MTSAM64GZ
Product Specification

MICRON®
TECHNOLOGY, INC.
PLATFORM ARCHITECTURES GROUP

This paper is a product specification for the MTSAM64GZ.

Table of Contents

1. SYSTEM BOARD DESCRIPTION

1.1 FEATURES

PROCESSOR SUPPORT

- Dual Slot 1 design accepts Intel® Pentium® II or Pentium III processors
- 66 MHz/100 MHz FSB
- 350 MHz to 550 MHz and future speed grades with 100 MHz FSB

CORE LOGIC CHIPSET

- Dual Micron Technology MT82P664 (Samurai 64M2) North Bridges
- Intel PIIX4e South Bridge
- 64-bit PCI at 33 MHz and 66 MHz
- Supports enhanced power management, including legacy power management and advanced configuration and power interface (ACPI)

EXPANSION SLOTS

- Two 64-bit, 66 MHz PCI slots (when a 33 MHz PCI card is in either slot, both slots will run at 33 MHz)
- Three 64-bit, 33 MHz PCI slots
- One ISA/64-bit, 33 MHz PCI shared slot

MAIN MEMORY

- Eight 168-pin DIMM sockets supporting 3.3V unbuffered PC100 SDRAM
- 64Mb and 128Mb memory technology support
- Maximum memory: 2GB using 256MB DIMMs

ETHERNET CONTROLLER

- Intel 82558 Fast Ethernet Controller
- Integrated IEEE 802.3, 10Base-T and 100Base-TX compatible PHY
- RJ45 connector
- Full or half duplex capable at 10 Mb/s and 100 Mb/s
- IEEE 802.3x, 100Base-TX flow control support

BOARD SIZE

- Extended ATX form factor (12" x 13" with cut-out "notch")
- No components on the back side

BIOS

- 2MB and 4MB flash BIOS support
- Phoenix BIOS, version 4.0, release 6.0

SCSI CONTROLLER

- Adaptec AIC-7891 SCSI controller
- 64-bit, 33 MHz PCI interface
- One 68-pin-wide Ultra2 SCSI connector
  - ♦ Max 80 MB/s data transfer rate
- One 50-pin-narrow SCSI connector
  - ♦ Max 20 MB/s data transfer rate

ON-BOARD I/O

- National Semiconductor PC87309 Super I/O
- One floppy connector (up to 2.88MB, 3-mode floppy support)
- Two serial ports
  - ♦ High-speed 16550A compatible
- Infrared port
  - ♦ IrDA 1.0 compliant
  - ♦ Access via front panel header
- One parallel port
  - ♦ Standard mode bidirectional parallel port
  - ♦ Enhanced parallel port (EPP)
  - ♦ Enhanced capabilities port (ECP)

SYSTEM MANAGEMENT

- Analog Devices ADM9240A
- Fan speed control/fan speed monitor
- Thermal monitor
- Voltage monitor
- Chassis intrusion

REGULATORY / ENVIRONMENTAL

- Federal Communications Commission (FCC) Methods
  - ♦ Class B (Declaration of Conformity)
- European Community (CE) Methods
  - ♦ Class B (Declaration of Conformity)
- Safety
  - ♦ Underwriters Laboratories (UL) 1950
- Environmental
  - ♦ Operating temperature: 0°C to 50°C
  - ♦ Humidity: 20% to 80%, operating, noncondensing

1.2 SYSTEM BOARD COMPONENT OVERVIEW

1.2.1 COMPONENT PLACEMENT

The MTSAM64GZ system board is a custom extended ATX footprint. Figure 1 shows the placement of all major connectors and components.

1) ISA slot
2) 33 MHz, 64-bit PCI slots
3) 66 MHz, 64-bit PCI slots
4) Intel 82371EB PCI ISA IDE Xcelerator (PIIX4e)
5) Adaptec AIC-7891 SCSI controller
6) Front panel I/O connector
7) Floppy disk connector
8) Primary IDE connector
9) Secondary IDE connector
10) Narrow SCSI connector
11) Wide SCSI connector
12) ATX power supply connector
13) DIMM connectors
14) Dual Slot 1 slots
15) Dual Micron SAM64M2 chipset
16) Intel 82558 10Mb/100Mb LAN controller

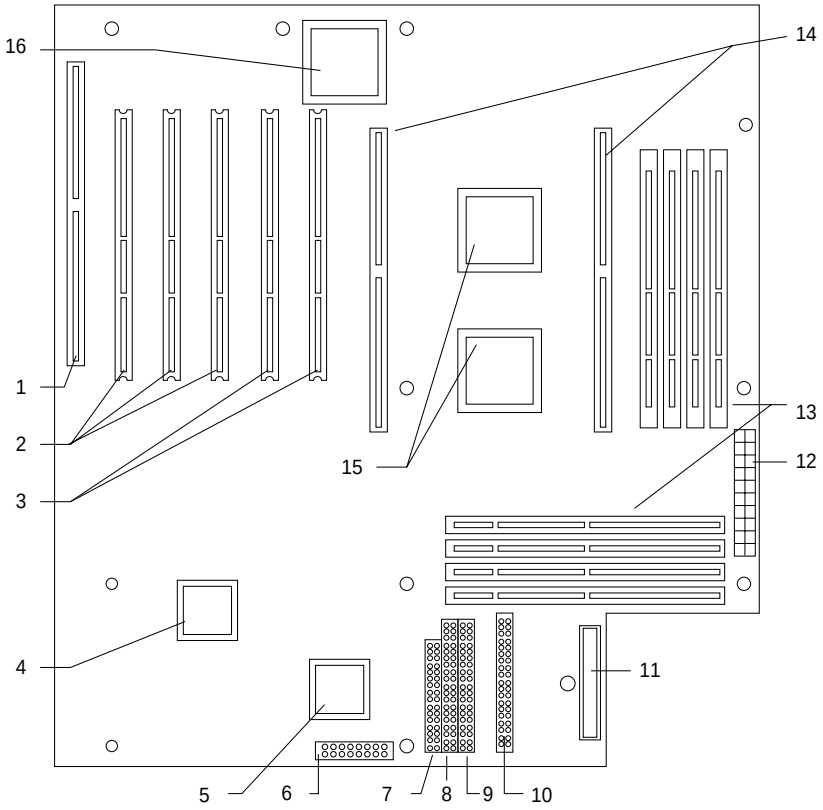

Figure 1
MTSAM64GZ Connectors and Components

1.3 MICROPROCESSOR SUPPORT

The MTSAM64GZ system board is a dual-processor design and will operate with one or two processors. When the system is run in dual-processor mode, the processors must be the same speed; processors of different speeds will not function correctly in dual-processor mode. When the system is run in single-processor mode, the second slot requires termination with a processor termination card.

The MTSAM64GZ system board is designed to support both the SECC and SESS processor cartridges and will support the following microprocessors:

- Intel Pentium II and Pentium III, 350 MHz to 550 MHz, plus future upgrades with 100 MHz front side bus.
- Intel Pentium II, 266 MHz to 333 MHz, plus future upgrades with 66 MHz front side bus.

1.4 MAIN MEMORY SUPPORT

The MTSAM64GZ system board has eight DIMM sockets divided into two physical groupings of four DIMM connectors each. When populating memory in the DIMM connectors, no particular order is required; however, for optimum performance, memory should be populated evenly between the two banks. The MTSAM64GZ supports EDO and SDRAM DIMM modules in 72-bit ECC and 64-bit non-ECC configurations. EDO memory is only supported with the system bus running at 66 MHz. When the system bus is running at 100 MHz, PC100 SDRAM is required for the system to function correctly. The MTSAM64GZ supports 32MB, 64MB, 128MB and 256MB DIMMs. Using eight 256MB modules, the system board will support a total of 2GB.

Interleaved Memory DIMM Association

Placing the same size memory DIMM in the associated slots will increase the memory bandwidth and performance of the system because when one memory bank DIMM slot is performing a precharge cycle, the system will access the memory in the other associated memory DIMM slot. This is all handled by the chipset.

Bank0 - Bank4
Bank1 - Bank5
Bank2 - Bank6
Bank3 - Bank7

1.5 CHIPSET

The MTSAM64GZ system board incorporates dual Micron Technology Samurai 64M2, P6-compatible north bridges. The Samurai 64M2 chipset provides an interface between the Pentium Pro processor bus, system memory, and multiple PCI buses. The Samurai 64M2 PCI interface operates at 33 MHz/66 MHz and 32/64-bit operation. The Samurai maintains a four-line-deep write buffer to memory and a four-line-deep read buffer from memory to post four WRITEs or defer three READs during Pentium Pro-to-PCI transfers. An eight-line-deep buffer is used to post eight WRITEs or prefetch eight READs for PCI-to-memory operations. The south bridge functions are handled by the Intel PIIX4e.

