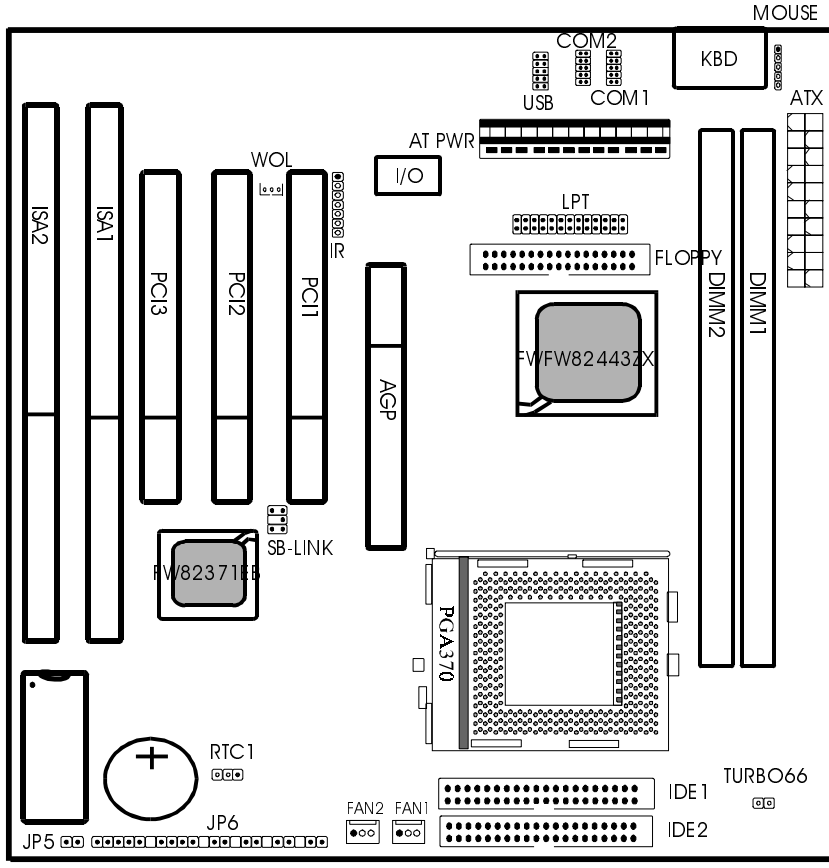
- Windows 95 or Windows 98 environment
- Lucky Star main boards
- Recommended system memory: 32 MB or above

Website to bundle updated "XStore Pro" IDE driver
The enclosed CD has integrated Xstore Pro driver. Updated drivers will be constantly provided at High Point's website. Lucky Star website is also linked to High Point.

- http://www.lucky-star.com.tw
- http://highpoint-tech.com

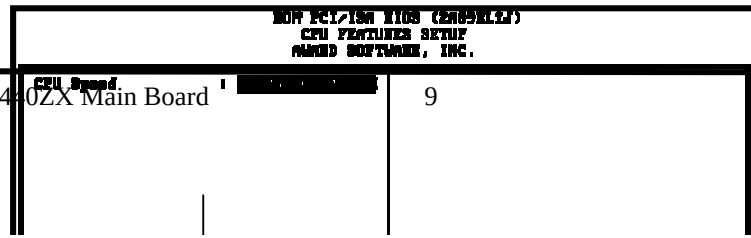
Chapter 2 Installation

2-1 Layout Reference



2-2 CPU Speed Setup

Since this is a jumperless design, there is no hardware jumper setting to adjust CPU speed. Enter BIOS CPU Speed Setup, and comes the below screen. BIOS can recognize CPU speed automatically. Press **"+"** or **" "** to select.



CPU Clock Ratio	
4.0/266 Mhz	
4.5/300 Mhz	
5.0/333 Mhz	
5.5/366 Mhz	
6.0/400 Mhz	
6.5/433 Mhz	
7.0/466 Mhz	
Manual	CPU Ratio: X4, X4.5, X5, X5.5, X6, X6.5, X7, X7.5
	CPU Frequency: 66 Mhz, 75 Mhz, 83 Mhz

Since over-clocking setup is not included in chipset specification, we provide no guarantee for any loss or damage resulting from this.

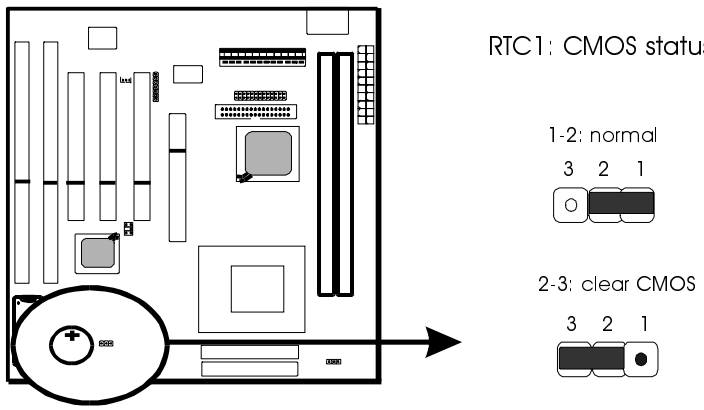
After installing processor, make sure actual CPU speed is the same as in BIOS "CPU speed Setting."

2-3 Jumper Setting

Benefiting from jumperless design, hardware installation becomes an easier procedure to achieve. There are only jumpers **RTC1** and **JP3** required of hardware handling.

2-3-1 RTC1- CMOS status

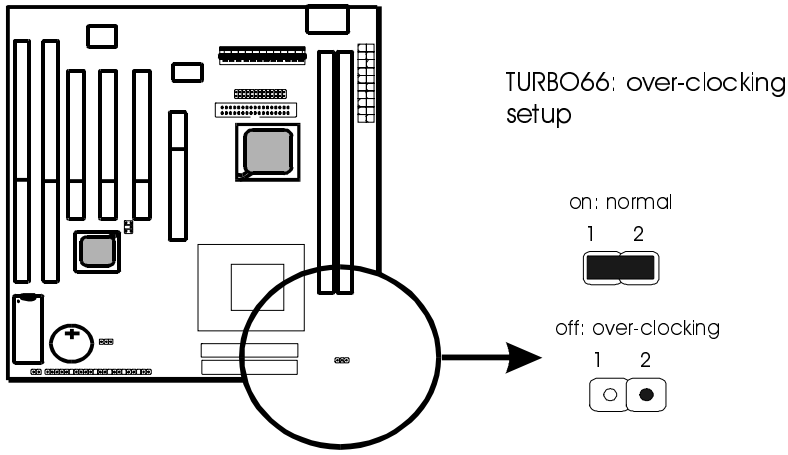
RTC1 is a 3-pin connector. Clear CMOS if system password is forgotten. Below is details to show how to clear CMOS.



