USER'S MANUAL

RHINO II

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CHAPTER 1   General Specifications Overview

Processor:
- Processor Type   Intel Pentium II CPU.
- External CPU clock   60/66 Mhz
- CPU Socket   242 pins Slot 1 on board.
- Coprocessor   Included in Pentium® processor.

Form Factor:
- Outer Dimensions   Standard ATX v2.0 guidelines
                          12" × 7.5" (30.48cm × 19.1cm)

Chipset:
- Motherboard chipset   Intel 82440FX chipset

Cache Memory:
- 1st cache memory   32KB 1st cache memory included in CPU
- 2nd cache memory   256KB/512KB 2nd cache in CPU.
- Cache mode   Support Write Back cache mode for both
                          L1/L2 Cache.

Memory Subsystem:
- DRAM SIMM sockets   4 x 72 pin 4MB / 8MB / 16MB / 32MB / 64MB
                          DRAM modules
- Max. Memory Size   256MB
- DRAM Type   Fast Page Mode (FPM) or Extended Data Out
                          EDO DRAM with or without parity bit.
- Enhancement   Mix of Fast Page Mode or EDO DRAM
                          supported
                          ECC and Parity capability.

Input/Output Subsystem
- PCI bus slots   3 x 32-bit PCI Bus slots (3 masters)
                          PCI 2.1 compliance
- ISA bus slots   3 x 16-bit ISA slots
- shared bus slots   1 x 32 bit PCI bus slot (master) OR
                          1x 16-bit ISA slot
- I/O bus speed   Up to 33MHz (PCI bus)

Integrated IDE, Super I/O Subsystem
- IDE support   Chipset built-in PCI IDE support up to 4 IDE
                          Drives, bus mastering. (Using IRQ 14 & IRQ
                          15)
                          Support Mode 3, 4 IDE, LS-120 floppy driver
                          & ATAPI CD-ROM.
- On board I/O   One Floppy Port supporting 2 floppy drives
                          of 360K / 720K / 1.2M / 1.44M/ 2.88M
                          Two serial ports (16550 Fast UART
                          compatibles)
                          One parallel Port (Standard, ECP, EPP
                          support)

USB Interface
* USB support   2 USB connector on board.
                                            Plug and Play peripherials easy to use
                                              up to 12M bit transfer rate

PS/2 Mouse/ Keyboard
* PS/2 Mouse/ Keyboard   6-pin Mini-DIN connectors on board.

Power Management
* Green functions   Support various Power Management schemes
                                              Sleep Switch for power saving

BIOS Subsystem
* BIOS Shadowing   Shadow RAM for System and Video BIOS
* BIOS Features   Built-in setup, Power-on self test, Drive table
                                              optimization, User-definable drive types,
                                              Password protection, Shadowing options

Plug & Play / BIOS Update
* Plug & Play BIOS   Support Plug & Play for easy installation
* Flash EEPROM   Use Flash EEPROM to allow easy BIOS
                                              update

System Support Functions
* System functions   7 DMA channels, 16 level interrupts,
                                              Programmable timers
* Support functions   Fast A20 gate and Fast Reset
* Clock   Enhanced real time clock/calendar with
                                              battery back-up

Other Features
* Size   ATX platform 7.5" (W) x 12" (L)
* Auto power off   Automatic power off when Win95 shutdown
                                              option selected. (function with ATX power
                                              supply only)
* Power Supply   Supports both AT and ATX power supply
                                              connector.
* Power /On switch   Support Power/ON switch when ATX power
                                              supply is plugged.

🖹 Note

128MB SIMMs using the 16MB technology are not qualified for use on Rhino II motherboard due to electrical loading characteristics. 128MB technology have not been qualified. However, they will be supported by the motherboard when they become available, depending upon the individual characteristics of the memory module.

CHAPTER 2   INSTALLATION AND UPGRADE

2.1   CPU Installation

Slot 1 Processor
The Intel Pentium II Processor utilizes Single Edge Contact (S.E.C) 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 performance processor into the systems. The S.E.C cartridge utilizes surface mount core components and a substrate with an edge finger connection. The S.E.C cartridge package (**Figure 1**) introduced on the Pentium II processor will also be used in the Deschutes and future Slot 1 processors.
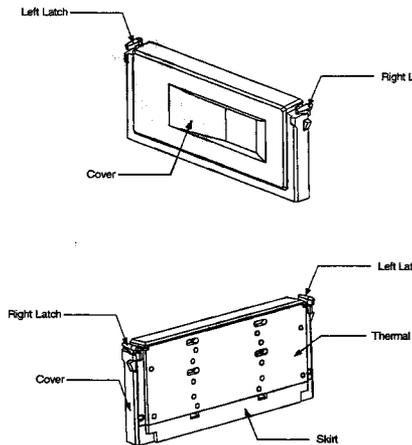
Figure 1. Intel Pentium II end-view.

Slot 1 Retention Mechanism and Attach Mount
The Intel enabled retention mechanism (**Figure 2**) holds the Slot 1 processor in place. The retention mechanism is keyed to the Slot 1 connector to ensure proper installation. The retention mechanism attach mount is pressed from the bottom of the motherboard and the retention mechanism is attached with captive nuts which are part of the retention mechanism assembly.
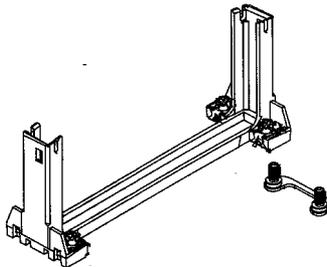
Figure 2. Slot 1 Mount diagram

Assembled S.E.C Cartridge, Heat Sink, Retention Mechanism.