MICRON TECHNOLOGY SAMURAI 64M2

- Pentium II processor bus frequencies supported up to 100 MHz
- Integrated DRAM controller
  - ♦ EDO and SDRAM support
  - ♦ 64/72-bit data path to memory
  - ♦ Automatic detection of memory type
  - ♦ 16Mb, 64Mb and 128Mb DRAM technology support
  - ♦ 3.3V DRAM support
- PCI bus interface
  - ♦ PCI revision 2.1 interface compliant
  - ♦ 32- and 64-bit PCI data bus interface
  - ♦ 33 MHz and 66 MHz PCI bus clock rate support
  - ♦ Data buffering for increased performance

82371AB PCI-TO-ISA / IDE XCELERATOR (PIIX4e)

- Multifunction PCI-to-ISA bridge
- Integrated IDE controller
- Enhanced DMA controller
- Interrupt controller based on two 82C59
- USB
  - ♦ Two USB version 1.0 ports for serial transfers at 12Mb/s or 1.5 Mb/s
- SMBus
- Real-time clock

1.6 I/O CONTROLLER

The National Semiconductor PC87309 Super I/O controller provides floppy disk controller, serial ports, parallel port and keyboard/mouse controller functions. This I/O solution is fully Plug and Play (PnP) version 1.0a compliant and PC97 compliant. The PC87309 supports the following features:

- 100% compatibility with PnP requirements specified in the "Plug and Play ISA Specification," PC97 and ISA
- Floppy disk controller (FDC)
  - ♦ Support for standard 5.25" and 3.5" floppy disk drives
  - ♦ Three-mode floppy disk drive (FDD) support
- Keyboard and mouse controller (KBC)
- Two UARTs
  - ♦ Software compatibility with the 16550A and the 16450
  - ♦ Seven IRQ channel options
  - ♦ UART data rates up to 1.5 Mb/s
  - ♦ Enhanced UART and infrared (IR) interface on the UART2 that supports HP SIR ASK IR option or Sharp IRD ASK IR option of Sharp IR consumer remote control circuitry
- Bidirectional parallel port
  - ♦ Seven IRQ channel options
  - ♦ Three 8-bit DMA channel options
  - ♦ Demand mode DMA support
  - ♦ Enhanced parallel port (EPP) that is EPP 1.9 compatible and IEEE 1284 compliant
  - ♦ Enhanced parallel port (EPP) that also supports version EPP 1.7 of the Xircom specification
  - ♦ Extended capabilities port (ECP)

1.7 SCSI CONTROLLER

The MTSAM64GZ system board provides an on-board SCSI controller. The SCSI subsystem is comprised of two Adaptec parts, the AIC-7891 and the AIC-3860. The AIC-7891 is a 64-bit, 33 MHz PCI device that supports Ultra2 low voltage differential (LVD) SCSI devices. The AIC-3860 allows legacy Ultra SCSI devices to connect to the SCSI bus without hindering the data rate of the Ultra2 SCSI devices on the "wide" 68-pin connector. Figure 2 shows how the SCSI buses are connected. The AIC-3860 resides between the AIC-7891 and the "narrow" 50-pin SCSI connector on the system board.

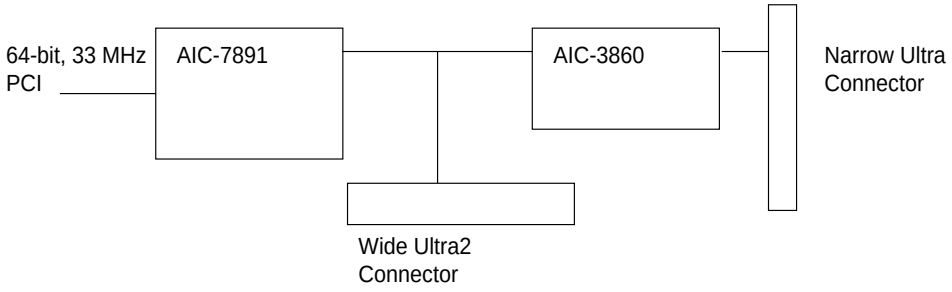

Figure 2
SCSI Bus Connectors

In order to maintain backward compatibility with earlier SCSI devices, the Ultra2 bus will support fast wide and ultra-wide devices. However, if any fast wide or ultra-wide devices are attached to the wide connector, the whole SCSI bus will run at the slower speed. For the wide connector to function in Ultra2 LVD mode, all devices must be Ultra2 and the cable must have Ultra2 termination.

ADAPTEC AIC-7891 FEATURES

- PCI interface
  - ♦ 64 bit
- Up to 80 MB/s on the Ultra2 SCSI bus
  - ♦ Up to 40 MB/s data transfer rate in 8-bit mode
  - ♦ Up to 80 MB/s data transfer rate in 16-bit mode
- 20-MIPS PhaseEngine RISC processor for SCSI command processing
- 512-byte data FIFO buffer for efficient PCI bus utilization
- Cache line streaming for improved PCI bus utilization
- Dual-address cycle for greater system memory addressability
- Target mode to support clustering, bridge and RAID applications
- Tagged command queuing to change the order of SCSI command execution and improve performance

1.8 ETHERNET CONTROLLER

The MTSAM64GZ system board integrates an Intel 82558 Fast Ethernet PCI Bus LAN Controller. The 82558 is a fully integrated 10Base-T/100Base-TX LAN solution with the media access controller (MAC) and the 10 Mb/s and 100 Mb/s physical layer interface on a single chip. An RJ45 connector is located in the ATX back panel.

INTEL 82558 FAST ETHERNET LAN CONTROLLER

- Dual-mode 10Base-T/100Base-TX PHY delivers proven performance of Intel's 82555 PHY technology
- Media access controller with internal transmit and receive FIFOs provides the reliable capabilities of Intel's 82557
- Integrated system and power management features
- Digitally controlled adaptive equalization and transmission
- 802.3x-compliant flow control
- Back-to-back transmit at 100 Mb/s with minimum interframe spacing
- 82557 style chained memory structure streamlined for performance enhancement and ease of migration from existing 82557 designs
- Improved transmit/receive routines and PCI bus utilization for maximized throughput and minimized CPU utilization
- Glueless 32-bit PCI bus master interface
- IEEE 802.3u auto-negotiation support for 10Base-T and 100Base-TX
- Full or half duplex capable at 10 Mb/s or 100 Mb/s

1.9 MECHANICAL DIMENSIONS

Figure 3 shows a dimensional drawing of the ATX back panel. Dimensions (units in inches) are provided to allow OEMs to specify an ATX I/O gasket shield for their chassis. The system board is designed to fit in most ATX full-size chassis. Figure 4 specifies the exact location of all chassis mounting holes and peripheral card connectors.

