Notice to End Users

This User's Guide & Technical Reference is for assisting system manufacturers and end users in setting up and installing the mainboard.

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Contents

Chapter 1
Introduction

Features

CPU

1. Supports Intel Pentium II (klamath) CPU using SLOT1 at 166 ~ 533 MHz
2. Supports CPU voltage autodetect circuit

Chipset

1. Intel 82440LX chipset
2. PCI Rev 2.1 compliant
3. Supports 66/133MHz, 3.3V AGP (Accelerated Graphics Port) slot

L2 Cache

1. CPU Card supports 256K/512k write back cache with Pipelined Burst SRAMs

Main Memory

1. Memory range from 8MB (minimum) to 1GB (EDO) or 512MB (SDRAM) (maximum) with DRAM Table Free configurations
2. Supports EDO/SDRAM with 50ns/60ns/70ns DRAM speed
3. **Supports 3 pcs 168pin DIMM sockets and 3 pcs 72pin SIMM sockets (3.3V DRAMs type)**
4. DRAM supports ECC or Parity function

BIOS

1. AWARD Plug and Play BIOS
2. Supports Advanced Power Management Function
3. Flash Memory for easy upgrade

Super I/O Function

1. Integrated USB (Universal Serial Bus) controller with two USB ports.
2. Supports 2 IDE channels with 4IDE devices (including 120MB IDE floppy)
3. Provides PCI IDE Bus Master function and supports Ultra DMA33 function
4. One floppy port (including 3.5", 1.2MB Mode 3 function)
5. Two high speed 16550 FIFO UART ports
6. One parallel port with EPP/ECP/SPP capabilities
7. PS/2 mouse connector
8. Built-in RTC, CMOS, keyboard controller on single I/O chip
9. Peripherals boot function (with ATX power)

Other Functions

1. AT size 22cm x 33cm
2. 3 PCI Master slots, 3 ISA slots, and 1 AGP slot
3. Supports SCSI/CD-ROM Boot function
4. Supports CPU temperature warning function
5. DIP switch or jumperless setting
6. AT/ATX power connector with auto detect
7. **Supports 75Mhz Bus Clock.**

Mainboard Layout with Default Settings

The default settings of the following figure is for the Pentium II (Klamath) 233MHz, SIMM voltage is at 5V, Keyboard Power On function is OFF, and the jumperless function is OFF.
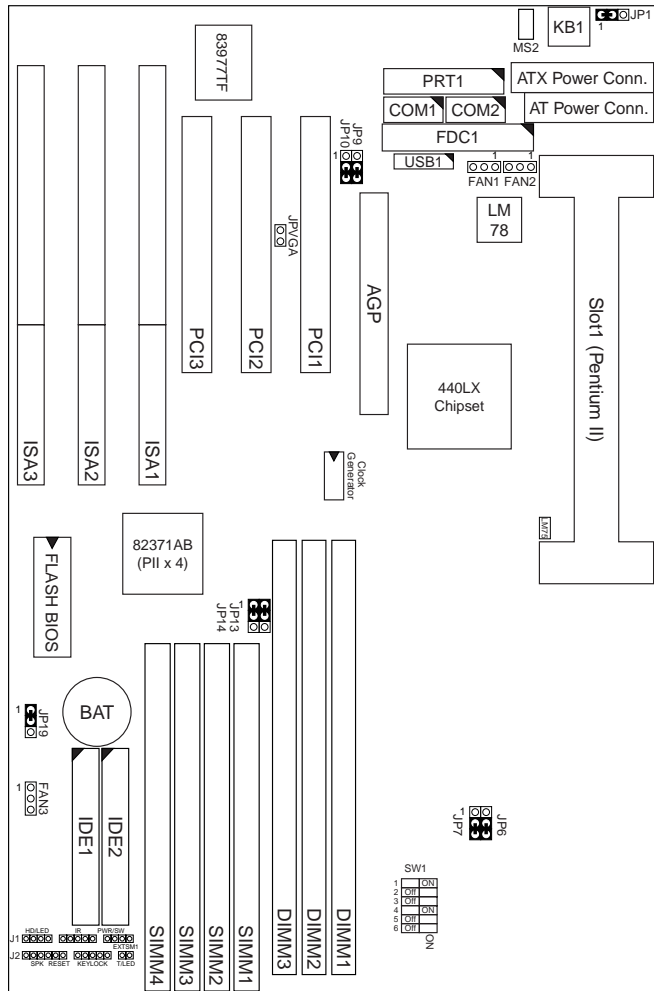
Figure 1–1. Motherboard Layout

Note: DIMM3 and SIMM 1 and 2 can not be installe at the same time (SIMM 1/2 & SIMM3/4 must be in paired.)

Chapter 2
Hardware Setup

There are two ways to set the CPU type and both ways are controlled by JP6 and JP7:

1. Use SW1 (hardware): JP6/JP7 must be closed at pin 2-3 (default). Refer to the following pages (page 4~7).
2. Use BIOS (jumperless): JP6/JP7 must be closed at pin 1-2. Refer to page 35 for detail description.

CPU Type DIP Switch Configuration

CPU 3.5X Clock Setting

Pentium II (klamath) – 233/66MHz
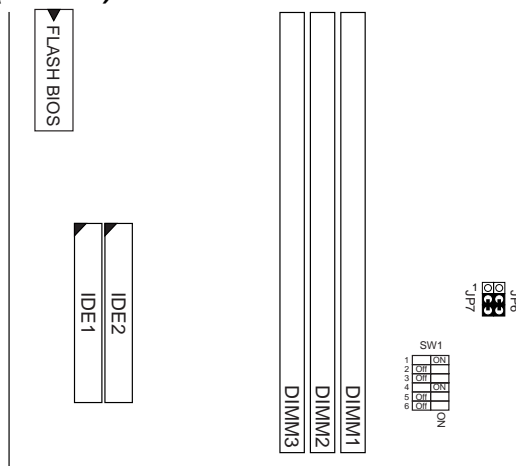
Figure 2–1. CPU Type Configuration

CPU 4.0X Clock Setting

Pentium II (klamath) – 266/66 MHz
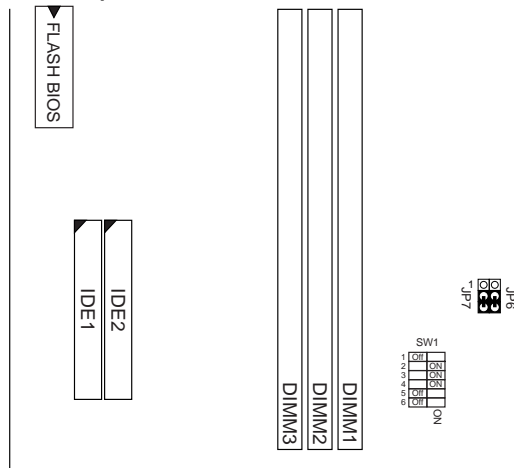
Figure 2–2. CPU Type Configuration

CPU 4.5X Clock Setting

Pentium II (klamath) – 300/66 MHz
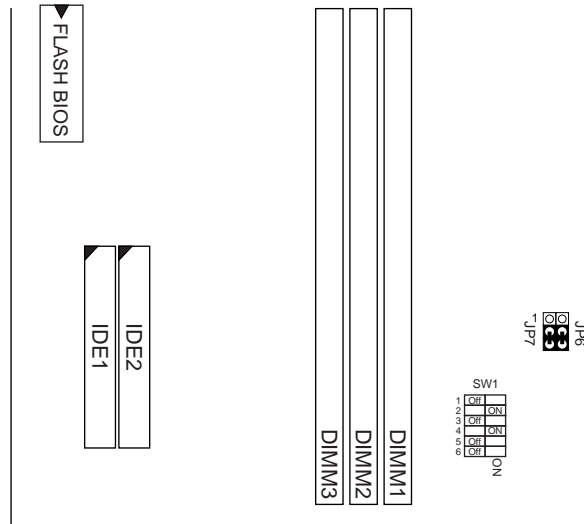
Figure 2–3. CPU Type Configuration

