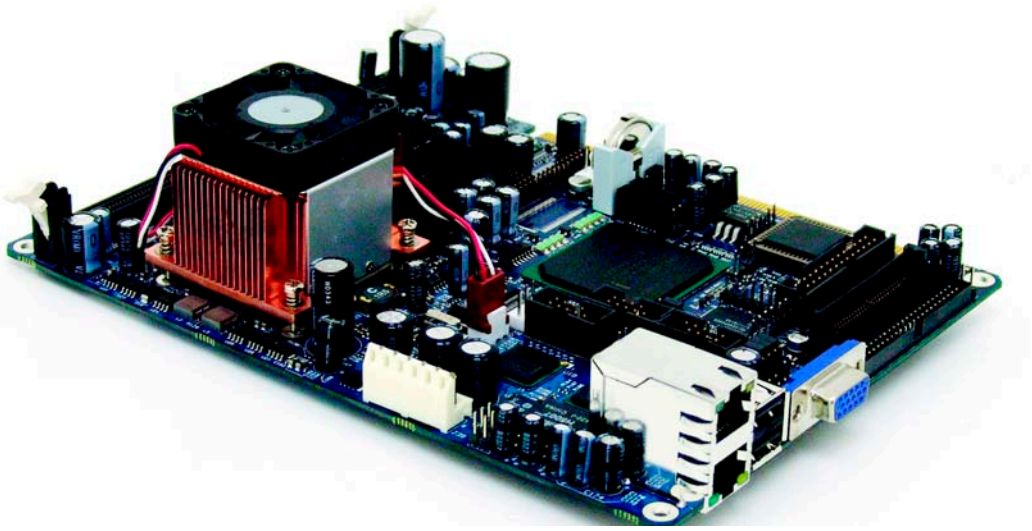
MUNG0560
User's Guide



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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

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Safety Instructions

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Before You Begin

Before handling the MUNGO560 , 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.

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Preface

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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 MUNGO560 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 and heat sink and fan.
- **Chapter 4, Hardware,** explains how to install the Pentium M chip, the heat sink and fan, and memory.
- **Chapter 5, BIOS,** 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 6, System Resource Allocation,** provides additional information on IRQs, DMA Channels, and memory mapping.
- **Chapter 7, Block Diagram,** details components and the flow of the MUNGO560.
- **Chapter 8, Troubleshooting,** provides help for basic technical issues.

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.

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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 unit s 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

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Overview

The MUNGO560 is Kontron's latest highest performance embedded board. Using the latest Intel 855GME and 6300ESB chipsets, the MUNGO560 supports all Intel Pentium M and Intel Celeron M processors in both socketed and soldered CPU offerings (by request).

With an Intel Pentium M processor up to 2.4GHz, and 64-bit I/O bus, the MUNGO560 provides unmatched performance to embedded applications-- performance comparable to an Intel Pentium 4 processor but without the extreme wattage and heat. By using an Intel Pentium M processor at 1.1GHz or Intel Celeron M processor, the MUNGO560 delivers performance to rougher embedded environments.

I/O Performance

The MUNGO560's modern I/O, such as four USB 2.0 ports, two SATA controllers and dual 10/100Base-T and 10/100/1000 Gigabit Ethernet, provide many advantages over older embedded board designs. The onboard Extreme Graphics 2 supports separate dual video output via a conventional AGP interface with support for LVDS flat panels.

The most unique feature of the MUNGO560 is its PICMG edge that supports risers to bring out 64-bit PCI-X slots for high performance I/O applications. Also included is a mini-PCI socket for add-on I/O with 64-bit extension for custom mini-PCI-X solutions, or just conventional 32-bit mini-PCI. The board also includes two Serial ports.

Additional I/O options are an AC-97(Sound Blaster®) audio output module anda USB add on module for up to seven USB 2.0 ports. The MUNGO560 comes with Linux and Windows 2000/XP drivers. Other OS drivers may be available by special request.

Checklist

- MUNGO560 embedded board

If this item is damaged, please contact Kontron.

Save all packing materials for future replacement and maintenance.

Chapter 2

Jumpers & Connectors

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Overview

This chapter provides the definitions and locations of jumpers, headers, and connectors. The MUNGO560 has multiple jumpers, which you can configure.

Jumpers on the MUNGO560 single board computer are shipped with the default settings. The default settings are marked with an asterisk (*).

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”.)

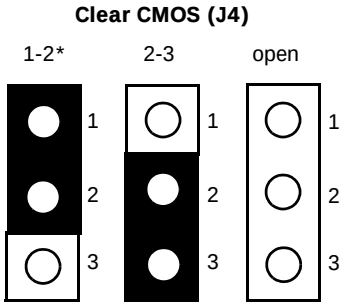
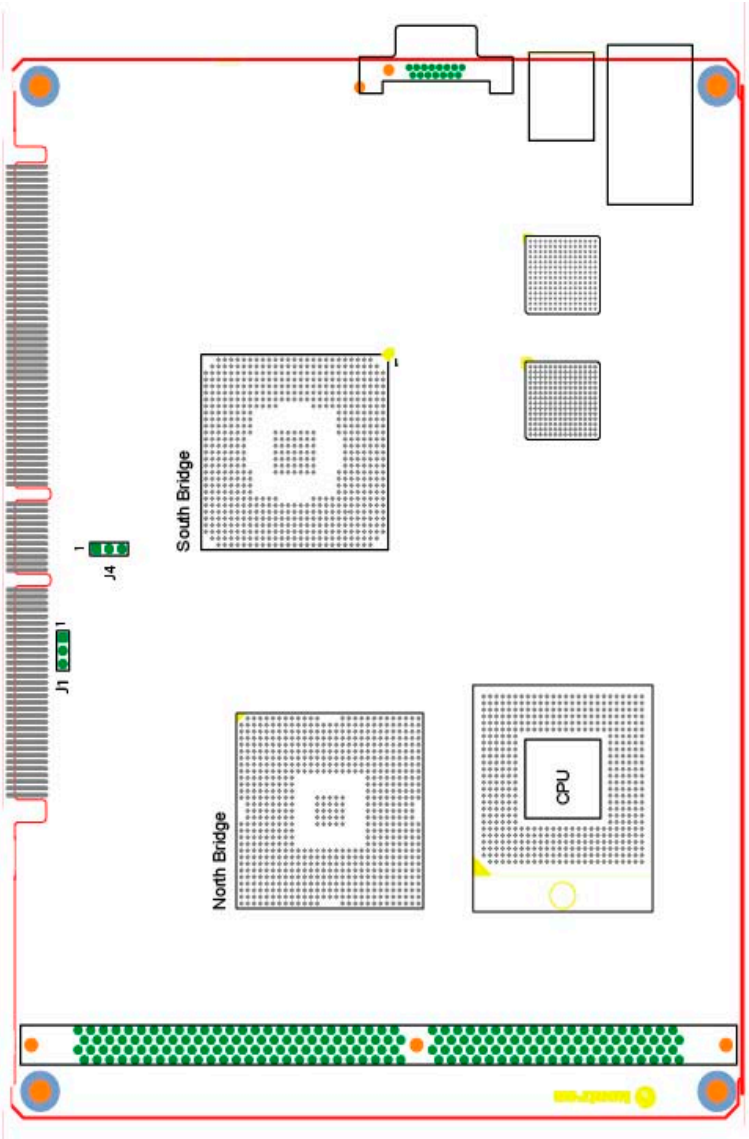


