

ASUS[®] TR-DLSR
Dual Socket 370 Motherboard

USER'S MANUAL

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(Turn to page 69 for detailed contents on OS Drivers)

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:

- Re-orient 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! Any changes or modifications to this product not expressly approved by the manufacturer could void any assurances of safety or performance and could result in violation of Part 15 of the FCC Rules.

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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.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

1. INTRODUCTION

1.1 How This Manual Is Organized

This manual is divided into the following sections:

1. INTRODUCTION	Manual information and checklist
2. FEATURES	Product information and specifications
3. HARDWARE SETUP	Instructions on setting up the motherboard.
4. BIOS SETUP	Instructions on setting up the BIOS
5. SOFTWARE SETUP	Instructions on setting up the included software
6. SOFTWARE REFERENCE	Reference material for the bundled software
7. APPENDIX	Optional items and general reference

1.2 Item Checklist

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

- (1) ASUS Motherboard
- (1) I/O Shield
- (1) Ribbon cable for master and slave IDE drives
- (1) 68-pin LVD SCSI ribbon cable for Ultra160 devices with Terminator
- (1) Ribbon cable for a 3.5" floppy disk drive
- (1) Support drivers and utilities
- (1) User's Manual

Optional Items

- (1) PGA370 CPU Terminator (required when installing only one CPU)

2. FEATURES

2.1 ASUS TR-DLSR Motherboard

The ASUS TR-DLSR motherboard is designed primarily for multi-server environments to optimize available space without sacrificing performance. Powered by dual Intel® Pentium® III Tualatin™ processors, the TR-DLSR efficiently complies with today's demand for a high-integration server.

2.1.1 Specifications

- **Latest Intel Processor Support:** Supports dual Socket 370-based Intel Pentium III Tualatin processors running up to 1.4GHz with 133MHz Front Side Bus (FSB) frequency
- **Multi-Processor OS:** Supports multi-processor operating systems such as Windows NT/2000, Unix, Linux, and Netware when dual processors of the same type and speed are installed.
- **ServerWorks LE 3.0 Chipset:** Features the ServerWorks LE 3.0 North Bridge and RCC Open South Bridge. Supports PC133 SDRAM with ECC, dual peer to peer PCI buses, and 64-bit 66MHz PCI bus speed.
- **Onboard Graphics:** Features ATI RAGE-XL PCI VGA controller that supports up to 4MB PC100-compliant 10ns SDRAM for 1280x1024 and true color resolutions.
- **Smart Networking:** Features two Intel 82559 Fast-Ethernet LAN controllers that fully support Alert-On-LAN II (AOL-II) and 10BASE-T/100BASE-TX.
- **PC133 Memory Support:** Equipped with four Dual Inline Memory Module (DIMM) sockets that support up to 4GB of registered ECC SDRAMs (available in 64, 128, 256, 512MB, or 1GB densities).
- **SCSI Support:** Equipped with the LSI 53C1010 Ultra160 64-bit dual-channel SCSI controller supports up to 30 SCSI devices.
- **Standard IDE Support:** Comes with an onboard PCI Bus Master IDE controller with two connectors that support four IDE devices on two channels. Supports PIO Modes 3 and 4 IDE devices, such as DVD-ROM, CD-ROM, CD-R/RW, LS-120, and Tape Backup drives.
- **PCI Expansion Slot:** One 64-bit 66MHz PCI slot
- **USB Ports:** Two stacked USB connectors to provide for additional peripherals
- **SMBus:** Features the System Management Bus interface, which is used to physically transport commands and information between SMBus devices.

2. FEATURES

- **Wake-Up Support:** Supports Wake-On-LAN and Wake-On-Ring, and BIOS Wake-Up.
- **ISA Multi-I/O:** Provides two high-speed UART compatible serial ports and one parallel port with EPP and ECP capabilities.
- **Server Health Monitoring:** Provides an easy way to examine and manage system status information, such as CPU and system voltages, temperatures, and fan status through the onboard hardware ASUS ASIC.
- **Enhanced ACPI:** Programmable BIOS (Flash EEPROM), offering enhanced ACPI for Windows 2000 compatibility, and autodetection of most devices for virtually automatic setup.
- **CPU Throttling:** This feature protects the CPU from overheating.

2. FEATURES

2.1.2 Performance

- **UltraPerformance:** Onboard Ultra160 dual channel SCSI controller with two connectors that support 30 Ultra160 SCSI devices in two channels.
- **High-Speed Data Transfer Interface:** SCSI transfers using Ultra160 dual-channel SCSI controller can handle rates up to 160MB/s. Ultra160 is backward compatible with slower SCSI devices so that older SCSI devices are not wasted. (Ultra160 SCSI cables have twisted pairs compared to flat ribbon cables used in older SCSI standards.)
- **SDRAM Optimized Performance:** This motherboard supports PC133 “registered” Synchronous Dynamic Random Access Memory (SDRAM), which increases the data transfer rate to 1064MB/s max
- **ACPI Ready:** ACPI (Advanced Configuration and Power Interface) is also 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, use an ACPI-supported OS, such as Windows 2000.
- **Compliance:** Both the Microsoft WHQL and hardware levels of the motherboard meet the requirements for SDG2.0 certification. The new SDG2.0 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 NT/2000. Color-coded connectors and descriptive icons make identification easy as required by PC ‘99.

2. FEATURES

2.1.3 Intelligence

- **Fan Status Monitoring and Alarm:** To prevent system overheat and system damage, the CPU, power supply, and system fans can be monitored for RPM and failure. All the fans are set for its normal RPM range and alarm thresholds.
- **Temperature Monitoring and Alert:** To prevent system overheat and system damage, this motherboard supports processor thermal sensing and auto-protection.
- **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.
- **Remote Ring On (requires modem):** This allows a computer to be turned on remotely through an internal or external modem. With this benefit on-hand, users can access any information from their computers from anywhere in the world.
- **Alert-on-LAN II (requires optional hardware component):** Part of Wired for Management to enable IT staff to remotely respond to and resolve system trouble that decreases down time and lower total cost of ownership. Remote management response via remote diagnostics and troubleshooting work even when the operating system has frozen. Remote power down for power management. Asset tracking and monitoring through features like presence ping and logoff notification.

2. FEATURES

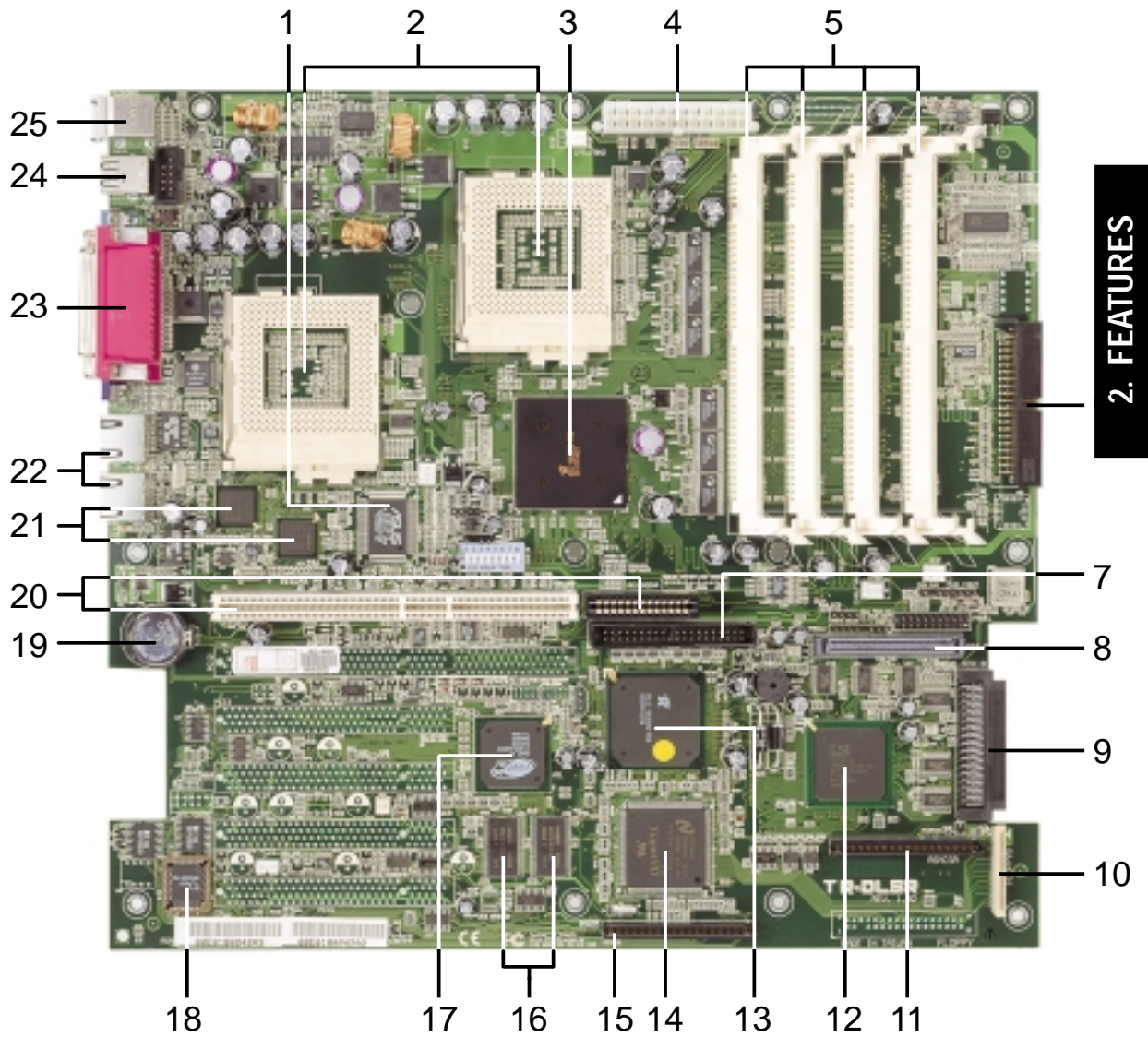
2.2 TR-DLSR Motherboard Components

See opposite page for locations.

	Location
Processor Support	Dual Socket 370 for Pentium III Tualatin Processors 2
Chipsets	ServerWorks ServerSet LE 3.0 North Bridge 3
	ServerWorks Open South Bridge 13
	4Mbit Flash ROM 18
	Super I/O Chipset 14
	Integrated Graphics Controller 17
Memory	DIMM Sockets 5
	(Maximum 4GB support for PC133 registered SDRAM)
	Onboard VGA Memory 16
Expansion Slots	64-bit 66MHz PCI Slot 20
	ASUS ASMS Connectors (ASMCSA/ASMCSB) 11, 15
System I/O	Floppy Disk Drive Connector 10
	Primary IDE Connector (IDE1) 6
	Secondary IDE Connector (IDE2) 7
	RJ-45 Fast-Ethernet Ports 22
	Parallel Port (Top) 23
	Serial Port (Bottom left) 23
	VGA Monitor Connector (Bottom right) 23
	USB Ports 24
	PS/2 Mouse Connector (Top) 25
	PS/2 Keyboard Connector (Bottom) 25
Network Features	Intel 82559 Fast-Ethernet Controller 21
	Wake-On-LAN Connector (see layout on page 14)
	Wake-On-Ring Connector (see layout on page 14)
Hardware Monitoring	System Voltage Monitoring (integrated in ASUS ASIC) 1
	Fan Power and Speed Monitoring Connectors (see layout on page 14)
Power	ATX Power Supply Connector 4
CMOS Battery	Lithium CR2032 3V 19
Special Feature	LSI 64-bit 66MHz Ultra160 dual-channel SCSI controller 12
	Onboard SCSI Connector (SCSI-A) 8
	Onboard SCSI Connector (SCSI-B) 9
Form Factor	Full-size ATX

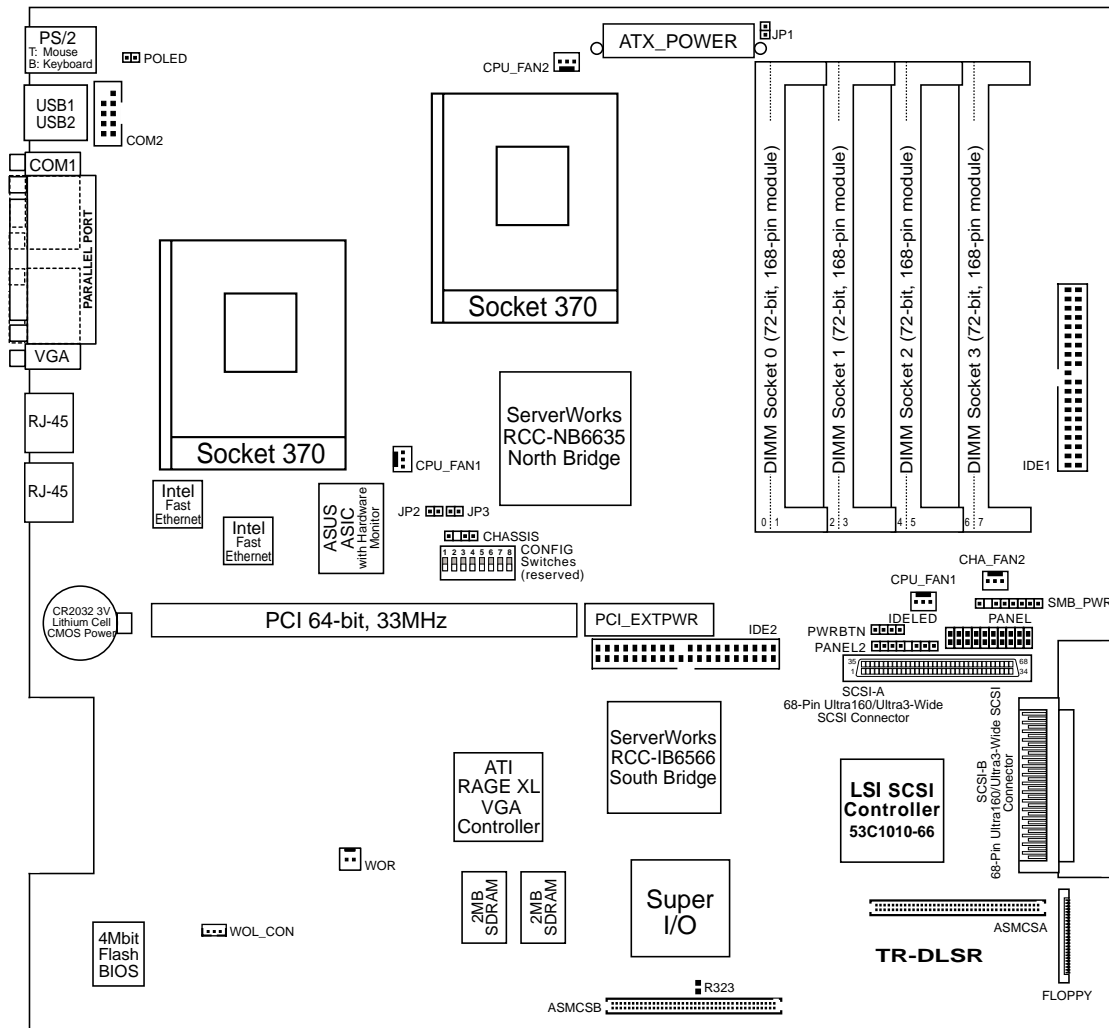
2. FEATURES

2.2.1 Component Locations



3. HARDWARE SETUP

3.1 TR-DLSR Motherboard Layout



3. HW SETUP
Motherboard Layout

3. HARDWARE SETUP

3.2 Layout Contents

Motherboard Settings

- 1) CONFIG 5-8 p. 17 CPU Bus Frequency Setting
- 2) CLRTC p. 18 Clear CMOS

Expansion Slots

- 1) DIMM 0/1/2/3 p. 19 168-Pin System Memory Support
- 2) CPU p. 21 Central Processing Unit (CPU)
- 3) PCI p. 24 64-bit PCI Bus Expansion Slot

External Connectors

- 1) PS2KBMS p. 27 PS/2 Mouse Connector (6-pin female)
- 2) PS2KBMS p. 27 PS/2 Keyboard Connector (6-pin female)
- 3) USB p. 27 Universal Serial Bus Ports 0 & 1 (two 4-pin female)
- 4) PRINTER p. 28 Parallel Port Connector (25-pin female)
- 5) COM1 p. 28 Serial Port COM1 Connector (9-pin male)
- 6) VGA p. 28 Monitor (VGA) Output Connector (15-pin female)
- 7) RJ-45 p. 28 Fast-Ethernet Connector (RJ45)

Internal Connectors

- 1) IDE1/IDE2 p. 29 Primary/Secondary IDE Connectors (two 40-1 pin)
- 2) IDE LED p. 30 IDE/SCSI Activity LED
- 3) FLOPPY p. 30 Floppy Disk Drive Connector (34-1 pin)
- 4) WOL_CON p. 31 Wake-On-LAN Connector (3-pin)
- 5) WOR p. 31 Wake-On-Ring Connector (2-pin)
- 6) SCSI-A/SCSI-B p. 32 68-pin Ultra160 SCSI Connectors (two 68-pin)
- 7) CPU_FAN1/2 p. 33 CPU and Chassis Fan Connectors (four 3-pin)
CHA_FAN1/2
- 8) CHASSIS p. 33 Chassis Open Alarm Lead (4-pin)
- 9) SMB p. 34 SMBus Connector (8-1 pins)
- 10) COM2 p. 36 Serial Port 2 (9-pin male)
- 11) ASMCSA/
ASMCSB p. 35 ASUS Ser Management Card Connectors
- 12) PANEL2 p. 35 Panel 2 Connector (8-pin)
- 13) JP2/JP3 p. 35 Thermal Sensor Connectors (two 2-pin)
- 14) ATXPWR p. 36 ATX Power Supply Connector (20/24-pin)
- 15) PWRBTN p. 36 Power Button Connector (2-pin)

3. HARDWARE SETUP

16) NIC (PANEL)	p. 37	NIC Activity LED (2-pin)
17) STATUS (PANEL)	p. 37	Status Activity LED (2-pin)
18) SMI (PANEL)	p. 37	System Management Interrupt Lead (2-pin)
19) PWRSW (PANEL)	p. 37	ATX Power Switch/Soft Off Lead (2-pin)
20) RESET (PANEL)	p. 37	Reset Switch Lead (2-pin)
21) PWR.LED (PANEL)	p. 37	System Power LED Lead (3-1 pin)
22) NMI (PANEL)	p. 37	Non-Mask Interrupt Switch (2-pin)
23) SPEAKER (PANEL)	p. 37	System Warning Speaker Connector (4-pin)
24) IDELED (PANEL)	p. 37	IDE/SCSI Activity LED (2-pin)

3.3 Hardware Setup Procedure

Complete the following steps before using your computer:

1. Check motherboard settings
2. Install memory modules
3. Install the Central Processing Unit (CPU)
4. Install Expansion Cards
5. Connect ribbon cables, panel wires, and power supply cables
6. Configure the BIOS parameter settings

3.4 Motherboard Settings

This section tells you how to change motherboard function settings through the switches and/or jumpers.

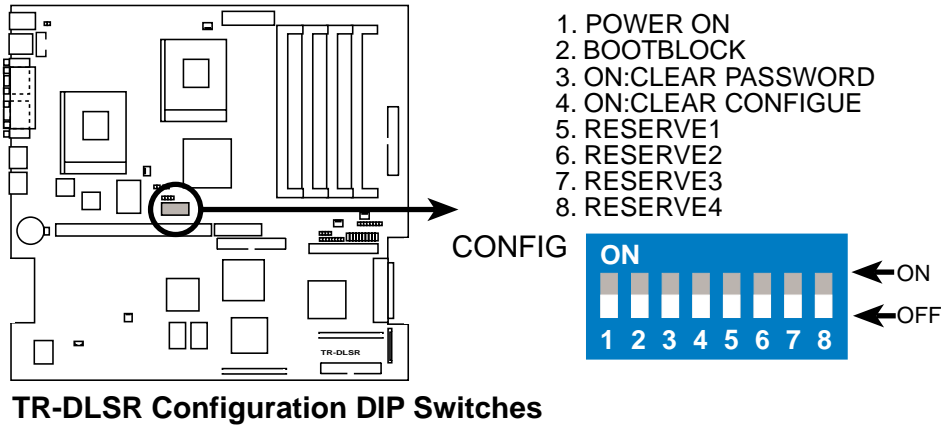
WARNING! Computer motherboards and expansion cards contain very delicate Integrated Circuit (IC) chips. To avoid damaging them due to static electricity, follow these precautions whenever you work on your computer.

1. Unplug the computer when working on the internal components.
2. Use a grounded wrist strap or touch a safely grounded object or to a metal object, such as the power supply case, before handling computer components.
3. Hold components by the edges and try not to touch the IC chips on them.
4. Whenever you uninstall any component, place the components on a grounded antistatic pad or in the bag that came with the components.
5. **Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply.** Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

3. HARDWARE SETUP

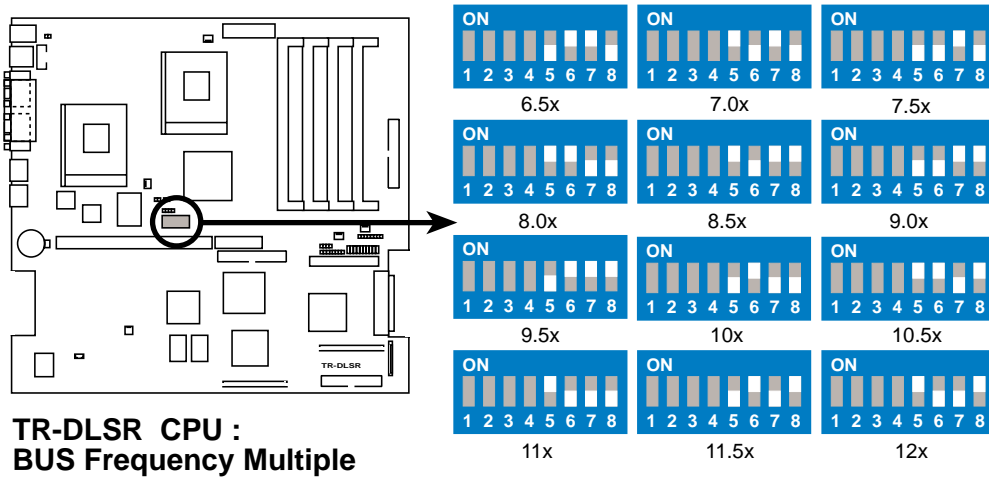
DIP Switch Settings

You may change the CPU core bus frequency multiple using the DIP switches. The white block on a DIP switch represents the ON or OFF position. The figure below shows the location of the DIP switches on the motherboard and the function of each switch.



CPU Core Bus Frequency Multiple (Switches 5-8)

This option sets the frequency multiple between the CPU's internal and external frequencies. The CPU frequencies must be set in conjunction with the CPU bus frequency.



WARNING! Frequencies other than the recommended CPU bus frequencies are not guaranteed to be stable.

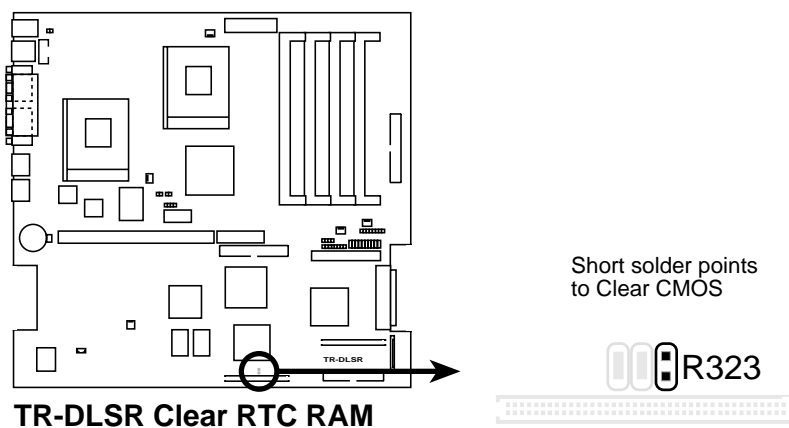
3. HARDWARE SETUP

Clear RTC RAM (R323)

These two solder points allow you to clear the RTC RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS Real Time Clock (RTC) RAM. The RAM data that include system setup information, such as system passwords, is powered by the onboard button cell battery.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the battery.
3. Short the solder points for a few seconds.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the key during the boot process and enter BIOS setup to re-enter CMOS data.



3. HARDWARE SETUP

3.5 System Memory

This motherboard uses only Dual Inline Memory Modules (DIMMs). Four DIMM sockets are available for **3.3Volt** (power level) registered Synchronous Dynamic Random Access Memory (SDRAM) of 16MB, 32MB, 64MB, 128MB, 256MB, 512MB, or 1GB densities with Serial Presence Detect (SPD) and Error Check and Correction (ECC). The motherboard supports a memory configuration of up to 4GB. One side (with memory chips) of the DIMM takes up one row on the motherboard.