CPU 5.0X Clock Setting

Pentium II (klamath) – 333/66 MHz
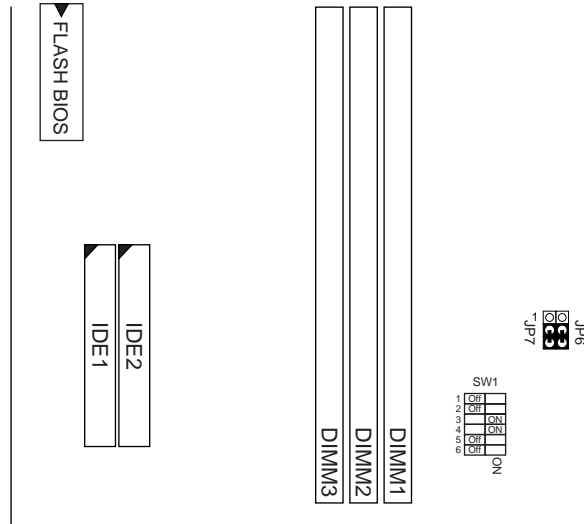
Figure 2–4. CPU Type Configuration

System Memory Configuration

This 82440LX motherboard supports 168 pin DIMM of 4MB, 8MB, 16MB, or 32MB to form a memory size between 8MB to 1GB (EDO) or 512MB (SDRAM). 82440LX chipsets provide "Table-Free" function. It means that users can install DRAM with any configuration and in any bank, and that is why the DRAM table is not needed but do remember that the DRAM must be 3.3V type. DIMM3 and SIMM 1 and 2 can not be installe at the same time (SIMM 1/2 & SIMM3/4 must be in paired.)

CPU Installation

Follow the following steps in order to install your Intel Pentium II (Klamath) properly.

Step 1:
Be sure you are in contact with heat sink vendors for attaching the heat sink on to the CPU.
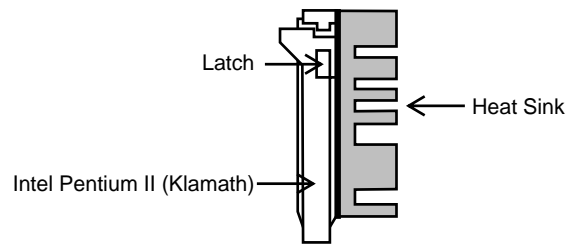
CPU Side View
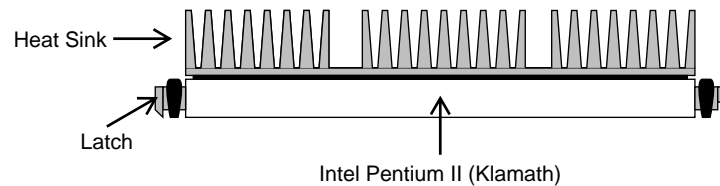
CPU Top View

Notice that the heat sink may be different from the drawings shown here.

Step 2:
Install the 2 pairs of screws, which are shown in the following drawing, onto the mainboard under the word KLAMATH.

Two of the screws are right around the word of KLAMATH and the other pair of screws should be inserted opposite the first pair.

The screws should be inserted from the bottom of the motherboard upward.
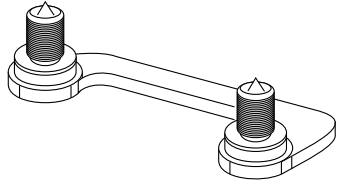
Step 3:
Retention clip is shown in the following figure:
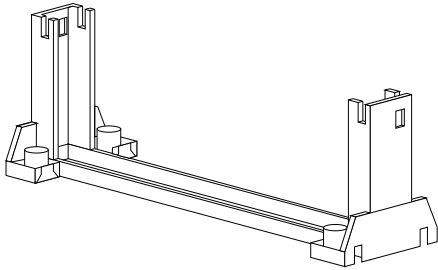
Set the board according to the following diagram before installing the retention clip.
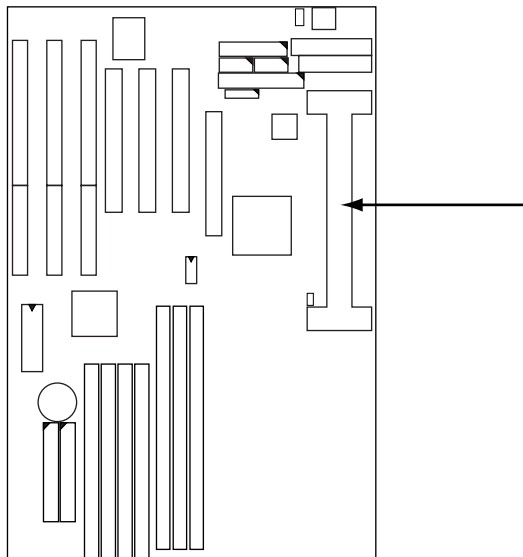
The retention clip should be inserted so that the small rectangle window is more toward to the right hand side of the board.

If installed incorrectly, you will not be able to insert the CPU into the retention clip and in this situation you might need to rotate the retention clip by 180°.

Tighten the 4 screws on the retention clip till the neck of the screws can not be seen from the bottom of the board

Step 4:
Pull the latches up on the base of the CPU supporter and insert it into the two holes directly to the left of the retention clip so that the larger hole is on the bottom.

Press the base of the CPU supporter down in to the holes and lock the latches.
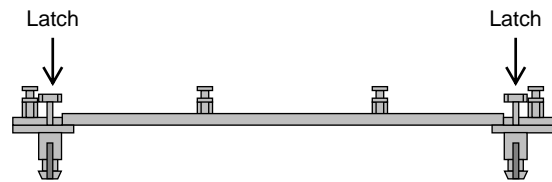
Side View of CPU Supporter Base

Step 5:
Flatten the two latches on the side of CPU. Insert the CPU into the retention clip and notice that the heat sink is on the right hand side of the board. Lock the two latches to secure the CPU.
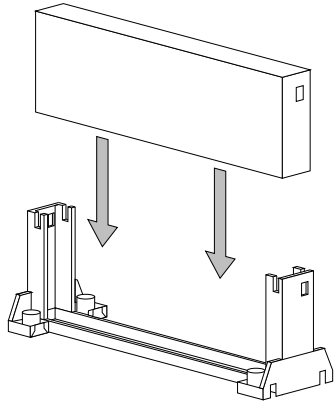
Step 6:
Insert the clip portion of the CPU supporter so that the heat sink can sit on the top of the whole CPU supporter.
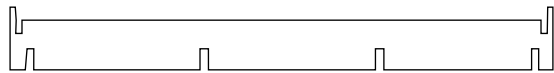
Top View of CPU Support Clip

Notice that the base and the clip of CPU Supporter may be different from the figures shown here.

Intel Single Edge Cartridge (S.E.C.) Cartridge Disassembly Process Application Note

WARNING: Opening, Altering, or tampering with the cover, thermal plate or other S.E.C. cartridge mechanical piece of the processor voids any warranty, express or implied, on this product.

The Pentium II (Klamath) processor is packaged in a S.E.C. cartridge. This package is an assembly consisting of a thermal plate, cover, processor card and skirt. The assembled S.E.C. cartridge is shown in Figure 1. Removal of the cover, skirt and thermal plate is required to use the

Pentium II (Klamath) processor card with a Logic Analyzer Interface (LAI).

OPENING OR ATTEMPTED OPENING OF THE S.E.C. CARTRIDGE VOIDS ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCT. BOARD MAKER IS NOT RESPONSIBLE FOR AND WILL NOT BE LIABLE FOR ANY DAMAGE OR LOSS AS A RESULT OF CUSTOMER FOLLOWING THESE DIRECTIONS, OR OTHERWISE ATTEMPTING TO OPEN THE S.E.C. CARTRIDGE, OR USING THE KLAMATH PROCESSOR WITH A LOGIC ANALYZER INTERFACE OR ANY OTHER DEVICE.

