Megaplex Quad Pentium II® Xeon™ PCI ISA System Guide

MAN-770
1/12/99

American Megatrends, Inc.
6145F Northbelt Parkway
Norcross, GA 30071

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Revision History

9/4/98 Initial release.
9/23/98 Released revised draft.
11/02/98 Added AMI Server Manager information.
1/12/99 Revised AMI Server Manager chapter.

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Preface

To the OEM

Thank you for purchasing the high performance American Megatrends Megaplex Quad Pentium II Xeon™ PCI ISA System. This product is a state-of-the-art set of a memory card and a motherboard that includes the famous AMIBIOS.

This manual was written for the OEM to assist in the proper installation and operation of this product. This manual describes the specifications and features of the Quad Pentium II Xeon system. It explains how to assemble a system based on the Quad Pentium II Xeon system and how to use the AMIBIOS that is specifically designed for this system. In addition, it describes AMI Server Manager Version 1.00, which is used to manage several servers simultaneously from one location.

This manual is not meant to be read by the computer owner who purchases a computer with this system. It is assumed that you, the computer manufacturer, will use this manual as a sourcebook of information, and that part of this manual will be included in the computer owner's manual.

Cont'd

Technical Support If you need help installing, configuring, or running this software, call American Megatrends technical support at 770-246-8600. You can also send questions to tech support at:

support@ami.com.

American Megatrends BBS The American Megatrends BBS permits you to access technical information about American Megatrends motherboard, peripheral, and BIOS products. Product Engineering Change Notices, Tech Tips, and technical documentation are available on the BBS. Some parts of the BBS are not accessible to all callers. Call American Megatrends Technical Support at 770-246-8600 to find out how to access the BBS. The BBS requires no parity, eight data bits, and one stop bit. The BBS phone number is 770-246-8780.

Web Site We invite you to access the American Megatrends world wide web site at *http://www.ami.com.*

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Packing List You should have received the following:

- a Series 769 CPU board,
- a Series 770 I/O board,
- three Series 776 CPU termination cards,
- a Series 777 memory expansion card (if ordered),
- a Series 778 memory termination card (if 777 is not ordered),
- four retention units, which include four base mechanisms, four top covers, eight ears, four pegs, and sixteen screws with nuts,
- four heatsinks for Pentium II Xeon CPUs with sixteen mounting screws,
- floppy diskettes that contain the American Megatrends BIOS upgrade for Server Manager software,
- Server Manager CD, with ATI264GT-B VGA Drivers,
- the *Megaplex Quad Pentium II Xeon PCI ISA System Guide*,
- the *Megaplex Server Chassis Guide*, and
- the warranty card.

Static Electricity The Megaplex Quad Pentium II Xeon motherboard and memory card can easily be damaged by static electricity. Make sure you take appropriate precautions against static electric discharge:

- wear a properly-grounded wristband while handling the Megaplex system or any other electrical component;
- touch a grounded anti-static surface or a grounded metal fixture before handling the Megaplex system,
- handle system components by the mounting bracket, if possible.

Cont'd

Batteries

Caution

Make sure you dispose of used batteries according to the battery manufacturer's instructions. Improper use of batteries can cause an explosion. Make sure you follow the battery manufacturer's instructions about using the battery. Replace used batteries with the same type of battery or an equivalent recommended by the battery manufacturer.

Attention

Il y a danger d'explosion s'il y a remplacement de la batterie. Remplacer uniquement avec une batterie du même type ou d'un équivalent recommandé par la constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Cont'd

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1 Hardware Installation

Features

The American Megatrends Megaplex Quad Pentium II Xeon ISA PCI system supports one to four Intel® Pentium II Xeon CPUs operating at 400/450 MHz.

Components

The Megaplex consists of the following components:

- a Series 769 CPU board,
- a Series 770 I/O board,
- three (3) Series 776 CPU termination cards,
- a Series 777 memory expansion card (if ordered), and
- a Series 778 memory termination card (if the 777 card is not installed).

CPUs

The four Pentium II Xeon CPU sockets are mounted on the Series 769 CPU board.

System Memory

The Megaplex system supports up to 8 GB of system memory, of which 4 GB is on the CPU board, and 4 GB on the memory expansion card. This system supports four-way interleaved memory operation with ABP and C2C for maximum performance. The system supports 168-pin buffered EDO DIMMs (FPM is not supported.) The system memory supports ECC (Error Checking and Correction).

Note: DRAM system memory is measured in megabits. For example, a DIMM that is 4 M x 72 has four (4) megabits of memory. See page 21 for more information about DRAM specifications.

Cont'd

Features, Continued

Cache Memory The Megaplex system provides 1 MB of cache memory internal to each Pentium II Xeon CPU.

ISA Expansion The Megaplex motherboard includes two ISA expansion slots. Both expansion slots can handle full-length ISA adapter cards.

PCI Local Bus The Megaplex motherboard has twelve PCI expansion slots, eight 32-bit and four 64-bit. The 32-bit slots are on two peer PCI buses provided by the first PXB (PCI Expander Bridge), while the 64-bit slots are on another independent PCI bus provided by the second PXB. All PCI slots are bus master slots. All PCI expansion slots can handle full-length PCI adapter cards.

Integrated I/O The Megaplex motherboard provides the following integrated I/O:

- one bidirectional parallel port that operates in Normal, EPP, or ECP mode,
- a VGA connector,
- two serial port connectors with 16550A UARTs,
- one floppy drive controller with support for 360 KB, 720 KB, 1.2 MB, 1.44 MB, and 2.88 MB floppy drives,
- dual channel Ultra DMA IDE support,
- two USB port connectors, and
- a standard 2-in-1 connector assembly for PS/2 keyboard and PS/2 mouse.

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Onboard VGA The Megaplex includes an onboard ATI 264GT-B PCI VGA controller with 2 MB of SGRAM. Video drivers for Windows NT are provided. You can download video drivers for all other operating systems from the ATI BBS at 905-764-9404. Make sure you load the ATI 264GT-B drivers from the diskette provided. Windows 95 auto detection tries to load the ATI Mach 64 drivers, which will not function properly.

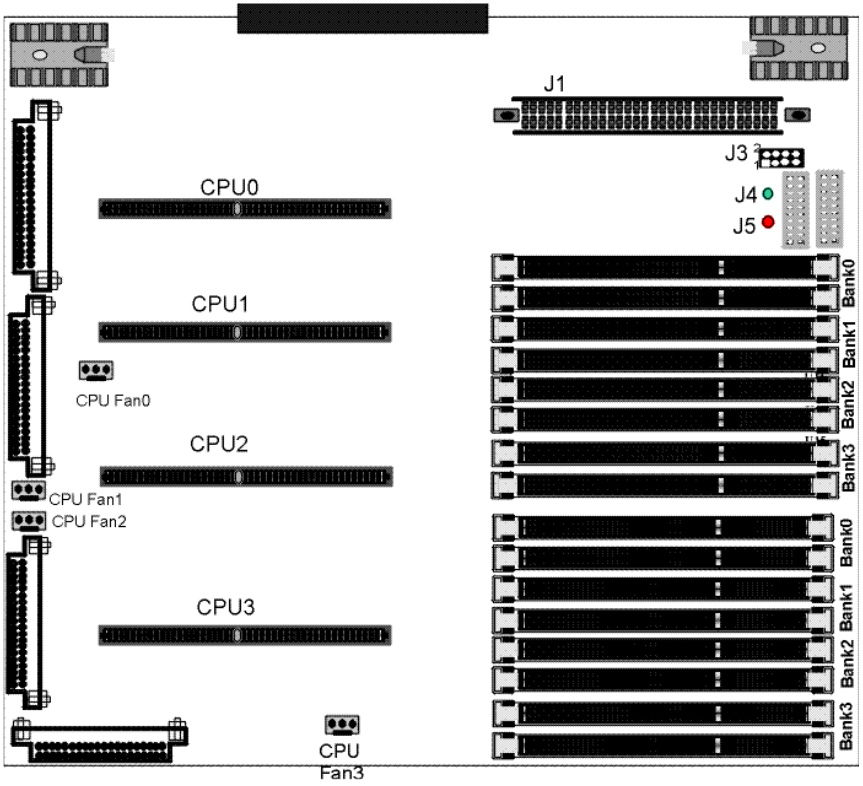
AMIBIOS AMIBIOS includes a PCI BIOS with AMIBIOS® Setup in flash ROM. Features include:

- automatic CPU detection,
- Plug and Play NVRAM and PCI-PCI bridge support,
- DMI support,
- ATAPI support for IDE CD-ROM drives,
- complete SM1/ACPI support,
- ability to boot from a CD-ROM drive,
- flex boot/silent boot support,
- USB support,
- ZIP drive support,
- GPNVRAM support,
- APM 1.2 support,
- complies with the Intel NSP specification,
- automatically detects IDE drive parameters,
- supports Enhanced IDE, including four IDE drives,
- supports ATA IDE mode programming,
- provides LBA and Block Mode support,
- provides boot sector virus protection,
- automatically detects and configures system memory, cache memory, and the CPU type,
- automatically configures PCI devices, and
- complies with the Plug and Play Version 1.0A BIOS specification.

PCI Bus Speed The Megaplex system conforms to the PCI Version 2.1 specification. The PCI slots are automatically configured by the AMIBIOS. The PCI slots operate synchronously with the CPU clock at 33 MHz.

Megaplex Dimensions

Series 769 CPU Board The Series 769 CPU board is 16” by 14”.



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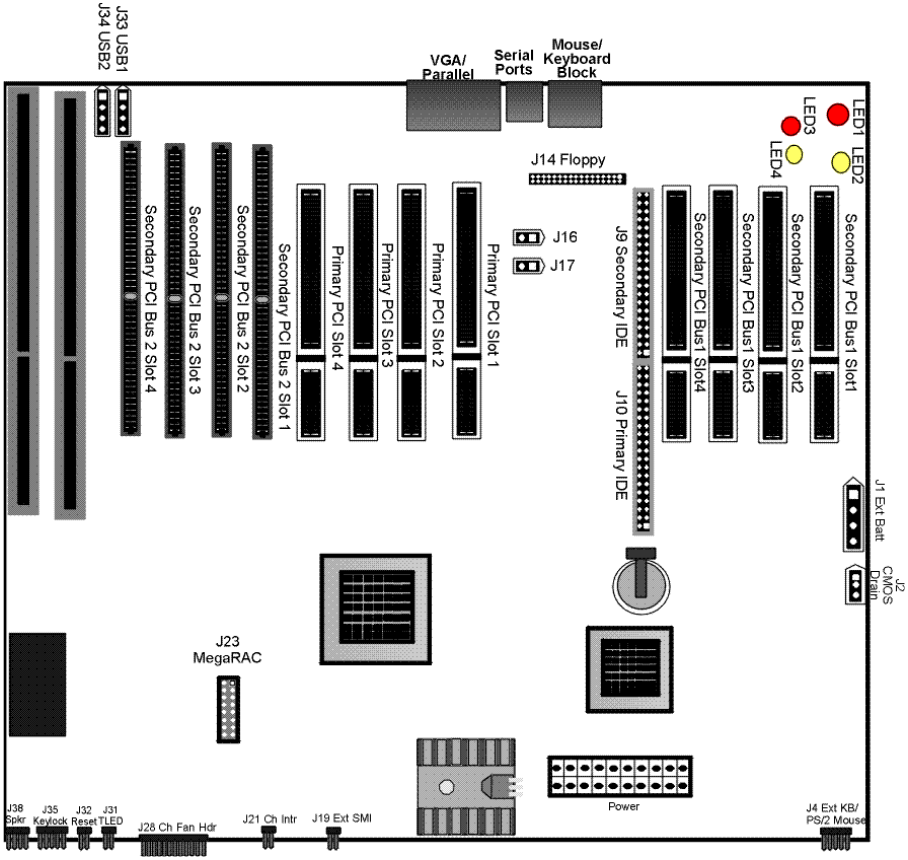
Megaplex Dimensions, Continued

Series 770 I/O Board The Series 770 I/O board is 16” by 13.8”.



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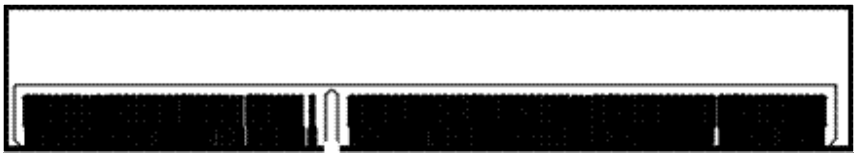
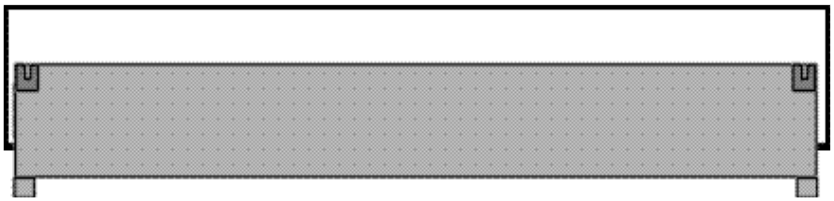
Megaplex Dimensions, Continued

Series 776 CPU Termination Board The Series 776 CPU termination board is 2.05” by 5.54”.



Series 778 Memory Termination Board The Series 778 memory termination board is 1.88” by 5.77”.



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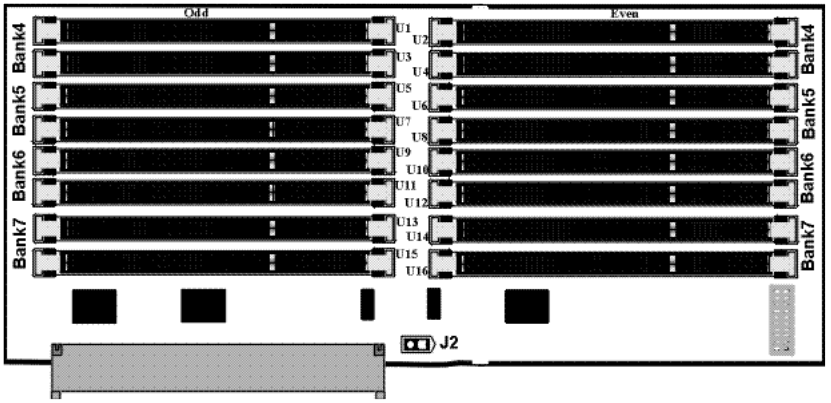
Series 777 Memory Expansion Board The Series 777 memory expansion board is 6.4” by 13”.



Installation Steps

Step	Action	Turn to
1	Unpack the boards.	Page 9
2	Configure CPU board.	Page 10
3	Configure I/O board.	Page 17
4	Install memory.	Page 18
5	Install the motherboard in cabinet.	Page 25
6	Connect power supply.	Page 27
7	Attach connectors.	Page 30
8	Test and configure.	Page 44

Warning

This motherboard contains sensitive electronic components that can be easily damaged by static electricity. Follow the instructions carefully to ensure correct installation and to avoid static damage.

Avoid Static Electricity

Static electricity can damage the motherboard and other computer components. Keep the motherboard in the anti-static bag until it is to be installed. Wear an anti-static wrist grounding strap before handling the motherboard. Make sure you stand on an anti-static mat when handling the motherboard. Avoid contact with any component or connector on any adapter card, printed circuit board, or memory module. Handle these components by the mounting bracket.

Step 1 Unpack the Boards

The Megaplex system includes the following components:

AMI Part Number	Description
Series 769	CPU board
Series 770	I/O board
Series 776	Three (3) CPU termination cards
Series 777	Memory expansion card (if ordered)
Series 778	Memory termination card (if the 777 card is not ordered)

Step	Action
1	Inspect the cardboard carton for obvious damage. If damaged, call 770-246-8645. Leave the motherboard in its original packing.
2	Perform all unpacking and installation procedures on a ground-connected anti-static mat. Wear an anti-static wristband grounded at the same point as the anti-static mat. Or use a sheet of conductive aluminum foil grounded through a 1 megohm resistor instead of the anti-static mat. Similarly, a strip of conductive aluminum foil wrapped around the wrist and grounded through a 1 megohm resistor serves the same purpose as the wristband.
3	Inside the carton, the boards are packed in an anti-static bag, and sandwiched between sheets of sponge. Remove the sponge and the anti-static bag. Place the boards on a grounded anti-static surface component side up. Save the original packing material.
4	Inspect the boards for damage. Press down on all ICs mounted in sockets to verify proper seating. Do not apply power to the board if it has been damaged.
5	If the boards are undamaged, they are ready to be installed.

Set Jumpers Set all jumpers and install the CPU before placing the motherboard in the chassis.

Step 2 Configure CPU Board

See the drawing on page 4 for the jumper locations on the Megaplex CPU board.

Important
Perform the following steps to configure the boards before installing a CPU.

J2, J9, J11, J12 CPU Fans

CPU Number	Jumper Number
CPU0	J2
CPU1	J9
CPU2	J11
CPU3	J12

These jumpers are the +12V connectors to cooling fans. The CPU fan cables must be connected to these connectors. The pinout is:

Pin Number	Signal Description
1	Ground
2	+12V
3	Tachometer output from the fan.

Cont'd

J3 CPU Clock Ratio J3 is an 8-pin berg on the Series 769 motherboard that sets the CPU clock ratio. The external clock speed is always 100 MHz. In the 769 motherboard graphic on page 4, Pin 1 of J3 is marked by the chamfered corner.

J3	Ratio	Internal CPU Speed
Short Pins 1-2 Short Pins 7-8	5:1	500 MHz
Short Pins 1-2 Short Pins 3-4 Short Pins 7-8	4:1	400 MHz This is the default setting.
Short Pins 5-6 Short Pins 7-8	7:2	350 MHz
Short Pins 3-4 Short Pins 7-8	9:2	450 MHz

DRAM Speed Settings J8 (on the CPU board) and J2 (on the memory expansion card) select DRAM speed.

J8/J2	DRAM Speed
OPEN (factory setting)	60ns EDO DRAM
Short	50ns EDO DRAM

Note: The DRAM speed setting should be the same on both the CPU card and the memory expansion card.

Installing One or Multiple CPUs

Number of CPUs to be Installed	CPU Installation
1	Install a CPU in any CPU socket and install a Series 776 CPU terminator card in the remaining three CPU slots.
2	Install CPUs in any two CPU slots and install a Series 776 CPU termination card in the remaining two CPU slots.
4	Install CPUs in all four CPU sockets.

Cont'd

> **Warning**
> Improper CPU installation can damage the CPU and the motherboard. You must follow the procedures in this section exactly as documented. Make sure you wear an antistatic wristband while installing the CPU. Follow all antistatic procedures described on page 8.

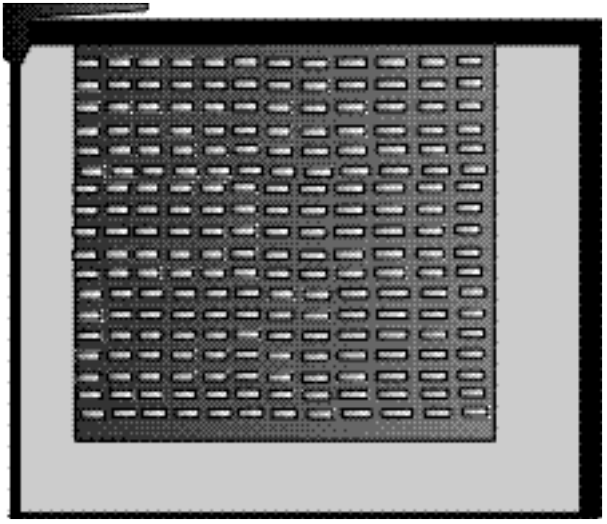
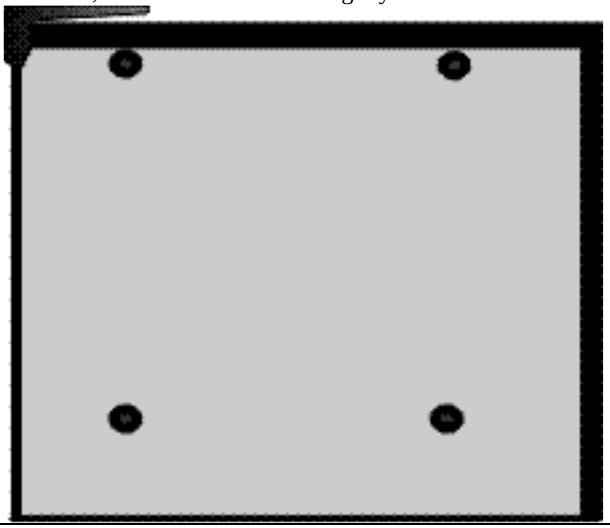
Install CPUs

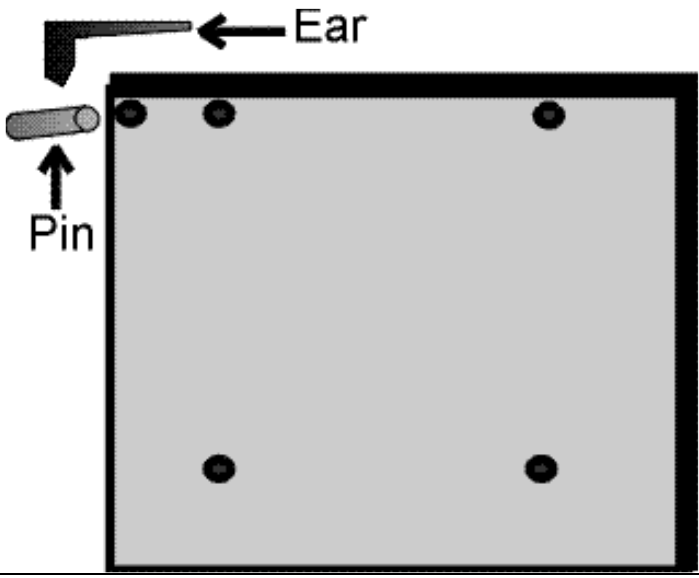
You must mount the CPU Retention Unit before the CPU is installed. Also the heatsink (provided in the kit) should be mounted on the CPU before the CPU is inserted in the slot. The retention mechanism includes:

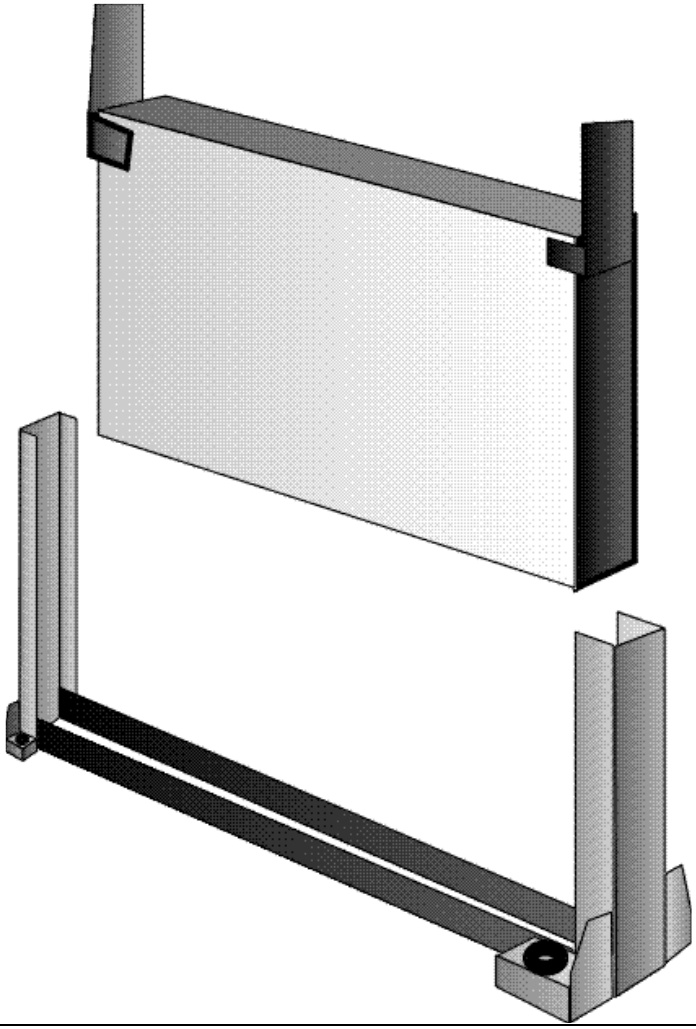
- base mechanism (4 pieces),
- top covers (4 pieces),
- ears (8 pieces),
- pegs (4 pieces), and
- screws (6-32, ¼ inch) with nuts (16 pieces).

