American Megatrends, Inc.

Titan-II PCI

Pentium™ EISA Motherboard

User's Guide

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Revision History

1/6/95   Initial release.

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Preface

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 404-246-8645.

Acknowledgments

This manual was written by Sudhakaran Valappil and Julia McDonald.

1 System Overview

The American Megatrends Titan-II motherboard has:

- Single or Dual Intel® P54C Pentium™ 3.3 Volt CPU
  operating at 90, 120, or 150 MHz internally,
- six EISA expansion slots, and
- four PCI expansion slots.

The motherboard conforms to the PCI Version 2.0 specification and uses the PCI local bus. The PCI slots operate synchronously with the CPU clock. The following table illustrates the frequency assignments:

CPU External Clock Frequency	PCI Expansion Slots Frequency
66 MHz	33 MHz
60 MHz	30 MHz
50 MHz	25 MHz

The frequency will vary according to the version of the motherboard ordered.

The PCI expansion slots are automatically configured by the onboard American Megatrends WINBIOS system BIOS.

Motherboard Dimensions

The Titan-II PCI Pentium EISA motherboard is approximately 12.1 inches wide by 13.8 inches long (the standard full AT® motherboard size with similar mounting hole locations).

Processor Type and Speed

The motherboard uses a 3.3V 90, 120, or 150 MHz (internal speed) Intel P54C or P54CT Pentium CPU operating externally at 50, 60, or 66 MHz in the single processor mode. There are two CPU sockets on the motherboard to support dual processors.

Description

Heat Sink with Fan

A heat sink with fan must be used with all Intel Pentium CPUs on all Pentium motherboards.

Main System Memory

The motherboard requires Fast Page Mode SIMMs operating at 70 ns (RAS access time). The motherboard supports up to 256 MB of onboard system memory via four 64-bit banks with the following types of SIMMs (Single Inline Memory Modules). Either two, four, six or eight SIMMs must be mounted.

SIMM Type
256 KB x 36 SIMMs
512 KB x 36 SIMMs
1 MB x 36 SIMMs
2 MB x 36 SIMMs
4 MB x 36 SIMMs
8 MB x 36 SIMMs
16 MB x 36 SIMMs

Fast ATA

This motherboard supports the Fast ATA specification.

L2 Secondary Cache Memory

• The motherboard supports 256 KB or 512 KB of direct
  mapped, write-back L2 external (secondary) cache
  memory.
• Thirty-two (32) pin sockets exist for 256 KB/512 KB of
  DIP L2 cache memory.
• The external (secondary) cache memory is mounted on the
  motherboard in two rows of four SRAMs each.
• For 256 KB cache with a 60/90 MHz CPU, the SRAM is
  15 ns 32 KB x 8 3.3V SRAMs.
• For upgrading to 512 KB the 32 KB x 8 3.3V SRAMs
  should be replaced by 64 KB x 8 15 ns 3.3V SRAMs in
  the same sockets.
• For a 66/100 MHz CPU, 12 ns SRAMs should be used.

> ### *Caution*
>
> *You must use 3.3V SRAMs when upgrading from*
> *256 KB to 512 KB of L2 cache memory.*

Shadowed ROM areas such as the system BIOS and Video BIOS can be cached and write-protected via Advanced
Setup. Cache memory is enabled and disabled through WINBIOS Setup Advanced Setup.

Amount of System Memory That Can be Cached

All installed system memory can be read from or written to L1 internal cache memory and L2 external cache memory.

Hardware Reset Switch

The Titan-II PCI Pentium EISA motherboard has a standard two-pin reset connector.

Pentium Internal Cache Memory

The Intel Pentium has an 8 KB data cache and an 8 KB code cache. This cache memory can be placed in either write-
back or write-through mode via Advanced Setup in WINBIOS Setup.

Shadow RAM

The system BIOS ROM is always shadowed. Video BIOS and Adaptor ROM shadowing can be enabled via Advanced Setup in 16 KB increments.

System BIOS

The Titan-II PCI Pentium EISA motherboard has a 128 KB WINBIOS with built-in WINBIOS Setup and user-definable hard disk drive types. The BIOS is stored in Flash EPROMs and can be reprogrammed via software without removing the ROM.

CMOS RAM

The Titan-II PCI Pentium EISA motherboard has 114 bytes of CMOS RAM on the Real Time Clock. The contents of CMOS RAM are configured by AMIBIOS Setup, resident with the system BIOS on the Flash EPROM. There is also an additional 8 KB of EISA Extended CMOS RAM.

Real Time Clock

The motherboard has a real time clock and CMOS RAM with built-in battery backup for WINBIOS Setup.

Onboard I/O

• two 40-pin IDE connectors for up to four IDE drives, with PCI local bus IDE Mode 3 support,
• a 34-pin connector to a floppy controller that supports up to two 720 KB, 1.2 MB, 1.44 MB, or 2.88 MB floppy drives with vertical recording support for 2.88 MB floppies,
• two ten-pin connectors for serial ports,
• a 26-pin connector for one bidirectional parallel port (with ECP and EPP support) on the motherboard, and
• a 10-pin berg for a PS/2 mouse connector.

Up to Four IDE Drives

The motherboard supports up to four IDE drives through two 40-pin IDE connectors, marked *Primary* and *Secondary.*

IDE Drive Assignments

If four IDE drives are connected, WINBIOS assigns the physical drive numbers; DOS assigns the logical drive letters as follows:

IDE Drive	Drive Number	Drive Letter if One Partition on Drive	Drive Letter if Two Partitions on Drive
Primary Master	80h	C:\	G:\
Primary Slave	81h	D:\	H:\
Secondary Master	82h	E:\	I:\
Secondary Slave	83h	F:\	J:\

IDE Autodetect

All IDE drives assigned to the secondary IDE connector are autodetected.

> ***Caution***
>
> *If the parameters for an IDE drive cannot be automatically detected by WINBIOS correctly, or if you are using a CHS (Cylinder-Head-Sector) translation mechanism that is different than the native mode of the IDE drive, the drive should not be attached to the secondary IDE controller.*

Power Management

The motherboard supports power management services, including: Green PC LED, signals to control Green PC-aware power supplies, automatic power down of IDE drives and video monitor and monitor blanking (HSYNC, VSYNC, and SYNCEN). The EPA Green PC specification is supported through the Megakey keyboard controller. The SMI (System Management Interrupt), APM, and system stop clock are supported.

Seven DMA Channels

There are seven DMA channels.

Timer Features

The motherboard has three programmable 16-bit counter/timers.

Refresh Generation

The Titan-II PCI Pentium EISA motherboard has a refresh generation feature.

I/O Capability

The motherboard accesses 32-, 16- or 8-bit I/O devices on the EISA bus and 32-bit devices on the PCI bus.

Green PC Monitor Connector

A 10-Pin dual-in-line connector for Green PC monitor support through the feature connector.

Fifteen Interrupt Levels

There are 15 hardware interrupt levels. The NMI takes precedence over all hardware interrupts. IRQs 3, 4, 5, 7, 9, 10, 11, 12, 14, and 15 can be allocated for use on either the ISA bus or the PCI bus.

EISA Bus

The EISA bus in the motherboard has a system clock that is generated by the bus clock (BCLK) and operates at approximately 8 MHz.

EISA and PCI Expansion Slots

The Titan-II PCI Pentium EISA motherboard has the following EISA and PCI expansion slots:

- four PCI expansion slots, and
- six EISA expansion slots for EISA/ISA adapter cards.

All PCI expansion slots are bus mastering. All 6 EISA slots are bus mastering. The PCI expansion slots are automatically configured by the onboard American Megatrends WINBIOS system BIOS.

PS/2 Mouse

A 10-pin berg header that can be attached via a customized serial cable to a PS/2-type mouse. Contact American Megatrends for cable and adapter information.

Speaker

A standard four-pin speaker connector.

