GA-6EX
PCI-ISA BUS
USER'S MANUAL

PENTIUM® II PROCESSOR MAINBOARD

FC CE

ISO 9002
ALL PRODUCTS MADE BY
CERTIFIED FACTORY

energy
EPA POLLUTION PREVENTER

FCC Compliance Statement:

This equipment has been tested and found to comply with limits for a Class B digital device , pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna

-Move the equipment away from the receiver

-Plug the equipment into an outlet on a circuit different from that to which the receiver is connected

-Consult the dealer or an experienced radio/television technician for additional suggestions

You are cautioned that any change or modifications to the equipment not expressly approve by the party responsible for compliance could void Your authority to operate such equipment.

This device complies with Part 15 of the FCC Rules. Operation is subjected to the following two conditions 1) this device may not cause harmful interference and 2) this device must accept any interference received, including interference that may cause undesired operation.

6EX

USER'S MANUAL

1. **System power on by PS/2 Mouse: If you are using ATX power supply, you are able to power on the system by double clicking any button of your PS/2 Mouse.**

2. **System power on by Keyboard: If your ATX power supply supports 720 mA 5V Stand-By function, you can choose to power on your system by entering password and then pressing the ENTER key from your keyboard.**

3. **Support 3 steps ACPI LED.**

4. **MODEM RING-ON. (COM B)**

5. **WAKE-UP ON LAN. (The ATX power supply supports larger than 600 mA 5V Stand-By current)**

Pentium® II Processor MAINBOARD

REV. 2.0 First Edition

R-02-01-080609

I. Quick Installation Guide :

CPU SPEED SETUP

The default system bus speed is 66.6MHz. The user can select the system bus speed (JP2, JP3, JP4) and change the DIP SWITCH (SW) selection to set up the CPU speed for 200 - 633MHz processor.

♦*The CPU speed must match with the frequency RATIO. It will cause system hanging up if the frequency RATIO is higher than CPU's.
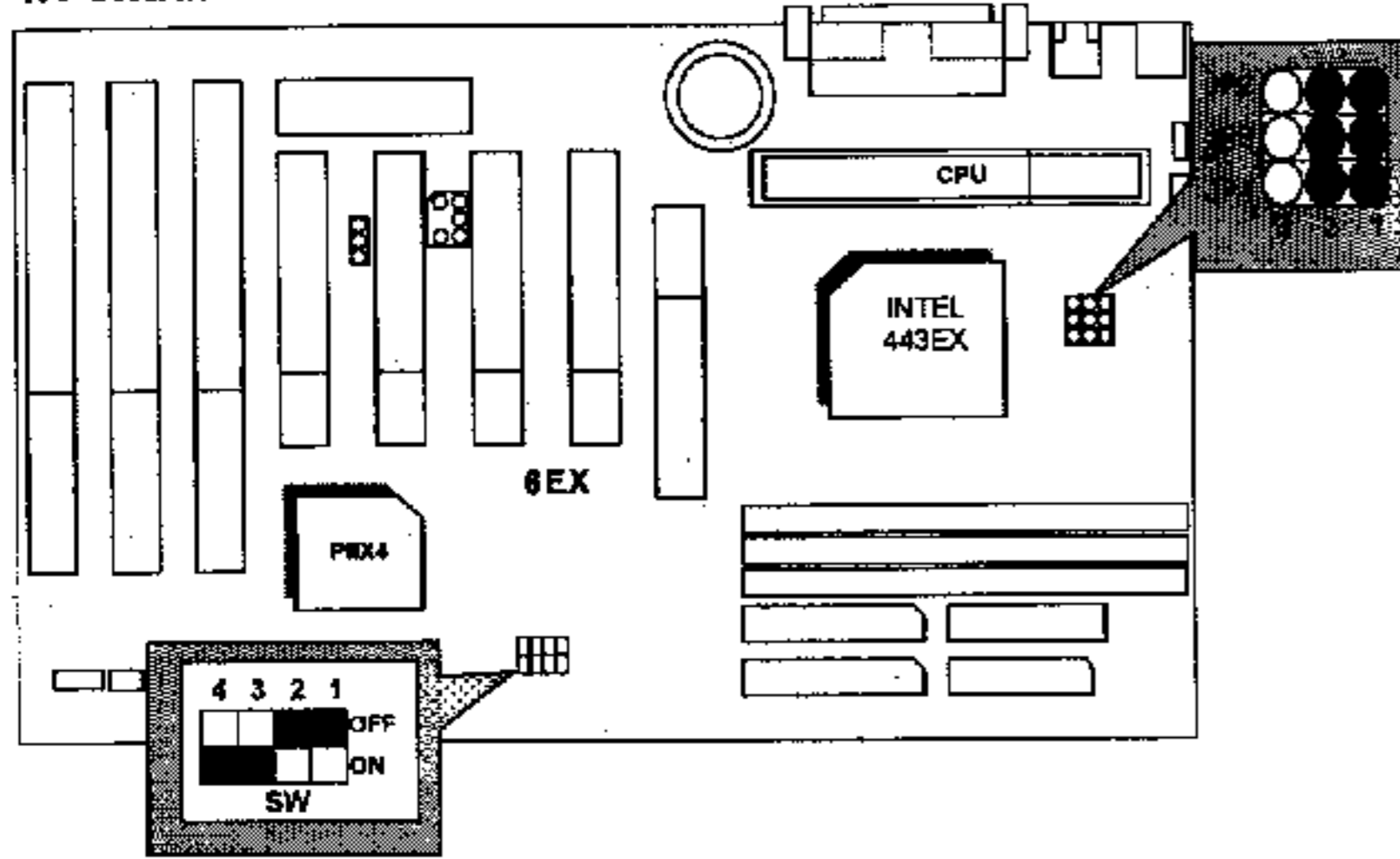
FREQ. RATIO	DIP SWITCH (SW)			
	SW1	SW2	SW3	SW4
X 3	ON	OFF	ON	ON
X 3.5	OFF	OFF	ON	ON
X 4	ON	ON	OFF	ON
X 4.5	OFF	ON	OFF	ON
X 5	ON	OFF	OFF	ON
X 5.5	OFF	OFF	OFF	ON

♦*JP2, JP3, JP4 (Select the system speed—66.6 / 75 / 83MHz)

MAIN CLOCK	JP4	JP3	JP2
66MHz	1-2	1-2	1-2
75MHz	1-2	2-3	1-2
83MHz	2-3	1-2	2-3

★Note: We don't recommend you to setup up your system speed up to 75 or 83MHz because they are not the standard spec. of peripherals. If you want to run 75 or 83 MHz in your system properly, it depends on your hardware configurations: CPU, SDRAM, Cards, etc.

The author assumes no responsibility for any errors or omissions which may appear in this document nor does it make a commitment to update the information contained herein.

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Sound Blaster is a registered trademark of Creative Technology Ltd in the United States and certain other countries. Sound Blaster-LINK and SB-LINK are trademarks of Creative Technology Ltd.

Jun 9, 1998 Taipei, Taiwan

1. Pentium® II 233 / 66MHz FSB

2. Pentium® II 266 / 66MHz FSB
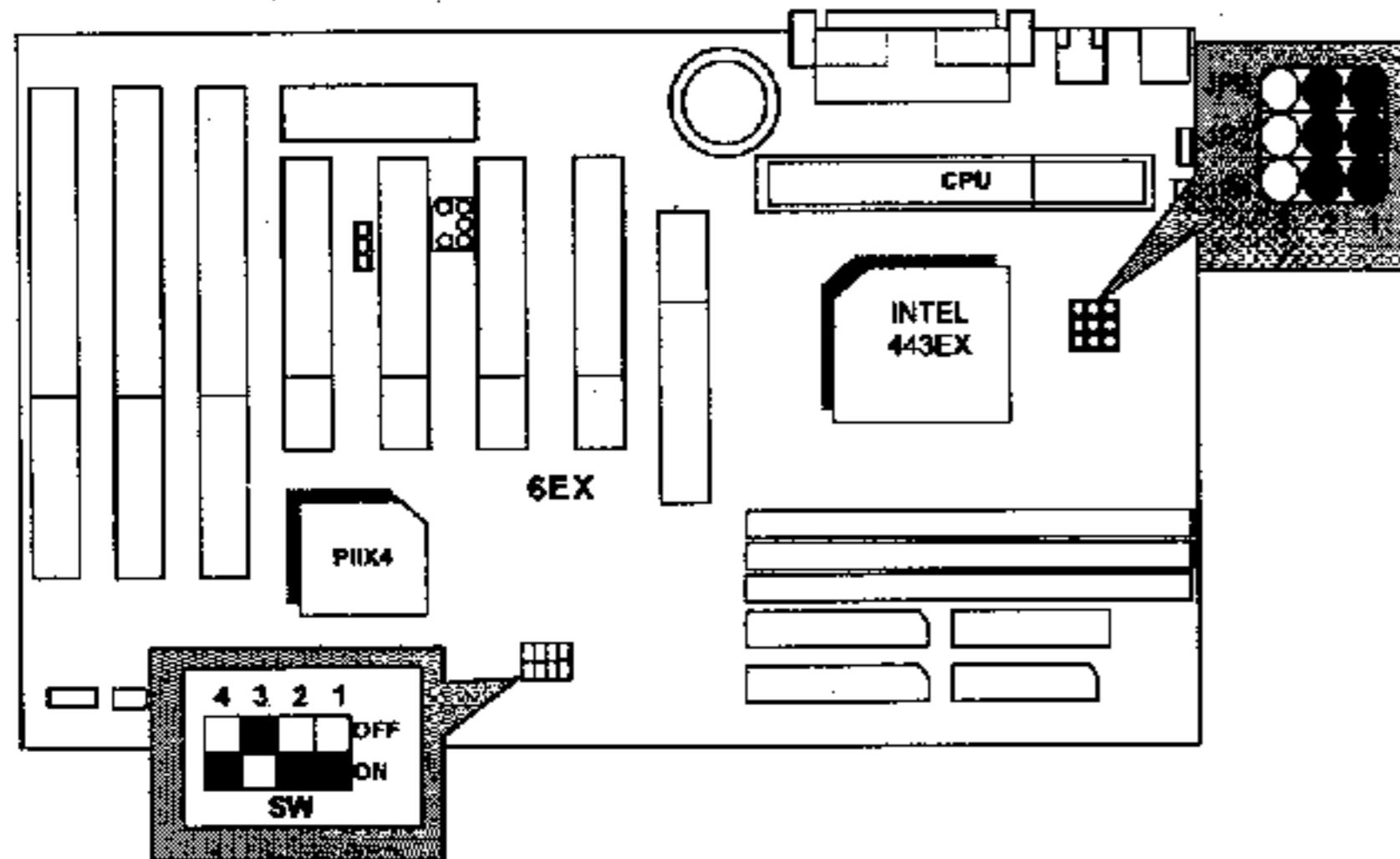
3. Pentium® II 300 / 66MHz FSB
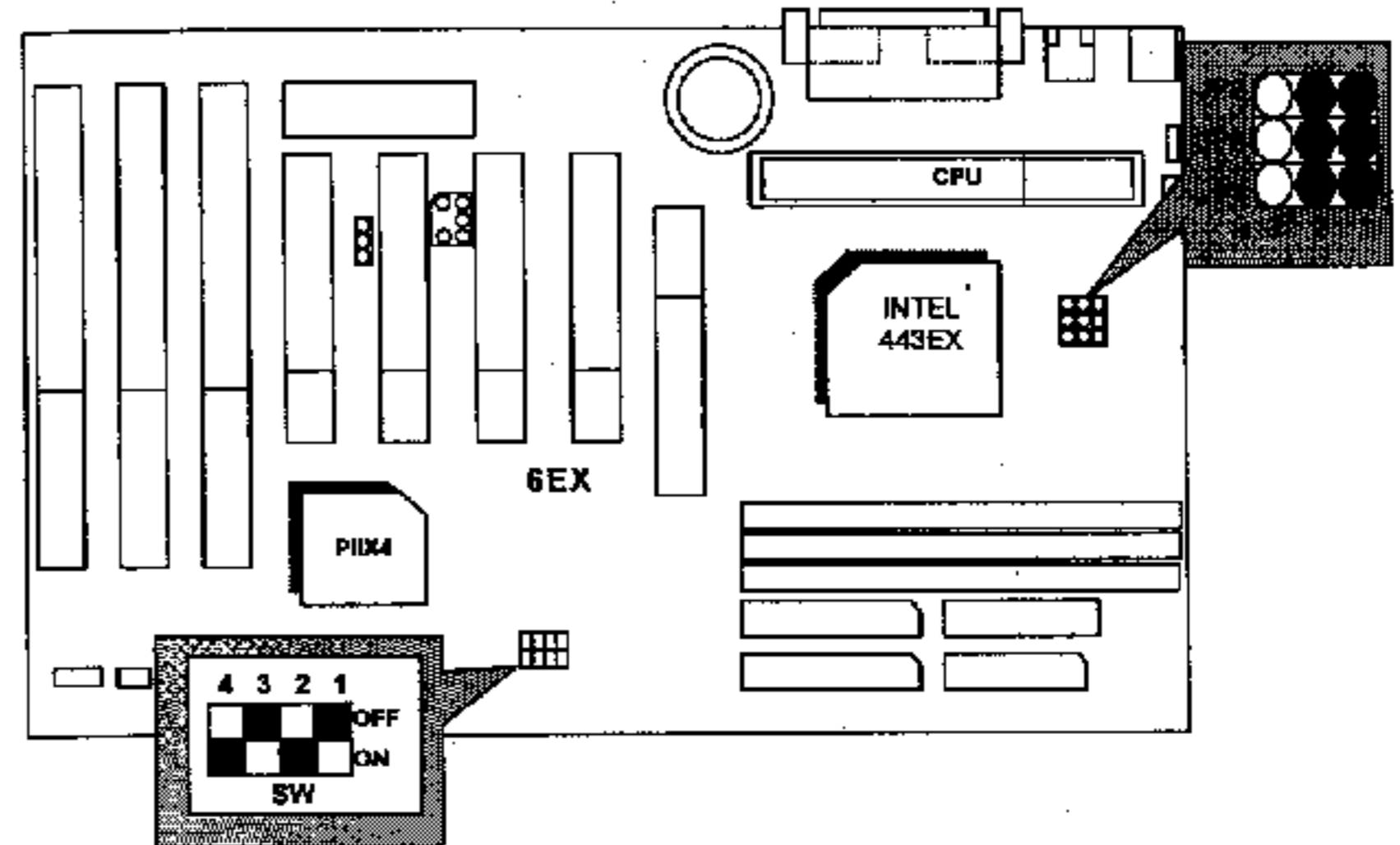
4. Pentium® II 333 / 66MHz FSB
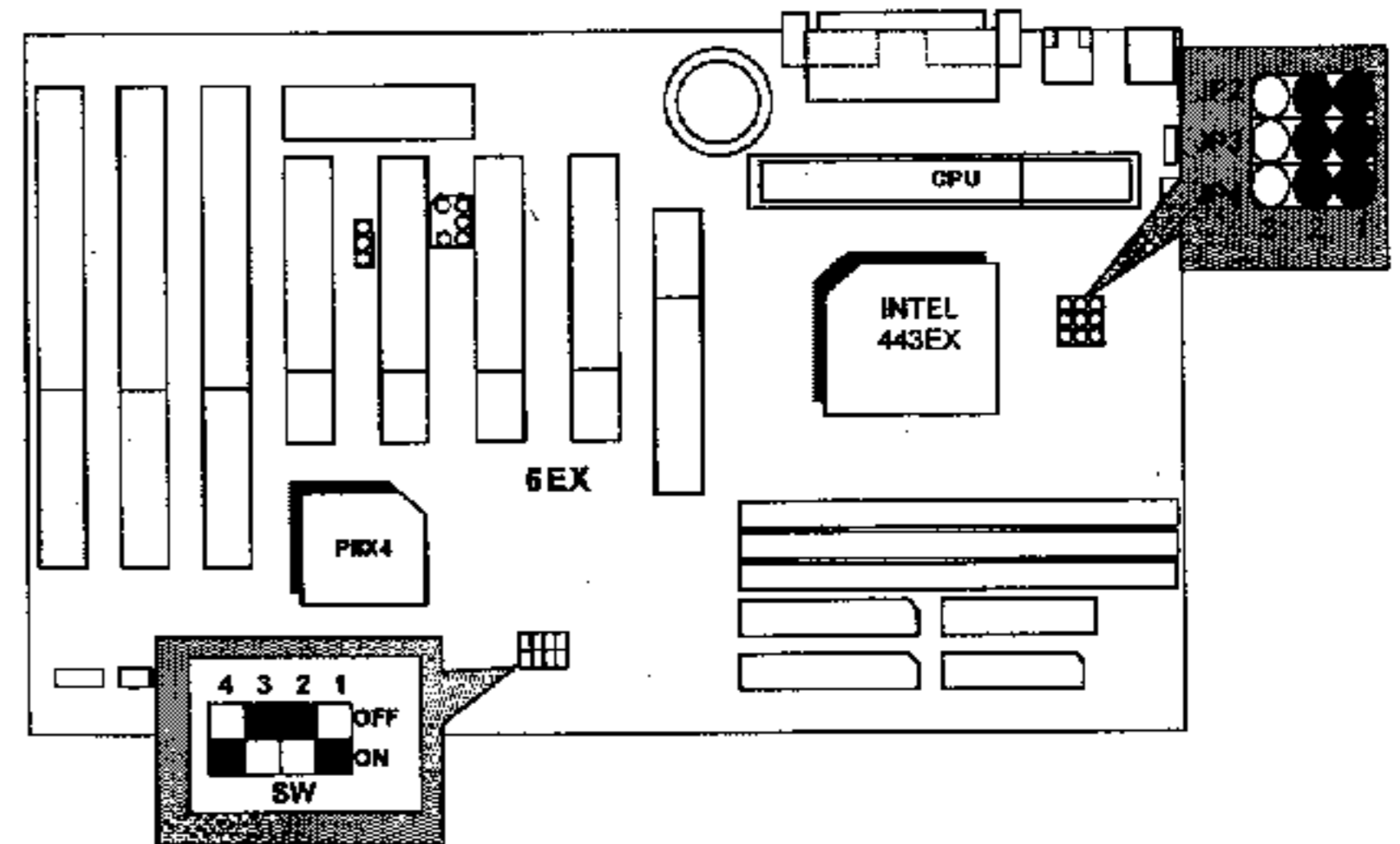
5. Pentium® II 366 / 66MHz FSB

4 3 2 1
OFF
ON
SW
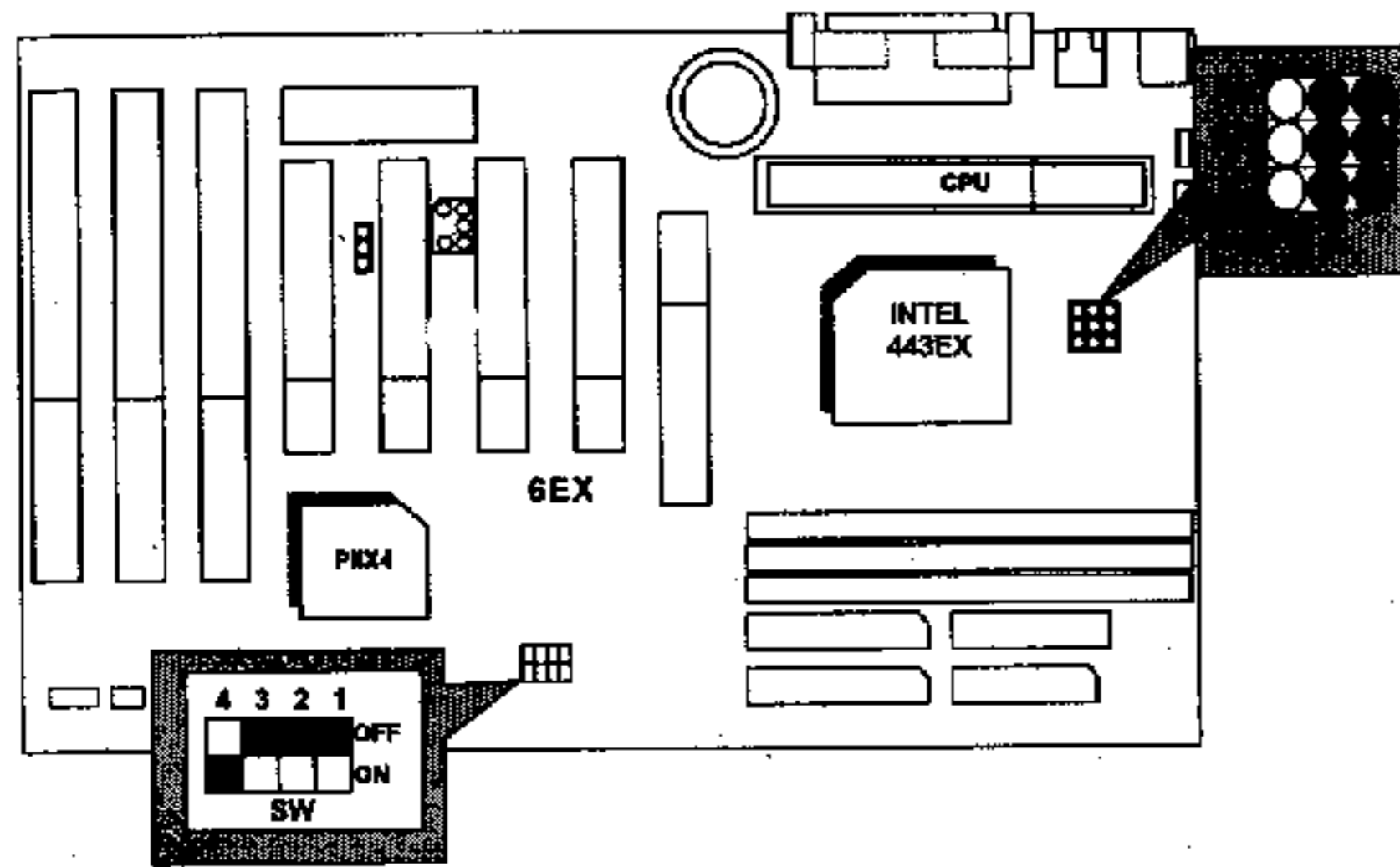
II. Jumper setting :

SPK : Speaker Connector

Pin No.	Function
1	VCC (+)
2	NC
3	NC
4	Data (-)

