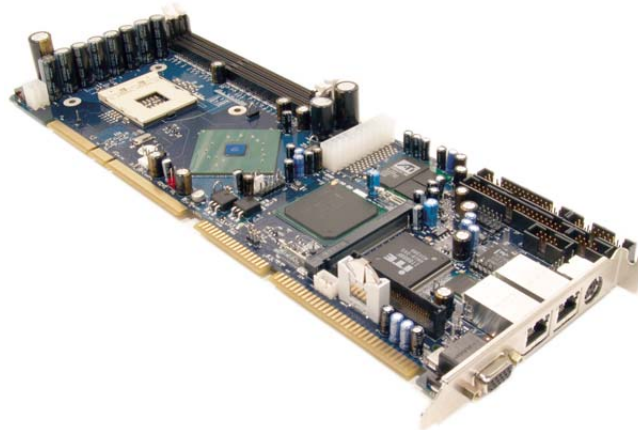




▼

PCI-953 Single Board Computer User's Guide



Manual PN: 930-0027-00-D
April 2006



kontron
www.kontron.com



Customer Service

Mailing Address:

Kontron - United States
14118 Stowe Drive
Poway, CA 92064 USA
Tel: 858-677-0877
Fax: 858-677-0895

Technical Support:

U.S. and Canadian Customers - 24 hours a day
Tel: 800-480-0044, option 1
Fax: 858-677-0898

International Customers - 9am to 4pm local time
Tel: (+49) 8165-77 112
Fax: (+49) 8165-77 110

Visit our site at:

www.kontron.com

© 2006 Kontron, an International Corporation. All rights reserved.

The information in this user's guide is provided for *reference* only. Kontron does not assume any liability arising out of the application or use of the information or products described herein. This user's guide may contain or reference information and products protected by copyrights or patents and does not convey any license under the patent rights of Kontron, nor the rights of others.

Kontron is a registered trademark of Kontron. All trademarks, registered trademarks, and trade names used in this user's guide are the property of their respective owners. All rights reserved. Printed in the United States of America and Canada. This user's guide contains information proprietary to Kontron. Customers may reprint and use this user's guide in other publications. Customers may alter this user's guide and publish it only after they remove the Kontron name, cover, and logo.

Kontron reserves the right to make changes without notice in product or component design as warranted by evolution in user needs or progress in engineering or manufacturing technology. Changes which affect the operation of the unit will be documented in the next revision of this user's guide.

Contents

Safety Instructions

Before You Begin	xi
When Working Inside a Computer.	xii
Preventing Electrostatic Discharge	xiii

Preface

How to Use This Guide	xvii
Customer Comments	xviii
Advisory Conventions	xix
Unpacking	xx
Regulatory Compliance Statements	xxi
Guarantee and Warranty Policy	xxiii
Guarantee	xxiii
Limited Warranty	xxiii
Return Procedure	xxiv
Limitation of Liability	xxv
Maintaining Your Computer	xxvi
Cleaning Components	xxvi
Environmental Factors	xxvi
Power Protection	xxvii

Chapter 1

Introduction

Overview	1-3
Checklist	1-5
Product Specifications	1-6
System Architecture	1-8
System Block Diagram	1-9

Chapter 2

Hardware Settings

Overview	2-3
Jumpers	2-3
Clear CMOS Operation	2-5
Connectors	2-6
Connector Pin Assignments	2-8

Chapter 3

System Installation

Overview	3-3
Pentium 4 Processor.....	3-3
Main Memory	3-6
Installing Memory	3-6
Installation	3-8
INF Chipset Component Driver	3-9
Ethernet Driver Support.....	3-9
Video Driver Support	3-9
On-board LED Indicator (for LAN status)	3-9

Chapter 4

BIOS Setup

Overview	4-3
Main Menu	4-4
The Menu Bar	4-5
The Legend Bar	4-6
Advanced Menu	4-8
PCI/PnP Setup	4-43
Boot Menu	4-49
Security Setup	4-58
Chipset Setup.....	4-62
Power Setup.....	4-65
Exit Menu	4-74

Chapter 5

Troubleshooting

On-board Hardware Installation	5-3
BIOS Setting	5-4
Operating System (OS) Diagnostics	5-7
Booting	5-7
Display Setup	5-8
Network setup	5-8

► **Figures**

Figure 1-1. PCI-953 Single Board Computer	1-4
Figure 2-1. Example of a 3-pin jumper	2-3
Figure 2-2. Jumper Locations	2-4
Figure 2-3. Connector Locations	2-7
Figure 2-4. System Interface Connector – Pin Assignments	2-9
Figure 3-1. Mounting Processors – Exploded Diagram	3-3
Figure 3-2. Heatsink Installation	3-4
Figure 3-3. Heatsink Diagram	3-5
Figure 3-4. DIMM Installation	3-7
Figure 3-5. Securing the Board Bracket	3-8
Figure 4-1. Main Menu – Screen Shot	4-4
Figure 4-2. General Help Menu	4-7
Figure 4-3. Advanced Menu	4-8
Figure 4-4. CPU Configuration Menu	4-10
Figure 4-5. IDE Configuration Control Menu	4-12
Figure 4-6. Disk Drive Settings	4-17
Figure 4-7. Floppy Configuration Menu	4-23
Figure 4-8. Super IO Configuration Menu	4-25
Figure 4-9. Hardware Health Configuration Menu	4-28
Figure 4-10. ACPI Setup Menu	4-29
Figure 4-11. General ACPI Configuration Menu	4-30
Figure 4-12. ACPI Advanced Menu	4-31
Figure 4-13. Event Log Configuration Menu	4-34
Figure 4-14. ISA Bridge Configuration Menu	4-35
Figure 4-15. Remote Access Configuration Menu	4-37
Figure 4-16. USB Configuration Menu	4-39
Figure 4-17. Gigabit Ethernet Configuration Menu	4-41
Figure 4-18. PCI/PnP Setup Menu	4-43
Figure 4-19. Boot Menu	4-49
Figure 4-20. Boot Settings Configuration Menu	4-50
Figure 4-21. Security Setup Menu	4-59
Figure 4-22. Chipset Setup Menu	4-62
Figure 4-23. Power Setup Menu	4-65
Figure 4-24. Exit Menu	4-74

Tables

Table 2-1. Connector Functions	2-7
Table 2-2. ISA (8-Bit) Bus Pin Assignments	2-21
Table 2-3. ISA (16-Bit) Bus Pin Assignments	2-22
Table 2-4. PCI (32-Bit) Bus Pin Assignments	2-23
Table 2-5. PCI (64-bit) Bus Pin Assignments	2-24
Table 4-1. BIOS Setup Navigation Keys	4-6

▶ Safety Instructions

Contents

Before You Begin	xi
When Working Inside a Computer	xii
Preventing Electrostatic Discharge	xiii



This page intentionally left blank.

► **Before You Begin**

Before handling the PCI-953, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety. Refer to the “Advisories” section in the Preface for advisory conventions used in this user’s guide, including the distinction between Warnings, Cautions, Important Notes, and Notes.

- ◆ Always use caution when handling/operating the computer. Only qualified, experienced, authorized electronics service personnel should access the interior of the computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.
- ◆ Use extreme caution when installing or removing components. Refer to the installation instructions in this user’s guide for precautions and procedures. If you have any questions, please contact Kontron Post-Sales Technical Support.



WARNING



High voltages are present inside the chassis when the unit’s power cord is plugged into an electrical outlet. Turn off system power, turn off the power supply, and then disconnect the power cord from its source before removing the chassis cover. Turning off the system power switch does not remove power to components.

► ***When Working Inside a Computer***

Before taking covers off a computer, perform the following steps:

- 1) Turn off the computer and any peripherals.
- 2) Disconnect the computer and peripherals from their power sources or subsystems to prevent electric shock or system board damage. This does not apply when hot swapping parts.
- 3) Follow the guidelines provided in “Preventing Electrostatic Discharge” on the following page.
- 4) Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

- ◆ To help avoid possible damage to system boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.
- ◆ When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.



CAUTION

Do not attempt to service the system yourself except as explained in this user's guide. Follow installation and troubleshooting instructions closely.



► **Preventing Electrostatic Discharge**

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedure to reduce the risk of damage to components. Kontron strongly encourages you to follow proper ESD procedure, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- ◆ When unpacking a static-sensitive component from its shipping carton, do not remove the component's antistatic packing material until you are ready to install the component in a computer. Just before unwrapping the antistatic packaging, be sure you are at an ESD workstation or grounded. This will discharge any static electricity that may have built up in your body.
- ◆ When transporting a sensitive component, first place it in an antistatic container or packaging.
- ◆ Handle all sensitive components at an ESD workstation. If possible, use antistatic floor pads and workbench pads.
- ◆ Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.
- ◆ Do not handle or store system boards near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

This page intentionally left blank.

Preface

Contents

How to Use This Guide	xvii
Customer Comments	xviii
Advisory Conventions	xix
Unpacking	xx
Regulatory Compliance Statements	xxi
Guarantee and Warranty Policy	xxiii
Guarantee	xxiii
Limited Warranty	xxiii
Return Procedure	xxiv
Limitation of Liability	xxv
Maintaining Your Computer	xxvi
Cleaning Components	xxvi
Environmental Factors	xxvi
Power Protection	xxvii



This page intentionally left blank.

► *How to Use This Guide*

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and upgrades.



Note: Additional technical information, BIOS updates, and drivers are available on our web site, www.kontron.com, under Technical Support.

The following is a summary of the chapter contents:

- ◆ **Chapter 1, Introduction**, presents the product specifications and system architecture for the PCI-953 single board computer.
- ◆ **Chapter 2, Jumpers and Connectors**, shows the definitions and locations of jumpers and connectors that you can easily configure for your system.
- ◆ **Chapter 3, System Installation**, describes how to properly mount the CPU, main memory, as well as how to properly install the PCI-953 into a chassis.
- ◆ **Chapter 4, BIOS Setup Information**, specifies the meaning of each setup parameter and describes how to get advanced BIOS performance. The POST checkpoint list provides a basic troubleshooting guide.
- ◆ **Chapter 5, Troubleshooting**, provides additional information for troubleshooting your system.

▶ *Customer Comments*

If you have any difficulties using this user's guide, discover an error, or just want to provide some feedback, please send us a message using the online form under "Contact Us" on our web site (www.kontron.com) under "Technical Support." Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised user's guide in our online Support Library. Thank you.



Note: You may also use the online form on our web site to submit comments or concerns about our products, or request technical support.

► *Advisory Conventions*

Four types of advisories are used throughout this user's guide to provide helpful information or to alert you to the potential for hardware damage or personal injury. They are Notes, Cautions, and Warnings. The following is an example of each type of advisory. Use caution when servicing any electrical component.



Note: A note is used to make helpful information stand out.



Important: An important note indicates information that is important for you to know.



CAUTION

A CAUTION indicates potential damage to hardware and tells you how to avoid the problem.



WARNING

A WARNING indicates the potential for bodily harm and tells you how to avoid the problem.



Disclaimer: We have tried to identify all situations that may pose a warning or caution condition in this user's guide. However, Kontron does not claim to have covered all situations that might require the use of a Caution or Warning.

Unpacking

When unpacking, follow these steps:

- 1) After opening the box, save it and the packing material for possible future shipment.
- 2) Remove all items from the box. If any items listed on the purchase order are missing, notify Kontron customer service immediately.
- 3) Inspect the product for damage. If there is damage, notify Kontron customer service immediately. Refer to “Guarantee and Warranty Policy” for the return procedure.

▶ **Regulatory Compliance Statements**

This section provides the FCC compliance statement for Class A devices.

▶ **FCC Compliance Statement for Class A Devices**

The product(s) described in this user's guide has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user's guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

Changes or modifications not expressly approved by Kontron could void the user's authority to operate the equipment.



Note: The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interference or to be noncompliant with the appropriate standards for its intended use.

This page intentionally left blank.

➤ **Guarantee and Warranty Policy**

➤ **Guarantee**

A thirty day money-back guarantee is provided on all standard products sold. Special order products are covered by our Limited Warranty, *however they may not be returned for refund or credit. EPROMs, RAM, Flash EPROMs or other forms of solid electronic media are not returnable for credit - but for replacement only.* An extended warranty is available. Consult the factory.

➤ **Refunds**

In order to receive a refund on a product for the purchase price, the product must not have been damaged by the customer or by the common carrier chosen by the customer to return the goods and the product must be returned complete (meaning all user's guides, software, cables, etc.) within 30 days of receipt and in an as-new and resalable condition. The "Return Procedure" must be followed to assure a prompt refund.

➤ **Restocking Charges**

Product returned *after 30 days, and before 60 days*, of the purchase will be subject to a minimum 20% restocking charge and charges for any damaged or missing parts. Products not returned within 60 days of purchase, or products which are not in an as-new and resalable condition, are not eligible for a credit return and will be returned to the customer.

➤ **Limited Warranty**

Effective April 1, 1998, all products carry a 2-year limited warranty. Within 2 years of purchase, Kontron will repair or replace, at our option, any defective product. Kontron will service the warranty for all standard catalog products for the first two years from the date of shipment. Please note: The 2-year warranty may not apply to special promotion items. Please consult the factory for warranty verification.

The limited warranty is void if the product has been subjected to alteration, neglect, misuse, or abuse; if any repairs have been attempted by anyone other than Kontron or its authorized agent; or if the failure is caused by accident, acts of God, or other causes beyond the control of Kontron or the manufacturer. Neglect, misuse, and abuse shall include any installation, operation, or maintenance of the product other than in accordance with the user's guide.

No agent, dealer, distributor, service company, or other party is authorized to change, modify, or extend the terms of this Limited Warranty in any manner whatsoever. Kontron reserves the right to make changes or improvements in any product without incurring any obligation to similarly alter products previously purchased.

Return Procedure

For any Guarantee or Limited Warranty return, please contact Kontron Customer Service at 800-480-0044 or 858-677-0877 and obtain a Return Material Authorization (RMA) Number. All product(s) returned to Kontron for service or credit **must** be accompanied by a Return Material Authorization (RMA) Number. Freight on all returned items **must** be prepaid by the customer who is responsible for any loss or damage caused by common carrier in transit. Returns for Warranty **must** include a Failure Report for each unit, by serial number(s), as well as a copy of the original invoice showing the date of purchase.

To reduce risk of damage, returns of product must be in an Kontron shipping container. If the original container has been lost or damaged, new shipping containers may be obtained from Kontron Customer Service at a nominal cost.

Kontron owns all parts removed from repaired products. Kontron uses new and reconditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If Kontron repairs or replaces a product, its warranty term is not extended.

Kontron will normally return your replacement or repaired items via Second Day Air. Overnight delivery or delivery via other carriers is available at an additional charge.

Shipments not in compliance with this Guarantee and Limited Warranty Return Policy will not be accepted by Kontron.

► Limitation of Liability

In no event shall Kontron be liable for any defect in hardware, software, loss, or inadequacy of data of any kind, or for any direct, indirect, incidental, or consequential damages in connection with or arising out of the performance or use of any product furnished hereunder. Kontron's liability shall in no event exceed the purchase price of the product purchased hereunder. The foregoing limitation of liability shall be equally applicable to any service provided by Kontron or its authorized agent.

Some sales items and customized systems are **not** subject to the guarantee and limited warranty. However in these instances, any deviations will be disclosed prior to sales and noted in the original invoice. **Kontron reserves the right to refuse returns or credits on software or special order items.**

➤ ***Maintaining Your Computer***

➤ **Cleaning Components**

Internal fans cool the computer by drawing in air through air vents in the front of the computer and blowing it out the rear-side panels. Dust and other debris is drawn in with the air and, if allowed to build up, will interfere with the operation of various system components and insulate components, preventing heat from dissipating. To prevent this, an air filter has been installed in front of the air vents in the front panel to block dust and other debris from entering the computer.

Dust and debris builds up on the air filter over time. When the air filter becomes very dirty, it is difficult for cooling air to pass through the air filter and enter the computer. So, the air filter must be cleaned to prevent the computer from overheating. Remove and clean the air filter on a regular basis following the steps described in the “Air Filter” section of Chapter 2. Also, regularly vacuum the exterior of the chassis to remove dust that has accumulated around the air vents.

➤ **Environmental Factors**

➤ *Temperature*

The ambient temperature within an enclosure may be greater than room ambient temperature. Installation in an enclosure should be such that the amount of air flow required for safe operation is not compromised. Consideration should be given to the maximum rated ambient temperature. Overheating can cause a variety of problems, including premature aging and failure of chips or mechanical failure of devices.

If the system has been exposed to abnormally cold temperatures, allow a two-hour warm-up period to bring it up to normal operating temperature before turning it on. Failure to do so may cause damage to internal components, particularly the hard disk drive.

► *Humidity*

High-humidity can cause moisture to enter and accumulate in the system. This moisture can cause corrosion of internal components and degrade such properties as electrical resistance and thermal conductivity. Extreme moisture buildup inside the system can result in electrical shorts, which can cause serious damage to the system.

Buildings in which climate is controlled usually maintain an acceptable level of humidity for system equipment. However, if a system is located in an unusually humid location, a dehumidifier can be used to maintain the humidity within an acceptable range. Refer to the “Specifications” section of this user’s guide for the operating and storage humidity specifications.

► *Altitude*

Operating a system at a high altitude (low pressure) reduces the efficiency of the cooling fans to cool the system. This can cause electrical problems related to arcing and corona effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

► **Power Protection**

The greatest threats to a system’s supply of power are power loss, power spikes, and power surges caused by electrical storms, which interrupt system operation and/or damage system components. To protect your system, always properly ground power cables and one of the following devices.

► *Surge Protector*

Surge protectors are available in a variety of types and usually provide a level of protection proportional with the cost of the device. Surge protectors prevent voltage spikes from entering a system through the AC power cord. Surge protectors, however, do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

▶ *Line Conditioner*

Line conditioners go beyond the overvoltage protection of surge protectors. Line conditioners keep a system's AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors. However, line conditioners cannot protect against a complete loss of power.

▶ *Uninterruptible Power Supply*

Uninterruptible power supply (UPS) systems offer the most complete protection against variations on power because they use battery power to keep the server running when AC power is lost. The battery is charged by the AC power while it is available, so when AC power is lost, the battery can provide power to the system for a limited amount of time, depending on the UPS system.

UPS systems range in price from a few hundred dollars to several thousand dollars, with the more expensive units allowing you to run larger systems for a longer period of time when AC power is lost. UPS systems that provide only 5 minutes of battery power let you conduct an orderly shutdown of the system, but are not intended to provide continued operation. Surge protectors should be used with all UPS systems, and the UPS system should be Underwriters Laboratories (UL) safety approved.

Chapter 1

► Introduction

Contents

Overview	1-3
Checklist	1-5
Product Specifications	1-6
System Architecture	1-8
System Block Diagram	1-9



➤ Overview

- **The PCI-953 single board computer accepts a Pentium 4 CPU and is designed to meet today's demanding application requirements, while maintaining complete compatibility with hardware and software designed for the IBM PC/AT.**

The PCI-953 processor design implements a 478-pin FC-mPGA2 socket for Pentium 4 processors up to 3.4GHz. The PCI-953 utilizes the Intel 875 (Canterwood) chipset, and supports up to 2GB of double data rate (DDR) synchronized dynamic random access memory (SDRAM). The gigabit Ethernet interface provides high performance and full featured connectivity to all segments of the PC market. The enhanced on-board PCI Integrated Drive Electronics (IDE) Ultra ATA/100 interface accommodates two drives at ATA/100/66/33 and supports Ultra DMA100/66/33, BMIDE, and Programmed Input/Output (PIO) mode 4 up to 14MB/second. The integrated Serial ATA (SATA) devices provide a high-speed storage solution with a 150MB/s data transfer rate. The on-board Super I/O Chipset integrates a floppy controller, two serial ports, one Personal System/2 (PS/2) keyboard/mouse controller, one dual and two single Universal Serial Bus 2.0 (USB 2.0) headers.