3.5.1 Memory Configurations

Install memory in any of the following combinations:

DIMM Location	168-pin DIMM	Total Memory
Socket 0 (Rows 0&1)	SDRAM 64MB, 128MB, 256MB, 512MB, 1GB	x1
Socket 1 (Rows 2&3)	SDRAM 64MB, 128MB, 256MB, 512MB, 1GB	x1
Socket 2 (Rows 4&5)	SDRAM 64MB, 128MB, 256MB, 512MB, 1GB	x1
Socket 3 (Rows 6&7)	SDRAM 64MB, 128MB, 256MB, 512MB, 1GB	x1
Total System Memory (Max. 4GB)		=

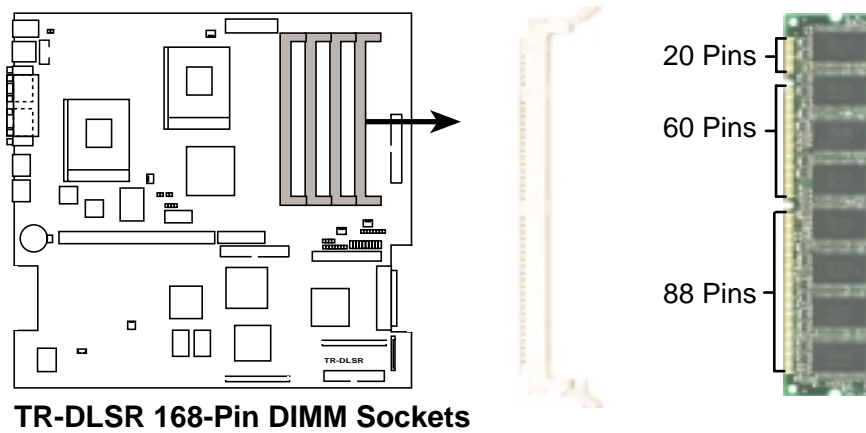
IMPORTANT: The system chipset only supports 64Mbit, 128Mbit, and 256Mbit “registered” SDRAMs with ECC. Make sure to use the specified DIMM types for smooth system operation.

3. HARDWARE SETUP

3.5.2 Memory Installation

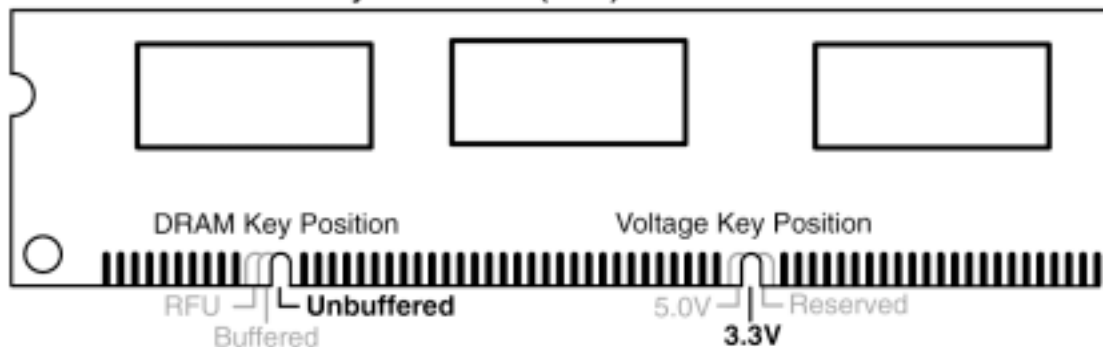
WARNING! Make sure that you unplug the power supply when adding or removing memory modules or other system components. Failure to do so may cause severe damage to both the motherboard and expansion cards (see **3.3 Hardware Setup Procedure** for more information).

Insert a DIMM into the DIMM socket as shown. Because the number of pins are different on either side of the breaks, the module only fits in one direction. SDRAM DIMMs have different pin contacts on each side.



Use only 3.3Volt “registered” SDRAM DIMMs. To determine the DIMM type, check the notches on the DIMMs (see the figure below).

168-Pin DIMM Notch Key Definitions (3.3V)

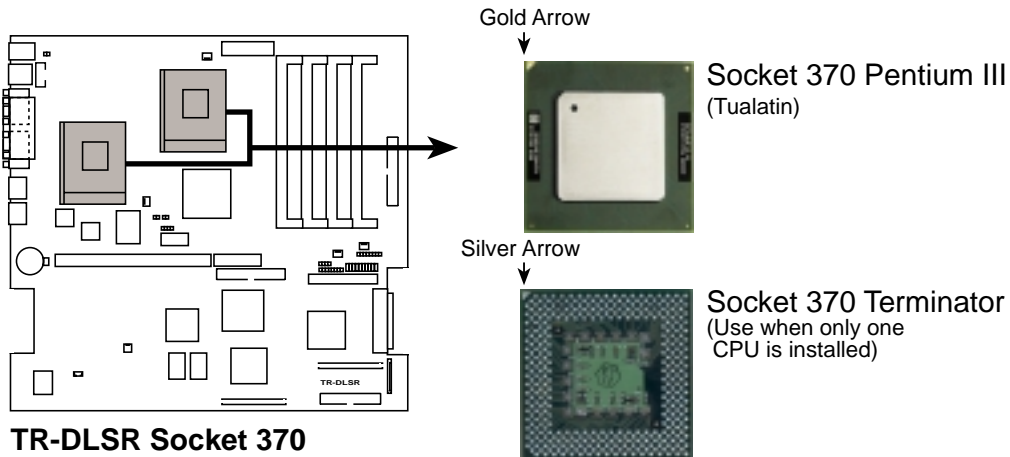


The notches on the DIMM shifts between left, center, or right to identify the type and also to prevent the wrong type from being inserted into the DIMM slot on the motherboard. You must tell your retailer the correct DIMM type before purchasing. This motherboard supports four clock signals per DIMM.

3. HARDWARE SETUP

3.6 Central Processing Unit (CPU)

The motherboard comes with a dual Socket 370 for Intel Pentium III Tualatin 1.4GHz CPUs with 133MHz Front Side Bus (FSB). The following illustration shows the location of the CPU sockets on the motherboard and the correct CPU orientation.



Note in the illustration that the CPU and the terminator have marks (usually a notch or a gold mark on one corner) to help you identify the proper orientation and enable you to correctly install them. It is important that you match the marked corner of the CPU and terminator with the corresponding corner on the socket so as not to damage the CPU pins.

WARNING! If you are installing this motherboard into a 1U system, you must use a specially designed heatsink qualified for critical environments. Failure to do so will cause the CPU to overheat and may damage both the CPU and the motherboard.

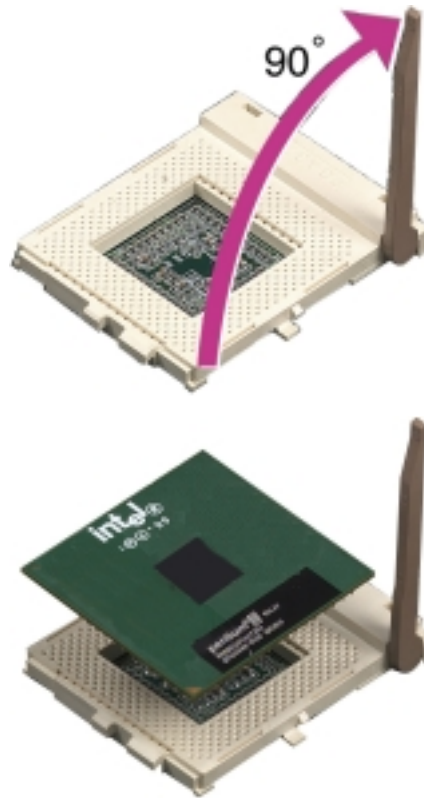
Proceed to the next section for the steps on how to properly install the CPU and the specially designed heatsink for the 1U system.

3. HARDWARE SETUP

3.6.1 Installing the CPU and Terminator

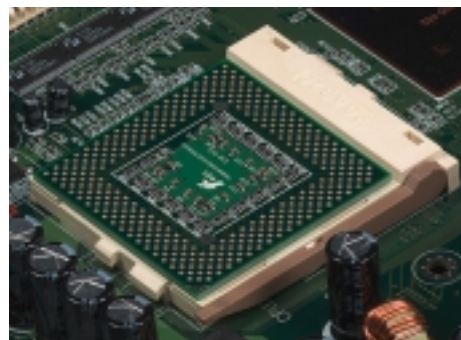
Follow these steps to install a CPU.

1. Locate the ZIF socket on the motherboard.
2. Unlock the socket by pressing the lever sideways then lifting it up to a 90°-100° angle.
3. Position the CPU above the socket such that its notched or marked corner matches the socket corner near the end of the lever, while making sure that the CPU is parallel to the socket.
4. Carefully insert the CPU into the socket until it fits in place.



CAUTION! The CPU fits only in one orientation. Do not force the CPU into the socket to prevent bending the pins and damaging the CPU. If the CPU does not fit completely, check its orientation or check for bent pins.

5. When the CPU is in place, press it firmly on the socket while you push down the socket lever to secure the CPU. The lever clicks on the socket indicating that it is locked.
6. Install the CPU terminator the same way as you would install a CPU. The figure on the right shows an installed CPU terminator.



NOTE: Do not forget to set the correct Bus Frequency and Multiple (frequency multiple setting is available only on unlocked processors) for the processor to avoid start-up problems.

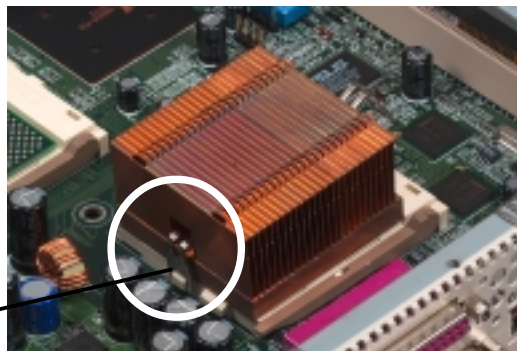
3. HARDWARE SETUP

3.6.2 Heatsink Installation

Follow these steps to install a CPU.

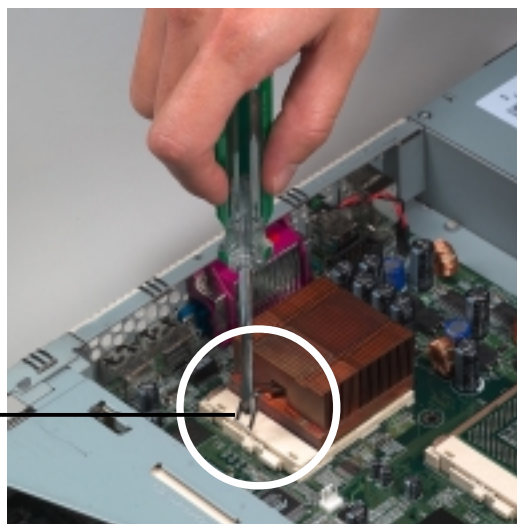
1. Carefully place the heatsink on top of the installed CPU and hook one end of the retaining clip to the protruding tab on the front of the socket. (TIP: The front part of the socket is where you find the gold mark or notch on the CPU.)

**Retaining Clip for the
Tab on the Front of
the Socket**

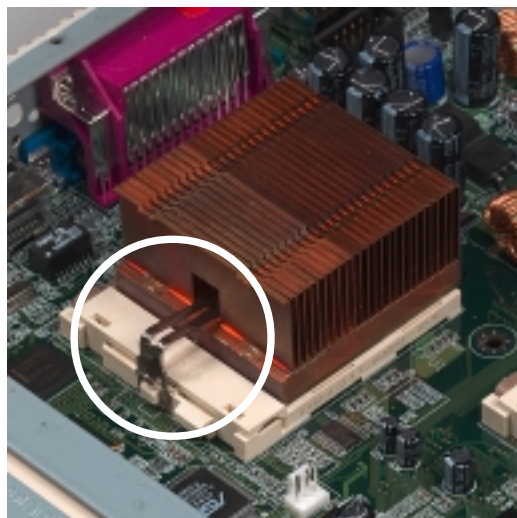


2. Use a flat screwdriver to hook the other end of the retaining clip to the protruding tab at the back of the CPU socket.

**Retaining Clip for the
Tab at the Back of the
Socket**



3. Check and make sure that the retaining clip is properly in place.



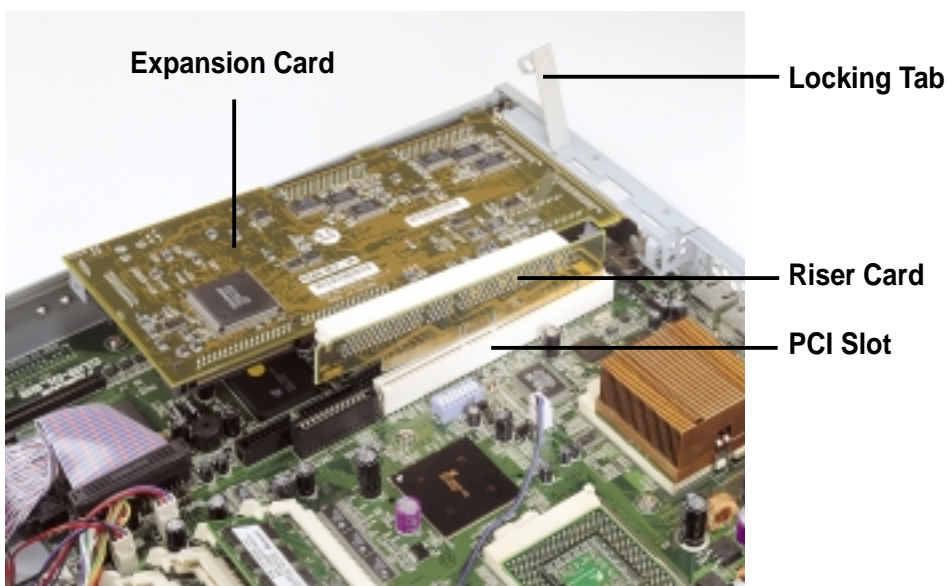
3. HARDWARE SETUP

3.7 Expansion Cards

WARNING! Unplug the 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.

3.7.1 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 cover and the bracket plate on the expansion slot. Keep the bracket for possible future use.
3. Lift the locking tab on top of the slot. If you are installing a long expansion card, lift the metal card guide also. This card guide is located on the bracket near the chassis fans.
4. Detach the riser card from the PCI card slot on the motherboard.
5. Carefully insert the golden fingers of the expansion card into the connector on the riser card.
6. Align the card bracket to the slot opening at the back of the system unit while inserting the end of the bracket to the slot holding tab.
7. Insert the golden fingers of the riser card to the PCI slot on the motherboard until it fits in place.
8. Press down the locking tab at the top of the expansion slot to secure the card.
9. If you installed a long expansion card, pull down the metal card guide and fit it to the other end of the card to hold the card in place.
10. Install the necessary software drivers for your expansion card.



3. HARDWARE SETUP

3.7.2 Assigning IRQs for Expansion Cards

Some expansion cards need 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 the motherboard has **PCI** audio onboard, an additional IRQ will be used. If the motherboard also has **MIDI** enabled, another IRQ will be used, leaving 4 IRQs free.

The following table lists the default IRQ assignments for standard PC devices. Use this table when configuring your system and for resolving IRQ conflicts.

ISA Interrupt (IRQ) Assignments

ISA INT	Priority	Standard Function
ISA 00	1	System Timer
ISA 01	2	Keyboard Controller
ISA 02	N/A	Programmable Interrupt
ISA 03*	11	Communications Port (COM2)
ISA 04*	12	Communications Port (COM1)
ISA 05*	13	Sound Card (sometimes LPT2)
ISA 06	14	Floppy Disk Controller
ISA 07*	15	Printer Port (LPT1)
ISA 08	3	System CMOS/Real Time Clock
ISA 09*	4	ACPI Mode when used
ISA 10*	5	IRQ Holder for PCI Steering
ISA 11*	6	IRQ Holder for PCI Steering
ISA 12*	7	PS/2 Compatible Mouse Port
ISA 13	8	Numeric Data Processor
ISA 14*	9	Primary IDE Channel
ISA 15*	10	Secondary IDE Channel

*These IRQs are usually available for PCI devices.

3. HARDWARE SETUP

PCI Interrupt (IRQ) Assignments

Device	PCI INTA	PCI INTB	PCI INTC	PCI INTD
64-bit PCI Slot	PCI 00	PCI 13	PCI 14	PCI 15

IRQ Assignments for Other Onboard Devices

Device	Assignment
ATI Video	PCI10
Intel 82559 #1	PCI6
Intel 82559 #2	PCI7
LSI 1010-66 CHA	PCI8
LSI 1010-66 CHB	PCI9

3. HARDWARE SETUP

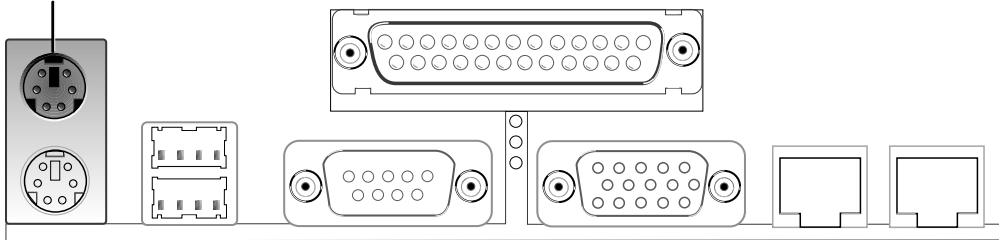
3.8 Connectors

3.8.1 External Connectors

1) PS/2 Mouse Port (Green 6-pin PS2KBMS)

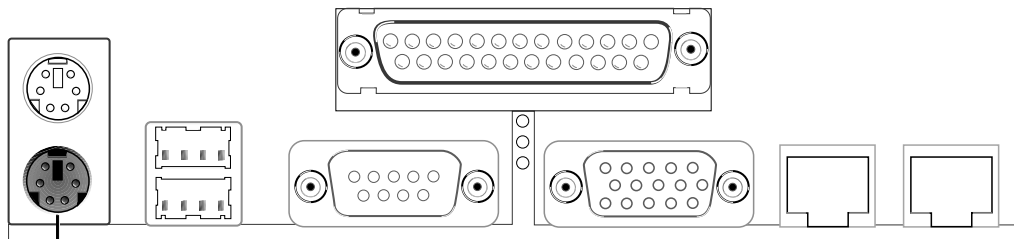
The system will direct IRQ12 to the PS/2 mouse if one is detected. If one is not detected, expansion cards can use IRQ12.

PS/2 Mouse (6-pin female)



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

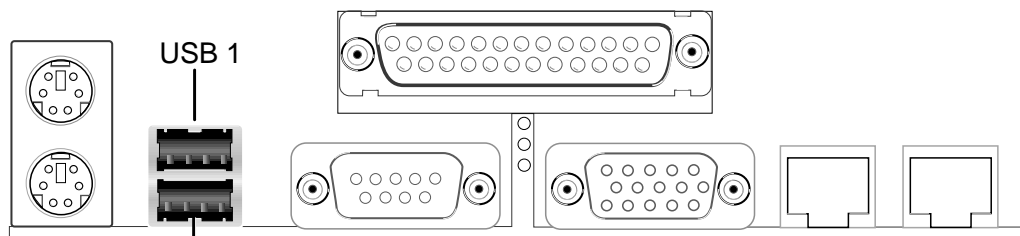
This connection is for a standard keyboard using an PS/2 plug (mini DIN). **This connector does not allow standard AT size (large DIN) keyboard plugs. You may use a DIN to mini DIN adapter on standard AT keyboards.**



PS/2 Keyboard (6-pin female)

3) Universal Serial BUS Ports 1 & 2 (Black two 4-pin USB)

Two USB ports are available for connecting USB devices.

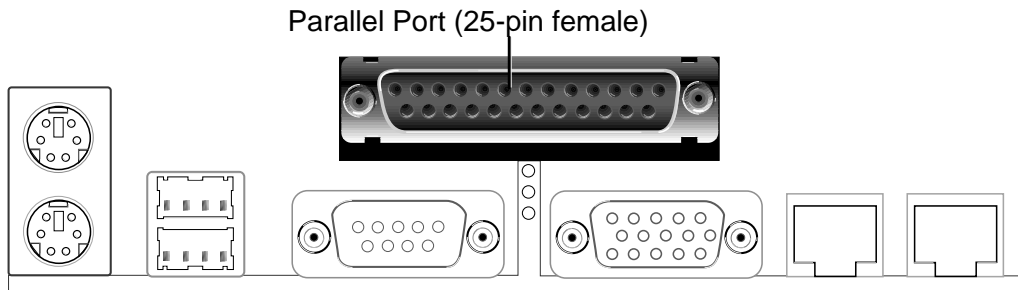


Universal Serial Bus (USB) 2

3. HARDWARE SETUP

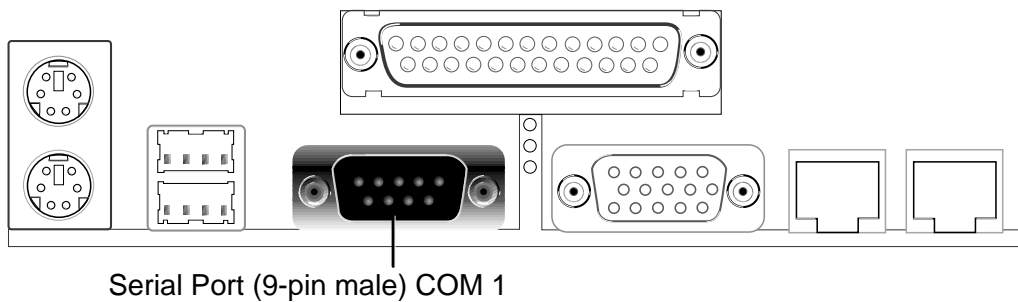
4) Parallel Port Connector (Burgundy 25-pin PRINTER)

A 25-pin port is available for a parallel printer. Enable the parallel port and select the IRQ through **Onboard Parallel Port** parameter in BIOS. (See **4.4.2 I/O Device Configuration**).



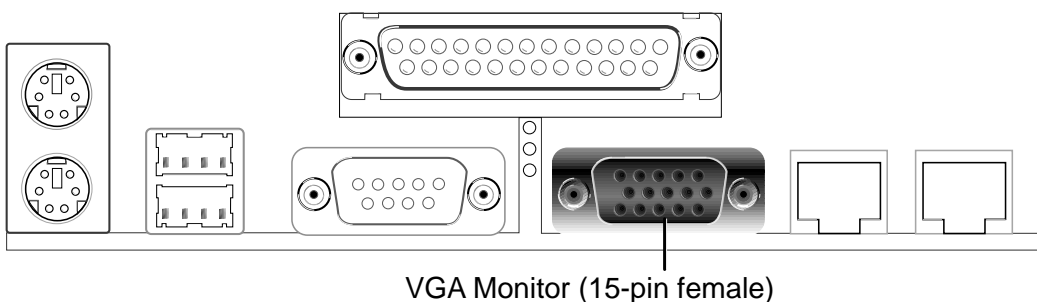
5) Serial Port Connector (Teal/Turquoise 9-pin COM1)

One serial port is available for pointing devices or other serial devices. To enable the port, see **Onboard Serial Port 1** in **4.4.2 I/O Device Configuration**.



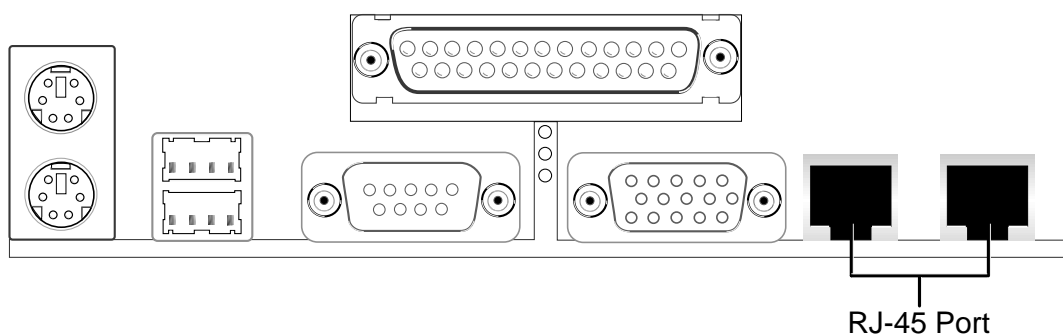
6) VGA Connector (Blue 15-pin VGA)

This connector is for a VGA monitor and other VGA-compatible devices.



7) Fast Ethernet LAN Connector (R-J45)

The RJ-45 connector allows connection to a Local Area Network (LAN) through a network hub.



