American Megatrends, Inc.

Atlas PCI Pentium

EISA Motherboard

User's Guide

MAN-717
7/11/94

American Megatrends, Inc.
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Revision History

7/11/94 Initial release.

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To the OEM

Thank you for purchasing the high performance American Megatrends Atlas PCI Pentium EISA motherboard. This product is a state of the art Pentium-based motherboard that includes the famous WinBIOS. It is assumed that you have also licensed the rights to use the American Megatrends documentation for the American Megatrends Atlas PCI 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 Atlas PCI motherboard. It explains how to assemble a system based on the Atlas PCI motherboard and how to use the WinBIOS that is specifically designed for this motherboard.

This manual is not addressed to the computer owner who purchases this motherboard or 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.

Packing Slip

You should have received:

- an American Megatrends Atlas PCI Pentium EISA motherboard,
- the *Atlas PCI Pentium EISA Motherboard User's Guide,*
- a diskette containing the American Megatrends ECU and EISA configuration files.
- the *American Megatrends ECU User's Guide,* and
- the AMIFlash Utility program.
- a Warranty Card for the Atlas PCI Pentium EISA motherboard,
- two 10-pin to DB9 connector serial cables (American Megatrends Part Number CBL-SUB-1-10), and
- one 26-pin to DB25 connector parallel cable (American Megatrends Part Number CBL-SUB-2-25).

The cable that attaches to the PS/2 mouse connector is the same as the serial cables listed above (American Megatrends Part Number CBL-SUB-1-10).

If using the Green PC features of this motherboard, you will also need a 10-pin to 25-pin Green PC cable (American Megatrends Part Number CBL-SUB-12-10) that is not supplied with the motherboard.

Call the American Megatrends Sales Department at 800-828-9264 to order the serial cables or Green PC cable.

The 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 on the BBS.

Data Transmission Rates

The BBS automatically handles modems with data transmission rates from 1,200 to 14,400 bps.

If using an HST modem, call 770-246-8780.

If using a non-HST modem, call 770-246-8782.

BBS Phone Numbers

The following table lists the characteristics of the BBS phone numbers. The BBS requires no parity, 8 data bits, and 1 stop bit.

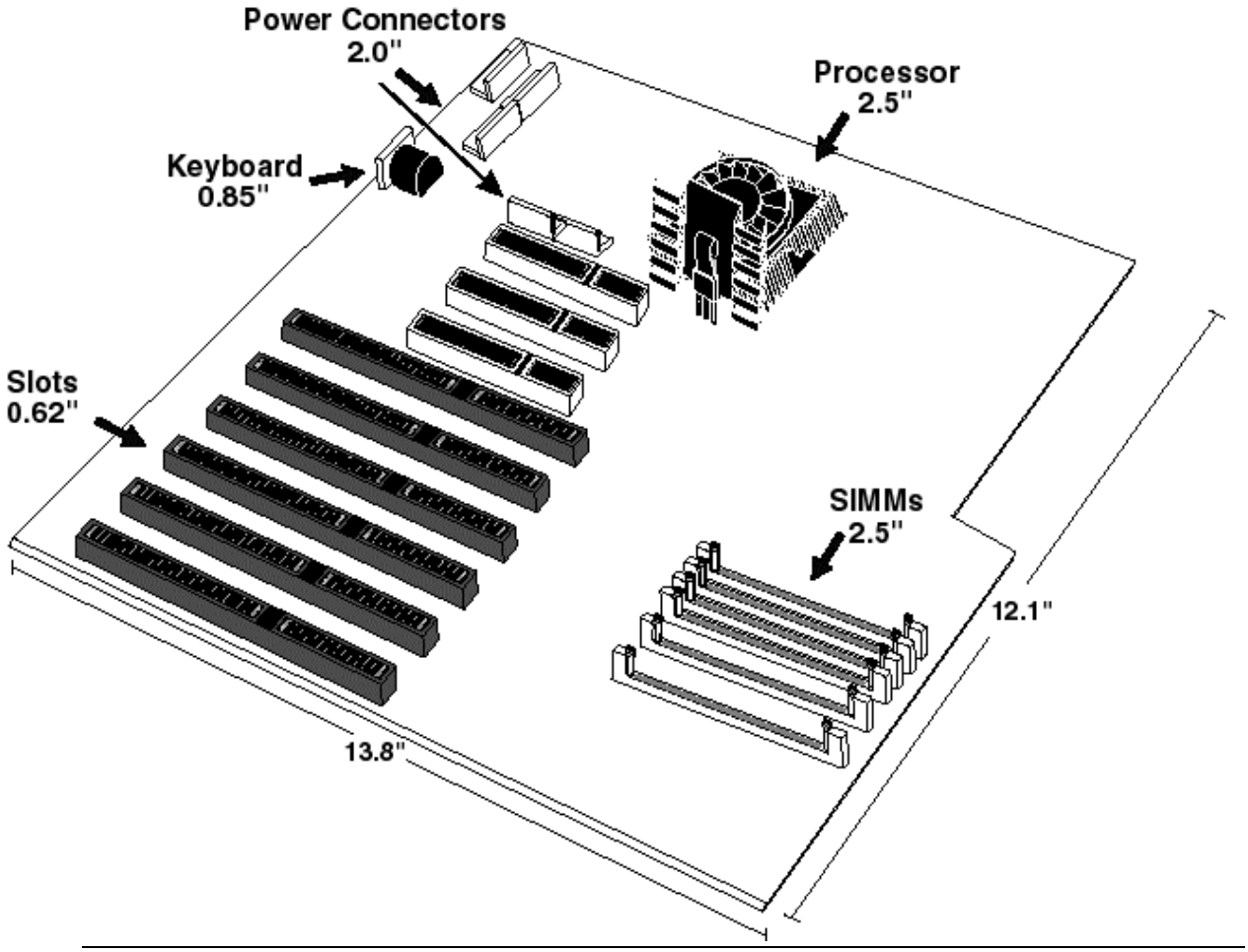
Phone Number	Characteristics
770-246-8780	Supports HST and v.42.
770-246-8781	Supports HST and v.42.
770-246-8782	Dual standard. Can handle 2400 or 9600 bps. Supports v.32 and v.42. Can handle up to 14,400 baud.
770-246-8783	Supports v.32 and v.42.

1 System Overview

The American Megatrends Atlas PCI (Peripheral Component Interconnect) is a full AT-size PCI EISA motherboard that supports a P54C Pentium® CPU operating at 60 or 66 MHz externally and 90 or 100 MHz internally.

This motherboard has three PCI Local Bus expansion slots. All three slots can be used for bus mastering PCI adapter cards.

The motherboard also has six EISA bus mastering expansion slots. The motherboard height restrictions are shown below.



Features

The American Megatrends Atlas PCI Pentium EISA motherboard has the following features:

- Supports 256 or 512 KB of direct-mapped write-back (or write-through) secondary cache memory.
- Supports from 2 to 192 MB of non-interleaved system memory via two to six x 36 single-sided or double-sided SIMMs on the motherboard.
- Supports up to four IDE hard disk drives through two IDE connectors on the motherboard on the fast PCI local bus. IDE Modes 0, 1, 2, and 3 with 32-bit read/write, and write posting are supported.
- Includes an SMC® FDC37C665 100-pin PQFP Universal Peripheral Controller that supports two National Semiconductor NS16C550 serial ports, a parallel port with ECP (Extended Capabilities Port) and EPP (Enhanced Parallel Port) support, and a floppy controller,
- Includes a 128 KB flash EPROM for the system BIOS.
- Includes a battery-backed Real Time Clock with 114 bytes of CMOS RAM to store system configuration data. It also has an additional 8 KB of EISA Extended CMOS RAM.
- Has six bus mastering EISA and three PCI bus mastering expansion slots. All expansion slots are bus mastering slots.

