MODEL 4823AB
User Manual V2.0

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Some components may not have been manufactured by Daisy Data Displays, Inc. If not, Daisy has been advised by the manufacturer of the component that the component has been tested and complies with the Class A computing device limits as described above.

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To the original purchaser, Daisy Data Displays, Inc., hereinafter referred to collectively as SELLER, warrants each of its manufactured products, and all components therein contained to be free from defects in materials and/or workmanship for a period of 24 months from the date of purchase.

Should a malfunction, or other indication of defect attributable directly to faulty materials and/or workmanship occur, Seller will, at its option, and without charge to the customer for labor and parts, repair or replace the defective product, F.O.B. Seller's plant, but Seller will not be responsible for freight from Purchaser to Seller's plant. In no event shall Seller be liable for any loss, inconvenience or damage, whether direct, incidental, consequential or otherwise resulting from abuse, misapplication or modification of the product, improper or faulty power, damage resulting from repairs or alterations performed by unauthorized persons, or conditions resulting from any other equipment attached to the product.

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This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. Seller makes every effort to provide clear and accurate technical information on the application of its products in the Operator's Manual, and assumes no liability for misuse of the information.

Table of Contents

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II. Introduction

Thank you for selection of a Daisy Data solution for your hazardous area operator interface needs.

This manual reviews procedures for installing and operating Daisy Data flat panel operator interface systems. In addition to the setup instructions and diagrams in this manual, Daisy Data provides an overview of the methods used to ensure that electronic systems are safe for hazardous areas. This explains the theory behind the unique product and services provided by Daisy Data.

Should you have any inquiries or concerns, please contact Daisy Data.

Daisy Data Displays, Inc.

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Applicable Hazardous Locations Safety Methods

Division 2: Non-Incendive Protection

The NEC defines a non-incendive circuit as "one other than field wiring, in which any arc or thermal effect produced under intended operating conditions of the equipment is not capable, under specified test conditions, of igniting the flammable gas-air, vapor-air or dust-air mixture." Non-incendive circuit designs do not take component failure into consideration, and therefore have a reduced safety level compared to IS circuit design. They can be worked on while energized without a hot-work permit.

Non-incendive devices can be rated for Division 2 as well as Zone 2 areas without a purge control or other protective device.

Please note that Daisy Data's systems have been fully tested under the supervision of Factory Mutual to ensure compliance with the standards, and are approved as non-incendive devices for all Division 2 areas.
*Part of the NEC definition of Division 2 areas.

III. Customer Service

All Daisy systems pass detailed quality control configuration and inspection before being shipped. Daisy Data strives to create the highest quality systems, and chooses top quality parts. However, like most electronic devices, units may experience issues over time. Should you experience problems, or have any further inquiries or comments, please contact Daisy Data's customer service department:

Business Phone	(717) 796-9999 Ext. 222
Fax	(717) 796-9990
Email	support@daisydata.com

Equipment returned to Daisy Data for service must be accompanied by a valid return merchandise authorization (RMA) number. Items or products shipped to Daisy Data without a valid RMA number will be refused. An RMA will be generated upon receipt of Company Name, Address, Contact, Product Model and Serial Numbers.

Typical Model/Serial Number Tag
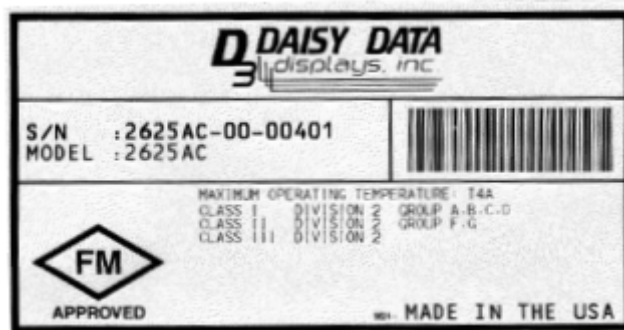
Daisy Data Displays Inc. prides itself on offering best in class support for your products. Our technical support team can help you with installation, configuration, troubleshooting, and other support issues for all Daisy Data's products.

IV. Specifications

MATERIAL

Enclosure — Cast Aluminum Powder Coat Finish

Viewport — NFI Touch Screen Standard
Design — NEMA 4X Non-incendive electrical equipment

PHYSICAL

15.0"
- 15.50" Height (H_1)
- 17.50" Width (W)
- 14.50" Height (H_2)
- 8.56" Depth (D_1)
- 1.56" Depth (D_2)
- 9.16" View Height (VH)
- 12.16" View Width (VW)

Weight — 60-65 Lbs.
Viewing Window — Glass Touch Screen

ELECTRICAL

Voltage — 19-28 VDC @ 17 Amps
Power — 70 W* (300 W w/ heaters)
Computer & display only

FLAT PANEL SPECIFICATIONS

Maximum Resolution — 1024x768
Dot Pitch — 0.297mm
Color Depth — 24 bit
Viewing Angle (Typical HxV) — 60°Left & Right x 40°Up & 60° Down
Brightness (Standard) — 350 nits

ENVIRONMENTAL

Shock IEC68 2-27 — 15G bi-directional impulse 11 msc, non operational 3 axes
Vibration IEC68 2-6 — 3 GRMS operational, 5-2000 Hz
5 GRMS non-operational, 5-2000 Hz, 3 axes
Operating Temperature — -40°- 150°F (-40°- 65°C)
Storage Temperature — -40°- 150°F (-40°- 65°C)
Relative Humidity — 10-95% Non-Condensing
Listed Approvals — EExnA IIC T4, ExII36

COMPUTER SPECIFICATIONS

Motherboard — Mini-ITX SBC, Integrated Graphics, 2 PCI Slots Dual 10/100 Base-T Network Interface
Storage (Standard) — 4GB Flash Drive, 1GB Ram
CPU (Standard) — Pentium™ M 1.8 GHz
Contact your Daisy Data Displays representative for info. on the latest CPU, memory, and hard drive options.

CONNECTIONS

From Motherboard — 1 Serial, 1 Parallel, 4 USB, Audio In/Out, Network, Game Port PS/2 Keyboard Port, PS/2 Pointing Device

AVAILABLE OPTIONS
- 820 Bezel
- 821 Sun Visor
- 823 Windows XP
- 9137 Yoke Mount

Specifications are subject to change without notice.
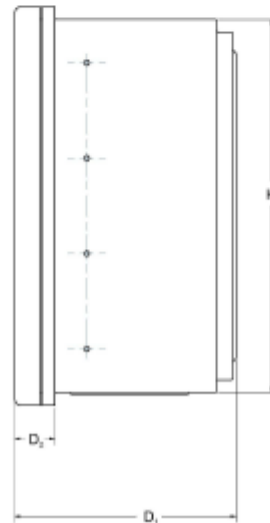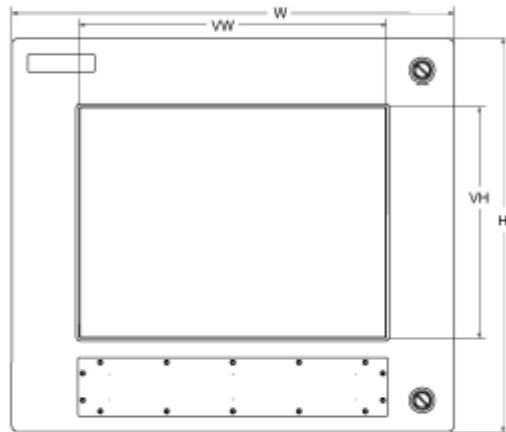
Figure 1 - Specifications

V. Front Door Callout

Figure 1. Front View

1. Door
2. Touch Screen
3. Latches
4. Display
5. Keypad

Figure 2.
Unlocked Latch

Figure 3.
Locked Latch
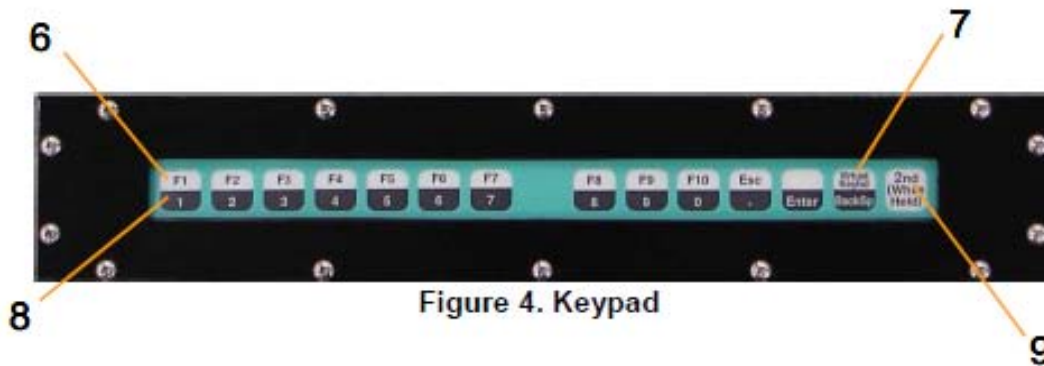
Figure 4. Keypad

6. Secondary Keys
7. Virtual Keyboard Key
8. Primary Keys
9. Secondary Function Key

Figure 2 - Front Door Callouts

VI. Mounting Callout

Figure 5. Top View

1. Accessory Mounting Holes (¼ - 20 threads)

2. Serial Identification Label (DO NOT REMOVE)
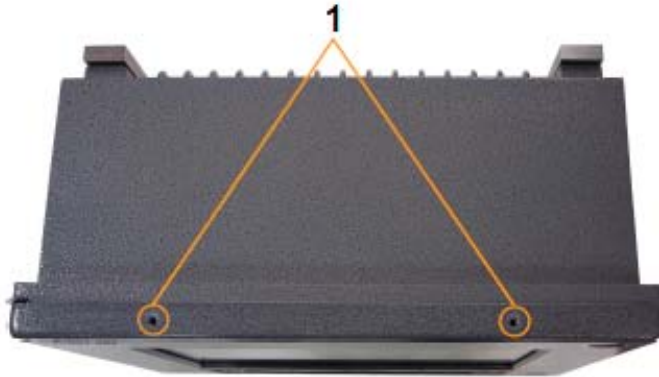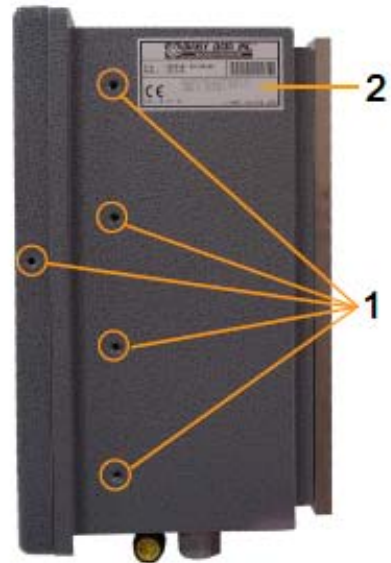

Figure 6. Latch side

Figure 7. Rear View

3. Adapter Mounting Bars (Part # M140-902498)

4. Customer Specific Mounting Pattern (¼ - 20 threads)

Figure 3 - Mounting Callouts

VII. Gland Plate Callout

Figure 4. Gland Plate
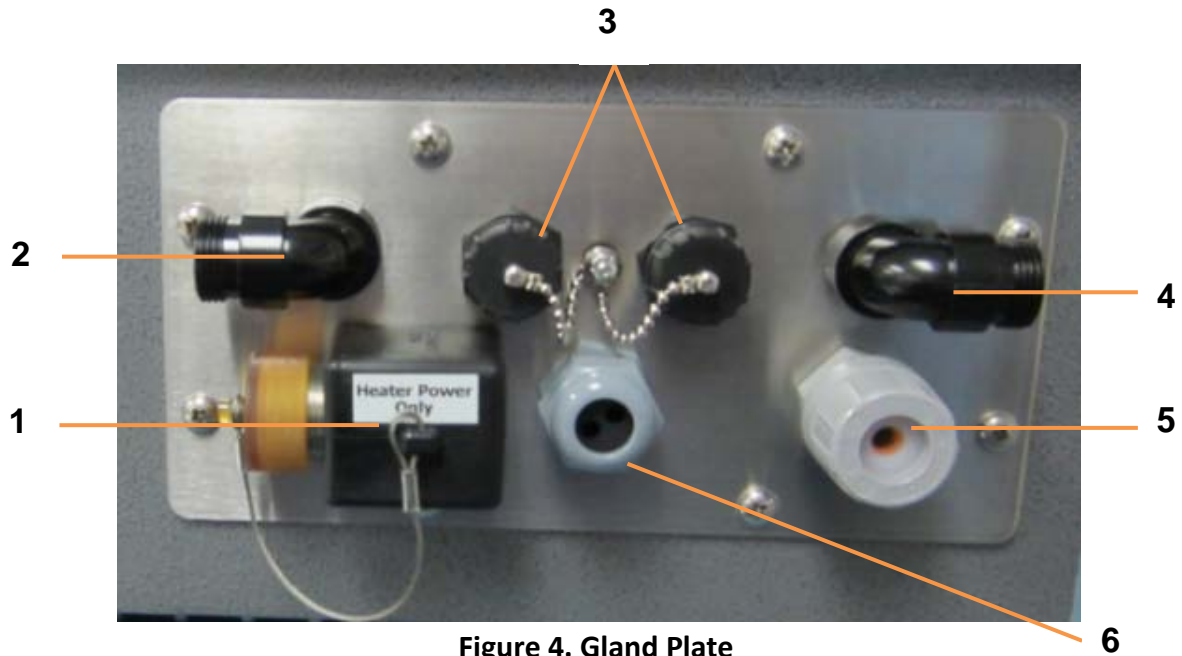
1. Heater Power Plug
2. 3-Prong Sealed Power Plug
3. Sealed USB Ports
4. 5-Prong Sealed Plug
5. Auxiliary Cord Grip, Single Cord
6. Auxiliary Cord Grip, Dual Cord
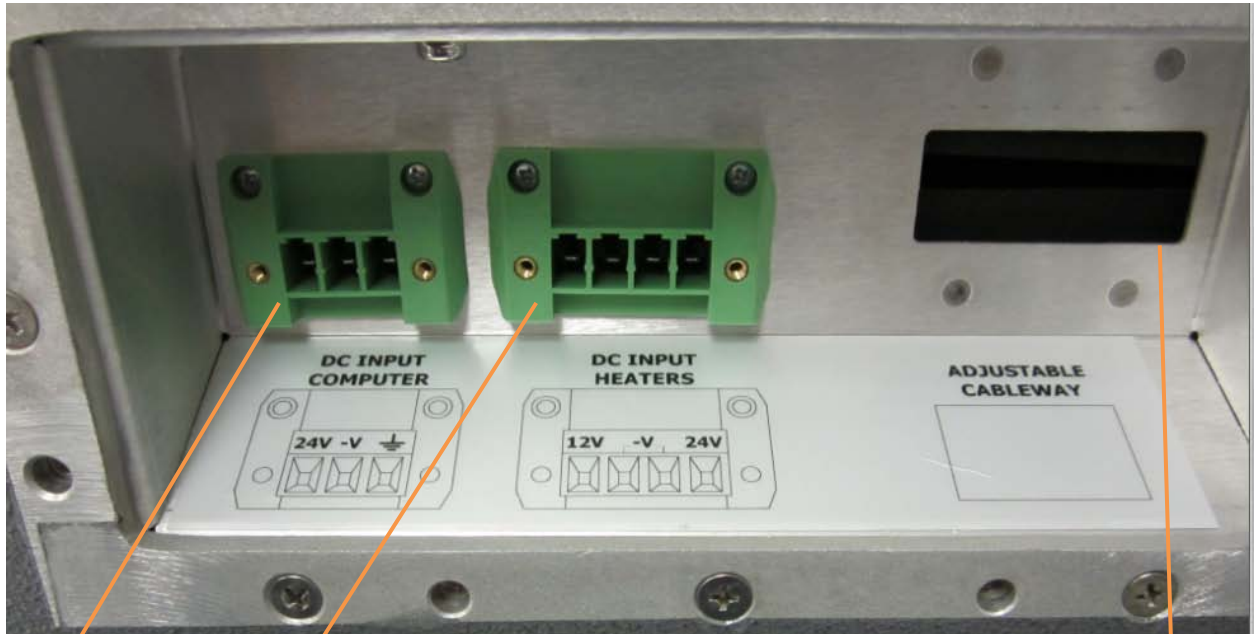
Figure 5. Recessed Connector Panel

1. 24VDC Input (Computer)
2. 12/24VDC Input (Heaters)
3. Adjustable Cableway

VIII. Inside Door Callout
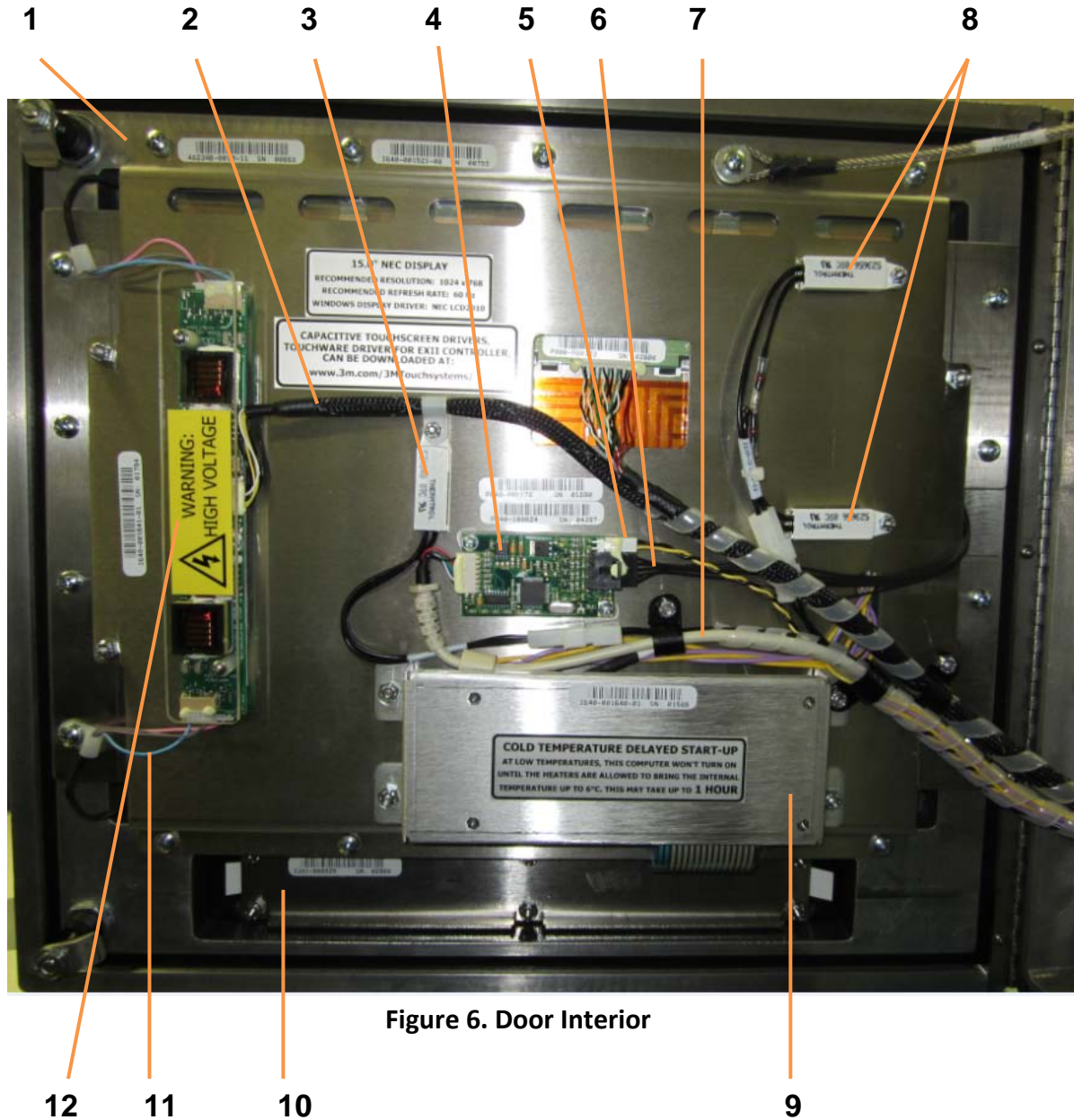
Figure 6. Door Interior

1. Door Assembly	7. T.S. USB Data Cable
2. Backlight Power/Signal Cable	8. Thermostat for All Heaters
3. Heater Thermostat for PSU	9. Keypad Controller (covered)
4. Touch Screen Controller	10. Keypad Assembly
5. T.S. Controller Power Cable	11. Lamp Voltage Cables
6. T.S. Controller Ribbon Extension	12. Backlight Inverter

IX. Interior Enclosure Callout
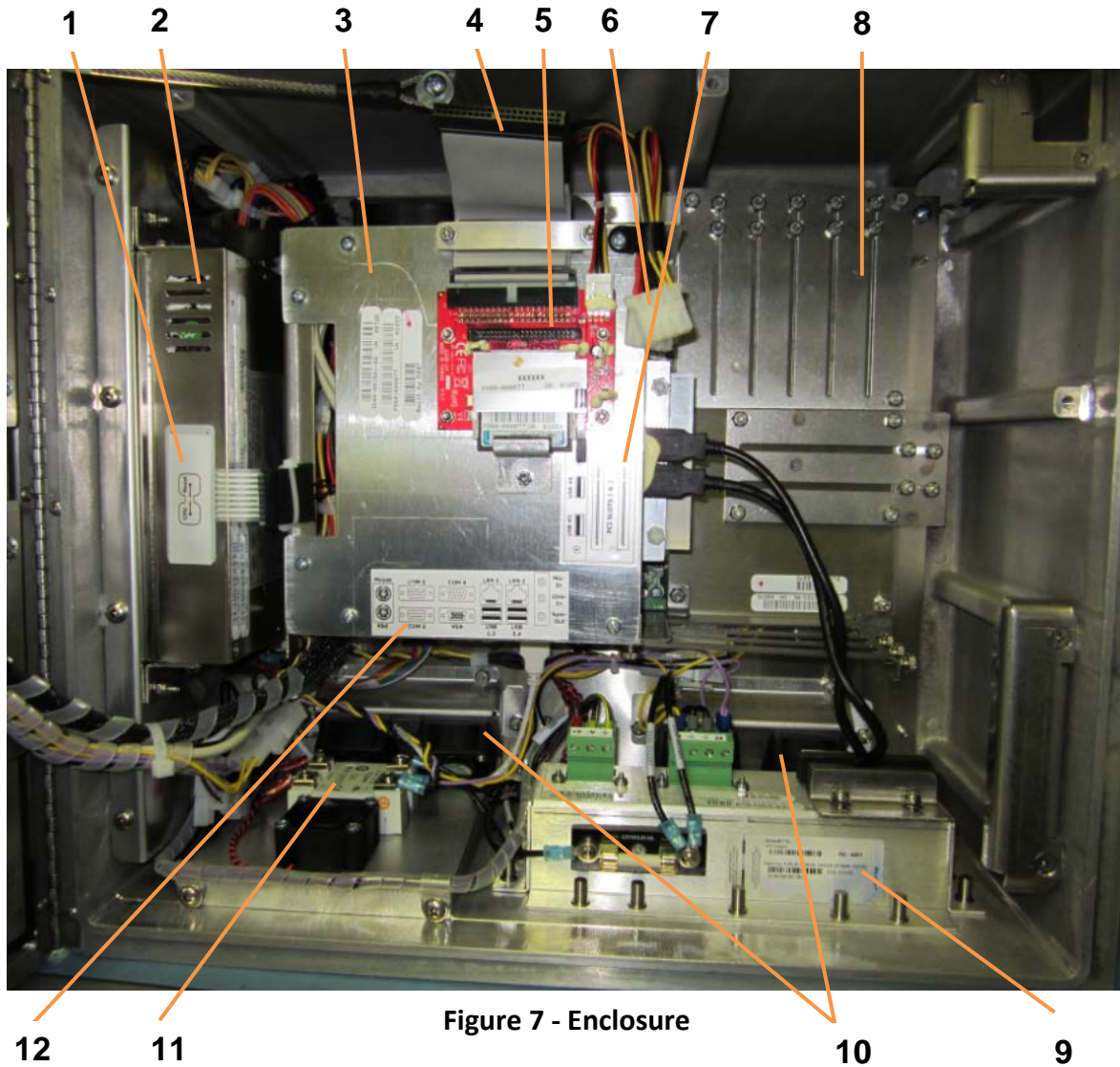
Figure 7 - Enclosure

1. CPU Reset Switch
2. Power Supply Assembly
3. Motherboard Cage
4. CD Drive IDE Connector
5. Flash Drive Assembly
6. CD Drive Power Connector
7. PCI/USB Label
8. PCI Card Retainers
9. Microsoft Serial Label
10. Enclosure Cooling Fans
11. Heater Relay
12. I/O Ports Label

X. PCI Card Retainer Assembly

1. Loosen thumb screws on CPU cage. (Qty. 4)

2. Remove 2 #6 nuts from studs.
3. Place card into bracket and slide stud assembly to about .50" from end of card.

4. Tighten thumb screws to lock PCI card in place.

5. Place single or double card bracket onto stud assembly and secure with 2 #6 nuts.

6. Angle clip bracket and attach to PCI card end. (Clip will snap tightly onto card)

7. Slide clip bracket over flush to card and secure with thumb screw. (Locktite in place to secure)

***MULTIPLE CARD AND CLIP BRACKETS SHOULD BE USED TO BETTER RETAIN THE END OF THE CARD FOR SHOCK AND VIBRATION. LOCATION AND NUMBER OF BRACKETS TO BE DECIDED UPON BY CUSTOMER NEEDS.