Figure 2-1. Example of a 3-pin jumper

Jumper Locations

The following diagram shows the layout of the MUNGO560 jumpers. For additional information, see the MUNGO560 Quick Reference on the Kontron Web site.



Jumper Pinouts

Asterisks mark the default setting for each of the jumpers.

LCD Power Selection (J1)

Pin	Jumper	Pin	Jumper	Pin
1,2	<+5V for LCD PWR>	2,3	<+3V for LCD PWR> *	3

RTC CMOS Clear (J4)

Pin	Jumper	Pin	Jumper	Pin
1,2	<Normal>*	2,3	<Clear CMOS>	3

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.

Pins	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).

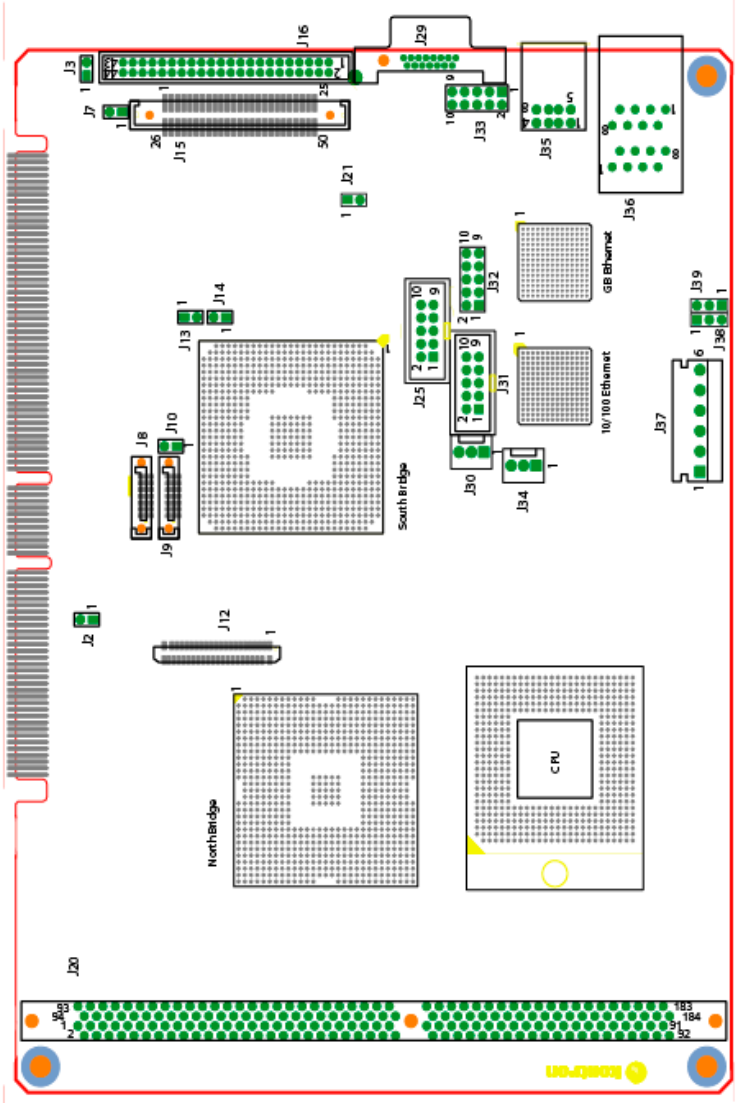
3) With system power still turned off, move the jumper at JP1 from pins 2-3 back to pins 1-2 (Normal Operation).

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. Jumpers are not shown in this diagram. For jumper information, see the preceding section on Jumpers. A complete list of SBC components and matching reference designators are on the next page.



Connector List

The following table lists the SBC component and its connector reference designator. See the previous illustration to find the location of the components.

Reference Designator	Component	Header
J2	SATA Activity	2-pin header
J7	IDE + CF Activity Header	2-pin header
J8	SATA Port 0	7-pin vertical header connector
J9	SATA Port 1	7-pin vertical header connector
J10	Chassis Intrusion	2-pin header
J12	2 x LVDS Interface	40-pin FFC connector
J13	Reset	2-pin header
J14	Power Switch	2-pin header
J15	Secondary IDE (Compact Flash)	50-pin vertical socket
J16	Primary IDE (2.5 inches)	44-pin shrouded header
J20	DDR Memory Socket	
J21	Chassis Speaker	2-pin header
J25	COM Port 1	10-pin shrouded header
J29	VGA	
J30	Chassis Fan I/F	3-pin header with Tach Monitoring
J31	COM Port 2	10-pin shrouded header
J32	AC '97 Audio Signals	10-pin header
J33	USB Ports 3 & 4	10-pin header
J34	CPU Fan I/F	3-pin header with Tach Monitoring

Reference Designator	Component	Header
J35	USB Ports 1 & 2	10-pin header
J36	Ethernet Ports 1 & 2	
J37	Power Input	6-pin locking connector
J38	10/100 ACT/Link	3-pin header
J39	10/100/1000 ACT/Link	3-pin header
J40	Mini-PCI (backside)	124-pin SODIMM socket
J41	64-bit Mini-PCI extension (back side)	60-pin dual row SMT stack

Connector Pinouts

The following tables detail the pinout of each of the MUNGO560 components.