I/O Address Space

I/O addresses 0100h through 03FFh are available on the ISA bus. If enabled, onboard peripheral devices use the standard AT I/O port address ranges.
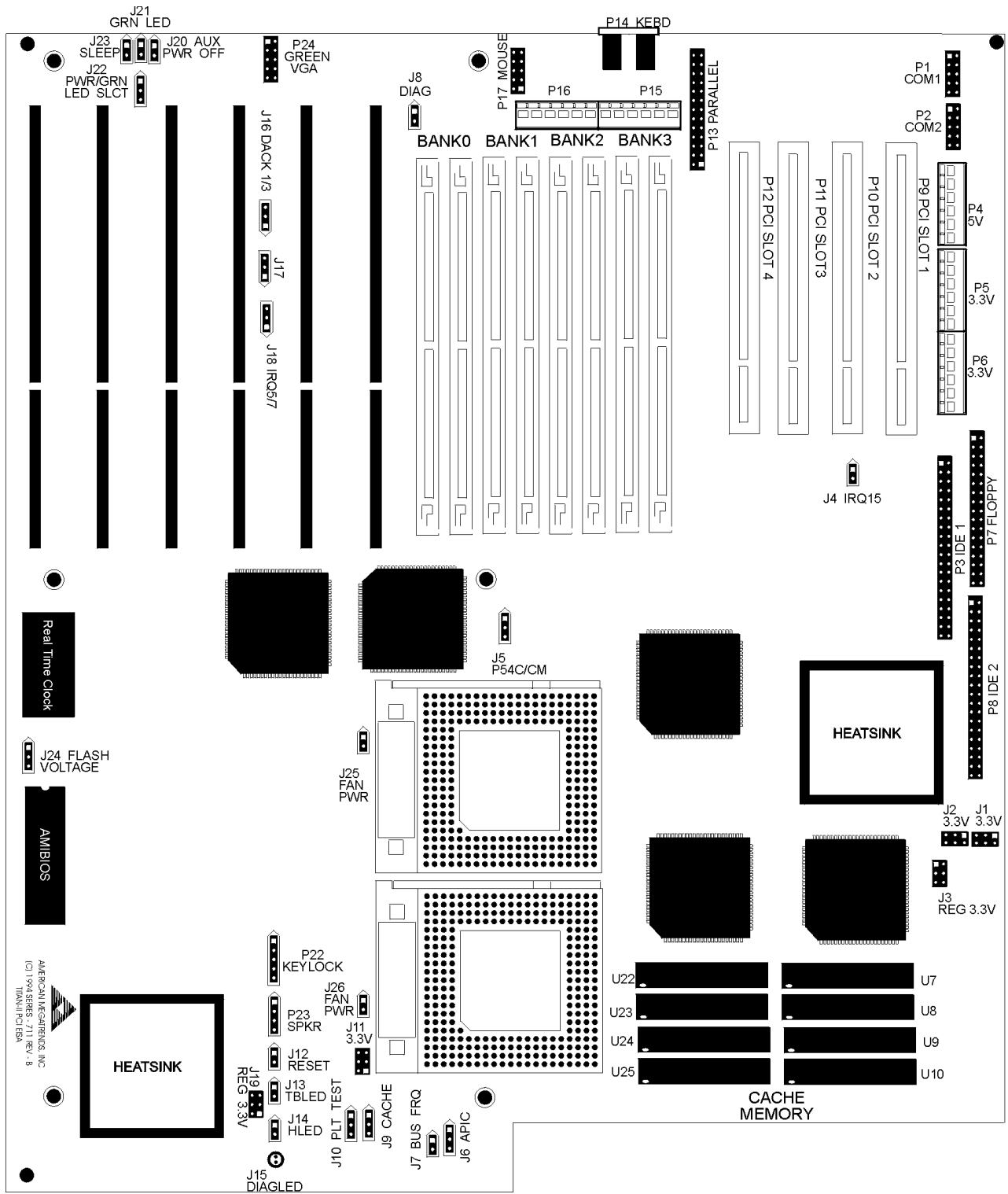
Keyboard

The motherboard uses a five-pin circular DIN connector and has a five-pin keyboard lock connector to prevent unauthorized access.

Chapter 1 System Overview

2   Installation

Unpacking the Motherboard

Step	Action
1	Inspect the cardboard carton for obvious damage. If damaged, call American Megatrends Technical Support at 404-246-8645. 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. 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, sandwiched between sheets of sponge. Remove the sponge and remove the anti-static bag.
4	Place the motherboard on a grounded anti-static surface component side up.
5	Save the original packing material in case of reshipment.
6	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.
7	If the motherboard is undamaged, it is ready to be installed.

J21
GRN LED

J23
SLEEP

J20 AUX
PWR OFF

J22
PWR/GRN
LED SLCT

P24
GREEN
VGA

J8
DIAG

P14 KBRD

P17 MOUSE

P16

P15

P13 PARALLEL

P1
COM1

P2
COM2

J16 DACK 1/3

J17

J18 IRQ5/7

BANK0 BANK1 BANK2 BANK3

P12 PCI SLOT 4

P11 PCI SLOT3

P10 PCI SLOT 2

P9 PCI SLOT 1

P4
5V

P5
3.3V

P6
3.3V

Real Time Clock

J24 FLASH
VOLTAGE

AMIBIOS

J5
P54C/CM

J25
FAN
PWR

J4 IRQ15

P3 IDE 1

P7 FLOPPY

HEATSINK

P8 IDE 2

J2   J1
3.3V 3.3V

J3
REG 3.3V

U22   U7

U23   U8

U24   U9

U25   U10

CACHE
MEMORY

P22
KEYLOCK

J26
FAN
PWR

J11
3.3V

J12
RESET

J13
TBLED

J14
HLED

J19
REG 3.3V

HEATSINK

J10 PLT TEST

J9 CACHE

J7 BUS FRQ

J6 APIC

J15
DIAGLED

AMERICAN MEGATRENDS, INC
(C) 1994 SERIES - 711 REV.- B
TITAN-III PCI EISA

Step 1

Set all user-configurable jumpers and switches, and then install upgrade processors before installing the motherboard in the chassis. The jumpers are:

Jumpers	Description
J27	Set IRQ12
J23	Clear password
J28, J29	Set bus frequency
J9	Cache Memory Configuration
J18	Parallel Port IRQ Select
J16 and J17	Extended Parallel Port DMA Select
J1, J2, J3, J11, J19	3.3V Power Supply Configuration
J7	CPU Internal Clock and External Clock Ratio
J5	P54C/CM CPU Type Select
P24	Green PC Monitor Connector
J20	Green PC Power Switch Connector
J24	Flash BIOS Programming Voltage
J22	Password LED Select
J21	Password LED
J23	Power Save Switch
J6	APIC (Advanced Programmable Interrupt Controller) Configuration
J10	PLL Test Mode

J9 Cache Memory Configuration

J9 is a three-pin berg that controls the L2 secondary cache memory configuration on the motherboard.

Cache Memory	J9
256 KB	Short Pins 1-2
512 KB	Short Pins 2-3

J27 IRQ12

J27 is a two-pin berg that selects IRQ12 for use by the onboard PS/2 mouse. When an onboard PS/2 mouse is used in the computer, J27 should be shorted. Leave J27 OPEN is no PS/2 mouse is used.

J27 Setting	IRQ12 Select
Shorted	PS/2 mouse is present.
OPEN	PS/2 mouse is absent.

J23 Clear Password

The J8 DIAG switch is not used to clear CMOS RAM in Rev C Titan II motherboards. On Rev.B and B1 Titan II motherboards, J8 was used to clear CMOS RAM. On Rev C motherboards, use the J23 Sleep switch to erase CMOS RAM, which erases the password. To erase a password:

Step	Action
1	Turn the computer power off and install a shorting bridge on J23 (Sleep Switch).
2	Turn the computer power on again. Wait until `CMOS Checksum Bad.` appears.
3	Turn power off. Remove the shorting bridge from J23 (leave J23 OPEN again).
4	Turn power on again. Run WINBIOS Setup and choose the proper system configuration settings.
5	Boot the computer.