Mount Retention Unit and Heatsink

Step	Action
1	Take one base mechanism and place it directly over the CPU Slot 0 (U22). The position of the mounting holes on the mechanism is asymmetric so that the unit can be placed in only one position over the slot. The mounting holes on the mechanism superimpose over the mounting holes on the CPU board.
2	Insert one screw from the bottom of the board in a mounting hole, and tighten a nut on it from the top. Repeat for the other three holes. **Note:** Do not use excessive force to tighten the screws, as this can damage the board/retention unit.
3	Repeat step 1 for Slot 1 (U30), Slot 2 (U45) and Slot 3 (U56).

Step	Action
4	Mount the heatsink on the CPU as shown:  The CPU has 5 mounting holes on the metal side. Use only the 4 holes as shown, and screw the heatsink tightly onto the CPU. 

Step	Action
5	Mount ears on the CPU as shown. There are two holes on both the top edges of the CPU, on both sides. Use them to insert the ears into position. 
6	Repeat step 3, 4 and 5 for all the CPUs to be installed.
7	Slide the CPUs in their respective slots from the top. Both the CPU and the Retention unit have a notch on one side, to prevent the CPU from sliding into the slot with wrong polarity. Make sure the CPUs are inserted with the right polarity.

Step	Action
8	Push the CPUs all the way to the bottom. When the CPU is seated properly, the ears cannot be in a standing position. Feel the ears to make sure they cannot stand up. If they can, the CPU needs to be pushed further. 
9	To pull the CPUs out, just pull the two ears upward into the standing position, and the CPU will be free from the socket.
10	Insert the pegs into position – two between Slot 0 and Slot 1, and the other two between Slot 2 & Slot 3. Make sure they go in the right position, and are seated properly, or the Top unit cannot be mounted.
11	Insert the top units in position. The units are polarized and can be inserted in only one direction. The polarity is shown with the dots. The end with the single dot goes in first, and at an inclination. The top will not sit properly if it is inserted vertically or horizontally to the board.

Step	Action
12	To latch the other end, push lightly from both the top and the side. You will hear a click when the attachment fits into place. The CPUs and the retention mechanism should be secured now.

Termination Card The Megaplex motherboard is shipped with a Series 776 CPU termination card that should be installed in the empty CPU slot.

You must install the termination card in the empty CPU slots if you install less than four (4) Pentium II Xeon CPUs. A green LED (J5) lights up if all four CPU slots are not occupied or the cards or CPUs are not inserted properly, and the board is powered.

Step 3 Configure I/O Board

Install jumpers as shown in the following tables.

J2 CMOS Drain J2 is a 3-pin jumper that can be used to erase the contents of CMOS RAM, where all system configuration information is stored.

CMOS Drain	J2 Setting
Normal operation (factory setting)	Short Pins 1-2
Drain CMOS	Short Pins 2-3

J16 VGA Disable J16 is a 2-pin jumper that enables the onboard VGA.

VGA Disable	J16 Setting
Enable onboard VGA (factory setting)	OPEN
Disable onboard VGA	Short

J17 Interrupt Disable J17 is a 2-pin jumper that enables the VGA interrupt.

VGA Interrupt Disable	J17 Setting
Disable VGA interrupt (factory setting)	Short
Enable VGA interrupt	OPEN

Step 4 Install Memory

System Memory System memory for the Megaplex is mounted on the Series 769 CPU board, which supports up to 4 GB of system memory, and the Series 777 memory card, which supports an additional 4 GB of system memory. Use 60/50 ns x 72 EDO Mode 3.3V 168-pin ECC buffered memory module DIMMs (Dual Inline Memory Modules).

The DIMMs in Megaplex are different from the x 36 SIMMs used by most other motherboards. The Megaplex memory modules are a new JEDEC-standard defined for 8-byte wide common CAS memory supported by most memory manufacturers. Computers that require a large amount of memory (such as servers) use DIMMs.

System Memory Requirements You must install DIMMs in all four slots of a bank. The eight memory banks are Bank0, Bank1, Bank2, and Bank3 on the CPU board, and Bank4, Bank5, Bank6, and Bank7 on the memory expansion board. Each bank of memory has four DIMM sockets.

Within a memory bank, all system memory must be of the same type. Mixing different types of DIMMs is not permitted.

All memory banks must have the same type and size DIMMs. Mixing different types of DIMMs is not permitted.

Rules for ABP and C2C Memory banks can be populated on either Series 769 or the memory expansion card. If you distribute memory between the CPU board, and the memory board, you can use ABP (Address bit permuting) and C2C (Card-to-card interleave) to improve system performance.

Cont'd

For 2-bank ABP If the memory card is not participating:

- both banks must be populated consecutively starting from Bank0, and
- both banks must have the same size and type of memory.

If the memory card is present, the memory on the card must meet the same requirements as on the CPU board.

For 4-bank ABP If the memory card is not participating:

- all four banks must be populated consecutively starting from Bank0, and
- all four banks must have the same size and type of memory.

If the memory card is present, the memory on the card must meet the same requirements as on the CPU board.

For 2-bank ABP and C2C

- Memory on both the CPU board and the memory card must meet 2-bank ABP requirements,
- both the CPU board and the memory card must have the same size and type of memory, and
- memory on the memory card should be populated in the same position as the CPU board.

For 4-bank ABP and C2C

- Memory on both the CPU board and the memory card should meet 4-bank ABP requirements, and
- both the CPU board and the memory card must have the same size and type of memory.

Note: If you do not plan to use the memory expansion card, you **must** terminate the memory expansion slot using a Series 778 memory terminator card. However, if you do this, the size of the system memory is limited to 4 GB. You can store the memory expansion card for future use.

Cont'd

System Memory Specifications

Item	Description
General	3.3 volt, 168 pin, x 72, ECC DIMM (Dual Inline Memory Module) buffered memory module, EDO 50/60 ns RAS Access Time.
Voltage	The memory chips used on the module must be 3.3 volt parts.
Pinout	The module pinout is 168 pin (instead of 72 pins on SIMMs).
Data Bits	The memory modules are 72 data bit modules
No ECC	It is "raw" single CAS DRAM. There is NO ECC logic on the memory module. ECC (Error Correction Code) is implemented in the motherboard chipset. ECC does not require parity chips.
Buffers	3.3V volt buffers (typically 163244 or 16244LVT) are used to buffer the CAS, Address lines, and Write enables. The x 72 ECC modules are buffered. The Megaplex memory card cannot use unbuffered memory modules.
Mode	Buffered EDO memory. Fast Page Mode is not supported.
DIMM Types	2 MBx72, 4 MBx72, 8 MBx72, 16 MBx72, and 32 MBx72.
Speed	60 ns/50 ns

Maximum Memory Up to 32 DIMMs can be installed to provide up to 8 GB of system memory. The minimum memory configuration should be four 2 MB x 72 DIMMs (64 MB of system memory) installed in bank0. You cannot mix memory types within a memory bank.

Cont'd

DRAM Specifications The total amount of system memory is automatically detected by AMIBIOS. System memory is always four-way interleaved.

DRAM system memory must be populated one bank at a time. All DIMMs in a bank must be of the same memory type. Each socket can hold one DIMM. You can use:

- 2 M x 72,
- 4 M x 72,
- 8 M x 72,
- 16 M x 72, or
- 32 M x 72 DIMMs.

Note: "M" in the above list stands for megabits.

Memory Display System memory is reported by AMIBIOS as it boots and again when the AMIBIOS System Configuration Screen is displayed just before the operating system boots. The memory displayed by AMIBIOS on the System Configuration Screen is 384 KB less than the total memory installed.

Cont'd

DRAM Configurations On the CPU board, the following configurations can be used:

Bank0	Bank1	Bank2	Bank3	Total
2M	None	None	None	64 M
2 M	2 M	None	None	128 M
2 M	2 M	2 M	None	192 M
2 M	2 M	2 M	2 M	256 M
4 M	None	None	None	128 M
4 M	4 M	None	None	256 M
4 M	4 M	4 M	None	384 M
4 M	4 M	4 M	4 M	512 M
8 M	None	None	None	256 M
8 M	8 M	None	None	512 M
8 M	8 M	8 M	None	768 M
8 M	8 M	8 M	8 M	1 G
16 M	None	None	None	512 M
16 M	None	None	None	1 G
16 M	16 M	16 M	None	1.5 G
16 M	16 M	16 M	16 M	2 G
32 M	None	None	None	1 G
32 M	32 M	None	None	2 G
32 M	32 M	32 M	None	3 G
32 M	32 M	32 M	32 M	4 G

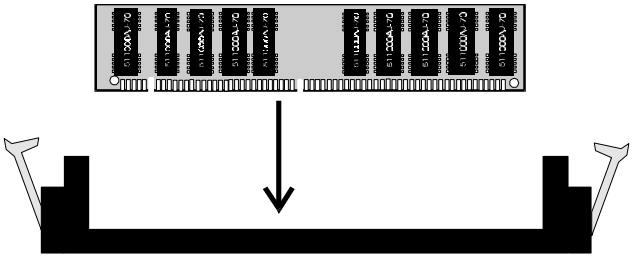
You can populate the memory module in a similar way. There is no restriction to the sequence in which the banks are populated (in the table above, a sequence has been followed due to space restrictions), but to take advantage of ABP and C2C, you must follow the rules previously mentioned.

Note: "M" in the above table stands for megabits.

Cont'd

Installing DIMMs The Series 777 Memory Card and Series 769 have 16 x 72 DIMM sockets. These sockets can be filled with either 2 MB x 72, 4 MB x 72, 8 MB x 72, 16 MB x 72, or 32 MB x 72 DIMMs.

Place the Memory Card on an anti-static mat. Each DIMM socket has a latch on either end. You cannot open all the latches at one time, so open one column at a time, install a DIMM, and then open the second column. With the component side of the DIMM facing you, insert the DIMM into the socket and secure the latches on either end of the DIMM, as shown below:



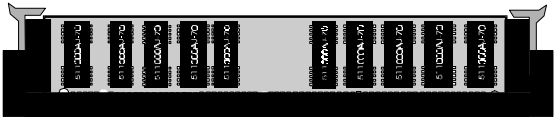
Populate the CPU board the same way. If you do not use the memory card, populate only the CPU board.

50 ns DRAM If using 50 ns DRAM, you must set the following jumpers on both the Series 769 CPU board, and the Series 777 memory board:

Board	Jumper	
769 CPU Board	J8	Select DRAM Speed. J8 is a two-pin berg. Short 50 ns EDO DRAM OPEN 60 ns EDO DRAM (factory setting)
777 Memory board	J2	Select DRAM Speed. J2 is a two-pin berg Short 50 ns EDO DRAM OPEN 60 ns EDO DRAM (factory setting)

Cont'd

DIMM with Latches Secured



Install Memory Card Insert the Memory Card in the motherboard **after** you install the motherboard in the computer case (see Step 5 on the following page).

Step 5 Install Motherboard

The motherboard mounting hole pattern is custom made. The chassis manufacturer should supply standoffs, and screws. The hole pattern on the chassis should match the pattern on the board.

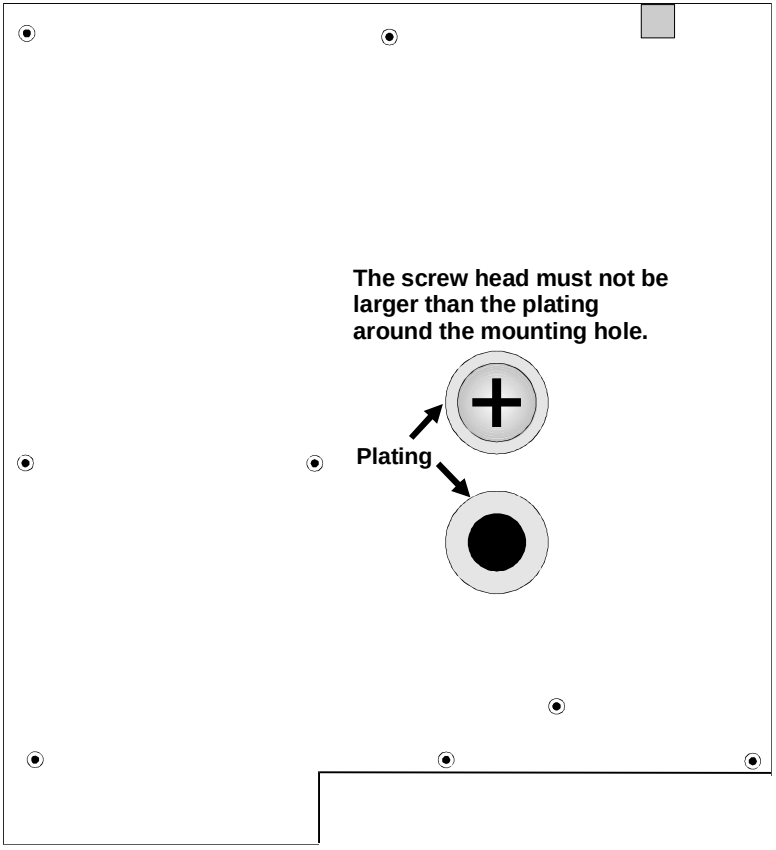
Step	Action
1	Place the chassis on an anti-static mat. Connect the chassis to ground to avoid static damage during installation. Connect an alligator clip with a wire lead to any unpainted part of the chassis. Ground the other end of the lead at the same point as the mat and the wristband.
2	Carefully slide the CPU board (Series 769) into the chassis. The motherboard should rest level with the chassis.
3	Align the mounting holes on the CPU board with the holes on the chassis. Place the mounting screws in the holes provided and tighten them.
4	Mount the memory card (if being used) in the memory card socket.
5	With extreme caution, place the I/O board in the cabinet so that the connector on the solder side of the board (J999) mates with the edge connector (J10) on the CPU board. Press the boards together to make a firm connection. **Warning:** If the boards do not mate properly before they are pressed together, the connector J999 on the I/O board can be severely damaged.
6	Repeat step 3 for the I/O board.

Note: The memory connector (J1) on the CPU board must be occupied. If the Series 777 memory card is not used, the connector must be terminated by a Series 778 memory termination card. If the card in J1 is not inserted properly or is uninstalled, a red LED (J4) lights up as a warning sign, when the board is powered.

Cont'd

Warning

If using metallic screws, make sure you use them only in the plated mounting holes. If using metallic screws, make sure the head of the screw fits completely inside the plated mounting holes. See the following graphic.



Note: The drawing above is only for illustration and does not show the exact position of the mounting holes.

Step 6 Connect Power Supply

The Megaplex motherboard is designed to fit in a custom-built chassis. The Megaplex requires four ATX-style power connectors. Make sure that the power switch is Off before assembly. Before attaching all components, make sure that the proper voltage has been selected. Power supplies often can run on a wide range of voltages and must be set (usually via a switch) to the proper range.

ATXPS Power Connectors Attach the power supply cables to the ATXPS power connectors on the motherboard, and the memory card.

Pin	Signal Description	Pin	Signal Description
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PSON (not used by the Megaplex. The power supply must turn on without these signals).
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	PowerGood	18	-5V
9	5VSB (not used by Megaplex)	19	+5V
10	+12V	20	+5V

Cont'd

Power Requirements At a minimum, one 800 watt power supply generating 95 amps at +5V and 62 amps at +3.3V must be used. A 1000 watt power supply generating 100 amps at +5V, 65 amps at 3.3V, and 20 amps at +12V is recommended.

+5 Volt Requirements The CPU board has the following +5V power requirements:

- the CPU requirement is 53 amps (approximately 14 amps per CPU), and
- the other logic requires 6 amps.

The I/O board has the following +5.5V requirements:

- the onboard logic requires 11 amps, and
- the PCI cards require 24 amps (two amps per slot).

No 5V power is used for the memory board. The total power requirement is 94 amps. Add the power requirements for all adapter cards and CPUs, all hard drives, CD-ROM drives, SCSI drives, and floppy drives. See the drive power specifications for all peripheral devices attached to the computer.

+3.3 Volt Requirements The CPU board has the following +3.3V requirements:

- the DIMMs require 24 amps (approximately 1.5 amps per DIMM), and
- the other logic requires one amp.

The I/O board has the following +3.3V requirements:

- the onboard PCI logic requires 12 amps.

The memory board has the following +3.3V requirements:

- the DIMMs require 24 amps (approximately 1.5 amps per DIMM), and
- the other logic requires one amp.

The total power requirement is 62 amps.

Cont'd

+12 Volt Requirements The Megaplex motherboard and CPU fans only use one amp at +12 volts. But the AT power supply specifications require that a +12 volt line must be available for peripheral devices, hard disk drives, and adapter cards. The +12V load depends on the +12 volt requirements of the drives and adapter cards installed in the computer. We recommend 20 amps at +12 volts.

-12V and -5V Requirements 1 amp each should be more than enough.

Cooling Requirements Each CPU dissipates 50 watts of power. To maintain a junction temperature of less than 158° F (70° C), adequate cooling must be provided.

AMI provides custom-made heatsinks for the Pentium II Xeon CPU. The CPU requires cooling by convection. To maintain a safe operating temperature, the cooling fans must provide a minimum airflow of 120 lfm horizontally over the CPUs, though an airflow of 150 lfm is recommended. It is also recommended that the I/O board receive the same amount of airflow to dissipate the heat generated by the expansion cards.

Note: If you plan to use different heatsinks, you must provide adequate airflow over the heatsinks to maintain a safe operating temperature.

Step 7 Attach Connectors

Connectors The Megaplex motherboard connectors are listed below:

Number	Connector	Turn to
J1	3.3V External battery	page 31
J11	KBD / PS2 mouse	page 33
J13	Serial port 1 & 2	page 33
J33, J34	USB port 1 & 2	page 34
J15	Parallel port and VGA	page 34, 40
J14	Floppy	page 35
J10	Primary IDE	page 38
J9	Secondary IDE	page 38
J8	IDE activity	page 39
J31	Turbo LED	page 40
J32	External reset	page 40
J35	Keyboard lock	page 41
J38	Speaker	page 41
J21	Chassis intrusion	page 41
J28	Chassis fan header	page 42
J41	I2C chassis connection	page 42
J23	MegaRAC connector	page 43

Cable Connector Ends When connecting chassis connectors to the motherboard, make sure to connect the correct connector end. Most connector wires are color-coded. Match the color of the wires leaving the switch or LED to the same pin on the connector end. There may be more than one connector with the same color-coded wires. If so, follow the wire to the switch or LED. All motherboard components are outlined by a white rectangular box with a broad arrow at one end. Pin 1 is always at the arrow end of the white outlined box.

Cont'd

Connectors When connecting chassis connectors to the motherboard, make sure to connect the correct connector end. Most connector wires are color-coded. Match the color of the wires leaving the switch or LED to the same pin on the connector end. There may be more than one connector with the same color-coded wires. If so, follow the wire to the switch or LED. Pin 1 is always indicated by an arrow, as shown below:

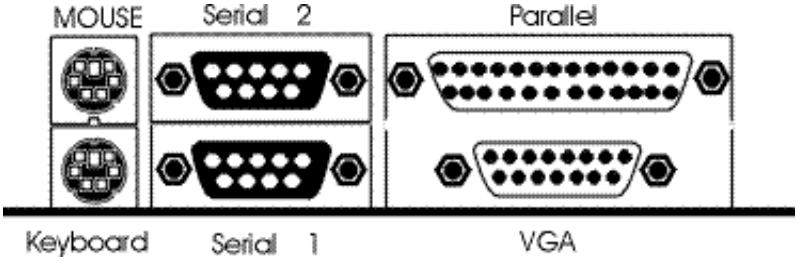
J1 3.3V External battery connector J1 is a 4-pin berg used for external battery connections. The pinout is:

Pin	Description
1	+3.3V
2	Not connected
3	GND
4	GND

Cont'd

Onboard Adapters The Megaplex I/O connector block at the back of the motherboard includes:

- a standard PS/2 mouse connector,
- a standard PS/2 keyboard connector,
- two serial ports,
- a parallel port, and
- onboard VGA controller connector.



Additional I/O Connectors The Megaplex also has:

- an IDE controller on the ISA bus (J9 and 10 are IDE connectors),
- two USB ports, and
- a floppy connector (J14).

Conflicts AMIBIOS minimizes conflicts between onboard and offboard I/O devices. AMIBIOS automatically checks the adapter cards installed in the expansion slots on the Megaplex motherboard for a hard disk or floppy controller and serial or parallel ports.