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

2-3-2 TURBO66: over-clocking setup

TURBO66 is a 2-pin jumper which allows 66 MHz F.S.B. CPUs to over-clock up to 100 F.S.B. This jumper is for internal test only. No guarantee is provided since chipset does not support.

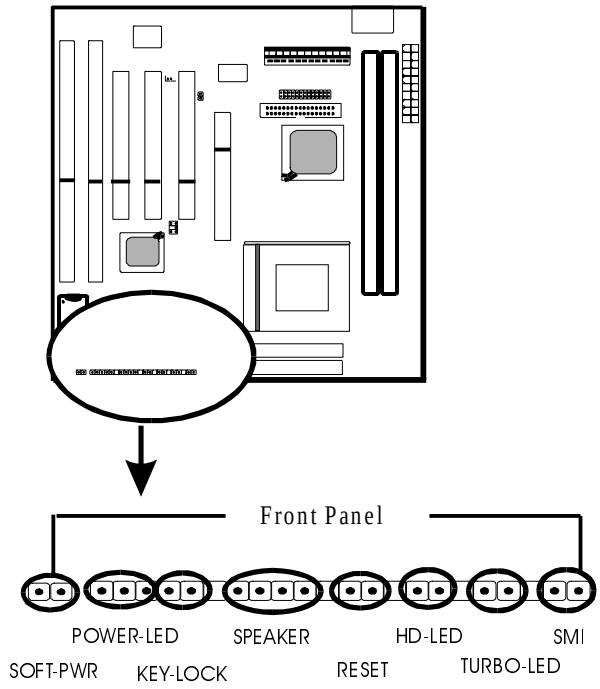


2-4 Connectors

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

2-4-1 Front Panel Connectors

Front panel has connectors such as **" SOFT-PWR," "POWER-LED," "KEYLOCK," "SPEAKER," "RESET," "HD-LED," "TURBO-LED," "SMI."** Please refer to the following further information.



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

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.

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. Set to "on" to disconnect the connector with the system and "off" for normal status.

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.

TB-LED with a 2 pins is used to connect to the Turbo LED on the front panel of the case (if there is).

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.

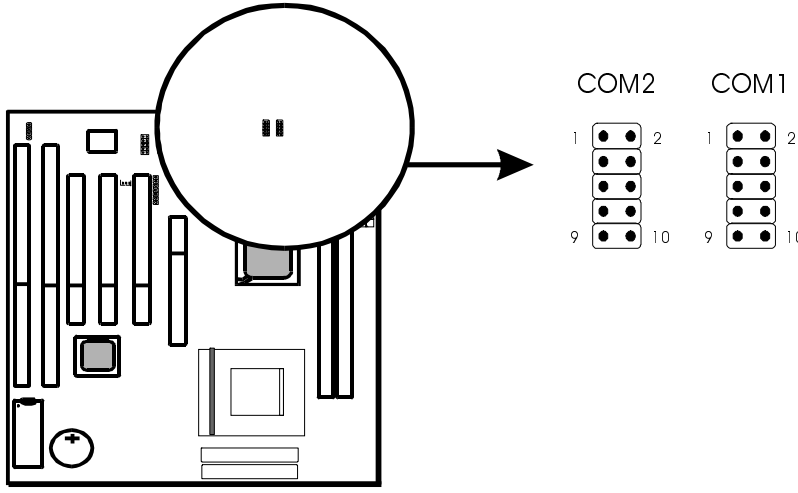
SMI connector is a 2-pin Berg strip, which is also called **"green"** or **"sleep"** connector. When SMI is turned from open to close and back to open, the system will enter sleep mode immediately. This function is to make sure power saving is working well. In PC system, this connector is used to connect 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.

2-4-2 Back Panel Connectors

Back Panel Connectors are COM1/ COM2, LPT, AT keyboard connector, and PS/2 mouse on case back panel. Refer to below details.

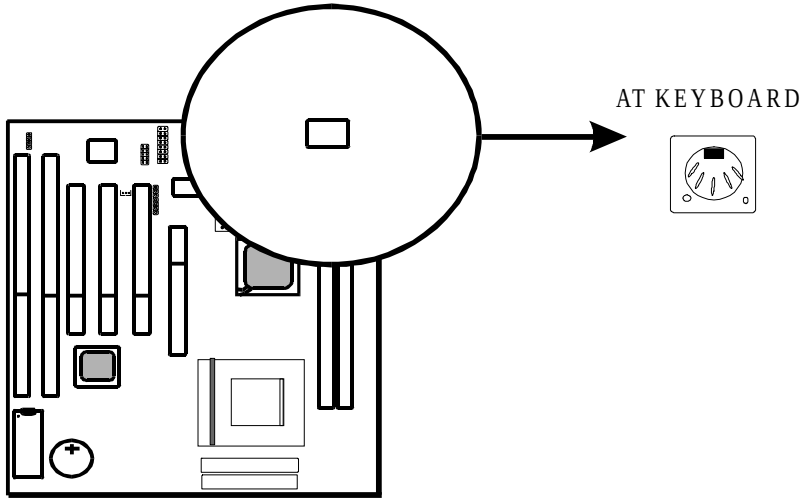
COM1 & COM2

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.



