American
Megatrends

Goliath PCI Quad

Pentium® Pro

EISA System

User's Guide

Limited Warranty

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Revision History

5/19/96   Initial release.
6/7/96   Updated for new BIOS release.

Preface

To the OEM Thank you for purchasing the high performance American Megatrends Goliath EISA system. This product is a state of the art set of CPU cards, memory card, and a baseboard that includes the famous AMIBIOS. It is assumed that you have also licensed the rights to use the American Megatrends documentation for the American Megatrends Goliath.

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 Goliath system. It explains how to assemble a system based on the Goliath system and how to use the AMIBIOS that is specifically designed for this system.

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 parts of this manual will be included in the computer owner's manual.

Technical Support

If you need help installing, configuring, or running this product, call American Megatrends technical support at 770-246-8645. You can also send questions to tech support at:

support@american.megatrends.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 770-246-8645 to find out how to access the BBS.

Phone Numbers The BBS requires no parity, eight data bits, and one stop bit. The characteristics of the BBS phone numbers are:

Phone Number	Characteristics
770-246-8780	28,800 baud rate. Supports v.34.
770-246-8781	28,800 baud rate. Supports v.34.
770-246-8782	Supports HST and v.42.
770-246-8783	Supports HST and v.42.

Web Site We invite you to access the American Megatrends world wide web site at:

http://www.megatrends.com.

Packing List

You should have received the following:

- a Goliath baseboard,
- a Series 731 CPU 1 card,
- a Series 732 CPU 2 card or a Series 733 terminator card,
- a Series 741 memory card,
- a U-shaped bracket with screws and spacers to be attached to the S730 baseboard, the CPU 2 card, and the memory card,
- a customized PS/2 mouse cable,
- two customized serial cables,
- one customized parallel cable,
- a Warranty Card, and
- the *American Megatrends Goliath Pentium Pro EISA System User's Guide*.

Static Electricity

The Goliath baseboard, CPU cards, 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 Goliath system or any other electrical component,
- touch a grounded anti-static surface or a grounded metal fixture before handling the Goliath system,
- handle system components by the mounting bracket, if possible.

Batteries   Make sure you dispose of used batteries according to the battery manufacturer's instructions. Improper use of batteries may 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.

1   Hardware Installation

Features

The American Megatrends Goliath Quad Pentium Pro™ EISA PCI system supports one to four Intel® Pentium Pro CPUs operating at 180 MHz or higher speeds.

Components   The Goliath consists of several components:
- a baseboard that includes the EISA and PCI expansion slots and most of the electronics,
- a primary and a secondary CPU Card. Each CPU Card can have 1 or 2 Pentium Pro CPUs,
- A Terminator Card (used only if the second CPU Card is not installed), and a
- memory card.

The Goliath system was designed to run with the memory card and both CPU Cards installed on the baseboard. However, the second CPU Card does not have to be installed if a Series 733 GTL terminator is installed in J8, the CPU Card 2 connector.

CPUs   The Pentium Pro CPUs are mounted on two separate CPU Cards for easy CPU upgrades. Each CPU card holds one or two Pentium Pro CPUs. All Intel Pentium Pro CPUs use 3.3V.

System Memory The Goliath system supports up to 1 GB of onboard system memory through eight 8 DIMM sockets. This system supports four-way interleaved memory operation for maximum performance. The system supports 168-pin DIMMs. The system memory supports ECC (Error Checking and Correction).

Cache Memory The Goliath system provides 256 KB or 512 KB of cache memory internal to each Pentium Pro CPU.

EISA Expansion The Goliath baseboard includes four EISA expansion slots. All EISA expansion slots can handle full-length EISA adapter cards.

PCI Local Bus The Goliath baseboard has six PCI expansion slots on two peer PCI buses using dual OPBs (Orion PCI Bridge) and totally independent parallel PCI operation on two peer PCI buses. The buses can transfer data simultaneously at a maximum rate of 132 MBs.

All PCI slots are bus master slots and comply with the PCI Version 2.0 specification. All PCI expansion slots except the Primary PCI 3 slot can handle full-length PCI adapter cards.

Integrated I/O The Goliath baseboard provides the following integrated I/O:

- one bidirectional parallel port that operates in Normal, EPP, or ECP mode,
- two serial ports 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,
- support for up to two Enhanced IDE drives on the PCI local bus,
- a berg header for a PS/2 mouse cable, and
- a standard DIN keyboard connector.

Power Monitors The Goliath baseboard includes power monitor that make sure all power lines are stable before the CPUs are started. The onboard voltage monitors check all voltages and provide a warning if power is about to fail.

IDE Features IDE support on the Goliath baseboard includes:

- supports up to 2 IDE drives on the local bus,
- supports IDE programmed I/O (PIO) modes 3 and 4,
- provides bus mastering IDE support,
- provides IDE on the local bus,
- supports 32-bit data transfers,
- provides Fast ATA support, and
- supports LBA and Block Mode.

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

- automatic CPU detection,
- Plug and Play NVRAM,
- PCI-PCI bridge support,
- DMI support,
- ATAPI support for IDE CD-ROM drives,
- ability to boot from a CD-ROM drive,
- complies with the Intel NSP specification,
- automatically detects IDE drive parameters,
- supports Enhanced IDE, including support for 2 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.

Features, Continued

PCI Bus Speed The Goliath system conforms to the PCI Version 2.0 specification. The PCI slots are automatically configured by the AMIBIOS. The PCI slots operate synchronously with the CPU clock, as follows:

CPU External Clock Frequency	PCI Expansion Slot Frequency
66 MHz	33 MHz
60 MHz	30 MHz

Goliath Dimensions

The full-size AT Goliath baseboard is approximately 12" by 13.1". The Series 732 CPU Card 2 is 13" long and 6" high. The Series 731 CPU Card 1 is 7" long by 6" high. The Series 741 Memory Card is 6.25" long and 6" high.

CPU Card 2

CPU Card 1

Bolt the Memory Card to the steel bracket with a plastic spacer between the bracket and the Memory Card.

Bolt the memory card to the steel U bracket with a plastic spacer between the bracket and the memory card. Secure the U bracket to the baseboard using the screw and nut pair.

Memory Card
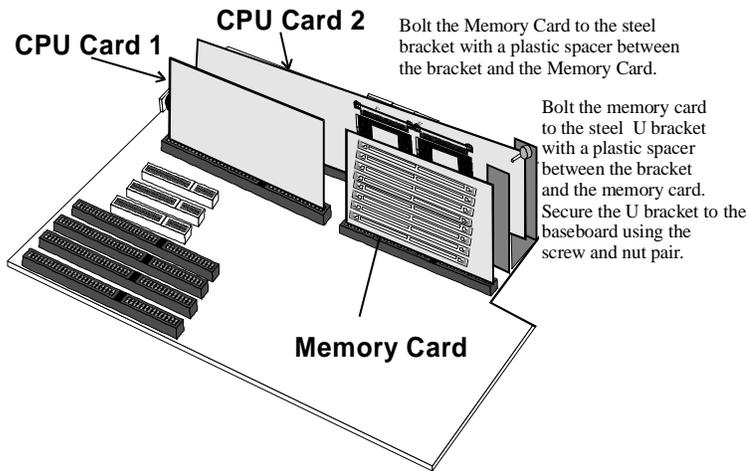
Installation Steps

Step	Action	
1	Unpack the baseboard and associated adapter cards.	
2	Configure the CPU.	
	Configure the CPU.	
	Set the Clock Ratio.	
	Configure CPU Card 1.	
	Configure CPU Card 2.	
	Install the CPU.	
3	Install memory.	
	Install system memory.	
4	Install the baseboard.	
5	Attach cables to connectors.	
	Connect the power supply.	
	Attach the keyboard cable.	
	Connect the mouse cable.	
	Attach connector cables.	
6	Connect the serial ports.	
7	Connect the parallel port.	
8	Connect floppy drives.	
9	Connect the IDE drive(s).	
10	Test and configure.	

STOP

Warning
This baseboard 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.

Goliath Baseboard Layout

J21 J20

J9 KEBD

J10 Mouse

J26

J4

J5
Ser1

J6
Ser2

J7
LPT1

P5

P10 PCI SLOT 1

P10 PCI SLOT 2

P12 PCI SLOT 3

PCI SLOT 4

PCI SLOT 5

PCI SLOT 6

J2 IDE

P1

P2

P3

P4

J24

J23

J19

J18

Real Time Clock

J25
Ext
SMI

J16

J17

J3
Floppy

J28
SPKR

J22
KBD
Lock

J27
RESET

J29
HLED

J15

J11

J12

Series 710 Rev-C Goliath
(C) 1996 American Megatrends

P6
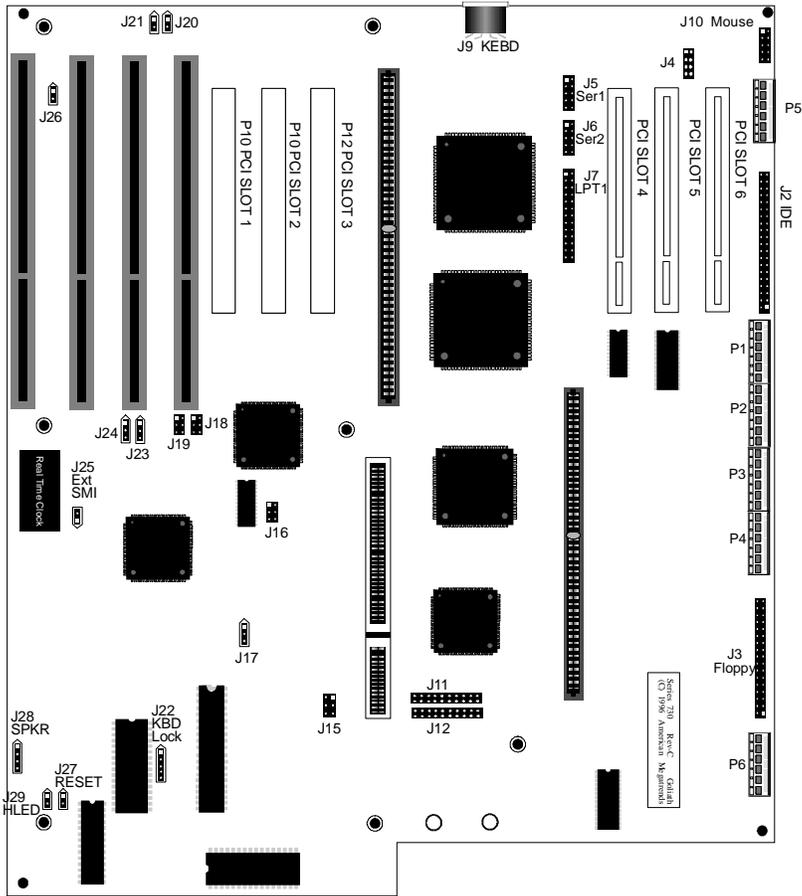
The ▢ Denotes Pin 1 in Jumpers and Connectors.
The ⬦ points toward Pin 1.