Cont'd

PS/2 Mouse Connector The PS/2 mouse 6-pin miniDIN connector is on top of the PS/2 miniDIN keyboard connector in the I/O connector block (shown above). The pinout is:

Pin	Signal Description
1	Mouse Data
2	N/C
3	GND
4	VCC
5	Mouse Clock
6	N/C

PS/2 Keyboard Connector The keyboard 6-pin miniDIN connector is below the mouse connector on the connector I/O block shown on the previous page. The pinout is:

Pin	Signal Description
1	Keyboard Data
2	N/C
3	GND
4	VCC
5	Keyboard Clock
6	N/C

Serial Connectors J13 includes two standard 9-pin D-type connectors are in the I/O connector block. The serial port base I/O port address and other settings can be selected in Peripheral Setup in AMIBIOS Setup. The serial connector pinout is:

Pin	Signal Description	Pin	Signal Description
1	Carrier Detect	6	Data Set Ready
2	Receive Data	7	Request to Send
3	Transmit Data	8	Clear to Send
4	Data Terminal Ready	9	Ring Indicator
5	GND		

Cont'd

USB Connectors J33 and J34 J33 and J34 are 4-pin berg connectors that connect by cable to the USB connectors mounted on the rear of the cabinet. The pinout is:

Pin	Signal Description
1	+5 Volt VCC
2	Data -
3	Data +
4	GND

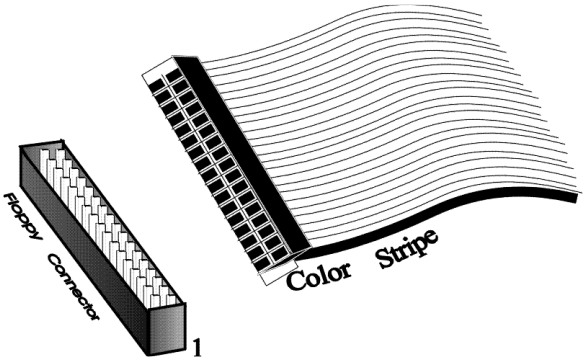
J15 Parallel Port Connector J15 includes a standard 26-pin parallel port connector and a VGA connector in the I/O block connector. The parallel pinout is shown below. Parallel port settings can be configured in Peripheral Setup in AMIBIOS Setup.

Pin	Signal Description	Pin	Signal Description
1	STROBE#	2	PD0
3	PD1	4	PD2
5	PD3	6	PD4
7	PD5	8	PD6
9	PD7	10	ACK#
11	BUSY	12	PE
13	SLCT	14	AUTOFD#
15	ERROR#	16	INIT#
17	SLCTIN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND		

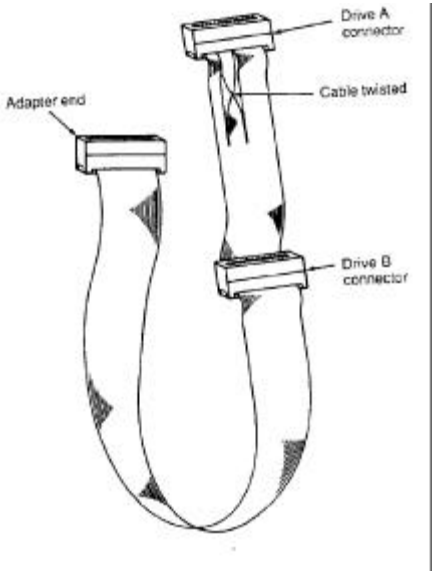
Cont'd

J14 Floppy

J14 is a 34-pin dual-inline shrouded connection. Connect the cable from the floppy drive to J14, as shown below. Choose Standard Setup and Peripheral Setup to configure the floppy controller.



The motherboard supports up to two 720 KB, 1.44 MB, or 2.88 MB 3½" drives and 360 KB and 1.2 MB 5¼" drives. The connecting cable is a 34-pin ribbon connector with two 34-pin edge connectors for attaching the floppy disk drives. There is a small twist in the cable between the floppy connectors. The last (end) connector should be connected to floppy drive A: as shown below.



J14 Floppy Connector Pinout

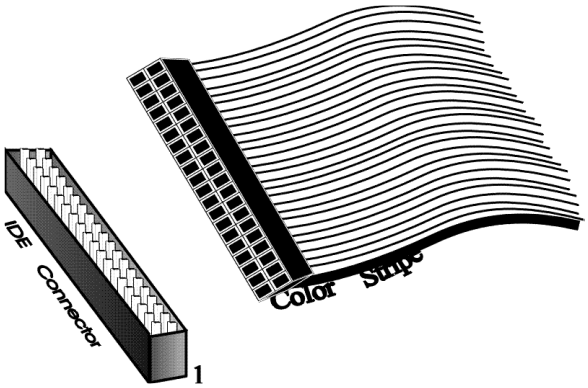
Pin	Use	Pin	Use
1	GND	2	DENSE1
3	GND	4	N/C
5	GND	6	DRATE0
7	GND	8	-INDEX
9	GND	10	-MOTOR0
11	GND	12	-FDSEL1
13	GND	14	-FDSEL0
15	GND	16	-MOTOR1
17	GND	18	DIR
19	GND	20	-
21	GND	22	-WDATA
23	GND	24	-WGATE
25	GND	26	-TRK0
27	GND	28	-WRPROT
29	GND	30	-RDATA
31	GND	32	HDSEL
33	GND	34	DSKCHNG

Twist in Floppy Cable

Floppy B to A	Floppy B to A	Floppy B to A	Floppy B to A
10 to 16	12 to 14	14 to 12	16 to 10
11 to 15	13 to 13	15 to 11	

Cont'd

Attach IDE Cable J9 and J10 are the IDE (Integrated Drive Electronics) hard disk drive connectors. The primary master and the primary slave IDE drives are connected by cable to J10, as shown below.



J10 is a 40-pin dual-inline shrouded connector that connects an ATA IDE drive to the primary onboard IDE connector. This motherboard supports IDE Mode 0 and LBA (Logical Block Address) mode, high capacity drives (over 528 MB), 32-bit data transfer, and fast IDE transfer. These IDE features are configured in Peripheral Setup in the AMIBIOS Setup utility. Disable the onboard IDE interface in Peripheral Setup to use an ISA ESDI, RLL, MFM, or SCSI hard disk drive.

J9 is similar to J10 and can be used as an additional IDE connector.

Cont'd

J9 and J10 Pinout The J9 and J10 pinout is:

Pin	Use	Pin	Use
1	-RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	KEY (N/C)
21	N/C	22	GND
23	-IOW	24	GND
25	-IOR	26	GND
27	IDERDY	28	ALE
29	N/C	30	GND
31	INT14	32	-IOCS16
33	HA1	34	N/C
35	HA0	36	HA2
37	-CS0	38	-CS1
39	-IDEACT	40	GND

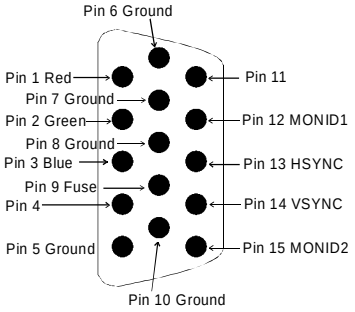
J8 IDE Indicator LED J8 is a two-pin berg that is attached via a cable to the externally-mounted IDE Activity LED. This LED lights when the IDE drive is running. Pin 1 is Anode. Pin 2 is Ground.

Warning

In some IDE drives, you may have to disable the IDE LED mounted on the drive by changing a jumper or setting a switch on the IDE drive itself, before the IDE drive sends a signal to this berg.

Cont'd

J15 VGA Connector J15 is a standard DB15 VGA connector for the onboard ATI Rage II PCI VGA controller is in the I/O connector block. The onboard VGA is enabled by default. You can disable the onboard VGA by placing a jumper on J23. Connect a VGA monitor to this connector via a standard VGA cable. The pinout for the standard female DB15 VGA connector is shown below:



Standard VGA Female Connector

J31 Turbo LED J31, Turbo LED (light-emitting diode) is not connected.

J32 External Reset J32 is a two-pin single-inline berg that is attached via a cable to an externally-mounted reset switch. When the reset switch is pressed, the system performs a hard reset. Pin 2 is Ground and Pin 1 is Hard Reset.

Cont'd

J35 Keyboard Lock J35 is a five-pin single-inline berg that is attached via a cable to the keyboard lock connector. The computer chassis may not include the keyboard lock and Power LED on a single connector. The keyboard lock allows you to lock the keyboard.

Pin	Description
1	LED power
2	LED power
3	GND
4	Keyboard Lock
5	GND

J38 Speaker Connector J38 is a four-pin single-inline berg attached via a cable to a standard system speaker. AMIBIOS signals hardware problems through the speaker.

Pin	Description
1	Data Out
2	GND
3	N/C
4	GND

J21 Chassis Intrusion Connector J21 is a 2-pin berg which should be connected by a cable to a NC (Normally Closed) switch on the chassis. The internal circuitry, when activated, monitors the state of the chassis, and informs the administrator if the chassis is opened.

Cont'd

J41 LCD Panel I2C header J41 is a 4-pin berg connector connected by a cable to the LCD panel on the chassis. The system communicates to the I2C device on the LCD panel through this connector. The pinout is:

Pin	Description
1	I2C Clock
2	GND
3	I2C Data
4	GND

J28 Chassis Fan Header J28 is a 26-pin dual-in-line berg connected by a cable to the chassis fans, and the external battery backup. The internal circuitry monitors the state of the chassis cooling fans, and the battery, and informs the administrator of any failure. The +12V pins supply power to the fans, while the fan pins read the tachometer lines of their respective fans. Up to eight fans can be monitored at a time. The J28 pinout is:

Pin	Description	Pin	Description
1	Fan 0	2	GND
3	Fan 1	4	GND
5	Fan 2	6	GND
7	Fan 3	8	GND
9	Fan 4	10	GND
11	Fan 5	12	GND
13	Fan 6	14	External battery (+)
15	External battery (+)	16	+12V
17	+12V	18	+12V
19	GND	20	+12V
21	+12V	22	+12V
23	GND	24	+12V
25	Fan 7	26	+12V

Cont'd

J23 MegaRAC Connector J23 is a shrouded 20-pin connector connected by a cable to the RAC (Remote Access Control) expansion card. The administrator can remotely control the system, if the RAC is implemented. This connector is custom made for the AMI MegaRAC card. The pinout is:

Pin	Description	Pin	Description
1	SMI	2	I2C clock
3	Not connected	4	GND
5	Not connected	6	I2C data
7	Not connected	8	Not connected
9	Not connected	10	Not connected
11	Reset	12	GND
13	GND	14	Not connected
15	Not connected	16	GND
17	Not connected	18	Not connected
19	Not connected	20	GND

Step 8 Test and Configure

Review the following points before powering up:

- make sure that all adapter cards are seated properly,
- make sure all connectors are properly installed,
- make sure the CPU is seated properly,
- make sure there are no screws or other foreign material on the motherboard,
- plug the system into a surge-protected power strip, and
- make sure blank back panels are installed on the back of the chassis to minimize RF emissions.

Start the Test Plug everything in and turn on the switch. If there are any signs of a problem, turn off the unit immediately. Reinstall the connectors. Call Technical Support if there are problems.

BIOS Errors If the system operates normally, a display should appear on the monitor. The BIOS Power On Self Test (POST) should execute.

If POST does not run successfully, it will beep or display error messages. Beeps indicate a serious problem with the system configuration or hardware. The Beep Code indicates the problem. AMIBIOS Beep Codes are defined in *the AMIBIOS Technical Reference.* Make sure the affected part is properly seated and connected. An error message is displayed if the error is less serious. Recheck the system configuration or the connections.

Configure the System Run AMIBIOS Setup. Load the Optimal settings. Enter the requested information and save the configuration data in NVRAM (Non-Volatile Random Access Memory (also called CMOS RAM). The system will then reset, run POST, and boot the operating system. See page 47 for information on configuring the computer.

2 AMIBIOS® Setup

In ISA computers, the system parameters (such as amount of memory, type of disk drives and video displays, and many other elements) are stored in CMOS RAM. Unlike the DRAM (dynamic random access memory) that is used for standard system memory, CMOS RAM requires very little power. When the computer is turned off, a back-up battery provides power to CMOS RAM, which retains the system parameters. Every time the computer is powered-on, the computer is configured with the values stored in CMOS RAM by the system BIOS, which gains control when the computer is powered on.

The system parameters are configured by a system BIOS Setup utility. Historically, BIOS Setup utilities have been character-based, required keyboard input, and have had user interfaces that were not very intuitive.

System Initialization Depending on the size of system memory, the BIOS can take up to eight minutes to initialize system memory. The system memory must be initialized to support ECC (error correction.) If you enable Quickboot or press the escape (Esc) key, BIOS will display the installed memory and it will take the following amount of time to initialize system memory:

- 15 – 20 seconds for 512 MB,
- 45 – 60 seconds for 1 GB,
- 2:00 – 2:30 minutes for 2 GB,
- 4 minutes for 4 GB, and
- 8 minutes for 8 GB.

If you press the Delete key during this time, BIOS will go immediately into setup. If you want a normal boot, wait the complete time for the system memory to initialize.

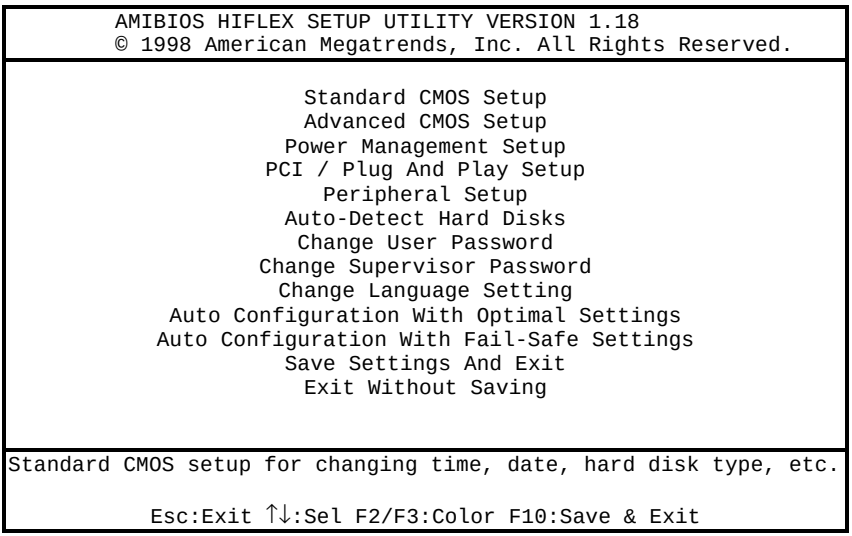
Starting AMIBIOS Setup As POST executes, the following appears:

```
Hit DEL if you want to run SETUP
```

Press Delete to run AMIBIOS Setup.

AMIBIOS Setup Menu

The AMIBIOS Setup main menu appears as follows. Each menu item is described in this chapter.



Section 1 Standard Setup

Choose Standard CMOS Setup from the AMIBIOS Setup main menu. All Standard Setup options are described in this section. The Standard CMOS Setup screen is shown below.

```
                AMIBIOS SETUP-STANDARD CMOS SETUP
      (C)1998 American Megatrends, Inc. All Rights Reserved

Date (mm/dd/yyyy): Tue Sep 1,1998            Base Memory: 640 KB
Time (hh/mm/ss) : 16:05:13                   Extd Memory: 255 KB

Floppy Drive A: 1.44MB 3½
Floppy Drive B: Not Installed

                                                 LBA  Blk  PIO 32Bit
                Type Size Cyln Head Wpcom Sec Mode Mode Mode Mode

Pri Master: Auto  42   40  981   5    981  17  Off  Off  Auto  On

Pri Slave: Not Installed

Sec Master: Not Installed

Sec Slave: Not Installed

Boot Sector Virus Protection Disabled

Month:  Jan – Dec                            ESC:Exit    ↑↓:Sel
Day:    01 – 31                              PgUp/PgDn:Modify
Year:   1901 – 2099                          F2/F3:Color
```

Date/Time

Select Standard CMOS Setup from the AMIBIOS Setup main menu. Highlight Date or Time using the arrow keys. Enter new values through the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in MM/DD/YYYY format. The time is entered in HH:MM:SS format. The time is in 24-hour format, also. For example, 5:30 a.m. appears as 05:30:00, and 5:30 p.m. as 17:30:00.

Press <PgUp> or <PgDn> after you have selected an option to display the complete list of valid setting in the bottom section of the screen. For example, when the cursor is in the Date field, the options for month, day, and year display, as seen in the screen above.

Cont'd

Floppy Drive A: and B: Move the cursor to these fields via ↑ and ↓ and select the floppy type. The settings are *360 KB 5¼ inch*, *1.2 MB 5¼ inch*, *720 KB 3½ inch*, or *1.44 MB 3½ inch.*

Boot Sector Virus Protection This option is near the bottom of the Standard Setup screen. The settings are *Enabled* or *Disabled.* Choose *Enabled* to enable boot sector protection. AMIBIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. If enabled, the following appears when a write is attempted to the boot sector. You may have to type *N* several times to prevent the boot sector write.

```
Boot Sector Write!!!
Possible VIRUS: Continue (Y/N)? _
```

The following appears after any attempt to format any cylinder, head, or sector of any hard disk drive via the BIOS INT 13 Hard Disk Drive Service:

```
Format!!!
Possible VIRUS: Continue (Y/N)? _
```

Cont'd

Primary Master, Primary Slave, Secondary Master, Secondary Slave

Select one of these hard disk drives to configure the hard disk drive named in the option. Press ENTER to autodetect. The settings for each of these drives are:

Setting	How to Configure
1 – 46 Predefined types	If you are configuring an old MFM drive and you know the drive type, select the correct drive type between 1 – 46.
USER: Enter parameters manually	If you are installing an old MFM drive and you do not know the drive type or the drive parameters do not match the drive parameters for types 1 – 46, enter the correct hard disk drive parameters.
AUTO: Set parameters automatically on each boot	Select *Auto* to let AMIBIOS determine the parameters. Click on OK when AMIBIOS displays the drive parameters. You can also change these parameters if you do not think AMIBIOS detected the drive parameters correctly or if you want to enable an enhanced IDE feature. You can modify these parameters as follows: Select *LBA/Large Mode*. Select *On* if the drive has a capacity greater than 540 MB. Select *Block Mode*. Select *On* to allow block mode data transfers. Select *32-Bit Mode*. Select *On* to allow 32-bit data transfers. Select the *PIO Mode*. It is best to select *Auto* to allow AMIBIOS to determine the PIO mode. If you select a PIO mode that is not supported by the IDE drive, the drive will not work properly. If you are absolutely certain that you know the drive's PIO mode, select PIO mode 0 - 5, as appropriate.
CDROM: Use for ATAPI CDROM drives	Select *CDROM* if configuring an ATAPI drive. AMIBIOS displays the drive parameters.
ARMD: Use for LS120, MO, Iomega Zip drives	Select this setting if you are configuring an LS120, MO (Magneto-Optical), or Iomega Zip drive.

Cont'd

Entering Drive Parameters You can also enter the hard disk drive parameters. The drive parameters are:

Parameter	Description
Type	The number for a drive with certain identification parameters.
Size	The formatted size of the drive is the number of heads times the number of cylinders times the number of sectors per track times 512 (bytes per sector).
Cylinders	The number of cylinders in the disk drive.
Heads	The number of heads.
Write Precompensation	The actual physical size of a sector gets progressively smaller as the track diameter diminishes. Yet each sector must still hold 512 bytes. Write precompensation circuitry on the hard disk compensates for the physical difference in sector size by boosting the write current for sectors on inner tracks. This parameter is the track number on the disk surface where write precompensation begins.
Landing Zone	This number is the cylinder location where the heads normally park when the system is shut down.
Sectors	The number of sectors per track. MFM drives have 17 sectors per track. RLL drives have 26 sectors per track. ESDI drives have 34 sectors per track. SCSI and IDE drives have even more sectors per track.
LBA Mode	LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 8.4GB.
Blk Mode	Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
PIO Mode	IDE PIO mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.
32Bit Mode	Hard disk drives connected to the computer via the ISA bus transfer data 16 bits at a time. An IDE drive on the PCI bus or VL-Bus can use a 32-bit data path.

Cont'd

Hard Disk Drive Types

Type	Cylinders	Heads	Write Precompensation	Landing Zone	Sectors	Size
1	306	4	128	305	17	10 MB
2	615	4	300	615	17	20 MB
3	615	6	300	615	17	31 MB
4	940	8	512	940	17	62 MB
5	940	6	512	940	17	47 MB
6	615	4	65535	615	17	20 MB
7	462	8	256	511	17	31 MB
8	733	5	65535	733	17	30 MB
9	900	15	65535	901	17	112 MB
10	820	3	65535	820	17	20 MB
11	855	5	65535	855	17	35 MB
12	855	7	65535	855	17	50 MB
13	306	8	128	319	17	20 MB
14	733	7	65535	733	17	43 MB
16	612	4	0	663	17	20 MB
17	977	5	300	977	17	41 MB
18	977	7	65535	977	17	57 MB
19	1024	7	512	1023	17	60 MB
20	733	5	300	732	17	30 MB
21	733	7	300	732	17	43 MB
22	733	5	300	733	17	30 MB
23	306	4	0	336	17	10 MB
24	925	7	0	925	17	54 MB
25	925	9	65535	925	17	69 MB
26	754	7	754	754	17	44 MB
27	754	11	65535	754	17	69 MB
28	699	7	256	699	17	41 MB
29	823	10	65535	823	17	68 MB
30	918	7	918	918	17	53 MB
31	1024	11	65535	1024	17	94 MB
32	1024	15	65535	1024	17	128 MB
33	1024	5	1024	1024	17	43 MB
34	612	2	128	612	17	10 MB
35	1024	9	65535	1024	17	77 MB
36	1024	8	512	1024	17	68 MB
37	615	8	128	615	17	41 MB
38	987	3	987	987	17	25 MB
39	987	7	987	987	17	57 MB
40	820	6	820	820	17	41 MB
41	977	5	977	977	17	41 MB
42	981	5	981	981	17	41 MB
43	830	7	512	830	17	48 MB
44	830	10	65535	830	17	69 MB
45	917	15	65535	918	17	114 MB
46	1224	15	65535	1223	17	152 MB
	AMIBIOS automatically sets IDE drive parameters. Select USER to enter MFM, ESDI, or RLL drive parameters. Select Not Installed for SCSI drives. Select CDROM for CD-ROM drives.					

Section 2 Advanced CMOS Setup

Choose Advanced CMOS Setup from the AMIBIOS Setup main menu. Advanced CMOS Setup options are displayed by highlighting the option using the arrow keys. All Advanced CMOS Setup options are described in this section.

Primary Display This option configures the type of monitor attached to the computer. The settings are *Absent, VGA/EGA, CGA40x25, CGA80x25,* or *Mono*. The Optimal and Fail-Safe default settings are *VGA/EGA.*

PS/2Mouse Support Set this option to *Enabled* to enable AMIBIOS support for a PS/2-type mouse. The settings are *Enabled* or *Disabled.* If IRQ12 is required to be free for PCI cards, then you must disable this option. If you disable this option, you cannot use a PS/2-type mouse. The Optimal and Fail-Safe default settings are *Enabled.*

Display BIOS P.O.S.T. Messages Set this option to display BIOS messages during the Power On Self Test. The settings are *Yes* or *No*. The Optimal and Fail-Safe default settings are *Yes*.