RST : Reset Switch

Open:
Normal operation

Short:
For Hardware
Reset System

PWR : Power LED

Pin No.	Function
1	LED anode (+)
2	LED cathode (-)
3	LED cathode (-)
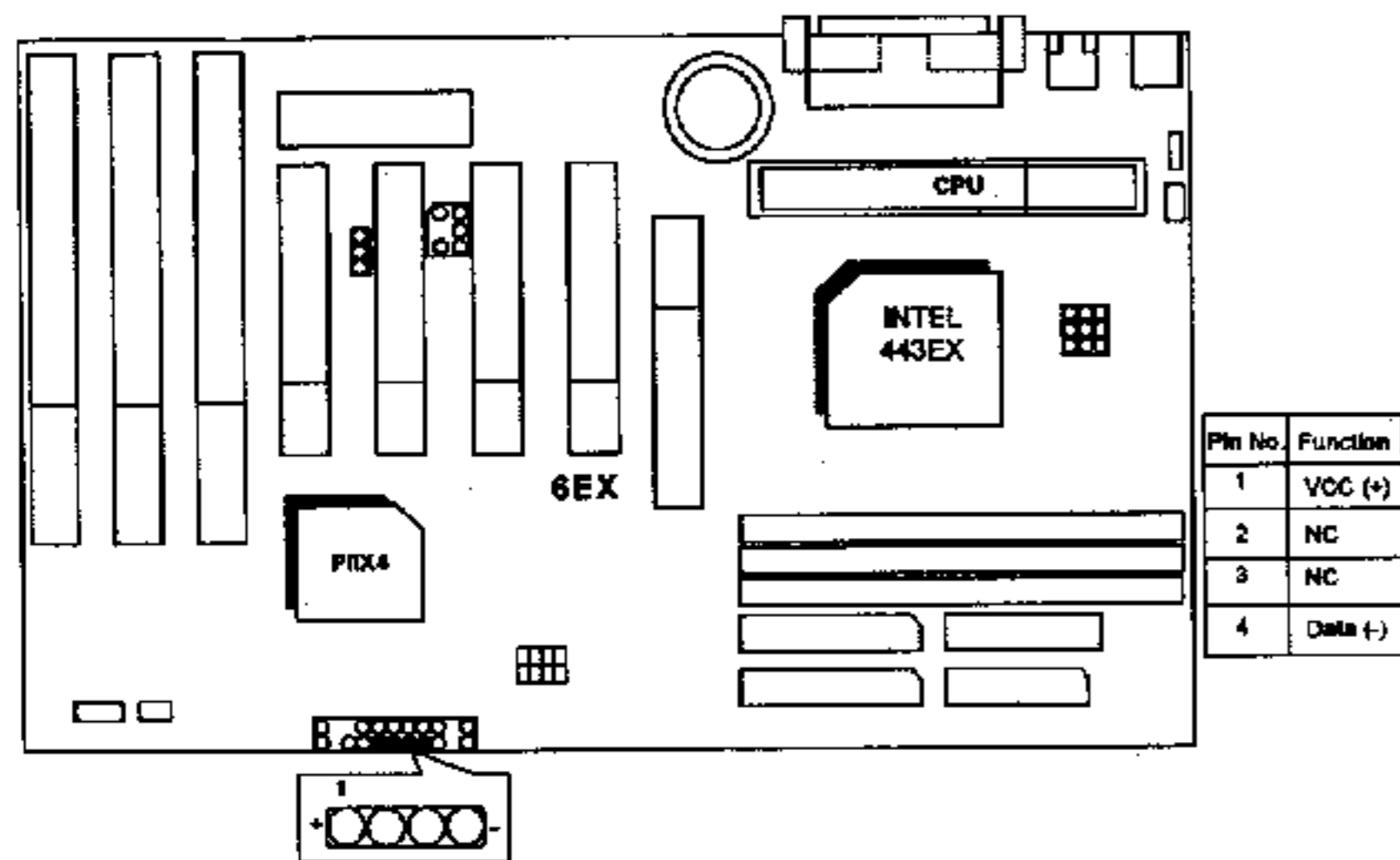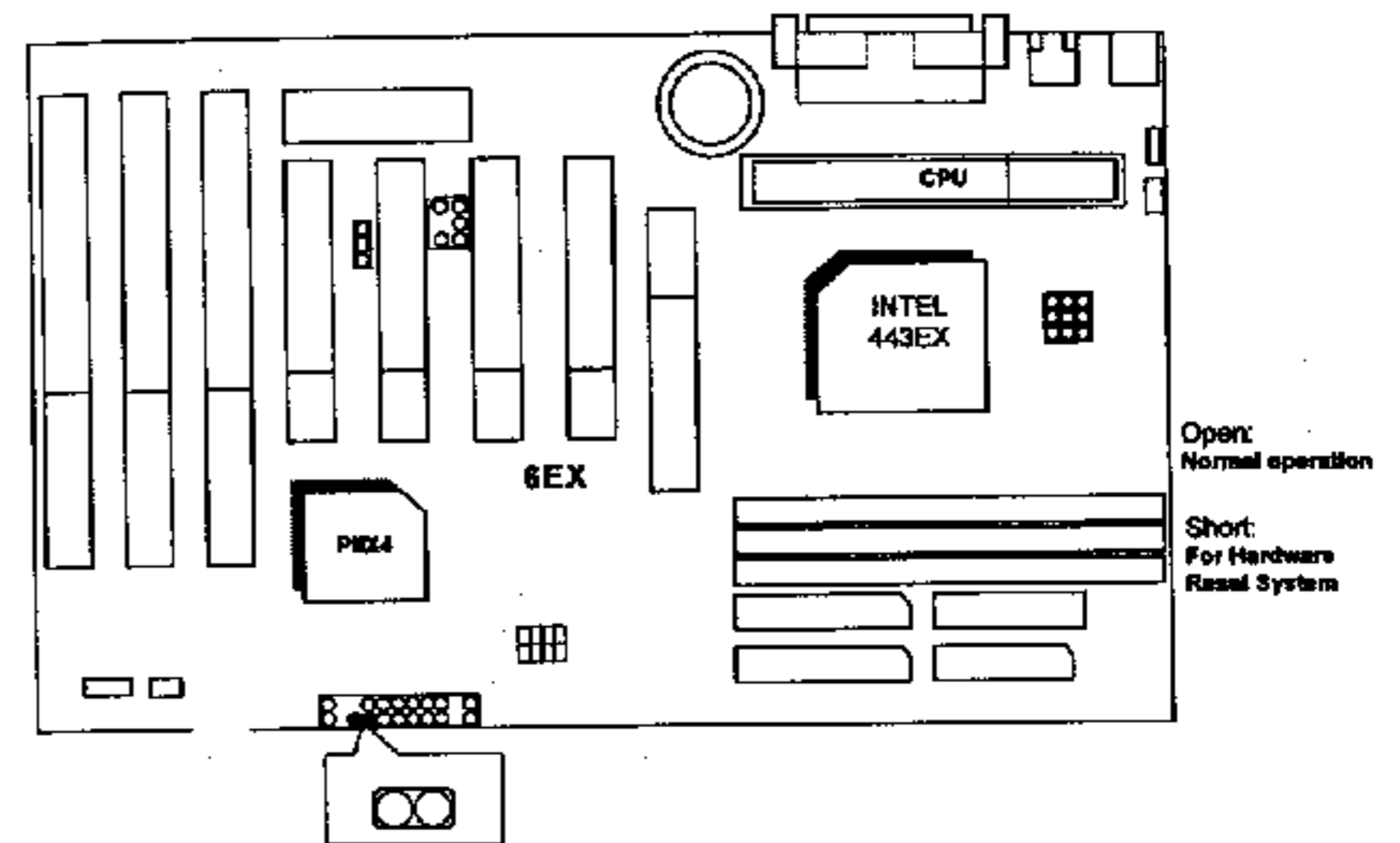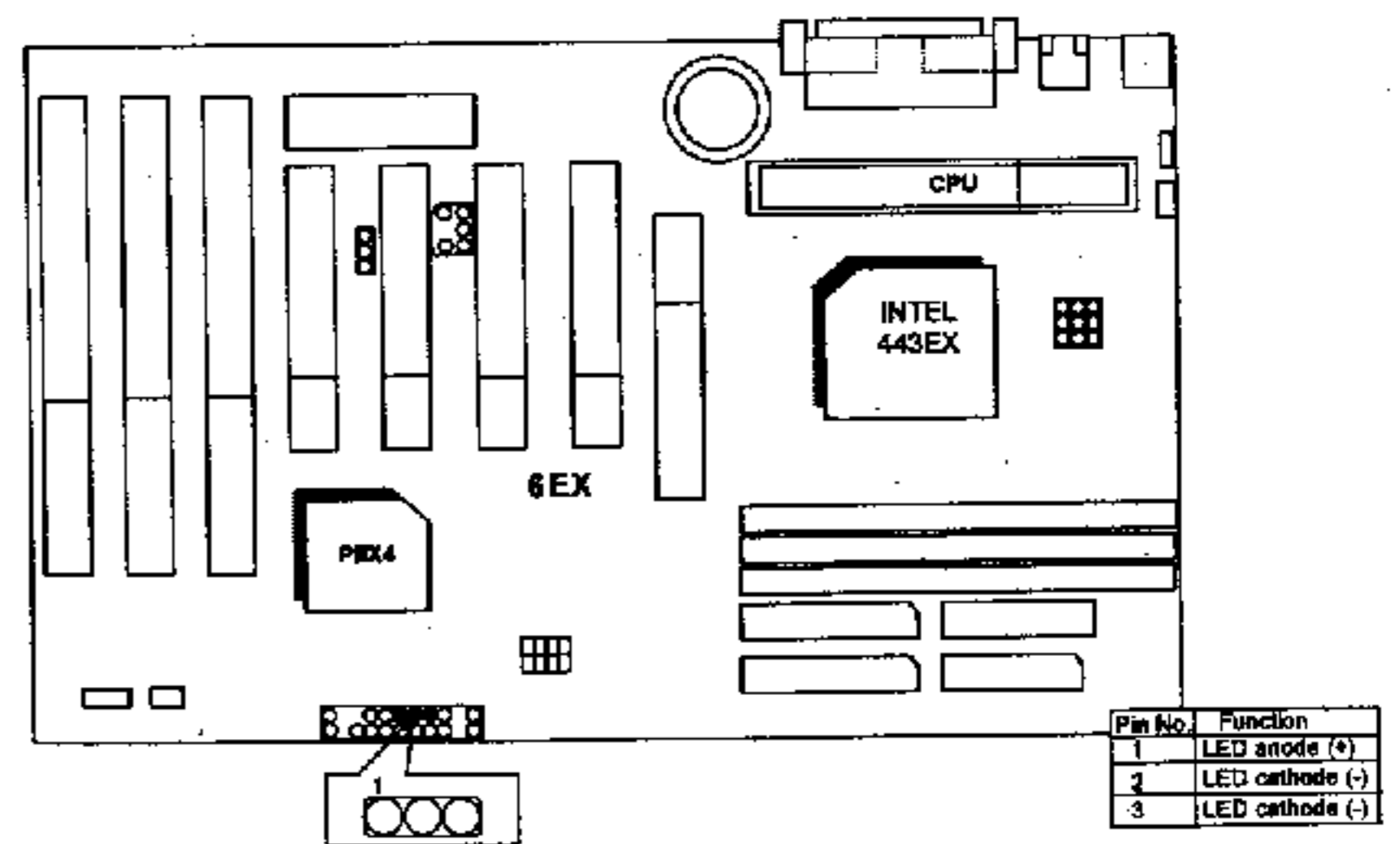
HD : IDE Hard Disk Active LED

Pin No.	Function
1	LED anode (+)
2	LED cathode (-)
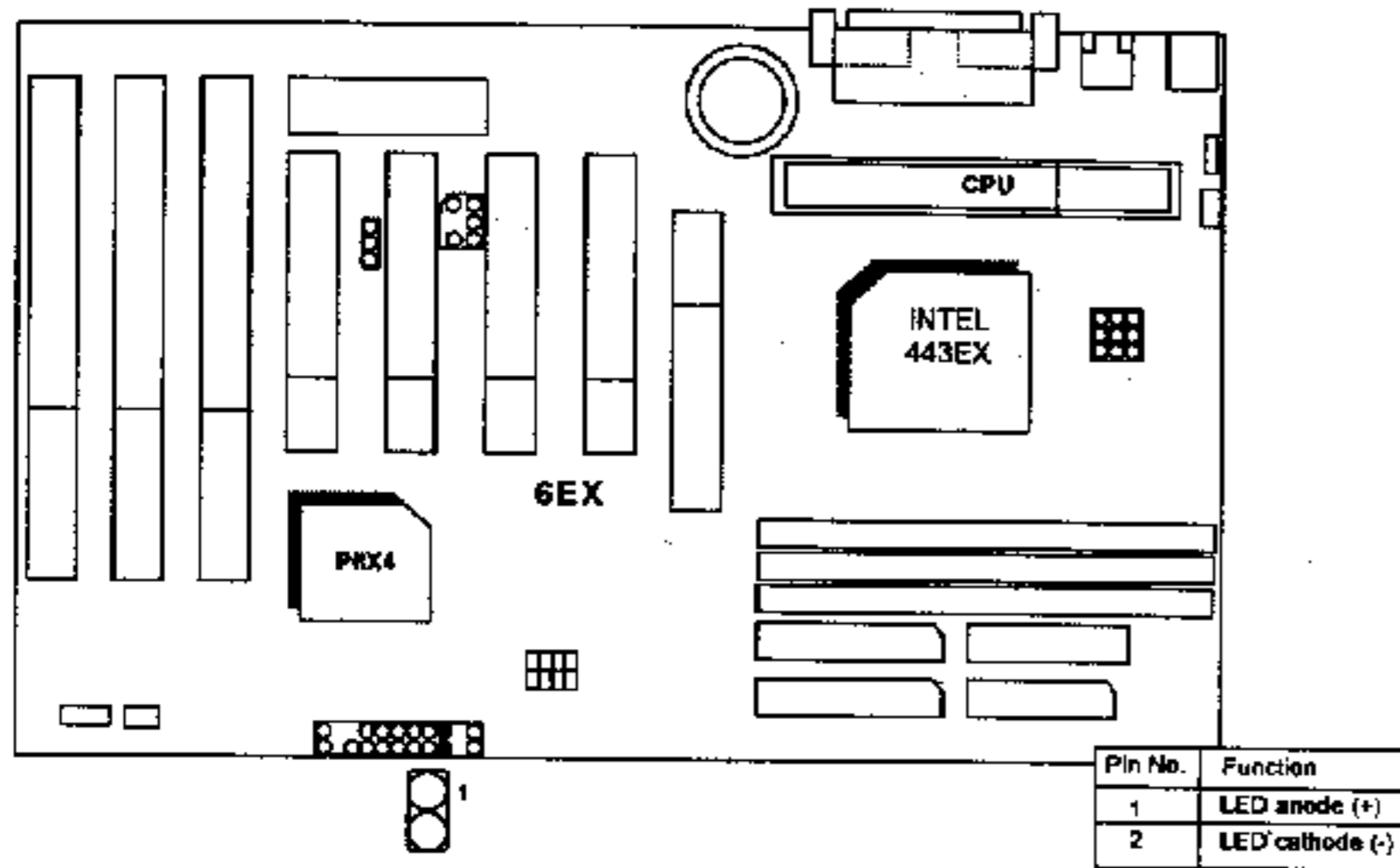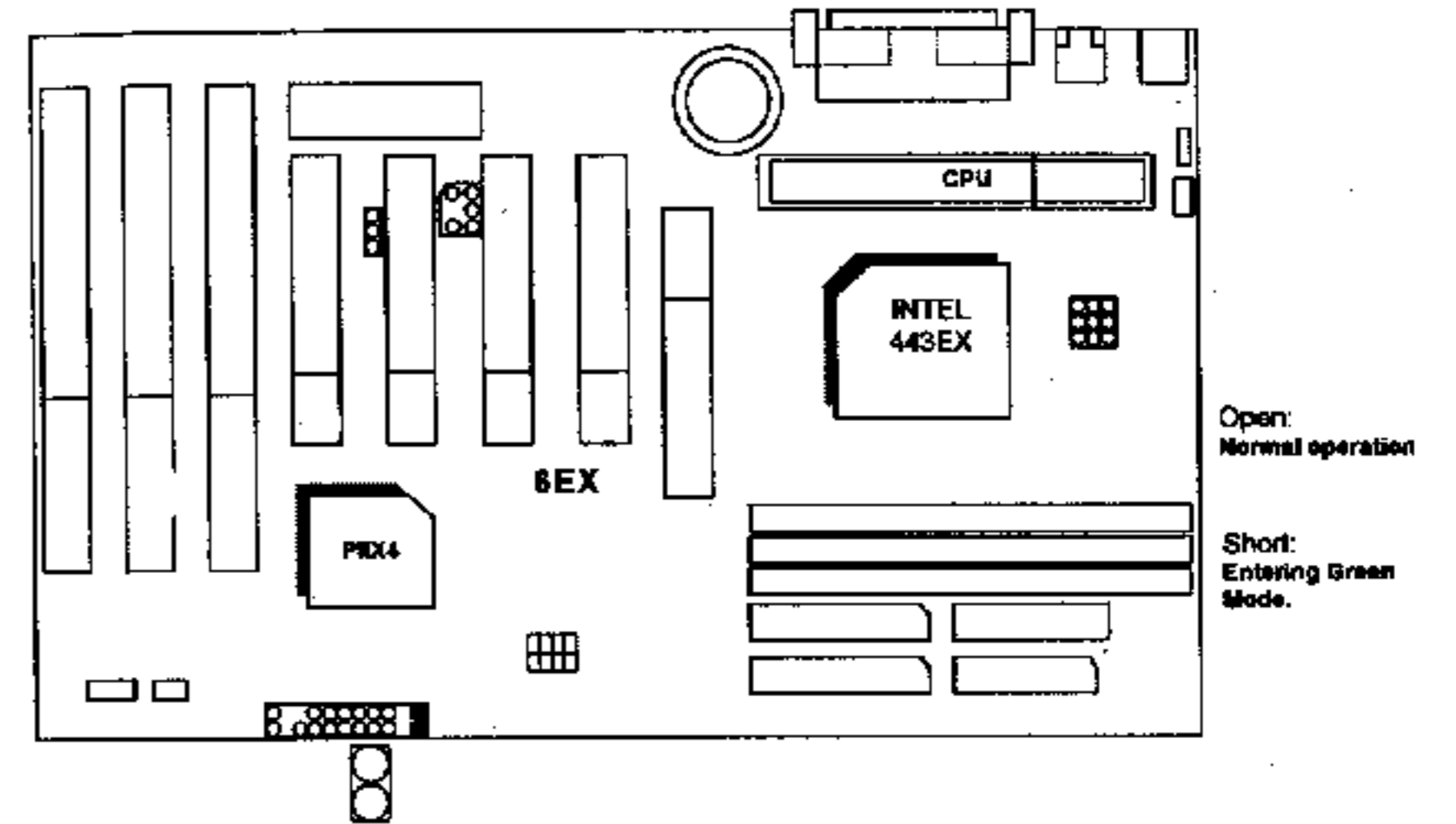
IR : Infrared Connector (Optional)

Pin No	Function
1	IR Data Output
2	GND
3	IR Data Input
4	NC
5	POWER (+)

GN : Green Function Switch

Open:
Normal operation

Short:
Entering Green
Mode.

GD : Green LED

PIN1:LED
Anode (+)

PIN2:LED
Cathode(-)
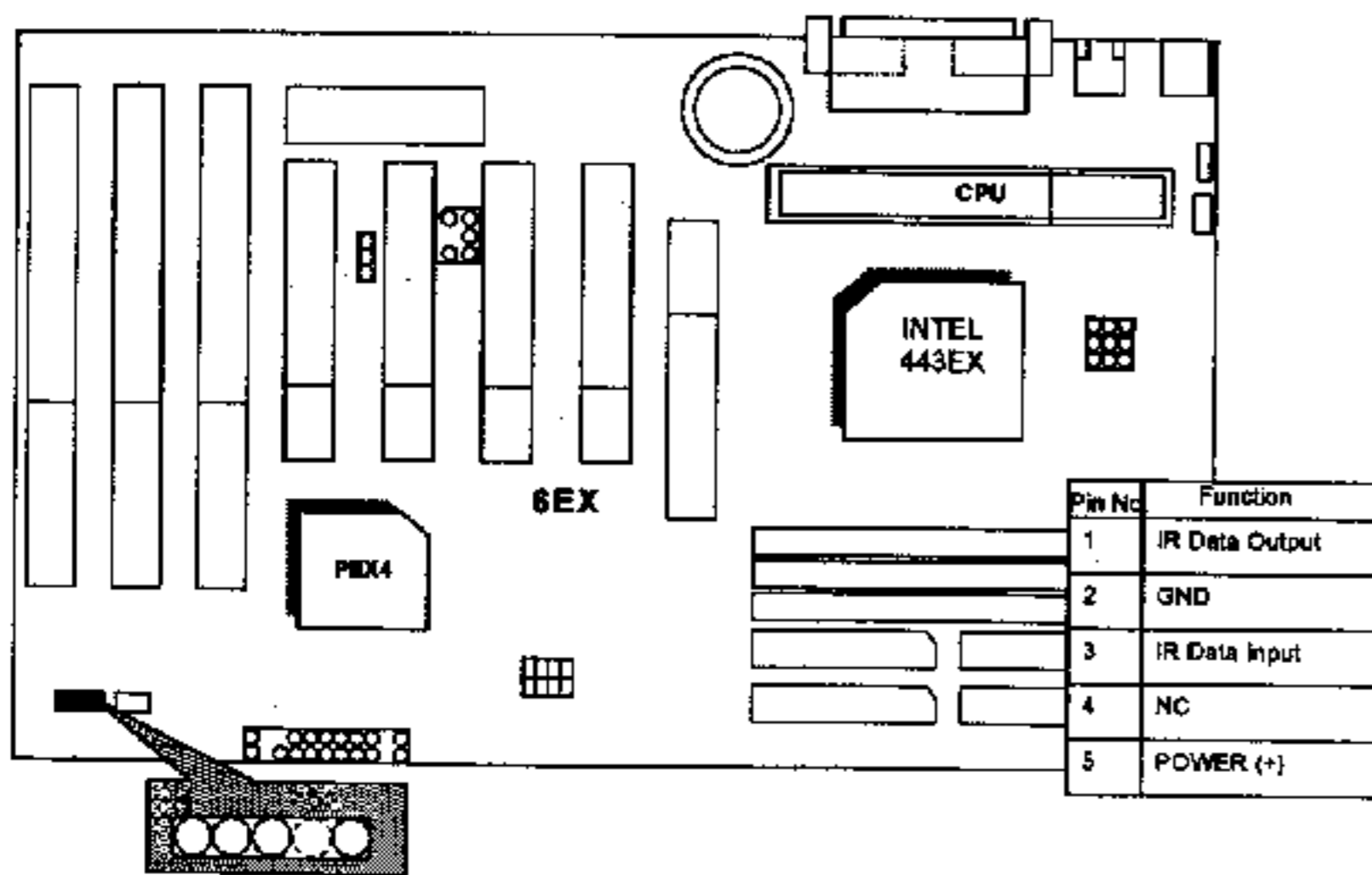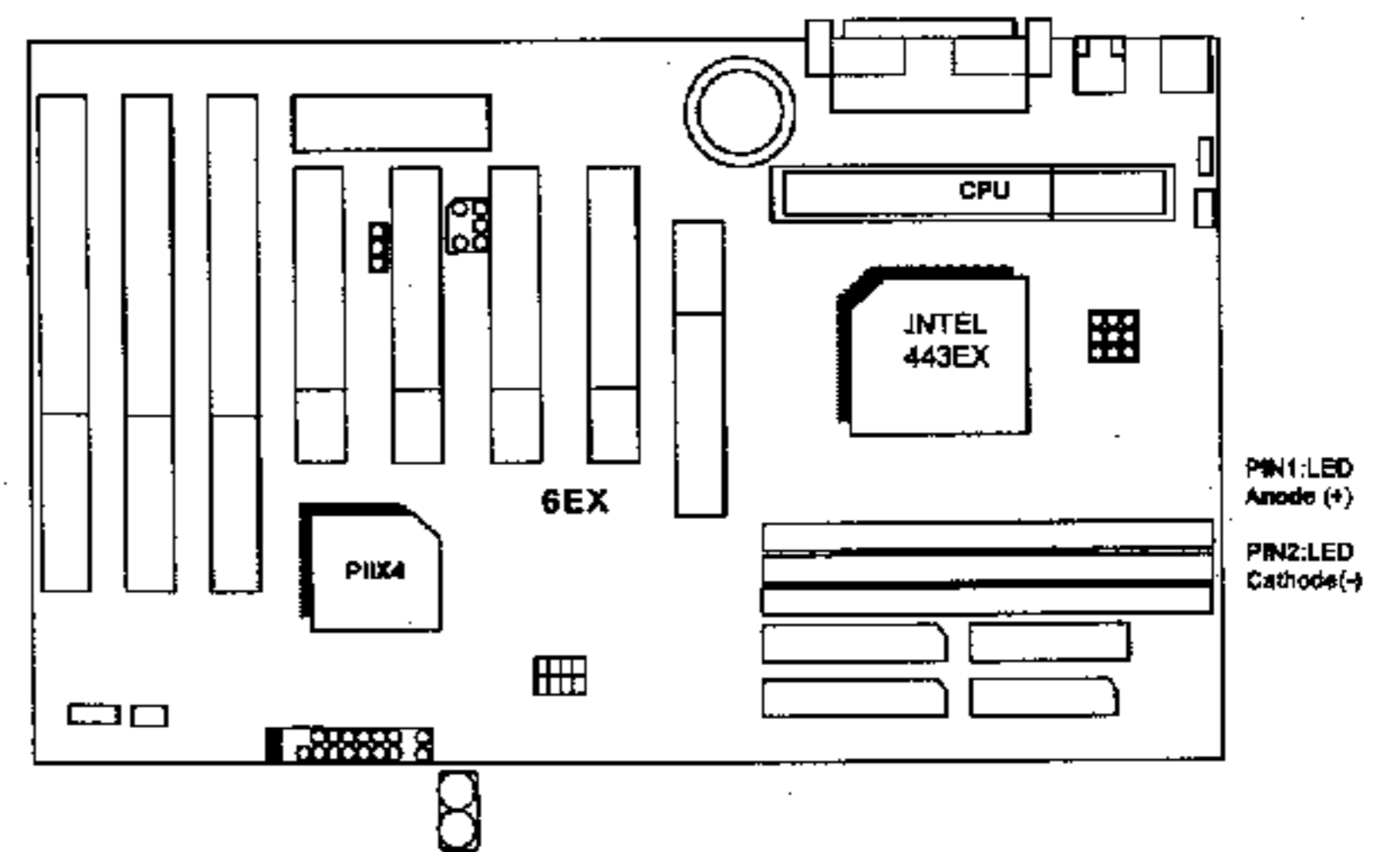
Soft PWR : Soft Power Connector