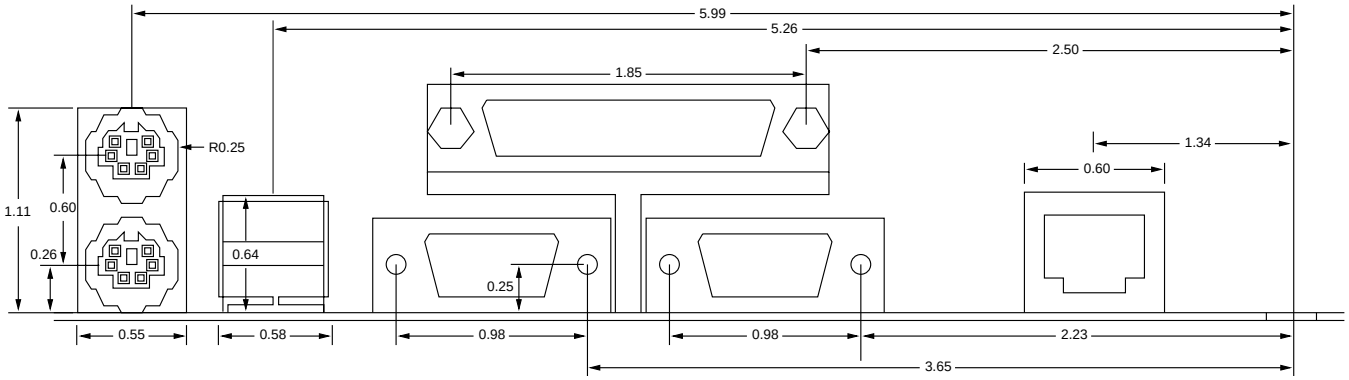

Figure 3
ATX Back Panel

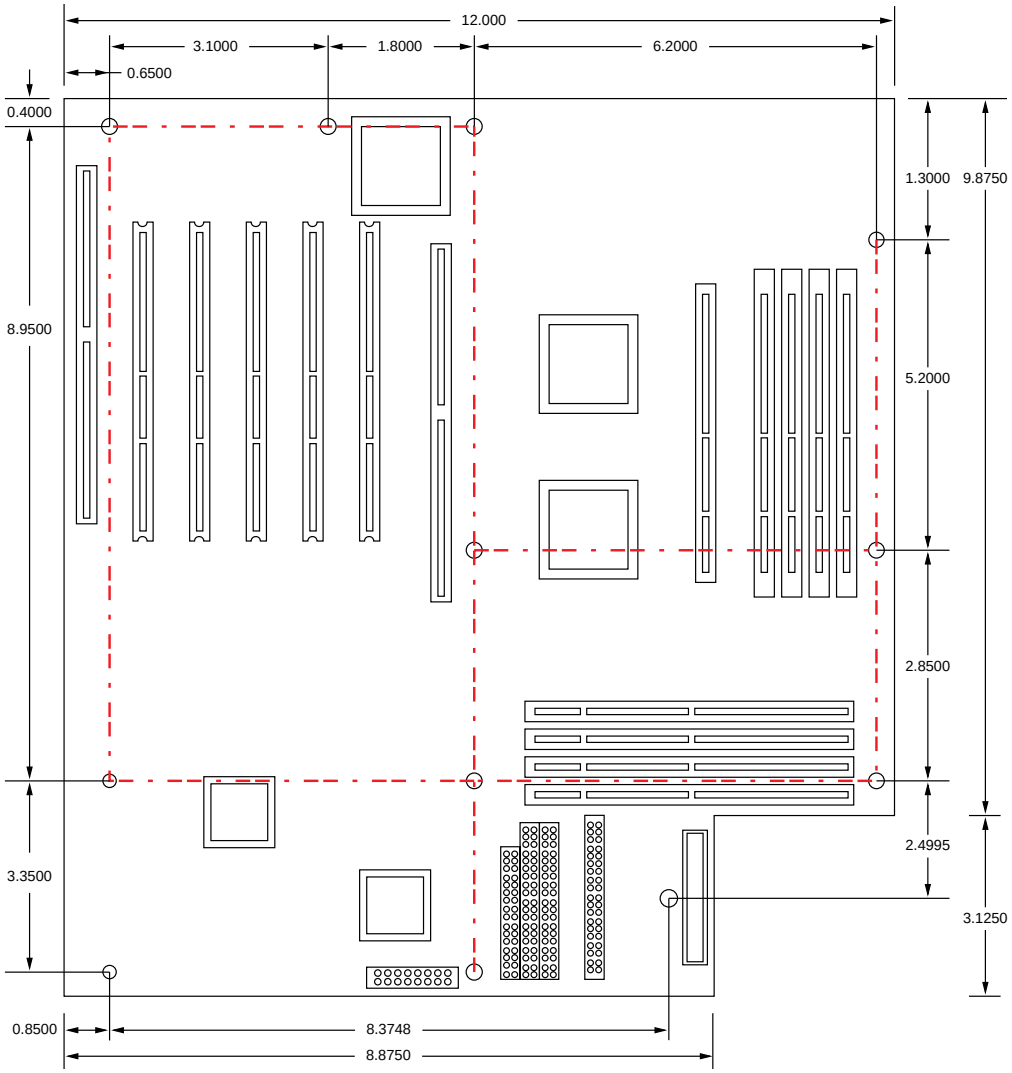

Figure 4
Chassis Mounting Holes and Peripheral Card Connectors

1.10 JUMPER SETTINGS

Figure 5 shows the approximate position of each jumper on the system board.

1) Processor core speed jumper block (J13)

1.10.1 PROCESSOR CORE SPEED JUMPER BLOCK (J13)

This jumper is used to set the internal multiplier for the processor. Table 1 shows how the jumpers must be set for each different processor speed. Most current and planned Intel processors have the internal clock multiplier locked. On these processors, the motherboard jumpers will have no effect.

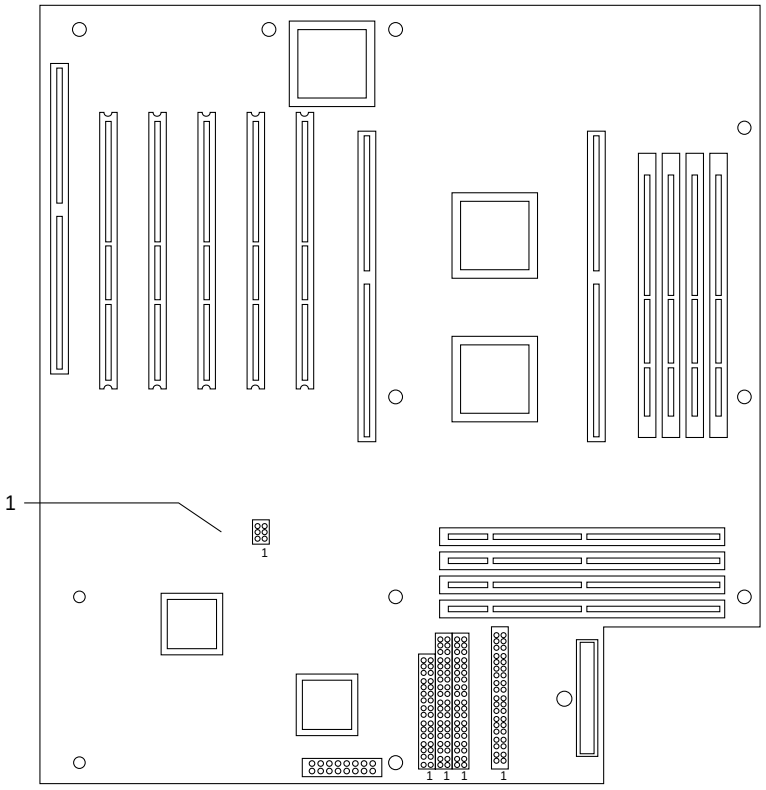

Figure 5
Jumpers

Table 1
Jumper Settings at Different Processor Speeds

Frequency	1-2	3-4	5-6
233 MHz/ 350 MHz	Open	Open	Jumper
266 MHz/ 400 MHz	Jumper	Jumper	Open
300 MHz/ 450 MHz	Open	Jumper	Open
333 MHz/ 500 MHz	Jumper	Open	Open

1.11 HEADER AND CONNECTOR LOCATIONS

The MTSAM64GZ system board follows the ATX design guideline version 2.0.3. The placement of all components and connectors will allow mounting the board in most full-size ATX cases. Figure 6 shows the placement of all connectors.

1) Wake-on-LAN header (J1)
2) ISA connector (slot 1)
3) 33 MHz, 64-bit PCI connectors (slots 2, 3 and 4)
4) 66 MHz, 64-bit PCI connectors (slots 5 and 6)
5) Battery
6) Chassis intrusion (J11)
7) SCSI hard drive LED (J19)
8) Floppy connector (J14)
9) Secondary IDE connector (J15)
10) Primary IDE connector (J16)
11) Narrow SCSI connector (J17)
12) Wide SCSI connector (J18)
13) ATX power supply connector
14) DIMM connectors
15) Primary processor slot 1
16) Chassis fan header (J6)
17) Fan header (J8)
18) Fan header (J7)
19) Secondary processor slot 1

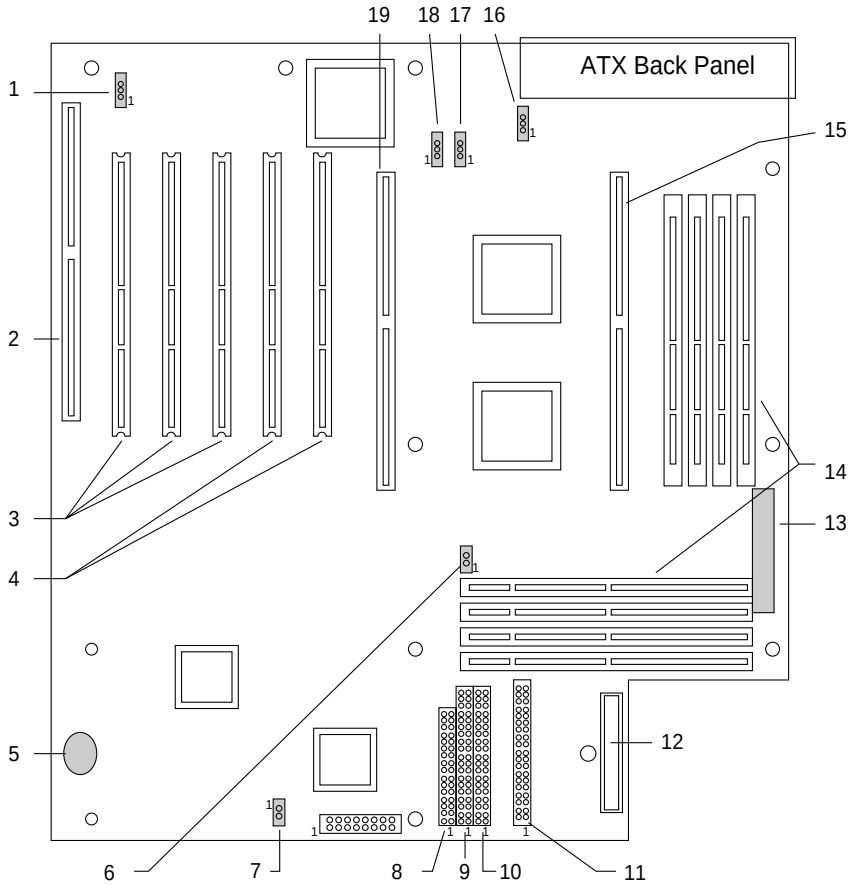

Figure 6
Connector Placement

1.12 ATX BACK PANEL PLACEMENT

The ATX back panel provides an area in the back of the chassis for bringing connectors off the system board. Figure 7 shows the function of each connector.

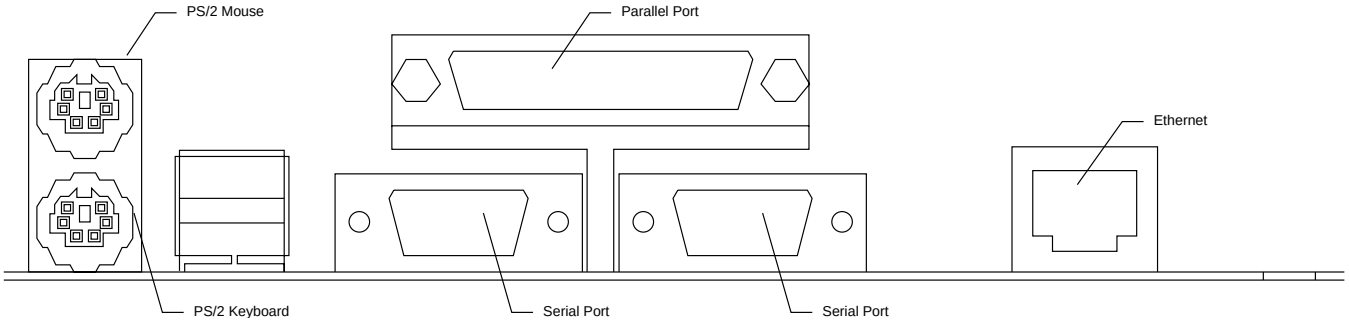

Figure 7
ATX Back Panel

1.12.1 FRONT PANEL CONNECTOR (P194)

The front panel header provides access to all of the user interface buttons and LEDs. Table 2 defines the pins on the front panel connector. Figure 8 shows the orientation of the front panel connector on the motherboard.

