

User's Manual

English

Chinese

Rhino 10

586 PCI Mainboard

 *Octek*

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Ocean Office Automation Ltd.
5th Floor, Kader Industrial Building,
22 Kai Cheung Road, Kowloon Bay,
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1.1 General Specifications Overview

Processor:

- Processor Type Intel Pentium CPU including P54C, P54CQS, P54CS, P55C, AMD K5 and Cyrix 6x86 CPU.
- External CPU clock 50/55/60/66 MHz

Chipset:

- Motherboard chipset Intel 82430VX
- Super I/O chipset 669 super I/O chipset

Cache Architecture:

- External Cache 256/512KB Synchronous Pipelined Burst SRAM

Memory Subsystem:

- DRAM SIMM sockets 4 x 72 pin 4MB / 8MB / 16MB / 32MB DRAM modules
- SDRAM DIMM sockets 2x168 pin 8MB / 16MB / 32MB / 64MB Synchronous DRAM / EDO RAM modules
- Max. Memory Size 128MB
- 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 2 x 32-bit PCI Bus slots (3 masters)
- ISA bus slots 3 x 16-bit ISA slots
- Shared bus slots 1 x 32 bit PCI bus slot (master) OR 1 x 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
- 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

- PS/2 Mouse Supports PS/2 Mouse through a 1x4 header

Power Management

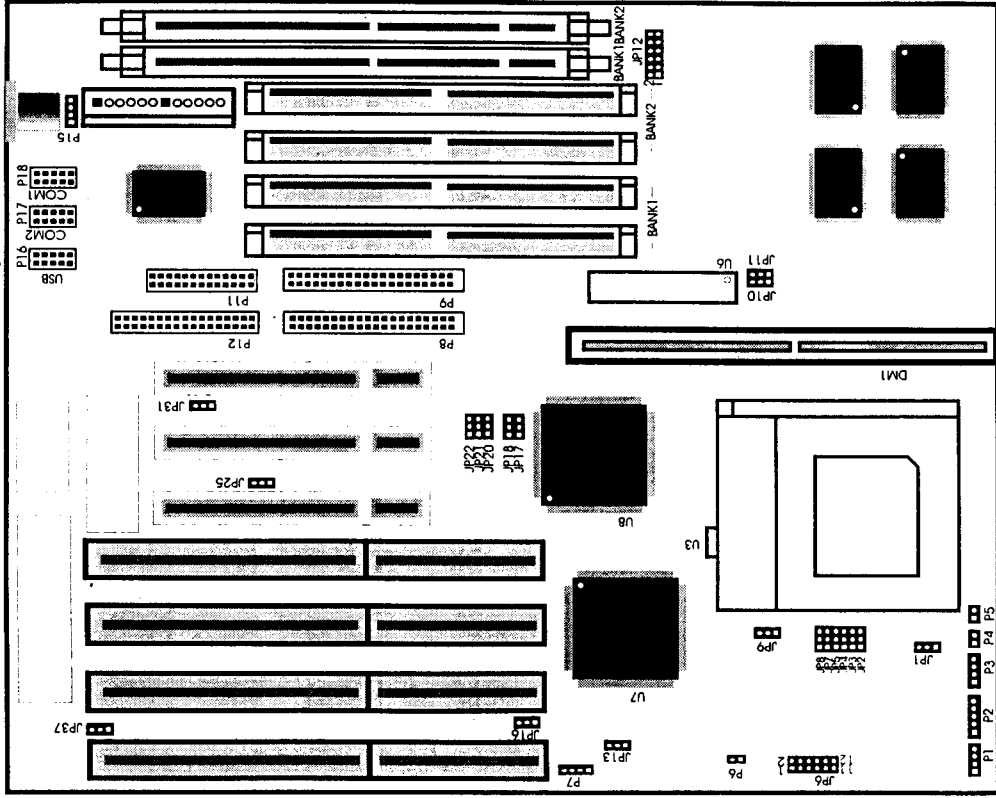
- Green functions Support various Power Management schemes
- Sleep Switch for power saving Sleep Switch for power saving

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

HARDWARE INSTALLATION & UPGRADE

2.1 Layout of RHINO 10 Main Board



Plug & Play / BIOS Update

- ◆ Plug & Play BIOS
- ◆ Flash EEPROM
- ◆ Support Plug & Play for easy installation
- ◆ Use Flash EEPROM (1M bits) to allow easy BIOS update

USB Devices

- ◆ USB Devices
- ◆ Interfaced with both host and hub control functions
- ◆ 2 programmable USB ports