Figure 8 - Card Retainer

XI. Trouble Shooting

Power Requirements
Model **4823AB**
Nominal Voltage 24VDC
Minimum Voltage 19VDC
Maximum Voltage 28VDC
Current (Warm Climate) 3-5 Amps
Current (Cold Climate) 15-17 Amps

Note 1
The computer is not permitted to start if the temperature drops below 0 Celsius inside the cabinet and will remain off until the temperature rises above 6 Celsius.

Note 2
The heaters turn on when the internal temperature drops below 8 Celsius and will remain on until the internal temperature rises above 16 Celsius.

The computer will not start

Verify power source. (See model requiremetns)

Can the power source meet the requirements? — No → Correct power system.

Yes

Is the temperature in the unit below 0 Celsius? *See note 1 — No →

Manual start

Yes

Is the heater relay indicator on? *See note 2 — No → Heater relay may be bad

Yes

Wait until the temperature inside the unit warms above 0 Celsius

Yes

Did the computer start? — No →

Manual start

Yes

This is normal operation for a cold climate

Figure 9 - Troubleshooting

Figure 10 - Troubleshooting (b)

Temperature < 8°C

Heaters Off   Heaters On

Temperature > 16°C

Temperature > 6° C

ATX Power Supply Off   ATX Power Supply On

Temperature < 0° C

Temperature > 28°C

Cooling Fans Off   Cooling Fans On

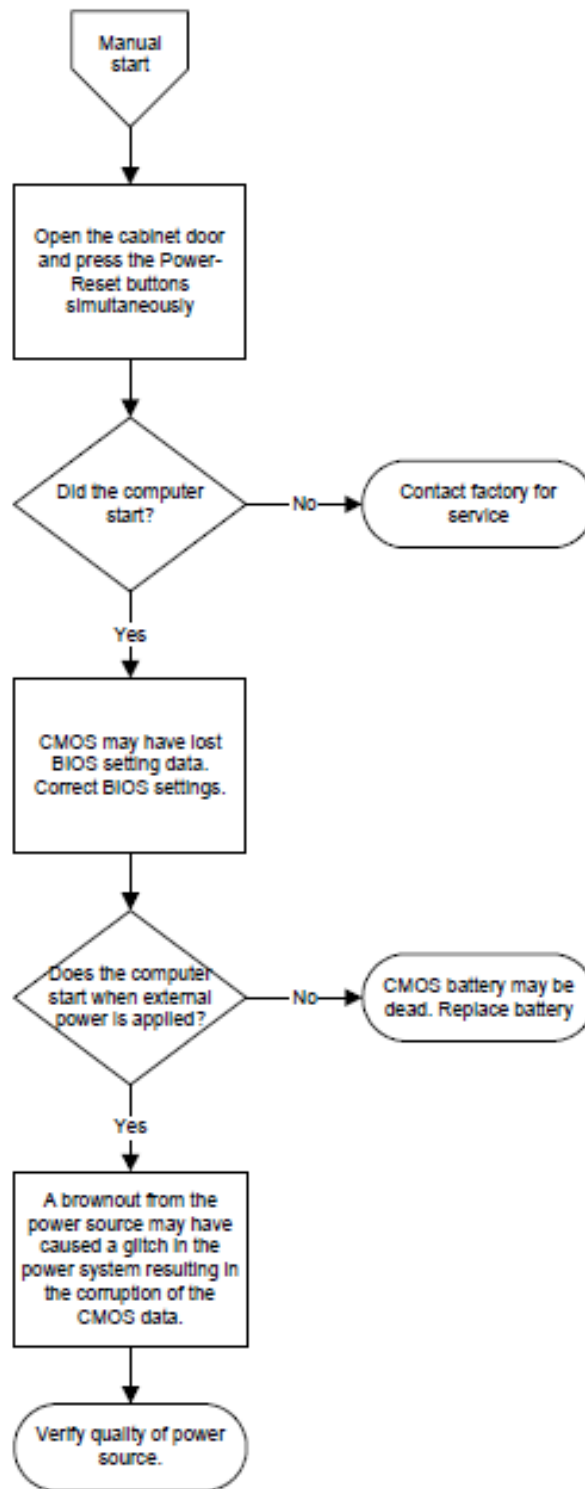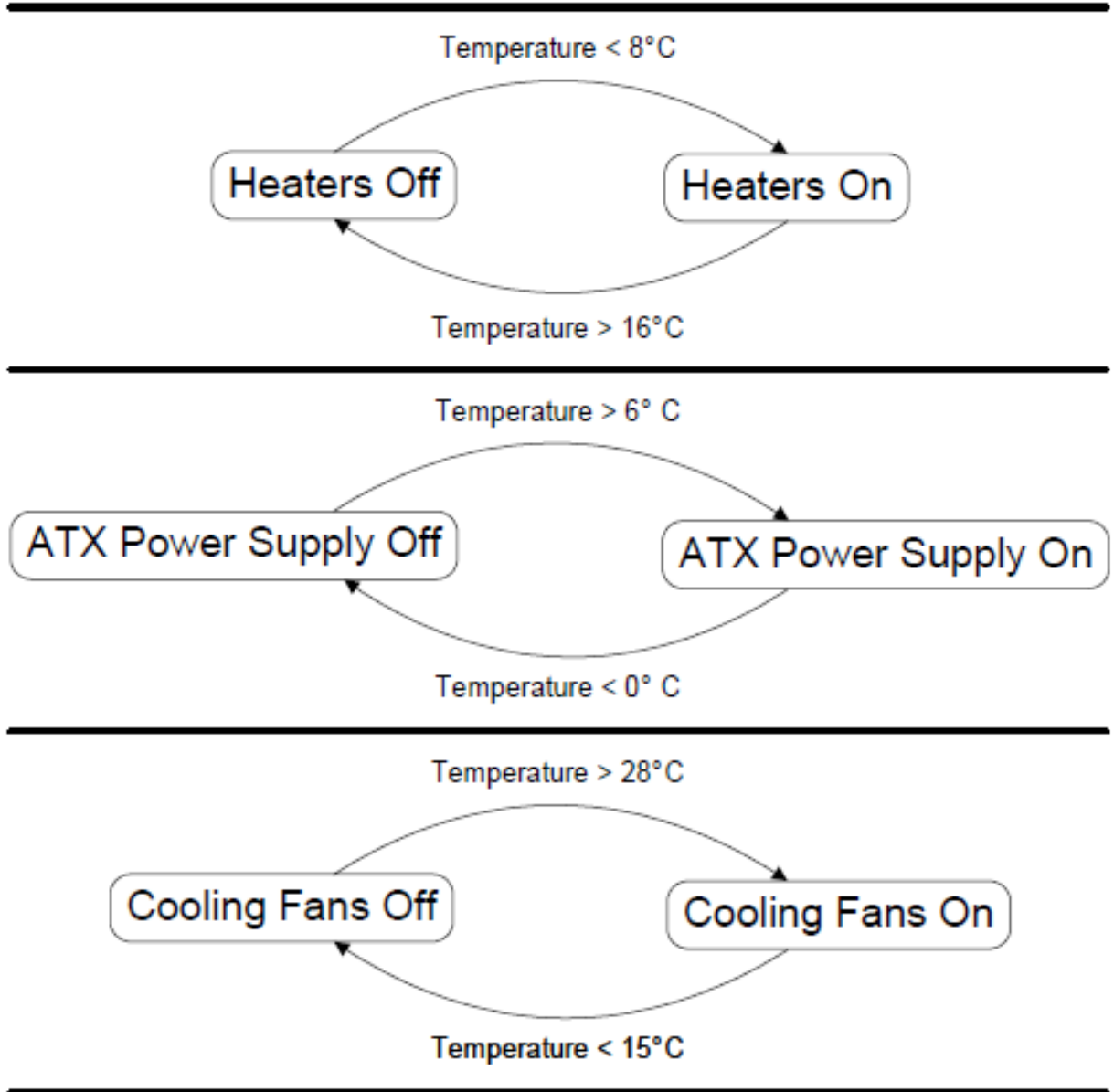Temperature < 15°C

Figure 14 Thermostat Operation

Cold Temperature Delayed Start-Up
At low temperatures, this computer won't turn on until the heaters are allowed to bring the internal temperature up to 6°C. This may take up to **1 hour**.

Figure 11 - Heat and Cooling Operations

XII. Components

Model Number: 4823AB

HVAC PART NUMBERS	DESCRIPTION
P071-000000	24VDC Heater (Thermofoil Panel)
I100-001809	Card Cage Cooler Fan Assembly
E906-000068	CPU Cooler Heatsink and Fan
I100-001834	Heater Thermostat Assembly Door Heater
I100-001842	Thermostat Assembly ATX Disable
I649-000038	Front Door Latch Kit
I640-001503	Cooling Fan Array Assembly

UI PART NUMBER	DESCRIPTION
P040-000078	Capacitive Touch Screen 15"
P040-100024	Touch Screen Controller
I301-000025	Membrane Switch Matrix Assembly
P040-240001	Membrane Legend
P000-000123	LCD Transflective Module 15"
P070-000520	LCD Backlight Inverter
I640-001521-08	Entire Door Assembly

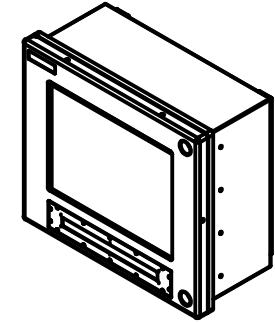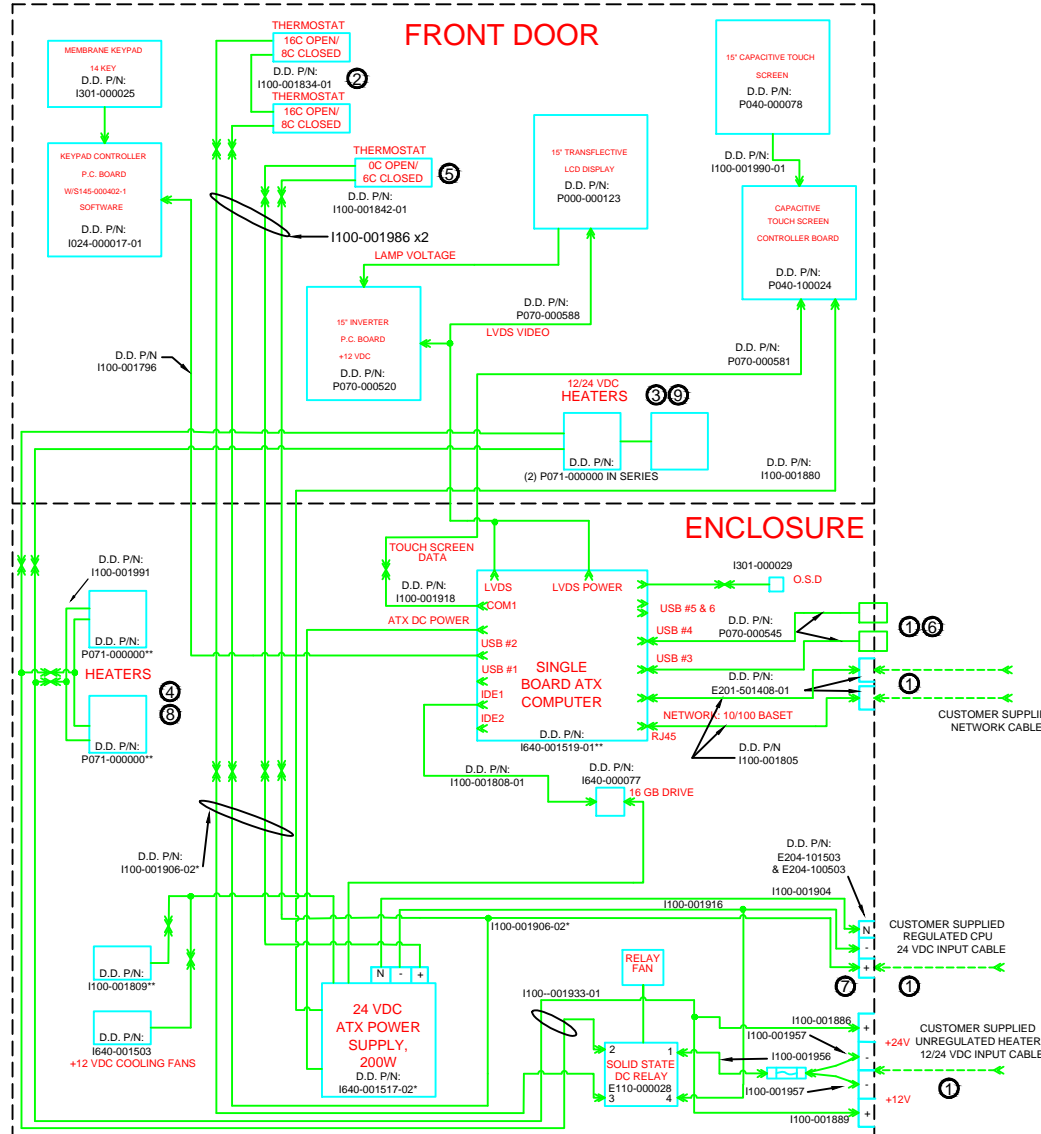| COMPUTER PART NUMBER	DESCRIPTION
I640-001601-02	Flash Drive Assembly
I640-001505-05	24VDC Power Supply Assembly
I640-001523-06	Computer Card Cage Assembly
P050-000229	Single Board Computer
P050-000230	PCI Riser Card
A301-000018-01	CPU Pentium M 1.8GHz
A314-001024	Memory, RAM, DDR400, PC3200, 1GB

XIII. Block Diagram and Mounting

The following two pages provide the unit block diagram, as well as the mounting configuration for 4823AB.

FRONT DOOR

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROV
-	A	Separated CPU and Heater Power	1/23/08	BP
-	B	UPDATED HEATER, CPU SCHEMATIC	5/28/08	RLW
-	C	ADDED CAPACITIVE TOUCH SCREEN	7/29/08	RLW
N/A	D	UPDATED HEATER WIRING	2/24/09	MO
N/A	E	UPDATED DIAGRAM	4/4/11	RW

MEMBRANE KEYPAD
14 KEY
D.D. P/N:
I301-000025

THERMOSTAT
16C OPEN/
8C CLOSED
D.D. P/N:
I100-001834-01
THERMOSTAT
16C OPEN/
8C CLOSED

15" CAPACITIVE TOUCH
SCREEN
D.D. P/N:
P040-000078

KEYPAD CONTROLLER
P.C. BOARD
W/S145-000402-1
SOFTWARE
D.D. P/N:
I024-000017-01

THERMOSTAT
0C OPEN/
6C CLOSED
D.D. P/N:
I100-001842-01

15" TRANSFLECTIVE
LCD DISPLAY
D.D. P/N:
P000-000123

D.D. P/N:
I100-001990-01

CAPACITIVE
TOUCH SCREEN
CONTROLLER BOARD
D.D. P/N:
P040-100024

I100-001986 x2

LAMP VOLTAGE

D.D. P/N
I100-001796

15" INVERTER
P.C. BOARD
+12 VDC
D.D. P/N:
P070-000520

D.D. P/N:
P070-000588

LVDS VIDEO

D.D. P/N:
P070-000581

12/24 VDC
HEATERS

D.D. P/N:
(2) P071-000000 IN SERIES

D.D. P/N:
I100-001880

ENCLOSURE

MODEL 4823AB: DIVISION 2 COMPACT NON-INCENDIVE 15" FLAT PANEL PC

D.D. P/N:
I100-001991

D.D. P/N:
P071-000000**

HEATERS

D.D. P/N:
P071-000000**

TOUCH SCREEN
DATA
D.D. P/N:
I100-001918

ATX DC POWER

LVDS
COM1

LVDS POWER

I301-000029
O.S.D

USB #5 & 6
USB #4
USB #3

D.D. P/N:
P070-000545

SINGLE
BOARD ATX
COMPUTER

USB #2
USB #1
IDE1
IDE2

D.D. P/N:
E201-501408-01

NETWORK: 10/100 BASET

RJ45

D.D. P/N:
I640-001519-01**

CUSTOMER SUPPLIED
NETWORK CABLE

D.D. P/N
I100-001805

D.D. P/N:
I100-001808-01

D.D. P/N:
I640-000077

16 GB DRIVE

D.D. P/N:
I100-001906-02*

D.D. P/N:
E204-101503
& E204-100503

I100-001904

I100-001916

I100-001906-02*

CUSTOMER SUPPLIED
REGULATED CPU
24 VDC INPUT CABLE

D.D. P/N:
I100-001809**

RELAY
FAN

I100-001886

I100-001957

D.D. P/N:
I640-001503
+12 VDC COOLING FANS

24 VDC
ATX POWER
SUPPLY,
200W
D.D. P/N:
I640-001517-02*

I100-001933-01

SOLID STATE
DC RELAY
E110-000028

I100-001956

I100-001957

I100-001889

CUSTOMER SUPPLIED
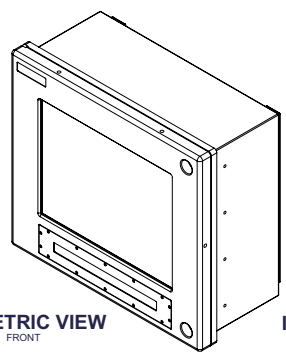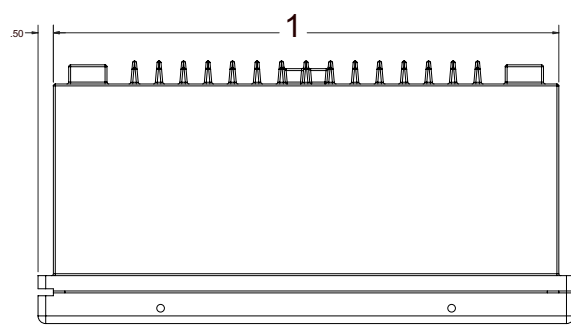UNREGULATED HEATER
12/24 VDC INPUT CABLE

+24V
+12V

*PART OF COMPLETE POWER
SUPPLY PANEL D.D. P/N
I640-001505-05

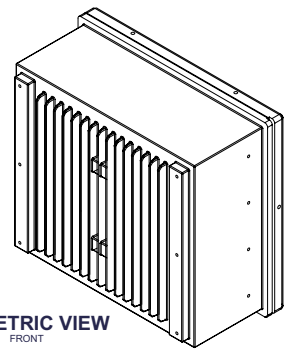**PART OF COMPLETE
MOTHERBOARD PANEL
D.D. P/N I640-001523

NOTES:

1. CABLE ENTRY THROUGH CUSTOMER SPECIFIED
   GLAND PLATE
2. THERMOSTATS I100-001834 WILL TURN ON THE HEATERS AT 8°C.
   THEN TURN THE HEATERS OFF AT 16°C
3. SET OF +24V HEATERS IN SERIES DRAW 2.35A, (56.3 WATTS)
4. EACH +24V HEATER DRAWS 4.7A, (112.9 WATTS)
   TOTAL FOR SET 9.4A, (225.8 WATTS)
5. THERMOSTAT I100-001842 WILL TURN OFF THE ATX P.S. AT 0°C.
   THE UNIT WILL TURN ON AT 6°C.
6. EXTERNAL USB CONNECTIONS SEALED WHEN COVERED WITH
   INCLUDED CAP (D.D. P/N E205-500000)
7. WIRE DESIGNATION: BLACK = +24VDC, GREEN/YELLOW = -24VDC,
   WHITE = GROUND
8. EACH +12V HEATER DRAWS 10A, (120 WATTS)
   TOTAL FOR SET 20A, (240 WATTS)
9. SET OF +12V HEATERS IN SERIES DRAW 5A, (60 WATTS)

TOLERANCES
DIMENSIONS ARE IN INCHES
FRACTIONS DECIMALS ANGLES
±1/32   .XX ±.02   ±1°
             .XXX ±.005

	APPROVALS	DATE
DESIGNED		
DRAWN	M. HADAWAY	01/10/07
CHECKED	R. RAVIDA	01/11/07

FINISH
N/A
MATERIAL
N/A

N/A = NOT APPLICABLE
N.C. = NO CONNECTION

Daisy Data Displays, Inc.
2850 Lewisberry Road, York Haven, PA 17370
We Thrive In Hardest Environments   Visit Us At www.d3inc.net

SCHEMATIC & BLOCK DIAGRAM
MODEL 4823AB

SIZE D   SCALE NO SCALE   D303-100048   8608   E
SHEET 1 OF 1

1

.50

ISOMETRIC VIEW
FRONT

ISOMETRIC VIEW
FRONT

2 x LOCKING LATCH

COOLING FINS

EXTERNAL MOUNTING HOLES
14 x 1/4-20 UNC-2B

2.67
17.50
12.16
2.63

15" LCD WITH VIEWING WINDOW CHOICE OF LEXAN, SAFETY GLASS OR TOUCHSCREEN.

