Titan III PCI EISA

Pentium

Motherboard

User's Guide

MAN-729
5/20/96

American Megatrends, Inc.
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Revision History

5/20/96 Initial release of preliminary version.

Preface

To the OEM Thank you for purchasing the high performance American Megatrends Titan III PCI EISA motherboard. This product is a state of the art motherboard 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 Titan III PCI EISA motherboard

This manual was written for the OEM to assist in the proper installation and operation of this motherboard. This manual describes the specifications and features of the Titan III PCI EISA motherboard. It explains how to assemble a system based on the Titan III PCI EISA motherboard and how to use the AMIBIOS that is specifically designed for this motherboard.

This manual is not meant to be read by the computer owner who purchases a computer with this motherboard. 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 an American Megatrends motherboard fails to operate as described or you are in doubt about a configuration option, please call technical support at 770-246-8645.

American Megatrends BBS

The American Megatrends BBS permits OEMs, VARs, and system integrators to access technical information about motherboard and BIOS products. Product Engineering Change Notices, Tech Tips, Technical Notes, and complete technical manuals are available.

Data Transmission Rates The American Megatrends BBS automatically handles modems with data transmission rates from 1,200 to 28,800 bps.

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

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.

Packing List

You should have received the following:

- an Titan III PCI EISA motherboard,
- a diskette that has the American Megatrends EISA Configuration Utility (ECU) and EISA configuration files,
- two serial cables,
- one parallel cable,
- a Warranty Card, and
- the *American Megatrends Titan III PCI EISA Pentium Motherboard User's Guide*.

Warning - Potential Memory Problems

SIMMs that have 36 chips (SIMMs that use x 1 memory chips) should not be installed on the Titan III Pentium PCI EISA motherboard.

36 chip SIMMs cause excessive loading in the Titan III motherboard circuitry. The Titan III chipset will have timing problems and the Titan III motherboard will not work reliably.

Do not Install 70 ns SIMMs

Only 60 ns DRAM SIMMs should be installed in the Titan III motherboard. The Titan III chipset timing cycles are very critical. The Titan III motherboard may not work reliably if 70 ns SIMMs are installed.

1 Hardware Installation

Overview

The American Megatrends Titan III PCI EISA Pentium motherboard features include:

- one or two Intel Pentium CPUs operating at 90, 100, 120, 133, 150, 166, or higher speeds,
- 256 MB of system memory,
- 512 KB pipelined burst mode cache memory,
- parity or ECC checking for system memory,
- four EISA expansion slots,
- four PCI expansion slots, and
- one PCI and one EISA slot is shared.

The motherboard 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

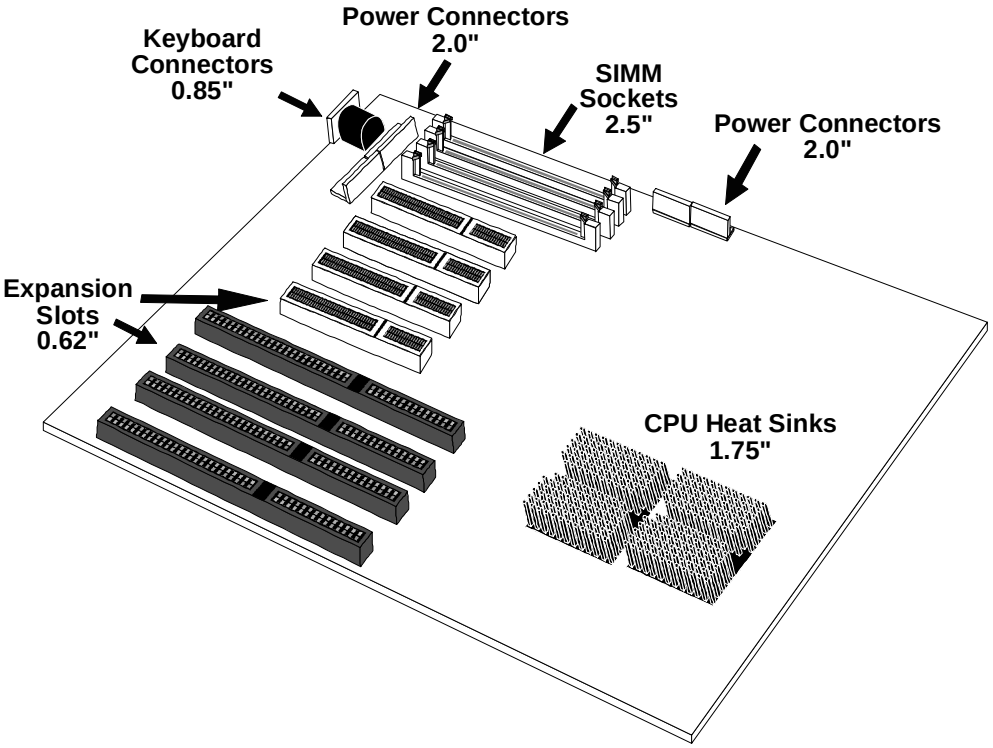
Onboard I/O

The Titan III PCI EISA Pentium motherboard includes:

- two 40-pin IDE connectors that support up to four IDE drives,
- the onboard I/O connectors are on the PCI local bus,
- a 34-pin floppy drive connector,
- two 10-pin serial port connectors,
- a 26-pin parallel port connector,
- a keyboard DIN connector, and
- a 10-pin berg mouse connector.

Titan III PCI EISA Dimensions

The motherboard is approximately 8.6” by 13” with the standard mounting holes.



Important

Make sure that the Pentium CPUs have adequate airflow. Install an 8 cm 0.2 Amp fan in the front of the computer case to pull air into the case, in addition to the standard computer case fan at the back of the computer chassis.