2 Specifications

The American Megatrends Atlas PCI is a full AT-size motherboard. The motherboard has an onboard fast IDE controller on the PCI local bus that supports IDE Modes 0, 1, 2 and 3 with 32-bit read/write, readahead, and write posting. The motherboard has an I/O Controller that supports floppy drives, serial ports, and a parallel port with ECP and EPP capabilities.

Motherboard Frequency

The Atlas PCI motherboard operates at either High or Low speed. High speed is the same as the speed of the CPU mounted on the motherboard (60/66 or 90/100 MHz). Low speed is approximately the same speed as that of an 8 MHz IBM® AT. Low speed is achieved by emulation.

The end user can select the frequency by:

- selecting High or Low speed via an option in WinBIOS Setup Advanced Setup,
- after system boot, pressing <Ctrl> <Alt> <-> for Low speed or <Ctrl> <Alt> <+> for High speed, or
- after system boot, pressing the hardware Turbo switch mounted on the computer chassis.

Socketed CPU

The Atlas PCI Pentium EISA motherboard uses a 3.3V 90 or 100 MHz Intel P54C Pentium CPU operating externally at 60 or 66 MHz in a ZIF socket.

Internal Cache Memory

The Pentium CPU includes both an 8 KB code cache and an 8 KB write-back data cache referred to as L1 internal cache memory. All onboard memory can be stored in internal cache memory on the CPU.

Internal cache memory can be enabled via Advanced Setup in WinBIOS Setup.

Secondary Cache Memory

The Atlas PCI motherboard has 256 KB or 512 KB of factory-installed L2 secondary (external) cache memory. The cache memory is direct-mapped programmable in write-through or write-back mode. The cache memory chips are:

Cache Memory	Description
256 KB L2 cache memory	uses eight 32 KB x 8 standard SRAMs. Cache data RAM operates at 15 ns.
256 KB L2 cache memory	uses four 32 KB x 18 burst SRAMs operating at 9 ns.
512 KB L2 cache memory	uses 64 KB x 18 asynchronous SRAMs. The cache data RAM operates at 15 ns.
512 KB L2 cache memory	uses four 64 KB x 18 burst SRAMs operating at 9 ns.
4 KB L2 cache memory Tag RAM	Integrated into the chipset.

The L2 secondary cache memory supports CPU burst reads and writes. The L2 secondary cache memory can be implemented in synchronous or asynchronous burst SRAMs.

The Intel Pentium is supported in both write-back and write-through modes. The external cache memory can also be in write-back or write-through mode.

L2 Secondary (External)l cache memory can be enabled via WinBIOS Setup Advanced Setup.

Cacheable Memory

All of system memory on the motherboard (up to 192 MB) can be read from or written to both L1 internal cache memory and L2 secondary cache memory.

Non-Cacheable Memory

Up to two blocks of system memory can be defined as non-cacheable. The contents of these areas cannot be read from or written to either L1 or L2 cache memory. The size of this area can be 64 KB to 512 KB and is defined through WinBIOS Setup Advanced Setup.

Storing BIOS ROM in Cache Memory

Both the contents of the system BIOS ROM and the video BIOS ROM can be read from or written to both L1 and L2 cache memory. The contents of both system BIOS ROM and the video BIOS ROM can also be write-protected. Options in WinBIOS Setup Advanced Setup control these features.

Chipset

The Atlas EISA motherboard uses the Intel Mercury chipset and EISA chipset consisting of the following ICs: 82434LX PCI, Cache, and Memory Controller (PCMC), 82433LX Local Bus Accelerator (LBX), 82375EB PCI to EISA bridge (PCEB), and the 82374EB EISA System Controller (ESC).

Other Connectors

- a four-pin berg connector attaches to a speaker,
- a two-pin connector connects a hardware reset switch,
- a five-pin connector connects a keyboard lock switch,
- a two-pin connector connects a turbo switch
- there are three 5V six-pin power supply connectors and two 3.3V power supply connectors,
- a 3.3V voltage regulator provides CPU power,
- a 34-pin dual inline header connects the floppy drives,
- two 40-pin headers connect up to four IDE drives on the PCI bus, and
- two 10-pin serial connectors and a 26-pin parallel connector.

Onboard System Memory

- The Atlas PCI motherboard supports from 2 to 192 MB of system memory via six 72-pin SIMM sockets. Either single-sided or double-sided SIMMs can be used.
- The system BIOS automatically detects and configures all onboard DRAM memory.
- Slave memory devices can be added on the PCI bus and the EISA bus for additional memory.
- The Atlas PCI motherboard can have two, four, or six 36 SIMMs in six SIMM sockets.
- The Atlas PCI motherboard supports 256 KB x 36, 1 MB x 36, and 4 MB x 36 single-sided SIMMs and 512 KB x 36, 2 MB x 36, and 8 MB x 36 double-sided SIMMs.
- 70 ns fast page mode DRAMs are required for onboard DRAM. Parity is checked on all system memory reads to ensure data integrity. The memory architecture is paged and non-interleaved.
- WinBIOS Setup Chipset Setup provides two options that permit the end user to configure up to two holes in memory. These holes will be available to devices on the PCI bus.

System Memory Buffers

The Atlas PCI Pentium EISA motherboard has five integrated write posting and read prefetch buffers:

Type of Memory Buffer	Buffer Size
CPU to memory posted write buffer	four quadwords deep
PCI to memory posted write buffer	eight quadwords deep
PCI to memory read prefetch buffer	four quadwords deep
CPU to PCI posted write buffer	four doublewords deep
CPU to PCI read prefetch buffer	four doublewords deep

PCI Expansion Slots

The motherboard has three bus mastering PCI slots operating at 30 or 33 MHz synchronous with the CPU clock.

EISA Expansion Slots and Bus Speed

The motherboard has six EISA expansion slots operating at 7.5 or 8.0 MHz.

CMOS RAM

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

System BIOS

The system BIOS resides on a 128 KB boot block flash ROM. The system BIOS can be updated through the AMIFlash software utility. The system BIOS is shadowed to RAM and can be read from or written to L1 and L2 cache memory, as controlled through Advanced Setup.

Adaptor ROM BIOS

The Adaptor ROM BIOS between C0000h - EFFFFh can be shadowed to RAM. The contents can be read from or written to secondary cache memory and the contents can be write-protected with 16 KB granularity via WinBIOS Setup Advanced Setup.

SCSI Support

SCSI support is optional. The motherboard may have an NCR 53C810 PCI SCSI controller, if the customer orders it.

Mouse

The Atlas PCI motherboard supports a PS/2- compatible mouse interface through a 10-pin dual-inline connector.

Keyboard

The standard Atlas PCI motherboard has a five-pin DIN keyboard connector.

Green PC Monitor Connector

The Atlas PCI motherboard has a 10-pin dual-inline connector for Green PC monitor support.

Atlas PCI Motherboard Dimensions

The Atlas PCI motherboard is approximately 12.1 inches wide by 13.8 inches long (the standard full AT® size with similar mounting hole locations). The following graphic shows the dimensions and height restrictions.

Universal Peripheral Controller

The Atlas PCI EISA motherboard has an SMC FDC37C665 Universal Peripheral Controller that supports up to two floppy drives (360 KB, 1.2 MB, 720 KB, 1.44 MB, or 2.88 MB), two serial ports (using National Semiconductor 16C550s), and one parallel port with ECP (Extended Capabilities Port) and EPP (Enhanced Parallel Port) capability.

Onboard PCI IDE Support

The onboard IDE is on the PCI bus. The IDE controller supports up to four IDE hard disk drives through two IDE connectors on the motherboard.

The IDE controller supports IDE Mode 0, Mode 1, Mode 2, and Mode 3. It also supports IDE read data prefetch and write posting. The WinBIOS supports 32-bit data transfers as well as the following cycle times for each IDE Mode.