THIS PROCEDURE IS PROVIDED BY BOARD MAKER SOLELY AT THE REQUEST OF THE CUSTOMER; BOARD MAKERDOES NOT RECOMMEND OPENING THE S.E.C. CARTRIDGE.

The following procedure is best known method for removal of the cover an thermal plate, however this is not a 100% proven method. There is still a possibility that damage to the processor card or components will occur leaving the processor non-functional. Please read all instructions prior to cover and thermal plate removal and exercise as much caution during the removal process in order to minimize damage.
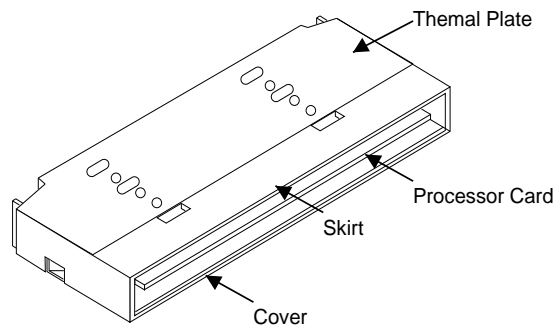
Figure 2–5.   S.E.C. Cartridge
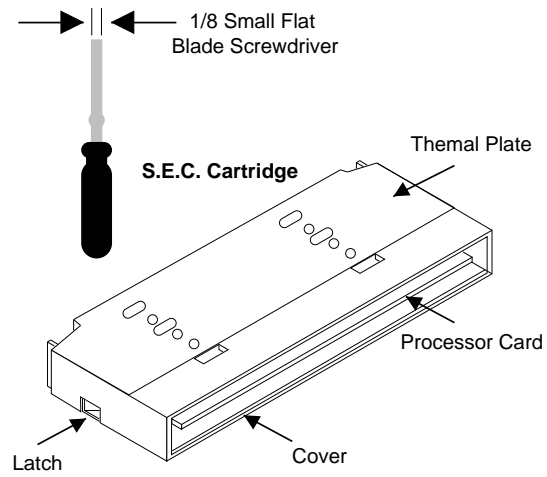
Figure 2–6. Suggested Tools

Note: *This procedure is not intended to allow re-assembly of the S.E.C. Cartridge. Damage to the cover and thermal plate are likely to occur.*

Place the S.E.C. cartridge (and possible attached heat sink) on an anti-static surface with the thermal plate/heat sink facing up. It is not necessary to remove the heat sink, but this would reduce the weight of the thermal plate/heat sink assembly and improve the handling of the S.E.C. cartridge assembly.

Themal Plate

1

2

Barbed posts which are
inside the S.E.C. cartridge
and are not visible, hold the
cover to the thermal plate.
They will release when
enough force is applied.
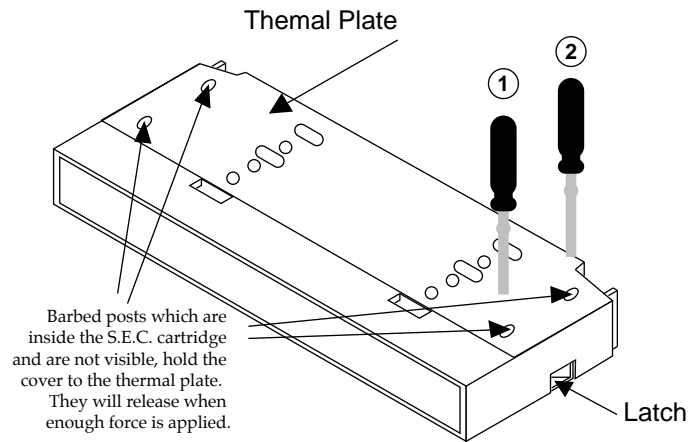
Latch

1. Place screwdriver between latch and thermal plate.
    Twist crewdriver until the thermal plate pops up away
    from the cover. The cover might crush under the force.

2. Slide the screwdriver down near the indent on the
    thermal plate and tist until the bottom of the plate pops
    up. Repeat on other end of the S.E.C. cartridge.

Thermal Plate Removal

Tool

Fine-tip round nose pliers (e.g., Sandvik part # 7590)

Procedure

1. Turn processor card over, so that the thermal plate is on
    the bottom.

2. Insert tips of round-nose pliers between tabs and locator
    pin as illustrated in Fig. 2.
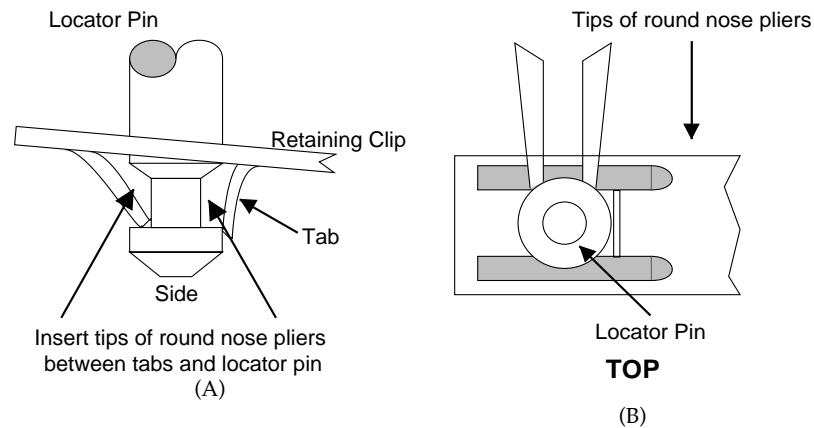
Figure 2–7. Round-nose pliers insertion points (a) side view (b) top view

Labels in figure (A): Locator Pin; Retaining Clip; Tab; Side; Insert tips of round nose pliers between tabs and locator pin; (A)

Labels in figure (B): Tips of round nose pliers; Locator Pin; **TOP**; (B)

3. Hold thermal plate firmly and push the round-nose pliers toward the locator pin (in the direction of the arrow in Fig. 2b). Push until the tabs bend away from the locator pin.

Note: When pushing pliers in, be sure not to angle the pliers so that they damage the secondary side of the printed circuit board (PCB). Pliers should be parallel to PCB.

4. Remove round-nose pliers. Spring clip should no longer be attached to locator pin. If spring clip is still attached, repeat steps 2 to 3 on same locator pin.

Note: Remove spring clips carefully. The spring clip is under compression and may spring back. Keep the edges of the clips from damaging PCB.

5. Repeat steps 2 through 4 until both spring clips are no longer attached.

Thermal Grease Removal

Materials

Wipe, Isopropyl Alcohol

Procedure

Thermal Plate:

Refer to Figure 2–6 for diagram of each step.

1. Use wipe to remove large deposits of grease from the backside of the heat sink.

2. Wipe with isopropyl alcohol until all visible traces of grease are eliminated from the backside of the heat sink.

Note: Thermal plate may be slightly discolored.

3. Discard wipe.

PLGA Heat Slug

1. Use wipe to remove large deposits of grease from the top side of the PLGA heat slug. Wipe until all visible traces of grease are eliminated from the top side of the heat slug.

Note: Be careful not to smear grease onto the PLGA body or the processor card board.

2. Use wipe to clean deposits from the edges of the heat slug.

Note: Be careful not to damage the chip caps on the PLGA when wiping the edges (see Fig.3).

