EC Declaration of Conformity

We

Iwill Corp.
No. 9-1, Kong 6th RD.,
Lin Kou 2nd Industrial
Park, Taipei, Taiwan R.O.C.

declare under sole responsibility that the

P6NS motherboard

meets the intent of Directive 89/336/ECC for Electromagnetic Compatibility. Compliance was demonstrated to the following specifications as listed in the official Journal of the European Communities:

EN 50081-1 Emissions:

EN 55022	**Radiated, Class B**
EN 55022	**Conducted, Class B**
EN 60555-2	**Power Harmonics**

EN 50082-1 Immunity:

IEC 801-2	**Electrostatic Discharge**
IEC 801-3	**RF Radiat**
IEC 801-4	**Fast Transient**

About This Manual

This **P6NS PPro SCSI Motherboard** is the newest member to our SCSI Motherboard solution products families. It incorporated with new Intel generation 82440FX Chipset and with Adaptec new Ultra / Ultra Wide SCSI embedded which is equilevent to AHA 2940UW. Adaptec RAID port option ready is a big advantage in this P6NS PPro SCSI motherboard. It can turn this SCSI motherboard to support hardware SCSI RAID by adding the RAIDBUS 1000 or the ARO 1130 adapter from Adaptec.
This SCSI motherboard incorporated with Intel new 440FX Chipset which is PCI Rev. 2.1 Compliant and support wide range of the DRAMs include Fast Page, EDO , Burst EDO DRAM type with SIMM socket. With 6 SIMM sockets available, it is very flexible for customer to configure the system memory from 8MB up to 512MB.

Run with the new Intel Pentium Pro based CPU is the most important feature that this motherboard provide. It support Intel Pentium Pro from 133Mhz up to 233Mhz.

Feature with Error Check Correction (ECC) system memory is another plus on this **P6NS PPro SCSI Motherboard** to outperform the whole system stability. It equip 4 of the 72 Pin SIMM that support Fast Page, EDO or BEDO DRAM with ECC.

This manual is subject to change without notice.

Trademark

Contents

CHAPTER 1
Overview

Thank you for purchasing this **P6NS PPro SCSI Motherboard**. This operation manual will guide you to proper configure and install. It has an overview of the engineer design and feature of this board. Also, this manual provides useful information for your later upgrade or change the configuration. Keep this, for your future need.

1.1 Features

This **P6NS PPro SCSI Motherboard** is a high performance on Intel Pentium Pro system hardware based motherboard. Both quality and innovative design to address the need of today's market. With various out-put voltage for Pentium Pro level CPU supported, 64 bit Burst Bus DRAM, Built-in Adaptec Wide/ Ultra Wide SCSI(AHA-2940UW) and Plug & Play Super I/O, this motherboard brings exceptional processing power that could only be achieved by Mini-computer. Incorporating the new emerging industrial standard Peripheral Component Interconnect (PCI) Local Bus together with the standard 16-bit Industrial Standard Architecture (ISA), this motherboard dramatically boots system I/O through for even the most demanding application in today's market. The hardware dimension is **Full ATX** form factor with four layer design technology.

The Intel® Pentium® Pro Processor is the 6th generation in the Intel 386™, Intel 486, and Pentium family of processors. The Pentium Pro Processor has several key features such as 12-stage super pipeline architecture, Built-in 256KB/512KB cache, Out of order execution, dynamic branch prediction & speculative execution and a pipestage time 33 percent less than the Pentium Processor, which helps achieve a higher clock rate on any given Process. It will be super pipeline for high clock speed from 150MHz up to 233MHz. The Pentium Pro Processor was used to the Dynamic Execution that is the combination of improved branch prediction, speculative execution and data flow analysis that enables the Pentium Pro processor to deliver its superior performance from CPU architecture.

The Pentium Pro Processor is a 64 bit processor with RISC technology. It requires 32-bit applications (like Microsoft Windows NT and OS/2) to optimize its capabilities and performances. The Pentium Pro processor delivers best value

for businesses moving to 32-bit computing when using the 32-bit Operating System and Applications.

- **CPU**
  Intel **Pentium Pro Processor** operating at **150 ~ 233 MHz** with **387 ZIF socket 8** is scalable to accept faster Processors in the future. The Pentium Pro Processor is the next in the Intel386, Intel486, and Pentium family of processor. The second Level Cache (L2), controller are some of the components that existed in the Pentium Pro Processor.

- **Memories**
  Supports up to 512 Mega Bytes DRAM(minimum of 8 MB) on board(72 Pin SIMM x 4, and BIOS auto FP DRAM, EDO and Burst EDO DRAM detection and configuration.

- **BIOS:**
  Award BIOS, on-screen "**Plug & Play**" setup for Adaptec SCSI, Enhanced IDE, and Super multi-IO. Support **Flash ROM** (This ROM provides better upgrade ability for user to update their BIOS data on the system board, user can down-load newer version BIOS from Internet,BBS or get the diskette file from your vender.

- **Expansion slots:**
  - 1 X 16-bits **ISA** slots.
  - X 32-bits **PCI** slots for PCI compatible add-on cards. (PCI#2 is occupied by the Adaptec SCSI, it is flexible for your choose while you install a prior or minor controller on this PCI bus.)
  - **1 X RAID port bus slot**

- **Ultra/ Ultra Wide SCSI interface:**
  - **Built in Adaptec PCI Ultra Wide SCSI (AIC 7880 chip) which is equilevent to Adaptec AHA-2940UW PCI SCSI controller.**
  - **Data transfer rate up to 40MB/Sec.**
  - **Complete software driver from Adaptec Inc., include EZ-SCSI for DOS/Windows, 7800 Family Set Driver for Netware, Windows NT , OS/2 , SCO Unix , Unixware.**

- **IDE functions**:
  - Built in dual PCI Bus EIDE Channels.
  - Support ATAPI (AT Attachment Packet Interface)

- **USB interface (Universal Serial Bus)**:
  - Plug and Play peripherals outside the box
  - Up to 12Mbit

- Easy of use

■ **Floppy Interface**:

- Support both 3 1/2" and 5 1/4" **floppy disk drives** and **Tape Drive** (360K / 720K/ 1.2M / 1.44M / **2.88MB**)
- **Enabled/Disable** selectable from system BIOS
- Non-Burst Mode DMA Option
- Byte Data FIFO
- Mode Driver (option)

■ **Serial Port**

- Two high speed 16550 UART serial port
- Address changeable form system BIOS
- Programmable Baud Rate Generator

■ **Parallel Port:**

- IRQ selectable for IRQ5(278h), 7IRQ(378h) from system BIOS.
- **Standard mode**--Compatible with IBM PC/AT Printer port
- **EPP Mode** --Enhanced Parallel Port compatible(EPP) compatible IEEE 1284
- **ECP Mode** --Microsoft & Hewlett Packard Extended Capabilities Port (ECP) Compatible
- Incorporates Chip Protect Circuit for protection against damage due to printer power-on

■ **Others function:**

- Support both Fast Page DRAM or EDO DRAM SIMM.
- Support Pentium CPU SMM (System Management Mode).
- Using Embeded Battery in RTC (Real Time Clock) which provides environmental protection and longer battery life.

■ **Input Power supply**

- Supports AT and ATX power Supply Connectors.
- Supports Power/ON Switch when ATX power Supply is plugged

■ **Physical Dimension**

Four Layer design technology and 245mm x 305mm full ATX form factor.

CHAPTER 2
Quick Installation

This SCSI Motherboard is shipped with manufacture preset at :

1. CPU Clock at **200 MHz**
2. Adaptec Ultra Wide SCSI Chip **Enabled**
3. Wide SCSI Mode **Enabled**
4. SCSI Terminator **Control by BIOS**
5. Printer ECP Mode at **DMA3**
6. Printer at **IRQ7**, Address at **378h**
7. Serial 1 at **IRQ4,** Serial 2 at **IRQ3**
8. PS/2 MOUSE at **IRQ 12**

Reference to the **Chapter 3** & **Chapter 4**, if you have devices conflict with the manufacture default.

Step 1. Install CPU and Cooler

Make sure the Clock Frequency is set to the same as the CPU installed.

Step 2. Install the memory

Plug at least 2 PCS of 72 pins Micro Edge DRAM modules.

Step 3. Install display controller and connect I/O ports

This system board is designed using **PCI** (Peripheral Component Interconnect) and **ISA** (Industry Standard Architecture) interface controller. This support +5Volt interface slots. All PCI interface controllers must be PCI Rev 2.1 compliant.

Step 4. Connect the power supply

Connect AT P8 and P9 or the ATX (Recommended) from power supply output.

Step 5. Power on the system

Turn on the Computer power.(Make sure the volutage 110 or 220 in your area)

Step 6. Setting up the system

Enter the "**Setup Menu**" screen by press the " **Del** " key while power on or warm reset the system. Always "**LOAD SETUP DEFAULT**" at first and select others necessary that your system require.

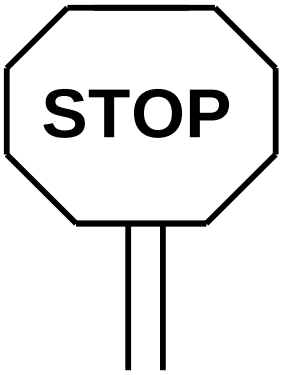
Step 7. Save the setup data to the CMOS

Exit the "**Setup Menu** " screen and then write to CMOS RAM. And enjoy the high performance system board.

Step 8. After boot your system O.S., insert the Adaptec EZ-SCSI Installation diskette in a floppy disk drive and follow the EZ-SCSI operation manual or reference to Adaptec 7800 Family Set manual which will guide you to install the DOS/Windows, Netware, Windows NT, OS/2 , SCO UNIX, Unixware.