3. HARDWARE SETUP

3.8.2 Internal Connectors

WARNING! Some pins are used for connectors or power sources. These are clearly distinguished from jumpers in the Motherboard Layout. Placing jumper caps over these connector pins will cause damage to your motherboard.

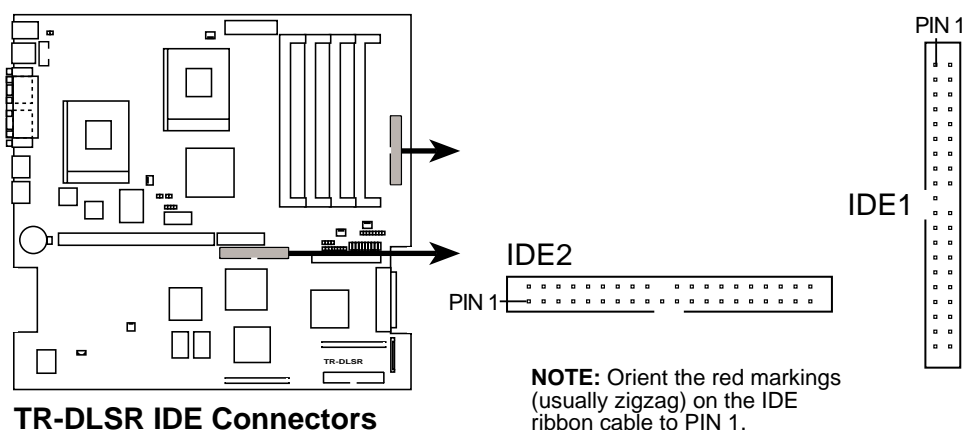
IMPORTANT: Always connect ribbon cables such that the red stripe matches Pin 1 on the connector. Pin 1 is usually on the side closest to the power connector on hard disk drives and CD-ROM drives, but may be on the opposite side on floppy disk drives.

1) Primary/Secondary IDE Connectors (40-pin IDE1/IDE2)

These connectors support UltraDMA/33 IDE hard disks. Use IDE ribbon cables to connect the master and slave devices to these connectors. If you install two hard disks, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings. BIOS supports specific device bootup (see **4.6. Boot Menu**).

NOTE: Pin 20 on each IDE connector is removed to match the covered hole on the UltraDMA cable connector. This prevents incorrect orientation when you connect the cables.

TIP: You may configure two hard disks to be both Masters with two ribbon cables – one for the primary IDE connector and another for the secondary IDE connector.

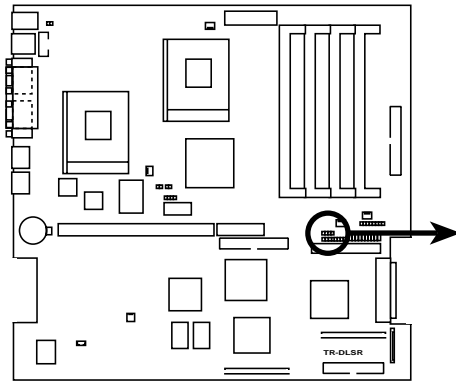


3. HARDWARE SETUP

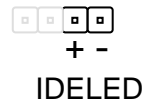
2) IDE/SCSI Activity LED (2-pin IDELED)

This connector supplies power to the chassis activity LED. Read and write activity by devices connected to the primary/secondary IDE and SCSI connectors cause the LED to light up.

NOTE: Another 2-pin IDE LED connector is available in the connector labeled PANEL.



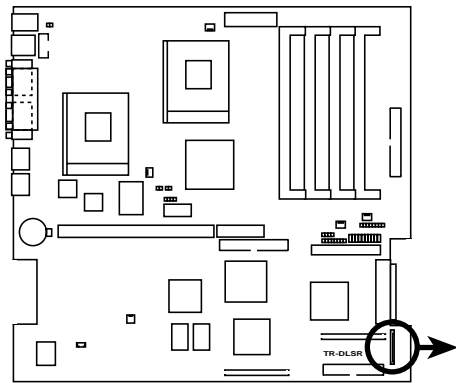
TR-DLSR IDE Activity LED



*Same as the "HDD Access LED" in the panel connectors

3) Floppy Disk Drive Connector (34-1 pin FLOPPY)

This connector supports the provided floppy drive ribbon cable. After connecting the single end to the board, connect the two plugs on the other end to the floppy drives. (Pin 5 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 5 plugged).



TR-DLSR Floppy Disk Drive Connector



PIN 1

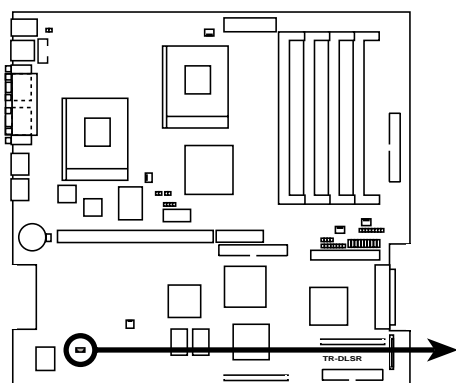
NOTE: Orient the red markings on the floppy ribbon cable to PIN 1.

3. HARDWARE SETUP

4) Wake-On-LAN Connector (3-pin WOL_CON)

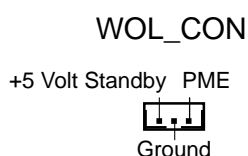
This connector connects to a LAN card with a Wake-On-LAN output, such as the ASUS PCI-L101 Ethernet card (see 7. *APPENDIX*). The connector powers up the system when a wakeup packet or signal is received through the LAN card.

IMPORTANT: This feature requires that **Wake On LAN** is enabled (see 4.5.1 *Power Up Control*) and that your system has an ATX power supply with at least 720mA +5V standby power.



TR-DLSR Wake-On-LAN Connector

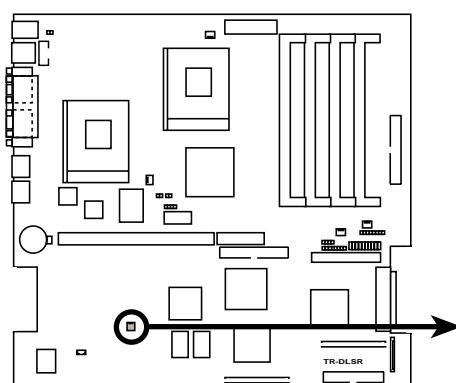
IMPORTANT: Requires an ATX power supply with at least 720mA +5 volt standby power



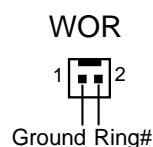
5) Wake-On-Ring Connector (2-pin WOR)

This connector connects to internal modem cards with a Wake-On-Ring output. The connector powers up the system when a ringup packet or signal is received through the internal modem card. **NOTE:** For external modems, Wake-On-Ring is detected through the COM port.

IMPORTANT: This feature requires that the **Power Up on Modem Act** parameter is enabled (see 4.5.1 *Power Up Control*) and that the system has an ATX power supply with at least 720mA +5V standby power.



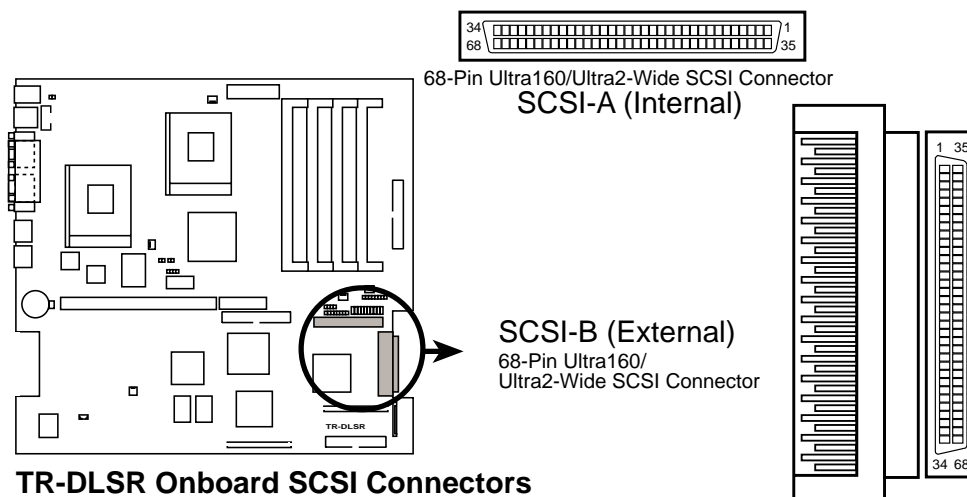
TR-DLSR Wake-On-Ring Connector



3. HARDWARE SETUP

6) Two 68-pin Ultra160 SCSI Connectors (SCSI-A, SCSI-B)

This motherboard has two 68-Pin Ultra160 SCSI connectors; one for each of the two channels. Each channel can support a maximum of 15 devices as specified by Ultra160 standards.



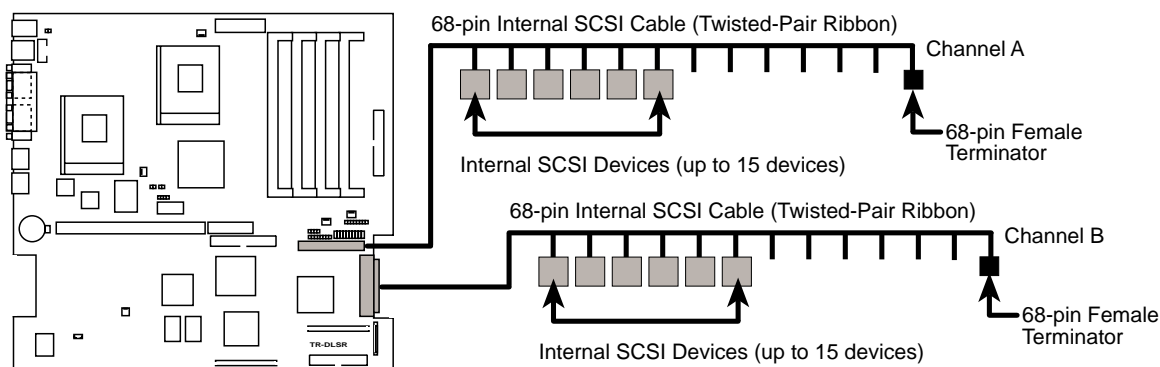
TR-DLSR Onboard SCSI Connectors

SCSI Connection Notes

This motherboard has two 68-Pin Ultra160 SCSI connectors; one for each of the two channels.

The onboard SCSI chipset incorporates an advanced multimode I/O cell that supports both single-ended (SE), Ultra2, and Ultra160 devices. With Ultra160 devices, the SCSI bus platform performs at full Ultra160 speeds (up to 160MB/sec) and extended cabling 12m (or 25m in a point-to-point configuration). When an SE device is attached, the bus defaults to an SE speed and 1.5m cable length.

IMPORTANT: Connect SCSI devices as shown. Each channel should have only one type of SCSI standard (e.g. Ultra160, Ultra2, Ultra-Wide). Mixing SCSI devices on the same channel decreases performance of the slower device.



TR-DLSR SCSI Connection Example

NOTE: Ultra160 SCSI devices do not have termination jumpers and must use a separate terminator on the last connector (internal) or device (external).

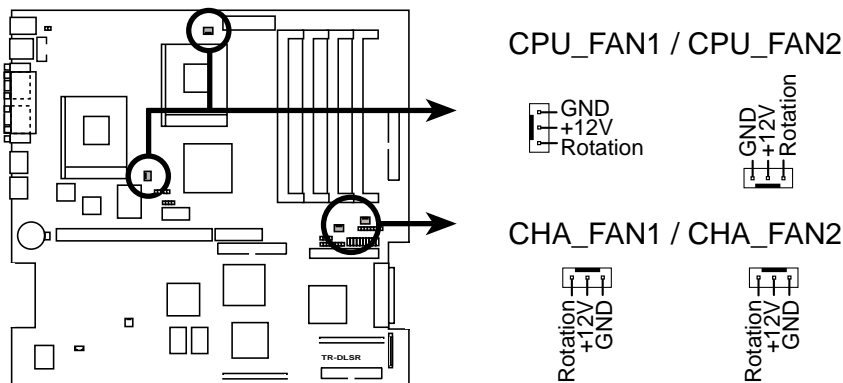
3. HARDWARE SETUP

7) CPU and Chassis Fan Connectors (3-pin CPU_FAN1/2, CHA_FAN1/2)

These connectors support cooling fans of 860mA (10.3 Watts) or less. Orient 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 connector.

NOTE: The "Rotation" signal is to be used only by a specially designed fan with rotation signal. The Rotations Per Minute (RPM) can be monitored using Intel LDSM Utility (provided with certain models).

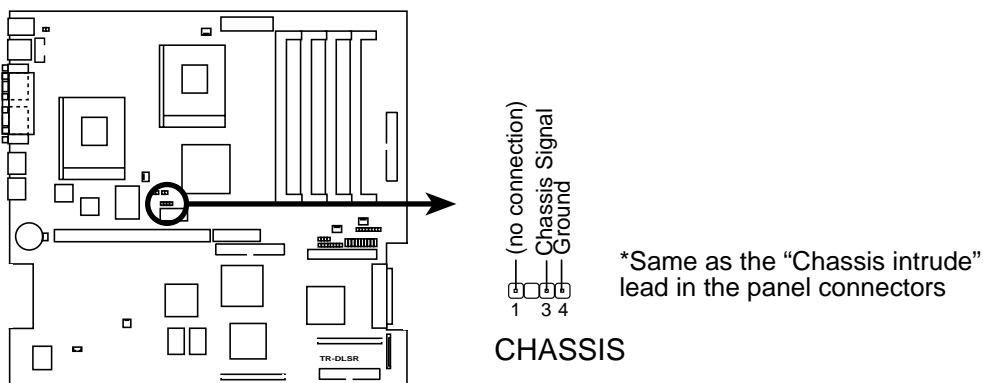
WARNING! The CPU and/or motherboard will overheat if there is no airflow across the CPU and onboard heatsinks. Damage may occur to the motherboard and/or the CPU fan if these pins are incorrectly used. **These are not jumpers, do not place jumper caps over these pins.**



TR-DLSR 12-Volt Cooling Fan Power

8) Chassis Open Alarm Lead Connector (CHASSIS)

This connector is designed for chassis intrusion detection. When any chassis component is removed, the contact should open and the motherboard will record a chassis intrusion event. The event can be processed by software such as LDSM.

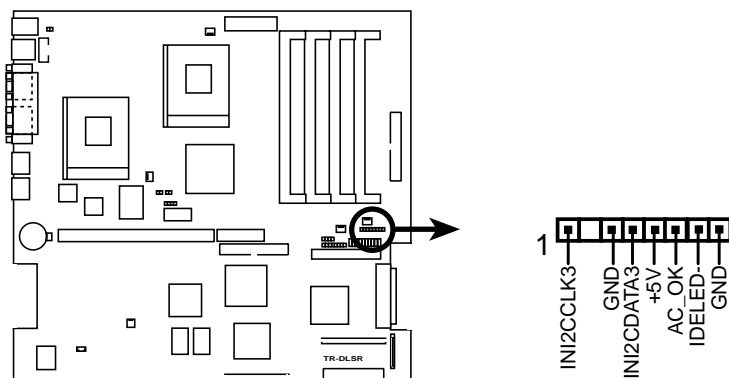


TR-DLSR Chassis Open Alarm Lead

3. HARDWARE SETUP

9) SMBus Connector (8-1 pin SMB)

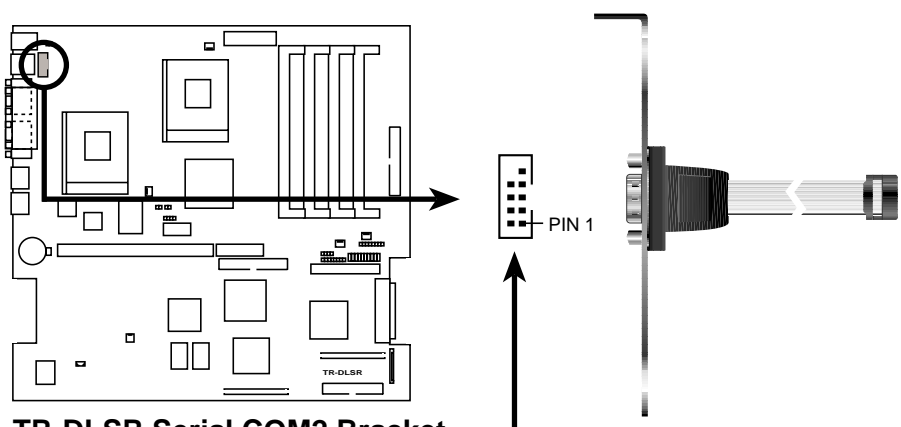
This connector allows you to connect SMBus (System Management Bus) devices. SMBus devices communicate by means of the SMBus with an SMBus host and/or other SMBus devices. SMBus is a specific implementation of an I²C bus, which is a multi-device bus; that is, multiple chips can be connected to the same bus and each one can act as a master by initiating data transfer.



TR-DLSR SMBus Power Connector

10) Serial Port 2 Connector (COM2)

This motherboard has a second serial port connector to accommodate additional serial peripherals. See the BIOS section *4.4.2 I/O Device Configuration* to configure Serial Port 2 settings.

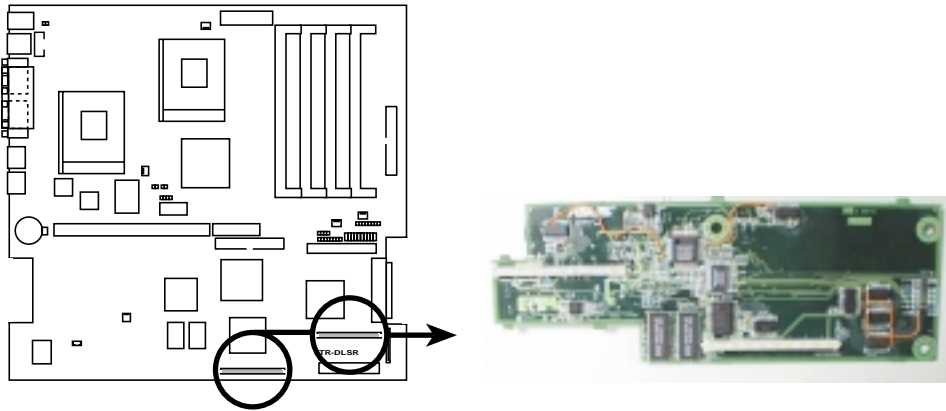


TR-DLSR Serial COM2 Bracket

3. HARDWARE SETUP

11) ASMC Connectors (ASMCSA/ASMCSB) *(Reserved)*

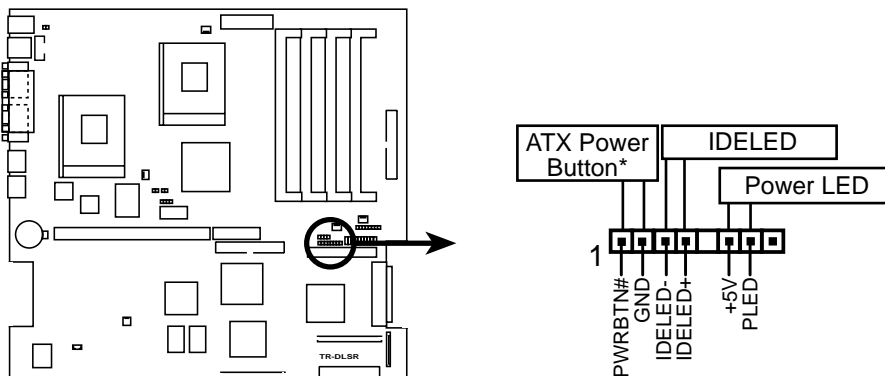
This motherboard has two ASMC connectors that can support the ASUS Server Management Card (ASMC). The ASMC is a future option.



TR-DLSR ASMC Connector

12) Panel 2 Connector (PANEL2)

This connector supports some of the functions in the 20-pin PANEL connector, such as the power button, IDE LED, and power LED.

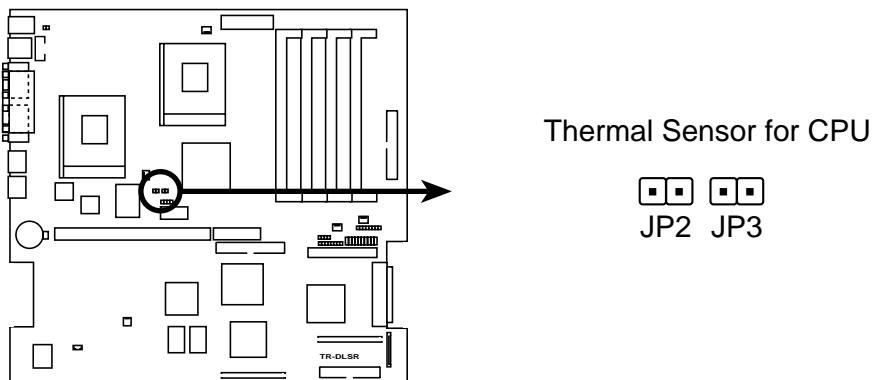


TR-DLSR Panel 2 Connector

* Requires an ATX power supply.

13) Thermal Sensor Connectors (JP2/JP3)

These connectors are for the thermal sensor cables from the power supply.



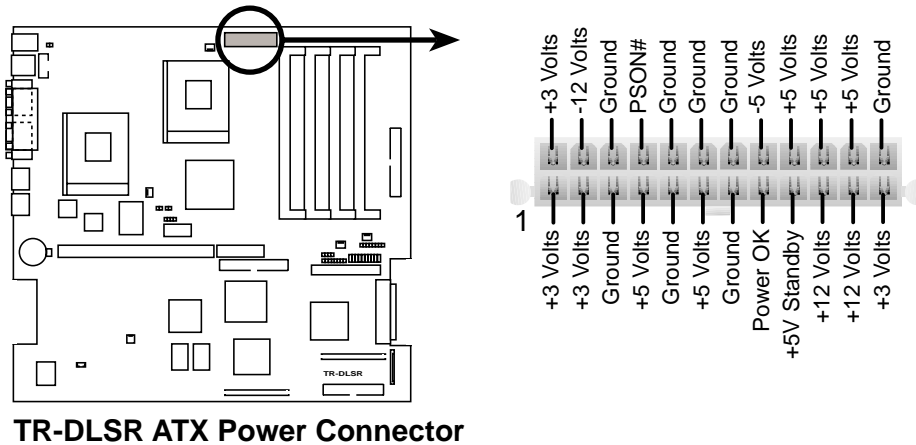
TR-DLSR Thermal Sensor Connectors

3. HARDWARE SETUP

14) ATX Power Connector (20/24-pin block ATXPWR)

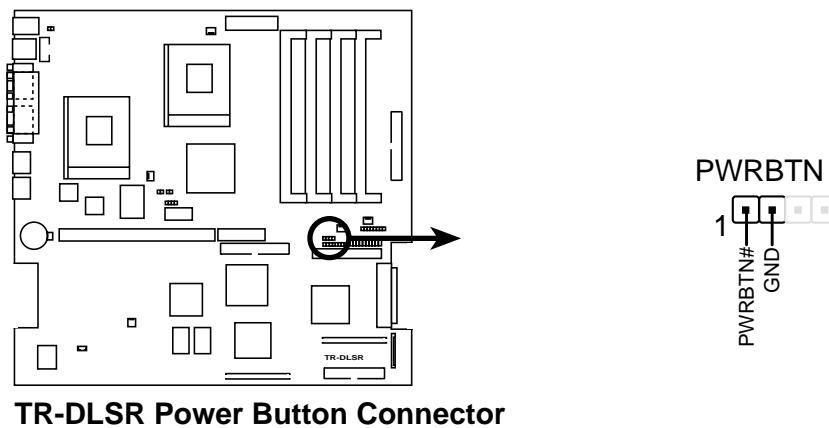
This connector connects to an ATX power supply. The plug from the power supply fits in only one orientation because of the different hole sizes. Find the proper orientation and push down firmly making sure that the pins are aligned.

IMPORTANT: Make sure that your ATX power supply can supply at least 720mA on the +5-volt standby lead (+5VSB). You may experience difficulty in turning ON your system if your power supply cannot support the load.



