KP6-LS (SMP)

A Dual Pentium ® II Processor based AGP mainboard

KP6-LS

Technical Support Services

If you need additional information, help during installation or normal use of this product, please contact your retailer. If your retailer can not help, you may E-Mail us with any questions at the following address tech@epox.com.

Record your serial number before installing your KP6-LS mainboard. (the serial number is located near the ISA slots at the edge of the board)

EPoX KP6-LS serial number:

_____

BIOS Upgrades

Please use either our Web Site or BBS for current BIOS Upgrades.

Internet Access

http://www.epox.com
sales@epox.com
tech@epox.com

Modem Access

886-2-247-2724 (Taiwan)
31-182-618451 (The Netherlands)

You can access this number via a Hayes-compatible modem with a 2,400 to 28,800 baud rate. The following setup format is required:

8 Data Bits, No Parity, 1 Stop Bit.

If your modem is unable to connect at higher baud rates, try connecting at 2,400 baud before contacting Technical Support.

Thank you for using EPoX mainboards!

EPoX

User Notice

The product name and revision number are both printed on the mainboard itself.

Handling Procedures

Static electricity can severely damage your equipment. Handle the KP6-LS and any other device in your system with care and avoid unneccessary contact with system components on the mainboard.

Always work on an antistatic surface to avoid possible damage to the motherboard from static discharge.

We assume no responsibility for any damage to the KP6-LS mainboard that results from failure to follow installation instructions or failure to observe safety precautions.

CAUTION

The KP6-LS mainboard is subject to damage by static electricity. Always observe the handling procedures.
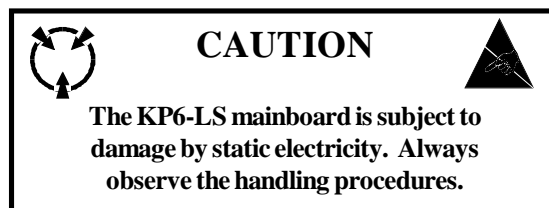
EPoX

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EPoX

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USERS
MANUAL

KP6-LS

C

G

D

B

A

Top Half

Bottom Half

EPoX
CD-Rom

or

E   F   H
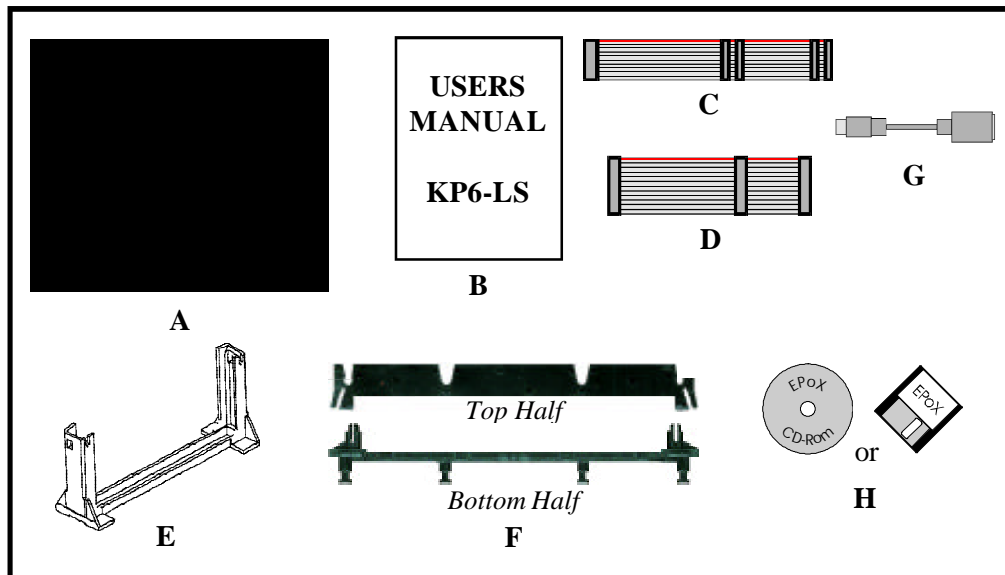
Overview

Pentium II

The Pentium® II Processor is the follow-on to the Pentium® Processor. The Pentium® II Processor, like the Pentium® Pro processor, implements a Dynamic Execution micro-architecture -- a unique combination of multiple branch prediction, data flow analysis, and speculative execution. This enables the Pentium® II Processor to deliver higher performance than the Pentium® processor, while maintaining binary compatibility with all previous Intel architecture processors.

A significant feature of the Pentium® II Processor, from a system perspective, is the built-in direct multiprocessing support. In order to achieve multiprocessing, and maintain the memory and I/O bandwidth to support it, new system designs are needed. For systems with dual processors, it is important to consider the additional power burdens and signal integrity issues of supporting multiple loads on a high speed bus. The Pentium® II Processor card supports both uni-processor and dual processor implementations.

The Pentium® II Processor utilizes Single Edge Contact (S.E.C.) (Figure 1) cartridge packaging technology. The S.E.C. cartridge allows the L2 cache to remain tightly coupled to the processor, while maintaining flexibility when implementing high perfor-mance processors into OEM systems. The second level cache is performance optimized and tested at the cartridge level. The S.E.C. cartridge utilizes surface mounted core components and a printed circuit board with an edge finger connec-tion. The S.E.C. cartridge package introduced on the Pentium® II Processor will also be used in future Slot 1 processors.

The S.E.C. cartridge has the following features: a thermal plate, a cover and a PCB with an edge finger connection. The thermal plate allows standardized heatsink attachment or customized thermal solutions. The thermal plate enables a reusable heatsink to minimize fit issues for serviceability, upgradeability and replacement. The full enclosure also protects the surface mount components. The edge finger connec-tion maintains socketabilty for system configuration. The edge finger connector is denoted as 'Slot 1 connector' in this and other documentation.

The entire enclosed product is called the Pentium® II Processor. The packaging technology and each of the physical elements of the product are referred to using accurate technical descriptions. This allows clear reference to the products as just a processor. This is the model used in past packaging technologies like PGA, TCP, PQFP, DIP, etc.

S.E.C. Cartridge Terminology

- Pentium® II Processor
  The new enclosed card packaging technology is called a "Single Edge Contact cartridge." This is similar to previous names for packaging technology such as PGA or TCP.
- Processor card
  The green PCB (with or without components on it)
- Processor core
  The silicon on the PLGA package on the PCB
- Cover
  The plastic cover on the opposite side from the thermal plate.
- Slot 1
  The slot that the S.E.C. cartridge plugs into, just as the Pentium® Pro processor uses Socket 8.
- Retention mechanism
  Formerly 'retention module' the dual posts, etc. that holds the cartridge in place.
- Thermal plate
  The heatsink attachment plate.
- Heat sink supports
  The support pieces that are mounted on the mainboard to provide added support for heatsinks.

The L2 cache (TagRAM, PBSRAM) components keep standard industry names.

The Pentium® II Processor is the first product to utilize the S.E.C. cartridge technology and Slot 1 connector. Unless otherwise noted, any references to "Pentium® II Processor," "Pentium® II Processor/Slot 1 processor" or Processor" will apply to both the Pentium® II Processor desktop processors.
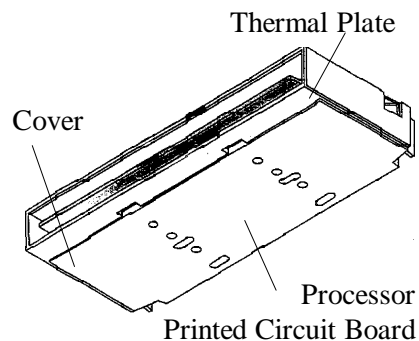
Figure 1: Pentium® II Processor CPU with S.E.C. Cartridge

Enterprise Symmetrical Multi-Processing (SMP)

At last an Enterprise-Class solution for your Bandwidth Critical applications server at PC prices. This mainboard features the latest Intel Pentium® II Processor horse-power in a Symmetrical Multi-Processing (SMP) configuration previously only available on RISC and Mainframe systems.

In SMP Operating Systems such as Unix® and Windows® NT the two main tasks of I/O and Application thread can be most efficiently done if split evenly over two CPU's. The core benefit to you is not only the reduced outlay in infrastructure, but also the PC-architecture that you need for security of investment and future compat-ibility.

This mainboard is also an excellent single-user Workstation solutions for Mission-Critical 32-bit applications such as Adobe® Photoshop for Windows® NT, where double floating-point power can really smooth out your work-load. Also provided are the latest PC Workstation technologies including A.G.P., USB, and PC2.1 Expansion Slots.

Operating Systems that support Dual Processing

Operating System Name	*Revision*	*S82093AA APIC*
Windows NT Server/Workstation	3.51 or above	Yes
Netware SMP	4.xx	No, will be supported in a future revision
SCO Unix MPX	3.0	No, not planned to be supported
SCO Unix Openserver	5.0	Yes
Solaris	2.4/2.5	No, will be supported in a future revision
Unixware	2.0x/2.1	No / Yes
OX/2 SMP	2.11	No, will be supported in a future revision

Accelerated Graphics Port
(AGP or A.G.P.)

Typically, 3D graphics rendering requires a tremendous amount of memory, and demands ever increasing throughput speed as well. As 3D products for the personal computer become more and more popular, these demands will only increase. This will cause a rise in costs for both end users and manufacturers. Lowering these costs as well as improving performance is the primary motivation behind AGP. By providing a massive increase in the bandwidth available between the video card and the processor, it will assist in relieving some of these pressures for quite sometime.

Hardware Monitoring

Hardware monitoring allows you to monitor various aspects of your systems operations and status. These include features such as CPU temperature, voltage and fan RPM's.

Desktop Management Interface
(DMI)

DMI, or Desktop Management Interface, is a BIOS level method for monitoring specific BIOS related hardware features. It allows the BIOS to collect and store information specific to the system, so that vendors and system integrators will have greater access to information regarding system configuration and design. This allows for better troubleshooting, migration planning, and upgradeability decision making.

KP6-LS Form-Factor

The EPoX KP6-LS is designed with ATX form factor - the latest industry standard of chassis. The ATX form factor is essentially a Baby-AT baseboard rotated 90 degrees within the chassis enclosure and a new mounting configuration for the power supply. With these changes the processor is relocated away from the expansion slots, allowing them all to hold full length add-in cards. ATX defines a double height aperture to the rear of the chassis which can be used to host a wide range of onboard I/O. Only the size and position of this aperture is defined, allowing PC manufacturers to add new I/O features (e.g.; TV input, TV output, joystick, modem, LAN, audio, etc.) to systems. This will help systems integrators differentiate their products in the marketplace, and better meet your needs.

•   By integrating more I/O down onto the board and better positioning the hard drive and floppy connectors material cost of cables and add-in cards is reduced.

•   By reducing the number of cables and components in the system, manufacturing time and inventory holding costs are reduced and reliability will increase.

•   By using an optimized power supply, it's possible to reduce cooling costs and lower acoustical noise. An ATX power supply, which has a side-mounted fan, allows direct cooling of the processor and add-in cards making a secondary fan or active heatsink unnecessary in most system applications.
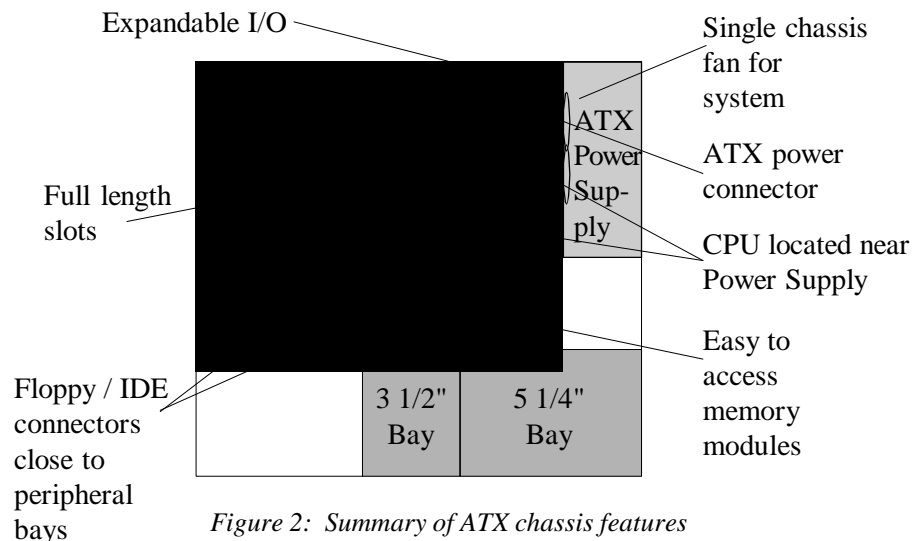
Figure 2: Summary of ATX chassis features

I/O Shield Connector

The KP6-LS is equipped with an I/O back panel. Please use the appropriate I/O shield (figure 3).