Open:
Normal
operation

Short:
Power On/Off
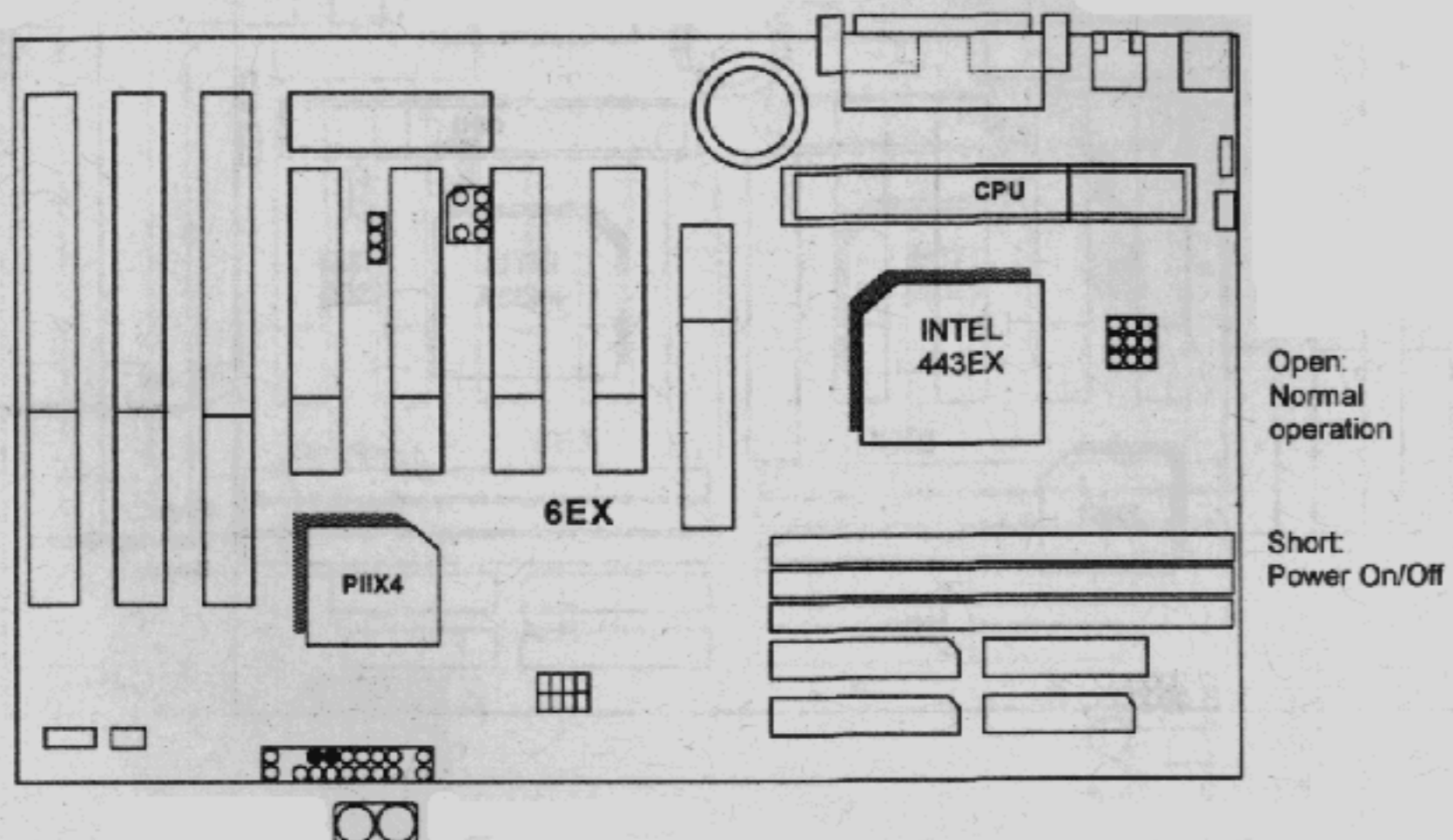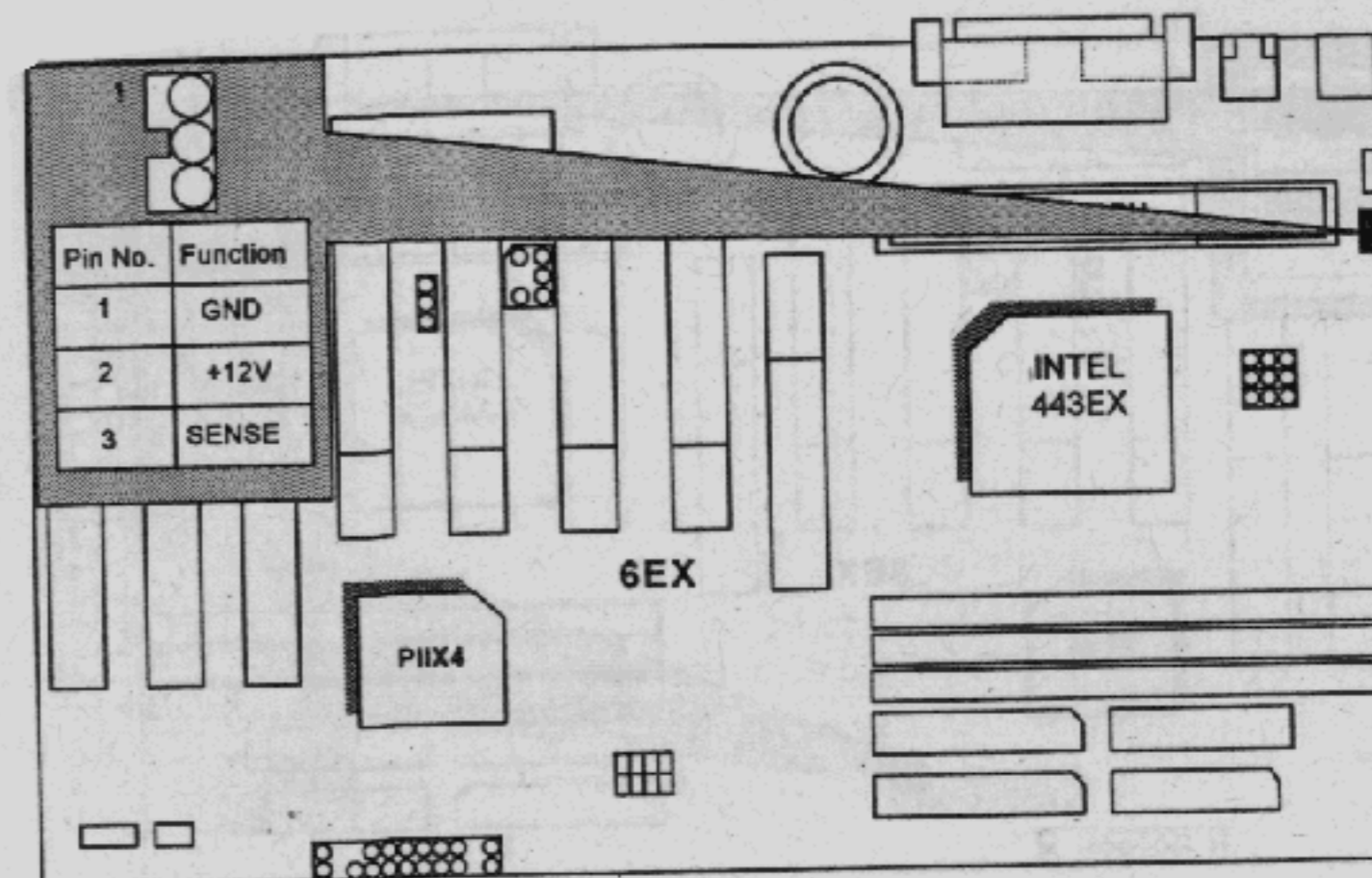
POWER : ATX Power Connector

Pin No.	Function
3,5,7 13,15-17	GND
4-6,18,20	VCC (+5V)
10	+12V
12	-12V
18	-5V
8	Power Good
9	5V SB (Stand by +5V)
14	PS-ON (Soft ON/OFF)

FAN PWR : CPU Cooling Fan Power Connector

Pin No.	Function
1	GND
2	+12V
3	SENSE
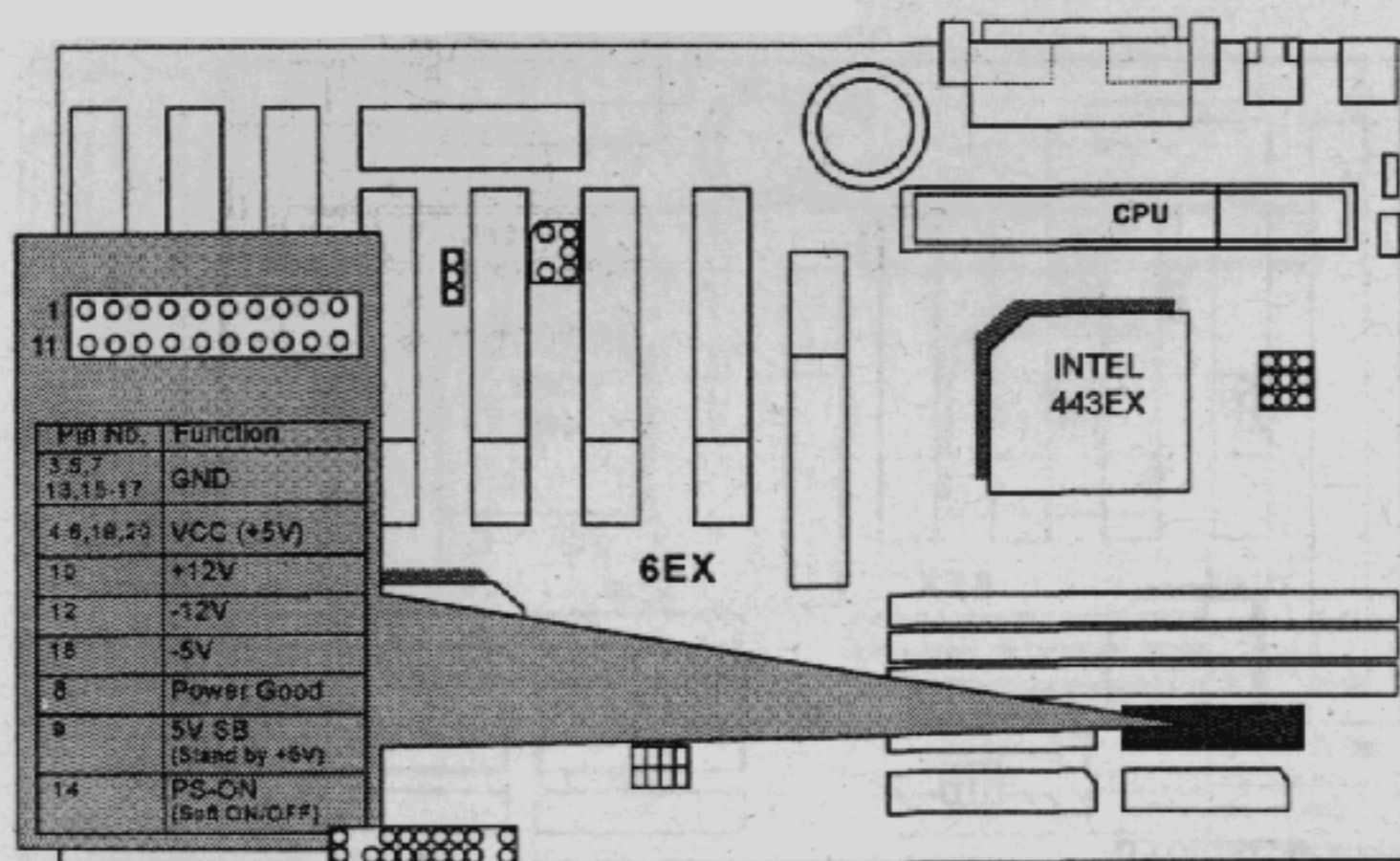
J2: Keyboard Connector & PS/2 Mouse

Pin No	PS/2 Mouse PS/2 Keyboard Function
1	Data
2	NC
3	GND
4	VCC(+5)
5	Clock
6	NC
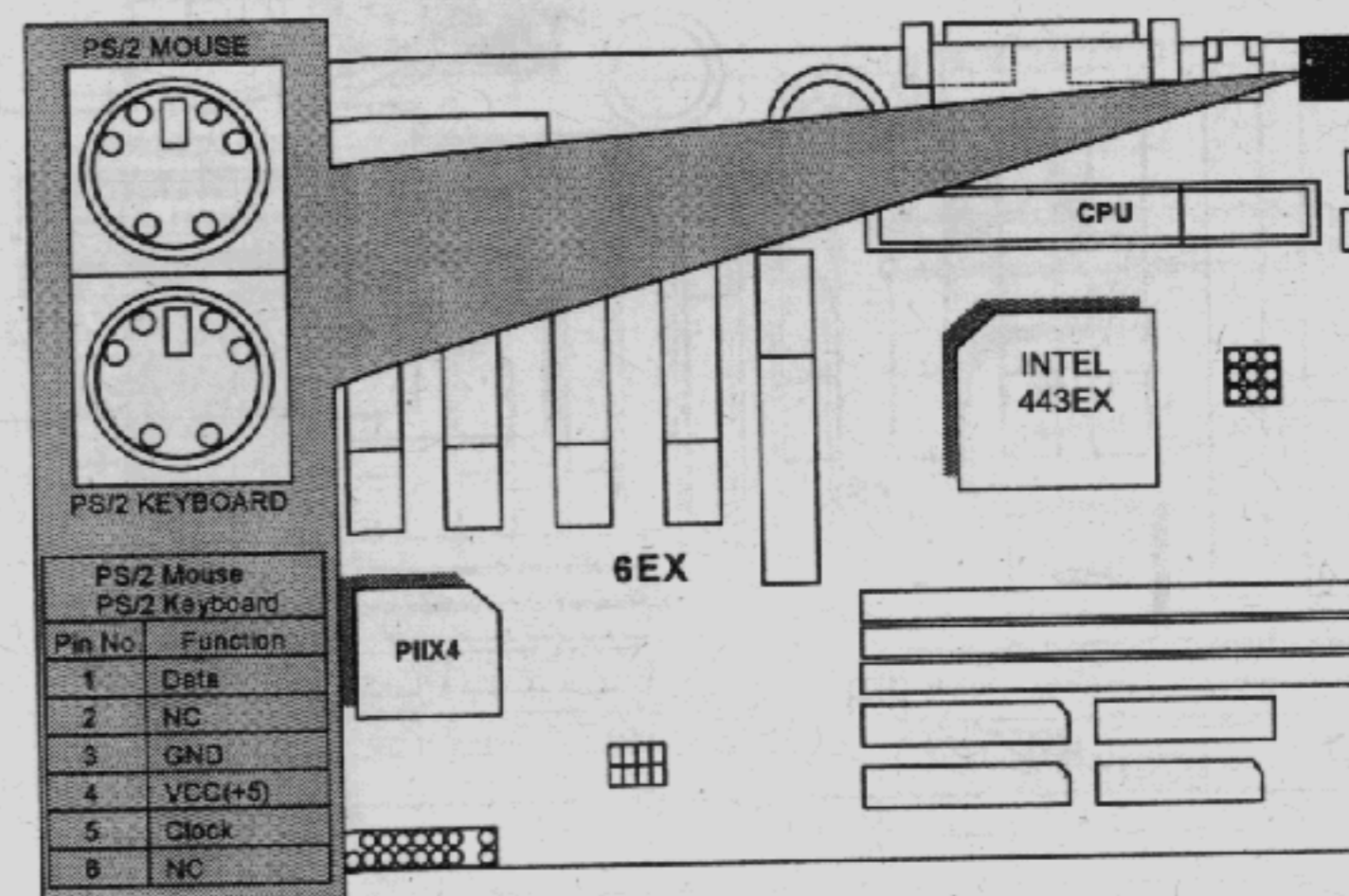
USB Port
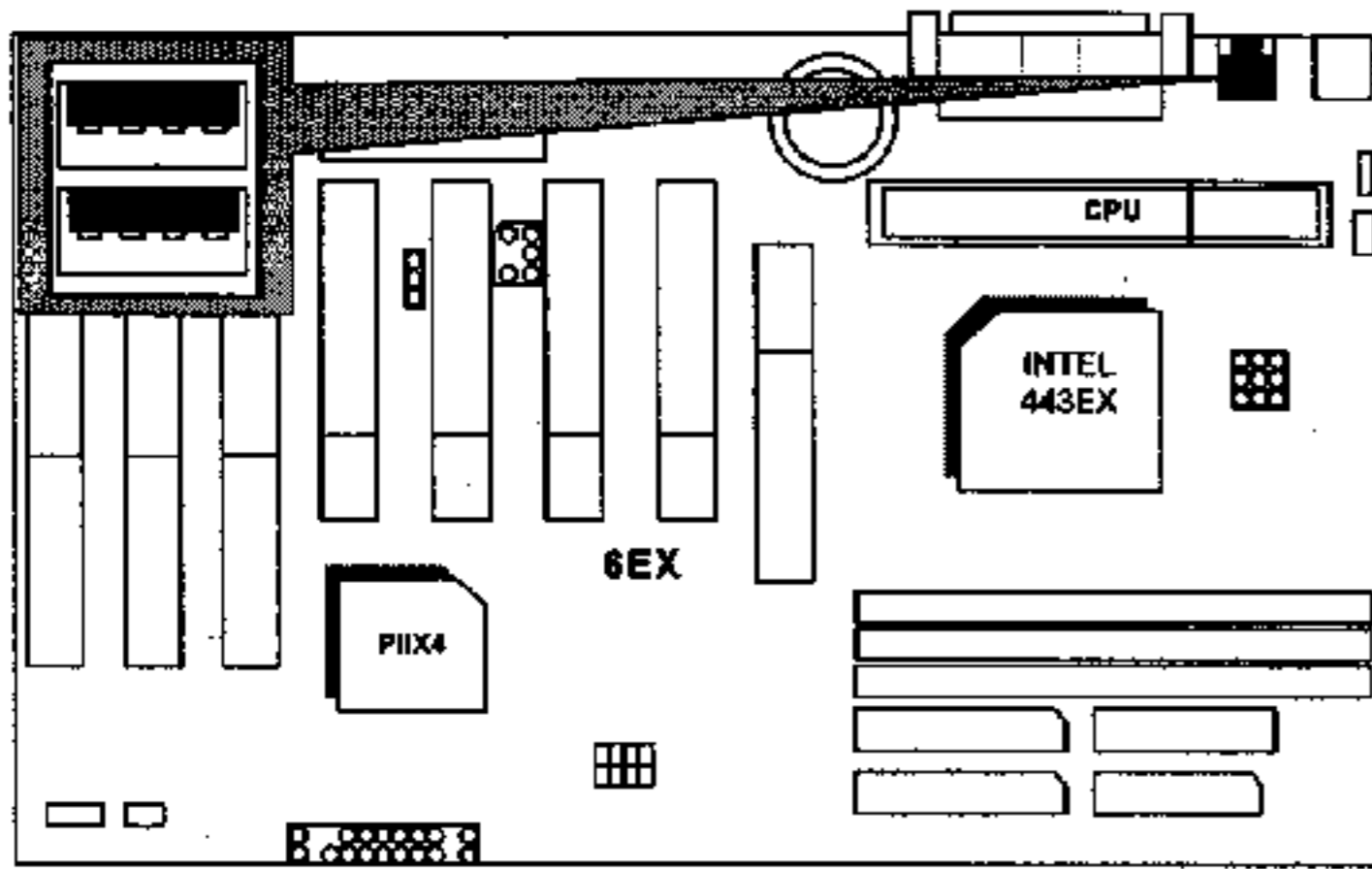
IDE1: Primary IDE port
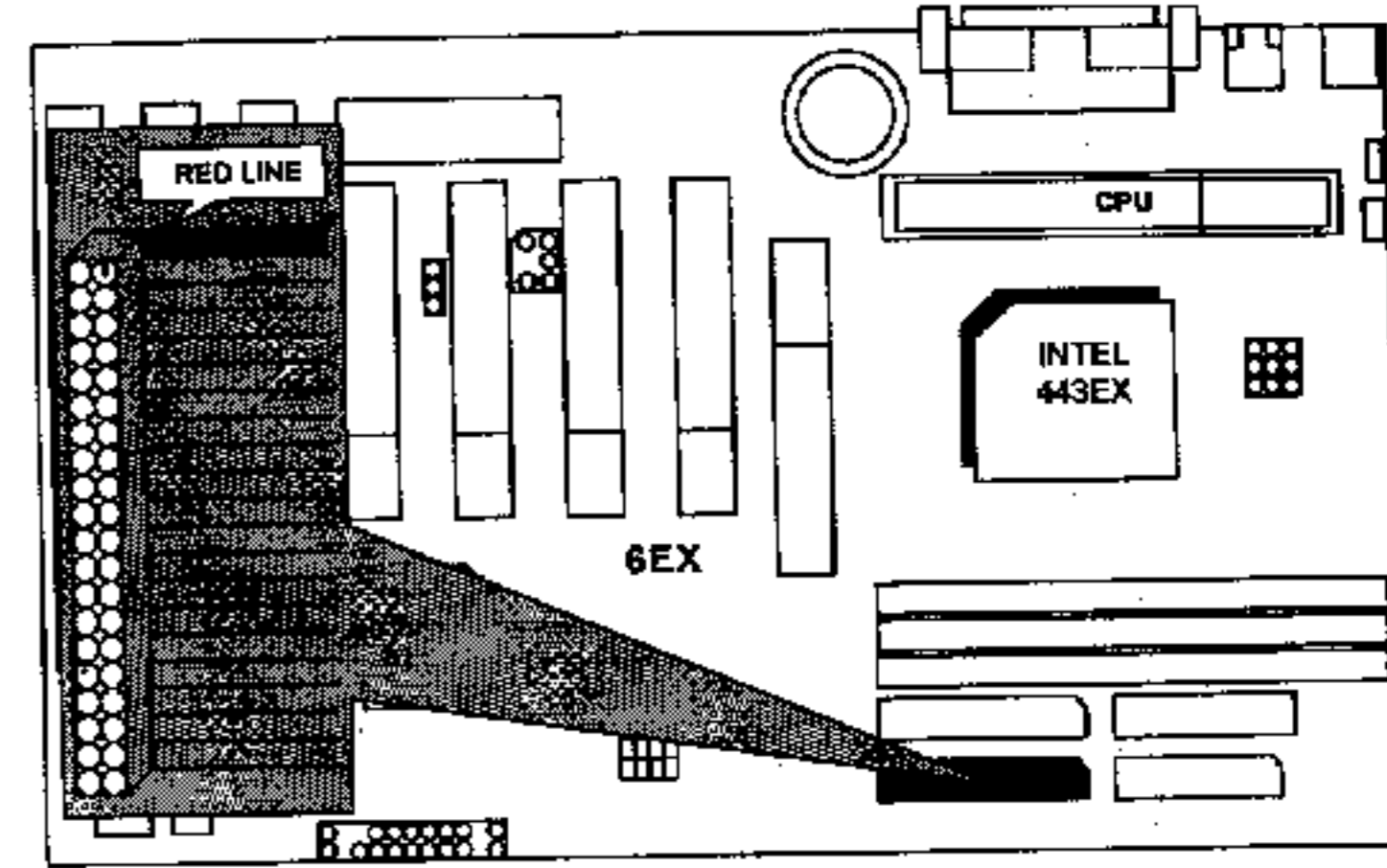
LPT PORT / COM A / COM B
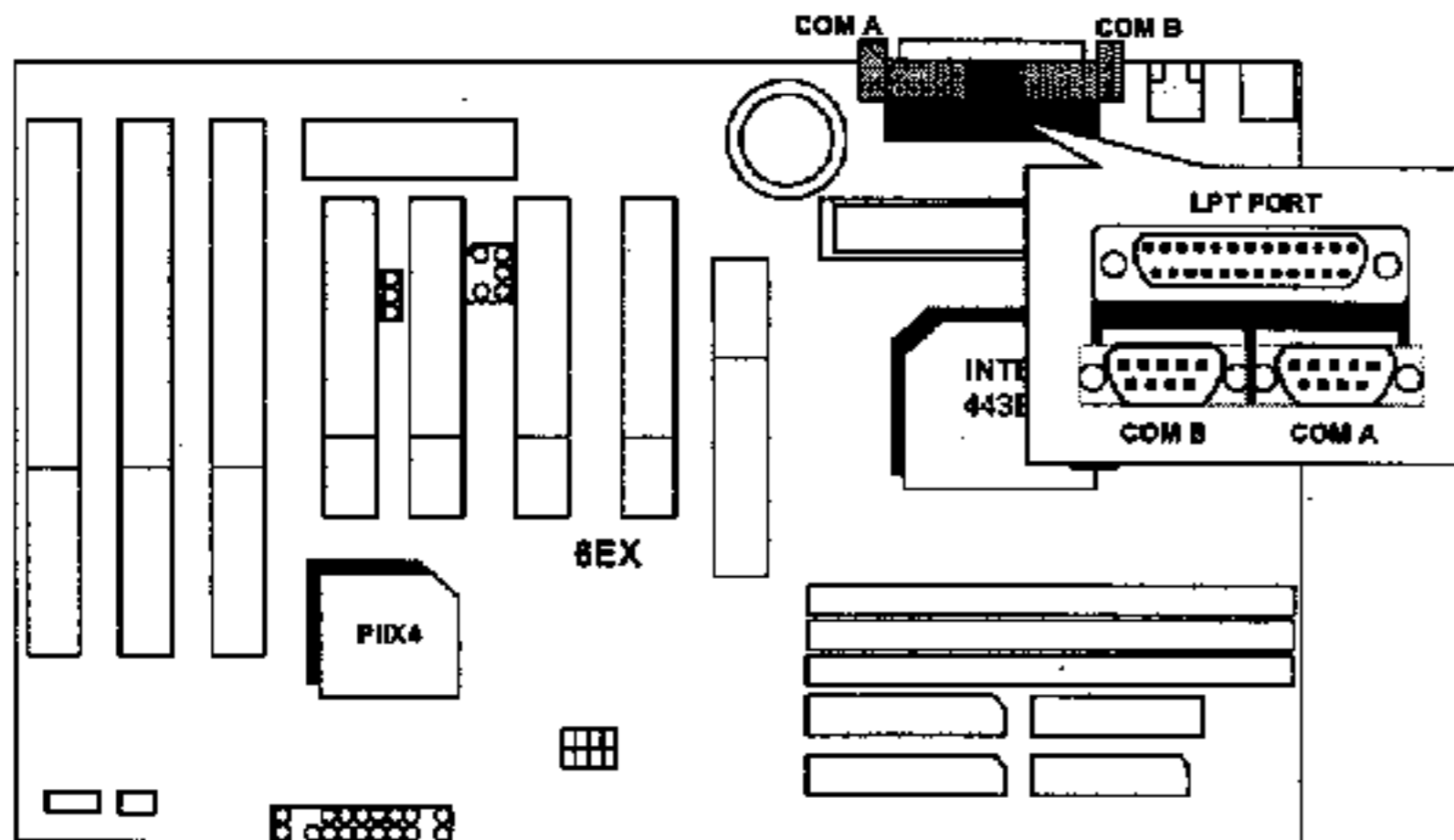
IDE2: Secondary IDE port
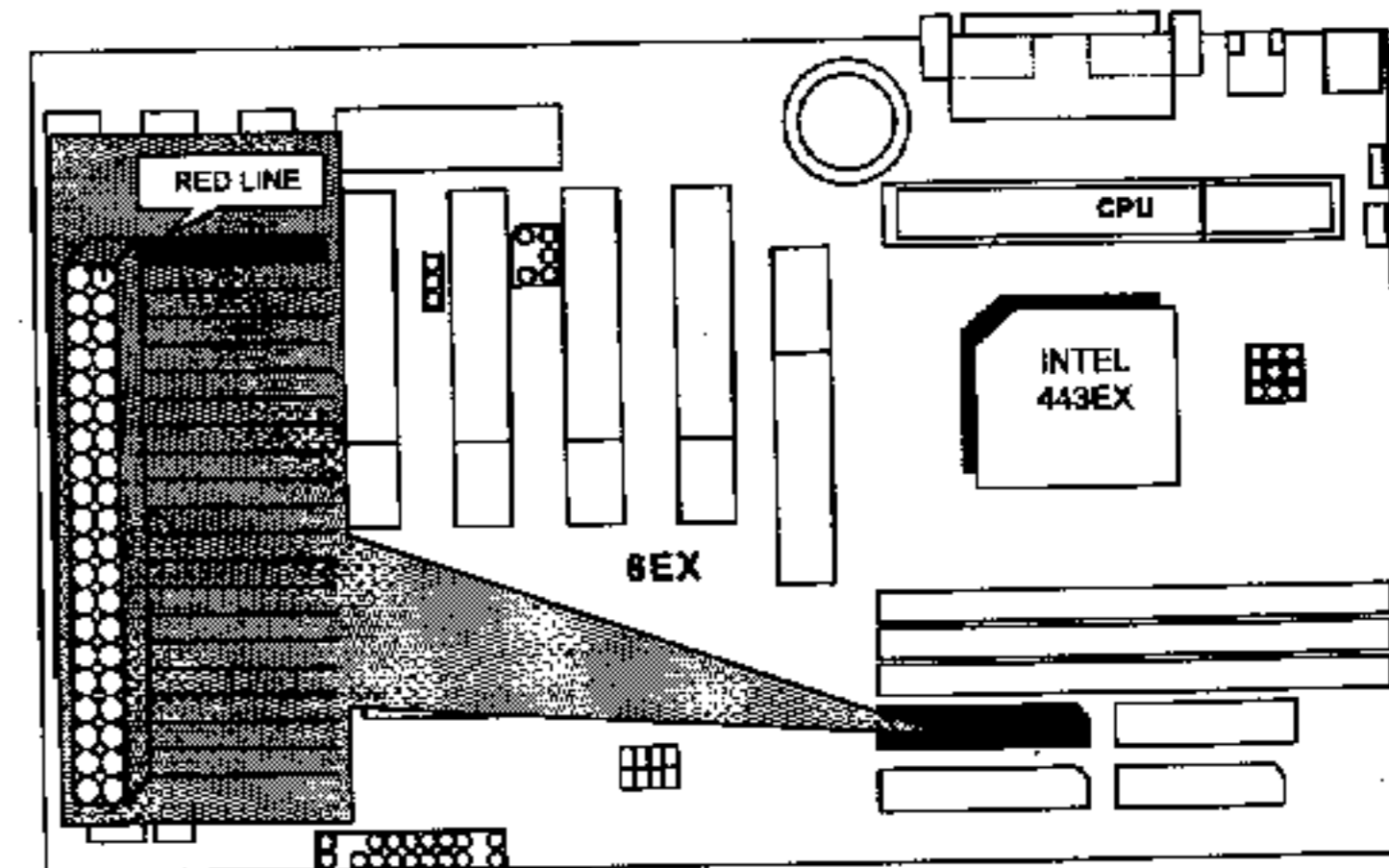
FLOPPY : FLOPPY PORT