SATA Port 0 (J8)

Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

SATA Port 1 (J9)

Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Chassis Intrusion (J10)

Pin	Switch	Pin	Description
1	<J10>	2	Chassis Intrusion Switch

2 x LVDS (J12)

Pin	Signal	Pin	Signal
1	DETECT	2	TX1_0N
3	TX1_0P	4	ENAVDD
5	TX1_1N	6	TX1_1P
7	ENAVEE	8	TX1_2N
9	TX1_2P	10	GND(0)
11	CLK_1N	12	CLK_1P
13	GND(1)	14	TX1_3N
15	TX1_3P	16	DATA
17	TX2_0N	18	TX2_0P
19	CLK	20	TX2_1N
21	TX2_1P	22	GND(2)
23	TX2_2N	24	TX2_2P
25	GND(3)	26	CLK_2N
27	CLK_2P	28	GND(4)
29	TX2_3N	30	TX2_3P
31	+5V(0)	32	+5V(1)
33	+5V(2)	34	+5V(3)
35	ENABLK	36	BKLGND(0)
37	BKLGND(1)	38	+12V(0)
39	+12V(1)	40	+12V(2)

Reset & Power Switch (J13, J14)

Pin	Switch	Pin	Description
1	<J13>	2	Chassis Reset Switch
1	<J14>	2	Chassis Power Switch

CompactFlash (J15)

This also serves as secondary IDE.

Pin	Signal	Pin	Signal
1	GND	26	Pull-Up
2	Data 3	27	Data 11
3	Data 4	28	Data 12
4	Data 5	29	Data 13
5	Data 6	30	Data 14
6	Data 7	31	Data 15
7	CS0#	32	CS1#
8	GND	33	GND
9	GND	34	IOR#
10	GND	35	IOW#
11	GND	36	+3.3V
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	Data 0	46	NC
22	Data 1	47	Data 8
23	Data 2	48	Data 9
24	Pull-Down	49	Data 10
25	Pull-Up	50	GND

Primary IDE (J16)

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 for keying
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	N/C
33	SA1	34	CBL_DET
35	SA0	36	SA2
37	HDC CS0 #	38	HDC CS1 #
39	HDD Active #	40	Ground
41	+5V	42	+5V
43	GND	44	NC

Chassis Speaker Header (J21)

Pin	Signal
1	+5V
2	Speaker Signal

COM Port 1 (J25)

Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCD)	2	Data Set Ready (DRS)
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	Remove for keying

VGA (J29)

Pin	Signal
1	R
2	G
3	B
4	N/C
5	GND
6	GND
7	GND
8	GND
9	+5V (FUSED)
10	GND
11	N/C
12	DDCDAT
13	HSYNC
14	VSYNC
15	DDCCLK

Chassis Fan I/F (J30)

Pin	Signal
1	**FAN CNTL**
2	**+12V**
3	**FAN TACH**

COM Port 2 (J31)

Pin	Signal	Pin	Signal
1	Data Carrier Detect (DCD)	2	Data Set Ready (DRS)
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	Remove for keying

AC '97 Audio (J32)

Pin	Signal	Pin	Signal
1	**SDIN**	**2**	**SDOUT**
3	**+3.3V**	**4**	**+12V**
5	**AC97_EN#**	**6**	**GND**
7	**SPKR_IN**	**8**	**AC97_RST#**
9	**BIT_CLK**	**10**	**SYNC**

USB 2.0 Port 3 & 4 (J33)

Pin	Signal	Pin	Signal
1	+5V (fused)	2	GND Shield
3	USBP4-	4	Ground
5	USBP4+	6	USBP3+
7	Ground	8	USBP3-
9	GND Shield	10	+5V (fused)

CPU Fan I/F (J34)

Pin	Signal
1	FAN CNTL
2	+12V
3	FAN TACH

USB 2.0 Port 1 & 2 (J35)

Pin	Signal
1	+5V (fused)
2	USBP1-
3	USBP1+
4	Ground
5	+5V (fused)
6	USBP2-
7	USBP2+
8	Ground

10/100/1GB Ethernet Ports 1 & 2 (J36)

Pin	Signal	Location	Function
1a	PORT1_MDX1+	Bottom RJ45	GBE
2a	PORT1_MDX1-	Bottom RJ45	GBE
3a	PORT1_MDX2+	Bottom RJ45	GBE
4a	PORT1_MDX3+	Bottom RJ45	GBE
5a	PORT1_MDX3-	Bottom RJ45	GBE
6a	PORT1_MDX2-	Bottom RJ45	GBE
7a	PORT1_MDX4+	Bottom RJ45	GBE
8a	PORT1_MDX4-	Bottom RJ45	GBE
1b	PORT1_MDX1+	Top RJ45	10/100
2b	PORT1_MDX1-	Top RJ45	10/100
3b	PORT1_MDX2+	Top RJ45	10/100
4b	NC	Top RJ45	10/100
5b	NC	Top RJ45	10/100
6b	PORT1_MDX2-	Top RJ45	10/100
7b	NC	Top RJ45	10/100
8b	NC	Top RJ45	10/100

Power (J37)

Pin	Signal
1	+5V
2	+5V
3	+12V
4	GND
5	GND
6	GND

LAN Activity Header 1 (J38)

This pinout is for the 10/100 ATC ACT/Link header.

Pin	Signal
1	ACT#
2	+3.3V
3	LINK#

LAN Activity Header 2 (J39)

This pinout is for the 10/100/1000 ACT/Link header.

Pin	Signal
1	ACT#
2	+3.3V
3	LINK#

Mini-PCI (J40)

The mini-PCI is located on the back of the board.

Signal	Pin	Pin	Signal
NC	1	2	NC
	KEY	KEY	
NC	3	4	NC
NC	5	6	NC
NC	7	8	NC
NC	9	10	NC
NC	11	12	NC
NC	13	14	NC
NC	15	16	NC
INTB#	17	18	+5V
+3.3V	19	20	INTA#
RSVD	21	22	RSVD
GND	23	24	+3.3VAUX
CLK	25	26	RST#
GND	27	28	+3.3V
REQ#	29	30	GNT#
+3.3V	31	32	GND
AD31	33	34	PME#
AD29	35	36	RSVD
GND	37	38	AD30
AD27	39	40	+3.3V
AD25	41	42	AD28

RSVD	43	44	AD26
CBE3#	45	46	AD24
AD23	47	48	IDSEL
GND	49	50	GND
AD21	51	52	AD22
AD19	53	54	AD20
GND	55	56	PAR
AD17	57	58	AD18
CBE2#	59	60	AD16
IRDY#	61	62	GND
+3.3V	63	64	FRAME#
CLKRUN#	65	66	TRDY#
SERR#	67	68	STOP#
GND	69	70	+3.3V
PERR#	71	72	DEVSEL#
CBE#1	73	74	GND
AD14	75	76	AD15
GND	77	78	AD13
AD12	79	80	AD11
AD10	81	82	GND
GND	83	84	AD9
AD8	85	86	CBE0#
AD7	87	88	+3.3V
+3.3V	89	90	AD6
AD5	91	92	AD4
RSVD	93	94	AD2

AD3	95	96	AD0
+5V	97	98	RSVD
AD1	99	100	RSVD
GND	101	102	GND
NC	103	104	M66EN
NC	105	106	NC
NC	107	108	NC
NC	109	110	NC
NC	111	112	NC
NC	113	114	GND
NC	115	116	NC
NC	117	118	NC
NC	119	120	NC
NC	121	122	NC
NC	123	124	NC

PCB Edge Connector (32 Bit)

This is a 32-bit PCI backplane.