IDE Mode	Cycle Time (in nanoseconds)
0	600
1	383
2	240
3	180

PCI IDE Support on the PCI Expansion Slots

PCI IDE adapter cards are supported on all PCI expansion slots.

3 PCI Local Bus

The PCI specification provides the electrical specifications for peripheral chip makers and the logic requirements for a PCI Controller. PCI also defines a local bus standard and a standard common I/O component-level interface.

The Atlas PCI EISA Motherboard conforms to the Intel PCI specifications. The PCI Local Bus Specification is a standard set of interface, architecture, timings, electrical, and physical specifications that permits all PCI Local Bus products to be totally interchangeable. PCI is a multiplexed extension of the CPU bus. In PCI, the CPU bus control mechanisms have been extended to optimize I/O support.

PCI is a specification for a local bus standard. PCI establishes a local bus standard in which a large variety of I/O components can be directly connected without using any glue logic.

What PCI Accomplishes

PCI is a way to physically interconnect highly integrated peripheral components and processor/memory systems.

PCI Features

Up to ten PCI loads can be used in the same system on the PCI bus, including the PCI Controller and an expansion bus controller for EISA, ISA, or MCA®. PCI decouples the CPU from the expansion bus.

The local bus defined in the current PCI specification works at 33 MHz and can use either a 32-bit or 64-bit data connection path to the CPU.

PCI Features

- is processor-independent,
- has a multiplexed address, command, and data bus and supports burst mode operation on reads and writes,
- runs synchronous with the CPU at speeds up to 33 MHz,
- has a maximum data transfer rate of 120 MBs (with a peak rate of 132 MBs on a 32-bit data path),
- has a maximum data transfer rate of 240 MBs (with a peak rate of 264 MBs on a 64-bit data path),
- has an optional 64-bit data path that is transparently interoperable with the 32-bit data path,
- has low latency random accesses (about 60 ns write access latency) to slave registers from a PCI bus master on the PCI bus,
- is capable of full concurrency with the processor and PCI bus masters,
- has full multimaster capability, allowing any PCI Master peer-to-peer access to any PCI slave,
- has hidden and overlapped central arbitration,
- has a low pin count (master - 47; slave - 45),
- has address and data parity, and
- uses three physical address spaces: 32-bit memory, 32-bit I/O, and a 256 byte-per-agent configuration space.

PCI Diagram

A typical PCI motherboard system block diagram follows.

Buffered Reads and Writes

The PCI Controller buffers reads and writes between the memory and the CPU and between PCI peripheral devices.

PCI Component Classes

PCI components must be one of three classes: bus master, slave, or master/slave combination.

Bus Mastering

PCI devices can be bus masters, slaves, or a combination of bus master and slave.

Concurrent Operation

The CPU in a PCI system runs concurrently with PCI bus mastering peripherals. Although bus mastering peripheral devices are arbitrated, significant improvements in data transfer rates can be achieved without splitting resource utilization between the CPU and a bus mastering device. Peripheral devices can operate at speeds up to 33 MHz in a PCI environment.

Burst Mode

The PCI specification also provides for burst mode of any length for both reads and writes.

Multiplexing

PCI is a multiplexed bus. Multiplexing allows more than one signal to be sent on the same electrical path. The PCI control mechanisms have been modified and extended to optimize I/O support.

Using PCI Adapter Cards

The Atlas PCI EISA motherboard has three PCI expansion slots. The PCI expansion slots can accept any adapter card that complies with the PCI Revision 2.0 specification.

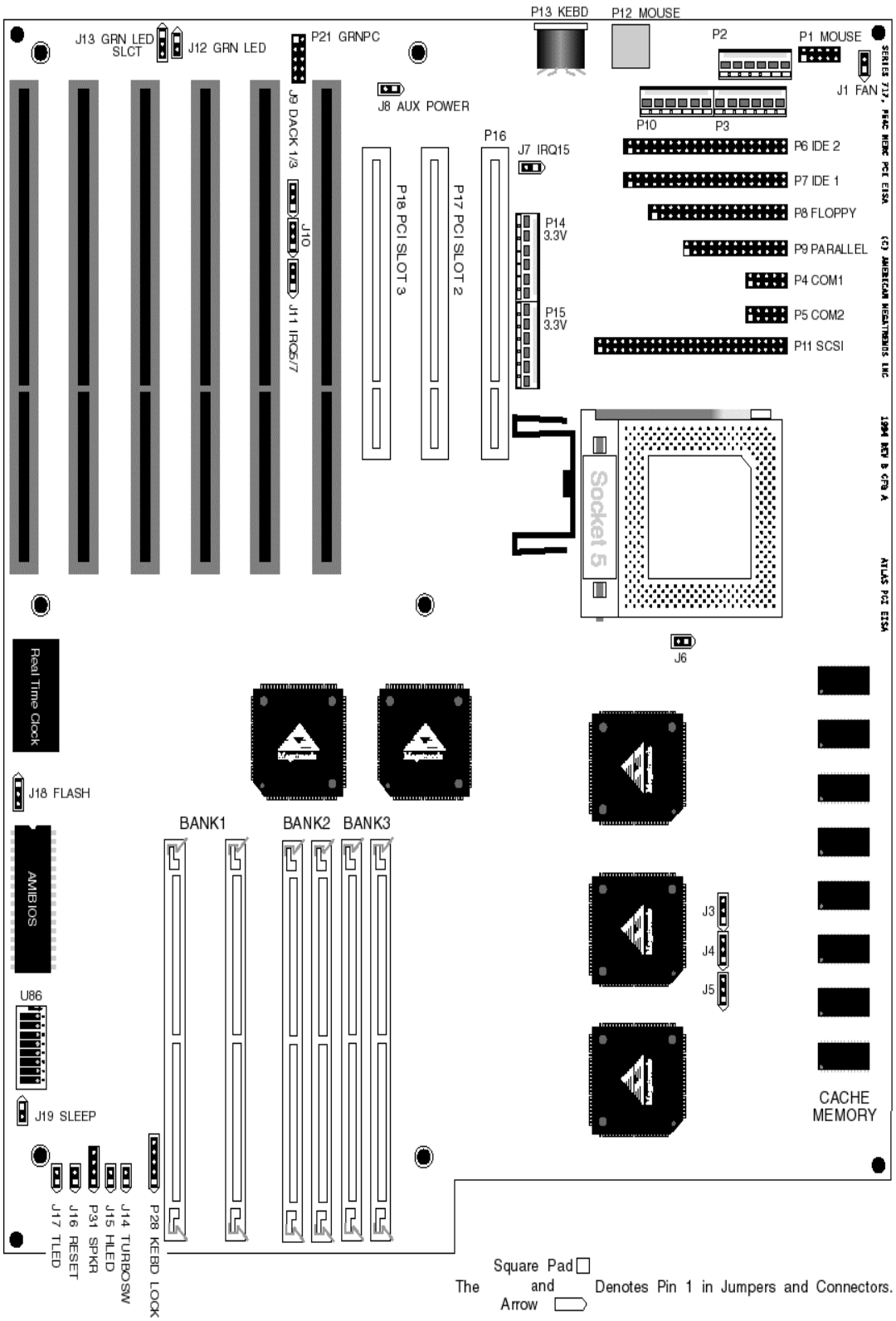
P16 (Slot E), P17 (Slot F), and P18 (Slot D) are all bus master PCI slots.

4 Installation

Unpacking the Motherboard

Step	Action
1	Inspect the cardboard carton for obvious damage. If damaged, call 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. 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 in case of reshipment.
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.