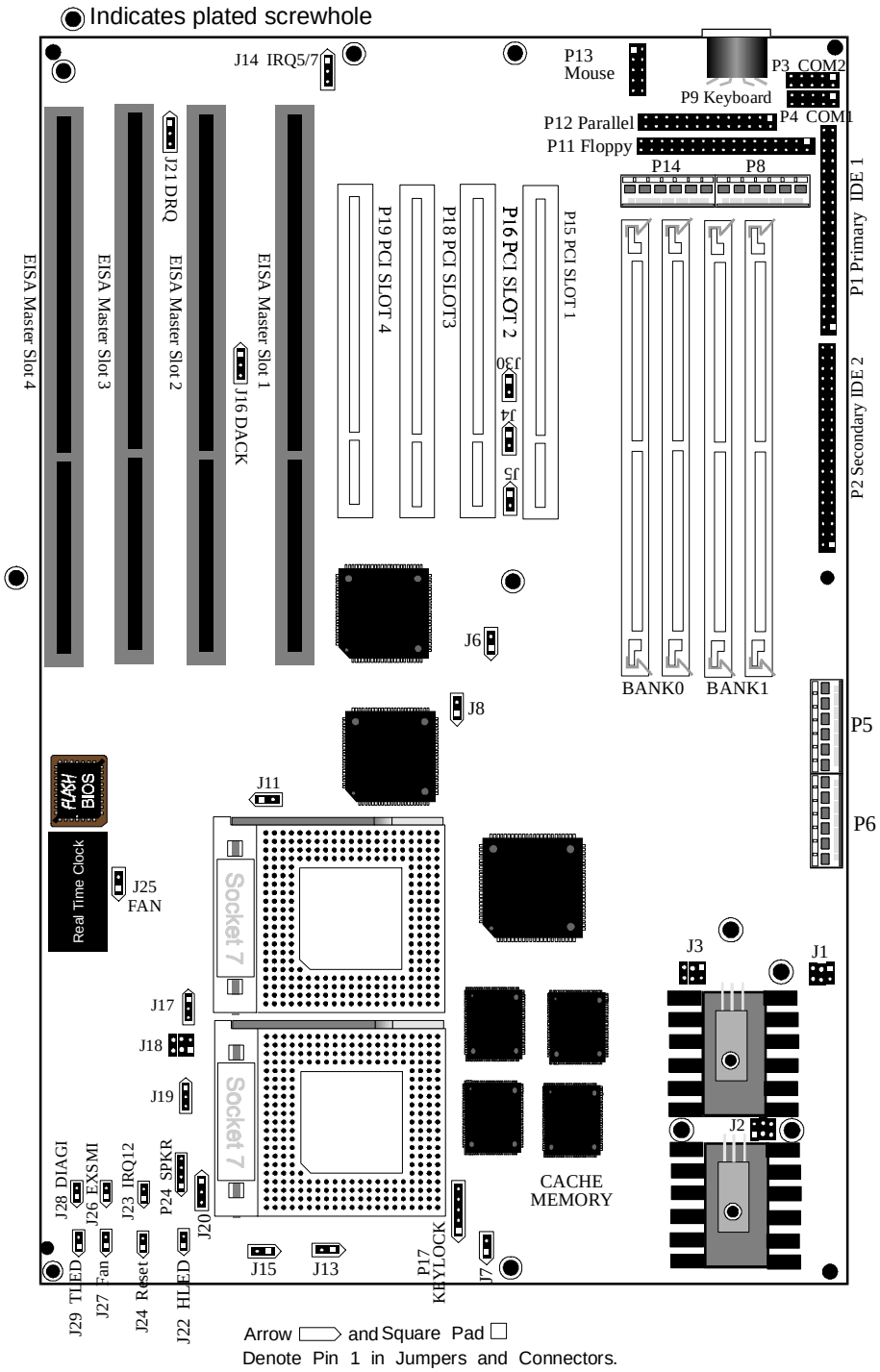
Installation Steps

Step	Action	
1	Unpack the motherboard.	
2	Configure the CPU. Configure the CPU. Select the CPU 3.3V Power Source Select the CPU Voltage. Select the CPU Speed. Install the CPU.	
3	Install memory.	
	Install System Memory.	
4	Install the Motherboard.	
5	Set Jumpers	
6	Attach cables to connectors.	
	Connect the Power Supply. Attach the Keyboard Cable. Connect the Mouse Cable. Connect Onboard I/O. Connect the Serial Ports. Connect the Parallel Port. Connect Floppy Drive(s). Connect the IDE Drive(s).	
7	Test and Configure.	

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.

Titan III PCI EISA Motherboard Layout



Step 1 Unpack the Motherboard

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

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

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.

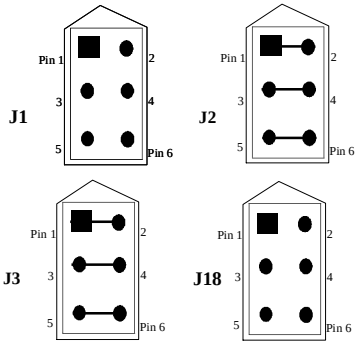
Step 2 Configure CPU

J1, J2, J3, and J18 select the CPU voltage. J6, J7, J8, J13, and J15 set the CPU speed.

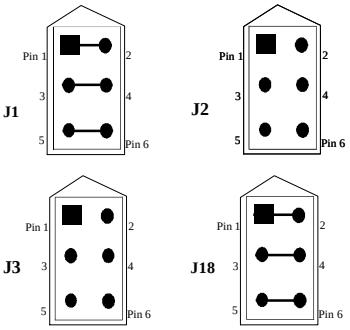
> ***Important***
> Perform the following steps before installing a CPU.

3.3V CPU Power J1, J2, J3, and J18 are six-pin bergs that select the 3.3V CPU power source. You can provide 3.3V through regulator (default) or 3.3V power supply.

From Regulator Set J1, J2, J13, and J18 as follows to configure 3.3V power from the regulator:



From 3.3V Power Supply Set J1, J2, J3, and J18 as follows to configure 3.3V power from the 3.3V power supply:



Cont’d

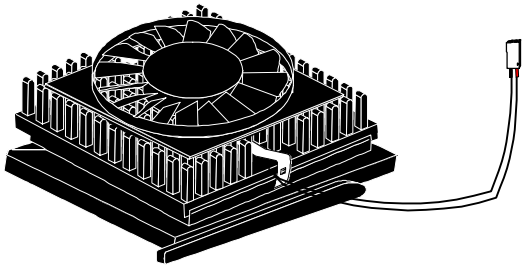
Step 2 Configure CPU, Continued

Select CPU Speed J6, J7, J8, J13, and J15 are two-pin bergs that together set the CPU speed. Both CPUs must run at the same speed if using two CPUs.

CPU Speed	J6	J8	J7	J13	J15
90 MHz	Shorted	OPEN	OPEN	OPEN	Shorted
100 MHz	OPEN	Shorted	OPEN	OPEN	OPEN
120 MHz	Shorted	OPEN	OPEN	Shorted	Shorted
133 MHz	OPEN	Shorted	OPEN	Shorted	OPEN
150 MHz	Shorted	OPEN	Shorted	Shorted	Shorted
166 MHz	OPEN	Shorted	Shorted	Shorted	OPEN

Important
Call American Megatrends technical support at 770-246-8645 to support a CPU running at a higher speed.

Connect CPU Fan J25 and J27 are two-pin bergs that connect power to the fan on the CPU heat sink. Pentium CPUs are shipped with *a heat sink and a CPU fan*. The wire from the CPU fan has two leads. Connect the Yellow lead to +12V (Pin 1 of J25 or J27).



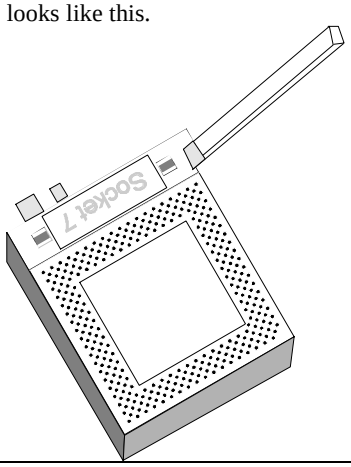
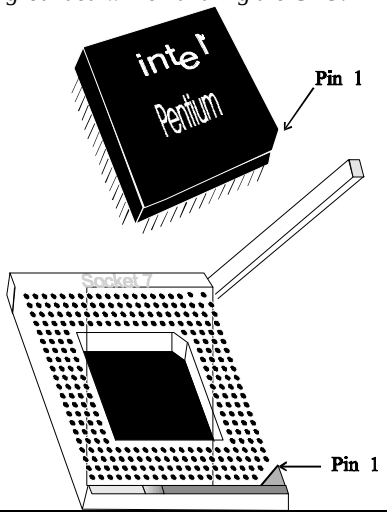
Warning
The yellow wire from the CPU fan must be connected to Pin 1 of J25 and J27.