*Figure 3:
KP6-LS
I/O back
panel layout*

Parallel Port

PS/2 Mouse

PS/2 Keyboard

USB   COM1   COM2
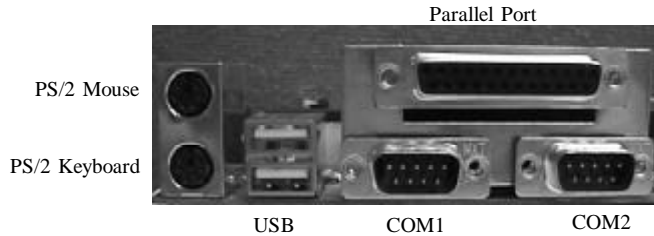
Power-On/Off (Remote)

The KP6-LS has a single 20-pin connector for ATX power supplies. For ATX power supplies that support the **Remote On/Off** feature, this should be connected to the systems front panel for system Power On/Off button. The systems power On/Off button should be a momentary button that is normally open.

The KP6-LS has been designed with "Soft Off" functions. You can turn Off the system from one of two sources: The first is the front panel Power On/Off button, and the other is the "Soft Off" function (coming from the KP6-LS's onboard circuit controller) that can be controlled by the operating system. Windows 95 will control this when the user clicks that they are ready to Shutdown the system.

*ATX
POWER SUPPLY*
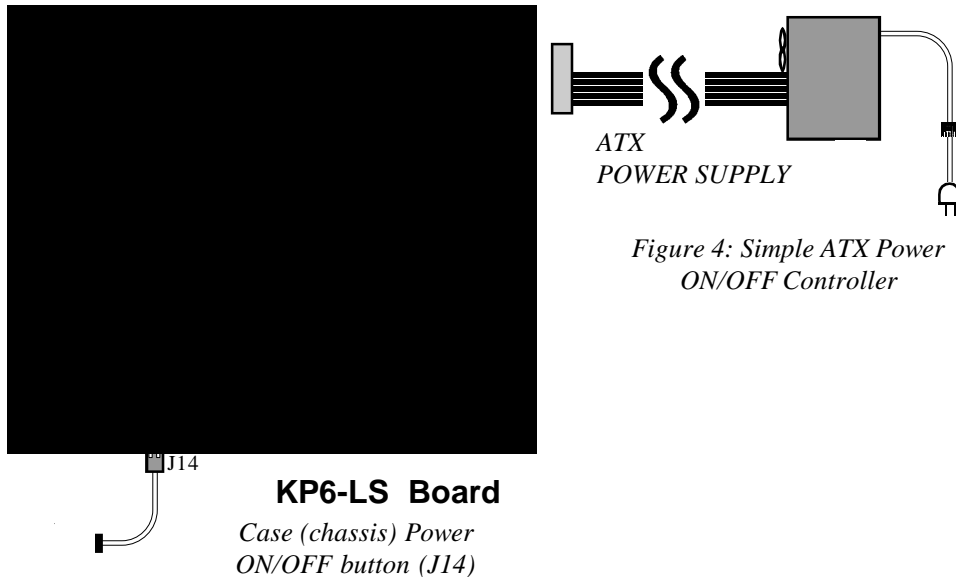
*Figure 4: Simple ATX Power
ON/OFF Controller*

J14

KP6-LS Board

*Case (chassis) Power
ON/OFF button (J14)*

System Block Diagram

Pentium® II Processor

Pentium® II Processor

PAC
PCI Bridge
and memory
controller
443LX

MA [0:13]
MD [0:63]
MPE [0:7]

AGP Bus

AGP Slot

Graphic
Video

PCI Slots

PIIX4
I/O Bridge

CD-Rom

HDD

USB 0   USB 1

ISA Slots

BIOS
Flash Memory

Serial Port 1
Serial Port 2
LPT Port
PS/2 Mouse
PS/2 Keyboard

Winbond
83C977
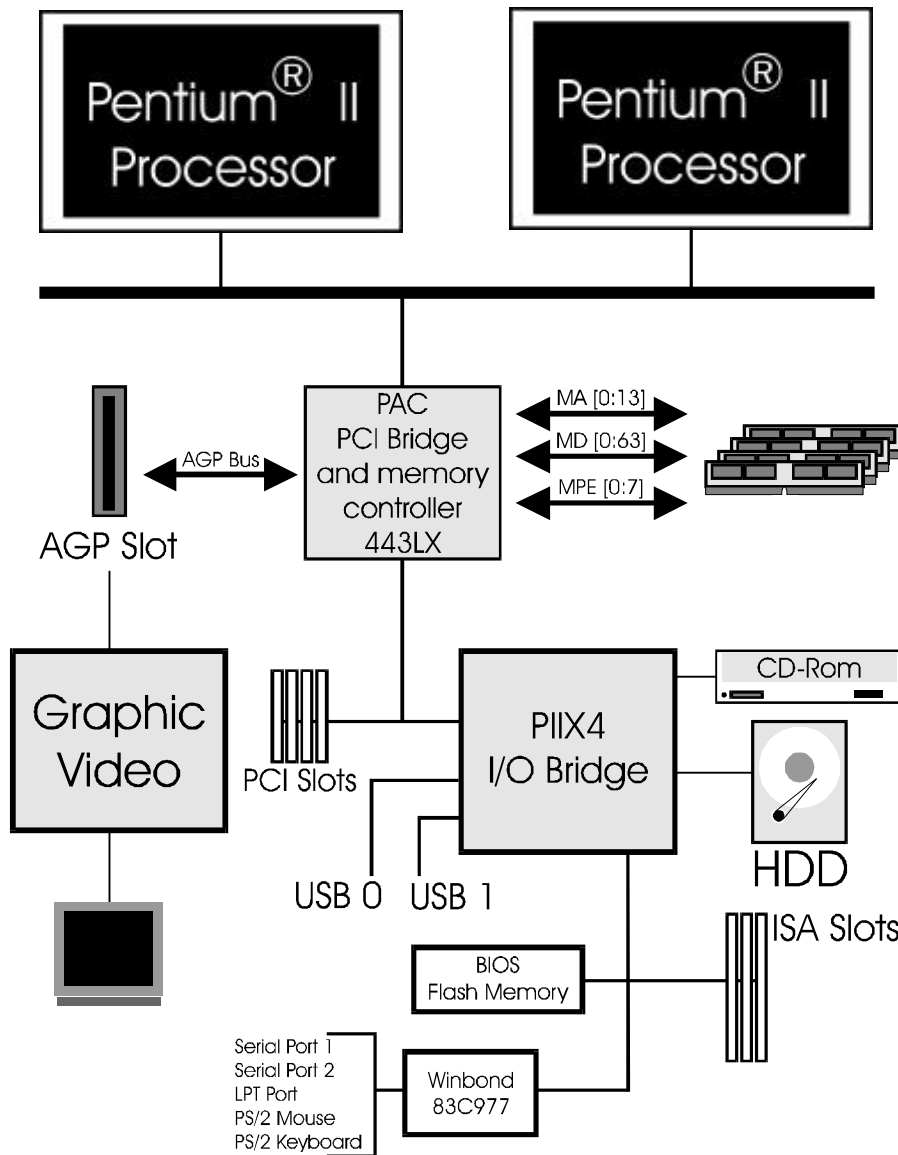
Figure 5: System Block Diagram

<div align="right">

Section 2
FEATURES

</div>

KP6-LS Features:

- KP6-LS is based on the Dual Pentium® II Processor operating at 233 ~ 330 MHz on Slot 1. The board is configured by an Easy-Setting-Single-Jumper (E.S.S.J.) to match your CPU clock speed.

- Designed with Intel's 82443 LX AGPset.

- Supports up to 1 Gigabyte of DRAM (minimum of 8 MB) on board, You can use 168-pin DIMM x 4. It will automatically detect Extended Data Output (EDO) DRAM or Synchronous DRAM memory (SDRAM) (please see Section 3-2).

- KP6-LS will support Error Checking and Correcting (ECC) when using parity DRAM memory modules. This will detect multiple bit errors and correct 1-bit memory errors.

- Supports (3) 16 bit ISA slots, (4) 32 bit PCI slots, (1) AGP slot and provides (2) independent high performance PCI IDE interfaces capable of supporting PIO Mode 3/4 and Ultra DMA 33 devices. The KP6-LS supports (4) PCI Bus Master slots and a jumperless PCI INT# control scheme which reduces configuration confusion when plugging in PCI card(s).

- Supports ATAPI (e.g. CD-ROM) devices on both Primary and Secondary IDE interfaces.

- Designed with Winbond W83977 Multi I/O: (1) floppy port, (1) parallel port (EPP, ECP), and (2) serial ports (16550 Fast UART), (1) IrDA. Note: Japanese "Floppy 3 mode" is also supported

- Includes a PS/2 mouse connector.

- Allows use of a PS/2 or AT keyboard.

- Features Award Plug & Play BIOS. With Flash Memory you can always upgrade to the current BIOS as they are released. (http://www.epox.com/ please visit our Technical Support section for the latest updates)

- KP6-LS utilizes a Lithium battery which provides environmental protection and longer battery life.

- Supports the Universal Serial Bus (USB) connector. The onboard PIIX4 chip provides the means for connecting PC peripherals such as; keyboards, joysticks, telephones, and modems.

- Built-in ATX 20-pin power supply connector.

- Software power-down when using Windows ® 95.

- Supports ring-in feature (remote power-on through external modem, allows system to be turned on remotely.

- Supports Wake On-Lan (WON).

- Resume by Alarm - Allows your system to turn on at a preselected time.

- Power Loss Recovery - In the event of a power outtage your system will automatically turn itself back on without user intervention.

- Supports CPU Hardware sleep and SMM (System Management Mode).

- Supports Desktop Management Interface (DMI) facilitating the management of desktop computers, hardware and software components and peripherals, whether they are stand-alone systems or linked into networks. (option)

EPoX

Section 3
INSTALLATION

KP6-LS Detailed Layout

PS/2 — Mouse (Top) / Keyboard (Bottom)

USB — USB 1 (Top) / USB 0 (Bottom)

ATX Power Input — J9

Parallel Port

COM 1

COM 2

CPU 1 Fan J13

CPU Cartridge SLOT 1 Primary

CPU Cartridge SLOT 1 Secondary

Bank 0 / Bank 1 / Bank 2 / Bank 3

DIMM 1 / DIMM 2 / DIMM 2 / DIMM 3

Intel 443LX PCIset

CPU 2 Fan J8

AGP SLOT

J12 Secondary IDE

JP12 / JP11 / JP10 / JP9

J11 Primary IDE

PCI Slot #1

J2 Infrared

PCI Slot #2

J1 Chassis Intrusion

JPX1 Wake On-Lan

330MH / 300MH / 266MH / 233MH / 200MH — JP7 Default

J14

PWR/ON

PCI Slot #3

Intel PIIX4 PCIset

FDD Connector — J13

H/D LED

G/LED

SLEEP

Winbond 83977 I/Oset

PCI Slot #4

J4

TBLED

LM79 Hardware Monitor

ISA Slot #1

Clear CMOS JP3

Intel 82093A

Battery

RST

SPEAK

KP6-LS Rev. #

ISA Slot #2

Chassis Fan J3

KEYLOCK

ISA Slot #3

JP1

Flash Memory for BIOS

Figure 1

Easy Installation Procedure

Easy Installation Procedure

The following must be completed before powering on your new system:
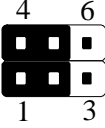
   3-1.   Configure Jumpers to match your hardware
   3-2.   Install memory chips
   3-3.   Install Pentium II Processor
   3-4.   Device Connectors

Section 3-1
Configure Jumpers
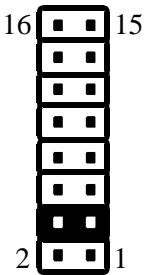
EPoX designs all motherboards with the fewest jumpers to make your install fast and easy.