The Pentium II processor will also be offered as an Intel Boxed processor. Intel Boxed processor are intended for system integrators who build systems from motherboards and standard components. The Boxed Pentium II processor will be supplied with an attached fan/heatsink.

Hold the processor so that the fan shroud is facing toward the pegs on the motherboard. Slide the processor into the retention mechanism and slide the supports onto the pegs. Ensure that the pegs on the motherboard slide into the holes in the heatsink support and that the alignment notch in the processor fits over the plug in Slot 1. Push the processor down firmly, with even pressure on both side of the top, until it is seated. As show in (**Figure 3).**
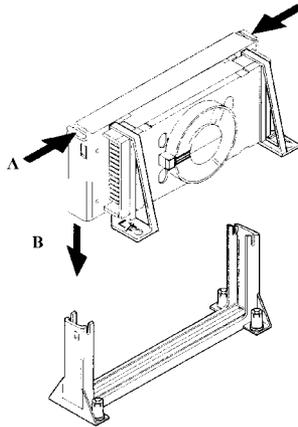
Figure 3. Slot 1 Pentium II CPU

☞ The CPU cooling fan can improve the ventilation of the motherboard in the case. The conduction of the airflow can enhance the cooling effect to the voltage regulator and onboard heatsink by continuously keeping the air-stream flows.

The airflow of the fan/heatsink is into the center and out of the sides of the fan/heatsink. The large arrows in the **Figure 4** denote the direction of airflow.
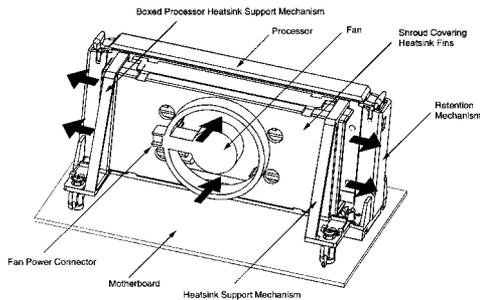
Figure 4 Airflow of fan/heatsink

2.2   System Memory

The Rhino II supports 60ns, faster Fast Page Mode(FPM) or Extended Data Out (EDO) DRAMs. It is recommended to populate Bank 1 first. Memory error checking and correction, ECC, is supported through parity SIMMS (x36).

To install SIMMs, do the following procedure:

1. Holding the SIMM only by the edges, remove it from its antistatic package.
2. Position the SIMM at about a 45° angle relative to the motherboard. Make sure the small notch in the middle of the bottom edge of the SIMM aligns with the notch in the SIMM socket.
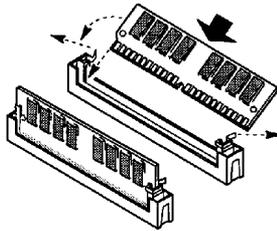
1. Insert the bottom edge of the SIMM into the SIMM socket and make sure it is seated firmly.
2. When the SIMM seats correctly, hold it at each end and gently push the top edge towards the retaining clips of the connector until the SIMM snaps into place. If the SIMM does not install correctly, gently spread the retaining clips just enough so that you can pull away the top edge of the SIMM and try again.

Below is some of the possible configuration for Rhino II.

BANK 1	BANK 2	TOTAL
1MX36 (4MB)	-----	8MB
1MX36 (4MB)	1MX36 (4MB)	16MB
2MX36 (8MB)	-----	16MB
1MX36 (4MB)	2MX36 (8MB)	24MB
2MX36 (8MB)	2MX36 (8MB)	32MB
4MX36 (16MB)	-----	32MB
1MX36 (4MB)	4MX36 (16MB)	40MB
2MX36 (8MB)	4MX36 (16MB)	48MB
4MX36 (16MB)	4MX36 (16MB)	64MB
8MX36 (32MB)	-----	64MB
1MX36 (4MB)	8MX36 (32MB)	72MB
2MX36 (8MB)	8MX36 (32MB)	80MB
4MX36 (16MB)	8MX36 (32MB)	96MB
8MX36 (32MB)	8MX36 (32MB)	128MB
16MX36 (64MB)	-----	128MB
1MX36 (4MB)	16MX36 (64MB)	136MB
2MX36 (8MB)	16MX36 (64MB)	144MB
8MX36 (32MB)	16MX36 (64MB)	192MB
16MX36 (64MB)	16MX36 (64MB)	256MB
32MX36 (128MB)	32MX36 (128MB)	512MB

Table 1   Memory Configuration Table

2.3 Keyboard Interface

PS/2* keyboard/mouse connectors are located on the back panel side of the board. It is recommended to turn off the system power before installing or removing a keyboard or mouse.

2.4   Real Time Clock, CMOS RAM and Battery

The integrated Real Time Clock (RTC) provides a time of day clock, and 100-year calendar with alarm features. These can be set in the BIOS SETUP program. The RTC also supports 242-byte battery-backed CMOS RAM for BIOS use. The CMOS RAM value can be cleared to the system defaults by using a jumper on (JP13).