CHAPTER 3
Hardware Installation

3.1 Preparation and Inspection



WARNING:

In order to avoid damage to this product caused by static discharge, please be sure to use static control measures and to touch the metal frame of the PC prior to opening this bag.

The **P6NS PPro SCSI Motherboard**, like all electronic equipment is static sensitive. Please take the proper precautions when handling the board. You should avoid static up, if possible, You should ground yourself by touching a metal table or your computer frame. Keep the board in its conductive wrapping until it is configured and ready to be installed in your system.
For installation, you may need some or all of the following tools:

The **P6NS PPro SCSI Motherboard**, like all electronic equipment is static sensitive. Please take the proper precautions when handling this board. You should avoid static up. If possible, You should ground yourself by touching a metal table or your computer frame. Keep the board in its conductive wrapping until it is configured and ready to be installed in your system.
For installation, you may need some or all of the following tools:

- SCSI HDD drive/devices manual(s).
- IDE HDD drive/devices and floppy drive manual(s).
- Peripherals that connect to your system's manual(s).
- MS DOS diskettes with FDISK and FORMAT programs.
- Medium size flat blade screwdriver.
- Medium sized Phillips head screwdriver.
- A 3/16 inch nut driver or wrench.

You should find the Following components when open the box :

1. **P6NS PPro SCSI Motherboard.**

2. This Operation Manual
3. Adaptec software driver Diskette (EZ-SCSI).
4. Adaptec 7800 Family Manager Set software driver Diskette.
5. Adaptec EZ-SCSI Manual.
6. Adaptec 7800 Family Manager Set Manual.
7. 68 pins high density internal Wide SCSI signal flat cable
8. 50 pins internal SCSI signal flat cable.
9. 40 pins internal IDE signal cable.
10. 34 pins internal Floppy Disk Drive signal cable.
11. External SCSI-2 port expansion kit (optional).
12. External Wide SCSI port expansion kit (optional).
13. High speed printer port software driver(optional).
14. 3 Mode Driver (option)

3.2 Placement

The P6NS PPro SCSI Motherboard is designed with Intel 82440FX PCIset chipset which is developed by INTEL Corporation to fully support Pentium Pro Processor PCI/ISA system. The Intel 82440FX PCIset chipset provides increased integration and improved performance designs. The chipset provides an integrated IDE controller with two high performance IDE interfaces for up to four IDE devices (hard devices, CD-ROM device, etc). The Adaptec (AHA-2940UW) Ultra/ Ultra Wide SCSI built in this SCSI motherboard provides not only the powerful connectivity but also software driver supported by original Adaptec. The SMC 37C669 Super I/O controller provides the standard PC I/O function: floppy interface, two 16 Byte FIFO serial ports and EPP/ECP capable parallel port. The **P6NS** layout is shown in next page for user's reference. **Care must be taken** when inserting memory modules, inserting Pentium Pro processor CPU or even plugging PCI card into associated slots to avoid damaging any circuits or sockets on board. A right fan and heatsink fan is required when installing Pentium Pro processor due to possible overheat.

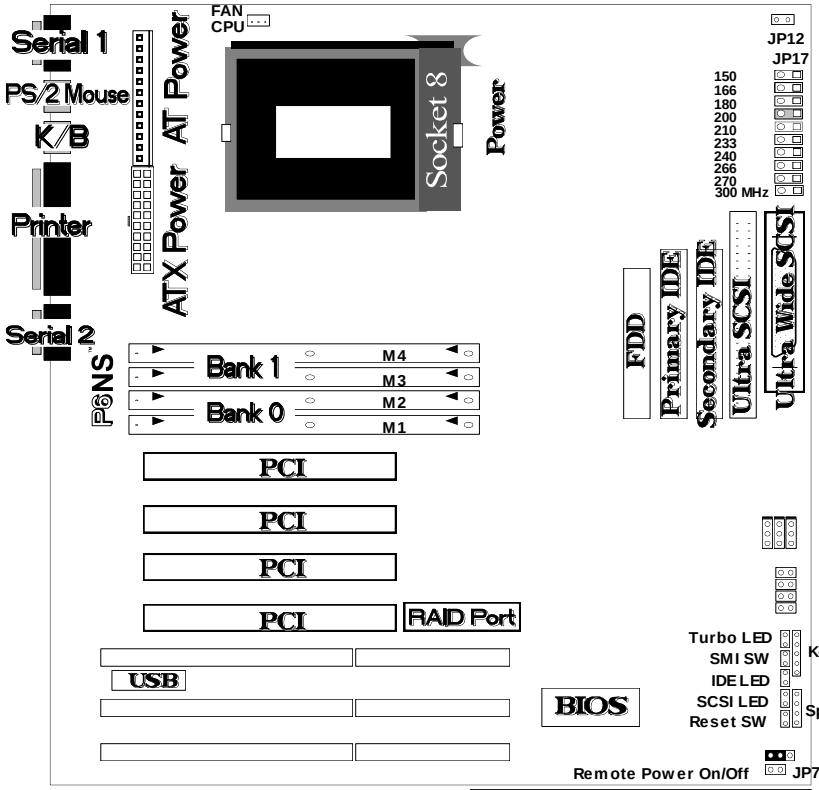
The P6NS supports minimum of 8MB of System Memory and maximum of 512MB while L2 Cache and cache controller included in Pentium Pro Processor .

The P6NS supports standard Fast Page, EDO (Extended Data Out or Hyper Page Mode) or Burst EDO DRAM. **The P6NS** provides four 72-pins SIMM sites for memory expansion. The socket support 1M x 32(4MB), 2M x 32(8MB), 4M x 32(16MB), 8M x 32(32MB) 16MB x 32(64MB), and 32MB x 32(128MB) single-sided or double-sided memory modules. The memory timing requires 70 nS Fast page devices or 60 nS EDO DRAM. Memory parity generation and checking or ECC (Error Checking and Correction) are supported (DRAM Modules may be

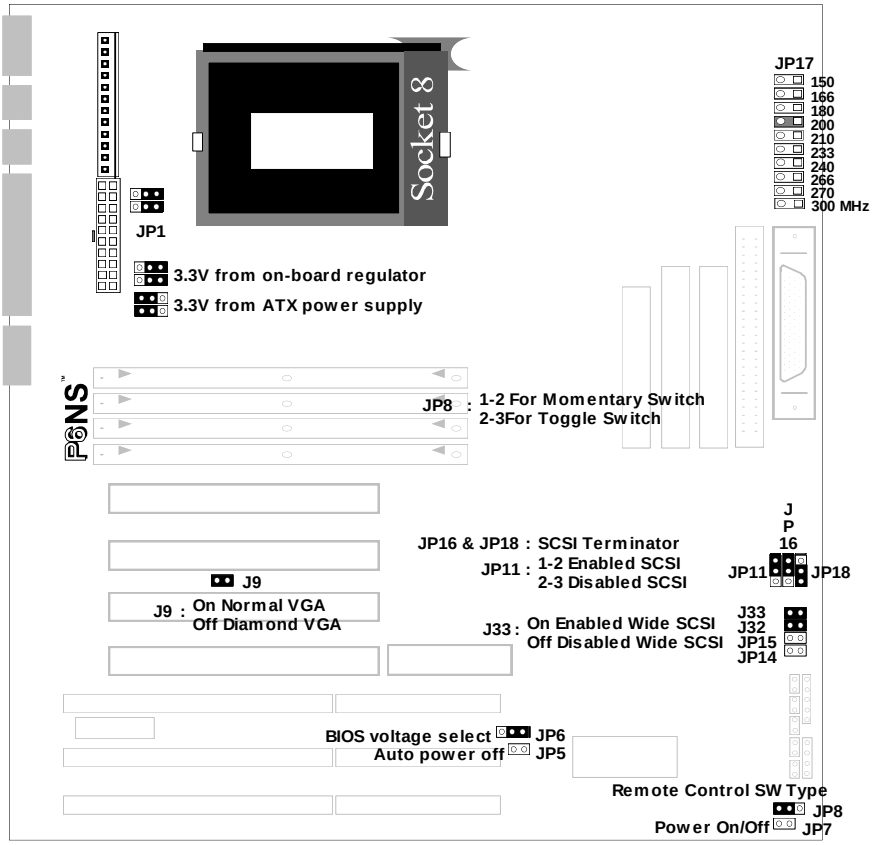
parity (x 72)or non-parity(x 64)or ECC(x 72). The BIOS will automatically detect which DRAM has installed in SIMM sites.

The P6NS supports **Onboard two PCI IDE** connectors, and detects IDE harddisk type by BIOS utility automatically.

The P6NS supports Award Plug & Play BIOS for the ISA and PCI cards. The BIOS can be located in Flash EPROM. The advantage of having Flash EPROM is much easier to replace BIOS code if necessary.