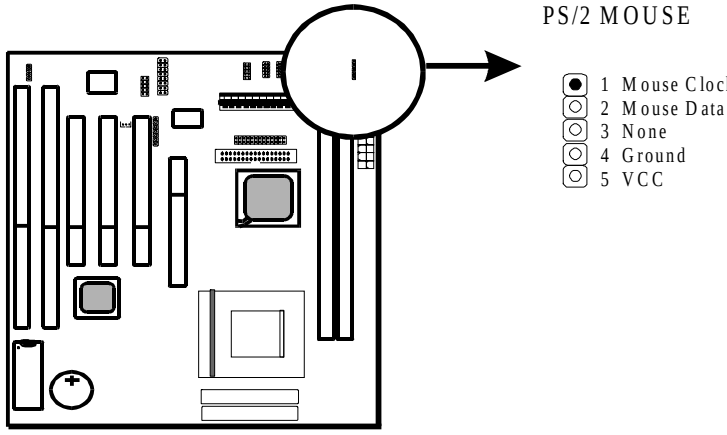
AT Keyboard Connector

AT keyboard connector is a 5-pin connector connecting to keyboard.



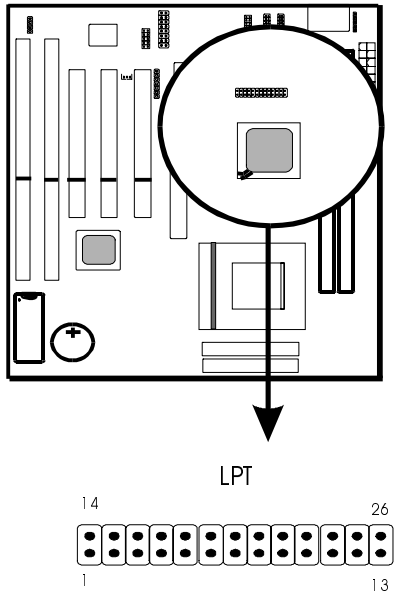
PS/2 Mouse Connector

PS/2 mouse is a 5-pin connector.



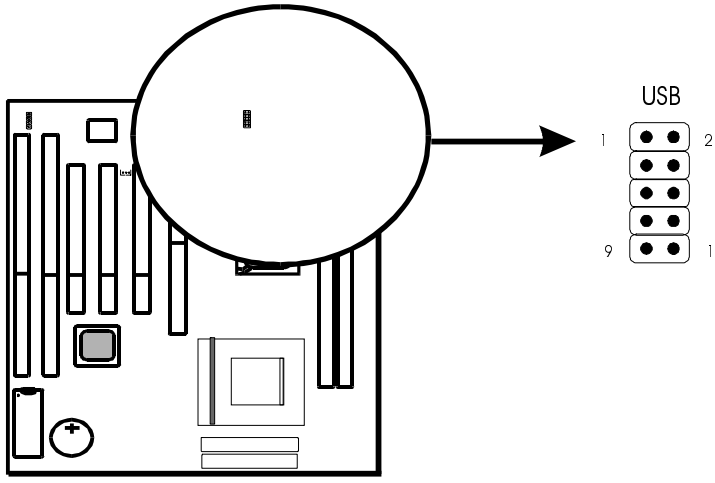
LPT

The onboard parallel port is a 25-pin female connector. It supports standard printer port, Enhanced Parallel Port (EPP), Extended Capabilities Port (ECP).



USB: USB (Universal Serial Bus) Connector

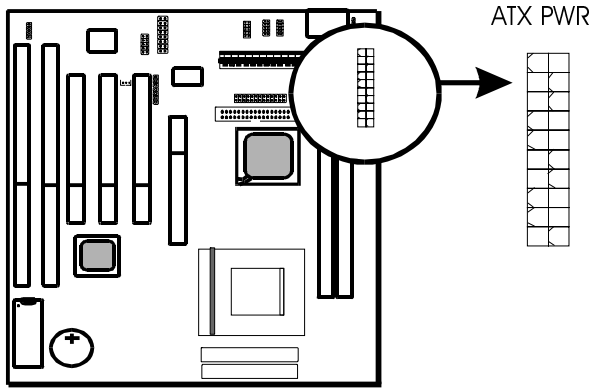
Universal Serial Bus connector, marked as **"USB,"** is used to connect USB devices. There are 2 USB connectors on this main board.



2-4-3 ATX Power Supply Connector

ATX power 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

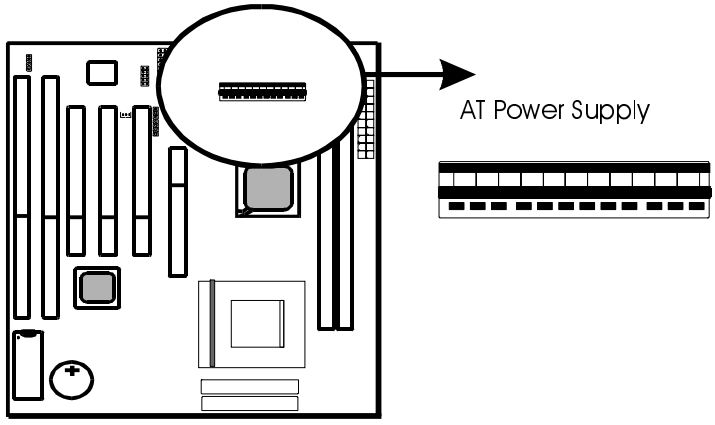
the front panel switch is momentarily pressed. Push the switch again to turn off the power to the system board.



To support functions such as "Wake up on LAN," we suggest that Pin 17 signal 5VSB on ATX Power supply should be able to offer at least 750 mA driving ability.

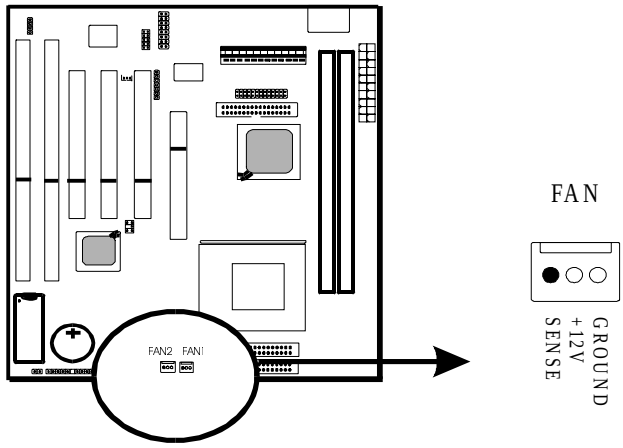
2-4-4 AT Power Supply Connector

This main board is AT/ATX power switch designed. AT power supply connector is a 12-pin connector.