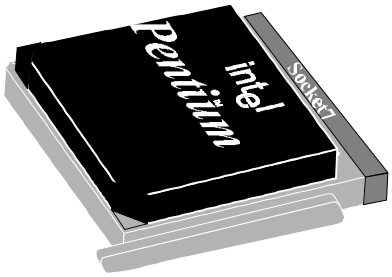
Cont'd

Step 2 Configure CPU, Continued

Install CPU Install the CPU in the ZIF (zero insertion force) socket by performing the following steps. Use this same procedure to install both CPUs, if using dual CPUs.

> STOP
>
> ***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.*

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.* 

Step	Action
3	Complete installation by lifting the ZIF lever to the other side of the socket, as shown below. 

Important

Make sure that the Pentium CPUs have adequate airflow. Install an 8 cm 0.2 Amp fan in the front of the computer case to pull air into the case, in addition to the standard computer case fan at the back of the computer chassis.

Step 3 Install Memory

System Memory Four 32-bit SIMM (Single-Inline Memory Module) sockets can be used. Memory must be populated one bank at a time. Each bank has two sockets: (Bank0 is U16 and U12. Bank1 is U10 and U6). Each bank must be populated with the same type of SIMM. If a 1 MB SIMM is installed in the first socket in Bank0, the same type of 1 MB SIMM must be installed in the second Bank0 SIMM socket. Each socket holds one SIMM. Use:

- 512 KB x 32 (or 36),
- 1 MB x 32 (or 36),
- 2 MB x 32 (or 36),
- 4 MB x 32 (or 36),
- 8 MB x 32 (or 36), or
- 16 MB x 32 (or 36) SIMMs consisting of 16 MB x 4 chips. Do not use 64 MB SIMMs that have 36 chips.

The motherboard supports banks of fast page mode and EDO (Extended Data Out) memory together operating at 60 ns (RAS access time).

> ***Important***
> You must use x 36 SIMMs when the **Parity** or **ECC** WINBIOS Setup options are set to *Enabled.*

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

Step 3 Install Memory, Continued

Select SIMMs SIMMs must meet the following specifications:

Parameter	Specification
Page Mode	FAST
Refresh	CAS before RAS
t_{CAC}	≤ 15 ns
t_{RAC}	≤ 70 ns
t_{AA}	≤ 35 ns
t_{RP}	50 ns
t_{CPA}	≤ 35 ns

SIMM Part Numbers

Type	Manufacturer	Part Number
1 MB x 36	Micron	MT12D136M-6
“	Mitsubishi	MH1M36ADJ-6
“	PNY	P361000-60
“	Motorola	MCM36100AS-60
“	Oki	MSC2355-60YS12
“	Samsung	KMM5361000AV-6
2 MB x 36	PNY	P362000-60
“	Samsung	EMM53620036-60
4 MB x 36	Micron	MT12D436M-6
“	Mitsubishi	MH4M36SAJ-6
“	Motorola	MCM36400S-60
“	PNY	P364000-60
“	Samsung	KMM5364100-6
8 MB x 36	Motorola	MCM36800S-60
“	PNY	P368000-60
“	Samsung	KMM5368100-6

Warning

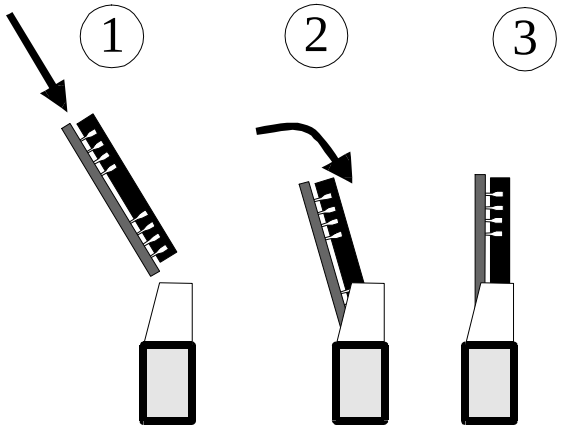
When using 16 MB x 36 (64 MB) SIMMs, make sure the SIMM consists of 64 MB x 4 chips Do not use 16 MB x 36 SIMMs that have 36 chips. These SIMMs do not work.

Cont’d

Step 3 Install Memory, Continued

Installing SIMMs The Titan III motherboard has four x 36 SIMM sockets. These sockets can be filled with either 512 KB x 32 (or 36), 1 MB x 32 (or 36), 2 MB x 32 (or 36), 4 MB x 32 (or 36), 8 MB x 32 (or 36), or 16 MB x 32 (or 36) SIMMs.

Place the motherboard on an anti-static mat. With the component side of the SIMM facing you, firmly push the SIMM into the socket at an angle, then push it up. When properly inserted, the SIMM clicks into place as the latching pins engage. The SIMM installation process is shown below:



Configure Cache Memory The Titan III PCI EISA motherboard includes 512 KB of factory-installed Pipeline Burst Mode L2 secondary cache memory. L2 secondary cache memory is not field-upgradable.

Step 4 Install the Motherboard

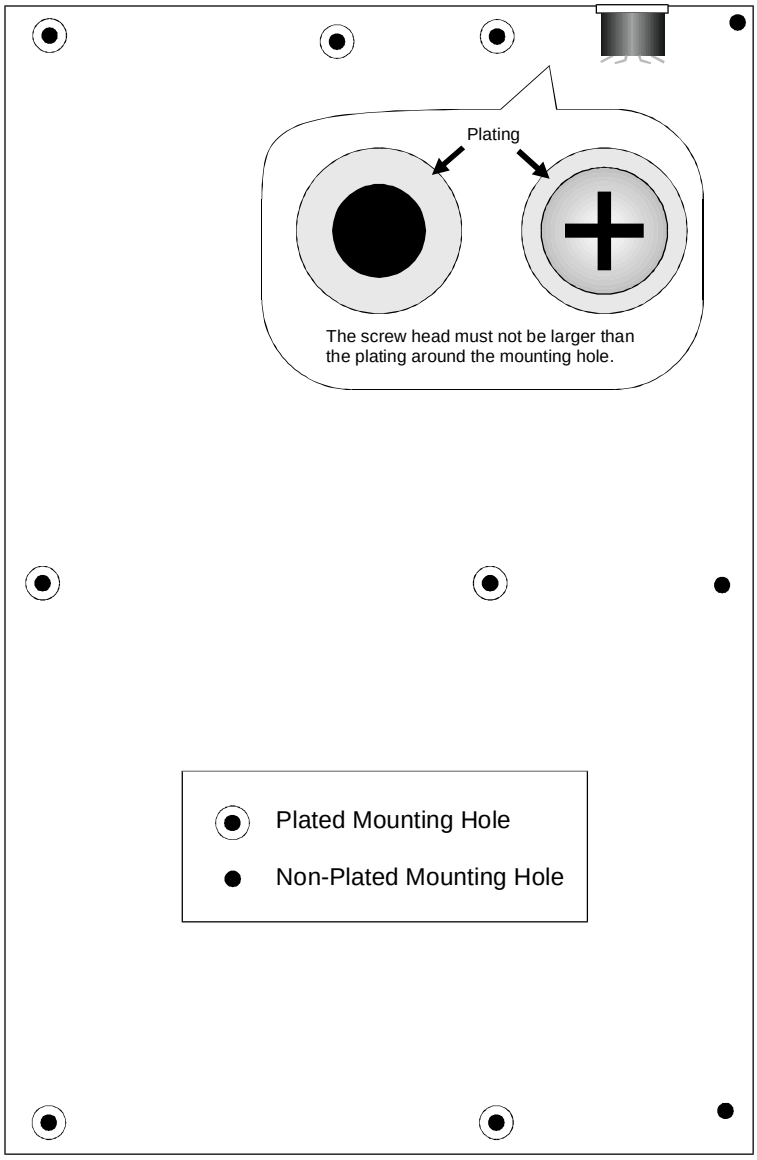
The motherboard mounting hole pattern is the same as the mounting hole pattern on a baby AT motherboard. Standoffs and mounting screws are not supplied with the motherboard. The chassis manufacturer should supply these parts.