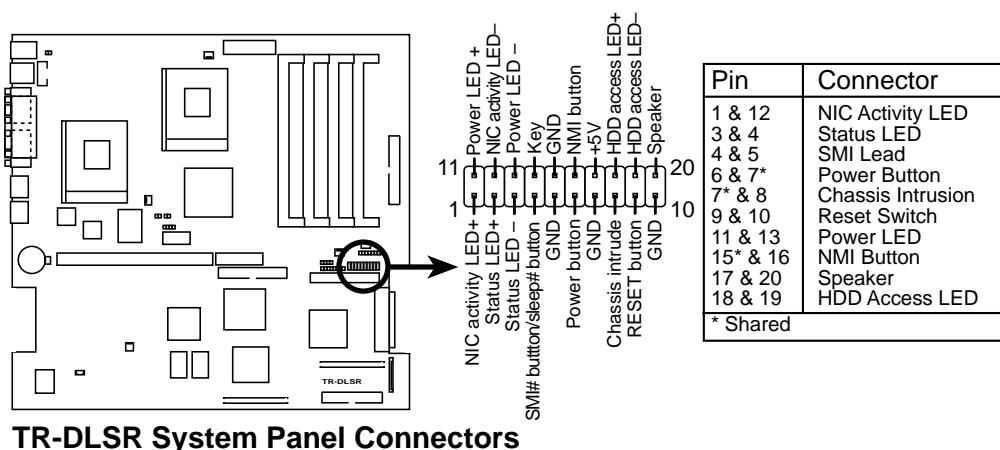
15) Power Button Connector (PWRBTN)

This connector allows you to turn the system ON or OFF. The power LED lights up when the system is turned ON.



3. HARDWARE SETUP

Refer to the following PANEL illustration for items 16-24.



16) NIC Activity LED Lead (2-pin)

This shows the status of the NIC through a panel-mounted LED.

17) Status LED (2-pin)

This shows the system status as programmed through the ASUS ASIC.

18) System Management Interrupt Lead (2-pin)

This allows the user to manually place the system into a suspend mode or “Green” mode where system activity will be instantly decreased to save electricity and expand the life of certain components when the system is not in use. This 2-pin connector (see the preceding figure) connects to the case-mounted suspend switch.

19) ATX Power Switch / Soft-Off Switch Lead (2-pin)

The system power is controlled by a momentary switch connected to this lead. Pushing the button once switches the system between ON and SLEEP or ON and SOFT OFF, depending on your BIOS or OS setting. Pushing the switch while in the ON mode for more than 4 seconds turns the system off. The system power LED shows the status of the system power.

20) Reset Switch Lead (2-pin)

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred method of rebooting to prolong the life of the system power supply.

21) System Power LED Lead (3-1 pin)

This 3-1 pin connector connects to the system power LED that lights up when the system is powered on and blinks when it is in sleep or soft-off mode. This feature can be programmed through the ASUS ASIC.

22) SMI Lead (2-pin)

This 2-pin connector connects to a panel button to allow a non-mask interrupt command to be sent to the operating system.

23) System Warning Speaker Lead (4-pin)

This 4-pin connector connects to the case-mounted speaker.

24) IDE Activity LED (2-pin)

This connector supplies power to the IDE activity LED. Read and write activity by devices connected to the Primary or Secondary IDE connectors cause this LED to light up.

3. HARDWARE SETUP

3.9 Starting Up the First Time

1. After making all the connections, replace the system case cover.
2. Be sure that all switches are off (in some systems, marked with ○).
3. Connect the power cord to the power connector at the back of the system chassis.
4. Connect the power cord to a power outlet that is equipped with a surge protector.
5. Turn on the devices in the following order:
 - a. Monitor
 - b. External SCSI devices (starting with the last device on the chain)
 - c. 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 chassis.)
6. The power LED on the front panel of the system case lights up. For ATX power supplies, the system LED lights up when you press the ATX power switch. If the monitor complies with “green” standards or if it has a power standby feature, the monitor LED may light up or switch between orange and green after the system LED does. The system then runs the power-on tests. While the tests are running, the BIOS beeps or additional messages 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. Check the jumper settings and connections or call your retailer for assistance.

Award BIOS Beep Codes

Beep	Meaning
One short beep when displaying logo	No error during POST
Long beeps in an endless loop	No DRAM installed or detected
One long beep followed by three short beeps	Video card not found or video card memory bad
High frequency beeps when system is working	CPU overheated System running at a lower frequency

7. At power on, hold down <Delete> to enter BIOS Setup. Follow the instructions in **4. BIOS SETUP**.
- * **Powering Off the computer:** You must first exit or shut down the system before switching off the power switch. For ATX power supplies, you can press the ATX power switch after exiting or shutting down the operating system. If you use Windows 9X, click the **Start** button, click **Shut Down**, then click **Shut down the computer?** The power supply should turn off after Windows shuts down.
- NOTE:** The message “You can now safely turn off your computer” does not appear when shutting down with ATX power supplies.

4. BIOS SETUP

4.1 Managing and Updating Your BIOS

4.1.1 Upon First Use of the Computer System

It is recommended that you save a copy of the original motherboard BIOS along with a Flash Memory Writer utility (AFLASH.EXE) to a bootable floppy disk in case you need to reinstall the BIOS later. **AFLASH.EXE** is a Flash Memory Writer utility that updates the BIOS by uploading a new BIOS file to the programmable flash ROM on the motherboard. This file works only in DOS mode. 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.

1. Type **FORMAT A:/S** at the DOS prompt to create a bootable system disk. **DO NOT** copy AUTOEXEC.BAT and CONFIG.SYS to the disk.
2. Type **COPY D:\AFLASH\AFLASH.EXE A:** (assuming D is your CD-ROM drive) to copy AFLASH.EXE to the boot disk you created.
NOTE: AFLASH works only in DOS mode. It does not work in the DOS prompt within Windows and does not work with certain memory drivers that may be loaded when you boot from the hard drive. It is recommended that you reboot using a floppy disk.
3. Reboot the computer from the floppy disk.

NOTE: BIOS setup must specify “Floppy” as the first item in the boot sequence.

4. In DOS mode, type **A:\AFLASH <Enter>** to run AFLASH.



```
ASUS ACPI BIOS
FLASH MEMORY WRITER V1.29
Copyright (C) 1994-99, ASUSTeK COMPUTER INC.

Flash Memory: Winbond W29C020 or SST 29EX020 or Intel B20820B

Current BIOS Version: ASUS XXX-XX ACPI BIOS Revision 100X
BIOS Model          : XXX-XX
BIOS Built Date     : 99/25/98

Choose one of the following:

1. Save Current BIOS To File
2. Update BIOS Including Boot Block and ESCD

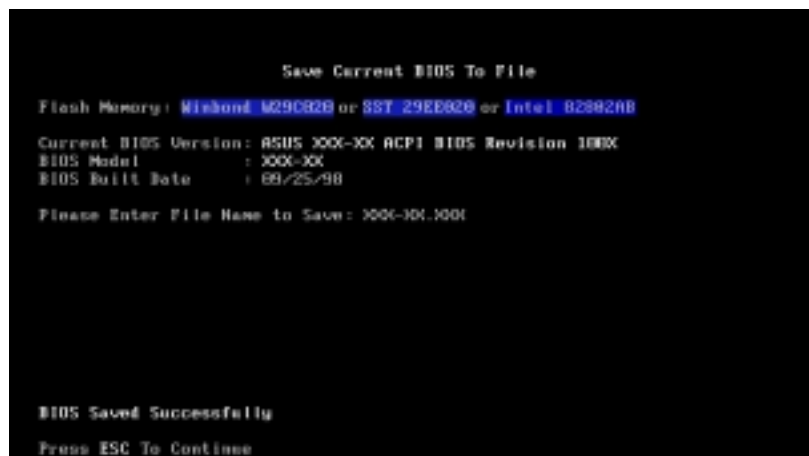
Enter choice: [1]

Press ESC To Exit
```

IMPORTANT! If the word “unknown” appears 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.

4. BIOS SETUP

5. Select **1. Save Current BIOS to File** from the Main menu and press <Enter>. The **Save Current BIOS To File** screen appears.



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

4. BIOS SETUP

4.1.2 Updating BIOS Procedures

WARNING! Update the BIOS only if you have problems with the motherboard and you know that the new BIOS revision will solve your problems. Careless updating can result to more problems with the motherboard!

1. Download an updated ASUS BIOS file from the Internet (WWW or FTP) (see ASUS CONTACT INFORMATION on page 3 for details) and save to the boot floppy disk you created earlier.
2. Boot from the floppy disk.
3. At the “A:\” prompt, type **AFLASH** and then press <Enter>.
4. At the **Main Menu**, type **2** then press <Enter>. The **Update BIOS Including Boot Block and ESCD** screen appears.
5. Type the filename of your new BIOS and the path, for example, **A:\XXX-XX.XXX**, then press <Enter>.

NOTE: To cancel this operation, press <Enter>.

```
Update BIOS Including Boot Block and ESCD
Flash Memory: Winbond W29C02B or SST 29EE020 or Intel 82802AB
Current BIOS Version: ASUS XXX-XX ACPI BIOS Revision 180X
BIOS Model          : XXX-XX
BIOS Built Date     : 09/25/99
Please Enter File Name for NEW BIOS: A:\XXX-XX.XXX
```

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

```
Update BIOS Including Boot Block and ESCD
Flash Memory: Winbond W29C02B or SST 29EE020 or Intel 82802AB
BIOS Version
(CURRENT ) ASUS XXX-XX ACPI BIOS Revision 180X
(test.aud) ASUS XXX-XX ACPI BIOS Revision 180X
BIOS Model
(CURRENT ) XXX-XX
(test.aud) XXX-XX
Date of BIOS Built
(CURRENT ) 09/25/99
(test.aud) 05/29/99
Check sum of 1001.010 in F206.
Are you sure (Y/N) ? [Y]
Press ESC To Return to Main Menu
```

4. BIOS SETUP

- The utility starts to program the new BIOS information into the Flash ROM. The boot block is updated automatically only when necessary. This minimizes the possibilities of boot problems in case of update failures. When the programming is done, *Flashed Successfully* appears.

```
Update BIOS Including Boot Block and ESCD
Flash Memory: Winbond W29C020 or SST 29EE020 or Intel B206200
BIOS Version
(CURRENT) ASUS XXX-XX ACPI BIOS Revision 100X
(Ftest.amd) ASUS XXX-XX ACPI BIOS Revision 100X
BIOS Model
(CURRENT) XXX-XX
(Ftest.amd) XXX-XX
Date of BIOS Built
(CURRENT) 05/25/99
(F0001.0001) 05/29/98
Check sum of 1001.010 is F266.
Are you sure (Y/N) ? Y
Block Erasing -- Done
Programming -- 3FFFF
Flashed Successfully
Press ESC To Continue
```

- Follow the onscreen instructions to continue.

```
ASUS ACPI BIOS
FLASH MEMORY WRITER V1.29
Copyright (C) 1994-99, ASUSTeK COMPUTER INC.
Flash Memory: Winbond W29C020 or SST 29EE020 or Intel B206200
Current BIOS Version: ASUS XXX-XX ACPI BIOS Revision 100X
BIOS Model : XXX-XX
BIOS Built Date : 05/29/99
Choose one of the following:
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
```

WARNING! If you encounter problems while updating the new BIOS, DO NOT turn off the system because this may cause boot problems. Just repeat the process, and if the problem still persists, load the original BIOS file you saved to the boot disk. If the Flash Memory Writer utility is not able to successfully update a complete BIOS file, the system may not boot. If this happens, call the ASUS service center for support.

4. BIOS SETUP

4.2 BIOS Setup Program

This motherboard supports a programmable EEPROM that you can update using the provided utility described in *4.1 Managing and Updating Your BIOS*.

The utility is used if you are installing a motherboard, reconfiguring your system, or prompted to “**Run Setup**”. This section describes how to configure your system using this utility.

Even if you are not prompted to use the Setup program, at some time in the future you may want to change the configuration of your computer. For example, you may want to enable the Security Password Feature or make changes to the power management settings. It will then be necessary to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the EEPROM.

The EEPROM on the motherboard stores the Setup utility. When you start up 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 in pressing the mentioned key, POST will continue with its test routines, thus preventing you from calling up Setup. If you still need to call Setup, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the Reset button on the system chassis. You can also restart by turning the system off and then back on again. But do so only if the first two methods fail.

The Setup program has been designed to make it as easy to use as possible. It is a menu-driven program, which means you can scroll through the various sub-menus and make your selections among the predetermined choices.

To access the BIOS Setup program, press the <Delete> key after the computer has run through its POST.

NOTE: Because the BIOS software is constantly being updated, the following BIOS setup screens and descriptions are for reference purposes only, and may not exactly match what you see on your screen.

4. BIOS SETUP

4.2.1 BIOS Menu Bar

The top of the screen has a menu bar with the following selections:

- MAIN** Use this menu to make changes to the basic system configuration.
- ADVANCED** Use this menu to enable and make changes to the advanced features.
- POWER** Use this menu to configure and enable Power Management features.
- BOOT** Use this menu to configure the default system device used to locate and load the Operating System.
- EXIT** Use this menu to exit the current menu or specify how to exit the Setup program.

To access the menu bar items, press the right or left arrow key on the keyboard until the desired item is highlighted.

4.2.2 Legend Bar

At the bottom of the Setup screen is a legend bar. The keys in the legend bar allow you to navigate through the various setup menus. The following table lists the keys found in the legend bar with their corresponding functions.

Navigation Key(s)	Function Description
<F1> or <Alt + H>	Displays the General Help screen from anywhere in the BIOS Setup
<Esc>	Jumps to the Exit menu or returns to the main menu from a sub-menu
<← or → (keypad arrow)>	Selects the menu item to the left or right
<↑ or ↓ (keypad arrow)>	Moves the highlight up or down between fields
- (minus key)	Scrolls backward through the values for the highlighted field
+ (plus key) or spacebar	Scrolls forward through the values for the highlighted field
<Enter>	Brings up a selection menu for the highlighted field
<Home> or <PgUp>	Moves the cursor to the first field
<End> or <PgDn>	Moves the cursor to the last field
<F5>	Resets the current screen to its Setup Defaults
<F10>	Saves changes and exits Setup

4. BIOS SETUP

General Help

In addition to the Item Specific Help window, the BIOS setup program also provides a General Help screen. You may launch this screen from any menu by simply pressing <F1> or the <Alt> + <H> combination. The General Help screen lists the legend keys with their corresponding functions.

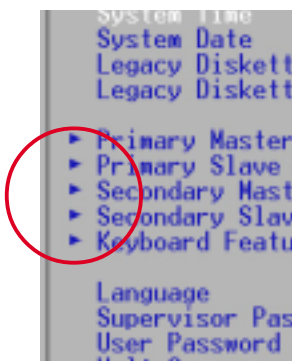
Saving Changes and Exiting the Setup Program

See *4.7 Exit Menu* for detailed information on saving changes and exiting the setup program.

Scroll Bar

When a scroll bar appears to the right of a help window, it indicates that there is more information to be displayed that will not fit in the window. Use <PgUp> and <PgDn> or the up and down arrow keys to scroll through the entire help document. Press <Home> to display the first page, press <End> to go to the last page. To exit the help window, press <Enter> or <Esc>.

Sub-Menu



Note that a right pointer symbol (as shown in the left view) appears to the left of certain fields. This pointer indicates that you can display a sub-menu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press <Enter>. The sub-menu appears. Use the legend keys to enter values and move from field to field within a sub-menu as you would within a menu. Use the <Esc> key to return to the main menu.

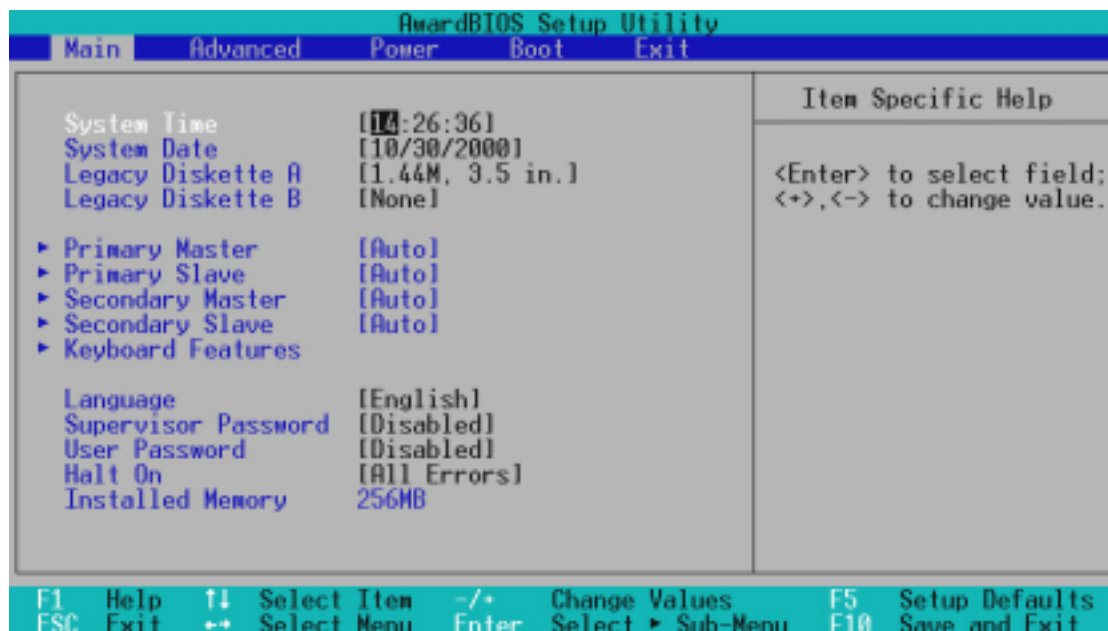
Take some time to familiarize yourself with the legend keys and their corresponding functions. Practice navigating through the various menus and sub-menus. If you accidentally make unwanted changes to any of the fields, use the set default hot key <F5> to load the Setup default values. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right of each menu. This window displays the help text for the currently highlighted field.

NOTE: The item heading in square brackets represents the default setting for that field.

4. BIOS SETUP

4.3 Main Menu

When the Setup program is accessed, the following screen appears:



System Time [XX:XX:XX]

Sets your system to the time that you specify (usually the current time). The format is hour, minute, second. Valid values for hour, minute and second are **Hour: (00 to 23)**, **Minute: (00 to 59)**, **Second: (00 to 59)**. Use the <Tab> or <Shift> + <Tab> keys to move between the hour, minute, and second fields.

System Date [XX/XX/XXXX]

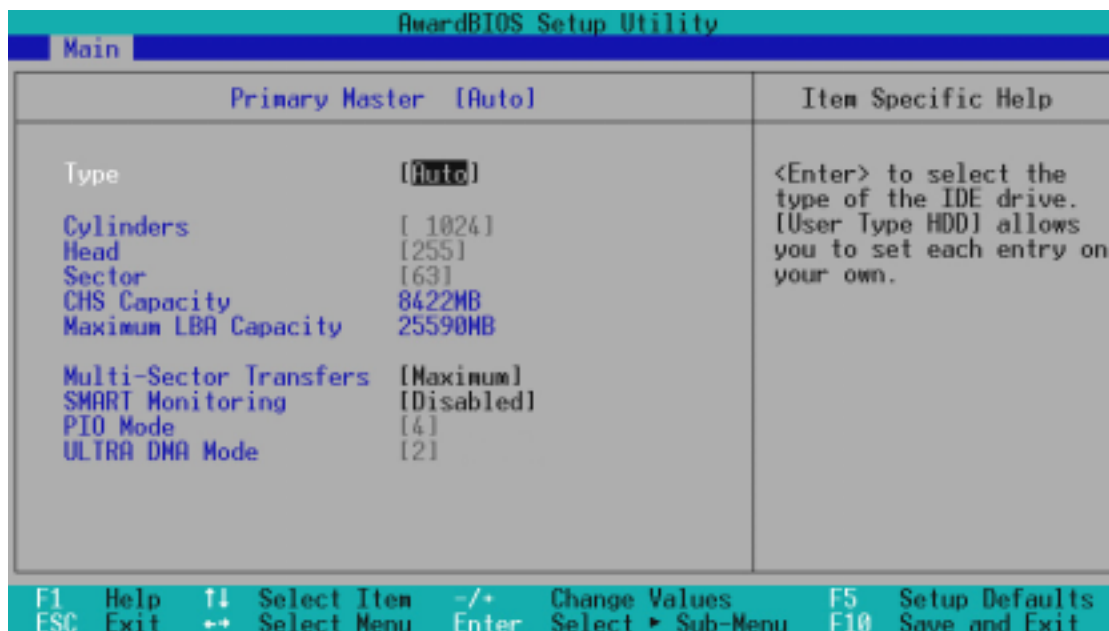
Sets your system to the date that you specify (usually the current date). The format is month, day, year. Valid values for month, day, and year are **Month: (1 to 12)**, **Day: (1 to 31)**, **Year: (100 year range)**. Use the <Tab> or <Shift> + <Tab> keys to move between the month, day, and year fields.

Legacy Diskette A [1.44M, 3.5 in.], Legacy Diskette B [None]

Sets the type of floppy drives installed. Configuration options: [None] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

4. BIOS SETUP

4.3.1 Primary & Secondary Master/Slave



NOTE: Before attempting to configure a hard disk drive, make sure you have the configuration information supplied by the manufacturer of the drive. Incorrect settings may cause your system to not recognize the installed hard disk. To allow the BIOS to detect the drive type automatically, select [Auto].

Type [Auto]

Select [Auto] to automatically detect an IDE hard disk drive. If automatic detection is successful, the correct values will be filled in for the remaining fields on this sub-menu. If automatic detection fails, your hard disk drive may be too old or too new. You can try updating your BIOS or enter the IDE hard disk drive parameters manually.

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).

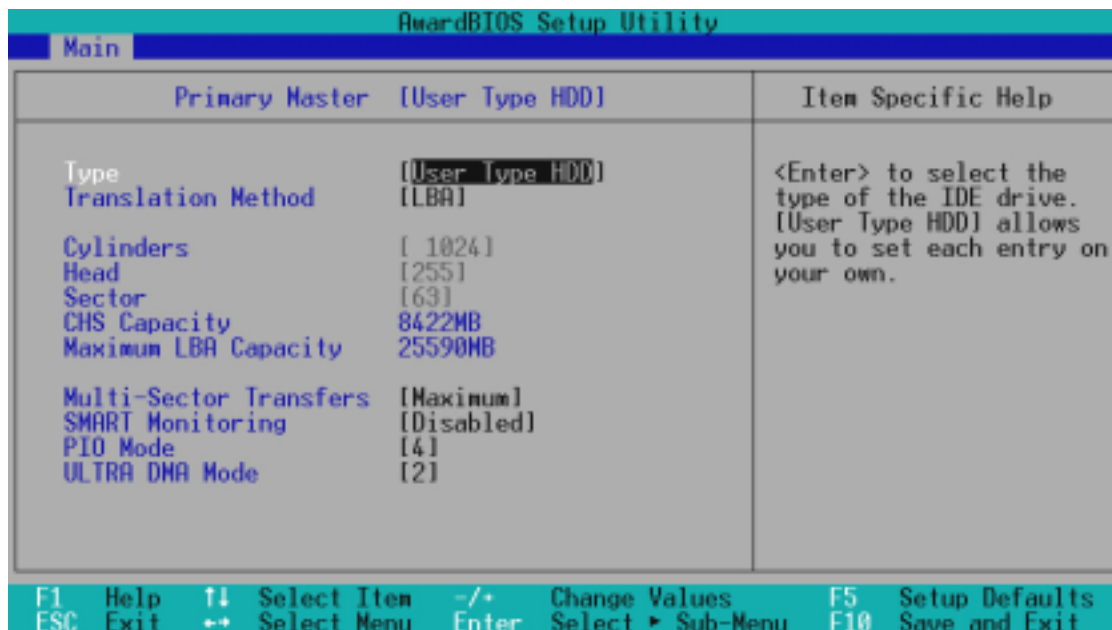
Other options for the **Type** field are:

[None] - to disable IDE devices

4. BIOS SETUP

IMPORTANT: If the hard disk was already formatted on an older system, Setup may detect incorrect parameters. You will need to enter the correct parameters manually, or use low-level format in case 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 the disk, you should enter the correct ones manually by setting [User Type HDD].

[User Type HDD]



Manually enter the number of cylinders, heads and sectors per track for your drive. Refer to your drive documentation or look on the drive for this information. If no drive is installed or if you are removing a drive and not replacing it, select [None].

Translation Method [LBA]

Select the hard disk drive type in this field. When Logical Block Addressing is enabled, 28-bit addressing of the hard drive is used without regard for cylinders, heads, or sectors. Note that LBA Mode is necessary for drives with greater than 504MB in storage capacity. Configuration options: [LBA] [LARGE] [Normal] [Match Partition Table] [Manual]

Cylinders

This field configures the number of cylinders. Refer to your drive documentation to determine the correct value to enter into this field. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD] and the **Translation Method** field must be set to [Manual].

4. BIOS SETUP

Head

This field configures the number of read/write heads. Refer to your drive documentation to determine the correct value to enter into this field. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD] and the **Translation Method** field must be set to [Manual].

Sector

This field configures the number of sectors per track. Refer to your drive documentation to determine the correct value to enter into this field. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD] and the **Translation Method** field must be set to [Manual].