System Support Functions

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

Other Features

- ◆ Power good
- ◆ 3.3V supply
- ◆ On board power good signal generation
- ◆ On board 3.3V supply to eliminate the need for special power supply for 3.3V component e.g. CPU, SRAM. Maximum rating : 30 W.
- ◆ 2.5V~2.9V supply
- ◆ Switches
- ◆ Size
- ◆ On board 2.5V~2.9V supply supports MMX grade CPUs
- ◆ Reset, Keylock, switches, Sleep Switch.
- ◆ 8.5" (W) x 11" (L)

JUMPER SETTING

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

2.2 CPU related settings

CPU Voltage Core Selection

RHINO 10 has on board 3.3V/3.5V regulators to directly support Intel Pentium CPU such as P54C, P54CQS, P55C, Cyrix 6x86 and AMD K5 CPUs. For MMX graded CPU, JP2-5 and JP7-8 must be set as 1-2. The voltage selection for Core voltage is set as follows :

JP2-5, JP7-8	JP6	CPU Core voltage	CPU Type
2-3*	1-2	3.5V	Cyrix 6x86, AMD K5.
	3-4*	3.3V	Intel P54C, P54CQS, P55C, P55C.
1-2	5-6	2.9V	Reserved.
	7-8	2.8V	Intel P55C.
	9-10	2.7V	Reserved.
	11-12	2.6V	Reserved.
	Open	2.5V	Reserved.

NOTE : Be careful to select the appropriate Core voltage for different CPU. Improper Core voltage supplied to CPU may result in "PERMANENT DAMAGE" to CPU !

NOTE : The official name of P55C is "Pentium(r) Processor with MMX Technology".

CPU Type

JP17	JP18	JP20	JP21	JP22	JP9	CPU Clock	CPU TYPE
1-2	1-2	1-2	1-2	1-2	1-2	50MHz	Intel P54C-75
1-2	2-3	1-2	1-2	1-2	1-2	50MHz	Cyrix 6x86-P120+ (100MHz)
1-2	1-2	1-2	1-2	1-2	1-2	55MHz	AMD K5-PR75
1-2	2-3	1-2	1-2	2-3	1-2	55MHz	Cyrix 6x86-P133+ (110MHz)
1-2	1-2	2-3	1-2	1-2	2-3	60MHz	Intel P54C-90
1-2	2-3	2-3	1-2	1-2	2-3	60MHz	Intel P54C-120
2-3	2-3	1-2	1-2	2-3	2-3	60MHz	Intel P54C-150
2-3	1-2	2-3	1-2	1-2	2-3	60MHz	Intel P54C-180
1-2	2-3	2-3	1-2	1-2	2-3	60MHz	Cyrix 6x86-P150+ (120MHz)
1-2	1-2	2-3	1-2	1-2	2-3	60MHz	AMD K5-PR90
1-2	1-2	2-3	1-2	1-2	2-3	60MHz	AMD K5-PR120 (90MHz)
1-2	2-3	2-3	1-2	1-2	2-3	60MHz	AMD K5-PR150 (120MHz)
1-2	1-2	1-2	2-3	1-2	1-2	66MHz	Intel P54C-100
1-2	2-3	1-2	2-3	1-2	1-2	66MHz	Intel P54C-133
2-3	2-3	1-2	2-3	1-2	1-2	66MHz	Intel P54C-166
2-3	1-2	1-2	2-3	1-2	1-2	66MHz	Intel P54C-200
1-2	2-3	1-2	1-2	1-2	1-2	66MHz	Cyrix 6x86-P166+ (133MHz)
1-2	1-2	1-2	2-3	1-2	1-2	66MHz	AMD K5-PR100
1-2	1-2	1-2	2-3	1-2	1-2	66MHz	AMD K5-PR133 (100MHz)

2.3 Control of System Speed

System speed can be controlled by keyboard. To change the speed by keyboard, use the minus sign (-) and the plus sign (+). Press <Ctrl> + <alt> + <“-”> for slow speed and <Ctrl> + <alt> + <“+”> for fast speed.

2.4 Reset CMOS

If the setting of the system setup is done improperly, it may make the system malfunction. If this happens, turn off the power and set jumper JP16 to 2-3 to clear the internal CMOS status register. Wait at least 5 seconds to ensure that the CMOS content has been completely cleared.

Next, set the jumper JP16 back to 1-2 and turn on the power. The BIOS will find the CMOS status register is reset and will regard the setup information invalid, so it will prompt you to correct the information.