9.16
15.50

14 BUTTON MEMBRANE KEYPAD (USER DEFINED LEGEND)

14.50

12.50
6.25
1.50

3 x 3.71
1.94
1.00
1.56
1.25
6.25
6.88
7.00
(8.56)

1.50
14.50
(17.50)

.50
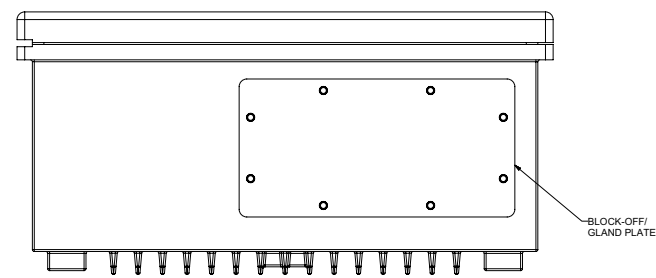
BLOCK-OFF/ GLAND PLATE

PRELIMINARY DRAWING- DIMENSIONS MAY BE CHANGED TO MEET CUSTOMER SPECIFICATIONS.

Daisy Data, Inc.
2850 Lewisberry Road, York Haven, PA 17370
We Thrive in the Harshest Environments.   Visit us at www.daisydata.com

TOLERANCES DIMENSIONS ARE IN INCHES	APPROVAL	DATE
	DRAWN G. DRAPCHO	05/13/05
	CHECKED R. RAVIDA	05/13/05

FRACTIONS 1/32"

DECIMALS
.XX = ˙.03
.XXX = ˙.015
ANGLES

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TITLE
MODEL 4823AB. COMPACT, NON-INC, 15" LCD, CAST AL.

PART NO. 4823AB	DWG NO./REV. 7785A
SIZE	SCALE 1:2	SHEET OF

XIV. Motherboard Manual

Continue to the next page for the **G5M100-N** user manual. This will describe many of the system settings and configurations, including BIOS menu, board layout, and specific features of the motherboard.

G5M100-N

Rev. A+
System Board
User's Manual

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Caution

To avoid damage to the system:
• Use the correct AC input voltage range.

To reduce the risk of electric shock:
• Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

Battery:
- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to the battery manufacturer's instructions.

FCC and DOC Statement on Class B

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

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

Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2. Shielded interface cables must be used in order to comply with the emission limits.

Notice

An electronic file of this manual is included in the CD. To view the user's manual in the CD, insert the CD into a CD-ROM drive. The autorun screen (Main Board Utility CD) will appear. Click "User's Manual" on the main menu.

Table of Contents

Chapter 1 - Introduction

Chapter 2 - Hardware Installation

Chapter 3 - BIOS Setup

Chapter 4 - Supported Softwares

Chapter 1 - Introduction

1.1 Features

Processor
- Intel® Pentium® M / Celeron® M processor (478-pin)
  - 400MHz system bus
  - Supports 64-bit host data bus and 32-bit addressing

Chipset
- Intel® 855GME chipset
  - Intel® 855GME Graphics Memory Controller Hub (GMCH)
  - Intel® 82801DB I/O Controller Hub (ICH4)

System Memory
- Two 184-pin DDR SDRAM DIMM sockets
- 2.5V unbuffered PC1600 (DDR200), PC2100 (DDR266) or PC2700 (DDR333) DDR SDRAM DIMM with ECC support
- Supports 128Mbit, 256Mbit and 512Mbit technologies providing maximum capacity of 1GB with x16 devices and up to 2GB with high density 512Mbit technology

BIOS
- Award BIOS, Windows® 98SE/2000/ME/XP Plug and Play compatible
- Supports SCSI sequential boot-up
- Supports DMI 2.0 function
- 4Mbit flash memory

Energy Efficient Design
- Supports ACPI specification and OS Directed Power Management
- Supports ACPI STR (Suspend to RAM) function
- Wake-On-Events include:
  - Wake-On-PS/2 Keyboard/Mouse
  - Wake-On-USB Keyboard
  - Wake-On-LAN
  - Wake-On-Ring
  - RTC timer to power-on the system
- System power management supported
- CPU stopped clock control

- Hardware supports SMI green mode
- Microsoft®/Intel® APM 1.2 compliant
- Soft Power supported - ACPI v1.0a specification
- AC power failure recovery

Damage Free Intelligence
- Monitors CPU/system temperature and overheat alarm
- Monitors 5VSB(V)/VBAT(V)/±5V/±12V/CPU(V) voltages and failure alarm
- Monitors CPU/chassis/2nd fan speed and failure alarm
- Read back capability that displays temperature, voltage and fan speed
- Watchdog timer function

Onboard Graphics Features
- Up to 64MB of dynamic video memory allocation
- Display core frequency at 133/200/250MHz
- Render core frequency at 100/133/166/200/250MHz
- Intel® Dual-Frequency Graphics Technology
- 2D graphics engine
    - Optimized 128-bit BLT engine
    - 32-bit Alpha Blended cursor
    - 8-bit, 16-bit and 32-bit color
- 3D graphics engine
    - Enhanced Hardware Binning Instruction Set
    - Bi-Cubic Filtering
    - Linear Gamma Blending for Video Mixer Rendering (VMR)
    - Video Mixer Rendering (VMR)
    - 3D setup and render engine
    - DirectX and OpenGL pixelization rules
    - 266-MegaTexel/s peak performance
    - 16- and 24-bit Z-buffering; 16- and 24-bit W-buffering
    - Optimal 3D resolution
    - Double and triple render buffer
- Graphics Power Management
    - Dynamic Frequency Switching
    - Memory Self-Refresh During C3
    - Intel® Display Power Saving Technology

Display

- Dedicated LFP (Local Flat Panel) interface
  - Supports data format up to 24-bpp
- Analog display
  - 350MHz integrated 24-bit RAMDAC
  - Pixel resolution up to 1600x1200 at 85Hz and up to 2048x1536 at 75Hz

LFP (Local Flat Panel) LVDS Interface

- Single- or dual-channel LVDS panel support up to UXGA panel resolution with frequency range from 25MHz to 112MHz (single/dual channel)
- Integrated PWM interface for LCD backlight inverter control

Onboard Audio Features

- Realtek ALC202A
- 18-bit stereo full-duplex codec with independent variable sampling rate
- High quality differential CD input
- True stereo line level outputs
- S/PDIF-out interface
- 2-channel audio output
- Speaker-out jack supports 2W amplifier providing better audio quality to the headphone or speakers

Onboard LAN Features

- Intel 82562EM fast ethernet controller
  - Basic 10/100 Client Connection
  - IEEE 802.3, 10BASE-T/100BASE-TX compliant physical layer interface
  - IEEE 802.3u Auto-Negotiation
  - 48-pin SSOP, 3.3V device
- Intel 82551QM fast ethernet controller
  - Integrated IEEE 802.3, 10BASE-T and 100BASE-TX compatible PHY
  - Glueless 32-bit PCI master interface
  - Glueless CardBus master interface
  - 128 Kbyte Flash interface
  - Thin BGA 15 mm^2 package

IDE Interface
- Supports ATA/33, ATA/66 and ATA/100 hard drives
- PIO Mode 4 Enhanced IDE (data transfer rate up to 14MB/sec.)

Processor Socket
- mPGA479M (Socket 479)

Rear Panel I/O Ports
- 4 USB 2.0/1.1 ports
- 2 RJ45 LAN ports
- 3 DB-9 serial ports
- 1 DB-15 VGA port
- 1 mini-DIN-6 PS/2 mouse port
- 1 mini-DIN-6 PS/2 keyboard port
- 3 audio jacks: speaker-out, line-in and mic-in

I/O Connectors
- 1 connector for 2 additional external USB 2.0/1.1 ports
- 1 connector for LCD brightness control
- 1 connector for LVDS LCD panel
- 1 connector for LCD power
- 1 front audio connector for line-out and mic-in jacks
- 1 CD-in internal audio connector
- 1 S/PDIF-out connector
- 1 connector for IrDA interface
- 1 44-pin IDE 2 connector for 2.5" HDD
- 1 40-pin IDE 1 connector for 3.5" HDD
- 1 floppy connector (FPC connector type)
- 1 ATX power supply connector
- 1 Wake-On-LAN connector
- 3 fan connectors

Expansion Slots
- 1 PCI slot for PCI expansion card or customized riser card slot for 1, 2 or 3 PCI slots expansion (for low profile PCI card only)
- 1 Mini PCI socket (124-pin)

Compatibility
- PCI 2.2 and AC '97 compliant

PCB
- 6 layers, mini board (Mini-ITX compatible)
- 17cm (6.7") x 17cm (6.7")

1.2 Special Features of the System Board

Watchdog Timer

The Watchdog Timer function allows your application to regularly "clear" the system at the set time interval. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

DDR

Double Data Rate SDRAM (DDR SDRAM) is a type of SDRAM that doubles the data rate through reading and writing at both the rising and falling edge of each clock. This effectively doubles the speed of operation therefore doubling the speed of data transfer.

S/PDIF

S/PDIF is a standard audio file transfer format that transfers digital audio signals to a device without having to be converted first to an analog format. This prevents the quality of the audio signal from degrading whenever it is converted to analog. S/PDIF is usually found on digital audio equipment such as a DAT machine or audio processing device. The S/PDIF connector on the system board sends surround sound and 3D audio signal outputs to amplifiers and speakers and to digital recording devices like CD recorders.

IrDA Interface

The system board is equipped with an IrDA connector for wireless connectivity between your computer and peripheral devices. The IRDA (Infrared Data Association) specification supports data transfers of 115K baud at a distance of 1 meter.

USB Ports

The system board supports USB 2.0 and USB 1.1 ports. USB 1.1 supports 12Mb/second bandwidth while USB 2.0 supports 480Mb/second bandwidth providing a marked improvement in device transfer speeds between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

Dual Function Power Button

Depending on the setting in the "Soft-Off By PWR-BTTN" field of the Power Management Setup, this switch will allow the system to enter the Soft-Off or Suspend mode.

Wake-On-Ring

This feature allows the system that is in the Suspend mode or Soft Power Off mode to wake-up/power-on to respond to calls coming from an external modem, internal modem or respond to calls from a modem PCI card that uses the PCI PME (Power Management Event) signal to remotely wake up the PC.

> **Important:**
> *If you are using a modem add-in card, the 5VSB power source of your power supply must support a minimum of ≥720mA.*

Wake-On-LAN

This feature allows the network to remotely wake up a Soft Power Down (Soft-Off) PC. It is supported via the onboard LAN port, via a PCI LAN card that uses the PCI PME (Power Management Event) signal or via a LAN card that uses the Wake-On-LAN connector. However, if your system is in the Suspend mode, you can power-on the system only through an IRQ or DMA interrupt.

> **Important:**
> *The 5VSB power source of your power supply must support ≥720mA.*

Wake-On-PS/2 Keyboard/Mouse

This function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system.

> **Important:**
> *The 5VSB power source of your power supply must support ≥720mA.*

Wake-On-USB Keyboard

This function allows you to use a USB keyboard to wake up a system from the S3 (STR - Suspend To RAM) state.

> **Important:**
> • *If you are using the Wake-On-USB Keyboard function for 2 USB ports, the 5VSB power source of your power supply must support ≥1.5A.*
> • *If you are using the Wake-On-USB Keyboard function for 3 or more USB ports, the 5VSB power source of your power supply must support ≥2A.*

RTC Timer to Power-on the System

The RTC installed on the system board allows your system to automatically power-on on the set date and time.

ACPI STR

The system board is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enables PCs to implement Power Management and Plug-and-Play with operating systems that support OS Direct Power Management. Currently, only Windows® 98/2000/ME/XP supports the ACPI function. ACPI when enabled in the Power Management Setup will allow you to use the Suspend to RAM function.

With the Suspend to RAM function enabled, you can power-off the system at once by pressing the power button or selecting "Standby" when you shut down Windows® 98/2000/ME/XP without having to go through the sometimes tiresome process of closing files, applications and operating system. This is because the system is capable of storing all programs and data files during the entire operating session into RAM (Random Access Memory) when it

powers-off. The operating session will resume exactly where you left off the next time you power-on the system.

Important:
The 5VSB power source of your power supply must support ≥1A.

Virus Protection

Most viruses today destroy data stored in hard drives. The system board is designed to protect the boot sector and partition table of your hard disk drive.
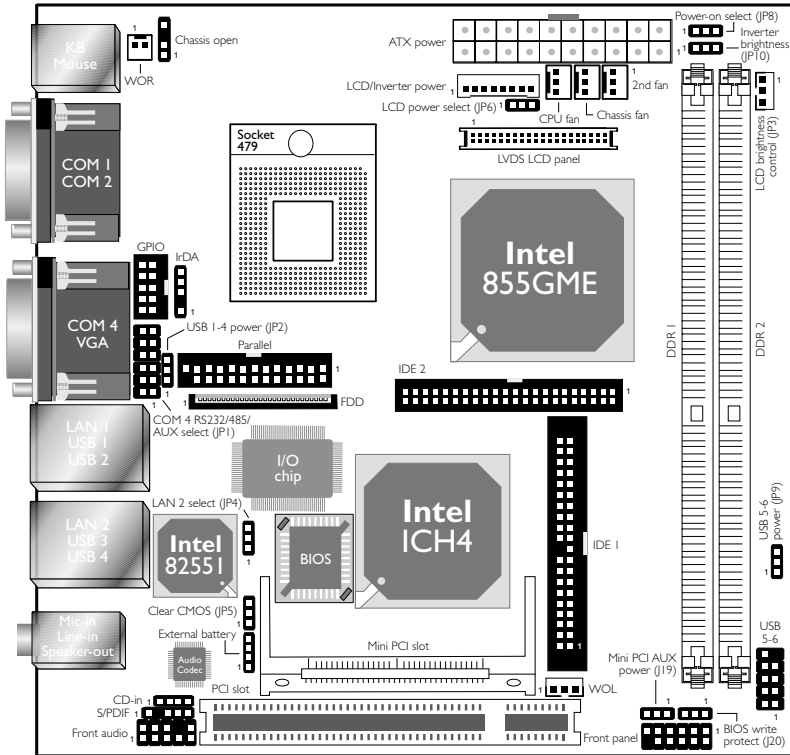
1.3 Package Checklist

The system board package contains the following items:

☑ The system board
☑ A user's manual
☑ One IDE cable
☑ One "Main Board Utility" CD

If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

2.1 System Board Layout

> Warning:
> *Electrostatic discharge (ESD) can damage your system board, proces-sor, disk drives, add-in boards, and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.*

2.2 System Memory

DDR 1
DDR 2
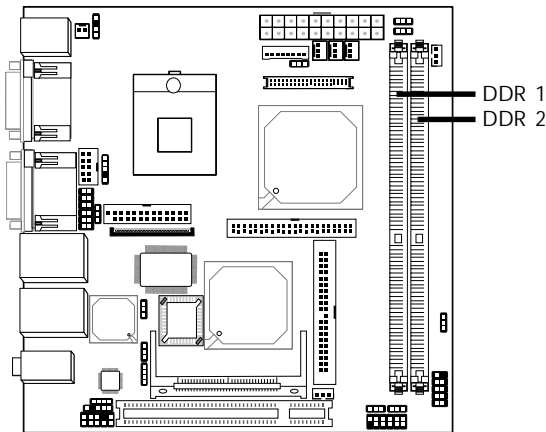
The system board supports DDR SDRAM DIMM. Double Data Rate SDRAM (DDR SDRAM) is a type of SDRAM that doubles the data rate through reading and writing at both the rising and falling edge of each clock. This effectively doubles the speed of operation therefore doubling the speed of data transfer.

BIOS Setting

Configure the memory in the Advanced Chipset Features submenu of the BIOS.

2.2.1 Installing the DIM Module

A DIM module simply snaps into a DIMM socket on the system board. Pin 1 of the DIM module must correspond with Pin 1 of the socket.
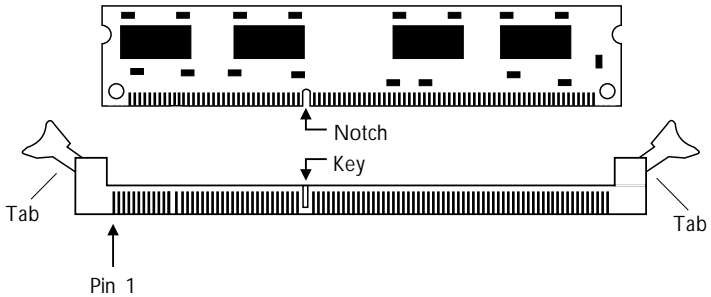
1. Pull the "tabs" which are at the ends of the socket to the side.

2. Position the DIMM above the socket with the "notch" in the module aligned with the "key" on the socket.

3. Seat the module vertically into the socket. Make sure it is completely seated. The tabs will hold the DIMM in place.

2.3 CPU

2.3.1 Overview

The system board is equipped with a surface mount mPGA479M (Socket 479) CPU socket. This socket is exclusively designed for installing an Intel® Pentium® M / Celeron® M processor.

2.3.2 Installing the CPU

1. Make sure the PC and all other peripheral devices connected to it has been powered down.

2. Disconnect all power cords and cables.

3. Locate the 479-pin CPU socket on the system board.
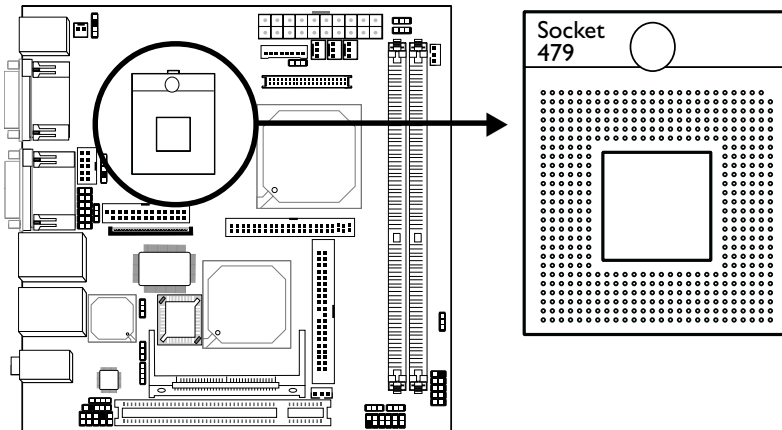
4. Follow the direction indicated on the socket to lock or unlock the CPU socket.

2.4 Jumper Settings

2.4.1 Clear CMOS Data

JP5

1-2 On: Normal
(default)

2-3 On:
Clear CMOS Data

If you encounter the following,

a) *CMOS data becomes corrupted.*
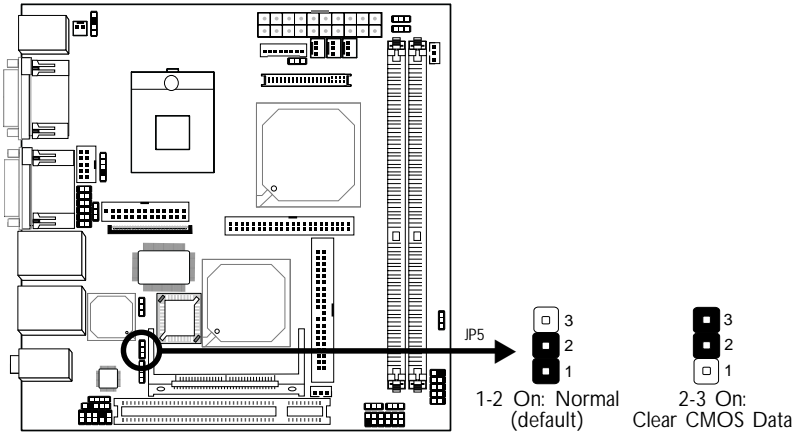*b)* *You forgot the supervisor or user password.*

you can reconfigure the system with the default values stored in the ROM BIOS.

To load the default values stored in the ROM BIOS, please follow the steps below.

1. Power-off the system and unplug the power cord.

2. Set JP5 pins 2 and 3 to On. Wait for a few seconds and set JP5 back to its default setting, pins 1 and 2 On.

3. Now plug the power cord and power-on the system.

19

2.4.2 USB Power Select
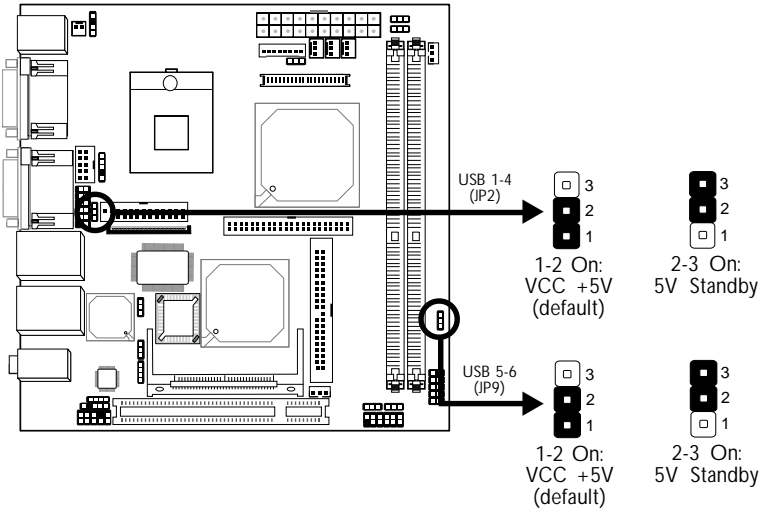
JP2 (for USB 1-4) and JP9 (for USB 5-6) are used to select the power of the USB ports. Selecting 5V Standby will allow you to use the USB keyboard to wake up the system.

BIOS Setting:

"USB KB Wake-Up From S3" in the Power Management Setup submenu of the BIOS must be set to Enabled. Refer to chapter 3 for more information.

Important:

- If you are using the Wake-On-USB Keyboard function for 2 USB ports, the 5VSB power source of your power supply must support ≥1.5A.
- If you are using the Wake-On-USB Keyboard function for 3 or more USB ports, the 5VSB power source of your power supply must support ≥2A.

2.4.3 LCD Panel Power Select
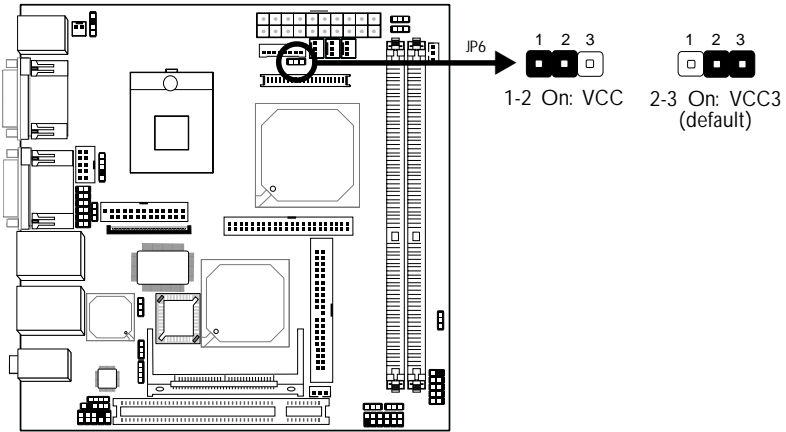
JP6 is used to select the power supplied to the LCD panel.