A Watchdog Timer function allows for a system reset if there is a failure. On-board Flash Read Only Memory (ROM) is used to update the system BIOS. The high precision Real-Time Clock/calendar is built to support Y2K for accurate scheduling and storing configuration information. All of these features make the PCI-953 single board computer excellent in stand-alone applications.

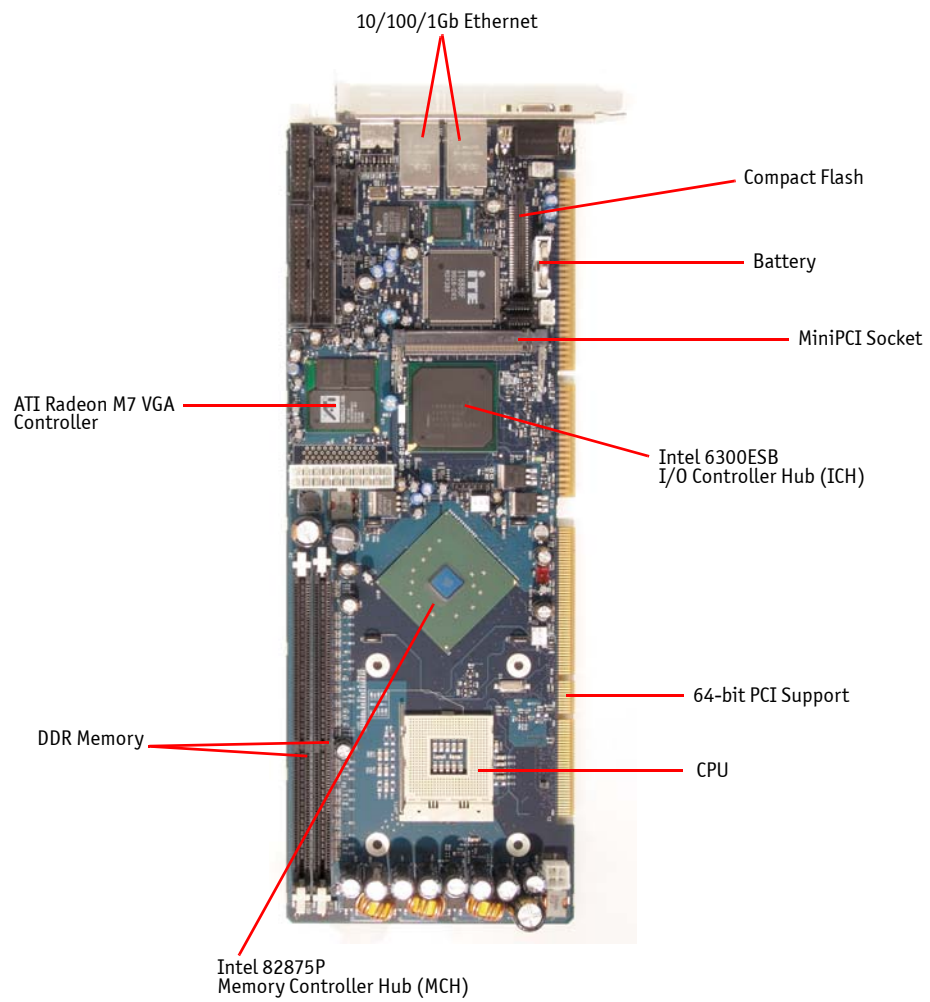


Figure 1-1. PCI-953 Single Board Computer

▶ Checklist

- ◆ PCI-953 Single Board Computer
- ◆ Serial cable
- ◆ USB cables
- ◆ PS/2 'Y-cable'
- ◆ PCI-953 Quick Reference
- ◆ Kontron Driver CD with drivers for all integrated components (supporting Windows 2000/XP).

If any of these items is damaged or missing, please contact Kontron. Save all packing materials for future replacement and maintenance.

► *Product Specifications*

- ◆ **Main processor:** Intel Pentium 4 processor (FC-mPGA2 socket 478) up to 3.4GHz with 400-800MHz FSB
- ◆ **BIOS:** AMI BIOS supporting Desktop Management Interface (DMI), Plug-n-Play (PnP), Advanced Power Management (APM), CPU hyper-threading, and an Advanced Configuration and Power Interface (ACPI) (option)
- ◆ **Main Memory:** Two DDR-400 184-pin DIMM sockets, supporting non-registered, ECC, and non-ECC DDR modules up to 1GB per socket, 2GB total.
- ◆ **Chipset:** Intel 875P chipset
- ◆ **Bus Interface:** Follows the ATX standard (64-bit PCI), fully complies with PCI bus specification V2.2 and PCI-X bus specification 1.0
- ◆ **PCI IDE Interface:** Supports one enhanced ATA/100 IDE port with PIO mode 4 and Ultra DMA/33/66/100 mode transfer and Bus Master features (2nd IDE channel is reserved for the on-board CompactFlash) and two Serial ATA (SATA) ports for a total of 4 fixed Hard Disk Drives (HDD)
- ◆ **Floppy Drive Interface:** Supports one Floppy Disk Drive (FDD) port up to two floppy drives [5.25-inch (360k, 1.2MB), 3.5-inch (720k, 1.2MB, 1.44MB, 2.88MB) diskette format and 3-mode FDD]
- ◆ **Serial Ports:** Supports two high-speed 16C550 compatible UARTs with 16-byte T/R FIFOs
- ◆ **PS/2 Mouse and Keyboard Interface:** Supports one 6-pin Mini-DIN connector for PS/2 mouse and keyboard connections (Y-cable required for PS/2 mouse)
- ◆ **Auxiliary I/O Interfaces:** Power switch, system reset switch, external speaker, HDD LED interface, and I²C
- ◆ **Real-Time Clock (RTC):** Motorola MC146818A-compatible RTC provides 256 bytes of battery backup for 7 year data retention
- ◆ **Watchdog Timer:** Programmable timeout intervals from 1us - 1s or 10ms- 10min

- ◆ **On-board Gigabit Ethernet:** Uses the Intel 82540 Gigabit Ethernet controller to support a Registered Jack 45 (RJ-45) interface at 10/100/1Gb Base-T speed
- ◆ **On-board Gigabit Ethernet:** Uses the Intel 82547 Gigabit Ethernet controller to support a Registered Jack 45 (RJ-45) interface at 10/100/1Gb Base-T speed
- ◆ **Universal Serial Bus 2.0 (USB 2.0):** Supports a dual USB 2.0 port accessible via a 10-pin header and two additional ports accessible via 5-pin headers
- ◆ **On-board AGP VGA:** Features an AGP 2.0 ATI M7 video chip with 32MB of dedicated video memory
- ◆ **MiniPCI Slot:** Supports a 32-bit miniPCI slot for system expansion
- ◆ **External Power Connectors:** Supports standard ATX and ATX-12V power connectors to provide additional power for embedded applications
- ◆ **Power Good:** On-board power good generator with reset time of 300 – 500ms
- ◆ **CPU Cooling Fan:** Supports one 3-pin header
- ◆ **Chassis Fans:** Supports one 3-pin header
- ◆ **System Monitoring Bus (SMBus) Feature:** Monitors the CPU and system temperatures, operating voltages, and fan status
- ◆ **Physical and Environmental Requirements:**
 - ◆ Dimension (L X W): 13.3 X 4.8 in (330 X 121.8mm)
 - ◆ Operating Temperature: 5 °C to 50 °C (41 °F to 122 °F)
 - ◆ Storage Temperature: -10 °C to 60 °C (14 °F to 140 °F)
 - ◆ Relative Humidity: 20% to 80%, non-condensing

▶ **System Architecture**

The following block diagram illustrates how the PCI-953 single board computer provides a highly integrated system solution. The system architecture of the PCI-953 single board computer includes two main VLSI chips, the Intel 875P MCH and Intel 6300ESB ICH to support a Pentium 4 processor with a front side bus (FSB) up to 800MHz, DDR-400 SDRAM, PCI and PCI-X bus interfaces, advanced power management (APM), ACPI-complaint power managment, SMBus communication, SATA, and Ultra DMA/33/66/100 IDE Bus Master. The on-board super I/O chip, LPC47B27X, supports a PS/2 keyboard/mouse, two UARTs (16550 compatible), and floppy drives. In addition, the two on-board gigabit Ethernet devices provide the user with additional flexibility and reliability.

The Intel 875 (Canterwood) Memory Controller Hub (MCH) provides a 64-bit AGTL+ based host bus interface, optimized 128-bit DRAM interface supporting two DDR-400 DIMMs at the maximum bus frequency of 400MHz. The 8Mbit non-volatile Flash memory supports the ability to Write Protect Flash under BIOS control. The 64-bit PCI-X bus interface supports 32-bit and 64-bit PCI at 33/66MHz.

The Intel 6300ESB ICH employs the Accelerated Controller Hub architecture which makes a direct connection from the memory to IDE controllers. It supports 2-channel dedicated Ultra DMA-33/66/100 IDE master interfaces, full Plug-and-Play compatibility, Advanced Programmable Interrupt Controller (APIC) interface, and internal real-time clock (RTC) to maintain the time and date of a system. It also supports dual-port USB-2.0 and PCI 2.2 Compliance operation. The Hub fully supports Operating System Directed Power Management via the Advanced Configuration and Power Interface (ACPI) specification.

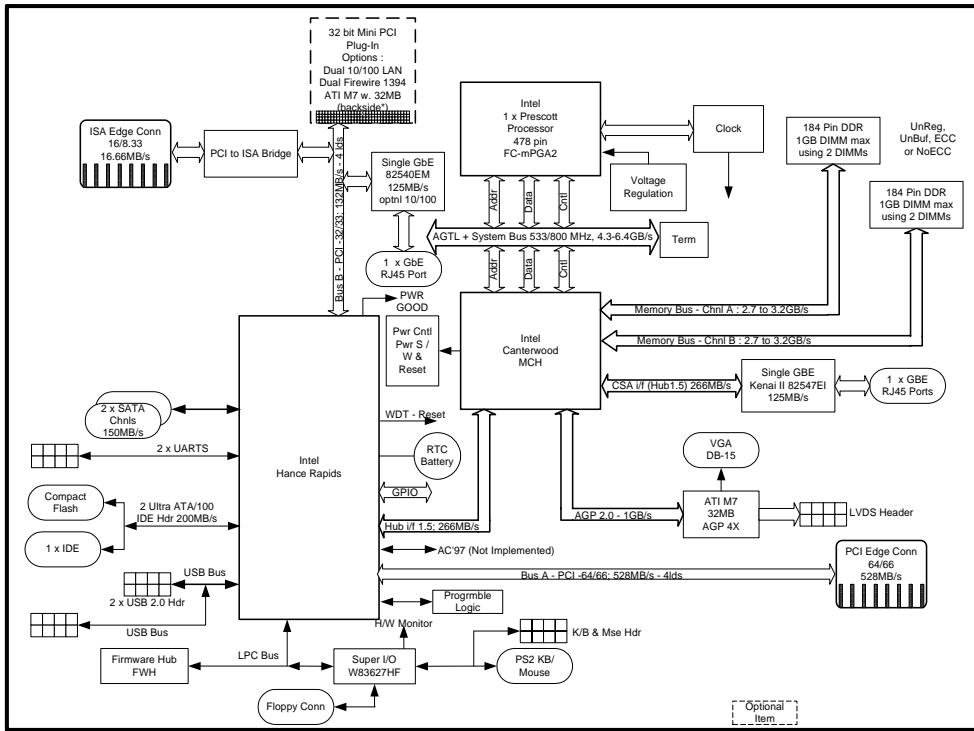
The Super I/O chip LPC47B27X integrates two high speed serial ports, a FDD interface, and an 8042 keyboard controller with a PS/2 mouse port.

In addition, an advanced feature is used on the PCI-953 single board computer to support detection and monitoring of the system temperature, operating voltage, and fan status.

There are two on-board PCI gigabit Ethernet devices via RJ-45 ports hard-mounted to the board bracket.

All of the details of operating relations are shown in the "System Block Diagram" on the following page.

System Block Diagram



Introduction

This page intentionally left blank.

Chapter 2

► Hardware Settings

Contents

Overview	2-3
Jumpers	2-3
Clear CMOS Operation.....	2-5
Connectors.....	2-6
Connector Pin Assignments	2-8



➤ Overview

This chapter provides the definitions and locations of jumpers, headers, and connectors. The PCI-953 is a jumperless board, which is controlled by the BIOS settings. It is not necessary to configure any jumpers for this board unless you intend to clear CMOS memory. CMOS Settings on the PCI-953 single board computer are shipped with the default settings. The default settings are marked with a star (*).

➤ Jumpers

In general, the jumpers are used to select options for certain features (Figure 2-1). Some jumpers are user-configurable, allowing system enhancement. Other jumpers are used for testing purposes only and should not be altered. To select any option, insert the jumper cap (Short) or remove (NC) the jumper cap from the jumper pins according to the diagram below. (Here NC stands for “Not Connected”.)

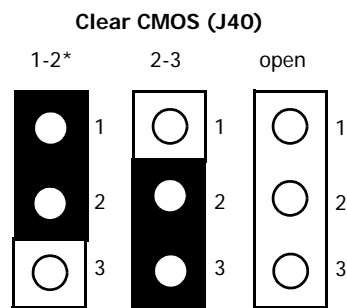


Figure 2-1. Example of a 3-pin jumper

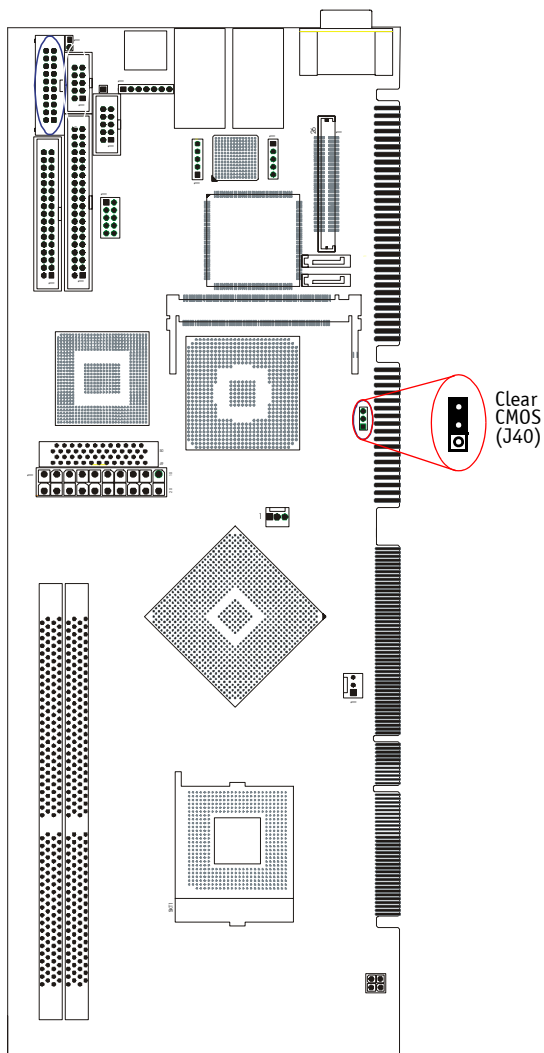


Figure 2-2. Jumper Locations

► Clear CMOS Operation

The following table indicates how to enable/disable the CMOS Clear Function hardware circuit by inserting a jumper at the proper position.

JP1	Description
1-2	Normal Operation
2-3	Clear CMOS Contents

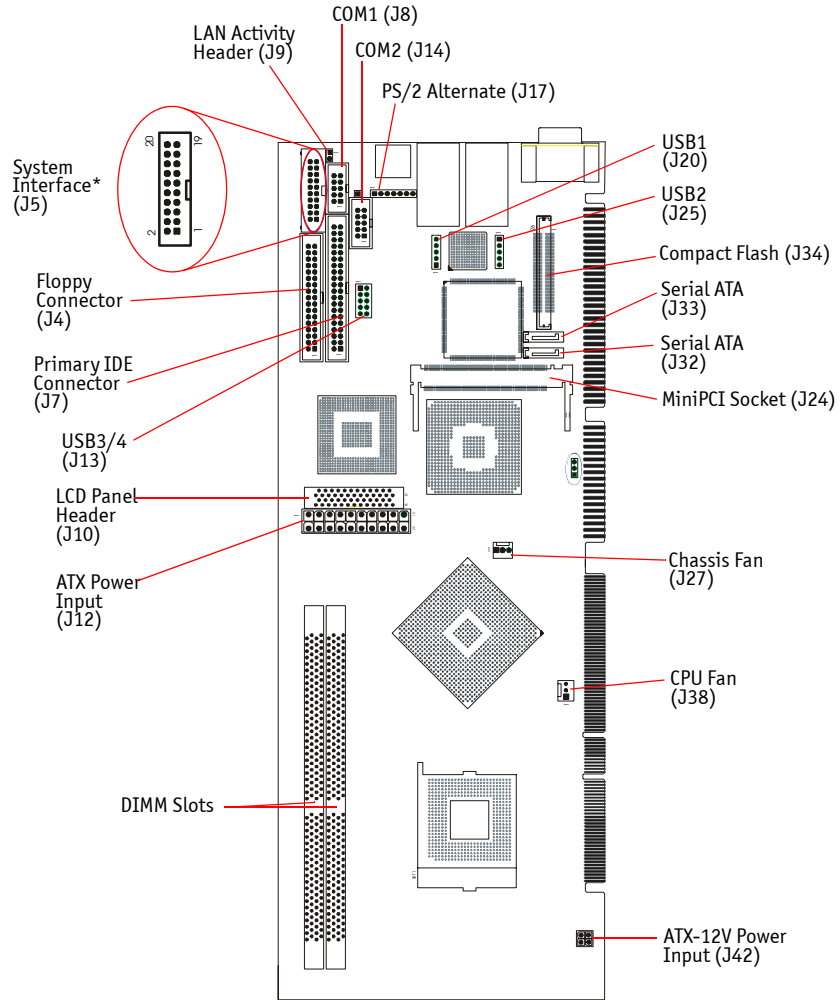
To Clear CMOS and then reload the BIOS default settings, follow these steps:

- 1) Disconnect all power to the system.
- 2) Move the jumper at JP1 from pins 1-2 to pins 2-3 and leave installed for several seconds (Clear CMOS Contents).
- 3) With system power turned off, move the jumper at JP1 from pins 2-3 back to pins 1-2 (Normal Operation).
- 4) Reconnect the system power and turn on the system. The message "CMOS settings wrong" and "CMOS date/time not set" will be displayed and the system will hold up.

Follow the displayed messages to reload the BIOS default settings.

Connectors

I/O peripheral devices are connected to the connectors as described in this section (Figure 2-2).



* Refer to Figure 2-4 for pin numbering assignments.