RED LINE

INTEL
443EX

6EX

JP1 : Keyboard Power On

CPU

INTEL
443EX

6EX

PIIX4

J13: System After Ac Back

Pin No.	Function
1	Signal
2	GND

CPU

INTEL
443EX

6EX

PIIX4

J19: Wake on LAN

CPU

INTEL
443EX

6EX

PIIX4

Pin No	Function
1	+5V SB
2	GND
3	Signal
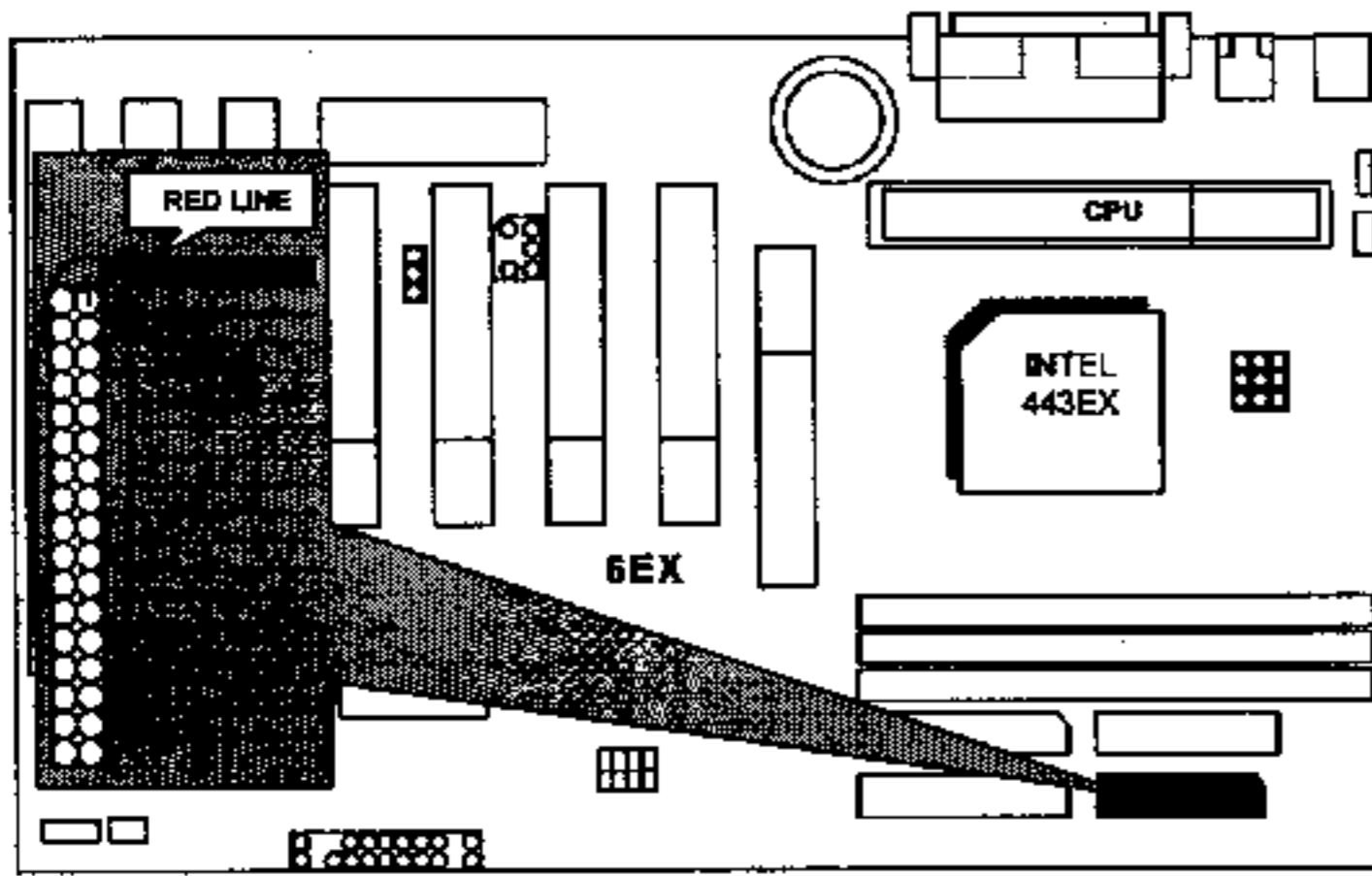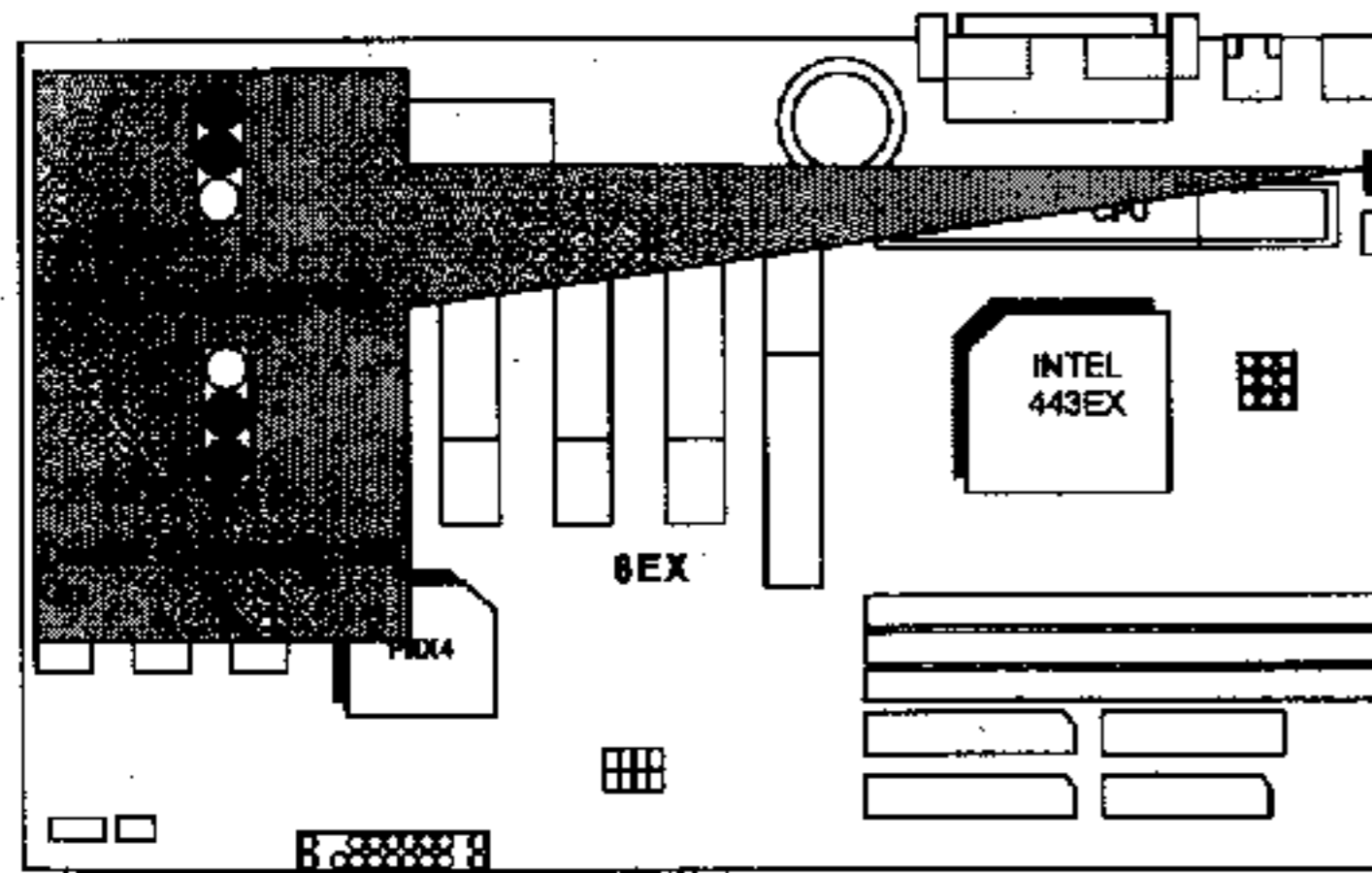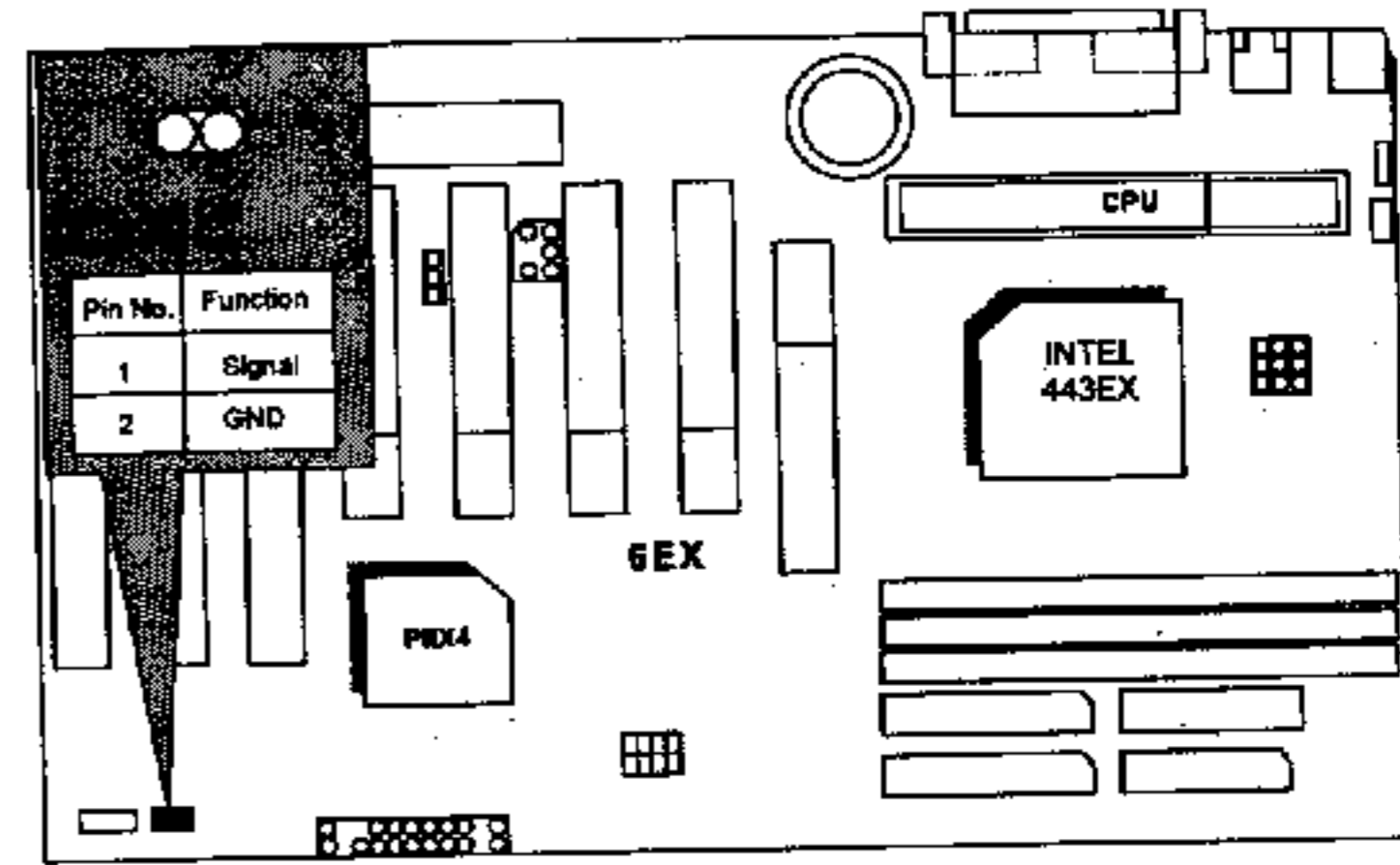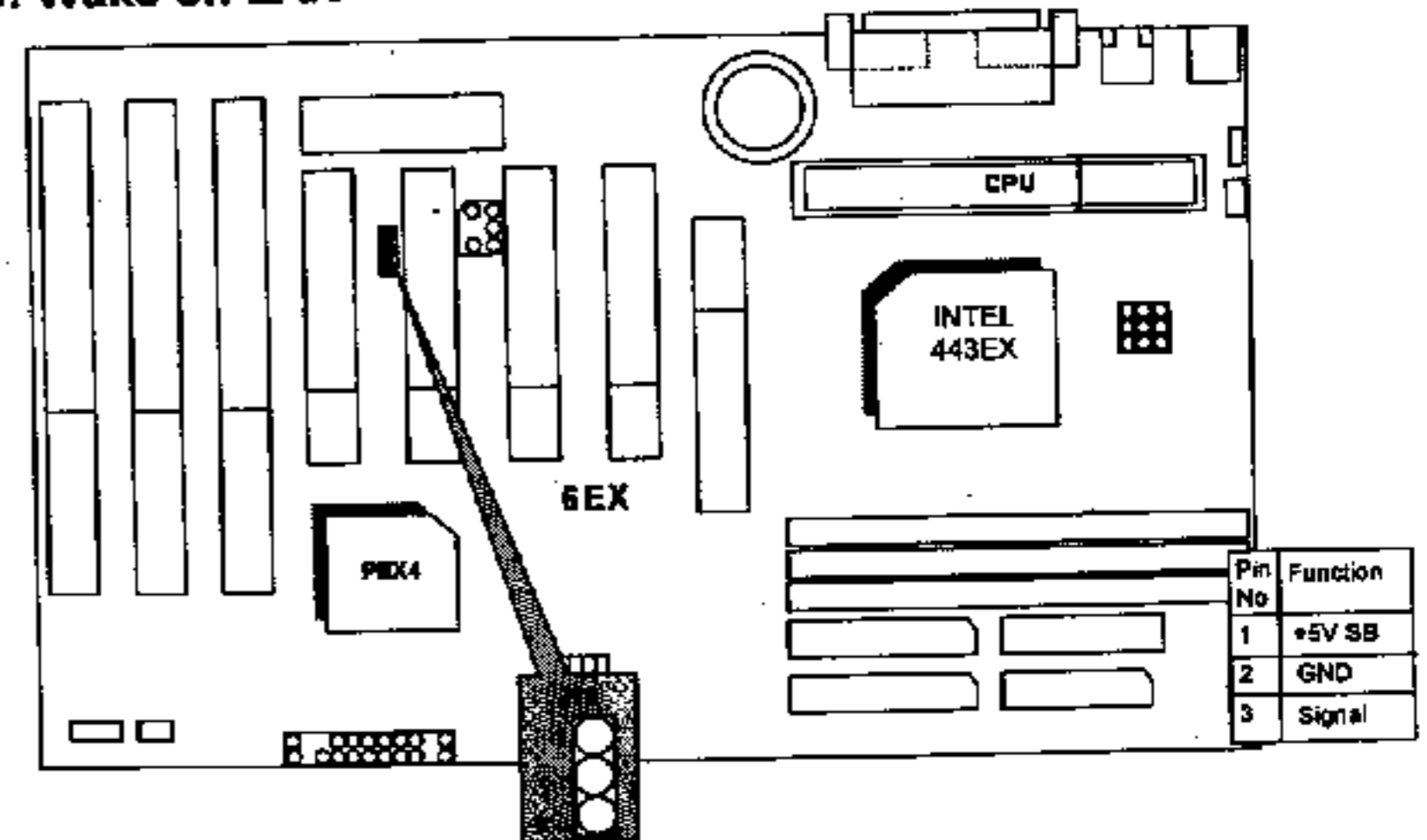
J18: SB-Link (Creative PCI Sound Card Support)
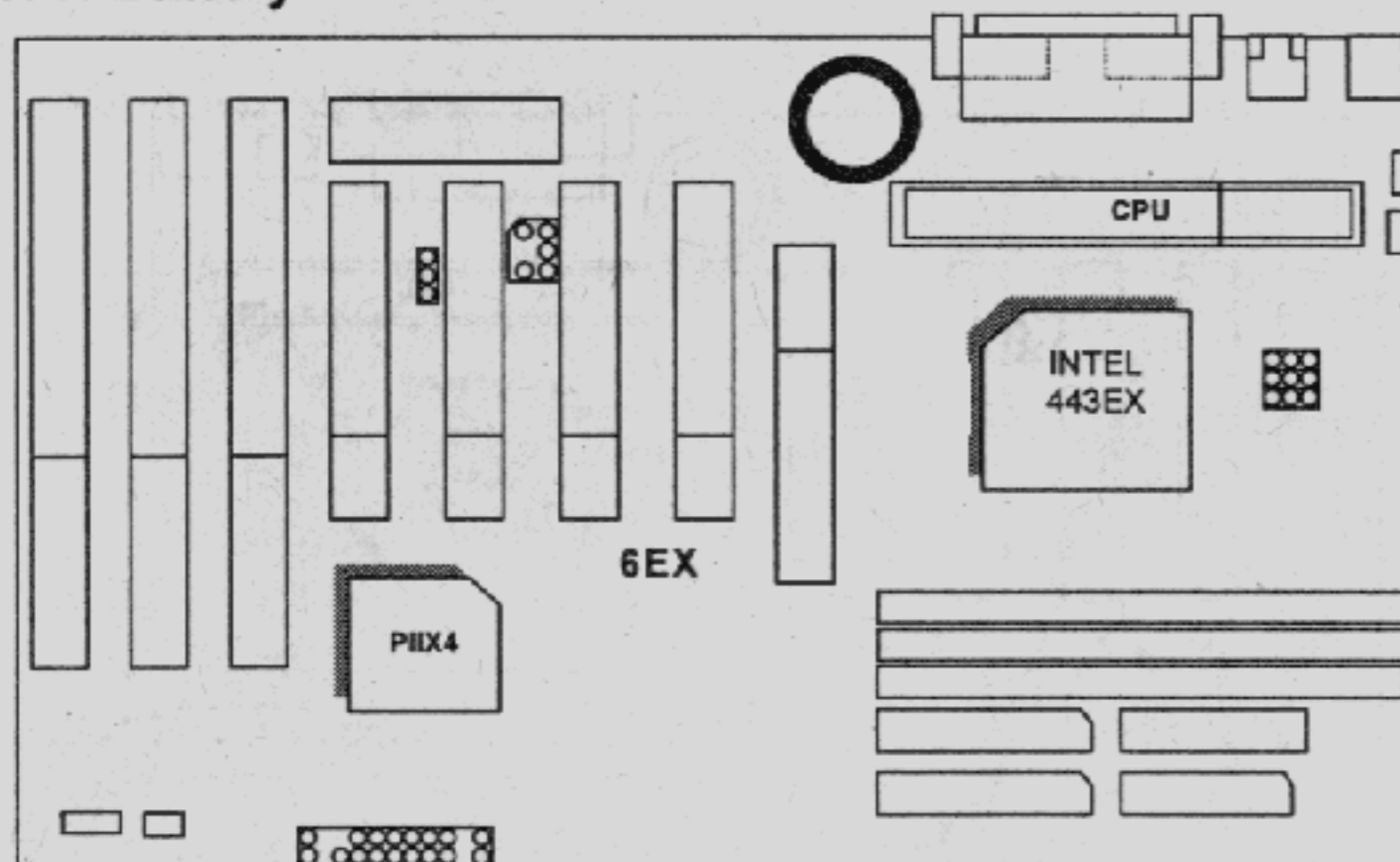
Pin No	Function
1	Signal
2	GND
3	NC
4	Signal
5	GND
6	Signal

BAT1: Battery

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.

III. Top Performance Test Setting:

The following performance data list is the testing results of some popular benchmark testing programs.