Goliath Terminator Card Layout

Goliath Memory Card Layout

DRAM Module1
DRAM Module2
DRAM Module3
DRAM Module4
DRAM Module5
DRAM Module6
DRAM Module7
DRAM Module8

Bank1

Bank2
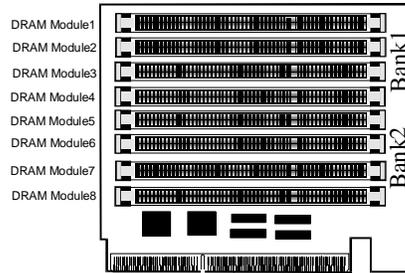
Avoid Static Electricity

Static electricity can damage the baseboard and other computer components. Keep the baseboard in the anti-static bag until it is to be installed. Wear an anti-static wrist grounding strap before handling the baseboard. Make sure you stand on an anti-static mat when handling the baseboard. 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 Goliath system includes the following components:

AMI Part Number	Description
Series 730	Baseboard
Series 731	CPU I Card (has 1 or 2 Pentium Pro CPUs)
Series 732	CPU 2 Card (has 1 or 2 Pentium Pro CPUs)
Series 733	GTL terminator (only used if Series 732 CPU 2 Card is not installed)
Series 741	Memory Card (8 rows of DIMM DRAM modules).

Step	Action
1	Inspect the cardboard carton for obvious damage. If damaged, call 770-246-8645. Leave the baseboard 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 baseboard is packed in an anti-static bag, and sandwiched between sheets of sponge. Remove the sponge and the anti-static bag. Place the baseboard on a grounded anti-static surface component side up. Save the original packing material.
4	Inspect the baseboard for damage. Press down on all ICs mounted in sockets to verify proper seating. Do not apply power to the baseboard if it has been damaged.
5	If the baseboard is undamaged, it is ready to be installed.

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

Step 2 Configure CPU

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

Compatible Mode J4 is an eight-pin berg on the baseboard that sets the compatibility mode. Leave J4 OPEN.

APIC Mode J17 is a 3-pin berg that sets the APIC (Advanced Programmable Interrupt Controller) mode. Always Short Pins 2-3 of J17.

External Clock J16 is a 6-pin berg on the baseboard that sets the PCI external bus clock speed. The primary and secondary PCI clock is set to 30 MHz or 33 MHz by a /2 synchronous divisor.

External PCI Clock Speed	J16	CPU Internal Speed	Internal PCI Speed
60 MHz	Short Pins 1-2	150 MHz	30 MHz
	Short Pins 5-6	180 MHz	
66 MHz	Short Pins 3-4	200 MHz	33 MHz

Step 2 Configure CPU, Continued

CPU Clock Ratio J15 is an 8-pin berg on the Series 730 baseboard that sets the CPU clock ratio for the Series 731 CPU Card 1.

J190 is an 8-pin berg on the Series 730 baseboard that sets the CPU clock ratio for the Series 732 CPU Card 2.

If two CPUs are installed on a CPU Card, the CPUs must operate at the same speed.

In Rev C of the baseboard, CPU Card 1 and CPU Card 2 can be set to different internal clock ratios.

J15 for CPU Card 1 J190 for CPU Card 2	Ratio	External CPU Speed	Internal CPU Speed
Short Pins 1-2 Short Pins 3-4 Short Pins 5-6 Short Pins 7-8	2:1	66 MHz	133 MHz
Short Pins 1-2 Short Pins 3-4 Short Pins 5-6	3:1	60 MHz	180 MHz
Short Pins 1-2 Short Pins 3-4 Short Pins 5-6	3:1	66 MHz	200 MHz
Short Pins 1-2 Short Pins 3-4 Short Pins 7-8	5:2	60 MHz	150 MHz
Short Pins 1-2 Short Pins 3-4	7:2	66 MHz	233 MHz
Short Pins 3-4 Short Pins 5-6 Short Pins 7-8	4:1	60 MHz	240 MHz
Short Pins 3-4 Short Pins 5-6	5:1	60 MHz	300 MHz
Short Pins 3-4 Short Pins 7-8	9:2	66 MHz	283 MHz
Short Pins 3-4	11:2	60 MHz	325 MHz

Cont'd

Step 2 Configure CPU, Continued

Configure CPU Card 1 You can install either one or two Pentium Pro CPUs in the ZIF sockets on CPU Card 1. The CPU external and internal clock speeds are set via J15 on the baseboard, as described on the previous screen. JP3 must always have a shorting bridge.

Set VRM Output J1 on the CPU Cards set the VRM output for the first CPU. J2 sets the VRM output for the second CPU. For a 3.3V CPU, short Pins 1-2, Pins 5-6, and Pins 7-8.

CPU Fans JP1 (for the first CPU) and JP2 (for the second CPU) are the +12V connectors for the cooling fans. The CPU fan cable must be connected to one of these connectors. Pin 1 of JP1 and JP2 is +12V. Pin 2 is Ground.

CPU Power Module The CPU Cards include two sockets for the two CPU power modules. VRM8 is Voltage Regulator Module 8. VRM works from 5V input.

CPU Card Layout The CPU Card 1 layout is shown below.

Configure CPU Card2 You can install either one or two Pentium Pro CPUs in the ZIF sockets on CPU Card 2. The CPU external and internal clock speeds are set via J190 on the baseboard. Both CPUs are configured in the same manner.

Set VRM Output J1 on the CPU Cards set the VRM output for the first CPU. J2 sets the VRM output for the second CPU. For a 3.3V CPU, short Pins 1-2, Pins 5-6, and Pins 7-8.
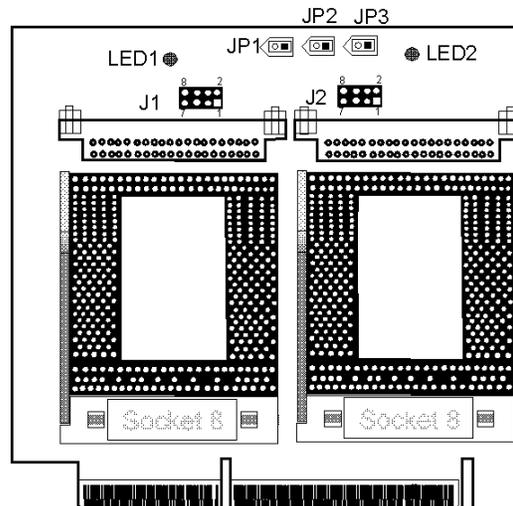
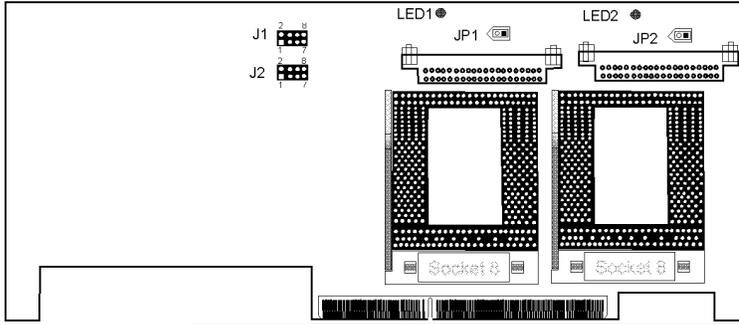**CPU Fans** JP1 (for the first CPU) and JP2 (for the second CPU) are the +12V connectors for the cooling fans. The CPU fan cable must be connected to one of these connectors. Pin 1 of JP1 and JP2 is +12V. Pin 2 is Ground.

CPU Power Module The CPU Cards include two sockets for the two CPU power modules. VRM8 is Voltage Regulator Module 8. VRM works from 5V input.

CPU Card 2 Layout

Cont'd

Step 2 Configure CPU, Continued

JP3   This jumper on the Series 731 CPU Card 1 should always be shorted.

Overheat LEDs The Goliath CPU Cards have two red LEDs (one for each CPU) that indicate if the CPU is overheating. A buzzer on the CPU Cards also sounds a warning if the CPUs are overheating.

> ### *Important*
>
> Turn the computer off as soon as possible if an overheat LED is lit. Operating the computer when this LED is on can permanently damage the computer. Make sure that the problem that caused the CPU to overheat is corrected before you turn the computer on again.

The most frequent cause of overheating is a non-working CPU fan or a disconnected CPU fan.