Figure 2-3. Connector Locations

Table 2-1. Connector Functions		
Connector	Function	Remark
J4	Floppy	34-pin shrouded header
J5	System Interface Connector	20-pin shrouded header
J7	Primary IDE Connector	40-pin shrouded header
J8	COM1	10-pin shrouded header
J9	LAN Activity header	2-pin header
J10	LCD Panel (LVDS)	50-pin shrouded header
J12	ATX Power Input	20-pin keyed header
J14	COM2	10-pin shrouded header
J17	PS/2 Alternate	7-pin unshrouded header
J18	PS/2 Keyboard/Mouse	PS/2 fixed rear panel mount
J20	USB 1	5-pin unshrouded header
J24	MiniPCI Socket	124-pin socket
J25	USB2	5-pin shrouded header
J27/J38	Chassis/CPU Fans	3-pin friction lock headers
J32/J33	Serial ATA	7-pin vertical headers
J34	CompactFlash	50-pin unshrouded header
J40	Clear CMOS	3-pin header
J42	ATX12V Power Connector	4-pin keyed header
LAN1/LAN2	Dual 10/100/1GB Ethernet Ports 1-2	Dual RJ-45 with 4 LEDs
VGA	Fixed rear panel VGA connector	HBD-15 connector
J13	USB3/ USB4 – Dual USB Interface	10-pin unshrouded header
DIMM 1-2	DIMM socket	2.5V DDR-400

► Connector Pin Assignments

J4: Floppy Connector			
Pin	Signal	Pin	Signal
1	GND	2	DENSEL
3	GND	4	NC
5	NC	6	DRATE0
7	GND	8	INDEX#
9	GND	10	MTR0#
11	GND	12	DRVS1#
13	GND	14	DRVSO#
15	GND	16	MRT1#
17	GND	18	DIR#
19	GND	20	STEP#
21	GND	22	WDATA#
23	GND	24	WGATE#
25	GND	26	TRKO#
27	GND	28	WRPRT#
29	GND	30	RDATA#
31	GND	32	HDSEL#
33	GND	34	DSKCHG#

J5: System Interface Connector (Figure 2-4)			
Pin	Signal	Pin	Signal
1	Speaker	2	+5V
3	I2C Data	4	I2C Clock
5	NC	6	NC
7	NC	8	GND
9	Intruder#	10	GND
11	PME#	12	GND
13	PWRBTN#	14	GND
15	RESET#	16	GND
17	PWR_LED	18	GND
19	HDD_ACT_LED#	20	Pull-up

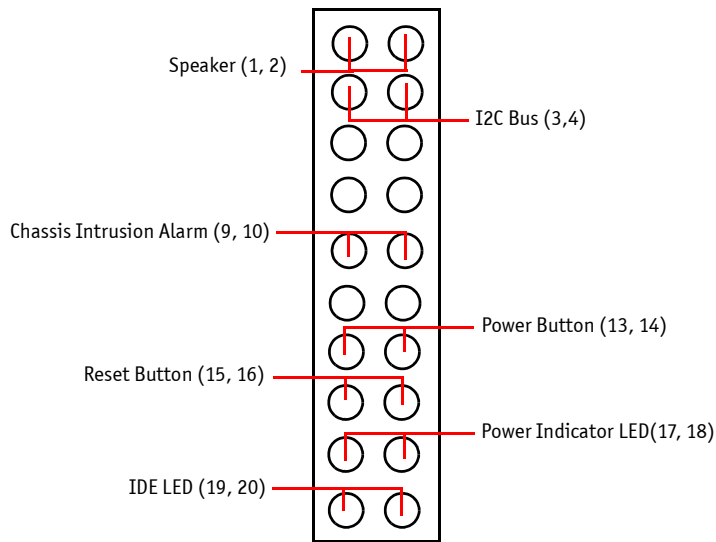


Figure 2-4. System Interface Connector – Pin Assignments

J7: Primary EIDE ATA Interface			
Pin	Signal	Pin	Signal
1	RESET#	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	Removed
21	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	Pull-down
29	DMA ACK#	30	Ground
31	INT REQ	32	NC
33	SA1	34	NC
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	ADD Active#	40	Ground

J10: LVDS LCD Panel Header			
Pin	Signal	Pin	Signal
1	NC	2	GND
3	TXOUT_L0-	4	GND
5	TXOUT_L0+	6	GND
7	TXOUT_L1-	8	GND
9	TXOUT_L1+	10	GND
11	TXOUT_L2-	12	GND
13	TXOUT_L2+	14	GND#
15	TXOUT_L3-	16	GND
17	TXOUT_L3+	18	GND
19	TXCLK_L-	20	GND
21	TXCLK_L+	22	GND
23	TXOUT_U0-	24	GND
25	TXOUT_U0+	26	GND
27	TXOUT_U1-	28	GND
29	TXOUT_U1+	30	GND
31	TXOUT_U2-	32	GND
33	TXOUT_U2+	34	GND
35	TXOUT_U3-	36	GND
37	TXOUT_U3+	38	GND
39	TXCLK_U-	40	GND
41	TXCLK_U+	42	GND
43	NC	44	GND

J10: LVDS LCD Panel Header			
Pin	Signal	Pin	Signal
45	DIGON	46	GND
47	BLON#	48	GND
49	NC	50	GND

J8/J14: COM1/COM2 Serial Port			
Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCD)	2	Data Set Ready (DSR)
3	Receive Data (RXD)	4	Request to Send (RTS)
5	Transmit Data (TXD)	6	Clear to Send (CTS)
7	Data Terminal Ready (DTR)	8	Ring Indicator (RI)
9	Ground (GND)	10	NC

J12: ATX Power Input			
Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON#
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PWR OK	18	-5V
9	+5VSBY	19	+5V
10	+12V	20	+5V

J17: PS/2 Alternate Header	
Pin	Signal
1	Keyboard Clock
2	Ground
3	Keyboard Data
4	+5V (fused)
5	Key
6	Mouse Clock
7	Mouse Data

J18: PS/2 Keyboard/Mouse Combo	
Pin	Signal
1	Keyboard Data
2	Mouse Data
3	GND
4	+5V (fused)
5	Keyboard Clock
6	Mouse Clock

J20/J25: USB1/USB2 Interfaces	
Pin	Signal
1	VCC
2	DATA -
3	DATA +
4	GND
5	Shield

J27: Chassis Fan	
Pin	Signal
1	FAN_status (pull-up 5V)
2	12V
3	GND

J24: MiniPCI Socket					
Pin	Signal	Pin	Signal	Pin	Signal
1	TIP	2	RING	3	8PMJ3
4	8PMJ1	5	8PMJ6	6	8PMJ2
7	8PMJ7	8	8PMJ4	9	8PMJ8
10	8PMJ5	11	LED1_GRNP	12	LED2_YELP
13	LED1_GRNN	14	LED2_YELN	15	NC
16	NC	17	INTB#	18	+5V
19	+3.3V	20	INTA#	21	Reserved
22	Reserved	23	GND	24	+3.3V Aux
25	CLK	26	-RST	27	GND
28	+3.3V	29	REQ#	30	GNT#
31	+3.3V	32	GND	33	AD31
34	PME#	35	AD29	36	Reserved
37	GND	38	AD30	39	AD27
40	+3.3V	41	AD25	42	AD28
43	Reserved	44	AD26	45	CBE3#
46	AD24	47	AD23	48	IDSEL
49	GND	50	GND	51	AD21
52	AD22	53	AD19	54	AD20
55	GND	56	PAR	57	AD17
58	AD18	59	CEB2#	60	AD16
61	IRDY#	62	GND	63	+3.3V
64	FRAME#	65	CLKRUN#	66	TRDY#

J24: MiniPCI Socket					
Pin	Signal	Pin	Signal	Pin	Signal
67	SERR#	68	STOP#	69	GND
70	+3.3V	71	PERR#	72	DEVSEL#
73	CBE#1	74	GND	75	AD14
76	AD15	77	GND	78	AD13
79	AD12	80	AD11	81	AD10
82	GND	83	GND	84	AD9
85	AD8	86	CBE0#	87	AD7
88	+3.3V	89	+3.3V	90	AD6
91	AD5	92	AD4	93	Reserved
94	AD2	95	AD3	96	AD0
97	+5V	98	Reserved	99	AD1
100	Reserved	101	GND	102	GND
103	AC_SYCN	104	M66EN	105	AC_SDATA_INA
106	AC_SDATA_OUT	107	AC_BIT_CLK	108	AC_SDATA_INB
109	AC_PRIMARY#	110	AC_RST#	111	MOD_AUDIO_OUT
112	Reserved	113	AUDIO_GND	114	GND
115	SYS_AUDIO_OUT	116	SYS_AUDIO_IN	117	SYS_AUDIO_OUT_GND
118	SYS_AUDIO_IN_GND	119	AUDIO_GND	120	AUDIO_GND
121	Reserved	122	MPCIACT#	123	VCC5A
124	3.3VAUX				

J32/J33 : Serial ATA Connectors	
Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

J34: CompactFlash (Secondary IDE)			
Pin	Signal	Pin	Signal
1	GND	26	Pull-up
2	Data3	27	Data11
3	Data4	28	Data12
4	Data5	29	Data13
5	Data6	30	Data14
6	Data7	31	Data15
7	CS0#	32	CS1#
8	GND	33	GND
9	GND	34	IOR#
10	GND	35	IOW#
11	GND	36	+3.3V

J34: CompactFlash (Secondary IDE)			
Pin	Signal	Pin	Signal
12	GND	37	IRQ
13	+3.3V	38	+3.3V
14	GND	39	CF_BOOT_EN#
15	GND	40	NC
16	GND	41	RST#
17	GND	42	IORDY
18	SA2	43	NC
19	SA1	44	+3.3V
20	SA0	45	CF_ACT#
21	Data0	46	NC
22	Data1	47	Data8
23	Data2	48	Data9
24	Pull-down	49	Data10
25	Pull-up	50	GND

J37: CPU Fan	
Pin	Signal
1	FAN_status (pull-up 5V)
2	12V
3	GND

J42: ATX12V Power Connector			
Pin	Signal	Pin	Signal
3	+12V	1	GND
4	+12V	2	GND

LAN1/LAN2: 10/100/1Gb Ethernet Ports 1-2	
Pin	Signal
1	TRP1+
2	TRP1-
3	TRP2+
4	TRP3+
5	TRP3-
6	TRP2-
7	TRP4+
8	TRP4-

USB 3/ USB 4: Dual USB Interface				
Pin	Signal	Pin	Signal	
USB Port 3	1	VCC	2	Shield
	3	DATA [0]-	4	GND
	5	DATA [0]+	6	DATA [1]+
	7	GND	8	DATA [1]-
	9	Shield	10	VCC
		USB Port 4		

VGA: VGA Connector (hard-mounted to rear I/O)	
Pin	Signal
1	R
2	G
3	B
4	NC
5	GND
6	GND
7	GND
q	GND
9	+5V (fused)
10	GND
11	NC
12	DDCDAT
13	HSYNC
14	VSYNC
15	DDCCLK

Table 2-2. ISA (8-Bit) Bus Pin Assignments

XT (8-Bit) Bus Side A		XT (8-Bit) Bus Side B	
Pin	Description	Pin	Description
1	I/OCHK#	1	Ground
2	SD7	2	Reset
3	SD6	3	+5 Volts
4	SD5	4	IRQ2 or 9
5	SD4	5	-5 Volts
6	SD3	6	DRQ2
7	SD2	7	-12 Volts
8	SD1	8	0WS#
9	SD0	9	+12 Volts
10	I/OCHRDY	10	Ground
11	AEN	11	SMEMW#
12	SA19	12	SMEMR#
13	SA18	13	IOW#
14	SA17	14	IOR#
15	SA16	15	DACK3#
16	SA15	16	DRQ3
17	SA14	17	DACK1#
18	SA13	18	DRQ1
19	SA12	19	REFRESH#
20	SA11	20	CLK
21	SA10	21	IRQ7
22	SA9	22	IRQ6
23	SA8	23	IRQ5
24	SA7	24	IRQ4
25	SA6	25	IRQ3
26	SA5	26	DACK2#
27	SA4	27	T/C
28	SA3	28	BALE
29	SA2	29	+5Volts
30	SA1	30	OSC
31	SA0	31	Ground

Table 2-3. ISA (16-Bit) Bus Pin Assignments

AT (16-Bit) Side C		AT (16-Bit) Side D	
Pin	Description	Pin	Description
1	SBHE#	1	MEMCS16#
2	LA23	2	I/OCS16#
3	LA22	3	IRQ10
4	LA21	4	IRQ11
5	LA20	5	IRQ12
6	LA19	6	IRQ15
7	LA18	7	IRQ14
8	LA17	8	DACK0#
9	MEMR#	9	DRQ0#
10	MEMW#	10	DACK5#
11	SD08	11	DRQ5
12	SD09	12	DACK6#
13	SD10	13	DRQ6#
14	SD11	14	DACK7#
15	SD12	15	DRQ7
16	SD13	16	5VDC
17	SD14	17	MASTER#
18	SD15	18	GROUND

Table 2-4. PCI (32-Bit) Bus Pin Assignments

I/O Pin	Description	I/O Pin	Description	I/O Pin	Description	I/O Pin	Description
E01	TRST#	E32	AD16	F01	-12V	F32	AD17
E02	+12V	E33	+3.3V	F02	TCK	F33	C/BE2#
E03	TMS	E34	FRAME#	F03	GND	F34	GND
E04	TDI	E35	GND	F04	TDO	F35	IRDY#
E05	+5V	E36	TRDY#	F05	+5V	F36	+3.3V
E06	INTA#	E37	GND	F06	+5V	F37	DEVSEL#
E07	INTC#	E38	STOP#	F07	INTB#	F38	GND
E08	+5V	E39	+3.3V	F08	INTD#	F39	LOCK#
E09	RESERVED	E40	SDONE	F09	PRSNT1#	F40	PERR#
E10	+5V	E41	SB0#	F10	RESERVED	F41	+3.3V
E11	RESERVED	E42	GND	F11	PRSNT2#	F42	SERR#
E12	GND	E43	PAR	F12	GND	F43	+3.3V
E13	GND	E44	AD15	F13	GND	F44	C/BE1#
E14	RESERVED	E45	+3.3V	F14	RESERVED	F45	AD14
E15	RST#	E46	AD13	F15	GND	F46	GND
E16	+5V	E47	AD11	F16	CLK	F47	AD12
E17	GNT#	E48	GND	F17	GND	F48	AD10
E18	GND	E49	AD9	F18	REQ#	F49	GND
E19	RESERVED	E50	KEY	F19	+5V	F50	KEY
E20	AD30	E51	KEY	F20	AD31	F51	KEY
E21	+3.3V	E52	C/BE0#	F21	AD29	F52	AD8
E22	AD28	E53	+3.3V	F22	GND	F53	AD7
E23	AD26	E54	AD6	F23	AD27	F54	+3.3V
E24	GND A24	E55	AD4	F24	AD25	F55	AD5
E25	AD24	E56	GND	F25	+3.3V	F56	AD3
E26	IDSEL	E57	AD2	F26	C/BE3#	F57	GND
E27	+3.3V	E58	AD0	F27	AD23	F58	AD1
E28	AD22	E59	+5V	F28	GND	F59	+5V
E29	AD20	E60	REQ64#	F29	AD21	F60	ACK64#
E30	GND	E61	+5V	F30	AD19	F61	+5V
E31	AD18	E62	+5V	F31	+3.3V	F62	+5V

Table 2-5. PCI (64-bit) Bus Pin Assignments

I/O Pin	Description	I/O Pin	Description
E63	GND	F63	Reserved
E64	C/BE7#	F64	GND
E65	C/BE5#	F65	C/BE6#
E66	+5V	F66	C/BE4#
E67	PAR64	F67	GND
E68	AD62	F68	AD63
E69	GND	F69	AD61
E70	AD60	F70	+5V
E71	AD58	F71	AD59
E72	GND	F72	AD57
E73	AD56	F73	GND
E74	AD54	F74	AD55
E75	+5V	F75	AD53
E76	AD52	F76	GND
E77	AD50	F77	AD51
E78	GND	F78	AD49
E79	AD48	F79	+5V
E80	AD46	F80	AD47
E81	GND	F81	AD45
E82	AD44	F82	GND
E83	AD42	F83	AD43
E84	+5V	F84	AD41
E85	AD40	F85	GND
E86	AD38	F86	AD39
E87	GND	F87	AD37
E88	AD36	F88	+5V
E89	AD34	F89	AD35
E90	GND	F90	AD33
E91	AD32	F91	GND
E92	Reserved	F92	Reserved
E93	GND	F93	Reserved
E94	Reserved	F94	GND

Chapter 3

► System Installation

Contents

Overview	3-3
Pentium 4 Processor.....	3-3
Main Memory	3-6
Installing Memory	3-6
Installation	3-8
INF Chipset Component Driver	3-9
Ethernet Driver Support.....	3-9
Video Driver Support	3-9
On-board LED Indicator (for LAN status)	3-9



➤ Overview

This chapter describes how to set up your system, add processors and memory, and install the PCI-953 single board computer into a chassis.

➤ Pentium 4 Processor

➤ Installing a CPU

- 1) Lift the CPU socket lever on the board outwards and upwards (Figure 3-1).
- 2) Align the processor pins with the pin holes in the socket. Make sure the notched corner or dot mark (pin 1) of the CPU corresponds to the socket's beveled end. Press down on the CPU gently until it fits into place.
- 3) Push down on the lever to lock the processor chip into the socket.
- 4) Apply some thermal paste to the center of the processor to prepare for installing the heatsink.

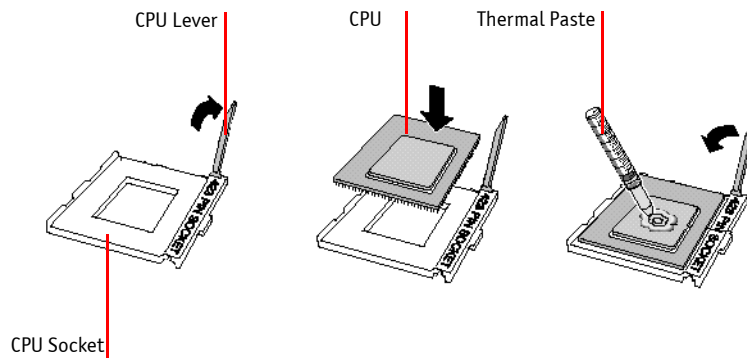


Figure 3-1. Mounting Processors – Exploded Diagram

► *Installing the Heatsink*

- 1) After installing the processor, locate the heatsink and all of its associated mounting accessories (X-bracket, screws, retention mechanism, and retention clips).
- 2) Position the X-bracket so that the pegs are aligned with the screw holes around the CPU socket from the rear side of the board, allowing the pegs to enter through the board.
- 3) Lay the board down on a flat surface with the front side facing up so that the pegs from the X-bracket protrude through the front side. Align the holes on the retention mechanism with the pegs from the X-bracket and position the retention mechanism so that it can be secured to the X-bracket.
- 4) Once joined together, use the four screws to secure the brackets together from the front side of the board.