Users have to modify the value for each item in chipset features as follow for top performance setting.

```
          ROM PCI/ISA BIOS (2A69KG0C)
              CHIPSET FEATURES SETUP
             AWARD SOFTWARE, INC.

Auto Configuration        : Enabled
DRAM Speed Selection       : Fast
Memory Buffer Strength     : Middle
Video RAM Cacheable        : Disabled
16BIT I/O Recovery Time    : 1
Memory Hole AT 15M-16M     : Disabled
Delayed Transaction        : Disabled
SDRAM RAS-to-CAS Delay     : Fast
SDRAM RAS Precharge Time   : Fast
SDRAM CAS latency Time     : 2


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

** Each value of items as above depends on your hardware configuration : CPU , SDRAM , Cards , etc.

Please modify each value of items If your system does not work properly .

These data are just referred by users, and there is no responsibility for different testing data values gotten by users. (The different Hardware & Software configuration will result in different benchmark testing results.)

- CPU   Pentium® II processor
- DRAM   (128 x 1) MB SDRAM (NEC D4564841G5-A10-9JF).
- CACHE SIZE 512 KB included in CPU
- DISPLAY   GA-600 AGP Display Card (4MB SGRAM)
- STORAGE Onboard IDE (IBM DHEA-38451)
- O.S.   Windows NT™ 4.0
- DRIVER   Display Driver at 1024 x 768 x 256colors x 75Hz.

              TRIONES Bus Master IDE Driver 3.70

Processor	Intel Pentium® II	
	266MHz(66x4)	333MHz(66x5)
Winbench98		
CPU mark32	721	839
FPU Winmark	1380	1710
Business Disk	1870	1880
Hi-End Disk	4450	4570
Business Graphics	159	181
Hi-End Graphics	175	200
Winstone98		
Business	29.7	32.5
Hi-End	33.0	36.3

TABLE OF CONTENTS

1.INTRODUCTION

1.1. PREFACE

Welcome to use the **6EX** motherboard. It is a Pentium[®] II Processor based PC / AT compatible system with AGP / PCI / ISA Bus, and has been designed to be the fastest PC / AT system. There are some new features allow you to operate the system with just the performance you want.

This manual also explains how to install the motherboard for operation, and how to set up your CMOS CONFIGURATION with BIOS SETUP program.

1.2. KEY FEATURES

❏ Intel Pentium[®] II Processor based PC / AT compatible mainboard.

❏ Slot 1 supports Pentium[®] II Processor running at 200-633 MHz.

❏ Intel 440EX chipset, Supports AGP / SDRAM / Ultra DMA/33 IDE Keyboard and PS/2 Mouse Power On / ACPI features.

❏ Supports 3xDIMMs using 3.3V EDO or SDRAM DIMM module.

❏ Supports 8 MB - 256 MB EDO / 256MB SDRAM memory on board.

❏ 1xAGP slot, 4xPCI Bus slots, 3xISA Bus slots.

❏ Supports 2 channels Ultra DMA/33 IDE ports for 4 IDE Devices.

❏ Supports 2xCOM (16550), 1xLPT (EPP / ECP), 1x Floppy port.

❏ Supports 2xUSB ports, 1xPS/2 Mouse / Keyboard.

❏ Licensed AWARD BIOS, 2Mbits FLASH RAM.

❏ 30.5 cm *18 cm ATX SIZE form factor, 4 layers PCB.

1.3. PERFORMANCE LIST

The following performance data list is the testing results of some popular benchmark testing programs.

These data are just referred by users, and there is no responsibility for different testing data values gotten by users. (The different Hardware & Software configuration will result in different benchmark testing results.)

- CPU   Pentium® II processor
- DRAM   (128 x 1) MB SDRAM (NEC D4564841G5-A10-9JF)
- CACHE SIZE 512 KB included in CPU
- DISPLAY   GA-600 AGP Display Card (4MB SGRAM)
- STORAGE   Onboard IDE (IBM DHEA-38451)
- O.S.   Windows NT™ 4.0
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TRIONES Bus Master IDE Driver 3.70

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Hi-End Graphics	175	200
Winstone98		
Business	29.7	32.5
Hi-End	33.0	36.3

1.4. BLOCK DIAGRAM
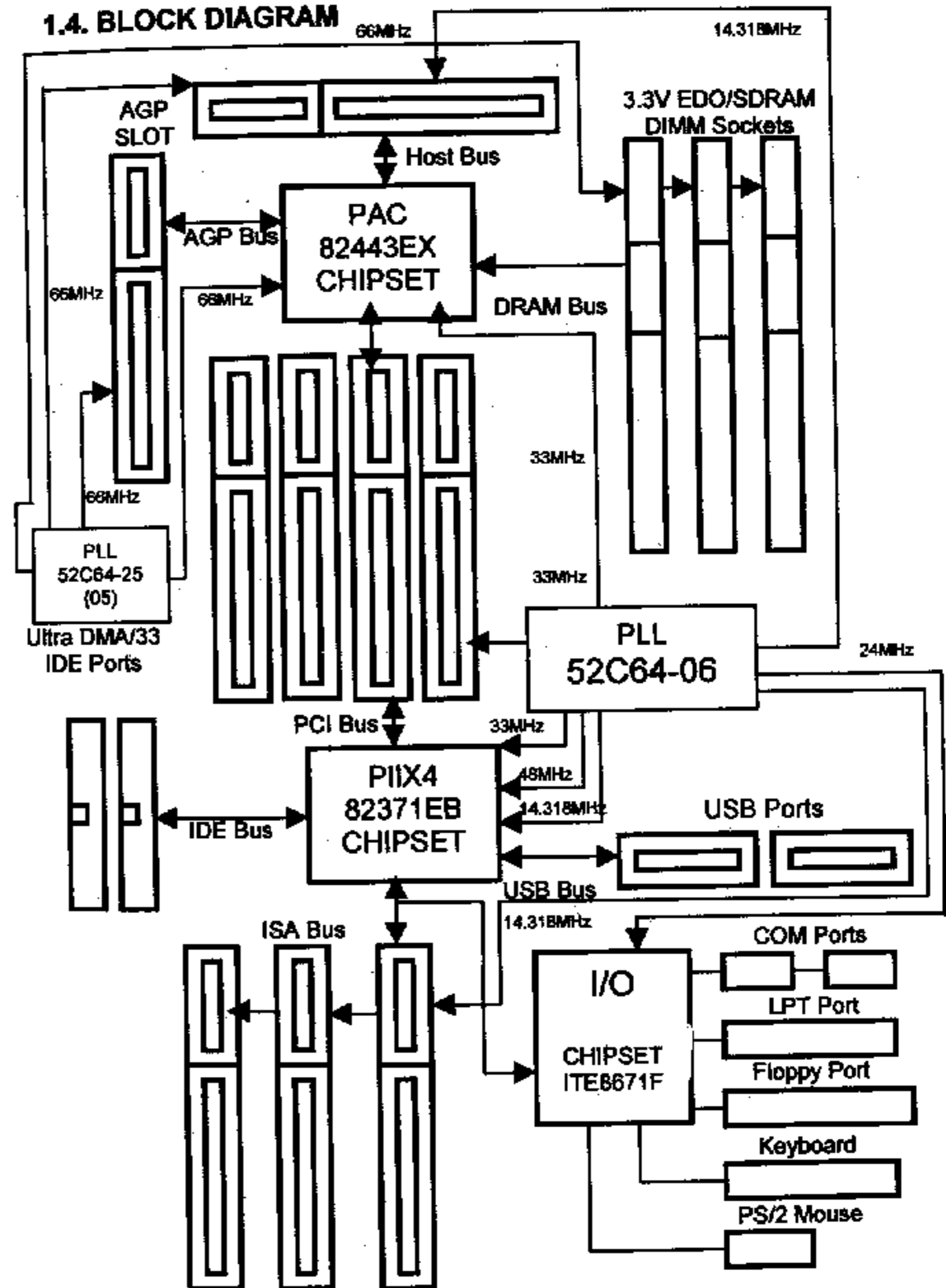
1.5. INTRODUCE THE Pentium® II Processor & AGP
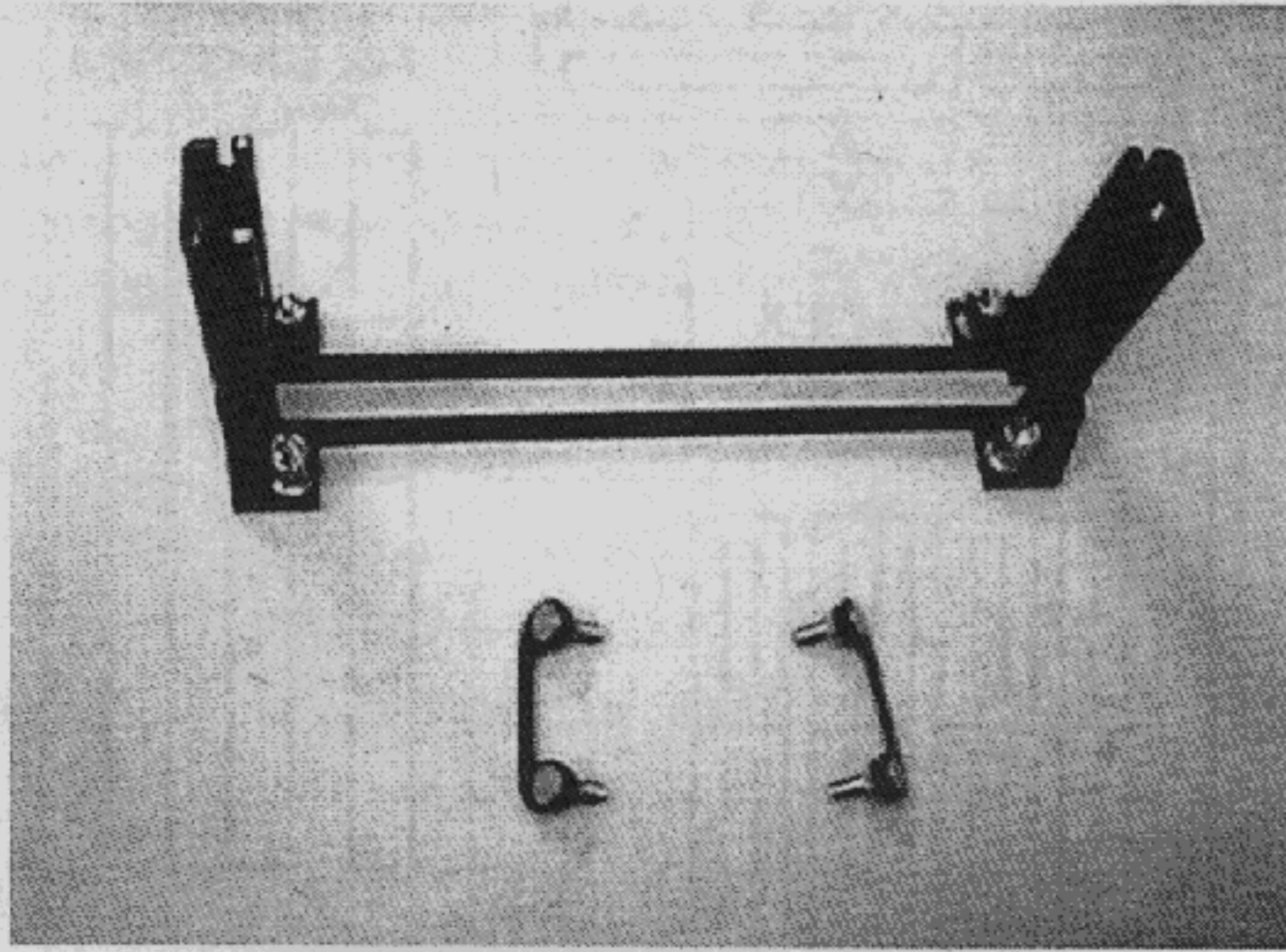
Figure 1:Retention Mechanism & attach Mount

Figure 2:OEM Pentium® II Processor
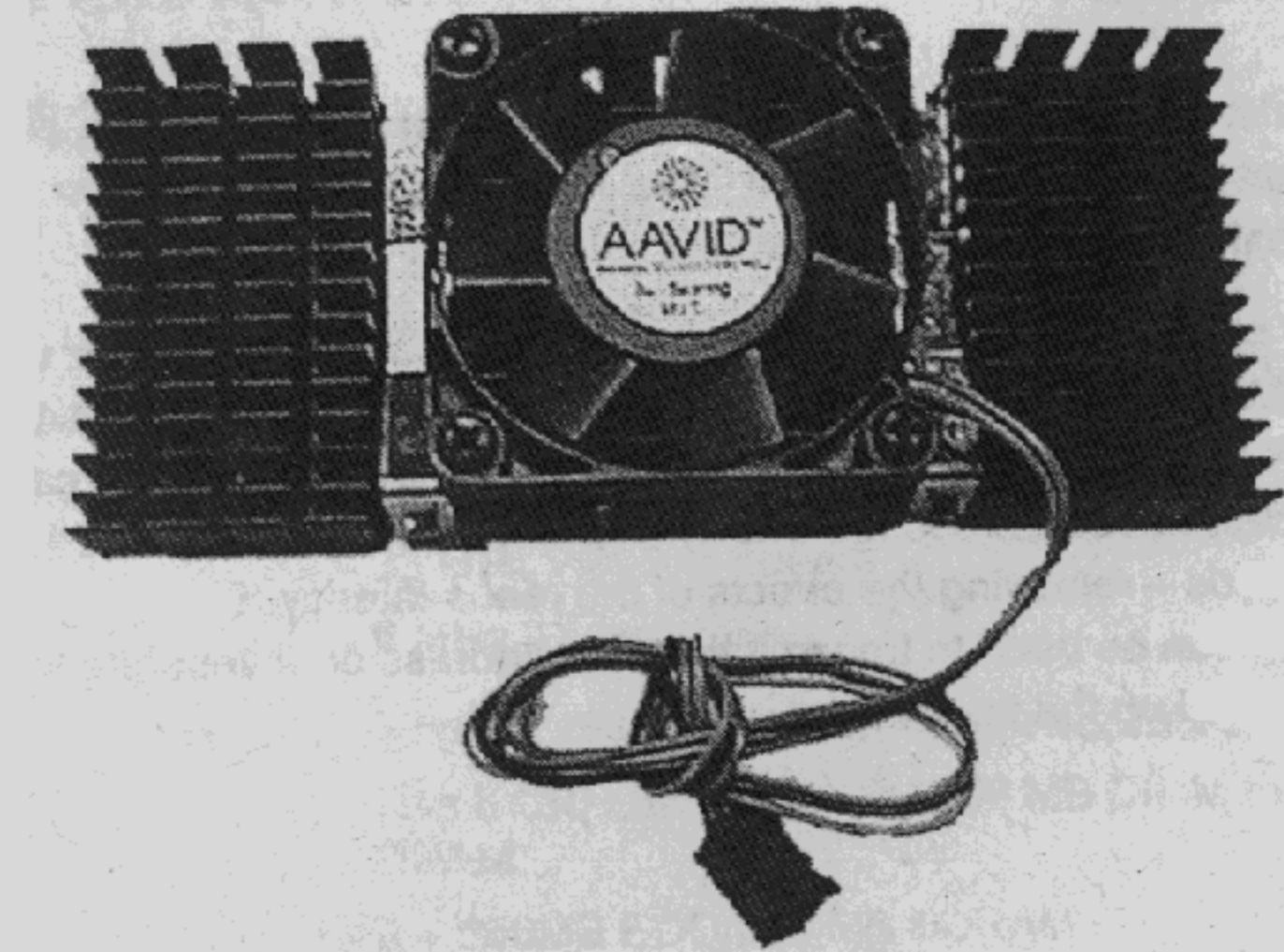
Figure 3:Heatsink / FAN & Heat sink support for OEM Pentium® II Processor
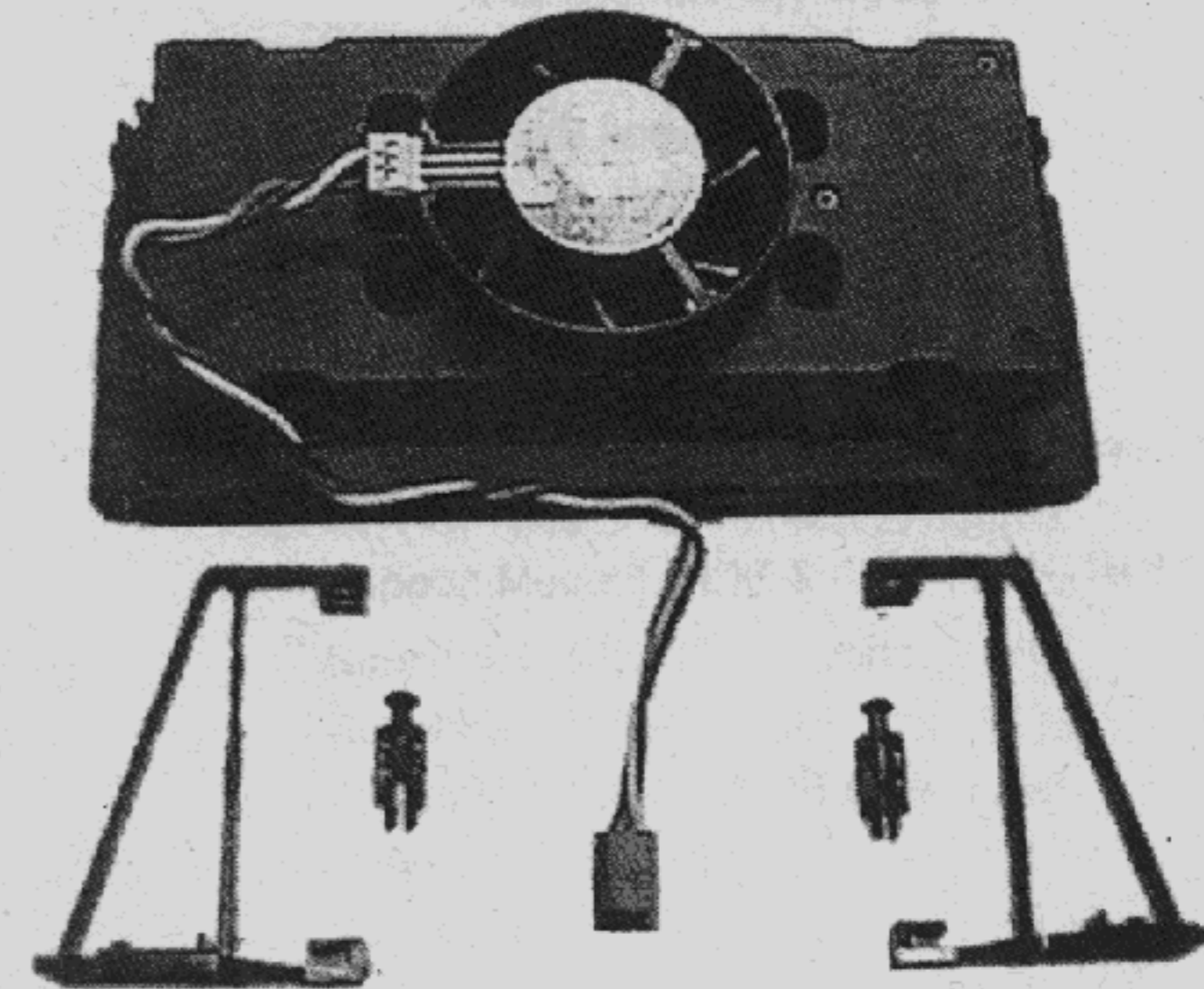
Figure 4:Boxed Pentium® II Processor & Heat sink support

1.6 What is AGP?

The Accelerated Graphics Port (AGP) is a new port on the Host-To-PCI bridge device that supports an AGP port. The main purpose of the AGP port is to provide fast access to system memory.

The AGP port can be used either as fast PCI port (32-bits at 66MHz vs. 32-bits at 33MHz) or as an AGP port which supports 2x data-rate, a read queue, and side band addressing. When the 2x-data rate is used, the port can transmit data at 533MB/sec (66.6*2*4). The read-queue can be used to pipeline reads – removing the effects of the reads-latency. Side band addressing can be used to transmit the dr⁻ ⁻ ⁻ ⁻ ⁻ on a separate line in order to speed up the transaction.

2. SPECIFICATION

2.1. HARDWARE

- CPU
  - Pentium® II Processor 200 – 633 MHz.
  - 242 pins 66 MHz slot1 on board.

- SPEED
  - 66 MHz system speed.
  - 66 MHz AGP bus speed. (133MHz 2X mode)
  - 33 MHz PCI-Bus speed.
  - 8 MHz AT bus speed.

- DRAM MEMORY
  - 3 banks 168 pins DIMM module sockets on board.
  - Use 8 / 16 / 32 / 64 / 128 / 256 MB DIMM module DRAM.
  - 8 ~ 256MB EDO/256 MB SDRAM.
  - Supports 3.3V SDRAM / EDO type DRAM.

- CACHE MEMORY
  - 32 KB 1st cache memory included in CPU.
  - 256KB/512 KB 2nd cache in CPU.
  - Supports DIB speed mode for L2 Cache.

- I/O BUS SLOTS
  - 4 33MHz Master / Slave PCI-BUS.
  - 3 8MHz 16 bits ISA BUS.
  - 1 66MHz / 133MHz AGP bus.

- IDE PORTS
  - 2 Ultra DMA/33 Bus Master IDE channels on board.(Using IRQ14,15)
  - Support Mode 3,4 IDE & ATAPI CD – ROM.

- I/O PORTS
  - Supports 2 16550 COM ports.
  - Supports 1 EPP/ECP LPT port.
  - Supports 1 1.44/2.88 MB Floppy port.
  - Supports 2 USB ports.
  - Supports PS/2 Mouse.

- • GREEN FUNCTION
  - – Suspend mode support.
  - – Green switch & ACPI LED support.
  - – IDE & Display power down support.
  - – Monitor all IRQ / DMA / Display / I/O events.
- • BIOS
  - – 2M bits FLASH RAM.
  - – Supports Plug & Play, DMI Function.
- • DIMENSION
  - – ATX Form Factor, 4 layers PCB.

2.2. SOFTWARE

- • DRIVER
  - – Bus Master IDE Driver.
  - – Suspend to HD utility.
  - – Patch_95 Driver.
- • BIOS
  - – Licensed AWARD BIOS.
  - – AT CMOS Setup, BIOS / Chipset Setup, Green Setup, Hard Disk Utility included.
- • O.S.
  - – Operation with MS-DOS®, Windows®95, WINDOWS™ NT, OS/2, NOVELL and SCO UNIX.

2.3. ENVIRONMENT

- • Ambient Temp. – 0°C to +50°C (Operating).
- • Relative Hum. – 0 to +85% (Operating).
- • Altitude – 0 to 10,000 feet (Operating).
- • Vibration – 0 to 1,000 Hz.
- • Electricity – 4.9 V to 5.2 V. (Max. 20A current at 5V.)

3. HARDWARE INSTALLATION

3.1. UNPACKING

The mainboard package should contain the following:

- • The 6EX mainboard.

- • The Retention Mechanism & Attach Mount

- • USER'S MANUAL for mainboard.

- • Cable set for IDE, Floppy.

- • Diskette or CD for Mainboard Utility.

The mainboard contains sensitive electric components, which can be easily damaged by static electricity, so the mainboard should be left in its original packing until it is installed.

Unpacking and installation should be done on a grounded anti-static mat. The operator should be wearing an anti static wristband, grounded at the same point as the anti-static mat.

Inspect the mainboard carton for obvious damage. Shipping and handling may cause damage to your board. Be sure there are no shipping and handling damages on the board before proceeding.

After opening the mainboard carton, extract the system board and place it only on a grounded anti-static surface component side up. Again inspect the board for damage. Press down on all of the socket IC's to make sure that they are properly seated. Do this only on with the board placed on a firm flat surface.

●*DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.

3.2. MAINBOARD LAYOUT

<Figure 3.1>
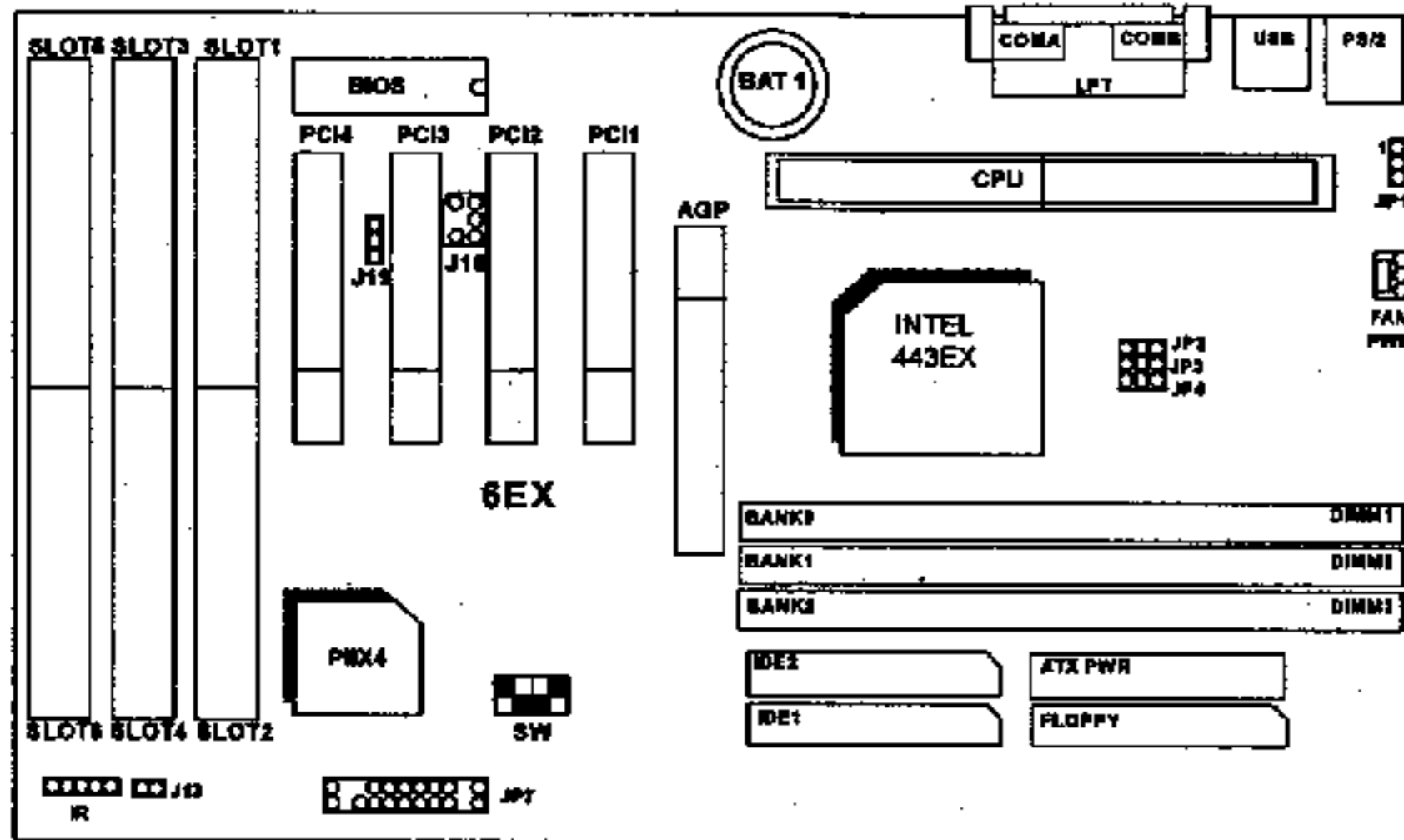
♦ *PCI 4 Only can use slave device

3.3. QUICK REFERENCE FOR JUMPERS & CONNECTORS

♦ I/O Ports Connector

USB	USB port.
IDE1	For Primary IDE port.
IDE2	For Secondary IDE port.
PS/2	For PS/2 Keyboard / Mouse port.
Floppy	For Floppy port
COM B	For Serial port2 (COM B).
COM A	For Serial port1 (COM A).
LPT	For LPT port.

♦ Slot 1

For Pentium® II Processor installed

♦ FAN PWR: CPU cooling FAN Power Connector

Pin No.	Function
1	GND.
2	+12V
3	SENSE

♦ INFRARED Connector (IR) -- Function Optional

Pin No.	Function
1	IR Data Output
2	GND
3	IR Data Input
4	NC
5	POWER (+)

♦ J13 : System After Ac Back

Open	Soft Off
Short	Full On

♦ JP1 : Keyboard Power On Selection

Pin No.	Function
1-2 Short	Enabled Keyboard power on.
2-3 Short	Disabled Keyboard power on.

♦ J19 : Wake on LAN Connector

Pin No.	Function
1	+5VSB
2	GND
3	CTRL-Signal

♦ J18 : For PCI Sound Card Connector

Pin No.	Function
1	Signal
2	GND
3	NC
4	Signal
5	GND
6	Signal

JP7 : 2*11 PIN Jumper
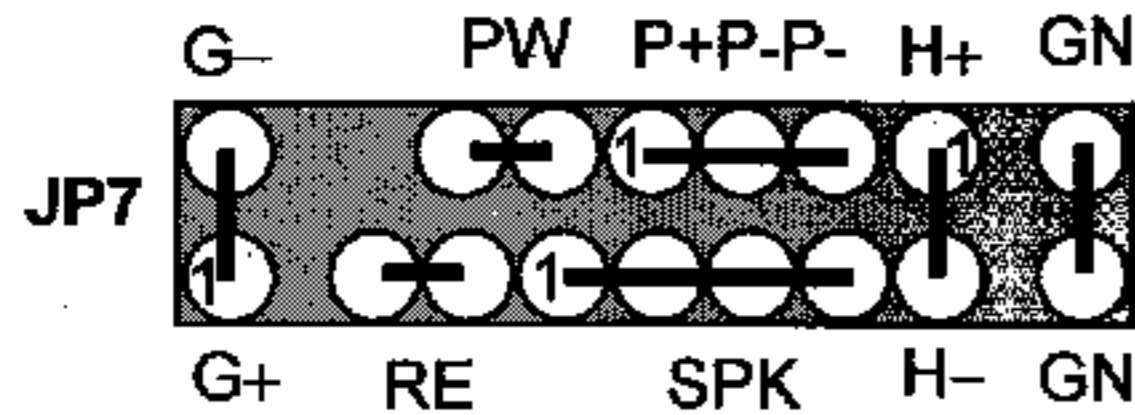
PW: Soft Power Connector

Open: Normal Operation
Short: Power On/Off

RE: Reset Switch

Open: Normal Operation
Short: For Hardware Reset System

P+P-P-: Power LED

PIN 1 : anode (+)
PIN 2 : cathode (−)
PIN 3 : cathode (−)

SPK : Speaker Connector

PIN 1 : VCC
PIN 2 : NC
PIN 3 : NC
PIN 4 : Data

H+H−: IDE Hard Disk Active LED

PIN 1: LED anode (+)
PIN 2: LED cathode (−)

GN: Green Function Switch

Open : Normal operation
Short : Entering Green Mode

G-G+: Green LED

PIN 1 : LED anode (+)
PIN 2 : LED cathode (−)

3.4. DRAM INSTALLATION

The mainboard can be installed with 8 / 16 / 32 / 64 / 128 / 256 MB 168 pins DIMM module DRAM, and the DRAM speed must be 50 or 60 ns for EDO & 67~100 MHz for SDRAM. The DRAM memory system on mainboard consists of bank 0, 1 & bank 2. (Bank 0 and Bank2 can't be installed at the same time if the DRAM Type is double side.) (Please refer to the "DRAM Configuration Table").

Since 168 pins DIMM module is 64 bits width, using 1 PCS which can match a 64 bits system. The total memory size is 8MB ~ 256MB EDO / 256MB SDRAM. The DRAM installation position refer to Figure 3.1, and notice the Pin 1 of DIMM module must match with the Pin 1 of DIMM socket. Insert the DRAM DIMM module into the DIMM socket at Vertical angle. If there is a wrong direction of Pin 1, the DRAM DIMM module couldn't be inserted into socket completely.

DRAM Configuration Table:

DRAM Type : Double Side

DIMM1 (Bank 0)	DIMM2 (Bank 1)	DIMM3 (Bank 2)	TOTAL
8MB	−	−	8MB
−	8MB	−	8MB
−	−	8MB	8MB
