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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SL-61A SERIAL

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 82440FX chipset
2. PCI Rev 2.1 compliant

L2 Cache

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

Main Memory

1. Memory range from 8MB (minimum) to 384MB (maximum) with DRAM Table Free configurations
2. Supports Fast Page Mode/EDO/BEDO DRAM with 50ns/60ns/70ns DRAM speed
3. **Supports 4 pcs 72pin SIMM sockets and 2 pcs 168pin DIMM sockets (3.3V or 5V EDO/FP 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
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. BABY AT size 22cm x 33cm
2. 4 PCI Master slots and 4 ISA slots
3. Supports SCSI/CD-ROM Boot function.

Mainboard Layout with Default Settings

The default settings of the following figure is for the
Pentium II (Klamath) 233/66 and AT power
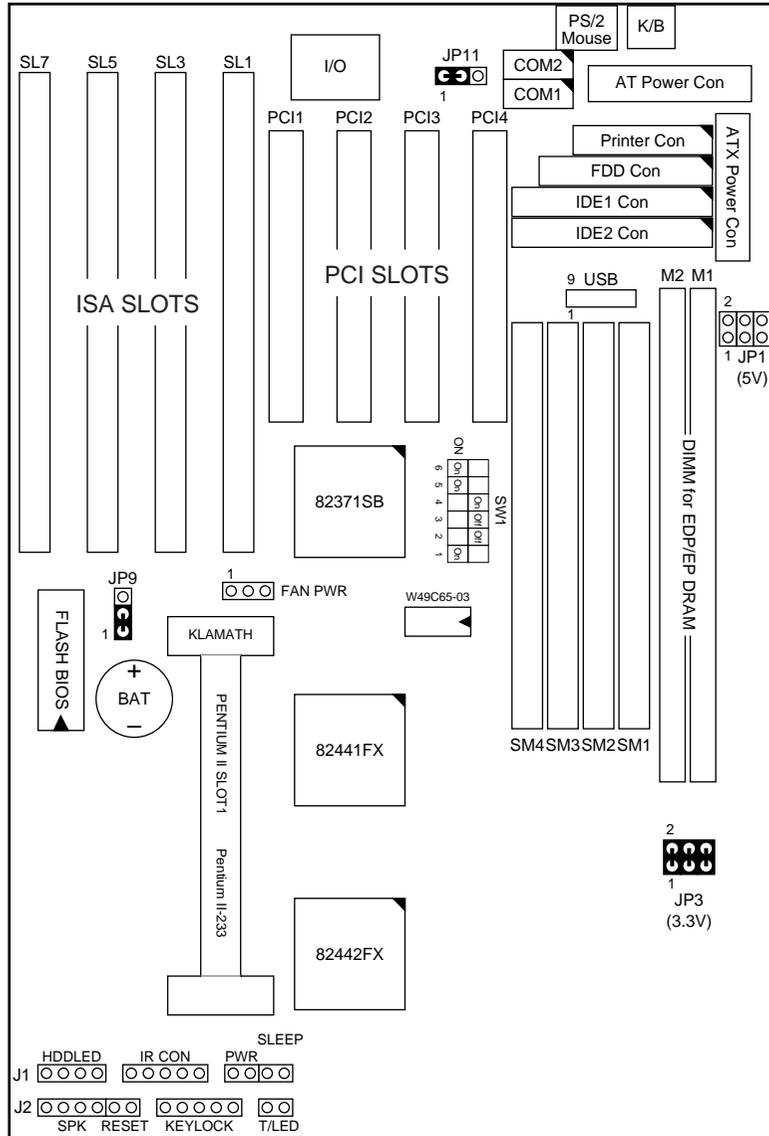
Figure 1–1. Motherboard Layout