The following will describe all of the jumpers that you are required to set before moving on to step 3-2.

Note: The jumpers as depicted as shown (Figure 1) in their correct physical orientation.

JP1: **BIOS Voltage Setting**
   JP1:   =   1-2 **-** +5V Flash (Default)
                       4-5
                   =   2-3 **-** +12V Flash
                       5-6

JP3: **CMOS Clear**
   JP3:   =   1-2 **-** Run Mode (Default)
                   =   2-3 **-** Clear CMOS
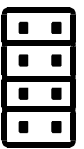
CPU Processor Selection

JP7:

16 [• •] 15

2 [• •] 1

JP7:   = 1-2 **-** 200MHz
          = 3-4 **-** 233MHz (Default)
          = 5-6 **-** 266MHz
          = 7-8 **-** 300MHz
          = 9-10 **-** 330MHz
          = 11-12 **-** Reserved
          = 13-14 **-** Reserved
          = 15-16 **-** Disable E.S.S.J.

JP9:
JP10:
JP11:
JP12:

Reserved CPU Processor Selections
JP9:   = Reserved
JP10:   = Reserved
JP11:   = Reserved
JP12:   = Reserved

Section 3-2
System Memory Configuration

Memory Layout

The KP6-LS supports (4) 168-pin DIMMs (Dual In-line Memory Module). The DIMMs can be either EDO (Enhanced Data Out) or SDRAM (Synchronized DRAM).

- DIMM SDRAM may be 83MHz (12ns), 100MHz (10ns) or 120MHz (8ns) bus speed.
- If you use both 50ns and 60ns memory you must configure your BIOS to read 60ns.
- When using Synchronous DRAM we recommend using the 4 clock variety over the 2 clock.
- **Fast Page Mode DRAM (FPM) is not supported by the LX AGPset. Only EDO and SDRAM are supported.**

Figure 2 and Table 1 show several possible memory configurations.

Total Memory	DIMM 1	DIMM 2	DIMM 3	DIMM 4
= 1GB Maximum	EDO/SDRAM* 8MB, 16MB, 32MB 64MB, 128MB, 256M X 1	EDO/SDRAM* 8MB, 16MB, 32MB, 64MB, 128MB, 256MB X 1	EDO/SDRAM* 8MB, 16MB, 32MB, 64MB, 128MB, 256MB X 1	EDO/SDRAM* 8MB, 16MB, 32MB, 64MB, 128MB, 256MB X 1
= 768MB Maximum	EDO/SDRAM* 8MB, 16MB, 32MB 64MB, 128MB, 256M X 1	EDO/SDRAM* 8MB, 16MB, 32MB, 64MB, 128MB, 256MB X 1	EDO/SDRAM* 8MB, 16MB, 32MB, 64MB, 128MB, 256MB X 1	None
= 512MB Maximum	EDO/SDRAM* 8MB, 16MB, 32MB, 64MB, 128MB, 256MB X 1	EDO/SDRAM* 8MB, 16MB, 32MB, 64MB, 128MB, 256MB X 1	None	None
= 256MB Maximum	EDO/SDRAM* 8MB, 16MB, 32MB, 64MB, 128MB, 256MB X 1	None	None	None

* SDRAM only supports 8, 16, 32, 64, 128MB DIMM modules.

Table 1

DIMM Module Installation

Figure 5 displays the notch marks and what they should look like on your DIMM memory module.

DIMMs have 168-pins and two notches that will match with the onboard DIMM socket. DIMM modules are installed by placing the chip firmly into the socket at a 90 degree angle and pressing straight down (figure 6) until it fits tightly into the DIMM socket (figure 7).

LEFT KEY ZONE
(UNBUFFERED)

CENTER KEY ZONE
(3.3 V DRAM)
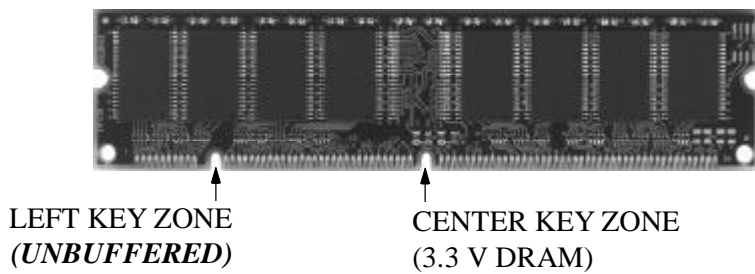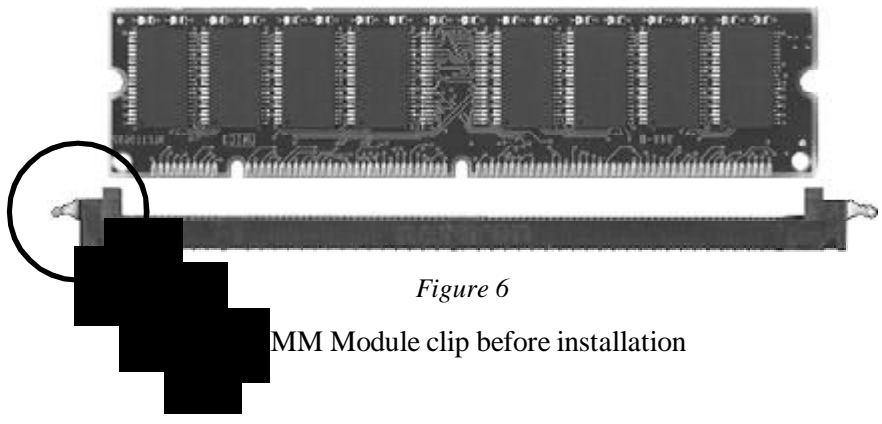
Figure 5

Figure 6

MM Module clip before installation

EPoX
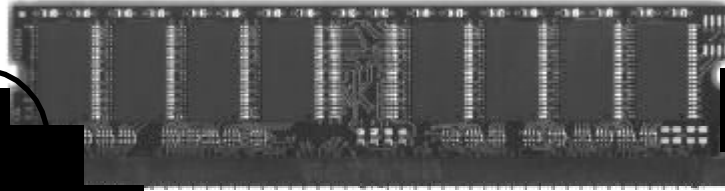
Figure 7

DIMM Module clip after installation

To remove the DIMM module simply press down both of the white clips on each side and the module will be released from the socket.

Section 3-3
Installing a Pentium II Processor

The KP6-LS uses the Single Edge Contact (SEC) slot for a Pentium II processor packaged in an SEC cartridge. The SEC slot is not compatible with other non-Pentium II processors.

Please have ready the following list of components so that we may install the processor onto the motherboard.

1. Pentium II retention mechanism with mounts
2. Heat sink support (top/bottom piece)
` 3. Pentium II processor heat sink
4. Intel Pentium II Processor

OK, now that you have all of your components ready, we can start.

The attach mount bridges (four screws mounted on the motherboard) are pre-installed for easy setup. Place the Pentium II Retention Mechanism over the attach mount bridges. Make sure to line up the notch on the Retention Module (figure 8) with the tab on the Slot 1 Socket.

The Notch
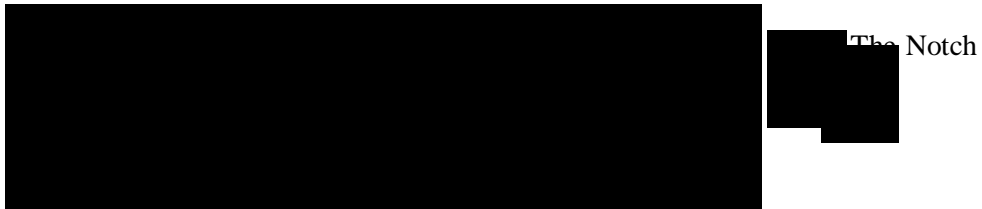
Figure 8

After placing the retention mechanism over the Slot 1 Socket, use a #2 Phillips head screw driver to tighten the (4) screws. **DUE NOT OVERTIGHTEN THE SCREWS!**

Now we are going to install the heatsink support base piece (figure 9) onto the motherboard. There is both a large and small hole (figure 10) so that the base will only fit in one direction. This piece needs to be pushed into the holes firmly until it is seated.

Figure 9

Figure 9 shows the layout of Slot 1 and the holes for mounting the Heatsink base piece (figure 8).

Motherboard

Layout

Large Hole for Heat Sink Base   *Small Hole for Heat Sink Base*
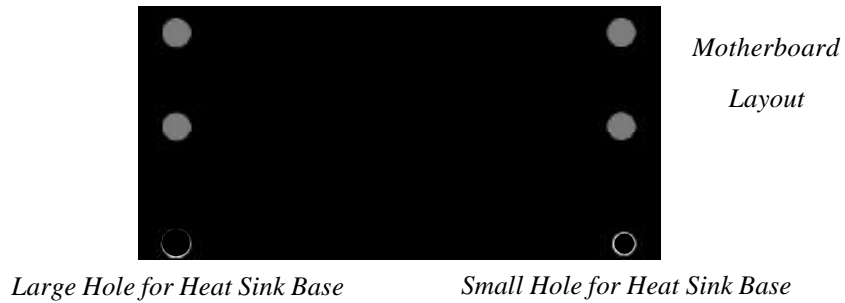
Figure 10

Now we are ready to install the SEC Cartridge (Pentium II Processor) into the Retention Module. The SEC Cartridge is mounted by sliding the SEC Cartridge into the Retention Module and letting it slide all the way down. Once it reaches the bottom make sure you press firmly on SEC cartridge to firmly secure into the Slot 1 Socket.

Now we need to secure the heatsink with the top half of the support (figure 11). Take the top piece of the support and slide it into the bottom fin (figure 11) on the heatsink and then push forward until it clips into the bottom base (figure 9) that is already there (figure 11).

Bottom fin   *Bottom fin*
of heatsink   *heatsink*

Top half of the support
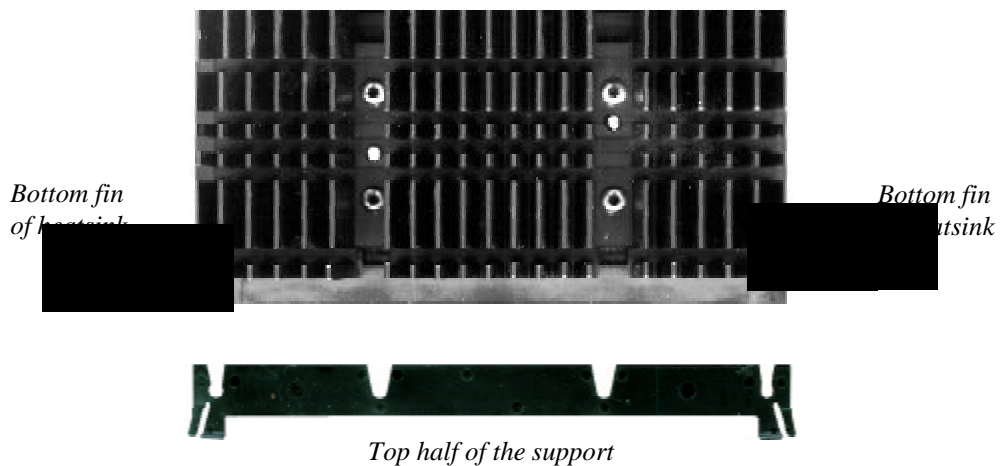
Figure 11

Section 3-4
Device Connectors

Please install the motherboard into the chassis.