8MB	8MB	−	16MB
−	8MB	8MB	16MB
16MB	−	−	16MB

–	16MB	–	16MB
--	--	16MB	16MB
8MB	16MB	–	24MB
--	8MB	16MB	24MB
16MB	16MB	–	32MB
--	16MB	16MB	32MB
32MB	--	--	32MB
--	32MB	--	32MB
--	--	32MB	32MB
8MB	32MB	–	40MB
--	32MB	8MB	40MB
16MB	32MB	--	48MB
--	32MB	16MB	48MB
32MB	32MB	--	64MB
--	32MB	32MB	64MB
64MB	–	--	64MB
–	64MB	--	64MB
–	--	64MB	64MB
8MB	64MB	–	72MB
--	64MB	8MB	72MB
16MB	64MB	–	80MB
–	64MB	16MB	80MB
32MB	64MB	--	96MB
--	64MB	32MB	96MB
64MB	64MB	–	128MB
--	64MB	64MB	128MB
128MB	128MB	--	256MB
--	128MB	128MB	256MB

3.5. CPU SPEED SETUP

The default system bus speed is 66.6MHz. The user can change the DIP SWITCH **(SW)** selection to set up the CPU speed for 200 - 366MHz processor. The CPU speed must match with the frequency RATIO. It will cause system hanging up if the frequency RATIO is higher than CPU's.

ON: O
OFF: X

DIP SWITCH (SW)				FREQ. RATIO	EXT.CLK. MHz	INT.CLK. MHz	CPU Type
1	2	3	4				
ON	OFF	ON	ON	3	66	200	Pentium® II 200 MHz
OFF	OFF	ON	ON	3.5	66	233	Pentium® II 233 MHz
ON	ON	OFF	ON	4	66	266	Pentium® II 266 MHz
OFF	ON	OFF	ON	4.5	66	300	Pentium® II 300 MHz
ON	OFF	OFF	ON	5	66	333	Pentium® II 333 MHz
OFF	OFF	OFF	ON	5.5	66	366	Pentium® II 366 MHz

Main Clock	JP4	JP3	JP2
66 MHz	1-2	1-2	1-2
75 MHz	1-2	2-3	1-2
83 MHz	2-3	1-2	2-3

🖝 We don't recommend you to setup up your system speed up to 75 or 83MHz because they are not the standard spec. of peripherals. If you want to run 75 or 83 MHz in your system properly, it depends on your hardware configurations: CPU, SDRAM, Cards, etc.

🖝 The CPU is a sensitive electric component and it can be easily damaged by static electricity, so users must keep it away from metal surface when the CPU is installed onto mainboard.

3.6. CMOS RTC & ISA CFG CMOS SRAM

The mainboard contains RTC & CMOS SRAM on board. They have a power supply from external battery to keep the DATA inviolate & effective. The RTC is a REAL-TIME CLOCK device, which provides the DATE & TIME to system. The CMOS SRAM is used for keeping the information of system configuration, so the system can automatically boot OS every time. Since the lifetime of internal battery is 5 years, the user can change a new Battery to replace old one when it has consumed.

♠※Danger of explosion if battery is incorrectly replaced.

♠※Replace only with the same or equivalent type recommended by the manufacturer.

♠※Dispose of used batteries according to the manufacturer's instructions.

3.7. SPEAKER CONNECTOR INSTALLATION

There is a speaker in AT system for sound purpose. The 4 - Pins connector SPK is used to connect speaker. Anode connects +, Cathode connects –.

3.8. HARDWARE RESET SWITCH CONNECTOR INSTALLATION

The RESET switch on panel provides users with HARDWARE RESET function. The system will do a cold start after the RESET switch is press and released by user. The RESET switch is a 2 PINS connector and should be installed to **RE** on mainboard.

3.9. POWER LED CONNECTOR INSTALLATION

System has power LED lamp on the panel of case. The power LED will light on off or flash to indicate which step on the system. The connector should be connected to **P+P–P–** of mainboard in correct direction.

3.10. IDE & ATAPI DEVICE INSTALLATION

There are two-Enhanced PCI IDE ports (**IDE1, IDE2**) on board, which following ATAPI standard SPEC. Any one IDE port can connected to two ATAPI devices (IDE Hard Disk, CD-ROM & Tape Driver), so total four ATAPI devices can exist in a system. The **HD** is the active LED port for ATAPI devices.

3.11. PERIPHERAL DEVICE INSTALLATION

After the I/O device installation and jumpers setup, the mainboard can be mounted into the case and fixed by screw. To complete the mainboard installation, the peripheral device could be installed now. The basic system needs a display interface card. If the PCI - Bus device is to be installed in the system, any one of four PCI - Bus slots can be used. **(PCI 4 Only can use slave device.)**

3.12. KEYBOARD & PS/2 MOUSE INSTALLATION

The main board supports PS/2 Mouse (**J2**). The BIOS will auto detect whether the PS/2 Mouse is installed or not & assign IRQ12 for PS/2 Mouse port if it is installed. After installing the peripheral device, the user should check everything again, and prepare to power-on the system.

4. BIOS CONFIGURATION

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS SRAM so that it retains the Setup information when the power is turned off.

4.1. ENTERING SETUP

Power ON the computer and press <Del> immediately will allow you to enter Setup. If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" bottom on the system case. You may also restart by simultaneously press <Ctrl>, <Alt>, and <Del> keys.

4.2. CONTROL KEYS

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu - Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu - Exit current page and return to Main Menu
PgUp key	Increase the numeric value or make changes
PgDn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Change color from total 16 colors
F3 key	Reserved
F4 key	Reserved
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the default CMOS value from BIOS default table, only for Option Page Setup Menu
F7 key	Load the default
F8 key	Reserved
F9 key	Reserved
F10 key	Save all the CMOS changes, only for Main Menu

4.3. GETTING HELP

4.3.1. Main Menu

The on-line description of the highlighted setup function is displayed at the bottom of the screen.

4.3.2. Status Page Setup Menu / Option Page Setup Menu

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc>.

4.4. THE MAIN MENU

Once you enter Award BIOS CMOS Setup Utility, the Main Menu (Figure 4.1) will appear on the screen. The Main Menu allows you to select from nine setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.
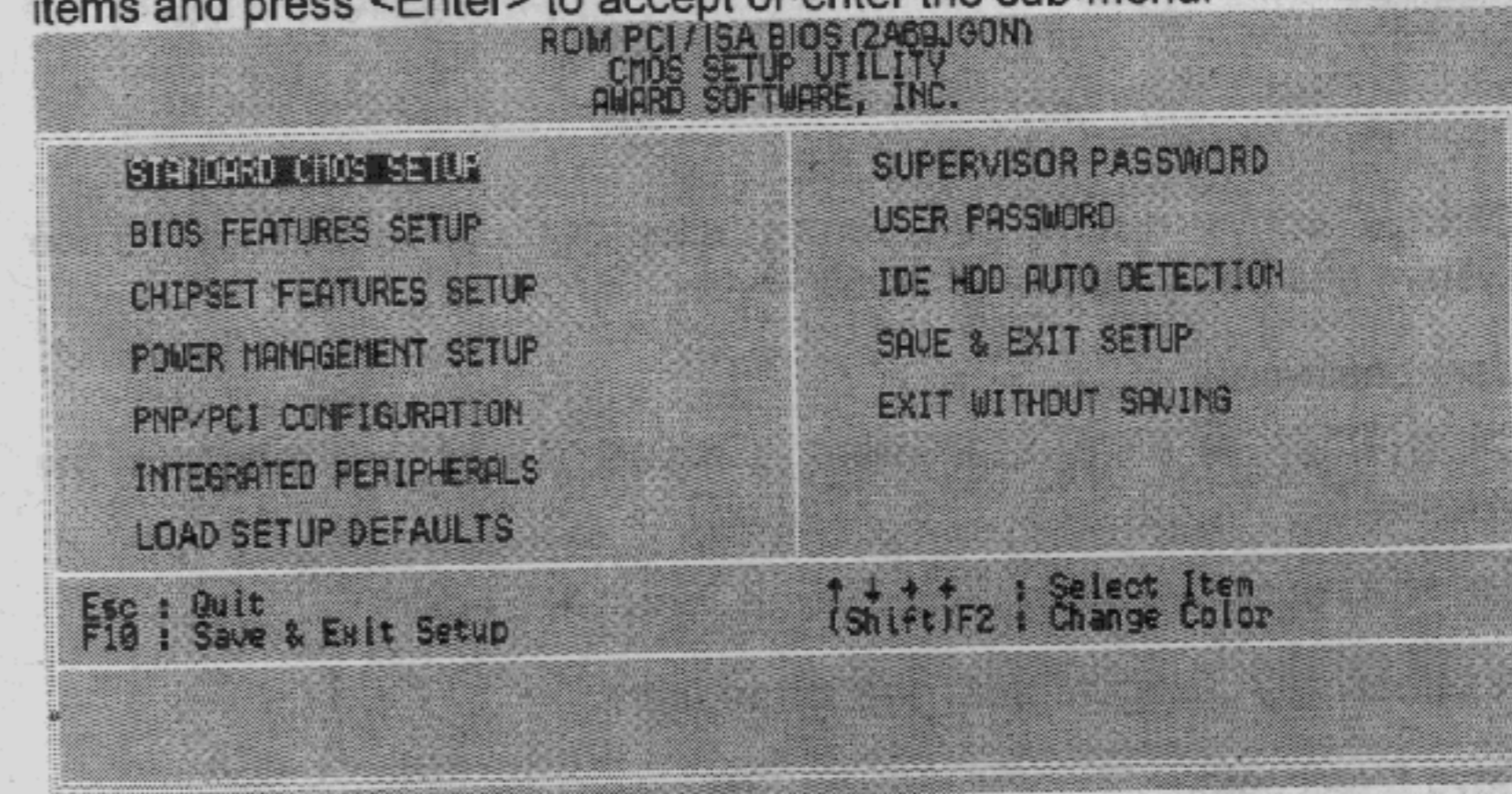
Figure 4.1: Main Menu

- Standard CMOS setup

  This setup page includes all the items in standard compatible BIOS.

- BIOS features setup

  This setup page includes all the items of Award special enhanced features.

- Chipset features setup

  This setup page includes all the items of chipset special features.

- Power management setup

  This setup page includes all the items of Green function features.

- PNP/PCI configuration

  This setup page includes all the configurations   ' & PnP ISA resources.

- Integrated peripherals

  This setup page includes all onboard peripherals.

- Load Setup defaults

  Setup Defaults indicates the value of the system parameters that the system would be in the best performance configuration.

- Supervisor password

  Change, set, or disable password. It allows you to limit access to the system and Setup, or just to Setup.

- User password

  Change, set, or disable password. It allows you to limit access to the system.

- IDE HDD auto detection

  Automatically configure hard disk parameters.

- Save & exit setup

  Save CMOS value settings to CMOS and exit setup.

- Exit without saving

  Abandon all CMOS value changes and exit setup.

4.5. STANDARD CMOS SETUP MENU

The items in Standard CMOS Setup Menu (Figure 4.2) are divided into 9 categories. Each category includes no, one or more than one setup items. Use the arrows to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.
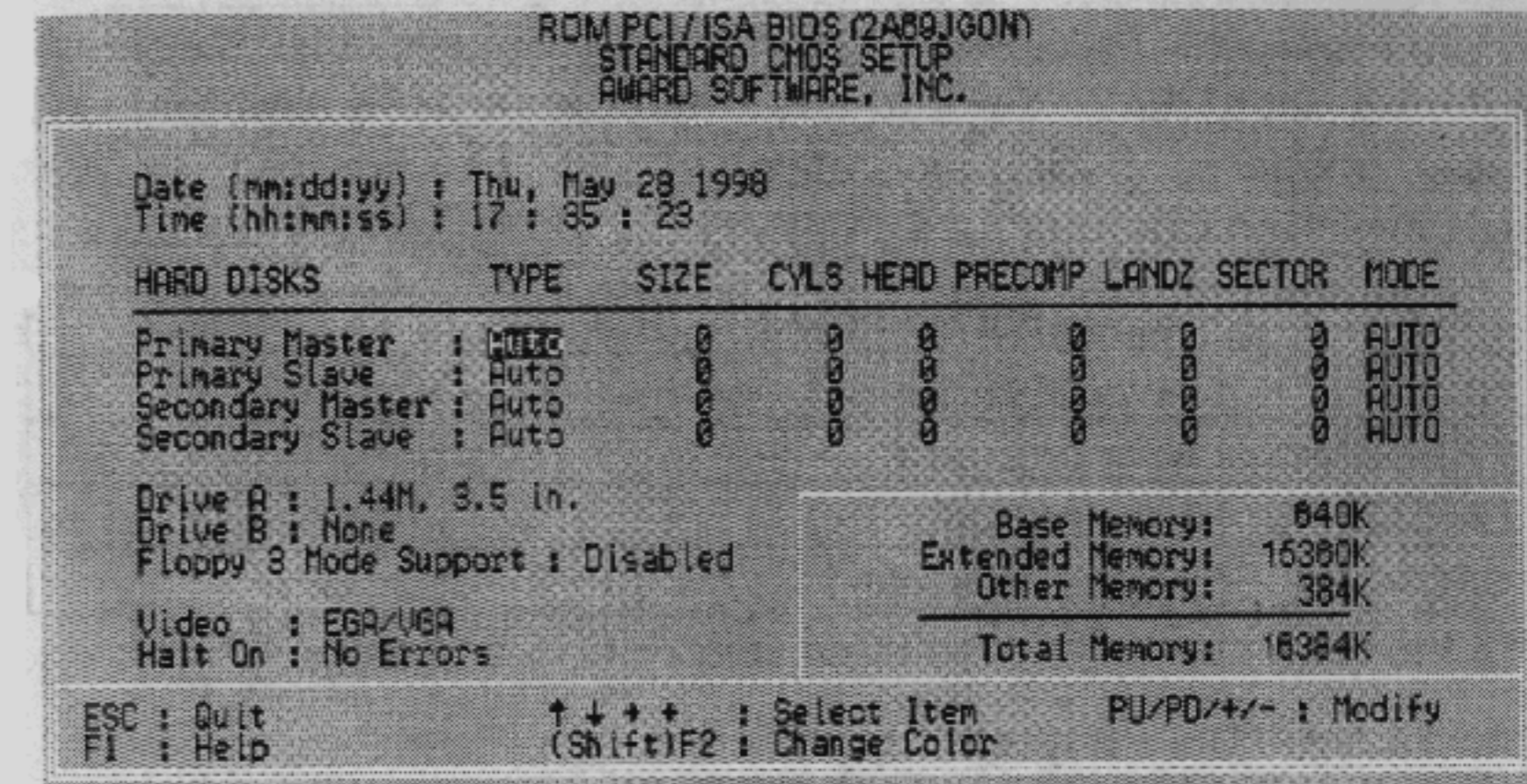
Figure 4.2: Standard CMOS Setup Menu

- Date

  The date format is <day>, <month> <date> <year>.

day	The day, from Sun to Sat, determined by the BIOS and is display-only
month	The month, Jan. Through Dec.
date	The date, from 1 to 31 (or the maximum allowed in the month)
year	The year, from 1994 through 2079

- Time

  The times format in <hour> <minute> <second>. The time is calculated base on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

- Primary HDDs / Secondary HDDs

  The category identifies the types of hard disk from drive C to F that has been installed in the computer. There are two types: auto type, and user

definable type. User type is user-definable; Auto type which will automatically detect HDD type.

Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category.

If you select User Type, related information will be asked to enter to the following items. Enter the information directly from the keyboard and press <Enter>. Such information should be provided in the documentation form your hard disk vendor or the system manufacturer.

CYLS.	Number of cylinders
HEADS	number of heads
PRECOMP	write precomp
LANDZONE	Landing zone
SECTORS	number of sectors

If a hard disk has not been installed select NONE and press <Enter>.

- Drive A type / Drive B type

The category identifies the types of floppy disk drive A or drive B that has been installed in the computer.

None	No floppy drive installed
360K, 5.25 in.	5.25 inch PC-type standard drive; 360K byte capacity.
1.2M, 5.25 in.	5.25 inch AT-type high-density drive; 1.2M byte capacity (3.5 inch when 3 Mode is Enabled).
720K, 3.5 in.	3.5 inch double-sided drive; 720K byte capacity
1.44M, 3.5 in.	3.5 inch double-sided drive; 1.44M byte capacity.
2.88M, 3.5 in.	3.5 inch double-sided drive; 2.88M byte capacity.

- Floppy 3 Mode Support (for Japan Area)

Disabled	Normal Floppy Drive.
Drive A	Drive A is 3 mode Floppy Drive.
Drive B	Drive B is 3 mode Floppy Drive.
Both	Drive A & B are 3 mode Floppy Drives.

- Video

The category detects the type of adapter used for the primary system monitor that must match your video display card and monitor. Although secondary monitors are supported, you do not have to select the type in setup.

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA, or PGA monitor adapters
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

- Halt on

The category determines whether the computer will stop if an error is detected during power up.

NO Errors	The system boot will not stop for any error that may be detected
All Errors	Whenever the BIOS detects a non-fatal error the system will be stopped and you will be prompted
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors

- Memory

The category is display-only which is determined by POST (Power On Self Test) of the BIOS.

Base Memory

The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system.

The value of the base memory is typically 512 K for systems with 512 K memory installed on the motherboard, or 640 K for systems with 640 K or more memory installed on the motherboard.

Extended Memory