Install CPUs Install the Pentium Pro CPUs in the ZIF (zero insertion force) socket on the CPU Card as shown below.

Do not install the CPU Card in the baseboard until after the CPUs are installed.

Both CPU Cards should be installed even if only one CPU Card includes a mounted CPU. Each CPU Card can have either one or two Intel Pentium Pro CPUs. Both CPUs on a CPU Card must run at the same frequency.

> **STOP**
> ### *Warning*
> Improper CPU installation can damage the CPU, the CPU Card, and the baseboard. You must follow the procedures in this section exactly as documented. Make sure you wear an antistatic wristband while installing the CPU.

Step	Action
1	Lift the lever on the ZIF socket. The empty CPU socket looks like this.
2	Check for bent pins on the CPU. Gently straighten any bent pins with pliers. Place the CPU in the middle of the socket, as shown below. Make sure that pin 1 of the CPU is aligned with pin 1 of the socket. Make sure you are properly grounded while handling the CPU.
3	Lift the ZIF lever to the other side of the socket. Close the handle until it latches.
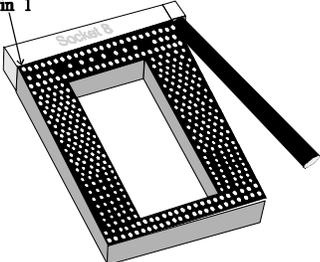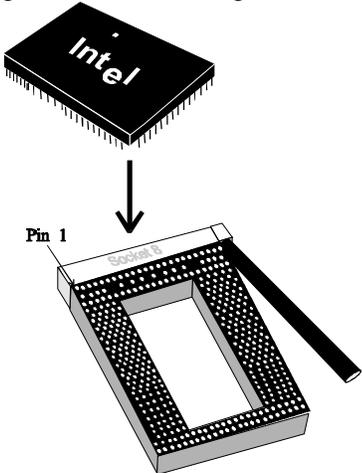
Step	Action
4	Install the fan/heat sink and press down. The installed CPU fan and heat sink will appear as follows.
5	Attach the fan cable to the appropriate fan connector (JP1 for the first CPU or JP2 for the second CPU). Latch the CPU clip on both sides to the tabs on the CPU socket.
6	Install the voltage regulator (VRM module) in the socket above each installed CPU, as shown below:
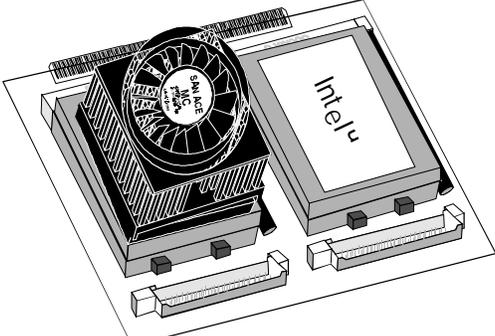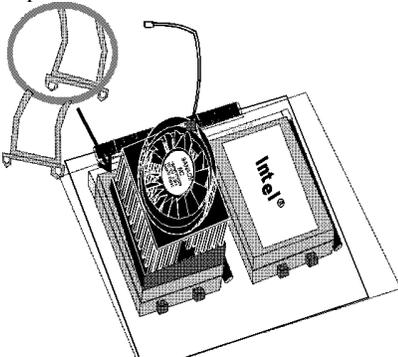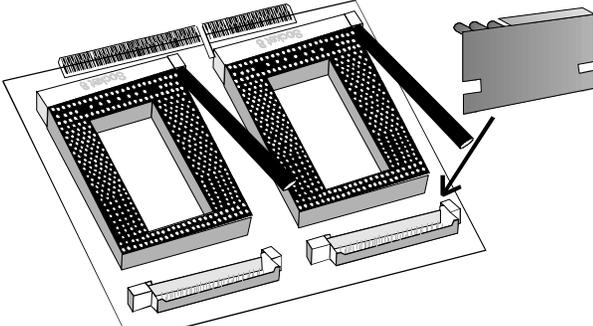
Step 2 Configure CPU, Continued

Insert the CPU Cards in the baseboard after installing the baseboard in the computer case.

> ### *Warning*
> Make sure that you insert and remove the CPU Cards vertically in and out of the sockets. Do not move the CPU Cards from side to side. Make sure the CPU Card is perpendicular to the base board. Insert pressure directly downward when installing the CPU Cards. When removing a CPU Card, pull the card straight up. Do not move it from side to side.

Using One CPU Card If installing CPU Card 1 only, insert the Terminator Card in the CPU Card 2 socket. Do not use CPU Card 2 alone.

Step 3 Install Memory

System Memory System memory for the Goliath is mounted on the memory card, which supports up to 1 GB of system memory. Use 60 ns Fast Page ECC 3.3V 168-pin ECC buffered memory module fast page mode or EDO DIMMs (Dual Inline Memory Modules). The memory card has eight 168-pin sockets.

Set DRAM Voltage J11 and J12 are 20-pin jumpers that set the DRAM voltage. Only 3.3V memory can be used.

Type of Memory	J11	J12
3.3V 60 ns	Short Pins 1-2	All OPEN
Fast Page Mode	Short Pins 3-4	
(or EDO)	Short Pins 5-6	
x 72 ECC	Short Pins 7-8	
Buffered Memory	Short Pins 9-10	
Module DIMMs	Short Pins 11-12	
	Short Pins 13-14	
	Short Pins 15-16	
	Short Pins 17-18	
	Short Pins 19-20	

Cont'd

Step 3 Install Memory, Continued

The DIMMs in Goliath are different from the x 36 SIMMs used by all other boards. The memory modules in the Goliath are a new JEDEC-standard defined for 8-byte wide common CAS memory and supported by most memory manufacturers. Most new computers that require a large amount of memory (such as servers) use DIMMs. The maximum DIMM height should be 1.5" so PCI slots are not blocked.

Memory Specifications

Item	Description
General	3.3 volt, 168 pin, x 72, ECC DIMM (Dual Inline Memory Module) buffered memory module, fast page mode (or EDO), 60 ns.
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 Goliath memory card cannot use unbuffered memory modules.
Mode	Goliath uses fast page mode modules. EDO (Extended Data Out) is a superset of fast page mode. EDO memory modules can be installed, but the EDO feature is not used.
DIMM Types	1 MBx72, 2 MBx72, 4 MBx72, 8 MBx72, and 16 MBx72.
Speed	60 ns

Maximum Memory Up to eight DIMMs can be installed to provide up to 1GB of system memory. The minimum memory configuration should be 4 MB x 72 DIMMs (128 MB of system memory). You cannot mix memory types within a memory bank.

Cont'd

DIMM Manufacturer's Part Numbers

Type	Manufacturer	Part Number
2 MB x 72 3.3V ECC FPM (16 MB)	Micron	MT9LD272G-60
	Micron	MT9LD272G-60X (EDO)
	Advantage	A16/ECCDIMM
	Samsung	KMM372V213AJ6
	IBM	11M2730HBE
4 MB x 72 3.3V ECC FPM (32 MB)	Micron	MT18LD472G-60
	Micron	MT18LD472G-60X (EDO)
	Advantage	A32ECCDIMM
	Samsung	KMM372V400AK6
	Samsung	KMM372F400AK6 (EDO)
	IBM	11M4730CBD
	NEC	MC-424000LAB72
8 MB x 72 3.3V ECC FPM (64 MB)	Micron	MT36LD872G-60 (FPM),
	Micron	MT36LD872G-60X (EDO)
	Advantage	A64/ECCDIMM
	Samsung	KMM372V803J6/AJ6
	IBM	11M8730CBD
16 MB x 72 3.3V ECC FPM (128 MB)	Advantage	A128ECCDIMM
	IBM	11M16730CBD
	Samsung	KMM372V1680J6
	Samsung	KMM372V1680AJ6

Memory Suppliers

Company	Contact	Phone	Fax
Advantage Memory Corp.	Dwayne Abrades	800 245 5299	714 453 8158
Centon	Paul Kindley, Steve Rick	714 855 9111	714 855 1144
Samsung	Greg Mordecai	770-447-6154	770-447-6714
Netmemory	John Deters	714 631 5388	714 631 8724

Also contact Micron, IBM, or Hitachi. American Megatrends will supply additional part numbers as they become available. The NRC part numbers may not be complete. *The DIMM parts listed above have not been tested*. Check the manufacturer's specifications carefully before using any DIMM.

Cont'd

DRAM Specifications The total amount of system memory is automatically detected by AMIBIOS. System memory is four-way interleaved (if there are four or eight DIMMs). The interleave factor is 2 if only two DIMM modules are installed. Populate system memory 4 DIMMs at a time for maximum performance. A memory bank must have either 1, 2, or 4 DIMMs installed in it.

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:

- 1 MB x 72,
- 2 MB x 72,
- 4 MB x 72,
- 8 MB x 72, or
- 16 MB x 72 DIMMs.

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.