2-4-5 CPU Fan Connectors

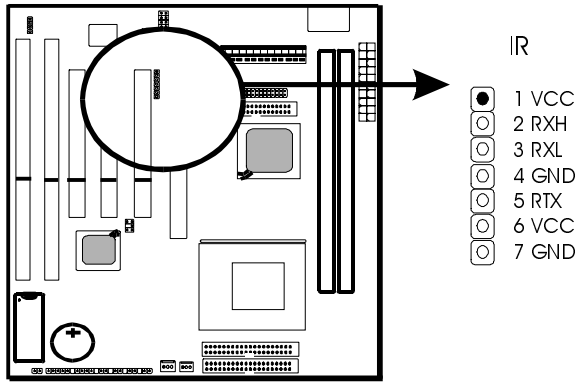
There are 2 fan connectors on this system board, and they are marked as **"FAN1," and "FAN2."** Each fan connector has three pins.



2-4-6 I.R. : IrDA Connector

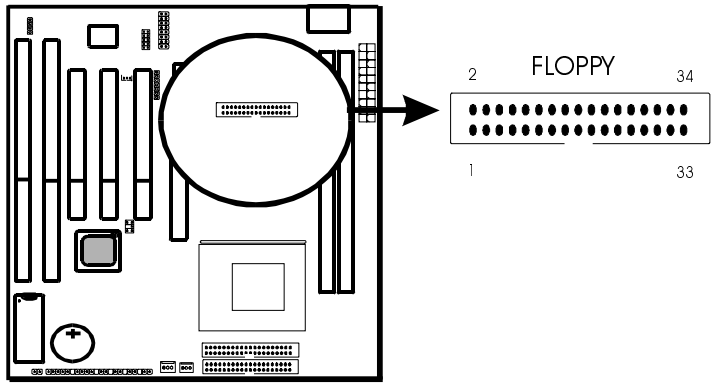
IR connector supports wireless infrared module. With this module and application software like Laplink, or Win95 Direct Cable Connection, user can transfer data to or from laptops, notebooks, PDA and printers. This connector supports **HPSIR**, **ASKIR,** and **Fast IR**.

Attach Infrared module to IR connector. Be sure to put in the right orientation during attachment.



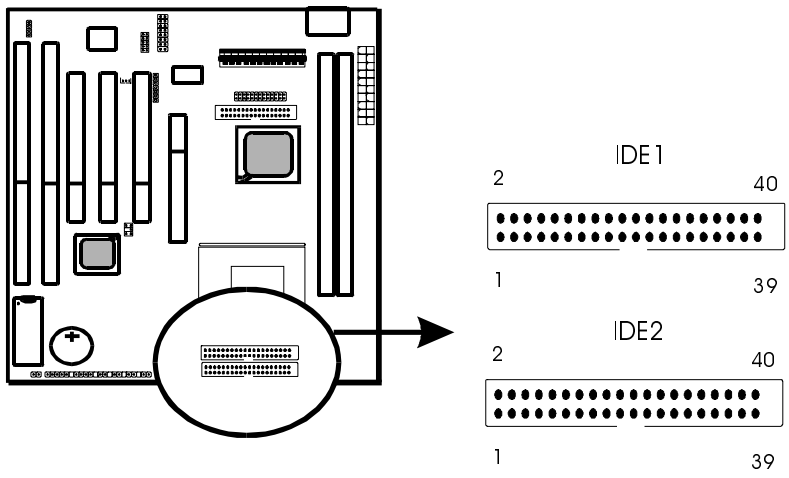
2-4-7 FLOPPY

Floppy Disk connector has 34 pins and is used to attach the floppy drive cable.



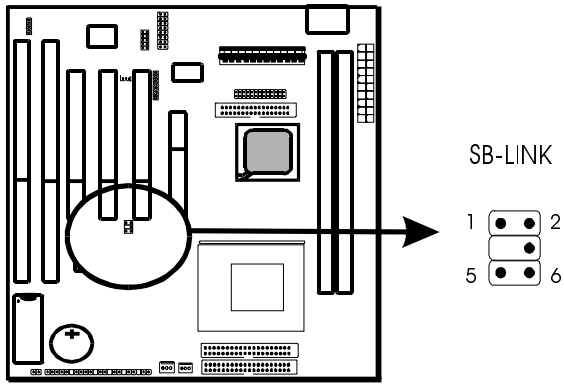
2-4-8 IDE1 & IDE2

IDE1 and IDE2 are 40 –pin IDE connectors. **IDE1** is primary channel, and **IDE2** is secondary channel. Each channel supports 2 IDE devices, and 4 devices in total for this main board.



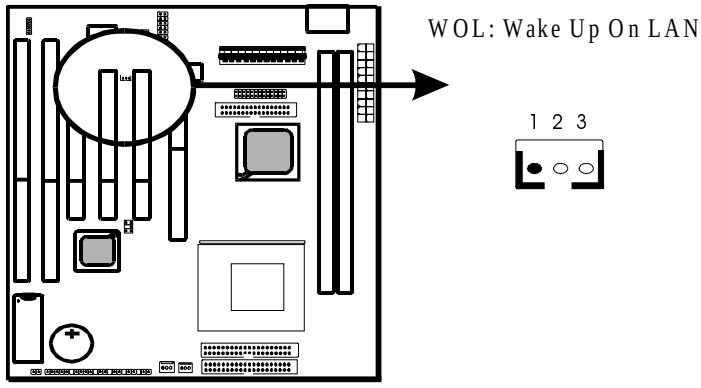
2-4-9 SB-Link Connector

SB-LINK is used to attach any "PC/PCI" standard sound card like Creative AWE64D or Yamaha XG…for compatibility under DOS mode.



2-4-10 Wake up on LAN

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



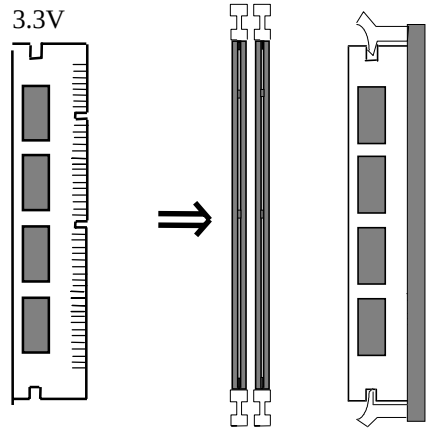
WOL (Wake up on LAN) function requirement:
Power supply should be able to offer at lest 750mA driving ability to the signal "5V trickle voltage."

