

ASUS[®] P2B-N
Pentium[®] II NLX Motherboard

USER'S MANUAL

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FCC & DOC COMPLIANCE

Federal Communications Commission Statement

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING! The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

I. INTRODUCTION

How this manual is organized

This manual is divided into the following sections:

- I. Introduction:** Manual information and checklist
- II. Features:** Information and specifications concerning this product
- III. Installation:** Instructions on setting up the motherboard and jumpers
- IV. BIOS Software:** Instructions on setting up the BIOS software
- V. Support CD:** Information on the included support software

Item Checklist

Please check that your package is complete. If you discover damaged or missing items, please contact your retailer.

- (1) ASUS motherboard
- (1) Universal retention mechanism for SECC/SECC2/SEPP
- (1) IDE ribbon cable for one hard disk drive
- (1) Floppy ribbon cable for one 3.5" floppy disk drive
- (1) FPC slim CD-ROM cable
- (1) Support CD with drivers and utilities
- (1) Motherboard User's Manual
- (1) System housing User's Manual

- (1) NLX Form-factor system housing, riser card, and power supply
- ASUS Slim CD-ROM (optional)
- ASUS PC100-compliant SDRAM (optional)
- S-P2FAN or P2T-Cable for Slot 1 processors (optional)
- IrDA-compliant infrared module (optional)



II. FEATURES

Features of the ASUS P2B-N Motherboard

The ASUS P2B-N motherboard is carefully designed for the demanding PC user who wants many advanced features processed by the fastest CPU.

Specifications

- **NLX:** Features ASUS' custom designed NLX form factor.
- **Multi-Speed:** Supports Intel Pentium® II (233MHz to 450MHz) and Celeron™ (266MHz and faster) processors.
- **Multi-Cache:** Supports processors with or without Pipelined Burst Level 2 cache.
- **Intel AGPset:** Features Intel's 440BX AGPset with I/O subsystems and front-side bus (FSB) platform, which boosts the traditional 66-MHz internal bus speed to 100MHz.
- **PC100 Memory Support:** Equipped with two DIMM sockets to support Intel PC100-compliant SDRAMs (8, 16, 32, 64, 128, or 256MB) up to 512MB.
- **100/10Mbps LAN:** Features an onboard Intel 82558 Ethernet LAN Controller (fully integrated 10BASE-T/100BASE-TX) and a LAN Activity LED for monitoring network conditions.
- **AGP VGA:** Features an onboard ATI 3D Rage Pro AGP 2X (8MB SDRAM) or Rage IIC (4MB SDRAM) for 3D hardware acceleration.
- **PCI Audio:** Features onboard the ESS Solo-1 32-bit 3D positional PCI audio which supports games and applications for Sound Blaster™ and Sound Blaster Pro and full-duplex stereo.
- **Thermal Sensor Connector with Optional Sensor:** Accurately detects the CPU temperature of processors with the ASUS Smart Fan or the Intel boxed processor heatsink with fan when connected to an ASUS P2T-Cable.
- **Hardware Monitoring:** Monitors your system's vital components/activities, such as fan rotations, voltages, and temperatures.
- **Riser Card:** Provides NLX power, primary IDE, floppy drive, LAN wake up connector, 2 PCI slots, 1 ISA slot, 2 USB ports, and 1 IrDA port.
- **Ultra DMA/33 BM IDE:** Comes with an onboard PCI Bus Master IDE controller with two connectors that supports four IDE devices in two channels, supports Ultra DMA/33, PIO Modes 3 and 4 and Bus Master IDE DMA Mode 2, and supports Enhanced IDE devices, such as Tape Backup, CD-ROM, and LS-120 drives.
- **Universal Retention Mechanism:** Supports a Pentium® II processor packaged in a Single Edge Contact Cartridge (SECC/SECC2) or a Celeron™ processor packaged in a Single Edge Processor Package (SEPP).
- **Wake-On-LAN Connector:** Supports Wake-On-LAN activity through the network interface.
- **IrDA Port:** Features an infrared port on the riser card for wireless interface.
- **Slim CD-ROM:** Supports an optional ASUS slim CD-ROM drive for ASUS' custom designed NLX form factor.

II. FEATURES

Special Features

- **ACPI Ready:** Features ACPI (Advanced Configuration and Power Interface) which is implemented on all ASUS smart series motherboards. ACPI provides more Energy Saving Features for future operating systems (OS) supporting OS Direct Power Management (OSPM) functionality. With these features implemented in the OS, PCs can be ready around the clock, yet satisfy all the energy saving standards. To fully utilize the benefits of ACPI, an ACPI-supported OS such as the successor of Windows 95 must be used.
- **Desktop Management Interface (DMI):** Supports DMI through BIOS which allows hardware to communicate within a standard protocol creating a higher level of compatibility. (Requires DMI-enabled components.)
- **Easy Installation:** Incorporates BIOS that supports autodetection of hard disk drives, PS/2 mouse, and Plug and Play devices to make setup of hard disk drives, expansion cards, and other devices virtually automatic.
- **Enhanced ACPI & Anti-Boot Virus BIOS:** Features a programmable BIOS (Flash EEPROM), offering enhanced ACPI for Windows 98 compatibility, built-in hardware-based virus protection, and autodetection of most devices for virtually automatic setup.
- **PC '98 Compliant:** Meets PC '98 compliancy in both the BIOS and hardware levels of ASUS smart series motherboards. The new PC '98 requirements for systems and components are based on the following high-level goals: Support for Plug and Play compatibility and power management for configuring and managing all system components, and 32-bit device drivers and installation procedures for Windows 95/98/NT.
- **Bundled PC-cillin:** Automatically detects and removes all viruses while your work.

Performance

- **Concurrent PCI:** Supports concurrent PCI, allowing multiple PCI transfers from PCI master buses to memory to CPU.
- **Double the IDE Transfer Speed:** Supports Ultra DMA/33 Bus Master IDE, which can improve data transfers up to 33MB/s. The best of all is that this new technology is compatible with existing ATA-2 IDE specs so there is no need to upgrade current hard drives or cables.
- **SDRAM Optimized Performance:** Supports the new generation memory, Synchronous Dynamic Random Access Memory (SDRAM), which increases the data transfer rate from 264MB/s max (using EDO memory) to 528MB/s max (using SDRAM).

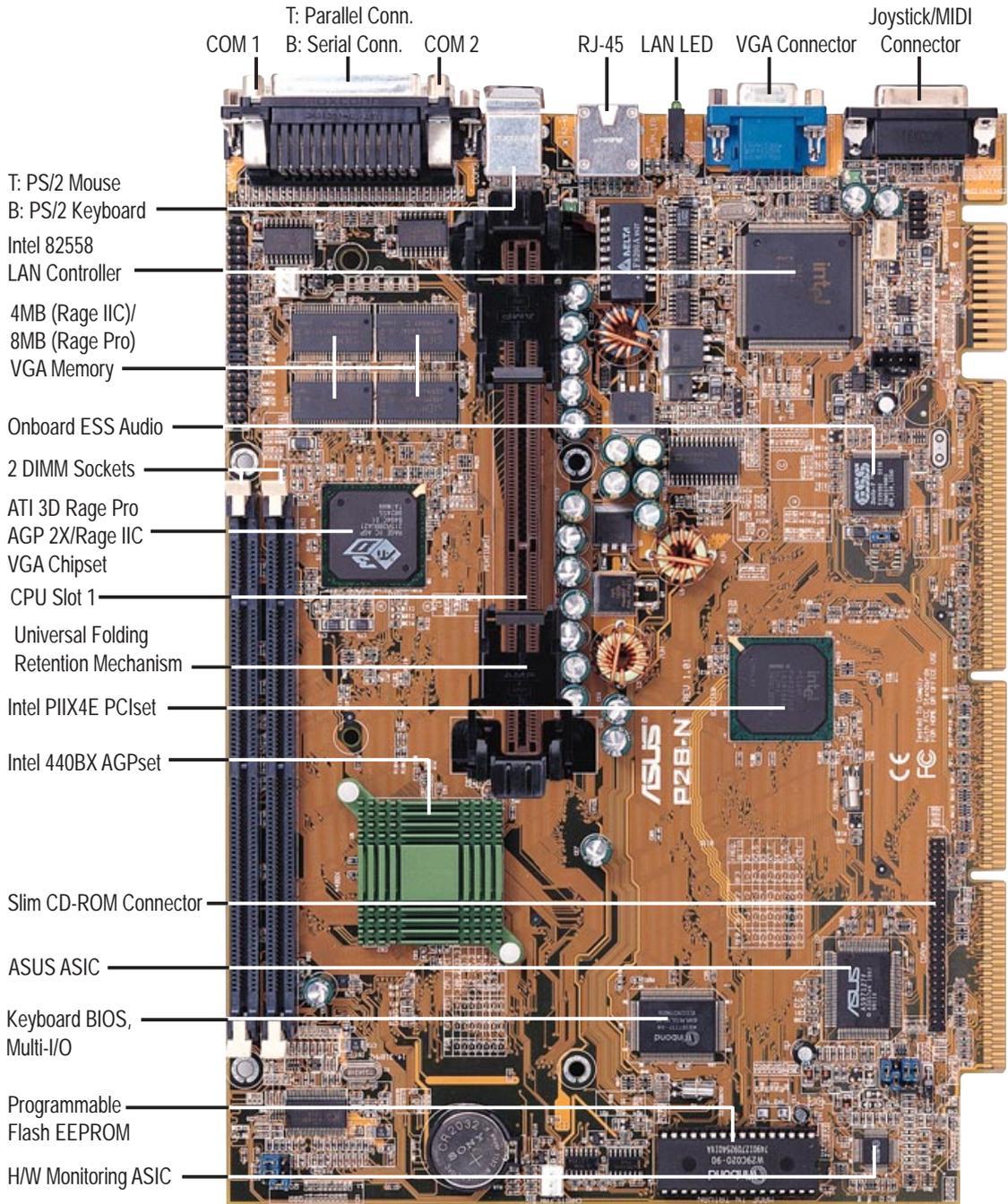
II. FEATURES

Intelligence:

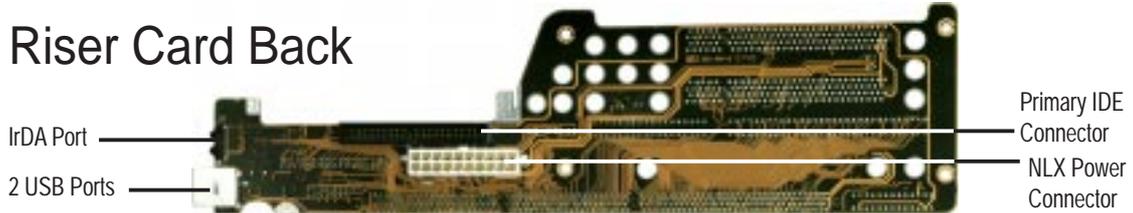
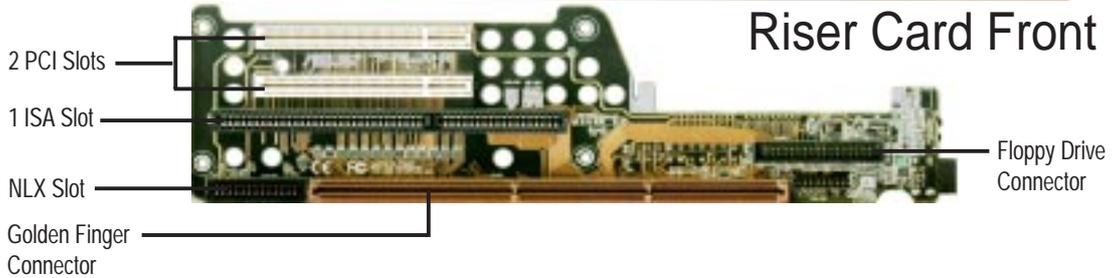
- **Auto Fan Off:** The system fans will power off automatically **even in sleep mode**. This function reduces both energy consumption *and* **system noise**, and is an important feature to implement silent PC systems.
- **Boot Virus Protection:** Anti-boot virus protection programmed into the BIOS.
- **Dual Function Power Button:** Pushing the power button for less than 4 seconds when the system is in the working state places the system into one of two states: sleep mode or soft-off mode, depending on the BIOS setting (see “Power Management Setup” in **IV. BIOS SOFTWARE**). When the power button is pressed for more than 4 seconds, it enters the soft-off mode regardless of the BIOS setting.
- **Fan Status Monitoring and Alarm:** To prevent system overheat and system damage, the CPU fan and system fans can be monitored for RPM and failure. All fans are set for its normal RPM range and alarm thresholds.
- **Keyboard Power (Wake) Up:** Keyboard Power (Wake) Up can be enabled or disabled to allow the computer to be powered on from the keyboard.
- **Message LED (requires ACPI OS support):** Chassis LEDs now act as information providers. Through the way a particular LED illuminates, the user can determine the stage the computer is in. A simple glimpse provides useful information to the user.
- **Remote Ring On (requires external modem):** This allows a computer to be turned on remotely through an external modem. With this benefit on-hand, any user can access vital information from their computer from anywhere in the world!
- **System Resources Alert:** Today’s operating systems such as Windows 95, Windows NT, and OS/2, require much more memory and hard drive space to present enormous user interfaces and run large applications. The system resource monitor will warn the user before the system resources are used up to prevent possible application crashes. Suggestions will give the user information on managing their limited resources more efficiently.
- **Temperature Monitoring and Alert:** To prevent system overheat and system damage, there are thermal sensors to monitor the CPU (the Pentium II processor requires a special heatsink with a thermal sensor) and system temperatures to warn of damaging temperatures.
- **Voltage Monitoring and Alert:** System voltage levels are monitored to ensure stable current to critical motherboard components. Voltage specifications are more critical for future processors, so monitoring is necessary to ensure proper system configuration and management.

II. FEATURES

Parts of the ASUS P2B-N Motherboard

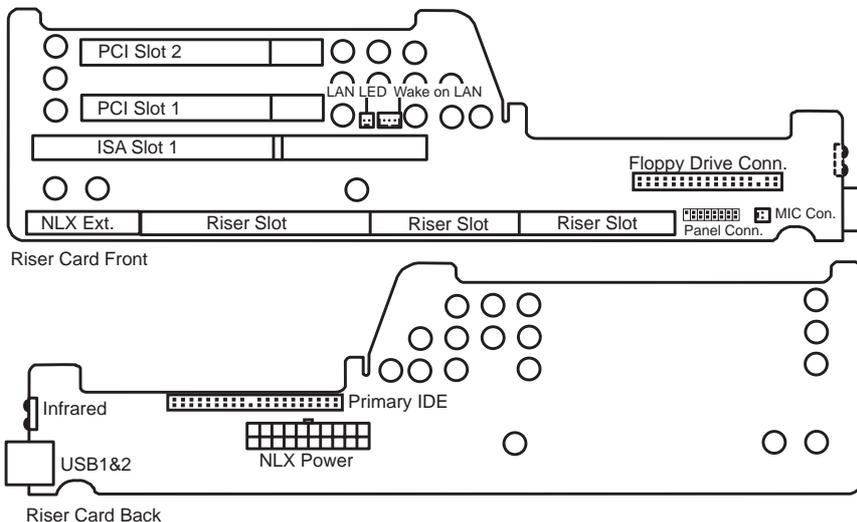
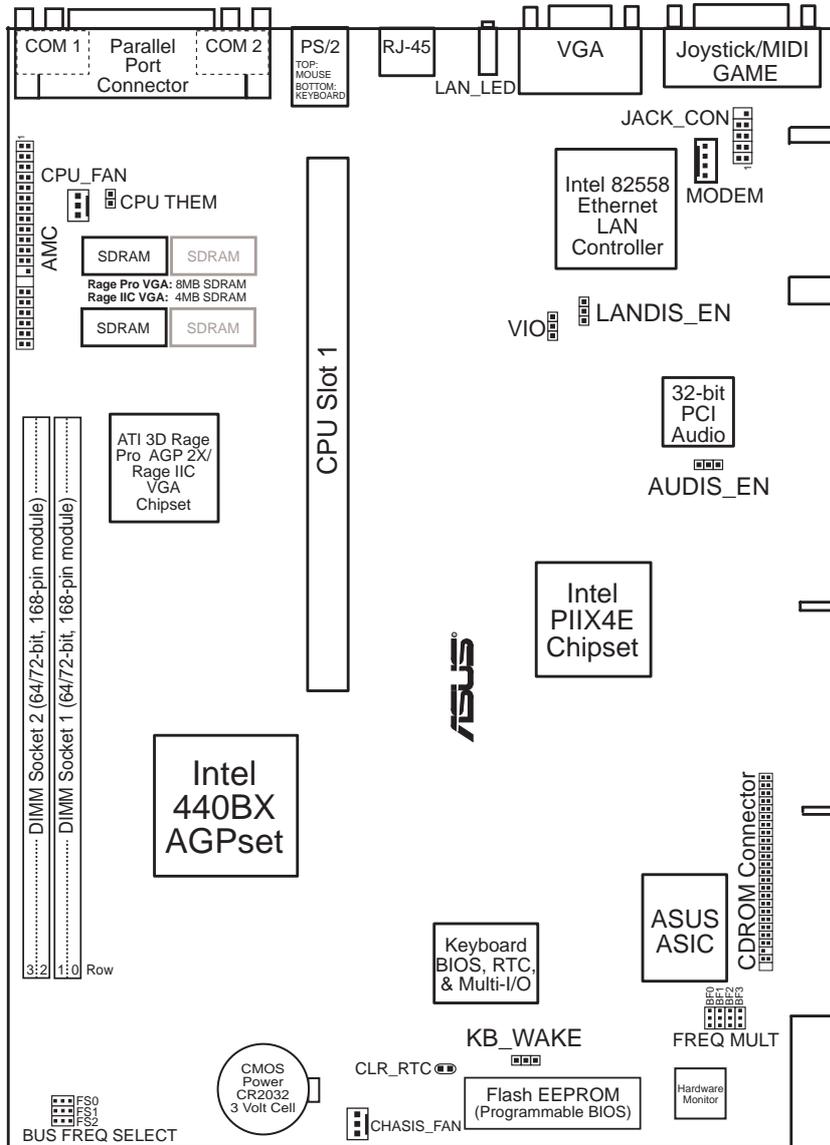


II. FEATURES
Motherboard Parts



III. INSTALLATION

ASUS P2B-N Motherboard Layout



III. INSTALLATION
Motherboard Layout

III. INSTALLATION

Jumpers

- | | | |
|-----------------------|-------|--|
| 1) CLR_RTC | P. 14 | Real Time Clock (RTC) RAM |
| 2) VIO | p. 15 | Voltage Input/Output Selection |
| 3) LANDIS_EN | p. 15 | LAN Setting (Enable/Disable) |
| 4) AUDIS_EN | p. 15 | Audio Setting (Enable/Disable) |
| 5) KB_WAKE | p. 16 | Keyboard Wake Up (Enable/Disable) |
| 6) FS0, FS1, FS2 | p. 16 | CPU External Clock (BUS) Frequency Selection |
| 7) BF0, BF1, BF2, BF3 | p. 17 | CPU Core:BUS Frequency Multiple |

Expansion Slots

- | | | |
|------------------|-------|---------------------------------------|
| 1) DIMM Sockets | p. 19 | 168-pin DIMM Memory Expansion Sockets |
| 2) CPU Slot 1 | p. 21 | Pentium®II/Celeron™ CPU Support |
| 3) SLOT 1 (ISA)* | p. 26 | 16-bit ISA Bus Expansion Slots* |
| 4) PCI1, 2 | p. 26 | 32-bit PCI Bus Expansion Slots |

Hardware Monitor

- | | | |
|-------------|-------|---|
| 1) CPU THEM | p. 25 | Pentium II/Celeron Processor Thermal Sensor Connector |
|-------------|-------|---|

Connectors

- | | | |
|----------------------|-------|---|
| 1) PS2KBMS | p. 28 | PS/2 Mouse Connector (6-pin female) |
| 2) PS2KBMS | p. 28 | PS/2 Keyboard Connector (6-pin female) |
| 3) GAME | p. 28 | Joystick or MIDI Connector (15-pin female) |
| 4) PRINTER | p. 29 | Parallel Port Connector (25-pin female) |
| 5) COM1, COM2 | p. 29 | Serial Port COM1 and COM2 (Two 9-pin male) |
| 6) VGA | p. 29 | VGA Compatible Connector (15-pin female) |
| 7) LAN_LED | p. 29 | LAN Diagnostic LEDs |
| 8) USB | p. 30 | Universal Serial BUS Ports 1 & 2 (Two 4-pin female) |
| 9) IR | p. 30 | Infrared Module |
| 10) NLX_PWR | p. 30 | NLX Motherboard Power Connector (20-pin block) |
| 11) IDE1 | p. 31 | Primary IDE Connector (40-pin block) |
| 12) FLOPPY | p. 31 | Floppy Drive Connector (34-pin block) |
| 13) LAN_LED, WOL_CON | p. 31 | LAN Activity Connectors (2-pin & 3-pin) |
| 14) PAN-CON | p. 32 | Front Panel Display LEDs and Switches (16-1 pin) |
| 15) MIC-CON | p. 32 | Front Panel Microphone Jack Connector (2-pin) |
| 16) AMC | p. 34 | ATI Multimedia Connector (40-3 pin block) |
| 17) JACK_CON | p. 34 | Back Panel Audio Connectors (10-1 pin block) |
| 18) CPU_, CHASIS_FAN | p. 34 | CPU Fan Power (Two 3-pin blocks) |
| 19) CDROM | p. 35 | CD-ROM Drive Connector (50-3 pins) |

*The onboard hardware monitor uses the address 290H-297H so legacy ISA cards must not use this address or else conflicts will occur.

III. INSTALLATION

Installation Steps

Before using your computer, you must complete the following steps:

1. **Set Jumpers on the Motherboard (if necessary)**
2. **Install System Memory Modules**
3. **Install the Central Processing Unit (CPU)**
4. **Install Expansion Cards**
5. **Connect Ribbon Cables, Cabinet Wires, and Power Supply**
6. **Setup the BIOS Software**

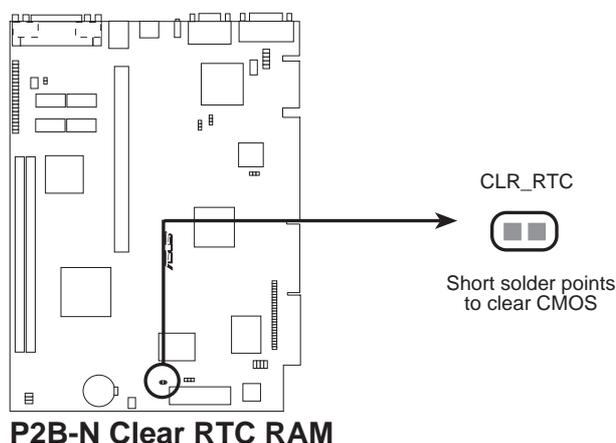
WARNING! Computer motherboards, baseboards and components, such as SCSI cards, contain very delicate Integrated Circuit (IC) chips. To protect them against damage from static electricity, you should follow some precautions whenever you work on your computer.

1. Unplug your computer when working on the inside.
2. Use a grounded wrist strap before handling computer components. If you do not have one, touch both of your hands to a safely grounded object or to a metal object, such as the power supply case.
3. Hold components by the edges and try not to touch the IC chips, leads or connectors, or other components.
4. Place components on a grounded antistatic pad or on the bag that came with the component whenever the components are separated from the system.

1. Jumpers

1. Real Time Clock (RTC) RAM (CLR_RTC)

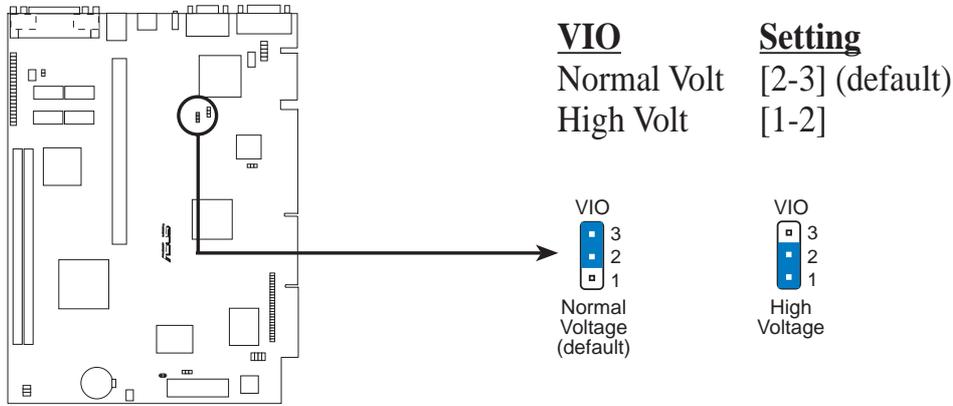
The CMOS RAM is powered by the onboard button cell battery. To clear the RTC data: (1) Unplug your computer, (2) Short solder points, (3) Turn on your computer, (4) Hold down <Delete> during bootup and enter BIOS setup to re-enter user preferences.