<div align="right">Cont'd</div>

Select DIMMs   DIMMs must meet the following specifications:

Parameter	Specification
Page Mode	FAST Page Mode
Refresh	CAS before RAS
t_{CAC}	≤ 20 ns
t_{RAC}	≤ 60 ns
t_{AA}	≤ 45 ns
t_{RP}	70 ns
t_{CPA}	≤ 45 ns

DRAM Configurations Valid memory configurations include:

Bank1				Bank0				Total
U8	U7	U6	U5	U4	U3	U2	U1	RAM
None	None	None	None	None	None	None	2 MB	16 MB
None	None	None	None	None	None	2 MB	2 MB	32 MB
None	None	None	None	2 MB	2 MB	2 MB	2 MB	64 MB*
None	None	None	2 MB	None	None	None	2 MB	32 MB
None	None	2 MB	2 MB	None	None	2 MB	2 MB	64 MB
2 MB	2 MB	2 MB	2 MB	2 MB	2 MB	2 MB	2 MB	128 MB*
None	None	None	None	None	None	None	1 MB	8 MB
None	None	None	None	1MB	1MB	1 MB	1 MB	32 MB*
1 MB	1 MB	1 MB	1 MB	1 MB	1 MB	1 MB	1 MB	64 MB*
None	None	None	None	None	None	None	4 MB	32 MB
None	None	None	None	4MB	4MB	4 MB	4 MB	128 MB*
4 MB	4 MB	4 MB	4 MB	4 MB	4 MB	4 MB	4 MB	256 MB*
None	None	None	None	None	None	None	16 MB	128 MB
None	None	None	None	16 MB	16 MB	16 MB	16 MB	512 MB*
16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	16 MB	1 GB*

*: four-way interleave configurations

Cont'd

Step 3 Install Memory, Continued

Installing DIMMs The Series 741 Memory Card has eight x 72 DIMM sockets. These sockets can be filled with either 1 MB x 72, 2 MB x 72, 4 MB x 72, 8 MB x 72, or 16 MB x 72 DIMMs.

Place the Memory Card on an anti-static mat. Each of the 8 DIMM sockets has a latch on either end. Make sure all DIM latches are fully open. 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:
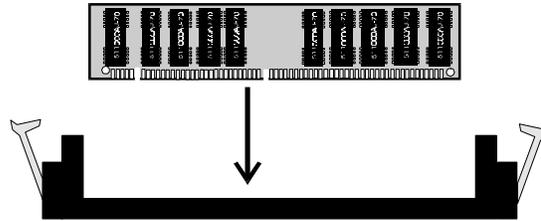
DIMM with Latches Secured
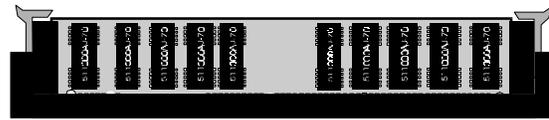
Install Memory Card Insert the Memory Card in the baseboard after installing the baseboard in the computer case

Step 4 Install the Baseboard

The baseboard mounting hole pattern is the same as the mounting hole pattern on the standard full-size AT baseboard. The chassis manufacturer should supply standoffs and screws.

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	Rotate the chassis so the front is to the right. The side facing you is where the baseboard is mounted. The power supply is mounted at the far end of the chassis.
3	Hold the baseboard, component-side up, with the edge with the power supply connector away from you. The keyboard and mouse should be to the left.
4	Carefully slide the baseboard into the chassis. Make certain the edge connectors fit the ports in the rear of the chassis. The baseboard should rest level with the chassis.
5	Mount CPU 1, CPU 2 and memory cards in their sockets. Fasten the brackets on the Series 731 and 732 cards to the back of the chassis. Fasten a U-bracket between the Series 732 card and the memory card. See below.
6	Align the mounting holes on the baseboard with the holes on the chassis. Place the mounting screws in the holes provided and tighten them.

CPU Card 1

CPU Card 2

Bolt the Memory Card to the steel bracket with a plastic spacer between the bracket and the Memory Card.

Bolt the memory card to the steel U bracket with a plastic spacer between the bracket and the memory card. Secure the U bracket to the baseboard using the screw and nut pair.

Memory Card
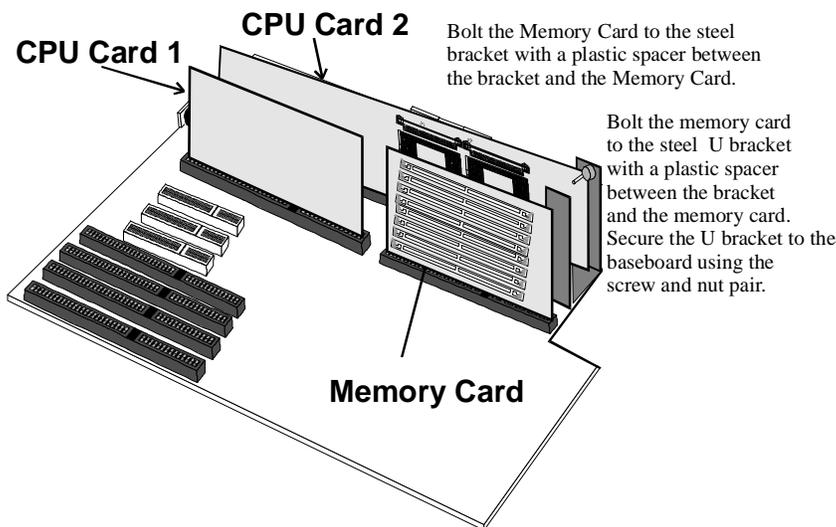
Cont'd

Step 4 Install Baseboard, Continued

```
┌──────────────────────────────────────────────┐
│  ╔══════╗                                      │
│  ║ STOP ║              *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.             │
└──────────────────────────────────────────────┘
```

The screw head must not be larger than the plating around the mounting hole.

Plating
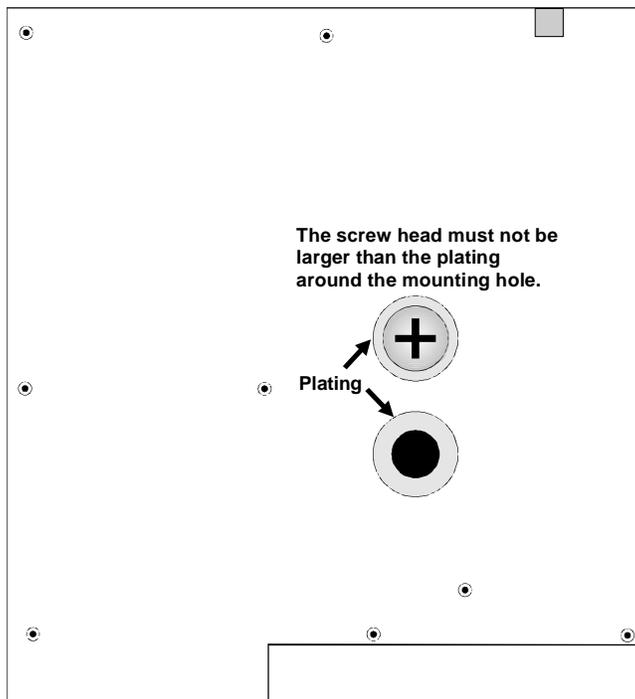
Step 5 Attach Power Supply

Connect Power The power supply should match the physical configuration of the chassis. 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. Power supplies are discussed below.

Power Cables Attach the power supply cables to the P3 and P4 power connectors on the baseboard. AT-compatible power supplies have two 6-pin power connectors, as shown below. The power supply manufacturers may have specific names like P8 and P9. Be aware of this when you discuss the connectors required. The P1, P2, P5, and P6 connectors are described below.
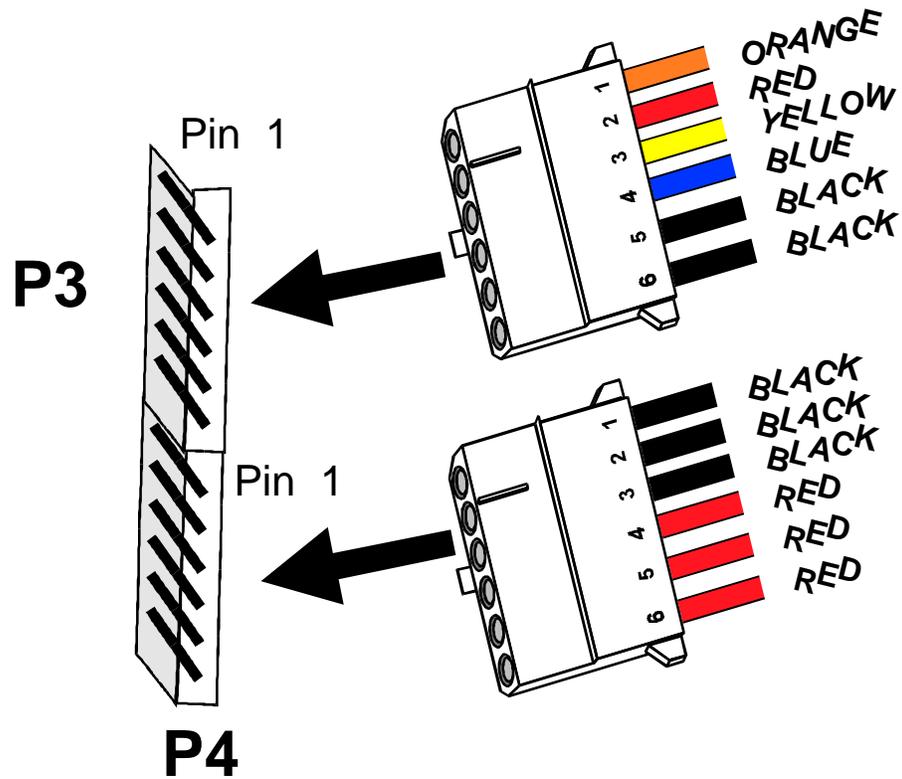
Step 6 Attach Power Supply, Continued

Goliath uses a 3.3 volt AT power supply. There are six power connectors on the base board. The power pin voltages are written on the base board silk screen. Check the top of the base board. The 3.3V P1 and P2 pinouts are exactly opposite of the +5V P5 and P6 pinouts. P1 or P2 must be connected before you can power up. P3 and P4 are standard AT 6-pin power connectors. P3 and P4 are keyed to prevent incorrect installation.