Motherboard Layout



Installation Steps

Step	Action	Turn to
1	Set switch and jumper options	Page 17
2	Install memory	Page 22
3	Install motherboard	Page 4
4	Connect the power supply	Page 6
5	Connect the keyboard	Page 32
6	Connect the mouse	Page 33
7	Connect cables	Page 34
8	Connect onboard I/O	Page 40
9	Install floppy drive	Page 45
10	Install hard disk drive	Page 45
11	Install adapter cards	Page 47
12	Test and configure	Page 55

Warning

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

Step 1 Set Switches and Jumpers

Set all user-configurable jumpers and switches before installing the motherboard in the chassis. There is one user-configurable switch and seven jumpers:

U86 Multipurpose switch
J11 Parallel Port IRQ Select
J10 Enhanced Parallel Port DMA Select Request
J9 Enhanced Parallel Port DMA Select Acknowledge
J13 Select Password LED
J7 IRQ 15 for Secondary IDE
J18 Flash BIOS Programming Voltage
J13 Green PC LED Select

Switch U86

U86 is an eight-position DIP switch that controls CPU speed, flash EPROM programming, diagnostic testing, synchronous SCSI, and the SCSI mode. See the graphic on page 16 for the location of U86. Switch positions 3, 7, and 8 are unused.

U86 Switch 2 Reprogram Flash ROM

Set U86 switch 2 ON only when American Megatrends has sent you a floppy disk with a new ROM file to reprogram the Flash EPROM.

CPU	Switch 2
Reprogram the Flash ROM from floppy disk.	ON
Normal operation (Factory setting)	OFF

U86 Switch 4 Manufacturing Test

U86 switch 4 is OFF. Do not change this switch position.

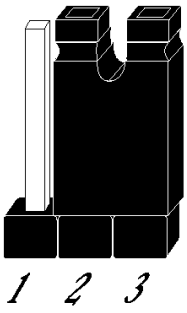
U86 Switches 3, 5, 6, 7, and 8

U75 switches 3, 5, 6, 7, and 8 are reserved.

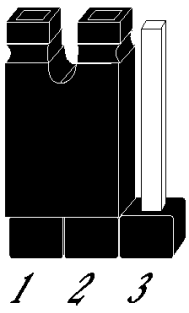
J11 Parallel Port IRQ Select

J11 is a three-pin header that sets the parallel port IRQ. See page 16 for the J11 location. A drawing of J11 with the shorting bridge installed is shown below.

Pin Settings	LPT1
Short Pins 1-2	IRQ7 *(Factory setting)*
Short Pins 2-3	IRQ5



Select IRQ3
Pins 2-3 Shorted

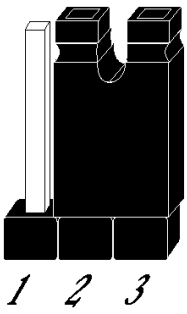


Select IRQ4 (Default)
Pins 1-2 Shorted

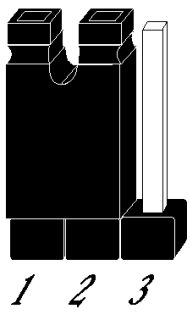
J10 Select Enhanced Parallel Port DMA Request

J10 is a three-pin header that selects the parallel port DMA request line. See page 16 for the J10 location. A drawing of J10 with the shorting bridge installed is shown below.

Pin Settings	DMA Channel
OPEN	Parallel Port is in Normal Mode (Factory setting)
Short Pins 1-2	DRQ1
Short Pins 2-3	DRQ3



Select IRQ4
Pins 2-3 Shorted

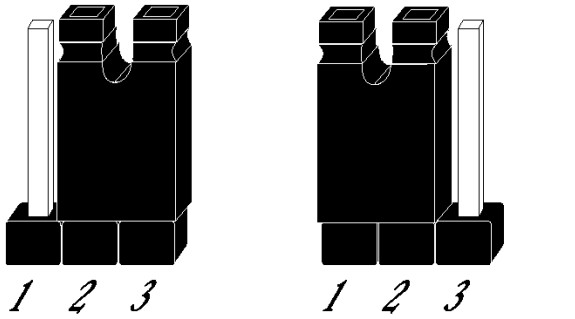


Select IRQ3 (Default)
Pins 1-2 Shorted

J9 Select Enhanced Parallel Port DMA Acknowledge

J9 is a three-pin header that selects the parallel port DMA Acknowledge line. See page 16 for the J9 location. A drawing of J9 with the shorting bridge installed is shown below.

Pin Settings	DMA Channel
OPEN	Parallel Port is in Normal Mode (Factory setting)
Short Pins 1-2	DACK1
Short Pins 2-3	DACK3



Select IRQ5
Pins 2-3 Shorted

Select IRQ7 (Default)
Pins 1-2 Shorted

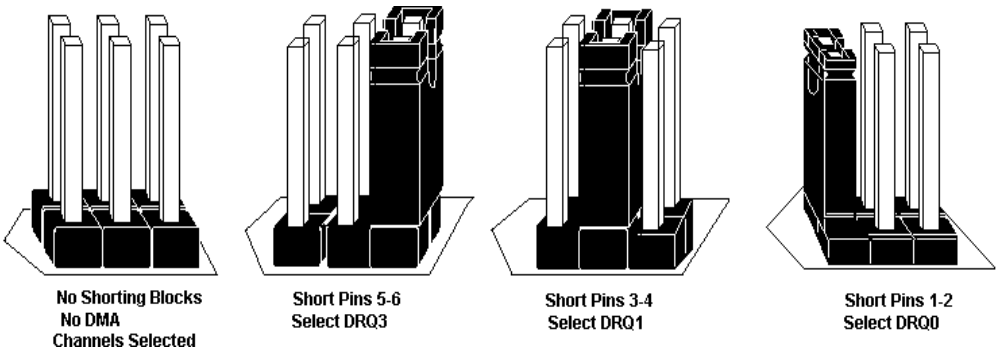
J13 Password LED Select

J13 is a three-pin berg that selects the Password LED. See page 16 for the J13 location. A drawing of J13 with the shorting bridge installed is shown below.

The end user must enter the correct system password if the Password LED is blinking. If the password LED blinks, the system has experienced no system activity during the length of time specified in Power Management Setup.

The WinBIOS system password feature and WinBIOS Power Management feature must be enabled before the Password LED will blink when the correct system password must be entered by the end user.

Pin Settings	LED selected
Short Pins 1-2	Front panel power LED is Password LED. *(Factory setting)*.
Short Pins 2-3	Separate Password LED using J13



J7 IRQ15 for Secondary IDE

J7 is a two-pin berg that passes the secondary IDE interrupt to IRQ 15. Place a shorting bridge on the two pins of this jumper only if the secondary IDE drive is connected to the secondary IDE connector. The factory setting is J7 OPEN.

J18 Select Flash EPROM Voltage

J18 is a three-pin berg that selects voltage level supplied to the Flash EPROM in U85. See page 16 for the J18 location. A drawing of J18 with the shorting bridge installed is shown below.

Pin Settings	LED selected
Short Pins 1-2	5 volts
Short Pins 2-3	12 volts (Factory setting)

Step 2 Install System Memory

The main memory subsystem on the Atlas PCI motherboard consists of six 32-bit 72-pin SIMM sockets arranged in three memory banks. Each bank of memory consists of two sockets. *Either two, four, or six SIMMs must be installed;* the memory banks are always non-interleaved.

You can use 256 KB x 36, 512 KB x 36, 1 MB x 36, 2 MB x 36, 4 MB x 36, or 8 MB x 36 bit SIMMs. The Atlas PCI motherboard uses fast page mode SIMMs operating at 70 ns (RAS access time).