III. INSTALLATION

2. +3V Voltage Selection (VIO)

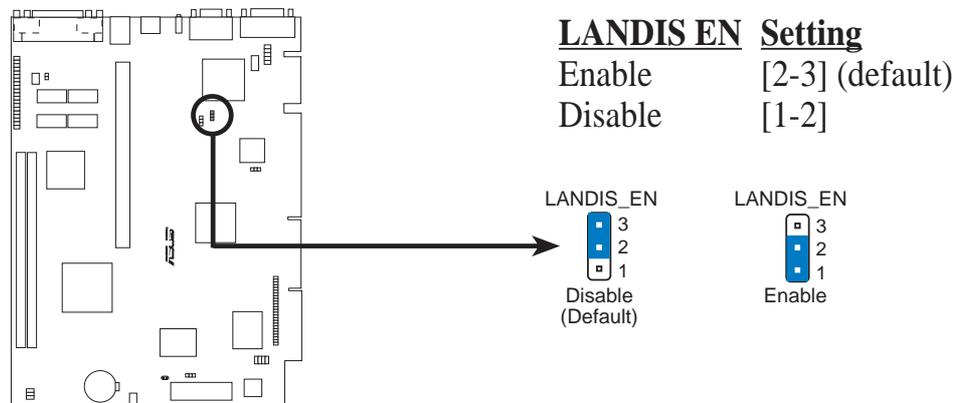
This jumper allows you to select the voltage supplied to the DRAM, chipset, AGP, and the CPU's I/O buffer. **IMPORTANT!** Setting this jumper to *High Volt* (3.5V) may cause your system to become unstable. It is strongly recommended that you leave this jumper on its default setting of *Normal Volt* (3.3V).



P2B-N Voltage Input/Output Selection

3. LAN Setting (LANDIS_EN)

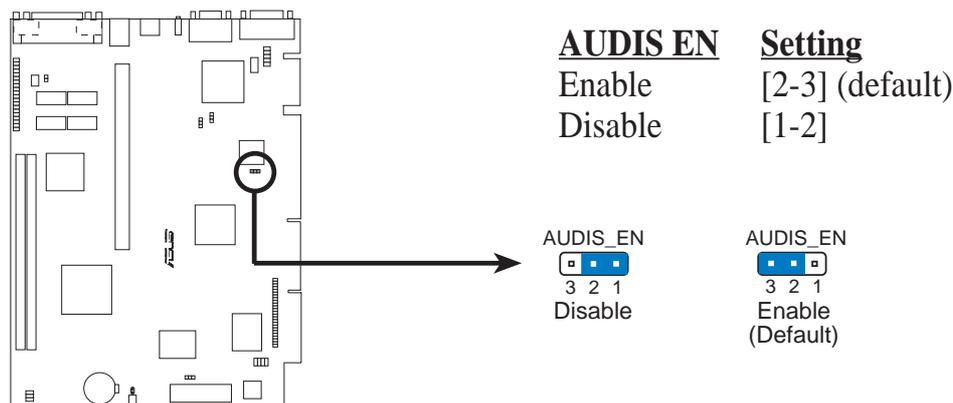
The onboard Intel 10/100 Fast Ethernet may be enabled or disabled using this jumper. The default is set to *Enable*.



P2B-N Onboard LAN Setting

4. Audio Setting (AUDIS_EN)

The onboard 32-bit PCI audio may be enabled or disabled using this jumper.

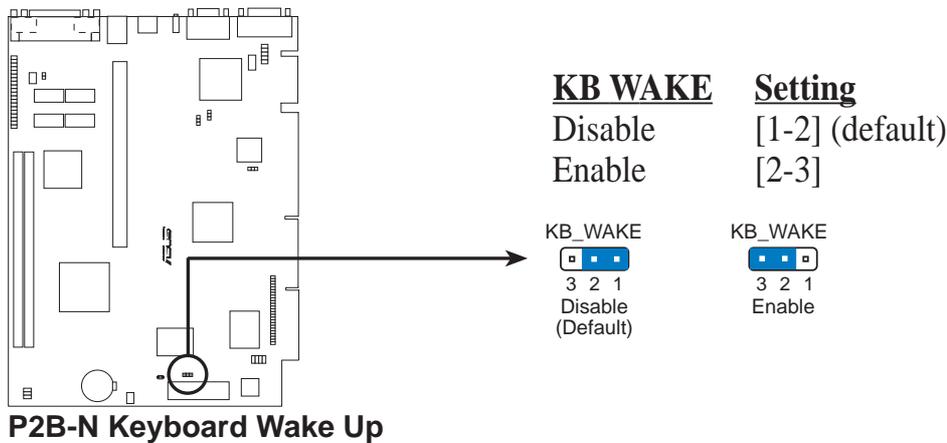


P2B-N Onboard Audio Setting

III. INSTALLATION

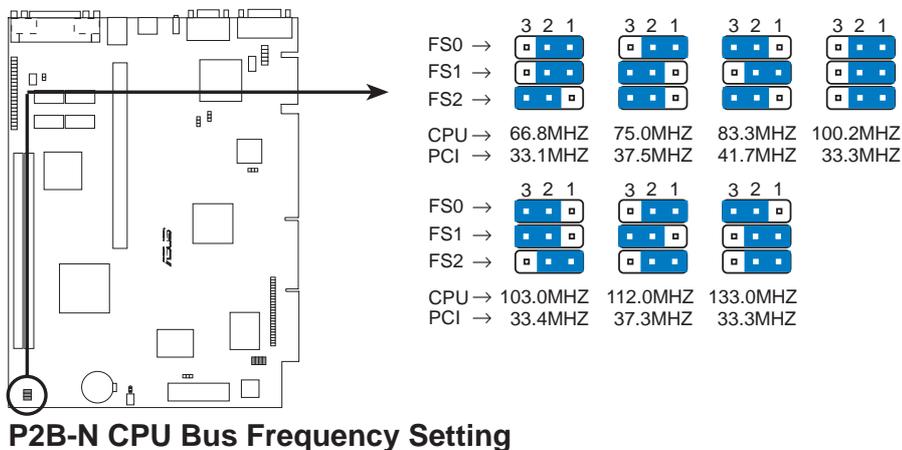
5. Keyboard Wake Up (KB_WAKE)

This allows you to disable or enable the keyboard power up function. Set this jumper to *Enable* if you wish to use your keyboard (by pressing the spacebar) to power up your computer. This feature requires an ATX power supply that can supply at least 300mA on the +5VSB lead. The default is set to *Disable* because not all computers have the appropriate ATX power supply. Your computer will not power on if you set this to *Enable* and if you do not have the right ATX power supply. **WARNING!** This jumper setting must coincide with the BIOS setting (see “Power Up By Keyboard” in the Power Management Setup of the BIOS SOFTWARE) or else conflicts will occur.



6. CPU Bus Frequency Selector (FS0, FS1, FS2)

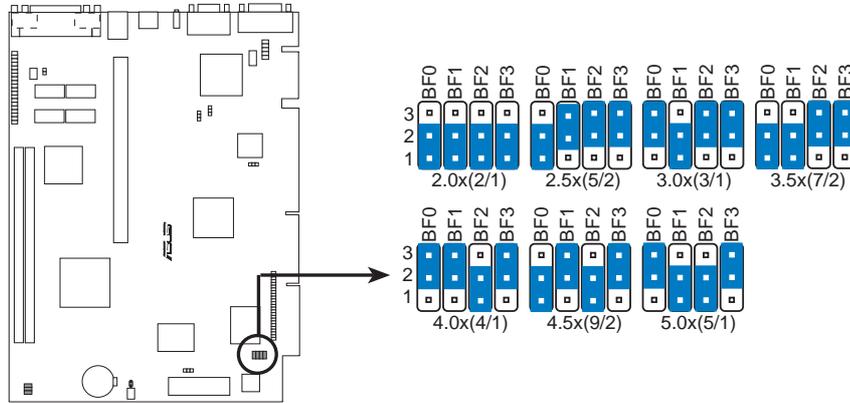
This option tells the clock generator what frequency to send to the CPU, DRAM, and AGPset. This allows the selection of the CPU's *External* frequency (or *BUS Clock*). The BUS Clock multiplied by the BUS Ratio equals the CPU's *Internal* frequency (the advertised CPU speed).



III. INSTALLATION

7. CPU Core:BUS Frequency Multiple (BF0, BF1, BF2, BF3)

This option sets the frequency multiple between the *Internal* frequency of the CPU and the CPU's *External* frequency. These must be set in conjunction with the *CPU Bus Frequency*.



P2B-N CPU Core:Bus Frequency Multiple Selection

WARNING! Frequencies above 100MHz exceed the specifications for the on-board Intel Chipset and are not guaranteed to be stable.

WARNING! PCI frequencies above 33MHz exceed the specifications for PCI cards and are not guaranteed to be stable.

III. INSTALLATION
Jumpers

Set the jumpers by the Internal speed of your processor as follows:

Intel CPU Model	Freq.	Ratio	BUS F.	(CPU BUS Freq.)			(Freq. Multiple)			
				FS0	FS1	FS2	BF0	BF1	BF2	BF3
Pentium II	450MHz	4.5x	100MHz	[1-2]	[1-2]	[1-2]	[1-2]	[2-3]	[1-2]	[2-3]
Pentium II	400MHz	4.0x	100MHz	[1-2]	[1-2]	[1-2]	[2-3]	[2-3]	[1-2]	[2-3]
Pentium II	350MHz	3.5x	100MHz	[1-2]	[1-2]	[1-2]	[1-2]	[1-2]	[2-3]	[2-3]
Pentium II/Celeron	333MHz	5.0x	66MHz	[1-2]	[1-2]	[2-3]	[2-3]	[1-2]	[1-2]	[2-3]
Pentium II/Celeron	300MHz	4.5x	66MHz	[1-2]	[1-2]	[2-3]	[1-2]	[2-3]	[1-2]	[2-3]
Pentium II/Celeron	266MHz	4.0x	66MHz	[1-2]	[1-2]	[2-3]	[2-3]	[2-3]	[1-2]	[2-3]

NOTES: Overclocking your processor is not recommended. It may result in a slower speed. Voltage Regulator Output Selection (VID) is not needed for the Pentium II processor because it sends a VID signal directly to the onboard power controller.

III. INSTALLATION

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III. INSTALLATION

2. System Memory (DIMM)

This motherboard uses only Dual Inline Memory Modules (DIMMs). Sockets are available for **3.3Volt** (power level) unbuffered Synchronous Dynamic Random Access Memory (SDRAM). One side (with memory chips) of the DIMM takes up one row on the motherboard.

To utilize the chipset's Error Checking and Correction (ECC) feature, you must use a DIMM module with 9 chips per side (standard 8 chips/side + 1 ECC chip) and make the proper settings through "Chipset Features Setup" in BIOS setup.

Memory speed setup is recommended through *SDRAM Configuration* under "Chipset Features Setup" in BIOS setup.

Install memory in any combination as follows:

DIMM Location	168-pin DIMM Memory Modules		Total Memory
Socket 1 (Rows 0&1)	SDRAM 8, 16, 32, 64, 128, 256MB	x1	
Socket 2 (Rows 2&3)	SDRAM 8, 16, 32, 64, 128, 256MB	x1	
	Total System Memory (Max 512MB)	=	

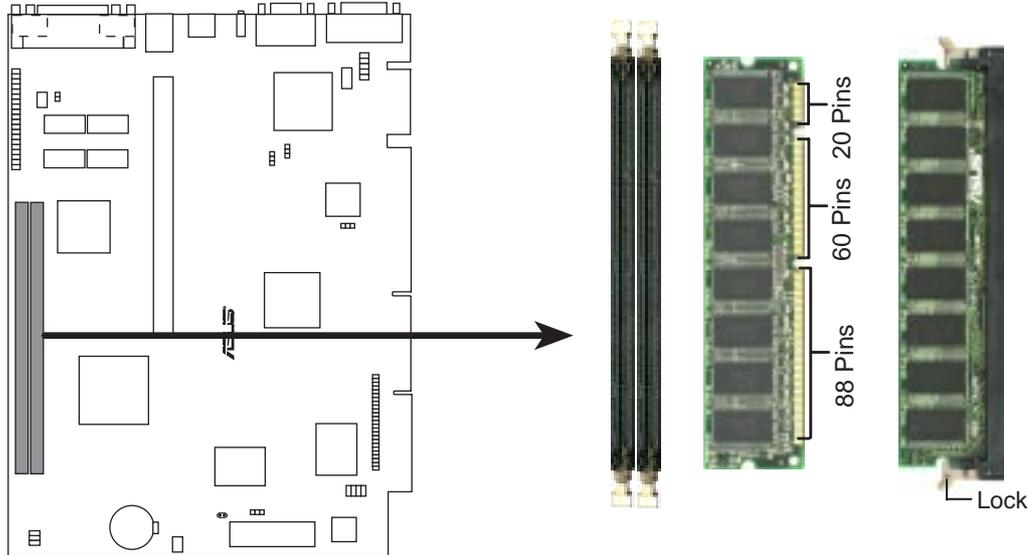
General DIMM Notes

- **For the system CPU bus to operate at 100MHz, use only PC100-compliant DIMMs compatible with Intel's PC100 SDRAM specifications.** This motherboard operates at 100MHz, thus most systems will not even boot if non-compliant modules are used because of the strict timing issues involved under this speed. If your DIMMs are not PC100-compliant, set the CPU bus frequency to 66MHz.
- Two possible memory chips are supported: SDRAM with and without ECC.
- SDRAM chips are generally thinner with higher pin density than EDO (Extended Data Output) chips.
- BIOS shows SDRAM memory on bootup screen.
- 8 chips/side modules do not support ECC, only 9 chips/side modules support ECC.
- Single-sided DIMMs come in 16, 32, 64, 128MB; double-sided come in 32, 64, 128, 256MB.

III. INSTALLATION

DIMM Memory Installation

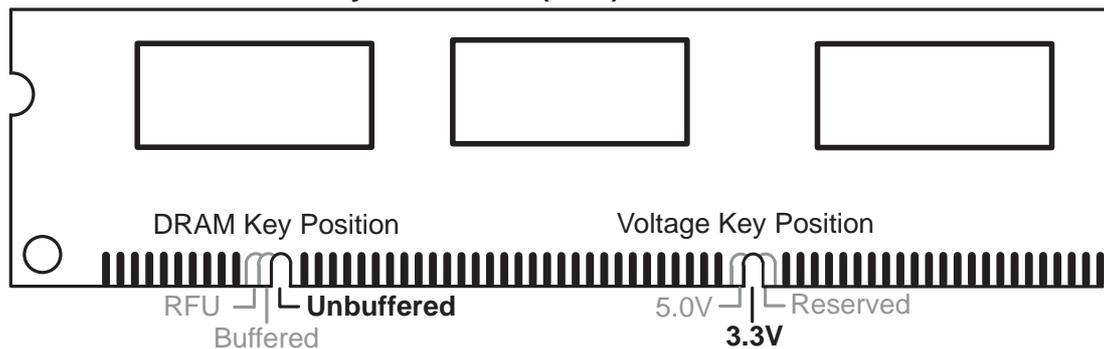
Insert the module(s) as shown. Because the number of pins are different on either side of the breaks, the module will only fit in the orientation as shown. DIMM modules are longer and have different pin contact on each side and therefore have a higher pin density. SIMM modules have the same pin contact on both sides.



P2B-N 168-pin DIMM Memory Sockets

The Dual Inline Memory Module (DIMM) must be **3.3V Unbuffered** for this motherboard. You can identify the type of DIMM module by the illustration below:

168-Pin DIMM Notch Key Definitions (3.3V)

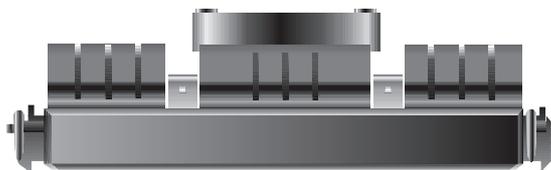


The notch on the DIMM module will shift between left, center, or right to identify the type and also to prevent the wrong type of DIMM to be inserted into the DIMM socket on the motherboard. Four clock signals are supported on this motherboard. You must ask your retailer for the specifications before purchasing memory modules.

III. INSTALLATION

3. Central Processing Unit (CPU)

Your motherboard provides a Slot 1 connector for a Pentium® II processor packaged in a Single Edge Contact Cartridge (SECC/SECC2) or a Celeron™ processor packaged in a Single Edge Processor Package (SEPP).



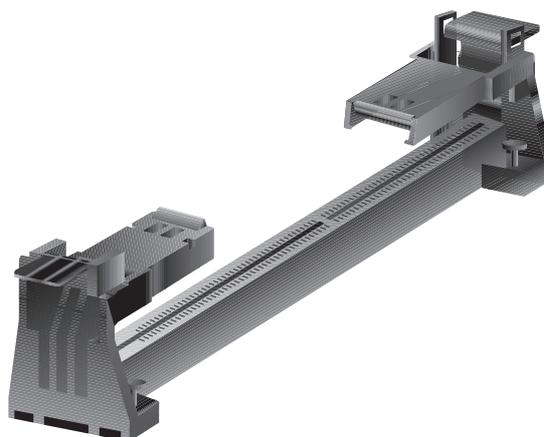
Pentium II processor packaged in an SECC with heatsink and fan (top view)



Pentium II processor packaged in an SECC2 or Celeron™ processor packaged in an SEPP with heatsink and fan (top view)

Universal Retention Mechanism

Your motherboard comes preinstalled with a Universal Retention Mechanism (URM). The URM supports Pentium II and Celeron processors.



Universal Retention Mechanism (URM)

Heatsinks

The recommended heatsinks (see section on recommended heatsinks for Pentium II processors for more information) for the boxed Pentium II and Celeron processors are those with three-pin fans that can be connected to the fan connectors on the motherboard.

WARNING! Be sure that there is sufficient air circulation across the processor's heatsink by regularly checking that your CPU fan is working. Without sufficient circulation, the processor could overheat and damage both the processor and the motherboard. You may install an auxiliary fan, if necessary.

III. INSTALLATION

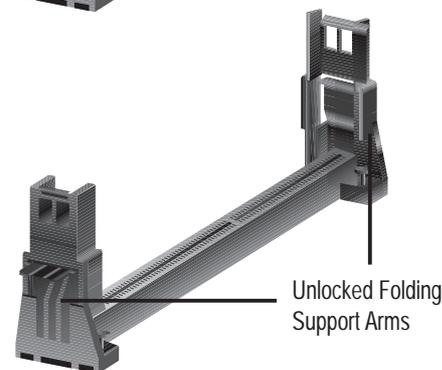
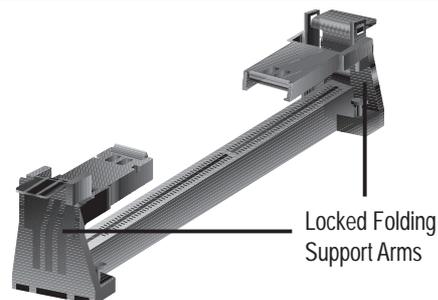
Installing the Processor

1. Unlock the URM's Folding Support Arms:

The folding support arms of the URM are locked when shipped.

To unlock the support arms, simply flip them up to an upright position.

The URM is now ready for the installation of your processor.

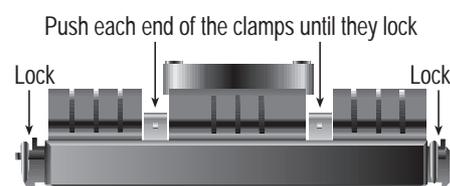


2. Attach the Heatsink

NOTE: Follow carefully the heatsink attachment instructions included with your heatsink or processor. The following steps are provided only as a general guide and may not reflect those for your heatsink.

SECC with Pentium® II

Place the SECC face down on a flat surface and lay the heat sink flush on the back (metal side) of the SECC. Check the orientation of the heatsink against the illustration below. The thicker fin must be orientated toward the bottom. The top clamp is wider than the bottom clamp so only this orientation will fit. With a screw driver, push the clamps one at a time into the SECC. Be sure that the heatsink is firmly pressed against the SECC.



SECC2 with Pentium® II/SEPP with Celeron™

Insert the heatsink clip through the holes at the SECC2/SEPP's back, making sure that the bottom of the clip plate sits against the processor's back. Remove the tab from the thermal grease, which is located on the bottom of the heatsink) and place the heatsink over the processor. A slight rocking motion may be necessary to place the heatsink on the SECC2/SEPP, with one pair of the heatsink clip legs going first through the corresponding heatsink holes, and then the other pair. (**NOTE:** The heatsink and SECC2/SEPP holes are slightly offset to ensure good locking grip between the two.)



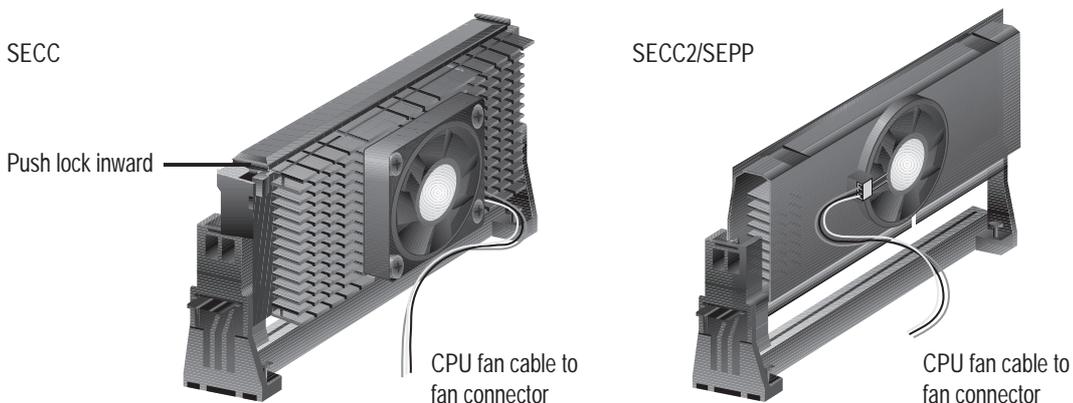
III. INSTALLATION

WARNING! Make sure the heatsink is mounted tightly against the SECC, SECC2 or SEPP; otherwise, the CPU will overheat. You may install an auxiliary fan to provide adequate circulation across the processor's passive heatsink.

3. Insert the SECC/SECC2/SEPP

SECC with Pentium® II only: Push the SECC's two locks inward until you hear a click (the picture in step 2 shows the locks in the outward position and inward in the picture below).

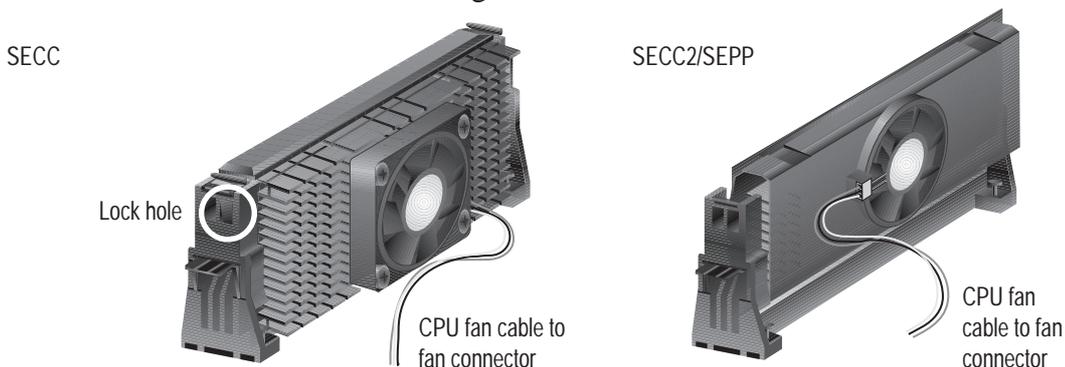
With the heatsink facing the motherboard's chipset, push the SECC, SECC2, or SEPP gently but firmly into the Slot 1 connector until it is fully inserted.



4. Secure the SECC/SECC2/SEPP

Secure the SECC/SECC2/SEPP in place by pushing the SECC/SECC2/SEPP until it is firmly seated on the Slot 1 connector.

SECC with Pentium® II only: The SECC locks should be outward when secured so that the lock shows through the retention mechanism's lock holes.



5. Attach the Thermal Sensor Cable (optional): If you purchased an ASUS Smart Fan (ASUS S-P2FAN) with an integrated thermal sensor cable (ASUS P2T-Cable) or purchased separately the P2T-Cable, you can connect the thermal sensor cable to your motherboard's thermal sensor connector. (See next page for information on ASUS Smart Thermal Solutions.)

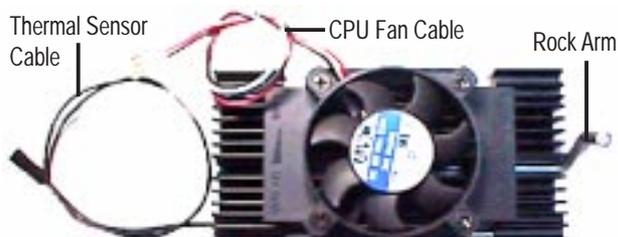
III. INSTALLATION

ASUS Smart Thermal Solutions

ASUS provides two smart solutions to Slot 1 CPU thermal problems: the **ASUS Smart Fan** or **ASUS S-P2FAN** and the **ASUS P2T-Cable**.

ASUS S-P2FAN

The optional ASUS Smart Fan or ASUS S-P2FAN is a CPU fan for a Pentium® II processor packaged in an SECC. Unlike other CPU thermal solutions, the ASUS S-P2FAN has



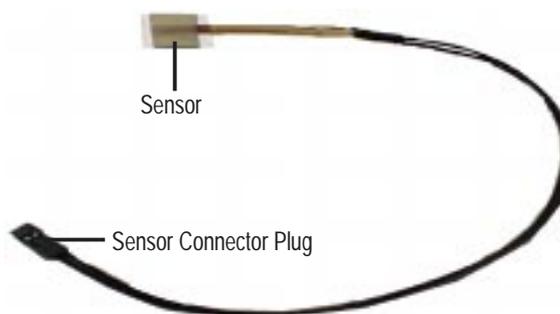
an integrated thermal sensor located near the center of the CPU heat source. The sensor is optimized by ASUS to give the most accurate reading of the CPU temperature, thus provides the best protection to your computer system.