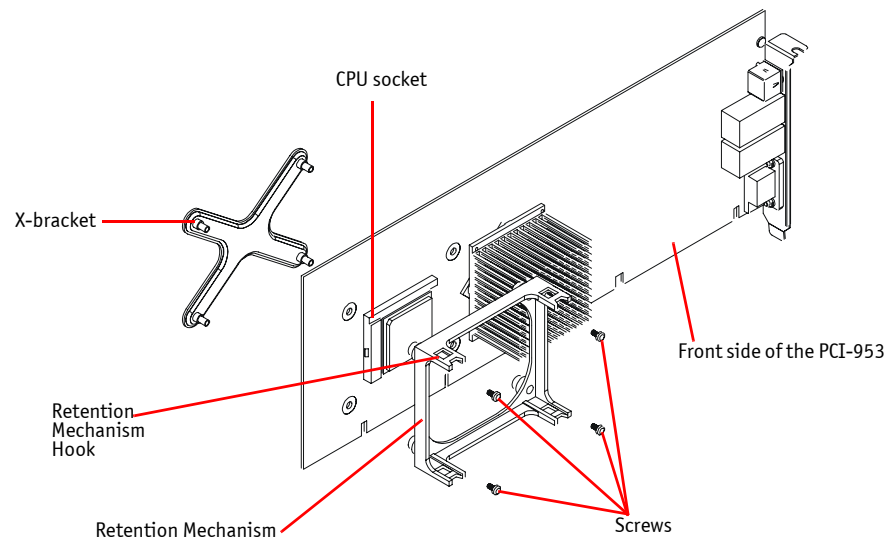


Figure 3-2. Heatsink Installation

- 5) Lay the board flat on a table and place the heatsink on top of the CPU. Apply slight down-pressure on the heatsink, while moving it back-and-forth (clockwise to counter-clockwise) to enhance thermal contact between the CPU and the heatsink.

- 6) Once in position, place a retention clip on either side of the heatsink and the retention mechanism. Secure the opposite side of the thumb tab on the retention clip to the hook on the plastic retention mechanism. Press down on the thumb tab to apply pressure to the heatsink across the top and secure to the hook on the other side of the plastic retention bracket (Figure 3-2). Perform this step on both sides of the heatsink.

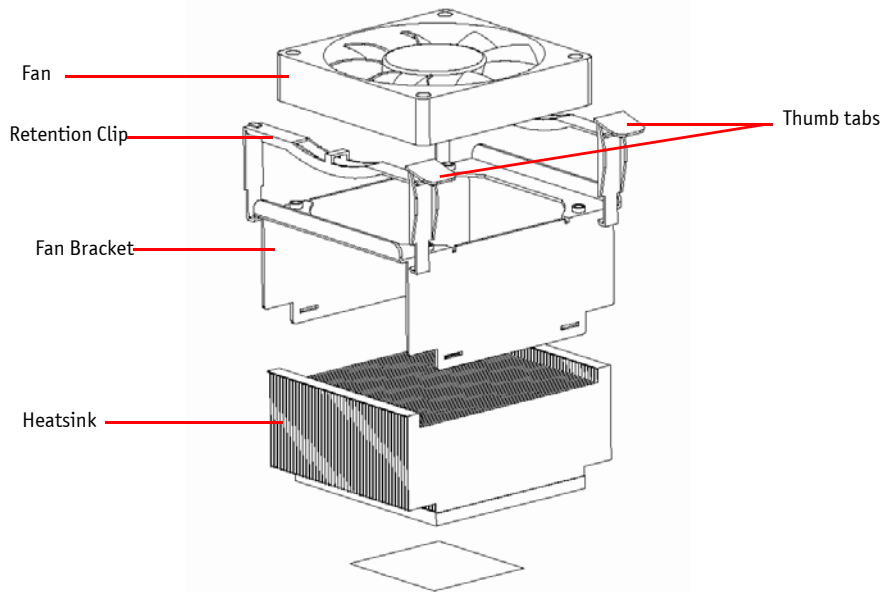


Figure 3-3. Heatsink Diagram

► Main Memory

The PCI-953 single board computer provides two DDR-400, 184-pin DIMM sockets, which support non-registered, ECC, and non-ECC DDR modules up to 1GB per socket, 2GB total. The maximum memory size for 2.5V DDR-400 SDRAM is 1GB per socket, 2GB total unbuffered. Different size DRAM modules may be used. **The PCI-953 single board computer will automatically detect the memory clock, based on the processor and SDRAM used.**

For system compatibility and stability, do not use generic DIMM. Use single- or double-sided DDR-400 DIMM modules.



Note: For system stability, do not change any of the DRAM parameters in BIOS setup to upgrade your system performance. See Chapter 4 for details.



CAUTION)

DIMM sockets are very durable but can be broken. Use extreme care when removing a DIMM from a socket. Make sure the DIMM is in the correct orientation before installation. **Any DIMM sockets broken due to abuse, mishandling or accident are not covered under the warranty.**



CAUTION)

Be sure to take proper electrostatic precautions **before** starting any work. See "Preventing Electrostatic Discharge" on page xiii.



► Installing Memory



Important: Although the MCH can run with single channel memory (with only one module installed), it is recommended that the memory be populated in pairs to gain the advantage of dual channels (Figure 1-1).

To add a DIMM card to the single board computer, follow these steps:

- 1) Move the module release levers on the single board computer (one on each end of the socket) outward, away from the socket (Figure 3-4).
- 2) Place the DIMM card so that the two notches on the contact edge line up with the two alignment nodes in the DIMM socket. Insert the DIMM card into the socket.

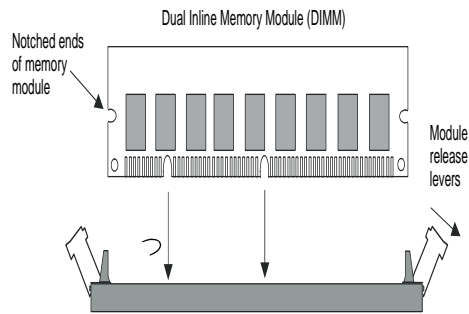


Figure 3-4. DIMM Installation

- 3) Using both hands, press downward and guide the DIMM card into the socket until it snaps into place. The module release levers will return to their upright position when the DIMM card is completely seated in the socket. The pegs on the tips of the release levers should align with the notches on both ends of the DIMM card.

► Installation

To install the PCI-953 single board computer into a chassis, perform the following steps:

- 1) Install the processor and memory modules (Figure 3-1 and Figure 3-4).
- 2) Make sure that a PICMG-1.0 backplane is properly secured in the desired chassis.
- 3) Align the PCI-953's edge connectors with the PICMG-1.0 slot on the backplane and firmly press straight down (Figure 3-5). If it does not slide into place, check the alignment and try again. (Do not force the board into the slot.)
- 4) Secure the I/O board bracket to the chassis with a screw.

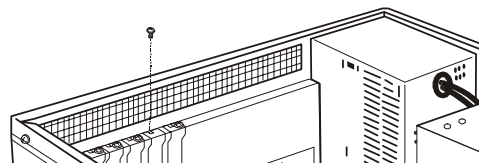


Figure 3-5. Securing the Board Bracket

- 5) Attach cables to the existing peripheral devices and secure them.



Important: It is necessary to use a Y-cable for the power supply's 20-pin ATX Power connector to connect power to both the backplane and the PCI-953 single board computer. Both the backplane and the SBC must be supplied power independently in order for the system boot.

-
- 6) Refer to the manual that came with your backplane for additional installation instructions.



Note: Refer to the following pages for instructions on how to install the INF/LAN drivers.

▶ **INF Chipset Component Driver**

Install the INF chipset component driver from the Kontron CPU Board Driver CD before installing any other drivers. The Intel 875 (Canterwood) chipset driver appears as "INF" in the /Chipset directory of the Kontron CPU Board CD.

▶ **Ethernet Driver Support**

In a Windows environment, the Intel 82547 Gigabit Ethernet appears as "Intel PRO" in the /Ethernet directory of the Kontron CPU Board Driver CD.

▶ **Video Driver Support**

In a windows environment, the ATI Radeon M7 video driver appears as "ATI M7" in the /Video directory of the Kontron CPU Board Driver CD.

▶ **On-board LED Indicator (for LAN status)**

The PCI-953 single board computer provides two LED indicators to show the status of the gigabit ethernet interfaces.

This page intentionally left blank,

Chapter 4

► BIOS Setup

Contents

Overview	4-3
Main Menu	4-4
The Menu Bar	4-5
The Legend Bar	4-6
Advanced Menu	4-8
PCI/PnP Setup	4-43
Boot Menu	4-49
Security Setup	4-58
Chipset Setup	4-62
Power Setup	4-65
Exit Menu	4-74



► **Overview**

The PCI-953 single board computer is equipped with the AMI BIOS, which is stored in Flash ROM. This AMI BIOS features a built-in setup program, allowing users to modify the system configuration. The system configuration is stored in CMOS RAM so it is retained during power-off periods. When the computer is turned on, the PCI-953 communicates with peripheral devices and checks its hardware resources against the information stored in CMOS memory. If an error is detected or CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors will abort the start-up.

The Setup program is for viewing and changing the BIOS settings for a computer. Setup is accessed by pressing the [Del] key after the POST memory test begins and before the operating system boot begins.

► Main Menu

To start the AMI BIOS Setup utility, turn on or reboot your system. AMI BIOS displays this message:

Press to enter SETUP

Pressing [DEL] displays the Main Menu, which looks like this:

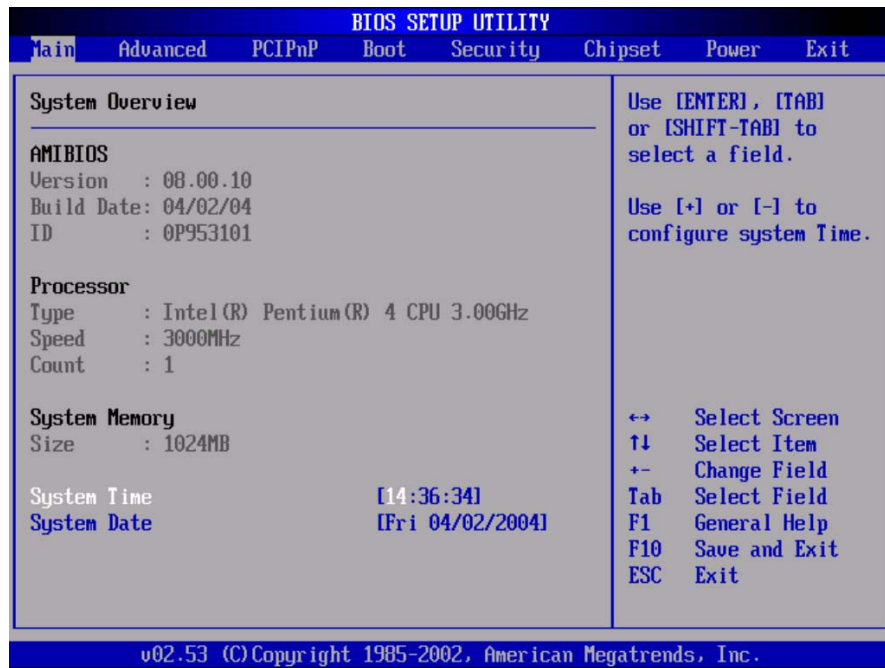


Figure 4-1. Main Menu – Screen Shot

See page 4 - 7 for a description of the fields on this menu.

▶ The Menu Bar

The Menu Bar at the top of the window lists these selections:

Main	Use this menu for basic system configuration.
Advanced	Use this menu to set the Advanced Features available on your system's chipset.
PCI PnP	Use this menu to configure and assign IRQs to onboard peripheral devices.
Boot	Use this menu to configure the order of bootable devices.
Security	Use this menu to set security permissions.
Chipset	Use this menu to configure the North and South Bridges.
Power	Use this menu to configure power management.
Exit	Exits the system setup and saves settings to CMOS.

Use the left and right arrow keys to make a selection.

See the section below, "Exiting Setup," for a description on exiting the Main Menu.

▶ The Legend Bar

In the BIOS setup, you can use the keyboard to choose among options or modify the system parameters to match the options with your system. The table below will show you all the keystroke functions in BIOS setup and their alternates.

Table 4-1. BIOS Setup Navigation Keys

Key	Functions
[F1]	Obtain general help on Setup navigation keys
[Esc]	Main Menu – Quit and do not save changes into CMOS Status Page Setup Menu Option Page Setup Menu – Exit current page and return to the Main Menu
Left or right arrows	Move to the item on the left or right (menu bar)
Up or down arrows	Move cursor up and down
[Tab] or [Shift-Tab]	Cycle cursor up and down
[Home] or [End]	Move cursor to top or bottom of window
[PgUp] or [PgDn]	Move cursor to previous or next page
[F9]	Load the default configuration values for this menu
[F10]	Save and exit
[Enter]	Execute command or select submenu.
[F10]	Save all CMOS changes and exit.

To select an item, use the arrow keys to move the cursor to the field you want. Then use the plus-and-minus value keys to select a value for that field. The Save Values commands in the Exit Menu saves the values currently displayed in all the menus.

To display a sub menu, use the arrow keys to move the cursor to the sub menu you want. Then press [Enter]. A pointer (▶) marks all sub menus.

➤ *Field Help Window*

The help window on the right side of each menu displays the help text for the currently selected field. It updates as you move the cursor to each field.

➤ *General Help Window*

Pressing [F1] on any menu brings up the General Help window that describes the legend keys and their alternates:

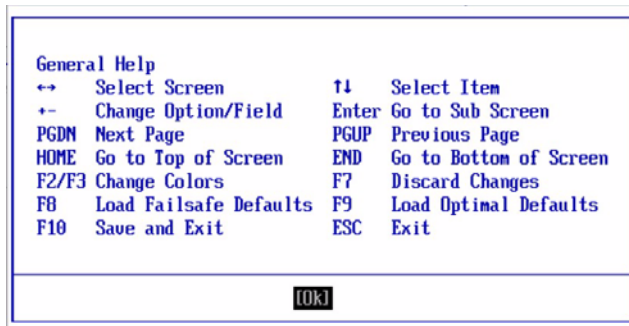


Figure 4-2. General Help Menu

The scroll bar on the right of any window indicates that there is more than one page of information in the window. Use [PgUp] and [PgDn] to display all the pages. Pressing [Enter] displays each page and then exits the window. Press [Esc] to exit the current window.

➤ *Main Menu Selections*

You can make the following selections on the Main Menu itself (Figure 4-1). Use the sub menus for other selections.

➤ **System Time**

This allows you to change the system time stored in the AMI BIOS.

➤ **System Date**

This allows you to change the system date stored in the AMI BIOS.

➤ *Advanced Menu*

Selecting "Advanced" from the menu bar on the Main Menu displays a menu like this:

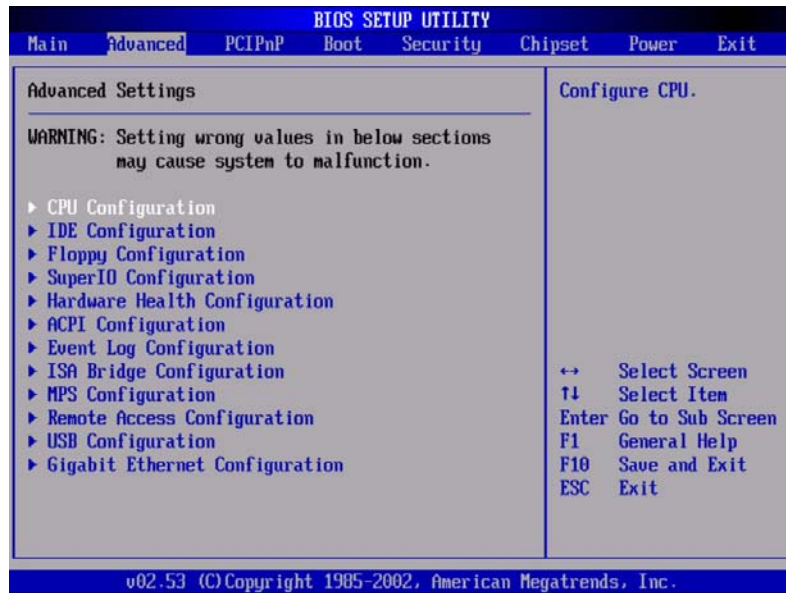


Figure 4-3. Advanced Menu

Use the legend keys to make your selections and exit to the Main Menu.

Feature	Description
CPU Configuration	This menu configures the CPU.
IDE Configuration	This menu enables you to configure your onboard and peripheral IDE devices.
Floppy Configuration	This menu provides configuration and setup options for floppy devices.
Boot Settings Configuration	This menu configures the boot up parameters
Super IO Configuration	This menu provides options to configure your onboard I/O devices, PS/2 Keyboard and mouse .
Hardware Health Configuration	This menu shows the system's hardware health monitor screen.
ACPI Configuration	This menu configures ACPI.
Event Log Configuration	This allows you to view or configure the event log.
ISA Bridge Configuration	This menu configures the onboard ISA bridge.
MPS Configuration	This function initiates multi-processor configuration.
Remote Access Configuration	This menu configures remote access via serial connection.
USB Configuration	This menu Enables or Disables USB support for legacy products.
Gigabit Ethernet Configuration	This menu configures the gigabit ethernet controllers and PXE support.

➤ CPU Configuration

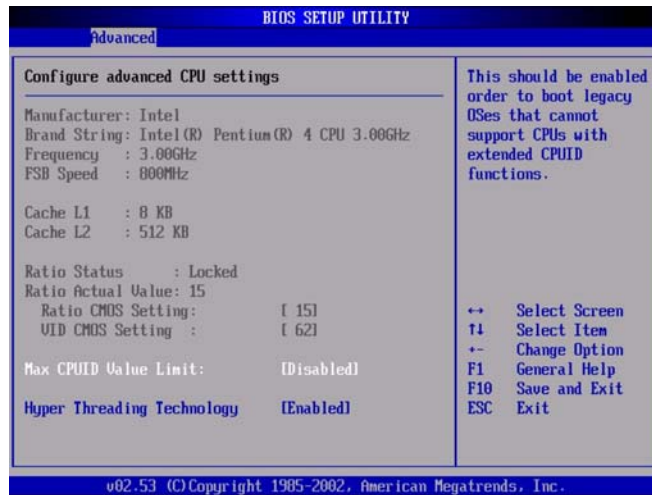


Figure 4-4. CPU Configuration Menu

➤ **Manufacturer**

This selection displays the manufacturer of the processor used in the system.

➤ **Brand String**

This selection displays the type of processor used in the system.

➤ **Frequency**

This selection displays the processor frequency.

➤ **FSB Speed**

This selection detects the system front side bus.

➤ **Cache L1 and L2**

These options display the L1 and L2 cache allocated.

➤ **Ratio Status**

This option displays the Ratio status of the CPU.

➤ **Ratio Actual Value**

This option displays the current ratio value of the CPU.

➤ **Ratio CMOS Setting**

If ratio status is not locked, the CPU ratio may be programmed by the user by entering the appropriate CPU FSB clock multiplier.

➤ **VID CMOS Setting**

If ratio status is not locked, the user may configure the CPU VID settings.

➤ **MAX CPU ID Value Limit**

This option should be enabled in order to boot legacy operating systems that cannot support CPUs with extended CPU ID functions.

Disabled*	Set this value to boot operating systems that support extended CPU ID functions. This is the default setting.
Enabled	Set this value to allow the BIOS to boot legacy operating systems.

➤ **Hyper Threading Technology**

This option enables hyper threading technology in the CPU. The Optimal setting is *Enabled*. The fail-safe setting is *Disabled*.

Disabled	Set this value to disable hyper threading processor support.
Enabled*	Set this value to enable hyper threading processor support. This is the default setting.