Motherboard System Memory Configurations

BANK1		BANK2		BANK3		Memory reported by WinBIOS
256 KB x 36	256 KB x 36	None	None	None	None	1,664 KB
256 KB x 36	256 KB x 36	256 KB x 36	256 KB x 36	None	None	3,712 KB
256 KB x 36	256 KB x 36	256 KB x 36	256 KB x 36	256 KB x 36	256 KB x 36	5,760 KB
256 KB x 36	256 KB x 36	512 KB x 36	512 KB x 36			5,760 KB
256 KB x 36	256 KB x 36	256 KB x 36	256 KB x 36	512 KB x 36	512 KB x 36	7,808 KB
256 KB x 36	256 KB x 36	1 MB x 36	1 MB x 36			9,856 KB
256 KB x 36	256 KB x 36	2 MB x 36	2 MB x 36			18,048 KB
256 KB x 36	256 KB x 36	4 MB x 36	4 MB x 36			34,442 KB
256 KB x 36	256 KB x 36	8 MB x 36	8 MB x 36			67,200 KB
256 KB x 36	256 KB x 36	256 KB x 36	256 KB x 36	1 MB x 36	1 MB x 36	11,904 KB
256 KB x 36	256 KB x 36	256 KB x 36	256 KB x 36	2 MB x 36	2 MB x 36	20,096 KB
256 KB x 36	256 KB x 36	256 KB x 36	256 KB x 36	4 MB x 36	4 MB x 36	36,480 KB
256 KB x 36	256 KB x 36	256 KB x 36	256 KB x 36	8 MB x 36	8 MB x 36	69,248 KB
512 KB x 36	512 KB x 36	None	None	None	None	3,712 KB
512 KB x 36	512 KB x 36	512 KB x 36	512 KB x 36	None	None	7,808 KB
512 KB x 36	512 KB x 36	1 MB x 36	1 MB x 36			11,904 KB
512 KB x 36	512 KB x 36	2 MB x 36	2 MB x 36			20,096 KB
512 KB x 36	512 KB x 36	4 MB x 36	4 MB x 36			36,480 KB
512 KB x 36	512 KB x 36	8 MB x 36	8 MB x 36			69,248 KB
512 KB x 36	512 KB x 36	512 KB x 36	512 KB x 36	256 KB x 36	256 KB x 36	9,856 KB
512 KB x 36	512 KB x 36	512 KB x 36	512 KB x 36	512 KB x 36	512 KB x 36	11,904 KB
512 KB x 36	512 KB x 36	512 KB x 36	512 KB x 36	1 MB x 36	1 MB x 36	16,000 KB
512 KB x 36	512 KB x 36	512 KB x 36	512 KB x 36	2 MB x 36	2 MB x 36	24,192 KB
512 KB x 36	512 KB x 36	512 KB x 36	512 KB x 36	4 MB x 36	4 MB x 36	40,576 KB
512 KB x 36	512 KB x 36	512 KB x 36	512 KB x 36	8 MB x 36	8 MB x 36	73,344 KB
1 MB x 36	1 MB x 36	None	None	None	None	7,808 KB
1 MB x 36	1 MB x 36	1 MB x 36	1 MB x 36	None	None	16,000 KB
1 MB x 36	1 MB x 36	1 MB x 36	1 MB x 36	256 KB x 36	256 KB x 36	18,048 KB
1 MB x 36	1 MB x 36	1 MB x 36	1 MB x 36	512 KB x 36	512 KB x 36	20,096 KB
1 MB x 36	1 MB x 36	2 MB x 36	2 MB x 36	None	None	24,192 KB
1 MB x 36	1 MB x 36	4 MB x 36	4 MB x 36			40,576 KB
1 MB x 36	1 MB x 36	8 MB x 36	8 MB x 36			73,344 KB
1 MB x 36	1 MB x 36	1 MB x 36	1 MB x 36	1 MB x 36	1 MB x 36	24,192 KB
1 MB x 36	1 MB x 36	1 MB x 36	1 MB x 36	2 MB x 36	2 MB x 36	32,384 KB
1 MB x 36	1 MB x 36	1 MB x 36	1 MB x 36	4 MB x 36	4 MB x 36	48,768 KB
1 MB x 36	1 MB x 36	1 MB x 36	1 MB x 36	8 MB x 36	8 MB x 36	81,536 KB
2 MB x 36	2 MB x 36	None	None	None	None	16,000 KB
2 MB x 36	2 MB x 36	2 MB x 36	2 MB x 36	256 KB x 36	256 KB x 36	34,442 KB
2 MB x 36	2 MB x 36	2 MB x 36	2 MB x 36	512 KB x 36	512 KB x 36	36,480 KB
2 MB x 36	2 MB x 36	2 MB x 36	2 MB x 36	1 MB x 36	1 MB x 36	40,576 KB
2 MB x 36	2 MB x 36	2 MB x 36	2 MB x 36	2 MB x 36	2 MB x 36	48,768 KB
2 MB x 36	2 MB x 36	2 MB x 36	2 MB x 36	4 MB x 36	4 MB x 36	65,152 KB
2 MB x 36	2 MB x 36	2 MB x 36	2 MB x 36	8 MB x 36	8 MB x 36	97,920 KB
4 MB x 36	4 MB x 36	None	None	None	None	32,384 KB
4 MB x 36	4 MB x 36	4 MB x 36	4 MB x 36	None	None	65,152 KB
4 MB x 36	4 MB x 36	4 MB x 36	4 MB x 36	256 KB x 36	256 KB x 36	67,200 KB
4 MB x 36	4 MB x 36	4 MB x 36	4 MB x 36	512 KB x 36	512 KB x 36	69,248 KB
4 MB x 36	4 MB x 36	4 MB x 36	4 MB x 36	1 MB x 36	1 MB x 36	73,344 KB
4 MB x 36	4 MB x 36	4 MB x 36	4 MB x 36	2 MB x 36	2 MB x 36	81,536 KB
4 MB x 36	4 MB x 36	4 MB x 36	4 MB x 36	4 MB x 36	4 MB x 36	97,920 KB
4 MB x 36	4 MB x 36	4 MB x 36	4 MB x 36	8 MB x 36	8 MB x 36	130,668 KB
8 MB x 36	8 MB x 36	None	None	None	None	65,152 KB
8 MB x 36	8 MB x 36	8 MB x 36	8 MB x 36	None	None	130,688 KB
8 MB x 36	8 MB x 36	8 MB x 36	8 MB x 36	256 KB x 36	256 KB x 36	132,736 KB
8 MB x 36	8 MB x 36	8 MB x 36	8 MB x 36	512 KB x 36	512 KB x 36	134,784 KB
8 MB x 36	8 MB x 36	8 MB x 36	8 MB x 36	1 MB x 36	1 MB x 36	138,880 KB
8 MB x 36	8 MB x 36	8 MB x 36	8 MB x 36	2 MB x 36	2 MB x 36	147,072 KB
8 MB x 36	8 MB x 36	8 MB x 36	8 MB x 36	4 MB x 36	4 MB x 36	163,456 KB
8 MB x 36	8 MB x 36	8 MB x 36	8 MB x 36	8 MB x 36	8 MB x 36	192,224 KB

DRAM Memory Parameters

Parameter	Specification
Page Mode	FAST
Refresh	CAS before RAS
t_{CAC}	≤ 20 ns
t_{RAC}	≤ 70 ns
t_{AA}	≤ 35 ns
t_{RP}	50 ns
t_{CPA}	≤ 40 ns