Signal	Pin	Pin	Signal
-12V	F01	E01	TRST#
TCK	F02	E02	+12V
GND	F03	E03	TMS
TDO	F04	E04	TDI
+5V	F05	E05	+5V
+5V	F06	E06	INTA#
INTB#	F07	E07	INTC#
INTD#	F08	E08	
REQ3#	F09	E09	
REQ1#	F10	E10	+5V(I/O)
GNT3#	F11	E11	CLKD
GND	F12	E12	GND
GND	F13	E13	GND
CLKA	F14	E14	GNT1#
GND	F15	E15	RST#
CLKB	F16	E16	+5V(I/O)
GND	F17	E17	GNT0#
REQ0#	F18	E18	GND
+5V(I/O)	F19	E19	REQ2#
AD31	F20	E20	AD30
AD29	F21	E21	+3.3V

GND	F22	E22	AD28
AD27	F23	E23	AD26
AD25	F24	E24	GND
+3.3V	F25	E25	AD24
C/BE3#	F26	E26	GNT2#
AD23	F27	E27	+3.3V
GND	F28	E28	AD22
AD21	F29	E29	AD20
AD19	F30	E30	GND
+3.3V	F31	E31	AD18
AD17	F32	E32	AD16
C/BE2#	F33	E33	+3.3V
GND	F34	E34	FRAME#
IRDY#	F35	E35	GND
+3.3V	F36	E36	TRDY#
DEVSEL#	F37	E37	GND
GND	F38	E38	STOP#
LOCK#	F39	E39	+3.3V
PERR#	F40	E40	SDONE
+3.3V	F41	E41	SBO#
SERR#	F42	E42	GND
+3.3V	F43	E43	PAR
C/BE1#	F44	E44	AD15
AD14	F45	E45	+3.3V
GND	F46	E46	AD13
AD12	F47	E47	AD11
AD10	F48	E48	GND

GND	F49	E49	AD09
Connector Key			
Connector Key			
AD08	F52	E52	C/BE0#
AD07	F53	E53	+3.3V
+3.3V	F54	E54	AD06
AD05	F55	E55	AD04
AD03	F56	E56	GND
GND	F57	E57	AD02
AD01	F58	E58	AD00
+5V(I/O)	F59	E59	+5V(I/O)
ACK64#	F60	E60	REQ64#
+5V	F61	E61	+5V
+5V	F62	E62	+5V

PCB Edge Connector (64 Bit)

This is a 64-bit PCI backplane.

Signal	Pin	Pin	Signal
RSVD	F63	E63	GND
GND	F64	E64	C/BE7#
C/BE6#	F65	E65	C/BE5#
C/BE4#	F66	E66	+5V
GND	F67	E67	PAR64
AD63	F68	E68	AD62
AD61	F69	E69	GND
+5V	F70	E70	AD60
AD59	F71	E71	AD58
AD57	F72	E72	GND
GND	F73	E73	AD56
AD55	F74	E74	AD54
AD53	F75	E75	+5V
GND	F76	E76	AD52
AD51	F77	E77	AD50
AD49	F78	E78	GND
+5V	F79	E79	AD48
AD47	F80	E80	AD46
AD45	F81	E81	GND
GND	F82	E82	AD44
AD43	F83	E83	AD42
AD41	F84	E84	+5V

GND	F85	E85	AD40
AD39	F86	E86	AD38
AD37	F87	E87	GND
+5V	F88	E88	AD36
AD35	F89	E89	AD34
AD33	F90	E90	GND
GND	F91	E91	AD32
RSVD	F92	E92	RSVD
RSVD	F93	E93	GND
GND	F94	E94	RSVD

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Chapter 3

Hardware

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Overview

This chapter describes how to set up your system, add a processor, memory, and install the heatsink/fan.

Installing the Pentium M Processor

1) Ensure that the “screw dial” is in the unlocked positioned (3 o’clock).

2) Carefully mount the processor, making sure that Pin 1 of the processor lines up with Pin 1 of the socket.

3) Gently turn the “screw dial” back to the locked position (9 o’clock).

Installing the Heatsink and Fan

1) Peel off the adhesive backing on the heatsink backplate.

2) With the motherboard on its solder side (upside down), install the backplate. The adhesive will make contact if the backplate is properly lined up.

3) With the processor installed, secure the heatsink and fan assembly to the backplate, using the four screws on the assembly.

4) Plug the CPU fan power to Connector J34.

Installing Memory

The MUNG0560 embedded board provides one 184-pin DIMM sockets to support on-board main memory. The maximum memory size for 2.5V DDR-200/266/333 SDRAM is 2GB.

For system compatibility and stability, do not use generic DIMM. Use single- or double-sided DDR-200/266/333 DIMM modules.



Note: For system stability, do not change any of the DRAM parameters in BIOS setup to upgrade your system performance. See the BIOS chapter 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. **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.



Adding a DIMM Card

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 3-1).

2) Place the DIMM card so that the notch on the contact edge lines up with the alignment node in the DIMM socket. Insert the DIMM card into the socket.

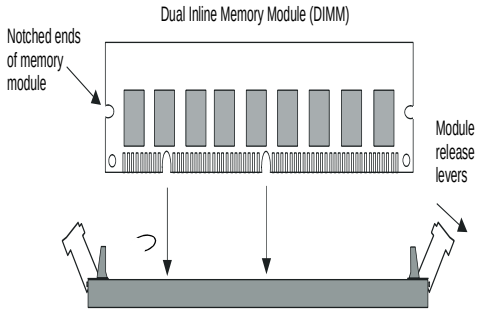


Figure 3-1. DIMM Installation

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.

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Chapter 4

Specifications

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Overview

The following information provides details on the technical specifications of the MUNG0560.