CHS Capacity

This field shows the drive's maximum CHS capacity calculated automatically by the BIOS from the drive information you entered.

Maximum LBA Capacity

This field shows the drive's maximum LBA capacity calculated automatically by the BIOS from the drive information you entered.

Multi-Sector Transfers [Maximum]

This option automatically sets the number of sectors per block to the highest number supported by the drive. This field can also be configured manually. Note that when this field is automatically configured, the set value may not always be the fastest value for the drive. Refer to the documentation that came with your hard drive to determine the optimal value and set it manually.

NOTE: To make changes to this field, the **Type** field must be set to [User Type HDD]. Configuration options: [Disabled] [2 Sectors] [4 Sectors] [8 Sectors] [16 Sectors] [32 Sectors] [Maximum]

SMART Monitoring [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. Configuration options: [Disabled] [Enabled]

PIO Mode [4]

This option lets you set a PIO (Programmed Input/Output) mode for the IDE device. Modes 0 through 4 provide successively increased performance. Configuration options: [0] [1] [2] [3] [4]

Ultra DMA Mode [Disabled]

Ultra DMA capability allows improved transfer speeds and data integrity for compatible IDE devices. Set to [Disabled] to suppress Ultra DMA capability. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD]. Configuration options vary according to your device.

4. BIOS SETUP

[CD-ROM] - for IDE CD-ROM drives

[LS-120] - for LS-120 compatible floppy disk drives

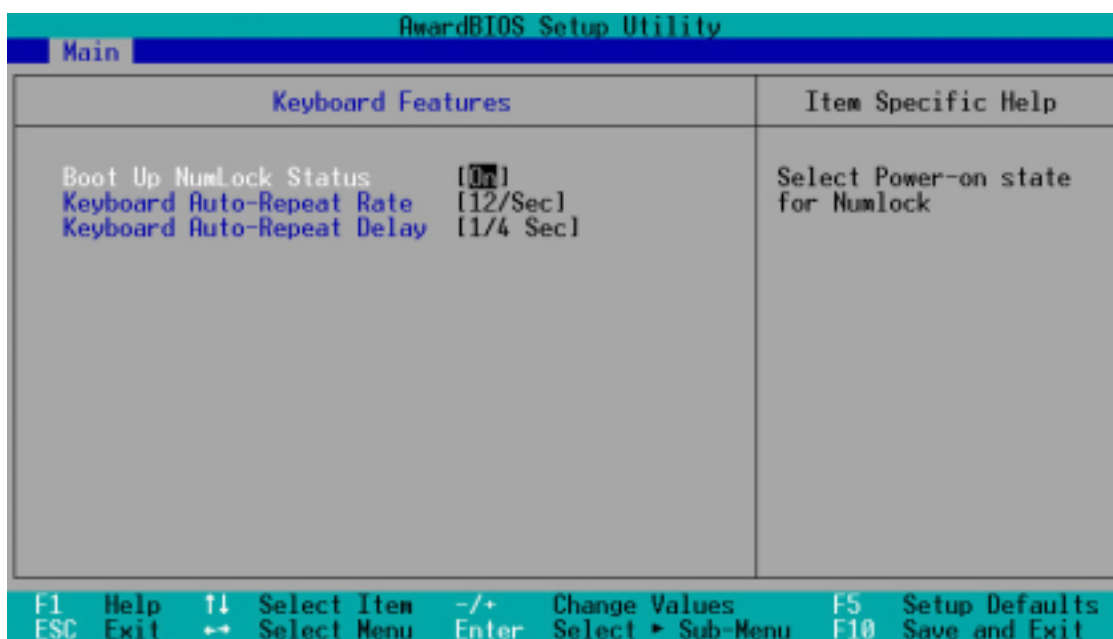
[ZIP-100] - for ZIP-100 compatible disk drives

[MO] - for IDE magneto optical disk drives

[Other ATAPI Device] - for IDE devices not listed here

After using the legend keys to make your selections on this sub-menu, press the <Esc> key to exit back to the Main menu. When the Main menu appears, you will notice that the drive size appear in the field for the hard disk drive that you just configured.

4.3.2 Keyboard Features



Boot Up NumLock Status [On]

This field enables users to activate the Number Lock function upon system boot. Configuration options: [Off] [On]

Keyboard Auto-Repeat Rate [12/Sec]

This controls the speed at which the system registers repeated keystrokes. Options range from 6 to 30 characters per second. Configuration options: [6/Sec] [8/Sec] [10/Sec] [12/Sec] [15/Sec] [20/Sec] [24/Sec] [30/Sec]

Keyboard Auto-Repeat Delay [1/4 Sec]

This field sets the time interval for displaying the first and second characters. Configuration options: [1/4 Sec] [1/2 Sec] [3/4 Sec] [1 Sec]

4. BIOS SETUP

Language [English]

This allows selection of the BIOS' displayed language. Currently only English is available.

Supervisor Password [Disabled] / User Password [Disabled]

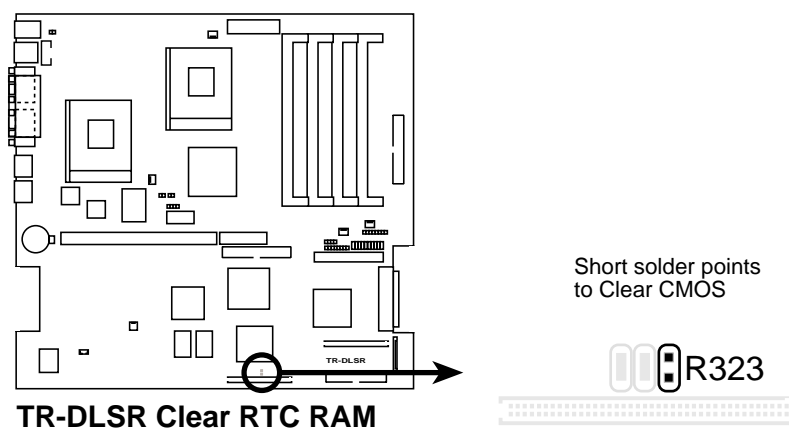
These fields allow you to set the passwords. To set the password, highlight the appropriate field and press <Enter>. Type in a password and press <Enter>. You can type up to eight alphanumeric characters. Symbols and other keys are ignored. To confirm the password, type the password again and press the <Enter>. The password is now set to [Enabled]. This password allows full access to the BIOS Setup menus. To clear the password, highlight this field and press <Enter>. The same dialog box as above will appear. Press <Enter> and the password will be set to [Disabled].

A Note about Passwords

The BIOS Setup program allows you to specify passwords in the Main menu. The passwords control access to the BIOS during system startup. The passwords are not case sensitive. In other words, it makes no difference whether you enter a password using upper or lowercase letters. The BIOS Setup program allows you to specify two separate passwords: a Supervisor password and a User password. When disabled, anyone may access all BIOS Setup program functions. When enabled, the Supervisor password is required for entering the BIOS Setup program and having full access to all configuration fields.

Forgot the Password?

If you forgot the password, you can clear the password by erasing the CMOS Real Time Clock (RTC) RAM. The RAM data containing the password information is powered by the onboard button cell battery. To erase the RTC RAM: (1) Unplug your computer, (2) Remove the battery, (3) Short the solder points, (4) Re-install the battery, (5) Turn ON your computer, (6) Hold down <Delete> during bootup and enter BIOS setup to re-enter CMOS data.



Halt On [All Errors]

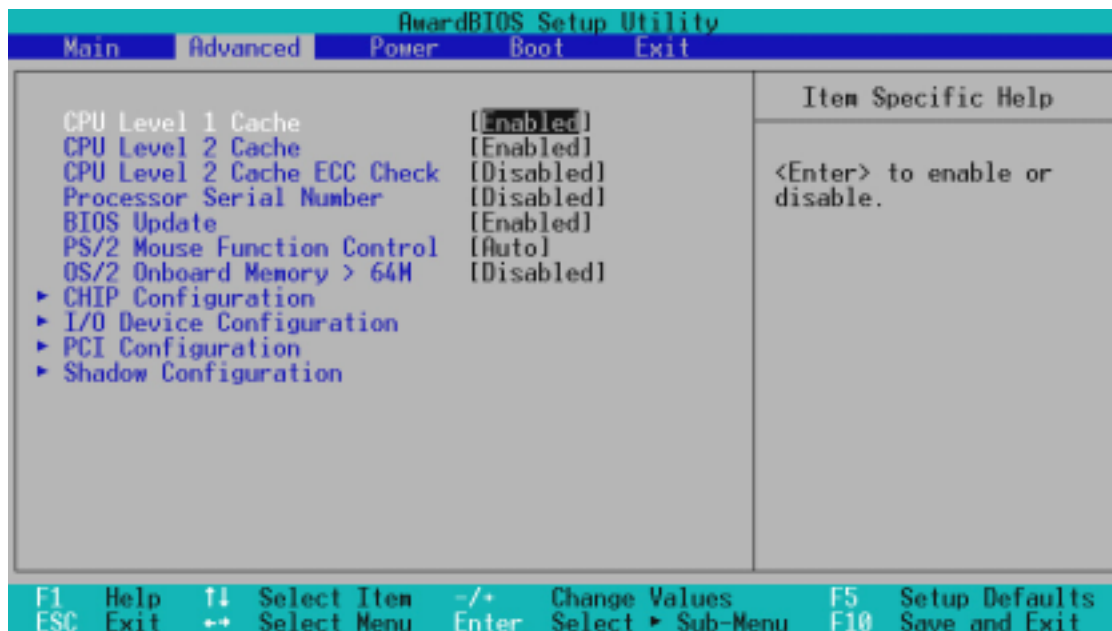
This field determines which types of errors will cause the system to halt. Configuration options: [All Errors] [No Error] [All but Keyboard] [All but Disk] [All but Disk/Keyboard]

Installed Memory [XXX MB]

This display-only field displays the amount of conventional memory detected by the system during bootup. You do not need to make changes to this field.

4. BIOS SETUP

4.4 Advanced Menu



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. Configuration options: [Disabled] [Enabled]

CPU Level 2 Cache ECC Check [Disabled]

This function controls the ECC capability in the CPU level 2 cache. Configuration options: [Disabled] [Enabled]

Processor Serial Number [Disabled]

The Processor Serial Number is a unique number that is added to every Pentium III processor to help verify the identity of the user across the Internet. Set this field to [Enabled] when you need increased security for doing business online or e-commerce. Otherwise, leave it to its default setting of [Disabled] for greater anonymity when surfing the Internet. **NOTE:** This field is available only when a Pentium III processor is installed in your system.

BIOS Update [Enabled]

This functions as an update loader integrated into the BIOS to supply the processor with the required data. In the default position of [Enabled], the BIOS will load the update on all processors during system bootup. Configuration options: [Disabled] [Enabled]

4. BIOS SETUP

PS/2 Mouse Function Control [Auto]

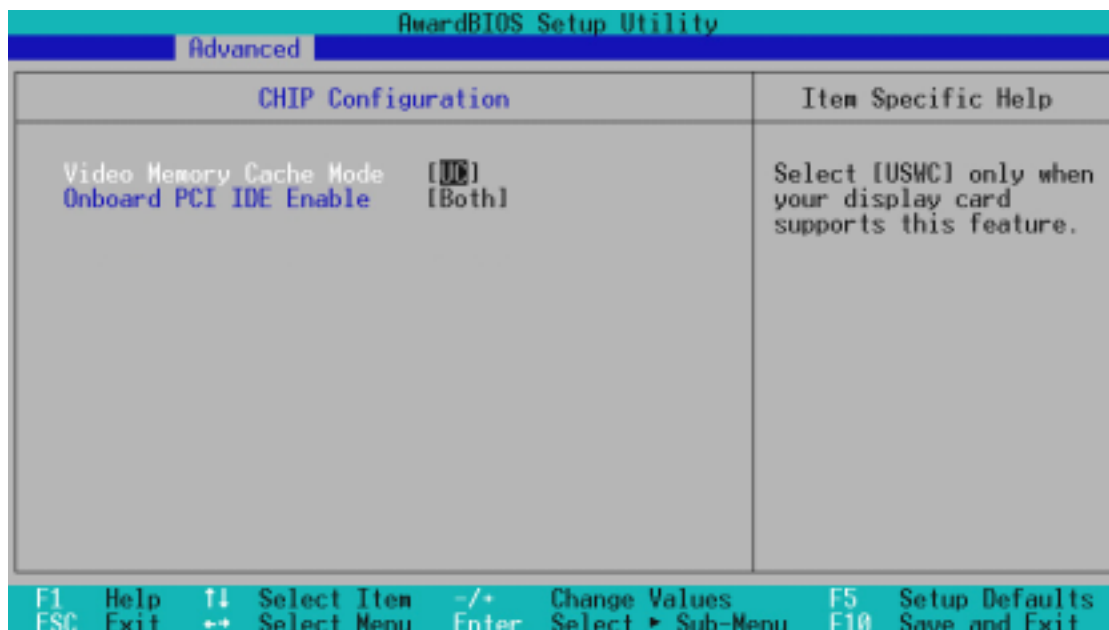
The default of [Auto] allows the system to detect a PS/2 mouse on startup. If detected, IRQ12 will be used for the PS/2 mouse. IRQ12 will be reserved for expansion cards only if a PS/2 mouse is not detected. [Enabled] will always reserve IRQ12, whether on startup a PS/2 mouse is detected or not. Configuration options: [Enabled] [Auto]

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]. Configuration options: [Disabled] [Enabled]

4. BIOS SETUP

4.4.1 Chip Configuration



Video Memory Cache Mode [UC]

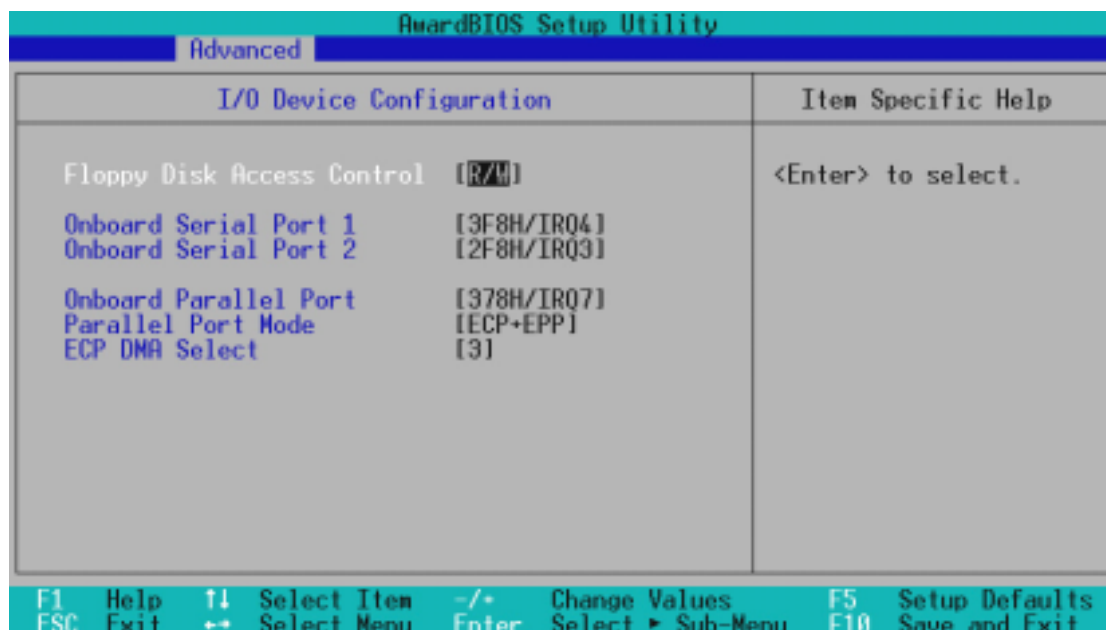
USWC (uncacheable, speculative write combining) is a new cache technology for the video memory of the processor. It can greatly improve the display speed by caching the display data. You must set this to UC (uncacheable) if your display card cannot support this feature; otherwise your system may not boot. Configuration options: [UC] [USWC]

Onboard PCI IDE Enable [Both]

You can select to enable the primary IDE channel, both the primary and secondary channels, or disable both channels. Configuration options: [Both] [Primary] [Disabled]

4. BIOS SETUP

4.4.2 I/O Device Configuration



Floppy Disk Access Control [R/W]

When set to [Read Only], this field protects files from being copied to floppy disks by allowing reads from the floppy disk drive but not writes. The setup default [R/W] allows both reads and writes. Configuration options: [R/W] [Read Only]

Onboard Serial Port 1 [3F8H/IRQ4]

Onboard Serial Port 2 [2F8H/IRQ3]

These fields allow you to set the addresses for the onboard serial connectors. Serial Port 1 and Serial Port 2 must have different addresses. Configuration options: [3F8H/IRQ4] [2F8H/IRQ3] [3E8H/IRQ4] [2E8H/IRQ10] [Disabled]

Onboard Parallel Port [378H/IRQ7]

This field sets the address of the onboard parallel port connector. If you disable this feature, **Parallel Port Mode** and **ECP DMA Select** configurations will not be available. Configuration options: [Disabled] [378H/IRQ7] [278H/IRQ5]

Parallel Port Mode [ECP+EPP]

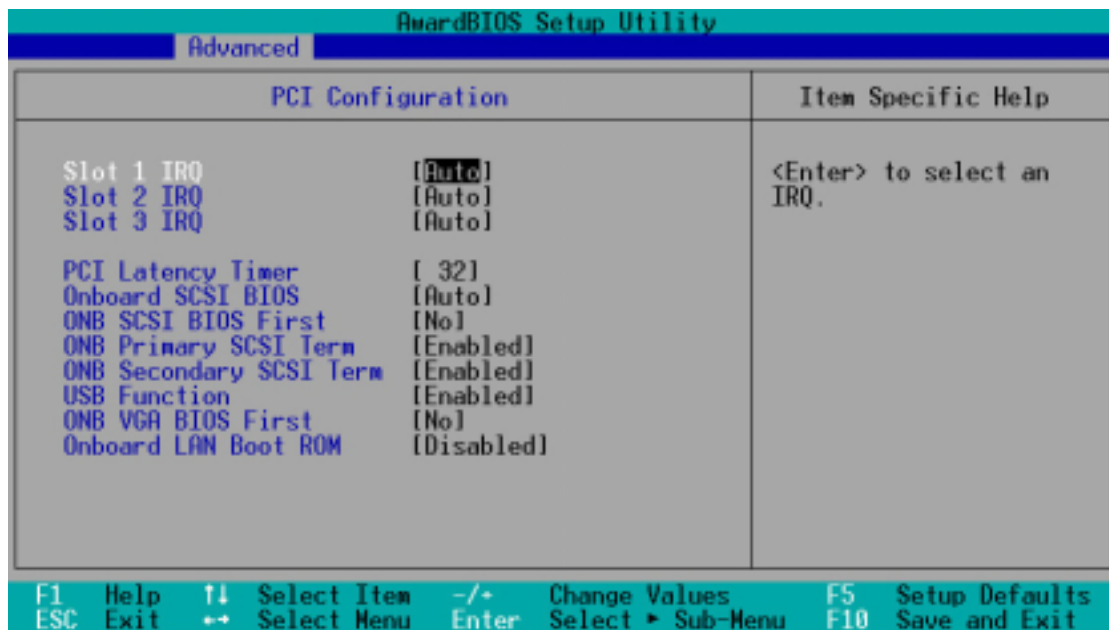
This field allows you to set the operation mode of the parallel port. [Normal] allows normal-speed operation but in one direction only; [EPP] allows bidirectional parallel port operation; [ECP] allows the parallel port to operate in bidirectional DMA mode; [ECP+EPP] allows normal speed operation in a two-way mode. Configuration options: [Normal] [EPP] [ECP] [ECP+EPP]

4. BIOS SETUP

ECP DMA Select [3]

This field allows you to configure the parallel port DMA channel for the selected **ECP** mode. This selection is available only if you select [ECP] or [ECP+EPP] in **Parallel Port Mode** above. Configuration options: [1] [3] [Disabled]

4.4.3 PCI Configuration



Slot 1, Slot 2, Slot 3 IRQ [Auto]

These fields set how IRQ use is determined for each PCI slot. The default setting for each field is [Auto], which utilizes auto-routing to determine IRQ use. Configuration options: [Auto] [NA] [3] [4] [5] [7] [9] [10] [11] [12] [14] [15]

PCI Latency Timer [32]

Leave on default setting for best performance vs. stability.

Onboard SCSI BIOS [Auto]

[Auto] allows the motherboard's BIOS to detect whether you have a Symbios SCSI controller. If the Symbios SCSI controller is detected, the motherboard's Symbios BIOS will be enabled; if no Symbios SCSI controller is detected, the onboard Symbios SCSI BIOS will be disabled.

[Disabled] will disable the motherboard's Symbios SCSI BIOS so that the BIOS on an add-on Symbios SCSI card can be used. If your Symbios SCSI card does not have a BIOS, the Symbios SCSI card will not function. Configuration options: [Auto] [Disabled]

4. BIOS SETUP

ONB SCSI BIOS First [No]

This field allows giving priority to the onboard SCSI BIOS for SCSI functions over other SCSI controllers. Configuration options: [No] [Yes]

ONB Primary SCSI Term, ONB Secondary SCSI Term [Enabled]

These fields allow you to enable or disable the onboard SCSI termination on the primary and secondary SCSI channels. Configuration options: [Enabled] [Disabled]

USB Function [Enabled]

Set this field to [Enabled] if you want to use Universal Serial Bus devices. Configuration options: [Disabled] [Enabled]

ONB VGA BIOS First [No]

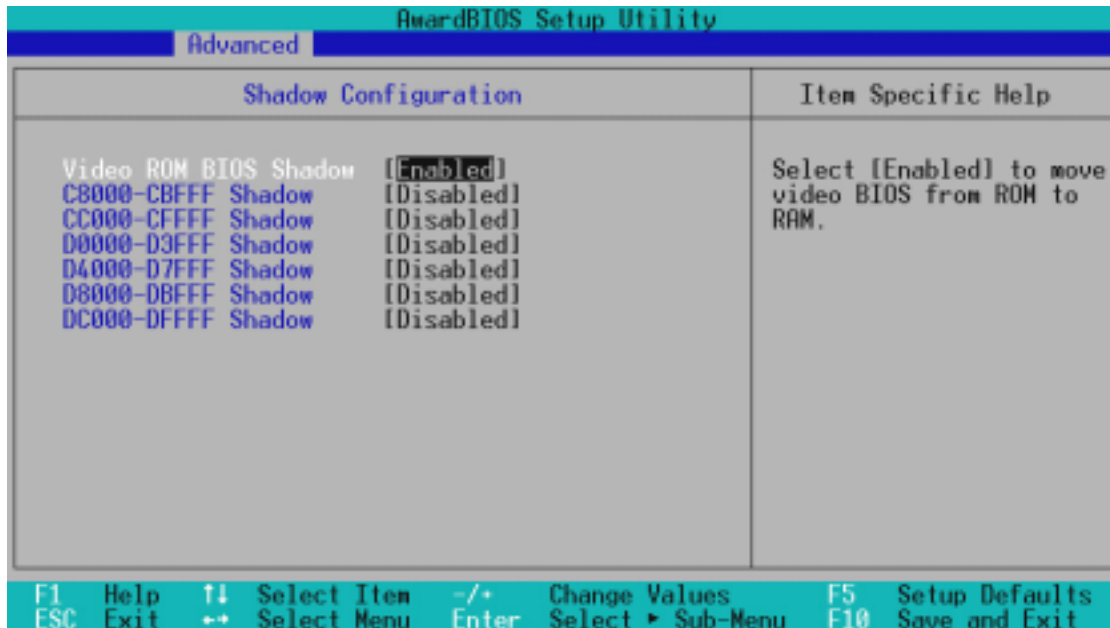
This field, when set to [Yes], gives priority to the onboard VGA BIOS over other VGA controllers. Configuration options: [No] [Yes]

Onboard LAN Boot ROM [Disabled]

When set to [Enabled], this field allows your computer to boot from the network using the onboard LAN controller boot ROM. Configuration options: [Disabled] [Enabled]

4. BIOS SETUP

4.4.4 Shadow Configuration



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. Configuration options: [Disabled] [Enabled]

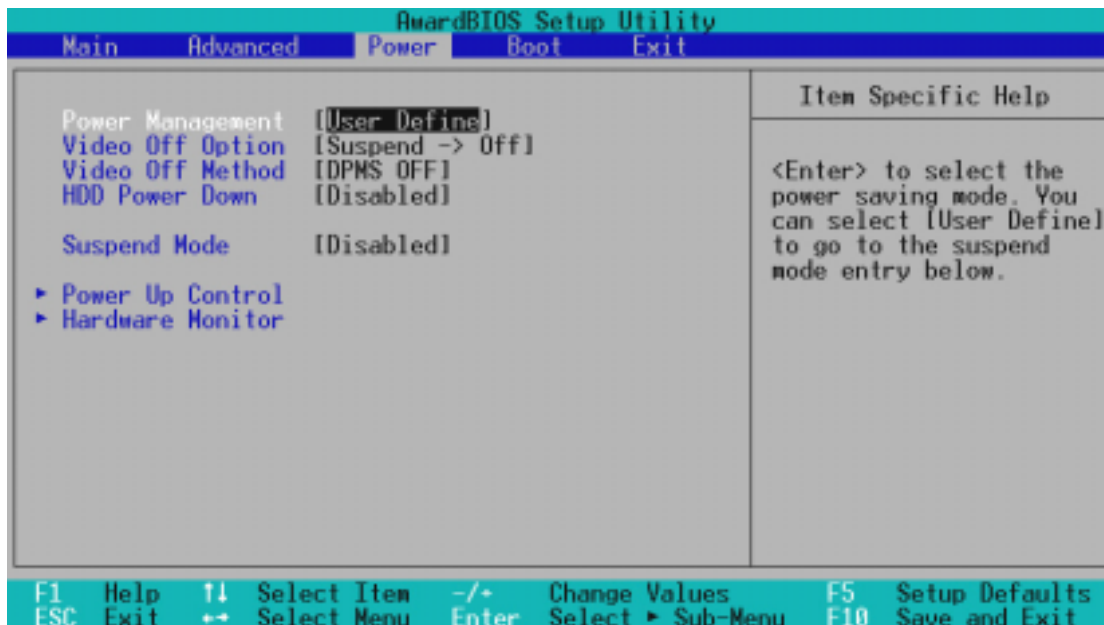
C8000-DFFFF Shadow [Disabled]

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. Configuration options: [Disabled] [Enabled]

4. BIOS SETUP

4.5 Power Menu

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



Power Management [User Define]

This option must be enabled to use any of the automatic power saving features. If this menu item is set to [Disabled], power management features will not function regardless of other field settings on this menu. The [User Define] option allows you to make your own selections in the Power menu. When set to [Max Saving], system power will be conserved to its greatest amount. The **Suspend Mode** field will then be set to predefined value that ensures maximum power savings.