Chapter 2 Installation

J28 and J29 Bus Frequency Select

The Titan-II EISA motherboard supports Intel CPUs that operate at voltage levels between 3.135 and 3.6V.

J28 and J29 are two-pin jumpers that support the 150 MHz P54C CPU. These jumpers should be shorted when a 150 MHz P54C CPU is installed. Short J29 when a 150 MHz P54C CPU is installed in U35. Short J28 when a 150 MHz P54C CPU is installed in U34. Also, J7 should be shorted when a 150 MHz P54C CPU is installed.

When using dual processor mode, both CPUs should be the same speed.

J28	J29	J7	Bus to Core Frequency	CPU Speed (External/ Internal)
Open	Open	Open	2:3	60/90 MHz
Open	Open	Closed	1:2	60/120 MHz
Closed	Closed	Open	1:3	60/180 MHz
Closed	Closed	Closed	2:5	60/150 MHz

J10 PLL Test Mode

J10 is a three-pin berg that enables the PLL test mode during In-Circuit Testing.

PLL Test Mode	J10
PLL Test Mode	Short Pins 1-2
Normal Operating Mode	Short Pins 2-3

J18 Parallel Port IRQ Select

J18 is a three-pin single-inline berg. Short pins 2-3 to select IRQ5 for the parallel port. Short pins 1-2 (the default) to select IRQ7 for the parallel port. If IRQ5 is selected, change IRQ5 in the WINBIOS Advanced Setup to *ISA*.

Step 1 Set Jumpers, Continued

J16 and J17 Extended Parallel Port DMA Select

J16 and J17 are three-pin single-inline bergs that select the EPP (Enhanced Parallel Port) DMA channels, shown below.

DMA Channel	J16	J17
DRQ1	Short Pins 1-2	Short Pins 1-2
DRQ3	Short Pins 2-3	Short Pins 2-3.
None (the factory setting)	OPEN	OPEN

J7 Set CPU Speed

J7 is a two-pin berg. Leave J7 OPEN if the CPU operates at 60 Mhz externally and 90, 120, or 150 MHz internally or 66 MHz externally and 100 MHz internally or 50 MHz externally and 75 MHz internally. Place a shorting bridge on J7 if the CPU operates at 50 MHz externally and 100 MHz internally.

> *Caution*
>
> *Place a shorting bridge on J7 only to select a CPU operating at 100 MHz internally and 50 MHz externally.*

J1, J2, J3, J11, and J19 3.3V Power Source Enable

These are six-pin bergs that enable a 3.3V power supply. The Titan-II PCI EISA motherboard is equipped with a 3.3V regulator that is installed for 3.3V CPUs. *Unless you need to provide 3.3V to the PCI bus, or if you are using a PCI card that requires it, you do not need to use an external 3.3V power supply.* The factory setting assumes that a 3.3V regulator is already installed on the motherboard. The factory setting is:

Jumper or Connector	Setting
J1	OPEN
J2	OPEN
J3	Short Pins 1-2, Short Pins 3-4, and Short Pins 5-6
J11	OPEN
J19	Short Pins 1-2, Short Pins 3-4, and Short Pins 5-6
P5	OPEN
P6	OPEN

Using an External 3.3V Power Supply

Set the jumpers and connectors as follows if using a 3.3V power supply:

Jumper or Connector	Setting
J1	Short Pins 1-2, Short Pins 3-4, and Short Pins 5-6
J2	Short Pins 1-2, Short Pins 3-4, and Short Pins 5-6
J3	OPEN
J11	Short Pins 1-2, Short Pins 3-4, and Short Pins 5-6
J19	OPEN
P5	Connect to the 3.3V power connector from the power supply.
P6	Connect to the 3.3V power connector from the power supply.

J6 APIC Configuration

J6 is a three-pin jumper that enables or disables the local APIC. In dual processor mode, APIC should be enabled.

J6 Setting	Description
Short Pins 1-2	Enable APIC (Dual Processor Installed).
Short Pins 2-3	Disable APIC (Single Processor Installed).

J20 Green PC Power

J20 is a two-pin berg that attaches to the Green PC power switch. This switch can be used to turn power off during Green PC mode. Pin 1 denotes the positive connector.

P24 Green PC Monitor Connector

Attach a 10-wire 10 to 26-pin flat cable between P24 on the motherboard and the VGA Feature Connector on the VGA adapter card or Graphics Accelerator.

Monitors that support the Display Power Management Specification (DPMS) can turn power off after examining this condition, saving power.

J5 P54C/CM CPU Type Select

Pins 2-3 should always be shorted.

J24 Flash Programming Voltage

Pins 2-3 of this jumper should always be shorted to provide +12V to the Flash BIOS for reprogramming.

J22 Password LED Select

This three-pin berg is used to select the LED, which will toggle when the system is waiting for the Password

J22 Setting	Description
Short Pins 1-2	Power LED is the Password LED.
Short Pins 2-3	Separate LED through J21.

J21 Password LED

This two-pin berg is used to connect the Password LED which is selected through J22.

J23 Power Save Switch

This two-pin berg connects a push/release switch. The system enters the Power Save mode immediately when this switch is pressed.

Supported CPU Speeds and Intel CPU Models

Board Rev Level	90 MHz	120 MHz	150 MHz
B	SX968	No	No
C	SX968	SK110 SY033	No
D	SX968	SK110 SY033	SY015
E	SX968	SK110 SY033	SY015

Step 2 Install Memory

The main memory subsystem on the Titan-II PCI EISA motherboard consists of four 64-bit memory banks. All banks house SIMM (Single Inline Memory Module) DRAM packages. You can use 256 KB x 36, 512 KB x 36, 1 MB x 36, 2 MB x 36, 4 MB x 36, 8 MB x 36, or 16 MB x 36 SIMMs. The SIMMs can be single-sided or double-sided.

The Titan-II PCI Pentium EISA motherboard uses fast page mode SIMMs operating at 70 ns (RAS access time).

Motherboard Memory Configurations

System memory must be populated two modules at a time. *Both of the modules in a memory bank must be the same type of SIMM.*

Installing SIMMs

The two banks of system memory have two sockets each. Use only one type of SIMM for each memory bank.

Place the motherboard on an anti-static mat. With the component side of the SIMM facing you, firmly push the card into the socket at a 45 degree angle, then push it up to a vertical position. When properly inserted, the SIMM clicks into place as the latching pins engage. See the following figure.
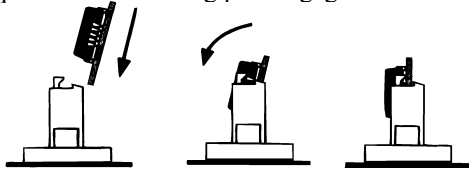
Reporting Memory

The system memory configuration is reported by WINBIOS as it boots and again when the WINBIOS System Configuration Screen is displayed just before DOS boots.

Step 3 Install CPU

In most cases, the CPU is already installed in the motherboard. Follow the procedures in this step to install the CPU if it is not present, to replace a defective CPU, or to add a second CPU.

> **_Warning_**
> _Improper CPU installation can damage the CPU and the motherboard._
> _You must follow the procedures in this section exactly as documented._

The ZIF (zero insertion force) CPU sockets are marked Socket 5, as shown on the drawing on page 10.

Step	Action
1	If installing a different CPU, remove the old CPU by lifting the lever on the ZIF socket and then extracting the CPU.
2	Pin 1 of the socket has a white diagonal line across one corner on the motherboard, which corresponds to pin 1 of the CPU. 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. The CPU should slide into the socket easily. Do not use force to push it down.
3	Complete installation by lifting the ZIF lever to the other side of the socket.

Repeat steps 2 and 3 when installing the second CPU. Make sure jumpers J5 and J6 are set correctly.