3. Re-wipe the top side of the heat slug.

Chip caps

Thermal Grease

Wipe grease off heat slug

Place wipe at the edge and
wipe residual grease from
edge of heat slug (trace out
edge of slug with wip - stay
clear of chip caps)

Wipe grease off edges of heat slug

Re-wipe to surface of slug

Done
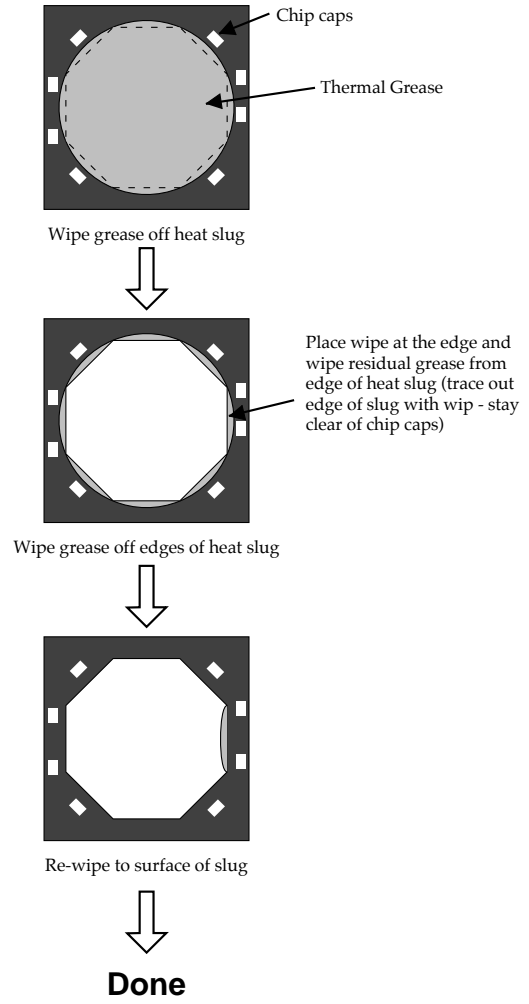
Figure 2–8. Grease Removal Process

Jumper Settings

FAN 1~3: Onboard FAN (12V) Connector

FAN#	Function
FAN1	Power FAN
FAN2	CPU FAN
FAN3	Chasis FAN
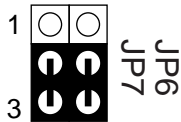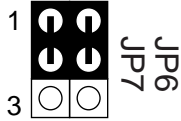
SW1: 5–6 Bus Clock Select

Bus Clock	SW1: 5–6
66MHz (default)	5 Off / 6 Off — On
75MHz	5 Off / 6 On — ON
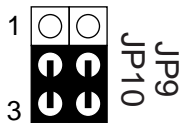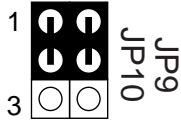
SW1: 1–4: Bus Ratio Select

Bus Ratio	SW1: 1–4	Bus Ratio	SW1: 1–4
3.0x	1 On / 2 Off / 3 On / 4 On — ON	5.0x	1 Off / 2 Off / 3 On / 4 On — ON
3.5x	1 On / 2 Off / 3 Off / 4 On — ON	5.5x	1 Off / 2 Off / 3 Off / 4 On — ON
4.0x	1 Off / 2 On / 3 On / 4 On — ON	6.0x	1 On / 2 On / 3 On / 4 Off — ON
4.5x	1 Off / 2 On / 3 Off / 4 On — ON		

JP6, JP7: DIP Switch or Jumperless Select

CPU Clock Setting	JP6/JP7
DIP SW1 Enabled (default)	
BIOS Setting Enabled (Jumperless)	

JP9, JP10: USB Port Select
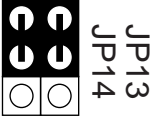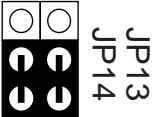
USB Port	JP9/JP10
Redirect all USB ports to USB connector (default)	
Redirect one USB to AGP port	

JPVGA: VGA Card

	JPVGA
For Special VGA Card*	⬚
Normal (default)	▮

> *Note:* This jumper is set for the special VGA card. Close this jumper when the systme isn't able to boot

JP13, JP14: SIMM's Voltage Select

SIMM Module Voltage	JP13/JP14
5V (default)	JP13 JP14
3.3V	JP13 JP14

> *Note:* These jumpers are used to select the SIMM module voltage. If the SIMM modules are 3.3V, make sure that the correct setting is being used, fail doing so, the modules will have a higher chance to be damaged.

JP19: Clear CMOS Data

Clear the CMOS memory by shorting this jumper momentarily; then remove the cap to retain new settings.

COMS Data	JP19
Clear Data	1 ○ ● ● 3 ●
Retain Data (default)	1 ● ● ● 3 ○

IDE LED Activity Light: (J1 pin1–4)

This connector connects to the hard disk activity indicator light on the case.

Infrared Port Module Connector (J1 pin6–10)

The system board provides a 5-pin infrared connector—IR1 as an optional module for wireless transmitting and receiving. **Pin 6 through 10 are Transmit, GND, Receive (low speed), Receive (high speed), and Vcc, respectively.**

J1 pin12, 13: PWR Switch

Power Switch: Toggle this pin for turnning on/off of the power supply (for ATX power only).

SLEEP Switch (J1 pin14, 15)

Toggle this jumper forces the system to sleep and the system won't wake up until the hardware event is coming. (The BIOS Power Management setting muse be Enabled.)

Speaker Connector (J2 pin1–4)

The speaker connector is a 4-pin connector for connecting the system and the speaker. (See the following drawing for jumper position.)

Reset Switch (J2 pin5, 6)

The system board has a 2-pin connector for rebooting your computer without having to turn off your power switch. This prolongs the life of the system's power supply.

Power LED and Keylock Switch (J2 pin8–12)

The keylock switch is a 5-pin connector for locking the keyboard for security purposes. (See the following drawing for jumper position, and pin1~3 is connected to power LED and pin 4~5 is connected to keylock switch.)

Turbo LED (J2 pin14, 15)

Connect the case's turbo LED to this connector.
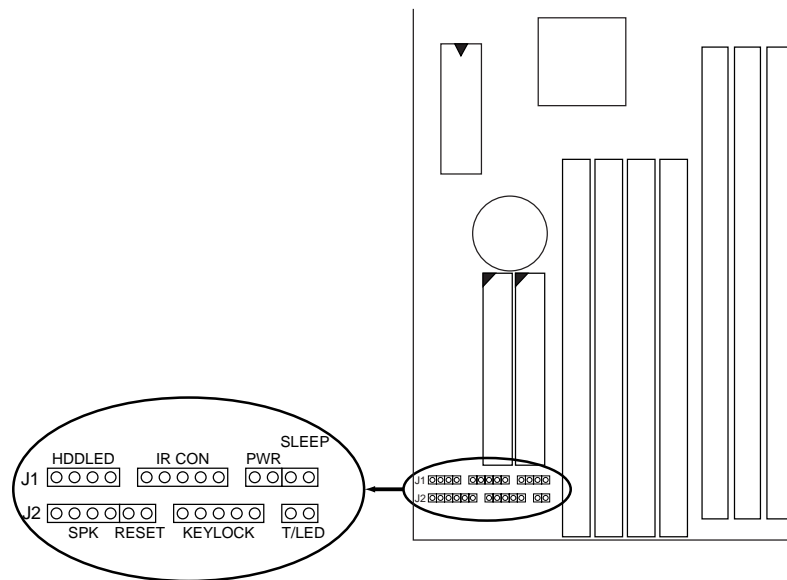
USB: USB Connector

This jumper connects to the USB cable to provide USB device.
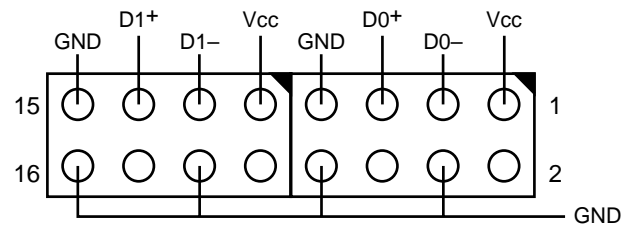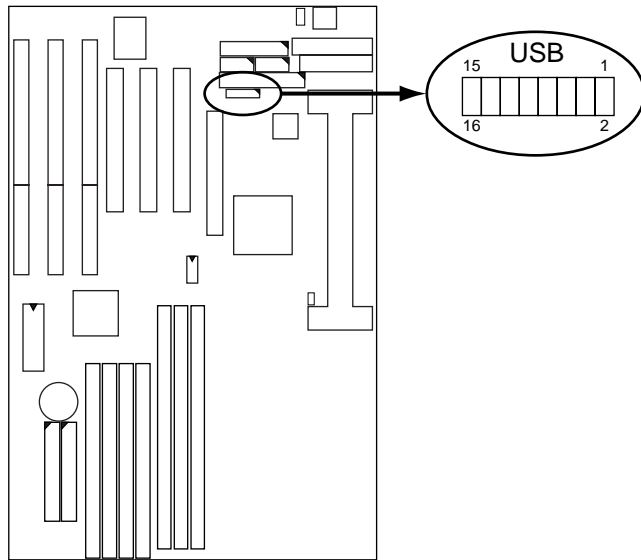
J1 Switch Signal Summary