► IDE Configuration

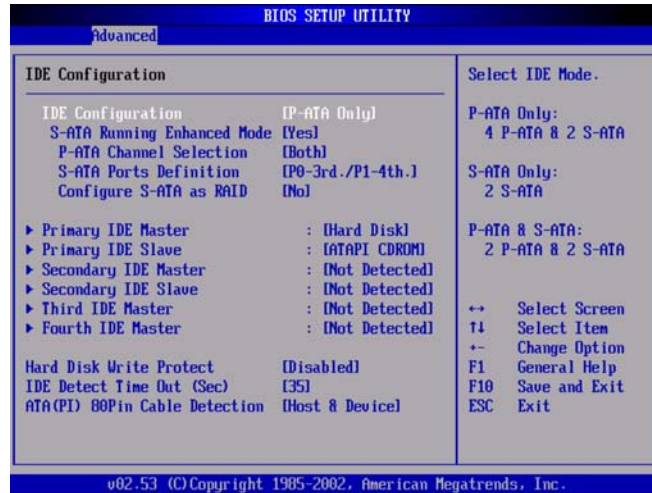


Figure 4-5. IDE Configuration Control Menu

► IDE Configuration

This function specifies the IDE and S-ATA channels used by the PCI IDE and S-ATA controllers.

P-ATA Only *	Set this value to utilize the P-ATA IDE channel. This is the optimal default and fail-safe default setting.
S-ATA Only	Set this value to utilize the enhanced S-ATA IDE channel.
P-ATA and S-ATA	Set this value to utilize both P-ATA and S-ATA channels.
Disabled	Set this value to disable IDE support.

► S-ATA Running Enhanced Mode

This function specifies the performance of S-ATA channels.

Yes*	Set this value to enable S-ATA enhanced mode. This is the optimal and fail-safe default setting.
No	Set this value to allow the BIOS to boot legacy operating systems.

➤ **P-ATA Channel Selection**

This function specifies the P-ATA channels used.

Primary	Set this value to select the Primary P-ATA channel.
Secondary	Set this value to select the Secondary P-ATA channel.
Both *	Set this value to select both IDE and Secondary P-ATA channels. This is the optimal and fail-safe default setting.

➤ **S-ATA Ports Definition**

This function defines the ports to be used in S-ATA mode. P0-3rd / P1-4th is the optimal and fail-safe default setting.

P0 – 1st / P1 – 2nd	Set this value to define this port for use in S-ATA mode.
P0 – 2nd / P1 – 1st	Set this value to define this port for use in S-ATA mode.
P0 – 3rd / P1 – 4th *	Set this value to define this port for use in S-ATA mode. This is the default setting.
P0 – 4th / P1 – 3rd	Set this value to define this port for use in S-ATA mode.

➤ **Configure S-ATA as RAID**

This function allows you to create RAID arrays using the performance of S-ATA devices.

Yes	Set this value to Yes to configure S-ATA devices for RAID.
No *	Set this value to No to utilize S-ATA devices without RAID. This is the optimal and fail-safe default setting.

➤ **Combined Mode Operation**

This function specifies the 1st channel when running both P-ATA and S-ATA in combined mode.

P-ATA 1st Channel *	Set this value to Yes to configure S-ATA devices for RAID.
S-ATA 2nd Channel	Set this value to No to utilize S-ATA devices without RAID. This is the optimal and fail-safe default setting.

➤ **Primary/Secondary/Third/Fourth IDE Master**

Select a hard disk detected by the system and press ENTER.

➤ **Primary/Secondary/Third/Fourth IDE Slave**

Select a hard disk detected by the system and press ENTER.

➤ **Hard Disk Write Protect**

Set this function to prevent the hard disk from being overwritten.

Options: Enabled, Disabled*

➤ **IDE Detect Timeout (seconds)**

When this function is set, the BIOS will stop searching for IDE devices after a specified time period (in seconds). This function allows fine tuning of boot times to boot immediately once all present devices are found.

0	This is the optimal setting for systems whose onboard controllers point to a specific IDE device in the AMI BIOS
5	Set this option to stop the BIOS from searching the IDE bus for IDE devices in five seconds.
10	Set this option to stop the BIOS from searching the IDE bus for IDE devices in ten seconds.
15	Set this option to stop the BIOS from searching the IDE bus for IDE devices in fifteen seconds.
20	Set this option to stop the BIOS from searching the IDE bus for IDE devices in twenty seconds.
25	Set this option to stop the BIOS from searching the IDE bus for IDE devices in twenty-five seconds.
30	Set this option to stop the BIOS from searching the IDE bus for IDE devices in thirty seconds.
35*	This is the default setting and is recommended for all IDE devices that are set to AUTO in the BIOS setting.

➤ **ATA (PI) 80-pin Cable Detection**

Set this selection to define the method used to detect a ATA (PI) 80-pin cable.

Host and Device*	Set this value to use both the CPU board's onboard IDE controller and the IDE device to detect the type of IDE cable present. This is the default setting.
Host	Set this value to use the CPU board to detect the type of IDE cable present.
Device	Set this value to use the IDE device to detect the type of IDE cable present.

► *Master and Slave Sub-Menus*

The Master and Slave sub-menus accessed from the Advanced Menu > IDE Configuration Menu, control these types of devices:

- ◆ Hard-disk drives
- ◆ Removable-disk drives, such as Zip drives
- ◆ CD-ROM drives

AMI BIOS supports up to four IDE disk adapters, called primary, secondary, third, and fourth adapters. Each P-ATA interface supports one master drive and one optional slave drive. Each S-ATA interface supports one master drive.

The PCI-953 has one IDE connector which is the primary IDE interface. The secondary IDE interface is connected to the Compact Flash connector, which only supports a single drive, either master or slave.

If you need to change your drive settings, selecting one of the Master or Slave drives on the Main Menu displays a sub-menu like this:

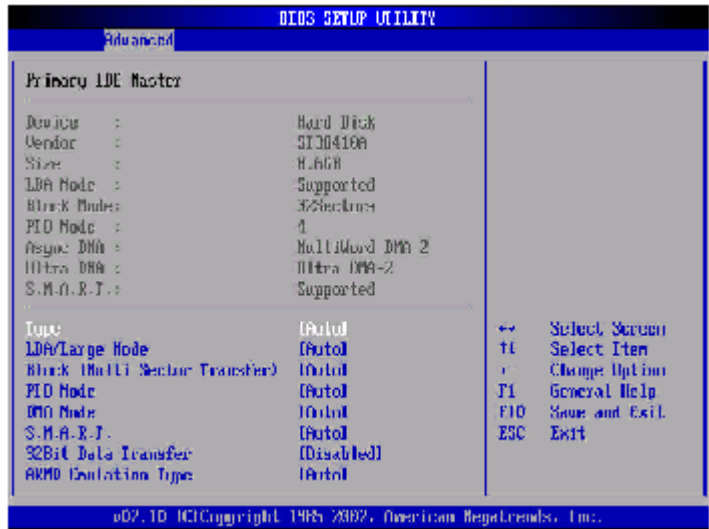


Figure 4-6. Disk Drive Settings

Use the legend keys listed on the bottom to make your selections and exit to the IDE Configuration Menu. Use the following chart to configure the hard disk.

► **Drive Parameters**

Parameter	Description
Device	Type of device
Vendor	Manufacturer of the device
Size	The size of the device

Parameter	Description
LBA Mode Control	In LBA mode, the maximum hard disk capacity is 137GB. For drive capacities over 137GB your BIOS must have 48-bit LBA mode addressing.
Block Mode	Block mode boosts IDE performance by increasing the amount of data transferred. Only 512b of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64Kb per interrupt.
PIO Mode	This function programs timing cycles between the IDE drive and the programmable IDE controller. As PIO mode increases, the cycle time decreases.
Async DMA	This indicates the highest Asynchronous DMA mode is supported.
Ultra DMA Mode	This indicates the highest Synchronous DMA mode is supported.
SMART	Self Monitoring Analysis and Reporting Technology protocol used by some manufacturers to predict drive failures.

When you enter the Advanced Menu, it usually displays the results of **Autotyping**– information each drive provides about its own parameters, such as cylinders, heads, and sectors, and how the drives are arranged as Masters or Slaves on your machine.

Some older drives, however, do not use Autotyping and require selecting type User and entering a pre-defined fixed-disk type value, such as 1 to 39, or specifying the drive parameters separately with the User type selected. You can find the correct parameters for hard-disk drives in the drive manual or written on the casing of the drive itself.



Note: Exiting this menu keeps your selections but loses internal autotyping information, which may not be selected. If you exit this menu and re-enter it, press [Enter] on Autotype again to restore the Autotype information.



Note: Do not attempt to change these settings unless you have an older drive that does not support autotyping.



Note: Before changing the contents of this menu, **write them down**. Once you have established correct parameters for your drive, **write them down and store them in a safe place**, such as a disk drive, for use in case these values are lost in CMOS or if autotyping fails. If these hard-disk parameters are not correctly entered in CMOS, you cannot access the data on your drive.



CAUTION



Incorrect settings can cause your system to malfunction. To correct mistakes, return to Setup and restore the Setup Defaults with [F9] and re-enter the correct drive parameters.

► Type

This options sets the type of device the BIOS boots from after completing the Power On Self Test (POST) routine.

Not Installed	Set this value to prevent the BIOS from searching for an IDE device on the specified channel.
Auto*	Set this value to allow the BIOS to detect the IDE disk drive type attached to the specific channel. This is the default setting.
CD-ROM	This option indicates that an IDE CD-ROM drive is attached to the specified channel. The BIOS will not search for additional IDE drives on this channel.
ARMD	This options specifies an ATAPI removable media device, such as: <ul style="list-style-type: none">◆ ZIP◆ LS-120

➤ **LBA/Large Mode**

Logical Block Addressing is a way of addressing data on a drive. The maximum drive capacity in LBA mode is 137GB.

Disabled	Set this value to prevent the BIOS from using LBA mode control on the specified channel.
Auto*	Set this value to allow the BIOS to auto-detect LBA mode control on the specified channel. This is the default setting.

➤ **Block (Multi-sector Transfer)**

This option sets the block mode multi-sectors transfer function.

Disabled	Set this value to prevent the BIOS from using multi-sector transfers on the specified channel. The data to and from the device will occur one sector at a time.
Auto*	Set this value to allow the BIOS to auto-detect multi-sector transfer on the specified channel. This is the default setting. The data to and from the device will occur multiple sectors at a time.

➤ **PIO Mode**

This function programs timing cycles between the IDE drive and the programmable IDE controller. As PIO mode increases, the cycle time decreases.

Auto	Set this value to allow the BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined. This is the default setting.
0	Set this value to allow the BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MBs.
1	Set this value to allow the BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MBs.
2	Set this value to allow the BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MBs.

3	Set this value to allow the BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MBs.
4	Set this value to allow the BIOS to use PIO mode 4. It has a data transfer rate of 16.6 MBs. This setting generally works with all hard disk drives manufactured after 1999. For other disk drive, such as IDE CD-ROM drives, check the specifications of the drive.

► DMA Mode

This option allows you to set the DMA mode options.

Auto	Set this value to allow the BIOS to auto detect the DMA mode. Use this value if the IDE disk drive support cannot be determined. This is the default setting.
SWDMA0	Set this value to allow the BIOS to use Single Word DMA mode 0. It has a data transfer rate of 2.1 MBs.
SWDMA1	Set this value to allow the BIOS to use Single Word DMA mode 1. It has a data transfer rate of 4.2 MBs.
SWDMA2	Set this value to allow the BIOS to use Single Word DMA mode 2. It has a data transfer rate of 8.3 MBs.
MWDMA0	Set this value to allow the BIOS to use Multi Word DMA mode 0. It has a data transfer rate of 4.2 MBs.
MWDMA1	Set this value to allow the BIOS to use Multi Word DMA mode 1. It has a data transfer rate of 13.3 MBs.
MWDMA2	Set this value to allow the BIOS to use Multi Word DMA mode 2. It has a data transfer rate of 16.6 MBs.
UDMA0	Set this value to allow the BIOS to use Ultra DMA mode 0. It has a data transfer rate of 16.6MBs. It has the same transfer rate as PIO mode 4 and Multi Word DMA mode 2.
UDMA1	Set this value to allow the BIOS to use Ultra DMA mode 1. It has a data transfer rate of 25 MBs.
UDMA2	Set this value to allow the BIOS to use Ultra DMA mode 2. It has a data transfer rate of 33.3 MBs.

UDMA3	Set this value to allow the BIOS to use Ultra DMA mode 3. It has a data transfer rate of 44.4MBs. To use this mode, it is required that an 80-conductor ATA cable is used.
UDMA4	Set this value to allow the BIOS to use Ultra DMA mode 4. It has a data transfer rate of 66.6MBs. To use this mode, it is required that an 80-conductor ATA cable is used.
UDMA5	Set this value to allow the BIOS to use Ultra DMA mode 5. It has a data transfer rate of 99.9MBs. To use this mode, it is required that an 80-conductor ATA cable is used.
UDMA6	Set this value to allow the BIOS to use Ultra DMA mode 6. It has a data transfer rate of 133.2MBs. To use this mode, it is required that an 80-conductor ATA cable is used.

► **S.M.A.R.T. for hard disks**

Self-Monitoring Analysis and Reporting Technology (SMART) feature can help predict drive failures.

Enabled	Set this value to allow the BIOS to use the SMART feature on support hard disk drives.
Disabled	Set this value to prevent the BIOS from using the SMART feature.
Auto*	Set this value to allow the BIOS to auto detect hard disk drive support. Use this setting if the IDE disk drive support cannot be determined. This is the default setting.

► **32-bit Data Transfer**

This option sets the 32-bit Data Transfer option.

Disabled	Set this value to prevent the BIOS from using 32-bit data transfers.
Enabled*	Set this value to allow the BIOS to use 32-bit data transfers on support hard disk drives. This is the default setting.

➤ ARMD Emulation Type

ATAPI Removable Media Device (ARMD) is a device that uses removable media, such as LS-120, ZIP, or Magneto-Optical (MO) drives. If you want to boot up from media on an ARMD, it is required that you emulate boot up from a floppy or hard disk drive. This is especially necessary when trying to boot to DOS. You can select the type of emulation used if you are booting from such a device.

Auto*	Set this value to allow the BIOS to automatically set the emulation used by ARMD. This is the default setting.
Floppy	Set this value for ARMD to emulate a floppy drive during boot up.
Hard Disk	Set this value for ARMD to emulate a hard disk drive during boot up.

➤ Floppy Configuration



Figure 4-7. Floppy Configuration Menu

► **Floppy Drive A and B**

This function selects the type of floppy drive.

Disabled	Set this value to prevent the use of the selected floppy disk drive channel. This option should be set if no floppy disk drive is installed on the specified channel. This is the default setting for Floppy Drive B.
360Kb	Set this value if the floppy disk drive attached to the corresponding channel is a 360 KB 5¼" floppy disk drive.
1.2 MB	Set this value if the floppy disk drive attached to the corresponding channel is a 1.2 MB 5¼" floppy disk drive.
720Kb	Set this value if the floppy disk drive attached to the corresponding channel is a 720 KB 3½" floppy disk drive.
1.44MB	Set this value if the floppy disk drive attached to the corresponding channel is a 1.44 MB 3½" floppy disk drive. This is the default setting for Floppy Drive A.

► **Floppy Drive Seek**

This function selects the type of floppy drive.

Disabled*	Set this value to prevent the BIOS from seeking the floppy disk drive during boot up. This is the default setting.
Enabled	Set this value to allow the BIOS to seek the floppy disk drive during boot up. This will cause the floppy disk drive to temporarily power on during POST.

➤ *Super IO Configuration*

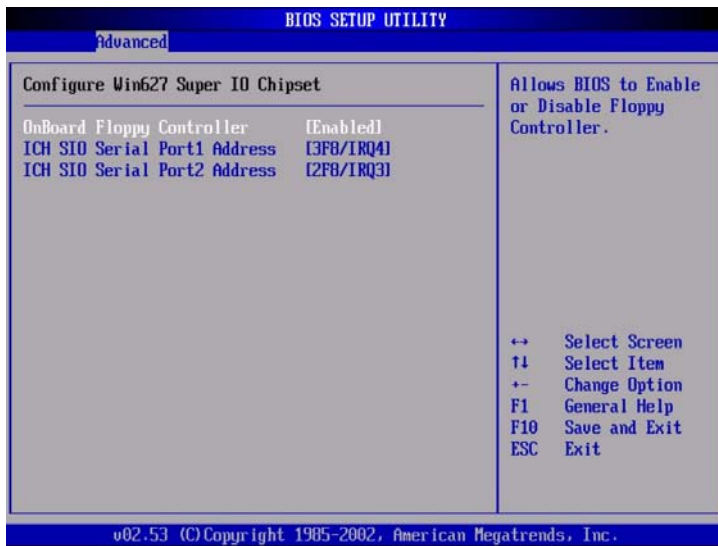


Figure 4-8. Super IO Configuration Menu

➤ **Onboard Floppy Controller**

This function enables or disables the floppy drive controller.

Disabled	Set this value to disable the floppy drive controller.
Enabled*	Set this value to enable the floppy drive controller. This is the default setting.

► **ICH SIO Serial Port 1 Address**

This option specifies the base I/O port address and Interrupt Request address of serial port 1. The Optimal setting is 3F8/IRQ4. The Fail-Safe default setting is 3F8/IRQ4.

Disabled	Set this value to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable.
3F8/IRQ4*	Set this value to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. This is the default setting. The majority of serial port 1 or COM1 ports on computer systems use IRQ4 and I/O Port 3F8 as the standard setting. The most common serial device connected to this port is a mouse. If the system will not use a serial device, it is best to set this port to Disabled.
2F8/IRQ3	Set this value to allow the serial port to use 2F8 as its I/O port address and IRQ 3 for the interrupt address. If the system will not use a serial device, it is best to set this port to Disabled.
3E8/IRQ4	Set this value to allow the serial port to use 3E8 as its I/O port address and IRQ 4 for the interrupt address. If the system will not use a serial device, it is best to set this port to Disabled.
2E8/IRQ3	Set this value to allow the serial port to use 2E8 as its I/O port address and IRQ 3 for the interrupt address. If the system will not use a serial device, it is best to set this port to Disabled.

► **ICH SIO Serial Port 2 Address**

This option specifies the base I/O port address and Interrupt Request address of serial Port 2. The Optimal setting is 2F8/IRQ3. The Fail-Safe setting is 2F8/IRQ3.

Disabled	Set this value to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable.
3F8/IRQ4	Set this value to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. If the system will not use a serial device, it is best to set this port to Disabled.

2F8/IRQ3*	<p>Set this value to allow the serial port to use 2F8 as its I/O port address and IRQ 3 for the interrupt address. This is the default setting. The majority of serial port 2 or COM2 ports on computer systems use IRQ3 and I/O Port 2F8 as the standard setting. The most common serial device connected to this port is an external modem. If the system will not use an external modem, set this port to Disabled.</p> <p>Note: Most internal modems require the use of the second COM port and use 3F8 as its I/O port address and IRQ 4 for its interrupt address. This requires that the Serial Port2 Address be set to Disabled or another base I/O port address and Interrupt Request address.</p>
3E8/IRQ4	<p>Set this value to allow the serial port to use 3E8 as its I/O port address and IRQ 4 for the interrupt address. If the system will not use a serial device, it is best to set this port to Disabled.</p>
2E8/IRQ3	<p>Set this value to allow the serial port to use 2E8 as its I/O port address and IRQ 3 for the interrupt address. If the system will not use a serial device, it is best to set this port to Disabled.</p>

► Hardware Health Configuration

Use this screen to view and configure hardware health monitoring.