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 and the rear is to the left. The side facing you is where the motherboard is mounted. The power supply is mounted at the far end of the chassis.
3	Hold the motherboard, component-side up, with the edge with the SIMM sockets toward you and the edge with the power supply connector away from you. The keyboard, mouse, and video connectors should be to the left.
4	Carefully slide the motherboard into the chassis. Make certain the edge connectors fit the ports in the rear of the chassis. The motherboard should rest level with the chassis.
5	Place the mounting screws in the holes provided and tighten them. If necessary, shift the motherboard slightly to align the mounting holes on the motherboard with the holes on the chassis. See the drawing below.

Warning

Do not use metallic screws in the top 3 mounting holes. These screw holes are not plated through holes. Non-plated screw holes are marked on the graphic below. When 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 graphic below.

Cont'd


Plating
The screw head must not be larger than the plating around the mounting hole.
Plated Mounting Hole
Non-Plated Mounting Hole

Step 5 Set Jumpers

Jumpers The Titan III motherboard has several jumpers that must be set properly. The non-CPU jumpers are:

Connector
J21 DMA for ECP
J16 DACK for ECP
J14 IRQ for Parallel Port
J17 Second CPU Type
J19 APIC Enable
J23 PS/2 Mouse IRQ
J28 Password clear
J4 and J30 IDE Bus Master

Select Parallel Port IRQ J14 is a 3-pin berg that selects the parallel port IRQ. If IRQ5 is selected, you must change the **IRQ5** option in PCI/PnP Setup to *ISA/EISA.*

Setting	Description
Short Pins 2-3	Select IRQ 5 for the parallel port.
Short Pins 1-2	Select IRQ 7 for the parallel port (Factory Setting).

Select Parallel Port DMA J16 is a 3-pin berg that selects the ECP (Extended Capabilities Port) DMA channel.

DMA Channel	J16	J21
None (Factory Setting)	OPEN	OPEN
DRQ1	Short Pins 1-2	Short Pins 1-2
DRQ3	Short Pins 2-3	Short Pins 2-3

J17 Select CPU J17 is a 3-pin berg that enables an Intel P54C/CM CPU pair. Pins 2-3 must always be shorted.

J19 APIC J19 is a 3-pin berg that enables the local Advanced Programmable Interrupt Controller. Enable the APIC if two CPUs are installed. The settings are:

Action	Set J19
Enable the APIC if 2 CPUs are installed.	Short Pins 1-2
Disable the APIC if only one CPU is installed.	Short Pins 2-3.

Cont'd

J23 PS/2 Mouse IRQ J23 is a 2-pin berg that enables the PS/2 mouse interrupt (IRQ12). Short J23 to use IRQ12 as the PS/2 mouse interrupt. You should always short J23. The only reason that you would not short J23 is if you had an ISA or EISA adapter card that had to use IRQ12. You would then set the **PS/2 Mouse** option in Advanced Setup to *Disabled* and set the **IRQ12** option in Advanced Setup to *ISA/EISA.*

J28 Password Clear J28 is a 2-pin berg that erases the system configuration data stored in CMOS RAM. It also erases your password. J28 should always remain OPEN in normal operation. If you forget the AMIBIOS password or want to delete the system configuration data stored in CMOS RAM, turn the power off and open the computer cover. Find J28. Place a shorting bridge on J28 (or touch a piece of metal to both pins of J28). Turn the computer power on when