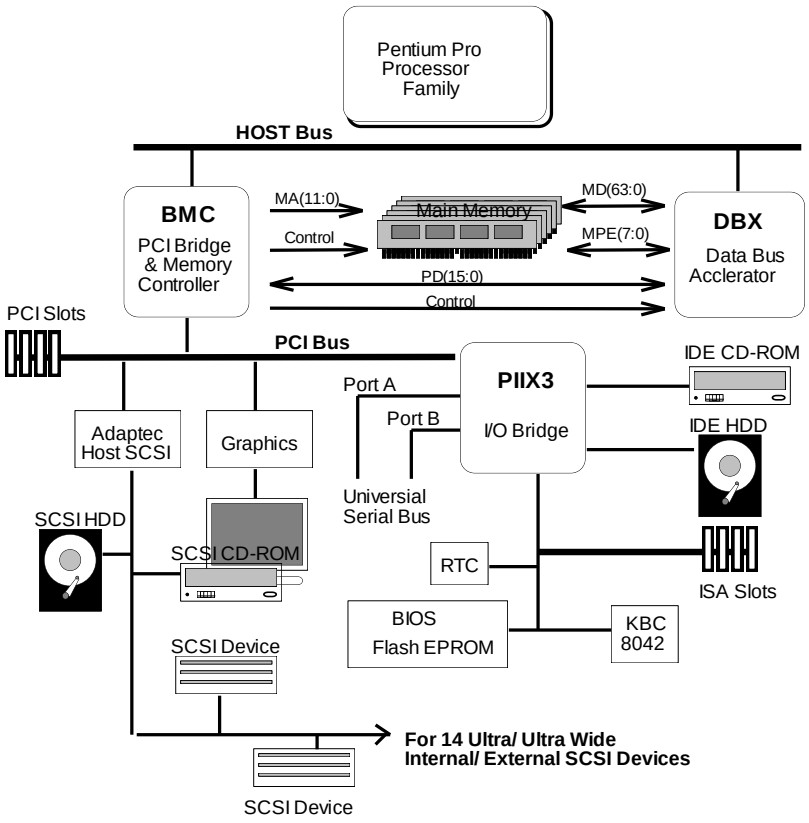


Placement & Connector



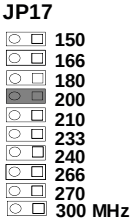
Jumper Setting

3.3 Block Diagram



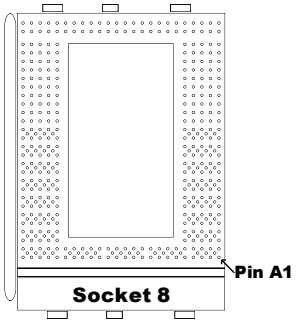
3.4 CPU group

The JP17 is a 2 row by 10 line jumper connector. Only move one single jumper cap on this connector. Make sure the speed that your CPU really is, or wrong speed select might cause the system hang.



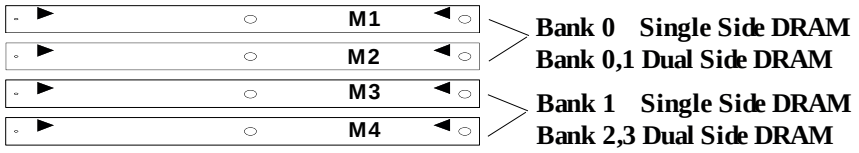
3.4.1 Intel Pentium Pro CPU socket

This CPU socket is a 387 pin socket 8. Care must be taken, When install the CPU into this socket,. Lift the handle bar, and make sure the CPU pin 1 is with the square base and it goes to particular hole on the ZIF(zero insertion force) socket. Once you match the hole with the pin 1, then gentle insert the CPU and press socket handle bar down.



3.4.2 System Memory Configuration

The **P6NS** supports different type of settings for the system memory. There is no jumper nor connector needed for memory configuration.



BANK 0 Socket 1 & 2	BANK 1 Socket 3 & 4	Total Size
4MB x 2	Empty	8MB
4MB x 2	4MB x 2	16MB
4MB x 2	8MB x 2	24MB
4MB x 2	16MB x 2	40MB
4MB x 2	32MB x 2	72MB
4MB x 2	64MB x 2	136MB
8MB x 2	Empty	16MB
8MB x 2	8MB x 2	32MB
8MB x 2	16MB x 2	48MB
8MB x 2	32MB x 2	112MB
16MB x 2	Empty	32MB
16MB x 2	16MB x 2	64MB
16MB x 2	32MB x 2	96MB
32MB x 2	Empty	64MB
32MB x 2	32MB x 2	128MB
32MB x 2	64MB x 2	192MB
64MB x 2	64MB x 2	256MB
128MB x 2	128MB x 2	512MB

NOTE :

1. P6NS supports very flexible memory configurations with its 4 SIMM sockets. The memory size of any configuration can be combined flexibly. BIOS will detect your memory configurations and sizes automatically.

2. P6NS support Fast Page DRAM, EDO or BEDO DRAM SIMMs, but cannot be mixed within the same memory bank.

3. SIMMs may be parity (x 72) or non parity (x 64) or ECC(x 72).

4. The 60nS EDO/BEDO DRAM is necessary.

5. The "BANK" means 64 Bit, means either M1+M2 or M3+M4

3.5 Integrated PCI Bridge

The **P6NS** utilizes **Intel's 440FX PCI set** chipset to support Pentium Pro

Processor PCI/ISA system. The Intel 82440FX PCI set chipset consists of the 82441FX PCI and Memory Controller (PMC), 82442FX Data Bus Accelerator (DBX) devices, and one 82371SB PCI ISA/IDE Accelerator (PIIX3) bridge chip. It provides an interface which translates CPU cycle into PCI bus cycle, and PCI burst read/write capability. In addition, it provides high performance PCI arbitor to support four PCI Masters, Rotating Priority Mechanism, Hidden Arbitration Scheme Minimizes Arbitration Overhead, and PCI Rev.2.1 compliant. The PMC provides bus control signals and address paths for transfers between the host bus, PCI bus, and main memory. The DBX is used to create the 64-bit CPU to main memory data path and DBX also interfaces to the 16-bit Private data bus for PCI transactions and providing optimal CPU-to-DRAM performance.

There are four interrupts in each PCI slot : INTA#, INTB#, INTC#, and INTD#. Since **the P6NS** adapts the PCI auto-configuration with the system BIOS Setup utility. When the system is turned on after adding a PCI add-in card, the BIOS automatically configure interrupts, DMA channels, I/O space, and other parameters. You do not have to configure jumpers or worry potential resource conflicts. Because PCI cards use the same interrupt resource as ISA cards, you must specify the interrupt used by ISA add-in cards in the BIOS Setup utility.

If however, a "Legacy card" (such as plug paddle card and cable into the ISA slot.) is plugged in the system, modification in the **<ROM SETUP UTILITY>** becomes necessary. First, enter <**PCI CONFIGURATION SETUP>** utility from <**ROM SETUP UTILITY.** main menu to set the <"**PCI IDE IRQ MAP TO** : **ISA**">. Secondly, you must enter <**CHIPSET FEATURES SETUP UTILITY**> from <**ROM SETUP UTILITY>** main menu and set the "<**Onboard Primary PCI IDE: Disabled>** and <**Onboard Secondary PCI IDE: Disabled>**." When you plug the PCI/ISA IDE card into the system, You should <**Disabled Onboard Primary and Secondary PCI IDE>** from <**CHIPSET FEATURES SETUP UTILITY>** too.

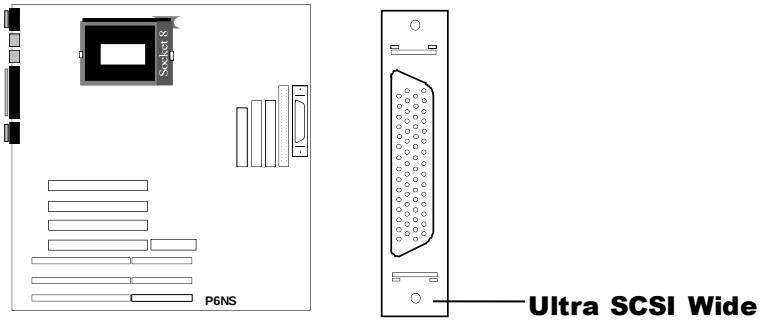
Some "Legacy card" (no paddle card and cable.) you can set the system interrupt request (IRQ) on the "Legacy card" (refer to user's manual of the card) to a proper system IRQ level (in general, card's Primary assigned to INTA and Secondary assigned to INTB). If the card is plugged into slot 1(marked PCI#1), you can not use second slot (marked PCI#2) because the Secondary INT signal takes INTB from the slot (refer to Page 3-12 for circuit diagram). The user then enter <**PCI CONFIGURATION SETUP>** utility from <**ROM SETUP UTILITY>** main menu and set the "<**PCI IDE IRQ MAP TO** : **PCI-Slot 1**>" (depend on the slot # where the Legacy card is plugged).

3.6 SCSI Interface

3.6.1 J27 Ultra Wide SCSI Connector

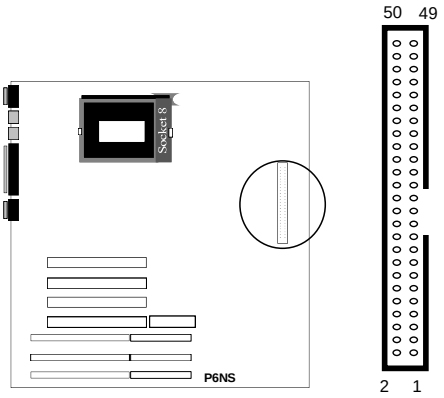
J27 is a 68 pins 16 bit internal Ultra Wide SCSI connector. It attaches the SCSI cable(s) from this P6NS SCSI controller to the SCSI peripherals.

The external SCSI port expansion kit is a optional for your connecting external devices. Be-sure the cable's colored side should align to pin #1 of this connector.



3.6.2 J26 Ultra SCSI Connector

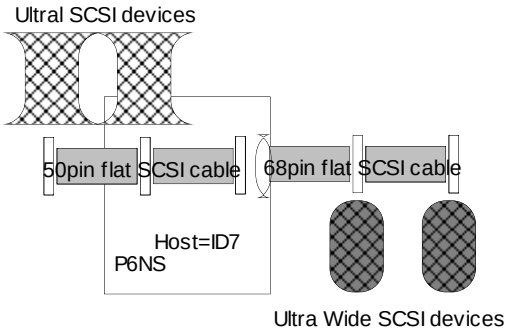
J26 is a 50 pins 8 bit internal Ultra SCSI connector. It attaches the SCSI cable(s) from this P6NS SCSI controller to the SCSI peripherals. The external SCSI port expansion kit is a optional for your connecting external devices. Be-sure the cable's colored side should align to pin #1 of this connector.