To Use the ASUS S-P2FAN

See **2. Attach the Heatsink** on the preceding page for the relevant procedures. Note that the S-P2FAN comes with a rock arm design for easy FAN/CPU installation.

ASUS P2T-Cable

The optional ASUS P2T-Cable can be used for a Pentium® II processor packaged in an SECC/SECC2 or a Celeron™ processor packaged in an SEPP .



NOTE: The ASUS P2T-Cable can only be used in a Slot 1 motherboard with a 2-pin thermal sensor connector.

To Use the ASUS P2T-Cable

NOTE: The following procedures assume that you have properly attached a heatsink onto an SECC/SECC2/SEPP.

1. Simply peel off the tab from the sensor and then stick the sensor near the middle edge of the Intel boxed processor heatsink with fan (middle) or to either the upper or lower edge of the Celeron™ heatsink (right), as indicated.

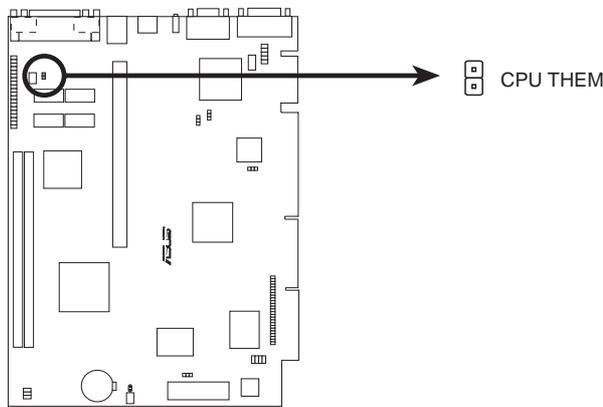
III. INSTALLATION



WARNING! Do not insert the sensor between the processor and heatsink, otherwise, it will cause damage to the P2T-Cable.

IMPORTANT! ASUS guarantees accurate readings only for the ASUS Smart Fan and the Intel boxed processor heatsink with fan because both have similar heat distribution and heatsink material.

2. Connect the P2T-Cable to the CPU thermal sensor connector (CPU THEM).



P2B-N CPU Thermal Sensor Connector

III. INSTALLATION
CPU

Recommended Heatsinks for Slot 1 Processors

The recommended heatsinks for the Slot 1 processors are those with three-pin fans, such as the ASUS Smart Fan, that can be connected to the motherboard’s CPU fan connector. These heatsinks, such as the Elan Vital Heatsink with Fan, dissipate heat more efficiently and with an optional hardware monitor, they can monitor the fan’s RPM and use the alert function with the Intel LANDesk Client Manager (LDCM) and the ASUS PC Probe software.

Elan Vital Heatsink with Fan

To install, simply follow the procedures for **Installing the Processor**. The Elan Vital heatsink, however, comes with a lever to clamp the heatsink into the SEC cartridge. Mount the heatsink in the orientation as shown then flip the lever from “Unlock” to “Lock.”



III. INSTALLATION

4. Expansion Cards

WARNING! Unplug your power supply when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards.

Expansion Card Installation Procedure

1. Read the documentation for your expansion card and make any necessary hardware or software settings for your expansion card, such as jumpers.
2. Remove your computer system's cover and the bracket plate on the slot you intend to use. Keep the bracket for possible future use.
3. Carefully align the card's connectors and press firmly.
4. Secure the card on the slot with the screw you removed above.
5. Replace the computer system's cover.
6. Set up the BIOS if necessary
(such as *IRQ xx Used By ISA: Yes* in PNP AND PCI SETUP)
7. Install the necessary software drivers for your expansion card.

Assigning IRQs for Expansion Cards

Some expansion cards need to use an IRQ to operate. Generally, an IRQ must be exclusively assigned to one use. In a standard design, there are 16 IRQs available but most of them are already in use, leaving 6 IRQs free for expansion cards. If your motherboard has audio onboard, an extra 3 IRQs will be used, leaving 3 IRQs free.

Both ISA and PCI expansion cards may require to use IRQs. System IRQs are available to cards installed in the ISA expansion bus first, then any remaining IRQs are available to PCI cards. Currently, there are two types of ISA cards. The original ISA expansion card design, now referred to as legacy ISA cards, requires that you configure the card's jumpers manually and then install it in any available slot on the ISA bus. You may use the Microsoft Diagnostics (MSD.EXE) utility located in the Windows directory to see a map of your used and free IRQs. If you use Windows 95, the **Resources** tab under **Device Manager** displays the resource settings being used by a particular device (to gain access, double-click the **System** icon under the **Control Panel** program). Ensure that no two devices share the same IRQs or your computer will experience problems when those two devices are in use at the same time.

III. INSTALLATION

To simplify this process, this motherboard has complied with the Plug and Play (PNP) specification which was developed to allow automatic system configuration whenever a PNP-compliant card is added to the system. For PNP cards, IRQs are assigned automatically from those available.

If the system has both Legacy and PNP ISA cards installed, IRQs are assigned to PNP cards from those not used by Legacy cards. The PCI and PNP configuration of the BIOS setup utility can be used to indicate which IRQs are being used by Legacy cards. For older Legacy cards that do not work with the BIOS, you can contact your vendor for an ISA Configuration Utility.

An IRQ number is automatically assigned to PCI expansion cards after those used by Legacy and PNP ISA cards. In the PCI bus design, the BIOS automatically assigns an IRQ to a PCI slot that has a card in it that requires an IRQ. To install a PCI card, you need to set something called the INT (interrupt) assignment. Since all the PCI slots on this motherboard use an INTA #, be sure that the jumpers on your PCI cards are set to INT A.

Assigning DMA Channels for ISA Cards

Some ISA cards, both legacy and PnP, may also need to use a DMA (Direct Memory Access) channel. DMA assignments for this motherboard are handled the same way as the IRQ assignment process described earlier. You can select a DMA channel in the PCI and PnP configuration section of the BIOS Setup utility.

IMPORTANT: To avoid conflicts, reserve the necessary IRQs and DMAs for legacy ISA cards (under PNP AND PCI SETUP of the BIOS SOFTWARE, choose *Yes* in *IRQ xx Used By ISA* and *DMA x Used By ISA* for those IRQs and DMAs you want to reserve).

ISA Cards and Hardware Monitor

The onboard hardware monitor uses the address 290H-297H, so legacy ISA cards must not use this address or else conflicts will occur.

III. INSTALLATION

5. External Connectors

WARNING! Some pins are used for connectors or power sources. These are clearly separated from jumpers in “Map of the Motherboard.” Placing jumper caps over these will cause damage to your motherboard.

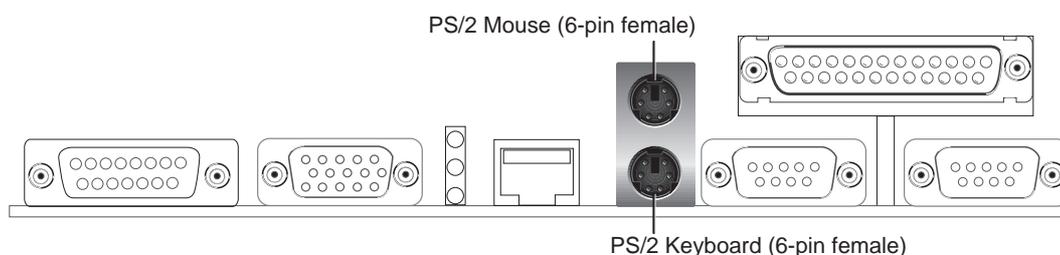
IMPORTANT: Ribbon cables should always be connected with the red stripe on the Pin 1 side of the connector. The four corners of the connectors are labeled on the motherboard. Pin 1 is the side closest to the power connector on hard drives and floppy drives. IDE ribbon cable must be less than 18in. (46cm), with the second drive connector no more than 6in. (15cm) from the first connector.

1. PS/2 Mouse Connector (6-pin PS2KBMS)

The system will direct IRQ12 to the PS/2 mouse if one is detected. If not detected, expansion cards can use IRQ12. See “PS/2 Mouse Control” in BIOS Features Setup of the BIOS SOFTWARE.

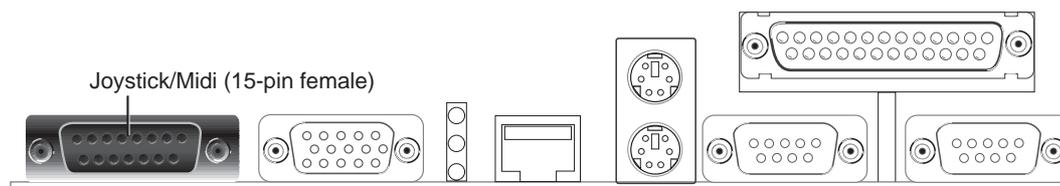
2. PS/2 Keyboard Connector (6-pin PS2KBMS)

This connector is for a standard keyboard using a PS/2 plug (mini DIN). **This connector will not allow standard AT size (large DIN) keyboard plugs. You may use a DIN to mini DIN adapter on standard AT keyboards.**



3. Joystick/MIDI Connector (15-pin GAME)

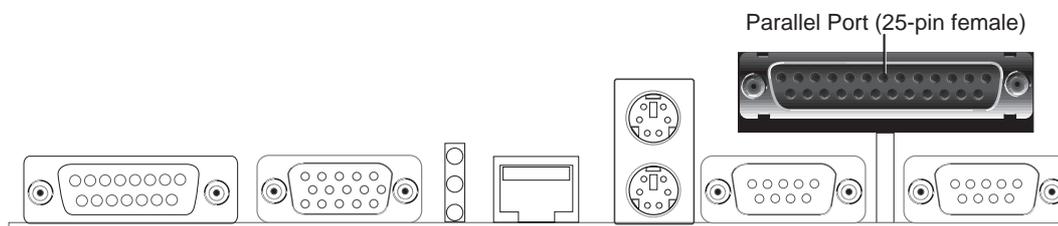
This connector is for a standard joystick or MIDI device.



III. INSTALLATION

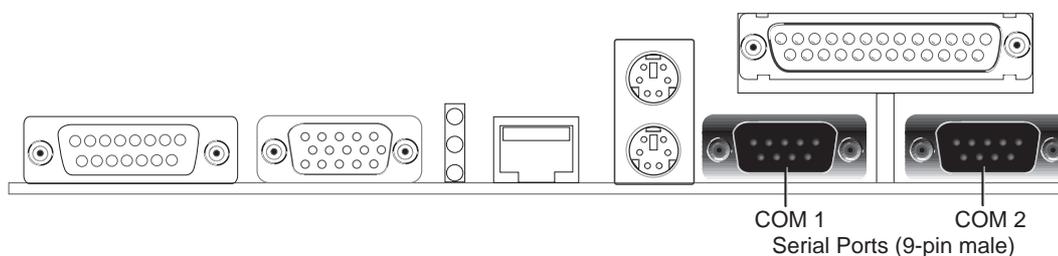
4. Parallel Connector (25-pin PRINTER)

You can enable the parallel port and choose the IRQ through “Onboard Parallel Port” in Chipset Features Setup of the BIOS SOFTWARE. **NOTE:** Serial printers must be connected to the serial port.



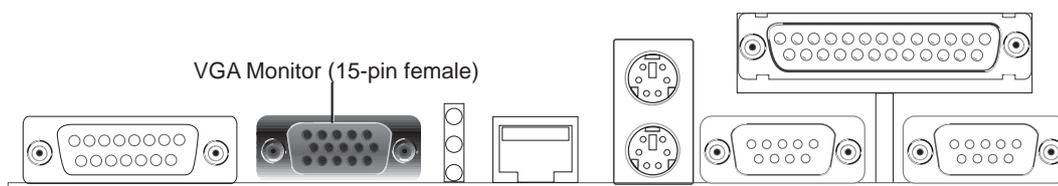
5. Serial Port Connectors (Two 9-pin COM1 AND COM2)

The two serial ports can be used for pointing devices or other serial devices. See “Onboard Serial Port” in Chipset Features Setup of the BIOS SOFTWARE.



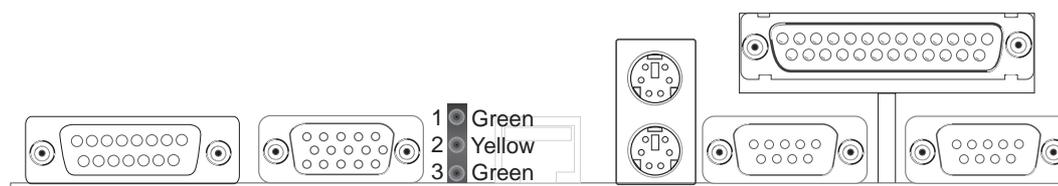
6. Monitor Connector (15-pin VGA)

This connector is for displaying on a standard VGA-compatible device.



7. LAN Diagnostic LEDs (LAN_LED)

These diagnostic LEDs help indicate if there is a problem with the network connector, cable, or hub.

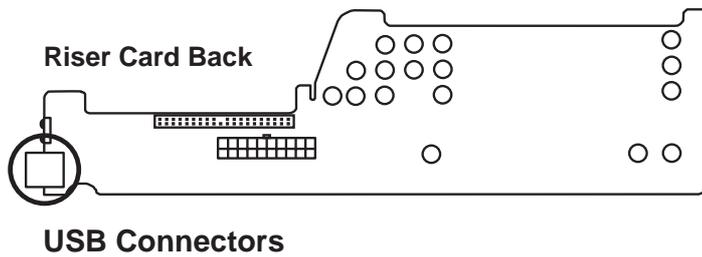


	LED on	LED off
1 Speed	10Mbps	100Mbps
2 Activity	No data	Data transfer
3 Link	Bad connection	Good connection

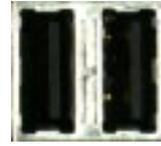
III. INSTALLATION

8. Universal Serial BUS Ports 1 & 2 (Two 4 pin Female Sockets)

Two USB ports are available for connecting USB devices.



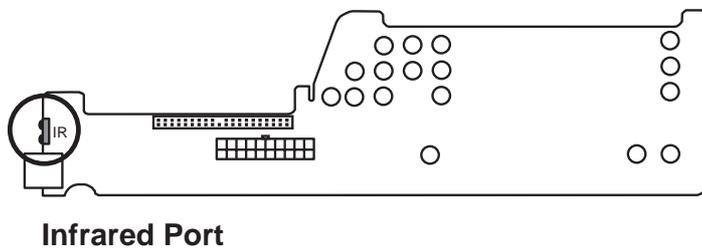
Port 1 Port 2



The USB connectors show through the front system panel.

9. IrDA-Compliant Infrared Module

This is an onboard infrared module for wireless transmitting and receiving of data through the front panel infrared lens.

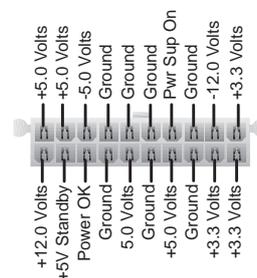
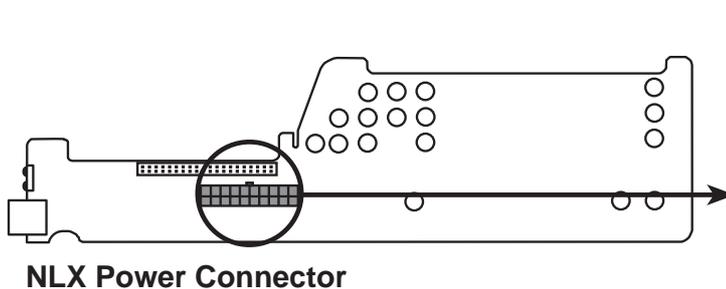


The infrared port sends data through the front system panel.

10. NLX Power Supply Connector (20-pin NLX_PWR)

This connector connects to an NLX power supply. The plug from the power supply will only insert in one orientation because of the different size holes. Find the proper orientation and push down firmly making sure that the pins are aligned.

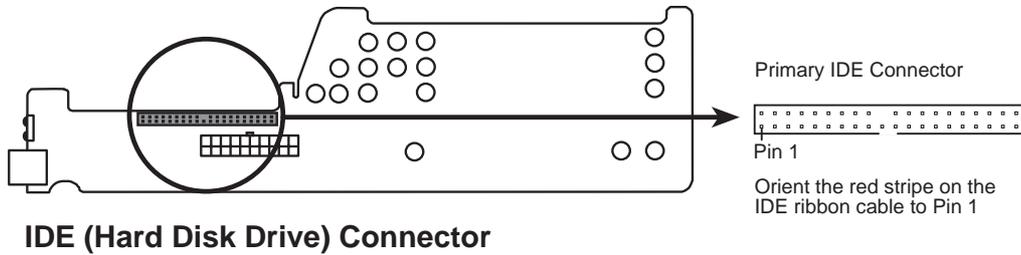
IMPORTANT: Be sure that the NLX power supply can deliver at least 720mA on the 5volt standby lead (+5VSB). You may experience difficulty in powering on your system without this specification.



III. INSTALLATION

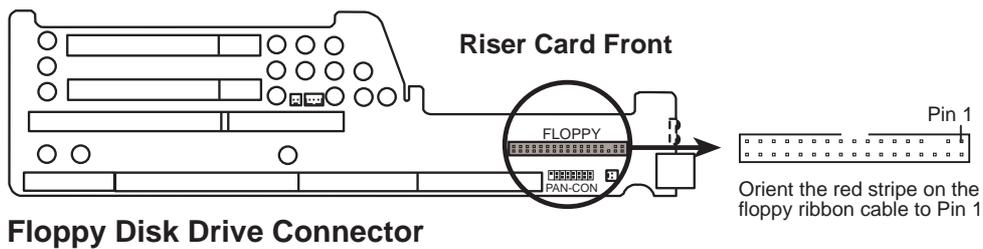
11. Primary IDE Connector (40-1 pin IDE1)

This connector supports the provided IDE hard disk drive ribbon cable. After connecting one end to the riser card, connect the other end to a hard disk drive. The primary IDE channel supports both a master and a slave IDE device but the system housing size only permits a standard IDE hard drive to be installed.



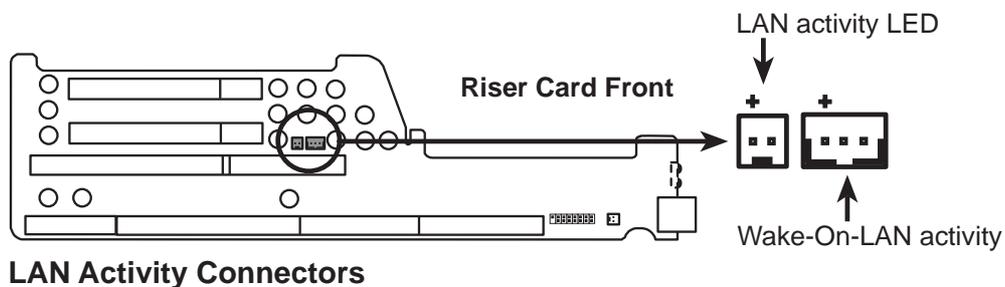
12. 3.5" Floppy Disk Drive Connector (34-1 pin FLOPPY)

This connector supports the provided floppy drive ribbon cable. After connecting the single end to the riser card, connect the other end to a 3.5" floppy disk drive.



13. LAN Activity Connectors (2-pin LAN_LED & 3-pin WOL_CON)

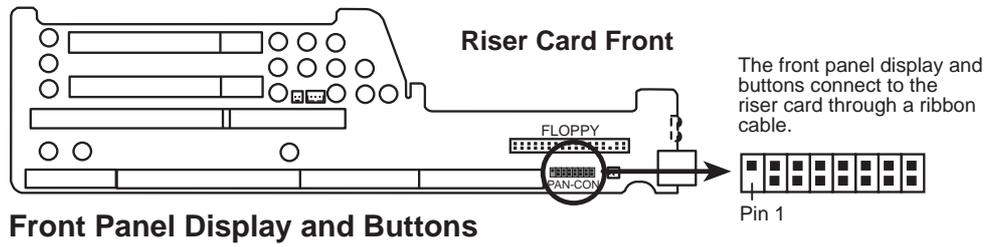
These connectors support Local Area Network (LAN) cards such as the ASUS PCI-L101 with output signals for data transfer activity. The LAN_LED connector allows the front panel LED to flash during transfer activity between the network and the computer. The WOL_CON connector allows the system to power up when there is a wakeup package (signal) received from the network.



III. INSTALLATION

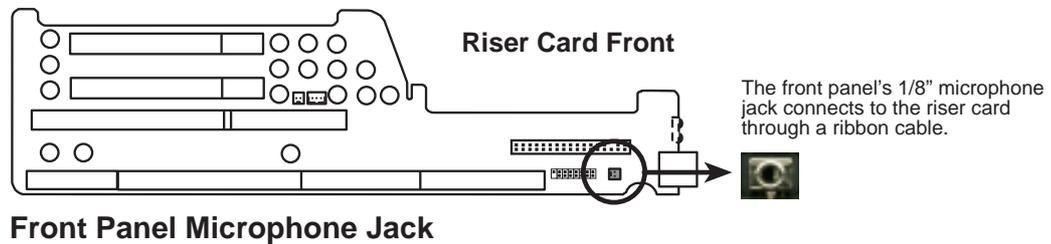
14. Riser Front Panel Connector (16-1 pin PAN-CON)

This connector is used to connect the front panel display LED's and buttons to the motherboard through a ribbon cable.



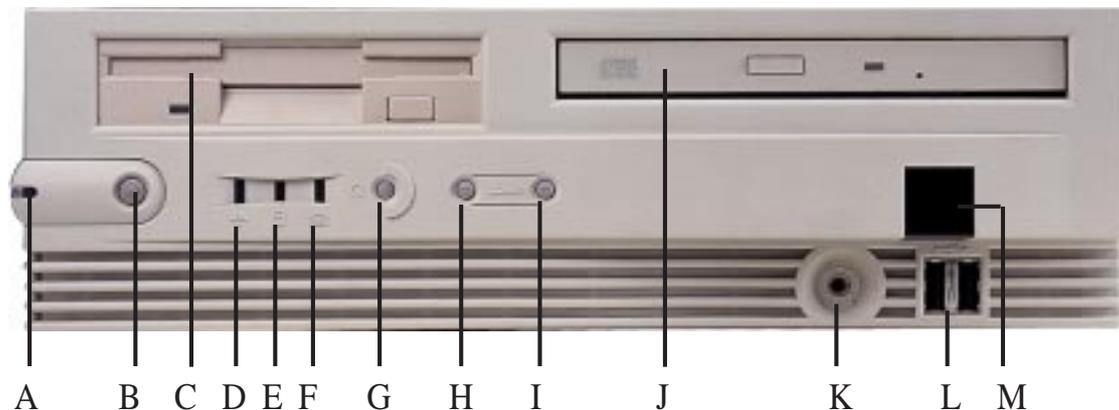
15. Riser Front Panel Microphone Connector (2-pin MIC-CON)

This connector is used to connect the front panel microphone jack to the motherboard through a ribbon cable.



III. INSTALLATION

Front Panel Descriptions



A. System Power LED

Lights when the system is powered on and flashes when it is in sleep mode.

B. NLX Power Button/ Soft Power Button

Switches between ON, OFF, and SLEEP mode. The functions are controlled and configurable through the “Power Up Control” in the POWER MANAGEMENT SETUP of the BIOS SOFTWARE.

C. Floppy Drive Bay

Accepts a standard 3.5” floppy drive, LS-120, or other compatible devices.

D. Network Activity LED

Flashes when data is transferred to or from a network card. (The network card requires an external LED wire connected to the Riser card’s LAN_LED.)

E. IDE Activity LED

Flashes when data is transferred by way of the IDE channels, includes the CD-ROM.

F. Message LED

The LED will remain lit when there is no modem activity and flash when there is data being transferred or mail waiting in the inbox. Requires ACPI OS support.

G. Reset Button

Switch used for rebooting the computer without having to use the power switch

H. Volume Down Button

Decreases the onboard audio amplifier’s volume.

I. Volume Up Button

Increases the onboard audio amplifier’s volume.

J. Slim CD-ROM Drive Bay

Accepts only a slim CD-ROM.

K. Microphone Jack

Accepts a 1/8” connector from a microphone or other audio source.

L. USB Port1 and Port2

Accepts 15 USB devices on each port.

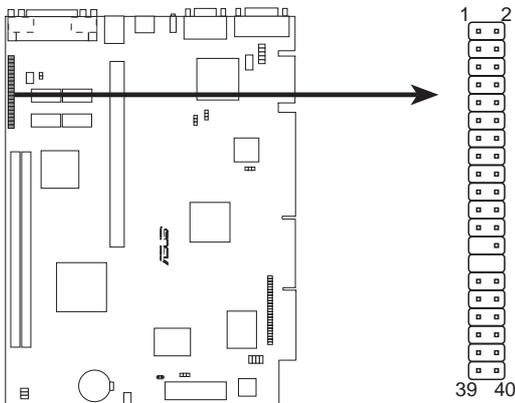
M. Infrared Window

Allows transmission and reception of infrared signals through the onboard infrared module.