Now that your motherboard is installed you are ready to connect all your connections (figure 12).

PS/2 Mouse   USB 1   Parallel Port
(Top)   (Top)   (Top)
PS/2 Keyboard   USB 0
(Bottom)   (Bottom)   Com1   Com2
                            (Bottom Left)   (Bottom Right)
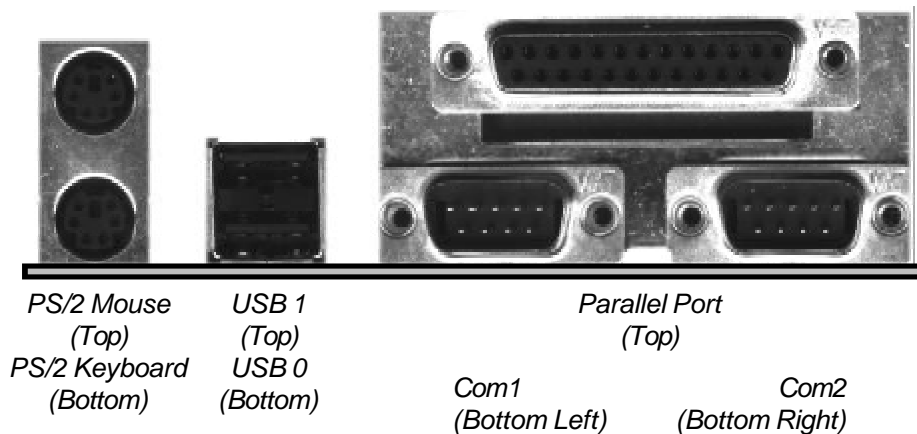
Figure 12

J1:   Chassis open monitoring
         • A plug-in to monitor the chassis
J3:   Chassis Fan Power
         • A plug-in for the chassis Fan Power
J4:   Chassis Panel Connector
         • Keylock, Speaker, Reset, Turbo, Sleep, G/LED and HDD LED
J5:   Floppy Controller
J6:   Primary IDE
J7:   Secondary IDE
J8:   CPU 2 Fan Power
         • A plug-in for the Power supply so that BIOS can monitor the RPM's
J12:   ATX Power Connector
         • 20-pin power connector
J13:   CPU 1 Fan Power
         • A plug-in for the CPU Fan Power

JPX1: • WakeOn-Lan (WOL)

Section   3-4
Device Connectors (continued)

J14   ▪ ▪   **Power On/Off -** This is connected to the power button on the case. Using the Soft-Off by Pwr-BTTN feature, you can choose either Instant Off (turns system off immediatly), or 4 sec delay (you need to hold the button down for 4 seconds before the system turns off). When the system is in 4 sec delay mode, EPoX has added a special feature to make the system go into suspend mode when the button is pressed momentarily.

+ ▪   **IDE LED indicator** - LED ON when Onboard PCI IDE Hard disks is

J4   ▪   activate

+ ▪   **Power Saving LED indicator** - LED ON when system is in any power
▪   saving mode

▪   **Sleep/Resume switch** : Closed to enter sleep mode, a keystroke or
▪   mouse movement will instantly "wake up" the system.

+ ▪   **Turbo LED indicator** - LED ON when higher speed is selected
▪

+ ▪   **Reset** - Closed to restart system.
▪

▪   **Speaker** - Connect to the system's speaker for beeping
▪   1. Speaker   3. GND
▪   2. N/C   4. GND
1 ▪

▪   **KeyLock** - Keyboard lock switch & Power LED connector
▪   1. Power LED(+)   4. Keylock
▪   2. N/C   5. GND
▪   3. GND
1 ▪

Section 4
AWARD BIOS SETUP

BIOS Instructions

Award's ROM BIOS provides a built-in Setup program which allows user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will stay unchanged unless there is a configuration change in the system, such as hard drive replacement or a device is added.

It is possible for the CMOS battery to fail, this will cause data loss in the CMOS only. If this does happen you will need to reconfigure your BIOS settings.

To enter the Setup Program :

Power on the computer and press the <Del> key immediately, this will bring you into the BIOS CMOS SETUP UTILITY.

```
                 ROM PCI/ISA BIOS (2A69JPA9)
                     CMOS SETUP UTILITY
                   AWARD SOFTWARE, INC.
 ┌─────────────────────────────────────────────────────────────────┐
 │   STANDARD CMOS SETUP            SUPERVISOR PASSWORD              │
 │                                                                   │
 │   BIOS FEATURES SETUP            USER PASSWORD                    │
 │                                                                   │
 │   CHIPSET FEATURES SETUP         IDE HDD AUTO DETECTION           │
 │                                                                   │
 │   POWER MANAGEMENT SETUP         SAVE & EXIT SETUP                │
 │                                                                   │
 │   PNP/PCI CONFIGURATION          EXIT WITHOUT SAVING              │
 │                                                                   │
 │   INTEGRATED PERIPHERALS                                          │
 │                                                                   │
 │   LOAD SETUP DEFAULTS                                             │
 ├─────────────────────────────────────────────────────────────────┤
 │ Esc : Quit                       ↑ ↓ →   : Select Item           │
 │ F10 : Save & Exit Setup          (Shift)F2 : Change Color        │
 ├─────────────────────────────────────────────────────────────────┤
 │              Time, Date, Hard Disk Type...                       │
 └─────────────────────────────────────────────────────────────────┘
```

Figure 1: CMOS Setup Utility

The menu displays all the major selection items. Select the item you need to reconfig-ure. The selection is made by moving the cursor (press any direction key) to the item and pressing the 'Enter' key. An on-line help message is displayed at the bottom of the screen as the cursor is moved to various items which provides a better under-standing of each function. When a selection is made, the menu of the selected item will appear so that the user can modify associated configuration parameters.

4-1 Standard CMOS Setup

Choose "Standard CMOS Setup" in the CMOS SETUP UTILITY Menu (Figure 2). The Standard CMOS Setup allows the user to configure system settings such as the current date and time, type of hard disk drive installed, floppy drive type, and display type. Memory size is auto-detected by the BIOS and displayed for your reference. When a field is highlighted (use direction keys to move the cursor and the <Enter> key to select), the entries in the field can be changed by pressing the <PgDn> or the <PgUp> key.

```
                        ROM PCI/ISA BIOS (2A69JPA9)
                           STANDARD CMOS SETUP
                           AWARD SOFTWARE, INC.

    Date (mm:dd:yy) : Mon, Dec  8 1997
    Time (hh:mm:ss) : 16 : 50 : 15

    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
    Video   : EGA/VGA               │  Extended Memory: 162816K
    Halt On : All Errors            │      Other Memory:     384K
                                    │
                                    │     Total Memory: 163840K

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

Figure 2: Standard CMOS Setup

NOTE: If the hard disk Primary Master/Slave and Secondary Master/Slave are set to Auto, then the hard disk size and model will be auto-detected.

NOTE: The "Halt On:" field is used to determine when to halt the system by the BIOS if an error occurs.
NOTE: Floppy 3 Mode support is a mode used to support a special 3.5" drive used in Japan. This is a 3.5" disk that stores only 1.2 MB, the default setting for this is disabled.

4-2 BIOS Features Setup

Selecting the "BIOS FEATURES SETUP" option in the CMOS SETUP UTILITY menu allows users to change system related parameters in the displayed menu. This menu shows all of the manufacturer's default values for the KP6-LS.

Pressing the [F1] key will display a help message for the selected item.

```
                ROM PCI/ISA BIOS (2A69JPA9)
                    BIOS FEATURES SETUP
                    AWARD SOFTWARE, INC.
 ┌──────────────────────────────────────┬──────────────────────────────────────┐
 │ Virus Warning            : Disabled  │ Video  BIOS Shadow  : Enabled         │
 │ CPU Internal Cache       : Enabled   │ C8000-CBFFF Shadow  : Disabled        │
 │ External Cache           : Enabled   │ CC000-CFFFF Shadow  : Disabled        │
 │ Quick Power On Self Test : Enabled   │ D0000-D3FFF Shadow  : Disabled        │
 │ Boot Sequence            : A,C,SCSI  │ D4000-D7FFF Shadow  : Disabled        │
 │ Swap Floppy Drive        : Disabled  │ D8000-DBFFF Shadow  : Disabled        │
 │ Boot Up Floppy Seek      : Enabled   │ DC000-DFFFF Shadow  : Disabled        │
 │ Boot Up NumLock Status   : On        │                                       │
 │ Boot Up System Speed     : High      │                                       │
 │ Gate A20 Option          : Fast      │                                       │
 │ Typematic Rate Setting   : Disabled  │                                       │
 │ Typematic Rate (Chars/Sec) : 6       │                                       │
 │ Typematic Delay (Msec)   : 250       │                                       │
 │ Security Option          : Setup     │                                       │
 │ PCI/VGA Palette Snoop    : Disabled  ├──────────────────────────────────────┤
 │ Assign IRQ For VGA       : Enabled   │ ESC : Quit          ↑↓→ : Select Item │
 │ MPS Version Control For OS : 1.4     │ F1  : Help          PU/PD/+/- : Modify│
 │ OS Select For DRAM > 64MB  : Non-OS2 │ F5  : Old Values  (Shift)F2 : Color   │
 │                                      │ F7  : Load Setup Defaults             │
 └──────────────────────────────────────┴──────────────────────────────────────┘
```

Figure 3: BIOS Features Setup

Virus Warning: During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and an error message will appear. You should then run an anti-virus program to locate the virus. Keep in mind that this feature protects only the boot sector, not the entire hard drive. The default value is Disabled.

Enabled: Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector.
Disabled: No warning message will appear when anything attempts to access the boot sector.

Note: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.

CPU Internal Cache: This controls the status of the processor's internal cache area.
The default is Enabled.

Enabled: This activates the processo's internal cache thereby increasing performance.
Disabled: This deactivates the processor's internal cache thereby lowering performance.

External (L2) Cache: This controls the status of the external (L2) cache area.
The default is Enabled.

Enabled: This activates the motherboard's L2 cache thereby increasing performance.
Disabled: This deactivates the motherboard's L2 cache thereby lowering performance.

Quick Power On Self Test: This category speeds up the Power On Self Test (POST).
The default is Enabled.

Enabled: This setting will shorten or skip of the items checked during POST.
Disabled: Normal POST.

Boot Sequence: This category determines which drive is searched first by the O/S (Operating System).
The default is A,C,SCSI.

The following is your list of options:
[A, C, SCSI] - [C, A, SCSI] - [C, CD-ROM, A] - [CD-ROM, C, A]
[D, A,CD-ROM],[E, A, CD-ROM] - [F, A, CD-ROM] - [SCSI, A, C]
[SCSI C, A] - [C Only]

Swap Floppy Drive: This will swap your physical drive letters A & B if you are using two floppy disks.
The default is Disabled.

> *Enabled: Floppy A & B will be swapped under the O/S.*
> *Disabled: Floppy A & B will be not swapped.*

Boot Up Floppy Seek: During Power-On-Self-Test (POST), BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. Only 360K type is 40 tracks while 760K, 1.2MB and 1.44MB are all 80 tracks.
The default is Enabled.

> *Enabled: The BIOS will search the floppy disk drive to determine if it is 40 or 80 tracks.*
> *Disabled: The BIOS will not search for the type of floppy disk drive by track number.*
>
> *NOTE: BIOS can not tell the difference between 720K, 1.2MB and 1.44MB drive types as they are all 80 tracks.*

Boot Up NumLock Status: This controls the state of the NumLock key when the system boots.
The default is On.

> *On: The keypad acts as a 10-key pad.*
> *Off: The keypad acts like the cursor keys.*

Boot UP System Speed: This controls the initial system speed of the computer.
The default is High.

> *High: This setting sets the computer into normal operation mode.*
> *Low: This setting sets the computer into a slower operating mode. Some add-in peripherals or old software may require this setting. Using CTRL+ALT+(+) will switch you back into high speed mode.*

Gate A20 Option: This refers to the way the system addresses memory above 1MB (extended memory).
The default is Fast.

> *Normal: The A20 signal is controlled by the keyboard controller or chipset hardware.*
> *Fast: The A20 signal is controlled by Port 92 or chipset specific method.*

Typematic Rate Setting: This determines the keystrokes repeat rate.
The default is Disabled.

> *Enabled*: *Allows typematic rate and typematic delay programming.*
> *Disabled*: *The typematic rate and typematic delay will be controlled by the keyboard controller in your system.*

Typematic Rate (Chars/Sec): This is the number of characters that will be re-peated by a keyboard press.
The default is 6.

> *6*: *6 characters per second.*   *8*: *8 characters per second.*
> *10*: *10 characters per second.*   *12*: *12 characters per second.*
> *15*: *15 characters per second.*   *20*: *20 characters per second.*
> *24*: *24 characters per second.*   *30*: *30 characters per second.*

Typematic Delay (msec): This setting controls the time between the first and the second character displayed by typematic auto-repeat.
The default is 250.

> *250*: *250 msec.*
> *500*: *500 msec.*
> *750*: *750 msec.*
> *1000*: *1000 msec.*

Security Option: This category allows you to limit access to the System and Setup, or just to Setup.
The default is Setup.

> *System*: *The system will not boot and the access to Setup will be denied if the correct password is not entered at the prompt.*
> *Setup*: *The system will boot; but the access to Setup will be denied if the incorrect password is not entered at the prompt.*

PCI/VGA Palette Snoop: This field controls the ability of a primary PCI VGA controller to share a common palette (When a snoop write cycles) with an ISA video card.
The default is Disabled.

> *Enabled*: *If an ISA card is connected to a PCI VGA card via the VESA connector, and that ISA card connects to a VGA monitor, then that ISA card uses the RAMDAC of the PCI card.*
> *Disabled*: *Disables the VGA card Palette Snoop function.*

MPS Version Control For OS: This will controll the version of the MPS that your systems uses.
The default is 1.4

> 1.1:   Version 1.1
> 1.4:   Version 1.4

OS Select For DRAM > 64MB: Some operating systems require special handling. Use this option only if your system has greater than 64MB of memory.
The default is Non-OS2.

> ***OS2****: Select this if you are running the OS/2 operating system with greater than 64MB of RAM.*
> ***Non-OS2****: Select this for all other operating systems and configurations.*

Video BIOS Shadow: This option allows video BIOS to be copied into RAM. Video Shadowing will increase the video performance of your system.
The default is Enabled.

> ***Enabled****: Video shadow is enabled.*
> ***Disabled****: Video shadow is disabled.*

C8000 - CBFFF Shadow:
CC000 - CFFFF Shadow:
D0000 - D3FFF Shadow:
D4000 - D7FFF Shadow:
D8000 - DBFFF Shadow:
DC000 - DFFFF Shadow:

These categories determine whether ROMs from option cards will be copied into RAM. This will be in 16K byte or 32K byte units, and the size will depend on chipset of the option card.

> ***Enabled****: Optional shadow is enabled.*
> ***Disabled****: Optional shadow is disabled.*

4-3 Chipset Features Setup

Choose the "CHIPSET FEATURES SETUP" in the CMOS SETUP UTILITY menu to display following menu.