3.6.3 Link Internal Ultra & Ultra Wide SCSI devices

The SCSI devices are cabled together in a single, connected series. This SCSI cable must run sequentially from one device to the next, with no branches.

Internal SCSI Connection

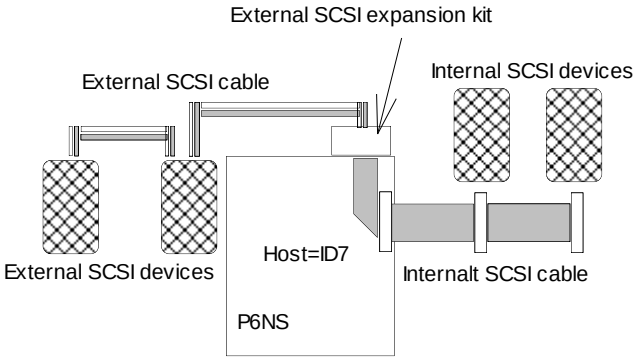


Note: The 50 pin SCSI is an 8 bit SCSI bus, the 68 pin SCSI is a 16 bit SCSI bus which has a pin-to- pin connected to the 50 pins SCSI connector.

Note: The SCSI termination must be on for the both side. The beginer and end must set the terminator on - otherwise the SCSI bus will not operate properly. For linking both the 50 & 68 pin SCSI together, the High byte terminator must set to on and Low byte set to off.

3.6.4 Link Internal & External SCSI devices

The concept of linking the internal and external SCSI devices is still the same--- cabled together in a single, connected series. This SCSI cable must run sequentially from one device to the next, with no branches. The manufacture provides two kinds of option --- Fast SCSI and Wide SCSI external expansion kit for user's multiple choices.



The manufacture provides two kinds of SCSI expansion kit for user's choices.
*SCSI-2 external expansion kit
*Wide SCSI external expansion kit

*Reference to Chapter 5. SCSI Select Utility for software setup.

3.6.5 Set SCSI IDs

You must assign a different SCSI ID to each device on the SCSI bus connected to the P6NS system board. See your SCSI device documentation for directions on how to determine the ID and change it.

- Ultra/ Ultra Wide SCSI devices that connect to this mainboard's SCSI connector can be assigned ID from 0 to 15(for 68 pin Wide SCSI connection). Normally, the host will use ID7. Or reference to Chapter 5 for more information.
- The SCSI ID0 is the best use for SCSI hard disk to be used as your computer's boot device, ID1 is best reserved for a secondary SCSI hard disk.(This is only when you use the SCSI hard disks and devices.)

3.6.6 SCSI Chip Select

JP11 is a 3 pin jumper connector. This is for SCSI Enabled/ Dsiabled control.

Function	JP11	Note
Enabled	1-2	*Default
Disabled	2-3	

3.6.7 SCSI Terminator Control

JP16&JP18 are both 3 pin jumper connectors. These are for Low/ High Byte SCSI Terminator.

Function	JP18	Note
Low Byte SCSI Terminator Always On	1-2	
Low Byte SCSI Terminator Always Off	off	
Low Byte SCSI Terminator Controlled by BIOS	2-3	*Default

Function	JP16	Note
High Byte SCSI Terminator Always On	1-2	*Default
High Byte SCSI Terminator Always Off	Off	
High Byte SCSI Terminator Controlled by BIOS	2-3	

3.6.8 Wide SCSI Select

J33 is a 2 pin jumper connector. This is for Wide SCSI function enabled.

Function	J33	Note
Wide SCSI Enabled	On	*Default
Wide SCSI Disabled	Off	

3.6.9 SCSI LED

J28 pin jumper connector. This is for SCSI LED. Reference to Chaptor 3.11 for more detail.

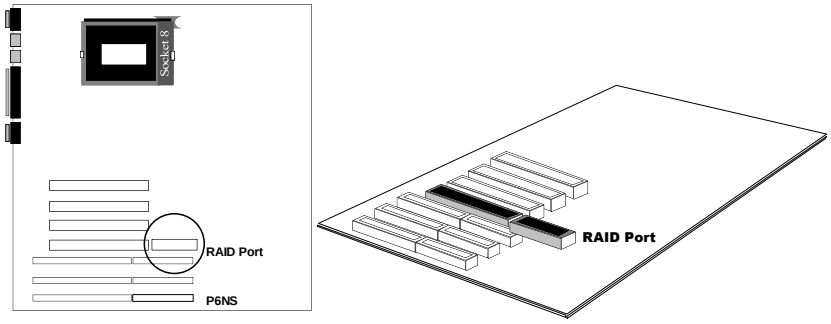
3.7 Adaptec® RAIDport option

3.7.1 SCSI RAIDPort

Turn this SCSI embedded Motherboard to be hardware assist RAID ready by adding the RAIDBUS 1000 or the Adaptec ARO 1130 adapter.
This RAID port option by adding the RAIDBUS 1000 adapter can support :

- Bus Master DMA
- Up to 133 Mbyte/Sec Burst rate
- RAID level :5,1,0 and 0/1
- Fully Netware 3.11, 3.12, 4.x & WinNT 3.51/ 4.0 supported by Adaptec

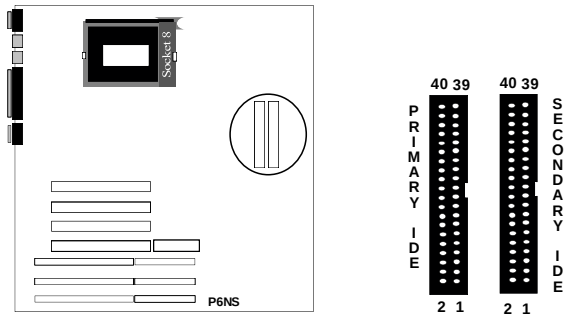
There is a PCI solt uses the 120 pin for PCI Local Bus with 60 pin RAID Port option.



3.8 IDE Interface

3.8.1 Primary, Secondary IDE Connectors

Primary / Secondary IDE are 40 pins internal IDE port connectors. Use a 40 pins flat cable to connect between this connector and the IDE devices. Normally put the boot-up hard disk at the primary IDE channel and other IDE devices at the secondary IDE channel (like CD-ROM). Each IDE connector can connect for two IDE devices and do not forget to set the first IDE device to "Master" and second IDE device to "Slave" when you connect two IDE devices in one connector.



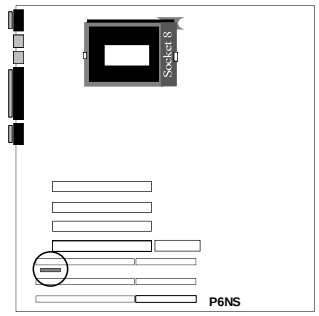
3.8.2 IDE LED

J29 pins LED connector. Reference to Chaptor 3.11 for more detail.

Pin	Assignment
1	LED anode (+)
2	LED cathode (-)

3.9 USB (Universal Serial Bus)

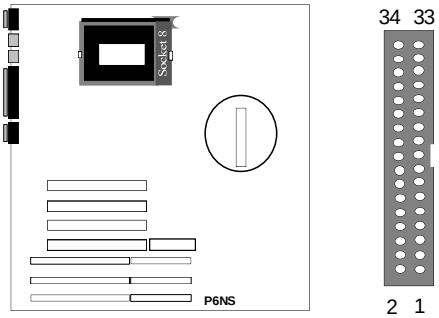
J8 is a 2 x 8 pin connector, this feature is reserved for future USB use.



3.10 Enhanced Multi-IO

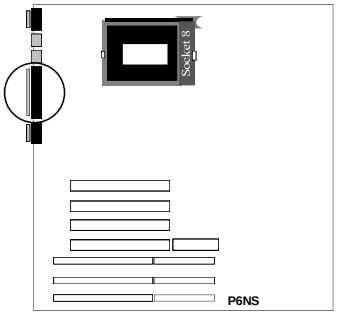
3.10.1 J22 FDC Connector

J22 is a 34 pins internal Floppy port connector. Use 34 pins flat cable to connect between this connector and floppy drives.



3.10.2 J2 Printer Connector

J2 is a standard 25 pin external D-Sub connector.



Following selection is all controled by the BIOS:

ECP Mode DMA Channel Select by BIOS
printer Port Address and IRQ Select by BIOS
(378h/3BC with IRQ7, 278h with IRQ5.)

Printer and IEEE 1284 cable

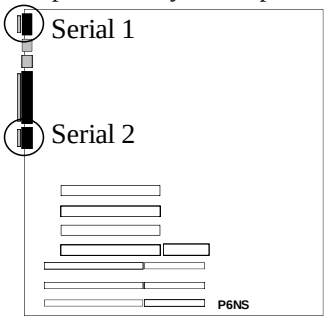
The IEEE 1284 compliant cables have better features on the following:

- Twisted pairs of conductors
- Full foil shield
- Wire braid
- Controlled impedance -- 62 ohm
- Limited cross-walk

With these features will guarantee the IEEE 1284 cable perform at much higher bandwidth rates that the fast Centronics, EPP and ECP modes perform at.
If you are using the ordinary parallel cables running at the EPP or ECP mode that this controller provided, you may experience that the data efforts.

3.10.3 J5/J1 Serial Port

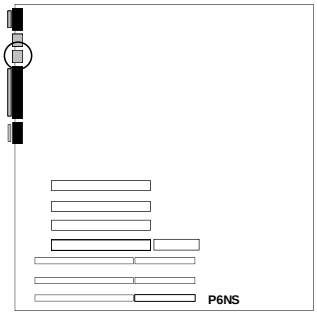
J5/J1 are 9 pins D-Sub Serial 1/Serial 2 port connector. Of course, a 9 pin to 25 pin convertor is optional for your 25 pin serial device.