2-5 DIMM Installation

Please make sure DIMM is 3.3V DIMM. Either DIMM 1, or DIMM2 supports 8 MB, 16 MB, 32 MB, 64 MB, and 128MB. Maximum memory for **SDRAM is up**

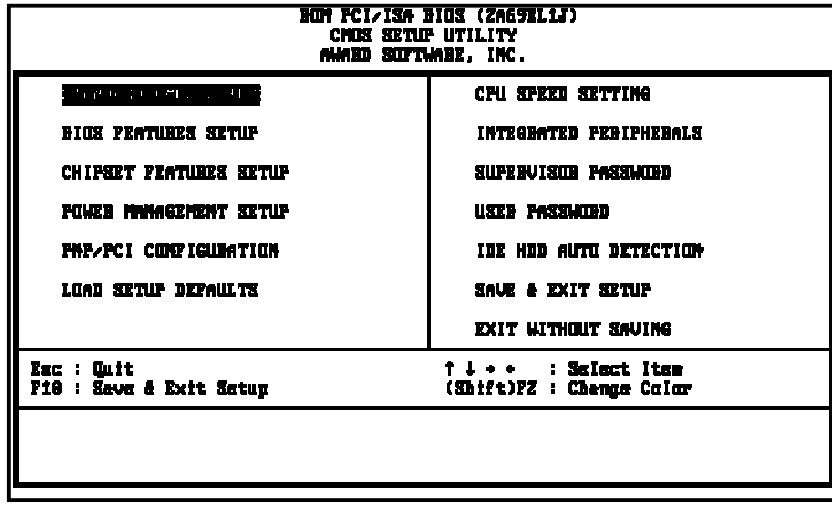
to 256 MB; EDO RAM is up to 512 MB. The user may insert DIMM modules in either DIMM1, or DIMM2.

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. DRAM SIMM modules have the same pin contact on both sides. SDRAM DIMM modules have different pin contacts on each side and therefore have a higher pin density.



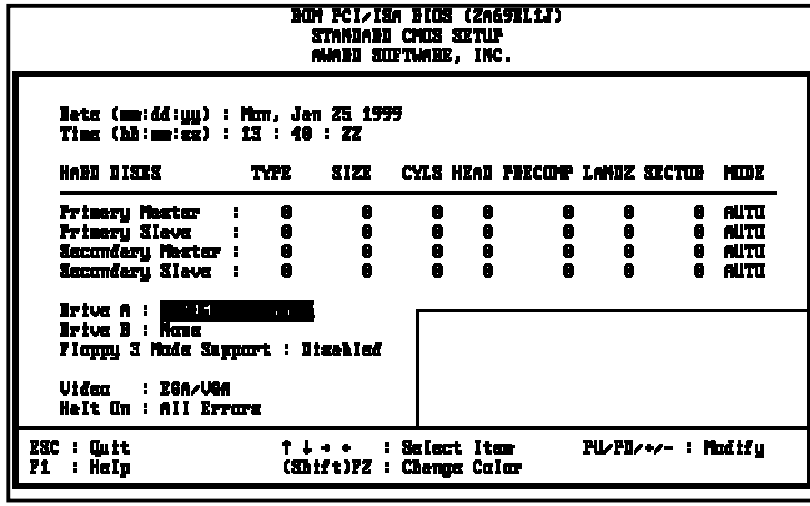
Chapter 3 BIOS Setup

3-1 Award® BIOS CMOS Setup



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



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".**

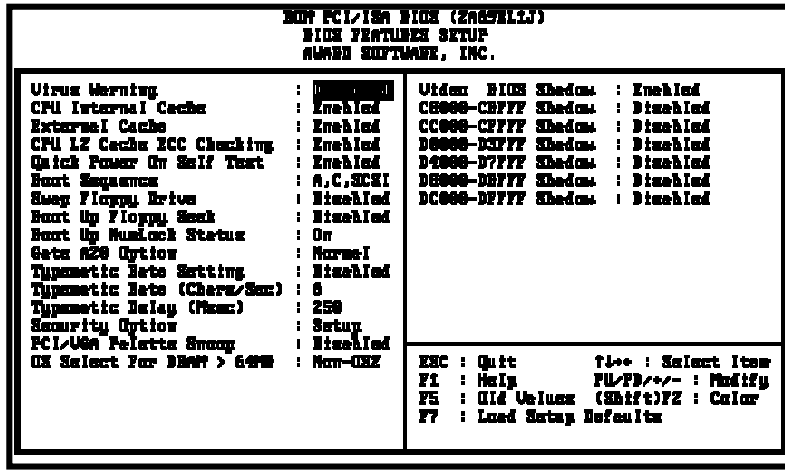
8. MODE :select **"AUTO"** to detect the mode type automatically. If your hard disk supports the **LBA** mode, select **"LBA"** or **"LARGE".** However, if your hard disk cyclinder is more than 1024 and does not support the lba function, you have to set at **"LARGE."** Select **"NORMAL"** if your hard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



Virus Warning
:Enabled
:Disabled (default)

CPU Internal Cache
Enabled : enable L1 cache
Disabled: disable L1 cache

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

CPU L2 Cache ECC Checking
Enabled (default): enable L2 cache ECC checking
Disabled: disable L2 cache ECC checking

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; second is 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 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 **enabled.**

Boot Up Numlock Status
:On(default)
:Off

Gate A20 Speed
: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

Item	Function	Note
Setup (default)	Security protection in CMOS setup menu	After setting password in BIOS CMOS **"Supervisor Password" or User Password,**" it protects BIOS CMOS setup.
System	Security protection in system boot-up & BIOS setup	This function secures the system under system boot-up and BIOS setup after setting password.