Processor

- Supports mPGA478 socket Intel® Pentium® M or Intel Celeron® M processors (Banias and Dothan) up to 2.16GHz
- PCB support of non-socket soldered Intel Pentium M or Intel Celeron M processors by special request

Chipset

- 855GME and 6300ESB

Bus Interfaces

- PCI 32-bit PICMG edge with 64-bit 33/66MHz edge extension
- 3.3 or 5V compatible multi-slot riser/backplane available
- CPU FSB 400MHz

Memory

- Up to 2GB single DDR 64-bit, 184-pin non-registered

FLASH Memory

- 4MB FLASH BIOS

I/O

USB Ports

- 4 USB 2.0 (two as dual stack and two via 10-pin header)
- Supports bootable USB

Serial Ports

- 2 RS-232
- 1 RS-232/422/485

Serial ATA

- Two drives supported

ATA/IDE

- Primary 44-pin 2.5-inch master/slave drive support up to UDMA/100

Ethernet

- One 10/100 BASE-T LAN
- One 10/100/1000 GB LAN

CompactFlash

- Type II secondary IDE or drive using vertical 50-pin CompactFlash

Mini-PCI

- Type III A or B
- 32-bit PCI with optional 64-bit extension (board backside)

I/O Options

USB Expansion Board

- Adding net gain of three more USB 2.0 ports
- 4-port module uses one existing USB port

Audio Speaker

- Support for external speaker

Audio Expansion Port

- AC 97 audio signals
- 10-pin header
- Supports daughter card with Audio
- Codec, AMP and audio connectors

Video

- Dual Enhanced Graphics interface
- 1 AGP VGA output
- 1 dual LVDS connection
- Supports LVDS flat panels

BIOS

- AMI BIOS
- BIOS supports firmware upgrade, write protect under BIOS control, Plug-n-Play, PCI bus, Serial ports, Watchdog, RTC, health monitoring, IDE, USB keyboard, boot without keyboard, USB boot, drive boot, CD-ROM, 10/100 and 10/100/1000 LAN, IDE CompactFlash card auto-detect on boot, Wakeon- LAN, BIOS setups default restore, console redirection, graphics disable for add-on PCI video card

OS Support

- Linux®
- Windows®2000/XP
- Others by special request

Mechanical Dimensions (W x D)

- Standard 5.25-inch form factor: 5.75 x 8-inch (146.1 x 203.2mm)

Environmental Specifications

Operating Temperature

- 0 ° to 50 °C (32 ° to 122 °F)

Non-operating Temperature

- -40 ° to 70 °C (-40 ° to 158 °F)

Operating Humidity

- 5 to 90% RHNC

Non-operating Humidity

- 5 to 95% RHNC @ (50 °F)

Operating Altitude

- 13,123-feet (4000-meters)

Non-operating Altitude

- 49,212-feet (15,000-meters)

Operating Vibration

- 5 to 500Hz, 1g, each axis

Non-operating Vibration

- 5 to 50Hz, 2g; 50 to 500Hz, 3g each axis

Reliability

- 2-year limited warranty

Power Specifications

Input Power Requirements

The input voltage range (maximum) requirements are:

- +5 V DC +/- 5%, max i/p current: 5.5A +/- 5%
- +12 V DC +/- 5%, max i/p current: 0.27A +/- 5%

Input Power

- The maximum steady state input power shall be 30.74W +/- 15%.