Step 2 Install System Memory, Continued

SIMM Part Numbers

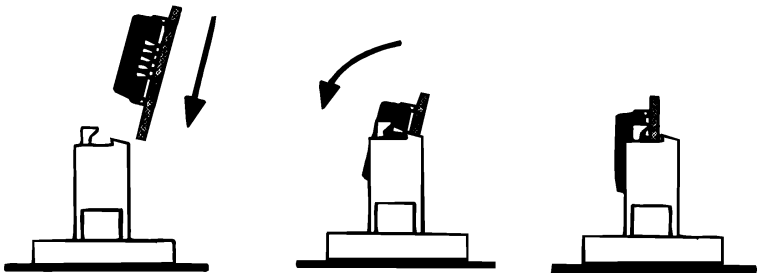
Type	Manufacturer	Part Number
256 KB x 36	Micron®	MT9D25636M-7
	Mitsubishi®	MH26636BJ-7
	Motorola®	MCM36256S-70
	Oki®	MSC2320A-70YS9
	PNY®	P36256-70
	Samsung®	KMM536256B-7
512 KB x 36	Samsung	KMM536512W-7 (single-sided) KMM536512W3-7 (double-sided)
	Motorola	MCM36512S-70
1 MB x 36	Micron	MT12D136M-7
	Mitsubishi	MH1M36ADJ-7
	PNY	P361000-70
	Motorola	MCM36100AS-70
	Oki	MSC2355-70YS12
	Samsung	KMM5361000AV-7
2 MB x 36	Micron	MT24D236M-7
	Samsung	KMM5362000A-7
	Motorola	MCM36200S70
4 MB x 36	Micron	MT12D436M-7
	Mitsubishi	MH4M36SAJ-7
	Motorola	MCM36400S-70
	PNY	P364000-70
	Samsung	KMM5364100-7
8 MB x 36	Motorola	MCM36800S-70
	PNY	P368000-707
	Samsung	KMM5368100-7

Step 2 Install System Memory, Continued

Installing SIMMs

Six SIMM sockets are located near the power connector on the motherboard. These sockets can be filled with either 256 KB x 36, 512 KB x 36, 1 MB x 36, 2 MB x 36, 4 MB x 36, or 8 MB x 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 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.

Normally, the x 36 SIMMs look like this:



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 the operating system is booted. The memory reported by WinBIOS is 384 KB less than the total amount of memory installed in the system because the memory between 640K and 1024K can be used to shadow the video, system, and other adapter BIOS.

Step 3 Install the Motherboard

The mounting hole pattern on the motherboard is the same as the mounting hole pattern on most full-size AT boards. Standoffs and mounting screws are not supplied.

Step 3 Install the Motherboard, Continued

Step	Action
1	Wear an anti-static wristband when performing this procedure.
2	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 to the same place that the mat and the wristband you are wearing are grounded to.
3	Rotate the chassis so that the front is to the right and the rear is to the left. Mount the motherboard on the side facing you. The power supply is mounted at the far end of the chassis.
4	Push four nylon standoffs from the solder side of the motherboard into 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.
5	Carefully slide the motherboard into the chassis. Make sure that the standoffs fit the standoff slots. The motherboard should not slide if the standoffs are properly locked. The motherboard should also rest level with the chassis. The far edge should fit the slots in the plastic clips.
6	Place the two mounting screws in the proper holes and tighten. If necessary, shift the motherboard slightly to align the mounting holes on the motherboard with the holes on the chassis. See page 16 and the previous page.

The computer case manufacturer may supply installation instructions. If so, follow those procedures as well as the above procedures.

Step 4 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. Make sure that the proper voltage has been selected before connecting power cables. Power supplies often have 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 that has built-in filters to suppress EMI. The Atlas PCI Pentium EISA motherboard has five power connectors, shown on the motherboard drawing below. P3 and P10 are standard ISA motherboard power connectors. P2, P15, and P14 are auxiliary connectors.

Connect Standard Power Cables to P3 and P10

Attach the standard EISA motherboard power supply cables to P3 and P10 on the motherboard. EISA power supplies have two 6-pin connectors (P3 and P10). The 6-pin cable with 3 red wires and 2 black wires is connected to P3. The 6-pin cable with the orange line to Pin 1 is connected to P10, as shown below. P2 is an auxiliary power supply connector that can be used for additional power needs. P15 and P14 are 3.3 volt connectors for PCI adapter cards.

Caution
P14 and P15 are not 5V power connectors.

Power Supply Connectors are Keyed

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

P10 Pinout

Pin	Description
1	Power Good (Orange wire)
2	+5V VCC (Red wire)
3	+12 Volts (Yellow wire)
4	-12 Volts (Blue wire)
5	Ground (Black wire)
6	Ground (Black wire)

P3 Pinout

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

P15 Pinout

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

P14 Pinout

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

Step 4 Connect the Power Supply, Continued

P2 Pinout

Pin	Description
1	Ground
2	Ground
3	Ground
4	Red
5	Red
6	Red

Step 5 Connect the Keyboard Cable

The keyboard connector is a 5-pin DIN socket labeled KEYBRD and P13 on the motherboard. Attach a standard AT-compatible keyboard cable. A 5-pin DIN to 6-pin mini DIN converter is needed to connect a PS/2-type keyboard.

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

Step 6 Connect the Mouse

The American Megatrends Atlas PCI Pentium EISA motherboard has two types of PS-2-type mouse connectors:

- a standard 6-pin miniDIN plug (P12), and
- a 10-pin berg connector (P1).

You cannot use both mouse connectors simultaneously.

P1 is a 10-pin berg connector that attaches to a PS/2-compatible mouse via a standard serial cable. P12 is a six-pin miniDIN socket (see below). P12 accepts a PS/2-compatible mouse. The mouse connectors are next to the keyboard connector. Attach a customized serial cable from the mouse connector to a DB9 serial port connector. You can order this cable from the American Megatrends Sales Department (404-263-8181). Ask for **Cable Assembly DB9, Male, 10-Pin,** part number **CBLSUB1-10.** P1 Pin 10 should be cut. The connector position is shown above. The six-pin miniDIN pinout, P1 (10 pin) pinout and P1 is shown below.

Pin	Signal Description
1	Mouse data
2	N/A
3	Ground
4	VCC
5	Mouse clock
6	Not used

Pin	Signal Description	Pin	Signal Description
1	Mouse clock	6	N/C
2	N/C	7	N/C
3	N/C	8	Vcc
4	N/C	9	Mouse data
5	Ground	10	N/C

Step 7 Connect Cables

When attaching chassis connectors to the motherboard, make sure you 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 can be determined easily. Each jumper is surrounded by a white line etched on the motherboard. One end of the white line always ends in an arrow. Pin 1 is always at the pointed end of the white line. Pin 1 is designated by a square pad on the motherboard graphic.

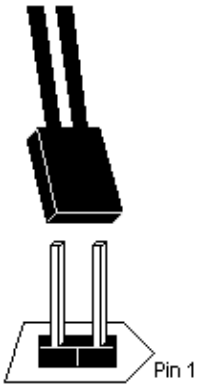
Connect the following cables to the motherboard:

- Reset Switch cable to J16,
- Speaker cable to P31,
- Keyboard Lock cable to P28,
- Turbo Switch cable to J14,
- Onboard Diag LED is J20,
- Turbo LED cable to J17,
- Password LED cable to J12,
- Sleep switch cable to J19,
- IDE hard disk drive activity LED cable to J15.
- Monitor power switch for Green PC mode (auxiliary power off cable) to J8,
- extra fan connected to J1.

J12 Password LED

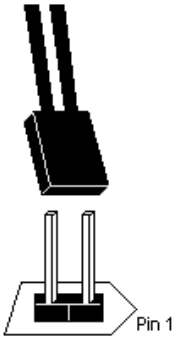
J12 is a two-pin berg that can be attached via a cable to an LED that flashes when the system has been inactive for a specified length of time and Pins 2-3 of J13 are shorted. Pin 1 is cathode and Pin 2 is the anode.

If a Password LED is not mounted on the computer case, another LED, such as the Power LED, can be made to flash if Pins 1-2 of J13 are shorted.



J19 Sleep Switch

J19 is a two-pin berg that attaches to an externally-mounted switch via a two-wire cable as shown below and to J19, the Password LED. The computer enters Sleep Mode immediately when the end user presses this switch.