3.11 Others

3.11.1 J3 Keyboard Connector

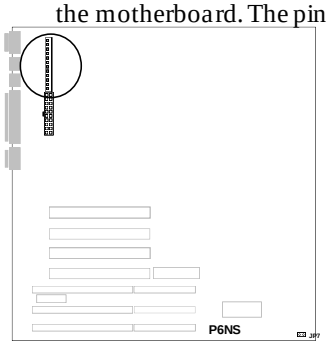
The J3 keyboard connector is a 5-pin, circular-type Mini-DIN socket. A Mini-DIN to DIN convertor is provided for a standard DIN keyboard. It is used to connect this SCSImotherboard keyboard interface to any standard AT-compatible keyboard (84 or 101key type keyboards). The pin assignment are as follows:



Pin	Assignmemnt
1	Keyboard clock
2	Keyboard data
3	n/c
4	Ground
5	VCC

3.11.2 Power Supply Connector

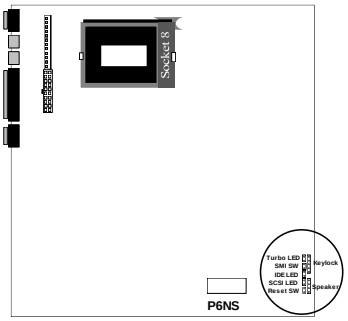
There are two types of power connector provided by this SCSI motherboard. **The 20 pin box header is ATX standard power connector. (will describe this on next chaptor ATX Form Factor)**. The 12-pin is AT standard power connectors. This is used to connect power lines and power good signal from the power supply's P8 and P9 headers to the motherboard. The pin assignments for P8 and P9 are indicated below:

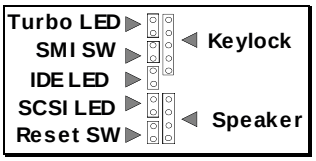


Pin	P8 Description	Pin	P9 Description
1	Power Good	7	Ground
2	+5V DC	8	Ground
3	+12V DC	9	-5V DC
4	-12V DC	10	+5V DC
5	Ground	11	+5V DC
6	Ground	12	+5V DC

Note: The standard AT power supply will not power-up from JP7 for it doesn't has the "POWER O.K." signal.

3.11.3 Reset, SCSI LED, IDE LED, SMI Switch, Turbo LED, Speaker, KeylockConnectors



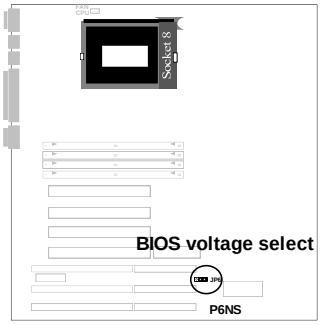


	Left pin	Right pin
Reset Switch	On = Reset , Off = Normal	
SCSI LED	Cathode	Anode
IDE LED	Cathode	Anode
SMI Switch	On=SMI, Off= Normale	
Turbo LED	Cathode	Anode
Speaker	VCC, GND, NC, Sound	
Keylock	LED Anode, NC, GND, Keylock, GND	

Note: This mainbaord has no Turbo function, it will not support Turbo switch. The Turbo LED will light-on when you connect a computer case that mounted Turbo LED and power on this system.

3.11.4 Flash EPROM Jumper Setting

Supports flash EPROM (ROM data can be changed on-board, without change/ replace the ROM chip) are supported.

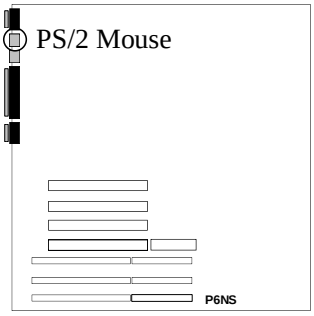


1
JP6

JP12	EPROM type	Note

1-2	5V Flash EPROM support (29xxx)	*Default
2-3	12V Flash EPROM support (28xxx)	

3.11.5 PS/2 Mouse



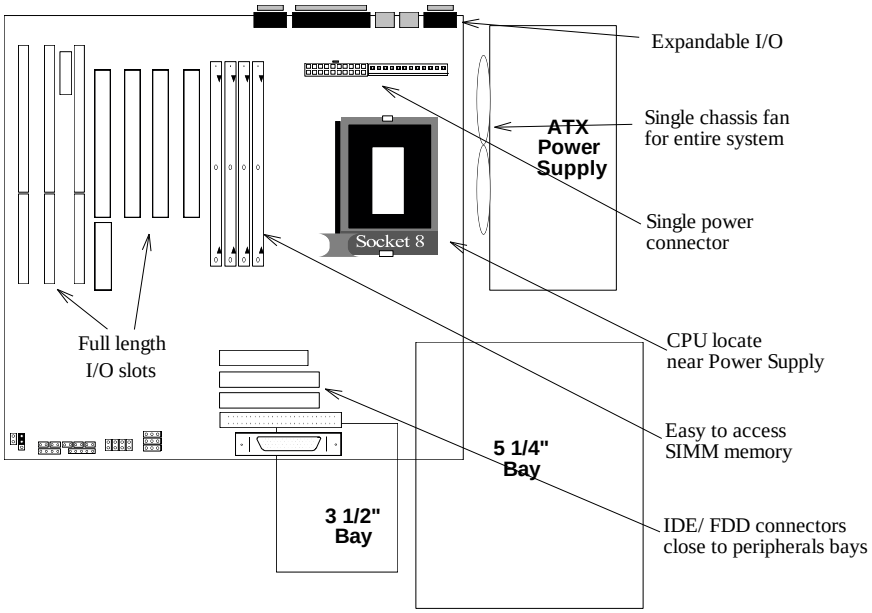
J4 is a 5 pin Mini-DIN PS/2 mouse connector, the manufacture default is IRQ12.

CHAPTER 4

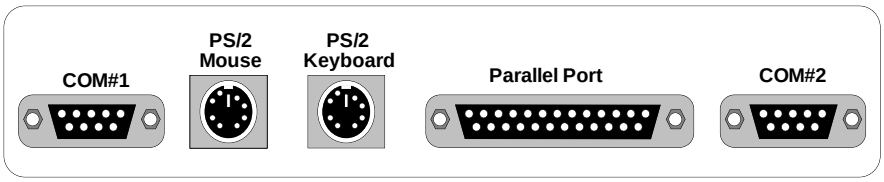
ATX Form-Factor Overview

The P6NS has been designed with ATX form-factor. The board size is 12" x 9.6" (305mm x 244mm). The ATX from-factor improves over Baby AT and LPX in a number of ways. By using the ATX chassis then the power supply orientation and specification and rotating the Baby AT baseboard through 90 degrees, the Pentium Pro processor can be relocated away from the expansion slots, and the longer side of Add-on card can be used to host more on board I/O. From Figure 3-1: Summary of ATX chassis features layout the user can gain a great deal improved functionality.

- Enhance the PC ease-of-use
- Supports full Length Slots for ISA and PCI Card
- Easy to install the SIMM Memory
- Better Support for the processor located
- Great blows air into the chasis with ATX power Supply

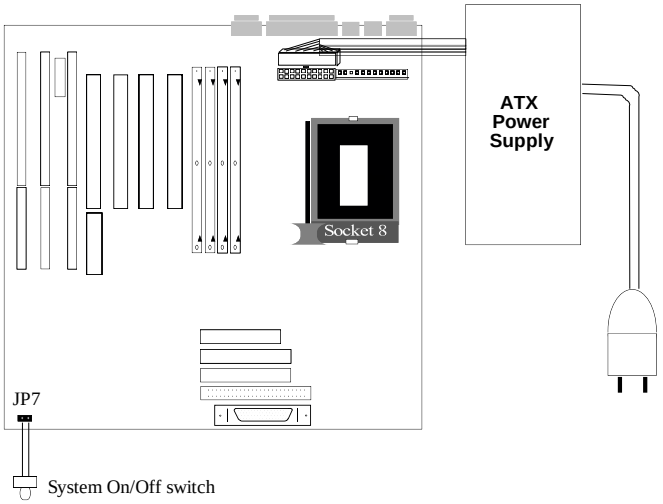


The P6NS is equipped with a standard I/O back pannel, featuring a serial port, PS/2 mouse port, PS/2 keyboard port, parallel port, and secondary serial port.

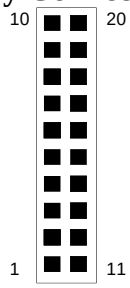


The P6NS Supports two power input connectors. Two 6-PIN connectors (for AT power supply) and a single 20-PIN connectors (for ATX power supply). For ATX power supplies that support the **Remote ON/OFF** feature, the should be connected to the system front panel for system power ON/OFF switch. The system power ON/OFF button should be a momentary Switch or togle switch , depends on the JP8 setting .

The P6NS has been designed with "soft off" functions. You can turn OFF the system from one of two sources: One is the front panel power ON/OFF switch, and the other is "Soft off" function (coming from the **P6NS** on-board's circuit controller) that can be controlled by operating system. Such as Windows 95: When the user clicks on the Shutdown icon, power can be turned off directly.



ATX Power Supply Connector :



Single Name	Pin	Pin	Single Name
3.3V	10	20	3.3V
-12.0V	9	19	3.3V
GND	8	18	GND
PS-ON	7	17	5.0V
GND	6	16	GND
GND	5	15	5.0V
GND	4	14	GND
-5.0V	3	13	PW-OK
5.0V	2	12	5VSB
5.0V	1	11	12.0V

This P6NS SCSI motherboard supports a on-board regulator to support the 3.3V power for the motherboard Chipset. User can choose a regular Switching Power Supply that doesn't support 3.3V for this motherboard.