Upgrading to a Dual Processor System

When upgrading to a dual processing system, it is possible that the 2 steppings of the P54C CPU may not match due to availability or current shipping stepping. If you must mix steppings of the Pentium processor in a dual processing system, the following guidelines must be met:

- The processors must be set to run at the same frequencies and the same bus/core fractions.
- Pins 2-3 of J5 must be shorted.
- If using B1, B3, B5, or C1 as Primary,
- use the following as Dual: B1 (CM Package), B3 (CM Package), B5, and C1

> **_Before Upgrading_**
> _There are different versions of the CPU available in_
> _the same stepping which have different voltage_
> _requirements. For this reason,_
> _call American Megatrends Technical Support before_
> _you purchase or install a P54C CPU to upgrade_
> _to a dual processing system._

Step 4 Install the Motherboard

The mounting hole pattern on the Titan-II PCI Pentium EISA motherboard is the same as the mounting hole pattern on a standard AT motherboard. Standoffs and mounting screws are not supplied with the motherboard. The standard 12 slot chassis should be used. The following table describes the installation.

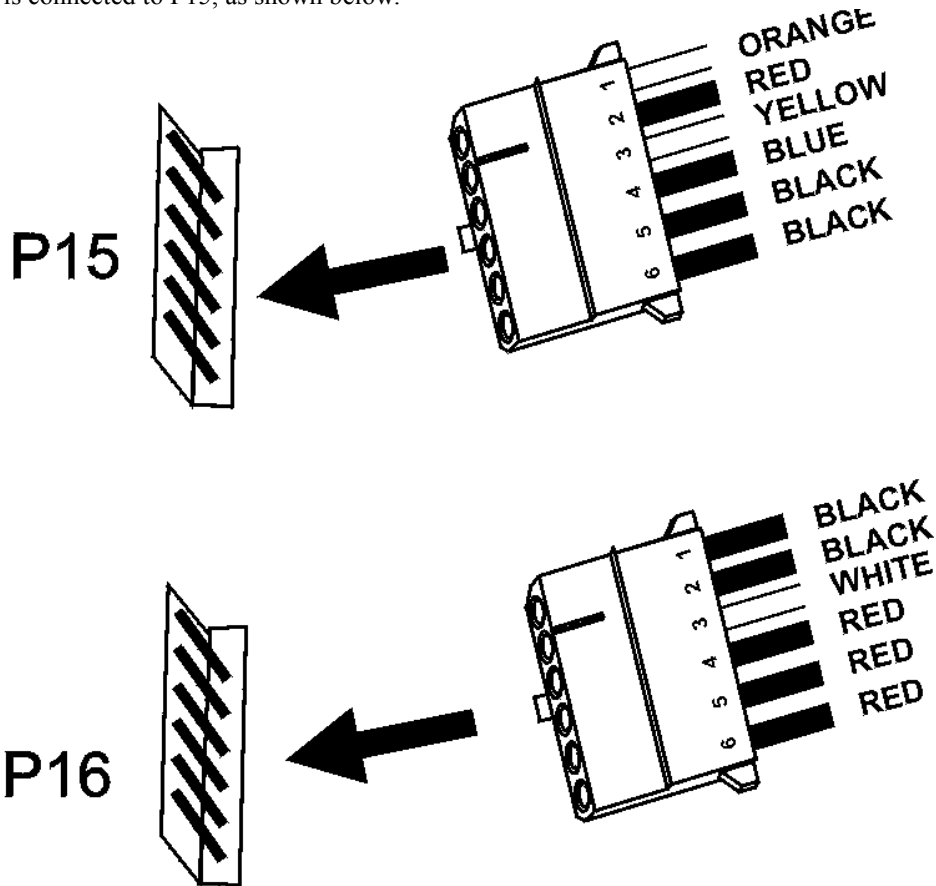| Step	Action
1	Place the chassis for the motherboard on an anti-static mat. Connect the chassis to ground to avoid static damage during installation. Connect an alligator clip with a wire lead to any unpainted part of the chassis. Ground the other end of the lead at the same point as the mat and the wristband.
2	Rotate the chassis so that 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	Push four nylon standoffs from the solder side of the motherboard in the holes provided for them. The standoffs lock in place. Find the slots provided for the standoffs on the chassis. Hold the motherboard, component-side up, with the edge with the standoffs toward you and the edge with the power supply connector away from you. The edge connectors for the adapter cards should be to the left.
4	Carefully slide the motherboard into the chassis. Make certain that the standoffs fit the slots provided for them. If the standoffs are properly locked, the motherboard should not slide. It should also rest level with the chassis. The far edge should fit the slots in the plastic clips.
5	Place the two mounting screws in the holes provided for them 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 graphic on page 10.

> *Caution*
>
> *Adequate air flow in the chassis must be provided when using dual processors. Installation of an 8 cm 0.2 amp fan at the front of the chassis is recommended to pull air in. This is in addition to the fan at the back of the case which pulls air out.*

Step 5 Connect the Power Supply

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. Use at least a 230 watt power supply, which should have built-in filters to suppress radiated emissions.

Connect to P15 and P16

Attach the power supply cables to P15 and P16 on the motherboard. AT-compatible power supplies have two 6-pin connectors. The 6-pin connector with 3 red wires and 2 black wires is connected to P16 and the remaining 6-pin connector is connected to P15, as shown below.
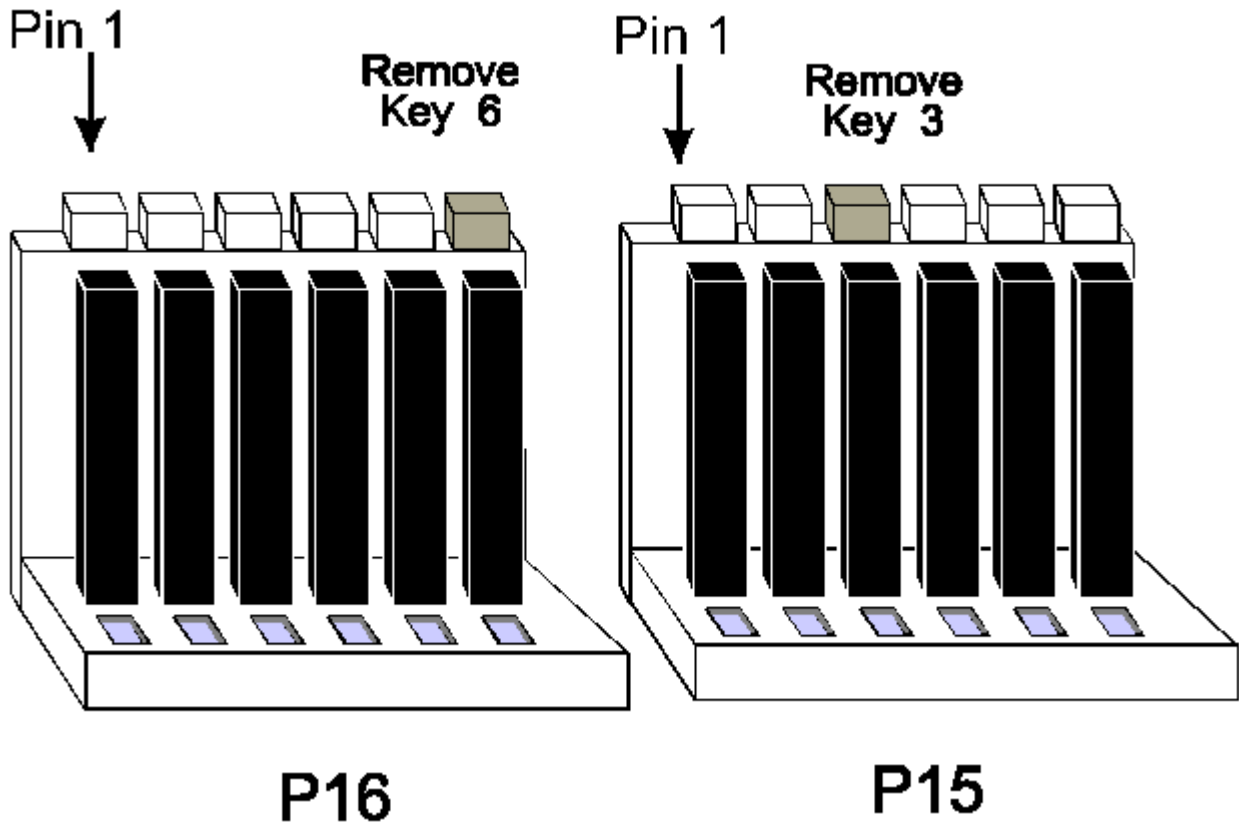