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

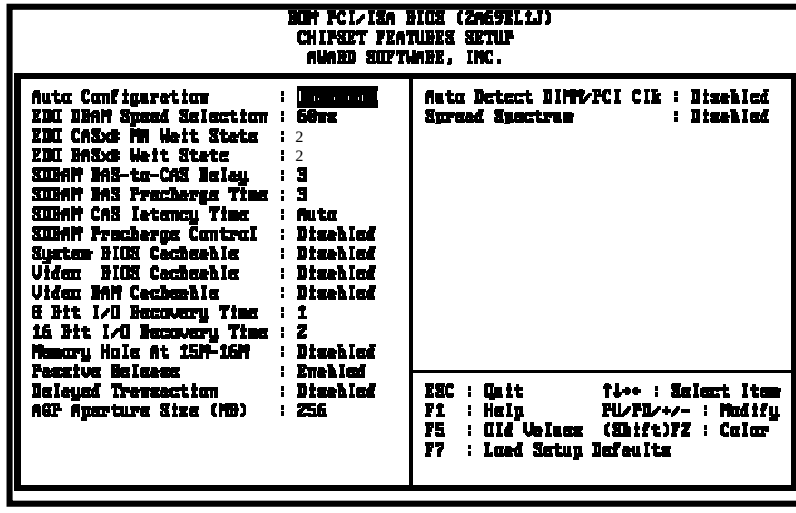
C8000-CBFFF Shadow, CC000-CFFF Shadow, D0000-D3FFF Shadow: D4000-D7FFF Shadow, D8000-DBFFF Shadow, DC000-DFFF Shadow

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



Auto configuration
BIOS will automatically detect the CPU speed and will auto-configurate the bus frequency, DRAM speed, cache and read/write cycle.
Enabled: (default)
Disabled:

SDRAM RAS# Precharge Time
SDRAM precharge time by RAS.
: 4
: 3 (default)

SDRAM RAS# to CAS delay
This controls the DRAM page miss and row miss leadoff timing.
: 2
: 3 (default)

System BIOS cacheable
define whether system BIOS area cacheable or not.
:Enabled
:Disabled (default)

Video BIOS cacheable: *to de*fine whether video BIOS area cacheable or not.
:Enabled
:Disabled (default)

Video RAM Cacheable
:Enabled --- allows caching of the video RAM, resulting in better system performance. However, if any program writes to this memory area, a system error may occur.
:Disabled (default)
8 Bit I/O Recovery Time:
This field defines the recovery time from 1 to 8 for 8-bit I/O.

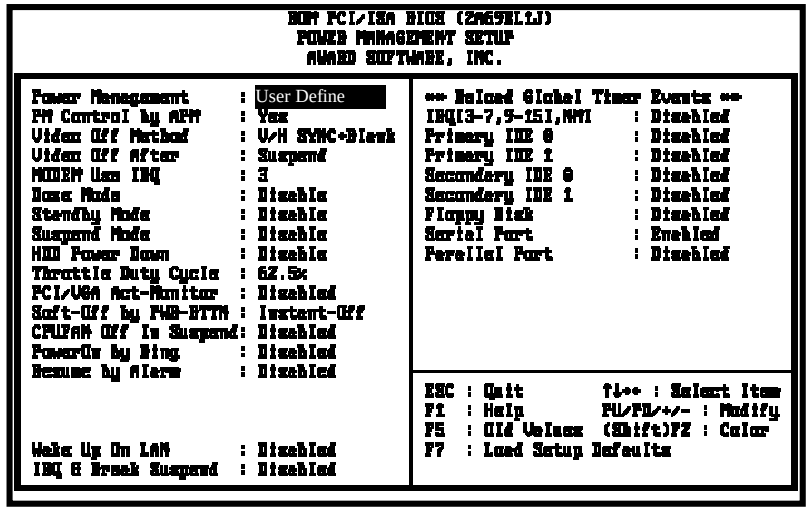
16 Bit I/O Recovery Time:
To define the recovery time from 1 to 4 for 16-bit I/O.

Memory Hole at 15M-16M: this field enable a memory hole in main memory space. CPU cycles matching an enabled hold are passed on to PCI note that a selected can not be changed while the L2 cache is enabled.
: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

Auto Detect DIMM/PCI CLK
:Disabled (default)
:Enabled

3-5 Power Management Setup



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

Video Off After:
: Suspend (default)
: Doze, NA, Standby

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

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

PowerOn by Ring
:Disabled(default)
:Enabled: modem ring on function--- system can be turned on through modem.

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

Resume by Alarm: 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.

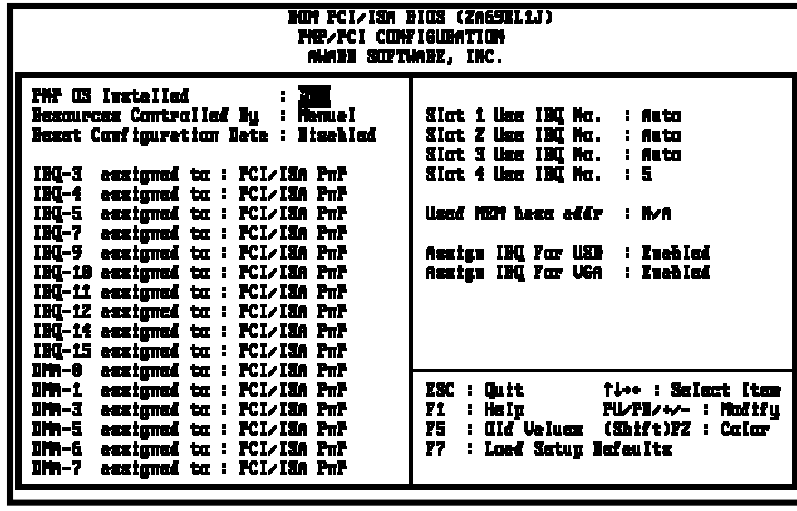
Note: this function only works when the system is turned off in Windows mode, and doze mode will not function.

Wake Up On LAN
:Enabled
:Disable (default)

To support functions such as "Wake up on LAN," "Keyboard Wake up," or "PS/2 Mouse Wake up," we suggest that Pin 17 signal 5VSB on ATX Power supply should be able to offer at least 750 mA driving ability.