JP1  **3.3V from on-board regulator** (default)

JP1  **3.3V from ATX power supply**

For the power On/Off switch control, through the JP7 is a 2 pin connector. Connect this JP7from motherboard to front panel for the system power control.

You also can choose Momentary of Toggle switch for this system. Through the JP8, will let you choose a Momentary (like Tact switch) or Toggle (like traditional Slide/ Push button switch).

JP8:1-2	JP7 is Momentary Switch	default
JP8: 2-3	JP7 is Toggle Switch	

CHAPTER 5
Award BIOS Setup

Notice

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Introduction

This section discusses Award's Setup program built into the ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

The Award BIOS installed in your computer system ROM (Read Only Memory) is a custom version of an industry standard BIOS. This means that it supports Intel/ Cyrix/ AMD processors in a standard IBM-AT compatible input/output system. The BIOS provides critical low-level support for standard devices such as disk drives and serial and parallel ports.

The Award BIOS has been customized by adding important, but non-standard, features such as virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

The rest of this manual is intended to guide you through the process of configuring your system using Setup.

Starting Setup

The Award BIOS is immediately activated when you first power on the computer. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after switching the system on, or

2. by pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self Test).

   Press DEL to enter SETUP.

   If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not

press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

Press **<F1>** To Continue, **<Del>** To Enter Setup.

Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

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

Getting Help

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

In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the Award BIOS supports an override to the CMOS settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

5.1 Main Menu

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

ROM PCI/ISA BIOS
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PNP / PCI CONFIGURATION SETUP INTEGRATED PERIPHERALS LOAD SETUP DEFAULTS	SUPERVISOR PASSWORD USER PASSWORD IDE HDD AUTO DETECTION HDD LOW LEVEL FORMAT SAVE & EXIT SETUP EXIT WITHOUT SAVING
Esc : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item (Shift) F2 : Change Color
Time, Date, Hard Disk Type...	

Note that a brief description of each highlighted selection appears at the bottom of the screen.

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Setup

This setup page includes all the items in a standard, AT-compatible BIOS.

BIOS Features Setup

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

Super / User Password Setting

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

Chipset Features Setup

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

Power Management Setup

This entry only appears if your system supports Power Management, screen PC", standards.

PNP / PCI Configuration Setup

This entry appears if your system supports PNP / PCI.

Integrated Peripherals

This section page includes all the items of IDE hard drive and Programmed Input / Output features.

Load Setup Defaults

The chipset defaults are settings which provide for maximum system performance. While Award has designed the custom BIOS to maximize performance, the manufacturer has the right to change these defaults to meet their needs.

IDE HDD Auto Detection

Automatically detect and configure hard disk parameters. The Award BIOS includes this ability in the event you are uncertain of your hard disk parameters.

HDD Low Level Format

If supported by your system, this provides a hard disk low level format utility.

Save & Exit Setup

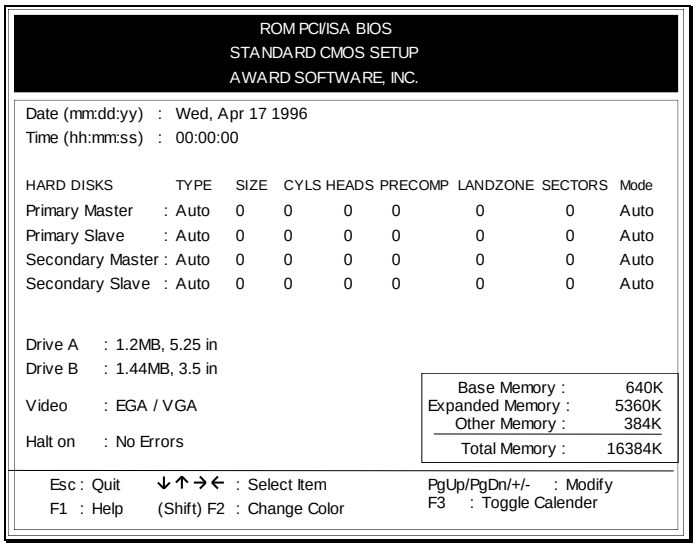
Save CMOS value changes to CMOS and exit setup.

Exit Without Save

Abandon all CMOS value changes and exit setup.

5.2 Standard CMOS Setup

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.



Date

The date format is <day>, <date> <month> <year>. Press <F3> to show the calendar.

day	The day, from Sun to Sat, determined by the BIOS and is display-only
date	The date, from 1 to 31 (or the maximum allowed in the month)
month	The month, Jan through Dec.
year	The year, from 1900 through 2099

Time

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

Daylight saving

The category adds one hour to the clock when daylight-saving time begins. It also subtracts one hour when standard time returns.

Enabled	Enable daylight-saving
Disabled	Disable daylight-saving

Primary Master/ Primary Slave/ Secondary Master/ Secondary Slave

The categories identify the types of 2 channels that have been installed in the computer. There are 45 predefined types and 4 user definable types are for Enhanced IDE BIOS. Type 1 to Type 45 are predefined. Type user is user-definable.
Press PgUp or PgDn to select a numbered hard disk type or type the number and press <Enter>. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use Type "User" to define your own drive type manually.
If you select Type "User", you will need to know the information listed below. Enter the information directly from the keyboard and press <Enter>. This information should be included in the documentation from your hard disk vendor or the system manufacturer.
If the controller of HDD interface is ESDI, the selection shall be "Type 1".
If the controller of HDD interface is SCSI, the selection shall be "None".
If you select Type"Auto", BIOS will Auto-Detect the HDD & CD-ROM Drive at the POST stage and showing the IDE for HDD & CD-ROM Drive.

TYPE	drive type
CYLS.	number of cylinders

HEADS	number of heads
PRECOMP	write precom
LANDZONE	landing zone
SECTORS	number of sectors
MODE	mode type

Drive A Type / Drive B Type

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

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

None	No floppy drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 megabyte capacity

Video

The category selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type in Setup.

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

Error Halt

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

No errors	Whenever the BIOS detects a non-fatal error the system will be stopped and you will be prompted.

All errors	The system boot will not be stopped for any error that may be detected.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors.

Memory

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

Base Memory

The POST will determine the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard, or 640K for systems with 640K or more memory installed on the motherboard.

Extended Memory

The BIOS determines how much extended memory is present during the POST. This is the amount of memory located above 1MB in the CPU's memory address map.

Other Memory

This refers to the memory located in the 640K to 1024K address space. This is memory that can be used for different applications. DOS uses this area to load device drivers in an effort to keep as much base memory free for application programs. The BIOS is the most frequent user of this RAM area since this is where it shadows RAM.

5.3 BIOS Features Setup

This section allows you to configure your system for basic operation. You have the opportunity to select the system default speed, boot-up sequence, keyboard operation, shadowing and security.

ROM / PCI ISA BIOS
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	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 Palett Snoop	:	Disabled		
OS Select For DRAM > 64MB	:	Non-OS2		

ESC : Quit ↑↓→←: Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift) F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

Virus Warning

When this item is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive for any attempt at modification. If an attempt is made, the BIOS will halt the system and the following error message will appear. Afterwards, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

```
! WARNING !
Disk boot sector is to be modified
Type "Y" to accept write or "N" to abort write
Award Software, Inc.
```

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

NOTE: ***Many disk diagnostic programs which attempt to access the boot sector table can cause the above warning message. If you will be running such a program, we recommend that you first disable Virus Protection beforehand.***

CPU Internal Cache/ External Cache

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

Enabled	Enable cache
Disabled	Disable cache

Quick Power On Self Test

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

Enabled	Enable quick POST
Disabled	Normal POST

Boot Sequence

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

C,A	System will first search for hard disk drive then floppy disk drive.
A,C	System will first search for floppy disk drive then hard disk drive.
CDROM, C, A	System will first search for CDROM drive, then hard disk drive and then floppy disk drive.
C, CDROM, A	System will first search for hard disk drive , then CDROM drive, and then floppy disk drive.

Swap Floppy Drive

This item allows you to determine whether enable the swap floppy drive or not. The choice: Enabled/Disabled.

Boot Up Floppy Seek

During POST, BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. 360K type is 40 tracks while 760K, 1.2M and 1.44M are all 80 tracks.

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

Boot Up NumLock Status

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on.

On	Keypad is number keys
Off	Keypad is arrow keys

Boot Up System Speed

Selects the default system speed -- the normal operating speed at power up.

High	Set the speed to high
Low	Set the speed to low

Gate A20 Option

This entry allows you to select how the gate A20 is handled. The gate A20 is a device used to address memory above 1 Mbytes. Initially, the gate A20 was handled via a pin on the keyboard. Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset to provide support for gate A20.

Normal	keyboard
Fast	chipset

Typematic Rate Setting

This determines if the typematic rate is to be used. When disabled, continually holding down a key on your keyboard will generate only one instance. In other words, the BIOS will only report that the key is down. When the typematic rate is enabled, the BIOS will report as before, but it will then wait a moment, and, if the key is still down, it will begin the report that the key has been depressed repeatedly. For example, you would use such a feature to accelerate cursor movements with the arrow keys.

Enabled	Enable typematic rate
Disabled	Disable typematic rate

Typematic Rate (Chars/Sec)

When the typematic rate is enabled, this selection allows you select the rate at which the keys are accelerated.

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)

When the typematic rate is enabled, this selection allows you to select the delay between when the key was first depressed and when the acceleration begins.

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.

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

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

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

OS Select for DRAM > 64

This item allows you to access the memory that over 64MB in OS/2.
The choice: Non-OS2, OS2.

PCI / VGA Palette Snoop

It determines whether the MPEG ISA/VESA VGA Cards can work with PCI/VGA or not.

Enabled	When PCI/VGA working with MPEG ISA/VESA VGA Card.
Disabled	When PCI/VGA not working with MPEG ISA/VESA VGA Card.