Display Add-On ROM Messages Set this option to display messages when you add an optional ROM. The settings are *Yes* or *No*. The Optimal and Fail-Safe default settings are *Yes*.

Pause-On Configuration Screen Set this option to pause at the configuration screen during setup. The settings are *Disabled, 1 sec, 2 sec, 3 sec, 4 sec, 5 sec, 6 sec, 7 sec, 8 sec, 9 sec,* or *10 sec.* The Optimal and Fail-Safe default settings are *10 sec.*

BootUp Num Lock Set this option to *On* to turn the Num Lock key On at system boot. The settings are *On* or *Off.* The Optimal and Fail-Safe default settings are *On.*

Cont'd

Password Check This option enables the password check option every time the system boots or the end user runs Setup. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if AMIBIOS is executed. See page 72 for instructions on changing a password. The Optimal and Power-On defaults are *Setup.*

MPS Mode Select 1.4 to boot to SCO UNIX 5.0/5.04, Novell 5.0, Windows NT 3.5/4.0/5.0, and OS/2 Advanced Server Version 4. Select 1.1 to boot to Unix Ware Version 7. The Optimal and Fail-Safe default settings are *1.4.*

Boot to Novell 4.X Select *Yes* to boot to Novell 3.X or 4.X. The Optimal and Fail-Safe settings are *No*.

Boot To OS/2 Set this option to *Yes* if running OS/2 operating system and using more than 64 MB of system memory on the motherboard. The settings are *Yes* or *No*. The Optimal and Fail-Safe default settings are *No.*

S.M.A.R.T. for Hard Disks Set this option to *Enabled* to permit AMIBIOS to use the SMART (Self Monitoring Analysis and Reporting Technology) protocol for reporting server system information over a network. The settings are *Enabled* or *Disabled*. The Optimal and Fail-Safe default settings are *Disabled*.

Quick Boot Set this option to *Enabled* to instruct AMIBIOS to boot quickly when the computer is powered on. The settings are *Disabled* or *Enabled*. If Quickboot is enabled, BIOS will not test the system memory; memory will be initialized only. The Optimal and Fail-Safe default settings are *Disabled.*

Cont'd

1st Boot Device This option sets the type of device for the first boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *Disabled, SCSI, NETWORK, Floppy, ARMD-FDD, ARMD-HDD, ATAPI CDROM, I2O, 1st IDE-HDD, 2nd IDE-HDD, 3rd IDE HDD,* or *4th IDE-HDD.* The default setting is *Floppy*. The Optimal and Fail-Safe default settings are *Floppy.*

2nd Boot Device This option sets the type of device for the second boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *Disabled, SCSI, Floppy, ARMD-FDD, ARMD-HDD, ATAPI CDROM, 1st IDE-HDD, 2nd IDE-HDD, 3rd IDE HDD,* or *4th IDE-HDD.* The default setting is *Disabled*. The Optimal and Fail-Safe default settings are *1st IDE.*

3rd Boot Device This option sets the type of device for the third boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *Disabled, Floppy, ARMD-FDD, ARMD-HDD, ATAPI CDROM, 1st IDE-HDD, 2nd IDE-HDD, 3rd IDE HDD,* or *4th IDE-HDD.* The default setting is *Disabled*. The Optimal and Fail-Safe default settings are *SCSI.*

4th Boot Device This option sets the type of device for the fourth boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *Disabled, Floppy, ARMD-FDD, ARMD-HDD, ATAPI CDROM, 1st IDE-HDD, 2nd IDE-HDD, 3rd IDE HDD,* or *4th IDE-HDD.* The default setting is *Disabled*. The Optimal and Fail-Safe default settings are *Disabled.*

Cont'd

Try Other Boot Devices Set this option to *Yes* to instruct AMIBIOS to attempt to boot from any other drive in the system if it cannot find a boot drive among the drives specified in the **1st Boot Device, 2nd Boot Device, 3rd Boot Device,** and **4th Boot Device** options. The settings are *Yes* or *No.* The Optimal and Fail-Safe default settings are *No.*

Cache Bus ECC The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe settings are *Enabled.*

Watch Dog Timer Set this option to *Enabled* to use the watch dog timer. If you enable the watch dog timer, the system will automatically reboot if the hardware detects no bus activity for approximately 1.2 seconds. The Optimal and Fail-Safe settings are *Disabled.*

Internal Cache This option sets the type of caching algorithm used by the L1 internal cache memory. The settings are *WriteBack, WriteThru,* or *Disabled.* The Optimal and Fail-Safe default settings are *WriteBack.*

External Cache This option sets the type of caching algorithm used by the external cache memory. The settings are *WriteBack, WriteThru,* or *Disabled.* The Optimal and Fail-Safe default settings are *WriteBack.*

System BIOS Cacheable When set to *Enabled*, the contents of the F0000h system memory segment can be read from or written to cache memory. The contents of this memory segment are always copied from the BIOS ROM to system RAM for faster execution. The settings are *Enabled* or *Disabled.* The default setting is *Enabled*. The Optimal setting is *Enabled.* The Fail-Safe setting is *Disabled.*

Cont'd

C000,16K Shadow
C400,16K Shadow This option controls the location of the contents of video ROM. The settings are:

Setting	Description
Enabled	The contents of the video ROM area (C0000h - C7FFFh) are written to the corresponding address in RAM.
Cached	The contents of the video ROM area (C0000h - C7FFFh) are written to the corresponding RAM address and can be read from or written to cache memory.
Disabled	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

The Optimal and Fail-Safe default settings are *Cached.*

C800,16K Shadow
CC00,16K Shadow
D000,16K Shadow
D400,16K Shadow
D800,16K Shadow
DC00,16K Shadow These options enable shadowing of the contents of the ROM area in the option title.

Setting	Description
Enabled	The contents of the ROM area are written to the corresponding address in RAM for faster execution.
Cached	The contents of the ROM area are written to the corresponding RAM address and can be read from or written to cache memory.
Disabled	The ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

The Optimal and Fail-Safe default settings are *Cached.*

Section 3 Power Management Setup

Choose Power Management Setup from the AMIBIOS Setup main menu. All Power Management Setup options are described in this section.

ACPI Aware O/S Set this option to *Yes* if the operating system you are running under complies with the Intel ACPI (Advanced Configuration and Power Interface) specification. The settings are *Yes* or *No.* The Optimal and Fail-Safe default settings are *No.*

Power Management/APM Set this option to *Enabled* to enable the chipset power management and APM (Advanced Power Management) features. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Power Button Function This option specifies how the power button mounted externally on the computer chassis is used. The settings are:

Setting	Description
On/Off	Pushing the power button turns the computer on or off.
Suspend	Pushing the Power button places the computer in Suspend mode or Full On power mode.

The Optimal and Fail-Safe default settings are *On/Off.*

Green PC Monitor Power State This option specifies the power state that the green PC-compliant video monitor enters when AMIBIOS places it in a power saving state after the specified period of display inactivity has expired. The settings are *Stand By, Suspend,* or *Off.* The Optimal default setting is *Suspend*. The Fail-Safe default setting is *Stand By.*

Cont'd

Video Power Down Mode This option specifies the power state that the video subsystem enters when AMIBIOS places it in a power saving state after the specified period of display inactivity has expired. The settings are *Standby, Suspend* or *Disabled.* The Optimal default setting is *Stand By*. The Fail-Safe default setting is *Disabled.*

Hard Disk Power Down Mode This option specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired. The settings are *Disabled, Stand By,* or *Suspend.* The Optimal default setting is *Suspend*. The Fail-Safe default setting is *Disabled*.

Hard Disk Time Out (Minute) This option specifies the length of a period of hard disk drive inactivity. When this length of time expires, the computer enters power-conserving state specified in the **Hard Disk Power Down Mode** option. The settings are *Disabled, 1 min. (minute), 2 min, 3 min., 4 min., 5 min., 6 min, 7 min., 8 min., 9 min., 10 min., 11 min., 12 min., 13 min,* or *14 min*. The Optimal and Fail-Safe default settings are *Disabled.*

Power Saving Type The settings are *POS, Sleep, Stop Clock,* and *Deep Sleep*. The Optimal and Fail-Safe default settings are *POS*.

Standby/Suspend Timer Unit This option specifies the unit of time used for the Standby and Suspend timeout periods. The settings are *32 sec, 4 msec, 4 min,* or *4 sec.* The Optimal and Fail-Safe default settings are *4 min.*

Cont'd

Standby Time Out This option specifies the length of a period of system inactivity while in Full power on state. When this length of time expires, the computer enters Standby power state. The settings are *Disabled, 4 min, 8 min, up to and including 508 minutes, in increments of 4 minutes.* The Optimal and Fail-Safe default settings are *Disabled*.

Suspend Time Out This option specifies the length of a period of system inactivity while in Standby state. When this length of time expires, the computer enters Suspend power state. The settings are *Disabled, 4 min, 8 min, up to and including 508 minutes, in increments of 4 minutes*. The Optimal and Fail-Safe default settings are *Disabled.*

Slow Clock Ratio This option specifies the speed at which the system clock runs in the Standby Mode power saving state. The settings are expressed as a percentage between the normal CPU clock speed and the CPU clock speed when the computer is in the power-conserving state. The settings are *0 - 12.5%, 12.5% - 25%, 25% - 37.5%, 37.5% -50% , 50% - 62.5%, 62.5% - 75%,* or *75% - 87.5%.* The Optimal and Fail-Safe default settings are *50% - 62.5%*.

Display Activity When set to *Monitor,* this option enables event monitoring on the video display. If set to *Monitor* and the computer is in a power saving state, AMIBIOS watches for display activity. The computer enters the Full On state if any activity occurs. AMIBIOS reloads the Standby and Suspend timeout timers if display activity occurs. The settings are *Monitor* or *Ignore.* The Optimal and Fail-Safe default settings are *Ignore*.

Cont'd

Device 6 (Serial Port 1)
Device 7 (Serial Port 2)
Device 8 (Parallel Port)
Device 5 (Floppy Disk)
Device 0 (Primary Master IDE)
Device 1 (Primary Salve IDE)
Device 2 (Secondary Master IDE)
Device 3 (Secondary Slave IDE) When set to *Monitor,* these options enable event monitoring on the specified hardware interrupt request line. If set to *Monitor* and the computer is in a power saving state, AMIBIOS watches for activity on the specified IRQ line. The computer enters the Full On state if any activity occurs. AMIBIOS reloads the Standby and Suspend timeout timers if activity occurs on the specified IRQ line.

The settings for each of these options are *Monitor* or *Ignore*. The Optimal default setting is *Ignore*, except for Device 0 (Primary Master IDE), which has an Optimal default setting of *Monitor.* The Fail-Safe default setting is *Monitor*.

Section 4 PCI/PnP Setup

Choose PCI/PnP Setup from the AMIBIOS Setup main menu. All PCI/PnP Setup options are described in this section.

USB Function Set this option to *Enabled* to enable the USB (universal serial bus). The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe settings are *Disabled*.

USB KB/Mouse Legacy Support Set this option for the USB to support older keyboard and mouse operation. The settings are *Disabled*, *Keyboard*, *Auto* or *Keyb+Mouse*. The Optimal and Fail-Safe settings are *Disabled*.

Port 64/60 Emulation Set this option to *Enabled* to enable Port 64/60 emulation. The Optimal and Fail-Safe settings are *Disabled.*

Plug and Play-Aware OS Set this option to *Yes* if the operating system in this computer follows the Plug and Play specification. Windows 95 is PnP-aware. The settings are *Yes* or *No.* The default setting is *Yes*. The Optimal and Fail-Safe default settings are *No*.

PCI VGA Palette Snoop When this option is set to *Enabled*, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example: if there are two VGA devices in the computer (one PCI and one ISA) and the VGA Palette Snoop bit is:

Snoop Bit	Action
Disabled	Data read and written by the CPU is only directed to the PCI VGA device's palette registers.
Enabled	Data read and written by the CPU is directed to the both the PCI VGA device palette registers and the ISA VGA device palette registers, and the palette registers of both devices can be identical.

This option must be set to *Enabled* if an ISA adapter card installed in the system uses VGA palette snooping. The Optimal and Fail-Safe default settings are *Disabled.*

Cont'd

Allocate IRQ to PCI VGA Set this option to *Yes* to allocate an IRQ to a VGA adapter card that uses the PCI local bus. The settings are *Yes* or *No*. The Optimal and Fail-Safe default settings are *Yes*.

The PCI/PnP Setup options are grouped by function. The first heading is:

Primary Bus Options

USB Device Latency This option specifies the latency timings (in PCI clocks) for the USB device. The settings are *32, 64, 96, 128, 160, 192, 224,* or *248*. The Optimal and Fail-Safe default settings are *248*.

PCI Slot-1 Latency This option specifies the latency timings (in PCI clocks) for PCI devices installed in the Slot-1 expansion slot. The settings are *32, 64, 96, 128, 160, 192, 224,* or *248*. The Optimal and Fail-Safe default settings are *64*.

PCI Slot-2 Latency This option specifies the latency timings (in PCI clocks) for PCI devices installed in the Slot-2 expansion slot. The setting is *128*. The Optimal and Fail-Safe default settings are *128*.

PCI Slot-3 Latency This option specifies the latency timings (in PCI clocks) for PCI devices installed in the Slot-3 expansion slot. The settings are *32, 64, 96, 128, 160, 192, 224,* or *248*. The Optimal and Fail-Safe default settings are *64*.

PCI Slot-4 Latency This option specifies the latency timings (in PCI clocks) for PCI devices installed in the Slot-4 expansion slot. The setting is *128*. The Optimal and Fail-Safe default settings are *128*.

Cont'd

USB IRQ Priority These options specify the IRQ priority for USB devices installed in the Slot-1 expansion slot. The settings are *Auto*, *IRQ5*, *IRQ9*, *IRQ10*, and *IRQ11*, in priority order. If *Auto* is selected, AMIBIOS automatically determines the optimal IRQ priority order. The Optimal and Fail-Safe default settings are *Auto*.

PCI Slot-1 IRQ Priority
PCI Slot-2 IRQ Priority
PCI Slot-3 IRQ Priority
PCI Slot-4 IRQ Priority These options specify the IRQ priority for PCI devices installed in the computer. The settings are *Auto*, *3*, *4*, *5*, *7*, *9*, *10*, *11*, *12*, and *14*, in priority order. If *Auto* is selected, AMIBIOS automatically determines the optimal IRQ priority order. The Optimal and Fail-Safe default settings are *Auto*.

The second heading is:

Secondary Bus-1 Options

PCI Slot-5 Latency
PCI Slot-6 Latency
PCI Slot-7 Latency
PCI Slot-8 Latency This option specifies the latency timings (in PCI clocks) for PCI devices installed in the Slot-5, Slot-6, Slot-7, and Slot-8 expansion slots. The setting is *248Clks*. The Optimal and Fail-Safe default settings are *248Clks*.

PCI Slot-5 IRQ Priority
PCI Slot-6 IRQ Priority
PCI Slot-7 IRQ Priority
PCI Slot-8 IRQ Priority This option specifies the IRQ priority for PCI devices installed in the Slot-5, Slot-6, Slot-7 and Slot-8 expansion slots. The setting is *248Clks*. The Optimal and Fail-Safe default settings are *248Clks*.

Cont'd

The third heading is:

Secondary Bus-2 Options

PCI Slot-9 Latency
PCI Slot-10 Latency
PCI Slot-11 Latency
PCI Slot-12 Latency This option specifies the latency timings (in PCI clocks) for PCI devices installed in the Slot-9, Slot-10, Slot-11, and Slot-12 expansion slots. The setting is *248Clks*. The Optimal and Fail-Safe default settings are *248ClksI*.

PCI Slot-9 IRQ Priority
PCI Slot-10 IRQ Priority
PCI Slot-11 IRQ Priority
PCI Slot-12 IRQ Priority This option specifies the IRQ priority for PCI devices installed in the Slot-9, Slot-10, Slot-11 and Slot-12 expansion slots. The setting is *N/A*. The Optimal and Fail-Safe default settings are *N/A.*

Cont'd

The fourth heading is:

Bus IRQ Resource Owner

IRQ3
IRQ4
IRQ5
IRQ7
IRQ9
IRQ10
IRQ11
IRQ12
IRQ14
IRQ15

These options specify the bus that the specified IRQ line is used on. These options allow you to reserve IRQs for legacy ISA adapter cards. These options determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these options to reserve the IRQ by assigning an *ISA* setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as *PCI/PnP*. IRQ14 and 15 will not be available if the onboard Triton 2 PCI IDE is enabled. If all IRQs are set to *ISA* and IRQ14 and 15 are allocated to the onboard PCI IDE, IRQ9 will still be available for PCI and PnP devices, because at least one IRQ must be available for PCI and PnP devices.

The settings are *Auto, Primary Bus, Secondary Bus1, Secondary Bus2, PnP, PCI,* or *ISA*. The Optimal and Fail-Safe default settings are *Auto* for IRQ5, 9, 10, and 11, *PnP* for IRQ 3, 4, 7, and 12, and *PCI* for IRQ 14, and 15.

Cont'd

The fifth heading is:

DMA Resource Center

DMA Channel 0
DMA Channel 1
DMA Channel 3
DMA Channel 5
DMA Channel 6
DMA Channel 7 These options allow you to specify the bus type used by each DMA channel. The settings are *PnP* or *ISA.* The Optimal and Fail-Safe default settings are *PnP.*

Reserved ISA Card Memory Size This option specifies the size of the memory area reserved for legacy ISA adapter cards. The settings are *Disabled, 16K, 32K,* or *64K.* The Optimal and Fail-Safe default settings are *Disabled.*

Reserved ISA Card Memory Address This option specifies the beginning address (in hex) of the reserved memory area. The specified ROM memory area is reserved for use by legacy ISA adapter cards.

The settings are *C0000, C4000, C8000, CC000, D0000, D4000, D8000,* or *DC000.* The Optimal and Fail-Safe default settings are *C8000.*

Section 5 Peripheral Setup

Choose Peripheral Setup from the AMIBIOS Setup main menu. All Peripheral Setup options are described below.

Onboard Floppy Controller Set this option to *Enabled* to enable the floppy drive controller (FDC) on the motherboard. The settings are *Auto (AMIBIOS automatically determines if the floppy controller should be enabled), Enabled,* or *Disabled.* The Optimal and Fail-Safe default settings are *Auto*.

Onboard Primary/Secondary IDE This option specifies the IDE channels used by the onboard IDE controller. The settings are *Disabled, Primary, Secondary,* or *Both.* The Optimal and Fail-Safe default settings are *Both.*

Onboard IDE BusMaster Set this option to *Enabled* to specify that the IDE controller on the PCI bus has bus mastering capability. The settings are *Disabled* or *Enabled.* The Optimal and Fail-Safe default settings are *Disabled*.

Onboard Primary Prefetch Set this option to allow prefetch of information from the IDR disk drives by the primary IDE controller. The settings are *Disabled, Master, Slave,* or *Both*. The Optimal and Fail-Safe default settings are *Disabled*.

Onboard Secondary Prefetch Set this option to allow prefetch of information from the IDR disk drives by the secondary IDE controller. The settings are *Disabled, Master, Slave,* or *Both*. The Optimal and Fail-Safe default settings are *Disabled*.

Offboard PCI\ISA IDE Card This option specifies whether an offboard PSI/ISA IDE card is used in the computer. You must also specify the PCI\ISA expansion slot on the motherboard where the offboard PCI\ISA controller card is installed. If an offboard PCI\ISA controller is used, the motherboard onboard IDE controller is automatically disabled. The settings are *Absent, ISA, PCI Slot1, PCI Slot2, PCI Slot3, PCI Slot4, PCI Slot5,* or *PCI Slot6.* The Optimal and Fail-Safe default settings are *Absent.*

Cont'd

Offboard Primary\Secondary This option specifies the PSI/ISA IDE cards used by the offboard IDE controller. The settings are *Disabled, Primary, Secondary,* or *Both.* The Optimal and Fail-Safe default settings are *Both.*

Offboard PCI IDE Primary IRQ This option specifies the primary IRQ used by the PCI IDE card. The setting is *IRQ14.* The Optimal and Fail-Safe default settings are *IRQ14.*

Offboard PCI IDE Secondary IRQ This option specifies the secondary IRQ used by the PCI IDE card. The setting is *IRQ15.* The Optimal and Fail default settings are *IRQ15.*

Serial Port1 IRQ This option specifies the IRQ used by serial port 1. The settings are *Disabled,* or *IRQ4.* The Optimal and Fail-Safe default settings are *IRQ4.*

Serial Port1 Address This option specifies the base I/O port address of serial port 1. The settings are *Disabled, 3F8h,* or *3E8h.* The Optimal and Fail-Safe default settings are *3F8h.*

Serial Port1 FIFO The settings are *Disabled* or *Enabled.* This option displays only if **Serial Port1 Address** is not set to *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Serial Port2 IRQ This option specifies the IRQ used by serial port 2. The settings are *Disabled,* or *IRQ3.* The Optimal and Fail-Safe default settings are *IRQ3.*

Serial Port2 Address This option specifies the base I/O port address of serial port 2. The settings are *Disabled, 2F8h,* or 2*E8h.* The Optimal and Fail-Safe default settings are *2F8h.*

Cont'd

Serial Port2 FIFO The settings are *Disabled* or *Enabled.* This option appears only if the **Serial Port2 Address** option is not set to *Disabled.* The Optimal and Fail-Safe default settings are *Disabled*.

Parallel Port IRQ This option specifies the IRQ used by the parallel port. The settings are *Disabled, IRQ7,* or *IRQ5.* The Optimal and Fail-Safe default settings are *IRQ7*.

Parallel Port Address This option specifies the address of the parallel port. The settings display only if **Parallel Port IRQ** is set to *IRQ5* or *IRQ7.* The settings are *Disabled, 378h,* or *278h.*

Parallel Port Mode This option specifies the parallel port mode. The settings display only if **Parallel Port Address** is set to *278h* or *378h.* The Optimal and Fail-Safe default settings are *ECP*. The settings are:

Setting	Description
Normal	The normal parallel port mode is used.
EPP	The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bidirectional data transfer driven by the host device.
ECP	The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve data transfer rates up to 2.5 Megabits per second. ECP provides symmetric bidirectional communication.
Bi-Dir	Data can be sent to and received from the parallel port.

Parallel Port DMA Channel This option is available only if the setting for the **Parallel Port Mode** option is *ECP.* This option sets the DMA channel used by the parallel port. The settings are *Disabled, DMA CH 1* or *DMA CH 3.* The Optimal and Fail-Safe settings are *Disabled.*

Section 6 Other Setup Options

Auto-Detect Hard Disks

Choose this option to let AMIBIOS automatically detect the hard disk drive parameters. The Standard CMOS Setup screen will appear after AMIBIOS has configured the drives. Press <Esc> and choose Save Settings and Exit to reconfigure the system configuration with the new hard disk drive parameters.

