

USER'S MANUAL

RHINO18

Pentium PCI Local Bus Motherboard



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Quick Manual for RHINO18

Chapter 1

1.1 General Specifications Overview

Processor:

- ◆ Processor Type Intel Pentium, Pentium with MMX, AMD K5/K6, Cyrix/IBM 6x86/6x86L, Cyrix 6x86MX
- ◆ External CPU clock 50/55/60/66/75 Mhz
- ◆ CPU voltage 2.5V/2.8V/2.9V/3.2V/3.3V/3.52V
support single/dual power plane

Chipset:

- ◆ Motherboard chipset VIA VT82C585VP, VT82C586A

Cache Architecture:

- ◆ External Cache 256K/512K Byte on-board Synchronous Pipelined Burst SRAM

Memory Subsystem:

- ◆ DRAM SIMM sockets 4 x 72 pin 4MB/8MB/16MB/32MB/64MB modules
- ◆ SDRAM DIMM sockets 1x168 pin 8MB/16MB/32MB/64MB Synchronous DRAM/ EDO RAM modules
- ◆ Max. Memory Size 256MB
- ◆ DRAM Type Fast Page Mode or EDO DRAM or Synchronous DRAM
- ◆ Enhancement Mix of Fast Page Mode or EDO DRAM supported

Input/Output Subsystem

- ◆ PCI bus slots 3 x 32-bit PCI bus slots (3 masters)
- ◆ ISA bus slots 2 x 16-bit ISA slots
- ◆ Shared bus slots 1 x 32-bit PCI bus slot (master) OR 1x 16-bit ISA slot

Integrated IDE, Super I/O Subsystem

- ◆ IDE support built-in PCI IDE controller
Ultra DMA33, LS-120 support
2 connectors supporting up to 4 IDE Drives
- ◆ On board I/O One Floppy Port supporting 2 floppy drives of 360KB/720KB / 1.2MB/1.44MB/ 2.88MB capacity.
Two serial ports (16550 Fast UART compatibles)
One parallel Port (Standard, ECP, EPP support)

PS/2 Mouse/Keyboard

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

Power Management

- ◆ Green functions Support various Power Management schemes,
WIN 95 Soft-off function
Sleep switch for power saving
- ◆ Power/On Switch Support Power/On switch when ATX power supply is plugged

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 Microsoft Windows95™ and Plug and Play BIOS compliant
- ◆ Flash EEPROM Use Flash EEPROM (1M bits) to allow easy BIOS update

USB Devices

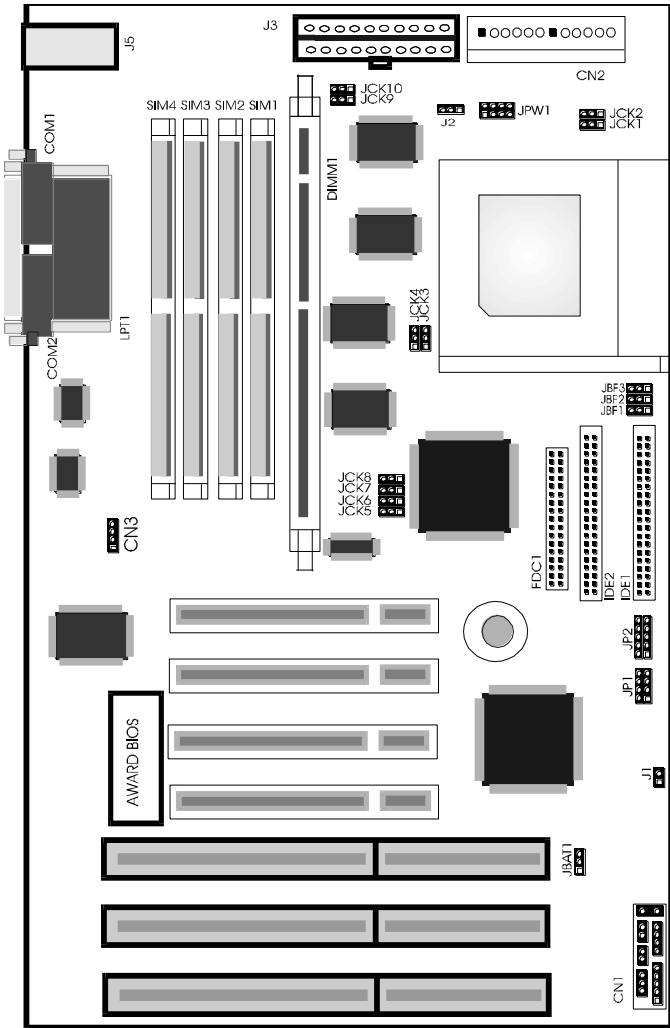
- ◆ USB Devices USB v1.0 and Intel Universal HCI v1.0 compatible; 2 programmable USB ports