> ***Important***
>
> *Do not use the P5 and P6 power connectors.*
> *P5 and P6 can only be used with 3.3V power supplies.*
> *P4 is an additional auxiliary 5V power connector.*
> *Some power supplies, 400 watts or greater,*
> *provide this connector.*

Power Supply Connectors are Keyed

The power connectors are keyed. The connector keys must be cut to fit some power supplies, as shown below.
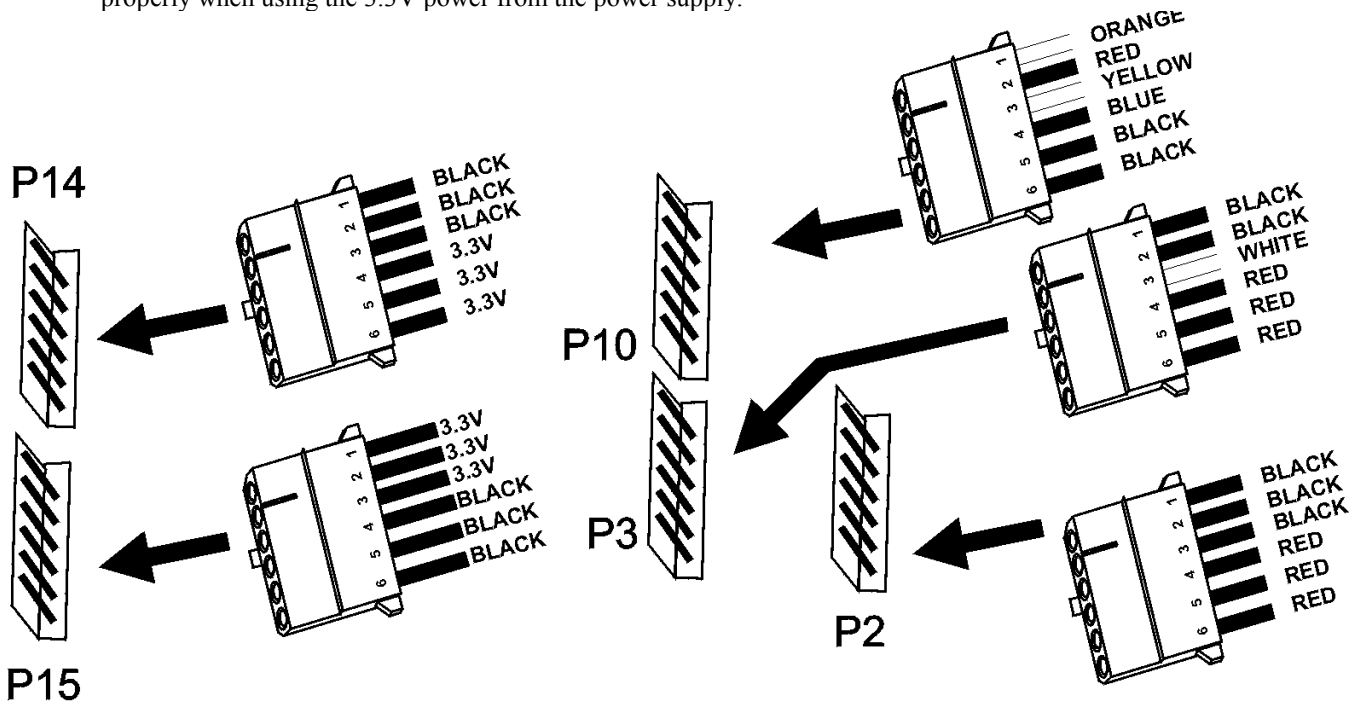

> ***Important***
>
> *Make sure that jumpers J1, J2, J3, J11 and J19*
> *are configured correctly when you use the 3.3V*
> *power connectors.*

3.3 V Power Supply Connector

The 3.3V connectors for the power supply are shown below. Make sure jumpers J1, J2, J3, J11, and J19 are set properly when using the 3.3V power from the power supply.

Excalibur PCI EISA motherboard
Power Supply
Connectors

Caution

On the 66/100 MHz motherboard, the regulator has to be used and the 3.3V power connector from the power supply should not be used.

Step 6 Connect the Keyboard Cable

The keyboard connector is a 5-pin DIN socket labeled KEYBD and P14 on the motherboard. Attach a standard AT-compatible keyboard cable. A 5-pin DIN to 6-pin miniDIN converter is needed to connect a PS/2-type keyboard.

Step 7 Connect Cables

When connecting chassis connectors to the motherboard, make sure to connect the correct connector end. Most connector wires are color-coded. Match the color of the wires leaving the switch or LED to the same pin on the connector end. There may be more than one connector with the same color-coded wires. If so, follow the wire to the switch or LED.

Pin 1 of all connectors is labeled on the motherboard to identify the pin orientation when plugging in cables.

The following cables should be connected to the motherboard:

• Reset Switch cable to J12,
• Speaker cable to P23,
• Keyboard Lock cable to P22,
• Turbo LED cable to J13,
• IDE Activity Indicator LED cable to J14.

J12 Reset Switch Connector

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.

P23 Speaker Connector

A four-pin single-inline berg that is attached via a cable to the system speaker. WINBIOS signals hardware problems through the speaker.

P22 Keyboard Lock Connector

A five-pin single-inline berg that is attached via a cable to the keyboard lock connector. The keyboard lock allows the user to lock the keyboard, protecting the system from unauthorized use.

J13 Turbo LED Connector

A two-pin berg that is attached via a cable to the turbo LED. This LED lights when the motherboard is running in turbo mode (the default setting).

J14 IDE Activity Indicator LED

A two-pin berg that is attached via a cable to the externally-mounted IDE Activity LED. This LED lights whenever the primary or secondary IDE drive is accessed.

Step 8 Connect the Mouse Cable

The mouse connector (P17) is a ten-pin dual-inline berg. Attach a customized mouse cable from the mouse connector to a standard DB9 port connector mounted externally on the chassis for the mouse. You can order this cable from the American Megatrends Sales Department (800-828-9264). Ask for **Cable Assembly DB9, Male, 10-Pin,** part number **CBLSUB1-10.** Cut Pin 10 on P17.

Step 9 Connect Onboard I/O

Onboard Adapters

The motherboard has two serial ports (P1 and P2), a parallel port (P13) onboard, and has IDE and floppy controllers. The serial and parallel port connectors are described below. The IDE connectors are described on page 27. The floppy connector is described on page 26.

P2 Serial Port 2 (COM2) and P1 Serial Port 1 (COM1)

P2 and P1 are 10-pin dual-inline bergs that connect via 10-pin double-row ribbons to male 9-pin D-sub connectors fastened to the chassis to provide an AT-compatible serial port interface. Be sure to properly connect the cables to the berg connectors. Pin 1 of each of the bergs is labeled "1". The wire leading to pin 1 on the cable usually has a colored stripe.

Attaching the Serial Port Cables

Two serial port cables are supplied with the motherboard to attach the serial port connectors (P2 and P1 to the external serial port DB25 or DB9 connectors on the chassis.

P13 Parallel Port

A 26-pin dual-inline berg. Use a 26-pin double-row ribbon cable to connect P13 and a female 25-pin D-sub connector on the chassis.