```
                    ROM PCI/ISA BIOS (2A69JPA9)
                      CHIPSET FEATURES SETUP
                       AWARD SOFTWARE, INC.

 Auto Configuration      : Enabled    SDRAM CAS latency Time    : 3
 DRAM Speed Selection    : 60ns       CPU Warning Temperature   : Disabled
 MA Wait State           : Slow       Current CPU Temperature   : 37°C/ 98°F
 EDO RAS# To CAS# Delay  : 3          Current System Temp.      : 30°C/ 86°F
 EDO RAS# Precharge Time : 4          Current CPUFAN1 Speed     :    0 RPM
 EDO DRAM Read Burst     : x333       Current CPUFAN2 Speed     : 4383 RPM
 EDO DRAM Write Burst    : x333       Current Chassis FAN Speed: 6367 RPM
 DRAM Data Integrity Mode : Non-ECC   CPU(V) :  2.80 V  +1.5V  :  1.48 V
 CPU-To-PCI IDE Posting  : Enabled    +3.3V  :  3.32 V  +5V    :  4.97 V
 System BIOS Cacheable   : Disabled   +12V   : 12.16 V  -12V   : 12.41 V
 Video  BIOS Cacheable   : Enabled    -5V    :  5.12 V
 Video RAM Cacheable     : Disabled
 8 Bit I/O Recovery Time : 1
 16 Bit I/O Recovery Time : 1
 Memory Hole At 15M-16M  : Disabled
 Passive Release         : Enabled    ESC : Quit         ↑↓→ : Select Item
 Delayed Transaction     : Disabled   F1  : Help         PU/PD/+/- : Modify
 AGP Aperture Size (MB)  : 64         F5  : Old Values  (Shift)F2 : Color
 SDRAM RAS-to-CAS Delay  : Fast       F7  : Load Setup Defaults
 SDRAM RAS Precharge Time : Fast
```

Figure 4: Chipset Features Setup

Auto Configuration: This selects predetermined optimal values of the chipset parameters.
The default is Enabled.

> *Enabled: This enables auto-configuration and provides the option to select predefined timing modes.*
> *Disabled: This allows the user to specify DRAM timing parameters.*
>
> *Note: **If you exceed the performance characteristics of memory in your system it will result in lockups, crashes and other problematic system operations.***

EDO DRAM Speed Selection: This value must correspond to the speed of the DRAM installed in your system.
The default is 60ns.

50ns: (Faster) Burst Wait State, for 50ns EDO DRAM.
60ns: (Slower) Burst Wait State, for 60ns Fast Page Mode/EDO DRAM.

MA Additional Wait State: This allows the option to insert an additional wait state before the beginning of a memory read. Use of this option may be required to achieve compatibility with some system configurations.
The default is Slow.

Fast: Inserts no wait state.
Slow: Inserts one wait state for the memory cycle.

EDO RAS# to CAS# Delay: Allows you to insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed.
The default is 3.

2: Faster performance.
3: Better reliability.

EDO RAS# Precharge Time: The precharge time is the number of cycles it takes for the RAS to accumulate its charge before EDO DRAM refresh. If insufficient time is allowed, refresh may be incomplete and the EDO DRAM may fail to retain data.
The default is 4.

3: Time equals 3 host clocks.
4: Time equals 4 host clocks.

EDO DRAM Read Burst (B/E/F): This setting will allow you to set the timing for burst mode reads from EDO DRAM. The lower the timing number the faster the system addresses the memory.
The default is x333.

x222: Use of this option may cause conflicts with some system configurations.
x333: This is used for standard system configurations.

EDO DRAM Write Burst (B/E/F): This setting will allow you to set the timing for burst mode writes to EDO DRAM. The lower the timing number the faster the system addresses the memory.
The default is x333.

x222: *Use of this option may cause conflicts with some system configura-tions.*
x333: *This is used for standard system configurations.*

DRAM Data Integrity Mode: Use this option to configure the type of DRAM in your system.
The default is Non-ECC.

Non-ECC: *If your memory is Non-ECC memory, choose this option.*
ECC: *If your memory is ECC memory, choose this option.*

CPU-To-PCI IDE Posting: This option allows the computer to post write cycles from the CPU to the PCI IDE interface. IDE accesses are posted in the CPU to PCI buffers, for cycle optimization.
The default is Enabled.

Enabled: *Enabled*
Disabled: *Disabled*

System BIOS Cacheable: This allows you to copy your BIOS code from slow ROM to fast RAM.
The default is Disabled.

Enabled: *The option will improve system performance. However, if any program writes to this memory area, a system error may result.*
Disabled: *System BIOS non-cacheable.*

Video BIOS Cacheable: This option copies the video ROM BIOS to fast RAM (C0000h to C7FFFh).
The default is Enabled.

Enabled: *Enables the Video BIOS Cacheable to speed up the VGA Perfor-mance.*
Disabled: *Will not use the Video BIOS Cacheable function.*

Video RAM Cacheable: This option allows the CPU to cache read/writes of the video RAM.
The default is Enabled.

Enabled: *This option allows for faster video access.*
Disabled: *Reduced video performance.*

EPoX

8 Bit I/O Recovery Time: This function allows you to set the wait state that is added to an 8 bit ISA instruction originated by the PCI bus.
The default is 3.

> *NA: No wait state*   *8: 8 wait states*
> *1: 1 wait states*   *2: 2 wait states*
> *3: 3 wait states*   *4: 4 wait states*
> *5: 5 wait states*   *6: 6 wait states*
> *7: 7 wait states*

16 Bit I/O Recovery Time: This function allows you to set the wait state that is added to an 16 bit ISA instruction originated by the PCI bus.
The default is 2.

> *NA: No wait state*   *4: 4 wait states*
> *3: 3 wait states*   *2: 2 wait states*
> *1: 1 wait states*

Memory Hole at 15M-16M: You can reserve this memory area for the use of ISA adaptor ROMs.
The default is Disabled.

> *Enabled: This field enables the main memory (15~16MB) to remap to ISA BUS.*
> *Disabled: Normal Setting.*
>
> *NOTE: If this feature is enabled you will not be able to cache this memory segment.*

Passive Release: This option allows access from the CPU to PCI bus to be active during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.
The default is Enabled.

> *Enabled: Enabled*
> *Disabled: Disabled*

Delayed Transaction: This option allows the chipset to use its embedded 32-bit posted write buffer to support delay transactions cycles.
The default is Disabled.

> *Enabled: Select enabled to support PCI 2.1 specification.*
> *Disabled: Disabled.*

AGP Aperture Size: The amount of system memory that the AGP card is allowed to share.
The default is 4.

> *4: 4MB of systems memory accessible by the AGP card.*
> *8: 8MB of systems memory accessible by the AGP card.*
> *16: 16MB of systems memory accessible by the AGP card.*
> *32: 32MB of systems memory accessible by the AGP card.*
> *64: 64MB of systems memory accessible by the AGP card.*
> *128: 128MB of systems memory accessible by the AGP card.*
> *256: 256MB of systems memory accessible by the AGP card.*

SDRAM RAS# to CAS# Delay: Allows you to insert a timing delay between the CAS and RAS strobe signals, used when SDRAM is written to, read from, or refreshed.
The default is Slow.

> *Fast: Provides faster memory performance.*
> *Slow: Provides better memory compatibility.*

SDRAM Precharge Time: The precharge time is the number of cycles it takes for the RAS to accumulate its charge before SDRAM refresh. If insufficient time is allowed, refresh may be incomplete and the SDRAM may fail to retain data.
The default is Slow.

> *Fast: Provides faster memory performance.*
> *Slow: Provides better memory compatibility.*

SDRAM CAS Latency Time: This setting defines the CALT timing parameter of the SDRAM in terms of clocks.
The default is 3.

> *2: Provides faster memory performance.*
> *3: Provides better memory compatibility.*

CPU Warning Temperature: This is the temperature that the computer will respond to an overheating CPU.
The default is disabled.

> *Enabled: Temperature is monitored on the CPU*
> *Disabled: This feature is turned off.*

EPoX

Current CPU Temperature: This is the current temperature of the CPU.

Current CPU 1 FAN Speed: The current power fan speed in RPMs.

Current CPU 2 FAN Speed: The current CPU fan speed in RPMs.

Current Chassis FAN Speed: The current chassis fan speed in RPMs.

CPU(V): The voltage level of the CPU.

4-4 Power Management Setup

Choose the "POWER MANAGEMENT SETUP" in the CMOS SETUP UTILITY to display the following screen. This menu allows the user to modify the power management parameters and IRQ signals. In general, these parameters should not be changed unless it's absolutely necessary.