J1	Pin	Signal Description
HDD LED Connector	1	+5V
	2	HDD LED Signal
	3	HDD LED Signal
	4	+5V
N.C.	5	No Connection
Infrared Connector	6	Infrared Transmit Signal
	7	GND
	8	Infrared Receive Signal (low speed)
	9	Infrared Receive Signal (high speed)
	10	+5V
N.C.	11	No Connection
PWR	12	GND
	13	Power Switch (for ATX Power)
SLEEP	14	GND
	15	Sleep Signal

MS1 Top View

+5V — N.C.
N.C.
Mouse Data
Mouse Clock
GND

COM1/2 (Top View)

CD — 1   6 — DSR
RX — 2   7 — RTS
TX — 3   8 — CTS
DTR — 4   9 — RING
GND — 5   10 — N.C.
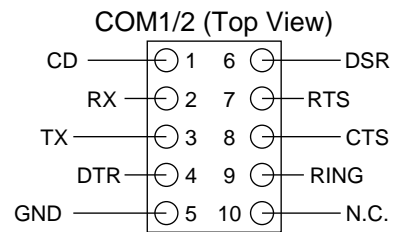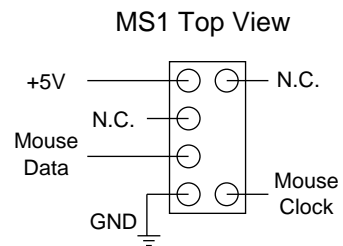
J2 Switch Signal Summary

J2	Pin	Signal Description
Speaker Connector	1	Speaker Signal
	2	No Connection
	3	Ground
	4	+5V
Reset Switch	5	Reset Signal
	6	Ground
N.C.	7	No Connection
Power LED Connector	8	+5V
	9	No Connection
	10	Ground
Keylock Connector	11	Keylock Signal
	12	GND
N.C.	13	No Connection
Turbo LED Connector	14	Turbo LED Connector
	15	Ground

Chapter 3
Award BIOS Setup

This 82440LX motherboard comes with the AWARD BIOS from AWARD Software Inc. Enter the Award BIOS program's Main Menu as follows:

1. Turn on or reboot the system.

    After a series of diagnostic checks, the following message will appear:

    ```
    PRESS <DEL> TO ENTER SETUP
    ```

2. Press the <DEL> key and the main program screen appears as in the following page.

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

3. Using one of the arrows on your keyboard to select an option and press <Enter>. Modify the system parameters to reflect the options installed in the system.

4. You may return to the Main Menu anytime by press <ESC> .

5. In the Main Menu, "SAVE AND EXIT SETUP" saves your changes and reboots the system, and "EXIT WITHOUT SAVING" ignores your changes and exits the program.

Standard CMOS Setup

Standard CMOS Setup allows you to record some basic system hardware configuration and set the system clock and error handling. You only need to modify the configuration values of this option when you change your system hardware configuration or the configuration stored in the CMOS memory got lost or damaged.

Run the Standard CMOS Setup as follows:

1. Choose "STANDARD CMOS SETUP" from the Main Menu and a screen with a list of options appears.

```
                        ROM PCI/ISA BIOS
                      STANDARD CMOS SETUP
                      AWARD SOFTWARE, INC.
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│  Date (mm:dd:yy) : Thu, May 9 1996                                    │
│  Time (hh:mm:ss) :  15 : 45 : 10                                      │
│                                                                       │
│  HARD DISKS          TYPE   SIZE    CYLS HEAD  PRECOMP  LANDZ  SECTOR  MODE │
│                                                                       │
│  Primary Master   : Auto     0       0    0       0       0       0   Auto │
│  Primary Slave    : Auto     0       0    0       0       0       0   Auto │
│  Secondary Master : Auto     0       0    0       0       0       0   Auto │
│  Secondary Slave  : Auto     0       0    0       0       0       0   Auto │
│                                                                       │
│  Drive A : 1.44M, 3.5 in.    ┌──────────────────────────────┐        │
│  Drive B : None              │    Base Memory:      640K     │        │
│  Floppy 3 Mode Support : Disabled │ Extended Memory:  15360K  │       │
│                              │     Other Memory:      384K   │        │
│  Video  : EGA/VGA            ├──────────────────────────────┤        │
│  Halt On : All Errors        │    Total Memory:   16384K     │        │
│                              └──────────────────────────────┘        │
│  Esc : Quit          ↑ ↓ → ←     : Select Item   PU/PD/+/− : Modify   │
│  F1 : Help           (Shift) F2 : Change Color                        │
└─────────────────────────────────────────────────────────────────────┘
```

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp/PgDn/+/– keys.

A short description of screen options follows:

Date (mm:dd:yy) Set the current date and time.
Time (hh:mm:ss)

Primary   This field records the specifications
(Secondary)   for all non-SCSI hard disk drives
Master/Slave   installed in your system. Refer to
                     the respective documentation on
                     how to install the drivers.

Drive A/B   Set this field to the types of floppy
                     disk drives installed in your system.
                     The choices are:
                     360KB, 5.25 in.,
                     1.2MB, 5.25 in.,
                     720KB, 3.5 in.,
                     1.44M, 3.5 in. (default),
                     2.88MB, 3.5 in., or None

Floppy 3 Mode   Drive A/B, Both: Enabled 3.5-inch,
Support   1.2MB function.
                     Disabled (default): Disabled 3.5-
                     inch, 1.2MB function.

Video   Set this field to the type of video
                     display card installed in the system.
                     The choices are: Monochrome;
                     Color 40x25; VGA/EGA (default);
                     or Color 80x25

Halt On   Set this filed to the type of errors
                     that will cause the system to halt.
                     The choices are: All Errors (default);
                     No Errors; All, But Keyboard;
                     All, But Diskette; or
                     All, But Disk/Key

3. Press <ESC> to return to the Main Menu when you finish
   setting up in the "Standard CMOS Setup".

BIOS Features Setup

BIOS Features Setup allows you to improve your system performance or set up some system features according to your preference.

Run the BIOS Features Setup as follows:

1. Choose "BIOS FEATURES SETUP" from the Main Menu and a screen with a list of options appears.

```
                     ROM PCI/ISA BIOS
                    BIOS FEATURES SETUP
                    AWARD SOFTWARE, INC.
┌─────────────────────────────────┬─────────────────────────────────┐
│Virus Warning           : Disabeld│ Video  BIOS Shadow  : Enabled   │
│CPU Internal Cache      : Enabled │ C8000-CBFFF Shadow  : Disabled  │
│External Cache          : Enabled │ CC000-CFFFF Shadow  : Disabled  │
│Quick Power on Self Test : Enalbed│ D0000-D3FFF Shadow  : Disabled  │
│Boot Sequence           : A,C, SCSI│ D4000-D7FFF Shadow  : Disabled  │
│Swap Floppy Drive       : Disabled│ D8000-DBFFF Shadow  : Disabled  │
│Boot Up Floppy Seek     : Disabled│ DC000-DFFFF Shadow  : Disabled  │
│Boot Up NumLock Status  : On      │                                 │
│Gate A20 Option         : Fast    │                                 │
│Typematic Rate Setting  : Disabled│                                 │
│Typematic Rate (Chars/Sec): 6     │ ESC : Quit      ↑↓→←: Select Item│
│Typematic Delay (Msec)  : 250     │ F1  : Help       PU/PD/+/- : Modify│
│Security Option         : Setup   │ F5  : Old Values (Shift)F2 : Color│
│PCI/VGA Palette Snoop   : Disabled│ F6  : Load BIOS Defaults         │
│OS Select for DRAMs>64MB : Non-OS/2│ F7  : Load Setup Defaults        │
└─────────────────────────────────┴─────────────────────────────────┘
```

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp/PgDn/+/– keys. An explanation of the <F> keys follows:

   <F1>: "Help" gives options available for each item.