The power requirements are unique for each system. Both +5V and +3.3V power is usually required.

+5V Power Required For each Pentium Pro processor that is installed, an additional 8A +5 volt is required. If four Pentium Pro CPUs are installed, 32A are required on +5V for the processors alone. Also each EISA and PCI adapter card that is installed requires power, usually 2.5A on +5V. Add the power required for all installed CPUs and installed adapter cards. Check the electrical specification for each adapter card for the power requirements. Make sure you check the power requirements for all drives. The base board needs 5A on the +5 volt for board electronics.

+3.3V Power Required The base board has 3.3V logic. The DRAM memory card also has 3.3V logic. The base board requires 6A on +3.3V for the logic. 16 MB x 72 DRAM modules usually requires 2.2A each. The maximum number of DRAM modules is eight. Up to 17.6A may be needed for system memory. The total +3.3V power requirement can be up to 25A.

+12V Power Required The Goliath base board and fans use 0.5A. There is no special requirement, but +12V must be present as per the AT power supply specification.

Cont'd

Step 5 Attach Power Supply, Continued

Total Power Required A minimum power requirement would be a 450 watts power supply with 50A on +5V and 25A on +3.3V. The power connector pins are rated for 6A. At least one each of P5/P6 and P1/P2 is required. P3 and P4 must be connected.

Power Supply An L-shaped AT power supply with maximum dimensions of 8.6" x 5.4" x 5.9" is required. An AC switch cable to the front panel is required . The base board does not support remote sensing. The L-shaped power supply is specified for a standard chassis. Other shapes and sizes can be used as per the customer chassis requirements.

Power Cables The power cables should be 24 inches or longer, with the power outputs length-compensated. The cable lengths are specified as a general guideline only. The standard 18 inch cables will be short in a larger chassis.

Power Supply Vendors

Supplier	Model	Contact	Phone	Fax
Antec	RPS 6002 *	Frank Fu	510 770 1200	510-770-1288
Astec	SA451-3500 **	Sales	619 757 1880	619 439 4243
PC Power & Cooling	Turbo cool 3.3 T45G	Larry Aldridge	800 722 6555	619 931 6988
Senstron	APA-5400F	Dr Sing Hung	908 417 0411	908 417 0422
Tri Mag	BM 7500	Sales	209 651 2222	209 651 0188

*   The Antec RPS6002 is larger than a standard L-shaped AT power supply. Antec has other products.

**   The Astec 451-3500 has an AC switch, no front panel cable, and needs remote sensing.

Some of the above models have lower +12V ampere rating than standard 450W power supplies. Make sure the power supply meets your system's power requirements.

Cont'd

Power Supply Summary You must determine if a power supply meets your electrical and mechanical requirements. This discussion is only a guideline. You must perform the power calculation for your system. You can always use a different power supply for drives. Redundancy and hot swap are system- and customer-dependent, not basic requirements.

Connector Keys The keys on the connector must be cut to fit on some power supplies, as shown below.

P4   P3
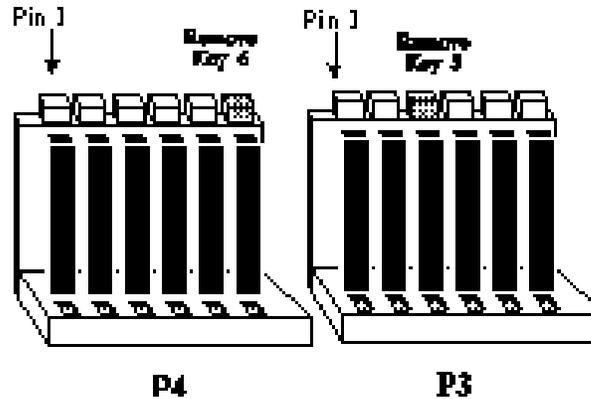
P3 Pinout

Pin	Description
1	Power Good (Orange wire) (Not used)
2	VCC (Red wire)
3	+12 Volts (Yellow wire)
4	-12 Volts (Blue wire)
5	Ground (Black wire)
6	Ground (Black wire)

P4 Pinout

Pin	Description
1	Ground (Black wire)
2	Ground (Black wire)
3	-5 Volts (White wire)
4	VCC (Red wire)
5	VCC (Red wire)
6	VCC (Red wire)

P1 Pinout   P1 and P2 provide a 3.3V power source.

Pin	Description
1	Ground (Black wire)
2	Ground (Black wire)
3	Ground (Black wire)
4	3.3V (Brown wire)
5	3.3V (Brown wire)
6	3.3V (Brown wire)

P2 Pinout

Pin	Description
1	Ground (Black wire)
2	Ground (Black wire)
3	Ground (Black wire)
4	3.3V (Brown wire)
5	3.3V (Brown wire)
6	3.3V (Brown wire)

P5 Pinout   P5 and P6 provide 5V power for additional drives.

Pin	Description
1	5V (Red wire)
2	5V (Red wire)
3	5V (Red wire)
4	Ground (Black wire)
5	Ground (Black wire)
6	Ground (Black wire)

P6 Pinout

Pin	Description
1	5V (Red wire)
2	5V (Red wire)
3	5V (Red wire)
4	Ground (Black wire)
5	Ground (Black wire)
6	Ground (Black wire)

Step 6 Attach Connectors

Connectors   The Goliath baseboard includes many connectors. Connection instructions, illustrations of connectors, and pinouts are supplied below. The Goliath baseboard connectors are:

Connector
Keyboard connector J9
Mouse connector J10
Reset switch J27
Speaker J28
Keyboard lock connector J22
IDE LED connector J29
Serial port connectors J5 and J6
Parallel port connector J7
Floppy connector J3
IDE drive connector J2

Cable Connector Ends When connecting chassis connectors to the baseboard, 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 baseboard 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, as shown below:

Cont'd

Keyboard Cable The keyboard attaches via a standard six-pin DIN keyboard connector (J9).

Pin	Assignments
1	Keyboard data
2	N/C
3	Ground
4	Vcc
5	Keyboard clock
6	N/C

IRQ 12 J24 is a 3-pin berg that specifies IRQ 12 use.

IRQ 12 Use	J24
The onboard PS/2 mouse uses IRQ12.	Short Pins 1-2 (factory setting)
IRQ 12 is available for bus devices.	Short Pins 2-3

PS/2 Mouse Cable Attach the customized 10-pin to 9-pin mouse connector cable supplied by American Megatrends to the 10-pin mouse berg connector (J10) on the baseboard. Attach the standard 9-pin mouse connector at the other end of the mouse cable to the mouse connector port on the computer case. Incorrect mouse installation can cause the system to hang.

Cont'd

Step 6 Attach Connectors, Continued

Connect Mouse Cable The mouse connector (J10) is a 10-pin berg. The mouse cable is the same as the serial cable in the Goliath baseboard. Two serial cables are shipped with the baseboard. Use one of these cables for the mouse.

Pin	Description	Pin	Description
1	Mouse Clock	2	N/C
3	N/C	4	N/C
5	N/C	6	VCC
7	N/C	8	Mouse Data
9	Ground	10	N/C

Connectors When connecting chassis connectors to the baseboard, 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 on the baseboard.

J27 Reset J27 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

Speaker Connector J28 is a four-pin single-inline berg optionally attached via a cable to a standard system speaker. AMIBIOS signals hardware problems through the speaker. Pin 1 on the baseboard is identified by the arrow on the white box around the berg.

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

Keyboard Lock J22 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 the user to lock the keyboard. Pin 1 on the baseboard is identified.

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

IDE Indicator LED J29 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.

Step 7 Attach Serial Ports

Onboard Adapters The Goliath baseboard has:

- two serial ports (J5 and J6),
- a parallel port (J7),
- an IDE controller on the PCI bus. The IDE connector is J2.
- a floppy connector (J3).

The serial and parallel port connectors are described below.

Conflicts AMIBIOS minimizes conflicts between onboard and offboard I/O devices.

AMIBIOS automatically checks the adapter cards installed in the expansion slots on the Goliath baseboard for a hard disk or floppy controller and serial or parallel ports.

J6, J5 Serial J6 and J5 are 10-pin connectors that provide an AT-compatible serial port interface. Connect the cables supplied with the Goliath system to the customized American Megatrends 10-pin to 9-pin D type cable to the 10-pin serial connectors. The serial port base I/O port address and other serial port settings can be selected in Peripheral Setup in WINBIOS Setup. The serial connector pinout is shown below.

Pin	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	Ground	10	CUT PIN

Step 8 Attach Parallel Port

J7 Parallel Port J7 is a 26-pin connector for a parallel port. The J7 pinout is shown below. Connect the American Megatrends customized 26-pin to DB25 cable provided with the Goliath system to J7. All parallel port settings can be configured through Peripheral Setup in WINBIOS 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	Ground
19	Ground	20	Ground
21	Ground	22	Ground
23	Ground	24	Ground
25	Ground	26	Ground

EPP DRQ J18 and J19 are 6-pin bergs that select the Enhanced Parallel Port (EPP) DRQ, as follows:

EPP DRQ	J18	J19
DRQ0	Short Pins 1-2	Short Pins 1-2
DRQ1	Short Pins 3-4	Short Pins 3-4
DRQ3	Short Pins 5-6	Short Pins 5-6
Factory Setting	OPEN	OPEN

Parallel IRQ J23 is a 3-pin berg that selects the IRQ used by the parallel port.