2.4.4 Inverter Brightness On/Off Select

JP10

1-2 On:
Low Active On

2-3 On:
High Active On
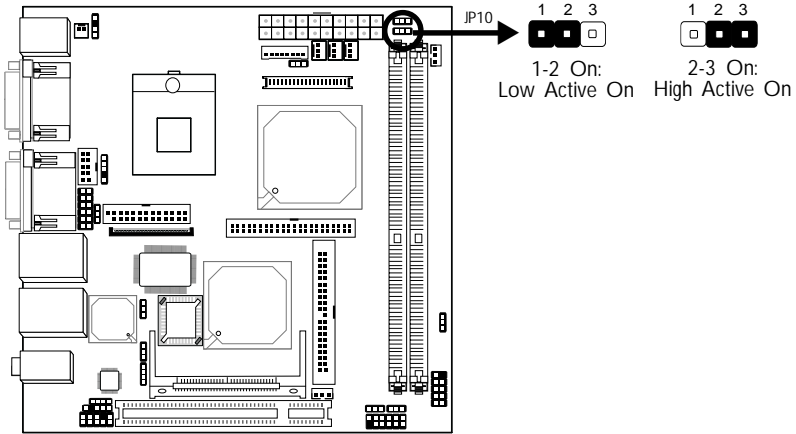
JP10 is used to turn on or off the inverter's brightness.

2.4.5 LCD Brightness Control (Voltage Level Adjust)

JP3

1
2
3

1-2: Increases the voltage level
2-3: Decreases the voltage level
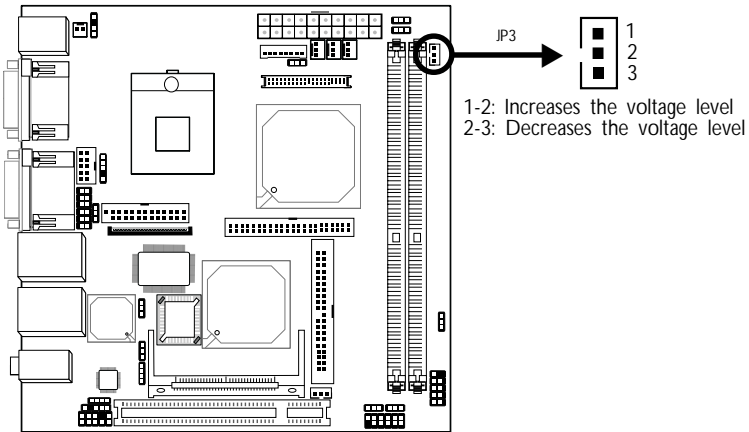
JP3 must be connected to the LCD Brightness Control button of the LCD Display Panel. It is used to adjust the brightness of the LCD Display Panel. Increasing or decreasing the voltage to control the LCD panel's brightness varies among Inverters. You must refer to the Inverter's specification to make the appropriate adjustment to the brightness of the LCD panel.

2.4.6 COM 4's RS232/RS485/AUX Select
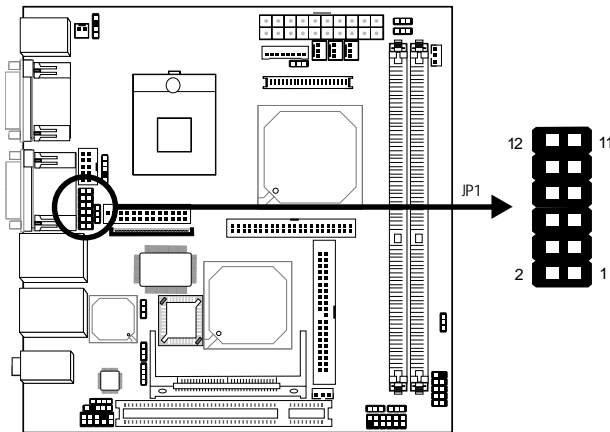
COM 4 RS232/RS485/AUX Select	JP1
RS232 (default)	1-3, 2-4, 7-9, 8-10 On
RS485	3-5, 4-6, 7-9, 8-10 On
Auxiliary power	9-11 (12V), 10-12 (5V) On

JP1 is used to set COM 4 to RS-232 or RS-485. If the serial device connected to this port requires auxiliary power from the system board, set JP1 pins 9-11 and 10-12 to On. This setting automatically sets COM 4 at RS-232.

2.4.7 Power-on Select

JP8

1 2 3
1-2 On:
Power-on via
power button
(default)

1 2 3
2-3 On:
Power-on via
AC power
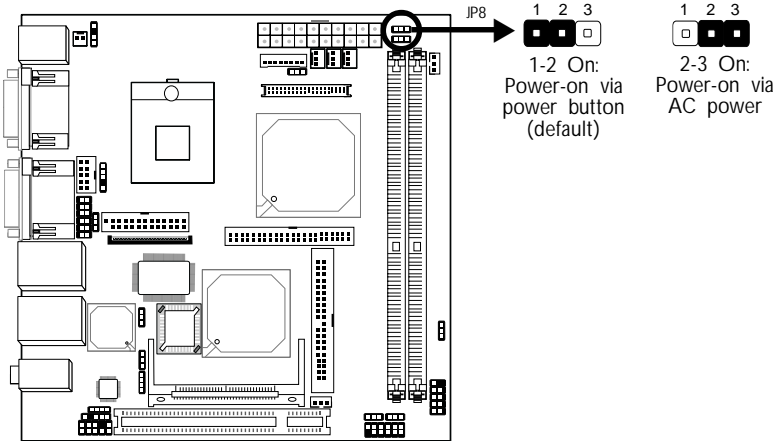
JP8 is used to select the method of powering on the system. If you want the system to power-on once AC power comes in, set JP8 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

2.4.8 BIOS Write Protect

3 2 1

1-2 On: Write only to BIOS utility

3 2 1

2-3 On: BIOS Write Protected

3 2 1

All Off: BIOS Not Write Protected
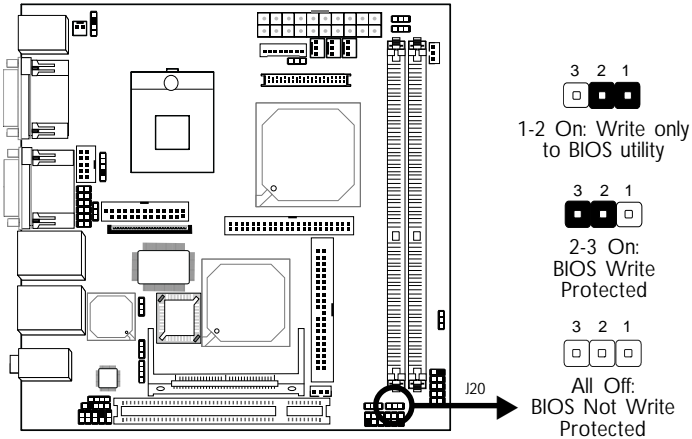
J20 is used to configure the BIOS Write Protect function. When this function is enabled, the system will be protected from unnecessary updating or flashing of the BIOS. It secures the BIOS therefore any updates to it will not take effect.

1-2 On:
The BIOS is basically protected but will allow you to update changes ONLY by using the "Save & Exit Setup" function in the BIOS setup utility. This prevents accidental flashing of the BIOS.

2-3 On:
The BIOS Write Protect function is enabled. The BIOS is secured therefore you cannot update or flash the BIOS.

All Off:
The BIOS Write Protect function is disabled. You can update or flash the BIOS anytime needed.

2.4.9 Mini PCI AUX Power

3 2 1   3 2 1

J19

1-2 On: 3.3V   2-3 On:
(default)   3VSB
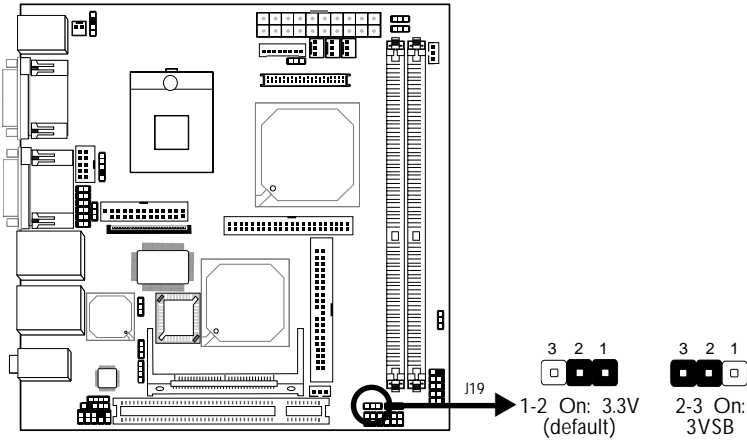
J19 is used to select the power supplied to the Mini PCI card that is installed in the Mini PCI socket. Selecting 3VSB will allow you to use the wake up function supported by the Mini PCI card.

2.4.10 LAN 2 Select

JP4

3
2
1

1-2 On:
Enabled
(default)

3
2
1

2-3 On:
Disabled
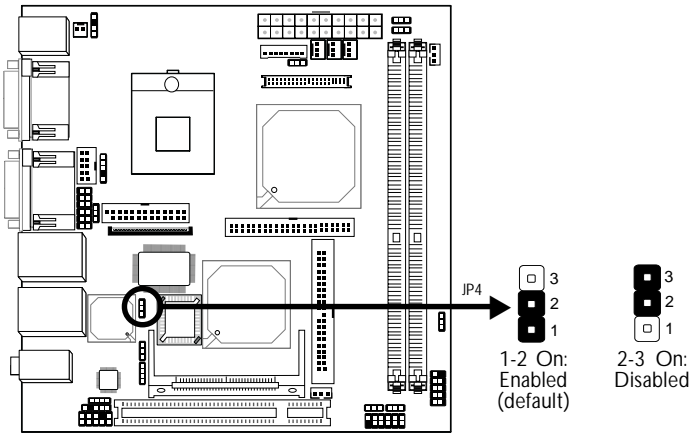
JP4 is used to enable or disable the onboard Intel 82551 LAN chip that controls the onboard LAN 2 port.

2.5 Rear Panel I/O Ports

PS/2 Mouse   COM 2   COM 4   LAN 1   LAN 2   Mic-in

Line-in

Speaker-out

PS/2 K/B   COM 1   VGA   USB 1-2 USB 3-4
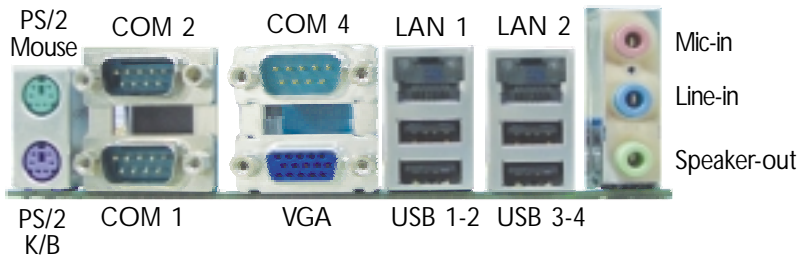
The rear panel I/O ports consist of the following:

- PS/2 mouse port
- PS/2 keyboard port
- 3 COM ports
- VGA port
- 2 LAN ports
- 4 USB ports
- Mic-in jack
- Line-in jack
- Speaker-out jack

2.5.1 PS/2 Mouse and PS/2 Keyboard Ports

PS/2 Mouse
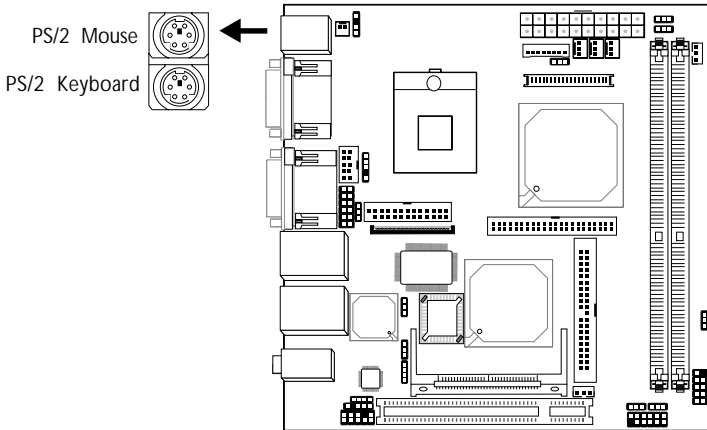
PS/2 Keyboard

The system board is equipped with an onboard PS/2 mouse (Green) and PS/2 keyboard (Purple) ports - both at location CN1 of the system board. The PS/2 mouse port uses IRQ12. If a mouse is not connected to this port, the system will reserve IRQ12 for other expansion cards.

Warning:
Make sure to turn off your computer prior to connecting or disconnecting a mouse or keyboard. Failure to do so may damage the system board.

Wake-On-PS/2 Keyboard/Mouse

The Wake-On-PS/2 Keyboard/Mouse function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system. To use this function:

• BIOS Setting:
  Configure the PS/2 wake up function in the Integrated Peripherals submenu ("Super IO Device" section) of the BIOS. Refer to chapter 3 for more information.

Important:
The 5VSB power source of your power supply must support ≥720mA.

2.5.2 Serial Ports
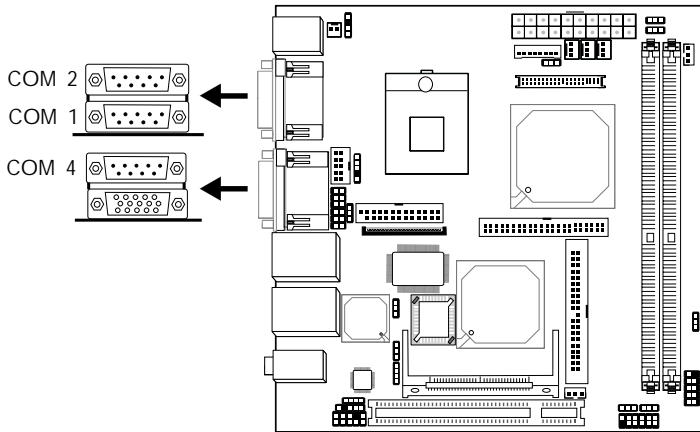
COM 2
COM 1
COM 4

The system board is equipped with 3 onboard serial ports at locations CN4 (COM 1 and COM 2) and CN6 (COM 4). These serial ports are RS-232 and/or RS-485 asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.

Jumper Setting

If the serial device connected to COM 4 requires auxiliary power from the system board, set JP1 appropriately. Refer to "COM 4's RS232/RS485/AUX Select" in this chapter for more information.

BIOS Setting

Select the serial ports' I/O address in the Integrated Peripherals submenu ("Super IO Device" section) of the BIOS. Refer to chapter 3 for more information.

2.5.3 VGA Port
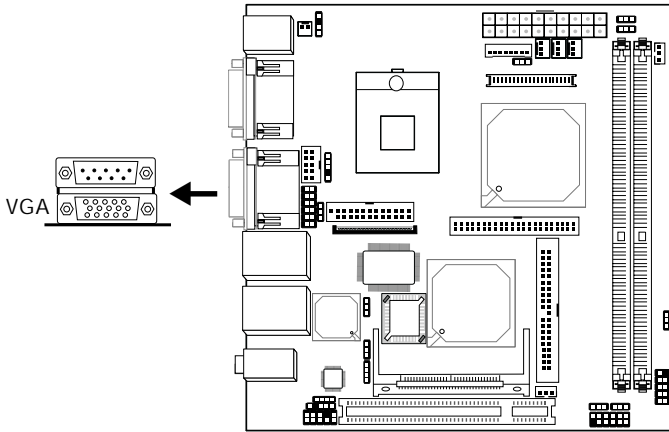
The system board can only be used with an analog video monitor. Connect the monitor's 15-pin D-shell cable connector to the VGA port (Blue) at location CN6. If your monitor supports analog video but does not have a 15-pin D-shell connector, see your monitor dealer for the adapter or optional cable. After you plug the monitor cable into the VGA port, gently tighten the cable screws to hold the connector in place. Some monitors have a switch that chooses between analog and TTL (or digital) operation. If your monitor has such a switch, set it for analog.

BIOS Setting

Configure the onboard VGA in the Advanced Chipset Features submenu of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the "Intel Graphics Drivers". Refer to chapter 4 for more information.

2.5.4 RJ45 Fast-Ethernet Port
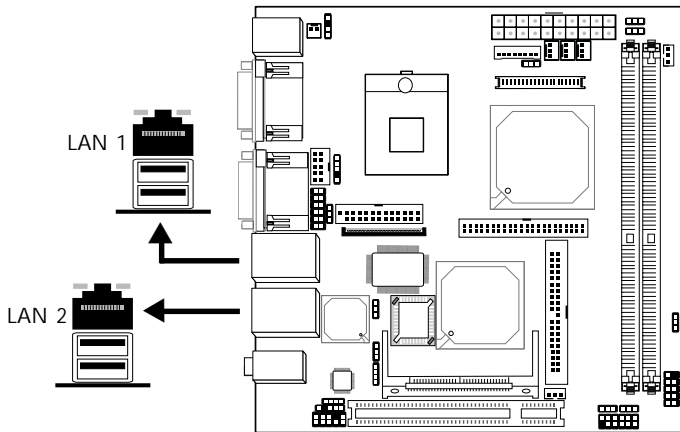
The system board is equipped with 2 onboard RJ45 LAN ports. LAN 1 which is controlled by the Intel 82562EM chip is at location CN5 and LAN 2 which is controlled by the Intel 82551QM chip is at location CN3. These ports allow the system board to connect to a local area network by means of a network hub.

Jumper Setting

Use JP4 to enable or disable the onboard LAN 2. Refer to "LAN 2 Select" in this chapter for more information.

BIOS Setting

Enable or disable the onboard LAN 1 in the Integrated Peripherals submenu ("Onboard Device" section) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the "LAN Drivers". Refer to chapter 4 for more information.

2.5.5 Universal Serial Bus Connectors

USB 2
USB 1

USB 4
USB 3

10 9

N. C. — Key
Ground — Ground
+Data — +Data
-Data — -Data
VCC — VCC

2 1
USB 5-6

The system board supports 6 USB 2.0/1.1 ports. USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

Four onboard USB 2.0/1.1 ports (Black) are at locations CN5 (USB 1-2) and CN3 (USB 3-4) of the system board.

The JUSB1 connector (USB 5-6) allows you to connect 2 additional USB 2.0/1.1 ports. The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to the system chassis then insert the connector that is attached to the USB port cables to JUSB1.

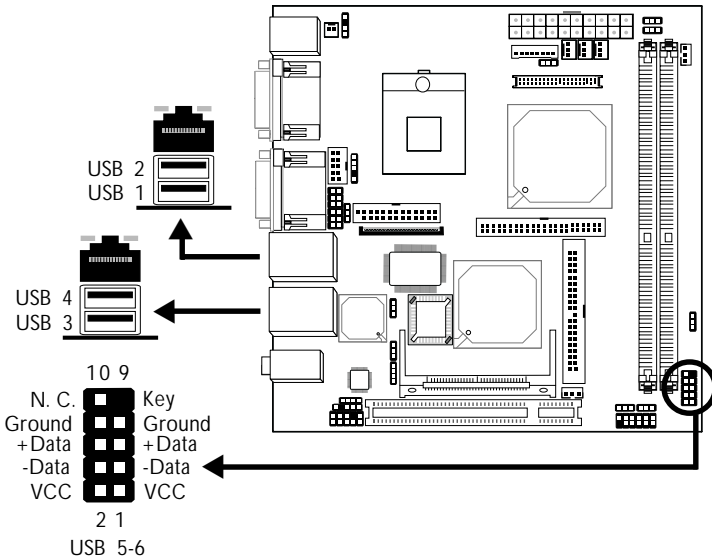### BIOS Setting

Configure the onboard USB in the Integrated Peripherals submenu ("Onboard Device" section) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

You may need to install the proper drivers in your operating system to use the USB device. Refer to your operating system's manual or documentation for more information.

If you are using a USB 2.0 device, install the "Intel USB 2.0 Drivers". Refer to chapter 4 for more information.

Wake-On-USB Keyboard

The Wake-On-USB Keyboard function allows you to use a USB keyboard to wake up a system from the S3 (STR - Suspend To RAM) state. To use this function:

• Jumper Setting:
  JP2 and/or JP9 must be set to "2-3 On: 5V Standby". Refer to "USB Power Select" in this chapter for more information.

• BIOS Setting:
  "USB KB Wake-Up From S3" in the Power Management Setup submenu of the BIOS must be set to Enabled. Refer to chapter 3 for more information.

> Important:
> • *If you are using the Wake-On-USB Keyboard function for 2 USB ports, the 5VSB power source of your power supply must support ≥1.5A.*
> • *If you are using the Wake-On-USB Keyboard function for 3 or more USB ports, the 5VSB power source of your power supply must support ≥2A.*

35

2.5.6 Audio
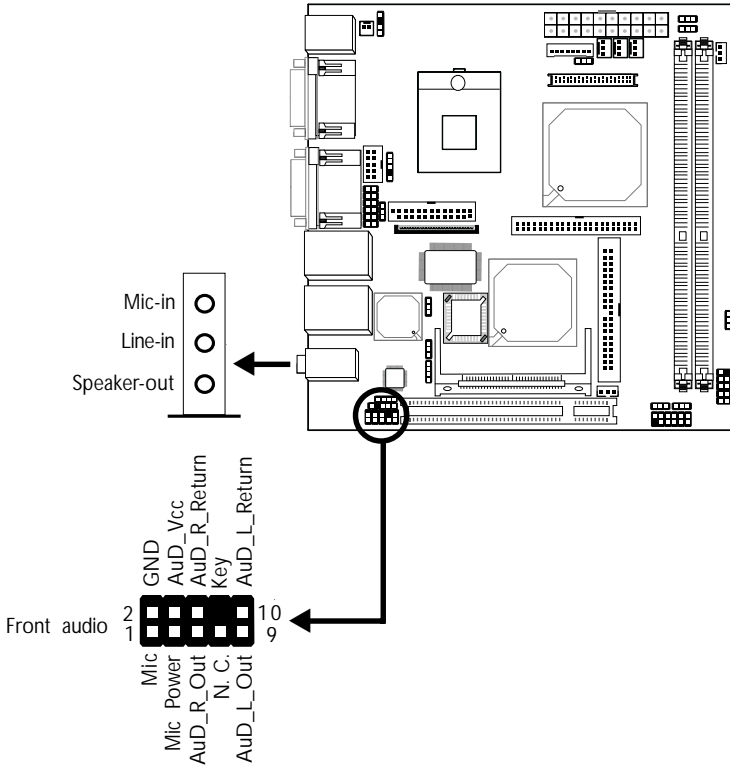
Audio Jacks

The system board is equipped with 3 audio jacks at location CN2. A jack is a one-hole connecting interface for inserting a plug.

- Mic-in Jack (Pink)

    This jack is used to connect an external microphone.

- Line-in Jack (Light Blue)

    This jack is used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc.

• Speaker-out Jack (Lime)

This amplified jack is used to connect external speakers for audio output from the system board. Using this jack disables the front audio's speaker-out function.

Front Audio

The front audio connector (J2) allows you to connect to the speaker-out and mic-in jacks that are at the front panel of your system. Using the speaker-out and mic-in jacks will disable the rear audio's speaker-out and mic-in functions.

Remove the jumper caps from pins 5-6 and pins 9-10 of J2 prior to connecting the front audio cable connector. Make sure pin 1 of the cable connector is aligned with pin 1 of J2. If you are not using this connector, make sure to replace the jumper caps back to their original pin locations.