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CMOS IS BAD
```

appears. Power down the computer. Remove the shorting bridge from J28. Power on the computer. Press <Del> to run WINBIOS Setup when the first AMIBIOS screen appears.

J4 and J30 Enable IDE Bus Master J4 and J30 enable IDE bus masters. Short J4 and J30 to enable IDE bus master mode. You must also set the **IDE Bus Master** option in PCI/PnP Setup to *Enabled*.

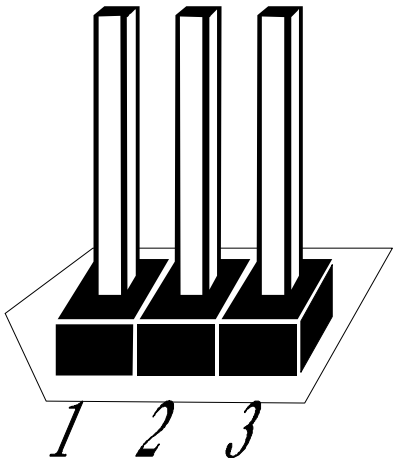
When IDE bus master mode is enabled, do not install a PCI bus master card in PCI Slot 4, it can only be in Slave mode.

Step 6 Attach Cables

Connectors The Titan III PCI EISA motherboard includes many connectors. Connection instructions, illustrations of connectors, and pinouts are supplied below. A list of all connectors described in this section follows:

Connector
Power supply connectors P8 and P14
Keyboard connector P9
Mouse connector P13
Reset switch J24
Speaker P24
Keyboard lock connector P17
Turbo LED connector J29
IDE LED connector J22
Serial port connectors P3 and P4
Parallel port connector P12
Floppy connector P11
IDE drive connectors P1 and P2

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, as shown below:

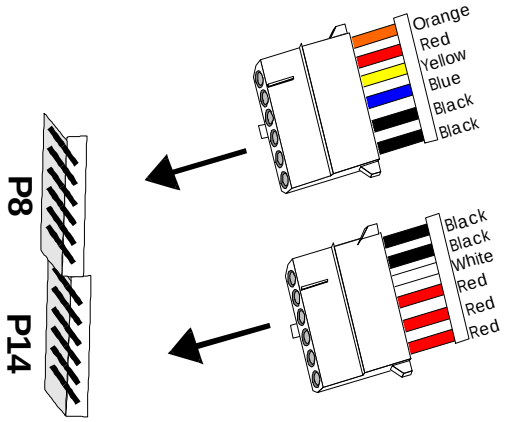


Cont'd

Step 6 Attach Cables, Continued

Connect Power Supply The power supply should match the physical configuration of the chassis. Make sure the power switch is off before assembly. Before attaching all components, make sure 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. Use at least a 300 watt power supply, which should have built-in filters to suppress radiated emissions.

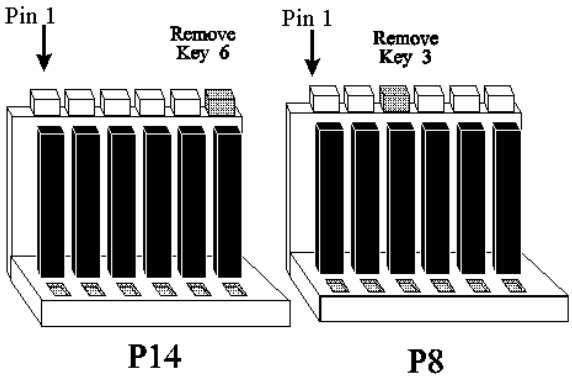
Connect Power Cables Attach the power supply cables to the power connector on the motherboard. AT-compatible power supplies have two main six-pin connectors, attached as shown below. The six-pin connector on the power cable with three red wires and two black wires is attached to P14. The other major connector is attached to P8.



Cont'd

Step 6 Attach Cables, Continued

Power Connector Keys The power connectors are keyed to prevent incorrect installation. The connector keys must be cut to fit some power supplies, as shown below.



P8 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)

P14 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)

Cont'd

P6 Pinout P6 provides 3.3V power.

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

P5 Pinout P5 provides auxiliary 5V power. Some 400 watt power supplies have an auxiliary 5V connector.

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

P9 Keyboard Connector The keyboard connector (P9) is a six-pin DIN socket. The P9 pinout is shown below.

Pin	Assignments
1	Keyboard clock
2	Keyboard data
3	Not used
4	Ground
5	VCC

Cont'd

Connect Mouse Cable The mouse connector (P13) is a 10-pin berg. The mouse cable is the same as the serial cable in the Titan III PCI EISA motherboard. Two serial cables are shipped with the motherboard. Use one of these cables for the mouse, or you can make your own cable using the following pinouts.

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

J24 Reset Switch Connector J24 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 1 is ground and Pin 2 is Hard Reset.

P24 Speaker Connector P24 is a four-pin single-inline berg that is optionally attached via a cable to a standard system speaker. AMIBIOS signals hardware problems through the speaker. Pin 1 on the motherboard is identified by the arrow around the berg.

Pin	Description
1	Data Out
2	Key
3	N/C
4	VCC

Cont'd

P17 Keyboard Lock P17 is a five pin single-inline berg that is attached via a cable to the keyboard lock connector (or separate keyboard lock and Power LED connectors). 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, protecting the system from unauthorized use. Pin 1 on the motherboard is identified by the broad arrow.

Pin	Description
1	VCC
2	N/C
3	Ground
4	Keyboard Lock (KBDINH)
5	Ground

J29 Turbo LED J29 is a 2-pin berg that is attached via a cable to the externally-mounted bipolar Turbo LED. The LED lights when the motherboard is running at high speed. Press <Ctrl> <Alt> <+> for high speed. Press <Ctrl> <Alt> <-> for low speed.

J22 IDE LED J22 is a 2-pin berg that is attached via a cable to the externally-mounted IDE Activity LED. This LED lights when the IDE drive is running.

> ***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 J22.

Cont'd

Onboard Adapters The Titan III PCI EISA motherboard has:

- two serial port connectors (P3 and P4),
- a parallel port connector (P12),
- an IDE controller on the PCI bus. The primary IDE connector is P1. The secondary connectors is P2.
- a floppy controller (P11).

The serial and parallel port connectors are described below.

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

AMIBIOS automatically checks the adapter cards installed in the expansion slots on the Titan III PCI EISA motherboard for a hard disk or floppy controller and serial or parallel ports.

P3, P4 P3 (serial port1) and P4 (serial port 2) are 10-pin connectors that provide an AT-compatible serial port interface. Connect the cables supplied with the motherboard to P3 and P4. The serial port base I/O port address and other serial port settings can be selected in Peripheral Setup in WINBIOS Setup.

The P3 and P4 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

Cont'd

P12 Parallel Port P12 is a 26-pin connector for a parallel port. The P12 pinout is shown below. Connect the 16-pin to DB25 cable provided with the motherboard to P12.

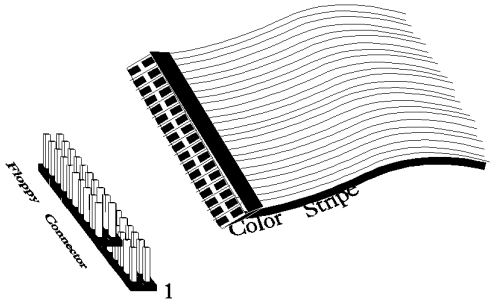
All parallel port settings can be configured through Peripheral Setup in WINBIOS Setup.

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

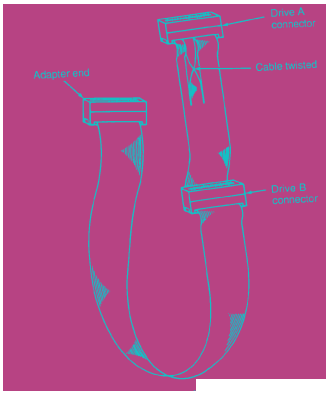
Cont'd

P11 Floppy

P11 is a 34-pin dual-inline berg. Connect the cable from the floppy drive to P11, 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 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.



Cont'd

P11 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

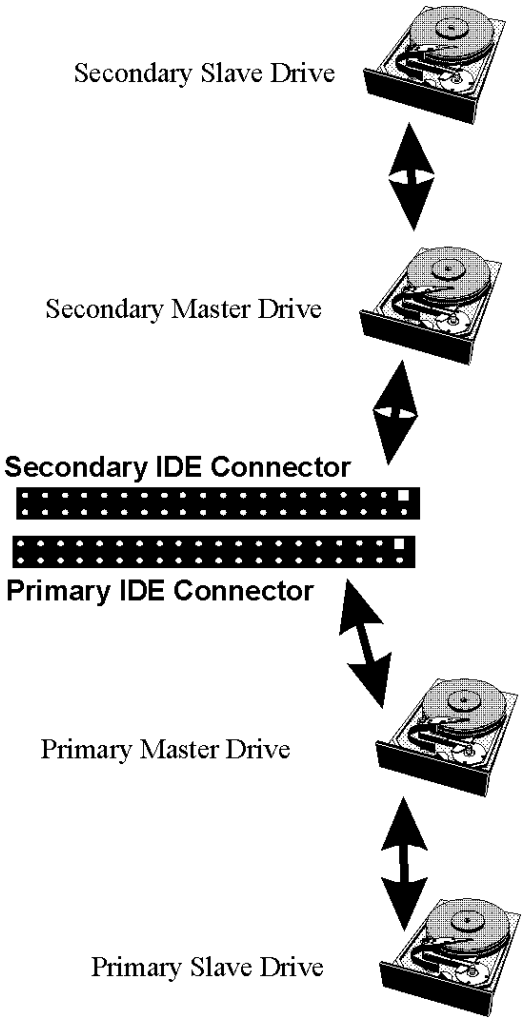
Floppy B to A	Floppy B to A	Floppy B to A	Floppy B to A
10 to 16	12 to 14	14 to 12	16 to 10
11 to 15	13 to 13	15 to 11	

Cont’d

Step 6 Attach Cables, Continued

IDE Drives

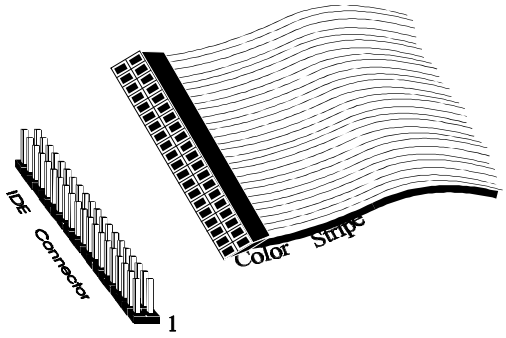
Attach the IDE drives in the following manner. Choose Peripheral Setup in WINBIOS Setup to enable the onboard IDE controller.



Cont'd

Step 6 Attach Cables, Continued

Attach IDE Cable P1 is the primary IDE (Integrated Drive Electronics) hard disk drive connector. Both the primary master and the primary slave IDE drives must be connected by cable to P1, as shown below.



P1 is a 40-pin dual-inline berg that connects an IDE drive to the primary onboard IDE connector. This motherboard 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 ISA ESDI, RLL, MFM, or SCSI hard disk drive controller.

Cont'd

P1 Pinout The P1 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	DMARQ0	22	GND
23	-IOW	24	GND
25	-IOR	26	GND
27	IDERDY	28	ALE
29	DMACK0	30	GND
31	INT14	32	-IOCS16
33	HA1	34	N/C
35	HA0	36	HA2
37	-CS0	38	-CS1
39	-IDEACT	40	GND

P2 Secondary IDE Controller P2 is the secondary IDE connector. P2 is a 40-pin dual-inline berg that connects the secondary primary and slave IDE drives to the secondary onboard IDE controller.