Parallel Port IRQ	J23
IRQ 7	Short Pins 1-2 (factory setting)
IRQ 5	Short Pins 2-3

Step 9 Attach Floppy

J3 Floppy   J3 is a 34-pin dual-inline berg. Connect the cable from the floppy drive to J3, as shown below. The onboard floppy controller cannot be used if a hard disk card with a floppy controller is installed. Choose Standard Setup and Peripheral Setup to configure the floppy controller.
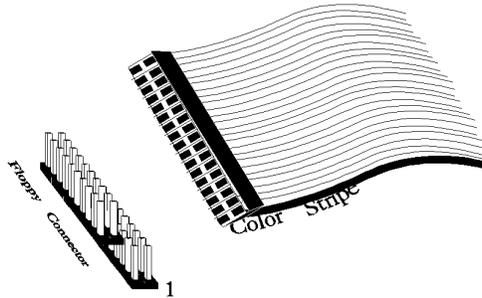
The baseboard supports up to two 720 KB, 1.44 MB, or 2.88 MB 3½" drives and 360 KB and 1.2 MB 5¼" drives. The connecting cable is a 34-pin ribbon connector with two 34-pin edge connectors for attaching the floppy disk drives. There is a small twist in the cable between the floppy connectors. The last (end) connector should be connected to floppy drive A::

Cont'd

J3 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	

Step 10 Attach IDE

IDE Drives Set the **Onboard IDE** option to *Primary* in Peripheral Setup to enable onboard IDE.

Important
J20 must be OPEN.

Attach IDE Cable J2 is the IDE (Integrated Drive Electronics) hard disk drive connector. The primary master and the primary slave IDE drives are connected by cable to J2, as shown below.
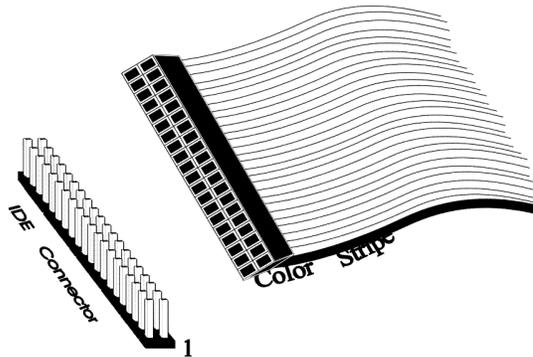
J2 is a 40-pin dual-inline berg that connects an ATA IDE drive to the primary onboard IDE connector. This baseboard supports IDE Modes 0, 1, 2, 3, and 4, IDE prefetch, LBA (Logical Block Address) mode, high capacity drives (over 528 MB), 32-bit data transfer, and fast IDE transfer. These IDE features are configured in Peripheral Setup in the WINBIOS Setup utility. Disable the onboard IDE interface in Peripheral Setup to use an EISA ESDI, RLL, MFM, or SCSI hard disk drive.

J21 IDE DREQ J21 is a 2-pin berg that enables the IDE DREQ. The settings are:

J21 Setting	IDE DREQ
Shorted	Enabled
OPEN	None

J2 Pinout   The J2 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

Step 11 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 baseboard,
- 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 WINBIOS 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.

2 WINBIOS Setup

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

Graphical Interface American Megatrends has a new type of system BIOS Setup utility. WINBIOS Setup has a graphical user interface you can access using a mouse. The WINBIOS Setup code is so compact that it can reside on the same ROM as the system BIOS. The system configuration parameters are set by WINBIOS Setup.

Since WINBIOS Setup resides in the ROM BIOS, it is available each time the computer is turned on.

Starting WINBIOS Setup As POST executes, the following appears:

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

Press <Del> to run WINBIOS Setup.

Using a Mouse with WINBIOS Setup

WINBIOS Setup has a built-in mouse driver and can be accessed by either a serial mouse or PS/2-style mouse. WINBIOS Setup supports Microsoft-Compatible serial mice and all PS/2-type mice.

The mouse click functions are: single click to change or select both global and current fields and double click to perform an operation in the selected field.

Using the Keyboard with WINBIOS Setup

WINBIOS has a built-in keyboard driver that uses simple keystroke combinations:

Keystroke	Action
<Tab>	Change or select a global field.
<→, ←, ↑, ↓	Change or select the current field.
<Enter>	Perform an operation in the current field.
+	Increment a value.
–	Decrement a value.
<Esc>	Abort any window function.
<PgUp>	Return to the previous screen.
<PgDn>	Advance to the next screen.
<Home>	Returns to the beginning of the text.
<End>	Advance to the end of the text.
<Ctrl><Alt><+>	Change to high speed.
<Ctrl><Alt><->	Change to low speed.

Section 1 Setup Options

WINBIOS Setup Menu

The WINBIOS Setup main menu is organized into four sections. Each of these sections corresponds to a section in this chapter.

Each section contains several icons. Clicking on each icon activates a specific AMIBIOS function. The WINBIOS Setup main windows and related functions are described below.

Main Windows The WINBIOS Setup main windows are:

- Setup, described in Section 1, has icons that permit you to set system configuration options such as date, time, hard disk type, floppy type, and many others,
- Utilities, described in Section 2, sets the screen color and allows language changes,
- Security, described in Section, has three icons that control AMIBIOS security features, and
- Default, described in Section 4, this section has three icons that permit you to select a group of settings for all WINBIOS Setup options.

Section 1 Setup

Standard Setup

Standard Setup options are displayed by choosing the Standard icon from the WINBIOS Setup main menu. All Standard Setup options are described in this section.

Date/Time   Select the Standard option. Select the Date and Time icon. The current values for each category are displayed. Enter new values through the keyboard.

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*, *1.44 MB 3½ inch*, or *2.88 MB 3½ inch.*

Pri Master, Pri Slave, Sec Master, Sec Slave Select one of these hard disk drive icons to configure the hard disk drive named in the option. Select *Auto* from the drive parameters screen to let AMIBIOS automatically configure the drive. A screen with a list of drive parameters appears. Click on *OK* to configure the drive.

Drive Type	How to Configure
SCSI	Select *Type*. Select *Not Installed* in the drive parameter screen. The SCSI drivers provided by the SCSI drive or SCSI host adapter manufacturer should allow you to configure the SCSI drive.
IDE	Select *Type.* Select *Auto* to let AMIBIOS determine the parameters. Click on OK when AMIBIOS displays the drive parameters. 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 Transfer*. 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.
CD-ROM	Select *Type*. Select *CDROM*. Click on *OK* when AMIBIOS displays the drive parameters.
Standard MFM Drive	Select *Type.* You must know the drive parameters. Select the drive type that exactly matches your drive's parameters.
Non-Standard MFM Drive	Select *Type.* If the drive parameters do not match the drive parameters listed for drive types 1 - 46, select *User* and enter the correct hard disk drive parameters.

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.
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.
Capacity	The formatted capacity 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).

Cont'd

Hard Disk Drive Types

Type	Cylinders	Heads	Write Precompensation	Landing Zone	Sectors	Capacity
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.					

Advanced Setup

The WINBIOS Setup options described in this section are displayed by choosing the Advanced Setup icon from the Setup section on the WINBIOS Setup main menu. All Advanced Setup options are described in this section.

Primary Display This option configures the primary display subsystem in the computer. The settings are *Mono (monochrome), 40CGA, 80CGA,* or *VGA/EGA.* The Optimal and Fail-Safe default settings are *VGA/EGA.*

Mouse Support When this option is set to *Enabled,* AMIBIOS supports a PS/2-type mouse. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

Boot Up Num Lock When this option is set to *On,* AMIBIOS turns off the *Num Lock* key when the system is powered on so you can use the arrow keys on both the numeric keypad and the keyboard. The settings are *On* or *Off.* The Optimal default and Fail-Safe default settings are *On.*

Password Check This option specifies the type of AMIBIOS password protection that is implemented. The Optimal and Fail-Safe default settings are *Setup.* The settings are:

Setting	Description
Setup	The password prompt appears only when an you attempts to run WINBIOS Setup.
Always	A password prompt appears every time the computer is powered on or rebooted.

The AMIBIOS password does not have to be enabled. You set the password by choosing the Password icon on the WINBIOS Setup screen.

Cont'd

OS/2 Compatible Mode Set this option to *Enabled* to permit AMIBIOS to run properly if OS/2 or any other operating system that does not support Plug and Play is to be run on this computer. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Floppy Drive Swap Set this option to *Enabled* to specify that floppy drives A: and B: are swapped. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Quick Boot Set this option to *Enabled* to permit AMIBIOS to boot the operating system within 5 seconds after the computer is powered on. This option replaces the old **Above 1 MB Memory Test** option. The Optimal default setting is *Disabled.* The Fail-Safe default setting is *Disabled.*

Setting	Description
Disabled	AMIBIOS tests all system memory. AMIBIOS wait up to 40 seconds for a READY signal from the IDE drive. AMIBIOS waits up to.5 seconds after sending a RESET signal to the IDE drive to permit the IDE drive to send a READY signal. AMIBIOS checks if the <Del> key was pressed. WINBIOS Setup is executed if <Del> was pressed.
Enabled	AMIBIOS does not test any system memory above 1 MB. AMIBIOS does not wait for a READY signal from the IDE drive. If a READY signal is not received immediately, AMIBIOS does not configure the drive. AMIBIOS does not wait.5 seconds after sending a RESET signal to the IDE drive. AMIBIOS does not check if the <Del> key was pressed. You cannot run WINBIOS Setup at system boot if this setting is selected.

Cont'd

Boot Up Sequence This option sets the sequence of boot drives (floppy drive A:, hard disk drive C:, or a CD-ROM drive) that AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are C:,A:, CDROM, A:,C:, CDROM, or CDROM, C:,A:. The Optimal and Fail-Safe default settings are C:,A:,CDROM.

CPU Microcode Update Set this option to Enabled to permit the Intel Pentium Pro CPU microcode to be updated. The CPU may malfunction if this option is set to Disabled. The settings are Enabled or Disabled. The Optimal and Fail-Safe default settings are Enabled.