Pins 5-6 and 9-10 short (default)	The front audio is disabled. The rear audio is enabled.
Pins 5-6 and 9-10 open	The front audio is enabled. The rear audio is disabled.

Driver Installation

Install the "Audio Drivers". Refer to chapter 4 for more information.

2.6 I/O Connectors

2.6.1 CD-in Internal Audio Connector
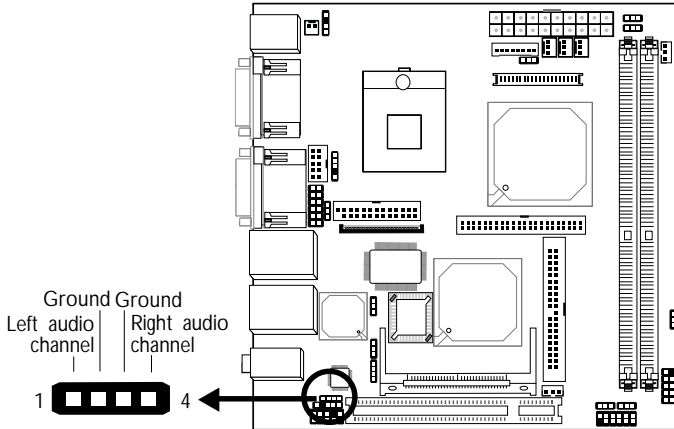
The CD-in (J4) connector is used to receive audio from a CD-ROM drive, TV tuner or MPEG card.

2.6.2 S/PDIF-out Connector
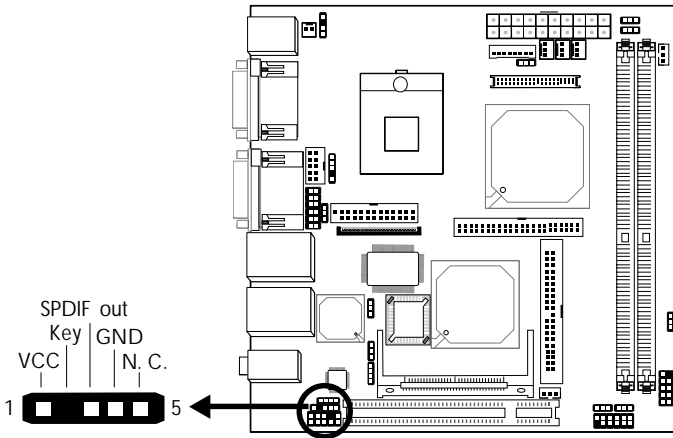
The S/PDIF-out connector (J3) is used to connect an external S/PDIF-out port. Your S/PDIF-out port may be mounted on a card-edge bracket. Install the card-edge bracket to the system chassis then connect the audio cable connector to J3. Make sure pin 1 of the audio cable connector is aligned with pin 1 of J3.

2.6.3 LVDS LCD Panel Connector and LCD/Inverter Power Connector

1 ▪▪▪▪▪▪▪▪ 8

LCD/Inverter
Power

1
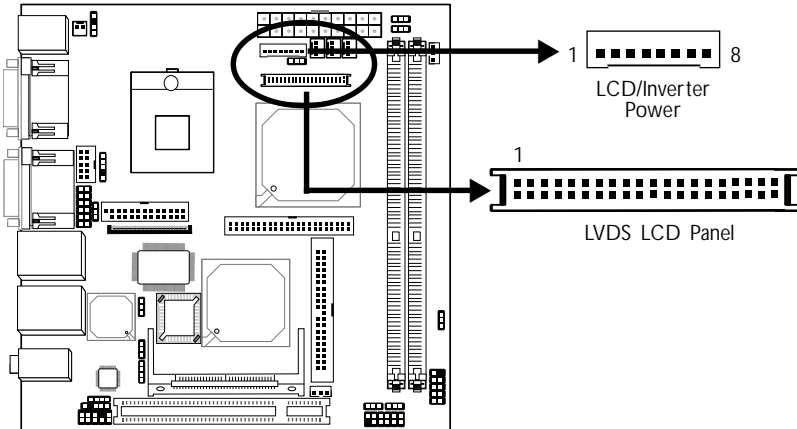
LVDS LCD Panel

The system board allows you to connect a LCD Display Panel by means of the LVDS LCD panel connector (CN9) and the LCD/Inverter power connector (CN8). These connectors transmit video signals and power from the system board to the LCD Display Panel. Refer to the next page for the pin functions of these connectors.

Jumper Settings

Refer to the "Jumper Settings" section in this chapter for settings relevant to the LCD panel.

BIOS Setting

Configure the LCD panel in the Advanced Chipset Features submenu of the BIOS. Refer to chapter 3 for more information.

LVDS LCD Panel Connector

Pins	Function	Pins	Function
1	GND	2	GND
3	LVDS_Out3+	4	LVDS_Out7+
5	LVDS_Out3-	6	LVDS_Out7-
7	GND	8	GND
9	LVDS_Out2+	10	LVDS_Out6+
11	LVDS_Out2-	12	LVDS_Out6-
13	GND	14	GND
15	LVDS_Out1+	16	LVDS_Out5+
17	LVDS_Out1-	18	LVDS_Out5-
19	GND	20	GND
21	LVDS_Out0+	22	LVDS_Out4+
23	LVDS_Out0-	24	LVDS_Out4-
25	GND	26	GND
27	LVDS_CLK1+	28	LVDS_CLK2+
29	LVDS_CLK1-	30	LVDS_CLK2-
31	GND	32	GND
33	COM3_DTR	34	COM3_TD
35	COM3_RTS	36	COM3_RI
37	COM3_RD	38	COM3_DSR
39	COM3_CTS	40	COM3_DCD

LCD/Inverter Power Connector

Pins	Function	Pins	Function
1	+12V	5	Panel Power
2	+12V	6	Panel Inverter Brightness Voltage Control
3	Panel Backlight On/Off Control	7	GND
4	+3.3V	8	GND

2.6.4 Parallel Port
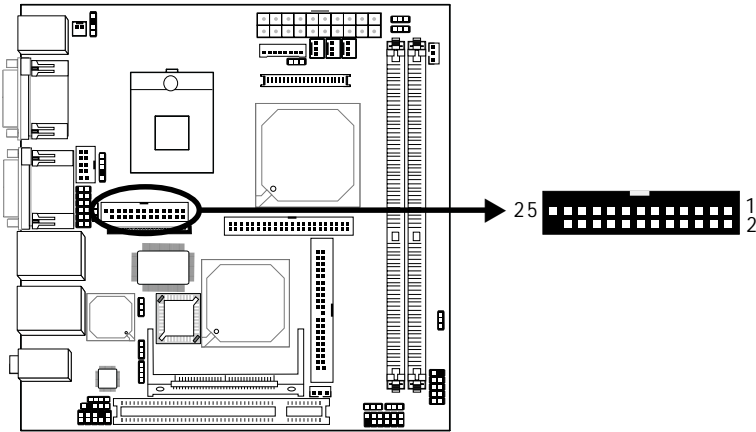
The system board is equipped with a 25-pin connector at location J11 for connecting your PC to a parallel printer. It supports SPP, ECP and EPP.

Setting	Function
SPP (Standard Parallel Port)	Allows normal speed operation but in one direction only.
ECP (Extended Capabilities Port)	Allows parallel port to operate in bidirectional mode and at a speed faster than the SPP's data transfer rate.
EPP (Enhanced Parallel Port)	Allows bidirectional parallel port operation at maximum speed.

BIOS Setting

Select the parallel port's mode in the Integrated Peripherals submenu ("Super IO Device" section) of the BIOS. Refer to chapter 3 for more information.

2.6.5 Floppy Disk Drive Connector
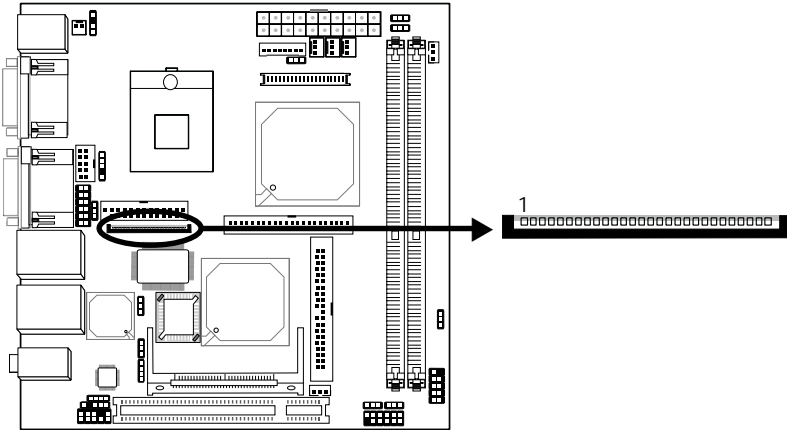
The system board is equipped with a 26-pin FPC type floppy disk drive connector. Only connect a 1.44MB slim-type floppy disk drive. Floppy drives other than the one mentioned above are optional.

Connecting the Floppy Disk Drive Cable

Install one end of the floppy disk drive cable into the floppy disk connector (J12) on the system board and the other end connector to the floppy drive. Pin 1 of the cable must align with pin 1 of J12.

BIOS Setting

Enable or disable this function in the Integrated Peripherals submenu ("Super I/O Device" section) of the BIOS. Refer to chapter 3 for more information.

2.6.6 IDE Disk Drive Connectors
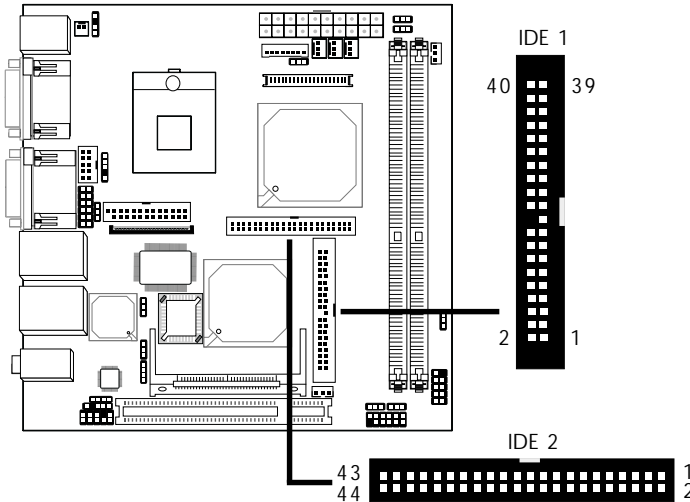
The system board is equipped with a 40-pin (IDE 1) and a 44-pin (IDE 2) IDE connectors. To prevent improper IDE cable installation, the IDE 1 connector has a keying mechanism. The connector on the IDE cable can be inserted into IDE 1 only if pin 1 of the cable connector is aligned with pin 1 of IDE 1.

The 40-pin IDE 1 connector is used for connecting 3.5″ hard drives while the 44-pin IDE 2 connector is used for connecting 2.5″ hard drives (2.0 pitch).

Each IDE connector supports 2 devices, a Master and a Slave. Use an IDE ribbon cable to connect the drives to the system board. An IDE ribbon cable have 3 connectors on them, one that plugs into an IDE connector on the system board and the other 2 connects to IDE devices. The connector at the end of the cable is for the Master drive and the connector in the middle of the cable is for the Slave drive.

Connecting the IDE Disk Drive Cable

Install one end of the IDE cable into IDE 1 (J16) or IDE 2 (J13) on the system board and the other connectors to the IDE devices.

> Note:
> *Refer to your disk drive user's manual for information about selecting proper drive switch settings.*

Adding a Second IDE Disk Drive

When using two IDE drives, one must be set as the master and the other as the slave. Follow the instructions provided by the drive manufacturer for setting the jumpers and/or switches on the drives.

The system board supports Enhanced IDE or ATA-2, ATA/33, ATA/66 and ATA/100 hard drives. We recommend that you use hard drives from the same manufacturer. In a few cases, drives from two different manufacturers will not function properly when used together. The problem lies in the hard drives, not the system board.

> Important:
> *If you encountered problems while using an ATAPI CD-ROM drive that is set in Master mode, please set the CD-ROM drive to Slave mode. Some ATAPI CD-ROMs may not be recognized and cannot be used if incorrectly set in Master mode.*

BIOS Setting

Enable or disable the onboard IDE in the Integrated Peripherals submenu ("OnChip IDE Device" section) of the BIOS. Refer to chapter 3 for more information.

2.6.7 IrDA Connector
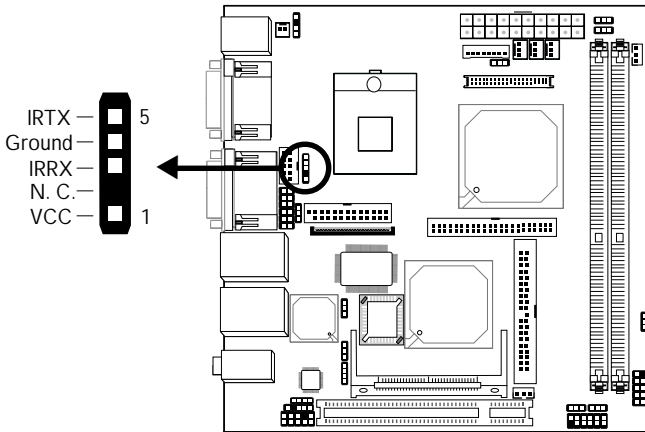
Connect your IrDA cable to connector J7 on the system board.

> **Note:**
> *The sequence of the pin functions on some IrDA cable may be reversed from the pin function defined on the system board. Make sure to connect the cable to the IrDA connector according to their pin functions.*

BIOS Setting

Set the "Serial Port 1 Mode" field in the Integrated Peripherals submenu ("Super IO Device" section) of the BIOS to the type of IrDA standard supported by your device.

Driver Installation

You may need to install the proper drivers in your operating system to use the IrDA function. Refer to your operating system's manual or documentation for more information.

2.6.8 Cooling Fan Connectors
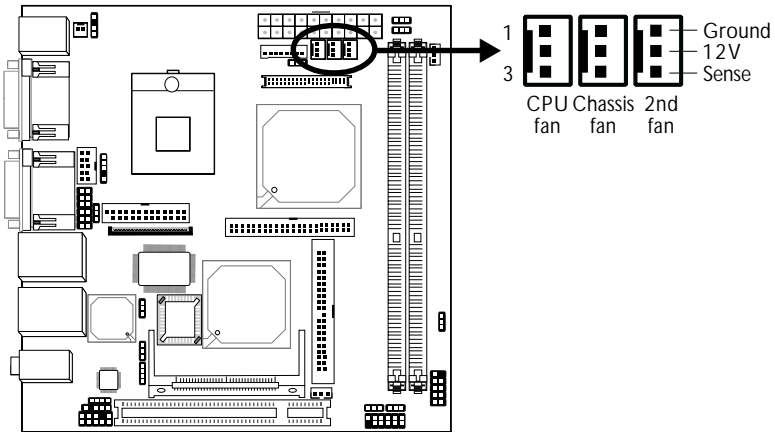
Connect the CPU fan's cable connector to the CPU fan connector (J15) on the system board. The chassis fan (J17) and 2nd fan (J18) connectors are used to connect an additional cooling fan. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

The "PC Health Status" submenu of the BIOS will display the current speed of the cooling fans. Refer to chapter 3 for more information.

2.6.9 Wake-On-LAN Connector

Ground
+5VSB WOL
1 ■ ■ ■ 3
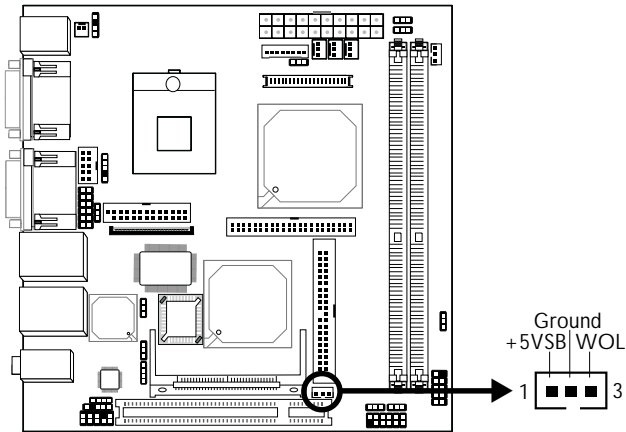
Your LAN card package should include a cable. Connect one end of the cable to the wakeup header on the card and the other end to location J14 on the system board. The network will detect Magic Packet and assert a wakeup signal to power-up the system. Refer to the add-in card's manual for details. Note: Your LAN card must support the remote wake up function.

Important:
The 5VSB power source of your power supply must support ≥720mA.

BIOS Setting

To use the Wake-On-LAN function, you must enable the "Wake Up On LAN" field in the Power Management Setup submenu of the BIOS.

2.6.10 Wake-On-Ring Connector
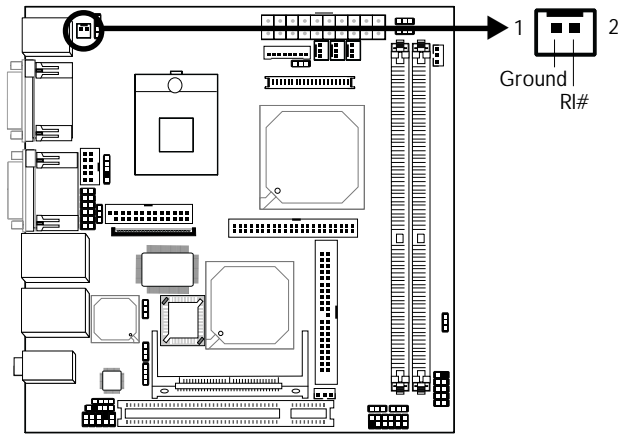
The Wake-On-Ring connector is used to connect to an internal modem add-in card that has the same connector. It will allow the system that is in the Suspend mode or Soft Power Off mode to wake-up/power-on to respond to calls coming from the internal modem card.

To use this function, connect one end of the cable (that came with the card) to the card's wake-on-ring connector and the other end to location J1 on the system board.

If you are using an external modem, the ring-on function will come through the serial port where the external modem is connected.

> Important:
> *If you are using a modem add-in card, the 5VSB power source of your power supply must support ≥720mA.*

BIOS Setting

To use the Wake-On-Ring function, you must enable the "Power On By Ring" field in the Power Management Setup of the BIOS.

2.6.11 Chassis Open Connector

VCC — 4
N. C. — 3
Chassis signal — 2
Ground — 1
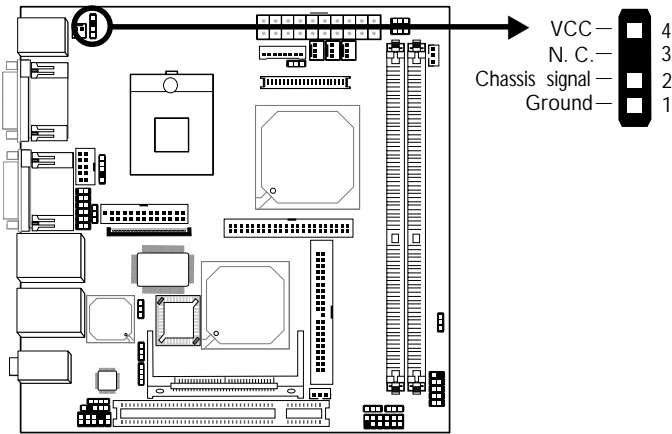
The system board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to J6. Whenever a chassis component has been removed, the sensor sends signal to J6 alerting you of a chassis intrusion event. To disable this function, place a jumper cap over J6.

Hardware Monitor for Windows

Install the "Hardware Monitor for Windows" utility. By default, the chassis intrusion detection function is disabled. When enabled, a warning message will appear when the chassis is open. The utility can also be configured so that a beeping alarm will sound when the chassis is open. Refer to the "Hardware Monitor for Windows" section in chapter 4 for more information.

2.6.12 Power Connector

+5V
+5V
-5V
Ground
Ground
Ground
PS-ON
Ground
-12V
3.3V

20 | • • • • • • • • • • | 11
10 | • • • • • • • • • • | 1

+12V
5VSB
PW-OK
Ground
+5V
Ground
+5V
Ground
3.3V
3.3V
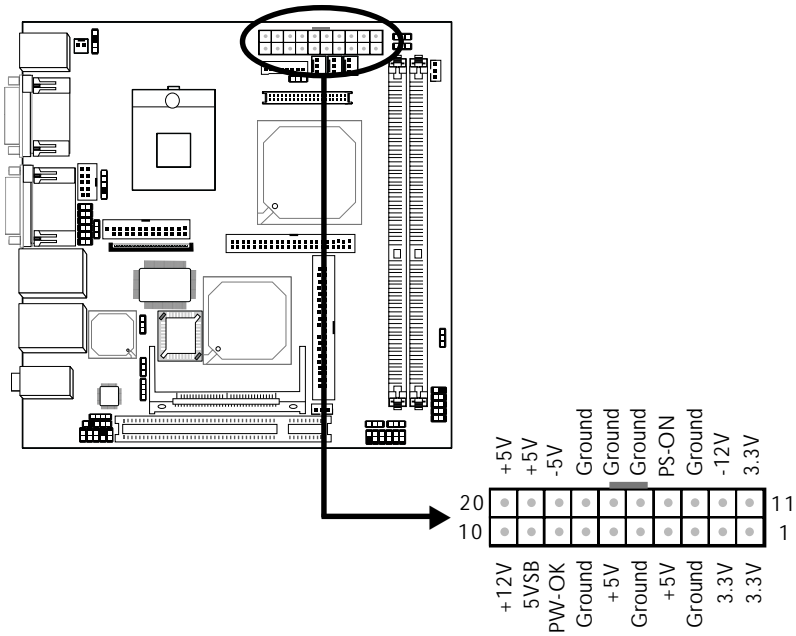
The 20-pin ATX main power connector must be inserted onto the PL1 connector. The system board requires a minimum of 90 Watt power supply to operate. We recommend that you use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1.

2.6.13 External Battery Connector


```
4  ■ — Ground
   ■ — N. C.
   ■ — N. C.
1  ■ — Battery (3V) Input
```
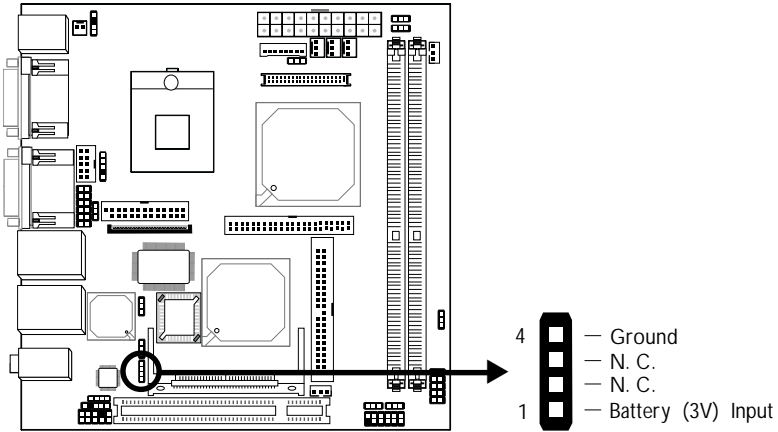
The external battery connector at location J10 is used to connect an external battery.