Table 2
Front Panel Pin Descriptions

Pin	Definition	Pin	Definition
1	Hard Drive LED Pull-Up to +5V	2	Front Panel Power LED (Green)
3	Hard Drive Active LED Signal	4	Front Panel Power LED (Yellow)
5	Ground	6	Front Panel Power Button
7	Front Panel Reset Button	8	Ground
9	+5V	10	NC
11	IrDA Serial Receive	12	Ground
13	Ground	14	NC
15	IrDA Serial Transmit	16	IR Power

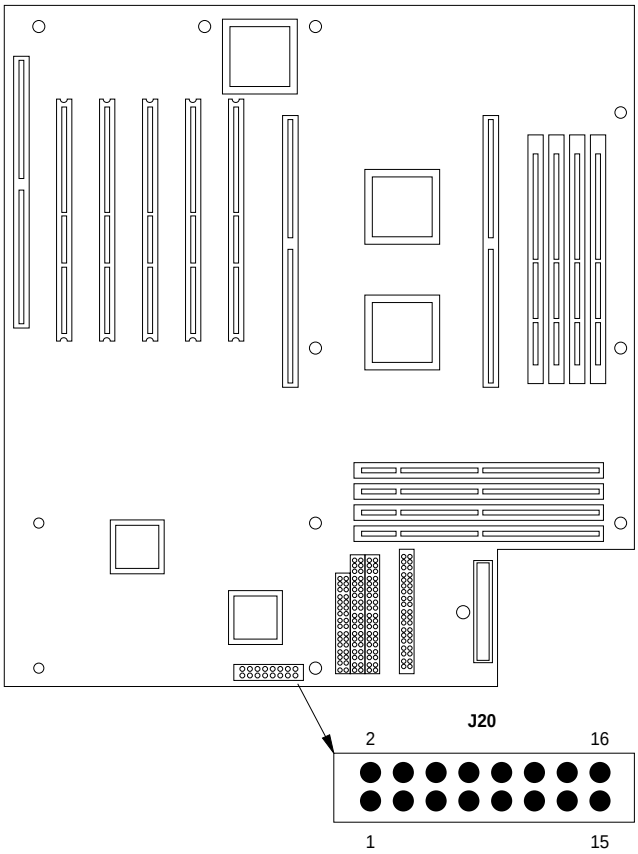

Figure 8
Front Panel Connector

2. SYSTEM BOARD BIOS SETUP

Access to the BIOS setup screens is gained by pressing the **F2** key during the system start process. The BIOS indicates it will accept the F2 key press by displaying the message, "Press F2 to Enter Setup," in the lower left corner of the screen. Some versions of the BIOS display a logo screen during post. When the logo appears, press **Tab** to display the post screen. When the F2 key is accepted, the BIOS displays the setup main menu.

Seven menus are available from the main setup screen:

- Main (displayed by default)
- Health
- Advanced
- Security
- Power
- Boot
- Exit

Each of these menus contains system configuration fields and/or prompts that allow access to submenus. The prompts that allow access to submenus are preceded by the symbol "▶." Highlighting the entry and pressing **Enter** accesses a submenu. These menus, fields and submenus are explained in detail in this section.

2.1 MAIN MENU

Main Health Advanced Security Power Boot Exit

		Item Specific Help
CPU Type:	Pentium® II	
CPU Speed:	350 MHz	
Second CPU:	Not Installed	<Tab>, <Shift-Tab>, or
System Memory:	64 MB	<Enter> selects field.
System Time:	[17:00:00]	
System Date:	[07/22/1998]	
Diskette A:	[1.44 MB, 31/2"]	
Diskette B:	[Not Installed]	
> Primary Master	[1025Mb]	
> Primary Slave	[None]	
> Secondary Master	[None]	
> Secondary Slave	[None]	
> Startup Options		

F1	Help	↑↓	Select Item	**-/+**	Change Values	**F9**	Setup Defaults
ESC	Exit	←→	Select Menu	**Enter**	Select > Submenu	**F10**	Save and Exit

Figure 9
Main Menu

2.1.1 CPU TYPE

This field shows the CPU type installed in the system. A typical display would read "Pentium® II."

Options: This field is for display purposes only and cannot be selected or edited.

2.1.2 CPU SPEED

This field shows the current speed of the installed CPU in megahertz. If two CPUs are installed, they must run at the same speed.

Options: This field is for display purposes only and cannot be selected or edited.

2.1.3 SECOND CPU

This field shows the status of the secondary CPU.

Options: This field is for display purposes only and cannot be selected or edited. Field displays "Installed" or "Not Installed."

2.1.4 SYSTEM MEMORY

This field shows the total amount of memory installed in the system in megabytes.

Options: This field is for display purposes only and cannot be selected or edited.

2.1.5 SYSTEM TIME

This field sets the system time contained in the real-time clock (RTC) hardware device. During power-up, the RTC time and date are read and saved in memory for use by the operating system.

Options: Enter the current time in hours, minutes and seconds in 24-hour military format. You can use the numeric keypad to type in specific field values or use the **+ Key** or **- Key** to increase or decrease numeric value. Press **Tab, Shift-Tab** or **Enter** to move between fields.

Entry Range:

Hours (hh)	0-23
Minutes (mm)	0-59
Seconds (ss)	0-59

Default: If CMOS is invalid, the default time is 00:00:00 and will count up from the time the system was first powered up; otherwise, the default value will be the current time.

2.1.6 SYSTEM DATE

This field sets the system date contained in the RTC hardware device. During power-up, the RTC time and date are read and saved in memory for use by the operating system.

Options: Enter the current date in "month/day/year" format. You can use the numeric keypad to type in specific values or use the **+ Key** or **- Key** to increase or decrease numerical values. To move between fields, press **Tab**, **Shift-Tab** or **Enter**.

Entry Range:

Month (mm)	1 - 12
Day (dd)	1 - 31
Year (yyyy)	1981-2099

Default: [01/01/1988] - January 1, 1988

2.1.7 DISKETTE A

Use this field to select the type of diskette drive installed as drive A.

Options:

- Not Installed
- 360KB, 5 1/4 in.
- 1.2MB, 5 1/4 in.
- 720KB, 3 1/2 in.
- 1.44MB, 3 1/2 in.
- 2.88MB, 3 1/2 in.

Default: 1.44MB, 3 1/2 in.

2.1.8 DISKETTE B

Use this field to select the type of diskette drive installed as drive B.

Options:

- Not Installed
- 360KB, 5 1/4 in.
- 1.2MB, 5 1/4 in.
- 720KB, 3 1/2 in.
- 1.44MB, 3 1/2 in.
- 2.88MB, 3 1/2 in.

Default: 1.44MB, 3 1/2 in.

2.1.9 IDE PRIMARY/SECONDARY MASTER/SLAVE

This field displays the capacity of the hard drive connected to the associated IDE adapter and provides access to the appropriate submenu. The capacity of the IDE hard drive will be displayed once the drive parameters have been entered; otherwise, "None" will be displayed.

Default: None

2.1.10 KEYBOARD FEATURES

This field provides access to the keyboard features submenu.

2.2 PRIMARY MASTER SUBMENU

Main

Primary Master [yyyyMB]		Item Specific Help
Type:	[Auto]	Set to [Auto] to configure the drive's parameters automatically. Set to [User] to edit the drive's parameters. Set to [CD-ROM or DVD] if a CD-ROM or DVD drive is installed. Set to [Removable] if an ATAPI/IDE removable drive is installed.
Cylinders:	[cccc]	
Heads:	[hh]	
Sectors/Track:	[ss]	
Maximum Capacity:	yyyyMB	
Multi-Sector Transfers:	[16 Sectors]	
LBA Mode Control:	[Enabled]	
32-Bit I/O:	[Enabled]	
Transfer Mode:	[Fast PIO 4]	
Ultra DMA Mode:	[Disabled]	

F1	Help	↑↓	Select Item	**-/+**	Change Values	**F9**	Setup Defaults
ESC	Exit	←→	Select Menu	**Enter**	Select > Submenu	**F10**	Save and Exit

Figure 10
Primary Master Submenu

Each IDE submenu will default to "Type: Auto." When an IDE device is auto-detected during boot-up, the cylinders, heads, sectors/track, multi-sector transfers, LBA mode control, 32-bit I/O, transfer mode, and Ultra DMA mode fields will be set with the values returned by the attached IDE hard drive. The transfer mode and Ultra DMA mode fields will be set to the maximum mode that the drive allows. If no IDE device is attached, the cylinders, heads, sectors and maximum capacity fields will be hidden and all other fields will be set to "Disabled."