III. INSTALLATION

16. ATI Multimedia Channel Connector (40-3 pin AMC)

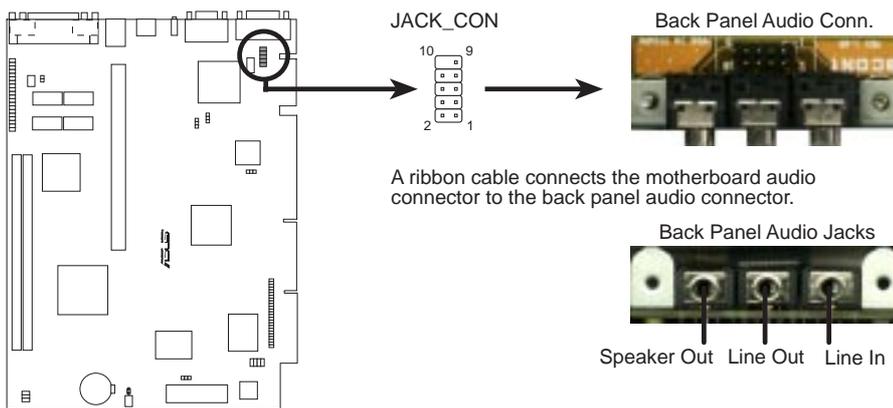
This connector is used for ATI video accessories such as video capture cards or television tuners.



P2B-N ATI Multimedia Channel Connector

17. Audio Connectors (10-1 pin JACK_CON)

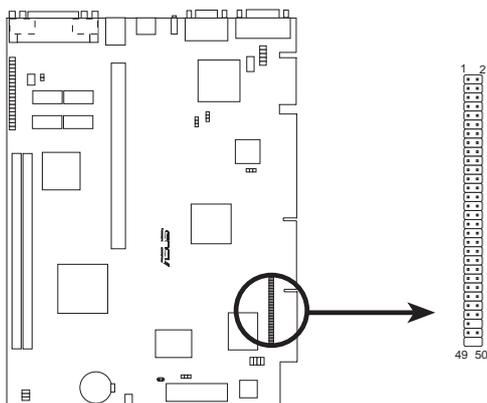
These connectors are provided for audio input and output signals.



P2B-N Audio Jack Connector

18. CD-ROM Connector (50-3 pin CDRM)

This is a proprietary CD-ROM connector which requires a converter in order to attach to a slim CD-ROM. Only a slim CD-ROM will fit in the NLX system housing.



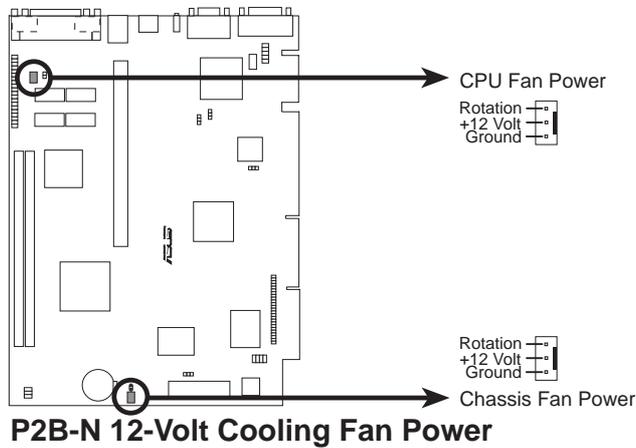
P2B-N CD-ROM Drive Connector

III. INSTALLATION

19. CPU Fan Connector (3-pin CHASIS_FAN, 3-pin CPU_FAN)

These connectors support cooling fans of 500mA (6 Watts) or less. Orientate the fans so that the heat sink fins allow airflow to go across the onboard heat sink(s) instead of the expansion slots. Depending on the fan manufacturer, the wiring and plug may be different. The red wire should be positive, while the black should be ground. Connect the fan's plug to the board taking into consideration the polarity of the this connector. **NOTE: The "Rotation" signal is to be used only by a specially designed fan with rotation signal.**

WARNING! The CPU and/or motherboard will overheat if there is no airflow across the CPU and onboard heatsinks. Damage may occur to the motherboard and/or the CPU fan if these pins are incorrectly used. **These are not jumpers, do not place jumper caps over these pins.**



III. INSTALLATION

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III. INSTALLATION

Power Connection Procedures

1. After all connections are made, close the system case cover.
 2. Be sure that all switches are off (in some systems, marked with ○).
 3. Connect the power supply cord into the power supply located on the back of your system case according to your system user's manual.
 4. Connect the power cord into a power outlet that is equipped with a surge protector.
 5. You may then turn on your devices in the following order:
 - a. Your monitor
 - b. External SCSI devices (starting with the last device on the chain)
 - c. Your system power. For ATX power supplies, you need to switch on the power supply as well as press the ATX power switch on the front of the case.
 6. The power LED on the front panel of the system case will light. For ATX power supplies, the system LED will light when the ATX power switch is pressed. The monitor LED may light up after the system's if it complies with "green" standards or if it has a power standby feature. The system will then run power-on tests. While the tests are running, additional messages will appear on the screen. If you do not see anything within 30 seconds from the time you turn on the power, the system may have failed a power-on test. Recheck your jumper settings and connections or call your retailer for assistance.
 7. During power-on, hold down <Delete> to enter BIOS setup. Follow the instructions in the next section, BIOS SOFTWARE.
- * **Powering Off your computer:** You must first exit or shut down your operating system before switching off the power switch. For ATX power supplies, you can press the ATX power switch after exiting or shutting down your operating system. If you use Windows 95, click the **Start** button, click **Shut Down**, and then click **Shut down the computer?**

NOTE: The message "You can now safely turn off your computer" will not appear when shutting down with ATX power supplies.

IV. BIOS SOFTWARE

Flash Memory Writer Utility

AFLASH.EXE: This is the Flash Memory Writer utility that updates the BIOS by uploading a new BIOS file to the programmable flash ROM chip on the motherboard. To determine the BIOS version of your motherboard, check the last four numbers of the code displayed on the upper left-hand corner of your screen during bootup. Larger numbers represent a newer BIOS file. This file works only in DOS mode.

NOTE: The following screen displays are provided as examples only and may not reflect the screen contents displayed on your system.

```
          ACPI BIOS
    FLASH MEMORY WRITER V1.0
    Copyright (C) 1994-99, ASUSTeK COMPUTER INC.

Flash Memory: 32T 256K09

Current BIOS Version: 6015      ACPI BIOS Revision 1001
Chipset and Model   : 16400X-P2B
BIOS Built Date    : 03/21/98

Choose one of the followings:
1. Save Current BIOS To File
2. Update BIOS Including Boot Block and ESCD

Enter choice: [1]

Press ESC To Exit
```

IMPORTANT! If “unknown” is displayed after **Flash Memory:**, the memory chip is either not programmable or is not supported by the ACPI BIOS and therefore, cannot be programmed by the Flash Memory Writer utility.

Main Menu

1. Save Current BIOS To File

This option allows you to save a copy of the original motherboard BIOS in case you need to reinstall it. It is recommended that you save **AFLASH.EXE** and the BIOS file to a bootable floppy disk.

To save your current BIOS, type [1] at the **Main Menu** and then press <Enter>. The **Save Current BIOS To File** screen appears.

Type a filename and the path, for example, **A:\XXX-X** and then press <Enter>.

```
          Save Current BIOS To File

Flash Memory: 32T 256K09

Current BIOS Version: 6015      ACPI BIOS Revision 1001
Chipset and Model   : 16400X-P2B
BIOS Built Date    : 03/21/98

Please Enter File Name to Save: A:\44881-1
```

IV. BIOS SOFTWARE

2. Update BIOS Including Boot Block and ESCD

This option updates the boot block, the baseboard BIOS, and the ACPI extended system configuration data (ESCD) parameter block from a new BIOS file. See the next page for procedures on downloading an updated BIOS file.

To update your current BIOS, type [2] at the **Main Menu** and then press <Enter>. The **Update BIOS Including Boot Block and ESCD** screen appears. Type the filename of your new BIOS and the path, for example, **A:\XXXXXXXX.AWD**, and then press <Enter>.

When prompted to confirm the BIOS update, press **Y** to start the update.

The utility starts to program the new BIOS information into the flash ROM. When the programming is finished, *Flashed Successfully* will be displayed.

Follow the onscreen instructions to continue.

```
Update BIOS Including Boot Block and ESCD
Flash Memory: SST 29EE009
Current BIOS Version: 6015      ACPI BIOS Revision 1001
Chipset and Model : 154800-P2B
BIOS Build Date : 03/21/98
Please Enter File Name for NEW BIOS: A:\XXXXXXXX.AWD
```

```
Update BIOS Including Boot Block and ESCD
Flash Memory: SST 29EE009
BIOS Version
[ CURRENT ] 6015      ACPI BIOS Revision 1001
[XXXXXXXX.AWD] 6015      ACPI BIOS Revision 1002
Chipset and Model
[ CURRENT ] 154800-<CP2B>-B
[XXXXXXXX.AWD] 154800-<CP2B>-B
Date of BIOS Built
[ CURRENT ] 03/21/98
[XXXXXXXX.AWD] 03/25/98
Are you sure (Y/N) ? [Y]
Press ESC To Return to Main Menu
```

```
Update BIOS Including Boot Block and ESCD
Flash Memory: SST 29EE009
BIOS Version
[ CURRENT ] 6015      ACPI BIOS Revision 1001
[XXXXXXXX.AWD] 6015      ACPI BIOS Revision 1002
Chipset and Model
[ CURRENT ] 154800-<CP2B>-B
[XXXXXXXX.AWD] 154800-<CP2B>-B
Date of BIOS Built
[ CURRENT ] 03/21/98
[XXXXXXXX.AWD] 03/25/98
Are you sure (Y/N) ? [Y]
Programming -- 20FFF
Flashed Successfully
Press ESC To Return to Main Menu
```

```
6015 ACPI BIOS
FLASH MEMORY WRITER V1.0
Copyright (C) 1994-98, ASUS/tek COMPUTER INC.
Flash Memory: SST 29EE009
Current BIOS Version: 6015      ACPI BIOS Revision 1001
Chipset and Model : 154800-P2B
BIOS Build Date : 03/21/98
Choose one of the followings:
1. Save Current BIOS To File
2. Update BIOS Including Boot Block and ESCD
Enter choice: [1]
You have flashed the EPROM! It is recommended that you turn off
the power, enter SETUP and LOAD Setup Defaults to have CMOS
updated with new BIOS when exits.
Press ESC To Exit
```

IV. BIOS
Flash Memory Writer

IV. BIOS SOFTWARE

Managing and Updating Your Motherboard's BIOS

Upon First Use of the Computer System

1. Create a bootable system floppy disk by typing [FORMAT A:/S] from the DOS prompt without creating "AUTOEXEC.BAT" and "CONFIG.SYS" files.
2. Copy AFLASH.EXE to the just created boot disk.
3. Run AFLASH.EXE from this new disk and select option **1. Save Current BIOS to File**. See **1. Save Current BIOS To File** on the previous page for more details and the rest of the steps.

Updating BIOS Procedures (only when necessary)

1. Download an updated ASUS BIOS file from the Internet (WWW or FTP) or a BBS (Bulletin Board Service) (see ASUS CONTACT INFORMATION on page 3 for details) and save to the disk you created earlier.
2. Boot from the disk you created earlier.
3. At the "A:\`" prompt, type **AFLASH** and then press <Enter>.
4. At the **Main Menu**, type **2** and then press <Enter>. See **2. Update BIOS Including Boot Block and ESCD** on the previous page for more details and the rest of the steps.

WARNING! If you encounter problems while updating the new BIOS, DO NOT turn off your system since this might prevent your system from booting up. Just repeat the process, and if the problem still persists, update the original BIOS file you saved to disk above. If the Flash Memory Writer utility was not able to successfully update a complete BIOS file, your system may not be able to boot up. If this happens, your system will need service.

IV. BIOS SOFTWARE

6. BIOS Setup

The motherboard supports two programmable Flash ROM chips: 5-Volt and 12-Volt. Either of these memory chips can be updated when BIOS upgrades are released. Use the Flash Memory Writer utility to download the new BIOS file into the ROM chip as described in detail in this section.

All computer motherboards provide a Setup utility program for specifying the system configuration and settings. If your motherboard came in a computer system, the proper configuration entries may have already been made. If so, invoke the Setup utility, as described later, and take note of the configuration settings for future reference; in particular, the hard disk specifications.

If you are installing the motherboard, reconfiguring your system or you receive a Run Setup message, you will need to enter new setup information. This section describes how to configure your system using this utility.

The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the system provides you with the opportunity to run this program. This appears during the Power-On Self Test (POST). Press <Delete> to call up the Setup utility. If you are a little bit late pressing the mentioned key(s), POST will continue with its test routines, thus preventing you from calling up Setup. If you still need to call Setup, reset the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the Reset button on the system case. You can also restart by turning the system off and then back on again. But do so only if the first two methods fail.

When you invoke Setup, the CMOS SETUP UTILITY main program screen will appear with the following options:



IV. BIOS SOFTWARE

Load Defaults

The “Load BIOS Defaults” option loads the minimum settings for troubleshooting. “**Load Setup Defaults**”, on the other hand, is for loading optimized defaults for regular use. Choosing defaults at this level, will modify all applicable settings.

A section at the bottom of the above screen displays the control keys for this screen. Take note of these keys and their respective uses. Another section just below the control keys section displays information on the currently highlighted item in the list.

Standard CMOS Setup

The “Standard CMOS Setup” option allows you to record some basic system hardware configuration and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option anymore. However, if the configuration stored in the CMOS memory on the board gets lost or damaged, or if you change your system hardware configuration, you will need to respecify the configuration values. The configuration values usually get lost or corrupted when the power of the onboard CMOS battery weakens.



The preceding screen provides you with a list of options. At the bottom of this screen are the control keys for this screen. Take note of these keys and their respective uses.

User-configurable fields appear in a different color. If you need information on the selected field, press <F1>. The help menu will then appear to provide you with the information you need. The memory display at the lower right-hand side of the screen is read-only and automatically adjusts accordingly.

Details of Standard CMOS Setup:

Date

To set the date, highlight the “Date” field and then press either <Page Up>/<Page Down> or <+>/<-> to set the current date. Follow the month, day and year format. Valid values for month, day and year are: **Month: (1 to 12), Day: (1 to 31), Year: (up to 2079)**

IV. BIOS SOFTWARE

Time

To set the time, highlight the “Time” field and then press either <Page Up>/<Page Down> or <+>/<-> to set the current time. Follow the hour, minute and second format. Valid values for hour, minute and second are: (**Hour: (00 to 23)**, **Minute: (00 to 59)**, **Second: (00 to 59)**).

NOTE: You can bypass the date and time prompts by creating an AUTOEXEC.BAT file. For information on how to create this file, please refer to the MS-DOS manual.

Hard Disks

This field records the specifications for all non-SCSI hard disk drives installed in your system. The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first of which is the “master” and the second is the “slave”.

Specifications for SCSI hard disks need not to be entered here since they operate using device drivers and are not supported by the BIOS. If you install other SCSI controller cards, refer to their respective documentations on how to install the required SCSI drivers.

For IDE hard disk drive setup, you can:

- Use the *Auto* setting for detection during bootup.
- Use the IDE HDD AUTO DETECTION in the main menu to automatically enter the drive specifications.
- Enter the specifications yourself manually by using the “User” option.

The entries for specifying the hard disk type include **CYLS** (number of cylinders), **HEAD** (number of read/write heads), **PRECOMP** (write precompensation), **LANDZ** (landing zone), **SECTOR** (number of sectors) and **MODE**. The **SIZE** field automatically adjusts according to the configuration you specify. The documentation that comes with your hard disk should provide you with the information regarding the drive specifications.

The **MODE** entry is for IDE hard disks only, and can be ignored for MFM and ESDI drives. This entry provides three options: *Normal*, *Large*, *LBA*, or *Auto* (see below). Set **MODE** to the *Normal* for IDE hard disk drives smaller than 528MB; set it to *LBA* for drives over 528MB that support Logical Block Addressing (LBA) to allow larger IDE hard disks; set it to *Large* for drives over 528MB that do not support LBA. *Large* type of drive can only be used with MS-DOS and is very uncommon. Most IDE drives over 528MB support the *LBA* mode.

IV. BIOS SOFTWARE

Auto detection of hard disks on bootup

For each field: Primary Master, Primary Slave, Secondary Master, and Secondary Slave, you can select *Auto* under the TYPE and MODE fields. This will enable auto detection of your IDE hard disk during bootup. This will allow you to change your hard disks (with the power off) and then power on without having to reconfigure your hard disk type. If you use older hard disks that do not support this feature, then you must configure the hard disk in the standard method as described earlier by the “User” option.

NOTE: After the IDE hard disk drive information has been entered into BIOS, new IDE hard disk drives must be partitioned (such as with FDISK) and then formatted before data can be read from and write on. Primary IDE hard disk drives must have its partition set to *active* (also possible with FDISK).

NOTE: SETUP Defaults are noted in parenthesis next to each function heading.

Drive A / Drive B (None)

These fields record the types of floppy disk drives installed in your system. The available options for drives A and B are: *360K, 5.25 in.; 1.2M, 5.25 in.; 720K, 3.5 in.; 1.44M, 3.5 in.; 2.88M, 3.5 in.; None*

To enter the configuration value for a particular drive, highlight its corresponding field and then select the drive type using the <page up>/<page down> or <+>/<-> keys.

Floppy 3 Mode Support (Disabled)

This is the Japanese standard floppy drive. The standard stores 1.2MB in a 3.5inch diskette. This is normally disabled but you may choose from either: *Drive A, Drive B, Both, and Disabled*

Video (EGA/VGA)

Set this field to the type of video display card installed in your system. The options are *EGA/VGA, CGA 40, CGA 80, and MONO* (for Hercules or MDA).

If you are using a VGA or any higher resolution card, choose *EGA/VGA*.

Halt On (All Errors)

This field determines which types of errors will cause the system to halt. Choose from *All Errors; No Errors; All,But Keyboard, All,But Diskette; and All,But Disk/Key*.

IV. BIOS SOFTWARE

BIOS Features Setup

The “BIOS Features Setup” option consists of configuration entries that allow you to improve your system performance, or let you set up some system features according to your preference. Some entries are required by the motherboard’s design to remain in their default settings.



A section at the lower right of the screen displays the control keys you can use. Take note of these keys and their respective uses. If you need information on a particular entry, highlight it and then press <F1>. A pop-up help menu will appear to provide you with the information you need. <F5> loads the last set values, <F6> and <F7> loads the BIOS default values and Setup default values, respectively.

NOTE: SETUP Defaults are noted in parenthesis next to each function heading.

Details of BIOS Features Setup

CPU Internal Core Speed

This function is reserved for future use and is currently disabled.

Boot Virus Detection (Enabled)

This field allows you to set boot virus detection, ensuring a virus-free boot sector. This new antivirus solution is unlike native BIOS tools, which offer limited virus protection typically by write-protecting the partition table. With this new solution, your computer is protected against boot virus threats earlier in the boot cycle, that is, before they have a chance to load into your system. This ensures your computer boots to a clean operating system. The system halts and displays a warning message when it detects a virus. If this occurs, you can either allow the operation to continue or use a virus-free bootable floppy disk to restart and investigate your system. Because of conflicts with new operating systems, for example, during installation of new software, you may have to set this to *Disabled* to prevent write errors.

IV. BIOS SOFTWARE

CPU Level 1 Cache / CPU Level 2 Cache (Enabled)

These fields allow you to choose from the default of *Enabled* or choose *Disabled* to turn on or off the CPU's Level 1 and Level 2 built-in cache.

CPU Level 2 Cache ECC Check (Disabled)

This function controls the ECC check capability in the CPU level 2 cache.

BIOS Update (Enabled)

This functions as an update loader integrated into the BIOS to supply the processor with the required data. The BIOS will load the update on all processors during system bootup in the default position of *Enabled*.

Turbo Mode (Disabled)

Leave on default setting.

Quick Power On Self Test (Enabled)

This field speeds up the Power-On Self Test (POST) routine by skipping retesting a second, third, and fourth time. Setup default setting for this field is *Enabled*. A complete test of the system is done on each test.

HDD Sequence SCSI/IDE First (IDE)

When using both SCSI and IDE hard disk drives, IDE is always the boot disk using drive letter C (default setting of *IDE*). This new feature allows a SCSI hard disk drive to be the boot disk when set to *SCSI*. This allows multiple operating systems to be used on both IDE and SCSI drives or the primary operating system to boot using a SCSI hard disk drive.

Boot Sequence (A,C)

This field determines where the system looks first for an operating system. Options are *A,C*; *C,A*; *A,CDROM,C*; *CDROM,C,A*; *D,A*; *E,A*; *F,A*; *C only*; *LS/ZIP, C*; *LAN,A,C*; and *LAN,C,A*. The setup default setting, *A, C*, is to check first the floppy disk and then the hard disk drive.

Boot Up Floppy Seek (Disabled)

When enabled, the BIOS will seek drive A once.

Floppy Disk Access Control (R/W)

This allows protection of files from the computer system to be copied to floppy disks by allowing the setting of *Read Only* to only allow reads from the floppy disk drive but not writes. The setup default *R/W* allows both reads and writes.

IDE HDD Block Mode Sectors (HDD MAX)

This field enhances hard disk performance by making multi-sector transfers instead of one sector per transfer. Most IDE drives, except older versions, can utilize this feature. Selections are *HDD MAX*, *Disabled*, *2*, *4*, *8*, *16*, and *32*.

HDD S.M.A.R.T. capability (Disabled)

This allows the enabling or disabling of the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) system which utilizes internal hard disk drive monitoring technology. This feature is normally disabled because system resources used in this feature may decrease system performance.

IV. BIOS SOFTWARE

PS/2 Mouse Function Control (Auto)

The default of *Auto* allows the system to detect a PS/2 mouse on bootup. If detected, IRQ12 will be used for the PS/2 mouse. IRQ12 will be reserved for expansion cards if a PS/2 mouse is not detected. *Enabled* will always reserve IRQ12, whether on bootup a PS/2 mouse is detected or not.

OS/2 Onboard Memory > 64M (Disabled)

When using OS/2 operating systems with installed DRAM of greater than 64MB, you need to set this option to *Enabled* otherwise leave this on *Disabled*.

.....

PCI/VGA Palette Snoop (Disabled)

Some display cards that are nonstandard VGA such as graphics accelerators or MPEG Video Cards may not show colors properly. The setting *Enabled* should correct this problem. Otherwise leave this on the setup default setting of *Disabled*.

Video ROM BIOS Shadow (Enabled)

This field allows you to change the video BIOS location from ROM to RAM. Relocating to RAM enhances system performance, as information access is faster than the ROM.

C8000-CBFFF to DC000-DFFFF (Disabled)

These fields are used for shadowing other expansion card ROMs. If you install other expansion cards with ROMs on them, you will need to know which addresses the ROMs use to shadow them specifically. Shadowing a ROM reduces the memory available between 640K and 1024K by the amount used for this purpose.

Boot Up NumLock Status (On)

This field enables users to activate the Number Lock function upon system boot.

Typematic Rate Setting (Disabled)

When enabled, you can set the two typematic controls listed next. Setup default setting is *Disabled*.

Typematic Rate (Chars/Sec) (6)

This field controls the speed at which the system registers repeated keystrokes. Options range from 6 to 30 characters per second. Setup default setting is **6**; other settings are 8, 10, 12, 15, 20, 24, and 30.

Typematic Delay (Msec) (250)

This field sets the time interval for displaying the first and second characters. Four delay rate options are available: 250, 500, 750, and 1000.

Security Option (System)

When you specify a *Supervisor Password* and/or *User Password* (explained later in this section), the Security Option field determines when the system prompts for the password. The default setting is *System*, where the system prompts for the User Password every time you start your system. The other option is *Setup*, where the system goes through its startup routine unless the Setup utility is called, when the system prompts for the Supervisor Password.

IV. BIOS SOFTWARE

Chipset Features Setup

The “Chipset Features Setup” option controls the configuration of the board’s chipset.



NOTE: SETUP Defaults are noted in parenthesis next to each function heading.

Details of Chipset Features Setup

SDRAM Configuration (By SPD)

This sets the optimal timings of settings for items 2–5, depending on the memory modules that you are using. Default setting is *By SPD*, which configures items 2–5 by reading the contents in the SPD (Serial Presence Detect) device. This 8-pin serial EEPROM device stores critical parameter information about the module, such as memory type, size, speed, voltage interface, and module banks.

SDRAM CAS Latency

This controls the latency between SDRAM read command and the time that the data actually becomes available. Leave on default setting.

SDRAM RAS to CAS Delay

This controls the latency between SDRAM active command and the read/write command. Leave on default setting.

SDRAM RAS Precharge Time

This controls the idle clocks after issuing a precharge command to SDRAM. Leave on default setting.

DRAM Idle Timer

This controls the idle clocks before closing an opened SDRAM page. Leave on default setting.

SDRAM MA Wait State (Normal)

This controls the leadoff clocks for CPU read cycles. Leave on default setting.

Snoop Ahead (Enabled)

Enabled will allow PCI streaming. Leave on default setting.

Host Bus Fast Data Ready (Disabled)

Leave on default setting.

IV. BIOS SOFTWARE

16-bit I/O Recovery Time (1 BUSCLK) / 8-bit I/O Recovery Time (1 BUSCLK)
Timing for 16-bit and 8-bit ISA cards, respectively. Leave on default setting.

Graphics Aperture Size (64MB)

Memory-mapped, graphics data structures can reside in a Graphics Aperture. Leave on default setting.

Video Memory Cache Mode (UC)

USWC (uncacheable, speculative write combining) is a new cache technology for the video memory of the processor. It can greatly improve the display speed by caching the display data. You must leave this on the default setting of UC (uncacheable) if your display card cannot support this feature, otherwise your system may not boot.

PCI 2.1 Support (Enabled)

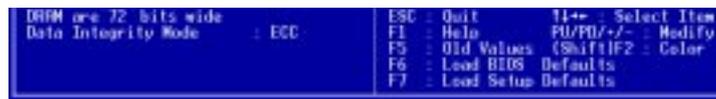
This function allows you to enable or disable PCI 2.1 features including passive release and delayed transaction. Leave *Enabled* (default setting) for PCI 2.1 compliancy.