2.6.14 Front Panel Connectors

RESET SW
HDD-LED
11 1
12 2
PWR-LED
PWR-BTN
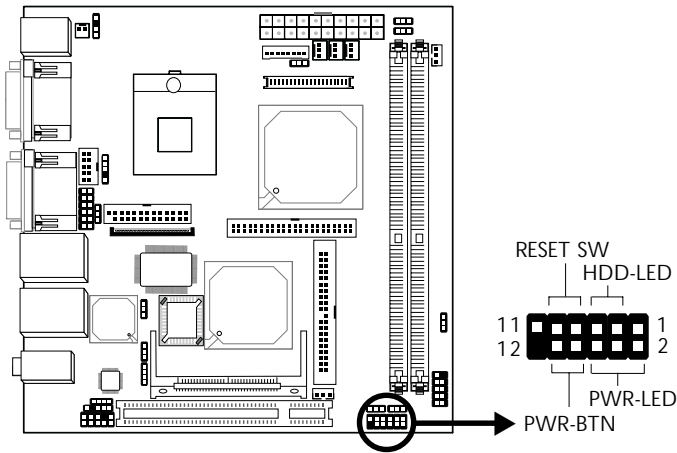
HDD-LED - HDD LED
This LED will light when the hard drive is being accessed.

RESET SW - Reset Switch
This switch allows you to reboot without having to power off the system.

PWR-BTN - Power Switch
This switch is used to power on or off the system.

PWR-LED - Power/Standby LED
When the system's power is on, this LED will light. When the system is in the S1 (POS - Power On Suspend) state, it will blink every second. When the system is in the S3 (STR - Suspend To RAM) state, it will blink every 4 seconds.

	Pin	Pin Assignment		Pin	Pin Assignment
N. C.	1	N. C.	PWR-LED	2 4 6	LED Power LED Power Signal
HDD-LED	3 5	HDD Power Signal	PWR-BTN	8 10	Ground Signal
RESET SW	7 9	Ground RST Signal			
N. C.	11	N. C.	Key	12	Key

2.6.15 PCI Slot
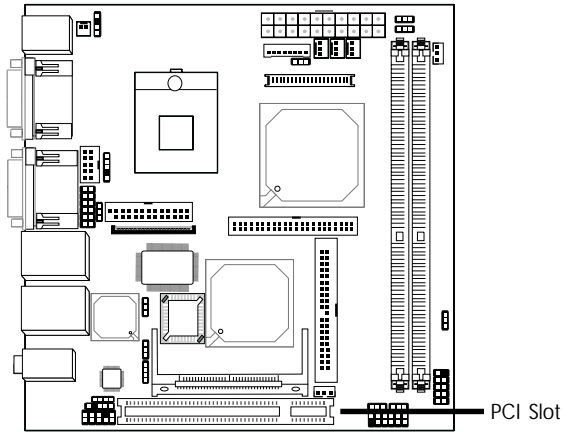
PCI Slot

You can install a PCI expansion card or a customized riser card designed for 1, 2 or 3 PCI slots expansion (for low profile PCI card only) into the PCI slot.

2.6.16 Mini PCI Socket
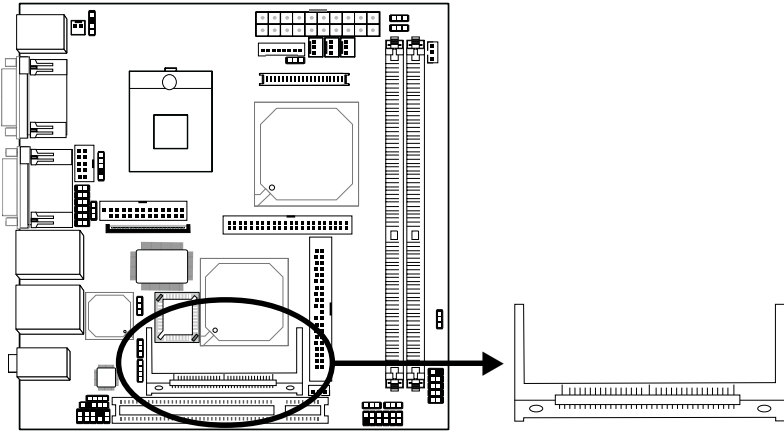
The Mini PCI socket is used to install a Mini PCI card. Mini PCI card is a small form factor PCI card with the same signal protocol, electrical definitions, and configuration definitions as the conventional PCI.

Jumper Setting

To wake up the system via the Mini PCI card, set J19 pins 2 and 3 to On - 3VSB.

Chapter 3 - BIOS Setup

3.1 Award BIOS Setup Utility

The Basic Input/Output System (BIOS) is a program that takes care of the basic level of communication between the processor and peripherals. In addition, the BIOS also contains codes for various advanced features found in this system board. This chapter explains the Setup Utility for the Award BIOS.

After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the following message will appear on the screen:

<p align="center">Press DEL to enter setup</p>

If the message disappears before you respond, restart the system or press the "Reset" button. You may also restart the system by pressing the <Ctrl> <Alt> and <Del> keys simultaneously.

When you press <Del>, the main menu screen will appear.

3.1.1 Standard CMOS Features

Use the arrow keys to highlight "Standard CMOS Features" and press <Enter>. A screen similar to the one below will appear.
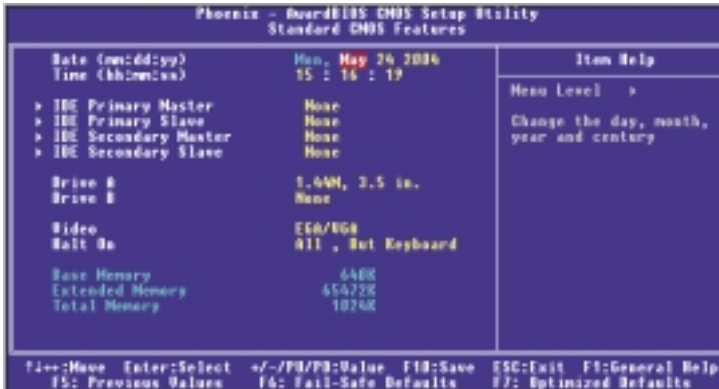
The settings on the screen are for reference only. Your version may not be identical to this one.

3.1.1.1 Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1999 to 2099.

3.1.1.2 Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

3.1.1.3 IDE Primary Master, IDE Primary Slave, IDE Secondary Master and IDE Secondary Slave

Move the cursor to the "IDE Primary Master", "IDE Primary Slave", "IDE Secondary Master" or "IDE Secondary Slave" field, then press <Enter>.
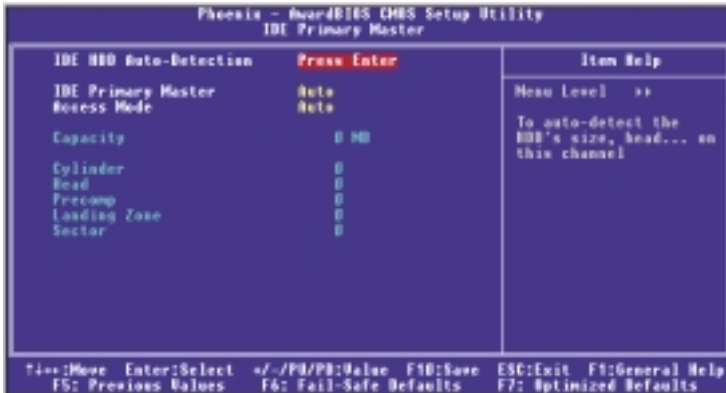
The settings on the screen are for reference only. Your version may not be identical to this one.

IDE HDD Auto Detection

Detects the parameters of the drive. The parameters will automatically be shown on the screen.

IDE Primary Master/Slave and IDE Secondary Master/Slave

If you wish to define your own drive type manually, select "Manual". The drive type information should be included in the documentation from your hard disk vendor. If you select "Auto", the BIOS will auto-detect the HDD & CD-ROM drive at the POST stage and show the IDE for the HDD & CD-ROM drive. If a hard disk has not been installed, select "None".

Access Mode

For hard drives larger than 528MB, you would typically select the LBA type. Certain operating systems require that you select Normal or Large. Please check your operating system's manual or Help desk on which one to select.

Capacity

Displays the approximate capacity of the disk drive. Usually the size is slightly greater than the size of a formatted disk given by a disk checking program.

Cylinder

This field displays the number of cylinders.

Head

This field displays the number of read/write heads.

Precomp

This field displays the number of cylinders at which to change the write timing.

Landing Zone

This field displays the number of cylinders specified as the landing zone for the read/write heads.

Sector

This field displays the number sectors per track.

3.1.1.4 Drive A and Drive B

These fields identify the types of floppy disk drives installed.

None	No floppy drive is installed
360K, 5.25 in.	5-1/4 in. standard drive; 360KB capacity
1.2M, 5.25 in.	5-1/4 in. AT-type high-density drive; 1.2MB capacity
720K, 3.5 in.	3-1/2 in. double-sided drive; 720KB capacity
1.44M, 3.5 in.	3-1/2 in. double-sided drive; 1.44MB capacity
2.88M, 3.5 in.	3-1/2 in. double-sided drive; 2.88MB capacity

3.1.1.5 Video

This field selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select the type. The default setting is EGA/VGA.

EGA/VGA Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA and PGA monitor adapters.

CGA 40 Color Graphics Adapter. Power up in 40-column mode.

CGA 80 Color Graphics Adapter. Power up in 80-column mode.

Mono Monochrome adapter. Includes high resolution monochrome adapters.

3.1.1.6 Halt On

This field determines whether the system will stop if an error is detected during power up. The default setting is All Errors.

No Errors The system boot will not stop for any errors detected.

All Errors The system boot will stop whenever the BIOS detects a non-fatal error.

All, But Keyboard The system boot will not stop for a keyboard error; it will stop for all other errors.

All, But Diskette The system boot will not stop for a disk error; it will stop for all other errors.

All, But Disk/Key The system boot will not stop for a disk or keyboard error; it will stop for all other errors.

3.1.1.7 Base Memory

Displays the amount of base (or conventional) memory installed in the system. The value of the base memory is typically 512K for systems with 512K memory installed on the motherboard or 640K for systems with 640K or more memory installed on the motherboard.

3.1.1.8 Extended Memory

Displays the amount of extended memory detected during boot-up.

3.1.1.9 Total Memory

Displays the total memory available in the system.

3.1.2 Advanced BIOS Features

The Advanced BIOS Features allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

```
           Phoenix - AwardBIOS CMOS Setup Utility
                    Advanced BIOS Features

 ▶ CPU Feature                  Press Enter   ▲        Item Help
   Virus Warning                Disabled
   CPU L1 & L2 Cache            Enabled            Menu Level    ▶
   CPU L3 Cache                 Enabled
   Quick Power On Self Test     Enabled
   First Boot Device            Floppy
   Second Boot Device           HDD-0
   Third Boot Device            LS120
   Boot Other Device            Enabled
   Swap Floppy Drive            Disabled
   Boot Up Floppy Seek          Enabled
   Boot Up NumLock Status       On
   Gate A20 Option              Fast
   Typematic Rate Setting       Disabled
 x Typematic Rate (Chars/Sec)   6
 x Typematic Delay (Msec)       250
   Security Option              Setup
   APIC Mode                    Enabled
   MPS Version Control For OS   1.4
   OS Select For DRAM > 64MB    Non-OS2
   Report No FDD For WIN 95     No
   Small Logo(EPA) Show         Disabled

 ↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
   F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults
```

The screen above list all the fields available in the Advanced BIOS Features submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

3.1.2.1 CPU Feature

This field is used to configure the CPU that is installed on the system board. Move the cursor to this field then press <Enter>.

3.1.2.2 Virus Warning

This field protects the boot sector and partition table of your hard disk drive. When this field is enabled, the Award BIOS will monitor the boot sector and partition table of the hard disk drive. If an attempt is made to write to the boot sector or partition table of the hard disk drive, the BIOS will halt the system and an error message will appear.

After seeing the error message, if necessary, you will be able to run an anti-virus program to locate and remove the problem before any damage is done.

Many disk diagnostic programs which attempt to access the boot sector table will cause the warning message to appear. If you are running such a program, we recommend that you first disable this field. Also, disable this field if you are installing or running certain operating systems like Windows® 98/2000/ME/XP or the operating system may not install nor work.

3.1.2.3 CPU L1 and L2 Cache

This field is used to speed up the memory access. Enable the external cache for better performance.

3.1.2.4 CPU L3 Cache

This field is used to enable or disable the CPU's L3 cache.

3.1.2.5 Quick Power On Self Test

This field speeds up Power On Self Test (POST) after you power on the system. When Enabled, the BIOS will shorten or skip some check items during POST.

3.1.2.6 First Boot Device, Second Boot Device, Third Boot Device and Boot Other Device

Select the drive to boot first, second and third in the "First Boot Device" "Second Boot Device" and "Third Boot Device" fields respectively. The BIOS will boot the operating system according to the sequence of the drive selected. Set "Boot Other Device" to Enabled if you wish to boot from another device.

3.1.2.7 Swap Floppy Drive

When this field is enabled and the system is booting from the floppy drive, the system will boot from drive B instead of drive A. When this field is disabled and the system is booting from the floppy drive, the system will boot from drive A. You must have two floppy drives to use this function.

3.1.2.8 Boot Up Floppy Seek

When enabled, the BIOS will check whether the floppy disk drive installed is 40 or 80 tracks. Note that the BIOS cannot distinguish between 720K, 1.2M, 1.44M and 2.88M drive types as they are all 80 tracks. When disabled, the BIOS will not search for the type of floppy disk drive by track number. Note that there will not be any warning message if the drive installed is 360KB.

3.1.2.9 Boot Up NumLock Status

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

3.1.2.10 Gate A20 Option

This entry allows you to select how gate A20 is handled. Gate A20 is a device used to address memory above 1 Mbyte. Initially, gate A20 was handled via the keyboard controller. Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset to provide support for gate A20.

3.1.2.11 Typematic Rate Setting

Disabled Continually holding down a key on your keyboard will cause the BIOS to report that the key is down.

Enabled The BIOS will not only report that the key is down, but will first wait for a moment, and, if the key is still down, it will begin to report that the key has been depressed repeatedly. For example, you would use such a feature to accelerate cursor movements with the arrow keys. You can then select the typematic rate and typematic delay in the "Typematic Rate (Chars/Sec)" and "Typematic Delay (Msec)" fields below.

3.1.2.12 Typematic Rate (Chars/Sec)

This field allows you to select the rate at which the keys are accelerated.

3.1.2.13 Typematic Delay (Msec)

This field allows you to select the delay between when the key was first depressed and when the acceleration begins.

3.1.2.14 Security Option

This field determines when the system will prompt for the password - everytime the system boots or only when you enter the BIOS setup. Set the password in the Set Supervisor/User Password submenu.

System The system will not boot and access to Setup will be denied unless the correct password is entered at the prompt.

Setup The system will boot, but access to Setup will be denied unless the correct password is entered at the prompt.

3.1.2.15 APIC Mode

Leave this field in its default setting.

3.1.2.16 MPS Version Control for OS

This field is used to select the MPS version used by the system.

3.1.2.17 OS Select for DRAM > 64MB

This field allows you to access the memory that is over 64MB in OS/2. The options are: Non-OS2 and OS2.

3.1.2.18 Report No FDD For WIN 95

The options are Yes and No.

3.1.2.19 Small Logo(EPA) Show

Enabled The EPA logo will appear during system boot-up.
Disabled The EPA logo will not appear during system boot-up.

3.1.3 Advanced Chipset Features

The screen above list all the fields available in the Advanced Chipset Features submenu, for ease of reference in this manual. In the actual CMOS setup, you have to use the scroll bar to view the fields. The settings on the screen are for reference only. Your version may not be identical to this one.

This section gives you functions to configure the system based on the specific features of the chipset. The chipset manages bus speeds and access to system memory resources. These items should not be altered unless necessary. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered some incompatibility or that data was being lost while using your system.

3.1.3.1 DRAM Timing Selectable

This field is used to select the timing of the DRAM.

By SPD   The EEPROM on a DIMM has SPD (Serial Presence Detect) data structure that stores information about the module such as the memory type, memory size, memory speed, etc. When this option is selected, the system will run according to the information in the EEPROM. This option is the default setting because it provides the most stable condition for the system. The "CAS Latency Time" and "Active to Precharge Delay" fields will show the default settings by SPD.

Manual If you want better performance for your system other than the one "by SPD", select "Manual" then select the best option in the "CAS Latency Time" and "Active to Precharge Delay fields.

3.1.3.2 CAS Latency Time

This field is used to select the local memory clock periods.

3.1.3.3 Active to Precharge Delay

The options are 5, 6 and 7.

3.1.3.4 DRAM RAS# to CAS# Delay

The options are 2 and 3.

3.1.3.5 DRAM RAS# Precharge

This field controls RAS# precharge (in local memory clocks).

3.1.3.6 DRAM Data Integrity Mode

The ECC (Error Checking and Correction) function is supported only in x72 (72-bit) PC SDRAM DIMMs. If you are using x64 (64-bit) PC SDRAM DIMMs, set this field to Non-ECC.

Non-ECC Uses x64 PC SDRAM DIMM.
ECC This option allows the system to recover from memory failure. It detects single-bit and multiple-bit errors, then automatically corrects single-bit error.

3.1.3.7 MGM Core Frequency

This field is used to select the FSB MEM/GFX LOW/GFX high core frequency.

3.1.3.8 System BIOS Cacheable

When this field is enabled, accesses to the system BIOS ROM addressed at F0000H-FFFFFH are cached, provided that the cache controller is enabled. The larger the range of the Cache RAM, the higher the efficiency of the system.

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3.1.3.9 Video BIOS Cacheable

As with caching the system BIOS, enabling the Video BIOS cache will allow access to video BIOS addresssed at C0000H to C7FFFH to be cached, if the cache controller is also enabled. The larger the range of the Cache RAM, the faster the video performance.

3.1.3.10 Memory Hole At 15M-16M

In order to improve system performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16MB. When enabled, the CPU assumes the 15-16MB memory range is allocated to the hidden ISA address range instead of the actual system DRAM. When disabled, the CPU assumes the 15-16MB address range actually contains DRAM memory. If more than 16MB of system memory is installed, this field must be disabled to provide contiguous system memory.

3.1.3.11 Delayed Transaction

When enabled, this function frees up the PCI bus for other PCI masters during the PCI-to-ISA transactions. This allows PCI and ISA buses to be used more efficiently and prevents degradation of performance on the PCI bus when ISA accesses are made.

3.1.3.12 Delay Prior To Thermal

This field is used to select the time that would force the CPU to a 50% duty cycle when it exceeds its maximum operating temperature therefore protecting the CPU and the system board from overheating to ensure a safe computing environment..

3.1.3.13 AGP Aperture Size (MB)

This field is relevant to the memory-mapped graphics data of the AGP card installed in your system. Leave this in its default setting, which is 64M.

3.1.3.14 On-Chip VGA

This field is used to enable or disable the onboard video.

3.1.3.15 On-Chip Frame Buffer Size

This field is used to select the frame buffer size.

3.1.3.16 Boot Display

This field is used to select the type of display to use when the system boots.

VBIOS   By default, the VBIOS will automatically detect for the CRT display first then the LCD flat panel display; depending on the display that is available when the system boots.

CRT   Select this option if you want the system to boot the CRT display.

LFP   Select this option if you want the system to boot the LCD flat panel display.

CRT+LFP Select this option if you want the system to boot both the CRT and LCD flat panel display.

3.1.3.17 Panel Scaling

This options are Auto, On and Off.

3.1.3.18 Panel Number

Panel 1   640x480, one channel LVDS (A0-A2) for 18-bit panels
Panel 2   800x600, one channel LVDS (A0-A2) for 18-bit panels
Panel 3   1024x768, one channel LVDS (A0-A2) for 18-bit panels
Panel 4   1280x1024, two channel LVDS (A0-A3, B0-B3) for 48-bit panels

If you are using one of the standard panels shown above, select the appropriate option according to the type of panel that you are using. Otherwise, please contact your dealer or sales representative for a custom-made BIOS that will suit the panel that you are using.

3.1.4 Integrated Peripherals
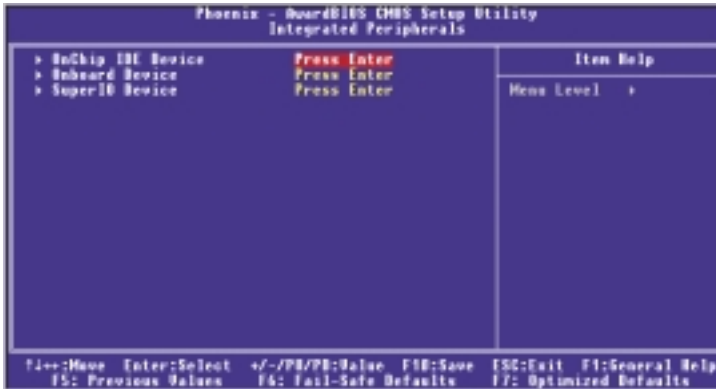
The settings on the screen are for reference only. Your version may not be identical to this one.

3.1.4.1 OnChip IDE Device

Move the cursor to this field and press <Enter>. The following screen will appear.

The settings on the screen are for reference only. Your version may not be identical to this one.

On-Chip Primary PCI IDE and On-Chip Secondary PCI IDE

These fields allow you to enable or disable the primary and second-ary IDE controller. The default is Enabled. Select Disabled if you want to add a different hard drive controller.

IDE Primary Master/Slave PIO and IDE Secondary Master PIO

PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to effect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by themselves. Your system supports five modes, 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode after checking your drive.

Auto   The BIOS will automatically set the system according to your hard disk drive's timing.

Mode 0-4 You can select a mode that matches your hard disk drive's timing. Caution: Do not use the wrong setting or you will have drive errors.

IDE Primary Master/Slave UDMA and IDE Secondary Master UDMA

These fields allow you to set the Ultra DMA in use. When Auto is selected, the BIOS will select the best available option after checking your hard drive or CD-ROM.

Auto   The BIOS will automatically detect the settings for you.

Disabled The BIOS will not detect these categories.

IDE HDD Block Mode

Enabled The IDE HDD uses the block mode. The system BIOS will check the hard disk drive for the maximum block size the system can transfer. The block size will depend on the type of hard disk drive.

Disabled The IDE HDD uses the standard mode.

3.1.4.2 Onboard Device

Move the cursor to this field and press <Enter>. The following screen will appear.
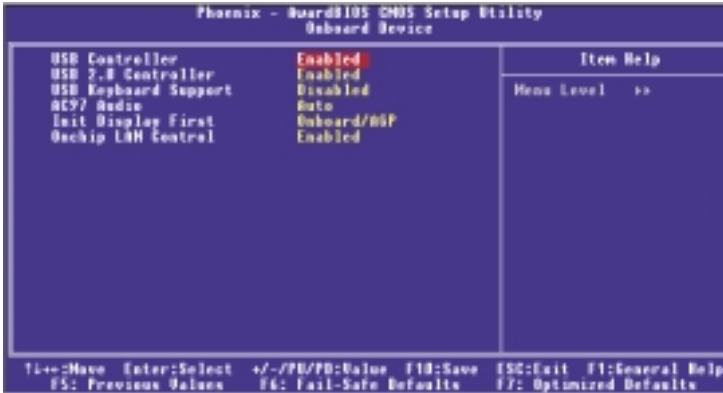
The settings on the screen are for reference only. Your version may not be identical to this one.