AMIBIOS Password Support

Two Levels of Password Protection AMIBIOS provides both a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.

The system can be configured so that all users must enter a password every time the system boots or when AMIBIOS Setup is executed, using either or both the Supervisor password or User password. The Supervisor and User passwords activate two different levels of password security.

Set the **Password Check** option in Advanced Setup (see the Advanced Setup section) by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when AMIBIOS Setup is executed). The password is encrypted and stored in NVRAM.

If you select password support, you are prompted for a 1 – 6 character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and reconfigure.

Remember the Password Keep a record of the new password when the password is changed. If you forget the password, you must erase the system configuration information in NVRAM (Non-Volatile Random Access Memory). See page 72 for information about erasing system configuration information.

Change User Password

Select Change User Password from the AMIBIOS Setup main menu.

```
Enter new User password:
```

appears. Type the password and press <Enter>. The screen does not display the characters entered. Retype the password as prompted and press <Enter>. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM after AMIBIOS completes. The next time the system boots, a password prompt appears if the Password Check option is set to *Always.*

Change Supervisor Password

Select Change Supervisor Password from the AMIBIOS Setup main menu.

```
Enter new supervisor password:
```

appears. Type the password and press <Enter>. The screen does not display the characters entered. Retype the password as prompted and press <Enter>. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM after AMIBIOS completes. The next time the system boots, a password prompt appears if the Password Check option is set to Always.

Change Language Settings

This option is not implemented in this AMIBIOS.

Auto Configuration with Optimal Settings

AMIBIOS will automatically set all AMIBIOS Setup options to a complete set of default settings when you choose this option. The following appears:

```
Load high performance settings (Y/N) ? N
```

The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal AMIBIOS Setup options if your computer is experiencing system configuration problems.

Auto Configuration with FailSafe Settings

AMIBIOS will automatically set all AMIBIOS Setup options to a complete set of default settings when you choose this option. The following appears:

```
Load failsafe settings (Y/N) ? N
```

The Fail-Safe settings are designed for maximum system stability, but not maximum performance. Choose the Fail-Safe AMIBIOS Setup options if your computer is experiencing system configuration problems.

Save Settings and Exit

When you have completed the system configuration changes, choose this option to leave AMIBIOS Setup and to reboot the computer so the new system configuration parameters can take effect.

Exit Without Saving

Choose this option to quit AMIBIOS Setup without making any permanent changes to the system configuration.

3 Programming the Flash ROM

The Megaplex system uses Flash EPROM to store the system BIOS. The advantage of Flash EPROM is the EPROM chip does not have to be replaced to update the BIOS. You can actually reprogram the BIOS, using a ROM file supplied by American Megatrends.

J39 Flash ROM Programming J39 is a 3-pin berg that enables flash EPROM programming. In normal operation, Pins 2-3 of J26 are always shorted. This is the factory setting.

Programming the Flash EPROM

Step	Action
1	Turn power off. Make sure the computer has a working speaker.
2	Remove the computer cover.
3	Insert the floppy disk with the `S770P.ROM file` in drive A:.
4	Before DOS boots, press and hold down the <Ctrl> and <Home> keys to reprogram the Flash EPROM-based AMIBIOS. The bootblock code immediately reads the A: drive, looking for the new BIOS information.
5	When the flash ROM has successfully been programmed, the computer will reboot.
6	Replace the computer cover and reboot.

Cont'd

Bootblock BIOS Actions When you reprogram from system boot, the bootblock BIOS code:

- Reads S770P.ROM from the root directory of the floppy disk in drive A:.
- Erases the Flash EPROM.
- Programs the Flash EPROM with the data read from the floppy disk in drive A:.
- Generates a CPU reset, rebooting the computer.

The bootblock part of the Flash EPROM is not programmed. Should you inadvertently open the disk drive door or turn power off to the computer while programming the Flash EPROM, the bootblock will be unaffected. Simply turn power back on and begin the Flash ROM programming process again.

S770P.ROM S770P.ROM resides on a floppy disk and contains the updated main BIOS code. American Megatrends will provide this file when the AMIBIOS for the Pentium II Xeon ISA motherboard must be updated.

S770P.ROM must be present in the root directory of the floppy disk before the onboard Flash EPROM can be reprogrammed. The file that has the main BIOS code must be named S770P.ROM.

Cont'd

Sequence of Operation The sequence of operation and expected behavior of the bootblock BIOS code is:

Step	Expected behavior
1 Look for floppy disk.	The system beeps one time before the BIOS attempts to read from floppy drive A:.
2 Look for S770P.ROM on the floppy disk.	S770P.ROM must be in the root directory of the floppy disk in drive A:. There is no beep if successful.
3 Read the floppy disk.	The floppy disk is read. There is no beep if this step is successful.
4 Check for BIOS file size.	The BIOS file size is checked. There is no beep if this step is successful.
5 Check for Flash EPROM.	The BIOS looks for an Intel i28F001BX-T Flash EPROM. It does not beep if this step is successful.
6 Erase the Flash EPROM.	Two beeps sound when the BIOS begins erasing the Flash EPROM.
7 Program the Flash EPROM.	Three beeps sound when the AMIFlash Code begins reprogramming the Flash EPROM.
8 Continue programming the Flash EPROM.	Four beeps sound when reprogramming has been successfully completed.
9 AMIFlash does a reset.	A CPU reset is generated to reboot the computer.

Beep Codes

The bootblock code produces a series of beeps during Flash ROM programming to:

- signify completion of a step (as shown on the previous page), or to
- signal an error.

Error beeps are arranged in a coded sequence and have different meanings depending on when they occur. The error beep codes and when they can occur are:

Number of Beeps	Description
1	Insert diskette in floppy drive A:.
2	The AMIBOOT.ROM file was not found in the root directory of the diskette in floppy drive A:.
3	Base memory error.
4	Flash program successful.
5	Floppy read error.
6	Keyboard controller BAT command failed.
7	No Flash EPROM detected.
8	Floppy controller failure.
9	Bootblock BIOS checksum error.
10	Flash erase error.
11	Flash program error.
12	AMIBOOT.ROM file size error.
Continuous beep	Flash Programming successful. Turn power off. The turn power on again to restart.

Bootblock Code Checkpoint Codes

Code	Description
E0h	Verify the bootblock BIOS checksum. Disable the internal cache, DMA, and interrupt controllers. Initialize the system timer. Start memory refresh.
E1h	Initialize the chipset registers. Set the BIOS size to 128K. Make the 512 KB base memory available.
E2h	Test the base 64 KB of system memory. Send the BAT command to the keyboard controller. Make sure that <Ctrl> <Home> was pressed. Verify the main system BIOS checksum.
E3h	The main system BIOS is good. Transfer control to the main system BIOS.
E4h	Start the memory test.
E5h	The memory test is over. Initialize the interrupt vector table.
E6h	Initialize the DMA and interrupt controllers.
E7h	Determine the CPU internal clock frequency.
E8h	Initialize the I/O chipset, if any.
E9h	Program the CPU clock-dependent chip set parameters.
EAh	Enable the timer and the floppy diskette interrupt. Enable the internal cache. Copy the bootblock BIOS and pass control to the bootblock BIOS in the 0000h segment.
EDh	Initialize the floppy drive.
EEh	Look for a diskette in drive A:. Read the first sector of the diskette.
EFh	Floppy read error.
F0h	Search for AMIBOOT.ROM in the root directory of the floppy diskette in drive A:.
F1h	The AMIBOOT.ROM file is not in the root directory.
F2h	Read the FAT. Analyze the FAT to find the clusters occupied by the AMIBOOT.ROM.
F3h	Start reading the AMIBOOT.ROM file, cluster by cluster.
F4h	The AMIBOOT.ROM file is not the correct size.
F5h	Disable the internal cache. Raise the Vpp. Enable Flash write and reset the Flash ROM.
FBh	Detect the flash type.
FCh	Start erasing flash blocks.
FDh	Program the Flash ROM in the E0000-EFFFFh region.
FEh	Start programming Flash at F0000-FFFFF region.
FFh	Flash programming is successful. The computer reboots.

4 AMI Server Manager Overview and Setup

AMI Server Manager (ASM) allows you to manage several servers simultaneously from one location. The main functions of AMI Server Manager are to display information and help you monitor the server environment.

Using AMI Server Manager, you can display hardware information about a remote system, as well as a local server. You can also view BIOS events and an event log. The health graph feature allows you to track remote server health history. AMI Server Manager Agent (provided with AMI Server Manager) must be installed and running in all servers being managed in order to monitor the health of each machine and retrieve system information.

Key Components The two key components of AMI Server Manager are:

- AMI Server Manager Agent, and
- AMI Server Manager Console.

AMI Server Manager Agent A copy of AMI Server Manager Agent must be installed and running in each server being managed for you to monitor the health of the machine and AMI Server Manager Agent works under Windows NT 4.0 Server. AMI Server Manager Agent has the following functions:

- collecting system information,
- collecting CPU/IO board health information,
- collecting Health Alerts from BIOS,
- collecting chassis information,
- collecting BIOS events,
- sending messages to the AMI Server Manager,
- sending pages to the operator,
- logging of health parameters, and
- passing data to the console.

The red triangle (AMI logo) is displayed in the system tray in the lower right corner of the screen when Server Manager Agent is active in a system.

AMI Server Manager Overview

AMI Server Manager Console AMI Server Manager Console is used to view information and monitor the health of a machine. Console is installed in a local or remote system and includes the following features:

- works under Windows NT,
- connects other Megaplex NT servers on demand,
- provides detailed server configuration information,
- provides hardware health monitoring via the onboard monitoring hardware in the Megaplex system,
- monitors health of components on chassis, such as drives, power supplies, and power supply fans,
- can display all system events as logged by the Megaplex system BIOS,
- can be run remotely from any management workstation,
- can page the system administrator about alert messages,
- can have the icons flash when there is a problem,
- offers password-based security,
- provides for remote reset and shutdown,
- displays chart of health parameters, and
- displays events from all connected servers.

Quick Start

This section contains information for a quick setup of the AMI Server Manager. Topics include:

- using one machine,
- monitoring several machines from one machine,
- performing initial setup of Health Information, and
- setting up a Pager Database, and
- setting up Monitoring Options.

Note: The user installing ASM must be a member of the Administrators group defined in the User Manager. Refer to Windows NT help for more information about the User Manager.

Using One Machine If you are going to use Server Manager on only one machine, you need to install AMI Server Manager Agent and AMI Server Manager Console on that machine. At the end of ASM Setup, reboot your machine. When the user logs into NT, the ASM Agent will start. Once the Agent is running, ASM Console can be loaded.

If you gave administrative privileges to ASM during installation, then when Console first loads you need to select which machine to connect to. Select the local machine and click OK. If you did not give ASM administrative privileges, then the console will load without asking which machine to connect to. This is because without administrative privileges, you can connect to the local machine only.

Note: The ASM administrative privileges have nothing to do with the Windows NT Administrators group.

Cont'd

Monitoring Several Machines from One Machine To monitor a remote machine from a local location, the machines must be connected via an intranet.

Install AMI Server Manager Agent on the remote machines you want to monitor. Restart each machine once ASM Setup is complete. After the machine restarts, you must log on. The account used to log on must be in the Administrators group. Once you log on, the ASM Agent starts. The machine must remain logged on for the Agent to continue to run. The Agent needs to be running in order to monitor that machine.

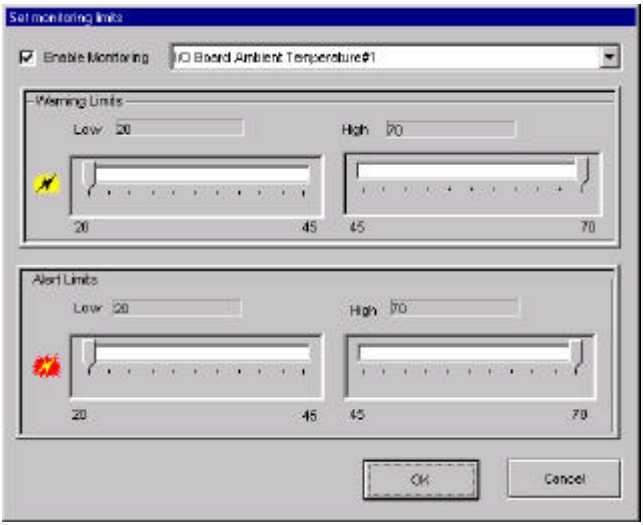
After you install the Agent and it is running on all remote machines you want to monitor, install ASM Console on the local machine. From this machine you can monitor all remote machines using the Console. You do not have to restart the machine after you complete installation. After you complete installation, you can start the Console by selecting it from the Start Menu.

When ASM Console first loads, you will be asked to select a machine. Selecting a machine allows you to get detailed information about that machine. Select a machine and click OK. The Console starts with the System Inventory group selected. The Health Events group shows any health warnings or alerts from the machines on the intranet running ASM Agent.

Cont'd

Setting Up the Health Information Group One of the most useful groups in the ASM Console is the Health Information group. To use ASM effectively, you must set this group up correctly. Click on the Health Information icon in the top frame. This enables the health buttons on the Toolbar. For more information about the Toolbar icons, refer to page 113. The following pages describe the Health Information procedures.

Setting Monitoring Limits Click on the Health Limits button on the toolbar to bring up the "Set monitoring limits" window:



Use the following procedure to disable monitoring for any health parameter that you do not want monitored, that is not supported by the hardware, or that is not applicable.

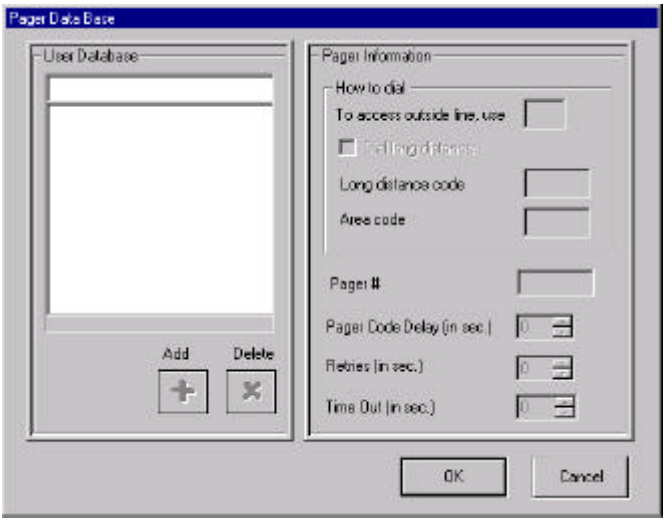
Step	Action
1	Click on the Health Information group. This enables the health buttons.
2	Click on the Health Limits button on the toolbar to bring up the Health Limits window.
3	Select a parameter from the drop down menu.
4	Remove the check mark from the Enable Monitoring box.
5	Click OK when done.

To change the limits of any enabled parameter, select that parameter and set the desired limits.

Cont'd

Setting Up Pager Database Options In order to use the pager feature, your local machine must have a modem installed and correctly set up in Windows. Also, it must be connected to an active phone line.

If an alert or warning is issued, you can set up ASM Console to dial a pager and enter a code to be displayed on the pager. Click on the Pager Database button on the toolbar to bring up the Pager Database screen.



Use the following procedure to set up the pager feature:

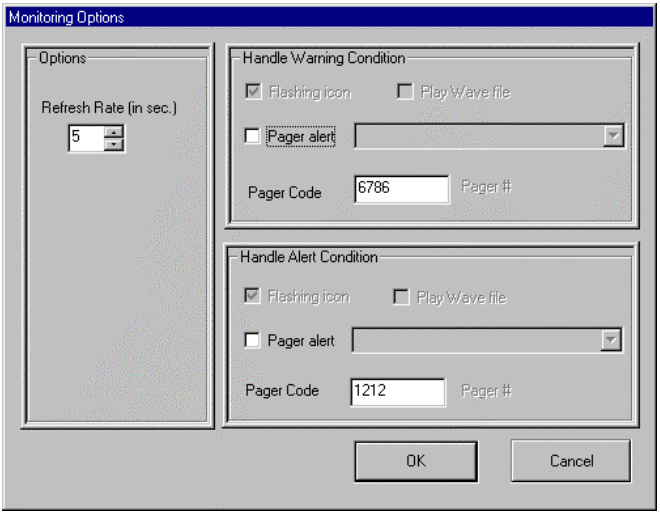
Step	Action
1	Click on the Health Information group to enable the health buttons.
2	Click on the Pager Database button on the toolbar to open the Pager Database window.
3	Enter the user name and pager information.
4	Click the Add button.
5	To add more users, enter their information, and click Add.
6	When all the users have been entered, click OK.

For more information on the Pager Database window, refer to Pager Database in the online help or on page 113 of this manual.

Cont'd

Setting Up Monitoring Options You can use the Monitoring Options screen to choose how often the server health parameters are checked, whether a pager alert should be sent, and how to handle warning and alert conditions.

Click on the Health Options button on the toolbar to bring up the Monitoring Options screen.



Use the following procedure to set up the monitoring options:

Step	Action
1	Click on the Health Information group to enable the health buttons.
2	Click on the Health Options button on the toolbar to open the Monitoring Options window.
3	In the Options section, set how often you want the monitoring values to be updated.
4	In the Handle Warning Condition section, select which user pager you want to be dialed when a warning occurs, and the pager code.
5	In the Handle Warning Condition section, select which user pager you want to be dialed when an alert occurs, and the pager code.
6	Click OK when done.

Installing AMI Server Manager

The user must be a member of the Administrators group in User Manager to install AMI Server Manager. Refer to Windows NT help for more information about User Manager.

Insert the ASM CD in the CD-ROM drive. Click on the Start button and choose Run. Type

```
D:SETUP
```

and click on OK to install AMI Server Manager. Follow the instructions on the screen. You will be asked for a username and password. ASM agent uses this information to control who can access ASM agent on that machine. You can also select which components to install and when you want ASM to be installed.

Note: If your CD-ROM is set up as a drive other than D, replace D above with the drive letter your CD is assigned.

AMI Server Manager Setup

AMI Server Manager Agent Setup ASM Setup is used to install ASM Agent. The Windows NT user installing Server Manager must be a member of the Administrators group defined in the User Manager. For more information about the User Manager, refer to the Windows NT help.

During ASM installation, you are asked which components you want to install. To install the ASM Agent, select the AMI Server Manager Agent component. ASM Setup will create an ASM Agent icon in the StartUp group on the Start Menu. When installation is complete, ASM Setup will need to restart your computer. Log on using an account in the Administrators group. When you log on, ASM Agent will start because it is in the StartUp group.

You can tell when the Agent is running by the AMI logo (similar to a red triangle) visible on your system tray. This is the Agent icon. To stop the Agent, double click the icon and close the Agent window that appears. The Agent icon will no longer be on the system tray.

If you want to start the ASM Agent, but do not see the Agent icon on the system tray, go to the Start Menu and select Programs, AMI Server Manager, and ASM Agent.

Cont'd

AMI Server Manager Console Setup To start Console, click the Start icon, and select Programs, AMI Server Manager, ASM Console. If you installed the Console only or gave ASM administrative privileges during installation, you will be asked which machine you want to connect to. Select a machine and click OK to load the console.

When ASM Console first loads, the System Inventory group is selected. (For more information about System Inventory, refer to page 98.) There are six icons on the framebar, one for each information group. If an icon is flashing, then there is a problem with that group. Click on the icon to see what is wrong and take corrective action. The rest of this chapter contains detailed information about the icons.

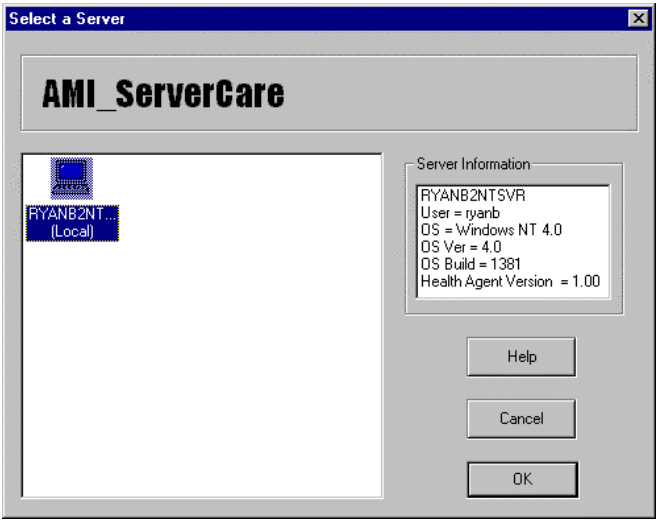
Note: If this is your first time running AMI Server Manager, please read the following section before you respond to a flashing icon.

Health Information Group Setup The Health Information group is one of the most useful groups in ASM Console. To use ASM effectively, you must set this group up correctly. You can disable monitored parameters, set up a pager database, and set up monitoring options.

Click on the Health Information icon in the top frame. This enables the health buttons on the Toolbar. For information about the procedures listed above, refer to page 85.

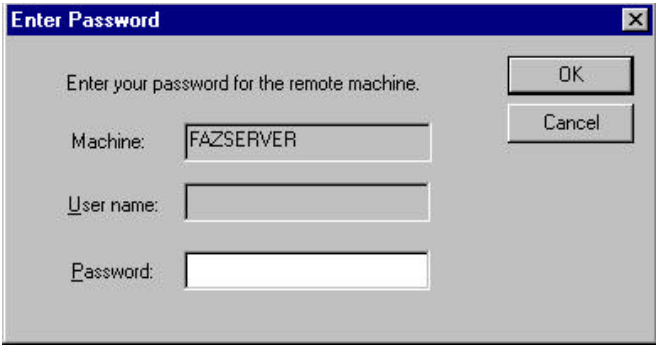
Selecting a Server

AMI Server Manager automatically detects all Megaplex NT servers connected to the network. Icons for all servers are displayed on the Server Selection screen, as shown below:



Click on a server icon to connect AMI Server Manager to that server. You can perform any AMI Server Manager function on the selected server after you have selected it. You can also click on the Connect button on other AMI Server Manager screens to connect to a different server.

If you set up a password during installation, the following dialog box displays when you press OK:



Warnings and Alerts

Warnings

When a health parameter value you are monitoring goes beyond the warning limit set in the Health Limits window, a warning is issued. When a warning is issued, a yellow warning icon appears next to the parameter causing the warning. In addition, the Health Information icon flashes when a warning occurs, if the Toggle Alert Flash option is checked in the Options menu.