Chapter 3 Overview of Award Bios Setup Menu Screens

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 RAM so data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM stay unchanged unless there is configuration change in the system, such as hard drive replacement or new equipment change.

It is possible that CMOS had a battery failure which cause data lose in CMOS_RAM. If so, re_enter system configuration parameters become necessary.

This chapter explains the information contained in the Setup program and tell you how to modify the setting according to your system configuration.

The BIOS supports Software Turbo Speed features. Instead of processing the Turbo Speed Button on the front panel, simply press the <**Ctrl**>, <**Alt**>, and <+> keys at the same time to enable the Turbo Speed feature; and press the <**Ctrl**>, <**Alt**>, and <-> keys at the same time to disable the feature.

3.1 CMOS Setup Utility

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

ROM PCI/ISA BIOS	
CMOS SETUP UTILITY	
AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	SUPERVISOR PASSWORD
BIOS FEATURES SETUP	USER PASSWORD
CHIPSET FEATURE SETUP	IDE HDD AUTO DETECTION
POWER MANAGEMENT SETUP	HDD LOW LEVEL FORMAT
PNP/PCI CONFIGURATION	SAVE & EXIT SETUP
INTEGRATED PERIPHERALS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
ESC: QUIT	↑↓→← : SELECT ITEM
F10: Save & Exit Setup	(Shift)F2: Change Color
Time, Date, Hard Disk Type..	

The menu displays all the major selection items and allow user to select any one of shown item. The selection is made by moving cursor (press any direction key) to the item and press 'Enter' key. An on_line help message is displayed at the bottom of the screen as cursor is moving to various items which provides user better understanding of each function. When a selection is made, the menu of selected item will appear so the user can modify associated configuration parameters.

3.2 Standard CMOS Setup

```
                        ROM PCI/ISA BIOS
                       STANDARD CMOS SETUP
                       AWARD SOFTWARE, INC.
 Date (mm:dd:yy) : Wed, May 8 1996
 Time (hh:mm:ss) : 15:38:55
 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.                 Base Memory:        640K
 Drive B : None                           Extended memory:    5360K
 Video   : EGA/VGA                        Other Memory:       16384K
 Halt On : All Errors                     Total Memory:    16384K
 ESC: Quit               ↑↓→← : Select Item     Pu/PD/+/- : Modify
 F1  : Help             (Shift)F2: Change Color
```

The Standard CMOS Setup screen is displayed above. System BIOS automatically detects memory size, thus no changes are necessary. It has a few items for setting. Each item may have one or more option settings. It allows you to change the system Date and Time, IDE hard disk, floppy disk drive types for drive A: and B:, boot up video display mode, and POST error handling selection. 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.

Hard Disk Configurations

TYPE:
Select from "**1**" to "**45**" to fill remaining fields with predefined values of disk drives. Select "**User**" to fill the remaining fields. Select "**Auto**" to detect the HDD type automatically.

SIZE:
The hard disk size. The unit is Mega Bytes.

CYLS:
The cylinder number of the hard disk.

HEAD:
The read/write head number of hard disk. The range is from "**1**" to "**16**".

PRECOMP:
The cylinder number at which the disk drive changes the write timing.

LANDZ:
The cylinder number that the disk drive heads (read/ write) are seated when the disk drive is paked.

SECTOR:
The sector number of each track defined on the hard disk. The range is from "**1**" to "**64**".

MODE:
Select "**Auto**" to detect the mode type automatically. If your hard disk supports the LBA mode, select "**LBA**" or "**Large**". However, if your hard disk cylinder is more than 1024 and does not support the LBA function, you have to set at "**Large**".
Select "**Normal**" if your hard disk supporting cylinders is below 1024.

3.3 BIOS Features Setup

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
CPU Level 2 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	: Disabled	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	ESC : Quit ↑↓→← : Select Item	
Typematic Delay (Msec)	: 250	F1 : Help PU/PD/+/- : Modify	
Security Option	: Setup	F5 : Old Values (Shift) F2 : Color	
PCI/VGA Palette Snoop	: Disabled	F6 : Load BIOS Defaults	
OS Select For DRAM > 64MB	: Non-OS2	F7 : Load Setup Defaults	

Moving around the BIOS and Chipset Features (refer to the next section) Setup programs shown works the same way as moving around the Standard CMOS Setup program. User are not encouraged to run the BIOS and Chipset Features Setup programs. Your system should have been fine-tuned before shipping. Improper Setup may cause the system to fail, consult your dealer before making any changes.

Virus Warning
When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an anti-virus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

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

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU.

CPU Level 2 Cache

The External Cache field may not appear if your system does not have external cache memory.

Quick Power On Self Test

Select Enabled to reduce the amount of time required to run the power-on self-test (POST). A quick POST skips certain steps. We recommend that you normally disable quick POST. Better to find a problem during POST than lose data during your work.

Boot Sequence

The original IBM PCs loaded the DOS operating system from drive A (floppy disk), so IBM PC-compatible systems are designed to search for an operating system first on drive A, and then on drive C (hard disk). However, modern computers usually load the operating system from the hard drive, and may even load it from a CD-ROM drive.

Swap Floppy Drive

This field is effective only in systems with two floppy drives. Selecting Enabled assigns physical drive B to logical drive A, and physical drive A to logical drive B.