Memory Hole At 15M–16M (Disabled)

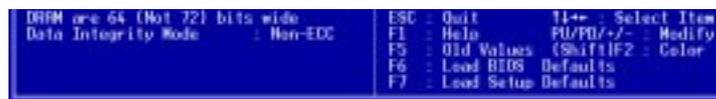
Enabling this feature reserves 15MB to 16MB memory address space to ISA expansion cards that specifically require this setting. This makes the memory from 15MB and up unavailable to the system. Expansion cards can only access memory up to 16MB. The default is *Disabled*.

DRAM are xx bits wide

If all your DIMMs have ECC (e.g., 8 chips + 1 ECC chip), they are considered 72bits and the following will be displayed:



If your DIMMs do not have ECC (e.g., 8 chips), they are considered 64 bits and the following will be displayed instead:



Data Integrity Mode (Non-ECC)

Non-ECC has byte-wise write capability but no provision for protecting data integrity in the memory module array. *EC-Only* data errors are detected but not corrected. *ECC* with hardware scrubbing allows a detection of single-bit and multiple-bit errors and recovery of single-bit errors. (See **2. System Memory**, section III for more information on memory modules.)

Onboard FDC Controller (Enabled)

When *Enabled*, this field allows you to connect your floppy disk drives to the onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller card to connect the floppy disk drives, set this field to *Disabled*.

IV. BIOS SOFTWARE

Onboard FDC Swap A & B (No Swap)

This field allows you to reverse the hardware drive letter assignments of your floppy disk drives. Two options are available: *No Swap* and *Swap AB*. If you want to switch drive letter assignments through the onboard chipset, set this field to *Swap AB*.

Onboard Serial Port 1 (3F8H/IRQ4)

Settings are *3F8H/IRQ4*, *2F8H/IRQ3*, *3E8H/IRQ4*, *2E8H/IRQ10*, and *Disabled* for the onboard serial connector.

Onboard Serial Port 2 (2F8H/IRQ3)

Settings are *3F8H/IRQ4*, *2F8H/IRQ3*, *3E8H/IRQ4*, *2E8H/IRQ10*, and *Disabled* for the onboard serial connector.

Onboard Parallel Port (378H/IRQ7)

This field sets the address of the onboard parallel port connector. You can select either: *3BCH/IRQ 7*, *378H/IRQ 7*, *278H/IRQ 5*, *Disabled*. If you install an I/O card with a parallel port, ensure that there is no conflict in the address assignments. The PC can support up to three parallel ports as long as there are no conflicts for each port.

Parallel Port Mode (ECP+EPP)

This field allows you to set the operation mode of the parallel port. The setting *Normal*, allows normal-speed operation but in one direction only; *EPP* allows bidirectional parallel port operation at maximum speed; *ECP* allows the parallel port to operate in bidirectional mode and at a speed faster than the maximum unidirectional data transfer rate; *ECP+EPP* allows normal speed operation in a two-way mode.

ECP DMA Select (3)

This selection is available only if you select *ECP* or *ECP+EPP* in the **Parallel Port Mode**. Select either DMA Channel *1*, *3*, or *Disable*.

UART2 Use Infrared (Disabled)

When enabled, this field activates the onboard infrared feature and sets the second serial UART to support the infrared module connector on the motherboard. If your system already has a second serial port connected to the onboard COM2 connector, it will no longer work if you enable the infrared feature. By default, this field is set to *Disabled*, which leaves the second serial port UART to support the COM2 serial port connector. See **IrDA-compliant infrared module connector** under section III.

Onboard PCI IDE Enable (Both)

You can select to enable the *primary* IDE channel, *secondary* IDE channel, *both*, or *disable* both channels (for systems with only SCSI drives).

IDE Ultra DMA Mode (Auto)

This field autodetects Ultra DMA capability (for improved transfer speeds and data integrity) for compatible IDE devices. Set to *Disable* to suppress Ultra DMA capability.

IDE 0 Master/Slave PIO/DMA Mode, IDE 1 Master/Slave PIO/DMA Mode (Auto)

Each channel (0 and 1) has both a master and a slave making four IDE devices possible. Because each IDE device may have a different Mode timing (*0*, *1*, *2*, *3*, *4*), it is necessary for these to be independent. The default setting of *Auto* will allow autodetection to ensure optimal performance

IV. BIOS SOFTWARE

Power Management Setup

The “Power Management Setup” option allows you to reduce power consumption. This feature turns off the video display and shuts down the hard disk after a period of inactivity.



NOTE: SETUP Defaults are noted in parenthesis next to each function heading.

Details of Power Management Setup

Power Management (User Define)

This field acts as the master control for the power management modes. *Max Saving* puts the system into power saving mode after a brief period of system inactivity; *Min Saving* is almost the same as *Max Saving* except that this time the system inactivity period is longer; *Disable* disables the power saving features; *User Define* allows you to set power saving options according to your preference.

IMPORTANT: Advanced Power Management (APM) should be installed to keep the system time updated when the computer enters suspend mode activated by the BIOS Power Management. For DOS environments, you need to add the statement, `DEVICE=C:\DOS\POWER.EXE`, in you `CONFIG.SYS`. For Windows 3.x and Windows 95, you need to install Windows with the APM feature. A battery and power cord icon labeled “Power” will appear in the “Control Panel.” Choose “Advanced” in the Power Management Field.

Video Off Option (Suspend -> Off)

This field determines when to activate the video off feature for monitor power management. The settings are *Always On* and *Suspend -> Off*.

IV. BIOS SOFTWARE

Video Off Method (DPMS OFF)

This field defines the video off features. The following options are available: *DPMS OFF*, *DPMS Reduce ON*, *Blank Screen*, *V/H SYNC+Blank*, *DPMS Standby*, and *DPMS Suspend*. The DPMS (Display Power Management System) features allow the BIOS to control the video display card if it supports the DPMS feature. *Blank Screen* only blanks the screen (use this for monitors without power management or “green” features. If set up in your system, your screen saver will not display with *Blank Screen* selected). *V/H SYNC+Blank* blanks the screen and turns off vertical and horizontal scanning.

.....

PM Timers

This section controls the time-out settings for the Power Management scheme. The fields included in this section are “HDD Power Down”, which places the hard disk into its lowest power consumption mode, and the “Suspend Mode” which suspends the CPU.

The system automatically “wakes up” from any power saving mode when there is system activity such as when a key is pressed from the keyboard, or when there is activity detected from the enabled IRQ channels.

HDD Power Down (Disable)

Shuts down any IDE hard disk drives in the system after a period of inactivity. This time period is user-configurable to *1–15 Min* or *Disable*. This feature does not affect SCSI hard drives.

Suspend Mode (Disable)

Sets the period of time after which each of these modes activate: *30 sec*, *1 Min*, *2 Min*, *4 Min*, *8 Min*, *20 Min*, *30 Min*, *40 Min*, *1 Hour*, and *Disable*.

.....

Power Up Control

This section determines the ways the system can be controlled when it is started or restarted, when modem activity is detected, or when power to the computer is interrupted and reapplied. The Soft-Off mode refers to powering off the system through a momentary button switch (ATX switch) or through the software as opposed to disconnecting the AC power by way of a rocker switch or other means.

PWR Button < 4 Secs (Soft Off)

When set to *Soft Off*, the ATX switch can be used as a normal system power-off button when pressed for less than 4 seconds. *Suspend* allows the button to have a dual function where pressing less than 4 seconds will place the system in sleep mode. Regardless of the setting, holding the ATX switch for more than 4 seconds will power off the system.

IV. BIOS SOFTWARE

PWR Up On Modem Act (Enabled)

This allows either settings of *Enabled* or *Disabled* for powering up the computer (turns the ATX power supply on) when the modem receives a call while the computer is Soft-off.

NOTE: The computer cannot receive or transmit data until the computer and applications are fully running, thus connection cannot be made on the first try. Turning an external modem off and then back on while the computer is off causes an initialization string that will also cause the system to power on.

AC PWR Loss Restart (Disabled)

This allows you to set whether you want your system to boot up after the power has been interrupted. *Disabled* leaves your system off after reapplying power and *Enabled* boots up your system after reapplying power.

Wake On LAN (Enabled)

This allows you to remotely power up your system through your network by sending a wake-up frame or signal. With this feature, you can remotely upload/download data to/from systems during off-peak hours. *Enabled* sets this feature.

IMPORTANT: This feature requires the optional network interface (see **VII. Network Interface**) and an ATX power supply with at least 720mA +5V standby power.

Automatic Power Up (Disabled)

This allows you to have an unattended or automatic power up of your system. You may configure your system to power up at a certain time of the day by selecting *Everyday*, which will allow you to set the time or at a certain time and day by selecting *By Date*.

.....

Fan Monitor (xxxxRPM)

The onboard hardware monitor is able to detect the Chassis Fan Speed, CPU Fan Speed, and the Power Supply Fan Speed in Rotations Per Minute (RPM). Set to *Ignore* if one of these are not used so that error messages will not be given.

.....

Thermal Monitor (xxxC/xxxF)

The onboard hardware monitor is able to detect the CPU and MB (motherboard) temperatures. Set to *Ignore* only if necessary.

.....

Voltage Monitor (xx.xV)

The onboard hardware monitor is able to detect the voltages put out by the voltage regulators. Set to *Ignore* only if necessary.

NOTE: If any of the monitored items are out of range, an error message will appear: "Hardware Monitor found an error, enter POWER MANAGEMENT SETUP for details". You will then be prompted to "Press **F1** to continue, **DEL** to enter SETUP".

IV. BIOS SOFTWARE

PNP and PCI Setup

The “PNP and PCI Setup” option configures the PCI bus slots. All PCI bus slots on the system use INTA#, thus all installed PCI cards must be set to this value.



NOTE: SETUP Defaults are noted in parenthesis next to each function heading.

Details of PNP and PCI Setup

PNP OS Installed (No)

This field allows you to use a Plug-and-Play (PnP) operating system to configure the PCI bus slots instead of using the BIOS. Thus interrupts may be reassigned by the OS when *Yes* is selected. When a non-PnP OS is installed or to prevent reassigning of interrupt settings, select the default setting of *No*.

Slot 1 IRQ / Slot 2 IRQ (Auto)

These fields set how IRQ use is determined for each PCI slot. The default setting for each field is *Auto*, which uses auto-routing to determine IRQ use. The other options are manual settings of *NA*, *3*, *4*, *5*, *7*, *9*, *10*, *11*, *12*, *14* or *15* for each slot.

PCI Latency Timer (32 PCI Clock)

The default setting of *32 PCI Clock* enables maximum PCI performance for this motherboard.

IRQ xx Used By ISA (No/ICU)

These fields indicate whether or not the displayed IRQ for each field is being used by a legacy (non-PnP) ISA card. Two options are available: *No/ICU* and *Yes*. The first option, the default value, indicates either that the displayed IRQ is not used or an ISA Configuration Utility (ICU) is being used to determine if an ISA card is using that IRQ. If you install a legacy ISA card that requires a unique IRQ, and you are not using an ICU, you must set the field for that IRQ to *Yes*. For example: If you install a legacy ISA card that requires IRQ 10, then set **IRQ10 Used By ISA** to *Yes*.

.....

IV. BIOS SOFTWARE

DMA x Used By ISA (No/ICU)

These fields indicate whether or not the displayed DMA channel for each field is being used by a legacy (non-PnP) ISA card. Available options include: *No/ICU* and *Yes*. The first option, the default setting, indicates either that the displayed DMA channel is not used or an ICU is being used to determine if an ISA card is using that channel. If you install a legacy ISA card that requires a unique DMA channel, and you are not using an ICU, you must set the field for that channel to *Yes*.

ISA MEM Block BASE (No/ICU)

This field allows you to set the base address and block size of a legacy ISA card that uses any memory segment within the C800H and DFFFH address range. If you have such a card, and you are not using an ICU to specify its address range, select a base address from the six available options; the **ISA MEM Block SIZE** field will then appear for selecting the block size. If you have more than one legacy ISA card in your system that requires to use this address range, you can increase the block size to either 8K, 16K, 36K, or 64K. If you are using an ICU to accomplish this task, leave **ISA MEM Block BASE** to its default setting of *No/ICU*.

Symbios SCSI BIOS (Auto)

Auto allows the BIOS to detect whether you have a Symbios SCSI card, if detected the onboard Symbios BIOS will be enabled, if not then it will be disabled. *Disabled* prevents the onboard Symbios BIOS to be enabled so that the external Symbios SCSI card's own BIOS can be used instead. **Note:** If your Symbios SCSI card does not have a BIOS, the Symbios SCSI card will not function.

USB IRQ (Enabled)

Enabled reserves an IRQ# for the USB to work, *Disabled* does not allow the USB to have an IRQ# and therefore prevents the USB from functioning. If you are not using any USB devices, you may set this feature to *Disabled* to save an extra IRQ# for expansion cards.

ONB VGA BIOS First (No)

This allows you to select whether you want to use the onboard VGA BIOS as the primary BIOS. *No* allows external VGA cards to take precedent when detected. *Yes* always uses the onboard VGA card's BIOS, even when an external VGA card is installed.

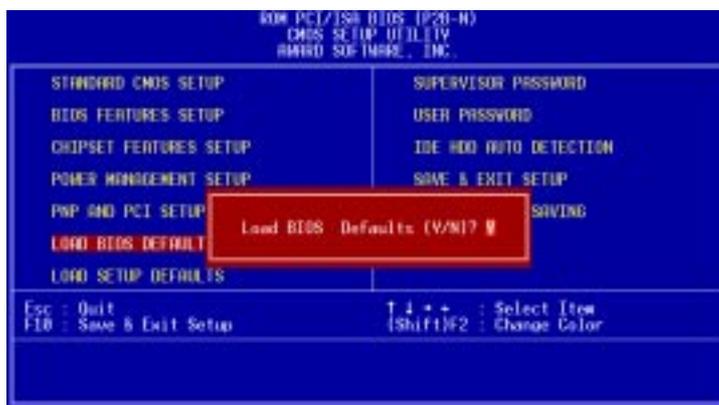
IV. BIOS SOFTWARE

Load BIOS Defaults

The “Load BIOS Defaults” option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high performance features. To load these default settings, highlight “Load BIOS Defaults” on the main screen and then press <Enter>. The system displays a confirmation message on the screen. Press <Y> and then <Enter> to confirm. Press <N> and then <Enter> to abort. This feature does not affect the fields on the Standard CMOS Setup screen.

Load Setup Defaults

The “Load Setup Defaults” option allows you to load the default values to the system configuration fields. These default values are the optimized configuration settings for the system. To load these default values, highlight “Load Setup Defaults” on the main screen and then press <Enter>. The system displays a confirmation message on the screen. Press <Y> and then <Enter> to confirm. Press <N> and then <Enter> to abort. This feature does not affect the fields on the Standard CMOS Setup screen.



IV. BIOS SOFTWARE

Supervisor Password and User Password

These two options set the system passwords. “Supervisor Password” sets a password that will be used to protect the system and the Setup utility; “User Password” sets a password that will be used exclusively on the system. By default, the system comes without any passwords. To specify a password, highlight the type you want and then press <Enter>. A password prompt appears on the screen. Taking note that the password is case sensitive, and can be up to 8 alphanumeric characters long, type in your password and then press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically reverts to the main screen.



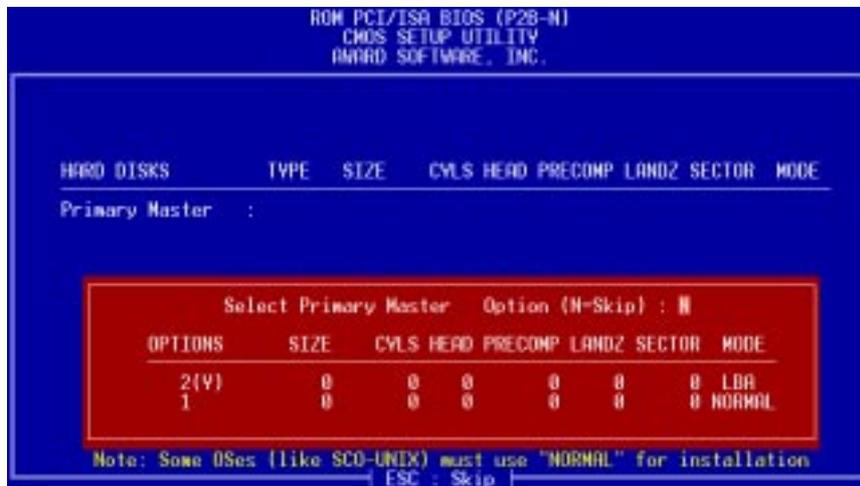
To implement password protection, specify in the “Security Option” field of the BIOS Features Setup screen when the system will prompt for the password. If you want to disable either password, press <Enter> instead of entering a new password when the “Enter Password” prompt appears. A message confirms the password has been disabled.

NOTE: If you forget the password, see **Clear Time Clock (Jumpers)** in section III for procedures on clearing the CMOS.

IV. BIOS SOFTWARE

IDE HDD Auto Detection

The “IDE HDD Auto Detection” option detects the parameters of an IDE hard disk drive, and automatically enters them into the Standard CMOS Setup screen.



Up to four IDE drives can be detected, with parameters for each listed inside the box. To accept the optimal entries, press <Y> or else select from the numbers displayed under the OPTIONS field (2, 1, 3 in this case); to skip to the next drive, press <N>. If you accept the values, the parameters will appear listed beside the drive letter on the screen. The process then proceeds to the next drive letter. Pressing <N> to skip rather than to accept a set of parameters causes the program to enter zeros after that drive letter.

Remember that if you are using another IDE controller that does not feature Enhanced IDE support for four devices, you can only install two IDE hard disk drives. Your IDE controller must support the Enhanced IDE features in order to use Drive E and Drive F. The onboard PCI IDE controller supports Enhanced IDE, with two connectors for connecting up to four IDE devices. If you want to use another controller that supports four drives, you must disable the onboard IDE controller in the Chipset Features Setup screen.

When auto-detection is completed, the program automatically enters all entries you accepted on the field for that drive in the Standard CMOS Setup screen. Skipped entries are ignored and are not entered in the screen.

If you are auto-detecting a hard disk that supports the LBA mode, three lines will appear in the parameter box. Choose the line that lists LBA for an LBA drive. Do not select Large or Normal.

The auto-detection feature can only detect one set of parameters for a particular IDE hard drive. Some IDE drives can use more than one set. This is not a problem if the drive is new and empty.

IV. BIOS SOFTWARE

IMPORTANT: If your hard disk was already formatted on an older previous system, incorrect parameters may be detected. You will need to enter the correct parameters manually or use low-level format if you do not need the data stored on the hard disk.

If the parameters listed differ from the ones used when the disk was formatted, the disk will not be readable. If the auto-detected parameters do not match the ones that should be used for your disk, do not accept them. Press <N> to reject the presented settings and enter the correct ones manually from the Standard CMOS Setup screen.

Save & Exit Setup

Select this option to save into the CMOS memory all modifications you specified during the current session. To save the configuration changes, highlight the “Save & Exit Setup” option on the main screen, type “Y”, and then press <Enter>.



IV. BIOS
Save & Exit

Exit Without Saving

Select this option to exit the Setup utility without saving the modifications you specify during the current session. To exit without saving, highlight the “Exit Without Saving” option on the main screen and then press <Enter>.

IV. BIOS SOFTWARE

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V. Support CD

ASUS Support CD

Insert the support CD or double-click your CD drive icon in “My Computer” to bring up the autorun menu or run **Setup.exe** in the root directory of the Support CD.

NOTE: The support CD contents are constantly updated without notice.

Support CD Main Menu



- **LDCM Local Setup:** Installs software to monitor the local system. The LANdesk Client Manager must be installed in order to use the hardware manager features.
- **LDCM Administrator Setup:** Installs software to monitor PC systems on the network within the same bridge address with the Local software installed. The administrator should install both Local and Administrator Software.
- **ASUS PC Probe Setup:** Installs a simple utility to monitor your computer's fan, temperature, and voltages. (**NOTE:** This utility will not run with LDCM installed.) A user's manual in Adobe Acrobat PDF format is available under the ASUSLM folder created on your system during setup.
- **Adobe Acrobat Reader:** Installs the Adobe Acrobat Reader software necessary to view the LDCM manual in the LDCM directory.
- **BusMaster:** Installs the Intel BusMaster IDE drivers.
- **Install Video Driver and Utility:** Installs the video driver and utilities for the onboard VGA chipset.
- **Install Audio Driver:** Audio driver installation instructions for the onboard audio.
- **Install Audio Utilities:** Installs AudioRack32 audio utility.
- **Install Software Wave Table:** Expands the audio sound capability for increased sound effects.

V. Support CD

- **Install Intel 82558 Lan Driver:** Installs the EtherExpress™ PRO/100+ adapter driver.
- **Patch for PIIX4 chipset:** Installs the necessary drivers for PCI card and PCI bridge for Windows 95/95a (OSR1) and 95b (OSR2) for ASUS motherboards.
- **Install PCCillin:** Installs “PC-cillin” virus protection software. View the online help if you have any questions.
- **Browse this CD:** Allows you to see the contents of the ASUS support CD.
- **Read Me:** View additional notes with Notepad.
- **LDCM Introduce (MPEG VCD):** View a video on the LDCM features.
- **Exit:** Exit the selection menu.

Additional CD Contents: DMI Configuration Utility in the **DMI** directory and Flash BIOS writer in the **AFLASH** directory.

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NOTE: The screen displays in this section may not reflect the screen contents displayed on your screen.

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ASUS[®] PC Probe



USER'S MANUAL

Included only with products using hardware monitoring components.

A. PC Probe Utility

Installing and Running ASUS PC Probe

The ASUS PC Probe is a convenient utility to monitor the computer system's vital components: fan rotations, voltages, and temperatures.

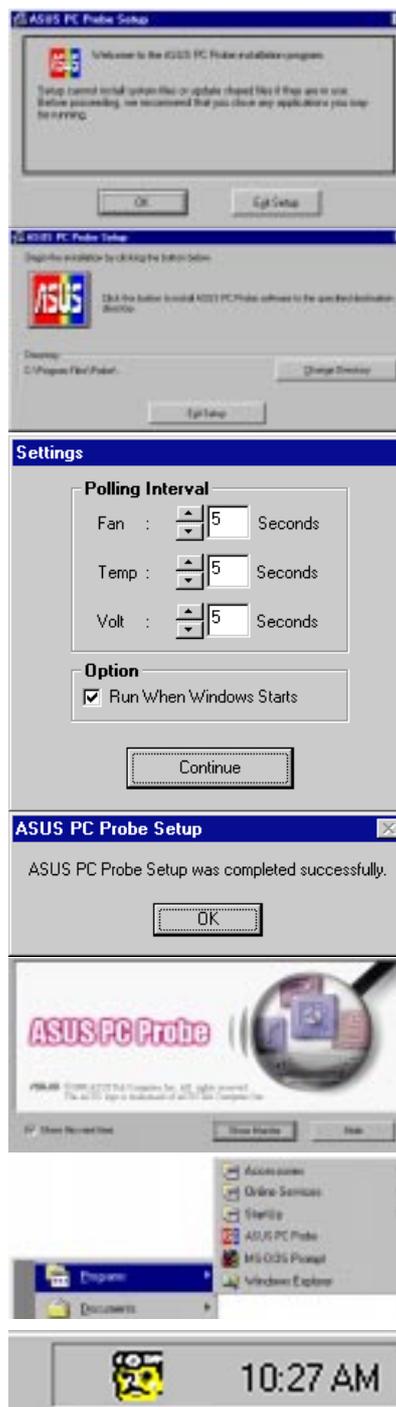
NOTE: ASUS PC Probe will not run if other hardware monitoring programs, such as Intel's LDCM utility, are installed.

1. Click "ASUS PC Probe Setup" on the main menu.
2. Click **OK** after reading the welcome message.
3. Click the **ASUS** button.
4. Make any desired setting changes. Then click **Continue**.
5. Click **OK** when the installation is completed. PC Probe will run automatically.

When ASUS PC Probe starts, a splash screen appears allowing you to "Show Monitor" or "Hide". You can select whether you want the splash screen to show the next time it opens.

Click "ASUS PC Probe" from the "Start" button to run the utility if you exit the utility or did not set it to "Run when Windows Starts."

The PC Probe icon  will appear on the taskbar's system tray indicating that ASUS PC Probe is running. Left clicking the icon will allow you to see your PC status.



A. PC Probe Utility

Uninstalling Programs

Uninstalling programs is a basic component within Windows 95. You may use this function if individual programs does not provide their own uninstallation methods.

1. If other hardware monitoring programs such as the Intel LDCM are installed, the ASUS PC Probe will not run.
2. Uninstall other hardware monitoring programs if you want to use the ASUS PC Probe by running “Add/Remove Programs” from the Control Panel.
3. Select the program you wish to remove and click **Add/Remove...**



The ASUS PC Probe can also be removed by the same method.