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



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

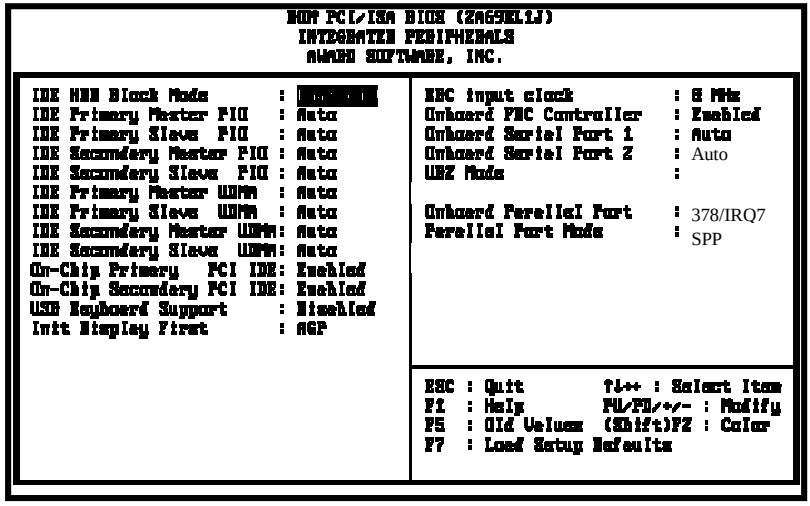
DMA-0 Assigned To--- DMA-7 Assigned To
: PCI/ISA PnP(default)
: Legacy ISA

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

Assign IRQ for USB
:Enable (default)
:Disable

Assign IRQ for VGA
:Enable (default)
:Disable

3-7 Integrated Peripherals



IDE HDD Block Mode
This feature enhances hard disk performance by making multi sector transfer instead of one sector per transfer. Most of IDE drivers, except very early designs ,can use this feature.
:Enabled (default)
:Disabled

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

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
This feature detects your secondary master hard disk device.
:**Auto** (default)
:Mode 0,1,2,3,4

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

USB Keyboard support
:Enabled
:Disabled (default)

Onboard FDC Controller
: Enabled (default)
: Disabled

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

On-Board Serial Port 2
: 3F8/IRQ4
: 2F8/IRQ3
: 3E8/IRQ4
: 2E8/IRQ3
: Auto (default)
: Disabled

Onboard Parallel Port
: 378/IRQ7 (default)
: 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

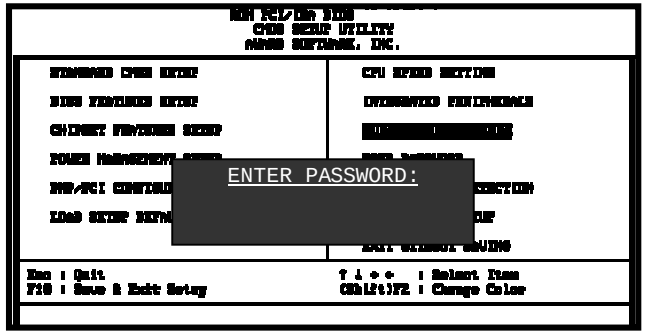
The "Supervisor/User Password setting" utility sets the security protection. There are two kinds of password functions in the setup menu : one is “Supervisor Password,” and the other is “User Password.” Their difference is:

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

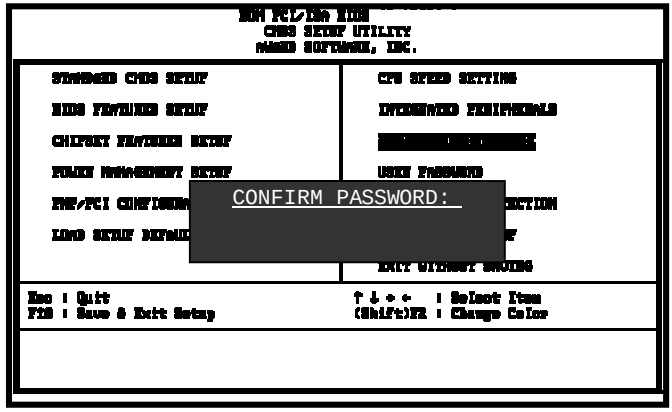
User Password: this function only allows you to enter the setup menu but not to change the options of the setup menu except “USER PASSWORD,” “SAVE & EXIT SETUP,” and “EXIT WITHOUT SAVING.”

1. How to set “Supervisor Password” & “User Password”
The setup of “Supervisor Password” and “User Password” has the same steps.

Step 1: Enter Password --Press <Enter> after appointing the password.



Step 2: **Confirm Password**
Typing the password again and pressing <**Enter**> .



If you forget password, please clear CMOS.
(refer to jumper RTC1)

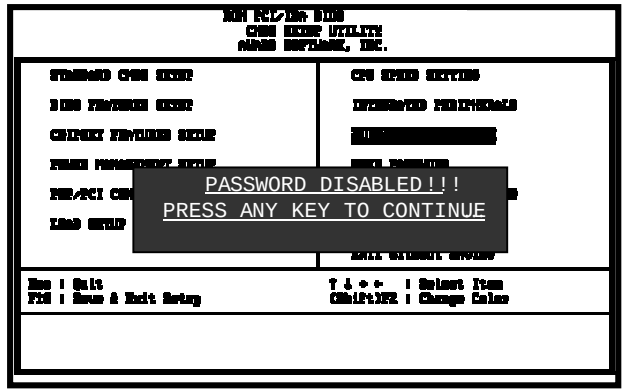
Step 3: Set “Security Option” in “BIOS Features Setup”

After setting password, enter “Security Option” in “BIOS Features Setup.” There are 2 options “Setup” & “System.” “Setup” will only secure CMOS setup through password. “System” is to secure PC sytem and password is required during system boot- up in addition to CMOS setup..