Chapter 2
Hardware Setup

CPU Type Configuration

CPU 3.5X Clock Setting

Pentium II (klamath) – 233/66MHz

SW1

		Off	Off	Off	
ON	On	On			On
6	5	4	3	2	1

82371SB

82441FX

KLAMATH   Pentium II (Klamath)-233
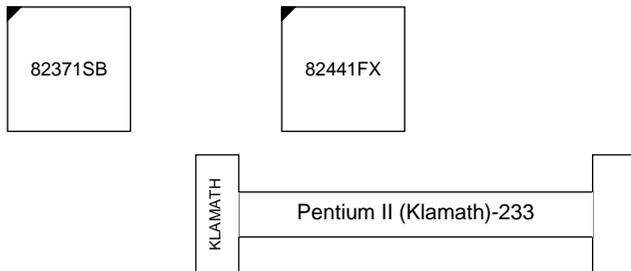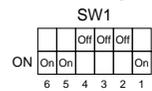
Figure 2–1. CPU Type Configuration

CPU 4.0X Clock Setting

Pentium II (klamath) – 266/66 MHz

SW1

Off	Off	Off	Off	
ON | | On | | | On |
6 5 4 3 2 1

82371SB

82441FX

KLAMATH

Pentium II (Klamath)-266
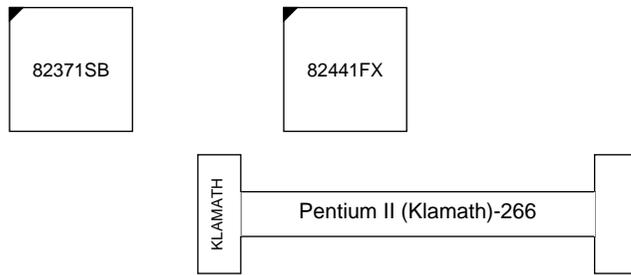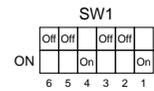
Figure 2–2. CPU Type Configuration

System Memory Configuration

This 82440FX motherboard supports 72-pin SIMMs and 168 pin DIMM of 4MB, 8MB, 16MB, or 32MB to form a memory size between 8MB to 384MB. **Each bank must have 2 pcs of DRAM modules (w/i same size and type) installed.** 82440FX 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.

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.

Latch
Heat Sink
Intel Pentium II (Klamath)

CPU Side View

Heat Sink
Latch
Intel Pentium II (Klamath)
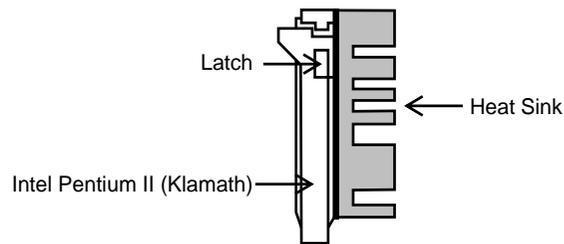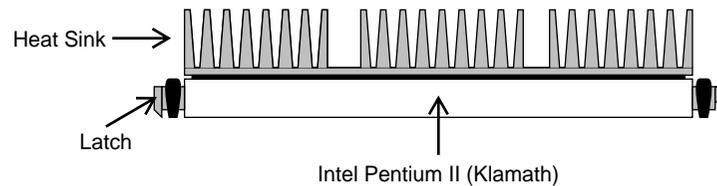
CPU Top View