For example, if the CPU1 Temperature low warning limit is set to 10 Celsius, and the high warning limit is 37 Celsius, then no warning is issued if CPU1 Temperature is between 10 and 37 Celsius. If the temperature of the CPU rises to 38, then a warning is issued for CPU1 Temperature.

Warning limits should be set closer to normal operating values than alert limits. If a parameter is operating beyond a warning limit, it should not fail immediately.

Alerts

When a health parameter value you are monitoring goes beyond the alert limit set in the Health Limits window, an alert is issued. When an alert is issued, a red warning icon appears next to the parameter causing the alert. In addition, the Health Information icon flashes when an alert is present, if the Toggle Alert Flash option is checked in the Options menu.

For example, if the CPU1 Temperature low alert limit is set to 7 Celsius, and the high alert limit is 42 Celsius, then no alert is issued if CPU1 Temperature is between 7 and 42 Celsius. If the temperature of the CPU drops to 6, an alert is issued for CPU1 Temperature.

Alert limits should be set farther from normal operating values than warning limits. If a parameter is operating beyond an alert limit, it may fail immediately.

Using the LCD

The AMI Server Manager Agent uses the LCD on the front of the Megaplex machine to display System Inventory and Health Data. For this information to be accurate, the Agent must be running.

Overview

Information for the AMI Server Manager Agent displays on the LCD ROM panel. This panel is located on the front of the Megaplex case, as seen in the picture below:

There are four function keys used to control the LCD: Enter, Exit, Up (arrow), and Down (arrow). These keys are located to the left of the display panel. Press any of these keys to access the main menu. At the main menu, highlight the item you want by using the Up and Down arrows and pressing Enter. Use the Exit key to go back one menu. Using this method, you can view system and health information about the Megaplex machine. The reset (RST), and power (PWR) buttons are located to the right of the display panel.

Note: If five seconds pass and you do not press a function key, the LCD will continue to scroll through all the available information. In addition, an asterisk (*) next to an item indicates a warning or an alert for that item.

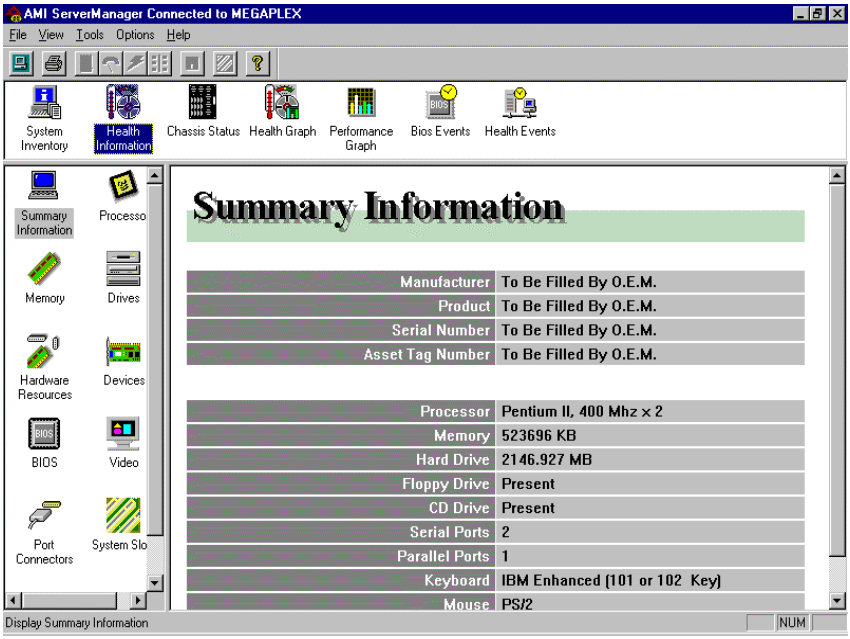
5 AMI Server Manager Screens

Basic Screen Information

This manual contains information about the following screen sections:

- Menu bar,
- Toolbar,
- Top frame,
- Left frame,
- Body frame, and
- Status bar.

Sample Screen The following sample screen displays the screen sections.



Cont'd

Basic Screen Information, Continued

Menu Bar

The menu bar contains the Server Manager functions in the following menus:

- File,
- View,
- Tools,
- Options, and
- Help.

For more information about the menus on the menu bar, refer to page 121.

Toolbar

You can use the following icons on the toolbar to perform Server Manager functions:

- Connect to a Workstation,
- Print,
- Pager Database,
- Health Limits,
- Health Options,
- Location/Category,
- Graph Options,
- Performance Graph, and
- Help.

For more information about toolbar icons, refer to page 113

Top Frame

The top frame contains the following icons for Server Manager functions:

- System Inventory,
- Health Information,
- Chassis Status,
- Health Graph,
- Performance Graph,
- Bios Events, and
- Health Events.

For more information about top frame icons, refer to page 118.

Cont'd

Left Frame Icons connected to each top frame icon display in the left frame (below the System Inventory icon.) For example, when you select the Bios Events icon in the top frame, two icons, System Events and Post Errors, display in the left frame, as shown in the sample screen on page 93.

Body Frame The body frame displays detailed information about the health parameters when you select an icon on the top frame. The body frame displays to the right of the left frame.

Status Bar The status bar displays a short text message showing the current condition of the program or the currently selected icon. The status bar displays below the left frame and body frame.

System Problem Indicators Three top frame icons flash on and off when system problems occur:

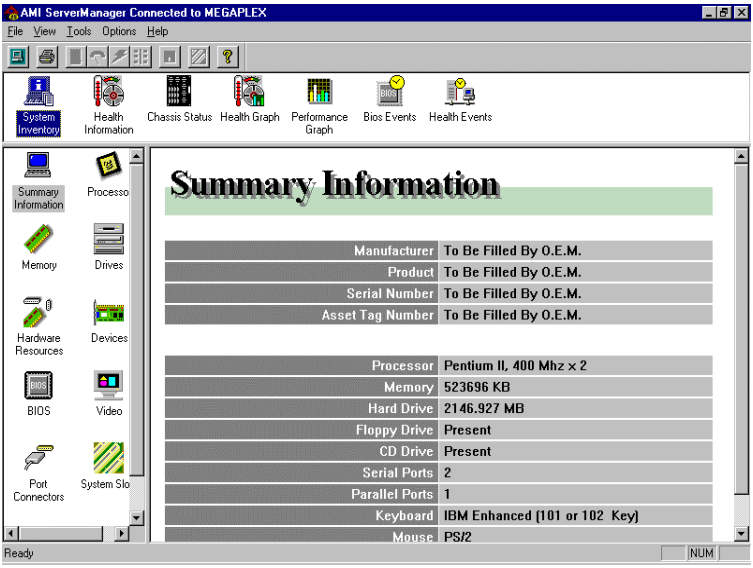
- Health Information,
- Chassis Status, and
- Bios Events.

For example, the Health Information icon flashes when there is a problem with a fan. You must select Toggle Alert Flash on the Options menu to enable these icons to flash.

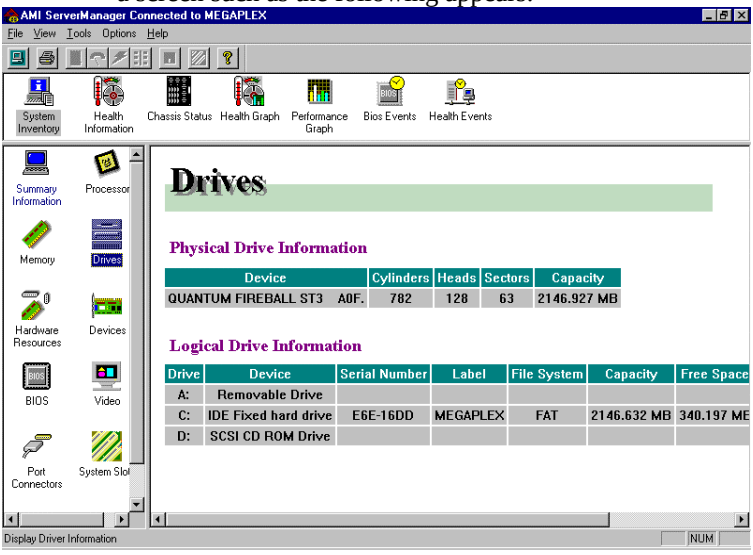
Based on the top frame icon selected, some toolbar and menu items are disabled or enabled. For more information, refer to the toolbar icons section on page 113, and the menu section on page 121.

Main Screen

After you select a server (see page90), the AMI Server Manager main screen appears, as shown below:

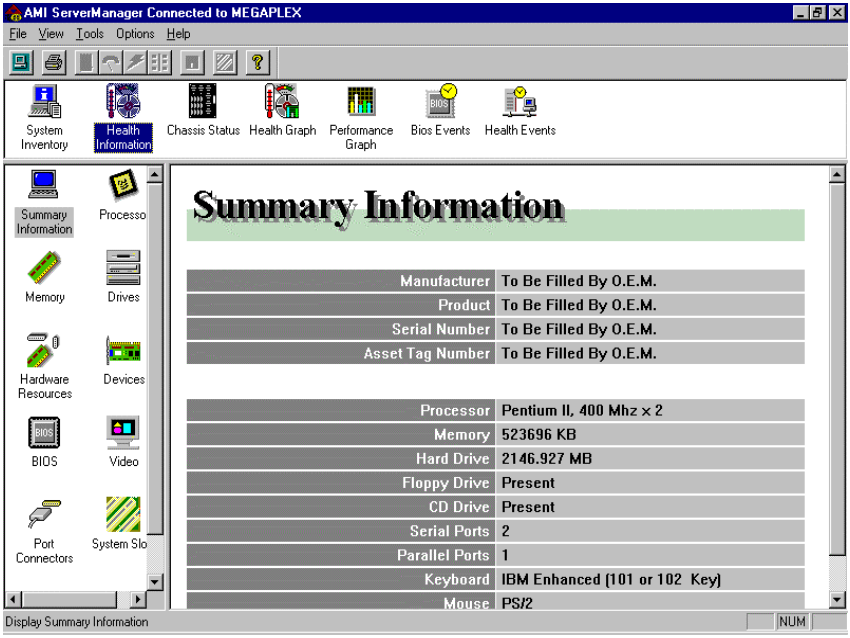


A summary of system configuration for the selected server information displays. Click on any icon on the left side of the screen to display additional system configuration information. For example, if you click on the Drives icon, a screen such as the following appears:



System Inventory

AMI Server Manager displays hardware inventory for the selected server. Click on the System Inventory icon on the AMI Server Manager main screen to access the System Inventory screen. The Print icon on the Toolbar is highlighted only when you select System Inventory. The System Inventory screen provides summary information, as shown in the sample screen below.



The icons for the hardware display in the left frame. The icons are:

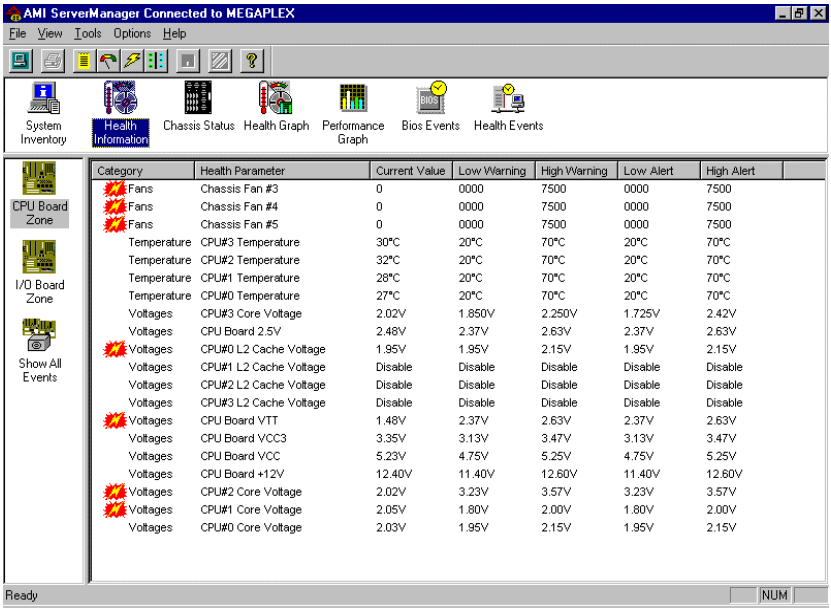
- Summary Information,
- Processors,
- Memory,
- Drives,
- Hardware Resources,
- Devices,
- BIOS,
- Video,
- Port Connectors, and
- System Slots.

Health Information

AMI Server Manager reports system environmental parameters, such as CPU temperature, fan status, and voltage levels. Click on the Health Information icon on the AMI Server Manager main screen to access the Health Information screen.

When you select the Health Information icon, the Pager Database icon, Health Limits icon, Health Options icon, and Location/Category icon on the Toolbar are highlighted. Use these icons to set up pagers, set health parameters, handle warning and alert conditions, and display a health report for the current server.

A sample health monitoring screen is shown below:



Category	Health Parameter	Current Value	Low Warning	High Warning	Low Alert	High Alert
Fans	Chassis Fan #3	0	0000	7500	0000	7500
Fans	Chassis Fan #4	0	0000	7500	0000	7500
Fans	Chassis Fan #5	0	0000	7500	0000	7500
Temperature	CPU#3 Temperature	30°C	20°C	70°C	20°C	70°C
Temperature	CPU#2 Temperature	32°C	20°C	70°C	20°C	70°C
Temperature	CPU#1 Temperature	28°C	20°C	70°C	20°C	70°C
Temperature	CPU#0 Temperature	27°C	20°C	70°C	20°C	70°C
Voltages	CPU#3 Core Voltage	2.02V	1.850V	2.250V	1.725V	2.42V
Voltages	CPU Board 2.5V	2.48V	2.37V	2.63V	2.37V	2.63V
Voltages	CPU#0 L2 Cache Voltage	1.95V	1.95V	2.15V	1.95V	2.15V
Voltages	CPU#1 L2 Cache Voltage	Disable	Disable	Disable	Disable	Disable
Voltages	CPU#2 L2 Cache Voltage	Disable	Disable	Disable	Disable	Disable
Voltages	CPU#3 L2 Cache Voltage	Disable	Disable	Disable	Disable	Disable
Voltages	CPU Board VTT	1.48V	2.37V	2.63V	2.37V	2.63V
Voltages	CPU Board VCC3	3.35V	3.13V	3.47V	3.13V	3.47V
Voltages	CPU Board VCC	5.23V	4.75V	5.25V	4.75V	5.25V
Voltages	CPU Board +12V	12.40V	11.40V	12.60V	11.40V	12.60V
Voltages	CPU#2 Core Voltage	2.02V	3.23V	3.57V	3.23V	3.57V
Voltages	CPU#1 Core Voltage	2.05V	1.80V	2.00V	1.80V	2.00V
Voltages	CPU#0 Core Voltage	2.03V	1.95V	2.15V	1.95V	2.15V

The screen displays the current values for the health parameter, along with the low and high warning limits, and the low and high alert limits. When the health parameters exceed the low or high limits, the system sends a warning or alert to the system administrator.

Cont'd

Location/Category Components You can view two sets of components in the Health Information group. The first is the Location components. These components show information grouped by location. The second set shows information grouped by Category of health variable.

The icons for the location and category components display in the left frame. You can click on the Health Information icon to toggle between the location and category components.

Location Components

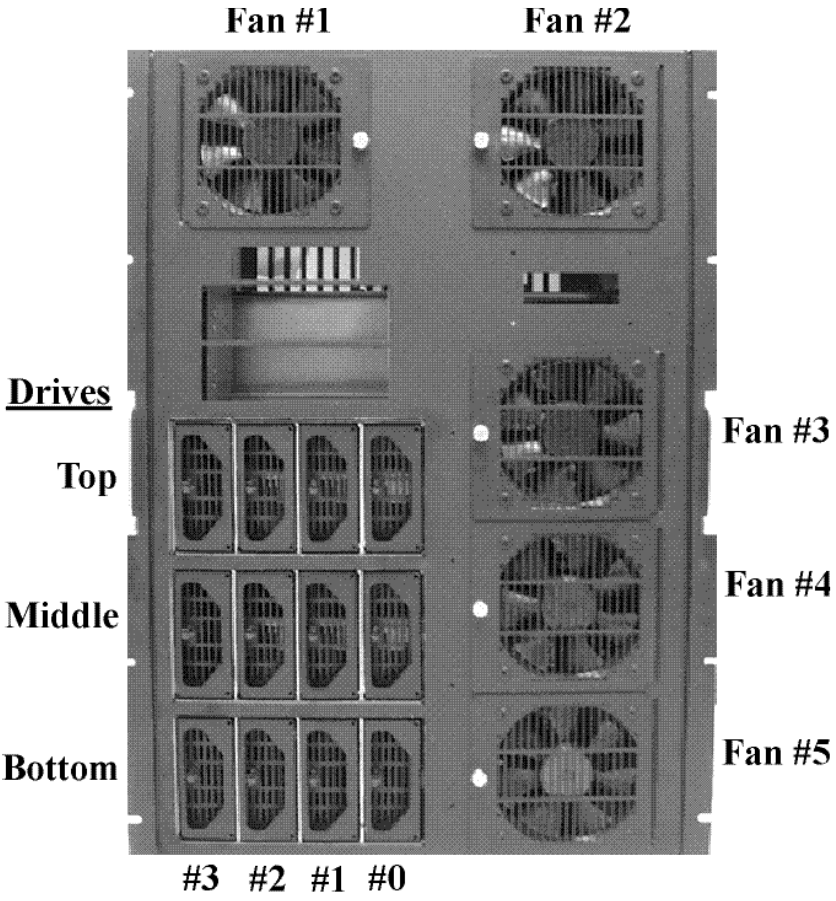
Component	Description
CPU Board	Displays the status of all available CPU board parameters, including fan speeds, temperatures, and voltages.
I/O Board	Displays the status of all available I/O board parameters, including fan speeds, temperatures, and voltages.
Show All Events	Displays the status of all parameters.

Category Components

Component	Description
Voltage	Displays all monitored voltages in the selected server.
Temperature	Displays all monitored temperatures in the selected server.
Fans	Displays the fan speed for all monitored fans in the selected server.
Show All	Displays all parameters.

Cont'd

Location of Fans on the Chassis The Megaplex chassis has five fans, and 12 drives on the front side. The Health Information screen displays health values for the fans. (The status of the drives displays when you select the Chassis Status icon.) The fans on the front of the chassis are numbered from one to five. The front of the chassis is shown below.



Cont'd

Health Monitoring Items for CPU Board The following table contains the categories and health parameters that display for the CPU board on the Health Information screen. The screen also displays the high and low warning and alert values for each parameter.

System Health
Voltage
CPU Board VTT
CPU Board VCC3
CPU Board VCC
CPU #0 Core
CPU #1 Core
CPU #2 Core
CPU #3 Core
CPU #0 L2 Cache
CPU #1 L2 Cache
CPU #2 L2 Cache
CPU #3 L2 Cache
CPU Board 25
CPU Board +12
Temperature
CPU #0
CPU #1
CPU #2
CPU #3
CPU Board Ambient #1
CPU Board Ambient #2
Fan
Chassis Fan #3
Chassis Fan #4
Chassis Fan #5

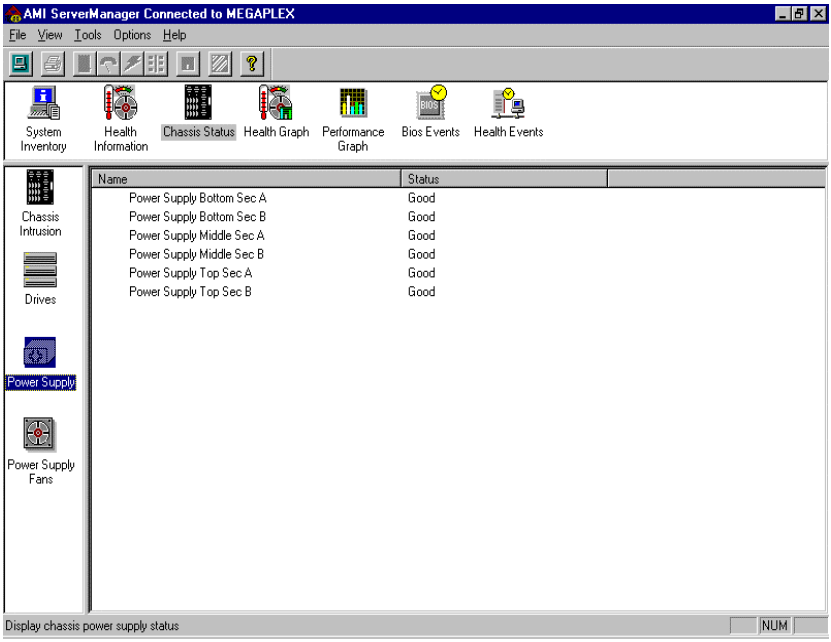
Cont'd

Health Monitoring Items for I/O Board The following table contains the categories and health parameters that display for the I/O board on the Health Information screen. The screen also displays the high and low warning and alert values for each parameter.

System Health
Voltage
I/O Board VTT
I/O Board VCC3
I/O Board VCC
I/O Board Slot VCC3
I/O Board +12
I/O Board -12
I/O Board -5
Temperature
I/O Board Ambient #1
I/O Board Ambient #2
I/O Board Ambient #3
I/O Board Ambient #4
Fan
Chassis Fan #1
Chassis Fan #2

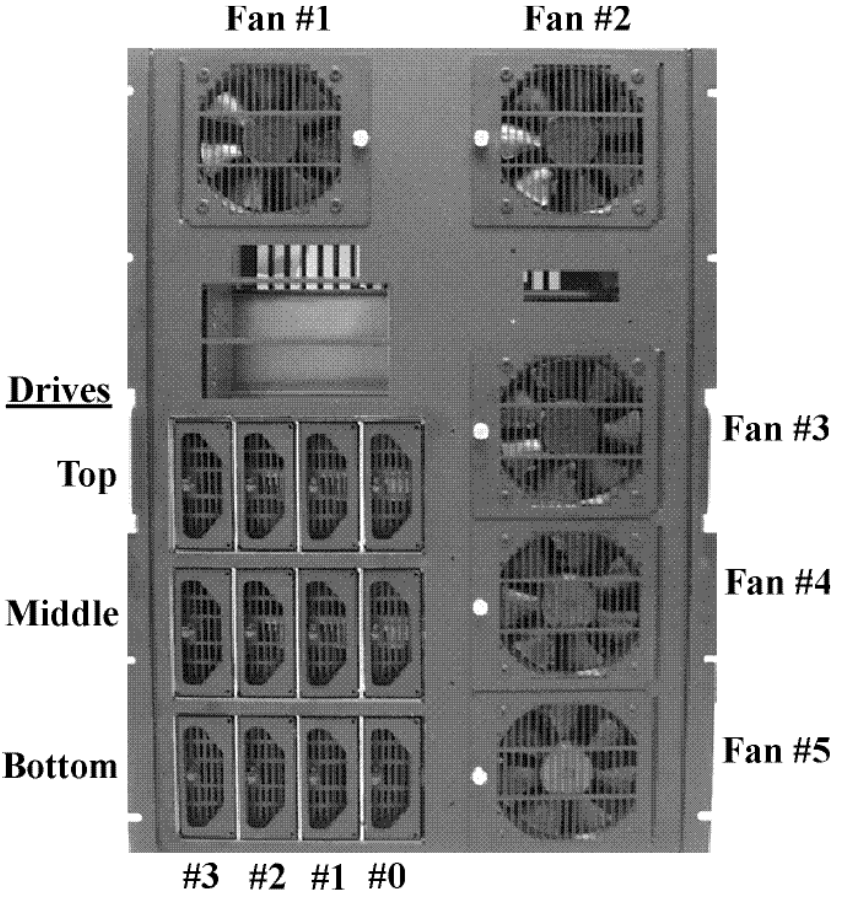
Chassis Status

The Chassis Status icon is used to display information about health components located in the chassis. This screen displays the chassis intrusion status, and the status of the drives, power supply, and power supply fans. Click on an icon in the left frame to view the status for a specific item. Chassis Instrusion Status indicates whether the chassis is open or closed. A sample Chassis Status screen is shown below.