When an IDE CD-ROM is auto-detected:

1. Type will be "Auto" with no capacity displayed.
2. Cylinders, heads, sectors/track, and maximum capacity will not be displayed.
3. Multi-sector transfers and LBA mode control will be "Disabled."
4. 32-bit I/O will be "Disabled."
5. Transfer mode will be whatever the CD-ROM supports.
6. Ultra DMA mode will be "Disabled."

2.2.1 TYPE

This field may be used to select a drive type or to specify that an IDE CD-ROM drive is installed.

Options:

- None
- User
- Auto
- CD-ROM
- ATAPI Removable
- IDE Removable

Default: Auto

2.2.2 CYLINDERS

This field may be used to set the number of cylinders. This field may only be edited when the type field is set to "User."

Options: None, An integer from 0 to 65535

Default: Nothing if the type field is set to "Auto," 0 if the type field is set to "User."

2.2.3 HEADS

This field may be used to set the number of heads. This field may only be edited when the type field is set to "User."

Options: An integer from 1 to 16

Default: Nothing if the type field is set to "Auto," 1 if the type field is set to "User."

2.2.4 SECTORS/TRACK

This field is used to set the number of sectors per track. This field may only be edited when the type field is set to "User."

Options: An integer from 0 to 63

Default: Nothing if the type field is set to "Auto," 1 if the type field is set to "User."

2.2.5 MULTI-SECTOR TRANSFERS

This field displays the number of sectors that are transferred before an interrupt occurs. This field is set when the drive is "Autotyped." This field may only be edited when the type field is set to "User."

Options:

- Disabled
- 2 sectors
- 4 sectors
- 8 sectors
- 16 sectors

Default: 16 sectors

2.2.6 LBA MODE CONTROL

This field enables logical block addressing (LBA) of the IDE drive. If the drive does not need LBA support (total capacity of the drive is less than 520Mb), then this field is set to "Disabled" automatically. This field may only be edited when the type field is set to "User."

Options: Enabled, Disabled

Default: If the drive is larger than 528Mb, this field will be set to "Enabled."

2.2.7 32-BIT I/O

This field enables 32-bit data transfers for faster disk performance. This field may only be edited when the type field is set to "User."

Options: Enabled, Disabled

Default: Enabled

Transfer Mode

This field displays the possible transfer modes for the IDE drive. This field may only be edited when the type field is set to "User."

Options:

- Standard
- Fast PIO 1
- Fast PIO 2
- Fast PIO 3
- Fast PIO 4

Default: The highest value the attached drive supports

2.2.8 ULTRA DMA MODE

This field displays which mode of Ultra DMA transfers is used for IDE and ATAPI devices. This field may only be edited when the type field is set to "User."

Options:
- Disabled
- Mode 0
- Mode 1
- Mode 2

Default: The highest value the attached drive supports

2.3 PRIMARY/SECONDARY MASTER/SLAVE

The fields on these submenus function the same as those on the primary master submenu.

2.4 STARTUP OPTIONS SUBMENU

Main

Startup Options		Item Specific Help
Post Screen:	[Disabled]	Selects power-on state for Numlock.
Summary Screen:	[Disabled]	
Stop On Errors:	[Enabled]	
Post Memory Test:	[Quick]	
Setup Prompt:	[Enabled]	
Numlock:	[Auto]	
Key Click:	[Disabled]	
Keyboard Auto-Repeat Rate:	[30/sec]	
Keyboard Auto-Repeat Delay:	[1/2 sec]	

F1	Help	↑↓	Select Item	**-/+**	Change Values	**F9**	Setup Defaults
ESC	Exit	←→	Select Menu	**Enter**	Select > Submenu	**F10**	Save and Exit

Figure 11
Startup Options Submenu

2.4.1 SUMMARY SCREEN

This menu item controls whether the summary screen is displayed prior to loading an operating system.

Options: Enabled, Disabled

Default: Disabled

2.4.2 POST SCREEN

When this menu item is enabled, the post diagnostic messages are displayed in place of the Micron logo.

Options: Enabled, Disabled

Default: Disabled

2.4.3 STOP ON ERRORS

This menu item controls whether the system stops with an F1/F2 prompt when an error during post is detected.

Options: Enabled, Disabled

Default: Disabled

2.4.4 POST MEMORY TEST

This menu item controls whether the installed DRAM is sized only, or tested and sized.

Options: Quick, Extensive

Default: Quick

2.4.5 SETUP PROMPT

This menu item controls whether the F2 setup prompt is displayed during post.

Options: Enabled, Disabled

Default: Disabled

2.4.6 NUMLOCK

This menu item determines if the keyboard numlock is set or reset during system initialization.

Options: Auto, On, Off

Default: Auto

2.4.7 KEY CLICK

This menu item determines if the system speaker emits a click each time a key is pressed.

Options: Enabled, Disabled

Default: Disabled

2.4.8 KEYBOARD AUTO-REPEAT RATE

This menu item determines how often a key is repeated when held down.

Options:

- 30/sec
- 26.7/sec
- 21.8/sec
- 18.5/sec
- 13.3/sec
- 10/sec
- 6/sec
- 2/sec

Default: 30/sec

2.4.9 KEYBOARD AUTO-REPEAT DELAY

This menu item determines the length of time a key must be held down before it will start to repeat.

Options:

- 1/4 sec
- 1/2 sec
- 3/4 sec
- 1 sec

Default: 1/2 sec

2.5 HEALTH MENU

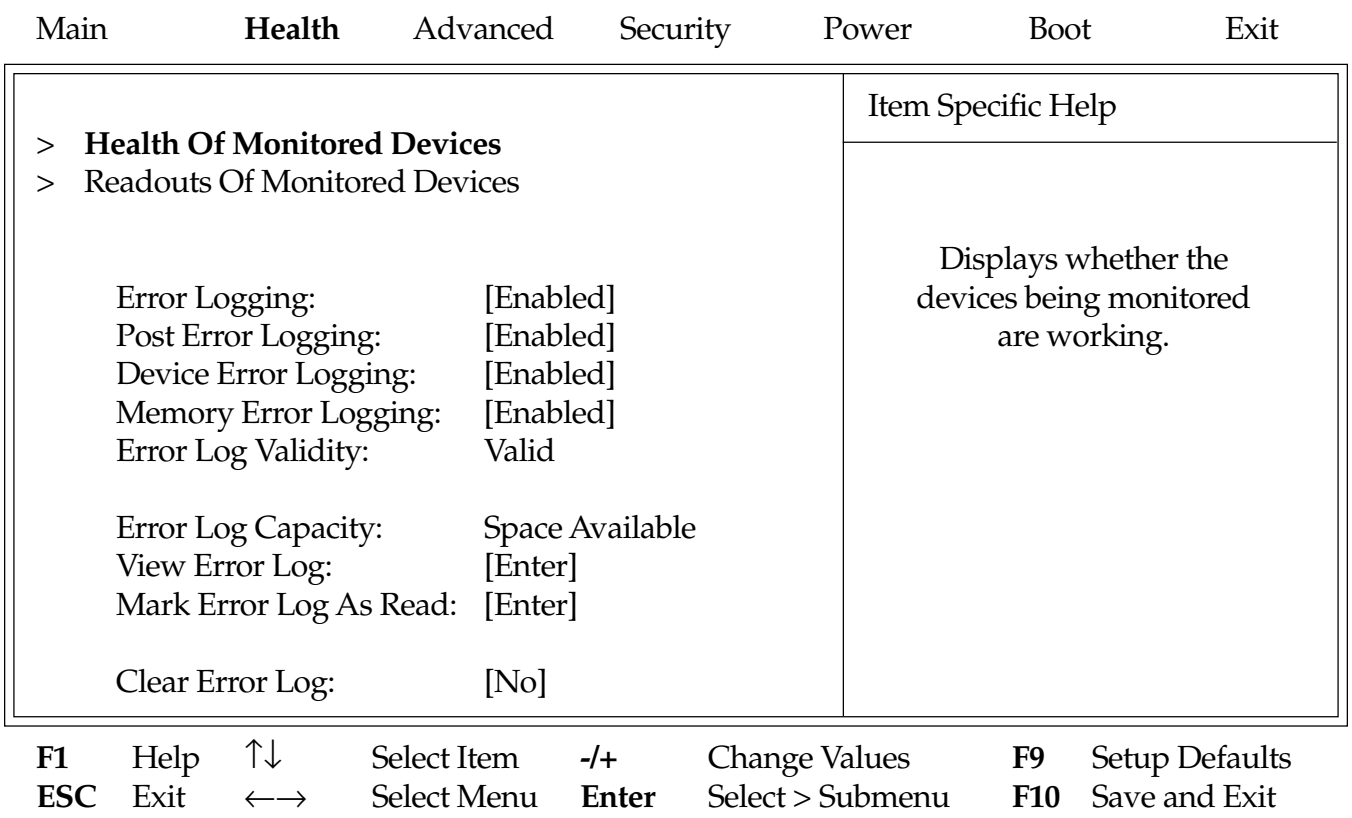

Figure 12
Health Menu

2.5.1 HEALTH OF MONITORED DEVICES SUBMENU

This item gives you access to the health of monitored devices submenu.

2.5.2 READOUTS OF MONITORED DEVICES SUBMENU

This item gives you access to the readouts of monitored devices submenu.