   Shift <F2>: Change color.

   <F5> : Get the previous values. These values are the values with which the user started the current session.

   <F6>: Load all options with the BIOS default values.

   <F7>: Load all options with the Setup default values.

A short description of screen options follows:

Virus Warning   Enabled: Activates automatically when the system boots up causing a warning message to appear if there is anything attempts to access the boot sector or hard disk partition table.

Disabled: No warning message will appear when there is something attempts to access the boot sector or hard disk partition table

Note: Many diagnostic (or boot manager) programs which attempt to access the boot sector table can cause the above warning message. If you will be running such a program, we recommend that you disable the virus protection first.

CPU Internal Cache   Choose Enabled (default) or Disabled. This option allows you to enable or disable the CPU's internal cache.

External Cache   Choose Enabled (default) or Disabled. This option allows you to enable or disable the external cache memory.

Quick Power On Self Test   Choose Enabled (default)or Disabled. This option allows you to speed up the Power On Self Test routine.

Boot Sequence   Default is "A, C, SCSI". This option
                       determines which drive to look for
                       first for an operating system.

Swap Floppy Drive Choose Enabled or Disabled
                       (default). This option swaps floppy
                       drive assignments when it is
                       enabled.

Boot Up Floppy   Enabled: During POST, BIOS
Seek   checks the track number of the
                       floppy disk drive to see whether it
                       is 40 or 80 tracks.

                       Disabled (default): During POST,
                       BIOS will not check the track
                       number of the floppy disk drive.

Boot Up NumLock   Choose On (default) or Off. This
Status   option lets user to activate the
                       NumLock function at boot-up.

Gate A20 Option   Choose Normal or Fast (default).
                       This option allows the RAM to
                       access the memory above 1MB by
                       using the fast gate A20 line.

Typematic Rate   Choose Enabled or Disabled
Setting   (default). Enable this option to
                       adjust the keystroke repeat rate.

Typematic Rate   Range between 6 (default) and 30
(Chars/Sec)   characters per second. This option
                       controls the speed of repeating
                       keystrokes.

Typematic Delay   Choose 250 (default), 500, 750, and
(Msec)   1000. This option sets the time
                       interval for displaying the first and
                       the second characters.

Security Option	Choose System or Setup (default). This option is to prevent unauthorized system boot-up or use of BIOS Setup.
PCI/VGA palette Snoop	Choose Enabled or Disabled (default). It determines whether the MPEG ISA cards can work with PCI/VGA or not.
Video BIOS Shadow	Enabled (default): Map the VGA BIOS to system RAM. Disabled: Don't map the VGA BIOS to system RAM.
C8000-CBFFF to DC000-DFFF Shadow	These options are used to shadow other expansion card ROMs.

3. Press <ESC> and follow the screen instructions to save or disregard your settings.

Chipset Features Setup

Chipset Features Setup changes the values of the chipset registers. These registers control the system options.

Run the Chipset Features Setup as follows:

1. Choose "CHIPSET FEATURES SETUP" from the Main Menu and a screen with a list of options appears.

```
                        ROM PCI/ISA BIOS
                     CHIPSET FEATURES SETUP
                      AWARD SOFTWARE, INC.
┌─────────────────────────────────────┬────────────────────────────────────┐
│ Auto Configuration      : Enabled    │ SDRAM CAS Latency Time  : 2          │
│                                      │ CPU Clock Ratio         : 3.5-233MHz │
│ MA Wait State           : Slow       │ CPU Clock Frequency     : 66MHz      │
│ EDO RAS# To CAS# Delay  : 3          │ Spread Spectrum         : Disabled   │
│ EDO RAS# Precharge Time : 4          │ CPU Warning Temperature : Disabled   │
│ EDO DRAM Read Burst     : x333       │ Current CPU Temperature :            │
│ EDO DRAM Write Burst    : x333       │                                      │
│ DRAM Data Integrity Mode : Non-ECC   │                                      │
│ CPU0To-PCI IDE Posting  : Disabled   │                                      │
│ System BIOS Cacheable   : Disabled   │                                      │
│ Video BIOS Cacheable    : Disabled   │                                      │
│ Video RAM Cacheable     : Disabled   │                                      │
│ 8 Bit I/O Recovery Time : 3          │                                      │
│ 16 Bit I/O Recovery Time : 2         │                                      │
│ Memory Hole At 15M-16M  : Disabled   ├────────────────────────────────────┤
│ AGP Aperture Size (MB)  : 64         │ ESC : Quit        ↑ ↓ → ←: Select Item│
│ SDRAM RAS-to-CAS Delay  : Slow       │ F1  : Help        PU/PD/+/- : Modify │
│ SDRAM RAS Precharge Time : Slow      │ F5  : Old Values (Shift)F2 : Color   │
│                                      │ F6  : Load BIOS Defaults             │
│                                      │ F7  : Load Setup Defaults            │
└─────────────────────────────────────┴────────────────────────────────────┘
```

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp/PgDn/+/− keys.

A short description of screen options follows:

Auto Configuration	Choose Enabled (default) or Disabled. The system sets all options on the left side of the screen automatically when choose Enabled.
DRAM Speed Selection	Choose 60ns or 70ns (default). Do not change this setting unless you know the DRAM access time spec.

MA Wait State	Use the default setting.
EDO RAS# to CAS# Delay	Use the default setting. This setup option allows you to determine the delay time in completing the transition from RAS to CAS.
EDO RAS# Precharge Time	Use the default setting. This option allows you to determine the number of the CPU clocks allocated for the RAS to accumulate/charge it before the DRAM is refreshed.
EDO DRAM Read Burst EDO DRAM Write Burst	Use the default setting. Burst read/write requests are generated by the CPU in four separate parts. The 1st part provides the location within the DRAM where the read or write is to take place while the remaining three parts provide the actual data. The lower the timing number is, the faster the system memory will be addressed.
DRAM Data Integrity Mode	Choose Non-ECC (default) or ECC depending on the DRAM type. ECC stands for Error Check and Correct.

Non-ECC:	Disabled ECC check function.
ECC:	Enabled ECC check function.

CPU-To-PCI IDE Posting	Choose Enabled (default) or Disabled.
System BIOS Cacheable	Choose Enabled or Disabled (default). When Enabled, the access to the system BIOS ROM addressed at F0000H-FFFFFH is cached.

Video BIOS Cacheable	Choose Enabled or Disabled (default). When Enabled, the access to the VGA BIOS ROM addressed at C0000H-C7FFFH is cached.
Video RAM Cacheable	Choose Enabled or Disabled (default). When Enabled, the access to the VGA RAM addressed is cached.
8 Bit I/O Recovery Time; **16 Bit I/O Recovery Time**	This delay happens when the CPU is running so much faster than the I/O bus that the CPU must be delayed to allow for the completion of the I/O. The choices for 8 bit I/O are NA, 1 to 8 CPU clock. Default is 3. The choices for 16 bit I/O are NA, 1 to 4 CPU clock. Default is 2.
Memory Hole At 15M-16M	Choose Enabled or Disabled (default). In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory's space below 16MB.
AGP Aperture Size (MB)	Choose 4 , 8, 16, 32, 64 (default), 128, or 256 MB. Memory mapped and graphics data structures can reside in a Graphics Aperture. This area is like a linear buffer. BIOS will auto report the starting address of this buffer to the O.S.
SDRAM RAS-To_CAS Delay	Use the default setting.