A. PC Probe Utility

Using the ASUS PC Probe

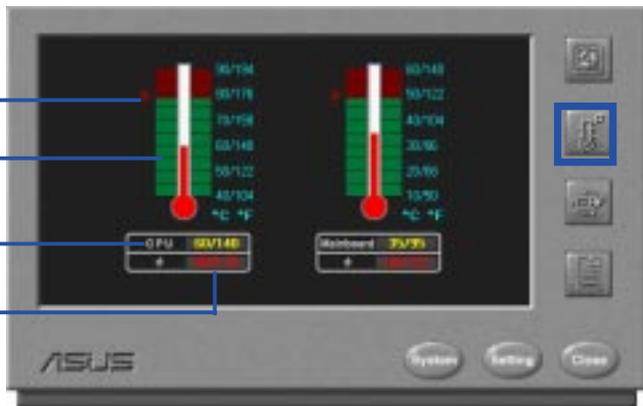
Fan Rotation Status

- Analog view of PC's fan rotation
- Digital view of PC's fan rotation
- PC's Fan warning threshold adjustment



PC Temperature Status

- Temperature Warning threshold adjustment
- Analog view of PC's temperature
- Digital view of PC's temperature
- Digital view of PC's temperature warning threshold



PC Voltage Status

- Upper warning threshold adjustment
- Analog view of PC's voltages
- Lower warning threshold adjustment
- Digital view of PC's voltages
- Digital view of PC's voltage warning thresholds



PC Status Summary

- PC's Fan Rotations per minute
- PC's Temperature °C/°F
- PC's Voltages



A. PC Probe Utility

Using the ASUS PC Probe

PC Probe System Info.



Get information on your mainboard and BIOS from this screen.



A. PC Probe Utility
Using PC Probe

PC Probe Settings



Change PC Probe refresh times here

Click here to start PC Probe each time you enter Windows.

Click the items you wish to reset to its default values and click this button.



PC Probe Task Bar Icon

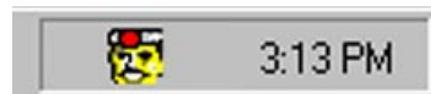
Right clicking the PC Probe icon will bring up a menu to turn on, off, or exit ASUS PC Probe.



The icon appears dimmed when off or unavailable.



When there is a problem, the icon's head mirror flashes red, the PC speaker beeps, and the ASUS PC Probe monitor is displayed.



A. PC Probe Utility

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B. Video Driver

First Time Installation

When you start Windows for the first time after the installation of your motherboard, Windows 95/98 will detect the onboard video chip (either ATI 3D Rage Pro AGP 2X or ATI 3D Rage IIC AGP, depending on your motherboard) and may attempt to install a driver from its system registry. When prompted to restart, select **No**. Then follow the normal installation procedure later in this section.

IMPORTANT: Selecting **No** for the initial restart prompt is a necessary step because Windows may load an older display driver that is incompatible with the onboard ATI 3D Rage chip. Always use the driver available on the ASUS Support CD or an applicable driver update from your ASUS vendor or from the ASUS web site.

Operating Systems

You should always use the latest operating system and updates when using new hardware in order to ensure full compliancy. For Windows 95, you must use OSR 2.0 or later. For Windows NT 4.0, you must use Service Pack 3.0 or later.

B. Video Driver

Install Video Driver and Utility (Windows 95/98)

Install Video Driver and Utility installs the video driver necessary for your card to have higher performance, resolutions, and special features. You can also install the ATI Player—a software multimedia player which provides full-screen MPEG video playback with excellent color quality, plus a host of advanced multimedia features.

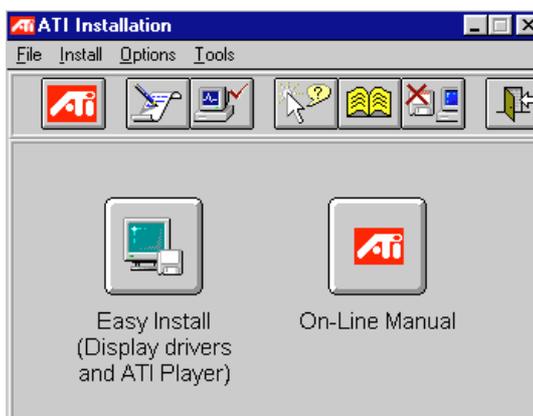
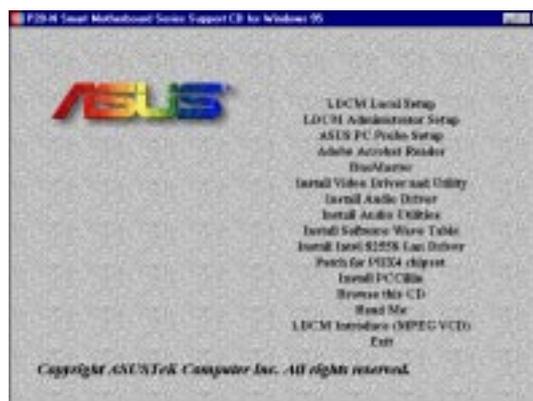
To install the video driver and utility for Windows 95/98

Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the autorun screen or run **Setup.exe** in the root directory of your CD-ROM drive.

Click **Install Video Driver and Utility**.

The *ATI Installation* dialog box will appear.

Click **Easy Install** to begin the Installation Wizard.



The *ATI Setup* screen will appear.

Click **Next** to proceed with the installation and follow the onscreen instructions to complete the installation.

When prompted to restart your computer, click **Yes**.



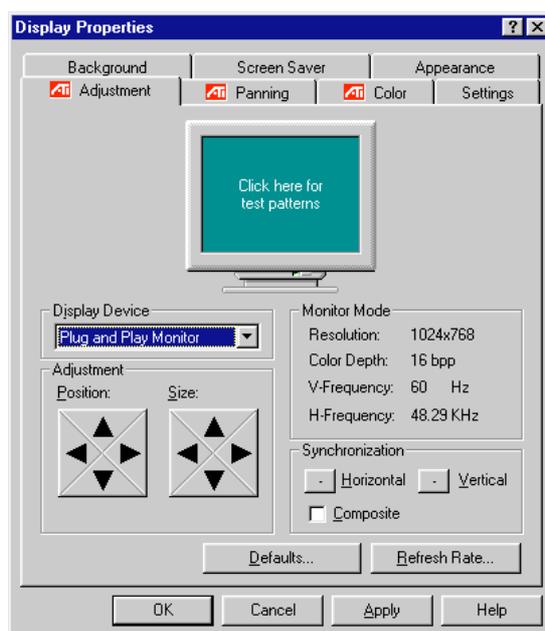
B. Video Driver

Display Settings for Windows 95/98

To change resolution, color, and other display properties, either right-click the Windows 95/98 desktop and then choose **Properties**, double-click the **Display** icon in the Control Panel, or right-click the ATI icon in the system tray.

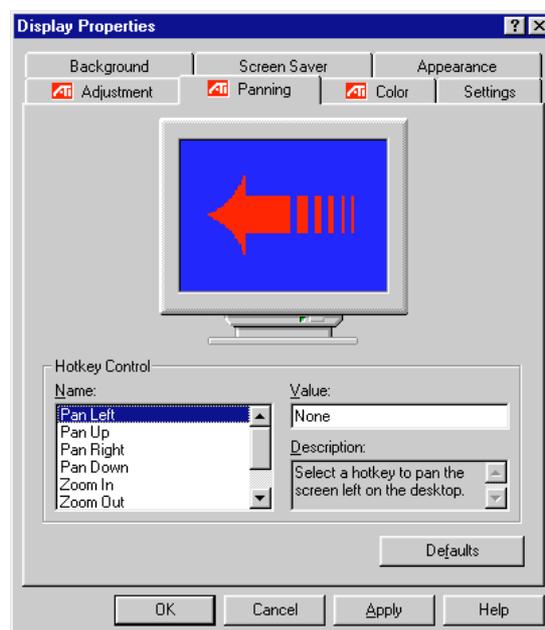
Adjustment Menu

You can adjust the screen output on the monitor from the Adjustment menu. Use the Position and Size arrows to center your screen and make it as large as possible.



Panning Menu

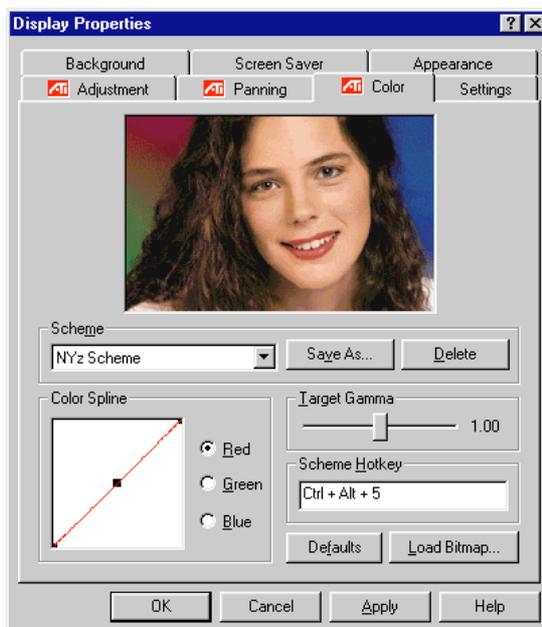
This allows you to assign hotkeys in the *Value* box for moving your screen up, down, left, right, in, or out in any application. Click **Defaults** to fill in the *Value* box with default values.



B. Video Driver

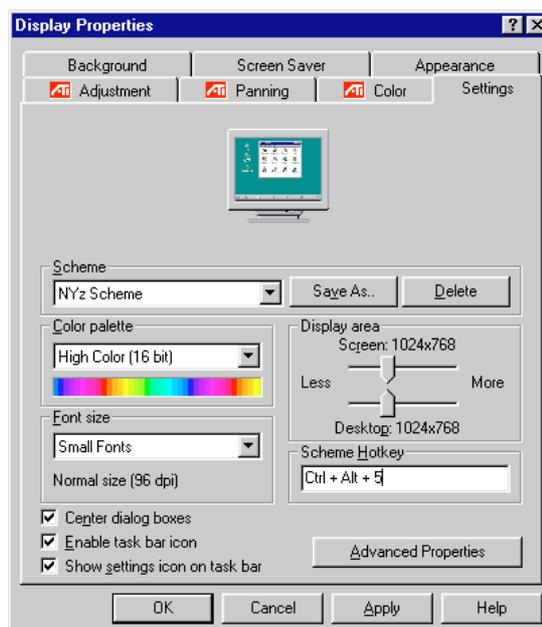
Color

This allows you to adjust the Gamma level for your monitor and color levels for Red, Green, and Blue. You can save your settings by clicking **Save As** and typing in a file name. This allows you to recall previously saved settings. Click **Defaults** to restore all settings to their defaults.



Settings

This allows you to adjust the Color palette, Font size, and Display area. Choose **Center dialog boxes** to keep messages visible, **Enable task bar icon** for easy access to the ATI configuration menus, and **Show settings icon on task bar** for quick resolution changes.



B. Other Video Drivers

Video Driver Installation for Windows NT 4.0

IMPORTANT!

- Windows NT 3.5x does not support AGP cards.
- Before installing the ASUS display driver in Windows NT 4.0, make sure that you have installed the **Windows NT 4.0 Service Pack version 3.0** (available on the Internet at http://www.microsoft.com/isapi/support/bldqpage.idc?ProductPage=q_servpk). Otherwise, the system will hang and will not be able to start up!
- For all the AGP features to be available you must be using Windows NT 5.0 (available in the future)

Installing Video Drivers for Windows NT 4.0

Windows NT will default to standard VGA mode (640x480, 16 colors) when you first start up. Follow the procedure below to install the video driver and player for Windows NT 4.0.

To install the video driver and player for Windows NT 4.0

1. Insert the ASUS Support CD into your CD-ROM drive.
If Windows NT autoruns the CD, skip to step 5.
2. Click **Start**.
3. Select **Run**.
4. Type **D:\ATISSETUP** (where D is your CD-ROM drive).
5. Click **Easy Install** to begin the Installation Wizard.
6. Follow the Wizard's on-screen instructions to complete the installation.

B. Other Video Drivers

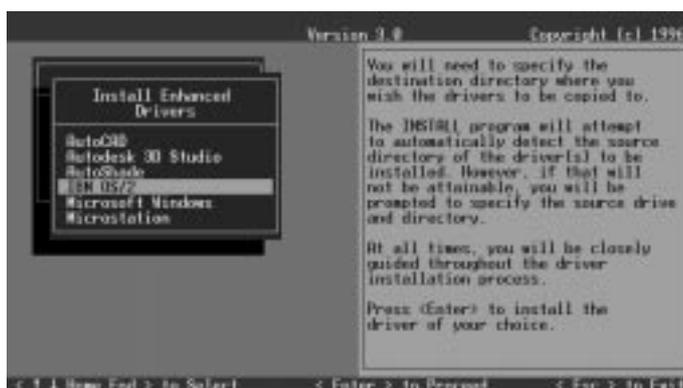
Video Driver Installation for IBM OS/2

The ATI OS/2 video driver is to be used for the English version of OS/2 only.

To install ATI video drivers for OS/2 or OS/2 Warp, use the INSTALL program. This program checks the system for possible conflicts, sets the monitor type, and installs the enhanced display driver.

To run the INSTALL program

1. Start OS/2.
2. Check that OS/2 is using a standard VGA driver and no other applications are running.
3. Double-click the **OS/2 System** folder.
4. Double-click the **Command Prompts** folder.
5. Double-click the **OS/2 Full Screen** object.
6. Insert the ASUS Support CD.
7. Type **D:** <Enter> (assuming D is your CD-ROM driver).
8. Type **CD ATI\UTILITY** <Enter>. Type **OS2INST** <Enter>



9. Select **Utilities Installation** from the Main Menu.
This copies the utilities onto your hard drive.
 10. Press <Enter> to select the default destination directory.
 11. When prompted, let the INSTALL program make changes to your Autoexec.bat file.
 12. Select **QUICK SETUP**.
You need to select QUICK SETUP to specify a monitor. Proper monitor selection is necessary for correct resolution and refresh rate operation.
 13. Select your monitor from the list.
or
If you do not see your monitor listed, see **Custom Monitor Configuration..**
- After you have selected a monitor, you are ready to copy the enhanced driver files.

B. Other Video Drivers

To copy the driver files

1. Select Drivers Installation from the Main Menu.
2. Select **IBM OS/2** from the list of applications.
3. Select **Install** for the correct version of OS/2.
4. Press <Enter> to select the default destination directory or specify a destination directory for the OS/2 driver files.
5. After the files have been copied, press any key.
6. Press **ESC** to exit.

You are now ready to install the enhanced driver for OS/2.

To install the driver for OS/2

1. In the OS/2 full-screen command prompt, type **DSPINSTL** <Enter>.
2. When the Display Driver Install panel appears, select **Primary Display**. Click **OK** to bring up the driver selection list.
3. Select the latest ATI driver version from the list, and click **OK**.
4. In the Monitor Configuration Selection Utility, select **Install Using Defaults for Monitor Type**, then click **OK**.
5. When the source directory panel appears, choose **Change** and specify the location of the driver. (The default location is C:\MACK_OS2.)
6. Click **SET**.
7. Click **INSTALL**.

B. Other Video Drivers

System Information (optional)

The program will check the system for possible conflicts with the device, and display both the device and system configurations in the INFO BOX. In case of a conflict, it will issue a warning and suggest possible corrective actions.

Your onboard video device is PCI Plug-and-Play compatible: your system will automatically allocate system resources and resolve possible conflicts between your Plug-and-Play compatible video device and other expansion cards.

System Information



Quick Setup (optional)

Select Quick Setup to configure the accelerator device to work with your monitor. As you highlight each monitor, the display specifications for that monitor type are listed in the INFO BOX. Proper monitor selection is necessary for correct resolution and refresh rate operation. You have four options to choose a correct Monitor Type.

Selecting Your Monitor Type: Factory Default/Apple.../IBM.../MIT.../NEC.../VESA-Std.../Generic.../Read VDIF.../Custom...

Select Read VDIF... If you have a VDIF file for your monitor and wish to use its parameters to automatically configure the video device. Additional VDIF details are provided later in this chapter, in the section: *VDIF Files*

Select Custom... if none of the above applies to you, or you wish to manually configure the settings. Please refer to the information provided later in this chapter in the section: **Custom Configuration**

Notes On Refresh Rates:

- A higher refresh rate reduces screen flicker, and therefore reduces eye strain. Not all refresh rates are supported at all color depths. Refer to the features section for specifications of your video device.
- The resolution used by your software application is independent of the refresh rate. Resolution depends on the installed software driver and selected display mode.

B. Other Video Drivers

VDIF Files (optional)

VDIF files are VESA Display Information Format files. They contain all the necessary configuration parameters for getting optimal resolution and refresh rate operation from the specified monitor. Consult your monitor manufacturer for availability of VDIF files.

If you have a VDIF file for your monitor, select it. The INSTALL program will read the VDIF file and automatically configure the device to properly work with your monitor.

Procedure:

1. Start the INSTALL program.
2. Select **Quick Setup** and press <Enter>.
3. Insert into a floppy drive the disk containing the VDIF file.
4. Select **READ VDIF...** and press <Enter>.
5. Type in the location of the VDIF file (typically A: or B:). INSTALL will read the file and configure the device to support your monitor according to the VDIF specification.

Custom Configuration

If your monitor is not listed in the Monitor Selection Menu, or you are not using DDC or VDIF, you can set up display modes, i.e., resolutions and refresh rates, on the device using the Custom... option. This option is useful even if you had selected a monitor from the list. For example, you can modify the screen centering or refresh rate on one resolution, and not change the other resolutions.

Procedure:

1. Start the INSTALL program.
2. Select **Quick Setup** and press <Enter>.
3. Select **Custom...** and press <Enter>.
4. Pick a resolution, then a refresh rate. You will see a box outline.

WARNING: Using the wrong refresh rate may permanently damage your monitor. For more information, please refer to the manual.

NOTE: An incorrect Monitor Type setting may damage your monitor. Review your monitor specifications before making a selection from the Monitor Selection Menu. Do not exceed the monitor specifications. Using a refresh rate (i.e., vertical frequency) that is higher than specified may damage your monitor. The manufacturer will not be liable for any damage caused by incorrect settings. Consult your monitor manual to determine the highest refresh rate for each resolution that your monitor supports. A scrambled screen indicates your monitor is not capable of the selected display mode. In which case, you should immediately press <Esc> to exit.

TIP: If the monitor produces a scrambled display, try a lower refresh rate. If it is already at the lowest refresh rate, set that resolution to Not Supported.”

5. Adjust the size and position of the box outline. Press <Enter> to accept.
6. Repeat steps 2 and 3 until you are satisfied with the box outline for all the resolutions. When finished, remember to exit and save the settings.

B. Other Video Drivers

Advanced Setup (optional)

If you wish to fine tune its settings for your monitor and system type, select Advanced Setup from the Main Menu. On-screen context sensitive help is displayed as you highlight each Advanced Menu item.

WARNING! The Advanced Configuration option allows you to use certain features that may add additional performance to your device. However these options may not be compatible with your system. If problems appear after an advanced option is changed, returning the device to factory defaults will rectify the situation.

Factory Defaults

The device can be reset to factory defaults by pressing <Shift>+<F7>.

Saving Your Configuration

Once you have finished configuring the necessary parameters described above, save them by pressing <F10>.

Diagnostics

All installed graphics modes for your video device can be viewed and tested, by running the INSTALL program from the DOS prompt, or by running a diagnostics program called M64DIAG.EXE. Do not run it in a windowed or full-screen DOS box. In the INSTALL program, select Test Graphics Adapter from the Diagnostics... option of the Main Menu. The Test Graphics Adapter menu has the following options:

- VGA Tests ...
- Accelerator Tests ...

Any time you suspect there is a problem, especially during installation, run the above tests. The information provided in this appendix will enable you to solve most problems.

B. Other Video Drivers

Troubleshooting

System Lockup

- If you are using a memory manager such as QEMM or 386MAX you need to modify the command line in the CONFIG.SYS file so that the address of the graphics device video BIOS, C000 - C7FF, is excluded. For example, add “EXCLUDE = C000 - C7FF” to the command line.
- Remove all unnecessary boards.
- Disable shadow RAM.
- Ensure that the board is seated correctly and that the device has been installed using the proper utilities.
- Try the device in a different system and reset to factory defaults using the INSTALL program. If the device works in another system, the problem is likely due to incorrect configuration.

Troubleshooting

Because a typical computer system consists of many different parts, difficulties may arise from a combination of items, from software or hardware installation, to monitor compatibility. Listed below are several checks you can make to help determine what the problem is.

Test Patterns OK; Applications Do Not Sync

The wrong monitor type has been selected. Change the settings in the INSTALL program.

Windows Driver Not Installing Properly

Windows must be running in 386 Enhanced Mode. Incompatible memory managers may prevent Windows from starting in enhanced mode. If this occurs, remove the offending driver or memory manager.

Windows NT 4.0 driver cannot pass “Test VGA.”

Please bypass “Test VGA” then load ATI drivers after completing installation.

AutoCAD Driver Not Installing Properly

If using a 386, ensure that AutoCAD has been configured for the appropriate ADI driver. The protected mode driver requires extended memory.

Error Codes and Messages

Problems and solutions for some common errors found by the test program are provided for your reference as follows:

B. Other Video Drivers

Memory aperture test failure or Diagnostics program locks or Reboots during aperture test

If you receive an error message indicating that the memory aperture location is conflicting with your system memory, restart the INSTALL program as follows: INSTALL APMAP <Enter>. Now when you enable Memory Aperture, you must select a location above but not overlapping System Memory (S), BIOS (B) or Reserved (R) locations. Not applicable for ISA cards.

Desired resolution is disabled and displayed in gray

A mode displayed in gray means that the BIOS is told this mode is not available, based on the device configuration. Reinstall using custom monitor selection.

Menu item is disabled and displayed in gray

The test program has determined that the mode or test is not available under the current configuration. Aperture tests are not available if the aperture is disabled, and CRT mode and pixel depth are determined by current installation, DAC type, memory size, and memory type.

Adapter not detected

This message should only occur when a mach64 ASIC is not detected. If this message occurs and a mach64 board is present, it may indicate an I/O conflict, conflicts between the Extended Memory Manager (EMM) and the video ROM. Try removing all other boards from the system and booting from a plain DOS disk. Try excluding the video BIOS address (C0000-C7FFF) from the memory manager. Refer to the documentation furnished with the memory manager software for information.

Any FIFO test error

The effects of a bad command FIFO should be visible. (e.g., the screen does not come up, or it displays garbage.)

Quick memory test error

Run Detailed RAM Test to confirm the error and identify the address of the error.

Detailed memory test error.

Run Detailed RAM Test several times to confirm the error and take notes of any messages and error codes.

DAC LUT test failure.

An error has occurred while testing the DAC LookUp Table. The problem should be visible on the top color bar of any 8bpp mode.

ROM checksum error.

An error has been detected in the ROM.

Draw sequence failure.

An error has occurred in the draw engine. If the error is intermittent, it might indicate a marginal RAM failure. The effects of this failure may not be immediately apparent.

B. Other Video Drivers

Windows 95 enhanced display driver

The Windows 95 enhanced display driver is capable of using monitor timing data contained within Windows 95. This data is selected by configuring a monitor type at Windows 95 installation time or via the “Settings” page of the display properties sheet.

The Windows 95 enhanced display driver may incorrectly interpret Windows 95 monitor timing data for some older monitors which require interlaced modes. This may cause some options to be disabled. A solution to this problem is to select one of the “(Standard monitor types)” available via the settings page of the display properties sheet.

If you change the selected monitor type via the “Settings” page of the display properties sheet the new timing data may not take effect until after restarting Windows 95. A solution to this problem is to always restart Windows 95 after changing the monitor type.

In Windows 95, display drivers can be installed via the “Add New Hardware” wizard. This is not recommended because when the Windows 95 enhanced display driver is installed via the “Add New Hardware” wizard the “Settings” page does not get installed into the display adapter property sheet.

Windows 95 property page problems

While adjusting monitor settings in the Adjustment page of the Display Properties sheet, your monitor could become unreadable. If this occurs, press the ESC key to return to your previous monitor settings.

ATI Video Player Notes

Why can my Video Player not execute in Windows 3.1 ?

The Video Player needs at least 600K DOS CONVENTIONAL MEMORY. You can try to close some programs to acquire more memory to use. If it still happens, return to DOS and run “MEMMAKER” in your DOS directory to modify your memory configuration. Quitting some DOS TSRs (Terminate and Stay Resident) programs also helps.

After installing Xing MPEG Player, my ATI Video Player cannot play Video CD even standard MPEG files.

Xing MPEG Player and ATI Video Player can not be installed together. They conflict with each other. The previously installed player will work abnormally. You can re-install ATI Video Player to recover it.

Why can I not use the TV output function in Windows 95?

You need to make sure that your resolution is 800x600 or lower and your refresh rate is less than or equal to 60Hz in NTSC and 50Hz in PAL.

B. Other Video Drivers

Other Problems & Actions

My monitor is not capable of high resolution or refresh rate.

It depends on the display characteristics of your monitor. Consult your monitor documentation for the proper configuration.

After installing the driver, Windows 95 doesn't prompt me to restart and the driver still doesn't work after I restart my computer.

You may have installed similar drivers before. Try the following steps to install:

1. Right-click **My Computer** on the desktop.
2. Select **Properties**. The **System Properties** dialog box appears.
3. Click the **Device Manager** tab. Be sure that **View devices by type** is selected.
4. Double-click **Display adapters**. If **Display adapters** does not appear, jump to step 8 and continue.
5. The name of your device will be listed in the box. Double-click it.
6. The properties box of your device appears. Click the **Driver** tab.
7. Click **Change Driver...** and follow the installation steps.
8. Click **Other devices**. Your device should be listed.
9. Click the name of your device to bring up the properties box of your device. Select the **Driver** tab.
10. Click **Change Driver...** and follow the installation steps.

After installation and restarting, Windows 95 informs me that the display setting is still incorrect.