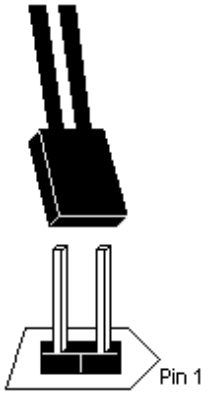


J20 Diag LED

J20 is an LED mounted on the motherboard used when manufacturing diagnostic tests are running.

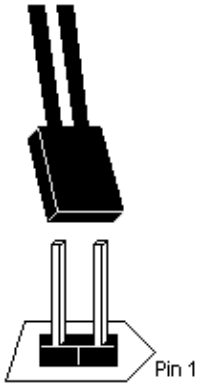
J15 IDE LED

J15 is a two-pin berg that can be attached via a cable to an LED that is lit when IDE hard disk drive activity occurs. Pin 2 is the anode. Pin 1 is the cathode.



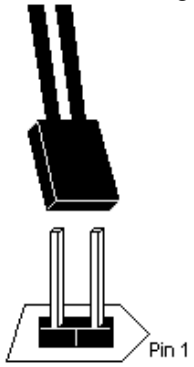
J17 Turbo LED

J17 is a two-pin berg that is attached via a cable to the externally mounted Turbo LED. The LED lights when the motherboard is running at high speed. Pin 1 is cathode. Pin 2 is anode.



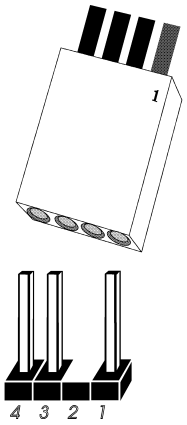
J16 Reset Switch Connector

J16 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, a hard reset is performed. Pin 1 is ground and Pin 2 is Hard Reset.



P31 Speaker Connector

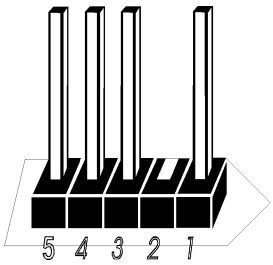
P31 is a four-pin single-inline berg that is attached via a cable to the system speaker. WinBIOS signals hardware problems through the speaker.



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

P28 Keyboard Lock Connector

P28 is a five-pin single-inline berg that attaches via a cable to the keyboard lock connector. The keyboard lock allows the user to lock the keyboard, protecting the system from unauthorized use.

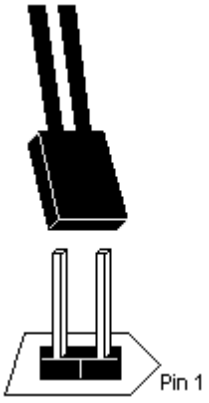


Pin	Description
1	LED power
2	Key
3	Ground
4	Keyboard lock
5	Ground

The front panel LED flashes if the system WinBIOS Low Power Mode feature is enabled and Pins 1-2 of J13 are shorted.

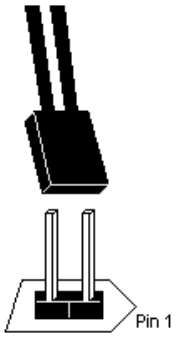
J14 Turbo Switch Connector

J14 is a two-pin single-inline berg that is attached via a cable to the externally mounted bipolar Turbo switch on the chassis. The turbo switch allows the user to set the motherboard clock speed to high or low speed.



J8 Auxiliary Power Off

J8 is a two-pin berg that is connected to the power supply two-pin cable that can turn off power to the auxiliary power output. J8 can be used to switch off power to the monitor after the timeout specified in Power Management Setup expires. J8 Pin 2 is GND. Pin 1 is the signal to switch off power.



J1 Fan Connector

J1 is a two-pin berg that can be attached to an additional CPU cooling fan. Pin 2 is the anode. Pin 1 is the cathode.

Step 8 Connect Onboard I/O

Onboard Serial Ports, Parallel Port, Floppy, and IDE

The Atlas PCI motherboard has two serial ports (P4 and P5), a parallel port (P9), two IDE connectors (P6 and P7), and a floppy connector (P8) onboard. The serial and parallel port connectors are described below, the IDE connector on page 47 and the floppy connector on page 45.

Checking for Conflicts

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

If WinBIOS...	then...
finds an IDE hard disk drive controller on an adapter card in an expansion slot,	the onboard IDE controller is automatically disabled.
finds a floppy drive controller on an adapter card in an expansion slot,	the onboard floppy controller is automatically disabled.
finds serial ports on an adapter card in an expansion slot,	the onboard serial ports are automatically disabled.
finds a parallel port on an adapter card in an expansion slot,	the onboard parallel port uses an alternative address

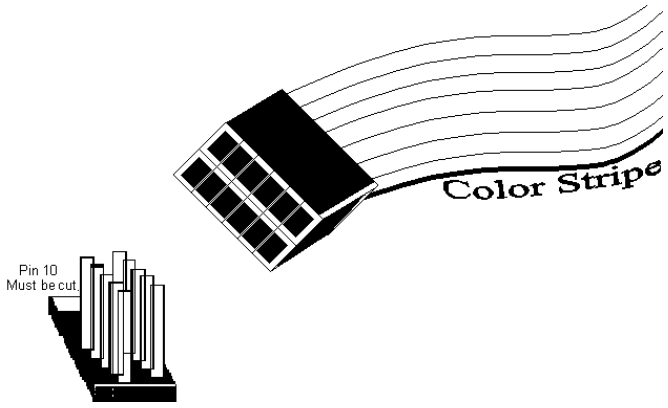
P4 Serial Port 1 (COM1) and **P5 Serial Port 2 (COM2)**

P4 and P5 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 ISA serial port interface. The connector pinout is shown below. Pin 1 on the bergs is labeled "1". The wire leading to pin 1 on the cable usually has a colored stripe. Pin 10 of both P4 and P5 should be cut as shown on page 44.

Pin	Use	Pin	Use
1	Carrier Detect	6	Data Set Ready
2	Receive Data	7	Request to Send
3	Transmit Data	8	Clear to Send
4	Data Terminal Ready	9	Ring Indicator
5	GND	10	Key (N/C)

Attaching the Serial Port Cables

Two serial port cables are supplied with the motherboard. Attach the cables to P4 and P5 and to the external serial port connectors on the chassis as shown below. See the drawing on page 16 for the P4 and P5 location.



Attaching the Parallel Port Cable

A parallel port cable is supplied with the motherboard to connect P9, the parallel port connector on the motherboard, to the externally mounted parallel port, as shown below. See the motherboard graphic on page 16 for the P9 location.

P9 Parallel Port Connector

P9 is a 26-pin dual-inline berg. The parallel port is bidirectional. A 26-pin double-row ribbon cable connects P9 and a female 25-pin D-sub connector on the chassis, shown above. The P9 pinout is:

Pin	Use	Pin	Use
1	-STROBE	14	-AUTOFEED
2	PD0	15	-ERROR
3	PD1	16	-INIT
4	PD2	17	-SLCTIN
5	PD3	18	GND
6	PD4	19	GND
7	PD5	20	GND
8	PD6	21	GND
9	PD7	22	GND
10	-ACK	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SLCT	26	N/C

P21 Green PC Monitor Connector

Attach a 10-wire 10 to 26-pin flat cable to P21, the Green PC monitor connector. The 26-pin end must be connected to the VGA adapter card feature connector. After the timeout specified in Power Management Setup, the motherboard drives the SYNC ENABLE, HSYNC, and VSYNC signals Low through open collector outputs. Monitors that support the display power management specification (DPMS) can switch the power off after examining this condition, thereby saving power. The P21 pinout follows.

Pin	Signal Description	Pin	Signal Description
1	N/C	6	N/C
2	N/C	7	N/C
3	TTL output for SYNC enable	8	Open Collector output for HSYNC control
4	N/C	9	Open Collector output for VSYNC control
5	N/C	10	GND

P21 Green PC Pin Arrangement

The P21 monitor connector pins are arranged as follows:

6	7	8	9	
1	2	3	4	5

P11 SCSI Connector

P11 is an optional part that may not be present on the motherboard.