Video BIOS Shadow

Determines whether video BIOS will be copied to RAM. However, it is optional depending on chipset design. Video Shadow will increase the video speed.

Enabled	Video shadow is enabled
Disabled	Video shadow is disabled

C8000 - CBFFF
DC000 - DFFFF

These categories determine whether option ROMs will be copied to RAM. An example of such option ROM would be support of on-board SCSI.

Enabled	Optional shadow is enabled
Disabled	Optional shadow is disabled

5.4 Chipset Features Setup

ROM PCI / ISA BIOS
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration	: Enabled	8 Bit I/O Recovery Time	: 1
		16 Bit I/O Recovery Time	: 1
DRAM Speed Selection	:60ns	Memory Hole AT 15M-16M	: Disabled
DRAM RAS# Precharge Time	:3		
MA Additional Wait state	: Disabled		
RAS# To Cas# Delay	:Enabled		
DAM Read Burst (B/E/F)	: 2/2/3		
DRAM Write Burst (B/E/F)	: 2/2/3		
ISA Bus Clock	: PCICLK/4		
DRAM Refresh Queue	: Enabled		
DRAM RAS Only Refresh	: Disabled		
Dram ECC/PARITY	: Enabled		
Fast Dram Refresh	: Disabled		
Read-Around-Write	: Enabled		
PCI Burst Write Combine	: Enabled		
PCI-To-DRAM Pipeline	: Enabled	ESC : Quit	↑ ↓ → ←: Select Item
CPU-To-PCI Write Post	: Disabled	F1 : Help	PU/PD/+/- : Modify
CPU-To-PCI IDE Posting	: Enabled	F5 : Old Values	(Shift) F2 : Color
System BIOS Cacheable	: Enabled	F6 : Load BIOS Defaults	
Video RAM Cacheable	: Disabled	F7 : Load Setup Defaults	

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

DRAM Settings

The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.

Auto Configuration

Pre-defined values for DRAM, cache.. timing according to CPU type & system clock.
The Choice: Enabled, Disabled.
Note: When this item is enabled, the pre-defined items will become SHOW-ONLY.

DRAM Timing

The DRAM timing is controlled by the DRAM Timing Registers. The timings programmed into this register are dependent on the system design. Slower rates may be required in certain system designs to support loose layouts or slower memory.

60ns	DRAM Timing Type.
70ns	DRAM Timing Type.

DRAM RAS# Precharge Time

DRAM must continually be refreshed or it will lose its data. Normally, DRAM is refreshed entirely as the result of a single request. This option allows you to determine the number of CPU clocks allocated for the **R**ow **A**ddress **S**trobe to accumulate its charge before the DRAM is refreshed. If insufficient time is allowed, refresh may be incomplete and data lost.

3	Three clocks.
4	Four clocks.

***Four clocks* is the default.**

DRAM R/W Leadoff Timing

This sets the number of CPU clocks allowed before reads and writes to DRAM are performed.

7/6	Seven clocks leadoff for reads and six clocks leadoff for writes.
6/5	Six clocks leadoff for reads and five clocks leadoff for writes.

***7/6 Leadoff timing* is the default.**

Fast RAS# to CAS# Delay

When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from Row Address Strobe (RAS) to Column Address Strobe (CAS).

3	Three CPU clock delay.
2	Two CPU clock delay.

***3 CPU clocks* is the default.**

DRAM Read <EDO/FPM>

This sets the timing for burst mode reads from two different DRAM(EDO/FPM). Burst read and write requests are generated by the CPU in four separate parts. The first 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 numbers, the faster the system will address memory.

x222/x333	Read DRAM (EDO/FPM) timings are 2-2-2/3-3-3
x333/x444	Read DRAM (EDO/FPM) timings are 3-3-3/4-4-4
x444/x444	Read DRAM (EDO/FPM) timings are 4-4-4/4-4-4

***x222/x333 timings* is the default.**

DRAM Write Burst Timing

This sets the timing for burst mode writes from DRAM. Burst read and write requests are generated by the CPU in four separate parts. The first 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 numbers, the faster the system will address memory.

x222	Write DRAM timings are 2-2-2-2
x333	Write DRAM timings are 3-3-3-3
x444	Write DRAM timings are 4-4-4-4

***x222 timings* is the default.**

Turbo Read Leadoff

The turbo read leadoff may be required in certain system designs to support layouts or faster memories.
***Disabled* is the default.**

DRAM Speculative Leadoff

The 430HX chipset is capable of allowing a DRAM read request to be generated slightly before the address has been fully decoded. This can reduce all read latencies.

More simply, the CPU will issue a read request and included with this request is the place (address) in memory where the desired data is to be found. This request is received by the DRAM controller. When the peculative Leadoff' is enabled, the controller will issue the read command slightly before it has finished determining the address.

***Disabled* is the default.**

Turn-Around Insertion

When this is enabled, the chipset will insert one extra clock to the turn-around of back-to-back DRAM cycles.

***Disabled* is the default.**

ISA Clock

This item allows you to select the PCI clock type.

PCI CLK/3	PCI clock type
PCI CLK/4	PCI clock type

Cache Features

System BIOS Cacheable

When enabled, accesses to the system BIOS ROM addressed at F0000H-FFFFFH are cached, provided that the cache controller is enabled.

Enabled	BIOS access cached
Disabled	BIOS access not cached

***Disabled* is the default.**

Video BIOS Cacheable

As with caching the System BIOS above, enabling the Video BIOS cache will cause access to video BIOS addressed at C0000H to C7FFFH to be cached, if the cache controller is also enabled

Enabled	Video BIOS access cached
Disabled	Video BIOS access not cached

***Disabled* is the default.**

PCI and IDE Configuration

Bit I/O Recovery Time

The recovery time is the length of time, measured in CPU clocks, which the system will delay after the completion of an input/output request. This delay

takes place because the CPU is operating so much faster than the input/output bus that the CPU must be delayed to allow for the completion of the I/O.

This item allows you to determine the recovery time allowed for 8 bit I/O. Choices are from NA, 1 to 8 CPU clocks.

***1* clock is the default.**

Bit I/O Recovery Time

This item allows you to determine the recovery time allowed for 16 bit I/O. Choices are from NA, 1 to 4 CPU clocks.

***1* clock is the default.**

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB.

Enabled	Memory hole supported.
Disabled	Memory hole not supported.

***Disabled* is the default.**

Peer Concurrency

Peer concurrency means that more than one PCI device can be active at a time.

Enabled	Multiple PCI devices can be active.
Disabled	Only one PCI device can be active at a time.

***Enabled* is the default.**

Chipset Special Features

When disabled, the chipset behaves as if it were the earlier

DRAM ECC/PARITY Select

This item allows you to select between two methods of DRAM error checking, ***ECC and Parity (default).***

Memory Parity / ECC Check

This item allows you to select between three methods of memory error checking, Auto, Enabled and Disabled

Single Bit Error Report

L2 Cache Cacheable Size

When a single bit error is detected, the offending DRAM row ID is latched. The latched Valued is held until software explicit clears the error status flag. You can select Enabled or Disabled.
This item determines the size of the L2 cacheability: 64MB / 512MB.

Chipset NA# Asserted

This item allows you to select between two method of chipset NA# asserted during CPU write cycles /CPU line fills, Enabled and Disabled.

Pipeline Cache Timing

This item allows you to select two timing of pipeline cache, Faster and Fastest.

5.5 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

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

Power Management	: User define	* Power Down & Resume Events *	
PM Control by APM	: Yes	IRQ3 (COM 2)	: ON
Video Off Method	: V/H SYNC + Blank	IRQ4 (COM 1)	: ON
		IRQ5 (COM 2)	: ON
Doze Mode	: Disabled	IRQ6 (Floppy Disk)	: ON
Standby Mode	: Disabled	IRQ7 (LPT 1)	: OFF
Suspend Mode	: Disabled	IRQ8 (RTC Alarm)	: OFF
HDD Power Down	: 15mm	IRQ9 (IRQ2 Redir)	: ON
		IRQ10 (Reserved)	: ON
** Wake Up Events In Doze & Standby **		IRQ11 (Reserved)	: ON
IRQ3 (Wake - Up Event)	: ON	IRQ12 (PS/2 Mouse)	: ON
IRQ4 (Wake - Up Event)	: ON	IRQ13 (Coprocessor)	: ON
IRQ8 (Wake - Up Event)	: ON	IRQ14 (Hard Disk)	: ON
IRQ12 (Wake - Up Event)	: ON	IRQ15 (Reserved)	: ON

ESC: Quit ↑↓→←: Select Item
F1 : Help PU/PD/+/- : Modify
F5 : Old Values (Shift) F2 : Color
F6 : Load BIOS Defaults
F7 : Load Setup Defaults

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. Doze Mode
2. Standby Mode
3. Suspend Mode
4. HDD Power Down

There are four selections for Power Management, three of which have fixed mode settings.

Disable (default)	No power management. Disables all four modes

Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management -- **ONLY AVAILABLE FOR SL CPU**. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

PM Control APM

When enabled, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock.

If the Max. Power Saving is not enabled, this will be preset to *No*.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management singaling.

PM Timers

The following four modes are Green PC power saving functions which are only user configurable when *User Defined* Power Management has been selected.

See above for available selections.

Doze Mode

When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.

Standby Mode

When enabled and after the set time of system inactivity, the fixed disk drive and the video would be shut off while all other devices still operate at full speed.

Suspend Mode

When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

HDD Power Down

When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Power Down & Resume Events

Power Down and Resume events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything which occurs to a device which is configured as *On*, even when the system is in a power down mode.

The following is a list of IRQ, **I**nterrupt **R**e**Q**uests, which can be exempted much as the COM ports and LPT ports above can. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.
As above, the choices are *On* and *Off*. *Off* is the default.
When set *On*, activity will neither prevent the system from going into a power management mode nor awaken it.