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.
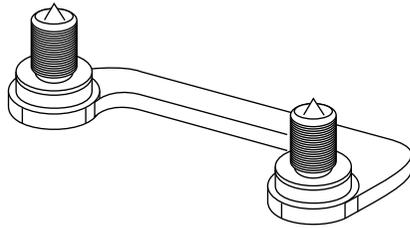
Step 3:
Retention clip is shown in the following figure:
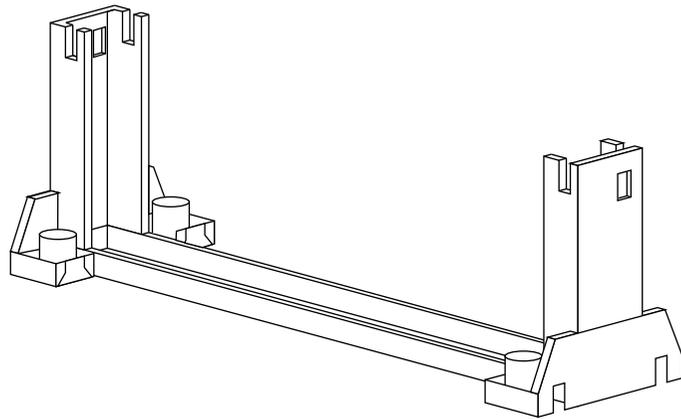
Set the board according to the following diagram before installing the retention clip.

SIMM

CPU Heatsink
should be on this side.
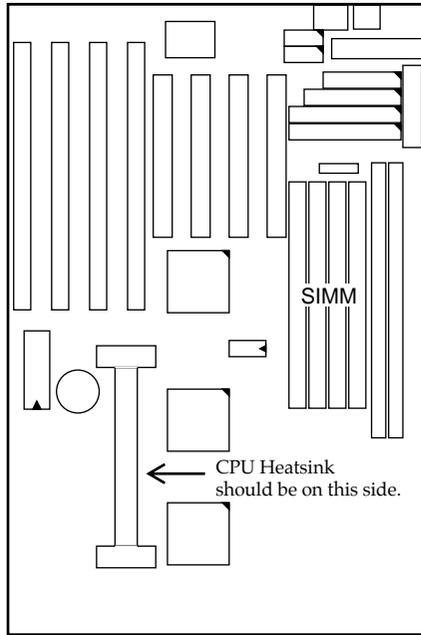
The retention clip should be inserted so that the small
rectangle window is more toward to the right hand side of
the board.

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.

Latch   Latch
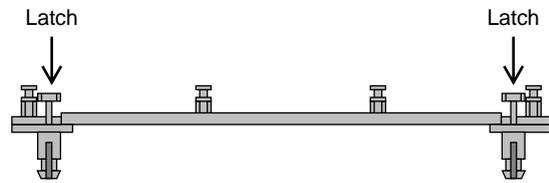
Side View of CPU Supporter Base

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.
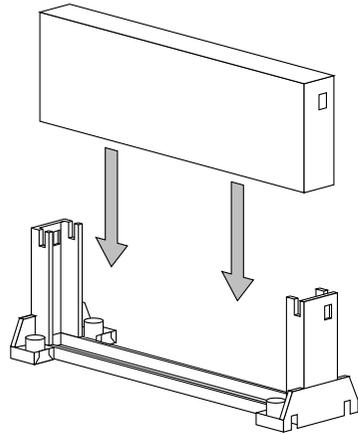
Step 6:
Insert the clip portion of the CPU supporter so that the heat
sink can sit on the top of the whole CPU supporter.
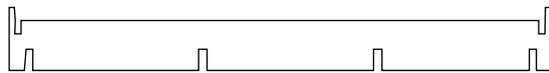
Top View of CPU Support Clip

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.