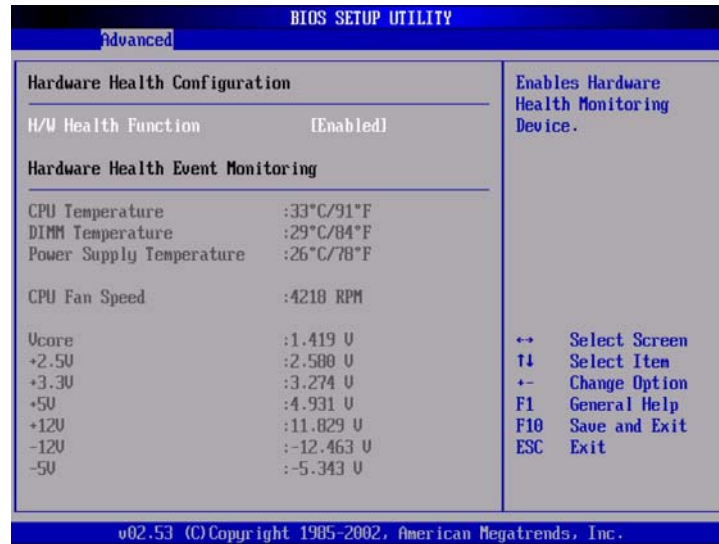


Figure 4-9. Hardware Health Configuration Menu

► Hardware Health Function

This function enables system health monitoring.

Disabled	Set this value to disable the hardware health function.
Enabled*	Set this value to monitor the system's health status. This is the optimal and fail-safe default setting.

▶ ACPI Setup

Selecting 'ACPI' from the Main menu in the BIOS utility will open the following screen:

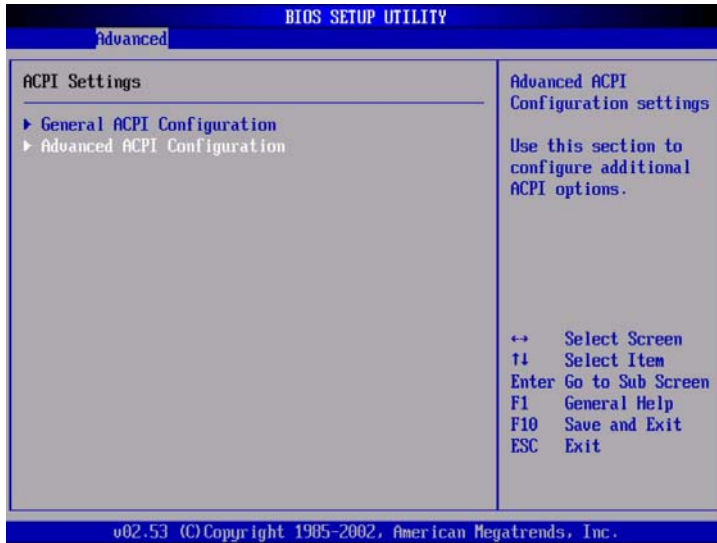


Figure 4-10. ACPI Setup Menu

➤ General ACPI Configuration

Use this screen to select the options for ACPI configuration.



Figure 4-11. General ACPI Configuration Menu

➤ Suspend Mode

This option select the ACPI state for system suspend. Auto is the optimal default setting. S1 (pos) is the fail-safe default setting.

Options: S1 (POS), S3 (STR), Auto

➤ Repost Video on S3 Resume

This option determines whether to invoke the VGA BIOS POST on S3 (STR) resume. No is the optimal and fail-safe default setting.

Options: No*, Yes

➤ USB Device Wakeup from S3/S4

This option determines if a USB device may wake the system from an S3/S4 suspend state. Disabled is the optimal and fail-safe default setting.

Options: Disabled*, Enabled

➤ ACPI Advanced

You can use this screen to select options for the ACPI Advanced Configuration Settings.

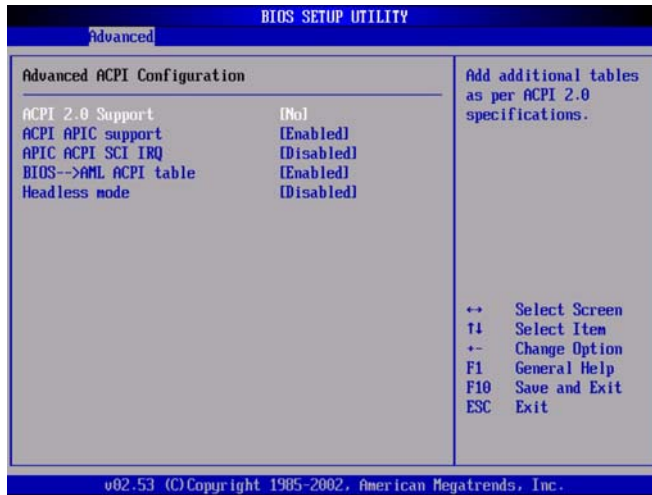


Figure 4-12. ACPI Advanced Menu

➤ ACPI 2.0

Set this value to allow or prevent the system to be compliant with the ACPI 2.0 specification.

No	This setting prevents the BIOS from supporting the ACPI 2.0 specification.
Yes	This setting allows the BIOS to support the ACPI 2.0 specification.

➤ ACPI APIC Support

This option determines whether or not to include the ACPI APIC table pointer to the RSDT pointer list. Enabled is the optimal and fail-safe default setting.

Enabled*	This setting will initiate ACPI APIC support. This is the default setting.
Disabled	This setting disables ACPI APIC support.

➤ **APIC ACPI SCI IRQ**

Set this value to Enabled to add the SCI IRQ into the ACPI APIC table.

Disabled*	This option disables adding the SCI IRQ into the ACPI APIC table. This is the optimal and fail-safe default setting.
Enabled	This option enables adding the SCI IRQ into the ACPI APIC table.

➤ **BIOS-> AML ACPI Table**

This option includes the BIOS -> AML exchange table pointer with the Root System Description Table ((x)RSDT) pointer list.

Disabled	This option disables the BIOS-> AML ACPI table.
Enabled*	This option enables the BIOS-> AML ACPI table. This is the optimal and fail-safe default setting.



Note: OEMB table is used to pass POST data to the AML code during ACPI O/S operations.

➤ **RSDT**

RSDT is the main ACPI table. It has no fixed place in memory. During the boot up process, the BIOS locates a pointer to the table during the memory scan. A Root System Descriptor Pointer (RSDP) is located in low memory space of the system. It provides the physical address of the RSDT. The RSDT itself is identified in memory because it starts with the signature "RSDT." Following the signature is an array of pointers that tell the operating system the location of other description tables that provide it with the information it needs about the standards defined on the current system and individual devices.

➤ **AML**

ACPI Machine Language (AML) is a binary code format that the operating system's ACPI AML interpreter parses to discover the machine's properties. On boot up the BIOS startup code copies it into system memory, where it can be interpreted by the operating system's ACPI AML interpreter.

▶ **Headless Mode**

This option is used to update the ACPI FACP table to indicate headless operations.

Disabled	This option disables updating the ACPI FACP table to indicate headless operation.
Enabled	This option enables updating the ACPI FACP table to indicate headless operation.

➤ Event Log Configuration

AMI BIOS logs certain events to the event log, which can be configured using this screen.

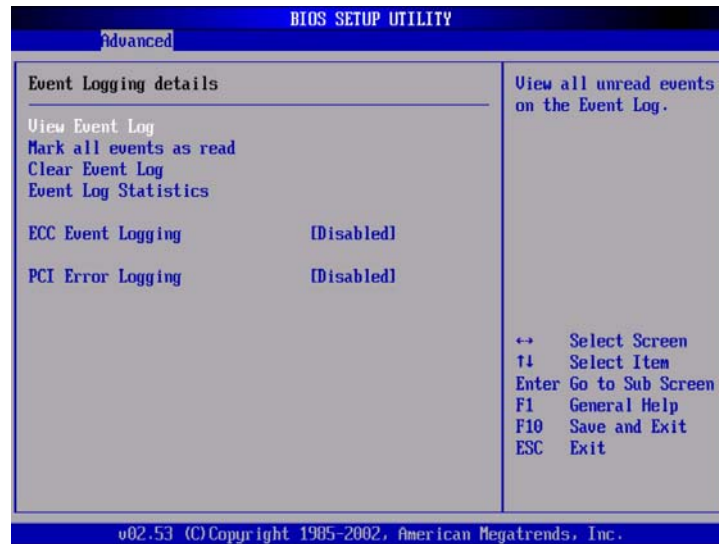


Figure 4-13. Event Log Configuration Menu

➤ View Event Log

This selection allows you to view the event log.

➤ Mark All Events as Read

This selection allows you to set the events in the log as already read.

➤ Clear Event Log

This selection allows you to clear all events in the event log.

➤ Event Log Statistics

This selection displays the total space, used space, and free space in the event log.

➤ ECC Event Logging

This selection enables the event log to log all ECC events that occur.

Disabled*	Set this value to disable the ECC Event Logging function. This is the optimal and fail-safe default setting.
Enabled	Set this value to enable ECC Event Logging.

➤ PCI Error Logging

This selection enables the event log to log all PCI errors that occur.

Disabled*	Set this value to disable the PCI Error Logging function. This is the optimal and fail-safe default setting.
Enabled	Set this value to enable PCI Error Logging.

➤ *ISA Bridge Configuration*

This menu allows you to configure the ITE8888 PCI to ISA bridge.

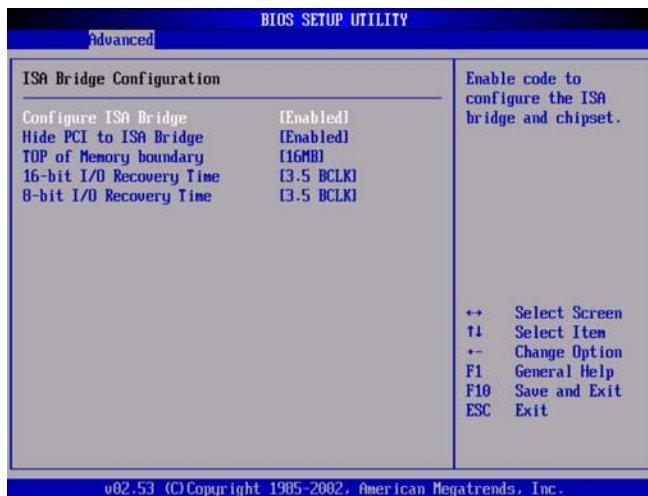


Figure 4-14. ISA Bridge Configuration Menu

➤ **Configure ISA Bridge**

This selection enables ISA Bridge Configuration.

➤ **Hide PCI to ISA Bridge**

Since Windows has problems when multiple ISA bridges are present, this selection hides the ISA bridge from the operating system.

➤ **Top of Memory Boundary**

This selection creates a memory boundary for PCI and ISA DMA access. 16MB is the optimal and fail-safe default setting.

Options: 1MB, 2MB, 3MB, 4MB, 5MB, 6MB, 7MB, 8MB, 9MB, 10MB, 11MB, 12MB, 13MB, 14MB, 15MB, 16MB*.

➤ **16-bit I/O Recovery Time**

This selection determines the recovery time for 16-bit I/O cycles. 3.5 BCLK is the optimal and fail-safe default setting.

Options: 3.5 BCLK*, 4.5 BCLK, 5.5, BCLK, 7.5 BCLK.

➤ **8-bit I/O Recovery Time**

This selection determines the recovery time for 8-bit I/O cycles. 3.5 BCLK is the optimal and fail-safe default setting.

Options: 3.5 BCLK*, 5.5 BCLK, 7.5, BCLK, 11.5 BCLK.

➤ ***MPS Configuration***

Use this screen to configure the Multi-processor specification.

➤ **MPS Revision**

This selects the appropriate MPS revision to use in creating the multi-processor table.

➤ Remote Access Configuration

Use this screen to configure the system for remote access.

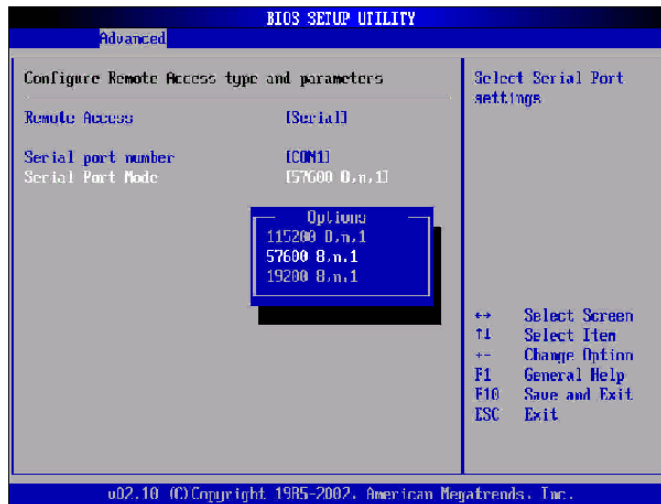


Figure 4-15. Remote Access Configuration Menu

➤ Remote Access

You can disable or enable the BIOS remote access feature here.

Disabled	Set this value to prevent the BIOS from using Remote Access.
Serial	Set the value for this option to Serial to allow the system to use the remote access feature. The remote access feature requires a dedicated serial port connection.

➤ **Serial Port Number**

Select the serial port you want to use for console redirection. You can set the value for this option to either COM1 or COM2.

COM1	Set this value to allow the system to use COM1 (Communication port1) for the remote access interface.
COM2	Set this value to allow the system to use COM2 (Communication port2) for the remote access interface.

➤ **Serial Port Mode**

Select the baud rate you want the serial port to use for console redirection.

115200 8,n,1	Set this value to allow you to select 115200 as the baud rate (transmitted bits per second) of the serial port.
57600 8,n,1	Set this value to allow you to select 57600 as the baud rate (transmitted bits per second) of the serial port.
19200 8,n,1	Set this value to allow you to select 19200 as the baud rate (transmitted bits per second) of the serial port.

► USB Configuration

Use this screen to configure the onboard USB devices.

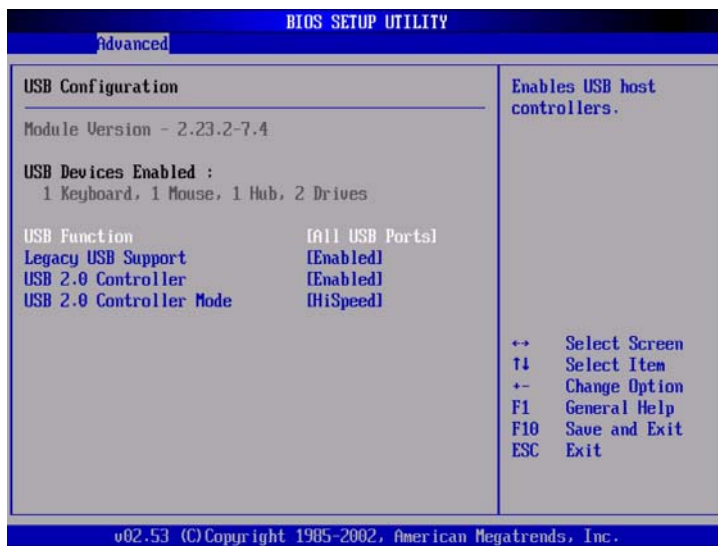


Figure 4-16. USB Configuration Menu

► USB Function

Set this value to allow the system to enable or disable the onboard USB ports. The Optimal and Fail-Safe default setting is All USB Ports.

Disabled	This setting makes the onboard USB ports unavailable.
2 USB Ports	This setting enables 2 USB ports.
All USB Ports*	This setting enables all USB ports. This is the default setting.

➤ **Legacy USB Support**

Legacy USB Support refers to the USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard will not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB drivers loaded on the system. Set this value to enable or disable the Legacy USB Support. The Optimal and Fail-Safe default setting is Disabled.

Disabled*	Set this value to prevent the use of any USB device in DOS or during system boot. This is the default setting.
Enabled	Set this value to allow the use of USB devices during boot and while using DOS.
Auto	This option auto detects USB Keyboards or Mice and if found, allows them to be utilized during boot and while using DOS.

➤ **USB 2.0 Controller**

Set this value to enable or disable the USB 2.0 controller. The optimal default setting is Enabled. The fail-safe default setting is Disabled.

Disabled	Set this value to disable the USB 2.0 controller. This is the fail-safe default setting.
Enabled	Set this value to enable the USB 2.0 controller. This is the optimal default setting.

➤ **USB 2.0 Controller Mode**

Set this value to configure the USB 2.0 controller to operate in High Speed mode (480Mbps) or Full Speed Mode (12Mbps). The optimal default setting is Enabled. The fail-safe default setting is Disabled.

High Speed	Set this value to configure the USB 2.0 controller to operate in High Speed mode (480Mbps). This is the optimal default setting.
Full Speed	Set this value to configure the USB 2.0 controller to operate in Full Speed mode (12Mbps). This is the fail-safe default setting.

➤ Gigabit Ethernet Configuration

Use this screen to configure the two onboard gigabit ethernet devices.

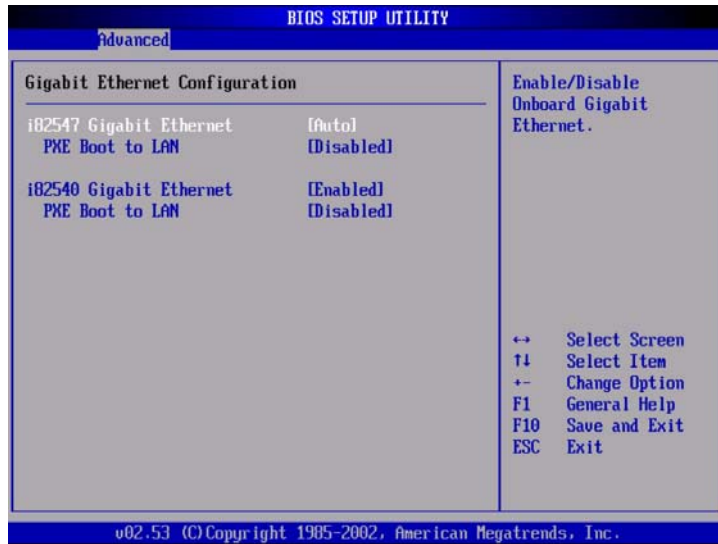


Figure 4-17. Gigabit Ethernet Configuration Menu

➤ i82547 Gigabit Ethernet

This option enables/disables the Intel 82547 gigabit ethernet controller. Auto is the optimal and fail-safe default setting.

Disabled	Set this value to disable the Intel 82547 gigabit ethernet controller.
Auto	Set this value to enable and auto-detect the Intel 82547 gigabit ethernet controller. This is the default setting.

➤ PXE Boot to LAN

This option enables/disables the PXE option ROM for the Intel 82547 gigabit ethernet controller. Disabled is the optimal and fail-safe default setting.

Options: Disabled*, Enabled

➤ **i82540 Gigabit Ethernet**

This option enables/disables the Intel 82540 gigabit ethernet controller. Auto is the optimal and fail-safe default setting.

Disabled	Set this value to disable the Intel 82540 gigabit ethernet controller.
Auto	Set this value to enable and auto-detect the Intel 82540 gigabit ethernet controller. This is the default setting.

➤ **PXE Boot to LAN**

This option enables/disables the PXE option ROM for the Intel 82540 gigabit ethernet controller. Disabled is the optimal and fail-safe default setting.