SDRAM RAS Precharge Time	Use the default setting.
SDRAM CAS Latency Time	Use the default setting.
CPU Clock Ratio	Choose 2.0-133MHz, 2.5-166MHz, 3.0-200MHz, 3.5-233MHz (default), 4.0-266MHz, 4.5-300MHz, or 5.0-333MHz. This value is based on the CPU clock at 66.6MHz and should be the same as the user's CPU spec.
CPU Clock Frequency	Choose Disabled (default), 50, 60, 66, 68, 75, or 83 MHz. This clock value is used for CPU and Bus clock. *Note: 1. CPU Frequency/Ratio value has to match with the User's CPU spec. The CPU may be damaged if the value is over the spec's value.* *2. The BIOS setting will not work unless the JP6 and JP7 are closed at 1-2, which is the jumperless position.*
Spread Spectrum Modulated	Choose Disabled (default) or Enabled. **This function is designed only for EMI test.**

CPU Warning Temperature   Choose Disabled (default), 60°C/140°F, 65°C/149°F, 70°C/158°F, 75°C/167°F, 80°C/176°F, 85°C/185°F, 90°C/194°F.

When CPU temperature is over the setting value, the speaker will sound an alarm and the clock will drop until the temperature is within optimum the temperature range.

Current CPU Temperature   BIOS will auto displays CPU temperature.

3. Press <ESC> and follow the screen instructions to save or disregard your settings.

Power Management Setup

Power Management Setup sets the system's power saving functions.

1. Choose "POWER MANAGEMENT SETUP" from the Main Menu and a screen with a list of options appears.

```
                        ROM PCI/ISA BIOS
                      POWER MANAGEMENT SETUP
                       AWARD SOFTWARE, INC.

Power Management     : Disabled      ** Reload Global Timer Events **
PM Control by APM    : No            IRQ[3-7,9-15], NMI   : Enabled
Video Off Method     : V/H SYNC+Blank Primary IDE 0       : Enabled
Video Off After      : NA            Primary IDE 1        : Enabled
Modem Use IRQ        : 3             Secondary IDE 0      : Enabled
                                     Secondary IDE 1      : Enabled
Doze Mode            : Disabled      Floppy Disk          : Enabled
Standby Mode         : Disabled      Serial Port          : Enabled
Suspend Mode         : Disabled      Parallel Port        : Enabled
HDD Power Down       : Disabled
Throttle Duty Cycle  : 62.5%
ZZ Active in Suspend : Disabled
VGA Active Monitor   : Enabled
Soft-Off by PWR-BTTN : Instant-Off
Resume by Ring       : Disabled
IRQ 8 Break Suspend  : Disabled      ESC : Quit        ↑ ↓ → ←: Select Item
                                     F1  : Help         PU/PD/+/- : Modify
                                     F5  : Old Values (Shift)F2 : Color
                                     F6  : Load BIOS Defaults
                                     F7  : Load Setup Defaults
```

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp/PgDn/+/− keys.

A short description of screen options follows:

Power Management	Choose Max. Saving, User Define, Disabled (default), or Min Saving.
PM Control by APM	Choose Yes or No (default). You need to choose Yes when the operating system has the APM functions, choose No otherwise.

Video Off Method Choose Blank , DPMS, or V/H Sync+Blank (default). You can chose either DPMS or V/H Sync+Blank when the monitor has the Green function. You need to choose Blank when the monitor has neither the Green function.

Video Off After

MODEM Use IRQ Assign the IRQ number to the modem which is being used so that the ring signal can wakeup the system. The default setting is 3 (COM2).

Doze Mode This option sets the CPU speed down to 33MHz during this mode.

Standby Mode These two options allow you to
Suspend Mode choose the mode for the different timers. The Standby Mode turns off the VGA monitor, and the Suspend Mode turns off the CPU and saves the energy of the system.

HDD Power Down Time is adjustable from 1 to 15 minutes. When the set time has elapsed, the BIOS sends a command to the HDD to power down, which turns off the motor.

Throttle Duty Choose the duty cycle time: 12.5%,
Cycle 25%, 37.5%, 50%, 62.5% (default), 75%, or 87.5%. The bigger of the percentage, the more saving power it gets.

ZZ Active in Suspend	Enabled:	PB SRAM (cache) still consumes power when entering the power management mode.
	Disabled:	(default) PB SRAM (cache) will not consume power when entering the power management mode.
VGA Active Monitor	Enabled:	the system can not enter the power saving mode when monitor is on.
	Disabled:	the system can enter the power saving mode when monitor is on.
Soft-Off by PWR-BTTN	Instant-off:	(default) turns off the system power at once after pushing the power button.
	Delay 4 Sec:	turns off the system power 4 seconds after pushing the power button (to meet PC97 spec.)
Resume by Ring	Enabled:	Wake up the system from ring signal.
	Disabled:	(default) Ring signal can not wake up the system.

IRQ (#), NMI;

Primary IDE 0
Primary IDE 1;

Secondary IDE 0
Secondary IDE 1;

Floppy Disk;

Serial Port;

Parallel Port

Enabled: (default) The system can not enter the power saving mode when I/O ports or IRQ# is activated.

Disabled: The system still can enter the power saving mode when I/O ports or IRQ# is activated.

Note: These functions can only be activated when the power management option is Enabled.

3. Press <ESC> and follow the screen instructions to save or disregard your settings.

PnP/PCI Configuration Setup

PnP/PCI Configuration Setup configures the PCI bus slots.

Run the Chipset Features Setup as follows:

1. Choose "PnP/PCI CONFIGURATION SETUP" from the Main Menu and a screen with a list of options appears.

```
                    ROM PCI/ISA BIOS
                  PNP/PCI CONFIGURATION
                   AWARD SOFTWARE, INC.

PNP OS Installed      : No      PCI IDE IRQ Map to      : PCI-AUTO
Resources Controlled By : Manual   Primary   IDE INT#     : A
Reset Configuration Data : Disabled  Secondary IDE INT#     : B

IRQ-3  assigned to : Legacy ISA   Used MEM base adr       : N/A
IRQ-4  assigned to : Legacy ISA   Used MEM Length*        : 8K
IRQ-5  assigned to : PCI/ISA PnP  Assign IRQ For USB      : Enabled
IRQ-7  assigned to : PCI/ISA PnP
IRQ-9  assigned to : PCI/ISA PnP
IRQ-10 assigned to : PCI/ISA PnP
IRQ-11 assigned to : PCI/ISA PnP
IRQ-12 assigned to : PCI/ISA PnP
IRQ-14 assigned to : PCI/ISA PnP
IRQ-15 assigned to : PCI/ISA PnP
DMA-0  assigned to : PCI/ISA PnP
DMA-1  assigned to : PCI/ISA PnP   ESC : Quit       ↑ ↓ → ←: Select Item
DMA-3  assigned to : PCI/ISA PnP   F1  : Help       PU/PD/+/- : Modify
DMA-5  assigned to : PCI/ISA PnP   F5  : Old Values (Shift)F2 : Color
DMA-6  assigned to : PCI/ISA PnP   F6  : Load BIOS Defaults
DMA-7  assigned to : PCI/ISA PnP   F7  : Load Setup Defaults
```

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp/PgDn/+/− keys.

A short description of screen options follows:

PNP OS Installed   Yes: OS supports Plug and Play function.
No (default): OS doesn't support Plug and Play function.

Note: BIOS will automaticaly disable all PnP resources except the boot device card when select Yes on Non-PnP OS.

Resources Controlled By	Choose Manual (default) or Auto. The BIOS checks the IRQ/DMA channel number on the ISA and PCI card manually if chose Manual and the IRQ/DMA channel number will be checked automatically if choose Auto.
Reset Configuration Data	Choose Enabled or Disabled (default). Disabled means to retain PnP configuration data in BIOS and Enabled means to reset PnP configuration data in BIOS.
IRQ-x assigned to DMA-x assigned to	Legacy ISA: Manually assigns IRQ/DMA to device. PCI/ISA PnP: BIOS assigns IRQ/DMA to device automatically.
PCI IDE IRQ Map To	Select PCI-AUTO (default), ISA, or assign a PCI SLOT number (depending on which slot the PCI IDE is inserted). If PCI-AUTO does not work, then assign an individual PCI SLOT number.
Primary/ IDE INT#	Choose A (default), B, C, or D.
Secondary IDE INT#	Choose A, B (default), C, or D.
Used MEM Base Addr	Choose N/A (default) or ISA legacy card requests to have memory start address.