Themal Plate

Processor Card

Skirt

Cover

Figure 2–3.   S.E.C. Cartridge

1/8 Small Flat
Blade Screwdriver

S.E.C. Cartridge

Themal Plate

Processor Card

Latch
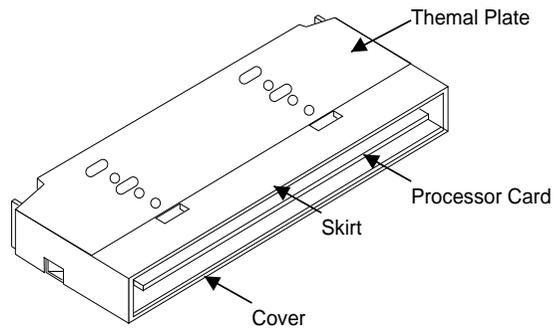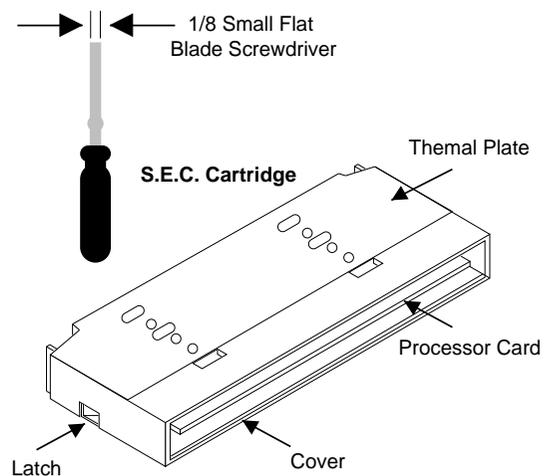
Cover

Figure 2–4. 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

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.
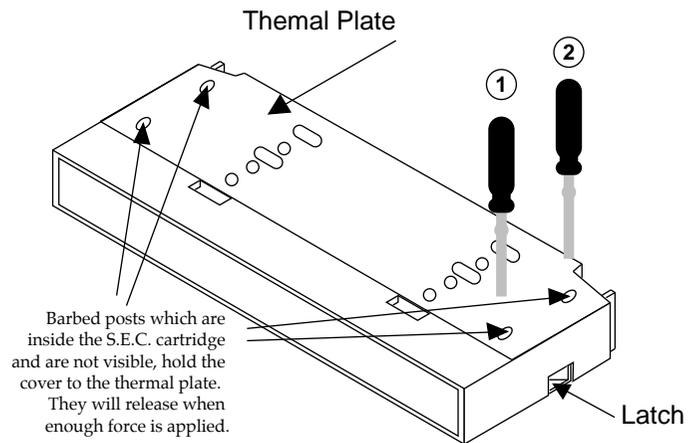
Latch

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.
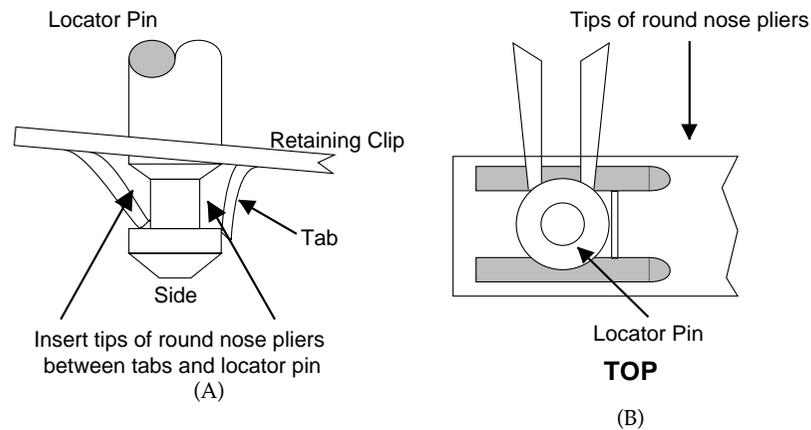
Figure 2–5. Round-nose pliers insertion points (a) side view (b) top view