2.5.3 ERROR LOGGING

This field enables or disables the SMBIOS event logging on a global level.
Options: Enabled, Disabled
Default: Enabled

2.5.4 POST ERROR LOGGING

This field enables or disables the SMBIOS event logging during post only.
Options: Enabled, Disabled
Default: Enabled

2.5.5 DEVICE ERROR LOGGING

This field enables or disables error logging of monitored devices.
Options: Enabled, Disabled
Default: Enabled

2.5.6 MEMORY ERROR LOGGING

This field enables or disables error logging of 1- and 2-bit ECC memory errors.
Options: Enabled, Disabled
Default: Enabled

2.5.7 ERROR LOG VALIDITY

This field verifies that the data contained in the error log is valid based on a checksum. This field is not user-changeable; it is for viewing only.
Options: Valid, Invalid

2.5.8 ERROR LOG CAPACITY

This field verifies that there is room in the error log buffer for further data. This field is not user-changeable; it is for viewing only.
Options: Space available, Full

2.5.9 VIEW ERROR LOG

This field displays the SMBIOS error log.
Options: None

2.5.10 MARK ERROR LOG AS READ

This field flags the error log handler that the log has been viewed.
Options: None

2.5.11 CLEAR ERROR LOG

This field deletes the SMBIOS error log. If set to "Yes," this field will be set back to "No" upon the next system boot.
Options: Yes, No
Default: No

2.6 HEALTH OF MONITORED DEVICES SUBMENU

Health

Health of Monitored Devices		Item Specific Help
System Board Temperature:	Ok	Every time the **Enter** key is pressed, the monitored devices will be read.
Fan 1 Speed:	Ok	
Fan 2 Speed:	Fan not Installed	
CPU 1 Power Supply:	Ok	
CPU 2 Power Supply:	Ok	
2.5 Volt Power Supply:	Ok	
3.3 Volt Power Supply:	Ok	
5 Volt Power Supply:	Ok	
12 Volt Power Supply:	Ok	
Read Monitored Devices:	**[Enter]**	
Reset Fan 1 Settings:	[Enter]	
Reset Fan 2 Settings:	[Enter]	

F1	Help	↑↓	Select Item	**-/+**	Change Values	**F9**	Setup Defaults
ESC	Exit	←→	Select Menu	**Enter**	Select > Submenu	**F10**	Save and Exit

***Note**: Reset Fan x settings option will only be visible if a fan is connected and functioning properly.*

Figure 13
Health of Monitored Devices Submenu

2.6.1 RESET FAN 1 SETTINGS

This field reads the current RPM value of the fan speed and uses that value as the maximum RPM value. Otherwise, the RPM value of the fan at power-on will be used as maximum.

Options: None

2.6.2 RESET FAN 2 SETTINGS

This field reads the current RPM value of the fan speed and uses that value as the maximum RPM value. Otherwise, the RPM value of the fan at power-on will be used as maximum.

Options: None

2.7 READOUTS OF MONITORED DEVICES SUBMENU

Health

Readouts of Monitored Devices		Item Specific Help
System Board Temperature:	34.3 Celsius	Every time the 'Enter' key is pressed, the monitored devices will be read.
Fan 1 Speed:	5443 RPM	
Fan 2 Speed:	0 RPM	
CPU 1 Power Supply:	1.20 Volts	
CPU 2 Power Supply:	0.00 Volts	
2.5 Volt Power Supply:	2.50 Volts	
3.3 Volt Power Supply:	3.34 Volts	
5 Volt Power Supply:	5.03 Volts	
12 Volt Power Supply:	11.94 Volts	
Read Monitored Devices:	**[Enter]**	

F1	Help	↑↓	Select Item	**-/+**	Change Values	**F9**	Setup Defaults
ESC	Exit	←→	Select Menu	**Enter**	Select > Submenu	**F10**	Save and Exit

Figure 14
Readouts of Monitored Devices Submenu

2.7.1 READ MONITORED DEVICES

This field reads the current voltage values for the various power planes, the RPM value of the fan speed and the current temperature from each installed CPU.

Options: None

2.8 ADVANCED MENU

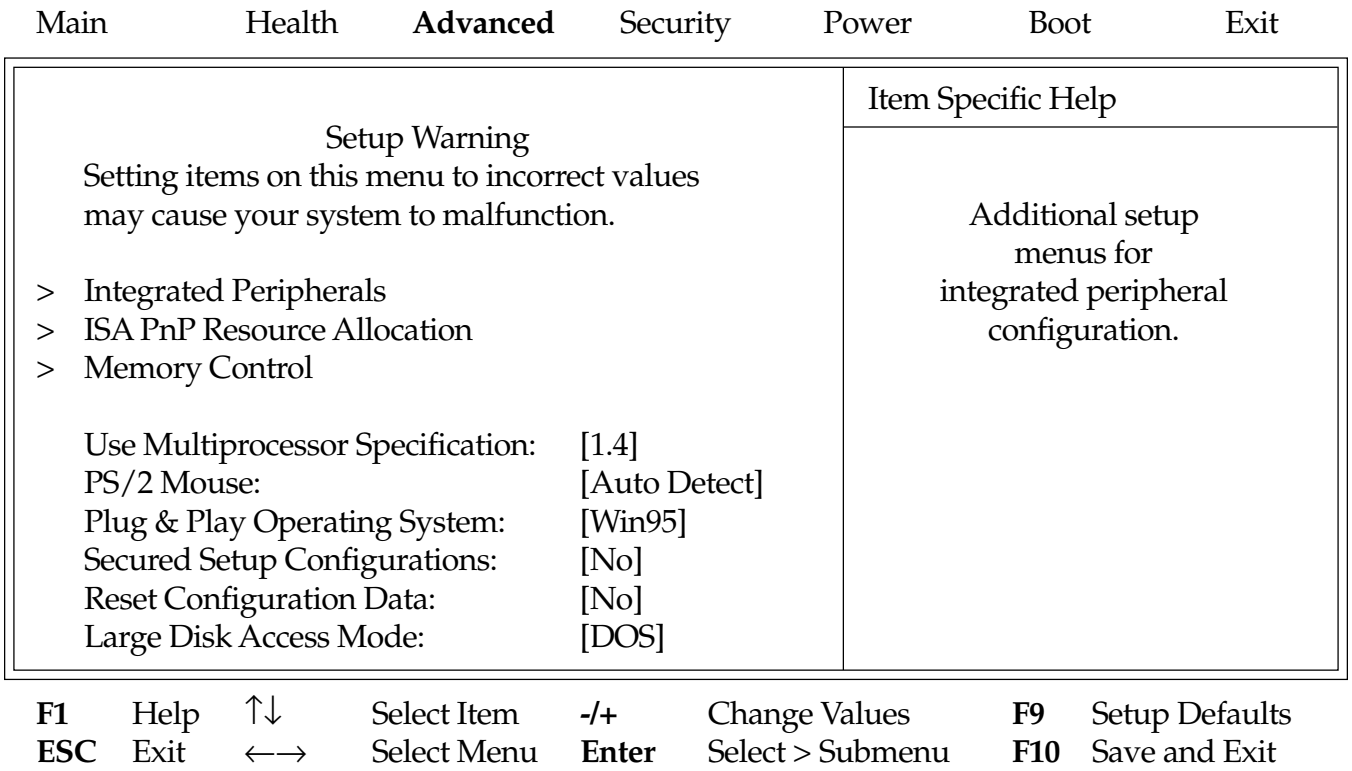

Figure 15
Advanced Menu

2.8.1 INTEGRATED PERIPHERALS SUBMENU

This item gives you access to the integrated peripherals submenu.

2.8.2 ISA PNP RESOURCE ALLOCATION SUBMENU

This item gives you access to the ISA PnP resource allocation submenu.

2.8.3 MEMORY CONTROL SUBMENU

This item gives you access to the advanced chip set control submenu.

2.8.4 USE MULTIPROCESSOR SPECIFICATION

Options: 1.1, 1.4
Default: 1.4

2.8.5 PS/2 MOUSE

Options: Enabled, Disabled, Auto Detect
Default: Auto Detect

2.8.6 PLUG AND PLAY OPERATING SYSTEM

Options: Win95, Win98/Win NT 5, Other
Default: Win95

2.8.7 SECURED SETUP CONFIGURATIONS

Options: Yes, No
Default: No

2.8.8 RESET CONFIGURATION DATA

The ESCD is a database that stores all the PnP information. Entering **Yes** will clear the ESCD and force the BIOS to re-enumerate the database. This is an action that should be used only if the ESCD has been corrupted. If set to "Yes," this field will be reset to "No" upon the next boot.

Options: Yes, No
Default: No

2.8.9 LARGE DISK ACCESS MODE

Options: DOS, Other
Default: DOS

2.9 INTEGRATED PERIPHERALS SUBMENU

Advanced

Integrated Peripherals		Item Specific Help
IDE Controller:	**[Both]**	Enable or Disable the integrated IDE controllers.
SCSI Controller:	[Enabled]	
Floppy Disk Controller:	[Enabled]	
LAN Adapter:	[Enabled]	
Serial Port A:	[Enabled]	
Base I/O Address	[3F8]	
Interrupt	[IRQ 4]	
Serial Port B:	[Enabled]	
Base I/O Address	[2F8]	
Interrupt	[IRQ 3]	
Mode	[Normal]	
Parallel Port:	[Enabled]	
Base I/O Address	[378]	
Interrupt	[IRQ 7]	
Mode	[ECP]	
DMA Channel	[DMA 1]	

F1	Help	↑↓	Select Item	**-/+**	Change Values	**F9**	Setup Defaults
ESC	Exit	←→	Select Menu	**Enter**	Select > Submenu	**F10**	Save and Exit

Figure 16
Integrated Peripherals Submenu

2.9.1 IDE CONTROLLER

If "Both" is selected, both the primary and secondary are enabled. If "Primary" is selected, only the primary is enabled. If "Secondary" is selected, only the secondary is enabled. If "Disabled" is selected, both the primary and secondary are disabled.