The BIOS determines how much extended memory is present during the POST.

This is the amount of memory located above 1 MB in the CPU's memory address map.

Expanded Memory

Expanded Memory in memory defined by the Lotus / Intel / Microsoft (LIM) standard as EMS.
Many standard DOS applications can not utilize memory above 640 K; the Expanded Memory Specification (EMS) swaps memory, which not utilized by DOS with a section, or frame, so these applications, can access all of the system memory.

Memory can be swapped by EMS is usually 64 K within 1 MB or memory above 1 MB, depends on the chipset design.

Expanded memory device driver is required to use memory as Expanded Memory.

Other Memory

This refers to the memory located in the 640 K to 1024 K address space. This is memory that can be used for different applications.

DOS uses this area to load device drivers to keep as much base memory free for application programs. Most use for this area is Shadow RAM.

4.6. BIOS FEATURES SETUP
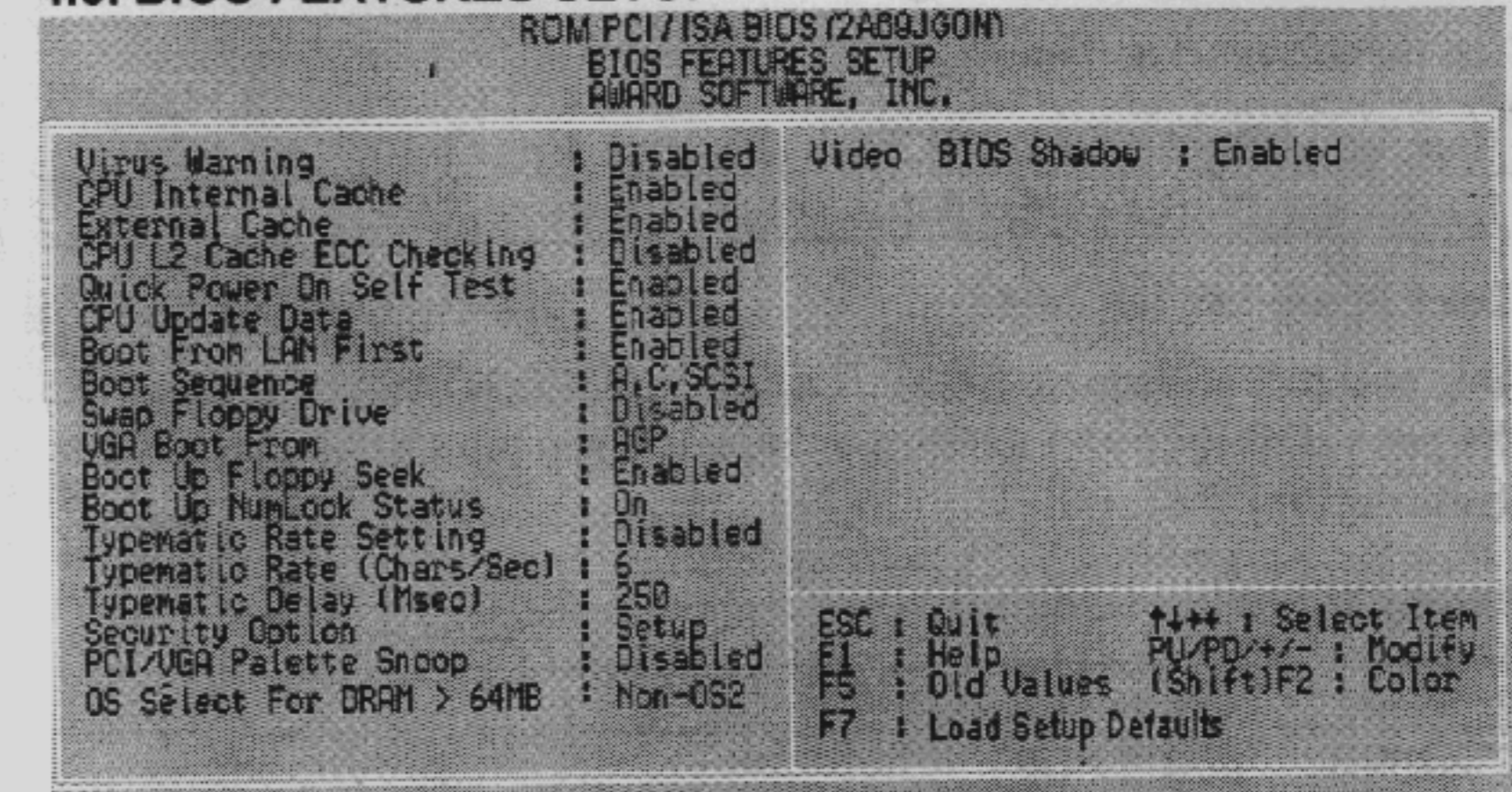
Figure 4.3: BIOS Features Setup

- Virus Warning

If it is set to enable, the category will flash on the screen when there is any attempt to write to the boot sector or partition table of the hard disk drive. The system will halt and the following error message will appear in the mean time. You can run anti-virus program to locate the problem.

Default value is Disabled.

Enabled	Activate automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table
Disabled	No warning message to appear when anything attempts to access the boot sector or hard disk partition table

- CPU Internal Cache / External Cache

These two categories speed up memory access. However, it depends on CPU / chipset design. The default value is Enabled.

Enabled	Enable cache
Disabled	Disable cache

- CPU L2 Cache ECC Checking

  The default value is Disabled.

Enabled	Enable CPU L2 Cache ECC Checking
Disabled	Disable CPU L2 Cache ECC Checking

- Quick Power On Self Test

  This category speeds up Power On Self Test (POST) after you power on the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

  The default value is Enabled.

Enabled	Enable quick POST
Disabled	Normal POST

- CPU Update Data

  The default value is Enabled.

Enabled	Enable CPU Update Data
Disabled	Normal CPU Update Data

- Boot From LAN First

  The default value is Enabled.

Enabled	Enable Boot From LAN First Function
Disabled	Disable Boot From LAN First Function

- Boot Sequence

  This category determines which drive computer searches first for the disk operating system (i.e., DOS). Default value is A, C, SCSI.

X1, X2, X3	System will first search for X1 disk drive then X2 disk drive and then X3 disk drive.

- Swap Floppy Drive

  The default value is Disabled.

Enabled	Floppy A & B will be swapped under DOS
Disabled	Floppy A & B will be normal definition

- VGA Boot From

  The default value is AGP

AGP	System will boot from AGP Display Card
PCI	System will boot from PCI VGA Card

- Boot Up Floppy Seek

  During POST, BIOS will determine the floppy disk drive installed is 40 or 80 tracks. 360 K type is 40 tracks 720 K, 1.2 M and 1.44 M are all 80 tracks. The default value is Enabled.

Enabled	BIOS searches for floppy disk drive to determine it is 40 or 80 tracks. Note that BIOS can not tell from 720 K, 1.2 M or 1.44 M drive type as they are all 80 tracks
Disabled	BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360 K

- Boot Up NumLock Status

  The default value is On.

On	Keypad is number keys
Off	Keypad is arrow keys

- Typematic Rate Setting

  The default value is Disabled.

Enabled	Enable Keyboard Typematic rate setting.
Disabled	Disable Keyboard Typematic rate setting.

- Typematic Rate (Chars / Sec.)

  The default value is 6.

6-30	Set the maximum Typematic rate from 6 chars. Per second to 30 characters. Per second.

- Typematic Delay (Msec.)

The default value is 250.

250-1000	Set the time delay from first key to repeat the same key in to computer.

- Security Option

This category allows you to limit access to the system and Setup, or just to Setup. The default value is Setup.

System	The system can not boot and can not access to Setup page will be denied if the correct password is not entered at the prompt
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt

☛ **To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup page freely.**

- PCI/VGA Palette Snoop
The default value is Disabled.

Enabled	For having Video Card on ISA Bus and VGA Card on PCI Bus.
Disabled	For VGA Card only.

- OS Select For DRAM>64MB
The default value is Non-OS2.

Non-OS2	Using non-OS2 operating system.
OS2	Using OS2 operating system and DRAM>64MB.

- Video BIOS Shadow

It determines whether video BIOS is able to copy to RAM, however, it is optional from chipset design. Video Shadow will increase the video speed. The default value is Enabled.

Enabled	Video shadow is enabled
Disabled	Video shadow is disabled

4.7. CHIPSET FEATURES SETUP
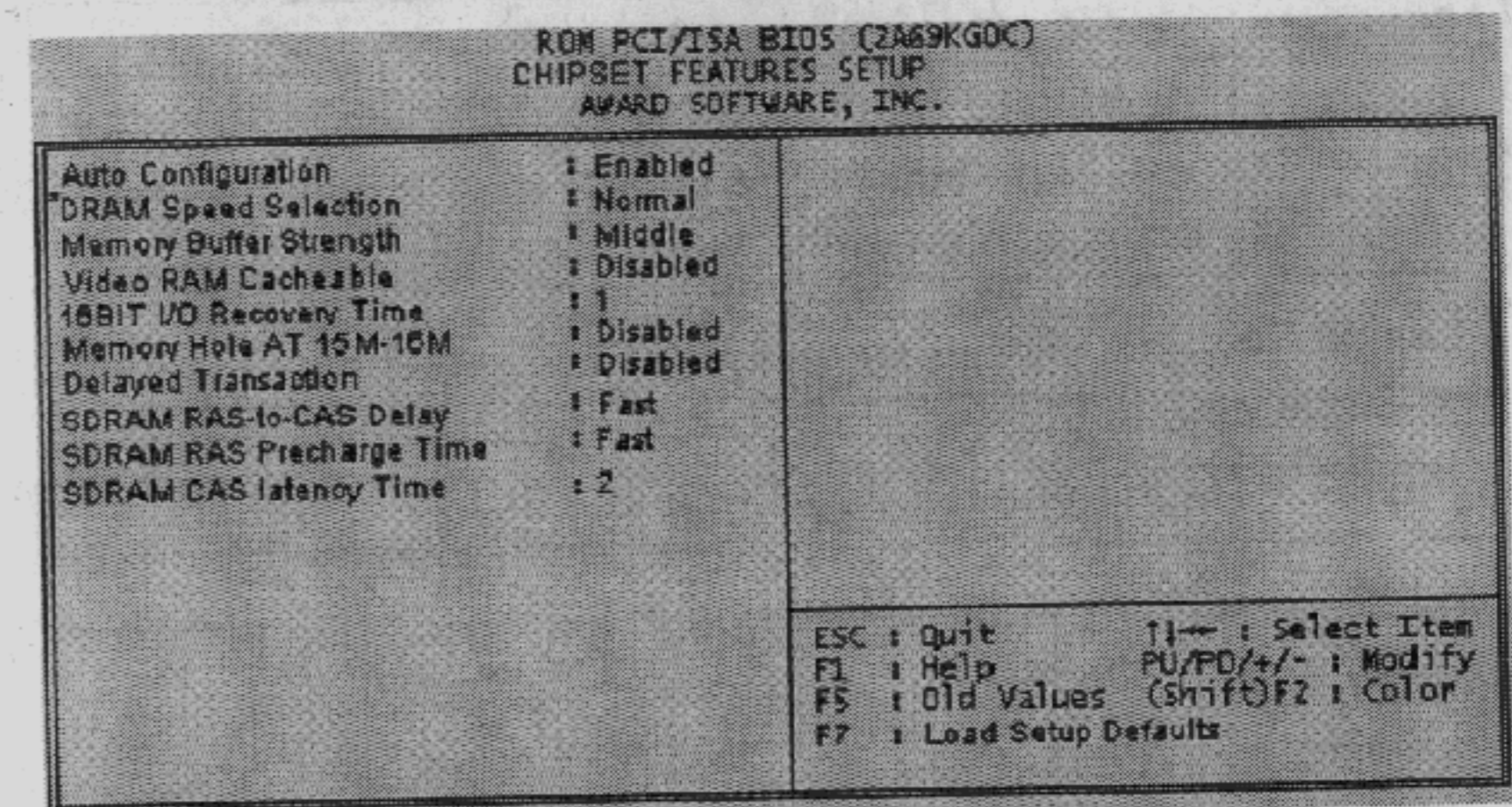
Figure 4.4: Chipset Features Setup

* This item will be unavailable when Auto Configuration is set to Diabled.

- Auto Configuration

The default value is Enabled.

Enabled	For 50 - 60ns EDO DRAM Timing.
Disabled	For slow speed DRAM Timing.

- DRAM Speed Selection

The default value is Normal.

Normal	For normal DRAM operation.
Fast	For Fastest DRAM timing operation.

- Memory Buffer Strength

  The default value is Middle.

Middle	For Middle Memory Buffer strength.
Low	For Low Memory Buffer strength.
High	For High Memory Buffer strength.

- Video RAM Cacheable

  The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable this function to get better VGA performance; while some brands of VGA must be disabled this function (e.g.ET4000W32P).

- 16 Bit I/O Recovery Time

  The default value is 1.

1-4	Set 16 Bit I/O recovery time from 1 to 4.
NA	None.

- Memory Hole At 15M-16M

  The default value is Disabled.

Disabled	Normal Setting.
Enabled	Set Address=15~16MB remap to ISA BUS.

- Delayed Transaction

  The default value is Disabled.

Disabled	Normal operation.
Enabled	For slow speed ISA device in system.

- SDRAM RAS-to-CAS Delay

  The default value is Fast

Slow	For 67 / 83 MHz SDRAM DIMM module.
Fast	For 100 MHz SDRAM DIMM module.

- SDRAM RAS Precharge Time

  The default value is Fast.

Slow	For 67 / 83 MHz SDRAM DIMM module.
Fast	For 100 MHz SDRAM DIMM module.

- SDRAM CAS latency Time

  The default value is 2.

3	For 67 / 83 MHz SDRAM DIMM module.
2	For 100 MHz SDRAM DIMM module.

4.8. POWER MANAGEMENT SETUP
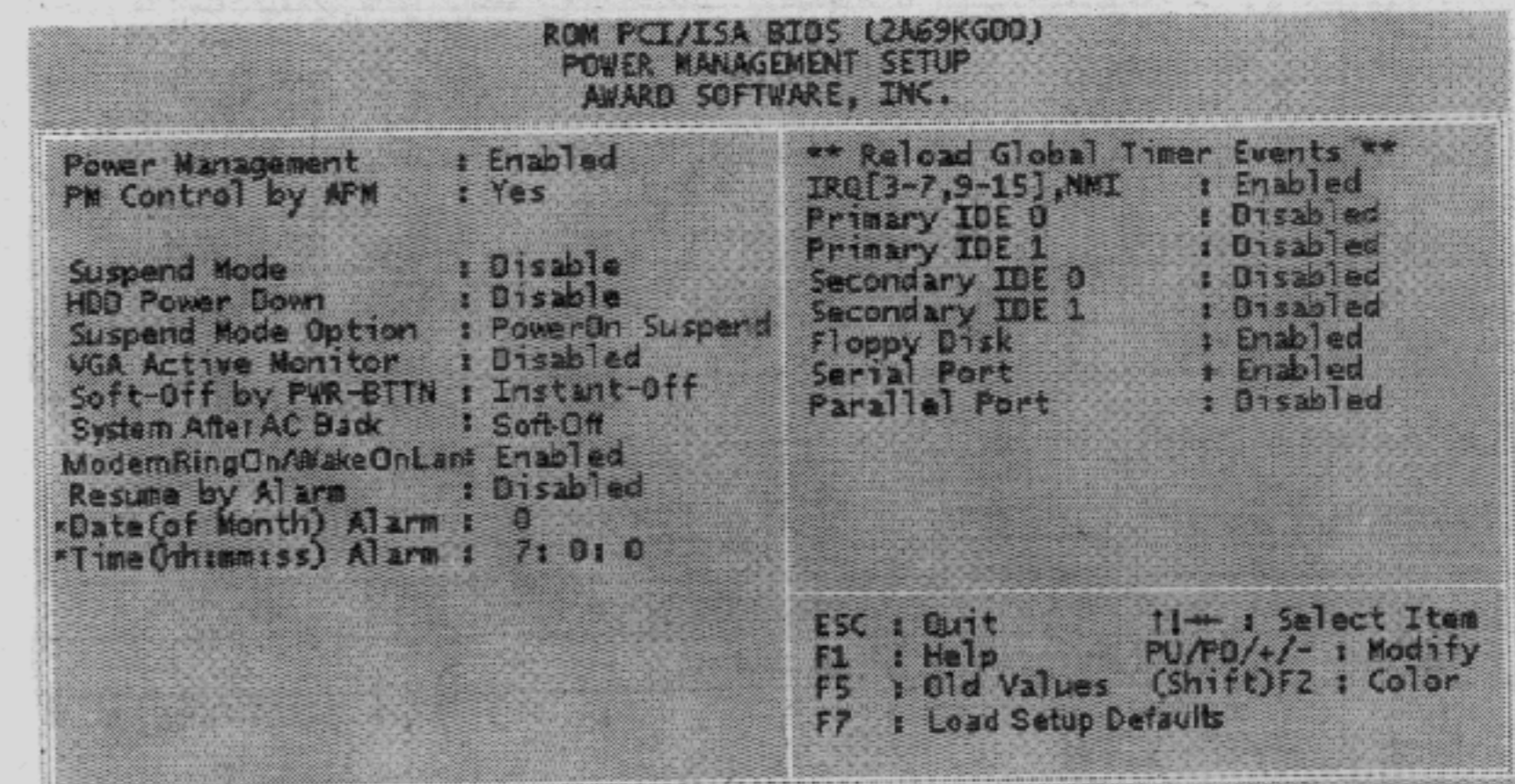
Figure 4.5: Power Management Setup

* These two items will show up when Resume by Alarm is enabled.

- Power Management

    The default value is Enabled.

Enabled	Enable Green function.
Disabled	Disable Green function.

- PM Control by APM

    The default value is Yes.

Yes	Enable software APM function.
No	Disable software APM function.

- Suspend Mode

    The default value is Disable.

Disabled	Disable Suspend Mode.
1 min - 1 Hour	Setup the timer to enter Suspend Mode.

- HDD Power Down

    The default value is Disable.

Disable	Disable HDD Power Down mode function.
1-15 mins.	Enable HDD Power Down mode between 1 to 15 mins.

- Suspend Mode Option

    The default value is PowerOn Suspend

 | PowerOn Suspend | Set the system to PowerOn Suspend mode |
    | --- | --- |
    | Suspend to Disk (optional) | Set the system to Suspend to Disk mode |

- VGA Active Monitor

    The default value is Disabled.

Disabled	Disable monitor VGA activity.
Enabled	Enable monitor VGA activity.

- Soft-off by PWR-BTTN

    The default value is Instant-Off.

Instant-off	Soft switch ON/OFF for POWER ON/OFF
Delay 4 Sec.	Soft switch ON 4sec. for POWER OFF.

- System After AC BACK

    The default value is Soft-Off.

Soft-Off	Set System Soft-Off Status.
Full-On	Set System Full-On Status.

- ModemRingOn / WakeOnLan

    The default value is Enabled.

Enabled	Enabled ModemRingOn / WakeOnLan function.
Disabled	Disabled ModemRingOn / WakeOnLan function.

- Resume by Alarm

    The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable alarm function to POWER ON system.

    If the default value is Enabled.

Date (of Month) Alarm :	0~31
Time (hh: mm: ss) Alarm :	(0~23) : (0~59) : (0~59)

- IRQ [3-7,9-15], NMI

    The default value is Enabled.

Disabled	Disable this function.
Enabled	Enable monitor IRQ [3-7,9-15] for Green event.

- Primary IDE 0 / 1

    The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable monitor Primary IDE 0 / 1 for Green event.

- Secondary IDE 0 / 1

    The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable monitor Secondary IDE 0 / 1 for Green event.

- Floppy Disk

  The default value is Enabled.

Disabled	Disable this function.
Enabled	Enable monitor Floppy Disk for Green event.

- Serial Port

  The default value is Enabled.

Disabled	Disable this function.
Enabled	Enable monitor Serial Port for Green event.

- Parallel Port

  The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable monitor Parallel Port for Green event.

4.9. PNP/PCI CONFIGURATION
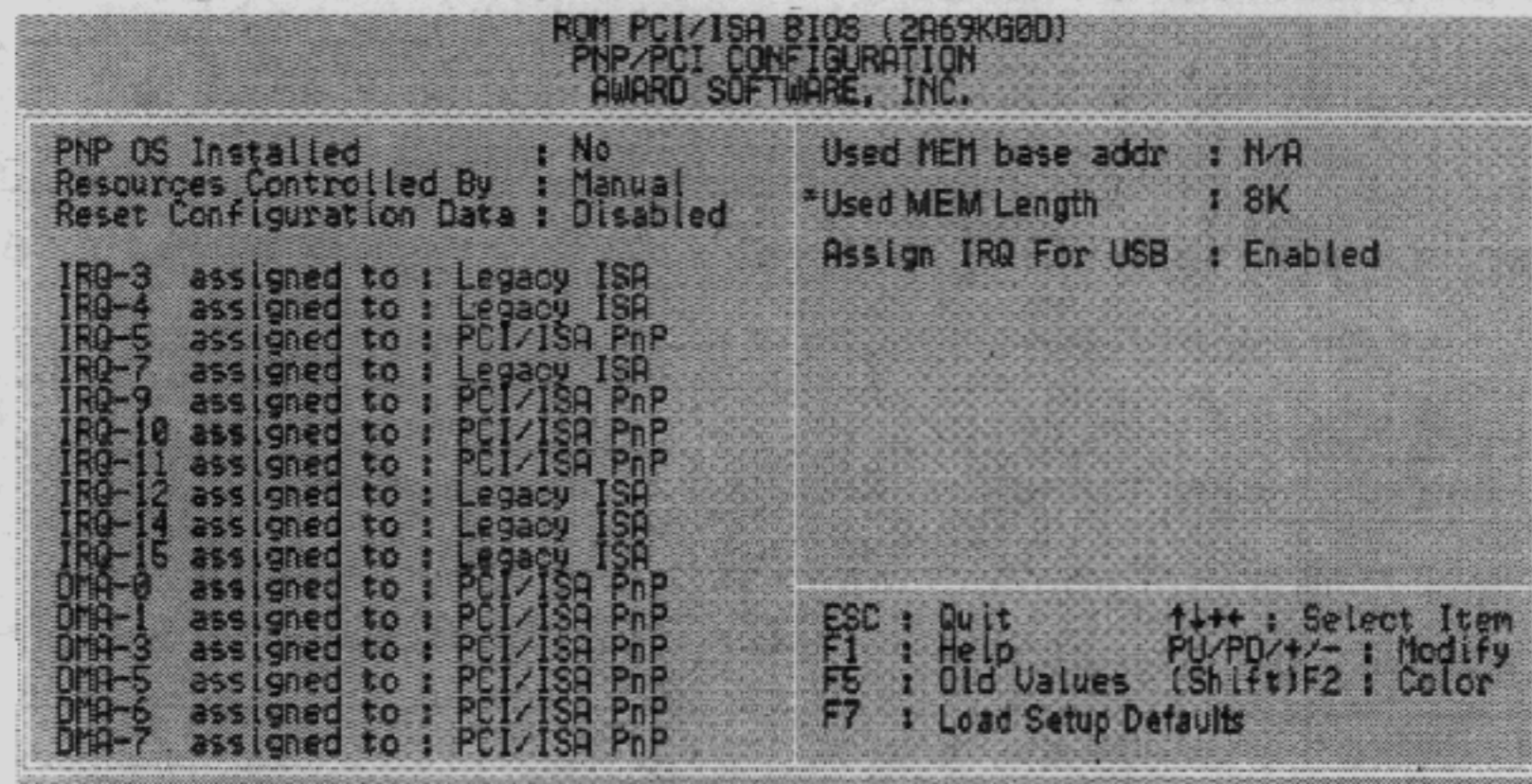
Figure 4.6: PCI Slot Configuration

* This item will show up when "Used MEM base addr" has been set.

- PNP OS Installed

  The default value is No.

Yes	Enable PNP OS Installed function.
No	Disable PNP OS Installed function.

- Resources Controlled by

  The default value is Manual.

Manual	User can set the PnP resource (I/O Address, IRQ & DMA channels) used by legacy ISA DEVICE.
Auto	BIOS automatically use these PnP rescuers.

- Reset Configuration Data

  The default value is Disabled.

Disabled	Disable this function.
Enabled	Enable clear PnP information in ESCD.

- IRQ (3,4,5,7,9,10,11,12,14,15), DMA(0,1,3,5,6,7) assigned to

  The default value is "Legacy ISA" or "PCI/ISA PnP".

Legacy ISA	The resource is used by Legacy ISA device.
PCI/ISA PnP	The resource is used by PCI/ISA PnP device (PCI or ISA).

- Used MEM base addr

  The default value is N/A.

N/A	Disable the MEM. block using.
C800 ~ DC00	Select the MEM. block starting address.

- Used MEM Length

  The default value is 8K.

8K ~ 64K	Select the MEM. block size.

- Assign IRQ For USB

  The default value is Enabled.

Enabled	Assign a specific IRQ for USB
Disabled	No IRQ is assigned for USB

4.10. INTEGRATED PERIPHERALS