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 the system inactivity period is longer; [Disabled] disables the power saving features; [User Define] allows you to set power saving options according to your preference. Configuration options: [User Define] [Disabled] [Min Saving] [Max Saving]

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`, to your CONFIG.SYS file. For Windows 3.x and Windows 95, you need to install Windows with the APM feature. For Windows 98 and later, APM is automatically installed. A battery and power cord icon labeled “Power Management” will appear in the “Control Panel.” Choose “Advanced” in the Power Management Properties dialog box.

4. BIOS SETUP

Video Off Option [Suspend -> Off]

This field determines when to activate the video off feature for monitor power management. Configuration options: [Always On] [Suspend -> Off]

Video Off Method [DPMS OFF]

This field defines the video off features. The DPMS (Display Power Management System) feature allows 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. Configuration options: [Blank Screen] [V/H SYNC+Blank] [DPMS Standby] [DPMS Suspend] [DPMS OFF] [DPMS Reduce ON]

HDD Power Down [Disabled]

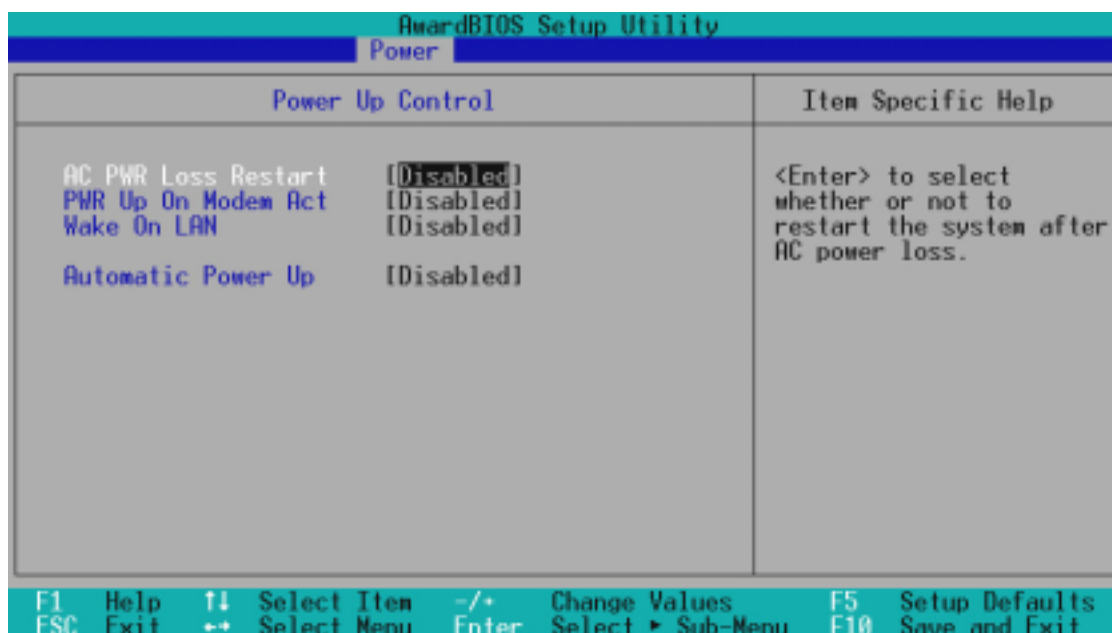
Shuts down any IDE hard disk drives in the system after a period of inactivity as set in this user-configurable field. This feature does not affect SCSI hard drives. Configuration options: [Disabled] [1 Min] [2 Min] [3 Min]...[15 Min]

Suspend Mode [Disabled]

This sets the time period before the system goes into suspend mode. Configuration options: [Disabled] [1~2 Min] [2~3 Min]...[1 Hour]

4. BIOS SETUP

4.5.1 Power Up Control



AC PWR Loss Restart [Disabled]

This allows you to set whether you want your system to reboot after the power has been interrupted. [Disabled] leaves your system off and [Enabled] resets your system. Configuration options: [Disabled] [Enabled]

PWR Up On Modem Act [Enabled]

This allows either settings of [Enabled] or [Disabled] for powering up the computer when the modem receives a call while the computer is in Soft-off mode. **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. Configuration options: [Disabled] [Enabled]

Wake On LAN [Disabled]

Wake-On-LAN allows your computer to be booted from another computer via a network by sending a wake-up frame or signal. Configuration options: [Disabled] [Enabled]

IMPORTANT: This feature requires an optional network interface card with Wake-On-LAN and an ATX power supply with at least 720mA +5V standby power.

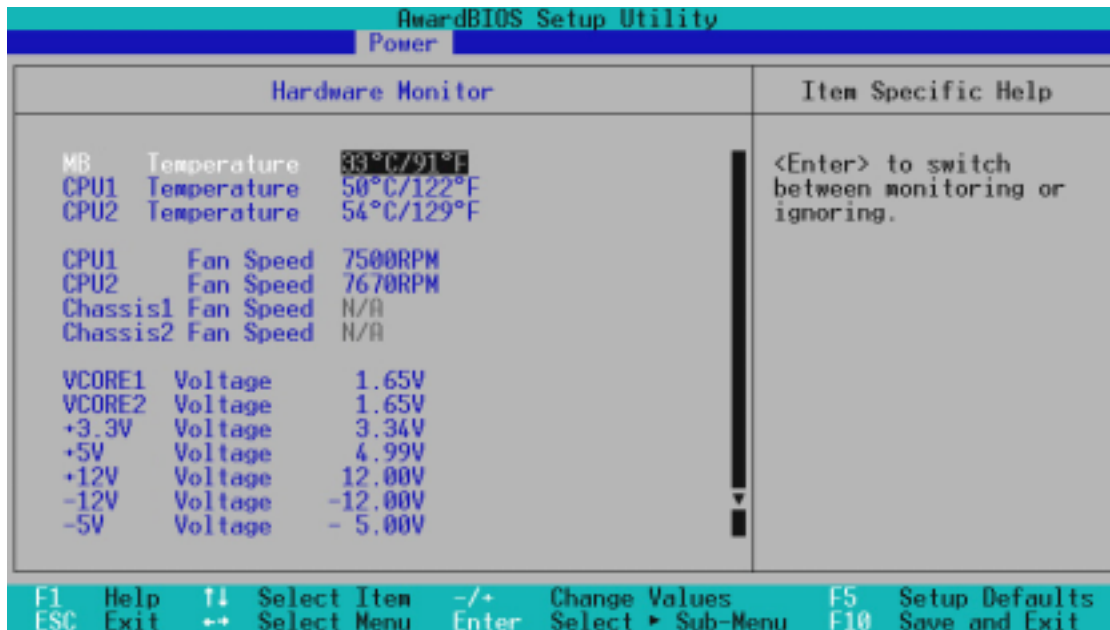
4. BIOS SETUP

Automatic Power Up [Disabled]

This allows an unattended or automatic system power up. You may configure your system to power up at a certain time of the day by selecting [Everyday] or at a certain time and day by selecting [By Date]. **NOTE:** *Automatic Power Up* will not work if the system is powered down by operating systems, such as Windows 98, which have ACPI support enabled. Configuration options: [Disabled] [Everyday] [By Date]

4. BIOS SETUP

4.5.2 Hardware Monitor



MB Temperature [xxxC/xxxF]

CPU1 Temperature [xxxC/xxxF]

CPU2 Temperature [xxxC/xxxF]

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

CPU1 Fan Speed [xxxxRPM]

CPU2 Fan Speed [xxxxRPM]

Chassis1 Fan Speed [xxxxRPM]

Chassis2 Fan Speed [xxxxRPM]

The onboard hardware monitor is able to detect the CPU fan speed and the chassis fan speed in rotations per minute (RPM). The presence of the fans is automatically detected. Set to [Ignore] only if necessary.

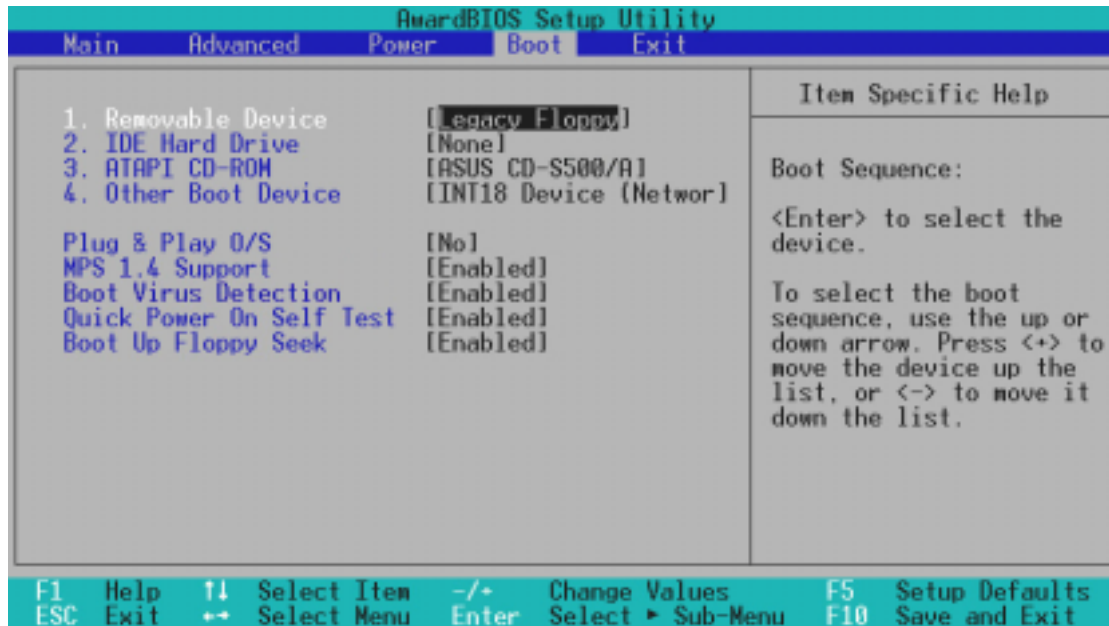
VCORE1 Voltage, VCORE2 Voltage, +3.3V Voltage, +5V Voltage, +12V Voltage, -12V Voltage, -5V Voltage [xx.xV]

The onboard hardware monitor is able to detect the voltage output by the onboard voltage regulators. Set to [Ignore] only if necessary.

NOTE: If any of the monitored items is out of range, an error message will appear: “Hardware Monitor found an error. Enter Power setup menu for details”. You will then be prompted to “Press **F1** to continue, **DEL** to enter SETUP”.

4. BIOS SETUP

4.6 Boot Menu



Boot Sequence

The Boot menu allows you to select among the four possible types of boot devices listed using the up and down arrow keys. By using the <+> or <Space> key, you can promote devices and by using the <-> key, you can demote devices. Promotion or demotion of devices alters the priority which the system uses to search for a boot device on system power up. Configuration fields include **Removable Devices**, **IDE Hard Drive**, **ATAPI CD-ROM**, and **Other Boot Device**.

Removable Device [Legacy Floppy]

Configuration options: [Disabled] [Legacy Floppy] [LS120] [ZIP-100] [ATAPI MO]

IDE Hard Drive

This field allows you to select which IDE hard disk drive to use in the boot sequence. Pressing [Enter] will show the product IDs of all connected IDE hard disk drives.

ATAPI CD-ROM

This field allows you to select which ATAPI CD-ROM drive to use in the boot sequence. Pressing [Enter] will show the product IDs of all your connected ATAPI CD-ROM drives.

4. BIOS SETUP

Other Boot Device Select [INT18 Device (Network)]

Configuration options: [Disabled] [SCSI Boot Device] [INT18 Device (Network)]

Plug & Play O/S [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. When [Yes] is selected, interrupts may be reassigned by the OS. When a non-PnP OS is installed or you want to prevent reassigning of interrupt settings, select the default setting of [No]. Configuration options: [No] [Yes]

MPS 1.4 Support [Enabled]

This field allows you to enable or disable the MultiProcessor Specification 1.4 support. Configuration options: [Disabled] [Enabled]

Boot Virus Detection [Enabled]

This field allows you to set boot virus detection, ensuring a virus-free boot sector. 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. Configuration options: [Disabled] [Enabled]

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. Configuration options: [Disabled] [Enabled]

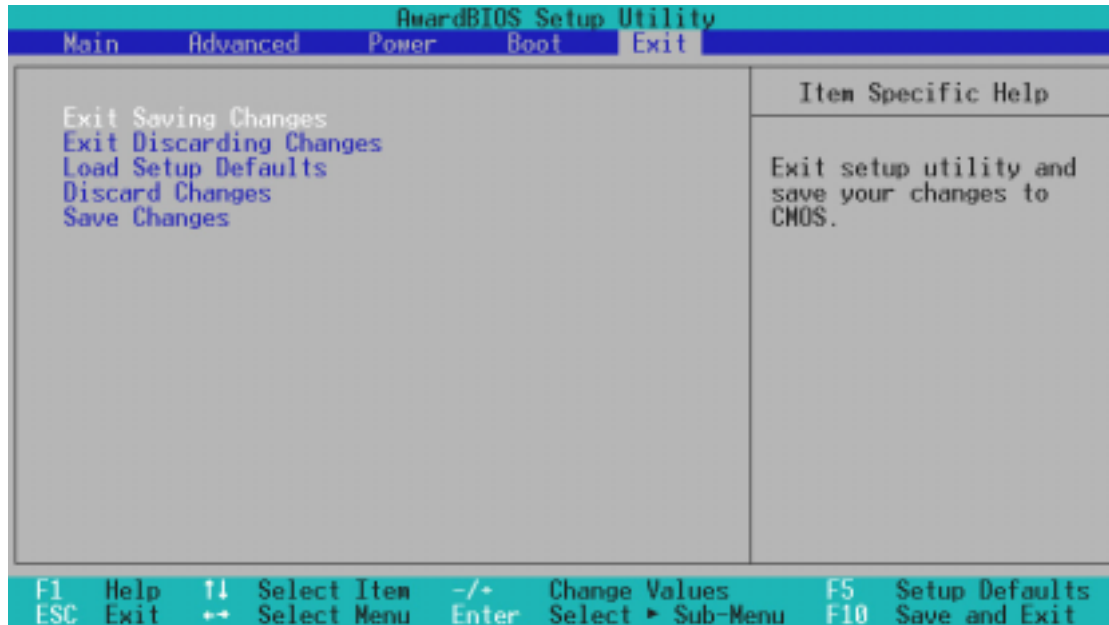
Boot Up Floppy Seek [Enabled]

When enabled, the BIOS seeks the floppy disk drive once during bootup. Configuration options: [Disabled] [Enabled]

4. BIOS SETUP

4.7 Exit Menu

Once you have made all of your selections from the various menus in the Setup program, you should save your changes and exit Setup. Select **Exit** from the menu bar to display the following menu:



NOTE: Pressing <Esc> does not exit this menu. You must select one of the options from this menu or <F10> from the legend bar to exit this menu.

Exit Saving Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. Once this option is selected, a confirmation is asked. Select [Yes] to save changes and exit.

NOTE: If you attempt to exit the Setup program without saving your changes, the program will prompt you with a message asking if you want to save your changes before exiting. Pressing <Enter> will then save changes while exiting.

Exit Discarding Changes

This option should only be used if you do not want to save the changes you have made to the Setup program. If you have made changes to fields other than system date, system time, and password, the system will ask for confirmation before exiting.

4. BIOS SETUP

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When this option is selected or if <F5> is pressed, a confirmation is requested. Select [Yes] to load default values. You can now select **Exit Saving Changes** or make other changes before saving the values to the non-volatile RAM.

Discard Changes

This option allows you to discard the selections you made and restore the values you previously saved. After selecting this option, a confirmation is requested. Select [Yes] to discard any changes and load the previously saved values.

Save Changes

This option saves your selections without exiting the Setup program. You can then return to other menus and make changes. After selecting this option, all selections are saved and a confirmation is requested. Select [Yes] to save any changes to the non-volatile RAM.

ASUS[®] TR-DLSR

Dual Socket 370 Motherboard

5. OS Driver Installation

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5. OS Driver Installation

1. Microsoft Windows NT Server

I. LSI SCSI Driver Installation

LSI Logic and Microsoft together provided miniport drivers, “SYM_HI.SYS” (for **SYM53C896**) and “LSI_U3.SYS” (for **SYM53C1010**). The SCSI chipset used on your motherboard will depend on the model you purchased. The following sections describe how to prepare and install the SCSI drivers. Since Windows NT 4.0 do not have drivers for such new SCSI controllers, the user must load the driver manually prior to Windows NT 4.0 installation.

A. Preparing a LSI Driver Diskette

The drivers are located on the ASUS Driver Support CD at:

```
\SDMS\DRIVERS\WINNT\XXXXX\I386\WINNT\MINIPORT
```

where **XXXXX** represents the specific Windows NT subdirectory. For example, the SYM_HI.SYS driver is located in the **WINNTHI** subdirectory. Copy the I386 and MINIPORT subdirectories to the root directory of a clean floppy diskette. Use this driver diskette during Windows NT installation. (-or-) Use the self-extracting image files for Windows NT drivers.

The SYM_HI.SYS executable driver is located on the ASUS Driver Support CD at:

```
\SDMS\DISKIMAG\NT_HI
```

The LSI_U3.SYS executable driver is located on the ASUS Driver Support CD at:

```
\SDMS\DISKIMAG\NT_U3
```

B. New System Installation

This procedure installs the SYM_HI.SYS or LSI_U3.SYS driver onto a Windows NT system. Use this procedure when installing Windows NT onto an unused SCSI drive. Windows NT automatically adds the driver to the registry and copies the driver to the appropriate directory. There are two method to install the Windows NT system. One is installed by booting from NT CD Disc; the other is by booting from NT three installation floppy diskettes.

5. OS Driver Installation

B1. CD-ROM Installation

1. Start the Windows NT installation by booting from the Windows NT CD-ROM. The system BIOS must support booting from a CD-ROM. LSI BIOS settings may need to be changed to allow CD-ROM booting when using a SCSI CD-ROM drive.
2. When the screen displays “**Windows NT Setup**”, immediately press the **F6** key. This must be done or else the new driver installed from the LSI driver diskette will not be recognized.
Note: If **F6** is not pressed, the user is still given the opportunity to load additional drivers later in the installation process. However, any driver loaded during Windows NT Setup are not immediately recognized and no devices controlled by that driver are available during Windows NT Setup.
3. When prompted for the manufacturer-supplied hardware support disk, insert the appropriate LSI driver diskette containing the Windows NT driver required to support your LSI adapter(s) and press Enter. The driver files are distributed with ASUS Driver Support CD and are created from above “*Preparing a LSI Driver Diskette*” Section.
4. Depending on the driver being installed, either “*LSI PCI High Performance Driver*”, or “*LSI Logic Ultra3 PCI SCSI Driver*” is shown highlighted. Press **Enter** to proceed.
5. Windows NT should now recognize the miniport driver(s) and the SCSI hardware. Press **Enter** to continue. At this point, simply follow the **Microsoft Windows NT** installation procedure. As for the onboard LAN and VGA, please refer to the later sections for network and graphics driver installation.

B2. Boot Floppy Disk Installation

1. Start the Windows NT installation by booting from the Microsoft Setup floppy diskette.
2. Press **Enter** when the Welcome to Setup screen appears. The Windows NT Workstation Setup window appears next.
3. Press **S** to skip automatic detection and perform a manual selection. A screen displays the message “*Setup has recognized the following mass storage devices in your computer...*”.
4. With floppy disk 2, there is an initial setup screen that prompts you to continue by pressing **Enter**.
5. Press **S** to skip mass storage device detection. (If **Enter** is pressed, the installation program scans for SCSI adapters and finds the LSI PCI (**53C810**) driver which is an older version of the **SYMC8XX.SYS** driver. Let installation continue and change the driver when the installation is completed.) To change the driver, see *Existing System Installation*.

5. OS Driver Installation

6. When a screen displays the SCSI adapters found, choose **S** to configure additional SCSI adapters.
7. Move the highlight bar to *Other* and press **Enter**.
8. When prompted for the *manufacturer-supplied hardware support disk*, insert the appropriate LSI driver diskette containing the Windows NT driver required to support your LSI adapter(s) and press **Enter**. The driver files are distributed with ASUS Driver Support CD and created from the previous section “*Preparing a LSI Driver Diskette*” section.
9. Depending on the driver being installed, either “*LSI PCI High Performance Driver*”, or *LSI Logic Ultra3 PCI SCSI Driver* is shown highlighted. Press **Enter** to proceed.
10. The Windows NT Workstation Setup window reappears. If using an IDE CD-ROM Drive for installation, press **S** to load additional drives. Another window appears. Scroll up and select: *IDE CD-ROM (ATAPI 1.2/PCI IDE Controller)* Press **Enter**. (-or-) If you have completed configuring additional SCSI adapters, press **Enter**.
11. Windows NT should now recognize the miniport driver and the SCSI hardware. Press **Enter** to continue. At this point, simply follow the **Microsoft Windows NT** installation procedure. As for onboard LAN and VGA installation, please refer the later sections for network and VGA driver installation.

C. Existing System Installation

1. Boot Windows NT system and log on as Administrator.
2. Click on the **Start** button. Select **Settings**—>**Control Panel**.
3. Double click on **SCSI Adapters** icon.
4. Click the Drivers tab. If the old NCRSDMS.SYS, NCRC810.SYS, NCRC8XX.SYS, or SYMC810.SYS drivers are listed, select the driver(s) and choose **Remove** before adding the new driver. If the driver name of the driver you are installing SYM_HL.SYS or LSI_U3.SYS is listed, remove it before adding the new driver. Select **OK** when the Remove Driver message prompts: “*Are you sure you want to remove this driver?*” Click **OK**.
5. Click **Add**. A list of installed adapters will appear.
6. Click the **Have Disk** button.
7. When prompted, insert the appropriate LSI driver diskette containing the Windows NT driver required to support your LSI adapter(s). The path to copy manufacturer’s files is: *A:\WINNT\MINIPORT* and select **OK**.
8. Depending on the driver being installed, either *LSI PCI High Performance Driver* or *LSI Logic Ultra3 PCI SCSI Driver* is shown highlighted on the Install Driver menu. If it is not highlighted, select it. Choose **OK**.

5. OS Driver Installation

9. For the path to the OEM SCSI Adapter files, **A:\WINNT\MINIPORT** should be displayed. Select **Continue**. Then remove the floppy diskette from your A: drive.
10. The System Settings Change message displays: “**You must restart your computer before the new settings take effect. Do you want to restart your computer now?**” Click on the **Yes** button to restart and reboot Windows NT. If you choose **Cancel**, remember that you must restart before the new driver will load.
11. Rebooting loads your new miniport driver(s).