Boot Up Floppy Seek

When Enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360-KB floppy drives have 40 tracks; drives with 720 KB, 1.2 MB, and 1.44 MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend that you set this field to Disabled to save time.

Boot Up NumLock Status

Toggle between On or Off to control the state of the NumLock key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operations.

Boot Up System Speed

Select High to boot at the default CPU speed; select Low to boot at the speed of the AT bus. Some add-in peripherals or old software (such as old games) may require a slow CPU speed. The default setting is High.

Typematic Rate Setting

When Disabled, the following two items (Typematic Rate and Typematic Delay) are irrelevant. Keystrokes repeat at a rate determined by the keyboard controller in your system.

When Enabled, you can select a typematic rate and typematic delay.

Typematic Rate (Chars/Sec)

When the typematic rate setting is enabled, you can select a typematic rate (the rate at which character repeats when you hold down a key) of 6, 8, 10,12, 15, 20, 24 or 30 characters per second.

Typematic Delay (Msec)
When the typematic rate setting is enabled, you can select a typematic delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 1000 milliseconds.

Security Option
If you have set a password, select whether the password is required every time the System boots, or only when you enter Setup.

PCI/VGA Palette Snoop
Your BIOS Setup many not contain this field. If the field is present, leave at Disabled.

OS Select for DRAM > 64MB
Select OS2 only if you are running OS/2 operating system with greater than 64 MB of RAM on your system.

Shadow
Software that resides in a read-only memory (ROM) chip on a device is called firmware. The Award BIOS permits shadowing of firmware such as the system BIOS, video BIOS, and similar operating instructions that come with some expansion peripherals, such as, for example, a SCSI adaptor.
Shadowing copies firmware from ROM into system RAM, where the CPU can read it through the 16-bit or 32-bit DRAM bus. Firmware not shadowed must be read by the system through the 8-bit X-bus. Shadowing improves the performance of the system BIOS and similar ROM firmware for expansion peripherals, but it also reduces the amount of high memory (640 KB to 1 MB) available for loading device drivers, etc.

Enable shadowing into each section of memory separately. Many system designers hardware shadowing of the system BIOS and eliminate a System BIOS Shadow option.

Video BIOS Shadow
Video BIOS shadows into memory area C0000-C7FFF. The remaining areas shown on the BIOS Features Setup screen may be occupied by other expansion card firmware. If an expansion peripheral in your system contains ROM-based firmware, you need to know the address range the ROM occupies to shadow it into the correct area of RAM.

3.4 Chipset Feature Setup

```
                        ROM PCI/ISA BIOS
                      CMOS SETUP UTILITY
                    CHIPSET FEATURE SETUP
┌─────────────────────────────────────────────────────────────────────────┐
│ Auto Configuration       : Enabled    8 Bit I/O Recovery Time    : 3      │
│ DRAM Speed Selection      : 70ns       16 Bit I/O Recovery Time   : 2      │
│ DRAM RAS# Precharge Time  : 4          Memory Hole At 15M-16M     : Disabled│
│ MA Additional Wait State  : Enabled    DRAM Fast Leadoff          : Enabled │
│ RAS# To CAS# Delay        : Enabled                                        │
│ DRAM Read Burst (B/E/F)   : x2/2/3                                         │
│ DRAM Write Burst (B/E/F)  : x3/3/4                                         │
│ ISA Bus Clock             : PCICLK/4                                       │
│ DRAM Refresh Queue        : Enabled                                        │
│ DRAM RAS Only Refresh     : Disabled                                      │
│ DRAM ECC/PARITY Select    : Disabled                                      │
│ Fast Dram Refresh         : Disabled                                      │
│ Read-Around-Write         : Enabled                                        │
│ PCI Burst Write Combine   : Enabled    ESC : Quit    ↑↓→←    : Select Item │
│ PCI-To-DRAM Pipeline      : Enabled    F1  : Help     PU/PD/+/- : Modify   │
│ CPU-To PCI Write Post     : Enabled    F5  : Old Values (Shift) F2 : Color │
│ System BIOS Cacheable     : Enabled    F6  : Load BIOS Defaults            │
│ Video RAM Cacheable       : Enabled    F7  : Load Setup Defaults           │
└─────────────────────────────────────────────────────────────────────────┘
```

Auto Configuration

Auto Configuration selects predetermined optimal values of chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is Enabled.

DRAM Speed Selection

The value in this field must correspond to the speed of the DRAM installed in your system. DO NOT change the default setting of this field, as determined by the system board manufacturer for the installed DRAM. This value is access speed, so a lower value means a faster system.

DRAM RAS# Precharge Time

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

MA Additional Wait State

Selecting Enabled inserts an additional wait state before the beginning of a memory read. The setting of this parameter depends on the board design. Do not change from the manufacturer's default unless you are getting memory addressing errors.

RAS# to CAS# Delay

This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Disabled gives faster performance; and Enabled gives more stable performance.

DRAM Read Burst (B/E/F)
Set the timing for burst-mode reads from DRAM. The lower the timing numbers, the faster the system addresses memory.

DRAM Write Burst (B/E/F)
Set the timing for burst-mode writes from DRAM. The lower the timing numbers, the faster the system addresses memory.