- **IRQ3 (COM 2)**
- **IRQ4 (COM 1)**

- **IRQ5 (LPT 2)**
- **IRQ6 (Floppy Disk)**
- **IRQ7 (LPT 1)**
- **IRQ8 (RTC Alarm)**
- **IRQ9 (IRQ2 Redir)**
- **IRQ10 (Reserved)**
- **IRQ11 (Reserved)**
- **IRQ12 (Reserved)**
- **IRQ13 (Coprocessor)**
- **IRQ14 (Hard Disk)**
- **IRQ15 (Reserved)**

5.6 PnP/ PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special

components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

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

Resources Controlled by	: Manual	PCI IRQ Actived By	: Level
Reset Configuration Date	: Disabled	PCI IDE IRQ Map To	: PCI-AUTO
		Primary IDE INT#	: A
IRQ-3 assigned to	: Legacy ISA	Secondary IDE INT#	: B
IRQ-4 assigned to	: Legacy ISA		
IRQ-5 assigned to	: PCI/ISA PnP	Onboard PCI SCSI Chip	:Enabled
IRQ-7 assigned to	: PCI/ISA PnP		
IRQ-9 assigned to	: PCI/ISA PnP		
IRQ-10 assigned to	: PCI/ISA PnP		
IRQ-11 assigned to	: PCI/ISA PnP		
IRQ-12 assigned to	: PCI/ISA PnP		
IRQ-14 assigned to	: PCI/ISA PnP		
IRQ-15 assigned to	: PCI/ISA PnP		
DMA-0 assigned to	: PCI/ISA PnP		
DMA-1 assigned to	: PCI/ISA PnP	ESC : Quit	↑↓→←: Select Item
DMA-3 assigned to	: PCI/ISA PnP	F1 : Help	PU/PD/+/- : Modify
DMA-5 assigned to	: PCI/ISA PnP	F5 : Old Values	(Shift) F2 : Color
DMA-6 assigned to	: PCI/ISA PnP	F6 : Load BIOS Defaults	
DMA-7 assigned to	: PCI/ISA PnP	F7 : Load Setup Defaults	

Resource Controlled by

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 95.

Choices are *Auto* and **Manual (default).**

Reset Configuration Data

This item allows you to determine reset the configuration data or not.

Choices are *Enabled* and ***Disabled* (default).**

IRQ3/4/5/7/9/10/11/12/14/15, DMA0/1/3/5/6/7 assigned to

This item allows you to determine the IRQ / DMA assigned to the ISA bus and is not available to any PCI slot.

Choices are *Legacy ISA* and ***PCI/ISA PnP*.**

PCI IRQ Activated by

This sets the method by which the PCI bus recognizes that an IRQ service is being requested by a device. Under all circumstances, you should retain the default configuration unless advised otherwise by your system manufacturer.

Choices are *Level* (default) and *Edge*.

PCI IDE IRQ Map

This allows you to configure your system to the type of IDE disk controller in use. By default, Setup assumes that your controller is an ISA (Industry Standard Architecture) device rather than a PCI controller. The more apparent difference is the type of slot being used.

If you have equipped your system with a PCI controller, changing this allows you to specify which slot has the controller and which PCI interrupt (A, B,C or D) is associated with the connected hard drives.

Remember that this setting refers to the hard disk drive itself, rather than individual partitions. Since each IDE controller supports two separate hard drives, you can select the INT# for each. Again, you will note that the primary has a lower interrupt than the secondary as described in "*lot x Using INT#*" above.

Selecting "*PCI Auto*" allows the system to automatically determine how your IDE disk system is configured.

Award's ROM BIOS provides a built-in Setup program which allows user modify the system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS RAM, so data will be retained even the system power is off. In general, you are not required to change any data. Unless there is a conflict or you re-configuring system, this will need to enter new setup information. Following section describes how to use this program and propriate entries.

The "LOAD SETUP DEFAULT" is recommended in your first time setup this system or you change the system's configuration. You will need "LOAD SETUP DEFAULT" first and re-confirure your system. This will be described in later chapter.

And, it is possible that battery failed which might cause data lose in CMOS RAM, then you need to re-enter the system's CMOS RAM and re-configure to get the suitable parameters.

5.7 Integrated Peripherals

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

IDE HDD Block Mode	: Enabled	USB Controller	: Enabled
IDE Primary Master PIO	: Auto		
IDE Primary Slave PIO	: Auto		
IDE Secondary Master PIO	: Auto		
IDE Secondary Slave PIO	: Auto		
On-Chip Primary PCI IDE	: Enabled		
On-Chip Secondary PCI IDE	: Enabled		
PCI Slot IDE 2nd Channel	: Enabled		

Onboard FDC Controller	: Enabled	
Onboard UART 1	: 3F8/IRQ4	
Onboard UART 2	: 2F8/IRQ3	
Onboard UART 2 Mode	: Standard	ESC : Quit ↑↓→←: Select Item ESC : Quit ↑↓→←: Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift) F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults
Onboard Parallel Port	:378/IRQ	
Parallel Port Mode	:ECP+EPP	
ECP Mode Use DMA	:3	
Parallel Port EPP Type	:EPP1.9	

IDE HDD Block Mode

This allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive (HDD).

Enabled	IDE controller uses block mode.
Disabled	IDE controller uses standard mode.

***Enabled* is the default.**

PCI Slot IDE 2nd Channel

This item allows you designate an IDE controller board inserted into one of the physical PCI slots as your secondary IDE controller.

Enabled	External IDE controller designated as the secondary controller
Disabled	No IDE controller occupying a PCI slot.

***Disabled* is the default.**

IDE PIO

IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship which are determined by the cabling configuration used to attach them to the controller. Your system supports two IDE controllers--a primary and a secondary--so you have to ability to install up to four separate hard disks.

PIO means Programmed Input/ Output. Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the

BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by themselves. This simpler and more efficient (and faster).

Your system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When *Auto* is selected, the BIOS will select the best available mode. This is true for the next four setup items:

1. IDE Primary Master PIO
2. IDE Primary Slave PIO
3. IDE Secondary Master PIO
4. IDE Secondary Slave PIO

On-Chip Primary PCI IDE

As stated above, your system includes two built-in IDE controllers, both of which operate on the PCI bus. This setup item allows you either to enable or disable the primary controller. You might choose to disable the controller if you were to add a higher performance or specialized controller.

Enabled	Primary HDD controller used -- Default
Disabled	Primary HDD controller not used.

On-Chip Secondary PCI IDE

As above for the Primary controller, this setup item you either to enable or disable the secondary controller. You might choose to disable the controller if you were to add a higher performance or specialized controller.

Enabled	Primary HDD controller used
Disabled	Primary HDD controller not used.

***Enabled* is the default.**

4.8 LOAD SETUP DEFAULTS

The chipset defaults are settings which provide for maximum system performance. While Award has designed the custom BIOS to maximize performance, the manufacturer has the right to change these defaults to meet their needs.

4.9 Supervisor/User Password Setting

You can set either supervisor or user password, or both of them. The differences between are:

supervisor password : can enter and change the options of the setup menus.
user password : just can enter but do not have the right to change the options of the setup menus.

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

ENTER PASSWORD:

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

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

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

4.10 IDE HDD AUTO DETECTION

Automatically detect and configure hard disk parameters. The Award BIOS includes this ability in the event you are uncertain of your hard disk parameters.

4.11 HDD LOW LEVEL FORMAT

If supported by your system, this provides a hard disk low level format utility.

4.12 SAVE & EXIT SETUP

Save CMOS value changes to CMOS and exit setup.

4.13 EXIT WITHOUT SAVING

Abandon all CMOS value changes and exit setup.

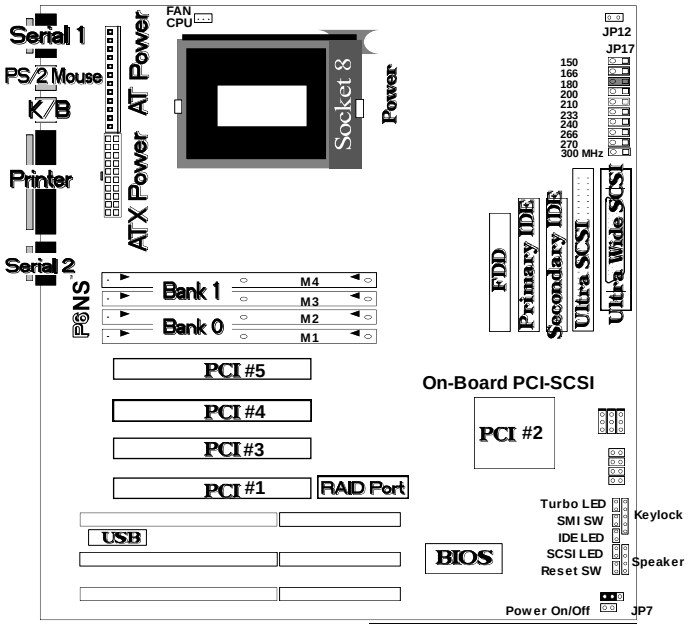
Appendix A

The PCI Configuration Note

Due to the PC Resource limitation, the motherboard supports 4 PCI Slots with 3 Interrupt only. PCI Slot#1 and PCI Slot #5 will share the same Interrupt.
We do recommand that each PCI add-on Card uses its own interrupt. In case you plug two PCI add-on cards to PCI#1 and PCI#5, please make sure one of them doesn't need the interrupt or they can share interrupt.

PCI No.	PCI#1	PCI#2	PCI#3	PCI#4	PCI#5
Solution	Slot with RAID port	On-Board SCSI Controller	Slot	Slot	Slot
INT Used	INTA#	INTB#	INTC#	INTD#	INTA#

The Placement of PCI Slot



Placement & Connector