II. Intel 82559 Network Driver Installation

A. Preparing Intel 82559 Lan Driver Diskette

If you need to use a floppy disk to install the onboard Intel 82559 network adapter drivers, use the **MAKEDISK.BAT** utility located in the **\LAN\MAKEDISK** directory on ASUS Driver Support CD.

MAKEDISK [operating system] [destination]

where **[operating system]** is the OS for which you are creating the diskette, and **[destination]** is the drive letter and path (such as A:). If no destination is specified, the A: drive will be used. The possible **[operating system]** options are:

NT = Microsoft Windows NT

W2K = Microsoft Windows* 2000

NW = Novell NetWare servers and clients

Make sure you have a 1.44 MB formatted, non-bootable diskette in the floppy drive when using this utility. Alternately, you can use the **MAKENT.BAT** files (located in the **\LAN** root directory on this CD) to simplify this process:

MAKENT.BAT — Creates a drivers disk for Windows NT

B. New System Installation

1. Press **Next** when **Installing Windows NT Networking** screen appears.
2. Select **Wired to the Network**: Press **Next**. You can select install IIS or not.
3. Press **Select from list.....** Insert the **PRO/100+ adapter diskette** or **ASUS Driver Support CD** and click **Have Disk**.

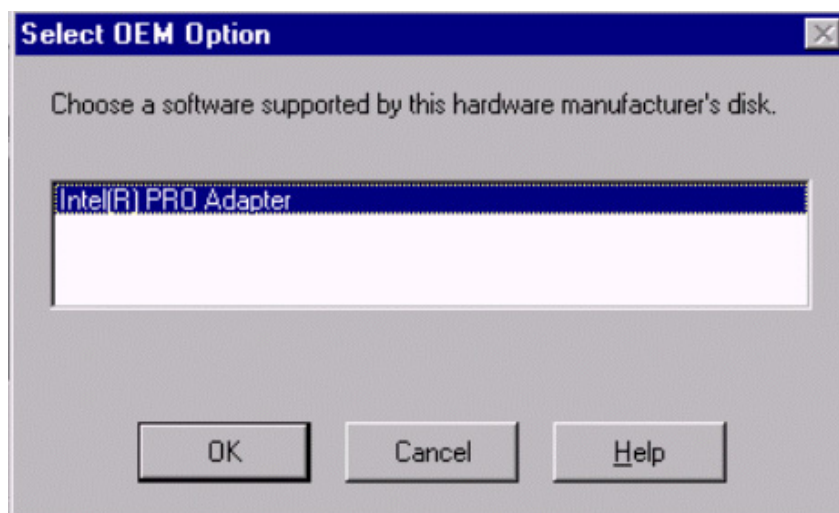
CAUTION: Don't let the Windows NT system to detect the onboard network device. The bundled driver cannot support Intel 82559 network controller and will cause the system installation failure.

5. OS Driver Installation

4. Type **D:\LAN** (for ASUS Driver Support CD) or **A:** (for floppy) in the dialog box and click **OK**. Then follow the prompts to complete installation. When the adapter is added you'll see a new adapter "**Intel(R) PRO Adapter**" listed in the Network adapters list.
5. Click **Next** to finish and configure any protocols as prompted.

C. Existing System Installation

1. Double-click the **Network** icon in the **Control Panel**.
2. Select the **Adapter** tab.
3. Click **Add**. You'll see a list of adapters.
4. Don't select an adapter from this list. Instead, insert the **PRO/100+ adapter diskette** or **ASUS Driver Support CD** and click **Have Disk**.
5. Type **D:\LAN** (for CD) or **A:** (for floppy) in the dialog box and click **OK**. Then follow the prompts to complete installation. When the adapter is added you'll see a new adapter listed in the Network adapters list.

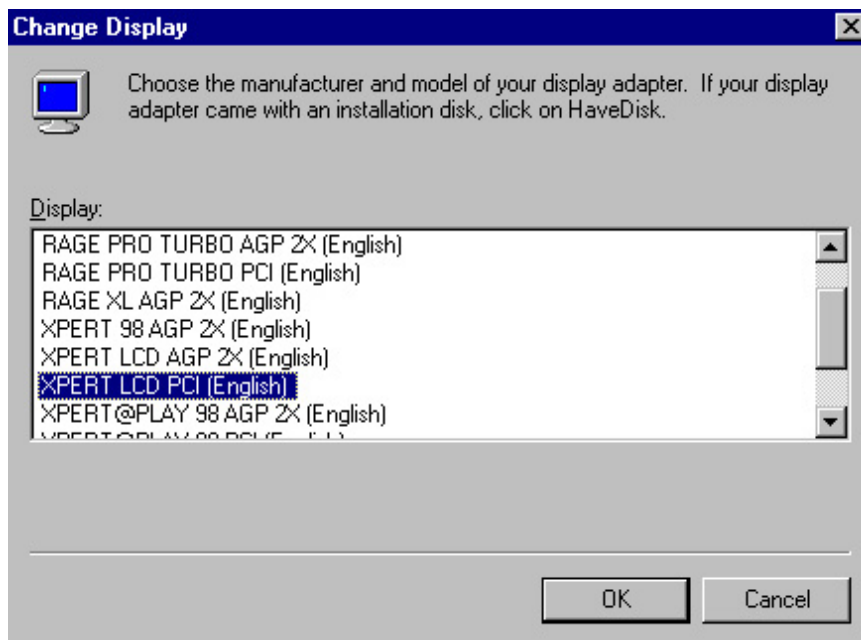


6. Click **OK** to finish and configure any protocols as prompted.
7. Restart Windows NT when prompted.

5. OS Driver Installation

III. ATI Rage XL Display Driver Installation

1. Start up Windows NT in VGA mode.
2. Run the Windows NT Display program located in the Control Panel, under **Settings** in the Start menu or right click the mouse button on the desktop and select **Properties** from the popup menu.
3. Select the **Settings** tab.
4. Select **Display Type...**
5. Select **Change...** from the display options.
6. Select **Have Disk...**
7. Windows NT system will prompt you for the correct path, enter the path of the driver, such as **D:\ATI\NT40** (assuming your CD-ROM drive is letter D)
8. A list of video adapters will be displayed. Select the “**XPERT LCD PCI**”, then click on **OK** button.



9. Windows NT will once again prompt for confirmation. All appropriate files are then copied to the hard disk. Select **Apply** in Control Panel.
10. The installed driver will become active once you restart Windows NT.

5. OS Driver Installation

2. Microsoft Windows 2000 Server

I. LSI SCSI Driver Installation

LSI Logic and Microsoft provide miniport drivers, called SYM_HI.SYS that are bundled with Windows 2000 along with non-bundled drivers LSI_U3.SYS. These miniport drivers complete the path to a LSI controller or processor with an optional SDMS SCSI BIOS. The next sections describe these drivers and their installation. Therefore, user only need to load the driver manually when the CUR-DLS M/B has build-in with LSI SYM53C1010 SCSI controller. As for LSI SYM53C896 SCSI controller, it's always bundled in Windows 2000 system.

A. Preparing a LSI Driver Diskette

The drivers are located on the ASUS Driver Support CD at:

```
\SDMS\DRIVERS\WIN2K\XXX2K\I386\WINNT\MINIPOINT
```

where **XXX2K** represents the specific Windows NT subdirectory. For example, the LSI_U3.SYS driver is located in the **Ultra32K** subdirectory. Copy all the files starting from the I386 subdirectory through the MINIPOINT subdirectory to the root directory of a clean floppy diskette. Use this LSI driver diskette during installation. (-or-) Use the self-extracting image files for Windows 2000 drivers. For the SYM_HI.SYS driver, the executable file is located here:

```
\SDMS\DISKIMAG\W2K_HI
```

For the LSI_U3.SYS driver, the executable file is located here:

```
\SDMS\DISKIMAG\W2K_U3
```

B. New System Installation

The SYM_HI.SYS drivers are bundled with Windows 2000. These drivers support the SYM53C8XX family of LSI controllers. The LSI_U3.SYS drivers are non-bundled drivers. The LSI_U3.SYS driver supports the SYM53C1010 LSI controller. To install Windows 2000 on a new system, the system BIOS must support booting from a CD-ROM. LSI BIOS settings may need to be changed to allow CD-ROM booting.

1. Start the Windows 2000 installation by booting from the Windows 2000 CD-ROM.

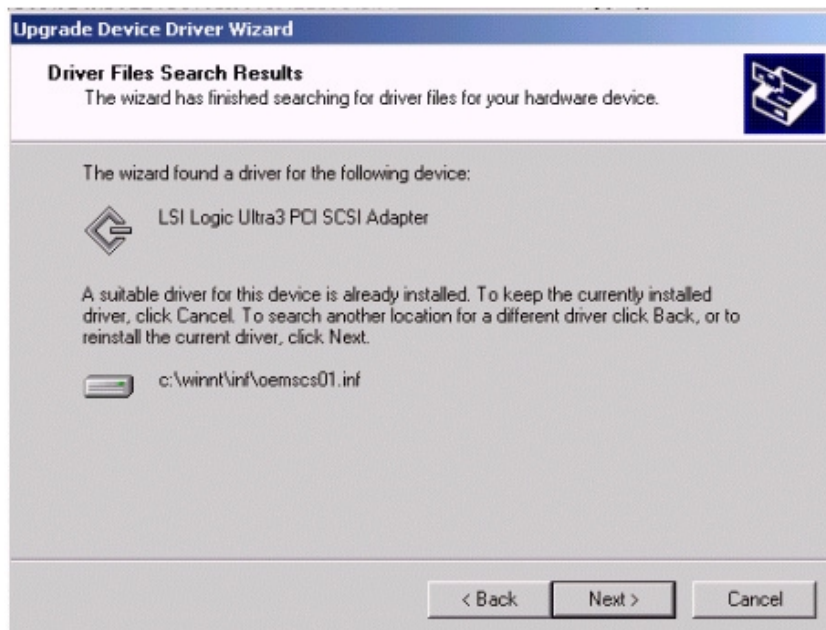
5. OS Driver Installation

2. For installation of the LSI_U3.SYS drivers, when the screen displays “*Windows 2000 Setup*” press the **F6** key to install the LSI_U3.SYS drivers. This must be done or else these new drivers will not be recognized. If only the SYMC8XX.SYS and/or SYM_HI.SYS drivers are needed no user action is required as they will be loaded from the CD-ROM automatically.
Note: If **F6** is not pressed, the user is still given the opportunity to load additional drivers later in the installation process. However, any driver loaded at this later time is not recognized and no devices controlled by that driver are available during Windows 2000 Setup.
3. When prompted for the manufacturer-supplied hardware support disk, insert the appropriate LSI driver diskette containing the Windows 2000 driver required to support your LSI adapter(s) and press **Enter**. The LSI Driver diskette is creating prior to installing Windows 2000.
4. The appropriate driver is shown highlighted. Press **Enter** to proceed.
5. Return to the Windows 2000 Setup screen. Press **Enter** to proceed. The message about setup loading files appears. At this point, simply follow the Microsoft Windows 2000 installation procedure.

C. Existing System Installation

1. Boot Windows 2000 and log on as Administrator.
2. Right click on **My Computer** and click on **Properties**.
3. Click on the **Hardware** tab, and then click on the **Device Manager** button.
4. Click the “+” to the left of the **SCSI** and **RAID** controllers line. Find the adapter desired for the driver upgrade and double click on the entry. Click on the **Driver** tab.
5. Information on the currently installed driver is displayed, and additional driver details can be viewed by clicking the **Driver Details.....** button.
6. To update the existing driver, click the **Update Driver** button. The Upgrade Device Driver Wizard begins. Click on the **Next** button.
7. Make sure Search for a suitable driver for my device is selected, then click on the **Next** button.
8. Make sure the Floppy disk drives location is checked. Insert the appropriate LSI driver diskette that contains the Windows 2000 driver required to support your LSI adapter(s) and press Enter. The LSI driver diskette was created earlier.
9. The system scans the existing driver database and the floppy diskette drive for drivers for the selected adapter.
10. A list of suitable drivers appears. The entry for the upgrade driver can be verified by scrolling the display to the right, and viewing the Location field. Highlight the driver for the upgrade installation disk and click on the **Next** button.

5. OS Driver Installation



11. In some cases, a message will state that this driver is not digitally signed. This message informs the user that a non-signed driver is being installed. Either click **No** to cancel the installation if the non-signed driver is not desired or click **Yes** to continue the installation.

Note: Drivers are digitally signed by the Microsoft Windows Hardware Quality Lab (WHQL). Due to the delay between the general customer release by LSI Logic of Windows drivers and the completion of WHQL testing, some drivers that are distributed with adapters or downloaded from the LSI Logic web site at www.lsillogic.com may not be digitally signed.

12. The system will load the driver from the LSI driver diskette. A message box may appear indicating that the target (existing) driver is newer than the source (upgrade) driver. Click **No** to cancel the driver upgrade at this point or click **Yes** to continue the installation.

5. OS Driver Installation

II. Intel 82559 Network Driver Installation

The Windows 2000 system can recognize onboard Intel LAN chip as “*Intel 8255x-based PCI Ethernet Adapter [10/100]*”. Basically, user doesn’t need to load/change any driver for onboard LAN device. However, you can change the bundled network driver on Windows 2000 by following approach.

A. Preparing Intel 82559 Lan Driver Diskette

If you need to use a floppy disk to install the onboard Intel 82559 network adapter drivers, use the **MAKEDISK.BAT** utility located in the \LAN\MAKEDISK directory on ASUS Driver Support CD.

MAKEDISK [operating system] [destination]

where *[operating system]* is the OS for which you are creating the diskette, and *[destination]* is the drive letter and path (such as A:). If no destination is specified, the A: drive will be used. The possible *[operating system]* options are:

NT = Microsoft Windows NT

2K = Microsoft Windows 2000*

NW = Novell NetWare servers and clients

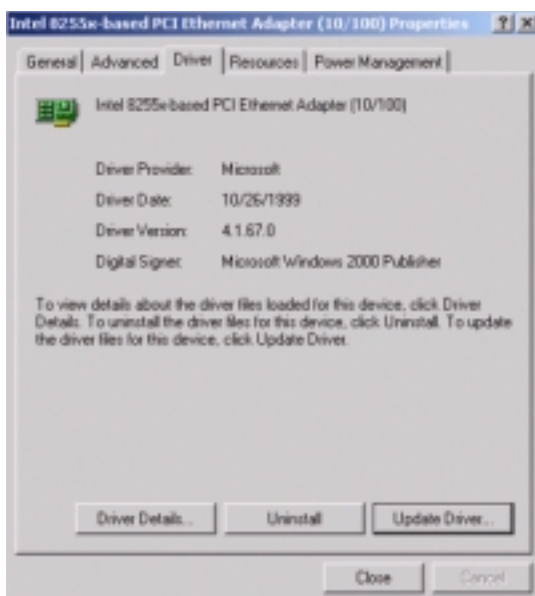
Make sure you have a 1.44 MB formatted, non-bootable diskette in the floppy drive when using this utility. Alternately, you can use the **MAKEW2K.BAT** files (located in the \LAN root directory on this CD) to simplify this process:

MAKEW2K.BAT — Creates a drivers disk for Windows 2000

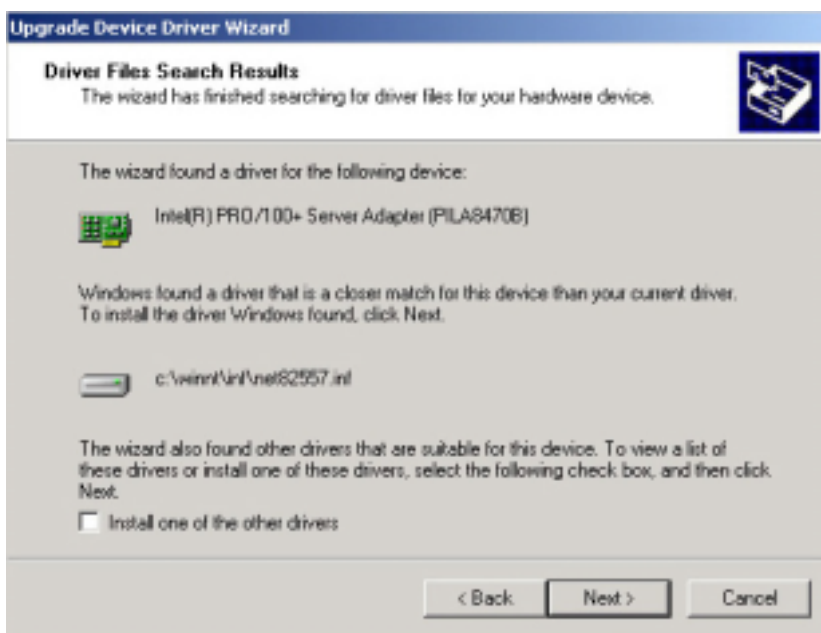
B. Update Driver on an Existing System Installation

1. Boot Windows 2000 system and log on as Administrator.
2. Click on the **Start** button. Select **Settings**—>**Control Panel**.
3. Double-click the **System** icon in the **Control Panel**.
4. Select the **Hardware** tab. Click on **Device Manager....** Button.
5. Click the **Network Adapters**. And highlight “*Intel 8255x-based PCI Ethernet Adapter [10/100]*”. Click right-button on the mouse. Select **Properties**.
6. Select the **Driver** tab. Click on **Update Drivers..** Button.

5. OS Driver Installation

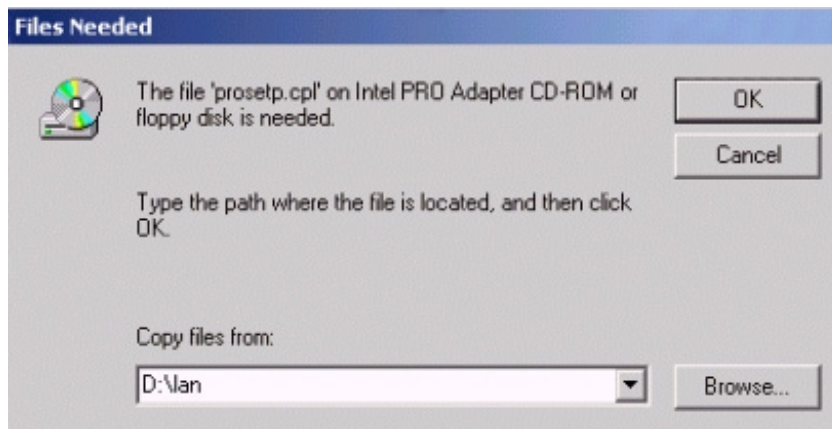


7. Click **Next**. Select the **“Display a list of the known drivers for this device”**.
8. Click **Have Disk...**. Select a location for the network driver. User can use floppy diskette or CD-ROM drive (\LAN directory from ASUS Driver Support CD). Click **OK**.
9. Select **“Intel® PRO/100+ PCI Adapter”** from the listed Network Adapters. Click **Next**. System would prompt you an Update Driver Warning message. Click **Yes** to continue Installing driver.



5. OS Driver Installation

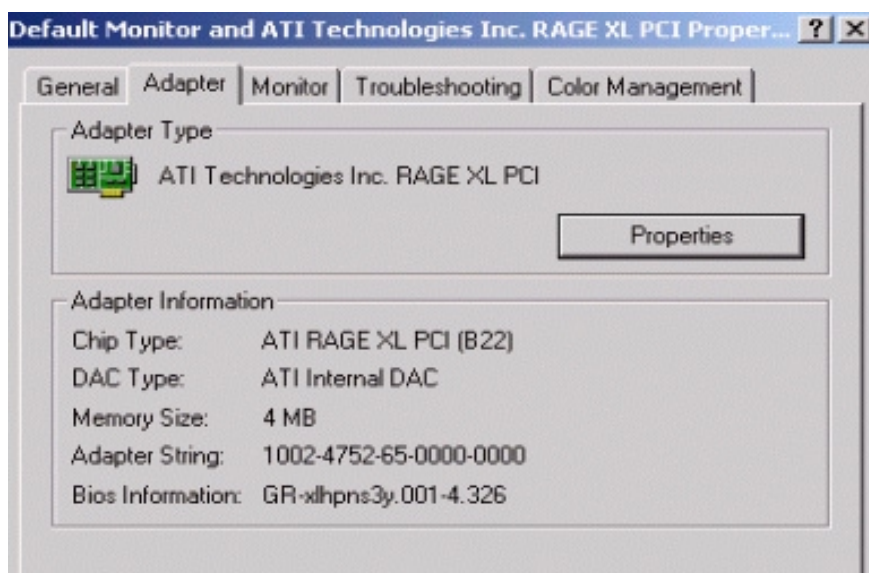
10. Click **Next**. When it prompted the file “prosetp.cpl” needed (see below figure). Type **D:\LAN** (from ASUS Driver Support CD) or **A:** (User must copy “prosetp.cpl” file from **D:\LAN** in advanced) in the dialog box and click **OK**.



11. Click **Finish**. Windows 2000 system will prompt if you want to restart the system now. After system been restarted, the new driver will be loaded into the system.

III. ATI Rage XL Display Driver Installation

Windows 2000 system can correctly recognize ATI RAGE XL PCI driver during system installation. User need not to load any driver for supporting the onboard ATI RAGE XL graphics chip.



5. OS Driver Installation

3. Novell NetWare Server

I. LSI SCSI Driver Installation

A single driver (*HAM) is provided for the Novell NetWare 3.12, 4.XX, and 5.0 environments. This document explains how to install and use the SDMS NWPA SCSI Host Adapter Module (HAM) driver for NetWare. The SDMS NWPA solution consists of the device drivers, SYMHINW.HAM and LSI_U3NW.HAM and the NetWare 4.XX installation files SYMHINW.DDI and LSI_U3NW.DDI. SYMHINW.HAM and LSI_U3NW.HAM are NWPA Host Adapter Modules (HAMs). In order to support SCSI devices, load the HAM in conjunction with a SCSI Custom Device Module (CDM). Novell has developed generic CDMs to support SCSI-2 hard drives, SCSI CD-ROM devices, SCSI Magneto Optical devices, SCSI tape devices, and SCSI changer devices. In addition, third party vendors are developing CDMs to support their specific devices. In the following, the NetWare 5.x, 4.xx and 3.12 installation procedure are listed for the reference.

A. Preparing a LSI Driver Diskette

The SDMS™ NWPA drivers for the Novell NetWare operating system are located on the ASUS Driver Support CD at:

`\\SDMS\\DRIVERS\\NetWare\\`

Copy all the drivers into a diskette and it will be used for the NetWare system installation. Label it as “*LSI driver for NetWare*”.

B. NetWare 5.XX New Installations

1. Begin the file server installation according to the instructions in the file server installation chapter in the Novell NetWare Installation Manual.
2. When the NetWare installation procedure prompts you a *Device type* screen, press **Modify** to add a **Storage adapters:** (Default only **IDEATA** available). Press **INS** for adding a new driver. Please put the *LSI driver for NetWare* diskette into drive **A:** Then use the **INS** key to select an unlisted driver. A dialog box appears. If the driver diskette is in the **A:** drive, press **Enter** to continue. The **SYMHINW.HAM** or **LSI_U3NW.HAM** drivers appear as a selection.

5. OS Driver Installation

3. Highlight Disk and CD-ROM Drivers (e.g., IDEATA). Press **Enter** and load an additional driver. Then press the **INS** key. The system always defaults to the **A:** path. Highlight the HAM driver and press **Enter**. Select **Yes** to save and move the driver into the operating system. Press **Enter** for the system to copy the files.
4. Load a separate instance of the driver for every LSI controller SCSI channel or host adapter present in the system.
5. When prompted for a slot number, accept the slot numbers displayed. Make sure to write these slot numbers down for future reference.
6. When asked to edit the STARTUP.NCF file, make sure the SYMHINW.HAM or LSI_U3NW.HAM is loaded once for each LSI controller SCSI channel present in the system. Add the statement SLOT=<slot number> to each load line in the STARTUP.NCF, by specifying the slot numbers written down in step 5 above, with only one slot number per load instance. The HAM driver(s) are loaded for each LSI controller SCSI channel from the first LOAD statement to the last LOAD statement.