```
                    ROM PCI/ISA BIOS (2A69JPA9)
                      POWER MANAGEMENT SETUP
                       AWARD SOFTWARE, INC.

 Power Management      : User Define    ** Reload Global Timer Events **
 PM Control by APM     : Yes           IRQ[3-7,9-15],NMI    : Enabled
 Video Off Method      : V/H SYNC+Blank Primary IDE 0        : Disabled
 Video Off After       : Standby       Primary IDE 1        : Disabled
 MODEM Use IRQ         : 3             Secondary IDE 0      : Disabled
                                       Secondary IDE 1      : Disabled
 Doze Mode             : Disable       Floppy Disk          : Disabled
 Standby Mode          : Disable       Serial Port          : Enabled
 Suspend Mode          : Disable       Parallel Port        : Disabled
 HDD Power Down        : Disable
 Throttle Duty Cycle   : 62.5%
 VGA Active Monitor    : Enabled
 Soft-Off by PWR-BTTN  : Instant-Off
 Resume by Ring        : Enabled
 Power Loss Recovery   : Disabled
 Resume by Alarm       : Enabled       ESC : Quit         ↑↓→ : Select Item
 Date(of Month) Alarm :   0            F1  : Help       PU/PD/+/- : Modify
 Time(hh:mm:ss) Alarm :   7: 0: 0      F5  : Old Values  (Shift)F2 : Color
 IRQ 8 Break Suspend   : Disabled      F7  : Load Setup Defaults
```

Figure 5: Power Management Setup

You can only change the content of Doze Mode, Standby Mode, and Suspend Mode when the Power Management is set to 'User Define'.

Power Management: Use this to select your Power Management selection. The default is User define.

Disabled: *The system operates in NORMAL conditions (Non-GREEN), and the Power Management function is disabled.*
Max. saving: *Maximum power savings. Inactivity period is 1 minute in each mode.*
Min. saving: *Minimum power savings. Inactivity period is 1 hour in each mode.*
User define: *Allows user to define PM Timers parameters to control power saving mode.*

PM controlled APM: This option shows weather or not you want the Power Management to be controlled the Advanced Power Management (APM).
The default is Yes.

Yes: *APM controls your PM*
No: *APM does not control your PM*

Video Off Method: This option allows you to select how the video will be disabled by the power management.
The default is V/H Sync + Blank

V/H Sync + Blank: *System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.*
DPMS: *Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.*
Blank Screen: *System only writes blanks to the video buffer.*

Video Off After: Tells you what time frame that the video will be disabled under current power management settings.
The default is Standby.

Standby: *Video powers off after time shown in standby mode setting.*
Doze: *Video powers off after time shown in doze mode setting.*
Suspend: *Video powers off after time shown in suspend mode setting.*
N/A: *Video power off not controlled by power management.*

MODEM Use IRQ: Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.
Default is IRQ 3.

EPoX

N/A: No IRQ is used.   *3: IRQ 3*
4: IRQ 4   *5: IRQ 5*
7: IRQ 7   *9: IRQ 9*
10: IRQ 10   *11: IRQ 11*

The KP6-LS supports HDD Power Down, Doze and Standby power saving functions when using the Intel Pentium II Processor.
The default is Disabled

Doze Mode: The "Doze" mode timer starts to count when no "PM events" have occurred.

Standby Mode: When the standby mode timer times-out, it will enter the standby mode and retain CPU at a slow working speed. The screen will be blanked out.

Suspend Mode: This function works only when the Pentium II Processor is installed. The timer starts to count when "System Standby" mode timer is timed out and no "PM Events" are occurring. Valid range is from 1 minute up to 1 hour.

HDD Power Down: HDD Standby timer can be set from 1 to 15 minute(s).

VGA Active Monitor: Use this option if your monitor has advanced power saving features.
The default is Enabled

> *Enabled: Your monitor's power features will be included in power management.*
> *Disabled: Your monitor's power features will not be included in power management.*

Soft-Off by PWR-BTTN: Use this to select your soft-off function.
The default is Instant Off.

> *Instant Off: Turns off instantly.*
> *4 Second Delay: Turns off after a 4 second delay. If momentary press of button, the system will go into Suspend Mode. Press again to take system out of Suspend Mode.*

Resume by Ring: This option is used to set the remote ring in feature.
The default is Enabled.

> *Enabled: The system can use remote ring-in to wake the system up.*
> *Disabled: The system cannot use remote ring in to wake system up.*

Power Loss Recovery: If the power to the system is cut off the system will turn itself back on with no user intervention.
The default is Enabled.

   Enabled: The system will power back on after a power interuption.
   Disabled: The system will stay off after a power interuption.

Resume by Alarm: This option allows you to have the system turn on at a preset time each day or on a certain day. This option is only available when Power Loss Recovery is Enabled.
The default is Enabled.

   Enabled: The system will turn on at the preset time.
   Disabled: The system will not turn on until you turn it on.

Date (of month) Alarm: This is how you set the date that the system will turn on.
The default is 0.

   0: Setting this to 0 will turn the system on everyday at the preset time.
   1-31: Represents the day of the month that you need the system to turn on.

Time (hh:mm:ss) Alarm: This sets the time that you need the system to turn on.
The deault is 08:00:00.

**Reload Global Timer Events **

These options allow the user to reset the global power features timer if any of the enabled events occur.

IRQ [3-7, 9-15], NMI: The default is Enable.
Primary IDE 0: The default is Disable.
Primary IDE 1: The default is Disable.
Secondary IDE 0: The default is Disable.
Secondary IDE 1: The default is Disable.
Floppy Disk: The default is Disable.
Serial Port: The default is Enable.
Parallel Port: The default is Disable.

4-5 PNP/PCI Configuration

The PNP/PCI configuration program is for the user to modify the PCI/ISA IRQ signals when various PCI/ISA cards are inserted in the PCI or ISA slots.

WARNING: Conflicting IRQ's may cause the system to not find certain devices.

```
                      ROM PCI/ISA BIOS (2A69JPA9)
                        PNP/PCI CONFIGURATION
                         AWARD SOFTWARE, INC.
 ┌──────────────────────────────────────┬──────────────────────────────────┐
 │ PNP OS Installed       : No          │ PCI IDE IRQ Map To  : ISA        │
 │ Resources Controlled By  : Manual    │                                  │
 │ Reset Configuration Data : Disabled  │                                  │
 │                                      │                                  │
 │ IRQ-3   assigned to : Legacy ISA     │ Used MEM base addr  : N/A        │
 │ IRQ-4   assigned to : Legacy ISA     │                                  │
 │ 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    │ PCI Latency Timer(CLK):   32     │
 │ 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    ├──────────────────────────────────┤
 │ DMA-3   assigned to : PCI/ISA PnP    │ ESC : Quit        ↑↓→ : Select Item│
 │ DMA-5   assigned to : PCI/ISA PnP    │ F1  : Help      PU/PD/+/- : Modify│
 │ DMA-6   assigned to : PCI/ISA PnP    │ F5  : Old Values  (Shift)F2 : Color│
 │ DMA-7   assigned to : PCI/ISA PnP    │ F7  : Load Setup Defaults         │
 └──────────────────────────────────────┴──────────────────────────────────┘
```

Figure 6: PCI Configuration Setup

PNP OS Installed: Do you have a PNP OS installed on your system. The default is No.

> *Yes: Select if you are using a PNP OS*
> *No: Select if your OS does not support PNP.*

Resources Controlled By: Who controlled the system PNP/PCI resources.
The default is Manual.

> *Manual: PNP Card's resources will be controlled manually. You can set which IRQ-X and DMA-X are assigned to PCI/ISA PNP or Legacy ISA Cards.*
> *Auto: If your ISA card and PCI card are all PNP cards, BIOS will assign the interrupt resource automatically.*

Reset Configuration Data: This setting allows you to clear ESCD data.
The default is Disabled

> *Disabled*: *Normal Setting.*
> *Enabled*: *If you have plugged in some Legacy cards to the system and they were recorded into ESCD (Extended System Configuration Data), you can set this field to Enabled in order to clear ESCD.*

PCI IDE IRQ Map To: This item allows the user to configure the system for the type of IDE hard disk controller in use. By default, the BIOS assumes that the hard drive controller is an ISA device rather than a PCI controller. If you are using a PCI controller, then you will need to change this to specify which PCI slot has the controller and which PCI interrupt (A, B, C, or D) is associated with the connected IDE devices.
The default value is PCI-AUTO. This will allow the system to automatically configure the IDE devices.
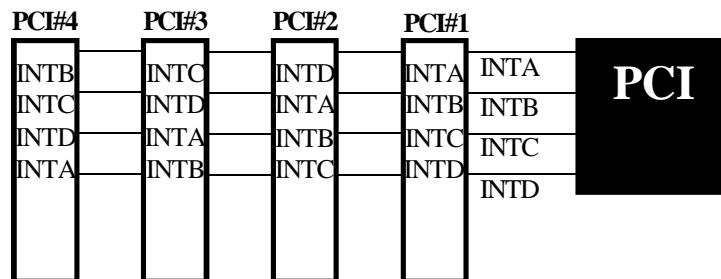
Figure 7: The Combination of PCI INT# lines

Used MEM base addr: The Used MEM base addr (CB00, CC00, D000, D400, D800, DC00) and Used MEM Length (8K, 16K, 32K, 64K) are used to support some specific ISA Legacy cards with requested memory space below 1M address. Now with these two functions, users can define where the used memory address is located and its length of the legacy area that is used by the legacy device to avoid the memory space conflict. For example, if you select "D000" for Used MEM base addr" and "16K" for "Used MEM Length", that means the address region D000H-D3FFFH is occupied by ISA legacy cards, and thus BIOS will not assign this region for PnP/ISA and PCI cards.
The default is N/A.

4-6 Load Setup Defaults

The "LOAD SETUP DEFAULTS" function loads the system default data directly from ROM and initializes the associated hardware properly. This function will be necessary only when the system CMOS data is corrupted.

4-7 Integrated Peripherals

```
                        ROM PCI/ISA BIOS (2A69JPA9)
                          INTEGRATED PERIPHERALS
                           AWARD SOFTWARE, INC.