ISA Bus Clock
Set the speed of the ISA bus here. The settings are tied to the speed of the PCI bus. If the PCI bus operates at 33 MHz, a setting of PCICLK/4 (default) would yield an ISA bus speed of approximately 8 MHz, the standard speed of the ISA bus. While most devices operate at higher ISA bus speeds, try a slower bus speed if your ISA device does not function properly at a high bus speed.

DRAM Refresh Queue
Enabled permits queuing up to four DRAM refresh requests, so DRAM can refresh at optimal times. Disabled makes all refreshes priority requests. Installed DRAM must support this feature; most do.

DRAM RAS Only Refresh
An alternate to CAS-before-RAS refresh. Leave Disabled unless your DRAM requires this older method of refresh generation.

DRAM ECC/Parity Select
Select Parity, ECC, or Disabled, depending on the type of DRAM installed in your system.

Fast DRAM Refresh
The cache DRAM controller offers two refresh modes, Normal and Hidden. In both modes, CAS takes place before RAS but the Normal mode requires a CPU cycle for each. On the other hand, a cycle is eliminated by "hiding" the CAS refresh in Hidden mode. Not only is the Hidden mode faster and more efficient, but it also allows the CPU to maintain the status of the cache even if the system goes into a power management "suspend" mode.

Read-Around-Write
DRAM optimization feature: If a memory read is addressed to a location whose latest write is being held in a buffer before being written to memory, the read is satisfied through the buffer contents, and the read is not sent to the DRAM.

PCI Burst Write Combine
When this option is Enabled, the chipset assembles long PCI bursts from the data held in these buffers.

PCI-To-DRAM Pipeline
DRAM optimization feature: If Enabled, full PCI-to-DRAM write pipelining is enabled. Buffers in the chipset store data written from the PCI bus to memory. When Disabled, PCI writes to DRAM are limited to a single transfer per write cycle.

CPU-To-PCI Write Post

When this field is Enabled, writes from the CPU to the PCI bus are buffered, to compensate for the speed differences between the CPU and the PCI bus. When Disabled, the writes are not buffered and the CPU must wait until the write is complete before starting another write cycle.

CPU-To-PCI IDE Posting

Select Enabled 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.

System BIOS Cacheable

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video RAM Cacheable

Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

8/16 Bit I/O Recovery Time

The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus.

These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

Memory Hole at 15M-16M

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

DRAM Fast Leadoff

Select Enabled to shorten the leadoff cycles and optimize performance.

3.5 Power Management Setup

```
                          ROM PCI/ISA BIOS
                        CMOS SETUP UTILITY
                      POWER MANAGEMENT SETUP
┌──────────────────────────────────────┬──────────────────────────────────────┐
│ Power Management     : Disabled       │  ** Power Down & Resume Events        │
│ PM Control by APM    : Yes            │ IRQ3   (COM2)          : OFF          │
│ Video OFF Method     : V/H SYNC+Blank │ IRQ4   (COM1)          : ON           │
│ MODEM Use IRQ        : 3              │ IRQ5   (LPT 2)         : OFF          │
│                                       │ IRQ6   (Floppy Disk)   : OFF          │
│ Doze Mode            : Disabled       │ IRQ7   (LPT 1)         : ON           │
│ Standard Mode        : Disabled       │ IRQ8   (RTC Alarm)     : OFF          │
│ Suspend Mode         : Disabled       │ IRQ9   (IRQ2 Redir)    : OFF          │
│ HDD Power Down       : Disabled       │ IRQ10  (Reserved)      : OFF          │
│   ** Wake Up Events In Doze & Standby ** │ IRQ11  (Reserved)    : OFF          │
│ IRQ3  (Wake-Up Event)  : ON           │ IRQ12  (PS/2 Mouse)    : ON           │
│ IRQ4  (Wake-Up Event)  : ON           │ IRQ13  (Coprocessor)   : OFF          │
│ 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 option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes. See the section PM Timers for a brief description of each mode.

This table describes each power management mode:

Max Saving   Maximum power savings. Only Available for SL CPUs. Inactivity period is 1 minute in each mode.

User Define   Set each mode individually.   Select time-out periods in the PM Timers section, following.

Min Saving   Minimum power savings. Inactivity period is 1 hour in each mode.

PM Control by APM

If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings.

Video Off Method

Determines the manner in which the monitor is blanked.

V/H SYNC+Blank   System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.

DPMS Support   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.

Modem Use IRQ

This feature allows you to select the IRQ# to meet your modem's IRQ#.

HDD Power Management

HDD Off After

After the selected period of drive inactivity (1 to 15 minutes), the hard disk drive powers down while all other devices remain active. Selecting Suspend tells the drive to power down immediately.

Doze Mode

After the selected period of system inactivity (1 minute to 1 hour), the CPU clock runs at slower speed while all other devices still operate at full speed.

Standby Mode

After the selected period of system inactivity (1 minute to 1 hour), the fixed disk drive and the video shut off while all other devices still operate at full speed.

Suspend Mode

After the selected period of system inactivity (1 minute to 1 hour), all devices except the fixed disk drive and CPU shut off.

PCI Masters

When Enabled, any PCI bus master activity wakes up the system or resets the inactivity timer.

Local Devices

When Enabled, any local device activity wakes up the system or resets the inactivity timer.

IRQn

When Enabled, any activity from the selected IRQ wakes up the system or resets the inactivity timer. The following is a list of IRQs assigned to common system peripherals.

IRQ3 (COM 2)	IRQ10 (Reserved)
IRQ4 (COM 1)	IRQ11 (Reserved)
IRQ5 (LPT 2)	IRQ12 (PS/2 Mouse)
IRQ6 (Floppy Disk)	IRQ13 (Coprocessor)
IRQ7 (LPT 1)	IRQ14 (Hard Disk)
IRQ9 (IRQ2 Redir)	IRQ15 (Reserved)

3.6 PnP/PCI Configuration