There may be a conflict between a previous and the current display drivers. This is caused by the incomplete removal of the previous display driver. Try the following steps to remove it:

1. Right-click **My Computer** on the desktop.
2. Select **Properties**. The **System Properties** dialog box appears.
3. Click the **Device Manager** tab. Be sure that **View devices by type** is selected.
4. Double-click **Display adapters**.
5. You will find two (or more) conflicting adapters.
6. Disable all previous adapters by selecting them and clicking **Remove**.
7. Close Device Manager and restart Windows 95.
8. Your display driver should work correctly this time.

C. ATI Player

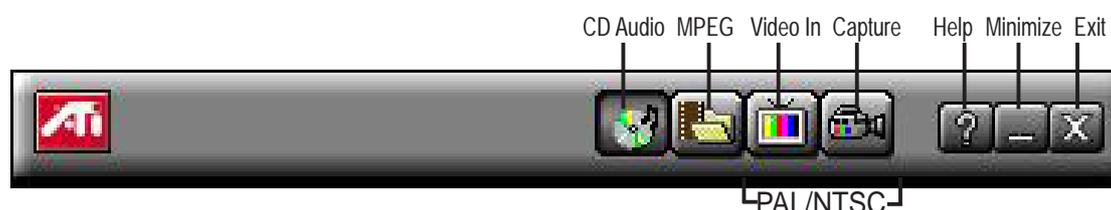
ATI Player

ATI Player and control panel (Windows 95/98)

If VIDEO drivers are installed, for playing video clips, the ATI Player icon will appear in the DeskTop. Double click on this icon to bring up the Video Screen as shown here: (Detailed button definitions are shown when holding the cursor over the individual buttons for a few seconds.)

The Task Control Panel

The Task control panel indicates what mode the player is in and what it's doing. (Your Task control panel may not look exactly like the illustration-only installed or available features will have controls.)



CD Audio—Play standard audio CDs (only in Windows 95/98)



MPEG Playback—Play MPEG and AVI video files



Video In (Tuner button)—Display live video sources (available only on video model)



Capture—Capture still images, video sequences, or audio-only (available only on video model)

Features

The question mark on top right of the Video Screen allows inspection into each button on the control panel. Click on the “?” then on a button that you would like to know about.

C. ATI Player
Windows 95/3.x

C. ATI Player

Playing Audio CDs (Only in window 95)



Click the Audio CD button in the Task control panel to switch to Audio CD mode



The Audio CD player has its own control panel for controlling the audio CD playback. You can use the Audio CD panel to play standard audio CDs. Advanced features such as Random play, Intro play, which plays the first ten seconds of each track, and Loop play are available.



The Audio CD player has its own display.

To play an audio CD

1. Insert the audio CD into your CD-ROM drive.
2. In the Audio CD panel, click the **Setup Dialogs** button .
3. Click the **Disc Info** tab.
4. From the *Available Tracks* list, add or remove tracks as desired. The Play List displays your current selections.
5. Click **OK**.
6. In the Audio CD panel, click the **Play** button .

The Audio CD player uses Windows 95 standard INI file to store disc names, track names, and the play list. You can use the Setup dialog to enter the name of the artist and the disc.

C. ATI Player

Playing Media Files

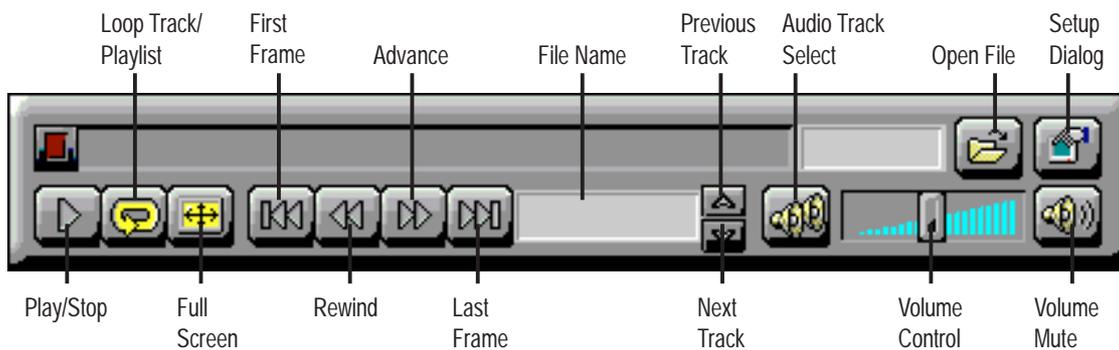


Click the MPEG Playback button in the Task control panel to switch to playback mode.



The Control panel changes to the Playback panel.

To view/hide the Playback panel in Full Screen mode, press F2.



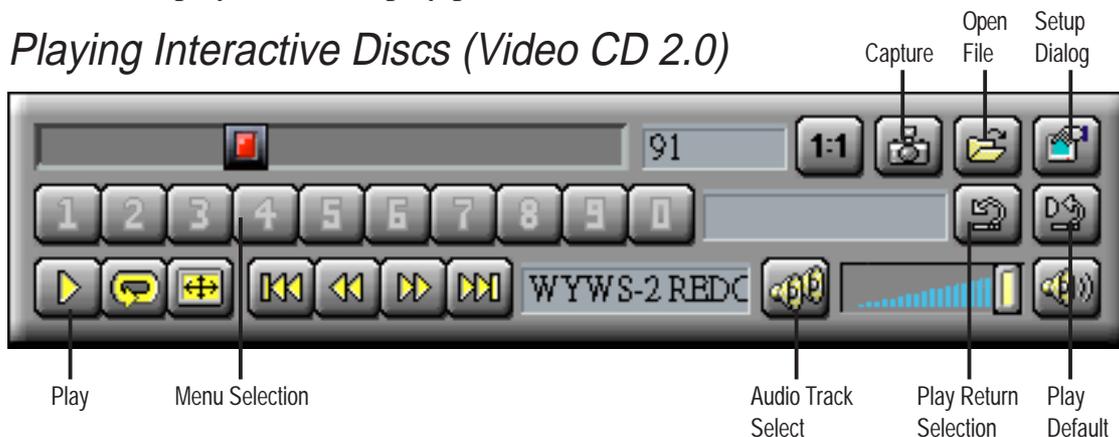
You can use the Media Playback panel to play the following media files:

- MPEG-1 digital audio and video, including Karaoke?including dual-channel audio, CDi, Games, and reference application titles
- *.AVI video files

To play a file

1. In the Playback panel, click the **File Open** button .
2. Select a file from the list.
3. Click **Add**, then click **OK**.
4. Click the **Play** button .
5. The file plays in the Display panel.

Playing Interactive Discs (Video CD 2.0)



When playing Video CD 2.0 discs, the Control panel changes to this interactive panel.

C. ATI Player
Windows 95/3.x

C. ATI Player

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D. Audio Driver

First Time Installation

When starting Windows 95/98/NT 4.0, the operating system will automatically detect the ESS Solo-1 PCI Audio Driver.

For Windows 95

1. When the *New Hardware Found* screen prompts for a driver, select **Driver from disk provided by hardware manufacturer** and insert the ASUS Support CD into your CD-ROM drive.
2. Click **OK**.
3. Click **Browse**.
4. Locate the **D:\audio\w95** folder (where D is your CD-ROM Drive) and click **OK**.
5. Click **OK** again and the driver files will be copied.
6. Click **Yes** to restart the computer.

For Windows 98

1. When the *Add New Hardware* screen prompts you for a driver, select **Display a list of all the drivers in a specific location, so you can select the driver you want** and click **Next**.
2. Select **Sound, video and game controllers** and click **Next**.
3. Click **Have Disk**.
4. Insert the ASUS Support CD into your CD-ROM drive.
5. Click **Browse**.
6. Locate the **D:\audio\w95** folder (where D is your CD-ROM Drive) and click **OK**.
7. Click **OK** again and the driver files will be copied.
8. Click **Yes** to restart the computer.

D. Audio Driver

First Time Installation

When starting Windows 95/98/NT 4.0, the operating system will detect that you have a new PCI Multimedia Device.

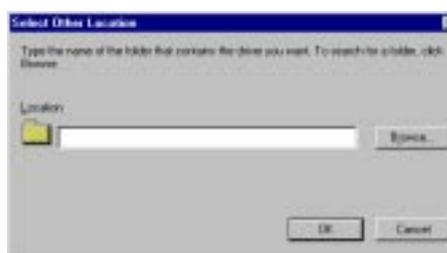
Click **Next** when the *Update Device Wizard* screen appears.



Click **Other Locations** to direct the wizard to the audio driver files.



Click **Browse** to locate the `\audio\Win95` folder for Windows 95/98 or the `\audio\Nt40` folder for Windows NT on the ASUS Support CD.



Click **OK** to select the folder.

Click **OK** and your device and driver location will be shown. Click **Finish**.



You will be prompted to insert the ASUS Support CD. Click **OK**.



Click **Browse** and locate the `\audio\Win95` (or `\audio\Nt40`) folder on the ASUS Support CD again.

Follow the self-explanatory instructions to finish your driver installation.

D. Audio Driver

For Windows NT 4.0

1. Run the Windows NT “Multimedia” program located in **Control Panel**.
(**Start->Settings->Control Panels->Multimedia**)
2. Click the **Devices** tab.
3. Select **Audio Devices** under Multimedia Devices.
4. Click **Add**.
5. Select **Unlisted or Updated Driver** under List of Drivers.
6. Click **OK**.
7. When Windows prompts you for the driver location, click **Browse**.
8. Locate the **D:\audio\Nt40** folder (where D is your CD-ROM Drive).
A list of audio drivers will be displayed.
9. Select the driver for your audio chipset and click **OK**.
Windows will prompt you to restart.
10. Click **OK** to restart the computer.

D. Audio Driver

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E. Audio Software

Audio Rack Installation

Reinsert your CD or double click on your CD drive icon in My Computer to bring up the autorun screen or run Setup.exe in the root directory of the CD. Click **Install Audio Utilities** from the main menu.

Audio Rack Introduction

The *AudioRack32* enables you to take advantage of your computer's audio capabilities with all of the controls conveniently in one compact space. You can play audio CDs, wave files (in .WAV and .AUD formats), and MIDI files (in .MID and .RMI formats). With the multisource Audio Mixer, you can blend these sources with line-in and microphone sources any way you choose. You can then record your creations as wave files and edit them with the Audio Recorder.

The *AudioRack32* has six main parts:

- Command Center—customizes the appearance of the *AudioRack32*.
- Audio Mixer—controls the volume and balance of the *AudioRack32* devices.
- Digital Audio Player—plays and records files in the .WAV format.
- MIDI Player—enables you to play MIDI files.
- Compact Disk Player—enables you to play audio CDs on a CD-ROM drive.

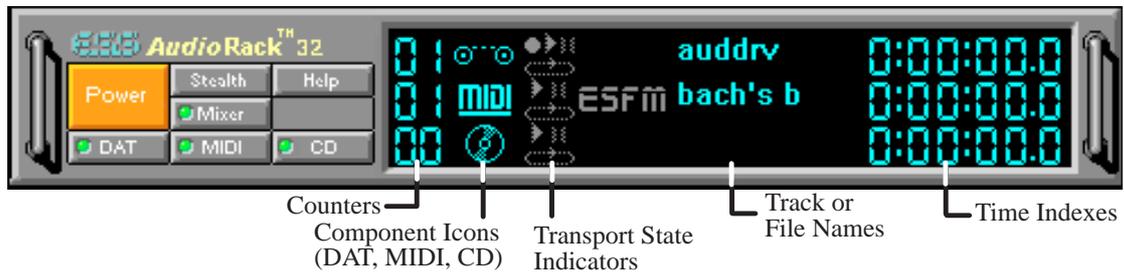
In addition, the *AudioRack32* has a miniature mode enabling you to control the *AudioRack32* while using minimal screen space.

The Audio Recorder is a separate application from the *AudioRack32*. It can be used to add effects and edit files recorded with the Digital Audio Player or by the Audio Recorder itself. The Audio Recorder can be launched from the *AudioRack32*'s Digital Audio Player or on its own.



E. Audio Software

The Command Center



Introduction

The Command Center controls which parts of the *AudioRack32* are displayed. You can display or hide any part of the *AudioRack32* you choose, customizing its appearance to suit your needs or desires. It also displays information on the status of the different audio components.

The Command Center Controls

-  closes the *AudioRack32* window.
-  enables the Miniature mode, minimizing the *AudioRack32* display.
-  displays or hides the Digital Audio Player.
-  accesses On-line Help.
-  displays or hides the Compact Disk Player.
-  displays or hides the Audio Mixer.
-  displays or hides the MIDI Player.

The Command Center Display

Counter: shows you which track or file in the playlist the component is playing.

Component Icon: is displayed when the associated component is shown and is not displayed when the component is hidden.

Transport State Indicator: shows the state of a component. It indicates when the component is playing, paused, has the Auto Repeat enabled, or in the case of the Digital Audio Player, is recording.

Track or File Name: shows the name of the current track or file in the playlist.

Time Index: displays the amount of time elapsed for the track or file in hours, minutes, seconds, and tenths of a second.

E. Audio Software

The Miniature Mode



Introduction

The Miniature mode is designed to give you full control of the *AudioRack32* while using a minimum of space. You are able to effectively use the *AudioRack32* and still have enough room on your desktop to run other applications. In the Miniature mode, you can play, pause, stop, and control the master volume of the *AudioRack32*.

The Miniature Mode Controls

-  stops currently playing tracks or files of active components.
-  plays currently loaded tracks or files of active components.
-  pauses currently playing tracks or files of active components.
-  calls a popup menu where you can restore the *AudioRack32*, invoke the **Always on Top** command, select active components (DAT, MIDI, or CD), or exit the *AudioRack32*. The Stop, Pause, and Play buttons affect components that are currently active.



controls the master volume.

E. Audio Software

The Audio Mixer



Introduction

The Audio Mixer has two modes: Playback mode and Record mode. You can use these two modes to fully control which of your audio sources you are listening to or recording, how loud each of those sources are and how they are balanced. Each audio source has its own module with mute, balance and volume controls.

In addition, the Audio Mixer provides special effects controls for chorus, reverb, treble, bass, and 3-D effects.

The Audio Mixer Controls

The two Playback and Record toggle buttons are used to switch between Playback mode and Record mode.

The Effects toggle button switches the display to the effects panel where you can use the buttons to enable and disable effects and the sliders to control the amount of the effect.

There are a number of audio source modules displayed on the Audio Mixer. The exact number displayed depends on the capabilities of your hardware. Each module has three controls:



a slider to adjust the balance

a slider to adjust the volume

a button for muting

Modules that your hardware may provide for are: Master, Line, Wave, Mic, CD, MIDI, and AuxB.

E. Audio Software

The Digital Audio Player



Introduction

The Digital Audio Player enables you to play, record, and compress sound as .WAV files. In addition, you can play .AUD files. The .WAV files use PCM, which is the Windows' audio file format. The .AUD format uses ESPCM' compression to produce an audio file. Files are written directly to your hard disk as you record, enabling you to record very large files. Your only limitation is the amount of free space on your hard disk. The voice activation feature is useful for recording any kind of intermittent audio. The Digital Audio Player provides a choice of linear PCM (8 or 16 bit) recording. Note that you have additional options using the Audio Recorder, which is invoked by the **Edit** button.

The Digital Audio Player Controls

-  starts recording to your hard disk.
-  goes to the end of the wave file or to the next file in the current playlist.
-  plays the wave file currently loaded.
-  enables or disables the Auto Repeat.
-  activates or deactivates the Pause
-  opens the Audio Recorder window.
-  stops the file currently playing.
-  opens the Set Playlist dialog box.
-  goes back one second in the wave file.
-  starts a new file by opening the New Options dialog box.
-  goes forward one second in the wave file.
-  brings up the Open file dialog box in order to load a file into the Digital Audio Player.
-  goes to the beginning of the wave file or to the previous file in the current playlist.
-  saves an audio file.

The Digital Audio Player Display

 The Level Meter displays the output from the left (top) and right (bottom) channels when a wave file is played.

 By clicking on the image of the tape deck, you can display information about the file currently loaded in the Digital Audio Player. The display tells you the file name, size, number of bits per sample, sample rate, and whether the file was recorded in stereo or mono. Click again to return to the image of the tape deck.

audrv.wav
47 Kbytes
16 bit 22 kHz
Mono

E. Audio Software

The MIDI Player



Introduction

The MIDI Player enables you to play MIDI files with the .MID or .RMI file extensions. These MIDI (Musical Instrument Digital Interface) files can be produced by sequencer programs and then played back using the MIDI Player. You can also mix MIDI files with other audio sources. Or you can compile MIDI files in a playlist and play them back in any order you choose.

The MIDI Player Controls

-  plays the MIDI file currently loaded.
-  goes back one file in the playlist.
-  activates or deactivates the Pause
-  goes forward one file in the playlist.
-  stops the file currently playing.
-  enables or disables the Auto Repeat.
-  goes back one second in the MIDI file.
-  opens the Set Playlist dialog box.
-  goes forward one second in the MIDI file.

The MIDI Player Display

By clicking on the image of the floppy drive, you can display the length and name of the current MIDI file in the playlist. Click the display to return to the image of the floppy drive.

 The MIDI Player has an indicator to show when you are listening to ESFM. When the ESFM light to the left of the playlist button is lit, the MIDI Player is using ESFM synthesis. ESFM performs superior-quality music synthesis compared to that of traditional FM, producing richer timbre and greater depth of instrument voices. **FM synthesis is a lower quality technology compared with Wave table synthesis. This card supports Wave table synthesis therefore ESFM is not supported on this card.**

E. Audio Software

The Compact Disk Player



Introduction

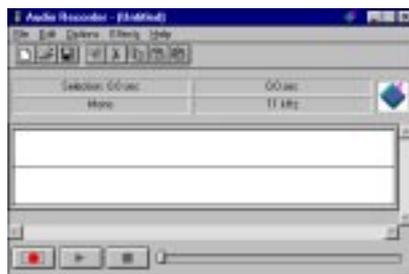
If you have a CD-ROM drive, you can play audio CDs. Check your hardware manual about setting up CD audio hardware and drivers. The Compact Disk Player uses intelligent CD playlist management: The Compact Disk Player maintains a record of each CD you play. It remembers the last playlist you used with each CD and loads that playlist automatically whenever you insert that CD.

The Compact Disk Player Controls

-  plays the MIDI file currently loaded.
-  goes back one file in the playlist.
-  activates or deactivates the Pause
-  goes forward one file in the playlist.
-  stops the file currently playing.
-  enables or disables the Auto Repeat.
-  goes back one second in the MIDI file.
-  opens the Set Playlist dialog box.
-  goes forward one second in the MIDI file.
-  ejects the CD from the CD-ROM drive.

E. Audio Software

The Audio Recorder



Introduction

The Audio Recorder enables you to record, compress, store, and play back voice, music, and other sound. It provides settings for sound attributes such as mono/stereo, compression level, and sampling rate. You can use it to embed sound objects in documents created in applications that support object linking and embedding (OLE).

The Audio Recorder's edit, record, and playback capabilities are compatible with the Windows Sound Recorder and other recorders that record and play back in the PCM format. Like the Digital Audio Player, the Audio Recorder can record and play back .WAV and .AUD files. The Audio Recorder allows a choice of compression from low, medium, and high ESPCM and ADPCM.

The Audio Recorder Controls

-  starts a new audio file.
-  inserts the Clipboard audio at the cursor or replaces the selected portion.
-  opens an audio file.
-  mixes the Clipboard audio with the audio beginning at the cursor.
-  saves an audio file.
-  starts recording.
-  reverses the last change you made to the current audio file.
-  plays the currently loaded audio file.
-  removes the selected portion of the audio file and stores it on the Clipboard.
-  pauses the file currently playing or recording.
-  copies the selected audio portion to the Clipboard without removing it.
-  determines the cursor position on the waveform.

The Audio Recorder Display



The four text boxes under the tool bar display the length in seconds of the selected part of the currently loaded file, the total length in seconds of the current file, whether the file is in stereo or mono, and the sampling rate in kilohertz.

To the right of the text boxes is a box displaying the icon associated with the particular file. If a file has no icon associated with it, it is given a default icon.

E. Audio Software

Release Notes

This information is provided for convenience only. Information here is subject to change without prior notice. View the installation CD for any updated information in Readme text files. The AudioRack also provides detailed online help (click the **Help** button on the “Command Center”)

Disable Eject Button on the CD Player

Under the Windows directory in the file “auddrive.ini”, there is a string “DisableEjectButton=0” under the [cdplayer] section. If you would like to disable EJECT button on the CD player, you can change the value from 0 to 1. You need to close AudioRack and launch it again to make the new settings take effect.

Using AudioRack CD Player as Default CD Player

During installation, you will be asked if you want to use AudioRack CD player as the default CD player. Normally Windows 95 CD player is the default and will automatically run when an audio CD is inserted into the CD-ROM. If you answer “Yes”, the installation program will overwrite the value of the key [HKEY_CLASSES_ROOT]\AudioCD\shell\play\command in the registry. You may switch back to Windows 95 CD player by resetting this key value.

Configuring Playback Mixer

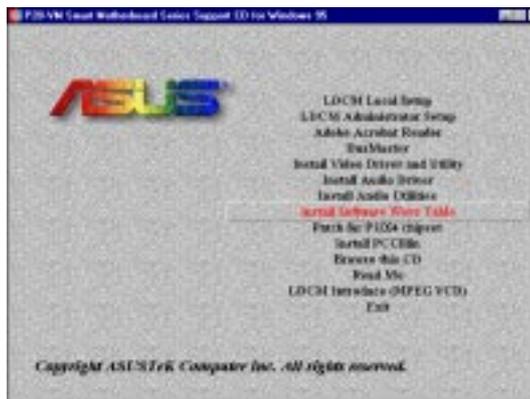
The onboard PCI audio device offers eight inputs for the playback mixer, including “Line”, “Wave”, “CD”, “Synth”, “Aux A”, “Aux B”, “Mic”, and “Mono In”. AudioRack can only display six of them at a time. You may configure the settings by modifying the file “auddrive.ini” in the Windows directory. Under the section [MixerRak], you can enable or disable the display of each input by setting its corresponding binary value to 1(enable) or 0(disable).

F. Software Wavetable

Install Software Wavetable (Windows 95/98)

Insert the ASUS Support CD into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the autorun menu or run **Setup.exe** in the root directory of your CD-ROM driver. This will bring up the main menu.

Click **Install Software Wave Table**.



Select **Install ESS Software Wavetable** and click **Next**.



When Setup has finished installing all the necessary files on your computer, it will prompt you to restart your computer.

Select **Yes, I want to restart my computer now** and then click **Finish** to restart your computer and complete setup.



G. Network Interface

This motherboard features an optional 32-bit 10/100Mbps Ethernet network interface. This interface supports the bus mastering architecture and auto-negotiation feature, which makes it possible to use the common twisted-pair cabling with RJ45 connectors for both 10Mbps and 100Mbps connections. Extensive driver support for commonly-used network systems is also provided.

Features

- Intel 82558 Ethernet LAN Controller (Fully integrated 10BASE-T/100BASE-TX)
- Wake-On-LAN Remote Control Function Supported
- PCI Bus Master Complies to PCI Rev. 2.1
- Consists of MAC & PHY (10/100Mbps) interfaces
- Complies to IEEE 802.3 10BASE-T and IEEE 802.3U 100BASE-TX interfaces
- Fully supports 10BASE-T & 100BASE-TX operations
- Single RJ-45 Connector: Auto-Detection of 10Mbps or 100Mbps Network Data Transfer Rates and Connected Cable Types
- 32 bit Bus Master Technology / PCI Rev. 2.1
- Plug and Play
- Enhancements on ACPI & APM
- Adheres to PCI Bus Power Management Interface Rev. 1.0, ACPI Rev. 1.0, and Device Class Power Management Rev. 1.0

Software Driver Support

NetWare ODI Drivers - Novell Netware 3.x, 4.x; NetWare LAN WorkPlace TCP/IP; Novell LAN Analyzer for Netware

Packet Drivers - FTP PC/TCP, NCSA TCP/IP, Accton LANSoft

NDIS Drivers - LAN Manager V2.x; Windows 3.x, 95, NT (Server/Workstation) V3.x, V4.0; IBM LAN Server 2.x, 3.0; IBM LAN Support V1.x; IBM OS/2 EE V2.0; DEC Pathworks V4.x & V5.0; Sun PC-NFS; Banyan VINES; IBM TCP/IP for DOS & OS/2; Wollongong Pathway Access

Unix Driver - SCO Unix

G. Network Interface

LED Connectors

Link Indicator: This connects to an LED to monitor 10Base-T and 100Base-TX connections. The LED lights to indicate a successful network connection, and remains steady if the connection is stable. If this indicator is off, the cable connection between the hub and the computer may be faulty or the driver configuration may be faulty.

Activity Indicator: This connects to an LED to monitor network activity. The LED lights when there are network packets sent or received through the RJ45 port. The rate of flashing is proportional to the amount of network traffic. If this is off, the computer is not sending or receiving network data.

Speed Indicator: This connects to an LED to monitor connection speed. The LED lights (**On**) when connection is made to a 100Base-TX host. If **Off**, the network connection is operating at 10Mbps.