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Chapter 5

BIOS

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Overview

The MUNGO560 single board computer is equipped with an 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, and so it is retained during power-off periods. When the computer is turned on, the MUNGO560 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 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 <DEL> to enter SETUP
```

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

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.

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 shows you the keystroke functions in BIOS setup and their alternates.

Table 5-1. 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 submenu, use the arrow keys to move the cursor to the submenu you want. Then press [Enter]. A pointer (▶) marks all submenus.

Field Help Window

The help window on the right side of each menu displays the help text for the 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:

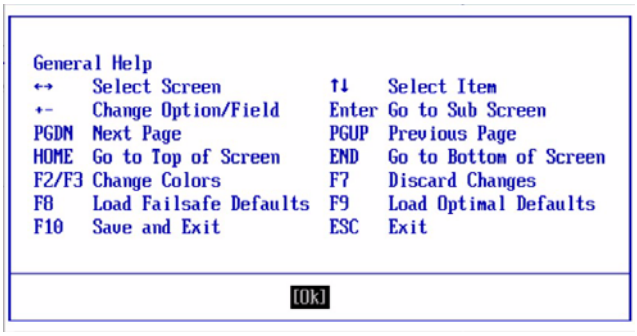


Figure 5-1. General Help Menu

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. Use the submenus 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 the following:

Feature	Description
CPU Configuration	This menu configures the CPU.
IDE Configuration	This menu enables you to configure your onboard and peripheral IDE devices.
Peripheral Configuration	This menu provides configuration and setup options for peripheral devices.
ACPI Configuration	This menu configures ACPI.
Event Log Configuration	This menu provides options to configure your onboard I/O devices, PS/2 Keyboard and mouse.
USB Configuration	This menu Enables or Disables USB support for legacy products.
Hardware Health Configuration	This menu shows the system's hardware health monitor screen.

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

An asterisk represents the default value

CPU Configuration

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 front-side bus.

Cache L1 and L2

These options display the L1 and L2 cache allocated.

Intel SpeedStep tech.

This option allows you to set the speed of the CPU.

Maximum Speed	Sets CPU speed to maximum.
Minimum Speed	Sets CPU speed to minimum.
Automatic*	Allows operating system to control CPU speed.
Disabled	The default CPU speed is used.

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. (4 P-ATA and 2 S-ATA)
S-ATA Only	Set this value to utilize the enhanced S-ATA IDE channel. (2 S-ATA)
P-ATA and S-ATA	Set this value to utilize both P-ATA and S-ATA channels. (2 P-ATA and 2 S-ATA)
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 *	Set this value to define this port for use in S-ATA mode. This is the optimal and fail-safe 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.

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.
The asterisk represents the default value.

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 5 seconds.
10	Set this option to stop the BIOS from searching the IDE bus for IDE devices in 10 seconds.
15	Set this option to stop the BIOS from searching the IDE bus for IDE devices in 15 seconds.
20	Set this option to stop the BIOS from searching the IDE bus for IDE devices in 20 seconds.
25	Set this option to stop the BIOS from searching the IDE bus for IDE devices in 25 seconds.
30	Set this option to stop the BIOS from searching the IDE bus for IDE devices in 30 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 Submenus

The Master and Slave submenus 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 MUNGO560 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 submenu.

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
Type	Select the type of device connected to the system. The default selection is “Auto.”
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 Asychronous DMA mode is supported.
Ultra DMA Mode	This indicates the highest Sychronous 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**. After 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: • 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 (Multisector 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. This is the optimal and fail-safe default setting.

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.

S.M.A.R.T. for Hard Disks

Self-Monitoring Analysis and Reporting Technology (SMART) feature can help predict drive failures. The asterisk represents the default value.

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. This is the optimal and fail-safe default setting.
Enabled	Set this value to allow the BIOS to use 32-bit data transfers on support hard disk drives. This is the default setting.

Peripheral Configuration Submenu

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 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. This is the optimal and fail-safe default setting.
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.

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*	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. 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. This is the Optimal and Fail-Safe setting.
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.

Mini-PCI Slot Bus Master

This enables Bus Mastering for the Mini-PCI slot.

General ACPI Configuration

Use this submenu to select options for ACPI configuration.

ACPI Aware O/S

This allows the O/S to be aware of the ACPI. The asterisk represents the default value.

Options: Yes* or No.

General ACPI Configuration

Suspend Mode

This option selects the ACPI state for system suspend. Auto is the optimal default setting. S1 (pos) is the fail-safe default setting. The asterisk represents the default value.

Options:
S1 (POS) only;
S1 & 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. The asterisk represents the default value.

Options: No, Yes*

S4 BIOS Support

This option enables S4BIOS support if S4 (Hibernation) is not supported by the O/S.

Options: Disabled*, Enabled

Advanced ACPI Configuration

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

ACPI 2.0

Set this value to allow or prevent the system to be complaint 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*	This setting will initiate ACPI APIC support.Enabled is the optimal and fail-safe default setting
Disabled	This setting disables ACPI APIC support.

APIC ACPI SCI IRQ

Set this value to Enabled the 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.

AMI OEMB 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 boot-up, 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. This is the default value.
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.

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.

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.

Remote Access Configuration

Use these selections to configure the remote access to your system.

Remote Access

This enables or disables your capability to access your system remotely.

Options: Enabled*, Disabled

Serial Port Number

Choose a number for your serial port.

Options: [115200 8,n,1*], 57600 8,n,1, 38400 8,n,1, 19200 8,n,1, 09600 8,n,1[

Flow Control

Select the flow control for console redirection.

Options: None*, Hardware, Software

Redirection after BIOS Post

Options: Always*, Disabled, Boot Loader,

Terminal Type

Select the target terminal type.

Options: ANSI*, VT100, VT-UT58

VT UTF8 Combo Key Select

Options: Disabled*, Enabled

USB Configuration

Use this screen to configure the onboard USB devices.

USB Function

Set this value to allow the system to enable or disable the onboard 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.

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.

Port 64/60 Emulation

This choice enables I/O Port 60h/64h emulation support. Enable this for USB keyboard legacy support for non-USB aware OSes.

Options: Disabled*, Enabled

USB 2.0 Controller

Set this value to enable or disable the USB 2.0 controller.

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).

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.

USB Beep Message

This enables the beep during USB device enumeration. The asterisk represents the default value.

Options: Enabled*, Disabled

Hotplug USB FDD Support