Used MEM Length*	Choose 8K, 16K, 32K, or 64K.

With the above two functions, users can define where the used memory address is located and its corresponding length of the legacy area. BIOS will skip the UMB area which is used by the legacy device to avoid memory space conflict.

* This function actives only when the "Used MEM Base Addr" is chosen.

Assign IRQ for USB	Choose Enabled (default) or Disabled.
	Enabled: Add one IRQ to USB controller.
	Deisabled: Remove IRQ from USB controller. The system will have extra IRQ for other devices but the USB controller will still not disabled (only IRQ was removed.)

3. Press <ESC> and follow the screen instructions to save or disregard your settings.

Load Setup Defaults

Load Setup Defaults option loads the default system values to the system configuration fields. If the CMOS is corrupted the defaults are loaded automatically. Choose this option and the following message appears:

```
"Load Setup Defaults (Y/N)? N"
```

To use the Setup defaults, change the prompt to "Y" and press <Enter>.

Integrated Peripherals

Integrated Peripherals option changes the values of the chipset registers. These registers control system options in the computer.

1. Choose "INTEGRATED PERIPHERALS" from the Main Menu and a screen with a list of options appears.

```
                    ROM PCI/ISA BIOS
                 INTEGRATED PERIPHERALS
                  AWARD SOFTWARE, INC.

IDE HDD Block Mode       : Enabled    UART Mode Select         : IrDA
IDE Primary Master PIO   : Auto       RxD, TxD Active          : Lo, Lo
IDE Primary Slave  PIO   : Auto       IR Transmittion Delay    : Disabled
IDE Secondary Master PIO : Auto       Onboard Parallel Port    : 378/IRQ7
IDE Secondary Slave  PIO : Auto       Parallel Port Mode       : ECP+EPP
IDE Primary Master  UDMA : Auto       ECP Mode Use DMA         : 3
IDE Primary Slave   UDMA : Auto       EPP Mode Select          : EPP1.7
IDE Secondary Master UDMA : Auto
IDE Secondary Slave  UDMA : Auto
On-Chip Primary PCI IDE  : Enalbed
On-Chip Secondary PCI IDE : Enalbed
USB Keyboard Support     : Disabled

KBC Input Clock          : 8 MHz
Onboard FDC Controller   : Enabled
Onboard Serial Port 1    : Auto       ESC : Quit      ↑ ↓ → ←: Select Item
Onboard Serial Port 2    : Auto       F1  : Help       PU/PD/+/- : Modify
                                      F5  : Old Values (Shift)F2 : Color
                                      F6  : Load BIOS Defaults
                                      F7  : Load Setup Defaults
```

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp/PgDn/+/− keys.

A short description of screen options follows:

IDE HDD Block Mode	Choose Enabled (default) or Disabled. If your hard disk size is larger than 540MB, choose Enabled, and, if you are using the IDE HDD Auto Detection option, the BIOS will choose this option automatically. (Note: Some HDDs of old models don't provide this feature.)

IDE Primary Master/Slave PIO IDE Secondary Master/Slave PIO	Choose Auto (default) or Mode 0~4. The BIOS will detect the HDD Mode type automatically when you choose Auto. You need to set to a lower mode than Auto when your hard disk becomes unstable.
On-Chip Primary/ Secondary PCI IDE	Enabled (default): Turn on the onboard IDE function. Disabled: Turn off the onboard IDE function.
USB Keyboard Support	Enabled: Enables function when the USB keyboard is being used. Disabled: (default) When the AT keyboard be used.
KBC Input Clock	Choose 6MHz, 8MHz (default), 12MHz, or 16MHz. There might be a compatible problem when is above 8MHz.
Onboard FDC Controller	Choose Enabled (default) or Disabled. Choose Disabled when you use an ISA card with FDD function, or , choose Enabled to use the onboard FDD connector.
Onboard Serial Port 1	Choose Auto (default), 3F8/IRQ4 , 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, or Disabled. Do no set port 1 & 2 to the same value except for Disabled.
Onboard Serial Port 2	Choose Auto (default), 3F8/IRQ4 , 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, or Disabled.
UART Mode Select	Choose Standard, IrDA (default), Normal, or ASKIR.

RxD, TxD Active	Choose Hi/Hi, Hi/Lo, Lo/Hi, or Lo/Lo (default). *: The above 2 options won't work unless UART 2 Mode ASKIR/IrDA is selected.*
IR Transmition Delay	Enabled: Enabled delay when transfers data. Disabled: (default) Disabled delay when transfers data.
Onboard Parallel Port	Choose the printer I/O address: 378H/IRQ7 (default), 3BCH/IRQ7, 278H/IRQ5
Parallel Port Mode	Choose SPP (default), ECP + EPP EPP, or ECP mode. The mode depends on your external device that connects to this port.
ECP Mode Use DMA	Choose DMA3 (default) or DMA1. Most sound cards use DMA1. Check with your sound card configuration to make sure that there is no conflict with this function. *: This option will not be displayed unless the EPP/ECP function is selected..*
EPP Mode Select	Choose EPP1.7 (default) or EPP1.9. EPP1.9 supports hardware handshake. This setting is dependent on your EPP device. *Note: The above 2 options will not be displayed unless the EPP/ECP function is selected.*

Power On Function Choose BUTTON ONLY (default), Password, Mouse Left, or Mouse Right.

Mouse Left: Use the PS/2 Mouse Left to boot the system.

Mouse Right: Use the PS/2 Mouse Right to boot the system.

Password: Choose a special password which is defined by the user or use one of the HOT keys (from CTRL-F1 to CTRL-F12) to boot the system.

3. Press <ESC> and follow the screen instructions to save or disregard your settings.

Supervisor/User Password

These two options allows you to set your system passwords. Normally, supervisor has a higher right to change the CMOS setup option than the user. The way to set up the passwords for both Supervisor and User are as follow:

1. Choose "Change Password" in the Main Menu and press <Enter>. The following message appears:

    ```
    "Enter Password:"
    ```

2. The first time you run this option, enter your password up to only 8 characters and press <Enter>. The screen does not display the entered characters.

3. After you enter the password, the following message appears prompting you to confirm the password:

    ```
    "Confirm Password:"
    ```

4. Enter exact the same password you just typed again to confirm the password and press <Enter>.

5. Move the cursor to Save & Exit Setup to save the password.

6. If you need to delete the password you entered before, choose the Supervisor Password and press <Enter>. It will delete the password that you had before.

7. Move the cursor to Save & Exit Setup to save the option you did, otherwise the old password will still be there when you turn on your machine next time.

8. Press <ESC> to exit to the Main Menu.

Note: If you forget or lose the password, the only way to access the system is to clear the CMOS RAM by setting JP19. All setup information will be lost and you need to run the BIOS setup program again.

IDE HDD Auto Detection

IDE HDD Auto Detection detects the parameters of an IDE hard disk drive and automatically enters them to the Standard CMOS Setup screen.

The screen will ask you to select a specific hard disk for Primary Master after you select this option. If you accept a hard disk detected by the BIOS, you can enter "Y" to confirm and then press <Enter> to check next hard disk. This function allows you to check four hard disks and you may press the <ESC> after the <Enter> to skip this function and go back to the Main Menu.

Save & Exit Setup

Save & Exit Setup allows you to save all modifications you have specified into the CMOS memory. Highlight this option on the Main Menu and the following message appears:

```
SAVE to CMOS and EXIT (Y/N)? Y
```

Press <Enter> key to save the configuration changes.

Exit Without Saving

Exit Without Saving allows you to exit the Setup utility without saving the modifications that you have specified. Highlight this option on the Main Menu and the following message appears:

```
Quit Without Saving (Y/N)? N
```

You may change the prompt to "Y" and press <Enter> key to leave this option.