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.
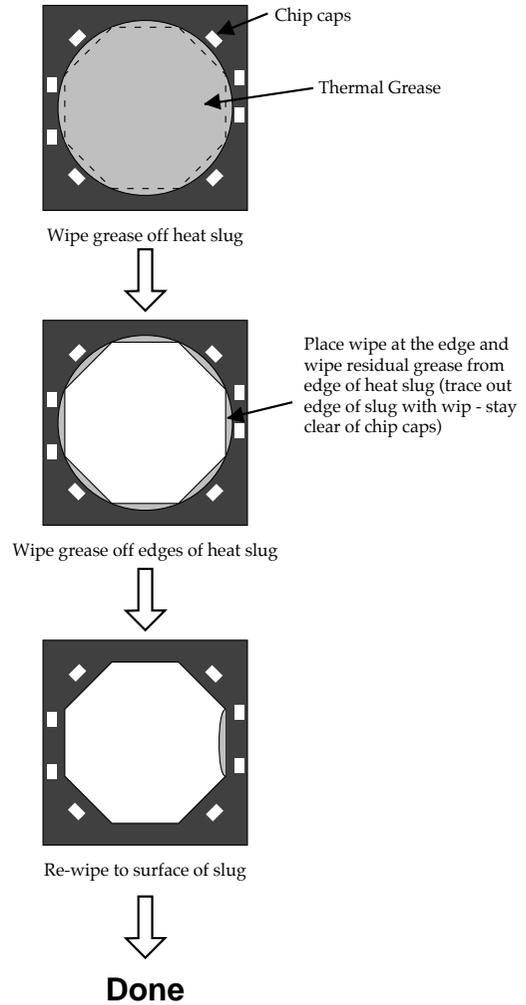
Figure 2–6. Grease Removal Process

Jumper Settings

Factory Fixed Jumpers

The following jumpers are set by the factory.

Jumpers	Factory settings
JP8, JP6	Factory setting at open
JP2, JP7	Factory setting at Short

JP1, JP3: DIMM Connector Power Source

JP1 and JP3 can not be closed at the same time.

DIMM Type	JP1	JP3
3.3V EDO/Fast Page DRAM (default)	Open	
5V EDO/Fast Page DRAM		Open

JP11: AT/ATX Power Select

Power Type	JP11
AT Power (12 pin) (default)	1 3
ATX Power (20 pin)	1 3

FAN: Onboard FAN (12V) Connector

FAN pin	Function
1	GND
2	+12V
3	Sensor

JP9: Clear CMOS Data

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

COMS Data	JP9
Clear Data	3 1
Retain Data (default)	3 1

SW1: 1–2 Bus Clock Select

Bus Clock	SW1: 1–2
60 MHz	On | | 2 | Off | 1 On
66MHz (default)	| Off | 2 On | | 1 On

SW1: 3–6: Bus Ratio Select

Bus Ratio	SW1: 3–6 (pins 6,5,4,3)	Bus Ratio	SW1: 3–6 (pins 6,5,4,3)
2.5x	On, Off, Off, Off — ON	5.5x	On, On, On, Off — ON
3.0x	Off, On, Off, Off — ON	6.0x	Off, Off, Off, On — ON
3.5x	On, On, Off, Off — ON	6.5x	On, Off, Off, On — ON
4.0x	Off, Off, On, Off — ON	7.0x	Off, On, Off, On — ON
4.5x	On, Off, On, Off — ON	7.5x	On, On, Off, On — ON
5.0x	Off, On, On, Off — ON	8.0x	Off, Off, On, On — ON

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.