A dummy FDD device is created that will be associated with the hotplugged FDD later. Auto option creates this dummy device only if there is no USB FDD present. The asterisk represents the default value.

Options: Auto*, Enabled, Disabled

Hardware Health Configuration

Use this screen to view and configure hardware health monitoring.

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.

PCI/PnP Menu

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

Plug and Play OS

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

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.

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 PCI VGA

Set this value to allow or restrict the system from giving the VGA adapter card an interrupt address.

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.

Disabled*	This is the default setting and should not be changed unless the VGA card manufacturer requires Palette Snooping to be Enabled. This is the default setting.
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 functions 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.

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.

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.

IRQ3 **IRQ4** **IRQ5** **IRQ7** **IRQ9**	**Available**	This setting allows the specified IRQ to be used by a PCI/ PnP device. This is the default setting.
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.

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.

Disabled*	Set this value to prevent BIOS from reserving memory to ISA devices. This is the default setting.
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.

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 with access to an operating system can include: hard drives, floppy drives, CD ROMs, removable devices (such as 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.

Use the Boot Menu to specify the priority of the devices from which the BIOS will attempt to boot the Operating System.

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].

Boot Settings Configuration

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.

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. This is the default setting.

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.

Security Menu

Password Support

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

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 submenu for the following items, select the item and press <Enter>:

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

The submenus are documented on the following pages.

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 submenu. You can use the submenu to change the supervisor password.

Change User Password

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

Disabled*	Set this value to prevent the Boot Sector Virus Protection. This is the default setting.
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)? _

Chipset Menu

Selecting 'Chipset' from the Main menu in the BIOS utility allows you to configure the north and south bridges.

North Bridge Configuration

Primary Video Device

This option allows you to select which graphics controller to use as the primary boot device. The asterisk represents the default value.

Options: Internal, External PCI, External AGP, Auto*

Graphics Mode Select

This option allows you to select the amount of system memory that will be used by the internal graphics device. The asterisk represents the default value.

Options: Disabled, Enabled - 1MB, Enable - 4MB, Enabled - 8MB*, Enabled - 16MB, Enabled - 32MB

IGD - Device 2, Function 1

Enabled or disable the Internal Graphics Device by setting either enabled or disabled. The asterisk represents the default value.

Options: Enabled*, Disabled

Boot Type

This allows you to select the type of boot screen. The asterisk represents the default value.

Options, VBIOS Default*, CRT, LFP, CRT + LFP, EFP, TV, CRT + EFP, CRT + TV, EFP + EFP2, EPP + TV

Flat Panel Type

This allows you to select the flat panel type.

Options, 1600x1200 LVDS is the default value.
Other choices include: 640x480LVDS, 800x600LVDS
1024x768LVDS, 1280x1024LVDS, 1400x1050LVDS, 640x480CMOS, 800x600CMOS,
1024x768CMOS, 1280x1024CMOS, 1400x1050CMOS, 1600x1200CMO

TV Standard

This option allows you to select the TV standard used for output.
The asterisk represents the default value.

Options: Automatic*, NTSC, PAL, SECAM

- NTSC Minor Standards: NTSC*, PAL, SECAM
- PAL Minor Standards: PAL B*, /G, /D, /H, /I, /M, /N, /60
- SECAM Standards: SECAM L*, /L1, /B, /D, /G, /H

Flat Panel Scaling

This option allows you to choose the flat-panel scaling. The asterisk represents the default value.

Options, Auto*, Force Scaling, Disabled

South Bridge Configuration

IOAPIC

Enable or disable the internal I/O Advanced Programmable Interrupt Controller (APIC) on the primary PCI bus. The asterisk represents the default value.

Options: Enabled*, Disabled

Extended IOAPIC

Enable or disable the internal I/O Advanced Programmable Interrupt Controller (APIC) on the secondary PCI bus (PCI. The asterisk represents the default value.

Options, Enabled*, Disabled

Onboard AC'97 Audio

Select the method used to detect audio. The asterisk represents the default value.

Options: Auto*, disabled

Onboard FPGA

When enabled, the BIOS will enable and program the FPGA device to enable extended functionality, which can include additional GPIO, LPT port, COM port and/or custom functions.

Options: Enabled*, Disabled

Power Menu

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



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.

Advanced SMI Enable Controls

Power Management/APM

Enabled or disable the SMI-based power management and APM support.
The asterisk represents the default value.

Options: Enabled*, Disabled

Power Button Mode

Select Power Button functionality. The asterisk represents the default value.

Options: On/Off*, Suspend

Resume after AC Power Loss

Configure the system to power on or stay off when power resumes after AC power loss.
The asterisk represents the default value.

Options, Always On*, Stay Off

Advanced Resume Event Controls

USB Controller Resume

Enable or disable USB wake from sleep states. The asterisk represents the default value.

Options: Enabled*, Disabled

PME Resume

Enable or disable PME wake from sleep states. The asterisk represents the default value.

Options: Disabled*, Enabled

RI Resume

Enable or disable RI wake from sleep states. The asterisk represents the default value.

Options: Disabled*, Enabled

Exit Menu

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

Load previous configuration now?
[Yes] [No]

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

Load Optimal 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:

Optimal Defaults?
[OK] [CANCEL]

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.

Load Failsafe Defaults

This option allows you to load the system’s failsafe defaults. The program prompts with this message:

Load Failsafe Defaults?
[OK] [CANCEL]

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Chapter 6

System Resource Allocations

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IRQ Lines

IRQ	Use	Available	Comment
0	Timer0	No	
1	Keyboard	No	
2	Cascade	No	
3	COMB	No	If disabled in setup, you can use this IRQ for other devices.
4	COMA	No	If disabled in setup, you can use this IRQ for other devices
5		Yes	
6		Yes	
7	LPT	No	You can configure LPT using IRQ5, too.
8	RTC	No	
9		Yes	
10		Yes	
11		Yes	
12		Yes	
13	Numeric processor	No	
14	EIDE Channel 1	No	
15	Compact Flash	No	If disabled in setup, you can use this IRQ for other devices

DMA Channels

DMA	Use	Available	Comment
0		Yes	
1		Yes	
2		Yes	This can serve as a possible alternative DMA channel for the LPT in ECP mode.
3	LPT	No	The DMA channel is only used for the ECP mode of LPT; it is available in other modes.
4	Cascade	No	
5		Yes	
6		Yes	
7		Yes	

I/O Addresses

I/O port addresses of the MUNGO560 are functionally identical to a standard PC/AT. All addresses not mentioned in this table should be available. Kontron recommends that you do not use I/O addresses below 0110hex with additional hardware for compatibility reasons, even if available.

PC and PC/XT Address Assignments

I/O Address	Usage	Available
0000-001F	DMA Controller 1	No
0020-003F	Interrupt Controller 1	No
0040-0044	Timer	No
0061	Port B Register	No
0070	NMI Enable Register	No
0070-0071	Real-time Clock	No