Other Features

- ◆ 3.3V/3.5V supply Maximum rating : 30 W.
- ◆ 2.5V~3.2V supply On board 2.5V~3.2V supply supports MMX grade CPUs
- ◆ Switches Reset, Keylock Switches, Sleep Switch.
- ◆ Size 8.5" (W) x 9.3" (L)

HARDWARE INSTALLATION & UPGRADE

2.1 Layout of RHINO18 Main Board



All factory settings are marked by * in the following sections.

2.2 CPU related settings

CPU Voltage Core Selection

RHINO 18 supports Intel Pentium (P54C) & Pentium with MMX (P55C), AMD K5 & K6, Cyrix/IBM 6x86/6x86L. Cyrix 6x86MX. Both single & dual voltage CPUs are supported. For dual voltage CPUs, JCK1/2/3/4 must be set as 2-3 to separate the core voltage & I/O voltage. The voltage selection for core voltage is as follows :

JCK1/2/3/4	JPW1	CPU Core voltage	CPU Type
1-2*	1-2	3.5V	Cyrix/IBM 6x86, AMD K5.
	3-4*	3.3V	Intel P54C
2-3	5-6	3.2V	AMD K6/200/233
	7-8	2.9V	AMD K6/166/200,Cyrix 6x86MX.
	9-10	2.8V	Intel P55C,Cyrix/IBM 6x86L.
	Open	2.5V	Reserved.

☞ Be careful to select the appropriate Core voltage for different CPU. Improper Core voltage supplied to CPU may result in “PERMANENT DAMAGE” to CPU !

☞ The Official Name of P55C is “Pentium Processor with MMX Technology.”

CPU Type

JBF1	JBF2	JBF3	JCK5	JCK6	JCK7	CPU CLK	CPU TYPE
Open	2-3	2-3	2-3	2-3	2-3	50MHz	Intel P54C-75,
Open	2-3	1-2	2-3	2-3	2-3		Cyrix 6x86-P120+
Open	2-3	2-3	2-3	2-3	2-3		AMD K5-PR75
Open	2-3	1-2	2-3	2-3	1-2	55MHz	Cyrix 6x86-P133+
Open	2-3	2-3	1-2	2-3	2-3	60MHz	Intel P54C-90
Open	2-3	1-2	1-2	2-3	2-3		Intel P54C-120
Open	1-2	1-2	1-2	2-3	2-3		Intel P54C-150
Open	1-2	2-3	1-2	2-3	2-3		Intel P54C-180
Open	2-3	1-2	1-2	2-3	2-3		Cyrix 6x86-P150+
Open	1-2	1-2	1-2	2-3	2-3		Cyrix 6x86MX-PR166
Open	2-3	2-3	1-2	2-3	2-3		AMD K5-PR90
Open	2-3	2-3	1-2	2-3	2-3		AMD K5-PR120
Open	2-3	1-2	1-2	2-3	2-3		AMD K5-PR150
Open	2-3	2-3	2-3	1-2	2-3		66MHz
Open	2-3	1-2	2-3	1-2	2-3	Intel P54C-133	
Open	1-2	1-2	2-3	1-2	2-3	Intel P54C-166,P55C-166	
Open	1-2	2-3	2-3	1-2	2-3	Intel P54C-200, P55C-200	
Open	2-3	1-2	2-3	1-2	2-3	Cyrix 6x86-P166+	
Open	1-2	1-2	2-3	1-2	2-3	Cyrix 6x86MX-PR200	
Open	2-3	2-3	2-3	1-2	2-3	AMD K5-PR100	
Open	2-3	2-3	2-3	1-2	2-3	AMD K5-PR133	
Open	1-2	1-2	2-3	1-2	2-3	AMD K5-PR166	
Open	1-2	1-2	2-3	1-2	2-3	AMD K6/166	
Open	1-2	2-3	2-3	1-2	2-3	AMD K6/200	
Open	2-3	2-3	2-3	1-2	2-3	AMD K6/233	
Open	2-3	1-2	1-2	2-3	1-2	75MHz	Cyrix 6x86-P200+
Open	2-3	1-2	1-2	2-3	1-2		IBM 6x86-P200+
Open	1-2	1-2	1-2	2-3	1-2		Cyrix 6x86MX-PR233