2.5 Peripheral setup

CMOS discharge

	JP16
Preserve CMOS	1-2 *
Clear CMOS	2-3

PS/2 MOUSE support

	JP37
Enabled	1-2*
Disabled	2-3

Battery select

	JP13
On-board Battery	1-2 *
External Battery	2-3

Power Good Signal

	JP25
External Power Good	1-2 *
On-board Power Good	2-3

2.6 Voltage for DIMM Sockets

	JP12
3.3V*	1-2,3-4,5-6*
5V	7-8,9-10,11-12

2.7 Connectors Pinout

HD LED Connector (P1)

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

Keyboard Connector (P2)

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

Speaker Connector (P3)

Pin	Signal Name
1	Speaker Data Out
2	N.C.
3	Ground
4	+5Vdc

Reset Connector (P4)

Pin	Signal Name
1	Reset
2	Ground

CHAPTER 3

Turbo LED Connector (P5)

Pin	Signal Name
1	Pull_Up_150
2	LED_Turbo-

Sleep Switch (P6)

Pin	Signal Name
1	EPMI
2	Ground

External Battery Connector (P7)

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

PS/2 Mouse Connector (P15)

Pin	Signal Name
1	+5V dc
2	GND
3	MDATA
4	MCLK

USB Connector (P16)

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

Power Connector (P13,P14)

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

Keyboard Connector (KB1)

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

CACHE & MEMORY CONFIGURATION

3.1 External cache (L2 cache) setting

256K Synchronous SRAM Configuration :

1. 256K cache using on board 256K SRAM

SRAM	Location	Type	Speed	Voltage
Tag SRAM	U6	8Kx8 /32Kx8	15ns	5V I/O
Data SRAM (1 st 256K)	U1,U2	2 pcs of 32Kx32 pipelined burst SRAM	7ns (Clock to o/p valid)	3.3V I/O
JP10		JP11		
2-3*		OPEN		

512K cache using on board 256K and 256K Cache Module

SRAM	Location	Type	Speed	Voltage
Tag SRAM	U6	32Kx8	15ns	5V I/O
Data SRAM (1 st 256K)	U1,U2	2 pcs of 32Kx32 pipelined burst SRAM	7ns (Clock to o/p valid)	3.3V I/O
Data RAM (2 nd 256K)	DM1	256K Cache Module w/o Tag	7ns (Clock to o/p valid)	3.3V I/O
JP10		JP11		
1-2		2-3		

Note: If 256K Cache Module contains a Tag RAM, U10 need not be installed

Memory Configuration

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

There are four SIMM sockets and two DIMM sockets located on the RHINO 10 motherboard, marked BANK 1 and BANK 2 which start from right to left consecutively. Either SDRAM 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.

BANK 1		BANK 2		Total
-----	512Kx32	512Kx32	512Kx32	4MB
-----	1Mx32	1Mx32	1Mx32	8MB
-----	2Mx32	2Mx32	2Mx32	16MB
-----	4Mx32	4Mx32	4Mx32	32MB
-----	8Mx32	8Mx32	8Mx32	64MB
-----	-----	-----	-----	4MB
-----	512Kx32	-----	-----	8MB
-----	1Mx32	-----	-----	16MB
-----	2Mx32	-----	-----	32MB
-----	4Mx32	-----	-----	64MB
-----	8Mx32	-----	-----	128MB
512Kx32	512Kx32	512Kx32	512Kx32	8MB
1Mx32	1Mx32	1Mx32	1Mx32	12MB
2Mx32	2Mx32	2Mx32	2Mx32	12MB
4Mx32	4Mx32	4Mx32	4Mx32	16MB
8Mx32	8Mx32	8Mx32	8Mx32	20MB
512Kx32	512Kx32	512Kx32	512Kx32	24MB
1Mx32	1Mx32	1Mx32	1Mx32	24MB
2Mx32	2Mx32	2Mx32	2Mx32	24MB
4Mx32	4Mx32	4Mx32	4Mx32	24MB
8Mx32	8Mx32	8Mx32	8Mx32	24MB
512Kx32	512Kx32	512Kx32	512Kx32	32MB
1Mx32	1Mx32	1Mx32	1Mx32	36MB
2Mx32	2Mx32	2Mx32	2Mx32	40MB
4Mx32	4Mx32	4Mx32	4Mx32	48MB
8Mx32	8Mx32	8Mx32	8Mx32	48MB
512Kx32	512Kx32	512Kx32	512Kx32	36MB
1Mx32	1Mx32	1Mx32	1Mx32	40MB
2Mx32	2Mx32	2Mx32	2Mx32	48MB
4Mx32	4Mx32	4Mx32	4Mx32	48MB
8Mx32	8Mx32	8Mx32	8Mx32	48MB
512Kx32	512Kx32	512Kx32	512Kx32	40MB
1Mx32	1Mx32	1Mx32	1Mx32	48MB
2Mx32	2Mx32	2Mx32	2Mx32	48MB
4Mx32	4Mx32	4Mx32	4Mx32	48MB
8Mx32	8Mx32	8Mx32	8Mx32	48MB
512Kx32	512Kx32	512Kx32	512Kx32	64MB
1Mx32	1Mx32	1Mx32	1Mx32	68MB
2Mx32	2Mx32	2Mx32	2Mx32	72MB
4Mx32	4Mx32	4Mx32	4Mx32	80MB
8Mx32	8Mx32	8Mx32	8Mx32	80MB
512Kx32	512Kx32	512Kx32	512Kx32	96MB
1Mx32	1Mx32	1Mx32	1Mx32	68MB
2Mx32	2Mx32	2Mx32	2Mx32	72MB
4Mx32	4Mx32	4Mx32	4Mx32	80MB
8Mx32	8Mx32	8Mx32	8Mx32	80MB
512Kx32	512Kx32	512Kx32	512Kx32	96MB
1Mx32	1Mx32	1Mx32	1Mx32	128MB
2Mx32	2Mx32	2Mx32	2Mx32	96MB
4Mx32	4Mx32	4Mx32	4Mx32	96MB
8Mx32	8Mx32	8Mx32	8Mx32	128MB