   IDE HDD Block Mode      : Enabled    IR Transmittiion delay  : Enabled
   IDE Primary Master PIO  : Auto       IR IRQ Select           : IRQ10
   IDE Primary Slave  PIO  : Auto       IR Mode Use DMA         : Disable
   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         : EPP1.9
   IDE Secondary Master UDMA: Auto
   IDE Secondary Slave  UDMA: Auto
   On-Chip Primary   PCI IDE: Enabled
   On-Chip Secondary PCI IDE: Enabled
   USB Keyboard Support     : Disabled

   KBC input clock          : 12 MHz
   Onboard FDC Controller   : Enabled
   Onboard Serial Port 1    : Auto     ESC : Quit        ↑↓→ : Select Item
   Onboard Serial Port 2    : Auto     F1  : Help        PU/PD/+/- : Modify
   Onboard IR Controller    : Enabled  F5  : Old Values  (Shift)F2 : Color
   IR Address Select        : 2E8H     F7  : Load Setup Defaults
   IR Mode                  : IrDA
```

Figure 8: Integrated Peripherals

Note: If you do not use the Onboard IDE connector, then you will need to set Onboard Primary PCI IDE: Disabled and Onboard Secondary PCI IDE: Disabled
Note: The Onboard PCI IDE cable should be equal to or less than 18 inches (45 cm.).

IDE HDD Block Mode: IDE Block Mode allows the controller to access blocks of sectors rather than a single sector at a time.
The default is Enabled.

> **Enabled**: *Enabled IDE HDD Block Mode. Provides higher HDD transfer rates.*
> **Disabled**: *Disable IDE HDD Block Mode.*

Onboard Primary PCI IDE: The default value is Enabled.

> **Enabled**: *Enables Onboard IDE primary port.*
> **Disabled**: *Disables Onboard IDE primary port.*

Onboard Secondary PCI IDE:
The default is Enabled.

> **Enabled**: *Enables Onboard IDE secondary port.*
> **Disabled**: *Disables Onboard IDE secondary port.*

IDE Primary Master PIO
The default is Auto.

> **Auto**: *BIOS will automatically detect the Onboard Primary Master PCI IDE HDD Accessing mode.*
> **Mode 0~4**: *Manually set the IDE Programmed interrupt mode.*

IDE Primary Slave PIO
The default is Auto.

> **Auto**: *BIOS will automatically detect the Onboard Primary Slave PCI IDE HDD Accessing mode.*
> **Mode 0~4**: *Manually set the IDE Programmed interrupt mode.*

IDE Secondary Master PIO:
The default is Auto.

> **Auto**: *BIOS will automatically detect the Onboard Secondary Master PCI IDE HDD Accessing mode.*
> **Mode 0~4**: *Manually set the IDE Programmed interrupt mode.*

IDE Secondary Slave PIO:
The default is Auto.

Auto: BIOS will automatically detect the Onboard Secondary Slave P CI IDE HDD Accessing mode.
Mode 0~4: Manually set the IDE Programmed interrupt mode.

IDE Primary Master UDMA: This allows you to select the mode of operation for the hard drive.
The default is Auto.

Auto: The computer will select the optimal setting.
Disabled: The hard drive will run in normal mode.

IDE Primary Slave UDMA: This allows you to select the mode of operation for the hard drive.
The default is Auto.

Auto: The computer will select the optimal setting.
Disabled: The hard drive will run in normal mode.

IDE Secondary Master UDMA: This allows you to select the mode of operation for the hard drive.
The default is Auto.

Auto: The computer will select the optimal setting.
Disabled: The hard drive will run in normal mode.

IDE Secondary Slave UDMA: This allows you to select the mode of operation for the hard drive.
The default is Auto.

Auto: The computer will select the optimal setting.
Disabled: The hard drive will run in normal mode.

USB Keyboard Support: This controls the activation status of an optional USB keyboard that may be attached.
The default is disabled.

Enabled: Enable USB keyboard support.
Disabled: Disable USB keyboard support.

OnBoard Primary PCI IDE: This option turns on and off the onboard primary IDE. The default is enabled.

Enabled: This activates the primary PCI IDE.
Disabled: This disables the primary PCI IDE and frees up the resource.

OnBoard Secondary PCI IDE: This option turns on/off the onboard secondary IDE. The default is enabled.

Enabled: This activates the secondary PCI IDE.
Disabled: This disables the secondary PCI IDE and frees up its resources.

KBC input clock: This sets the keyboard clock value.
The default is 12 MHz.

Options: 6, 8, 12, 16 are the available choices.

Onboard FDC Controller: This controls the state of the onboard floppy controller. The default value is Enabled.

Enabled: Enable the Onboard Winbond Chips's floppy drive interface
controller.
Disabled: Disable the Onboard Winbond Chip's floppy drive interface
controller.

Onboard Serial Port 1: This field allows the user to configure the 1st serial port. The default is Auto.

AUTO: Enable Onboard Serial port 1 and address is Auto adjusted
COM1: Enable Onboard Serial port 1 and address is 3F8H/IRQ4.
COM2: Enable Onboard Serial port 1 and address is 2F8H/IRQ3.
COM3: Enable Onboard Serial port 1 and address is 3E8H/IRQ4.
COM4: Enable Onboard Serial port 1 and address is 2E8H/IRQ3.
Disabled: Disable Onboard SMC CHIP's Serial port 1.

Onboard Serial Port 2: This field allows the user to configure the 2nd serial port. The default is Auto.

AUTO: Enable Onboard Serial port 2 and address is Auto adjusted
COM1: Enable Onboard Serial port 2 and address is 3F8H/IRQ4.
COM2: Enable Onboard Serial port 2 and address is 2F8H/IRQ3.
COM3: Enable Onboard Serial port 2 and address is 3E8H/IRQ4.
COM4: Enable Onboard Serial port 2 and address is 2E8H/IRQ3.
Disabled: Disable Onboard SMC CHIP's Serial port 2.

Onboard IR Controller: IrDA Controller.
The default is Enabled.

IR Address Select: The port location of the IR controller.
The default is 2E8H.

IR Mode: The mode of the IR controller.
The default is IrDA

IR Transaction Delay:
The default is Enabled.

IR IRQ Select:
The default is IRQ 10

IR Mode use DMA:
The default is Disable.

Onboard Parallel port: This field allows the user to configure the LPT port.
The default is 378H / IRQ7.

  378H: Enable Onboard LPT port and address is 378H and IRQ7.
  278H: Enable Onboard LPT port and address is 278H and IRQ5.
  3BCH: Enable Onboard LPT port and address is 3BCH and IRQ7.
  Disabled: Disable Onboard Winbond Chip's LPT port.

Parallel Port Mode: This field allows the user to select the parallel port mode.
The default is ECP+EPP.

  Normal: Standard mode. IBM PC/AT Compatible bidirectional parallel port.
  EPP: Enhanced Parallel Port mode.
  ECP: Extended Capabilities Port mode.
  EPP+ECP: ECP Mode & EPP Mode.

ECP Mode USE DMA: This field allows the user to select DMA1 or DMA3 for
the ECP mode.
The default is DMA3.

  DMA1: This field selects the routing of DMA1 for the ECP mode.
  DMA3: This field selects the routing of DMA3 for the ECP mode.

4-8 Change Supervisor or User Password

To change the password, choose the "SUPERVISOR PASSWORD or USER PASSWORD" option from the CMOS SETUP UTILITY menu and press [Enter].

NOTE: Either "Setup" or "System" must be selected in the "Security Option" of the BIOS FEATURES SETUP menu.

1. If CMOS is corrupted or the option was not used, a default password stored in the ROM will be used. The screen will display the following message:

    Enter Password:

    Press the [Enter] key to continue after the proper password is given.

2. If the CMOS is corrupted or the option was used earlier and the user wishes to change the default password, the SETUP UTILITY will display a message and ask for a confirmation.

    Confirm Password:

3. After pressing the [Enter] key (ROM password if the option was not used) or current password (user-defined password), the user can change the password and store new one in CMOS RAM. A maximum of 8 characters can be entered.

4-9 IDE HDD Auto Detection

The "IDE HDD auto detection" utility is a very useful tool, especially when you do not know which kind of hard disk type you are using. You can use this utility to detect the correct disk type installed in the system automatically. But now you can set HARD DISK TYPE to Auto in the STANDARD CMOS SETUP. You don't need the "IDE HDD AUTO DETECTION" utility. The BIOS will Auto-detect the hard disk size and model on display during POST.

```
                      ROM PCI/ISA BIOS (2A69JPA9)
                         STANDARD CMOS SETUP
                         AWARD SOFTWARE, INC.
 ┌─────────────────────────────────────────────────────────────────────────┐
 │   Date (mm:dd:yy) : Mon, Dec  8 1997                                      │
 │   Time (hh:mm:ss) : 16 : 50 : 15                                          │
 │                                                                          │
 │   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            │     │
 │   Video   : EGA/VGA         │ Extended Memory: 162816K            │     │
 │   Halt On : All Errors      │    Other Memory:     384K            │     │
 │                             │                                      │     │
 │                             │    Total Memory: 163840K            │     │
 ├─────────────────────────────┴─────────────────────────────────────┤     │
 │ ESC : Quit              ↑ ↓ →   : Select Item     PU/PD/+/- : Modify │
 │ F1  : Help            (Shift)F2 : Change Color                      │
 └─────────────────────────────────────────────────────────────────────────┘
```

Figure 8: IDE HDD Auto Detection

NOTE: HDD Modes

The Award BIOS supports 3 HDD modes : NORMAL, LBA & LARGE NORMAL mode

Generic access mode in which neither the BIOS nor the IDE controller will make any transformations during accessing.

The maximum number of cylinders, head & sectors for NORMAL mode are.

> 1024, 16 & 63
> no. Cylinder   (1024)
> x no. Head   (16)
> x no. Sector   (63)
> <u>x no. per sector   (512)</u>
>   528 Megabytes

If user set his HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that!

LBA (Logical Block Addressing) mode: A new HDD accessing method to overcome the 528 Megabyte bottleneck. The number of cylinders, heads & sectors shown in setup may not be the number physically contained in the HDD. During HDD accessing, the IDE controller will transform the logical address described by sector, head & cylinder into its own physical address inside the HDD. The maximum HDD size supported by LBA mode is 8.4 GigaBytes which is obtained by the following formula:

no. Cylinder	(1024)
x no. Head	(255)
x no. Sector	(63)
x bytes per sector	(512)
	8.4 GigaBytes

LARGE mode: Extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinder without LBA support (in some cases, user do not want LBA). The Award BIOS provides another alternative to support these kinds of LARGE mode.

CYLS	HEADS	SECTOR	MODE
1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS (or other OS) that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside

INT 12h in order to access the right HDD address!

Maximum HDD size:

no. Cylinder	(1024)
x no. Head	(32)
x no. Sector	(63)
x bytes per sector	(512)
	1 GigaByte

Note: To support LBA or LARGE mode of HDDs, there must be some software involved. All the software is located in the Award HDD Service Routine (INT 13h). It may fail to access a HDD with LBA (LARGE) mode selected if you are running under a Operating System which replaces the whole INT 13h.

UNIX operating systems do not support either LBA or LARGE and must utilize the Standard mode. UNIX can support drives larger than 528MB.

4-10 HDD Low Level Format

Interleave: Select the interleave number of the hard disk drive you wish to perform a low level format on. You may select from 1 to 8. Check the documentation that came with the drive for the correct interleave number, or select 0 for automatic detection.

Auto scan bad track: This allows the utility to scan first then format by each track.

Start: Press<Y>to start low level format.

3-11 Save & Exit Setup

The "SAVE & EXIT SETUP" option will bring you back to the boot up procedure with all the changes you just recorded in the CMOS RAM.

3-12 Exit Without Saving

The "EXIT WITHOUT SAVING" option will bring you back to normal boot up procedure without saving any data into CMOS RAM.

All old data in the CMOS will not be destroyed.

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Section 5
DMI ACCESS

DMI Access

DMI, or desktop Management Interface, is a feature that is able to auto-detect and record information about your computer system. This information is used by computing professionals to accurately determine your system configuration and to diagnose and resolve problems.

The computer's BIOS will detect and record as much information as it is able to, and will store that information in a special location in the BIOS.

The DMI configuration utility will allow system integrators to add information that the BIOS cannot detect, such as model and brand of motherboard and other components. This information cannot be detected by the bios and must be added by the system integrator or vendor.