Options: Both, Primary, Secondary, Disabled
Default: Both

2.9.2 SCSI CONTROLLER

Options: Enabled, Disabled
Default: Enabled

2.9.3 FLOPPY DISK CONTROLLER

Options: Enabled, Disabled
Default: Enabled

2.9.4 LAN ADAPTER

Options: Enabled, Disabled
Default: Enabled

2.9.5 SERIAL PORT A

Options: Enabled, Disabled, Auto
Default: Enabled

Base I/O Address
When Serial Port A is set to "Enabled," this field appears.
Options: 3F8, 2F8, 3E8, 2E8
Default: 3F8

Interrupt
When Serial Port A is set to "Enabled," this field appears.
Options: IRQ 3, IRQ 4
Default: IRQ 4

2.9.6 SERIAL PORT B

Options: Enabled, Disabled, Auto
Default: Enabled

Base I/O Address
When Serial Port B is set to "Enabled," this field appears.
Options: 3F8, 2F8, 3E8, 2E8
Default: 3F8

Interrupt
When Serial Port B is set to "Enabled," this field appears.
Options: IRQ 3, IRQ 4
Default: IRQ 4

Mode
When Serial Port B is set to "Enabled," this field appears.
Options: Normal, IrDA, ASK IR
Default: Normal

2.9.7 PARALLEL PORT

Options: Enabled, Disabled, Auto
Default: Enabled

Mode
When Parallel Port is set to "Enabled," this field appears.
Options: Output only, Bidirectional, ECP, EPP
Default: ECP

Base I/O Address
When Parallel Port is set to "Enabled," this field appears.
Options: 378, 278, 228
Default: 378

Interrupt
When Parallel Port is set to "Enabled," this field appears.
Options: IRQ 5, IRQ 7
Default: IRQ 7

DMA Channel
This field is only available if Parallel Port is set to "Enabled" and Mode is set to "ECP."
Options: DMA 1, DMA 3
Default: DMA 1

2.10 ISA PnP RESOURCE ALLOCATION SUBMENU

Advanced

ISA PnP Resource Allocation		Item Specific Help
Upper Memory Blocks:		
C800 - CBFF	**[Available]**	Reserves the specified block of upper memory for use by legacy ISA devices.
CC00 - CFFF	[Available]	
D000 - D3FF	[Available]	
D400 - D7FF	[Available]	
D800 - DBFF	[Available]	
DC00 - DFFF	[Available]	
ISA IRQs:		
IRQ 3	[Available]	
IRQ 4	[Available]	
IRQ 5	[Available]	
IRQ 7	[Available]	
IRQ 9	[Available]	
IRQ 10	[Available]	
IRQ 11	[Available]	

F1	Help	↑↓	Select Item	**-/+**	Change Values	**F9**	Setup Defaults
ESC	Exit	←→	Select Menu	**Enter**	Select > Submenu	**F10**	Save and Exit

Figure 17
ISA PnP Resource Allocation Submenu

This menu option allows the user to configure memory and IRQ requirements for legacy ISA devices. To access the submenu, highlight this entry and press **Enter**.

ISA PnP Resource Allocation - Item Specific Help

This field allows the user to reserve specific memory blocks and IRQs for use by legacy ISA devices.

2.10.1 UPPER MEMORY BLOCKS

The following memory regions may be reserved for legacy ISA devices:

- C800 - CBFF
- CC00 - CFFF
- D000 - D3FF
- D400 - D7FF
- D800 - DBFF
- DC00 - DFFF

Options: Available, Reserved
Default: Available

2.10.2 ISA IRQs

The following IRQs may be reserved for legacy ISA devices:

- IRQ 3
- IRQ 4
- IRQ 5
- IRQ 7
- IRQ 9
- IRQ 10
- IRQ 11

Options: Available, Reserved
Default: Available

2.11 MEMORY CONTROL SUBMENU

Advanced

Memory Control		Item Specific Help
Primary Memory Controller:		When 'Enabled' memory errors are corrected.
DIMM Socket 0:	SDRAM, 64 MB	
DIMM Socket 1:	Empty	
DIMM Socket 2:	Empty	
DIMM Socket 3:	Empty	
Secondary Memory Controller:		
DIMM Socket 4:	Empty	
DIMM Socket 5:	Empty	
DIMM Socket 6:	Empty	
DIMM Socket 7:	Empty	
Memory Control:		
Memory Clock Speed	100 MHz	
Memory Error Correction	[Disabled]	

F1	Help	↑↓	Select Item	**-/+**	Change Values	**F9**	Setup Defaults
ESC	Exit	←→	Select Menu	**Enter**	Select > Submenu	**F10**	Save and Exit

Figure 19
Memory Control Submenu

2.11.1 MEMORY ERROR CORRECTION

This field enables or disables ECC memory error correction.
Options: Enabled, Disabled, Auto
Default: Enabled

2.12 SECURITY MENU

Main Health Advanced **Security** Power Boot Exit

		Item Specific Help
Supervisor Password:	Clear	Supervisor Password controls access to the setup utility and to the system at boot.
User Password:	Clear	
Set Supervisor Password:	[Enter]	
Set User Password:	[Enter]	
Password On Boot:	[Disabled]	
Fixed Disk Boot Sector:	[Normal]	
Diskette Access:	[Supervisor]	

F1	Help	↑↓	Select Item	**-/+**	Change Values	**F9**	Setup Defaults
ESC	Exit	←→	Select Menu	**Enter**	Select > Submenu	**F10**	Save and Exit

Figure 20
Security Menu

The security menu allows two passwords to be set, the supervisor password and the user password. The supervisor password allows access to the system and all setup menus. The user password allows access to the system and setup, but causes some setup items to become non-editable. All items in the setup menus can be accessed until the supervisor password is set. Once the supervisor password has been set, access to the setup menus will be granted by correctly entering either the supervisor password or user password.

2.12.1 USING A PASSWORD - ACCESSING SETUP MENUS

When the supervisor password is set and you attempt to gain access to the setup menus (F2 key was pressed during boot), you have three chances to enter the correct password. If a password is not entered correctly on the first or second try, the system will display an "Invalid Password" message. If a password is not entered correctly on the third try, the system will blank the screen, display a "System Disabled" message and then lock up. The only way to recover is to reset or power cycle the system.

2.12.2 SUPERVISOR PASSWORD

This field may not be edited. One of the following values will be displayed, depending on whether the supervisor password is set or cleared. The set supervisor password field is used to change the displayed value.

Options: Set, Clear

Default: Clear

2.12.3 USER PASSWORD

This field may not be edited. One of the following values will be displayed, depending on whether the user password is set or cleared. The set user password field is used to change the displayed value.

Options: Set, Clear

Default: Clear

2.12.4 SET SUPERVISOR PASSWORD

If you press **Enter** when this item is highlighted, a menu will be displayed that will allow entry of a supervisor-level password.

Options: This field is fixed. Press **Enter**.

Set Supervisor Password	
Enter New Password	[ ]
Confirm New Password	[ ]

Clearing/Entering a Supervisor Password

Select "Set Supervisor Password" and press **Enter**. To clear the password, enter the current password and press **Enter**. Press **Enter** for both remaining fields.

To set a password, enter up to seven alphanumeric characters (including spaces), press **Enter**, enter the same characters again, and press **Enter**. Press **Enter** again to return to the main security menu. If the same characters were not entered in both fields, an error message will be displayed. Press **Enter** to clear the error message.

If **Esc** is pressed while entering characters in either field, setup will return to the main security menu.

2.12.5 SET USER PASSWORD

If you press **Enter** when this item is selected, a menu will be displayed that will allow entry of a user-level password. This item can be accessed only after a supervisor password has been set.

If the supervisor and user passwords are set and the supervisor password is then cleared, the user password will also be cleared.

Options: This field is fixed. Press **Enter**.

Set User Password	
Enter New Password	[ ]
Confirm New Password	[ ]

Clearing/Entering a User Password

Highlight "Set User Password" and press **Enter**. To clear the password, press **Enter** once for each field.

To set a password, enter up to seven alphanumeric characters (including spaces), press **Enter**, enter the same characters again, and press **Enter**. If the same characters were not entered in both fields, an error message will be displayed. Press **Enter** to clear the error message.

Press **Enter** again to return to the main security menu.

If **Esc** is pressed while entering characters in either field, setup will return to the main security menu.

2.12.6 PASSWORD ON BOOT

This field can be used to control access to the system. If neither password has been set, this item will not function. If enabled and at least one of the passwords has been set, the system will ask for a password after post has been completed.

Options: Enabled, Disabled

Default: Disabled

2.12.7 FIXED DISK BOOT SECTOR

Options: Normal, Write Protect

Default: Normal

2.12.8 DISKETTE ACCESS

Options: Supervisor, User

Default: User

2.13 POWER MENU

Main Health Advanced Security **Power** Boot Exit

		Item Specific Help
Power Savings Mode	[Disabled]	Select Power Management Mode.
Video & Hard Disk Timeout	Disabled	'Maximum' powers down system components after a short period of inactivity. 'Minimum' allows components to be idle for a longer period of time before being powered down. Select 'Customize' to lter the settings. 'Disabled' will turn off power management.
Sleep Timeout	Disabled	

F1	Help	↑↓	Select Item	**-/+**	Change Values	**F9**	Setup Defaults
ESC	Exit	←→	Select Menu	**Enter**	Select > Submenu	**F10**	Save and Exit

Figure 21
Power Menu

2.13.1 POWER SAVINGS MODE

If enabled, the APM functions in the BIOS will control any non-APM-aware operating system (such as DOS) and allow devices to be powered off after a certain period of inactivity.