Cont'd

Location of Drives on the Chassis The status for the 12 drives on the chassis indicates whether they are present or absent. The drives are numbered from zero to three in each of the three drive sections, Top, Middle, and Bottom. The values for drive status are "Present" or "Absent."



Cont'd

Power Supply and Fans There are six power supplies, in two sections, A and B. Each section has a Top, Middle, and Bottom power supply. For example, the top power supply in section A is denoted as "Power Supply Top Sec A", as shown in the sample Chassis Status screen on page 104. The values for the power supplies are "OK", "Bad", or "Absent."

There are also six power supply fans, in two sections, A and B. Each section has a Top, Middle, and Bottom power supply. Each power supply fan is designated as a left or right fan. The values for the power supply fans are "OK", "Bad", and "Absent."

Examples of Chassis Status Information The following table displays examples of the status information that can appear on the Chassis Status screen.

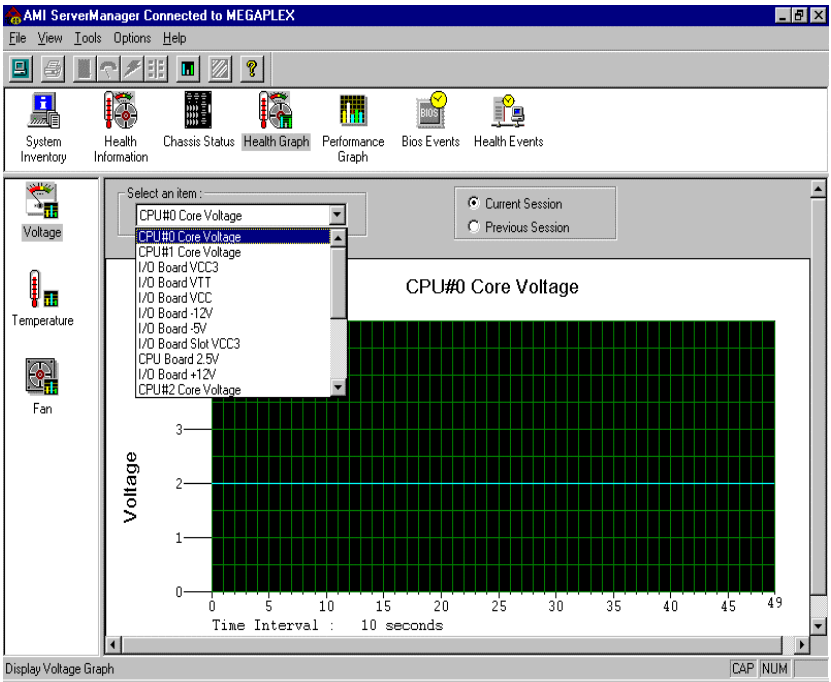
Chassis Status Information	
Drive Status	
Drive Top ID 0	Present
Drive Middle ID 2	Absent
Power Supply Status	
Power Supply Middle Sec A	OK
Power Supply Bottom Sec B	BAD
Power Supply Fan Status	
Power Supply Fan Right - Top	Absent
Power Supply Fan Left - Bottom	OK

Health Graph

The Health Graph plots all historical values in a chart. The Health Graph displays information from the current session, and from the previous session. For the current session, data is collected from when AMI Server Manager started. For the previous session, all data is logged in the GPNV RAM (General Purpose Non-Volatile Random Access Memory). Data is collected about the voltage, temperature, and fan, as indicated by the icons on the left of the screen.

AMI Server Manager can display a graph of system activity on the selected server. Select Health Graph to highlight the Health Graph icon on the Toolbar. Click on the icon to set the type and mode of graph to display.

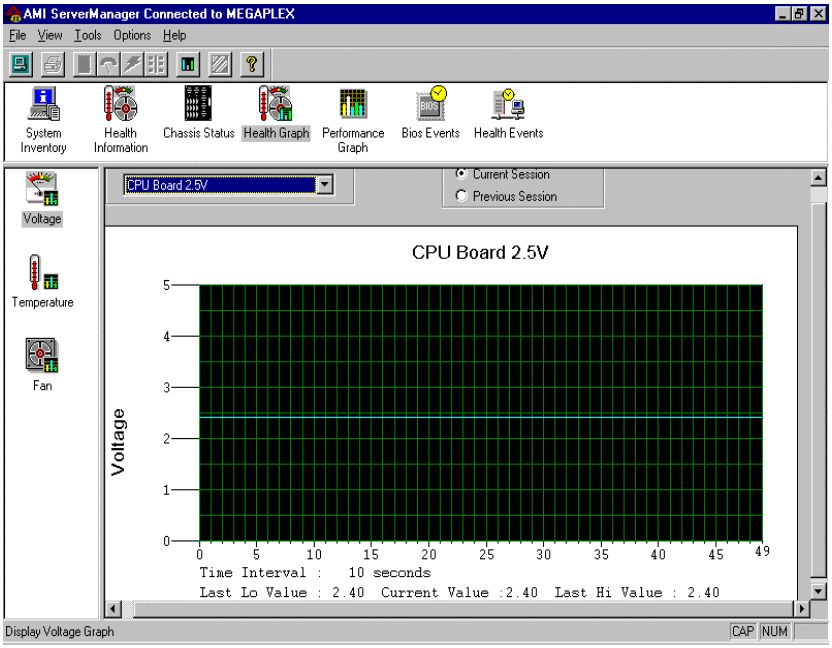
Select Current Session or Previous Session. Select an icon on the left of the screen for a list of voltages, temperatures, or fans. Scroll through the items and choose one. AMI Server Manager displays a graph of the recent readings for the selected item. A sample health graph for the CPU#0 Core Voltage is shown below.



The section of the Health Graph screen below the graph displays the following information for a current session:

- Time Interval,
- Last Lo Value,
- Current Value, and
- Last Hi Value.

Time Interval and TimeSpan display when you select Previous Session.

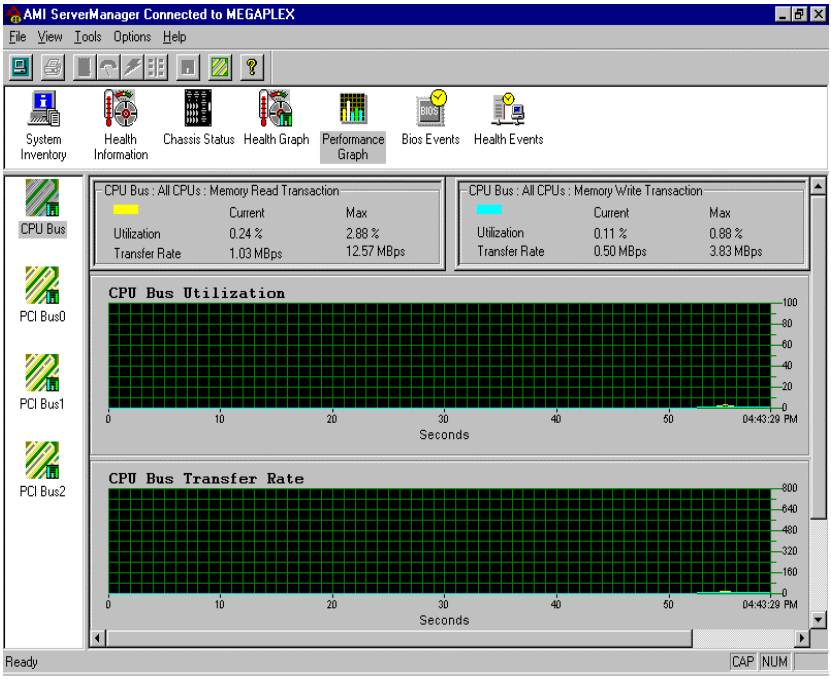


Performance Graph

The Performance Graph is used to view a graph of the performance of a component. There are four components. For each component, there are two measurements: Utilization and Transfer Rate. The four components are:

- **CPU Bus** - view the performance information for individual CPUs or all CPUs,
- **PCI Bus0** - view the performance information for PCI slots 1, 2, 3, and 4, and the onboard VGA,
- **PCI Bus1** - view the performance information for PCI slots 5, 6, 7, and 8, and
- **PCI Bus2** - view the performance information for PCI slots 9, 10, 11, and 12.

You can use the Performance Graph toolbar icon to modify the parameters, and set the Sampling Interval (rate at which the data is refreshed.) A sample Performance Graph screen for the CPU Bus (All CPUs) is shown below.



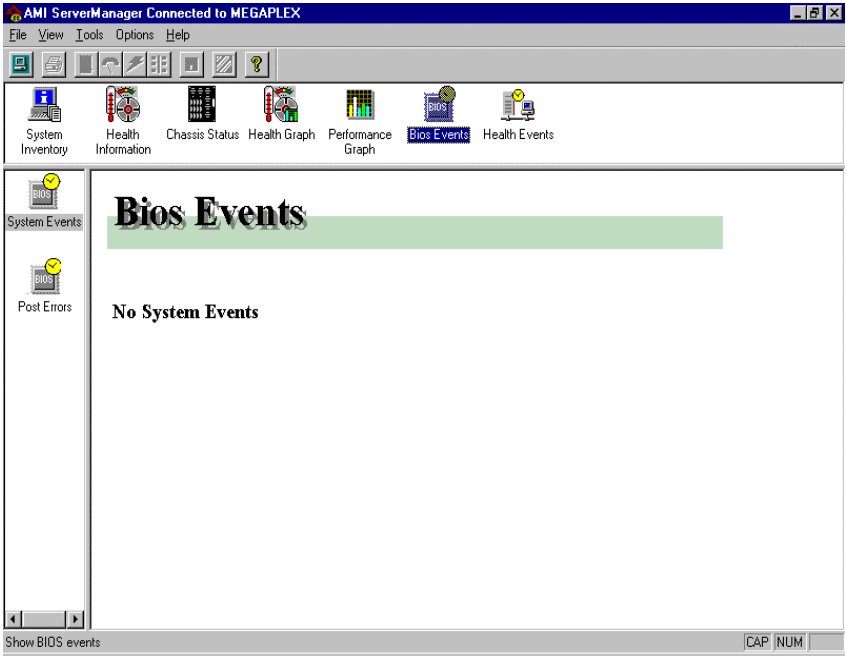
BIOS Event Display

There are two components in the BIOS Events group:

- System Events displays all system events, and
- Post Errors displays all post errors.

The system BIOS checks for problems in the server and logs them in GPNV (General Purpose Non-Volatile RAM.) AMI Server Manager reports all BIOS events recorded by the system BIOS and displays them when you click on the BIOS Events icon on the AMI Server Manager main screen.

A sample BIOS Event display screen is shown below:



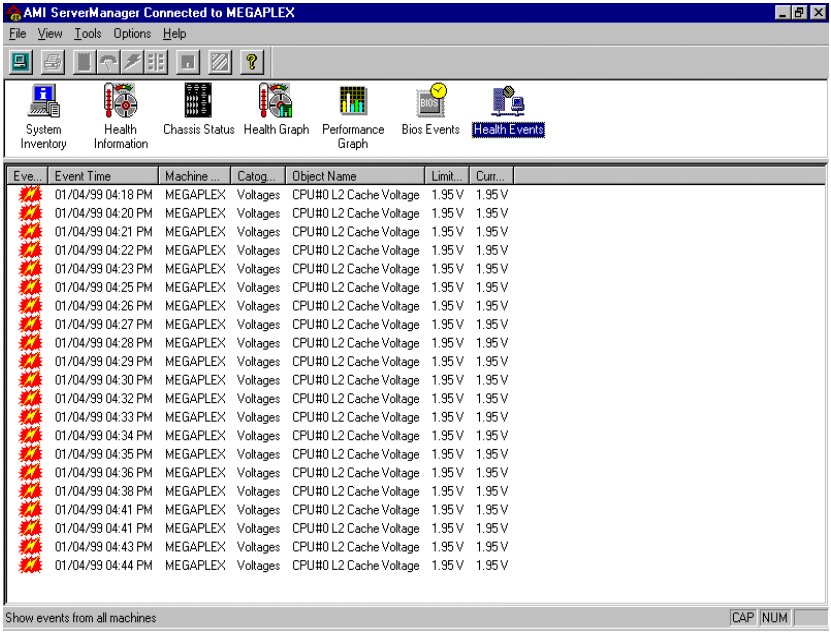
Health Events

Select this group to see if you have received any warnings or alerts. If you have, they will display here , showing the time of the failure and the machine on which the failure occurred. Also, you will be able to see what failed and what the current value is. There is no left frame for the Health Events icon.

To receive warnings and alerts from a remote machine, the remote machine must be running HealthAgent.

AMI Server Manager can display the contents of the event log for the selected server.

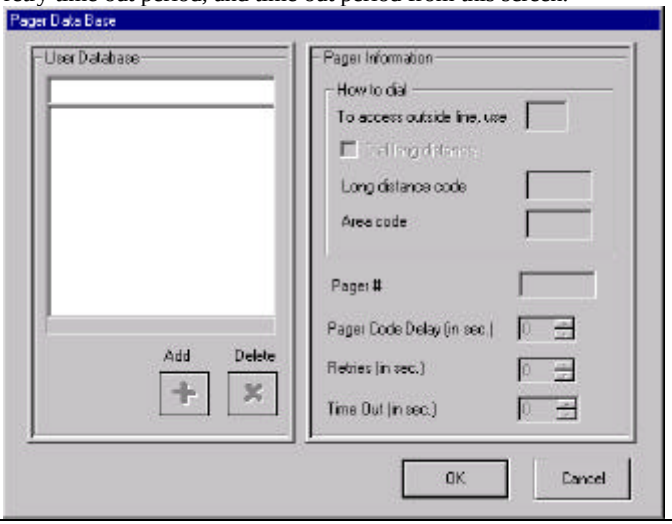
Click on the Health Events icon on the AMI Server Manager main screen. A sample event log screen is shown below.



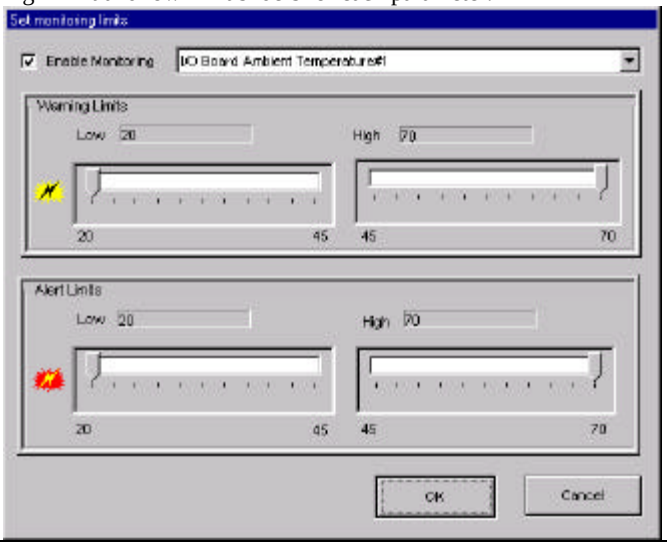
6 AMI Server Manager Icons and Menus

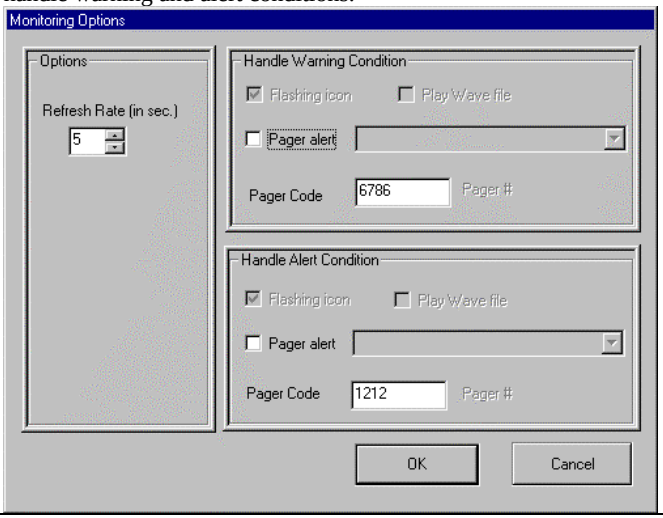
AMI Server Manager Toolbar Icons

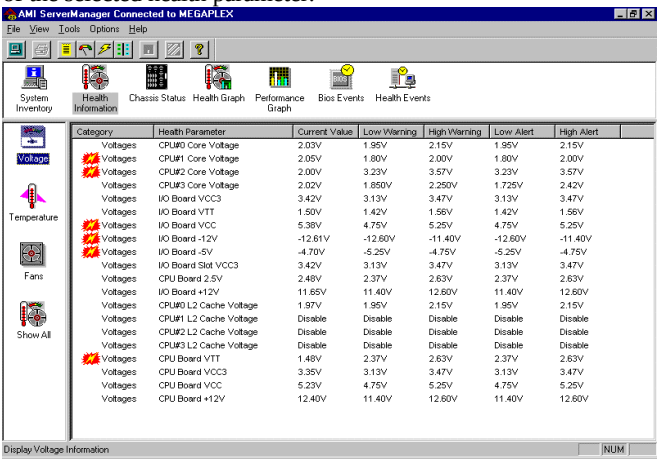
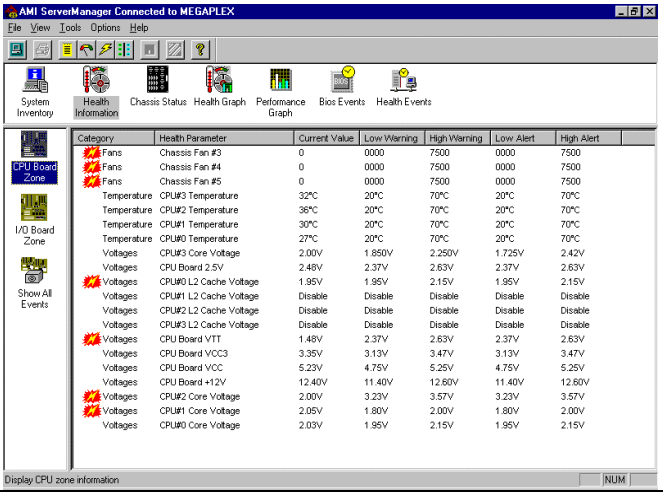
Toolbar Icons The nine toolbar icons on the main screen are located below the menu bar and above the top frame icons. Based on the top frame icon selected, some toolbar items are enabled or disabled. The following table describes the toolbar icons and tells when they are enabled.

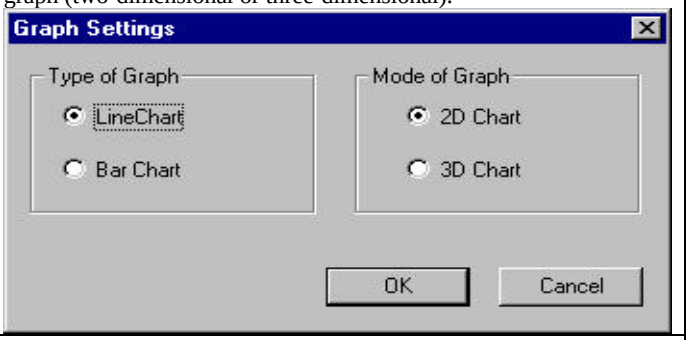
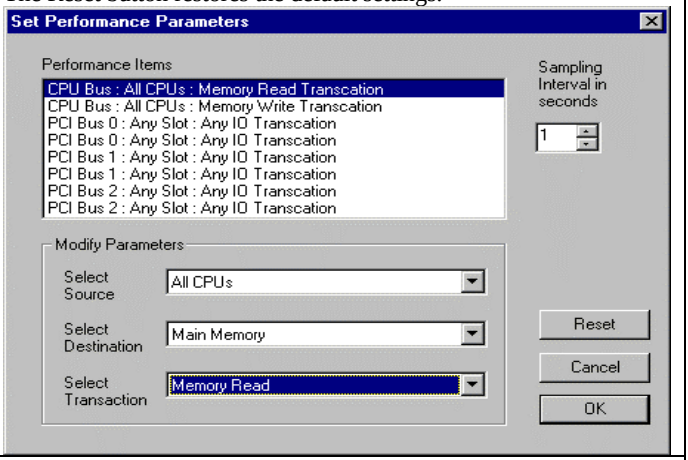
Icon	Meaning
 Connect to a Workstation	Click on this icon to select a different server. The Server Selection screen (see page 90) will appear. Click on a server icon to run AMI Server Manager on the selected server. *This icon is always enabled.*
 Print	Click on this icon to print the contents of the screen. *This icon is enabled only when the System Inventory icon is selected.*
 Pager Database	AMI Server Manager can call a pager to notify you if a server is having a problem. Click on this icon to choose a pager from the pager database. *This icon is enabled only when the Health Information icon is selected.* The screen shown below displays. You can add or delete pager numbers and configure the page information from this screen. You can enter prefixes for dialing outside lines, long distance codes, area codes, pager number, delays, retry time out period, and time out period from this screen. 

Icon	Meaning
 Health Limits	Click on this icon to establish the limits for the server health parameters (acceptable voltage ranges, fan operating speeds, etc.). *This icon is enabled only when the Health Information icon is selected.* The screen shown below displays. Choose the system health parameter from the pull-down list at the top of this screen. Set the warning and alert limits by moving the high limit and low limit sliders for each parameter.