```
Award DMI Configuration Utility V1.08u, Copyright Award Software Inc. 1996
[Edit DMI] [Add DMI] [Load DMI FILE] [Save DMI FILE]

      BIOS                      ===    Display Component    ===
     System
 Enclosure/Chassis      Type : BIOS Information
    Processor           Handle : 0000
 Memory Controller        Vendor Name : Award Software International, Inc.
   Memory Module          BIOS Version : 4.51 PG
   Memory Module          BIOS starting Address Segment : E000
   Memory Module          BIOS Build Date : 03/24/97
   Memory Module          BIOS Characteristics : Press [ENTER] for detail
      Cache               Size of BIOS ROM : 0128K
      Cache
   Port Connector
   Port Connector
   Port Connector
   Port Connector
   Port Connector
   Port Connector
   Port Connector
   System Slots
   System Slots

↑↓←→-Move cursor ENTER-Accept DEL-Delete ESC-Abort&Exit
```

Figure 1: DMI Screen Shoot

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Appendix A:

A-1   MEMORY MAP

Address Range	Size	Description
[00000-7FFFF]	512K	Conventional memory
[80000-9FBFF]	127K	Extended Conventional memory
[9FC00-9FFFF]	1K	Extended BIOS data area if PS/2 mouse is installed
[A0000-C7FFF]	160K	Available for Hi DOS memory
[C8000-DFFFF]	96K	Available for Hi DOS memory and adapter ROMs
[E0000-EEFFF]	60K	Available for UMB
[EF000-EFFFF]	4K	Video service routine for Monochrome & CGA adaptor
[F0000-F7FFF]	32K	BIOS CMOS setup utility
[F8000-FCFFF]	20K	BIOS runtime service routine (2)
[FD000-FDFFF]	4K	Plug and Play ESCD data area
[FE000-FFFFF]	8K	BIOS runtime service routine (1)

A-2   I/O MAP

[000-01F]	DMA controller.(Master)
[020-021]	INTERRUPT CONTROLLER.(Master)
[022-023]	CHIPSET control registers. I/O ports.
[040-05F]	TIMER control registers.
[060-06F]	KEYBOARD interface controller.(8042)
[070-07F]	RTC ports & CMOS I/O ports.
[080-09F]	DMA register.
[0A0-0BF]	INTERRUPT controller.(Slave)
[0C0-0DF]	DMA controller.(Slave)
[0F0-0FF]	MATH COPROCESSOR.
[1F0-1F8]	HARD DISK controller.
[278-27F]	PARALLEL port 2.
[2B0-2DF]	GRAPHICS adapter controller.
[2F8-2FF]	SERIAL port 2.
[360-36F]	NETWORK ports.
[378-37F]	PARALLEL port 1.
[3B0-3BF]	MONOCHROME & PARALLEL port adapter.
[3C0-3CF]	EGA adapter.

[3D0-3DF]   CGA adapter.
[3F0-3F7]   FLOPPY DISK controller.
[3F8-3FF]   SERIAL port 1.

A-3 TIMER & DMA CHANNELS MAP

TIMER MAP:
TIMER Channel 0   System timer interrupt.
TIMER Channel 1   DRAM REFRESH request.
TIMER Channel 2   SPEAKER tone generator.
DMA CHANNELS:
DMA Channel 0   Available.
DMA Channel 1   Onboard ECP (Option).
DMA Channel 2   FLOPPY DISK (SMC CHIP).
DMA Channel 3   Onboard ECP (default).
DMA Channel 4   Cascade for DMA controller 1.
DMA Channel 5   Available.
DMA Channel 6   Available.
DMA Channel 7   Available

A-4 INTERRUPT MAP

NMI :
Parity check error.
IRQ (H/W):
0   System TIMER interrupt from TIMER 0.
1   KEYBOARD output buffer full.
2   Cascade for IRQ 8-15.
3   SERIAL port 2.
4   SERIAL port 1.
5   PARALLEL port 2.
6   FLOPPY DISK (SMC CHIP).
7   PARALLEL port 1.
8   RTC clock.
9   Available.
10   Available.
11   Available.
12   PS/2 Mouse.
13   MATH coprocessor.

| 14 | Onboard HARD DISK (IDE1) channel. |
| 15 | Onboard HARD DISK (IDE1) channel. |

A-5   RTC & CMOS RAM MAP

RTC & CMOS:

00	Seconds.
01	Second alarm.
02	Minutes.
03	Minutes alarm.
04	Hours.
05	Hours alarm.
06	Day of week.
07	Day of month.
08	Month.
09	Year.
0A	Status register A.
0B	Status register B.
0C	Status register C.
0D	Status register D.
0E	Diagnostic status byte.
0F	Shutdown byte.
10	FLOPPY DISK drive type byte.
11	Reserve.
12	HARD DISK type byte.
13	Reserve.
14	Equipment type.
15	Base memory low byte.
16	Base memory high byte.
17	Extension memory low byte.
18	Extension memory high byte.
19-2d	
2E-2F	
30	Reserved for extension memory low byte.
31	Reserved for extension memory high byte.
32	DATE CENTURY byte.
33	INFORMATION FLAG.
34-3F	Reserve.
40-7F	Reserved for CHIPSET SETTING DATA.

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EPoX

Appendix B:

B-1 POST CODES

ISA POST codes are typically output to I/O port address 80h.

POST (hex)	DESCRIPTION
01-02	Reserved.
C0	Turn off OEM specific cache, shadow.
03	1. Initialize EISA registers (EISA BIOS only).
	2. Initialize all the standard devices with default values
	Standard devices includes.
	- DMA controller (8237).
	- Programmable Interrupt Controller (8259).
	- Programmable Interval Timer (8254).
	- RTC chip.
04	Reserved
05	1. Keyboard Controller Self-Test.
06	2. Enable Keyboard Interface.
07	Reserved.
08	Verifies CMOS's basic R/W functionality.
C1	Auto-detection of onboard DRAM & Cache.
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster.
08	Test the first 256K DRAM.
09	OEM specific cache initialization. (if needed)
0A	1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers. Initialize INT numbers from 33-120 with Dummy (Spurious) Interrupt Handler.
	2. Issue CPUID instruction to identify CPU type.
	3. Early Power Management initialization. (OEM specific)
0B	1. Verify the RTC time is valid or not.
	2. Detect bad battery.
	3. Read CMOS data into BIOS stack area.
	4. PnP initializations including. (PnP BIOS only)
	- Assign CSN to PnP ISA card.
	- Create resource map from ESCD.
	5. Assign IO & Memory for PCI devices. (PCI BIOS only)

0C	Initialization of the BIOS Data Area. (40:ON - 40:FF)
0D	1. Program some of the Chipset's value according to Setup. (Early Setup Value Program)
	2. Measure CPU speed for display & decide the system clock speed.
	3. Video initialization including Monochrome, CGA, EGA/VGA. If no display device found, the speaker will beep.
0E	1. Test video RAM. (If Monochrome display device found)
	2. Show messages including.
	- Award Logo, Copyright string, BIOS Data code & Part No.
	- OEM specific sign on messages.
	- Energy Star Logo. (Green BIOS ONLY)
	- CPU brand, type & speed.
	- Test system BIOS checksum. (Non-Compress Version only)
0F	DMA channel 0 test.
10	DMA channel 1 test.
11	DMA page registers test.
12-13	Reserved.
14	Test 8254 Timer 0 Counter 2.
15	Test 8259 interrupt mask bits for channel 1.
16	Test 8259 interrupt mask bits for channel 2.
17	Reserved.
19	Test 8259 functionality.
1A-1D	Reserved.
1E	If EISA NVM checksum is good, execute EISA initialization. (EISA BIOS only)
1F-29	Reserved.
30	Detect Base Memory & Extended Memory Size.
31	1. Test Base Memory from 256K to 640K.
	2. Test Extended Memory from 1M to the top of memory.
32	1. Display the Award Plug & Play BIOS Extension message. (PnP BIOS only)
	2. Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port ... according to setup value.
33-3B	Reserved.
3C	Set flag to allow users to enter CMOS Setup Utility.
3D	1. Initialize Keyboard.
	2. Install PS2 mouse.

3E	Try to turn on Level 2 cache. **Note:** Some chipset may need to turn on the L2 cache in this stage. But usually, the cache is turn on later in POST 61h.
3F-40	Reserved.
BF	1. Program the rest of the Chipset's value according to Setup. (Later Setup Value Program)
41	2. If auto-configuration is enabled, program the chipset with pre-defined Values.
42	Initialize floppy disk drive controller.
43	Initialize Hard drive controller.
45	If it is a PnP BIOS, initialize serial & parallel ports.
44	Reserved.
45	Initialize math coprocessor.
46-4D	Reserved.
4E	If there is any error detected (such as video, kb...), show all error messages on the screen & wait for user to press <F1> key.
4F	1. If password is needed, ask for password. 2. Clear the Energy Star Logo. (Green BIOS only)
50	Write all CMOS values currently in the BIOS stack area back into the CMOS.
51	Reserved.
52	1. Initialize all ISA ROMs. 2. Later PCI initializations. (PCI BIOS only) - assign IRQ to PCI devices. - initialize all PCI ROMs. 3. PnP Initialzations. (PnP BIOS only) - assign IO, Memory, IRQ & DMA to PnP ISA devices. - initialize all PnP ISA ROMs. 4. Program shadows RAM according to Setup settings. 5. Program parity according to Setup setting. 6. Power Management Initialization. - Enable/Disable global PM. - APM interface initialization.
53	1. If it is NOT a PnP BIOS, initialize serial & parallel ports. 2. Initialize time value in BIOS data area by translate the RTC time value into a timer tick value.
60	Setup Virus Protection. (Boot Sector Protection) functionality according to Setup setting.

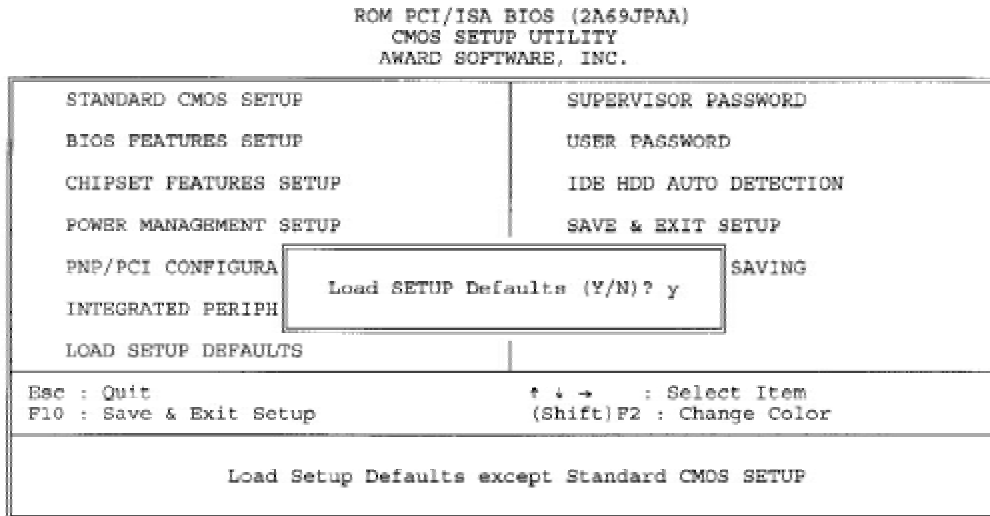|	
61	1. Try to turn on Level 2 cache.
	Note: If L2 cache is already turned on in POST 3D, this part will be skipped.
	2. Set the boot up speed according to Setup setting.
	3. Last chance for Chipset initialization.
	4. Last chance for Power Management initialization. (Green BIOS only)
	5. Show the system configuration table.
62	1. Setup daylight saving according to Setup value.
	2. Program the NUM Lock, typematic rate & typematic speed according to Setup setting.
63	1. If there is any changes in the hardware configuration, update the ESCD information. (PnP BIOS only)
	2. Clear memory that have been used.
	3. Boot system via INT 19H.
FF	System Booting. This means that the BIOS already pass the control right to the operating system.

B-2   Unexpected Errors:

POST (hex)	DESCRIPTION
B0	If interrupt occurs in protected mode.
B1	Unclaimed NMI occurs.0

Appendix C

NOTE:
The "**LOAD SETUP DEFAULTS**" function loads the system default data directly from ROM and initializes the associated hardware properly. This function will be necessary when you accept this mainboard, or the system CMOS data is corrupted.

```
                    ROM PCI/ISA BIOS (2A69JPAA)
                        CMOS SETUP UTILITY
                       AWARD SOFTWARE, INC.

    STANDARD CMOS SETUP            SUPERVISOR PASSWORD

    BIOS FEATURES SETUP            USER PASSWORD

    CHIPSET FEATURES SETUP         IDE HDD AUTO DETECTION

    POWER MANAGEMENT SETUP         SAVE & EXIT SETUP

    PNP/PCI CONFIGURA                              SAVING
                      Load SETUP Defaults (Y/N)? y
    INTEGRATED PERIPH

    LOAD SETUP DEFAULTS

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

        Load Setup Defaults except Standard CMOS SETUP
```

LOAD SETUP DEFAULTS