```
          ROM PCI / ISA BIOS (2A69JG0N)
             INTEGRATED PERIPHERALS
              AWARD SOFTWARE, INC.

IDE HDD Block Mode      : Enabled    PS/2 Mouse Power On    : Disabled
IDE Primary Master PIO  : Auto       Keyboard Power On      : Disabled
IDE Primary Slave  PIO  : Auto      *KB Power On Multikey   : Enter
IDE Secondary Master PIO: Auto
IDE Secondary Slave  PIO: Auto
IDE Primary Master UDMA  : Auto
IDE Primary Slave  UDMA  : Auto
IDE Secondary Master UDMA: Auto
IDE Secondary Slave  UDMA: Auto
On-Chip Primary   PCI IDE: Enabled
On-Chip Secondary PCI IDE: Enabled
USB Keyboard Support     : Disabled

Onboard FDC Controller   : Enabled
Onboard Serial Port 1    : 3F8/IRQ4
Onboard Serial Port 2    : 2F8/IRQ3   ESC : Quit          ↑↓←→ : Select Item
Onboard Parallel Port    : 378/IRQ7   F1  : Help          PU/PD/+/- : Modify
Parallel Port Mode       : SPP        F5  : Old Values  (Shift)F2 : Color
                                      F7  : Load Setup Defaults
```
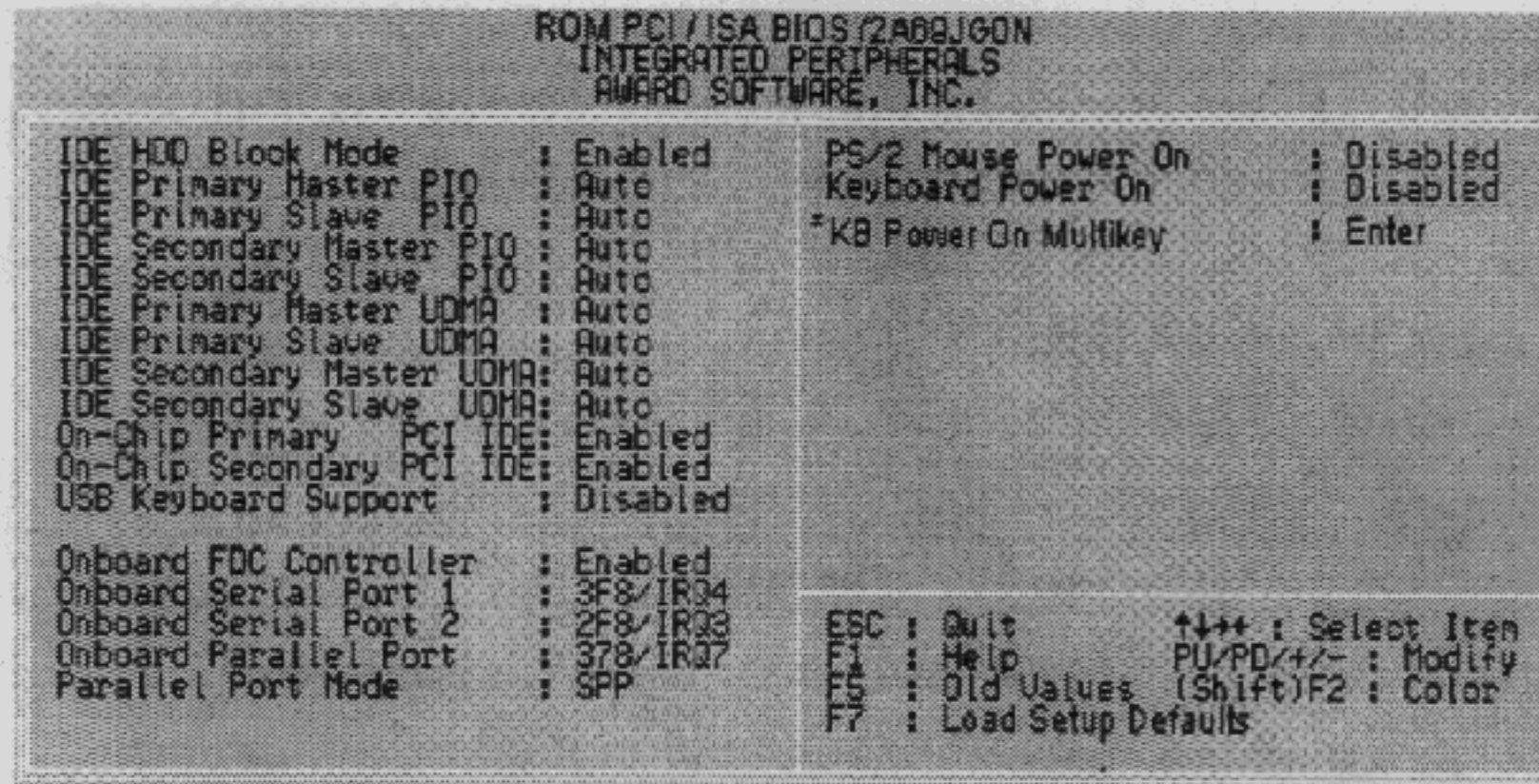
Figure 4.7: Integrated Peripherals

* This item will show up when "Keyboard Power On :Multikey" is selected.

- IDE HDD Block Mode

  The default value is Enabled.

Enabled	Enable IDE HDD Block Mode
Disabled	Disable IDE HDD Block Mode

- IDE Primary Master PIO (for onboard IDE 1st channel).

  The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Mode0~4	Manually set the IDE Accessing mode.

- IDE Primary Slave PIO (for onboard IDE 1st channel).

  The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Mode0~4	Manually set the IDE Accessing mode.

- IDE Secondary Master PIO (for onboard IDE 2nd channel).

  The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Mode0~4	Manually set the IDE Accessing mode.

- IDE Secondary Slave PIO (for onboard IDE 2nd channel).

  The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Mode0~4	Manually set the IDE Accessing mode.

- IDE Primary Master UDMA.

  The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Disabled	Disable UDMA function.

- IDE Primary Slave UDMA.

  The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Disabled	Disable UDMA function.

- IDE Secondary Master UDMA.

  The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Disabled	Disable UDMA function.

- IDE Secondary Slave UDMA.

  The default value is Auto.

Auto	BIOS will automatically detect the IDE HDD Accessing mode.
Disabled	Disable UDMA function.

- On-Chip Primary PCI IDE

  The default value is Enabled.

Enabled	Enable onboard 1st channel IDE port.
Disabled	Disable onboard 1st channel IDE port.

- On-Chip Secondary PCI IDE

  The default value is Enabled.

Enabled	Enable onboard 2nd channel IDE port.
Disabled	Disable onboard 2nd channel IDE port.

- USB Keyboard Support

  The default value is Disabled.

Enabled	Enable USB Keyboard Support.
Disabled	Disable USB Keyboard Support.

- Onboard FDC Controller

  The default value is Enabled.

Enabled	Enable onboard FDC port.
Disabled	Disable onboard FDC port.

- Onboard Serial Port 1

  The default value is 3F8/IRQ4.

Auto	BIOS will automatically setup the port 1 address.
3F8/IRQ4	Enable onboard Serial port 1 and address is 3F8.
2F8/IRQ3	Enable onboard Serial port 1 and address is 2F8.
3E8/IRQ4	Enable onboard Serial port 1 and address is 3E8.
2E8/IRQ3	Enable onboard Serial port 1 and address is 2E8.
Disabled	Disable onboard Serial port 1.

- Onboard Serial Port 2

  The default value is 2F8/IRQ3.

Auto	BIOS will automatically setup the port 2 address.
3F8/IRQ4	Enable onboard Serial port 2 and address is 3F8.
2F8/IRQ3	Enable onboard Serial port 2 and address is 2F8.
3E8/IRQ4	Enable onboard Serial port 2 and address is 3E8.
2E8/IRQ3	Enable onboard Serial port 2 and address is 2E8.
Disabled	Disable onboard Serial port 2.

- Onboard Parallel port

  The default value is 378/IRQ7.

378/IRQ7	Enable onboard LPT port and address is 378/IRQ7.
278/IRQ5	Enable onboard LPT port and address is 278/IRQ5.
3BC/IRQ7	Enable onboard LPT port and address is 3BC/IRQ7.
Disabled	Disable onboard LPT port.

- Parallel Port Mode

  The default value is SPP.

SPP	Using Parallel port as Standard Printer Port.
EPP	Using Parallel port as Enhanced Parallel Port.
ECP	Using Parallel port as Extended Capabilities Port.
ECP/EPP	Using Parallel port as ECP & EPP mode.

- PS/2 Mouse Power on

  The default value is Disabled.

Disabled	Disable PS/2 Mouse Power on .
DblClick	Click twice on PS/2 mouse any button to Power on system.

- Keyboard Power on

  The default value is Disabled.

Disabled	Disable Keyboard Power on .
Multikey	Enter multikey combination to Power on system.

☞ **You can power on your system by entering the keyboard power on password. If your password consists of more than one character, you have to press the ENTER key after entering the password**.

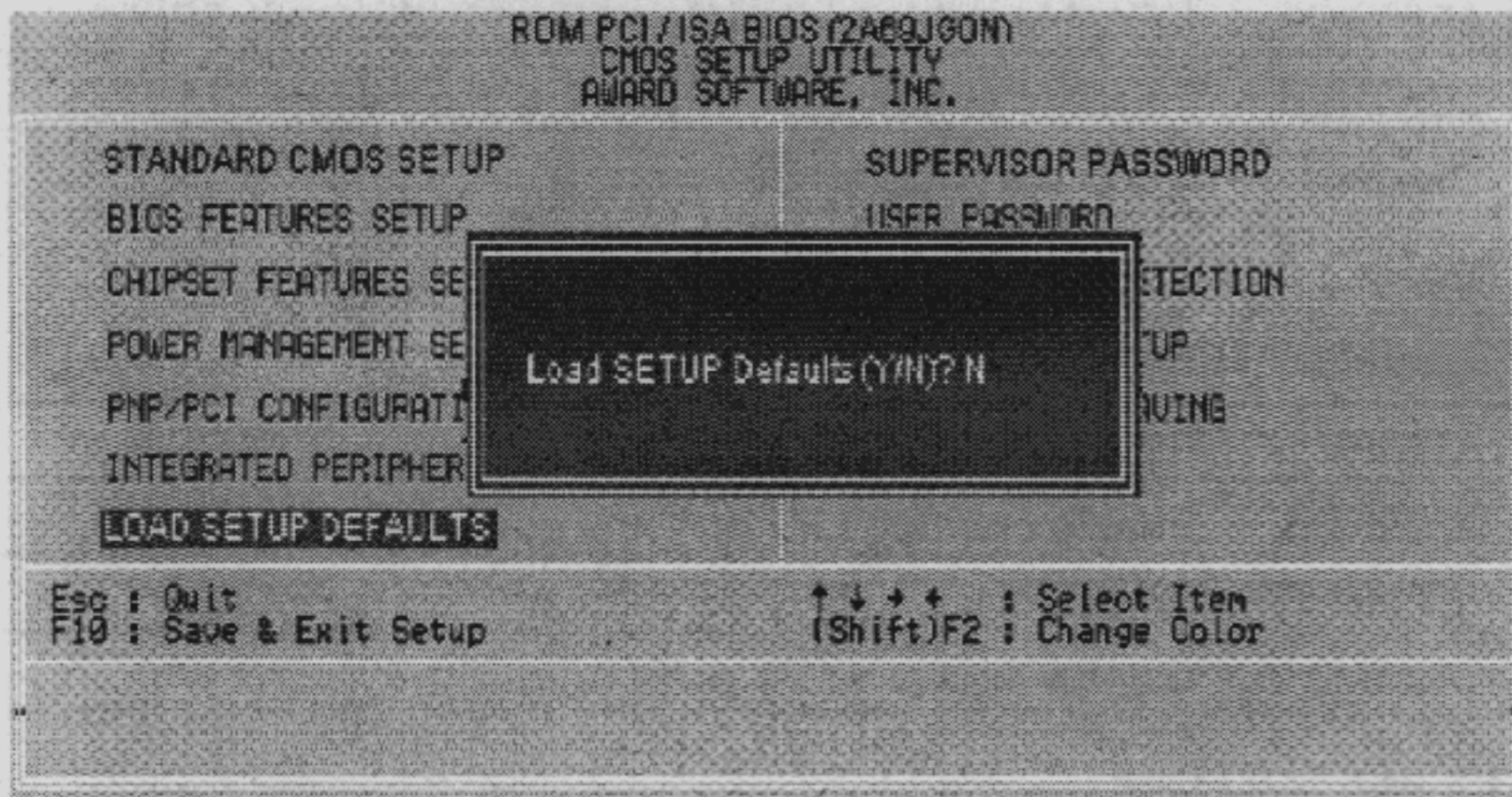## 4.11. LOAD SETUP DEFAULTS

Figure 4.8: Load SETUP Defaults

- Load SETUP Defaults

  To load SETUP defaults value to CMOS SRAM, enter "Y". If not, enter "N".

4.12. Supervisor Password /User Password

When you select this function, the following message will appear at the center of the screen to assist you in creating a password.
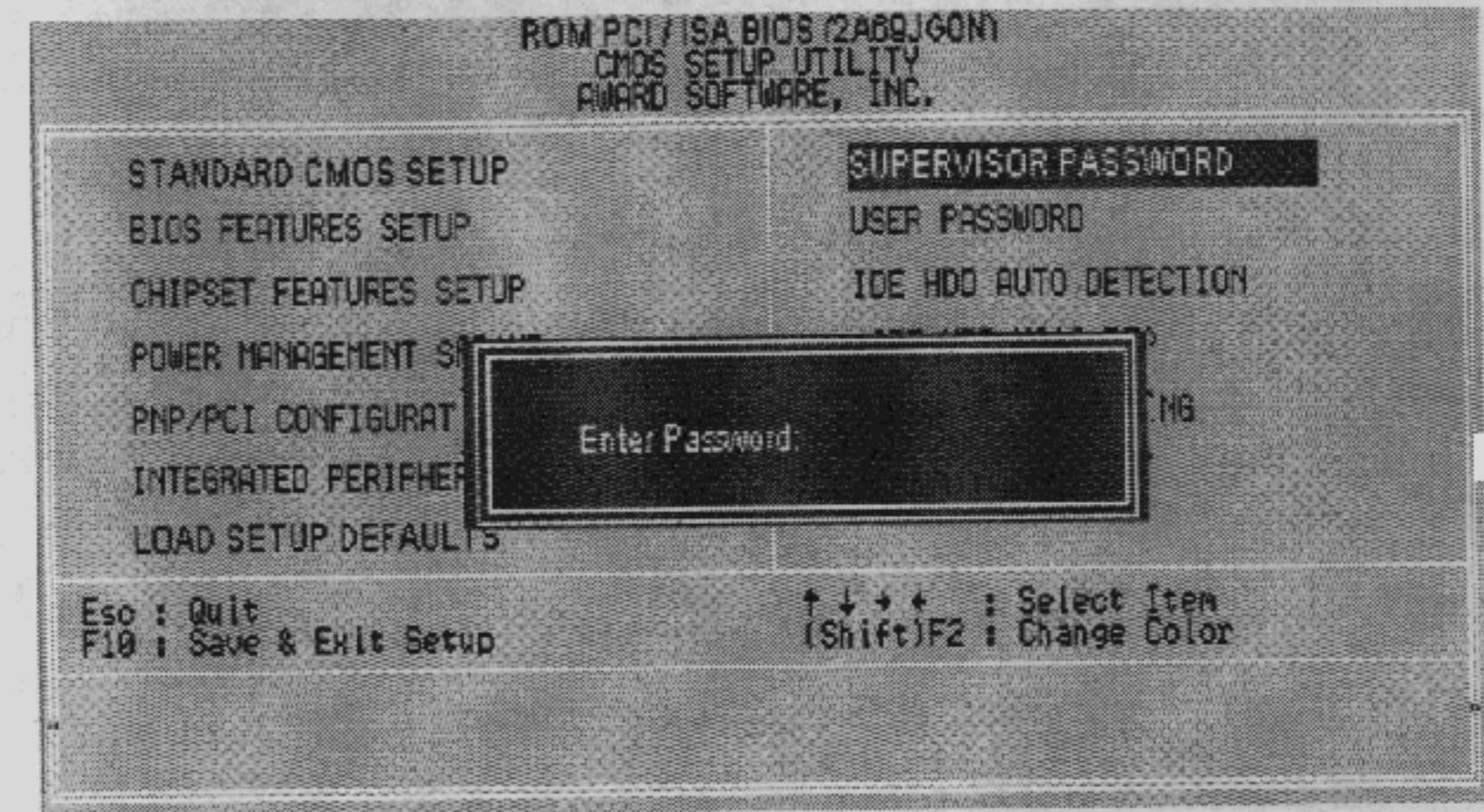

Figure 4.9: Password Setting

Type the password, up to eight characters, and press <Enter>. The password typed now will clear the previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To disable password, just press <Enter> when you are prompted to enter password. A message "PASSWORD DISABLED" will appear to confirm the password being disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

If you select System at Security Option in BIOS Features Setup Menu, you will be prompted for the password every time the system is rebooted or any time you try to enter Setup Menu. If you select Setup at Security Option in BIOS Features Setup Menu, you will be prompted only when you try to enter Setup.
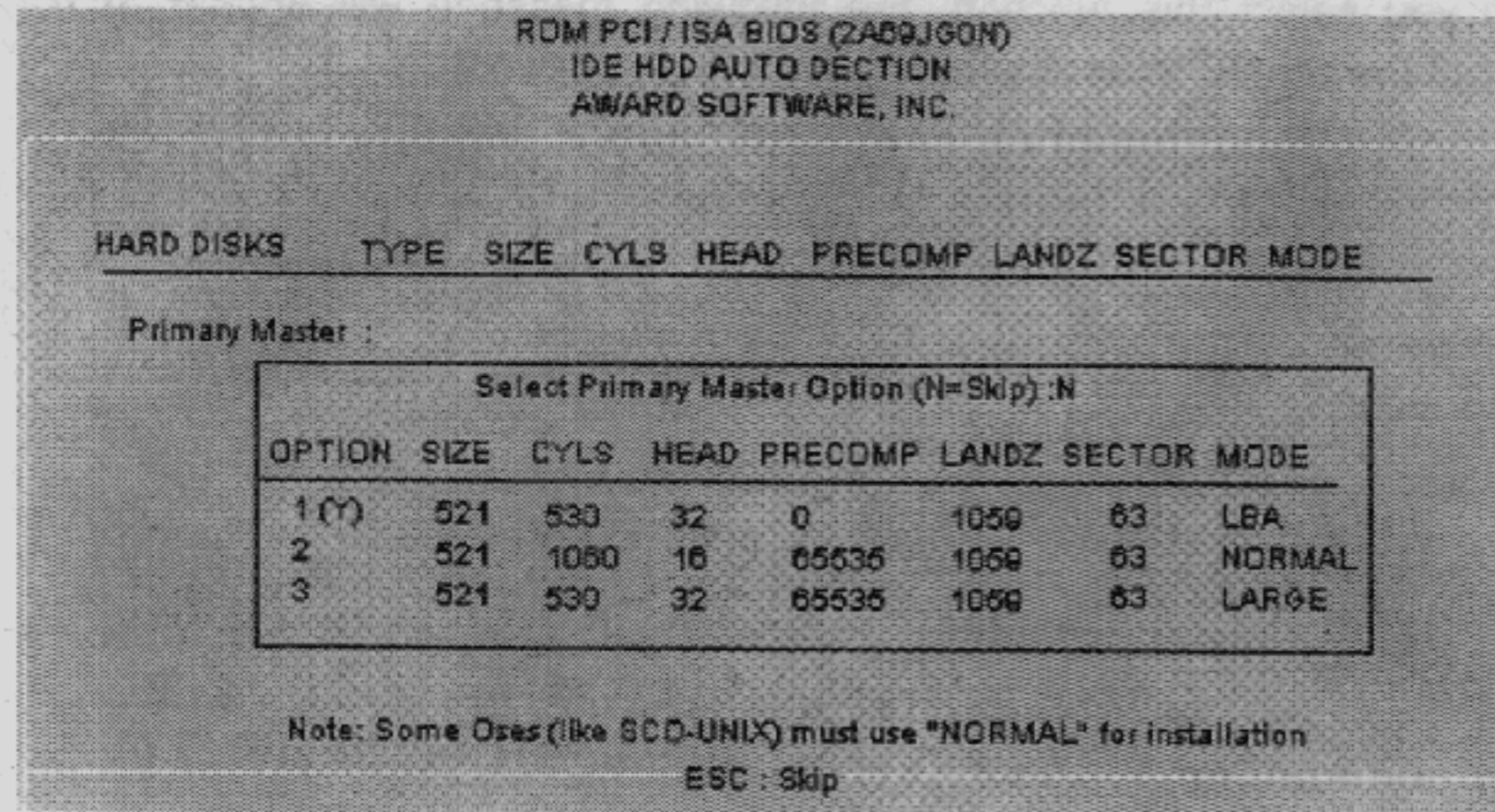
4.13. IDE HDD AUTO DETECTION

Figure 4.10: IDE HDD Auto Detection

Type "Y" will accept the H.D.D. parameter reported by BIOS.

Type "N" will keep the old H.D.D. parameter setup. If the hard disk cylinder number is over 1024, then the user can select LBA mode or LARGER mode for DOS partition larger than 528 MB.
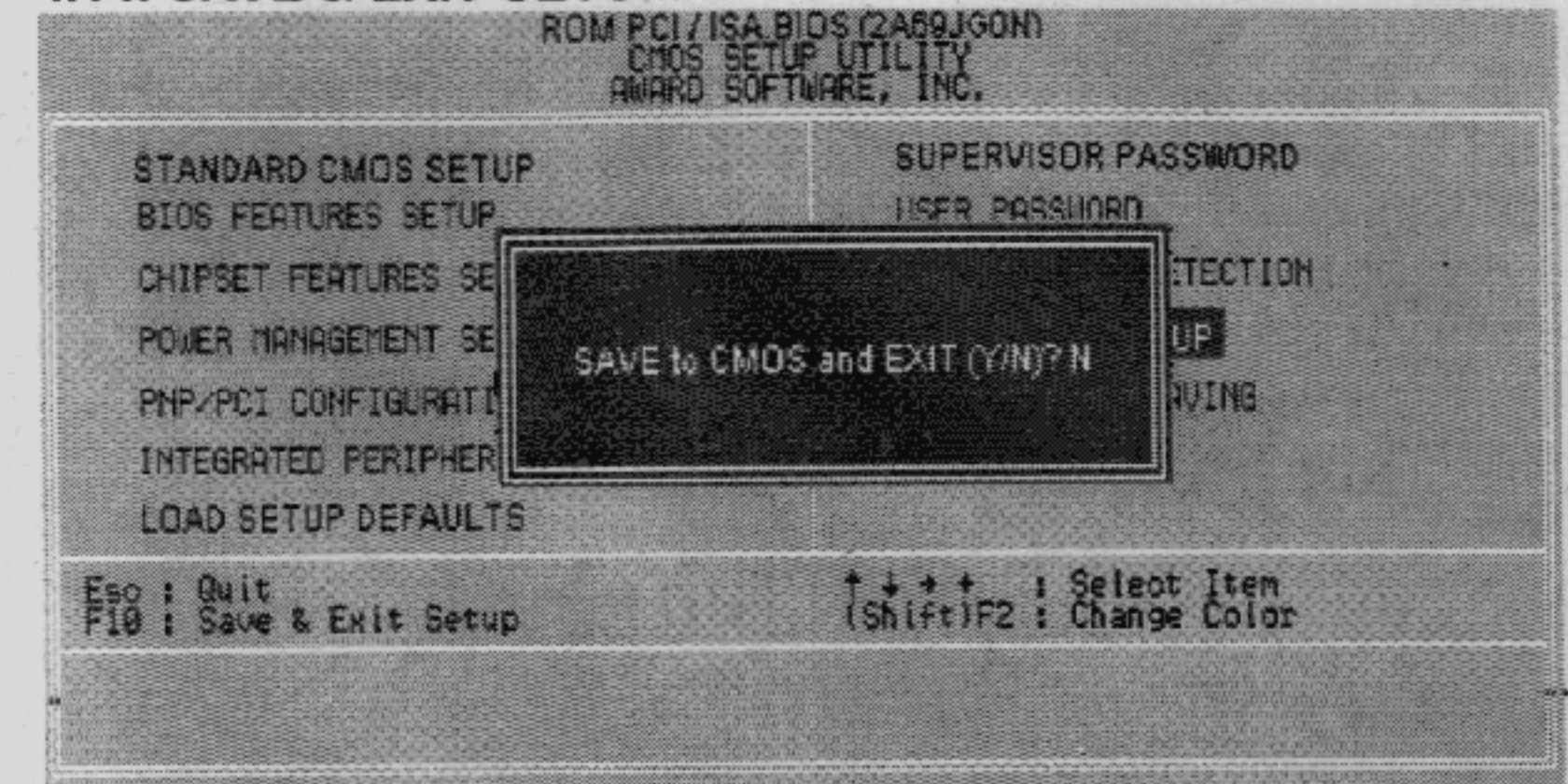
4.14. SAVE & EXIT SETUP

Figure 4.11: Save & Exit Setup

Type "Y" will quit the Setup Utility and save the user setup value to RTC CMOS SRAM.

Type "N" will return to Setup Utility.

4.15. EXIT WITHOUT SAVING

ROM PCI / ISA BIOS (2A69JGON)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP   SUPERVISOR PASSWORD

BIOS FEATURES SETUP   USER PASSWORD

CHIPSET FEATURES SE   ETECTION

POWER MANAGEMENT SE   Quit Without Saving (Y/N)? N   UP

PNP/PCI CONFIGURATI   VING

INTEGRATED PERIPHER

LOAD SETUP DEFAULTS

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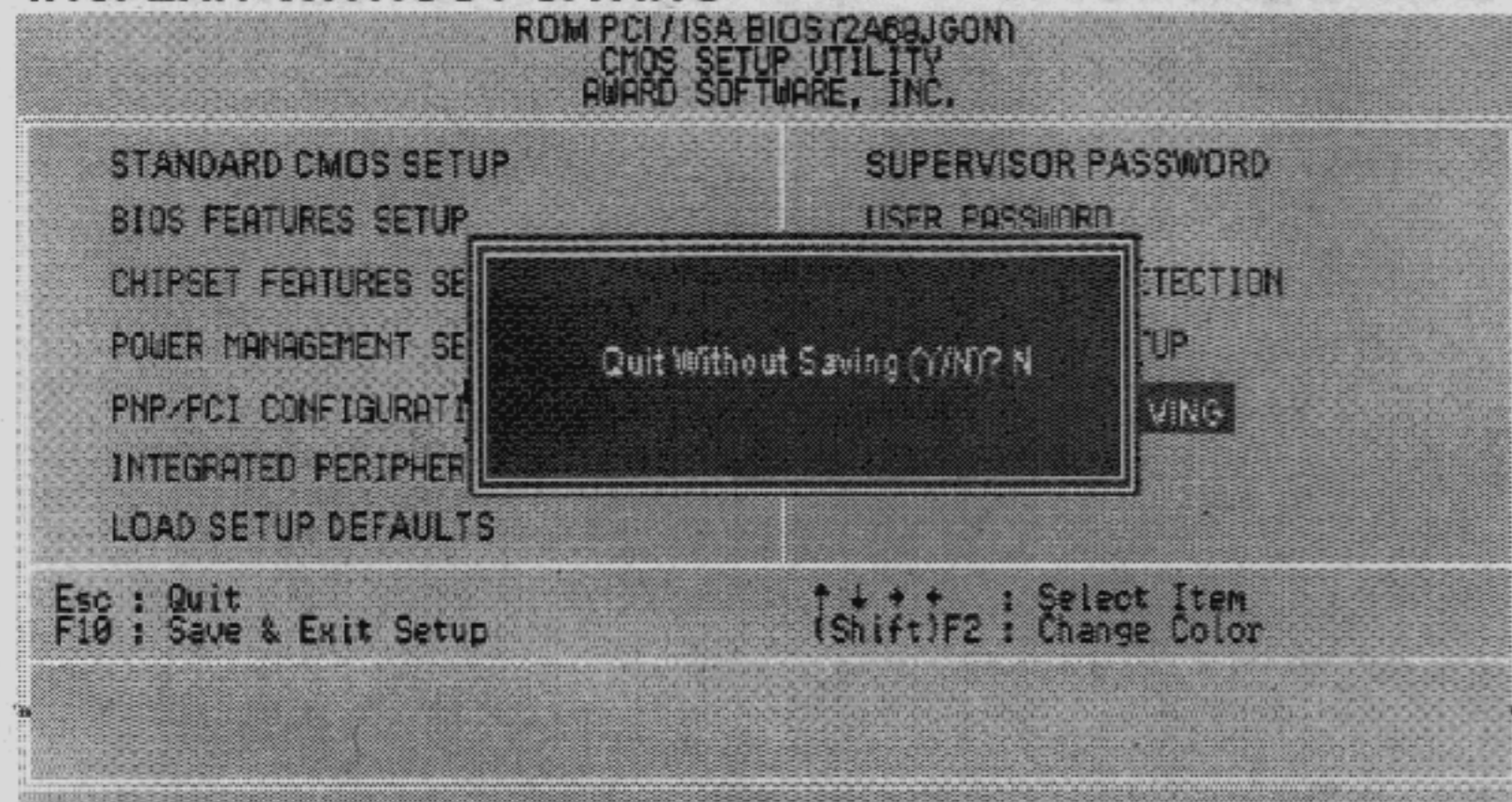F10 : Save & Exit Setup   (Shift)F2 : Change Color

Figure 4.12: Exit Without Saving

Type "Y" will quit the Setup Utility without saving to RTC CMOS SRAM.

Type "N" will return to Setup Utility.