SLEEP

HDDLED   IR CON   PWR
J1 ⊙⊙⊙⊙   ⊙⊙⊙⊙⊙   ⊙⊙⊙⊙

J2 ⊙⊙⊙⊙⊙⊙   ⊙⊙⊙⊙⊙   ⊙⊙
   SPK   RESET   KEYLOCK   T/LED
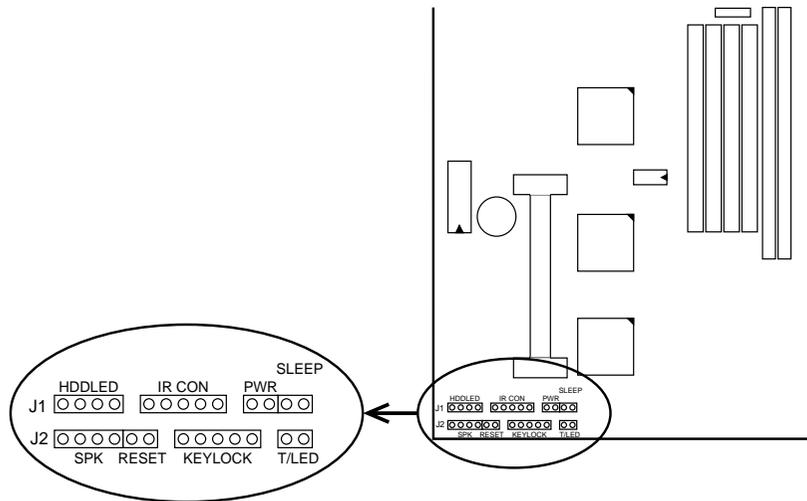
USB: USB Connector

This jumper connects to the USB cable to provide USB device.

USB

9   16

1   8

GND

9 ⊙ ⊙ ⊙ ⊙ | ⊙ ⊙ ⊙ ⊙ 16

1 ⊙ ⊙ ⊙ ⊙ | ⊙ ⊙ ⊙ ⊙ 8

Vcc   D0+   Vcc   D1+
   D0−   GND   D1−   GND
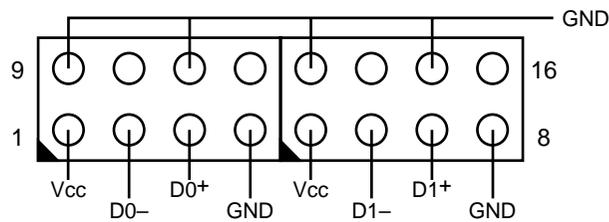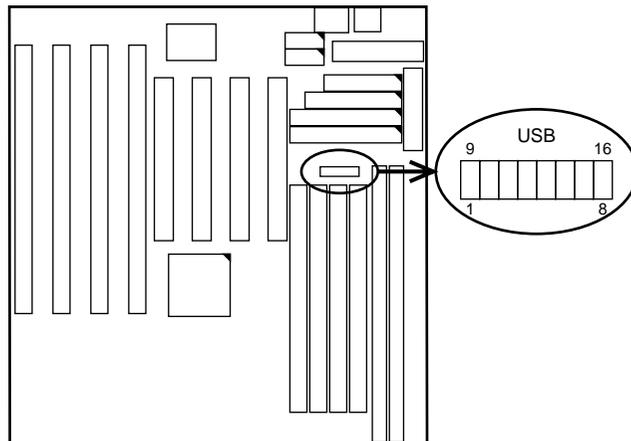
J1 Switch Signal Summary

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

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

AT Power Connector

Pin	Description
1	Power Good
2	+5V
3	+12V
4	−12V
5	Ground
6	Ground
7	Ground
8	Ground
9	−5V
10	+5V
11	+5V
12	+5V

Chapter 3
Award BIOS Setup

This 82440FX 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.
 ┌───────────────────────────────────────┬────────────────────────────────────┐
 │CPU Internal Cache      : Enabled       │Video  BIOS Shadow  : Enabled       │
 │External Cache          : Enabled       │C8000-CBFFF Shadow  : Disabled      │
 │Quick Power on Self Test : Enalbed      │CC000-CFFFF Shadow  : Disabled      │
 │Boot Sequence           : A,C, SCSI     │D0000-D3FFF Shadow  : Disabled      │
 │Swap Floppy Drive       : Disabled      │D4000-D7FFF Shadow  : Disabled      │
 │Boot Up Floppy Seek     : Disabled      │D8000-DBFFF Shadow  : Disabled      │
 │Boot Up NumLock Status  : On            │DC000-DFFFF Shadow  : Disabled      │
 │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:

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 Seek   Enabled: During POST, BIOS 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 Status   Choose On (default) or Off. This 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 Setting   Choose Enabled or Disabled (default). Enable this option to adjust the keystroke repeat rate.