Options: Disabled, Customize, Maximum, Minimum

Default: Disabled

2.13.2 VIDEO AND HARD DISK TIMEOUT

This field specifies the period of system inactivity that must transpire before the system will power off the display and any IDE hard disk drives attached to the system. This field may only be edited when the power savings option is set to "Customize."

Options:

- Disabled
- 1 minute
- 2 minutes
- 4 minutes
- 6 minutes
- 8 minutes
- 12 minutes
- 16 minutes

Default: Disabled

2.13.3 SLEEP TIMEOUT

This field specifies the period of system inactivity that must transpire before the system will power off all APM-compliant devices and stop the CPU. This field may only be edited when the power savings option is set to "Customize."

Options:

- Disabled
- 5 minutes
- 10 minutes
- 15 minutes
- 20 minutes
- 30 minutes
- 40 minutes
- 60 minutes

Default: Disabled

2.14 BOOT MENU

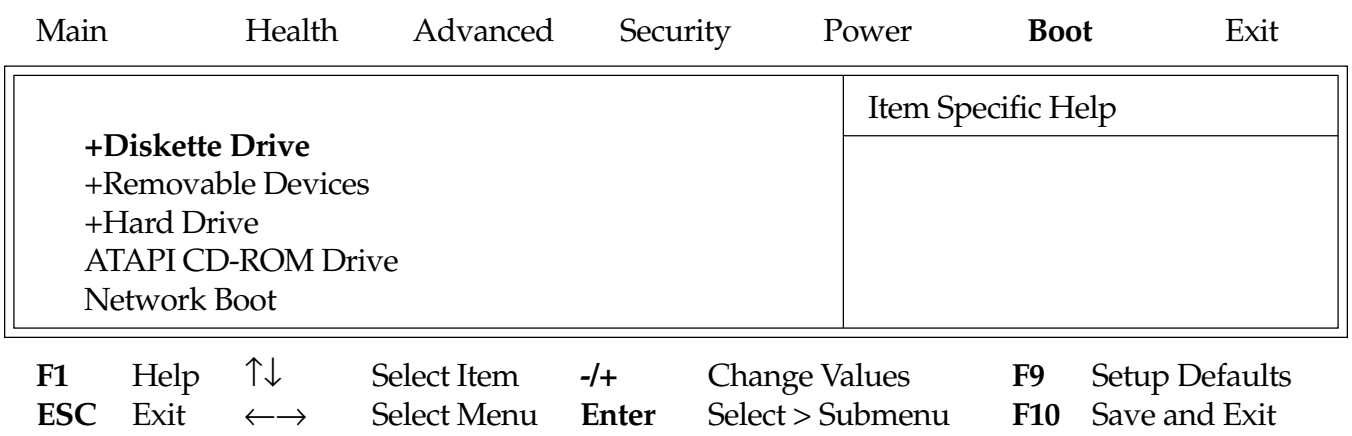

Figure 22
Boot Menu

The boot menu allows the user to select the order in which the system attempts to boot the operating system. The order listed is the order in which the system will attempt to boot.

2.14.1 FIRST, SECOND, THIRD, FOURTH, FIFTH BOOT DEVICE

Use the **+ Key** and **- Key** to move the hightlighted device up or down in the boot order. The system will attempt to boot from the devices in the order they appear on the screen. If the highlighted field has a "+" next to it, press **Enter** to view the sub-items.

Options:
- Diskette Drive
- Removable Devices
- Hard Drive
- ATAPI CD-ROM Drive
- Network Boot

Default:
- First Boot Device [Diskette Drive]
- Second Boot Device [Removable Devices]
- Third Boot Device [Hard Drive]
- Fourth Boot Device ATAPI CD-ROM Drive
- Fifth Boot Device Network Boot

2.15 EXIT MENU

Main	Health	Advanced	Security	Power	Boot	**Exit**

	Item Specific Help
Save Changes & Exit Discard Changes & Exit Load Setup Defaults Discard Changes Save Changes	Save changes and exit the setup utility.

F1	Help	↑↓	Select Item	**-/+**	Change Values	**F9**	Setup Defaults
ESC	Exit	←→	Select Menu	**Enter**	Execute Command	**F10**	Save and Exit

Note: *Select an option by highlighting the desired entry and pressing* ***Enter****.*

Figure 23
Exit Menu

2.15.1 SAVE CHANGES AND EXIT

Selecting this option saves the current setup screen configuration in non-volatile memory. The system is then restarted so that the new configuration will be activated.

Pop-Up Window

Upon executing this command, the following window is displayed, confirming the selection. Pressing **Enter** executes the command; highlighting **No** or pressing **Esc** aborts the command.

Setup Confirmation
Save configuration changes and exit now? [Yes] [No]

2.15.2 DISCARD CHANGES AND EXIT

This option allows you to exit from setup without updating nonvolatile memory.

Pop-Up Window

Upon executing this command, the following window is displayed, confirming the selection. Pressing **Enter** executes the command; highlighting **No** or pressing **Esc** aborts the command.

Setup Warning
Configuration has not been saved! Save before exiting? [Yes] [No]

2.15.3 LOAD SETUP DEFAULTS

This option loads the default system configuration into all Setup screens.

Pop-Up Window

Upon executing this command, the following window is displayed, confirming the selection. Pressing **Enter** executes the command; highlighting **No** or pressing **Esc** aborts the command.

Setup Confirmation
Load default configuration now? [Yes] [No]

2.15.4 DISCARD CHANGES

This option loads the previous values from CMOS for all setup items.

Pop-Up Window

Upon executing this command, the following window is displayed, confirming the selection. Pressing **Enter** executes the command; highlighting **No** or pressing **Esc** aborts the command.

Setup Confirmation
Load previous configuration now? [Yes] [No]

2.15.5 SAVE CHANGES

Selecting this option saves the current setup screen configuration in non-volatile memory.

Pop-Up Window

Upon executing this command, the following window is displayed, confirming the selection. Pressing **Enter** executes the command; highlighting **No** or pressing **Esc** aborts the command.

Setup Confirmation
Save configuration changes now? [Yes] [No]

Glossary

A

ACPI Advanced Configuration and Power Interface
AGP Advanced Graphics Port
APIC Advanced Programmable Interrupt Controller
APM Automatic Power Management
ASK IR Amplitude Shift Keyed Infrared
ATA Advanced Technology Attachment
ATAPI Advanced Technology Attachment Protocol Interface

B

BIOS Basic Input/Output System

C

CD-ROM Compact Disk Read-Only Memory
CE European Community
CGA Color Graphics Adapter
CMOS Complementary Metal Oxide Semiconductor
CODEC Compressor/Decompressor
COM Communications Port
CPU Central Processing Unit

D

DAC/ADC Digital to Analog Converter/ Analog to Digital Converter
DIMM Dual In-line Memory Module
DMA Direct Memory Access
DOS Disk Operating System
DRAM Dynamic Random-Access Memory
DVD Digital Video Display

E

ECP Enhanced Capabilities Port
EGA Enhanced Graphics Adapter
EIO Extended Input/Output
EMC Electromagnetic Compliance
EPP Enhanced Parallel Port
ESCD Extended System Configuration Data

F

FCC Federal Communications Commission
FDC Floppy Disk Controller
FIFO First In, First Out
FSB Front Side Bus

G

GND Ground

H

HP SIR Hewlett Packard - Serial Infrared

I

IDE Intelligent Drive Electronics or Integrated Drive Electronics
IEEE Institute of Electrical and Electronics Engineers
I/O Input/Output
INT Interrupt
IR Infrared
IrCC Infrared Communications Controller
IrDA Infrared Data Association
IRQ Interrupt Request
ISA Industry Standard Architecture

L

LAN Local Area Network
LBA Logical Block Addressing
LED Light-Emitting Diode
LOD Level of Detail
LPT Line Printer Terminal, or any type of printer
LVD Low Voltage Differential

M

mA Milliamp
Mb Megabit
Mb/s Megabit per Second
MB Megabyte
MHz Megahertz
MIDI Musical Instrument Digital Interface
MONO Monochrome Adapter

N

NIC Network Interface Card
NMI Nonmaskable Interrupt
NVLAP National Voluntary Laboratory Accreditation Program

O

OS Operating System

P

PAC PCI/AGP Controller
PCB Printed Circuit Board
PCC Power Control Ciruitry
PCI Peripheral Component Interconnect
PHY Physical Signal Layer
PIO Programmed Input/Output
PIRQ Programmable IRQ
PME Power Management Event
PnP Plug-and-Play

R

RAID Redundant Arrays of Inexpensive Disks
RAM Random-Access Memory
ROM Read-Only Memory

S

SDRAM Synchronous Dynamic Random-Access Memory
Sharp IRD Sharp Infrared data
SMBus System Management Bus
SMsC Standard Microsystem Corportation
SPP Standard Parallel Port

U

UART Universal Asynchronous Receiver-Transmitter
UDMA Ultra Direct Memory Access
UHCI Universal Host Controller Interface
USB Universal Serial Bus

V

V Volt
VGA Video Graphics Array

Z

ZIF Zero Insertion Force