USB Controller

This field is used to enable or disable the USB ports.

USB 2.0 Controller

If you are using USB 2.0, this field must be set to Enabled.

USB Keyboard Support

If you are using a USB keyboard under DOS, set this field to Enabled.

AC97 Audio

Auto   Select this option when using the onboard audio codec.

Disabled   Select this option when using a PCI sound card.

Init Display First

This field is used to select whether to initialize the onboard VGA or PCI first when the system boots.

Onboard/AGP   When the system boots, it will first initialize the onboard VGA.

PCI Slot   When the system boots, it will first initialize PCI.

Onchip LAN Control

This field is used to enable or disable the onboard Intel 82562EM LAN chip that controls the onboard LAN 1 port.

3.1.4.3 Super IO Device

Move the cursor to this field and press <Enter>. The following screen will appear.

The settings on the screen are for reference only. Your version may not be identical to this one.

Power On Function

This field allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system.

Keyboard 98	When this option is selected, press the "wake up" key of the Windows® 98 compatible keyboard to power-on the system.
Password	When this option is selected, set the password you would like to use to power-on the system in the "KB Power On Password" field.
Hot Key	When this option is selected, select the function key you would like to use to power-on the system in the "Hot Key Power On" field.
Mouse Left	When this option is selected, double-click the left button of the mouse to power-on the system.
Mouse Right	When this option is selected, double-click the right button of the mouse to power-on the system.
Any Key	Press any key to power-on the system.

KB Power On Password

Move the cursor to this field and press <Enter>. Enter your password. You can enter up to 5 characters. Type in exactly the same password to confirm, then press <Enter>.

The power button will not function once a keyboard password has been set in this field. You must type the correct password to power-on the system. If you forgot the password, power-off the system and remove the battery. Wait for a few seconds and install it back before powering-on the system.

Hot Key Power On

This field is used to select a function key that you would like to use to power-on the system.

Onboard FDC Controller

Enabled	Enables the onboard floppy disk controller.
Disabled	Disables the onboard floppy disk controller.

Onboard Parallel Port

378/IRQ7, 3BC/IRQ7, 278/IRQ5 Selects the I/O address and IRQ for the onboard parallel port.
Disabled Disables the onboard parallel port.

Parallel Port Mode

The options are SPP, EPP, ECP and ECP+EPP. These apply to standard specifications and will depend on the type and speed of your device. Refer to your peripheral's manual for the best option.

SPP
Allows normal speed operation but in one direction only.

"ECP (Extended Capabilities Port)"
Allows parallel port to operate in bidirectional mode and at a speed faster than the normal mode's data transfer rate.

"EPP (Enhanced Parallel Port)"
Allows bidirectional parallel port operation at maximum speed.

EPP Mode Select

This field is used to select the EPP mode.

ECP Mode Use DMA

This field is used to select the DMA channel used for the parallel port.

PWRON After PWR-Fail

Off   When power returns after an AC power failure, the system's power is off. You must press the Power button to power-on the system.

On   When power returns after an AC power failure, the system will automatically power-on.

Former-Sts When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

Onboard Serial Port 1, Onboard Serial Port 2, Onboard Serial Port 3 and Onboard Serial Port 4

3F8, 2F8, 3E8, 2E8 Allows you to manually select an I/O address for the onboard serial port 1, 2, 3 or 4.

Disabled   Disables the onboard 1, 2, 3 or 4.

Serial Port 1 Use IRQ, Serial Port 2 Use IRQ, Serial Port 3 Use IRQ and Serial Port 4 Use IRQ

These fields are used to select an IRQ for the onboard serial port 1, 2, 3 or 4.

Serial Port 1 Mode

COM 1 functions as either a serial port or IrDA. You cannot use both at the same time.

Normal   This option sets COM 1 as serial port.
IrDA   This option sets COM 1 as IrDA.

3.1.5 Power Management Setup

The Power Management Setup allows you to configure your system to most effectively save energy.

The settings on the screen are for reference only. Your version may not be identical to this one.

3.1.5.1 ACPI Function

This function should be enabled only in operating systems that support ACPI. Currently, only Windows® 98/2000/ME/XP supports this function. If you want to use the Suspend to RAM function, make sure this field is enabled then select "S3(STR)" in the "ACPI Suspend Type" field.

3.1.5.2 ACPI Suspend Type

This field is used to select the type of Suspend mode.

S1(POS)   Enables the Power On Suspend function.
S3(STR)   Enables the Suspend to RAM function. If you are using the Windows® 98 operating system, refer to "Using the Suspend to RAM Function" in appendix B for more information.

3.1.5.3 Run VGABIOS if S3 Resume

When this field is set to Auto, the system will initialize the VGA BIOS when it wakes up from the S3 state. This can be configured only if the "ACPI Suspend Type" field is set to "S3(STR)".

3.1.5.4 Power Management

This field allows you to select the type (or degree) of power saving by changing the length of idle time that elapses before the "Suspend Mode" field is activated.

Min Saving	Minimum power saving time for Suspend mode = 1 hr.
Max Saving	Maximum power saving time for Suspend mode = 1 min.
User Define	Allows you to set the power saving time in the "Suspend Mode" field.

3.1.5.5 Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC + Blank	This will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This only writes blanks to the video buffer.
DPMS Support	Initializes display power management signaling. Select this if your video board supports it.

3.1.5.6 Video Off In Suspend

This field is used to activate the video off feature when the system enters the Suspend mode.

3.1.5.7 Suspend Type

The options are Stop Grant and PwrOn Suspend.

3.1.5.8 MODEM Use IRQ

This field is used to set an IRQ channel for the modem installed in your system.

3.1.5.9 Suspend Mode

When the system enters the Suspend mode, the CPU and onboard peripherals will be shut off.

3.1.5.10 HDD Power Down

This is selectable only when the Power Management field is set to User Define. When the system enters the HDD Power Down mode according to the power saving time selected, the hard disk drive will be powered down while all other devices remain active.

3.1.5.11 Soft-Off by PWR-BTTN

This field allows you to select the method of powering off your system.

Delay 4 Sec. Regardless of whether the Power Management function is enabled or disabled, if the power button is pushed and released in less than 4 sec, the system enters the Suspend mode. The purpose of this function is to prevent the system from powering off in case you accidentally "hit" or pushed the power button. Push and release again in less than 4 sec to restore. Pushing the power button for more than 4 seconds will power off the system.

Instant-Off Pressing and then releasing the power button at once will immediately power off your system.

3.1.5.12 CPU THRM-Throttling

Thermal throttling regulates the thermal environment by alternating between running the processor at full speed and placing the processor in a sleep state whenever the upper limits of the thermal envelop are reached.

3.1.5.13 Wake-Up By PCI Card

Enabled   This field should be set to Enabled only if your PCI card such as LAN card or modem card uses the PCI PME (Power Management Event) signal to remotely wake up the system. Access to the LAN card or PCI card will cause the system to wake up. Refer to the card's documentation for more information.

Disabled   The system will not wake up despite access to the PCI card.

3.1.5.14 Power On By Ring

When this field is set to Enabled, the system will power-on to respond to calls coming from a modem. Refer to "Wake-On-Ring Connector" in chapter 2 for more information.

3.1.5.15 Wake Up On LAN

If you are using a LAN card that supports the remote wake up function, set this field to Enabled. The will allow the network to remotely wake up a Soft Power Down (Soft-Off) PC. However, if your system is in the Suspend mode, you can wake up the system only through an IRQ or DMA interrupt. Refer to "Wake-On-LAN Connector" in chapter 2 for more information.

3.1.5.16 USB KB Wake-Up From S3

This field, when enabled, allows you to use a USB keyboard or USB mouse to wake up a system that is in the S3 (STR - Suspend To RAM) state. This can be configured only if the "ACPI Suspend Type" field is set to "S3(STR)".

3.1.5.17 Resume By Alarm

Enabled   When Enabled, you can set the date and time you would like the Soft Power Down (Soft-Off) PC to power-on in the "Date (of Month) Alarm" and "Time (hh:mm:ss) Alarm" fields. However, if the system is being accessed by incoming calls or the network (Resume On Ring/LAN) prior to the date and time set in these fields, the system will give priority to the incoming calls or network.

Disabled Disables the automatic power-on function. (default)

3.1.5.18 Date (of Month) Alarm

0   The system will power-on everyday according to the time set in the "Time (hh:mm:ss) Alarm" field.

1-31   Select a date you would like the system to power-on. The system will power-on on the set date, and time set in the "Time (hh:mm:ss) Alarm" field.

3.1.5.19 Time (hh:mm:ss) Alarm

This is used to set the time you would like the system to power-on. If you want the system to power-on everyday as set in the "Date (of Month) Alarm" field, the time set in this field must be later than the time of the RTC set in the Standard CMOS Features submenu.

3.1.6 PnP/PCI Configurations

This section shows how to configure the PCI bus system. It covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

The settings on the screen are for reference only. Your version may not be identical to this one.

3.1.6.1 Reset Configuration Data

Enabled The BIOS will reset the Extended System Configuration Data (ESCD) once automatically. It will then recreate a new set of configuration data.

Disabled The BIOS will not reset the configuration data.

3.1.6.2 Resources Controlled By

The Award Plug and Play BIOS has the capability to automatically configure all of the boot and Plug and Play compatible devices.

Auto(ESCD) The system will automatically detect the settings for you.

Manual Choose the specific IRQ resources in the "IRQ Resources" field.

3.1.6.3 IRQ Resources

Move the cursor to this field and press <Enter>. The "IRQ-3" to "IRQ-15" fields will appear. Set each system interrupt to either PCI Device or Reserved.
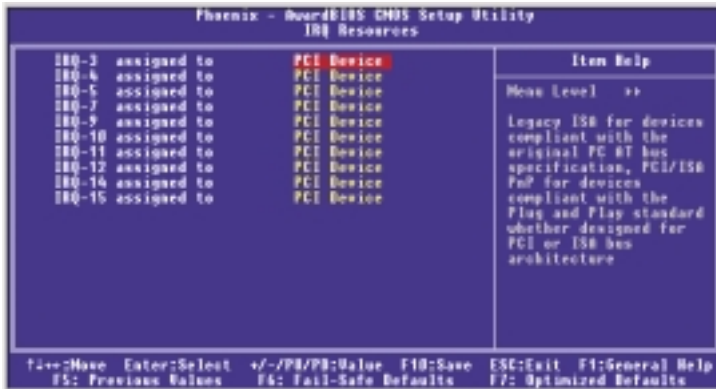
The settings on the screen are for reference only. Your version may not be identical to this one.

3.1.6.4 PCI/VGA Palette Snoop

This field determines whether the MPEG ISA/VESA VGA cards can work with PCI/VGA or not. The default value is Disabled.

Enabled MPEG ISA/VESA VGA cards work with PCI/VGA.
Disabled MPEG ISA/VESA VGA cards does not work with PCI/ VGA.

3.1.7 PC Health Status
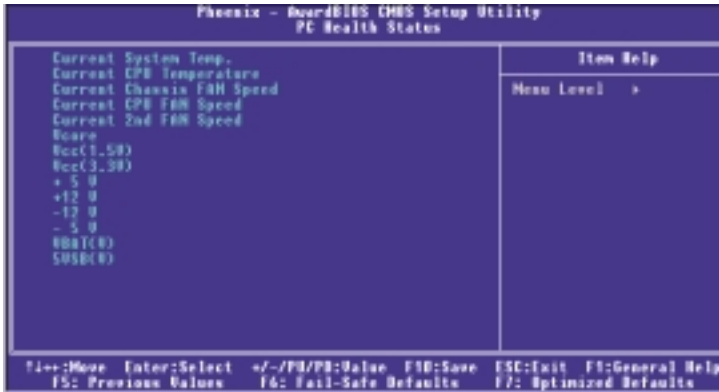
The settings on the screen are for reference only. Your version may not be identical to this one.

3.1.7.1 Current System Temp., Current CPU Temperature, Current Chassis Fan Speed, Current CPU Fan Speed and Current 2nd Fan Speed

These fields will show the internal temperature of the system, current temperature of the CPU, and the current fan speed of the cooling fans in RPM (Revolutions Per Minute).

3.1.7.3 Vcore, Vcc(1.5V) and Vcc(3.3V)

These fields will show the detected voltage of the processor.

3.1.7.4 +5V, +12V, -12V, -5V, VBAT(V) and 5VSB(V)

These fields show the output voltage of the power supply.

3.1.8 Frequency/Voltage Control
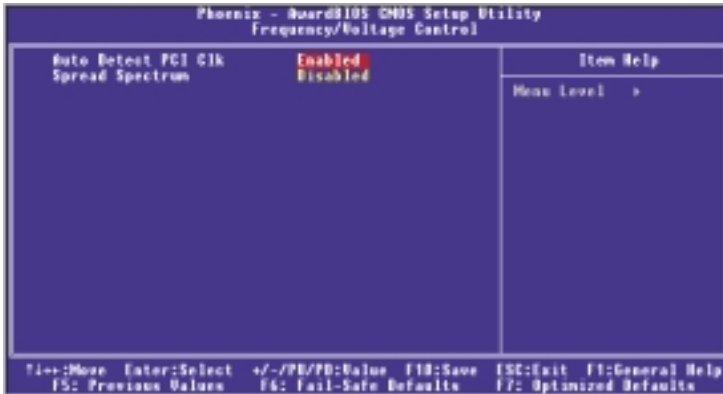
The settings on the screen are for reference only. Your version may not be identical to this one.

3.1.8.1 Auto Detect PCI Clk

When enabled, the system will automatically send clock signals to existing PCI devices.

3.1.8.2 Spread Spectrum

Leave this field in its default setting. Do not alter this setting unless advised by an engineer or technician.

3.1.9 Load Fail-Safe Defaults

The "Load Fail-Safe Defaults" option loads the troubleshooting default values permanently stored in the ROM chips. These settings are not optimal and turn off all high performance features. You should use these values only if you have hardware problems. Highlight this option in the main menu and press <Enter>.

If you want to proceed, type <Y> and press <Enter>. The default settings will be loaded.

3.1.10 Load Optimized Defaults

The "Load Optimized Defaults" option loads optimized settings from the BIOS ROM. Use the default values as standard values for your system. Highlight this option in the main menu and press <Enter>.

Type <Y> and press <Enter> to load the Setup default values.

3.1.11 Set Supervisor Password

If you want to protect your system and setup from unauthorized entry, set a supervisor's password with the "System" option selected in the Advanced BIOS Features. If you want to protect access to setup only, but not your system, set a supervisor's password with the "Setup" option selected in the Advanced BIOS Features. You will not be prompted for a password when you cold boot the system.

Use the arrow keys to highlight "Set Supervisor Password" and press <Enter>.

Type in the password. You are limited to eight characters. When done, the message below will appear:

Confirm Password:

You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set Supervisor Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

3.1.12 Set User Password

If you want another user to have access only to your system but not to setup, set a user's password with the "System" option selected in the Advanced BIOS Features. If you want a user to enter a password when trying to access setup, set a user's password with the "Setup" option selected in the Advanced BIOS Features.

Using user's password to enter Setup allows a user to access only "Set User Password" that appears in the main menu screen. Access to all other options is denied.

Use the arrow keys to highlight "Set User Password" and press <Enter>.

Type in the password. You are limited to eight characters. When done, the message below will appear:
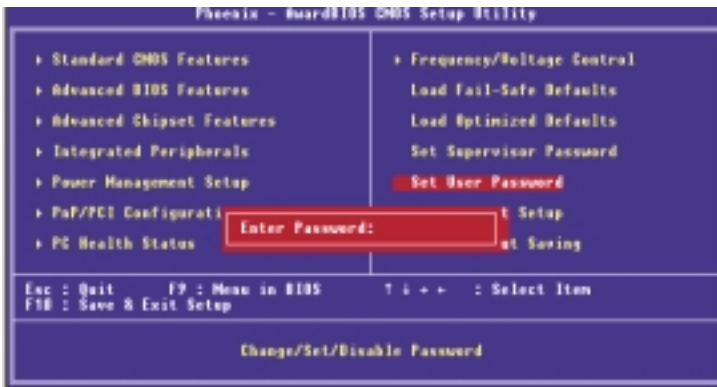
Confirm Password:

You are asked to verify the password. Type in exactly the same password. If you type in a wrong password, you will be prompted to enter the correct password again. To delete or disable the password function, highlight "Set User Password" and press <Enter>, instead of typing in a new password. Press the <Esc> key to return to the main menu.

3.1.13 Save & Exit Setup

When all the changes have been made, highlight "Save & Exit Setup"
and press <Enter>.

Type "Y" and press <Enter>. The modifications you have made will
be written into the CMOS memory, and the system will reboot. You
will once again see the initial diagnostics on the screen. If you wish to
make additional changes to the setup, press <Ctrl> <Alt> <Esc>
simultaneously or <Del> after memory testing is done.

3.1.14 Exit Without Saving

When you do not want to save the changes you have made,
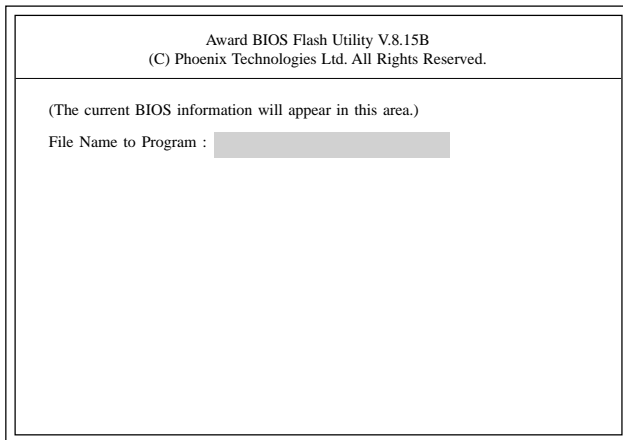highlight "Exit Without Saving" and press <Enter>.

Type "Y" and press <Enter>. The system will reboot and you will
once again see the initial diagnostics on the screen. If you wish to
make any changes to the setup, press <Ctrl> <Alt> <Esc> simulta-
neously or <Del> after memory testing is done.

3.2 Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility, AWDFLASH.EXE. Please contact technical support or your sales representative for the files.

1. Save the new BIOS file along with the flash utility AWDFLASH.EXE to a floppy disk.

2. Reboot the system and enter the Award BIOS Setup Utility to set the first boot drive to "Floppy".

3. Save the setting and reboot the system.

4. After the system booted from the floppy disk, execute the flash utility by typing AWDFLASH.EXE. The following screen will appear.

```
┌─────────────────────────────────────────────────────────┐
│              Award BIOS Flash Utility V.8.15B            │
│         (C) Phoenix Technologies Ltd. All Rights Reserved.│
│  ┌───────────────────────────────────────────────────┐  │
│  │ (The current BIOS information will appear in this area.)│
│  │ File Name to Program : �_____      │  │
│  │                                                   │  │
│  │                                                   │  │
│  │                                                   │  │
│  │                                                   │  │
│  │                                                   │  │
│  │                                                   │  │
│  └───────────────────────────────────────────────────┘  │
└─────────────────────────────────────────────────────────┘
```

5. Type the new BIOS file name onto the gray area that is next to "File Name to Program" then press <Enter>.

6. The following will appear.

    Do You Want to Save BIOS (Y/N)

    This question refers to the current existing BIOS in your system. We recommend that you save the current BIOS and its flash utility; just in case you need to reinstall the BIOS. To save the current BIOS, press <Y> then enter the file name of the current BIOS. Otherwise, press <N>.

7. The following will then appear.

    Press "Y" to Program or "N" to Exit

8. Press <Y> to flash the new BIOS.

Chapter 4 - Supported Software

4.1 Desktop Management Interface (DMI)

The system board comes with a DMI built into the BIOS. DMI, along with the appropriately networked software, is designed to make inventory, maintenance and troubleshooting of computer systems easier. With DMI, a network administrator or MIS engineer can remotely access some information about a particular computer system without physically going to it. Quite often a service call may be unnecessary as the problem can be solved remotely.

The DMI utility in the BIOS automatically records various information about your system configuration. Information about the type and speed of CPU, type and amount of memory for each memory slot, BIOS revision level, types of add-in PCI boards and components, certain revision numbers of hardware installed, etc. are automatically detected and stored in the DMI pool, which is a part of the system board's Plug and Play BIOS. Additional information, such as ISA based peripherals, which may not be automatically detected, can be manually recorded in the DMI pool by using the Add DMI menu. The DMI pool data is then verified or updated whenever the system hardware or setup is altered.
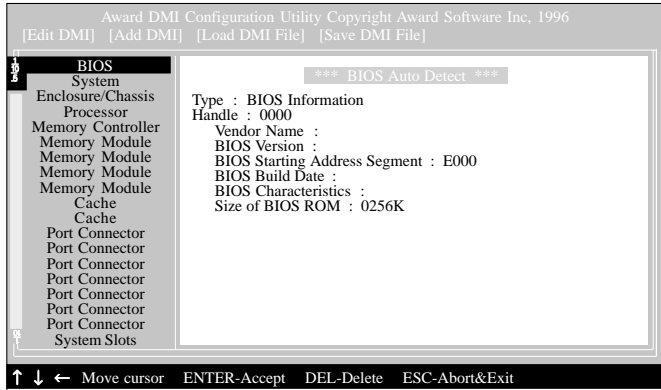
4.1.1 Running the DMI Utility

To run the DMI utility, type: DMICFG.EXE. Please contact technical support or your sales representative for the utility.

The DMI utility must run in real mode with at least 180K of base memory. Memory managers like HIMEM.SYS (required by Windows) must not be installed. You may do this by using one of the 3 methods listed below.

1. Boot up from a system diskette without the AUTOEXEC.BAT and CONFIG.SYS files,

2. "REM" HIMEM.SYS in the CONFIG.SYS, or

3. Press <F5> during bootup to bypass your AUTOEXEC.BAT and CONFIG.SYS files.

4.1.2 Using the DMI Utility

```
         Award DMI Configuration Utility Copyright Award Software Inc, 1996
         [Edit DMI]   [Add DMI]   [Load DMI File]   [Save DMI File]

              BIOS                        *** BIOS Auto Detect ***
             System
         Enclosure/Chassis     Type  :  BIOS Information
            Processor          Handle  :  0000
         Memory Controller        Vendor Name  :
          Memory  Module          BIOS Version  :
          Memory  Module          BIOS Starting Address Segment  :  E000
          Memory  Module          BIOS Build Date  :
          Memory  Module          BIOS Characteristics  :
              Cache              Size of BIOS ROM  :  0256K
              Cache
          Port Connector
          Port Connector
          Port Connector
          Port Connector
          Port Connector
          Port Connector
          Port Connector
          System Slots

         ↑ ↓ ←  Move cursor    ENTER-Accept    DEL-Delete    ESC-Abort&Exit
```

The four menus located on top of the DMI Configuration Utility screen
are Edit DMI, Add DMI, Load DMI File and Save DMI File. Use the
← or → (left or right) arrow keys to select a menu from the Menu
bar.

On the left side of the screen is a list of the system configuration items.
Use the ↑ or ↓ (up or down) arrow keys to select an item.

The commands at the bottom of the screen will allow you to navigate
through the various setup menus.