Step 9 Connect Onboard I/O, Continued

Attaching the Parallel Port Cable

A parallel port cable is supplied with the motherboard to connect the parallel port connector (P13) to the external parallel port connector.

Step 10 Install Floppy Drive

P7 Floppy Disk Drive Connector

A 34-pin dual-inline berg. Connect the cable from the floppy drive to P7. The onboard floppy controller cannot be used if a hard disk adapter card with floppy controller is installed. The following graphic depicts a floppy cable and the P7 34-pin floppy connector.

The motherboard supports 3½" and 5¼" floppy disk drive in low density (360 KB or 720 KB) and high density (1.2 MB, 1.44 MB, or 2.88 MB). Up to two floppy disk drives can be connected.

Attach IDE Cable to P3

P3 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 P3, as shown below.

P3 IDE Hard Disk Connector

P3 is a 40-pin dual-inline berg that connects a hard disk drive that has an IDE interface to the primary onboard IDE Controller. This motherboard supports IDE Modes 0, 1, 2, and 3, 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.

P8 Secondary IDE Controller

P8, the secondary IDE connector, is a 40-pin dual-inline berg that connects the secondary master and slave IDE drives to the secondary onboard IDE controller. Attach the secondary master and slave IDE drives to P8 via a standard 40-pin IDE cable as shown on page 27. Disable the onboard IDE interface in Peripheral Setup to use an ISA ESDI, RLL, MFM, or SCSI hard disk drive controller.

Step 12 Install Adapter Cards

The Titan-II PCI Pentium EISA motherboard provides full EISA bus mastering adapter card support and full compatibility with all IBM XT and AT-compatible adapter cards via six EISA expansion slots. The Titan-II PCI Pentium EISA motherboard also has four PCI Local Bus expansion slots, all capable of bus mastering.

NCR SCSI BIOS

The NCR SCSI BIOS for PCI SCSI Host Adapter cards is part of the Titan-II PCI Pentium EISA motherboard WINBIOS.

If a PCI SCSI Host Adapter card does not have an onboard SCSI BIOS, WINBIOS automatically provides the NCR SCSI BIOS on the PCI bus for the SCSI Host Adapter card to use.

PCI Local Bus Expansion Slots

The PCI Local Bus expansion slot sockets are distinctly different than the standard EISA/ISA expansion slot sockets. These slots obviously accept a different kind of adapter card than the standard EISA/ISA adapter cards. The slots are much more compact and smaller. PCI Slots 1, 2, 3, and 4 are all master slots.

EISA Adapter Cards

The EISA adapter cards have different fingers on the edge connecters than ISA adapter cards. The EISA expansion slots have two rows of contacts, one below the other. An ISA (AT-compatible) Adapter Card can be inserted in the EISA connector only far enough to make contact with the upper row of contacts. The longer fingers on EISA adapter cards allow contact with the second row of contacts. See the following graphic.

When installing EISA adapter cards, make sure that they snap in twice and are fully seated in the EISA expansion slot. If the card makes contact only with the upper row of contacts, it cannot function properly.

Step 13 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,
- if the upgrade processor is used, make sure it 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.

After powering up successfully, complete the following:

- Configure the System.
- Run WINBIOS Setup.
- Run the American Megatrends EISA Configuration Utility (ECU) to properly configure the system. The ECU and the !AMI7111.CFG and AMI7111.OVL. files are shipped on a floppy disk with all Titan-II PCI EISA motherboards. The *American Megatrends EISA Configuration Utility User's Guide* provides complete details about running the ECU.

3   AMIBIOS

WINBIOS Setup has a graphical user interface that permits mouse access, and is so compact that it can reside on the same ROM as the system BIOS. The system configuration parameters are set via WINBIOS Setup. Since WINBIOS Setup resides in the ROM BIOS, it is available each time the computer is turned on.

The WINBIOS Setup consists of the following option groups:

- Standard Setup
- Advanced Setup
- Chipset Setup
- Power Management Setup
- Peripheral Setup

There are two default settings for the Setup options: Optimal and Fail-Safe.

The Optimal default settings are best-case values that should optimize system performance. If CMOS RAM is corrupted, the Optimal settings are loaded automatically.

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.

Standard Setup Options

Date, Day, and Time Configuration

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

Primary Master
Primary Slave

Select one of these hard disk drive icons to configure the drive named in the option. WINBIOS supports up to four IDE hard disk drives: the primary master, primary slave, secondary master, and secondary slave. If the hard disk drive is an IDE drive, select **Detect Primary** or **Detect Slave** from the Utility section of the WINBIOS Setup main menu to have WINBIOS automatically detect the IDE drive parameters and report them to this screen.

Entering Drive Parameters

You can also enter the hard disk drive parameters. Hard disk type 47 is the user-definable drive type. The drive parameters are: Type, Cylinders, Heads, Write Precompensation, Landing Zone, Sectors, and Capacity.

Using Auto Detect Hard Disk (Only for IDE Drives)

If you select **Detect Primary** or **Detect Slave** from the Utility section of the WINBIOS Setup main menu, WINBIOS automatically finds all IDE hard disk drive parameters for all attached IDE drives. WINBIOS places the hard disk drive parameters that it finds in the **Primary Master** or **Primary Slave** options in Standard Setup.

Floppy Drive A:
Floppy Drive 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.*

Advanced Setup

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

Typematic Rate (Chars/Sec)

Sets the rate at which characters on the screen repeat when a key is pressed and held down. The Optimal default is *30 characters per second.* The Fail-Safe default is *Disabled.*

System Keyboard

Specifies if error messages are displayed if a keyboard is not attached. This option permits you to configure workstations with no keyboards. The Optimal and Fail-Safe default settings are *Present.*

Primary Display

Configure the type of monitor attached to the computer. The Optimal and Fail-Safe default settings are *VGA/EGA.*

Mouse Support

When *Enabled,* WINBIOS supports a PS/2-type mouse. IRQ12 will be reserved when mouse support is *Enabled.* The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

Above 1 MB Memory Test

When *Enabled,* the BIOS memory test is performed on all system memory. When this option is set to *Disabled,* the memory test is done only on the first 1 MB of system memory. The Optimal default setting is *Disabled.* The Fail-Safe default setting is *Enabled.*

Memory Test Tick Sound

Enables (turns on) or disables (turns off) the ticking sound during the memory test. The Optimal default setting is *Disabled.* The Fail-Safe default setting is *Enabled.*

Parity Error Check

Enables or disables parity error checking for system RAM. The settings are *Enabled* (all system RAM parity is checked) or *Disabled* (parity is checked only on the first 1 MB of system RAM). The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

Extended BIOS RAM Area

Specify in this option if the top 1 KB of the system programming area beginning at 639K or 0:300 in the system BIOS area in low memory will be used to store hard disk information. The Optimal and Fail-Safe default settings are *0:300.*

System Boot Up Num Lock

When *On,* this option turns off *Num Lock* when the system is powered on so the end user can use the arrow keys on both the numeric keypad and the keyboard. The Optimal and Fail-Safe default settings are *On.*

Floppy Drive Seek At Boot

When enabled, WINBIOS performs a Seek command on floppy drive A: before booting the system. The Optimal default setting is *Disabled.* The Fail-Safe default setting is *Enabled.*

Floppy Drive Swapping

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

System Boot Up Sequence

Sets the sequence of boot drives (either floppy drive A: or hard disk drive C: (primary master) that WINBIOS attempts to boot from after POST completes. The Optimal default setting is *C:,A:.* The Fail-Safe default setting is *A:,C:.*

Cache Memory

Enables or disables the internal and/or L2 secondary cache. The Optimal default setting is *Both*. The Fail-Safe default setting is *Disabled*.

Internal Cache Mode

Specifies the type of caching algorithm used for L1 internal cache memory on the CPU. The mode can be either write-back or write-thru. The Optimal default setting is *Write-back*.