Options: Disabled*, Enabled

► PCI/PnP Setup

Selecting 'PCI/PnP' from the Main menu in the BIOS utility will open the following screen:

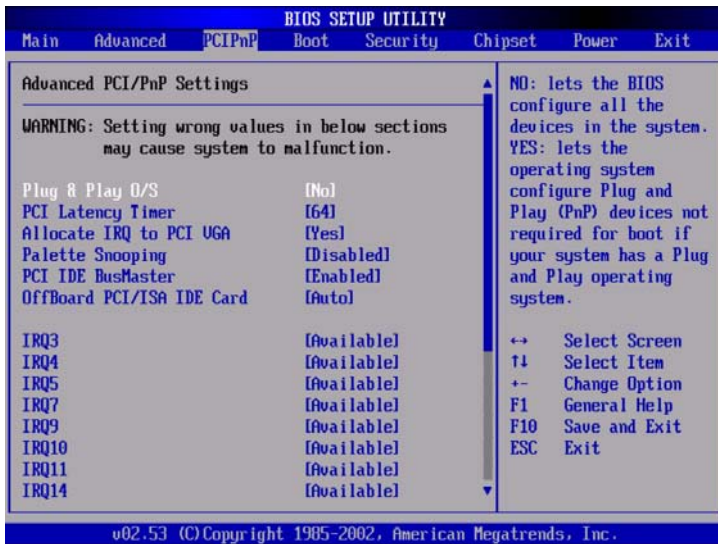


Figure 4-18. PCI/PnP Setup Menu

► Plug and Play OS

Set this value to allow the system to modify the settings for Plug and Play operating

No*	The No setting is for operating systems that do not meet the Plug and Play specifications. It allows the BIOS to configure all the devices in the system. This is the default setting.
Yes	The Yes setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system is running Plug and Play aware operating systems.

► **PCI Latency Timer**

Set this value to allow the PCI Latency Timer to be adjusted. This option sets the latency of all PCI devices on the PCI bus. The Optimal and Fail-Safe default setting is 64.

32	This option sets the PCI latency to 32 PCI clock cycles.
64*	This option sets the PCI latency to 64 PCI clock cycles. This is the default setting.
96	This option sets the PCI latency to 96 PCI clock cycles.
128	This option sets the PCI latency to 128 PCI clock cycles.
160	This option sets the PCI latency to 160 PCI clock cycles.
192	This option sets the PCI latency to 192 PCI clock cycles.
224	This option sets the PCI latency to 224 PCI clock cycles.
248	This option sets the PCI latency to 248 PCI clock cycles.

► **Allocate IRQ to VGA**

Set this value to allow or restrict the system from giving the VGA adapter card an interrupt address. The Optimal and Fail-Safe default setting is Yes.

Yes*	Set this value to allow the allocation of an IRQ to a VGA adapter card that uses the PCI local bus. This is the default setting.
No	Set this value to prevent the allocation of an IRQ to a VGA adapter card that uses the PCI local bus.

▶ **Palette Snooping**

Set this value to allow the system to modify the Palette Snooping settings. The Optimal and Fail-Safe default setting is Disabled.

Disabled*	This is the default setting and should not be changed unless the VGA card manufacturer requires Palette Snooping to be Enabled.
Enabled	This setting informs the PCI devices that an ISA based Graphics device is installed in the system. It does this so the ISA based Graphics card will function correctly. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with your adapter card's manuals first, before modifying the default settings in the BIOS.

▶ **PCI IDE Bus Master**

Set this value to allow or prevent the use of PCI IDE busmastering. The Optimal and Fail-Safe default setting is Disabled.

Disabled*	Set this value to prevent PCI busmastering. This is the default setting.
Enabled	This option specifies that the IDE controller on the PCI local bus has mastering capabilities.

▶ **Offboard PCI/ISA IDE Card**

Set this value to allow the OffBoard PCI/ISA IDE Card to be selected. The Optimal and Fail-Safe default setting is Auto.

Auto*	This setting will auto select the location of an OffBoard PCI IDE adapter card. This is the default setting.
PCI Slot 1	This setting will select PCI Slot 1 as the location of the OffBoard PCI IDE adapter card. Use this setting only if there is an IDE adapter card installed in PCI Slot 1.
PCI Slot 2	This setting will select PCI Slot 2 as the location of the OffBoard PCI IDE adapter card. Use this setting only if there is an IDE adapter card installed in PCI Slot 2.

PCI Slot 3	This setting will select PCI Slot 3 as the location of the OffBoard PCI IDE adapter card. Use this setting only if there is an IDE adapter card installed in PCI Slot 3. This option is available even if the system does not have a PCI Slot 3. If the system does not have a PCI Slot 3, do not use this setting.
PCI Slot 4	This setting will select PCI Slot 4 as the location of the OffBoard PCI IDE adapter card. Use this setting only if there is an IDE adapter card installed in PCI Slot 4. This option is available even if the system does not have a PCI Slot 4. If the system does not have a PCI Slot 4, do not use this setting.
PCI Slot 5	This setting will select PCI Slot 5 as the location of the OffBoard PCI IDE adapter card. Use this setting only if there is an IDE adapter card installed in PCI Slot 5. This option is available even if the system does not have a PCI Slot 5. If the system does not have a PCI Slot 5, do not use this setting.
PCI Slot 6	This setting will select PCI Slot 6 as the location of the OffBoard PCI IDE adapter card. Use this setting only if there is an IDE adapter card installed in PCI Slot 6. This option is available even if the system does not have a PCI Slot 6. If the system does not have a PCI Slot 6, do not use this setting.

► **PCI IDE Bus Master**

Set this value to allow the IRQ settings to be modified. The Optimal and Fail-Safe default setting is Available.

IRQ3 IRQ4 IRQ5 IRQ7 IRQ9	Available*	This setting allows the specified IRQ to be used by a PCI/PnP device.
IRQ10 IRQ11 IRQ14 IRQ15	Reserved	This setting allows the specified IRQ to be used by a legacy ISA device.

➤ **DMA**

Set this value to allow the DMA setting to be modified. The optimal and Fail-Safe default setting is Available.

DMA Channel 0 DMA Channel 1 DMA Channel 3 DMA Channel 5 DMA Channel 6 DMA Channel 7	Available*	This setting allows the specified DMA to be used by PCI/PnP device.
	Reserved	This setting allows the specified DMA to be used by a legacy ISA device.

➤ **Reserved Memory Size**

Set this value to allow the system to reserve memory that is used by ISA devices. The Optimal and Fail-Safe default setting is Disabled.

Disabled*	Set this value to prevent BIOS from reserving memory to ISA devices.
16K	Set this value to allow the system to reserve 16K of the system memory to the ISA devices.
32K	Set this value to allow the system to reserve 32K of the system memory to the ISA devices.
64K	Set this value to allow the system to reserve 64K of the system memory to the ISA devices.

► **Reserved Memory Address**

Set this to the memory base address to be used by legacy ISA devices. The Optimal and Fail-Safe default setting is Disabled.

C0000	Set ISA memory base to C0000h.
C4000	Set ISA memory base to C4000h.
C8000	Set ISA memory base to C8000h.
CC000	Set ISA memory base to CC000h.
D0000	Set ISA memory base to D0000h.
D4000	Set ISA memory base to D4000h.
D8000	Set ISA memory base to D8000h.
DC000	Set ISA memory base to DC000h.

► Boot Menu

After you turn on your computer, it will attempt to load the operating system, such as Windows 2000, from the device of your choice. If it cannot find the operating system on that device, it will attempt to load it from one or more other devices in the order specified in the Boot Menu. Boot devices (i.e., with access to an operating system) can include: hard drives, floppy drives, CD ROMs, removable devices (e.g., Iomega Zip drives), and network cards.



Note: Specifying any device as a boot device on the Boot Menu requires the availability of an operating system on that device. Most PCs come with an operating system already installed on hard drive C:. Selecting "Boot" from the Menu Bar displays the Boot menu, which looks like this:



Figure 4-19. Boot Menu

Use the Boot Menu to arrange to specify the priority of the devices from which the BIOS will attempt to boot the Operating System. In the example above, the BIOS will attempt first to boot from the floppy drive. Failing that, it will attempt to boot from the CD-ROM driver, and then the Primary Master hard disk, and so on down the list.

Removable Devices, Hard Drive, and Network Boot are the generic types of devices on your system from which you can boot an operating system. You may have more than one device of each type. If so, the generic type is marked with a plus or minus sign. Use the [Enter] key to expand or collapse the devices marked with [+] or [-]. Press [Ctrl+Enter] to expand all such devices.



Note: Floppy drives are managed on this menu as part of Removable Devices.

To change a device's priority on the list, first select it with the up-or-down arrows, and move it up or down using the [+] and [-] keys. Pressing [n] moves a device between the Removable Devices and Hard Drive. Pressing [Shift+1] enables or disables a device.

To access the properties or boot features of each boot device, select the device using the up-or-down arrows and press [Enter] (Figure 4-19).

► *Boot Settings Configuration*

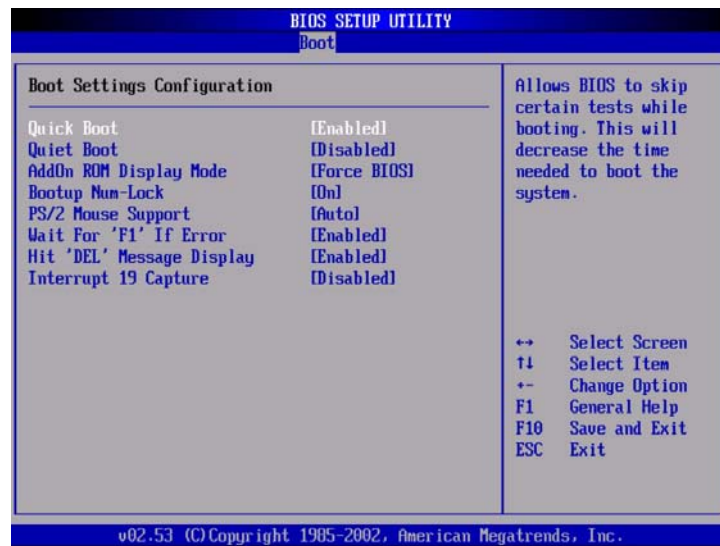


Figure 4-20. Boot Settings Configuration Menu

▶ Quick Boot

This option will bypass some POST tests in order to speed up the boot process.

Disabled*	Set this value to allow the BIOS to perform all POST tests. This is the default setting.
Enabled	Set this value to allow the BIOS to skip certain POST tests to boot more quickly.

▶ Quiet Boot

Set this value to allow the boot up screen options to be modified between POST messages or OEM logo.

Enabled*	Set this value to allow the computer system to display the OEM logo. This is the default setting.
Disabled	Set this value to allow the computer system to display the POST messages.

▶ Add-on ROM Display Mode

Set this option to display add-on ROM (read-only memory) messages. Examples of this are a SCSI BIOS or VGA BIOS.

Force BIOS*	Set this value to allow the computer system to force a third party BIOS to display during system boot. This is the default setting.
Keep Current	Set this value to allow the computer system to display the ezPORT information during system boot.

► **Boot-up Num Lock**

Set this value to allow the Number Lock setting to be modified during boot up.

Off	This option does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard will light up when the Number Lock is engaged.
On*	Set this value to allow the Number Lock on the keyboard to be enabled automatically when the computer system is boot up. This allows the immediate use of 10-keys numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard will be lit. This is the default setting.

► **PS/2 Mouse Support**

Set this value to allow the PS/2 mouse support to be adjusted.

Disabled	This option will prevent the PS/2 mouse port from using system resources and will prevent the port from being active. Use this setting if installing a serial mouse.
Enabled*	Set this value to allow the system to use a PS/2 mouse. This is the default setting.

► **Wait for 'F1' if Error**

Set this value to allow the Wait for 'F1' Error setting to be modified.

Disabled	This prevents the ezPORT to wait on an error for user intervention. This setting should be used if there is a known reason for a BIOS error to appear. An example would be a system administrator must remote boot the system. The computer system does not have a keyboard currently attached. If this setting is set, the system will continue to boot up in to the operating system. If 'F1' is enabled, the system will wait until the BIOS setup is entered.
Enabled*	Set this value to allow the system BIOS to wait for any error. If an error is detected, pressing <F1> will enter Setup and the BIOS setting can be adjusted to fix the problem. This normally happens when upgrading the hardware and not setting the BIOS to recognize it. This is the default setting.

► **Hit 'DEL' Message Display**

Set this value to allow the Hit "DEL" to enter Setup Message Display to be modified.

Disabled	This prevents the system from displaying "Hit Del to enter Setup" during memory initialization. If Quiet Boot is enabled, the Hit 'DEL' message will not display.
Enabled*	This allows the system to display "Hit Del to enter Setup" during memory initialization.

► **Interrupt 19 Capture**

When enabled, this function allows option ROMs to trap INT 19h.

Disabled*	Set this value to disable this function. This is the default setting.
Enabled	Set this value to allow the system to trap INT19h.

► *Boot Device Priority*

Selecting 'Boot Device Priority' from the Boot menu in the BIOS utility will open the Boot Device Priority screen.



► **1st/2nd/3rd Boot Devices**

Set the boot device options to determine the sequence in which the computer checks which device to boot from. The settings are Removable Dev., Hard Drive, or ATAPI CDROM. The Optimal and Fail-Safe settings are:

- ◆ 1st Boot Device: Removable Device
- ◆ 2nd Boot Device: Hard Drive
- ◆ 3rd Boot Device: ATAPI CD-ROM

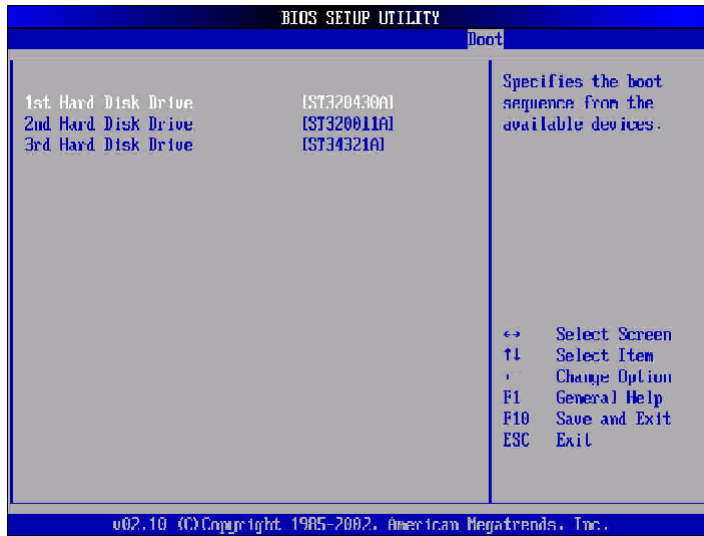
To change the boot order, select a boot category type such as Hard disk drives, Removable media, or ATAPI CD ROM devices from the boot menu. For example, if the 1st boot device is set to Hard disk drives, then BIOS will try to boot to hard disk drives first.



Note: When you select a boot category from the boot menu, a list of devices in that category appears. For example, if the system has three hard disk drives connected, then the list will show all three hard disk drives attached.

► Hard Disk Drives

Selecting 'Hard Disk Drives' from the Boot menu in the BIOS utility will open the Hard Disk Drives screen.



➤ Removable Devices

Selecting 'Removable Devices' from the Boot menu in the BIOS utility will open the Removable Devices screen.



▶ ATAPI CD-ROM Drives

Selecting 'ATAPI CD-ROM Drives' from the Boot menu in the BIOS utility will open the ATAPI CD-ROM Drives screen.



▶ Intruder SEL

Set this value to allow option ROMs such as network controllers to trap BIOS interrupt 19.

Disabled	The BIOS prevents option ROMs from trapping interrupt 19.
Enabled	The BIOS allows option ROMs to trap interrupt 19.

➤ **Security Setup**

➤ **Password Support**

It is possible to set both a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.

The system can be configured so that all users must enter a password every time the system boots or when ezPORT Setup is executed, using either or either the Supervisor password or User password.

The Supervisor and User passwords activate two different levels of password security. If you select password support, you are prompted for a one to six character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and reconfigure.

➤ **Remember the Password**

Keep a record of the new password when the password is changed. If you forget the password, you must erase the system configuration information in NVRAM. See “Deleting a Password” for information about erasing system configuration information.

Select Security Setup from the BIOS setup menu. All Security Setup options, such as password protection and virus protection, are described in this section. To access the sub menu for the following items, select the item and press <Enter>:

- ◆ Change Supervisor Password
- ◆ Change User Password
- ◆ Clear User Password

The Security Setup screen is shown below. The sub menus are documented on the following pages.

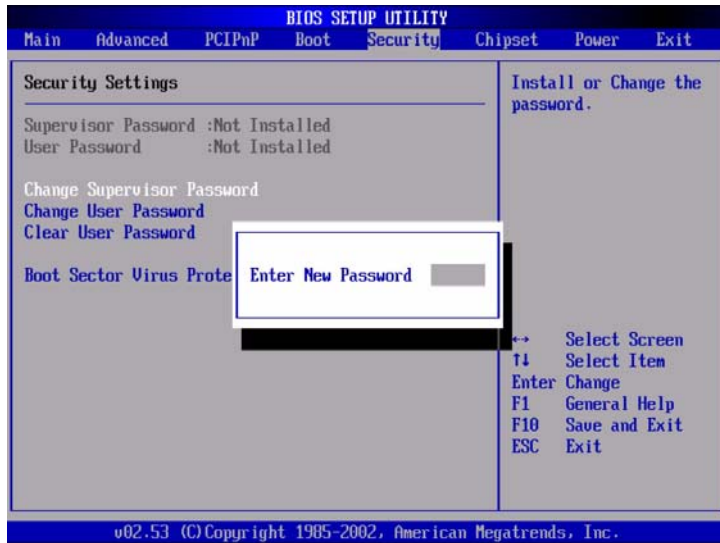


Figure 4-21. Security Setup Menu

➤ **Supervisor Password**

Indicates whether a supervisor password has been set. If the password has been installed, Installed displays. If not, *Not Installed* is displayed.

➤ **User Password**

Indicates whether a user password has been set. If the password has been installed, Installed displays. If not, *Not Installed* is displayed.

➤ **Change Supervisor Password**

Select this option and press <Enter> to access the sub menu. You can use the sub menu to change the supervisor password.

➤ **Change User Password**

Select this option and press <Enter> to access the sub menu. You can use the sub menu to change the user password.

➤ **Clear User Password**

Select this option and press <Enter> to access the sub menu. You can use the sub menu to clear the user password.

➤ **Boot Sector Virus Protection**

This option is near the bottom of the Security Setup screen. The Optimal and Fail-Safe default setting is Disabled.

Disabled*	Set this value to prevent the Boot Sector Virus Protection.
Enabled	Select Enabled to enable boot sector protection. ezPORT displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. If enabled, the following appears when a write is attempted to the boot sector. You may have to type N several times to prevent the boot sector write. Boot Sector Write! Possible VIRUS: Continue (Y/N)? _ The following appears after any attempt to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard disk drive Service: Format!!! Possible VIRUS: Continue (Y/N)? _

➤ ***Change Supervisor Password***

Select Change Supervisor Password from the Security Setup menu and press <Enter>.

Enter New Password:

appears. Type the password and press <Enter>. The screen does not display the characters entered. Retype the password as prompted and press <Enter>. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM after ezPORT completes.

► *Change User Password*

Select Change User Password from the Security Setup menu and press <Enter>.

Enter New Password:

appears. Type the password and press <Enter>. The screen does not display the characters entered. Retype the password as prompted and press <Enter>. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM when completed

► *Clear User Password*

Select Clear User Password from the Security Setup menu and press <Enter>.

Clear New Password

[Ok] [Cancel]

appears. Type the password and press <Enter>. The screen does not display the characters entered. Retype the password as prompted and press <Enter>. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM when completed.