```
                         ROM PCI/ISA BIOS
                     PCI CONFIGURATION SETUP
                       AWARD SOFTWARE, INC.
 Resources Controlled By    : Manual      PCI IRQ Activated By       : Level
 Reset Configuration Data   : Disabled    PCI IDE 2nd Channel        : Enabled
                                          PCI IDE IRQ Map To         : PCI-AUTO
 IRQ-3    assigned to       : Legacy ISA    Primary    IDE INT#      : A
 IRQ-4    assigned to       : Legacy ISA    Secondary IDE INT#       : B
 IRQ-5    assigned to       : PCI/ISA PnP
 IRQ-7    assigned to       : PCI/ISA PnP  Use MEM base addr         : N/A
 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       : Legacy ISA
 IRQ-15   assigned to       : Legacy ISA
 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
```

Resources Controlled By

The Award Plug and Play BIOS can automatically configure all the boot and Plug and Play compatible devices. If you select Auto (Manufacture default), all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assign them.

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

IRQ n Assigned to

When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).

PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

DMA n Assigned to

When resources are controlled manually, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:

Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific DMA channel

PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

PCI IRQ Activated by

Leave the IRQ trigger set at Level unless the PCI device assigned to the interrupt specifies Edge-triggered interrupts.

PCI IDE IRQ Map to

This field lets you select PCI IDE IRQ mapping or PC AT (ISA) interrupts. If your system does not have one or two PCI IDE connectors on the system board, select values according to the type of IDE interface(s) installed in your system (PCI or ISA). Standard ISA interrupts for IDE channels are IRQ14 for primary and IRQ15 for secondary.

Primary/Secondary IDE INT#

Each PCI peripheral connection is capable of activating up to four interrupts: INT# A, INT# B, INT# C and INT# D. By default, a PCI connection is assigned INT# A. Assigning INT# B has no meaning unless the peripheral device requires two interrupt services rather than just one. Because the PCI IDE interface in the chipset has two channels, it requires two interrupt services. The primary and secondary IDE INT# fields default to values appropriate for two PCI IDE channels, with the primary PCI IDE channel having a lower interrupt than the secondary.

3.7 Integrated Peripherals

```
                          ROM PCI/ISA BIOS
                       INTEGRATED PERIPHERALS
                        AWARD SOFTWARE, INC.
IDE HDD Block Mode            : 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

KBC input clock               : 8MHz
Onboard FDC Controller        : Enabled
Onboard Serial Port 1         : 3F8/IRQ4
Onboard Serial Port 2         : 2F8/IRQ3
UR 2 Mode                     : Standard      ESC : Quit      ↑↓→←      : Select Item
                                             F1   : Help       PU/PD/+/- : Modify
Onboard Parallel Port         : 378/IRQ7      F5   : Old Values  (Shift) F2  : Color
Parallel Port Mode            : SPP           F6   : Load BIOS Defaults
USB Controller                : Disbaled      F7   : Load Setup Defaults
```

IDE HDD Block Mode
Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

PCI Slot IDE 2nd Channel
You may separately disable the second channel on an IDE interface installed in a PCI expansion slot.

KBC input clock
Keyboard controller input clock rate 8MHz or 12MHz, Default value 8MHz.

On-Chip Primary/Secondary PCI IDE
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.

IDE Primary/Secondary Master/Slave PIO
The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

USB Controller
Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.

Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.

Onboard Serial Port 1/2

Select a logical COM port name and matching address for the first and second serial ports.

Onboard Parallel Port

Select a logical LPT port name and matching address for the physical parallel (printer) port.

Parallel Port Mode

Select an operating mode for the onboard parallel port. Select Compatible or Extended unless you are certain both your hardware and software support EPP (Enhanced Parallel Port) or ECP (Extended Capabilities Port) mode.

SPP	PC AT Standard parallel port
EPP	Fast, bidirectional port used primarily by non-printer peripherals, CD ROM, tape, hard drive, network adapters, etc.
ECP	Fast, buffered port, used primarily by new generation of printers and scanners.

3.8 Load Setup Defaults

Load the system default data directly from ROM and initialize associated hardware properly. This function will be necessary only when the system CMOS data is corrupted.

3.9 Supervisor/ User Password

When you select this function, a message appears at the center of the screen:

```
ENTER PASSWORD:
```

Type the password, up to eight characters, and press Enter. Typing a password clears any previously entered password from CMOS memory.
Now the message changes:

```
CONFIRM PASSWORD:
```

Again, type the password and press Enter.
To abort the process at any time, press Esc.
In the Security Option item in the BIOS Features Setup screen, select System or Setup:

System	Enter a password each time the system boots and when ever you enter Setup.
Setup	Enter a password when ever you enter Setup.

☞ **NOTE:** To clear the password simply press Enter when asked to enter a password. Then the password function is disabled.

3.10 IDE HDD Auto Detection

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


 HARD DISKS  TYPE  SIZE  CYLS  HEAD  PRECOMP  LANDZ  SECTOR  MODE
 Primary Master  :



            Select Primary Master Option (N=Skip):  N
     OPTIONS   SIZE   CYLS   HEAD   PRECOMP   LANDZ   SECTOR   MODE
       2(Y)    540    524    32          0    1047       63   LBA
        1      540    1048   16      65535    1047       63   NORMAL
        3      540    524    32      65535    1047       63   LARGE
     Note:  Some Oses (like SCO-UNIX) must use "NORMAL" for installation
```

The IDE Hard Disk Drive Auto Detection feature automatically configurations your new hard disk. Use it for a quick configuration of new hard drives. This feature allows you to set the parameters of up to four IDE HDDs. The option with "(Y)" are recommended by the system BIOS. You may also keys in your own parameters instead of setting by the system BIOS. After all setting, press ESC key to return the main menu. For confirmation, enter the Standard CMOS Setup feature.

3.11 Save and Exit Setup
After you have made changes under Setup, press <**ESC**> to return to the main menu. Move cursor to "Save and Exit Setup" or press "F10" and then press "Y" to change the CMOS Setup. If you did not change anything, press <**ESC**> again or move cursor to "Exit Without Saving" and press "**Y**" to retain the Setup settings. The following message will appear at the center of the screen to allow you to save data to CMOS and exit the setup utility:

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

3.12 Exit without Saving
If you select this feature, the following message will appear at the center of the screen to allow you to exit the setup utility without saving CMOS modifications:

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

APPENDIX-A   CONNECTORS PINOUT

A.1   FRONT PANEL CONNECTORS

A.1.1   Remote On/Off (CN2)

Pin	Signal Name
1	ATX-Power on
2	Ground

A.1.2   Sleep/Resume Switch (JP18)

Pin	Signal Name
1	Sleep Request
2	Ground

A.1.3   Infra-red (P6)

Pin	Signal Name
1	IRRx
2	GND
3	IRTx
4	+5V

A.1.4   Hard Drive LED (P9)

Pin	Signal Name
1	Pull_Up_330
2	HD_LED-
3	HD_LED-
4	Pull_Up_330

A.1.5   Reset Connector (P8)

Pin	Signal Name
1	Ground
2	Reset

A.1.6   Speaker Connector (P10)

Pin	Signal Name
1	Speaker Data_Out
2	N.C.
3	Ground
4	+5V dc

A.1.7   Keylock Connector (P7)

Pin	Signal Name
1	+5V dc
2	Mechanical Key
3	Ground
4	Keyboard Inhibit
5	Ground

A.1.8 External Battery Connector (P3)

Pin	Signal Name
1	+3.6V dc
2	N.C.
3	Ground
4	Ground

A.1.9 ATX Power Connector (J8)

PIN	Signal Name	Pin	Signal Name
1	+3V	11	+3V
2	+3V	12	-12V
3	GND	13	GND
4	+5V	14	Remote Power On
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	Power Good	18	-5V
9	5V STB	19	+5V
10	+12V	20	+5V

A.1.10 PS/2 Mouse Connector (CN7)

Pin	Signal Name
1	MDATA
2	N.C
3	GND
4	+5V
5	MCLK
6	N.C

A.1.11 PS/2 Keyboard Connector (CN7)

Pin	Signal Name
1	KDATA
2	N.C
3	GND
4	+5V
5	KCLK
6	N.C

A.2 COOLING FAN CONNECTORS

A.2.1 FAN Connector (J9)

Pin	Signal Name	Pin	Signal Name
1	+12V	4	GND
2	N.C	5	N.C
3	GND	6	+12V

A.2.2 CPU FAN Connector (J3)