Attach the secondary master and slave IDE drives to P2 via a standard 40-pin IDE cable as shown on the previous screen.

Cont'd

P2 Pinout The P2 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	DAMRQ0	22	GND
23	-IOW	24	GND
25	-IOR	26	GND
27	IDERDY	28	ALE
29	DMACK0	30	GND
31	INT15	32	-IOCS16
33	HA1	34	N/C
35	HA0	36	HA2
37	-CS2	38	-CS3
39	N/C	40	GND

Bus Master IDE The Titan III EISA motherboard supports bus master IDE. When connecting a device that uses bus master IDE, make sure that the IDE Bus Master option in Peripheral Setup is set to *Enabled.*

Make sure that J4 and J30 are shorted if using bus master IDE. When bus master IDE is enabled, PCI slot 4 (P19) does not support a PCI bus master card.

Step 7 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 WINBIOS Setup. You must enter the requested information and save the configuration data in CMOS RAM. The system will then reset, run POST, and boot the operating system. See the following chapter for information about configuring the computer.

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 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.

Graphical BIOS Setup American Megatrends has a new type of system BIOS Setup utility. WINBIOS Setup has a graphical user interface the end user 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.

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 on the next screen.

WINBIOS Setup Menu

The WINBIOS Setup main menu, shown below, 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:

WINBIOS Setup Windows	See Section
The Setup icons allow you to set system configuration options such as date, time, hard disk type, and floppy type.	1
The Utilities section allows you to change the WINBIOS Setup screen colors.	2
The Security icons allow you to configure passwords and enable AMIBIOS anti-virus protection.	3
Default has three icons that permit you to select a group of settings for all AMIBIOS WINBIOS Setup options.	4

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 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 the PgUp and PgDn keys 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.*

Cont'd

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.
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.
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 drive parameters for you hard disk 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.
Cylinders	The number of cylinders in the disk drive.
Heads	The number of heads.
Write Precompensation	The 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 where write precompensation begins.
Landing Zone	This number is the cylinder location where the heads will 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 drive may 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

MFM 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

Advanced Setup

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

System Keyboard This option not only indicates that a keyboard is attached to the computer, if set to Absent, all BIOS error messages about missing keyboard are suppressed. The settings are *Absent* or *Present.* The Optimal and Fail-Safe default settings are *Present.*

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

Mouse Support Set this option to *Enabled* to enable AMIBIOS support for a PS/2-type mouse. Short J23 on the motherboard if PS/2 mouse support is set to *Enabled.* The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

Parity Check Set this option to *Enabled* to check the parity of all system memory. When set to *Disabled*, system memory parity is not checked. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Disabled.*

Boot Up Num Lock Set this option to *On* to turn 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 and Fail-Safe default settings are *On.*

Cont'd

Password Check This option enables password checking every time the system boots or when you run WINBIOS 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 WINBIOS is executed. The Optimal and Fail-Safe defaults are *Setup.*

OS/2 Compatible Mode Set this option to *Enabled* if running the IBM® OS/2® operating system and using more than 64 MB of system memory on the motherboard. The settings are *Enabled* or *Disabled*. The Optimal and Fail-Safe default settings are *Disabled.*

Floppy Drive Seek When this option is set to *Enabled,* AMIBIOS performs a Seek command on floppy drive A: before booting the system. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled*.

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

Quick Boot Set this option to *Enabled* to allow the BIOS to boot to the operating system within 5 seconds after the computer power switch is turned on. The settings are *Enabled* or *Disabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

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) AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are *C:,A:,CDROM, C:,CDROM,A:, A:,C:,CDROM, A:,CDROM,C: CDROM,A:,C:,* or *CDROM,C:,A:*. The Optimal and Fail-Safe default settings are *A:,C:,CDROM.*

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

External Cache This option enables L2 secondary cache memory. The L2 secondary (external) cache memory is always in Write-back mode. The settings are *Disabled* or *Enabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

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

Caching Controller Set this option to *Present* if a caching controller is installed in the computer. The settings are *Absent* or *Present.* The Optimal and Fail-Safe default settings are *Absent.*

Cont’d

C000,32K Shadow These options specify the way that the 32 KB of video ROM beginning at C0000h is handled by AMIBIOS. 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 not only copied from ROM to RAM, the contents of the C0000h - C7FFFh RAM area can be written to or read from cache memory.
Shadow	The contents of the video ROM area from C0000h - C7FFFh are copied (shadowed) 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 enable shadowing of the contents of the ROM area named in the option title. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards. 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 not only copied from ROM to RAM, the contents of the C0000h - C7FFFh RAM area can be written to or read from cache memory.
Shadow	The contents of the video ROM area from C0000h - C7FFFh are copied (shadowed) from ROM to RAM for faster execution.

The Optimal and Fail-Safe defaults are *Disabled.*

Chipset Setup

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

Memory Hole This option specifies the location of a memory hole. The settings are *Disabled* or *15 MB-16 MB.* The Optimal and Fail-Safe default settings are *Disabled.*

DRAM Timings This option specifies the speed of the system memory DRAM installed in this computer. The settings are *70ns* or *60ns.* The Optimal and Fail-Safe default settings are *70ns.*

Parity Check (72-bit SIMMs) This option sets the type of system memory integrity tests that are used. The settings are *Parity, ECC,* or *Disabled*. The Optimal and Fail-Safe default settings are *Disabled.*

ISA 8 Bit I/O Recovery Time This option specifies the length of the delay that is added to the CPU cycle between consecutive 8-bit I/O operations on the ISA bus. The length of the delay is related to the CPU type and frequency. The settings are *Disabled, 1 (BUSCLK), 2, 3, 4, 5, 6,* or *8.* The Optimal and Fail-Safe default settings are *1*.