Edit DMI

1. Use the ← or → arrow keys to select the Edit DMI menu.

2. Highlight the item on the left screen that you would like to edit
    by using the ↑ or ↓ arrow keys, then press <Enter>.

3. The cursor will move to the screen you select allowing you to edit
    information. The screen will also display the auto-detected
    information.

4. Press <F10> to update the edited information into the flash ROM.

Add DMI

1. Use the ← or → arrow keys to select the Add DMI menu.

2. Highlight the item on the left screen that you would like to add by using the ↑ or ↓ arrow keys, then press <Enter>.

3. The cursor will move to the screen you select allowing you to enter information about the added item.

4. Press <F10> to save information into the flash ROM.

To view information about the added items, go to the Edit DMI menu.

Load DMI File

1. Use the ← or → arrow keys to select the Load DMI File menu.

2. The following message will appear.

   Press [Enter] to select DMI file for load

   Press <Enter>.

3. The DMI files will appear on the screen. Select the file you would like to load and press <Enter>.

4. The following message will appear.

   Do you want to execute? (Y/N)

   Type <Y>. All previous DMI structures will be destroyed and the new file will be saved into the flash ROM.

Save DMI File

1. Use the ← or → arrow keys to select the Save DMI File menu.

2. The following message will appear.

   *Press [Enter] to select DMI file for save*

   Press <Enter>.

3. Enter the directory and filename under which you would like the DMI file saved.

4.2 Drivers, Utilities and Software Applications

The CD that came with the system board contains drivers, utilities and software applications required to enhance the performance of the system board.

Insert the CD into a CD-ROM drive. The autorun screen (Main Board Utility CD) will appear. If after inserting the CD, "Autorun" did not automatically start (which is, the Mainboard Utility CD screen did not appear), please go directly to the root directory of the CD and double-click "Setup".
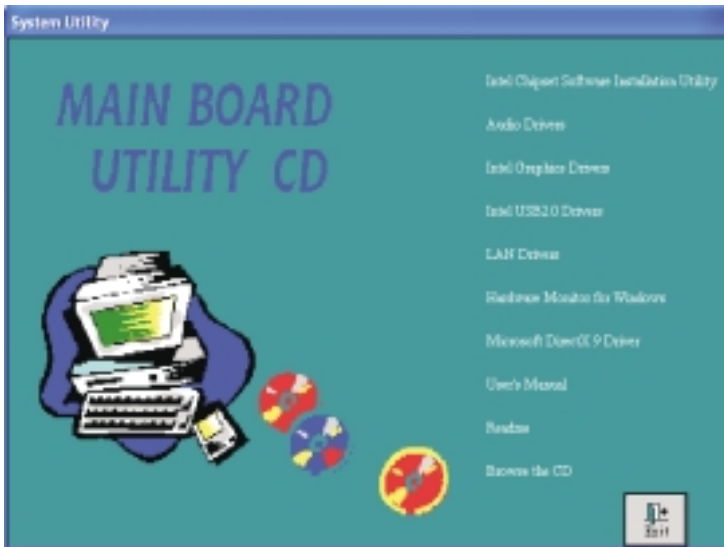
4.2.1 Intel Chipset Software Installation Utility

The Intel Chipset Software Installation Utility is used for updating Windows® 98SE/2000/ME/XP's INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, please follow the steps below.

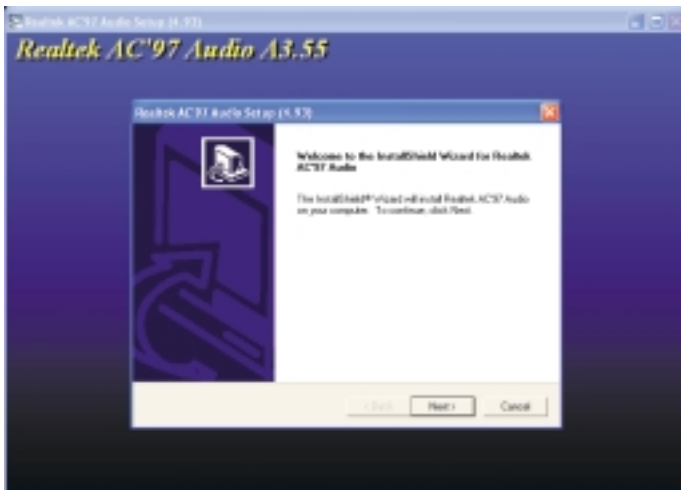1. Click "Intel Chipset Software Installation Utility" on the main menu. The following screen will appear.
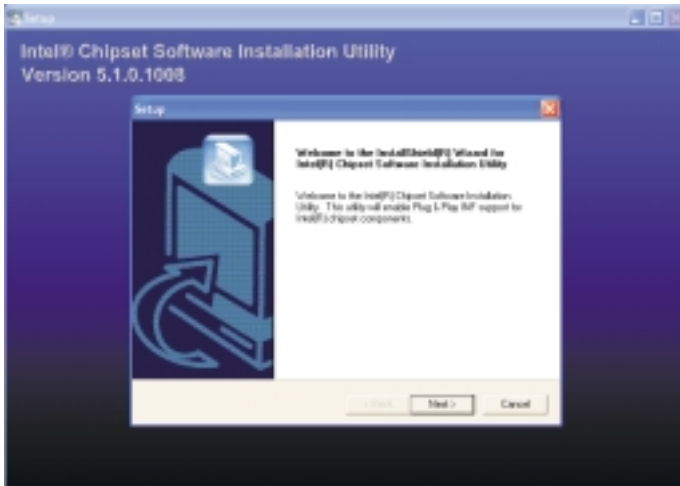
2. Follow the prompts on the screen to complete installation.

3. Reboot the system for the utility to take effect.

4.2.2 Audio Drivers

The Realtek audio drivers are supported in the following operating systems: Windows® 98SE, Windows® ME, Windows NT® 4.0, Windows® 2000 and Windows® XP.

To install the driver, please follow the steps below.

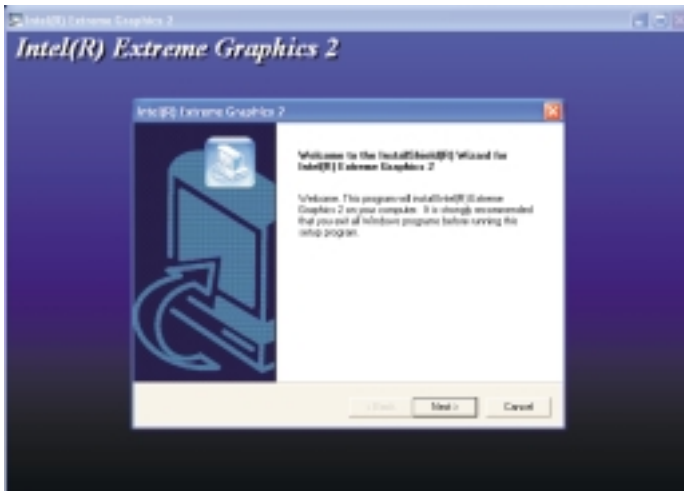1. Click "Audio Drivers" on the main menu. The following screen will appear.

2. Follow the prompts on the screen to complete installation.

3. Reboot the system for the driver to take effect.

4.2.3 Intel Graphics Drivers

To install the driver, please follow the steps below.

1. Click "Intel Graphics Drivers" on the main menu. The following screen will appear.


2. Follow the prompts on the screen to complete installation.

3. Reboot the system for the driver to take effect.

4.2.4 Intel USB 2.0 Drivers

If you are using a USB 2.0 device, you must install the USB 2.0 driver. The drivers are supported in the following operating systems: Windows® 98 SE, Windows® ME and Windows® 2000.

To install the driver, please follow the steps below.

1. Click "Intel USB 2.0 Drivers" on the main menu. If you are using Windows® 98 SE or Windows® ME, the following screen will appear.
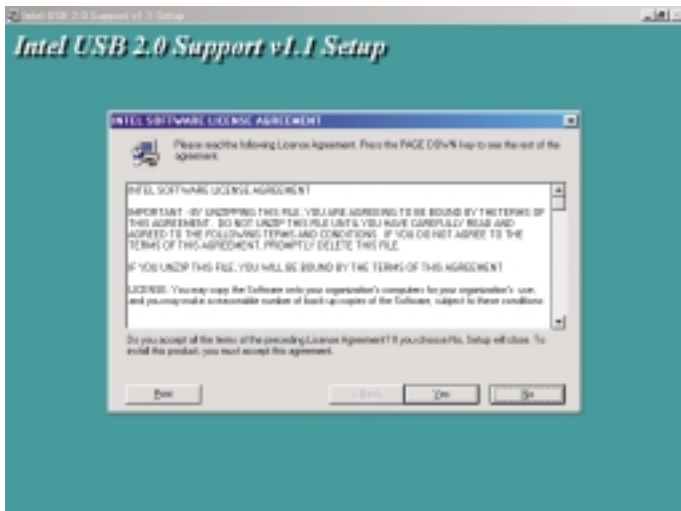
Windows® 2000 does not support auto-installation of the USB 2.0 driver. When you click "Intel USB 2.0 Drivers", a "readme" screen will appear.

2. Follow the installation instructions shown on the screen.

3. Reboot the system for the driver to take effect.

Important:
If you are using Windows® XP, you must install the Windows Service Pack 1 USB 2.0 driver which comes available after you have installed the operating system.

4.2.5 LAN Drivers

To install the driver, please follow the steps below.

1. Click "LAN Drivers" on the main menu.

2. Click "Wired LAN Adapters". The following screen will appear.

3. Click "Install Software". This will install the LAN application software. After installing the software, run the application software by double-clicking the icon on the lower right of the taskbar. The "Intel(R) PROSet II" screen will appear. For more information about using the utility, click "View User Guide" on the screen above.

4. Go back to the screen above to install the LAN driver. Click "Install Base Driver".

5. Follow the prompts on the screen to complete installation.

6. Reboot the system for the driver to take effect.

4.2.6 Hardware Monitor for Windows

Hardware Monitor for Windows is capable of monitoring the system's hardware conditions such as the temperature of the CPU and system, voltage, and speed of the cooling fans. It also allows you to manually set a range to the items being monitored. If the values are over or under the set range, a warning message will pop-up. The utility can also be configured so that a beeping alarm will sound whenever an error occurs. We recommend that you use the "Default Setting" which is the ideal setting that would keep the system in good working condition.

> **Note:**
> *Use this utility only in Windows® 98SE, Windows® ME, Windows® 2000, Windows NT® 4.0 or Windows® XP operating system.*

To install the utility, please follow the steps below.

1. Click "Hardware Monitor for Windows" on the main menu. The screen below will appear.
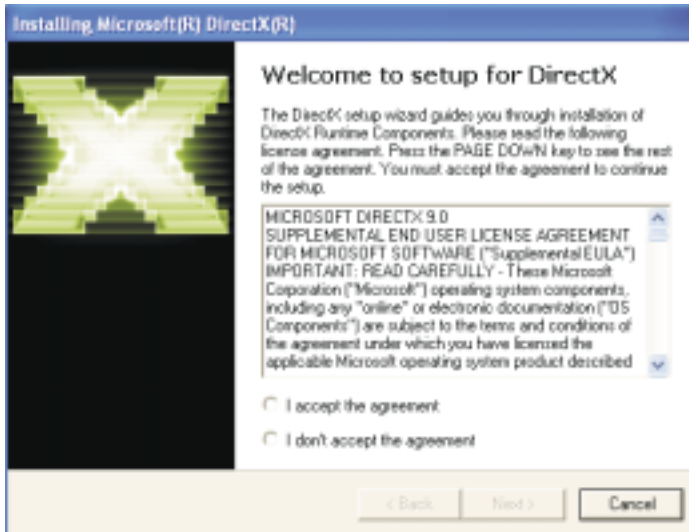

2. Follow the prompts on the screen to complete installation.

3. Restart the system.

4.2.7 Microsoft DirectX 9 Driver

To install, please follow the steps below.

1. Click "Microsoft DirectX 9 Driver" on the main menu. The following screen will appear.

2. Click "I accept the agreement" then click "Next".

3. Follow the prompts on the screen to complete installation.

4. Reboot the system for the driver to take effect.

4.3 Installation Notes

1. "Autorun" ONLY supports the Windows® 98 SE, Windows® ME, Windows® 2000, Windows NT® 4.0 and Windows® XP operating systems. If after inserting the CD, "Autorun" did not automatically start (which is, the Main Board Utility CD screen did not appear), please go directly to the root directory of the CD and double-click "Setup".

2. All steps or procedures to install software drivers are subject to change without notice as the softwares are occassionally updated. Please contact technical support or your sales representative for the latest version of the drivers or software applications.

Appendix A - Watchdog Timer

A.1 Watchdog Timer

The following parameters are references for setting the time interval of the Watchdog Timer function. The system will regularly be "cleared" according to the set time interval. If the system hangs or fails to function, it will also reset according to the time interval so that your system will continue to operate.

mov dx,02e <Enter>
mov al,87 <Enter>
out dx,al <Enter>
out dx,al <Enter>
mov dx,02e <Enter>
mov al,07 <Enter>
out dx,al <Enter>
inc dx <Enter>
inc al <Enter>
out dx,al <Enter>
dec dx <Enter>
mov al,f6 <Enter>
out dx,al <Enter>
inc dx <Enter>
mov al,xy <Enter>
out dx,al <Enter>

"XY" is the Watchdog Time count value for the "00h to "FFh" range wherein the time can be set from 0 sec. to 255 sec.

Appendix B - Using the Suspend to RAM Function

B.1   Using the Suspend to RAM Function

If you are using the Windows® 98 operating system, please follow the steps below.

1.   Select "Power Management Setup" in the main menu screen and press <Enter>.

2.   In the "ACPI Function" field, select "Enabled".

3.   In the "ACPI Suspend Type" field, select "S3(STR)".

The settings on the screen are for reference only. Your version may not be identical to this one.

4.   Press <Esc> to return to the main menu.

5.   Select "Save & Exit Setup" and press <Enter>. Type <Y> and press <Enter>.

6.   Install Windows® 98 by typing the following parameter. This is to ensure that the ACPI function is supported.

[drive]:>setup /p j

If you have previously installed Windows® 98, you need to upgrade the system in order to support ACPI. Please contact Microsoft for upgrade information.

7. Boot Windows® 98. In the Windows® 98 desktop, click the Start button. Move the cursor to Settings, then click Control Panel.

   To check whether ACPI was properly installed, double-click the System icon. In the System Properties dialog box, click the "Device Manager" tab. In "View devices by type", click "System devices".
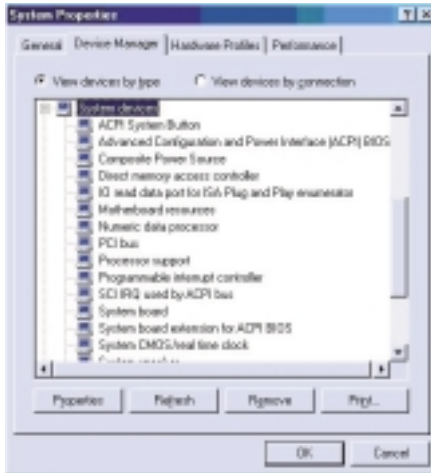

8. Double-click the System icon. In the System Properties dialog box, click the Performance tab.

9. Click File System. In the "Typical role of this computer" field, select "Mobile or docking system". Click Apply, then click OK. Restart the computer.
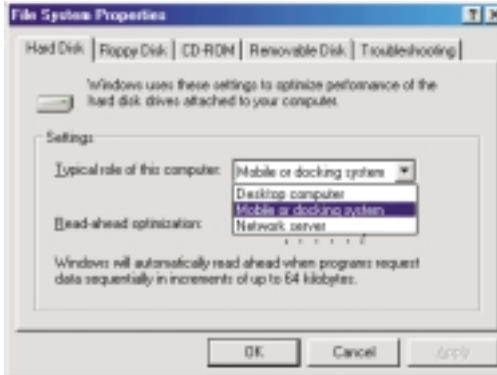

10. Repeat step 7 to open the Control Panel dialog box. Double-click the Power Management icon.

11. Click the Advanced tab. In the "When I press the power button on my computer" field, select "Standby".
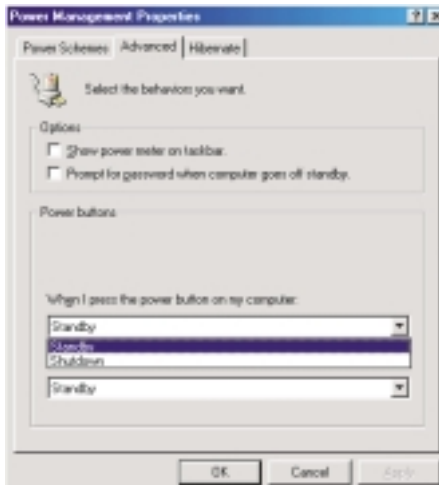
12. After completing the steps above and you want to power-off the computer, you do not need to go through the process of closing files, applications and operating system. You can power-off the computer at once by pressing the power button or selecting "Standby" when you shut down Windows® 98.

To power-on the computer, just press the power button. The operating session where you left off when you power-off the computer will resume in not more than 8 seconds.

If you have changed the color or resolution (in the Display Properties dialog box), do not apply the settings without restarting. You must restart the computer.
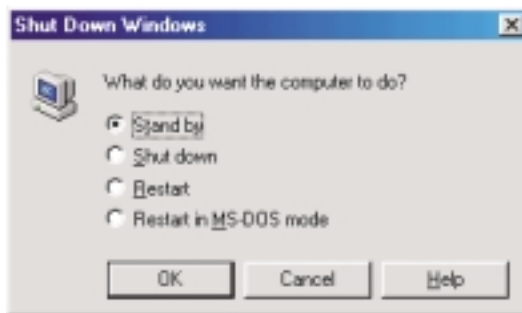
Important:
If you are unable to use the Suspend to RAM function (after performing the steps above in Windows® 98 or when you are in Windows® 2000/ME/XP), please check whether your add-in cards or devices support this function. If this function is not supported, you need to download the appropriate driver from their respective website.

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Appendix C - System Error Message

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message, PRESS F1 TO CONTINUE, CTRL-ALT-ESC or DEL TO ENTER SETUP, will be shown in the information box at the bottom. Enter Setup to correct the error.

C.1 POST Beep

There are two kinds of beep codes in the BIOS. One code indicates that a video error has occured and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by three short beeps. The other code indicates that a DRAM error has occured. This beep code consists of a single long beep.

C.2 Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list indicates the error messages for all Awards BIOSes:

CMOS BATTERY HAS FAILED
The CMOS battery is no longer functional. It should be replaced.

> Caution:
> *Danger of explosion if battery incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the battery manufacturer's instructions.*

CMOS CHECKSUM ERROR
Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISPLAY SWITCH IS SET INCORRECTLY
The display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different

setting than indicated in Setup. Determine which setting is correct, either turn off the system and change the jumper or enter Setup and change the VIDEO selection.

FLOPPY DISK(S) fail (80)
Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40)
Floppy type mismatch.

Hard Disk(s) fail (80)
HDD reset failed.

Hard Disk(s) fail (40)
HDD controller diagnostics failed.

Hard Disk(s) fail (20)
HDD initialization error.

Hard Disk(s) fail (10)
Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)
Sector Verify failed.

Keyboard is locked out - Unlock the key
The BIOS detects that the keyboard is locked. Keyboard controller is pulled low.

Keyboard error or no keyboard present
Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are being pressed during the boot.

Manufacturing POST loop
System will repeat POST procedure infinitely while the keyboard controller is pull low. This is also used for the M/B burn in test at the factory.

BIOS ROM checksum error - System halted
The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail
The BIOS reports memory test fail if the memory has error(s).

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Appendix D - Troubleshooting

D.1 Troubleshooting Checklist

This chapter of the manual is designed to help you with problems that you may encounter with your personal computer. To efficiently troubleshoot your system, treat each problem individually. This is to ensure an accurate diagnosis of the problem in case a problem has multiple causes.

Some of the most common things to check when you encounter problems while using your system are listed below.

1. The power switch of each peripheral device is turned on.
2. All cables and power cords are tightly connected.
3. The electrical outlet to which your peripheral devices are connected is working. Test the outlet by plugging in a lamp or other electrical device.
4. The monitor is turned on.
5. The display's brightness and contrast controls are adjusted properly.
6. All add-in boards in the expansion slots are seated securely.
7. Any add-in board you have installed is designed for your system and is set up correctly.

Monitor/Display

If the display screen remains dark after the system is turned on:

1. Make sure that the monitor's power switch is on.
2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.
3. Check that the video input cable is properly attached to the monitor and the system's display adapter.
4. Adjust the brightness of the display by turning the monitor's brightness control knob.

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The picture seems to be constantly moving.

1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.
2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.
3. Make sure your video card's output frequencies are supported by this monitor.

The screen seems to be constantly wavering.

1. If the monitor is close to another monitor, the adjacent monitor may need to be turned off. Fluorescent lights adjacent to the monitor may also cause screen wavering.

Power Supply

When the computer is turned on, nothing happens.

1. Check that one end of the AC power cord is plugged into a live outlet and the other end properly plugged into the back of the system.
2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.
3. The power cord may have a "short" or "open". Inspect the cord and install a new one if necessary.

Floppy Drive

The computer cannot access the floppy drive.

1. The floppy diskette may not be formatted. Format the diskette and try again.
2. The diskette may be write-protected. Use a diskette that is not write-protected.
3. You may be writing to the wrong drive. Check the path statement to make sure you are writing to the targeted drive.
4. There is not enough space left on the diskette. Use another diskette with adequate storage space.

Hard Drive

Hard disk failure.

1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.
2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave. The master hard drive must have an active/bootable partition.

Excessively long formatting period.

1. If your hard drive takes an excessively long period of time to format, it is likely a cable connection problem. However, if your hard drive has a large capacity, it will take a longer time to format.

Parallel Port

The parallel printer doesn't respond when you try to print.

1. Make sure that your printer is turned on and that the printer is on-line.
2. Make sure your software is configured for the right type of printer attached.
3. Verify that the onboard LPT port's I/O address and IRQ settings are configured correctly.
4. Verify that the attached device works by attaching it to a parallel port that is working and configured correctly. If it works, the printer can be assumed to be in good condition. If the printer remains inoperative, replace the printer cable and try again.

Serial Port

The serial device (modem, printer) doesn't output anything or is outputting garbled characters.

1. Make sure that the serial device's power is turned on and that the device is on-line.
2. Verify that the device is plugged into the correct serial port on the rear of the computer.
3. Verify that the attached serial device works by attaching it to a serial port that is working and configured correctly. If the serial device does not work, either the cable or the serial device has a problem. If the serial device works, the problem may be due to the onboard I/O or the address setting.
4. Make sure the COM settings and I/O address are configured correctly.

Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the keyboard is properly connected.
2. Make sure there are no objects resting on the keyboard and that no keys are pressed during the booting process.

System Board

1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.
2. Check the jumper settings to ensure that the jumpers are properly set.
3. Verify that all memory modules are seated securely into the memory sockets.
4. Make sure the memory modules are in the correct locations.
5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.
6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.

Revision History

REV	Description	Date	Author
1.0	Initial	2/7/07	DH
2.0	Complete overhaul; Updated to reflect current specifications	2/28/13	RP