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

Typematic Delay (Msec)   Choose 250 (default), 500, 750, and 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 │ 8 Bit I/O Recovery Time   : 3    │
│                                 │ 16 Bit I/O Recovery Time  : 2    │
│ DRAM Speed Selection  : 70ns    │ Memory Hole At 15M-16M    : Disabled │
│ DRAM RAS# Precharge Time  : 3   │                                  │
│                                 │                                  │
│ RAS# To CAS# Delay    : Disabled│                                  │
│ DRAM Read Burst (B/E/F) : x2/3/4│                                  │
│ DRAM Write Burst (B/E/F): x3/3/4│                                  │
│ ISA Bus Clock         : PCICLK/4│                                  │
│ DRAM Refresh Queue    : Enabled │                                  │
│ DRAM RAS Only Refresh : Disabled│                                  │
│ DRAM ECC/PARITY Select: Disabled│                                  │
│ Fast DRAM Refresh     : Disabled│                                  │
│ Read-Around-Write     : Enabled │                                  │
│ PCI Burst Write Combine : Disabled├──────────────────────────────────┤
│ PCI-To-DRAM Pipeline  : Enabled │ ESC : Quit      ↑↓→←: Select Item│
│ CPU-To-PCI Write Post : Enabled │ F1  : Help      PU/PD/+/- : Modify│
│ CPU-To-PCI IDE Posting: Enabled │ F5  : Old Values (Shift)F2 : Color│
│ System BIOS Cacheable : Disabled│ F6  : Load BIOS Defaults         │
│ Video RAM Cacheable   : Disabled│ 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.

DRAM 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.
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.
DRAM Read Burst (B/E/F) **DRAM Write Burst (B/E/F)**	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.
ISA Bus Clock	Use the default setting.
DRAM Refresh Queue	Use the default setting.
DRAM RAS Only Refresh	Use the default setting.
DRAM ECC/PARITY Select	Use the default setting.
Fast Dram Refresh	Use the default setting.
Read-Around-Write	Use the default setting.
PCI Burst Write Combine	Use the default setting.

PCI-TO-DRAM Pipeline   Use the default setting.

CPU-To-PCI Write Post   Choose Enabled (default) or Disabled.

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 RAM Cacheable   Choose Enabled or Disabled (default). When Enabled, the access to the VGA RAM addressed is cached.

8 Bit I/O Recovery Time Select Item
16 Bit I/O Recovery Time Select Item   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.

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      │ ** Power Down & Resume Events **    │
│ PM Control by APM   : No            │ IRQ 3  (COM 2)        : ON          │
│ Video Off Method    : V/H SYNC+Blank│ IRQ 4  (COM 1)        : ON          │
│ MODEM Use IRQ       : 3             │ IRQ 5  (LPT 2)        : ON          │
│                                     │ IRQ 6  (Floppy Disk)  : ON          │
│ Doze Mode           : Disabled      │ IRQ 7  (LPT 1)        : ON          │
│ Standby Mode        : Disabled      │ IRQ 8  (RTC Alarm)    : OFF         │
│ Suspend Mode        : Disabled      │ IRQ 9  (IRQ2 Redir)   : ON          │
│ HDD Power Down      : Disabled      │ IRQ 10 (Reserved)     : ON          │
│                                     │ IRQ 11 (Reserved)     : ON          │
│                                     │ IRQ 12 (PS/2 mouse)   : ON          │
│ ** Wake Up Events In Doze & Standby ** │ IRQ 13 (Coprocessor)  : ON       │
│ IRQ3  (Wake-Up Event) : ON          │ IRQ 14 (Hard Disk)    : ON          │
│ IRQ4  (Wake-Up Event) : ON          │ IRQ 15 (Reserved)     : ON          │
│ IRQ8  (Wake-Up Event) : ON          ├────────────────────────────────────┤
│ IRQ12 (Wake-Up Event) : ON          │ 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.