Table 1 SIMM Memory Configuration Table

Bank 1	Bank 2	Total
1M x 64	-----	8 MB
-----	-----	8 MB
1M x 64	1M x 64	16MB
2M x 64	1M x 64	16MB
-----	-----	16MB
2M x64	2M x64	16MB
1M x 64	1M x 64	24MB
2M x64	2M x64	24MB
4Mx64	2M x64	32MB
-----	-----	32MB
4Mx64	4Mx64	32MB
1M x 64	1M x 64	40MB
4Mx64	4Mx64	40MB
2M x64	2M x64	48MB
4Mx64	4Mx64	48MB
8Mx64	4Mx64	64MB
-----	-----	64MB
8Mx64	8Mx64	64MB
1M x 64	1M x 64	72MB
8Mx64	8Mx64	72MB
2M x 64	2M x 64	80MB
8Mx64	8Mx64	80MB
4Mx64	4Mx64	96MB
8Mx64	8Mx64	96MB
8Mx64	8Mx64	128MB

Table 2 DIMM Memory Configuration Table

!! IMPORTANT :

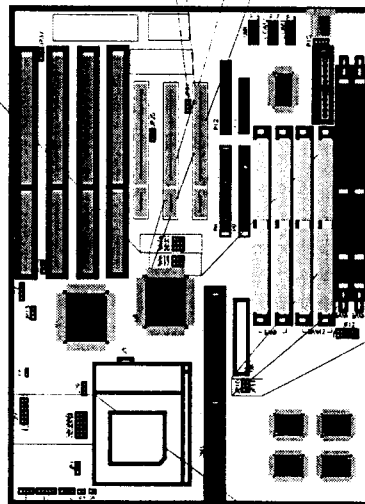
IF SIMMS ARE INSTALLED, DO NOT INSTALL DIMM IN THE CORRESPONDING BANK, OR VICE VERSA.

IF DIMM INSTALLED, THE DIMM VOLTAGE SHOULD BE SET CORRECTLY FOR SDRAM OR EDO RAM.

Quick Manual for RHINO 10

CPU CLOCK SETTING				
	50 MHz	55 MHz	60 MHz	66 MHz
JP9	1-2	1-2	2-3	1-2
JP20	1-2	1-2	2-3	1-2
JP21	1-2	1-2	1-2	2-3
JP22	1-2	2-3	1-2	1-2

CLOCK MULTIPLIER				
	x1.5	x2	x2.5	x3
JP17	1-2	1-2	2-3	2-3
JP18	1-2	2-3	2-3	1-2



CACHE SIZE		
	256K	512K
JP10	2-3	1-2
JP11	NC	2-3

VOLTAGE SELECT			
JP6	V _{core}	JP2-5, JP7-8	VIO
1-2	3.5V		
3-4	3.3V		
5-6	2.9V	2-3	SINGLE POWER CPUs
7-8	2.8V		
9-10	2.7V	1-2	SPLITTED POWER CPUs
11-12	2.6V		
OPEN	2.5V		