Adapter Shadow Cacheable

Enables or disables the cacheability of the shadowed adapter ROM area. The Optimal default and Fail-Safe settings are *Disabled*. For video cards, follow the card manufacturer's recommendations.

System BIOS Shadow Cacheable

Enables or disables the cacheability of the system, ROM BIOS in the F0000h memory segment. This segment is always shadowed to RAM. The Optimal default and Fail-Safe settings are *Enabled*.

Password Checking

Enables the password check option every time the system boots or the end user runs Setup. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if WINBIOS is executed. The Optimal and Fail-Safe default settings are *Setup*.

Video Shadow C000,32K

When *Enabled,* the video ROM area from C0000h - C7FFFh is copied (shadowed) to RAM for faster execution. The Optimal default setting is *Enabled.* The Fail-Safe default setting is *Disabled.*

Shadow C800,16K
Shadow CC00,16K
Shadow D000,16K
Shadow D400,16K
Shadow D800,16K
Shadow DC00,16K

Enables shadowing of the contents of the ROM area named in the option title. These options are for adaptor ROM on ISA or EISA adapter cards only which should not be shadowed unless so indicated by the card manufacturer. Adaptor ROMs on all PCI adapter cards are automatically shadowed to RAM by WINBIOS. The settings are *Shadow* or *Disabled.*

ISA Card Reserved Memory Base

Supports some network adapter cards which have dual ported memory in addition to the ROM. The Optimal and Fail-Safe settings are *Disabled.*

ISA Card Reserved Memory Size

Selects the memory size for the reserved memory base. It can be used only if the ISA card reserved memory base address is selected. The available sizes are 8 KB, 16 KB, 32 KB, and 64 KB.

Operating System Supports PnP

This option can be set to yes if the operating system supports PnP. The Optimal and Default settings are *No.*

IRQ 3 through IRQ 15

These options specify the bus that the Interrupt request line in the option title can be used on. The settings are *ISA* (the IRQ can only be used on the ISA bus) or *PCI* (the IRQ can only be used on the PCI bus). The Optimal and Fail-Safe default settings are *ISA,* except for **IRQ 5, IRQ 9, IRQ10, IRQ11, and IRQ15** where the Optimal default settings are *PCI.*

Caution

If a PCI VGA adapter card is installed in the computer and this card requires a free interrupt, you must select the *PCI* setting for at least one of the above IRQ options.

If the computer does not work after system boot, press <Ins> during the boot process to load the BIOS Fail-Safe default settings.

Important

If the Advanced Setup **Mouse Support** option is set to *Enabled,* IRQ12 can only be used for the onboard PS/2 mouse and will not be available for ISA or PCI device.

To use IRQ12 on the ISA bus, set the **Mouse Support** option to *Disabled* and set the **IRQ 12** option to *ISA.*

To use IRQ12 on the PCI bus, set the **Mouse Support** option to *Disabled* and set the **IRQ 12** option to *PCI.*

```
┌─────────────────────────────────────────────────┐
│                   Important                       │
│                                                   │
│  If the primary IDE controller is enabled, IRQ 14 │
│  can only be used by the onboard primary IDE      │
│  controller. IRQ 14 will not be available for any │
│  PCI or ISA adapter card.                         │
│                                                   │
│  If IRQ 14 must be used for an ISA adapter card,  │
│  set the Onboard Primary/Secondary IDE option in  │
│  Peripheral Setup to Disabled or Secondary and    │
│  set the IRQ 14 option to ISA.                     │
│                                                   │
│  If IRQ 14 must be used for a PCI adapter card,   │
│  set the Onboard Primary/Secondary IDE option in  │
│  Peripheral Setup to Disabled or Secondary and    │
│  set the IRQ 14 option to PCI.                     │
└─────────────────────────────────────────────────┘
```

> ***Important***
>
> If the primary IDE controller is enabled, IRQ 14 can only be used by the onboard primary IDE controller. IRQ 14 will not be available for any PCI or ISA adapter card.
>
> If IRQ 14 must be used for an ISA adapter card, set the **Onboard Primary/Secondary IDE** option in Peripheral Setup to *Disabled* or *Secondary* and set the IRQ 14 option to *ISA*.
>
> If IRQ 14 must be used for a PCI adapter card, set the **Onboard Primary/Secondary IDE** option in Peripheral Setup to *Disabled* or *Secondary* and set the IRQ 14 option to *PCI*.

> ***Important***
>
> If the secondary IDE controller is enabled, IRQ 15 can only be used by the onboard secondary IDE controller. IRQ 15 will not be available for any PCI or ISA adapter card.
>
> If IRQ 15 must be used for an ISA adapter card, set the **Onboard Primary/Secondary IDE** option in Peripheral Setup to *Disabled* or *Primary* and set the IRQ 15 option to *ISA*.
>
> If IRQ 15 must be used for a PCI adapter card, set the **Onboard Primary/Secondary IDE** option in Peripheral Setup to *Disabled* or *Primary* and set the IRQ 15 option to *PCI*.

Chipset Setup

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

Base Memory Size

This option specifies the size of the base memory. The Optimal and Fail-Safe default settings for this option are *640KB.*

VGA Palette Snooping

Set to *Enabled* if the computer has an ISA adapter card that requires palette snooping. The Optimal and Fail-Safe default settings are *Disabled.*

PCI Master Latency Timer

Specifies the amount of time that a PCI master can be active in the system (in units of PCI clocks). For systems with only one PCI master, this option should be set to the maximum *240* PCI clocks.For systems with many PCI/ISA masters, this option should be set to a smaller value to make sure that all PCI devices can gain bus ownership as necessary. The Optimal and Fail-Safe default settings are *240* PCI clocks.

Memory Hole Start Address

A allows creation of a hole of 1 MB size within the 16 MB main memory. It can be placed at any 1 MB boundary, starting at the 2 MB boundary. Optimal and Fail-Safe Default settings are *Disabled.*

System Using Caching Controller

Set to *Yes* when a caching SCSI controller adapter card is used. The Optimal and Fail-Safe Default settings are *No*.

Power Management Setup

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

Advanced Power Management

Enables or disables the motherboard power management features. The Optimal and Fail-Safe default settings are *Disabled.*

Timeout Value

Specifies the length of time all monitored activities can be inactive before the system goes into suspend state.

Auxiliary Power Supply Timeout

This option can be used to control a Green PC-Capable power supply. Power supplies that support a timeout feature provide a cable with a two-pin berg header. The black wire should be ground and should be connected to pin 2 of J20.

When this option is set to enabled, the power supply can be placed in Green PC Power Savings mode when the timeout period value expires via the J20 output.

IDE Power Down

When *Enabled* to enable IDE drives that have the power down feature to power down when the system enters suspend state. The Optimal and Fail-Safe default settings are *Disabled.*

Megakey VGA Power Down

When *Enabled* if the VGA adapter card feature connector is connected to P24, the 10-pin berg on the motherboard. Monitors that support DPMS can be turned off when the timeout value expires.

DPMS VGA Power Down

Set this option to *Enabled* to enable VGA adapter cards that have the power down feature to power down when the system enters suspend state. The VGA adapter cards must support the VESA DPMS (Display Power Management Services) specification Revision 1.0. If the monitor is DPMS-compliant, it will also go to a sleep state. The Optimal and Fail-Safe default settings are *Disabled.*

IRQ 3 through IRQ 15 Break Event

These options are defined as system events. If set to *Enabled*, the system will exit the suspend mode when any interrupt activity happens in the selected IRQ. If set to *Disabled,* any IRQ activity is ignored. The IRQ1 break event is always enabled so that the system can exit the suspend mode when any key on the keyboard is pressed. The Optimal and Fail-Safe default settings are *Disabled.*

Peripheral Setup

The WINBIOS Setup options described below are selected by choosing the Peripheral Setup icon from the WINBIOS Setup main menu.