ISA 16 Bit I/O Recovery This option specifies the length of the delay that is added to the CPU cycle between consecutive 16-bit I/O operations on the ISA bus. The length of the delay is related to the CPU type and frequency. The settings are *Disabled, 1 (BUSCLK), 2, 3,* or *4.* The Optimal and Fail-Safe default settings are *1*.

Power Management Setup

The AMIBIOS Setup options described in this section are selected by choosing the Power Management Setup icon from the Setup section on the AMIBIOS Setup main menu.

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

Instant-On Timeout (Minute) This option specifies the length of a period of system inactivity while the computer is in Full power on state. When this length of time expires, AMIBIOS takes the computer to a lower power consumption state, but the computer can return to full power instantly when any system activity occurs. *This option is only available if supported by the computer hardware.* The settings are *Disabled* or *1 Min.* through *15 Min* in 1 minute intervals. The Optimal and Fail-Safe default settings are *Disabled.*

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 *Off, Standby, Suspend,* or *Disabled.* The Optimal and Fail-Safe default settings are *Standby.*

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 and Fail-Safe default settings are *Standby.*

Cont'd

Power Management Setup, Continued

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, Standby,* or *Suspend.* The Optimal and Fail-Safe default settings are *Suspend.*

Hard Disk Timeout (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 (see the previous screen). The settings are *Disabled* or *1 Min.* through *15 Min* in 1 minute intervals. The Optimal and Fail-Safe default settings are *Disabled.*

Standby Timeout 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* or *1 Min.* through *15 Min* in 1 minute intervals. The Optimal and Fail-Safe default settings are *1.*

Suspend Timeout 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* or *1 Min.* through *15 Min* in 1 minute intervals. The Optimal and Fail-Safe default settings are *1.*

Slow Clock Ratio This option specifies the speed at which the system clock runs in power saving states. The settings are expressed as a ratio between the normal CPU clock speed and the CPU clock speed when the computer is in the power-conserving state. The settings are *1:1, 1:2, 1:4, 1:8, 1:16, 1:32, 1:64,* and *1:128.* The Optimal and Fail-Safe defaults are *1:8.*

Cont'd

IRQ3
IRQ4
IRQ5
IRQ7
IRQ8
IRQ9
IRQ10
IRQ11
IRQ12
IRQ13
IRQ14
IRQ15

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 power 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*, *Both,* or *Ignore.*

The Optimal and Fail-Safe default settings are *Ignore* for all the above options except IRQ12, IRQ14, and IRQ15. The Optimal default setting for IRQ12 is *Both.* The Optimal default setting for IRQ14 and IRQ15 is *Monitor.*

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.

Plug and Play Aware OS Set this option to *Yes* if the operating system installed in the computer is Plug and Play-aware. AMIBIOS only detects and enables PnP ISA adapter cards that are required for system boot. The Windows 95 operating system detects and enables all other PnP-aware adapter cards. Windows 95 is PnP-aware. Set this option to *No* if the operating system (such as DOS, OS/2, Windows 3.x) does not use PnP. *You must set this option correctly or PnP-aware adapter cards installed in your computer will not be configured properly.* The settings are *No* or *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:

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 any ISA adapter card installed in the system requires VGA palette snooping. The Optimal and Fail-Safe default settings are *Disabled.*

Cont'd

PCI Slot-1 Latency Timer
PCI Slot-2 Latency Timer
PCI Slot-3 Latency Timer
PCI Slot-4 Latency Timer This option sets latency of the PCI device in the specified PCI expansion slot. The settings are in units equal to PCI clocks. The settings are *32, 64, 96, 128, 160, 192, 224,* or *248.* The Optimal default setting is *248.* The Fail-Safe default setting is *Empty Slot.*

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

Cont'd

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, 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 *PCI/PnP*. IRQ12 only appears if Mouse Support in Advanced Setup is set to *Disabled.* IRQ14 and 15 will not be available if the onboard PCI IDE is enabled. If all IRQs are set to *ISA* and IRQ14 and 15 are allocated to the onboard PCI IDE, IRQ9 is still available for PCI and PnP devices. At least one IRQ must be available for PCI and PnP devices. The settings are *ISA, PnP,* or *PCI/PnP*. The default settings are:

PCI/PnP Setup Option	Optimal Default	Fail-Safe Default
IRQ3	PnP	PCI/PnP
IRQ4	PnP	PCI/PnP
IRQ5	PCI/PnP	PCI/PnP
IRQ7	PnP	PCI/PnP
IRQ9	PCI/PnP	PCI/PnP
IRQ10	PCI/PnP	PCI/PnP
IRQ11	PCI/PnP	PCI/PnP
IRQ12	PnP	PnP
IRQ14	PCI/PnP	PCI/PnP
IRQ15	PCI/PnP	PCI/PnP

Cont’d

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 specified 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 *C8000.*

Peripheral Setup

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

Onboard Floppy Controller Set this option to *Enabled* to enable the floppy drive controller 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 *Enabled.*

Onboard Primary/Secondary IDE This option specifies the IDE channel that is used on the onboard IDE controller. The settings are:

Setting	Description
Disabled	The onboard IDE controller is not used.
Primary	The primary channel on the onboard IDE controller is used.
Secondary	The secondary channel on the onboard IDE controller is used.
Both	Both the primary and secondary channels on the onboard IDE controller is used.

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

Onboard IDE Bus Master Set this option to *Enabled* to specify that the onboard IDE device on the PCI local bus has bus mastering capability. Short J4 and J30 on the motherboard when this option is set to *Enabled.* When J4 and J30 are shorted, PCI Slot 4 is in slave mode only. Non-bus mastering PCI adapter cards (such as a VGA card) can then be installed in PCI Slot 4 without using a PCI bus mastering slot.

The settings are *Disabled* or *Enabled.* The Optimal and Fail-Safe default settings are *N/A.*

Cont'd

Offboard PCI/ISA IDE Card This option specifies if an offboard IDE controller adapter card, installed in either an ISA expansion slot or a PCI expansion slot in the computer, will be used. If an offboard PCI IDE controller is used, the onboard IDE controller on the motherboard is automatically disabled. The settings are *Absent, PCI/PnP, ISA/EISA, PCI,* or *ISA.* The Optimal and Fail-Safe default settings are *Absent.* This option forces IRQ 14 and 15 to a PCI slot on the PCI local bus to support non-compliant PCI IDE adapter cards.

Offboard Primary/Secondary This option specifies the IDE channel that is used on the onboard IDE controller. The settings are:

Setting	Description
Disabled	The onboard IDE controller is not used.
Primary	The primary channel on the onboard IDE controller is used.
Secondary	The secondary channel on the onboard IDE controller is used.