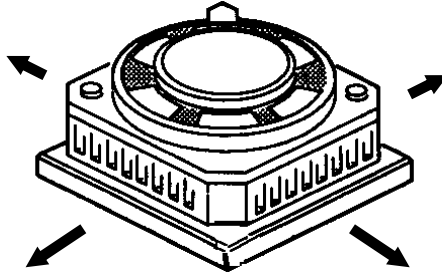
2.3 CPU Cooling Fan and Heatsink

CPU cooling fan is inevitable to the functionality of high speed CPU. The higher the core frequency of CPU, the more heat will be generated. Poor ventilation of the CPU and the voltage regulator will cause overheat. Permanent damage to the motherboard or even damage to the CPU itself will be resulted in the worst case.

Besides, the orientation of 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.

☞ Important :

Make sure the fins of the heating beneath the CPU cooling fan is pointed to the direction of the voltage regulator.



2.4 Voltage for DIMM

Sockets

	JCK9,JCK10
3.3V*	1-2
5V	2-3

2.6 Connectors Pinout

Power LED Connector(CN1 5-9)

Pin	Signal Name
5	GND
7	NC
9	PW_LED

Keylock Connector (CN1 1-3)

Pin	Signal Name
1	-KB_Lock
3	GND

Speaker Connector (CN1 13-19)

Pin	Signal Name
13	Speaker Data_Out
15	N.C.
17	N.C.
19	+5Vdc

Reset Connector (CN1 18-20)

Pin	Signal Name
18	Reset
20	Ground

USB Connector (J4/JP1)

Pin	Signal Name	Pin	Signal Name
5	VCC	1	VCC
6	Port 0-	2	Port 1-
7	Port 0+	3	Port 1+
8	Ground	4	Ground

2.5 RESET CMOS

	JBAT1
CLEAR CMOS	2-3
NORMAL*	1-2

Sleep Switch (CN1 10-12)

Pin	Signal Name
10	Sleep_SW
12	Ground

HD LED Connector (CN1 23-24)

Pin	Signal Name
23	HD_LED-
24	VCC

PS/2 Mouse Connector (J5 upper)

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

ATX Power/On Button(J1)

Pin	Signal Name
1	Ground
2	Power On

CHAPTER 3

PS/2 Power Connector (CN2)

Pin	Signal Name
1	Power Good
2	+5Vdc
3	+12Vdc
4	-12V dc
5	Ground
6	Ground
7	Ground
8	Ground
9	-5Vdc
10	+5Vdc
11	+5Vdc
12	+5Vdc

ATX Power Connector (J3)

Pin No.	Pin Name
1	+3.3V
2	+3.3V
3	GND
4	+5V
5	GND
6	+5V
7	GND
8	PWR GD
9	STB5V
10	+12V
11	+3.3V
12	-12V
13	GND
14	PWR ON
15	GND
16	GND
17	GND
18	-5V
19	+5V
20	+5V

PS/2 Keyboard Connector (J5)

Pin	Signal Name
1	Keyboard data
2	Not used
3	Ground
4	VCC
5	Keyboard clock

Memory Configuration

CHAPTER 3

3.1 SDRAM (Synchronous DRAM) / Fast Page mode / EDO DRAM Installation

There are four SIMM sockets and one DIMM sockets located on the RHINO18 motherboard, marked BANK 0, BANK 1 and BANK 2 which start from right to left consecutively. Either EDO or Fast Page Mode memory can install in BANK 1 or BANK 2.

For SIMM Modules, either Single or Double sided memory module can be installed in pairs on each Memory Bank. For DIMM Modules, either Single or Double sided memory module can be installed. Please reference to the following tables.

RHINO18 supports up to 256MB memory . Both SIMMs and DIMM can be installed simultaneously. Each SIMM and DIMM can support 4MB, 8MB, 16MB, 32MB, and 64MB. Any combinations of SIMM and DIMM installed should not exceed the maximum memory size.

The memory size installed can be calculated easily by applying the following formula : -

$$M = 2 \times S \times B + D$$

where M is the Total Memory Installed

S is the Memory Size of the installed SIMM

B is the no. of Memory Bank installed with SIMM

D is the Memory Size of the installed DIMM.

For example : all SIMMs are installed with 4MB modules and one 16MB EDO is installed on DIMM socket. The total memory M is :-

$$S = 4\text{MB} ; B = 2; D = 16\text{MB}$$

$$M = 2 \times 4 \times 2 + 16 = 32 \text{ MB}$$

3.3V SDRAM/5V EDO DIMM module can be used on RHINO 18. System BIOS will automatically detect the memory type & size.