C. NetWare 4.XX New Installations

1. Begin the file server installation according to the instructions in the file server installation chapter in the Novell NetWare Installation Manual.
2. When the NetWare installation procedure prompts you for a driver disk, insert the *LSI driver for NetWare* diskette into drive **A:** Then use the **INS** key to select an unlisted driver. A dialog box appears. If the driver diskette is in the **A:** drive, press **Enter** to continue. The **SYMHINW.HAM** or the **LSI_U3NW.HAM** driver appears as a selection.
3. Highlight Disk and CD-ROM Drivers (e.g., IDEATA). Press **Enter** and load an additional driver. Then press the **INS** key. The system always defaults to the **A:** path. Highlight the HAM driver and press **Enter**. Select **Yes** to save and move the driver into the operating system. Press **Enter** for the system to copy the files.
4. Load a separate instance of the driver for every LSI controller SCSI channel or host adapter present in the system. User must load twice for LSI SCSI driver with different slot number from *STARTUP.NCF* file as below.
load SYMHINW.HAM (or LSI_U3NW.HAM) Slot=10004
load SYMHINW.HAM (or LSI_U3NW.HAM) Slot=10005
5. When prompted for a slot number, accept the slot numbers displayed. Make sure to write these slot numbers down for future reference.
6. When asked to edit the STARTUP.NCF file, make sure the SYMHINW.HAM or LSI_U3NW.HAM is loaded once for each LSI controller SCSI channel present in the system. Add the statement SLOT=<slot number> to each load line in the STARTUP.NCF, by specifying the slot numbers written down in step 5 above, with only one slot number per load instance.

5. OS Driver Installation

II. Intel 82559 Network Driver Installation

A. Preparing Intel 82559 Lan Driver Diskette

If you need to use a floppy disk to install the onboard Intel 82559 network adapter drivers, use the **MAKEDISK.BAT** utility located in the \LAN\MAKEDISK directory on ASUS Driver Support CD.

MAKEDISK [operating system] [destination]

where *[operating system]* is the OS for which you are creating the diskette, and *[destination]* is the drive letter and path (such as A:). If no destination is specified, the A: drive will be used. The possible [operating system] options are:

NT = Microsoft Windows NT

W2K = Microsoft Windows* 2000

NW = Novell NetWare servers and clients

Make sure you have a 1.44 MB formatted, non-bootable diskette in the floppy drive when using this utility. Alternately, you can use the **MAKENW.BAT** files (located in the \LAN root directory on this CD) to simplify this process:

MAKENW.BAT — Creates a drivers disk for Novell NetWare servers and clients.

B. NetWare 4.XX & 5.X Installations

1. Prepare the Intel PRO/100+ NetWare drivers from previous section.
2. Install NetWare 4.xx or 5.x according to the NetWare instructions.
3. When the NetWare installation procedure prompts you for a Network Driver, insert the Intel PRO/100+ drivers diskette into drive **A:** Then use the **INS** key to select an unlisted driver. A dialog box appears. The “**E100B.LAN — Intel Pro/100+ PCI Adapter driver**” driver appear as a selection.

CAUTION: If the “Loader could not find public symbol: <symbol name>” error message prompted when system is loading Intel Pro/100+ PCI network driver, it’s because the related network driver modules are too old. User must download the latest Netware Support Pack from Novell web site at: <http://support.novell.com/products/nw411/patches.htm> (For example: the support pack for NetWare 4.11).

5. OS Driver Installation

4. Installation of the Intel 82559 Network Adapter for NetWare 5.x or 4.xx is complete.

Add or check the load and bind statements you need to the server's AUTOEXEC.NCF file so the PRO/100+ adapter driver loads automatically load and bind the server driver as follows:

```
LOAD C:<PATH>\E100B SLOT=x FRAME=ETHERNET_802.2  
BIND IPX TO E100B NET=xxxxxxxx
```

Where: SLOT=x Specifies the NBI (NetWare Bus Interface) slot number. Substitute x with the valid value for the adapter. You will be prompted with the slot number(s) of installed PRO/100+ adapters. The NBI numbers are different from the slot number indicated in the SETUP.EXE utility. NET=xxxxxxxx is the unique network address for that LAN segment. The default frame type is 802.2. If your workstation needs to use the 802.3 frame type, see the section later in this document about using multiple frame types on one adapter.

III. ATI Rage XL Display Driver Installation

User can select the "Super VGA" for the X Server on NetWare 5.x server system. The other NetWare system didn't support X Server and user didn't need the VGA driver support.

5. OS Driver Installation

4. SUN Solaris X86 Server

I. LSI SCSI Driver Installation

A. Building the SYMHISL Driver Update Diskette

To create a SYMHISL diskette for Solaris installations, copy the raw symitu.dd image file onto a 1.44 Mbytes floppy diskette. This process is dependent upon the operating system that you are using to create this diskette. See the instructions below for UNIX System and DOS System Users.

For UNIX System Users:

Follow these steps to create the SYMHISL Driver Update diskette:

1. Insert a 3.5" diskette into the floppy diskette drive.
2. At the UNIX prompt, type:

```
#volcheck -v  
#dd if=/<path>/symitu.dd of=/vol/dev/aliases/floppy0 bs=36k  
#eject floppy
```

The *<path>* is where the dd image is located. On this CD-ROM, the dd image file is located here:

/SDMS/DRIVERS/UNIXES/SOLARIS/SOLARIS/SYMITU.DD

For DOS System Users:

Under this section, DOS system users have two choices.

1. Use a utility that will copy the raw dd image onto a 1.44 Mbytes floppy diskette. This dd image is located at:
\SDMS\DRIVERS\UNIXES\SOLARIS\SOLARIS\SYMITU.DD
RAWRITE3.COM, which is a public domain utility, is available on this CD-ROM at this location: *\SDMS\DRIVERS\UNIXES\RAWRITE3.COM*
Instructions for using this utility are included in its accompanying RaWrite file or as a Microsoft Word document located at:
\SDMS\DRIVERS\UNIXES\RAWRITE3.DOC
2. The other DOS alternative is to use the self-extracting image file that is located at: *\SDMS\DISKIMAG\SOLARIS.EXE*

B. New System Installation

These instructions provide details to install the SDMS symhisl driver using the SYMHISL Update diskette created above during installation of the operating system using the SYM53C896 or SYM53C1010 controller. To use the driver on the SYMHISL Driver Update diskette to install Solaris X86 (Intel Platform Edition) on a machine, follow the next steps.

5. OS Driver Installation

1. Insert the Solaris Device Configuration Assistant Diskette into your machine's diskette drive. Also insert the Solaris Installation CD-ROM; or for network installation, verify with your system administrator that the Solaris Network Installation image is available on your network.
2. Turn on your machine. When the Solaris Device Configuration Assistant screen appears, choose **F4_Add Driver**. The message "Enumerating buses..." appears. Then, the Install Driver Update screen appears.
3. Remove the Solaris Device Configuration Assistant Diskette from the diskette drive and insert the first Solaris Driver ITU diskette you want.
4. Press **F2_Continue**. The Select Solaris System Version screen appears.
5. Select the appropriate Solaris operating system, and press **F2_Continue**. The Loading Driver Update Software screen appears, along with a progress bar that shows the percentage of drivers that have been extracted from the diskette. Drivers are read into memory and survive long enough for the system to successfully boot to its installation program. When all the new drivers on the diskette have been processed, the Continue Driver Update Installation screen appears.
6. Remove the Solaris Driver ITU diskette from the diskette drive and insert the next Solaris Driver ITU diskette you want, if any.
7. Press **F2_Continue**. The Loading Driver Update Software screen appears, along with a progress bar that shows the percentage of drivers that have been extracted from the diskette.
8. Repeat Step 4 through Step 8 until all the Solaris Driver ITU diskettes you want are installed.
9. When all the drivers are processed, remove the Solaris Driver ITU diskette from the diskette drive and reinsert the Solaris Device Configuration Assistant Diskette.
Important: Do not remove the Solaris Device Configuration Assistant Diskette from the diskette drive until you see the following message displayed in a dialog box: "If you want to bypass the device configuration and boot screens when the system reboots, eject the Device Configuration Assistant/Boot diskette now."
10. Press **F2_Continue**. The Solaris Device Configuration Assistant screen appears.
11. Press **F2_Continue**. The "Enumerating buses" message appears. The Scanning Devices screen is then displayed. System devices are scanned. When scanning is complete, the Identified Devices screen appears.
12. Press **F2_Continue**. The message "Loading driver..." appears followed by messages about the drivers that are required to boot your system. After a few seconds, the Boot Solaris screen appears.

5. OS Driver Installation

13. At the Boot Solaris screen, select the device controller attached to the device that contains your install medium, i.e., CD-ROM or Network device.
14. Press **F2_Continue**. Drivers for the device controller that you selected are displayed. Your system boots to run the install program. The install program starts and your machine begins booting the complete Solaris operating environment. The following messages appears some time later, and prompts the user to insert each of the Solaris Driver ITU diskette(s) required to install into your machine:
Installing unbundled device driver support Extracting driver list from tree...
<ITU diskette name> driver-name... Please insert the Driver Update diskette labeled <ITU diskette name>. Press <ENTER> when ready.
15. Remove the Solaris Device Configuration Assistant Diskette. Reinsert the SYMHISL Driver ITU diskette that you inserted earlier into the diskette drive.
16. Press Enter. Packages and/or patches that contain the new drivers are installed from the diskette onto your machine. Messages about each installation appear accordingly. When the following prompt appears:
Please insert the Driver Update diskette labelled <SYMHISL>. Press <ENTER> when ready.
17. Insert the SYMHISL ITU diskette into the floppy diskette drive. When the prompt asking if you wish to create a new instance of the SYMHISL package appears, respond with **N** for no. When the prompt asking if you wish to overwrite the existing instance of SYMHISL appears, respond with **Y** for yes.
18. If drivers on other Solaris Driver ITU diskettes are required, remove the Driver ITU diskette from the diskette drive, insert the next Driver ITU diskette when prompted to insert it, press **Enter**, and repeat this process until all drivers you need are installed.
19. Press **Enter**. When the installation has completed, the message “Installation complete” appears.
20. Remove the diskette from the floppy diskette drive. Reboot your machine. When the Solaris operating environment is finished booting and running, the new devices whose drivers you installed are available for use.

5. OS Driver Installation

C. Existing System Installation

Before adding new or updated drivers, the newly supported hardware devices should be installed and configured according to the instructions in the corresponding Device Reference Page, if any. See the Device Reference Manual for Solaris (Intel Platform Edition). When the Solaris Intel Platform Edition software is already installed, the simplest way to add new or updated drivers is to install the Driver ITU diskettes as patches on your system. For more information about managing diskettes and drives, see the System Administration Guide.

1. To add new or updated drivers, go to the *root* (\) directory.
2. To see if the Volume Management software is running on the machine that you are updating, type at the command prompt:

```
# ps -ef | grep vold
```

3. To temporarily stop Volume Management if it is running, type this command at the system prompt:

```
# /etc/init.d/volmgt stop
```

4. Insert the Solaris Driver ITU diskette into the diskette drive.
5. Mount the Solaris Driver ITU diskette at the */mnt* mount point:

```
# mount -F pcfs /dev/diskette /mnt
```

Note: You must mount the Solaris Driver ITU diskette at this point in the file structure to update your system successfully.

6. Execute the install script on the diskette:

```
# /mnt/DU/sol_27/i86pc/Tools/install.sh -i
```

The install.sh script searches for all new or updated drivers on the diskette. When a new or updated driver is found, this prompt appears:

Unconditionally installing ITUs <ITU driver names>

Install patch driver-name [y]

7. If the driver is the one that you want to install, type **Y** for yes or press Enter. If the driver is not the one you want to install, type **N** for no. If you specify yes, the install.sh script installs the driver you indicated as well as bootmod and bootbin patches.
8. When the installation has completed, and the install.sh script exits, unmount the diskette by typing at the command prompt:

```
# cd /
```

```
# unmount /mnt
```

9. Remove the Solaris Driver ITU diskette from the diskette drive.
10. Reboot your machine by typing at the command prompt:

```
# touch /reconfigure
```

```
# reboot
```

5. OS Driver Installation

11. If you have not already done so, turn off your system, add the new hardware, and turn on your system again.

12. At the << Current Boot Parameters >> prompt, type:

b -r

to force reconfiguration of the machine. When the Solaris operating environment is finished booting and running, the new devices whose drivers you installed are available for use.

II. Intel 82559 Network Driver Installation

Solaris7 system can correctly recognize Intel 82559 controller by itself at installation step. User didn't need to load the network driver for the onboard LAN device.

III. ATI Rage XL Display Driver Installation

Solaris 7 cannot support ATI Rage XL graphic default, user can configure the graphic as a "Standard VGA" device for supporting Solaris X Window.

5. OS Driver Installation

5. SCO Open Server 5.0.x

I. LSI SCSI Driver Installation

A. Building the SCO OpenServer BTL D Diskette

To create a BTL D diskette for SCO OpenServer system, copy the raw dd image file onto a 1.44 Mbytes floppy diskette. This process is dependent upon the operating system that you are using to create this diskette. See the instructions below for UNIX System and DOS System Users.

For UNIX System Users:

Follow these steps to create the BTL D diskette:

1. Insert a 3.5" diskette into the floppy diskette drive.
2. At the UNIX prompt, type: [dd if=/*<path>*/sco.dd of=/dev/fd0135ds18]. The *<path>* is where the dd image is located. On this CD-ROM, the dd image file is located here:

/SDMS/DRIVERS/UNIXES/OPNSERV/SCO.DD

For DOS System Users:

Under this section, DOS system users have two choices.

1. Use a utility that will copy the raw dd image onto a 1.44 Mbytes floppy diskette. This dd image is located at:

\SDMS\DRIVERS\UNIXES\OPNSERV\SCO.DD

RAWRITE3.COM, which is a public domain utility, is available on this CD-ROM at this location:

\SDMS\DRIVERS\UNIXES\RAWRITE3.COM

Instructions for using this utility are included in its accompanying RaWrite file or as a Microsoft Word document located at:

\SDMS\DRIVERS\UNIXES\RAWRITE3.DOC

2. The other DOS alternative is to use the self-extracting image file that is located at:

\SDMS\DISKIMAG\OPNSERV.EXE

5. OS Driver Installation

B. New System Installation

This procedure installs SCO UNIX onto a hard disk drive. This installation is necessary to build a new UNIX kernel that includes your SDMS driver. During installation, you are given the option of retaining current partitions on the root hard disk. For instance, you could have a DOS partition or a user UNIX partition already established on the drive. For more details on UNIX installation, refer to the SCO OpenServer Handbook.

1. Link the SDMS BTL D into the UNIX kernel during installation.
2. Insert the SCO UNIX installation diskette and reboot the system. For SCO OpenServer 5, this diskette is labeled Boot Disk.
3. At the boot prompt, type: **[Boot : link]** Press **Enter**.
4. At the next prompt, type: **[slha]** Do not remove the boot diskette. Press **Enter**.
5. When prompted during the installation, insert either the proper installation diskette or the **SDMS BTL D** diskette, and press **Enter**.

The system may prompt you to enter a routine number: “Please enter which routine (0-40) to replace ‘?’ to list, ‘a’ to add “slhainit” at the end [default], ‘n’ to do nothing, or ‘q’ to quit” Enter the indicated routine number that precedes this message. Then the system may prompt with another inquiry: “Please enter which routine (0-2) to replace ‘?’ to list, ‘a’ to add “slhapoll” at the end [default], ‘n’ to do nothing, or ‘q’ to quit”

Enter the indicated routine number that precedes this message.

6. Continue the installation according to the SCO UNIX documentation.

C. Existing System Installation

This procedure assumes SCO UNIX is already installed on a hard disk drive. This installation is necessary to build a new UNIX kernel that includes the proper LSI host adapter driver. The basic steps for accomplishing this are outlined below. For more details on UNIX installation, refer to the SCO UNIX System Administrator’s Reference Manual.

1. The SCO OpenServer 5 system automatically creates a file *unix.safe* during installation. To access this UNIX kernel, type after the boot prompt: **[Boot : unix.safe]** Press **Enter**.
2. **Log** on as system administrator “*root*”.
3. Insert the **SDMS BTL D** diskette in the floppy drive and type: **[# installpkg]** Press **Enter** to continue.

5. OS Driver Installation

4. A prompt appears to insert the requested diskette. Since the BTL D diskette is already inserted, press Enter.
5. A prompt asks for the name of the package. Type: [slha] Press **Enter** to continue.
6. If a driver is already present from a previous installation, a prompt inquires about replacing it. Reply **y** for yes.
7. Once the install package (installpkg) has completed, relink the kernel by typing:
[# /etc/conf/cf.d/link_unix]
8. The system will execute the command and then will prompt for a series of responses:
 - a. *“Do you want this kernel to boot by default (y/n)?”* Type: [y] Press **Enter**.
The system backs up the old kernel.
 - b. *“Do you want the kernel environment rebuilt (y/n)?”* Type: [y] Press **Enter**.
9. To activate the new kernel, you must reboot the system. At the command prompt, type: [# reboot] (or init 6)

II. Intel 82559 Network Driver Installation

Since the Intel 82559 network driver is non-bundled driver for SCO OpenServer 5.0.x, user must download the Prob100+ Network Driver from SCO FTP site at: <ftp://ftp.sco.com/pub/drivers/OSR505/network/>. Or user can find the Intel 82559 Network driver from ASUS Driver Support CD at: `\LAN\UNIX\SCO5\`

To install these drivers, take the following steps:

1. Log on as root.
2. Download and copy the Intel 82559 volume image *“VOL.000.000”* from SCO web site (or copy from Driver Support CD) to a directory, for example, `/tmp/vol`.
3. Run **‘custom’** and select **‘Install New’**. Install from your host machine using **‘Media Images’**.
4. Give the directory name where the volume images have been downloaded, for example, `/tmp/vol`.
5. Complete the installation and exit custom.
6. Run **‘netconfig’** and configure the onboard Intel 82559 network adapter: *“Intel® PRO/100B/PRO+/100+ PCI Adapter”*
7. To activate the new kernel, you must reboot the system. At the command prompt, type: [# reboot] (or init 6)

III. ATI Rage XL Display Driver Installation

Since ATI Rage XL graphic driver is not bundled for SCO OpenServer 5.0.x, user can configure the graphic as standard *“IBM VGA”*. Or, user can change the graphics driver by using *“mkdev graphics”* instruction from command prompt.

5. OS Driver Installation

6. SCO UnixWare Server

I. LSI SCSI Driver Installation

A. Building the SCO UnixWare C8XX BTL D Diskette

To create a C8XX BTL D diskette to use with UnixWare 2.1.X or UnixWare 7, copy the raw dd image file onto a 1.44 Mbytes floppy diskette. This process is dependent upon the operating system that you are using to create this diskette. See the instructions below for UNIX System and DOS System Users. After the driver diskette been created, labeled as “*PCI SCSI SCO UnixWare driver*”.

For UNIX System Users:

Follow these steps to create the BTL D diskette:

1. Insert a 3.5" diskette into the floppy diskette drive.
2. At the UNIX prompt, type: [dd if=<path>/unixware.dd of=/dev/rfd0]. The <path> is where the dd image is located. For UnixWare 2.1.X, the dd image file is located here:

/SDMS/DRIVERS/UNIXES/UNIXWARE/UW21X/UNIXWARE.DD

For UnixWare 7, the dd image file is located here:

/SDMS/DRIVERS/UNIXES/UNIXWARE/UW7/UNIXWARE.DD

For DOS System Users:

Under this section, DOS system users have two choices.

1. Use a utility that will copy the raw dd image onto a 1.44 Mbytes floppy diskette. For UnixWare 2.1.X, this dd image is located at:

\\SDMS\DRIVERS\UNIXES\UNIXWARE\UW21X\UNIXWARE.DD

For UnixWare 7, this dd image is located at:

\\SDMS\DRIVERS\UNIXES\UNIXWARE\UW7\UNIXWARE.DD

RAWRITE3.COM, which is a public domain utility, is available on this CD-ROM at this location:

\\SDMS\DRIVERS\UNIXES\RAWRITE3.COM

Instructions for using this utility are included in its accompanying RaWrite file or as a Microsoft Word document located at:

\\SDMS\DRIVERS\UNIXES\RAWRITE3.DOC

2. The other DOS alternative is to use the self-extracting image file appropriate for your version of UnixWare. These are located under:

\\SDMS\DISKIMAG\UW21X.EXE (-or-) \\SDMS\DISKIMAG\UW7.EXE

5. OS Driver Installation

B. New System Installation

1. Boot the computer using the installation diskettes that you received with the UnixWare operating system distribution package. UnixWare 7 has two diskettes.
2. Follow the instructions on the screen.
3. Insert the “*PCI SCSI SCO UnixWare driver*” diskette when prompted to insert the host adapter diskette. To install other host adapter drivers, insert the host adapter diskette provided with the UnixWare distribution package and press Enter. If there are no other host adapter drivers to install, continue the installation and follow the instructions.
4. The system loads the required drivers, such as **C8XX**, and indicates when they are loaded.
5. At the end of the installation, you will see a prompt to reinsert the **HBA** driver diskette. Insert the “*PCI SCSI SCO UnixWare driver*” diskette and press **Enter**. The kernel will be built and the installation will terminate.
6. Remove the driver diskette when prompted to do so and reboot the system.

C. Existing System Installation

Adding or Updating the C8XX Package for LSI SCSI controller. Before you install the C8XX driver, make a backup copy of the existing kernel:

1. Log on as *root*.
2. At the shell prompt, type: `[# cp /stand/unix /stand/unix.safe]`
Use this copy of the old kernel to reboot the system if the driver installation fails. Refer to Troubleshooting for more information.
3. Once the old kernel is saved, insert the “*PCI SCSI SCO UnixWare driver*” diskette.
4. Load the driver using the *pkgadd* command by typing: `[# pkgadd -d diskette1]`
5. Select **C8XX** and press **Enter**. The **C8XX** driver is then loaded onto the system.
6. The system will again prompt you to load a driver even if loading was successful. Type **q** (quit) and press **Enter**.
7. Verify that the driver is now loaded successfully by typing: `[# pkginfo c8xx]`
8. The package information should look like this: “*system c8xx LSI IHV HBA*”
9. After the C8XX package is loaded, a message indicating a system reboot is necessary may appear. To reboot the system, type the following command: `[# init 6]`

During the boot process, the driver scans the SCSI bus and lists the devices found on it. If the kernel panics during boot, then reboot the system with the saved copy of the old kernel. Booting from the saved copy of the kernel is described in the following section titled “Troubleshooting.” If the reboot is successful, the system is ready to use.

5. OS Driver Installation

II. Intel 82559 Network Driver Installation

Since SCO UnixWare system cannot support Intel 82559 default, user can download the Prob 100+ Network Driver from SCO FTP site at: <ftp://ftp.sco.com/pub/drivers/UW710/network/>

Or user can find the Intel 82559 Network driver from ASUS Driver Support CD at:
`\LAN\UNIX\UWx\`

It is not necessary, nor recommended, to remove previous versions of this package from the system before installing this updated version. To install this package, you may use the *scoadmin* Application Installer from the desktop, or as a root login with *pkgadd* command.

1. From the UnixWare 7.1.1 OS Updates CD-ROM (Disk 2): # `pkgadd -d cdrom1 nd`
2. Or, from a download file image or copied from support CD. Copy the driver to a temporary directory, for example `/usr/tmp/nd_711.pkg`. # `pkgadd -d /usr/tmp/nd_711.pkg`

NOTE: Do not use /tmp as the download directory. It could fail with a 'No space' message during *pkgadd*.

The warnings: *WARNING: UnixWare Update 7.x.x should be reapplied* can be safely ignored. There are no files in the Updates that patch this package.

3. After the *nd* package is loaded, a message indicating a system reboot is necessary may appear. To reboot the system, type the following command: # `init 6`

III. ATI Rage XL Display Driver Installation

Since SCO UnixWare 7 cannot support ATI Rage XL graphic default, user must configure the graphic as standard "IBM VGA". User can change the graphics driver by using *scoadmin* instruction from command prompt.

5. OS Driver Installation

7. Linux RedHat 6.x and 7.x

I. LSI SCSI Driver Installation

The LSI SYM53C896 SCSI drivers are bundled under Linux RedHat 6.x and 7.x systems. User can easily follow the Linux RedHat 6.x and 7.x installation procedure to finish the system installation. However, for the SYM53C1010 controller, user must rebuild a new OS kernel (Redhat 6.x) or load the LSI driver (Redhat 7.x) to support the SYM53C1010 controller.

For the kernel rebuilding procedure to support Redhat 6.x, check the **README** file from the ASUS support CD in the following path:

`\SDMS\DRIVERS\UNIXES\LINUX\README`

To support Redhat 7.0, download the LSI 1010 driver **REDHAT70.EXE** from the ASUS website www.asus.com.tw/products/addon/scsi/scsilan_drv.html. After downloading the file, extract the driver into a floppy disk. In the Redhat 7.0 installation wizard screen, use the “*Linux dd*” command to install **Redhat Linux 7.0**.

II. Intel 82559 Network Driver Installation

Linux RedHat 6.x and 7.x systems can automatically recognize the Intel 82559 controller during installation. User doesn't need to load or modify the network driver for the onboard LAN device.

III. ATI Rage XL Display Driver Installation

Select “**ATI Xpert XL**” in installation stage to support X Window on Linux RedHat 6.x. User can also change the graphics driver later by executing the “*setup*” instruction under the command prompt. The Redhat 7.x can automatically detect the onboard graphics.