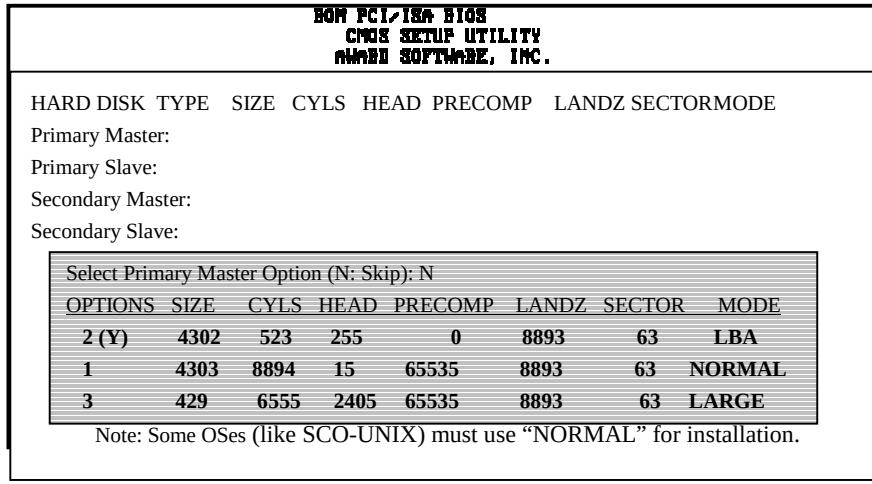
2. How to Disable “Supervisor Password” & “User Password”

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

Setp 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.” Thus, press any key as instructed to disable the 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. You don't need the **"IDE HDD Auto 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!

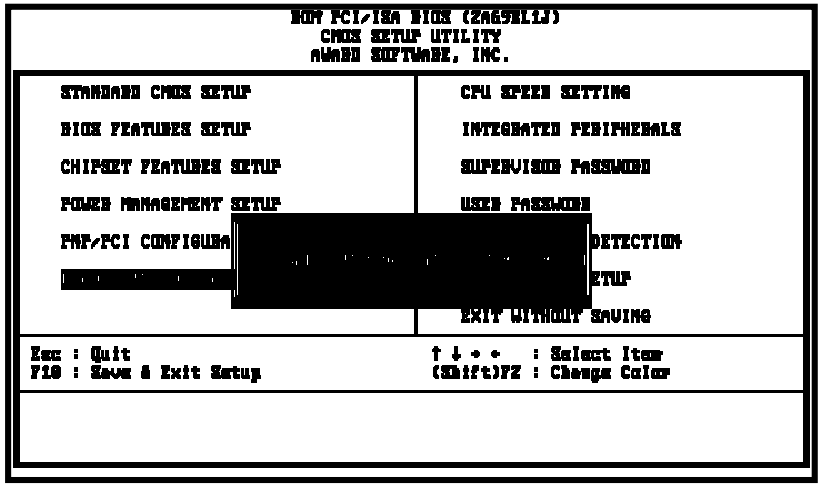
4. Maximum HDD Size:

	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 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.

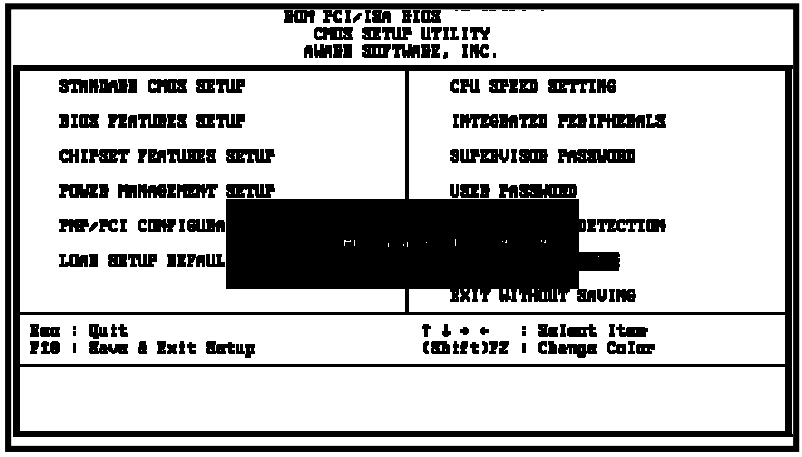
3-10 Load Setup Defaults



"**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

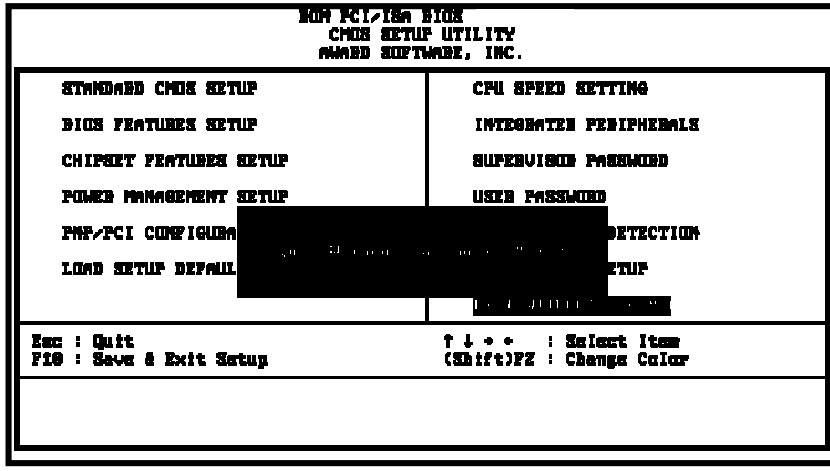
3-11 Save & Exit Setup

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

1. NMI: non-maskable interrupt

2. IRQ(H/W):
0 system timer interrupt from timer 0
1. 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

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 Type Drive Type Byte
12	Hard Disk Type Byte
13	Reserved
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
33	Information Flag
34-3F	Reserved
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

Type	Cylinder	Heads	Write Pre-comp	Landing Zone	Sectors	Size
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	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)

I/O Address (HEX)	**I/O device**
36C - 36F	Reserved
378 - 37F	Parallel Printer Port 1

I/O Address (HEX)	**I/O device**
380 - 38F	SDLC, Bisynchronous 2
390 - 393	Cluster
3A0 - 3AF	Bisynchronous 1
3B0 - 3BF	Monochrome Display and Printer Adapter
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 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 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 Web-site Service

If you have any questions this manual may not help, such as updated BIOS, or any information you need regarding our products, please visit our web-site at

■http://www.lucky-star.com.tw

Website to bundle updated "XStore Pro" IDE driver
Updated drivers will be constantly provided at High Point's website. Lucky Star website is also linked to High Point.

■http://highpoint-tech.com