☞ For 3.3V SDRAM module, make sure to set JCK9, JCK10 to 1-2 for 3.3V supply. It is not recommended to mix 3.3V module with 5V module at the same time.

CMOS Setup Configuration

BIOS Setup

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.

4.1 CMOS Setup Utility

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

ROM PCI/ISA BIOS CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP BIOS FEATURES SETUP CHIPSET FEATURE SETUP POWER MANAGEMENT SETUP PNP/PCI CONFIGURATION LOAD SETUP DEFAULTS	INTEGRATED PERIPHERALS 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..	

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

4.2 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: 15360K			
Video : EGA/VGA					Other Memory: 384K			
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.

4.3 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 External Cache	: Enabled	CC000 - CFFFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D0000 - D3FFF Shadow	: Disabled
Boot Sequence	: A, C, SCSI	D4000 - D7FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D8000 - DBFFF Shadow	: Disabled
Boot Up Floppy Seek	: Disabled	DC000 - DFFFF Shadow	: Disabled
Boot Up NumLock Status	: On		
Boot Up System Speed	: High		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: Setup	ESC : Quit	↑↓→← : Select Item
PCI/VGA Palette Snoop	: Disabled	F1 : Help	PU/PD/+/- : Modify
OS Select For DRAM > 64MB	: Non-OS2	F5 : Old Values (Shift)	F2 : Color
		F6 : Load BIOS Defaults	
		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, modem 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.

External 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, modem 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 may 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.

4.4 Chipset Features Setup

ROM PCI/ISA BIOS CMOS SETUP UTILITY CHIPSET FEATURES SETUP			
Auto Configuration	: Enabled	8 Bit I/O Recovery Time	: 1
DRAM Speed Selection	: 70ns	16 Bit I/O Recovery Time	: 1
DRAM RAS# Precharge Time	: 3	Memory Hole At 15M-16M	: Disabled
MA Additional Wait State	: Disabled	DRAM Fast Leadoff	: Disabled
RAS# To CAS# Delay	: Enabled	Passive Release	: Enabled
DRAM Read Burst (B/E/F)	: x2/3/4	Delayed Transaction	: Disabled
DRAM Write Burst (B/E/F)	: x3/3/4		
ISA Bus Clock	: PCICLK/3		
DRAM Refresh Queue	: Enabled		
DRAM RAS Only Refresh	: Enabled		
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.

DRAMRAS Only Refresh

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

DRAMECC/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.

4.5 Power Management Setup

ROM PCI/ISA BIOS CMOS SETUP UTILITY POWER MANAGEMENT SETUP		
Power Management	: User Define	** Power Down & Resume Events
PM Control by APM	: Yes	IRQ3 (COM2) : ON
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) : 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 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 minutes 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 hours 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 minutes to 1 hours), 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 minutes to 1 hours), 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 minutes to 1 hours), 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)

4.6 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
IRQ-3 assigned to	: Legacy ISA	PCI IDE IRQ Map To	: PCI-AUTO
IRQ-4 assigned to	: Legacy ISA	Primary IDE INT#	: A
IRQ-5 assigned to	: PCI/ISA PnP	Secondary IDE INT#	: B
IRQ-7 assigned to	: Legacy ISA	Used 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, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns 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.

4.7 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
IDE Primary Master UDMA	: Enabled
IDE Primary Slave UDMA	: Enabled
IDE Secondary Master UDMA	: Enabled
IDE Secondary Slave UDMA	: Enabled
PCI Slot IDE 2nd Channel	: Disabled
USB Controller	: Disabled
Onboard FDC Controller	: Enabled
Onboard UART 1	: 3F8/IRQ4
Onboard UART 2	: 2F8/IRQ3
Onboard UART 2 Mode	: Standard
Onboard Parallel Port	: 378/IRQ7
Parallel Port Mode	: Normal
ESC : Quit ↑↓→← : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift) F2 : Color F6 : Load BIOS Defaults 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.

IDE Primary/Secondary Master/Slave UDMA

The integrated peripheral controller contains an IDE interface with support for DMA33 mode. 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.

Compatible	PC AT parallel port
Extended	PS/2-compatible, bidirectional
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.

4.8 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.

4.9 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.

4.10 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

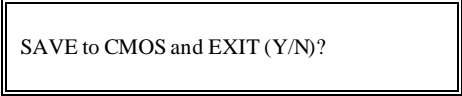
Note: Some Oses (like SCO-UNIX) must use "NORMAL" for installation

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.

4.11 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)?

4.12 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)?