Network Cable Connection

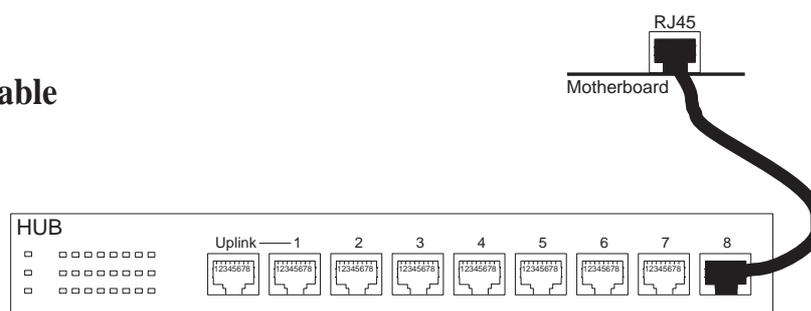
Twisted Pair Ethernet (TPE) - Connect a single network cable to the RJ45 connector. For 100BASE-TX, your network cable must be category 5 (not category 3), twisted-pair wiring with RJ45 connectors. If you plan on running the interface at 100 Mbps, it must be connected to a 100BASE-TX hub (not a 100BASE-T4 hub). For 10BASE-T, use category 3, 4, or 5 twisted-pair wiring.

Twisted-Pair Cable

The cable used to connect the Ethernet card to a host (generally a Hub) is called a straight-through twisted-pair. The end connectors are called RJ45 connectors, which are not compatible with the standard RJ11 telephone connectors. The illustration shows a connection between a typical Hub and this motherboard's network interface.

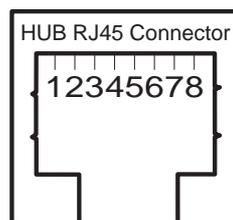
Straight-Through Cable

Hub	Card
1 IRD+	1 OTD+
2 IRD-	2 OTD-
3 OTD+	3 IRD+
6 OTD-	6 IRD-



RJ45 Connector

Pin 1	Output Transmit Data +
Pin 2	Output Transmit Data -
Pin 3	Input Receive Data +
Pin 6	Input Receive Data -
Pins 4,5,7,8	(Reserved)



G. Network Interface

DOS and Windows 3.1 Setup for Novell

Automatic configuration

Some computers automatically detect and configure adapters and interfaces while booting. The network interface's IRQ level and I/O memory address of this motherboard are automatically set by the BIOS each time you start your computer.

Start your computer to automatically configure the network interface. Configuration is complete when the DOS prompt appears. You can now continue with the procedure below.

If your computer displays an error while booting, it may require additional steps.

Run Setup to install network drivers

Setup can automatically install NetWare DOS ODI client drivers for you or display a README file with installation instructions for other NOS drivers.

1. If your computer already has network drivers installed, restart the computer without loading them. If the drivers are loaded from the AUTOEXEC.BAT or CONFIG.SYS file, type REM in front of each line that loads a network driver. Or, with DOS 6.x or later press "F5" as DOS starts, to bypass the drivers.
2. Insert the ASUS Configuration and Drivers disk in a floppy drive, switch to that drive, and at the DOS prompt, type "SETUP".
3. If you have another network adapter in your computer, an adapter selection menu appears on the screen. Select the adapter you want by noting the Ethernet address.
4. Select Automatic Setup from the Main menu. Then follow the instructions on the screen. (If you want to test the interface with a responder on the network, see the next procedure.) Setup displays the configuration, then runs a series of diagnostic tests that makes sure the network interface or adapter and network are functioning properly. If Setup finds a problem, it displays the results and some possible solutions.
5. When Setup finishes the tests, you'll see the Install Network Drivers screen.
6. Select the driver you want to install. Setup can install a NetWare client driver for you. If you're installing other drivers, Setup displays a README file with installation instructions.

G. Network Interface

Troubleshooting

If you can't connect to a server, first try the suggestions here, then turn to the Troubleshooting section if necessary.

- Make sure you're using the drivers for this interface. The driver filename contains the letter B (for example, E100BODI.COM).
- If you're replacing an existing adapter, make sure the LINK statement in your NET.CFG is correct for the new interface or adapter. For example, the LINK statement for a NetWare client should be: "LINK DRIVER E100BODI"
- Verify that the frame type in your NET.CFG file matches your network.
- If setting up a server, check your LOAD and BIND statements.
- Test the interface by running diagnostics in Setup. Additional testing is available by using a responder.
- Check the README files.

Responder testing on the network (optional)

Setup can test the interface more thoroughly if you have a responder on the network while running the tests.

1. Go to a computer on the network with any EtherExpress adapter or interface installed (except EtherExpress 32 or EtherExpress 16 MCA).
2. Run the appropriate configuration program for the installed interface and set it up as a responder.
3. Return to the computer with the new adapter or interface. Run Setup and make the new interface the sender. Test the interface.

Windows NT Server or Workstation

Automatic configuration

Some computers automatically detect and configure adapters or interfaces while booting. The network interface's IRQ level and I/O address are automatically set by the BIOS each time you start your computer.

Start your computer to automatically configure the network interface. Configuration is complete when Windows NT starts or the DOS prompt appears.

If your computer displays an error while booting, it may require additional steps to configure.

Install network drivers - Windows NT Version 4.0 only

After starting Windows NT, you need to install the device drivers. Have the Windows NT CD-ROM disk available for this procedure.

G. Network Interface

NOTE: If you are installing Windows NT 4.0 at this time, click the Start Search button when the network network interface or adapter installation window appears. This allows NT to autodetect the network interface or adapter. You may then skip steps 1 - 4 below.

1. Double-click the Network icon in the Control Panel.
2. Click the **Adapters** tab in the window that appears.
3. Click **Add**. A list of network interface or adapter appears.
4. Select “Intel EtherExpress PRO Adapter” and click **OK**.

Install network drivers - Windows NT Version 3.5x only.

After setting up the network interface and starting Windows NT, you need to install the Intel drivers and test the network interface or adapter.

1. Double-click the Network icon in the Control Panel.
2. Click **Add Adapter**.
3. When the list of adapters appears, scroll to the end of the list and select <Other> Requires disk from manufacturer.
4. Insert the ASUS Configuration and Drivers disk in the A: drive and click **OK**.
5. Select the “Intel EtherExpress PRO Adapter” and click **OK**.
6. Click **OK** in the Network Settings dialog box and remove the installation disk. When prompted, restart Windows NT.

To install multiple network interface or adapters, repeat this procedure for each new network interface or adapter.

Troubleshooting

If Windows NT reports an error or you can't connect to the network, try the suggestions here first, then turn to the Troubleshooting section if necessary.

- Make sure you're using the drivers for this network interface or adapter. Drivers are located on the Windows NT CD-ROM or on the ASUS Drivers and Configuration disk.
- Make sure the driver is loaded and the protocols are bound. Check the Network Bindings dialog box in Windows NT.
- Check the Windows NT Event Viewer for error messages.
- If you are attaching to a NetWare network, check your frame type and verify that NetWare client software has been installed.
- Check with your LAN administrator — you may need to install supplemental networking software.

G. Network Interface

Windows 95

Automatic Configuration

Some computers automatically detect and configure adapters or interfaces while booting. The network interface's IRQ level and I/O address of this motherboard are automatically set by the BIOS each time you start your computer.

Start your computer to automatically configure the network interface or adapter. Configuration is complete when Windows 95 starts. If your computer displays an error while booting, it may require additional steps to configure.

Install Network Drivers from Diskette

Have your Windows 95 installation CD-ROM or disks available, as Windows 95 prompts for them when you install the new network interface or adapter.

1. After you have set up your motherboard for network use, start Windows 95. The *New Hardware Found* dialog box appears. If this box does not appear and Windows 95 starts normally, you may need to manually add the network interface or adapter.
2. Click "Driver from disk provided by hardware manufacturer," then click **OK**. The *Install From Disk* dialog box appears.
3. Insert the ASUS Configuration and Drivers disk.
4. Specify A:\ (or B:\) as the path, then click **OK**.
5. Follow prompts for any Windows 95 installation disks and restart when prompted. (If you installed from CD-ROM, the installation files are typically located at D:\Win95, where D is your CD-ROM drive.)

After restarting Windows 95, you should be able to connect to your network by double-clicking the Network Neighborhood.

Troubleshooting

If you can't connect to a server or if Windows 95 reports an error after you double-click Network Neighborhood, try the suggestions here first, then the Troubleshooting section if necessary.

- Make sure you're using the drivers that are on the drivers diskette that ships with this network interface or adapter.
- Make sure the driver is loaded and the protocols are bound. Check Device Properties list for trouble indicators (an X or ! symbol).
- Check with your LAN administrator — you may need to install supplemental networking software.

NetWare Server, Client 32, UNIX, OS/2, Banyan, and Other Operating Systems

For these, refer to our online documents. On a DOS computer, view the appropriate README file for information on installing your network driver.

G. Network Interface

Select Duplex Mode (optional)

Duplexing is a performance option that lets you choose how the network interface or adapter sends and receives data packets over the network. This motherboard's network interface can operate at full duplex only when connected to a full duplex 10BASE-T, 100BASE-TX switching hub, or another full duplex network interface or adapter. To summarize:

- **Auto (requires a full duplex network interface or adapter or switching hub with auto-negotiation capability).** The network interface or adapter negotiates with the hub to send and receive packets at the highest rate. This is the default setting. If the hub does not provide auto-negotiation, the network interface or adapter runs at half duplex.
- **Full duplex (requires a full duplex switching hub or network interface or adapter).** The network interface or adapter can send and receive packets at the same time. This mode can increase network interface or adapter performance capability. If the full duplex hub provides auto-negotiation, the network interface or adapter runs at full duplex. If the full duplex hub does not provide auto-negotiation, you need to set the network interface or adapter duplex mode manually (see following paragraphs)
- **Half duplex.** The network interface or adapter performs one operation at a time; it either sends or receives.

NOTE: If your hub is running at 100 Mbps and half duplex, your potential bandwidth is higher than if you run at 10 Mbps and full duplex.

Manually Configuring for Full Duplex

If your switch supports auto-negotiation with the N-way standard, duplex configuration is automatic and no action is required on your part. However, few switches in the current installed base support auto-negotiation. Check with your network system administrator to verify. Most installations will require manual configuration to change to full duplex.

Configuration is specific to the driver you're loading for your network operating system (NOS), as shown in the following paragraphs. To set up the duplex mode, refer to the section below that corresponds to your operating system. The performance of the network interface or adapter may suffer or your network interface or adapter may not operate if your hub does not support full duplex and you configure the network interface or adapter to full duplex. Leave the network interface or adapter on half duplex if you are not sure what type of hub you are connected to.

DOS ODI, NDIS 2.01 Clients

Edit the NET.CFG or PROTOCOL.INI file. Add keywords to Link Driver section:

```
FORCEDUPLEX 2  
SPEED 100 (or 10 if 10BASE-T)
```

G. Network Interface

NetWare server

In AUTOEXEC.NCF, Load E100B.LAN and add the following statement (you must include the equal sign for servers):

```
FORCEDUPLEX=2  
SPEED=100 (or 10 if 10BASE-T)
```

For more information, see the README file for NetWare servers.

Windows NT

While running Windows NT:

1. From the Control Panel, double-click the Intel PROSet icon.
2. PROSet examines your system and displays the Adapter Setup window.

Windows 95

While running Windows 95:

1. From the Control Panel, double-click the Intel PROSet icon.
2. PROSet examines your system and displays the Adapter Setup window. If you have multiple adapters, click the adapter you are configuring (you can identify it by its Ethernet address). Each adapter must be configured separately.
3. From the window that appears, click **Change**.
4. From the Adapter Setup window, click the menu for Network Speed.
5. Click **100** or **10 Mbps**, depending on your hub speed.
6. Click the menu for Duplex Mode
7. Click **Full**.
8. Click **OK** when finished.
9. Click **OK** to restart Windows 95.

Other operating systems

See the *Adapter Installation and Special Configurations* README file. "Push" Installation for Windows 95

If you are a LAN Administrator setting up server-based push installation of Windows 95 as defined in Microsoft Windows 95 Resource Kit, additional steps are required for this network interface or adapter.

G. Network Interface

Troubleshooting

If the interface can't connect to the network

Make sure the cable is installed properly.

The network cable must be securely attached at both RJ-45 connections (interface and hub). If the cable is attached but the problem persists, try a different cable. The maximum allowable distance from network interface or adapter or interface to hub is 100 meters.

If you're directly connecting two computers (no hub), use a crossover cable. Most hubs require a straight-through cable, while most switches require a crossover cable (see your hub or switch documentation to verify).

Check the LED lights on the network interface or adapter.

The optional network condition connector module has three diagnostic LEDs. These lights help indicate if there's a problem with the connector, cable, or hub. The table below describes the LEDs.

<u>LED</u>	<u>Indication</u>	<u>Meaning</u>
LNK	On	The interface and hub have acknowledged a connection; the link between the hub and interface is good.
	Off	The cable connection between the hub and interface is faulty; or you have a driver configuration problem.
ACT	On or flashing	The interface is sending or receiving network data. The frequency of the flashes varies with the amount of network traffic.
	Off	The interface is not sending or receiving network data.
SPD	On	Network connection operating at 100 Mbps.
	Off	Network connection operating at 10 Mbps.

Make sure you're using the correct drivers.

Make sure you're using the drivers that come with your motherboard. The driver filename contains the letter B (for example, E100BODI.DOS).

Make sure the hub port and the network interface or adapter have the same duplex setting.

If you configured the network interface for full duplex, make sure the hub port is also configured for full duplex. Setting the wrong duplex mode can degrade performance, cause data loss, or result in lost connections.

G. Network Interface

Testing the network interface or adapter

Test the network interface or adapter by running Intel diagnostics. For DOS or Windows 3.1 computers, run Setup on the ASUS Configuration and Drivers disk. For Windows NT and Windows 95 run Intel PROSet by double-clicking the Intel PROSet Icon in the Control Panel. Click Help from the main PROSet window to get complete diagnostics information and instructions.

Common problems and solutions

SETUP.EXE reports the network interface or adapter is “Not enabled by BIOS”.

- The PCI BIOS isn't configuring the network interface or adapter correctly. Try the PCI installation tips.

The computer hangs when the drivers are loaded.

- Change the PCI BIOS interrupt settings. See the next page for PCI installation tips.
- If you are using EMM386, it must be version 4.49 or newer (this version ships with MS-DOS 6.22 or newer).

Diagnostics pass, but the connection fails or errors occur.

- At 100 Mbps use category 5 wiring and make sure the network cable is securely attached.
- For NetWare clients, make sure you specify the correct frame type in the NET.CFG file.
- Make sure the duplex mode setting on the network interface or adapter matches the setting on the hub.
- At 100 Mbps, connect to a 100BASE-TX hub only (not T4).

The LNK LED doesn't light.

- Make sure you've loaded the network drivers.
- Check all connections at the network interface or adapter and the hub.
- Try another port on the hub.
- Make sure the duplex mode setting on the network interface or adapter matches the setting on the hub.
- Make sure you have the correct type of cable between the network interface or adapter and the hub. 100 BASE-TX requires two pairs. Some hubs require a cross-over cable while others require a straight-through cable. See the *Cabling* README file for more information on cabling.

The ACT LED doesn't light.

- Make sure you've loaded the correct network drivers.
- The network may be idle. Try accessing a server.
- The network interface or adapter isn't transmitting or receiving data. Try another network interface or adapter.
- May not be using four-pair cable for TX wiring.

G. Network Interface

The network interface or adapter stopped working when another network interface or adapter was added to the computer.

- Make sure the cable is connected to the motherboard's network interface or RJ45 port.
- Make sure your PCI BIOS is current.
- Make sure the other network interface or adapter supports shared interrupts. Also, make sure your operating system supports shared interrupts — OS/2* doesn't.

The interface stopped working without apparent cause.

- Try reconnecting the cable to the RJ45 port first.
- The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.
- Try another motherboard of the same model.
- Run the diagnostics.

The Wake On LAN feature is not working.

- Make sure the WOL cable is attached and power is applied to the computer.
- Check the BIOS for its WOL setting. Some computers may need to be configured to WOL.
- Make sure the network cable is fully attached to the network interface or adapter.

Link LED does not light when power is connected.

- Make sure WOL cable is attached and power is applied to computer.
- Make sure network cable is attached at both ends.

G. Network Interface

Technical Information

Fast Ethernet Wiring

100BASE-TX Specification: The 100BASE-TX specification supports 100 Mbps transmission over two pairs of category 5 twisted-pair Ethernet (TPE) wiring. One pair is for transmit operations and the other for receive operations. Segment lengths are limited to 100 meters with 100BASE-TX for signal timing reasons. This complies with the EIA 568 wiring standard.

Fast Ethernet Hubs and Switches

The two basic types of hubs are shared hubs and switching hubs. This motherboard's network interface can be used with either type of hub for 10 Mbps. At 100 Mbps, a TX hub or switch is required.

Shared hubs

In a shared network environment, computers are connected to hubs called repeaters. All ports of the repeater hub share a fixed amount of bandwidth, or data capacity. On a 100 Mbps shared hub, all nodes on the hub must share the 100 Mbps of bandwidth. As stations are added to the hub, the effective bandwidth available to any individual station gets smaller. Shared hubs do not support full duplex.

Think of a shared repeater hub as a single-lane highway that everyone shares. As the number of vehicles on the highway increases, the traffic becomes congested and transit time increases for individual cars.

On a shared hub all nodes must operate at the same speed, either 10 Mbps or 100 Mbps. Fast Ethernet repeaters provide 100 Mbps of available bandwidth, ten times more than what's available with a 10BASE-T repeater.

Repeaters use a well-established, uncomplicated design, making them highly cost effective for connecting PCs within a workgroup. These are the most common type of Ethernet hubs in the installed base.

Switching hubs

In a switched network environment, each port gets a fixed, dedicated amount of bandwidth. In the highway scenario, each car has its own lane on a multi-lane highway and there is no sharing.

In a switched environment, data is sent only to the port that leads to the proper destination station. Network bandwidth is not shared among all stations, and each new station added to the hub gets access to the full bandwidth of the network.

If a new user is added to a 100 Mbps switching hub, the new station receives its own dedicated 100 Mbps link and doesn't impact the 100 Mbps bandwidth of another station. Switching hubs can effectively increase the overall bandwidth available on the network, significantly improving performance. Switching hubs can also support full duplex.

G. Network Interface

Using Wake On LAN

The Wake On LAN feature operates according to a published specification. In simple terms, the specification allows designers to build network adapters or interfaces that are capable of “listening to” network activity even when the computer is turned off. WOL adapters or interfaces have a special low power standby mode that is active when the rest of the computer is without power. The network interface or adapter will respond to a special “wake-up” packet sent by another computer or network device. Typically this wake-up packet causes the network interface or adapter to signal the computer to power up and run a pre-defined program.

Question and Answer

Q: What is Wake-On-LAN ?

A: The Wake-On-LAN feature provides the capability to remotely power on systems supporting Wake-On-LAN by simply sending a wake-up frame. With this feature, remotely uploading/downloading data to/from systems during off-peak hours will be feasible.

Q: What can Wake-On-LAN do for you ?

A: Wake-On-LAN is a remote management tool with advantages that can reduce system management workload, provide flexibility to the system administrator’s job, and then of course save you time-consuming efforts and costs.

Q: What components does Wake-On-LAN require to be enable?

A: To enable Wake-On-LAN function, your system requires an Ethernet LAN adapter card or interface that can activate the Wake-On-LAN function, a client with Wake-On-LAN capability, and software such as LDCM Rev. 3.10 or up that can trigger the wake-up frame.

G. Network Interface

Glossary

100Base-TX

IEEE's specification for running 100Mbps Ethernet using twisted-pair cables.

10Base-T

IEEE's specification for running 10Mbps Ethernet using twisted-pair cables.

10Base2

IEEE's specification for running Ethernet using thick coaxial cables.

BNC

A connector with a half-twick locking shell typically used for thin coaxial cables.

Boot ROM

Read-only memory chip that allows a workstation to communicate with LAN cards or other network interfaces.

Driver

A program that enables the network operating system to communicate with LAN cards.

IEEE 802.3 standard

Standard for the physical and electrical connections in local area networks developed by the IEEE (Institute of Electrical and Electronics Engineers).

IEEE 802.3u standard

IEEE standard for Local Area Networks (LAN) employing CSMA/CD as the access method. This standard is intended to encompass several media types and techniques for signal rates from 1Mb/s to 100Mb/s.

Interrupt (IRQ)

Signal suspending a program temporarily and transfers control to the operating system when input or output is required.

LED

Light emitting diode

Mbps

Megabits per second

G. Network Utility

Desktop Management Interface (DMI)

Introducing the ASUS DMI Configuration Utility

This motherboard supports DMI within the BIOS level and provides a DMI Configuration Utility to maintain the Management Information Format Database (MIFD). DMI is able to auto-detect and record information pertinent to a computer's system such as the CPU type, CPU speed, and internal/external frequencies, and memory size. The onboard BIOS will detect as many system information as possible and store those collected information in a 4KB block in the motherboard's Flash EPROM and allow the DMI to retrieve data from this database. Unlike other BIOS software, the BIOS on this motherboard uses the same technology implemented for Plug and Play to allow dynamic real-time updating of DMI information versus creating a new BIOS image file and requiring the user to update the whole BIOS. This DMI Configuration Utility also allows the system integrator or end user to add additional information into the MIFD such as serial numbers, housing configurations, and vendor information. Those information not detected by the motherboard BIOS and has to be manually entered through the DMI Configuration Utility and updated into the MIFD. This DMI Configuration Utility provides the same reliability as PnP updating and will prevent the refreshing failures associated with updating the entire BIOS.

System Requirements

The DMI Configuration Utility (DMICFG2.EXE) must be used in real mode in order for the program to run, the base memory must be at least 180K. Memory managers like HIMEM.SYS (required by windows) must not be installed. You can boot up from a system diskette without AUTOEXEC.BAT and CONFIG.SYS files, "REM" HIMEM.SYS in the CONFIG.SYS, or press <F5> during bootup to bypass your AUTOEXEC.BAT and CONFIG.SYS files.

H. DMI Utility

Using the ASUS DMI Configuration Utility

NOTE: The following screen displays are provided as examples only and may not reflect the screen contents on your system.

Edit DMI (or delete)



Use the ←→ (left-right) cursors to move the top menu items and the ↑↓ (up-down) cursor to move between the left hand menu items. The bottom of the screen will show the available keys for each screen. Press enter at the menu item to enter the right hand screen for editing. “Edit component” appears on top. The reversed color field is the current cursor position and the blue text are available for editing. The orange text shows auto-detected information and are not available for editing. The blue text “Press [ENTER] for detail” contains a second pop-up menu is available, use the + - (plus-minus) keys to change the settings. Enter to exit *and save*, ESC to exit *and not save*.

If the user has made changes, ESC will prompt you to answer Y or N. Enter Y to go back to the left-hand screen *and save*, enter N to go back to left-hand screen and *not save*. If editing has not been made, ESC will send you back to the left hand menu without any messages.

Notes

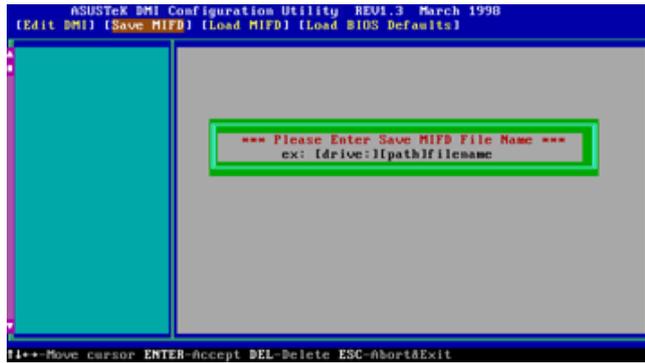
A heading, *** BIOS Auto Detect ***, appears on the right for each menu item on the left side that has been auto detected by the system BIOS.

A heading, *** User Modified ***, will appear on the right for menu items that have been modified by the user.



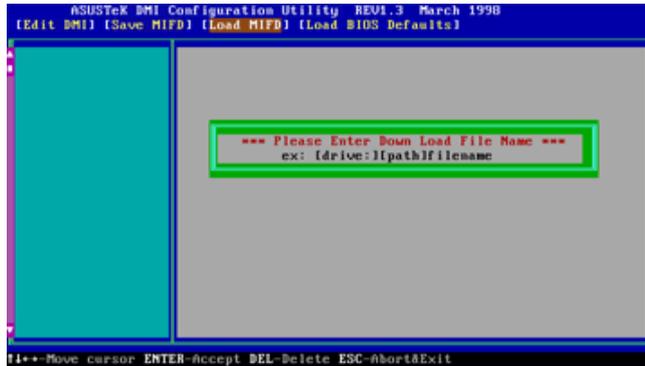
G. NetDMK Utility Interface

Save MIFD



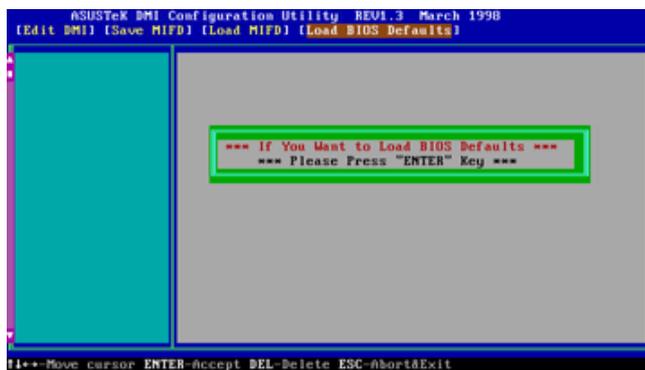
You can save the MIFD (normally only saved to flash ROM) to a file by entering the drive and path here. If you want to cancel save, you may press ESC and a message “Bad File Name” appears here to show it was not saved.

Load MIFD



You can load the disk file to memory by entering a drive and path and file name here.

Load BIOS Defaults



You can load the BIOS defaults from a MIFD file and can clear all user modified and added data. You must reboot your computer in order for the defaults to be saved back into the Flash BIOS.

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