► Chipset Setup

Selecting 'Chipset' from the Main menu in the BIOS utility will open the following screen:



Figure 4-22. Chipset Setup Menu

► DRAM Frequency

This function selects the DRAM frequency. Auto is the optimal default setting. 266 is the fail-safe default setting.

266	This value selects a DRAM frequency of 266MHz. This is the fail-safe default setting.
333	This value selects a DRAM frequency of 333MHz.
400	This value selects a DRAM frequency of 400MHz.
Auto*	This value automatically selects the correct DRAM frequency. This is the optimal default setting.

► **Configure DRAM Timing by SPD**

This selection provides the option to select DRAM timing detection using Serial Presence Detect (SPD) or by manually setting it. Enabled is the default setting.

Disabled	Set this option to configure DRAM timing manually.
Enabled*	Set this option to configure DRAM timing using SPD. This is the default setting.

► **DRAM CAS# Latency**

This option selects DRAM CAS# latency. 2.5 is the default setting.

Options: 2, 2.5*, 3

► **DRAM RAS# Precharge**

This option selects DRAM RAS# precharge. 4 CLKs is the optimal and fail-safe default setting.

Options: 2CLKs, 3CLKs, 4CLKs*

► **DRAM RAS# to CAS# Delay**

This option selects the DRAM RAS# to CAS# delay. 4CLKs is the optimal and fail-safe default setting.

Options: 2CLKs, 3CLKs, 4CLKs*

► **DRAM Precharge Delay**

This option selects the DRAM precharge delay. 8CLKs is the optimal and fail-safe default setting.

Options: 5CLKs, 6CLKs, 7CLKs, 8CLKs*

► **DRAM Burst Length**

This option selects the DRAM burst length. 8 is the optimal default setting. 4 is the fail-safe default setting.

Options: 4, 8*

▶ **DRAM Integrity Mode**

This option enables/disables DRAM ECC Integrity Mode. Disabled is the optimal and fail-safe default setting.

Options: Disabled*, ECC

▶ **Memory Hole**

This option enables/disables the Memory Hole at 15MB-16MB. Disabled is the optimal and fail-safe default setting.

Options: Disabled*, 15MB-16MB

▶ **Primary Graphics Adapter**

This option selects which graphics adapter to use as the primary boot device. PCI is the optimal and fail-safe default setting.

Options: AGP, PCI*

▶ **Graphics Aperture Size**

This option selects the size of the AGP aperture. 64MB is the optimal and fail-safe default setting.

Options: 4MB, 8MB, 16MB, 32MB, 64MB*, 128MB, 256MB

► Power Setup

Selecting 'Power' from the Main menu in the BIOS utility will open the Power Management Setup screen.



Figure 4-23. Power Setup Menu



Note: The Power Management Setup screen is not displayed when Advanced Power Management (APM) is not supported. The Power Setup screen can vary for different motherboards.

➤ **Power Management/APM**

Set this value to allow Power Management/APM support. The Optimal and Fail-Safe default setting is Enabled.

Disabled	Set this value to prevent the chipset power management and APM features.
Enabled*	Set this value to allow the chipset power management and APM features.

➤ **Video Power Down Mode**

This option specifies the Power State that the video subsystem enters when the BIOS places it in a power saving state after the specified period of display inactivity has expired. The Optimal and Fail-Safe setting is Suspend.

Disabled	This setting prevents the BIOS from initiating any power saving modes concerned with the video display or monitor.
Standby	This option places the monitor into standby mode after the specified period of display inactivity has expired. This means the monitor is not off. The screen will appear blacked out. The standards do not cite specific power ratings because they vary from monitor to monitor.
Suspend*	This option places the monitor into suspend mode after the specified period of display inactivity has expired. This means the monitor is not off. The screen will appear blacked out. The standards do not cite specific power ratings because they vary from monitor to monitor, but this setting use less power than Standby mode.

▶ Hard Disk Power Down Mode

This option specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired. The Optimal and Fail-Safe setting is Suspend.

Disabled	This setting prevents hard disk drive power down mode.
Standby	This option stops the hard disk drives from spinning during a system standby.
Suspend*	This option cuts power to the hard disk drives during a system suspend.

▶ Standby/Timeout

This option specifies the length of time the system waits before it enters standby mode. The Optimal and Fail-Safe default setting is Disabled.

Disabled*	Set this value to prevent the computer system from entering standby mode.
1min	Set this value to allow the computer system to enter standby mode after being inactive for 1min.
5min	Set this value to allow the computer system to enter standby mode after being inactive for 5min.
10min	Set this value to allow the computer system to enter standby mode after being inactive for 10min.
20min	Set this value to allow the computer system to enter standby mode after being inactive for 20min.
30min	Set this value to allow the computer system to enter standby mode after being inactive for 30min.
40min	Set this value to allow the computer system to enter standby mode after being inactive for 40min.
50min	Set this value to allow the computer system to enter standby mode after being inactive for 50min.
60min	Set this value to allow the computer system to enter standby mode after being inactive for 60min.

➤ **Suspend Timeout (Minute)**

This option specifies the length of time the system waits before it enters suspend mode. The Optimal and Fail-Safe default setting is Disabled.

Disabled*	This setting prevents the system from entering suspend mode.
1min	Set this value to allow the computer system to enter suspend mode after being inactive for 1min.
5min	Set this value to allow the computer system to enter suspend mode after being inactive for 5min.
10min	Set this value to allow the computer system to enter suspend mode after being inactive for 10min.
20min	Set this value to allow the computer system to enter suspend mode after being inactive for 20min.
30min	Set this value to allow the computer system to enter suspend mode after being inactive for 30min.
40min	Set this value to allow the computer system to enter suspend mode after being inactive for 40min.
50min	Set this value to allow the computer system to enter suspend mode after being inactive for 50min.
60min	Set this value to allow the computer system to enter suspend mode after being inactive for 60min.

➤ **Keyboard & PS/2 Mouse**

Power management will monitor activity on these devices to determine activity occurring in the system. Monitor is the optimal and fail-safe default setting.

Ignore	This selection ignores activity on this device.
Monitor*	This selection monitors activity on this device.

➤ **FDC/LPT/COM Ports**

Power management will monitor activity on these devices to determine activity occurring in the system. Monitor is the optimal and fail-safe default setting.

Ignore	This selection ignores activity on this device.
Monitor*	This selection monitors activity on this device.

➤ **Primary Master IDE**

Power management will monitor activity on this device to determine activity occurring in the system. Monitor is the optimal and fail-safe default setting.

Ignore	This selection ignores activity on this device.
Monitor*	This selection monitors activity on this device.

➤ **Primary Slave IDE**

Power management will monitor activity on these devices to determine activity occurring in the system. Monitor is the optimal and fail-safe default setting.

Ignore	This selection ignores activity on this device.
Monitor*	This selection monitors activity on this device.

➤ **Secondary Master IDE**

Power management will monitor activity on these devices to determine activity occurring in the system. Monitor is the optimal and fail-safe default setting.

Ignore	This selection ignores activity on this device.
Monitor*	This selection monitors activity on this device.

▶ **Secondary Slave IDE**

Power management will monitor activity on these devices to determine activity occurring in the system. Monitor is the optimal and fail-safe default setting.

Ignore	This selection ignores activity on this device.
Monitor*	This selection monitors activity on this device.

▶ **Throttle Slow Clock Ratio**

ISet this value to allow the THRM (thermal) Throttle Ratio to be selected. This type of throttling is used to lower power consumption and reduce thermals. The Optimal and Fail-Safe default setting is 50%.

87.5%	This setting allows the BIOS to throttle back the CPU clock to operate 87.5 percent of the time.
75%	This setting allows the BIOS to throttle back the CPU clock to operate 75 percent of the time.
62.5%	This setting allows the BIOS to throttle back the CPU clock to operate 62.5 percent of the time.
50%*	This setting allows the BIOS to throttle back the CPU clock to operate 50 percent of the time.
37.5%	This setting allows the BIOS to throttle back the CPU clock to operate 37.5 percent of the time.
25%	This setting allows the BIOS to throttle back the CPU clock to operate 25 percent of the time.
12.5%	This setting allows the BIOS to throttle back the CPU clock to operate 12.5 percent of the time.

➤ **System Thermal**

This option disables/enables thermal monitoring to generate a power management event. Disabled is the optimal and fail-safe default setting.

Disabled*	This selection disables thermal PME. This is the default setting.
Enabled	This selection enables thermal PME.

➤ **Power Button Mode**

This option specifies how the externally mounted power button on the front of the computer chassis is used. The Optimal and Fail-Safe default setting is On/Off.

On/Off*	Pushing the power button turns the computer on or off.
Standby	Pushing the power button places the computer in Standby mode
Suspend	Pushing the power button places the computer in Suspend mode or Full On power mode.

➤ **Restore on AC Power Loss**

This option configures the system to remain off/on, or to resume the last power state after AC power is returned to the system. Last State is the optimal and fail-safe default setting.

Power Off	This selection keeps the system power off after AC power is restored to the system.
Power On	This selection restores the system power and turns the system on after AC power is restored.
Last State*	This selection returns to the previous powered state when AC power is restored. This is the default setting.

➤ **Display Activity**

Set this value to allow or prevent display activity from waking the system from a power management state. The Optimal and Fail-Safe default setting is Ignore.

Ignore*	This setting prevents display activity to wake up the system from a power management state.
Monitor	This setting allows display activity to wake up the system from a power management state.

➤ **Resume on Ring**

This option will configure the system to wake up from sleep or soft-off mode when a call is received by a telephony device, such as a modem. Set this value to enable/disable the Resume on Ring wake event.

Disabled*	This setting disables the Resume on Ring wake event. This is the default setting.
Enabled	This setting enables the Resume on Ring wake event.

➤ **Resume on LAN**

This option will configure the system to wake up from sleep or soft-off mode when a signal or packet from a remote location is received by the ethernet device. Set this value to enable/disable the Resume on LAN wake event.

Disabled*	This setting disables the Resume on LAN wake event. This is the default setting.
Enabled	This setting enables the Resume on LAN wake event.

➤ **Resume on PME#**

This option will configure the system to wake up from sleep or soft-off mode when a power management event (PME) is generated by the system. Set this value to enable/disable the Resume on PME# wake event.

Disabled*	This setting disables the Resume on PME# wake event. This is the default setting.
------------------	---

Enabled	This setting enables the Resume on PME# wake event.
----------------	---

➤ **Resume on RTC Alarm**

This option will configure the system to wake up from sleep or soft-off mode using the real time clock (RTC) alarm to specify a wake up time. Set this value to enable/disable the Resume on RTC Alarm wake event.

Disabled*	This setting disables the Resume on RTC Alarm wake event. This is the default setting.
Enabled	This setting enables the Resume on RTC Alarm wake event.

➤ Exit Menu

Selecting "Exit" from the menu bar displays this menu:



Figure 4-24. Exit Menu

The following sections describe each of the options on this menu. Note that [Esc] does not exit this menu. You must select one of the items from the menu or menu bar to exit.

➤ Save Changes and Exit

After making your selections on the Setup menus, always select either "Saving Values" or "Save Changes." Both procedures store the selections displayed in the menus in CMOS (short for "battery-backed CMOS RAM") a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS.

After you save your selections, the program prompts with this message:

```
Save configuration changes and exit now?  
[Yes]  [No]
```

Make your selection using the arrow keys and press *Enter*. If you attempt to exit without saving, the program asks if you want to save before exiting.

During boot up, PhoenixBIOS attempts to load the values saved in CMOS. If those values cause the system boot to fail, reboot and press [F2] to enter Setup. In Setup, you can get the Default Values (as described below) or try to change the selections that caused the boot to fail.

➤ *Discard Changes and Exit*

Use this option to exit Setup without storing in CMOS any new selections you may have made. The selections previously in effect remain in effect.

➤ *Discard Changes*

If you change your mind about changes you have made during a Setup Session and have not yet saved the values to CMOS, you can restore the values you previously saved to CMOS.

Selecting "Discard Changes" on the Exit menu updates all the selections and prompts with this message:

```
Load previous configuration now?  
[Yes] [No]
```

Make your selection using the arrow keys and press *Enter*.

➤ *Load Setup Defaults*

To display the default values for all the Setup menus, select "Load Setup Defaults" from the Main Menu. The program prompts with this message:

```
Load Default configuration now?  
[Yes] [No]
```

Make your selection using the arrow keys and press *Enter*. If the BIOS program detects a problem in the integrity of values stored in CMOS during boot up, it displays these messages:

```
System CMOS checksum bad - run SETUP  
Press <F1> to resume, <F2> to Setup
```

The CMOS values have been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS.

Press [F1] to resume the boot or [F2] to run Setup with the ROM default values already loaded into the menus. You can make other changes before saving the values to CMOS.

▶ *Save Changes*

Selecting “Save Changes” saves all the selections without exiting Setup. You can return to the other menus if you want to review and change your selections.

Chapter 5

► Troubleshooting

Contents

On-board Hardware Installation	5-3
BIOS Setting	5-4
Operating System (OS) Diagnostics	5-7
Booting	5-7
Display Setup	5-8
Network setup	5-8



► On-board Hardware Installation

Question	Answer
How do I connect my keyboard and mouse?	<p>Users may install a PS/2 keyboard and mouse with a PS/2 interface (using a Y-cable), J18, on the I/O board bracket of the PCI-953. By default, a PS/2 keyboard will work if no Y-cable is used.</p> <p>However, it is also fine to install a standard keyboard using the PS/2 alternate header (J17) or via the standard keyboard connector on the backplane, if available.</p>
OK. I have finished up hardware installation, but I get nothing when I power on the system. Why?	<p>Verify that all cables are connected and that pin 1 orientation is correct for each cable.</p> <p>Ensure that your power supply is connected to the 20-pin connector and 4-pin ATX12V connector on the SBC. Also, check that an additional 20-pin cable is connected from the power supply to the backplane.</p>
If I connect two IDE devices over one IDE flat cable, the system either does not start or hangs from time to time. Why?	<p>ABCsure that you have configured the two IDE devices as master and slave, respectively.</p>

BIOS Setting

It is assumed that users have correctly adapted modules and connected all the device cables required before powering on the system. The:

- ◆ CPU, CPU fan, and CPU fan power cable,
- ◆ 184-pin DDR-400 SDRAM,
- ◆ keyboard and mouse,
- ◆ floppy drive and IDE hard disk,
- ◆ VGA connector,
- ◆ device power cables, and
- ◆ ATX accessories power cable

are good examples that deserve attention.

It is possible to encounter system failures that result in malfunction of any device if these are not correctly installed.

To make sure that you have a successful start with the PCI-953 single board computer, it is recommended, when going with the boot-up sequence, to press the [Del] key and enter the BIOS setup menu to create a BIOS configuration that matches your application requirements.

➤ *Loading the Default Optimal Settings*

To load the default optimal settings, follow these steps:

- 1) When prompted with the main setup menu, scroll down to “Load Optimal Defaults”.
- 2) Press [Enter] and “Y” to load in the default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration.

Kontron recommends that you do this any time the system appears to be unstable during the boot up sequence.

➤ *Auto Detect Hard Disks*

In the BIOS => Standard CMOS setup menu, pick up any Primary/Secondary Master/Slave IDE ports, and press [Enter]. Setup the IDE port and its access mode to “Auto”. This will force system to automatically detect the IDE devices that are being connected each time the system is booted.

➤ *Improper Disable Operation*

There are many occasions where a user may use the BIOS to disable a device/feature in a particular application and forget to re-enable the device before they use another application that needs the disabled device. This may cause the system to fail in detecting the device and initiate a system failure.

Ensure that the BIOS settings for the devices or ports needed are not disabled. These devices/ports may include the floppy drive, COM1/COM2 ports, USB ports, external cache, on-board VGA, and Ethernet.

It is also common to disable a certain device/port to release an IRQ resource. A few good examples are:

disable COM1 serial port to release IRQ #4
disable COM2 serial port to release IRQ #3
disable PS/2 mouse to release IRQ #12,
..., etc.

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Counter
IRQ #1	Keyboard
IRQ #2	Programmed Controller
IRQ #3	COM2
IRQ #4	COM1
IRQ #5	Nothing
IRQ #6	Floppy Disk Controller
IRQ #7	Printer Port (Parallel Port)
IRQ #8	CMOS Clock
IRQ #9	Nothing
IRQ #10	USB interface
IRQ #11	Nothing
IRQ #12	PS/2 mouse
IRQ #13	Data Processor
IRQ #14	Primary IDE Controller
IRQ #15	Secondary IDE Controller

It is then very easy to find out which IRQ resource is available for additional peripherals. If the IRQ resource is not enough, disable some of the devices listed above to release additional IRQ resources.

▶ **Operating System (OS) Diagnostics**

This section describes how to use the drivers for any Microsoft Windows-95/98/NT device. For other operating systems, please refer to the OS manual/guidebook.

▶ **Booting**

If **Windows 95/98/ME** hangs during loading and the Windows logo shows no progress or no display is given, follow these steps:

- 1) Restart your system and press [F5] when the Windows system is loading to enter "Safe mode".
- 2) Once in "Safe mode," remove any devices that are not running or installed properly.
- 3) Restart Windows. The devices that have been removed will be detected again. The drivers will be loaded automatically if the drivers have been copied into the system database, or you will be asked to provide a driver source for installation.

For **Windows-NT 4.0** users, it is not always recommended that you change your hardware configuration after your first installation. However, if such a change is needed, please note that sometimes Windows-NT 4.0 will stop loading and prompt you with error messages. Please note that reinstallation on this NT hard disk may be inevitable. You have to backup your data stored in this hard disk because it is almost impossible to revive this system unless booting up with another hard disk. If this NT hard disk is installed with FAT16 disk format, please boot up your system with any Windows OS. You will then be able to see this NT hard disk and retrieve any data. However, if this NT hard disk is installed with NTFS disk format, only NTFS allow you to retrieve this hard disk data.

► Display Setup

By default, any Windows OS starts with a 640 x 480 by 16 color display setting.

- 1) Load the display driver provided on the Single Board Computer Technical Reference CD to maximize the VGA performance.
- 2) If you are using a monitor that Windows cannot identify, in the "Display Setup" menu select an appropriate monitor manually.
- 3) For Windows-NT 4.0 users, as PCI-953 provides Direct AGP on-board, Service Pack 3.0 or above is required to activate this display feature.

► Network setup

Windows 95/98/ME users:

- 1) If you will be using an off-board ISA/PCI network card, install the card in an available slot.
- 2) Start Windows 95/98/ME and let Windows 95/98/ME automatically detect your network adapter.
- 3) Provide the driver and complete the installation.
- 4) Restart Windows.
- 5) Once Windows is loaded, go to Control Panel -> System -> Device Manager and see if your network adapter has been installed properly. A warning sign will be prompted if the network adaptor is not properly installed.
- 6) Remove any network device from System Setup menu that is not properly installed. Then restart Windows to re-detect your network adapter again.
- 7) Once hardware installation is complete, go to Control Panel -> Network to set up your networking configuration. This includes DNS, IP, and Gateway. Appropriate protocols are required to carry your networking activities. Please refer to your system administrator for additional assistance.

Windows-NT 4.0 users:

- 1) Install your network adapter manually in Control Panel -> Network -> Adapter. Drivers are required at this stage.
- 2) Enter or set networking information.
- 3) Restart your system.
- 4) When replacing a network interface device, make sure you removed all old network adapters and protocols from the network setup menu.

Note: Network setup within Windows-NT 4.0 is not as easy as within Windows 95/98/ME. Special familiarity and care are required to come out with a successful installation. Contact Kontron Technical Support for assistance.