Both	Both the primary and secondary channels on the onboard IDE controller is used.

The Optimal and Fail-Safe default settings are Disabled.

Offboard PCI IDE Primary IRQ
Offboard PCI IDE Secondary IRQ These options specify the PCI interrupt used by the primary and secondary IDE channels on the offboard PCI IDE controller. The settings are *Disabled, Hardwired, INTA, INTB, INTC,* or *INTD.* The Optimal and Fail-Safe default settings are *N/A.*

Serial Port1 IRQ This option specifies the IRQ used for serial port1. The settings are *IRQ3, IRQ4* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Cont'd

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

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 IRQ This option specifies the IRQ used for serial port1. The settings are *IRQ3, IRQ4,* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

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

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 IRQ This option specifies the IRQ used for serial port1. The settings are *IRQ5, IRQ7,* or *Disabled.* The Optimal and Fail-Safe default settings are *IRQ7.*

Parallel Port Address This option specifies the base I/O port address for the parallel port. The settings are *378h, 278h,* or *Disabled.* The Optimal default setting is *378h.* The Fail-Safe default setting is *N/A.*

Cont'd

Parallel Port Mode This option specifies the parallel port mode. ECP and EPP are both bidirectional data transfer modes that adhere to the IEEE P1284 specifications. The settings are:

Setting	Description
Normal	The standard AT-compatible 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.

The Optimal default setting is *Normal*. The Fail-Safe default setting is *N/Al.*

Parallel Port DMA Channel This option is only available if the setting for the **Parallel Port Mode** option is *Extended* or *ECP*. This option sets the DMA channel used by the parallel port. The settings are *DMA Ch 1* or *DMA Ch 3*. The Optimal and Fail-Safe default settings are *N/A.*

Section 2 Security

Three icons appear in this part of the WINBIOS Setup screen:

- Supervisor (Password),
- User (Password), and
- Anti-Virus.

Two Levels of Passwords Both the Supervisor and the User icons configure password support. If you use both, 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 WINBIOS Setup is executed, using either or both the Supervisor password or User password.

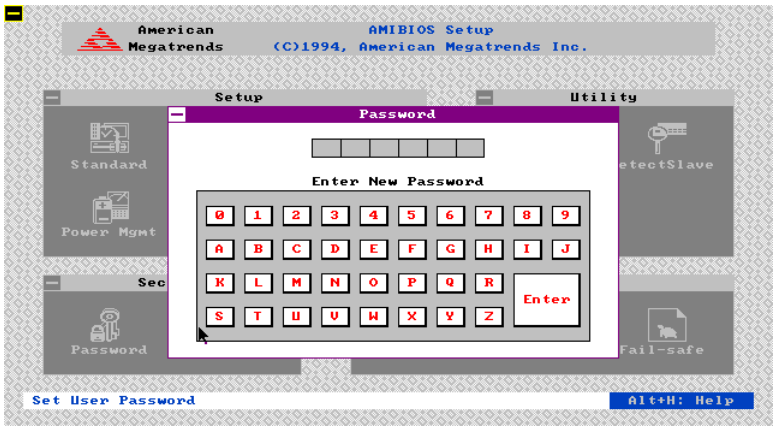
AMIBIOS Password Support

The Supervisor and User icons activate two different levels of password security. If

WINBIOS Setup has an optional password feature. The system 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 *Supervisor* or *User* 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>. The password is stored in NVRAM after WINBIOS completes. The next time the system boots, a password prompt appears if the password function is present and enabled.

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).

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 13 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.

Color Set Color Set sets the Setup screen colors.

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 Flash ROM

All versions of the Titan III PCI EISA motherboard use 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. The end user can actually reprogram the BIOS, using a ROM file supplied by American Megatrends.

Programming the Flash EPROM

Step	Action
1	Turn power off. Make sure the computer has a working speaker.
2	Insert the floppy disk with the S729P.ROM file in drive A:.
3	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.
4	When the flash ROM has successfully been programmed, the computer will reboot.

Boot Block BIOS Actions When you reprogram from system boot, the boot block BIOS code:

Reads S729P.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.

Cont'd

S729P.ROM S729P.ROM resides on a floppy disk and contains the updated main BIOS code. American Megatrends will provide this file when the AMIBIOS for the Titan III PCI EISA motherboard must be updated.

S729P.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 S729P.ROM.

Sequence of Operation The sequence of operation and expected behavior of the boot block 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 S729P.ROM on the floppy disk.	S729P.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	Boot Block 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 Boot Block 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 boot block BIOS and pass control to the boot block 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 table. 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 Specifications

Item	Description
CPU	Intel Pentium 90, 100, 120, 133, 150, 166 MHz or higher speed CPU
Expansion slots	Three EISA/ISA expansion slots Four PCI expansion slots One EISA/PCI shared slot
L1 internal cache memory	The Intel Pentium has 8 KB data cache and 8 KB instruction cache.
L2 secondary cache memory	512 KB Pipelined Burst Mode L2 secondary cache memory
Cache memory /system memory	The 512 KB of cache memory can cache up to 256 MB of system memory
Type of SRAM	Secondary cache memory supported through pipelined burst cache (100-pin PQFP).
System memory	Fast Page Mode or Extended Data Out (EDO) SIMMs operating at 60 ns.
Max. system memory	256 MB
Fast ATA	Supports the Fast ATA specification using PIO mode 4 and multiword DMA mode 2.
System BIOS	This motherboard has a 128 KB AMIBIOS system BIOS located on a Flash EEPROM with built-in WINBIOS Setup.
BIOS shadowing	The system BIOS is always copied from ROM to RAM for faster execution. The end user can shadow 16 KB ROM segments from C000h – DCFFFh.
AMIBIOS features	IDE block mode support, IDE 32-bit data transfer support, IDE Programmed I/O mode 0, 1, 2, 3, and 4 support, IDE LBA mode support, APM (Advanced Power Management) and Flash BIOS hooks, EPA Green PC-compliant, PCI and Plug and Play (PnP) support, and DIM (Device Initialization Manager) support, DMI (Desktop Management Interface) support, ATAPI support, can boot from a CD-ROM drive, automatically detects system memory, cache memory, and IDE drive parameters, Fast ATA IDE mode programming, Boot sector virus protection, instant-on support, automatically configures PnP and PCI devices.
IDE	Provides two 40-pin IDE connectors onboard that support up to four IDE drives.
Floppy	Onboard support for up to two 360 KB, 720 KB, 1.2 MB, 1.44 MB, or 2.88 MB floppy drives.
Parallel port	Onboard parallel port connector.
Serial ports	Two onboard serial port connectors.
Keyboard	Includes a standard DIN keyboard connectors.
Mouse	Includes a 10-pin berg mouse connector.
Power supply	Includes three power supply connectors.

Item	Description
Real time clock/ CMOS RAM	A real time clock and 128 bytes of CMOS RAM with a battery backup is provided on the motherboard. Also includes battery-backed 8 KB x 8 SRAM for EISA configuration data.
Power management	Power management services include: automatic IDE and video power down, monitor blanking, SMI (System Management Interrupt) support, APM, and system stop clock.
Speaker	Standard four-pin speaker connection.
Temperature Monitor	A buzzer sounds when the ambient temperature inside the computer case goes above or below the standard operating range.
Watchdog Timer	This timer monitors for a system lock up condition. It automatically resets the system at lock up.