| Pin	Signal Name
1	GND
2	+12V
3	GND

APPENDIX-B   HARDWARE SETTINGS

B.1   Layout of RHINO II Main Board
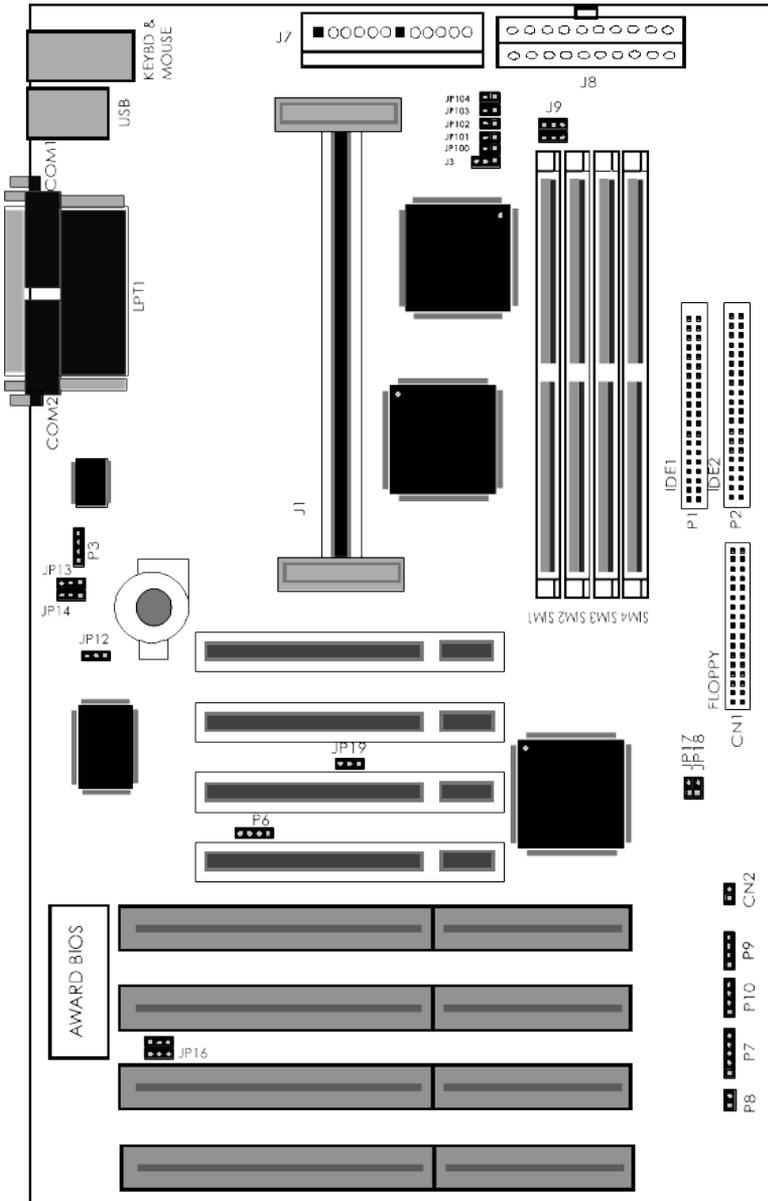
B.2 Back Panel Connections

The back panel provides external access to PS/2 style keyboard and mouse connectors as well as two serial ports and one parallel port.
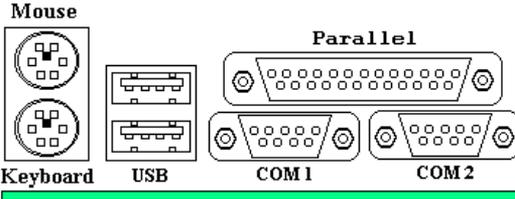
B.3 System Component Map

Jumper Connectors	Function
CN4	COM 1 Port Connector
CN5	COM 2 Port Connector
CN3	PRINTER Port Connector
CN7	PS/2 MOUSE Connector
CN7	PS/2 KEYBOARD Connector
P8	Reset
P7	Keylock
CN2	Power ON
P10	Speaker
P9	IDE LED Connector
P1	Primary IDE Connector
P2	Secondary IDE Connector
CN1	Floppy Connector
P3	External Battery Connector
CN6	USB Connector
P6	Infra Red Connector
JP18	External SMI

B.4 Jumper Settings

B.4.1 PENTIUM® II CPU SPEED

These jumpers allow the board to be configured for different speeds of the Pentium® II processor. The jumpers also affect the PCI and ISA clock speeds according to the following table:

CPU CLOCK

CPU Clock	Bus ratio	JP101	JP102	JP103	JP104
200 MHz	× 3	OPEN	1-2	OPEN	OPEN
233 MHz	× 3.5	1-2	1-2	OPEN	OPEN
266 MHz	× 4	OPEN	OPEN	1-2	OPEN
300 MHz	× 4.5	1-2	OPEN	1-2	OPEN
Res 1	× 5	OPEN	1-2	1-2	OPEN
Res 2	× 5.5	1-2	1-2	1-2	OPEN

Res 1 & Res 2 are Reserved Setting.

Bus Frequency

P6 bus freq	JP100
60MHz	1-2
66MHz *	OPEN

* Manufacture default Bus frequency is 66MHz

28
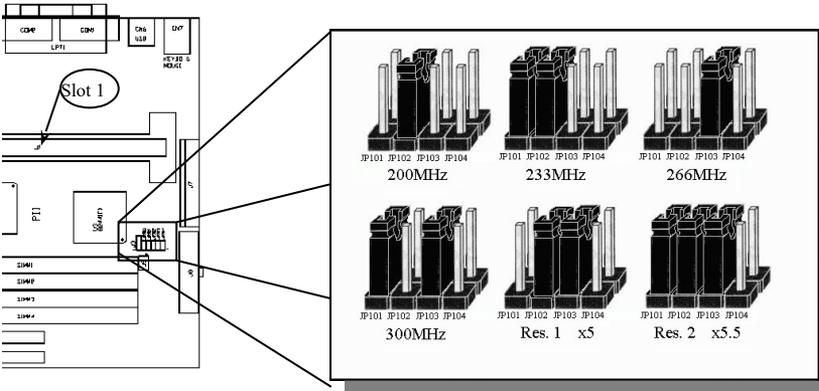
B.4.2   Miscellaneous

Power Supply Type (JP12)

1-2	AT power supply
2-3	ATX power supply

Real Time Clock (RTC) (JP13)

2-3	CLEAR
1-2	NORMAL

Battery (JP14)

1-2	Internal Battery
2-3	External Battery

VGA (JP19)

1-2	NORMAL
2-3	SPECIAL VGA

** Note: Try to change this Jumper setting if your system cannot display correctly.

FLASH (JP16)

1-2*	1M
2-3	2M

* Manufacture Default