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 Suspend Mode These two options allow you to 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.

IRQx (Wake-Up Event) Set these IRQs individually. Activity detected from any enabled IRQ channel (ON) will wake up the system.

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 addr  : N/A
IRQ-4  assigned to : Legacy ISA   Used MEM Length*    : 8K
IRQ-5  assigned to : PCI/ISA PnP
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 IRQ Actived By	Choose Edge or Level (default). Most PCI trigger signals are Level.
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.

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   Parallel Port Mode       : SPP
IDE Primary Master PIO   : Auto      ECP Mode Use DMA          : 3
IDE Primary Slave  PIO   : Auto      EPP Mode Select           : EPP1.7
IDE Secondary Master PIO : Auto      Phonering Wake Up         : Disabled
IDE Secondary Slave  PIO : Auto      USB Controller            : Disabled
On-Chip Primary   PCI IDE : Enabled  USB Keyboard Support      : Disabled
On-Chip Secondary PCI IDE : Enabled
PCI Slot IDE 2nd Channel  : Enabled

KBC Input Clock          : 8 MHz
Onboard FDC Controller   : Enabled
Onboard Serial Port 1    : 3F8/IRQ4
Onboard Serial Port 2    : 2F8/IRQ3
Onboard IR Controller*   : Enabled
IR Address Select*       : 3E8H
IR Mode*                 : IrDA      ESC : Quit      ↑ ↓ → ←: Select Item
IR Transmittion Delay*   : Disabled  F1  : Help        PU/PD/+/- : Modify
IR IRQ Select            : IRQ10     F5  : Old Values (Shift)F2 : Color
FIR Mode Use DMA*        : Disabled  F6  : Load BIOS Defaults
Onboard Parallel Port    : 378/IRQ7  F7  : Load Setup Defaults
```

*: These items valid only when "Onboard IR Controller" is set Enabled.

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.

PCI Slot IDE 2nd Channel   Enabled (default) : Reserved IRQ15 for secondary IDE device.

Disabled: Release IRQ15 for other devices.

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 3F8/IRQ4 (default), 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 3F8/IRQ4 , 2F8/IRQ3 (default), 3E8/IRQ4, 2E8/IRQ3, or Disabled.

Onboard IR Controller   Enabled: Enables the onboard IR function.
Disabled (default): Disables the onboard IR function.

IR Address Select   Choose 3F8H, 2F8H, 3E8H, 2E8H (default), 3E0H, or 2E0H.

Note: 3E8/2E8/3E0/2E0H may conflict with COM3/COM4 I/O port. Change the setting when internal modem/fax card is installed.

IR Mode   Choose IrDA (default), ASKIR, FIR, or CIR.

IR Transmition Delay   Enabled: Enabled delay when transfers data.

Disabled (default): Disabled delay when transfers data.

IR IRQ Select	Choose 3, 4, 10 (default), or 11.
	Note: Choose IRQ3/4 maybe conflict with COM1/COM2, and IRQ11 may conflict with USB controller.
FIR Mode Use DMA	Choose Disabled (default), 0, 1, or 3.
	Note: Settings 0, 1, or 3 may be conflict with other devices (such as sound card, ECP).
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.

Phoning Wake Up   Enabled: Enables the ring signal to
                       wake up the system.
                 Disabled (default): Disables the
                       ring signal.

USB Controller   Enabled: Enable USB function and
                 it will occupy one IRQ, usually the
                 IRQ11.

                 Disabled (default): Disable USB
                 function and it will not occupy IRQ.
                 **Choose Disabled when it is not
                 connect to an USB device.**

USB Keyboard   Enabled: Enables function when
Support   the USB keyboard is
                       being used.
                 Disabled (default): when the AT
                       keyboard be used.

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 JP9. 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.