MPS Mode This option specifies the version of the Intel Multiprocessor Specification (MPS) being used. The settings are *1.1* or *1.4.* The Optimal and Fail-Safe default settings are *1.4.* Windows NT supports MPS 1.4. OS/2 supports MPS 1.1.

L1/L2 Cache This option specifies the caching algorithm used for both L1 (internal) and L2 (secondary) cache memory on the CPU. The settings are *WriteThru, WriteBack,* or *Disabled.* The Optimal and Fail-Safe default settings are *WriteBack.*

System BIOS Cacheable AMIBIOS always copies the system BIOS from ROM to RAM for faster execution. Set this option to *Enabled* to permit the contents of the F0000h RAM memory segment to be written to and read from cache memory. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

Cont'd

VGA Memory Cache Mode This option specifies if the type of system memory installed in the computer supports shared use of system memory between video memory and system memory. The settings are *UC (Uncacheable)* memor*y* or *USWC (Uncacheable, Speculatable, Write-Combining)* memory. The Optimal and Fail-Safe default settings are *UC*.

C000,32K Shadow These options specify how the contents of the video ROM are handled. The settings are:

Setting	Description
Disabled	The contents of the video ROM are not copied to RAM.
Cached	The contents of the video ROM area from C0000h - C7FFFh are copied from ROM to the corresponding RAM address for faster execution. After being copied to RAM, the video ROM contents can also be read from and written to cache memory.
Shadow	The contents of the video ROM area from C0000h - C7FFFh are copied from ROM to RAM for faster execution.

The Optimal default setting is *Cached*. The Fail-Safe default setting is *Disabled.*

C800,16K Shadow
CC00,16K Shadow
D000,16K Shadow
D400,16K Shadow
D800,16K Shadow
DC00,16K Shadow These options specify how the contents of the adapter ROM named in the option title are handled. The ROM area not used by ISA adapter cards is allocated to PCI adapter cards. The settings:

Setting	Description
Disabled	The contents of the video ROM are not copied to RAM.
Cached	The contents of the video ROM area from C0000h - C7FFFh are copied from ROM to the corresponding RAM address for faster execution. After being copied to RAM, the video ROM contents can also be read from and written to cache memory.
Shadow	The contents of the video ROM area from C0000h - C7FFFh are copied from ROM to RAM for faster execution.

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

Chipset Setup

Choose the Chipset Setup icon from the Setup section on the AMIBIOS Setup main menu. All Chipset Setup options are then displayed and are described in this chapter.

CPU Base Frequency This option sets the CPU external frequency. The settings are *50 MHz*, *60 MHz*, or *66 MHz*. The Optimal default setting is *60 MHz*. The Fail-Safe default setting is *50 MHz*.

Fast Strings Set this option to *Enabled* to enable fast strings. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Disabled*.

ECC Set this option to *Enabled* to enable ECC (Error Checking and Correction) in the Orion Memory Controller (OMC). The OMC detects errors on the Pentium Pro system bus by checking the ECC value with data and the parity provided with the control signals. The OMC also generates ECC with data and parity with control signals so that errors can be detected on the bus. The settings are *Enabled* or *Disabled*. The Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled*.

In-Order Queue Depth This option specifies the queue depth on the Pentium Pro system bus. Queue entries are executed in the order that they were placed on the queue. The settings are *1* or *8.* The Fail-Safe default setting is *8.* The Optimal default setting is *8.*

OPB P6 To PCI Write Posting Set this option to *Enabled* to enable Pentium Pro writes to the PCI bus to be posted in the OPB (Orion PCI Bridge). The write is actually performed at a later time, but setting this option to *Enabled* guarantees that the write will be performed. The settings are *Enabled* or *Disabled.* The Optimal default setting is Enabled. The Fail-Safe default setting is *Disabled.*

OPB PCI To P6 Write Posting Set this option to *Enabled* to enable PCI writes to the Pentium Pro system bus to be posted in the OPB (Orion PCI Bridge). The write is actually performed at a later time, but setting this option to *Enabled* guarantees that the write will be performed. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

OPB Burst Write Assembly Set this option to *Enabled* to enable back-to-back sequential Pentium Pro to PCI memory space cache line writes to USWC memory to be converted to continuous PCI write bursts. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

OPB P6 Line Read Set this option to *Enabled* to enable PCI Memory Read Line commands to fetch full Pentium Pro cache lines. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

Cont'd

OPB P6 Line Read Prefetch Set this option to *Enabled* to enable PCI Memory Read Line commands to fetch a full Pentium Pro cache line plus a prefetch of up to 3 additional full Pentium Pro cache lines. The prefetch operation does not cross 4 KB boundaries. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

PCEB GAT Mode Set this option to *Enabled* to enable GAT mode. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

PCEB EISA-PCI Line Buffer Set this option to *Enabled* to enable the EISA-PCI line buffer. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

PCEB Master Retry Timer This option sets the length of a delay inserted before an EISA bus mastering device retries a failed operation. The settings are *Disabled, 16 CLKs, 32 CLKs* or *64 CLKs.* The Optimal default setting is *Disabled.* The Fail-Safe default setting is *Disabled.*

OMC Write CAS This option specifies the length of a delay inserted before the Write Column Address Strobe (CAS) signal is sent by the Orion Memory Controller (OMC). The settings are *2 CLKs or 3 CLKs*. The Optimal default setting is *2 CLKs*. The Fail-Safe default setting is *3 CLKs.*

Watchdog Timer Set this option to *Enabled* to enable the watchdog timer. The settings are *Enabled* or *Disabled*. The Optimal and Fail-Safe default settings are *Disabled.*

PCI/PnP Setup

Choose the PCI/PnP Setup icon from the WINBIOS Setup screen to display the PCI and Plug and Play Setup options, described below.

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 Setting	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's palette registers and the ISA VGA device palette registers, permitting the palette registers of both devices to be identical.

This option must be set to *Enabled* if an ISA adapter card requires VGA palette snooping. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

PCI VGA Frame Buffering Set this option to *Enabled* to enable VGA frame buffering. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

PCI Slot-1 Latency Timer
PCI Slot-2 Latency Timer
PCI Slot-3 Latency Timer
PCI Slot-4 Latency Timer These options specify the latency timings (in PCI clocks) for PCI devices installed in the four PCI expansion slots. If no PCI card is installed in a PCI slot, the corresponding WINBIOS Setup option cannot be selected. The settings are *32, 64, 96, 128, 160, 192, 224,* or *248.* The Optimal default setting is 64. The Fail-Safe default setting is *128.*

PCI Slot 1 IRQ Preference
PCI Slot 2 IRQ Preference
PCI Slot 3 IRQ Preference
PCI Slot 4 IRQ Preference
PCI Slot 5 IRQ Preference
PCI Slot 6 IRQ Preference These options specify the IRQ priority to be used for PCI devices installed in PCI expansion slots. The settings are *Auto, IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, IRQ14,* or *IRQ15.* The Optimal and Fail-Safe default settings are *Auto.*

IRQ3
IRQ4
IRQ5
IRQ7
IRQ9
IRQ10
IRQ11
IRQ12
IRQ14
IRQ15   These options specify the bus or the PCI slot range that the specified IRQ line is
                          used on. They allow you to reserve IRQs for legacy ISA adapter cards. You can
                          also specify the IRQ used for each group of PCI expansion slots. The Goliath
                          base board has two groups of PCI expansion slots: The primary group (PCI
                          expansion slots 1, 2, and 3) and the secondary PCI expansion slots (PCI
                          expansion slots 4, 5, and 6). All IRQs are available to the primary PCI slots.
                          The IRQ pool for the secondary PCI slots is: IRQ3, IRQ5, IRQ7, IRQ10, and
                          IRQ15. Make sure that at least one of these IRQs is reserved for the secondary
                          PCI slots if you have installed a PCI adapter card in PCI expansion slot 4, 5, or
                          6.

                          These options determine if AMIBIOS should remove an IRQ from the pool of
                          available IRQs passed to devices that can be configured by the BIOS. The
                          available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs
                          must be removed from the pool, set 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 PnP. IRQ12 only appears if the
                          Mouse Support option in Advanced Setup is set to *Disabled.* IRQ14 will not be
                          available if the Onboard Primary IDE Controller option is set to *Enabled.* If all
                          IRQs are set to ISA and IRQ14 is allocated to the onboard PCI IDE, IRQ9 will
                          still be available for PnP devices, since at least one IRQ must be available for
                          PnP. The settings are ISA, Prim-Slots, or Sec-Slots.

PCI/PnP Setup, Continued

IRQ Options, cont'd The Optimal and Fail-Safe default settings are:

PCI/PnP IRQ Option	Optimal	Fail-Safe
IRQ3	PnP	Prim-Slots
IRQ4	PnP	Prim-Slots
IRQ5	Sec-Slots	Sec-Slots
IRQ7	PnP	Prim-Slots
IRQ9	Prim-Slots	Prim-Slots
IRQ10	Sec-Slots	Sec-Slots
IRQ11	Prim-Slots	Prim-Slots
IRQ12	PnP	PnP
IRQ14	Prim-Slots	Prim-Slots
IRQ15	Sec-Slots	Sec-Slots

DMA Channel 0
DMA Channel 1
DMA Channel 3
DMA Channel 5
DMA Channel 6
DMA Channel 7 These options specify the bus that the DMA channel is used on. The settings are *PnP* or *ISA/EISA*. The Optimal and Fail-Safe default settings are *PnP*.