Onboard FDC

Set this option to *Enabled* to use the floppy drive controller on the motherboard. The Optimal default setting is *Enabled.*

Onboard Primary/Secondary IDE

This option specifies which IDE controller is enabled. The Optimal and Fail-Safe default settings are *Disabled.*

Primary IDE Block Mode

This option specifies the IDE drives attached to the primary IDE controller that support block mode. The Optimal and Fail-Safe default settings are *Disabled.*

Primary IDE 32-Bit Transfer

Specifies the IDE drives attached to the primary IDE controller that support 32-bit transfers. The Optimal and Fail-Safe default settings are *Disabled.*

Primary IDE LBA Mode

Specifies the IDE drive attached to the primary IDE controller that support LBA mode. The Optimal and Fail-Safe default settings are *Disabled.*

Warning
The drive is re-mapped each time this option is enabled or disabled. Existing data will be destroyed.

Primary Master Disk Mode

Specifies the IDE mode used by the master IDE drive attached to the primary IDE controller. *Selecting a mode not supported by the primary master IDE drive will cause data loss.*

Primary Slave Disk Mode

Specifies the IDE mode used by the slave IDE drive attached to the primary IDE controller. *Selecting a mode not supported by the primary slave IDE drive will cause data loss.*

Secondary IDE Block Mode

Specifies the IDE drives attached to the onboard secondary IDE controller that support block mode. The Optimal and Fail-Safe default settings are *Disabled.*

Secondary IDE 32-Bit Transfer

Specifies the IDE drives attached to the secondary IDE controller that support 32-bit transfers. The Optimal and Fail-Safe settings are *Disabled.*

Secondary IDE LBA Mode

Specifies the IDE drives attached to the onboard secondary IDE controller that support IDE LBA mode. The Optimal and Fail-Safe default settings are *Disabled.*

> *Warning*
> *The drive is re-mapped each time this option is enabled or*
> *disabled. Existing data will be destroyed.*

Secondary Master/Slave Disk Mode

Specifies the IDE mode used by the master and slave IDE drives attached to the secondary IDE controller. *Selecting a mode not supported by the secondary master IDE drive will cause data loss.* The Optimal and Fail-Safe default settings are *Disabled.*

Secondary Master Disk Installed

Set this option to *Yes* to enable WINBIOS to actively seek for the secondary master drive. The Optimal and Fail-Safe default settings are *No.*

Secondary Slave Drive Installed

Set this option to *Yes* to enable WINBIOS to actively seek for the secondary slave drive. The Optimal and Fail-Safe default settings are *No.*

PCI IDE Card Present In

Specifies the PCI expansion slot where the external IDE controller is installed. The settings are *Absent, Slot 1, Slot 2, Slot 3,* or *Slot 4.* The Optimal and Fail-Safe default settings are *Absent.* Do not set for onboard IDE.

PCI IDE IRQ Connected To

Specifies the PCI interrupt the PCI IDE IRQ is connected to. The Optimal and Fail-Safe defaults are *INTA. INTB, INTC, or INTD* can be selected if the particular PCI IDE card requires it.

Serial Port 1

Specifies the base I/O port address used for onboard serial port 1. The serial port uses eight consecutive I/O port addresses. The Optimal and Fail-Safe default settings are *Disabled.*

Serial Port 1 FIFO

Set this option to *Enabled* to enable the FIFO (First In, First Out) buffer for serial port 1. The Optimal and Fail-Safe default settings are *Disabled. The FIFO buffer should never be enabled for serial ports connected to a mouse.*

Serial Port 2

Specifies the base I/O port address used for onboard serial port 2. The serial port uses eight consecutive I/O port addresses. The Optimal and Fail-Safe default settings are *Disabled.*

Serial Port 2 FIFO

Set this option to *Enabled* to enable the FIFO (First In, First Out) buffer for serial port 2. The Optimal and Fail-Safe default settings are *Disabled. The FIFO buffer should never be enabled for serial ports connected to a mouse.* Most software which supports the FIFO buffer can control it directly and may expect this option to be *Disabled.*

Parallel Port

Specifies the I/O port address used for the onboard parallel port. The Optimal and Fail-Safe default settings are *Disabled.*

4 Flash Programming

The American Megatrends Titan-II PCI Pentium EISA motherboard uses Flash EPROM to store the system BIOS. The advantage of using a Flash EPROM is that 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 system power off.
2	Place the floppy disk that has the latest S711P.ROM BIOS file in floppy drive A:.
3	Make sure that the system has a speaker that is connected.
4	Place a two-pin shorting bridge on pins 2-3 of J24.
5	Turn system power on while pressing and holding down the <Ctrl> and <Home> keys.

The following events occur:

• the S711P.ROM is read from the root directory of the floppy disk in drive A:,
• the Flash EPROM is erased;
• the Flash EPROM is reprogrammed with the data read from the floppy disk in drive A:, and
• generates a CPU reset, rebooting the system.

The Flash portion of Flash EPROM is not programmed.

S711P.ROM resides on a floppy disk and contains the updated main BIOS code. American Megatrends will provide this file when the WINBIOS for the Titan-II PCI Pentium EISA motherboard must be updated.

S711P.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 S711P.ROM.

Chapter 4 Flash Programming

A Upgrading Cache Memory

L2 secondary (external) cache memory on the American Megatrends Titan-II PCI Pentium EISA motherboard can be upgraded from 256 KB to 512 KB by removing the existing 32 KB x 8 15 ns SRAMs and installing 64 KB x 8 15 ns SRAMs in their place. *You must use 3.3V SRAM DIPs.*

Recommended Parts

Manufacturers of the 32 KB x 8 15 ns 3.3V SRAMs are:

Manufacturer	Part Number
Micron	MI5LC2568-15
Alliance	AS7C3256-15PC

One manufacturer of the 64 KB x 8 15 ns 3.3V SRAMs is:

Manufacturer	Part Number
Alliance	AS7C3512-15PC

How to Upgrade Cache Memory

Step	Action
1	Turn the system off. If the motherboard is already installed in a computer case, remove the cover and expose the motherboard.
2	*Make sure you are properly grounded to prevent electrostatic discharge.*
3	Remove the existing 32 KB x 8 15 ns SRAMs from the sockets.
4	Install the new 64 KB x 8 3.3V SRAM DIPs in sockets U7, U8, U9, U10, U22, U23, U24, and U25. Make sure that Pin 1 of the sockets matches Pin 1 of the SRAM DIPs.
5	Jumper Pins 2-3 on J9 on the motherboard.
6	Reinstall the motherboard and turn system power on.
7	The system BIOS should report 512 KB of secondary cache memory now after the computer boots. If it does not, repeat the cache memory installation procedure above.

Appendix A Upgrading Cache Memory

B   Engineering Specifications

Temperature Ranges

The following values are ambient temperatures inside the computer case. The board temperatures reflect the Pentium CPU Heat dissipation requirements because it will be the hottest component. Temperature specifications vary with the CPU frequency.

Frequency	Heat Sink	Airflow over CPU	Airflow over other components	Temperature Range
90 or 100 MHz	YES	200 feet per minute	Not critical	0 ° through 50 ° C.

You must make sure that there is adequate air flow over the CPU inside the case.

Humidity

The recommended humidity range for operation of the American Megatrends Titan-II EISA PCI Pentium motherboard is 20% to 80% non-condensing.

Engineering Specifications, Continued

The Titan-II EISA PCI Pentium motherboard requires +5V ~7A. The ISA bus requirements are:

+5V   ~13A
-5V 1.6A
+12V   5A
-12V   2.4A
The +5V supply current to the EISA Bus is limited by the power connector.

Power Consumption

The two SIMM memory banks consume 2 Amps each, for a total of 4 Amps.

Each EISA expansion slot is rated at 3.0 Amps maximum. There are six EISA expansion slots. Each PCI expansion slot is rated at 3.0 Amps maximum The are four PCI expansion slots

The total maximum power consumption for the EISA and PCI expansion slots is 30 Amps.

Conclusion

The minimum rating of the power supply should be 240 Watts for a fully loaded motherboard, including a 12V power source.

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