0072	CMOS Register	No
0080-008F	DMA Page Register	No
0092	Port A Register (Fast A20 Gate)	No
00A0 - 00BF	Interrupt Controller 2	No
00C0 - 00DF	DMA Controller 2	No
00E0 - 00EF	System Control	No
00F0 - 00FF	Math Coprocessor	No
0100 - 010F	System Control	No
01F0 - 01F7		No
0278 - 027Fh		Yes
02F8 -02FF	Serial Port 2	Yes

I/O Address	Usage	Available
0378-037F	Parallel Port 1	No
03BC-03C4h		Yes
03C0 - 03Df	Video	No
03E8-03EFh		Yes
03F8-03FF	Serial Port 1	No

Memory Map

The processor module can support up to 32MB of memory. The first 640KB of DRAM is used for main memory.

Using DOS, you can address 1MB of memory directly. Memory area above 1MB (high memory, extended memory) is accessed via DOS using special drivers such as HIMEM.SYS and EMM386.EXE, which are part of the operating system.

Other operating systems such as Linux or Windows allow you to address the full memory area directly.

Upper Memory	Use	Available	Comment
A0000h - BFFFFh	VGA Memory	No	Mainly used by graphics adapter cards. If a PCI graphic card is in the system, this memory area is mapped to the PCI bus.
C0000h - CBFFFh	VGA BIOS	No	Free for ISA bus or shadow RAM. C0000h - C7FFFh is mainly used by external ISA VGA cards.
CC000h - EFFFFh		Yes	Free of ISA bus or shadow RAM in standard configurations.
F0000h - FFFFFh	System BIOS	No	

Chapter 7

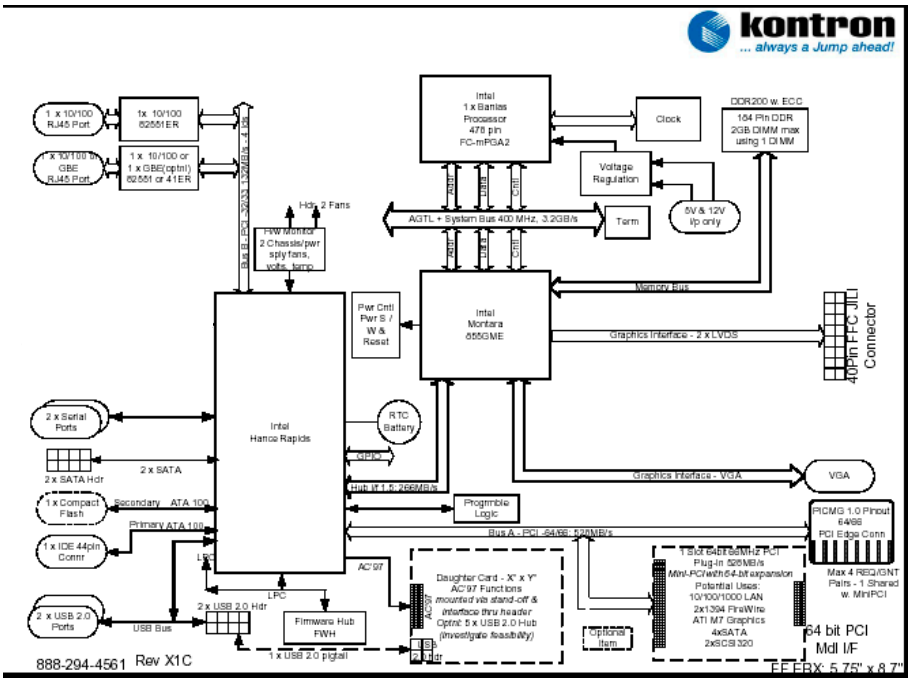
Block Diagram

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Overview

This block diagram shows the details of the operating relations of the embedded board's components.



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Chapter 8

Troubleshooting

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Troubleshooting

Table 8-1 on the following page provides troubleshooting procedures for some common problems. For problems not addressed in Table 8-1, use the following general guidelines:

- The components of a computer are all interrelated. That is, a "video" problem may be caused by the disk controller. The simplest diagnostic technique involves replacing the suspect board with a new one. If that does not fix the problem, remove all boards except for the minimum required by the system. Then run the system, replace each board until the problem shows itself.
- Was the system working prior to a change? Undo the change (remove a board if you have added something new or remove additional memory and see if the system works properly. The change may need a different configuration or may be faulty.
- Check for loose connections. Reseat ISA and PCI boards. Check drive cables, power cables to fans, and disk drive cables.
- Occasionally flash BIOS can be corrupted by hardware or software. Check the Kontron web site (*www.kontron.com*) for the latest version of BIOS and follow the steps for reflashing.
- When upgrading or adding hardware to an existing system, take careful note of board positions, and cables. Putting things back in a different order, such as PCI boards in different slots and SCSI HD connections in a different order, can change the functionality of a system.
- Confirm jumpers and switch settings for all boards in the system are correct. Verify with the individual product manuals the functions and settings of all switches.

If these quick and simple steps fail to resolve the problem, contact Kontron Technical Support for further advanced troubleshooting or reference the "Support" pages on the Kontron web site (*www.kontron.com*).

Common Problems

Table 8-1. Troubleshooting Steps

Symptom	Probable Cause	Recommended Solution
Why does my computer not turn on?	Power cord is not plugged in	Ensure the power cord is plugged into the electrical outlet, chassis, and surge protector if present. Often power cords can become inadvertently disconnected.
	Surge protector is not turned on and/or plugged in	If you are using a surge protector, ensure the surge protector is turned on and plugged in to the electrical outlet.
	Power supply cabling is shorted to the chassis	Ensure the power supply cabling is not shorted to chassis. Reposition the power supply cables in the chassis so they are not pinched or crimped. **Note:** In the case of a short, the power supply will sense the short and shut off. When the short is removed, the power supply should automatically sense the removal of the short and restore operation. If cables become damaged, contact Kontron for repair or replacement.

Symptom	Probable Cause	Recommended Solution
System gets power, but computer does not run. No disk activity or beeps.	Faulty board or CPU	Follow these steps: 1) Remove all boards except the CPU and video. 2) Turn on the system and watch for video and listen for beeps. 3) If there is no activity, turn off the system, remove the video board, and then turn on the system. Listen for beeps. a) If no beeps are heard, replace the CPU or test the CPU in another chassis. b) If beeps are heard, replace video board. c) If video comes up, replace each board one at a time. A faulty board will prevent the system from booting. d) Ensure the CPU and RAM are seated properly on the SBC. Consult the SBC manual for jumper settings.

Symptom	Probable Cause	Recommended Solution
System is not booting, just beeping	Memory is not seated correctly or is faulty	1 beep, 2 beeps, or 3 beeps: Reseat the memory first. If that does not fix the problem, replace the memory with known good chips.
	Video board is not seated correctly or, if CPU includes on-board video, is disabled in CMOS setup	8 beeps (memory error on the video adapter): Reseat the video board to ensure it is completely inserted in its slot. If the CPU includes on-board video, follow these steps: 1) Clear CMOS (see your manual for instructions) or reflash the BIOS to re-enable the on-board video. 2) Otherwise, install an external video adapter so that you can enter CMOS setup and enable the on-board video.
	BIOS is corrupt	If your system still fails to boot after reseating memory and checking cables and boards, try reflashing the BIOS with the latest version if possible.
Non Plug-n-Play board is not functioning	IRQ not specified for ISA expansion board in BIOS	A legacy ISA expansion board generally will require an IRQ set aside for its use. The IRQ required by the board will need to be reserved for the ISA bus. Enter the SBC BIOS SETUP and set aside the IRQ required. Refer to the SBC manual.
When attempting to boot the system, "No ROM BASIC" is displayed	System cannot find a proper bootable sector on the boot device	Install an operating system on the hard drive or boot from a floppy disk.

Symptom	Probable Cause	Recommended Solution
Hard disk drive controller failure	Ribbon cable or power connector not installed correctly	Confirm correct cabling to the hard drive ribbon cable and power connectors.
	Master/Slave jumpers not configured on the hard drives	Configure the "Master/Slave" jumpers on the hard drives. When sharing a single IDE channel, one drive must be Master and the second drive must be configured to Slave.
	Hard drive parameters in BIOS are not correct	Confirm hard drive parameters in the BIOS setup are correct. Auto-detect the drives and confirm detected parameters are correct for the hard drives.
	Hard drive not seen in FDISK	Verify that the hard drive is seen in FDISK and run FDISK /mbr from boot floppy.
Boot to floppy drive failure	Cable connection is inverted	If the floppy drive is always running, confirm the data cable orientation. The cable connection may be inverted.
	Required files for the operating system to boot missing or the disk is damaged	Format the floppy disk on a working system with the command "**Format A:/S**". This will format and move the required boot files to the floppy disk for DOS. Other operating systems may require re-installation.

Symptom	Probable Cause	Recommended Solution
Boot to SCSI failure	SCSI devices are not properly identified and/or termination is not properly implemented	Follow these steps: 1) Ensure that all SCSI devices are properly identified with a unique ID. Generally the boot drive will be ID 0. 2) Confirm that proper termination is implemented. Termination should be enabled on the end devices only.
	BIOS settings are incorrect	Verify the BIOS settings are correct on the SCSI controller. If uncertain of the controller BIOS settings, most controllers have an option to "Reset" the BIOS to default configuration.