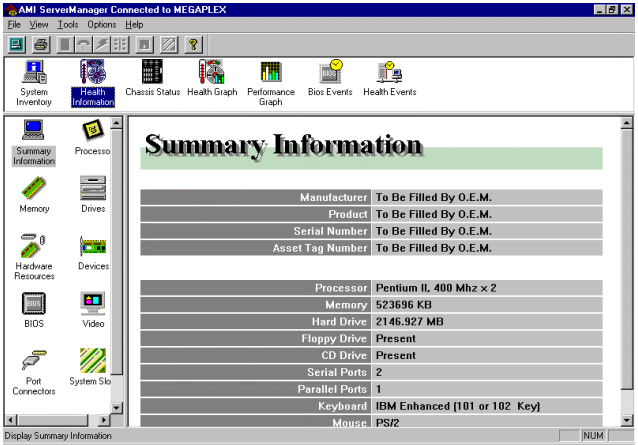
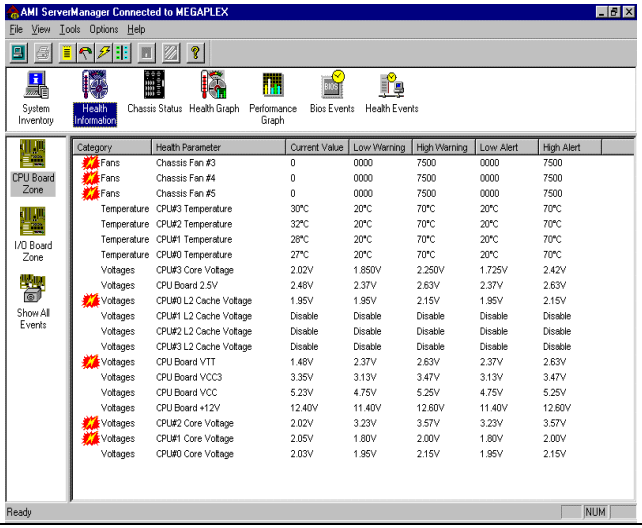
Icon	Meaning
 Health Options	Click on this icon to set the options for handling warning and alert conditions. *This icon is enabled only when the Health Information icon is selected.* The screen shown below displays. From this screen, you can choose how often the server health parameters are checked, if a pager alert should be sent, and how to handle warning and alert conditions. 

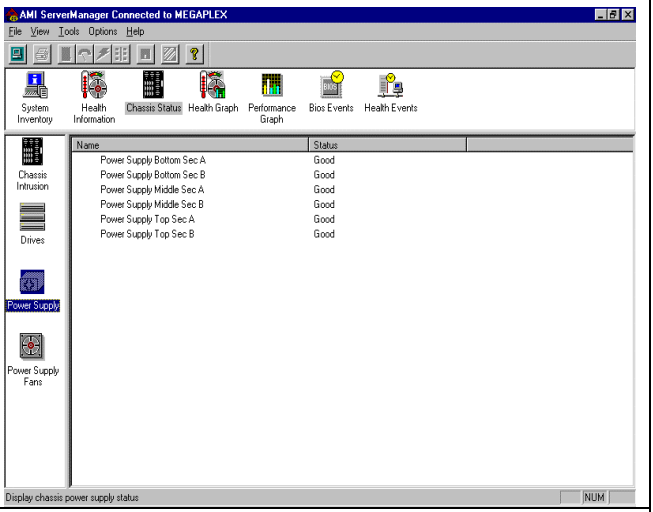
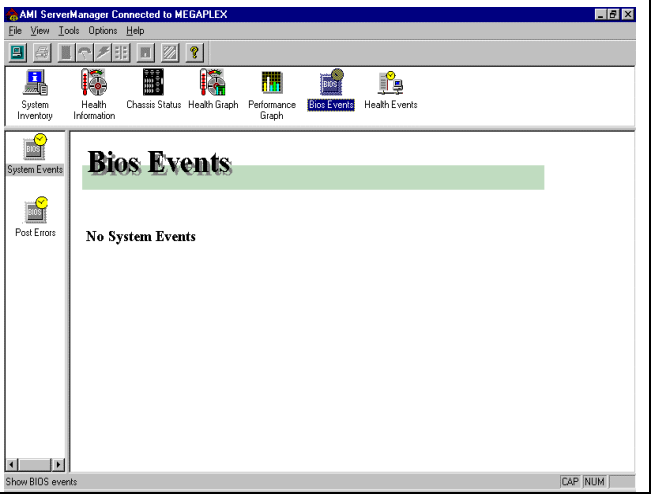
Icon	Meaning
 Location/ Category	Click on this icon to display a health report for the current server for location components (such as CPU board and I/O board), and category components (such as voltage and temperature). You can click on this icon to toggle back and forth between location and category components. *This icon is enabled only when the Health Information icon is selected.* For category components, click on the Voltage, Temperature, Fan, or Show All icons on the left of the screen to display the current status of the selected health parameter.  For the location components, click on the Location/Category icon again to display additional icons. The location icons are shown below. By clicking on the appropriate icon, you can display health parameters for the Megaplex CPU Board Zone, I/O Board Zone, or All Events. 

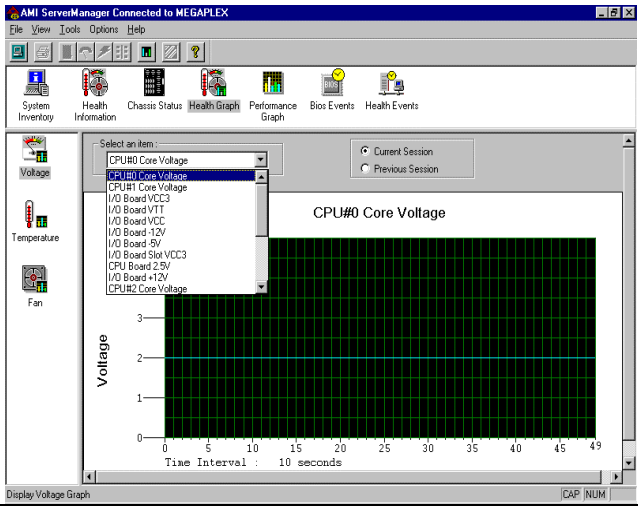
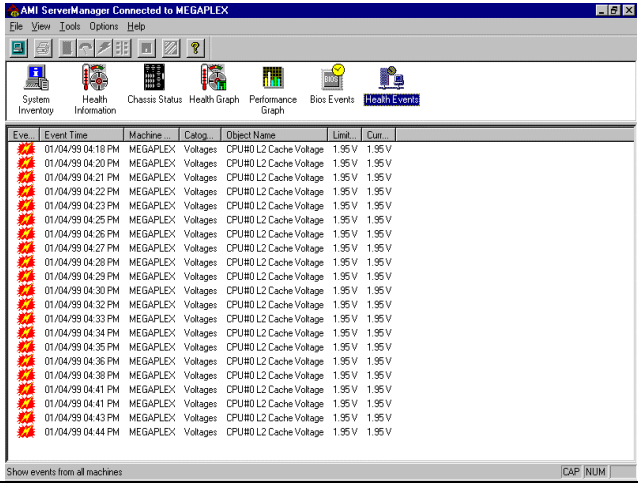
Icon	Meaning
 Graph Options	Click on this icon to configure the type of graph that is displayed for the system performance function. *This icon is enabled only when the Health Graph icon is selected.* When you click on this icon, the following setting box displays for you to select the type of chart (line chart or bar chart) and mode of graph (two-dimensional or three-dimensional): 
 Performance Graph	Click on this icon to select the component (CPUs or slots) to make a performance graph for. You can modify the parameters that are measured and the frequency that the data is updated. *This item is enabled only when the Performance Graph icon is selected.* When you click on this icon, the following setting box displays for you to select a component, parameters, and sampling interval. There are eight performance items to measure Utilization and Transfer Rate for each of the four components. Use the Modify Parameters section to set the parameters. The Sampling Interval is used to modify how often the performance information is updated, from 1 to 60 seconds. The Reset button restores the default settings. 
 Help	Click on this icon to display AMI Server Manager help topics. *This icon is always enabled.*

AMI Server Manager Top Frame Icons

Top Frame Icons The icons on the top frame of the main AMI Server Manager screen are:

Icon	Meaning
	Click on this icon to display a summary of system configuration information about the selected server. A screen such as the following appears: 
	Click on this icon to display the system health parameters for the selected server. A screen such as the following appears: 

Icon	Meaning
 Chassis Status	Click on this icon to display the chassis status for the selected server. A screen such as the following appears: 
 Bios Events	Click on this icon to display the most recent BIOS events for the selected server. A screen such as the following appears: 

Icon	Meaning
 Health Graph	Click on this icon to display the most recent history of health parameters for the selected server. A screen such as the following appears: 
 Health Events	Click on this icon to display the event log for the selected server. A screen such as the following appears: 

AMI Server Manager Menus

The AMI Server Manager menus are:

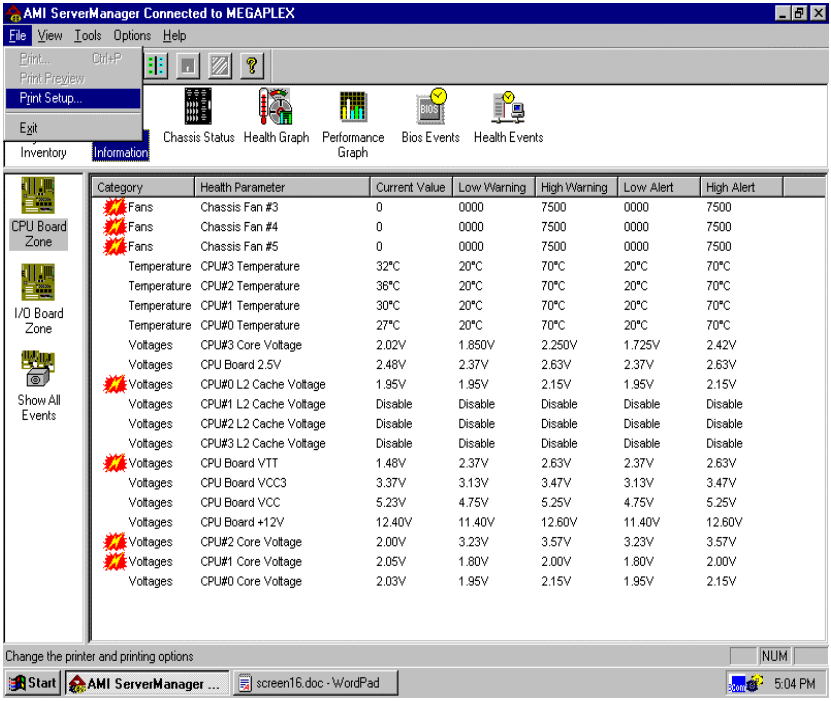
- File,
- View,
- Tools,
- Options, and
- Help.

Menu Headings The menu headings are located above the toolbar icons. Based on the top frame icon selected, some menu items are enabled or disabled. The following table shows when these menu items are enabled (listed here as they display from left to right across the screen):

Menu Item	When Enabled
Print	Enabled only when the System Inventory icon is selected. This menu item is in the File menu.
Connect to a Workstation	Always enabled. This menu item is in the Tools menu.
Change Password Reboot Shutdown	Enabled only when you are connected to a remote server. These menu items are in the Options menu.
Graph Settings	Enabled only when the Health Graph icon is selected. This menu item is in the Options menu.
Pager Database Health Limits Health Options Location/Category	Enabled only when the Health Information icon is selected. These menu items are in the Options menu.
Help	Always enabled.

Cont'd

File Menu The File menu options are:



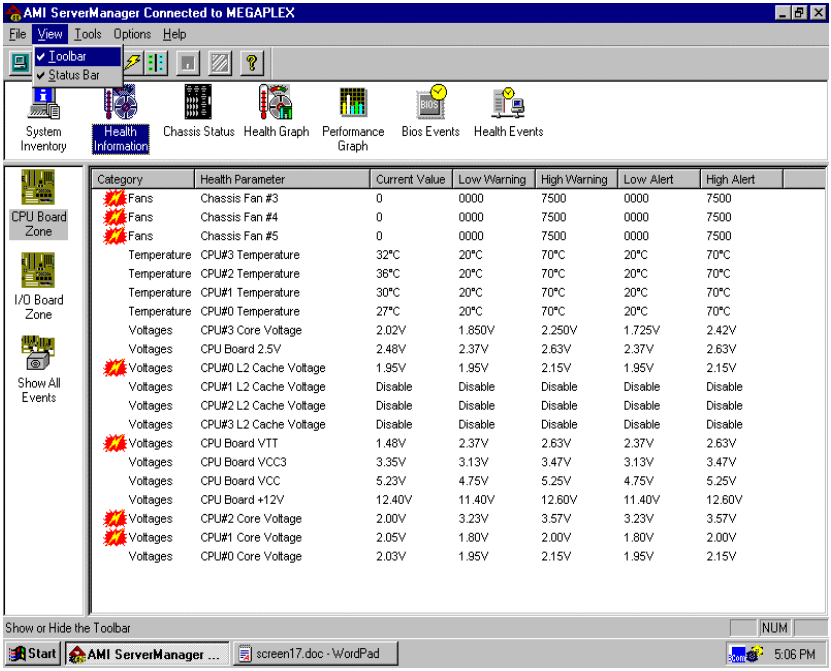
Menu Item	Description
Print	Choose this option to print the information displayed on the screen. *The Print menu options is enabled only when the System Information icon is selected.*
Print Preview	Choose this option to display the print format of the contents of the current screen without actually printing.
Print Setup	Choose this option to select a printer and to configure printer properties and options.
Exit	Choose this option to end the AMI Server Manager session.

Cont'd

View Menu

The View menu is shown below. The View menu options are described below:

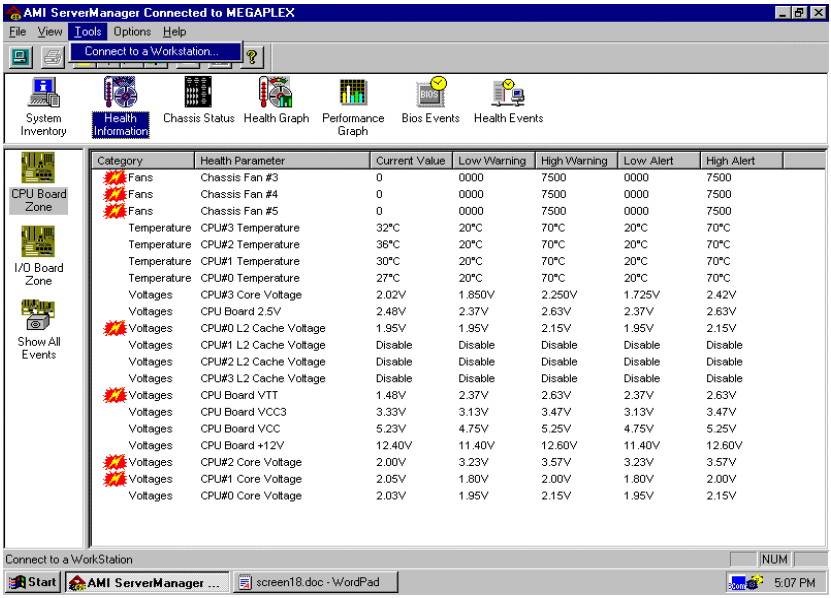
- Toolbar - choose this option to display the toolbar. If the toolbar is already displayed, choose this option to hide the toolbar.
- Status Bar - choose this option to display the status bar. If the status bar is already displayed, choose this option to hide it. (The status bar is located immediately below the left frame and the body frame.)



Cont'd

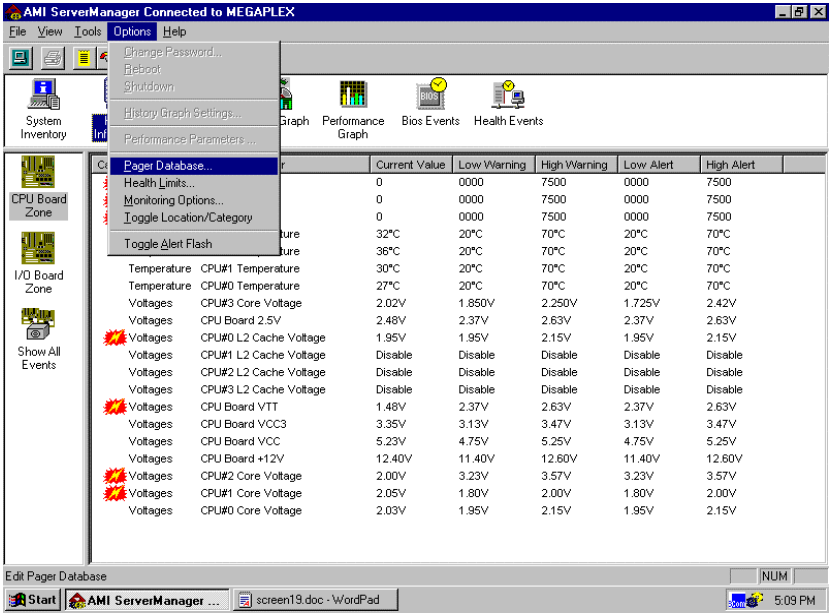
Tools Menu

The tools menu is shown below. The only menu item is Connect to a Workstation. If you choose this option, the Open Server screen appears and you can choose a different server to run AMI Server Manager with.



Cont'd

Options Menu The Options menu is shown below. Some menu items are disabled or enabled, depending on the top frame icon selected.



Cont'd

Options Menu, continued The following table describes the Options menu items and when they are enabled.

Menu Item	Description
Change Password	Choose this item to change the password used when you connected to a server. *This item is enabled only when you are connected to a remote server.*
Reboot	Choose this item to reboot the server. *This item is enabled only when you are connected to a remote server.*
Shutdown	Choose this item to shut the server down. *This item is enabled only when you are connected to a remote server.*
Graph Settings	Choose this item to set the type and mode of graph. *This item is enabled only when you select the Health Graph icon.*
Pager Database	Choose this item to choose a pager from the pager database. *This item is enabled only when you select the Health Information icon.*
Health Limits	Choose this item to establish the limits for the server health parameters. *This item is enabled only when you select the Health Information icon.*
Monitoring Options	Choose this item to set health parameters, such as Refresh Rate, Handle Warning Condition, and Handle Alert Condition. *This item is enabled only when you select the Health Information icon.*
Toggle Location/ Category	Choose this item to display a health report for the current server for location and category components. *This item is enabled only when you select the Health Information icon.*
Toggle Alert Flash	Choose this item to enable the Health Information, Chassis Status, and Bios Events icons to flash when there is a problem.

Help Menu AMI Server Manager provides Help information for selected topics. Choose this option to display the AMI Server Manager Help screens.

7 Flashing the LCD ROM

The AMI Server Manager Agent uses the LCD on the front of the Megaplex machine to display System Inventory and Health Data. For this information to be accurate, the Agent must be running. This chapter contains:

- An overview of the LCD and its function,
- graphics of the LCD ROM panel,
- tools required for the process, and
- the procedure for flashing LCD ROM.

Overview

Information for the AMI Server Manager Agent displays on the LCD ROM panel. This panel is located on the front of the Megaplex case, as seen in the picture below:

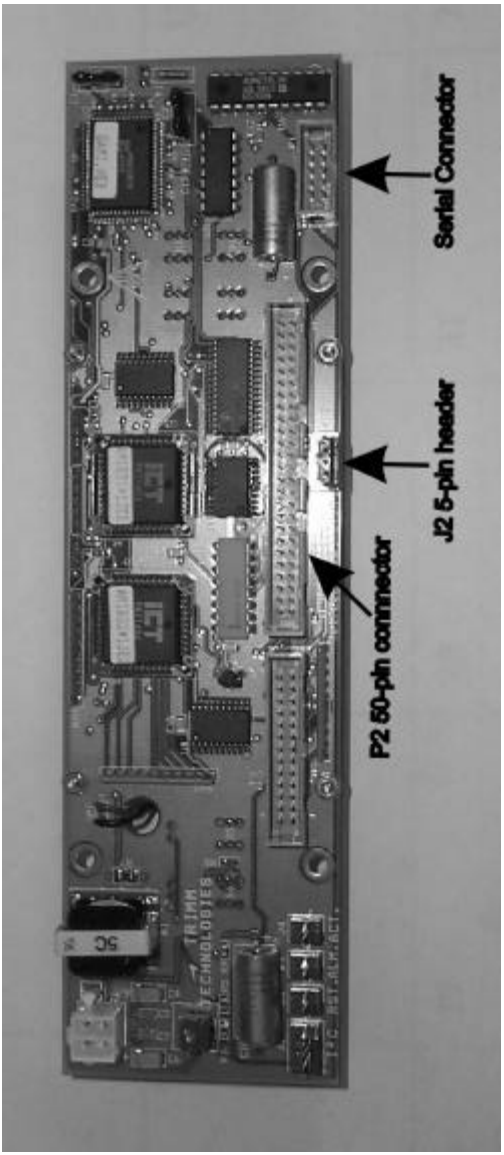
There are four function keys used to control the LCD: Enter, Exit, Up (arrow), and Down (arrow). These keys are located to the left of the display panel. Press any of these keys to access the main menu. At the main menu, highlight the item you want by using the Up and Down arrows and pressing Enter. Use the Exit key to go back one menu. Using this method, you can view system and health information about the Megaplex machine.

The reset (RST), and power (PWR) buttons are located to the right of the display panel.

Note: If five seconds pass and you do not press a function key, the LCD will continue to scroll through all the available information. In addition, an asterisk (*) next to an item indicates a warning or an alert for that item.

LCD ROM Panel

The following graphic shows the back of the LCD ROM display panel. The P2 50-pin connector, J2 5-pin header, and the serial connector are used to flash the LCD ROM.



Cont'd

Tools

The following tools are required to upgrade the LCD ROM:

- sorting header (supplied),
- floppy with LCD ROM upgrade image,
- null modem cable,
- PC with an available serial port, and
- terminal emulation software.

Flashing the LCD ROM

Use the following procedure to flash the LCD ROM.

Step	Action
1	Turn off the Megaplex machine
2	Take off the top cover of the Megaplex chassis.
3	Take off the cable from the 50-pin connector, P2.
4	Put the "sorting header" on the 5-pin connector, J2. When you place the sorting header on the connector, the five holes on the back of the sorting header face the 50-pin connector, P2.
5	Connect a null modem cable to the serial connector.
6	Boot the PC in DOS or Windows.
7	Connect the other end of the null-modem cable to the serial connector of a PC.
8	Run your terminal software.
9	Turn on the Megaplex machine.
10	Download the firmware image through the terminal software.
11	Turn off the Megaplex machine.
12	Disconnect the null-modem cable and the sorting header.
13	Reconnect the cable to the 50-pin connector, P2.
14	Turn on the Megaplex. The LCD is ready.

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