Reserved 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 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. This option does not appear if the Reserved Memory Size option is set to *Disabled.* The settings are *C0000, C4000, C8000, CC000, D0000, D4000, D8000,* or *DC000.* The Optimal and Fail-Safe default settings are *N/A.*

Peripheral Setup

Choose the Peripheral Setup icon from the WINBIOS Setup screen to display the Peripheral Setup options, described below.

Onboard Floppy Controller This option enables the floppy drive controller on the motherboard. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

Onboard Primary IDE Controller Set this option to *Enabled* to enable the onboard IDE controller. The settings are *Disabled* or *Enabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Onboard IDE Bus Master Set this option to *Enabled* to enable PCI bus mastering support for the onboard IDE controller. This option only appears if the Onboard Primary IDE Controller option is set to *Enabled.* The settings are *Enabled* or *Disabled.* The Optimal default setting is *Disabled*. The Fail-Safe default setting is *N/A.*

Serial Port1 Address This option specifies the base I/O port address used by serial port 1. The settings are *Disabled, 3F8h,* or *3E8h.* The Optimal default setting is *3F8h.* The Fail-Safe default setting is *Disabled.* The Fail-Safe default setting cannot be changed.

Serial Port1 FIFO Set this option to *Enabled* to enable the FIFO buffer for serial port1. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Disabled.* The Fail-Safe default setting is *N/A.*

Serial Port2 Address This option specifies the base I/O port address of serial port 2. The settings are *Disabled, 2F8h,* or *2E8h.* The Optimal default setting is *2F8h.* The Fail-Safe default setting is *Disabled.* The Fail-Safe default setting cannot be changed.

Serial Port2 FIFO Set this option to *Enabled* to enable the FIFO buffer for serial port2. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Disabled.* The Fail-Safe default setting is *N/A*.

Parallel Port Address This option specifies the base I/O port address of the parallel port on the motherboard. The settings are *Disabled, 378h,* or *278h.* The Optimal default setting is *378h.* The Fail-Safe default setting is *Disabled.* The Fail-Safe default setting cannot be changed.

Parallel Port Mode This option specifies the parallel port mode. The Optimal default setting is *Normal*. The Fail-Safe default setting is *N/A*. 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.

Parallel Port DMA Channel This option is only available 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 0, DMA Ch 1,* or *DMA Ch 3*. The Optimal and Fail-Safe default settings are *N/A*.

Section 2 Security

AMIBIOS Password Support

WINBIOS Setup has a two-level password feature. A Supervisor password and a User password can be configured. Both the Supervisor and User password or either password can be configured.

Supervisor Password The Supervisor password takes precedence over the User password. WINBIOS setup can be configured so that certain Setup screens or options only appear when the Supervisor password has been properly entered.

User Password The computer can be configured so that all users must enter a password every time the system boots or when WINBIOS Setup is executed.

Setting a Password

The password check option is enabled in Advanced Setup by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when WINBIOS is run). The password is encrypted and stored in NVRAM.
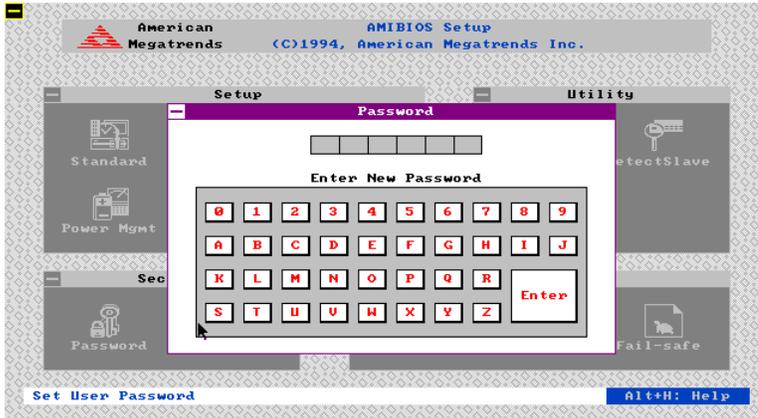
As shown on the above screen, you are prompted for a 1 – 6 character password. You can either type the password on the keyboard or select each letter of the password, one at a time, using the mouse. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and reconfigure.

If You Do Not Want to Use a Password Just press <Enter> when the password prompt appears.

Changing a Password

Select the *Password* icon from the Security section of the WINBIOS Setup main menu. Enter the password and press <Enter>. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press <Enter>. If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press <Esc> to return to the WINBIOS Main Menu. The password is stored in NVRAM after WINBIOS completes. The next time the system boots, you are prompted for the password if the password function is present and is enabled.

Remember the Password Keep a record of the new password when the password is changed. If you forget the password, remove the computer cover, set switch 1-2 (the DIAG switch) to ON, power on the computer. AMIBIOS will erase the password.

Anti-Virus

When this icon is selected from the Security section of the WINBIOS Setup main menu, AMIBIOS issues 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. The settings are *Enabled* or *Disabled.* 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 13h Hard Disk Drive Service:

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

Section 3 Utility

The icons in this section of the WINBIOS Setup main screen permit you to choose a different set of colors for the WINBIOS Setup screens and to use a set of screen instructions written in a different language. The text for the screen messages written different language must have been incorporated into the AMIBIOS when the BIOS was manufactured.

Color Set   Color Set sets the Setup screen colors.

Language   If this feature is enabled, you can select WINBIOS Setup messages in different languages.

Section 4 Default

The icons in this section permit you to select a group of settings for all WINBIOS Setup options. Not only can you use these icons to quickly set system configuration parameters, you can choose a group of settings that have a better chance of working when the system is having configuration-related problems.

Original   Choose the Original icon to return to the system configuration values present in WINBIOS Setup when you first began this WINBIOS Setup session.

Optimal   You can load the optimal default settings for the WINBIOS by selecting the Optimal icon. The Optimal default settings are best-case values that should optimize system performance. If NVRAM is corrupted, the Optimal settings are loaded automatically.

Fail-Safe   You can load the Fail-Safe WINBIOS Setup option settings by selecting the Fail-Safe icon from the Default section of the WINBIOS Setup main menu.

The Fail-Safe settings provide far from optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.

3 Programming the Flash ROM

The Goliath 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.

J26   J26 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 S730P.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.

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

Reads S730P.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.

S730P.ROM S730P.ROM resides on a floppy disk and contains the updated main BIOS code. American Megatrends will provide this file when the AMIBIOS for the Goliath EISA baseboard must be updated.

S730P.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 S730P.ROM.

Programming the Flash ROM, Continued

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 S730P.ROM on the floppy disk.	S730P.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 screen), 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.

A   Mechanical Drawings

SIDE VIEW : CHASSIS FRONT : 730, 732 AND 741 BOARD ASSEMBLY

SCH : GOLIATH | COPYRIGHT: AMERICAN MEGATRENDS INC. | SERIES: 730 | REV: C | DATE: 5/20/96 | MECH 2 OF 3
ECN: 00 | | | | BOARD FREQUENCY: 180/200 MHZ/ 200+

A,B,C,D,E,F,G,H = MOUNTING HOLES

X1,X2,X3 = SUPPORT HOLES

A=0.40, 0.70
B=6.50, 0.70
C=12.70, 0.50
D=0.40, 5.60
E=6.50, 5.60
F=12.70, 5.60
G=0.40, 8.40
H=11.80, 8.40
X1=6.55, 10.75
X2=5.10, 8.85
X3=0.225, 10.775

(0.00, 12.100)

GOLIATH CASE FITTING : HOLE LOCATIONS : 12 SLOT CHASSIS

MOUNTING HOLES CENTRE CO ORDINATE SHOWN
BOARD EDGE CO ORDINATES SHOWN
CONNECTORS (PCI,EISA,CPU) PIN 1 CO ORDINATES SHOWN
NOTE : CPU1/CPU2/MEMORY BOARDS HEIGHT IS 6.15"

ALL DIMENSIONS IN INCHES

(0.225, 10.775)

◯ X3

PIN 1 (0.50, 7.204)

◯ (0.400, 8.400)
G

◯ (0.400, 0.700)
A

◯ (0.400, 5.600)
D

series 731 cpu card 1 slot
(1.100, 6.020)

(1.625, 3.413)   PCI SLOT 1
(1.625, 4.213)   PCI SLOT 2
(1.625, 5.013)   PCI SLOT 3
(1.625, 9.813)   PCI SLOT 4
(1.625, 10.613)   PCI SLOT 5
(1.625, 11.413)   PCI SLOT 6

(1.000, 0.450)   EISA SLOT 4
(1.000, 1.250)   EISA SLOT 3
(1.000, 2.050)   EISA SLOT 2
(1.000, 2.850)   EISA SLOT 1

X2 ◯
(5.100, 8.850)

◯ X1
(6.550, 10.750)

series 731 cpu card 2 slot
(5.90, 8.903)

series 741 memory board slot
(7.000, 6.050)

(11.80, 8.40)
◯ H

B ◯
(6.500, 0.700)

E ◯
(6.500, 5.600)

C ◯
(12.700, 0.500)

F ◯
(12.700, 5.600)

13.0, 6.10

(13.0, 6.10)

(13.0, 12.1)

(13.0, 0)

REFERENCE POINT
X,Y = 0.0

PCI SLOTS 1,2,3 ARE ON PRIMARY PCI
PCI SLOTS 4,5,6 ARE ON SECONDARY BUS
BOTH ARE PEER BUSSES OFF CPU BUS
BACK PANEL BRACKETS ARE SUPPORTED
FOR ALL PCI, EISA AND CPU1,2 CARDS

BOARD FORM FACTOR IS FULL AT
MOUNTING HOLES ARE FOR FULL AT , PLUS EXTRA SUPPORTS
EXTRA SUPPORT X1,X2,X3 ADD PLASTIC STAND OFFS FOR RIGIDITY