P11 is a standard 50-pin internal SCSI connector. You can attach any standard SCSI device via a standard SCSI cable to P21. Make sure that the SCSI bus is properly terminated.

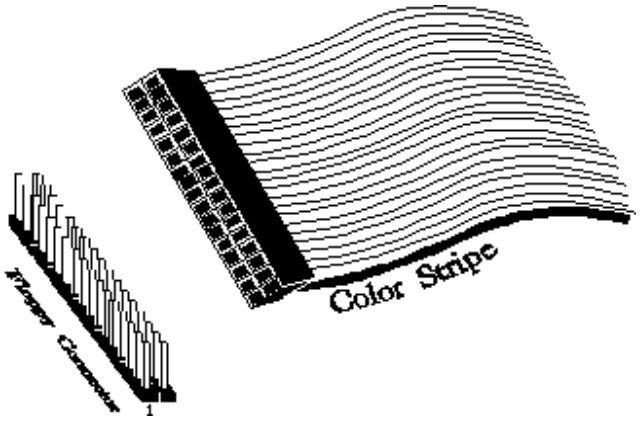
Cutting Pins

Pins must be cut on the two serial port connectors and the parallel port connector, as shown below.

Step 9 Install Floppy Drive

P8 Floppy Disk Drive Connector

P8 is a 34-pin dual-inline berg. Connect the cable from the floppy drive(s) to P8. The onboard floppy controller cannot be used if an adapter card with floppy controller is installed.



P12 Floppy Disk Connect and Cable

The motherboard supports up to two 720 KB, 1.44 MB, 2.88 MB 3½" drives and/or 360 KB and 1.2 MB 5¼" floppy drives. The 34-pin ribbon attaches to P8 and the drives. The cable has a small twist between the floppy connectors. The end connector is connected to floppy drive A:.

P8 Floppy Connector Pinout

Pin	Use	Pin	Use
1	GND	2	RPM/LC
3	GND	4	N/C
5	GND	6	DRATE
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	-STEP
21	GND	22	-WDATA
23	GND	24	-WGATE
25	GND	26	-TRK0
27	GND	28	-WRPROT
29	GND	30	-RDATA
31	GND	32	HDSEL
33	GND	34	DSKCHNG

Twist in Floppy Cable

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

Step 10 Install Hard Disk

Attach Primary IDE Cable to P7

The two IDE hard disk drive connectors are P6 (Secondary) and P7 (Primary). Both connectors are 40-pin dual-inline bergs. Each IDE connector supports up to two IDE drives. Use the second IDE connector if more than two IDE hard disk drives must be supported. Attach the 40-wire ribbon cable from the primary IDE drive(s) to P7. Attach the secondary (third and fourth) IDE drives to P6.

The onboard IDE controller is on the PCI bus for higher performance. The P7 pinout is:

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

P6 Secondary IDE Drive Connector

To use a third and fourth IDE hard disk drive, attach the 40-wire ribbon cable from the IDE drive to P6. The P6 pinout is:

Pin	Use	Pin	Use
1	-RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	KEY (N/C)
21	N/C	22	GND
23	-IOW	24	GND
25	-IOR	26	GND
27	IOCHRDY	28	ALE
29	N/C	30	GND
31	-IDE2INT	32	-IOCS16
33	HA1	34	N/C
35	HA0	36	HA2
37	-CS2	38	-CS3
39	-IDEACT	40	GND

Step 11 Install Adapter Cards

The Atlas PCI Pentium 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 Atlas PCI Pentium motherboard also has three PCI Local Bus expansion slots, all capable of bus mastering.

PCI Local Bus Expansion Slots

The PCI Local Bus expansion slot sockets are distinctly different than the standard ISA expansion slot sockets. These slots obviously accept a different kind of adapter card than the standard ISA adapter cards. The slots are much more compact and smaller. PCI Slots D, E, and F are all master slots.

EISA Adapter Cards

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:

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.

8-Bit ISA Slot Pinout

Pin	Use	Pin	Use
A1	IOCHCK-	B1	GND
A2	SD07	B2	RSTDRV
A3	SD06	B3	+5
A4	SD05	B4	IRQ9
A5	SD04	B5	-5
A6	SD03	B6	DREQ2
A7	SD02	B7	-12
A8	SD01	B8	OWS-
A9	SD00	B9	+12
A10	IOCHRDY	B10	GND
A11	AEN	B11	SMEMW-
A12	SA19	B12	SMEMR-
A13	SA18	B13	IOW-
A14	SA17	B14	IOR-
A15	SA16	B15	DACK3-
A16	SA15	B16	DREQ3
A17	SA14	B17	DACK1-
A18	SA13	B18	DREQ1
A19	SA12	B19	REF-
A20	SA11	B20	SYSCLK
A21	SA10	B21	IRQ7
A22	SA09	B22	IRQ6
A23	SA08	B23	IRQ5
A24	SA07	B24	IRQ4
A25	SA06	B25	IRQ3
A26	SA05	B26	DACK2-
A27	SA04	B27	T/C
A28	SA03	B28	BALE
A29	SA02	B29	+5
A30	SA01	B30	OSC
A31	SA00	B31	GND

16-Bit ISA Extension Pinout

The following 16-bit pins are an extension of the 8-bit board layout and are used in conjunction with the 8-bit board standard pins.

Pin	Use	Pin	Use
C1	SBHE-	D1	MEMCS16-
C2	LA23	D5	IOCS16-
C3	LA22	D3	IRQ10
C4	LA21	D4	IRQ11
C5	LA20	D5	IRQ12
C6	LA19	D6	IRQ13
C7	LA18	D7	IRQ14
C8	LA17	D8	DACK0-
C9	MEMR-	D9	DREQ0
C10	MEMW-	D10	DACK5-
C11	SD08	D11	DREQ5
C12	SD09	D12	DACK6-
C13	SD10	D13	DREQ6
C14	SD11	D14	DACK7-
C15	SD12	D15	DREQ7
C16	SD13	D16	+5
C17	SD14	D17	MASTER-
C18	SD15	D18	GND

32-bit EISA Slot Pinout

The following table identifies the pin values for the pins on each of the eight rows of pins on an EISA adapter card. 8- and 16-bit ISA signals are shown. Pins labeled *xxxxxx* are generally used to isolate signals on the bus from adjacent power pins. Rows A, B, C, and D are upper (ISA) contacts. Rows E, F, G, and H are lower (EISA) contacts. The following table lists the pinouts for Rows F, B, E, and A.

32-bit EISA Slot Pinout, cont'd

Row F	Row B	Row E	Row A
1 GND	1 GND	1 CMD#	1 IOCHK#
2 + 5 volts	2 RESDRV	2 START#	2 D7
3 + 5 volts	3 + 5 volts	3 EXRDY	3 D6
4 *xxxxxx*	4 IRQ 9	4 EX32#	4 D5
5 *xxxxxx*	5 - 5 volts	5 GND	5 D4
6 Access Key	6 DRQ 2	6 Access Key	6 D3
7 *xxxxxx*	7 - 12 volts	7 EX16#	7 D5
8 *xxxxxx*	8 NOWS#	8 SLBURST#	8 D1
9 + 12 volts	9 + 12 volts	9 MSBURST#	9 D0
10 M-IO	10 GND	10 W-R	10 CHRDY
11 LOCK#	11 SMWTC#	11 GND	11 AEN
12 Reserved	12 SMRDC#	12 Reserved	12 SA19
13 GND	13 IOWC#	13 Reserved	13 SA18
14 Reserved	14 IORC#	14 Reserved	14 SA17
15 BE# 3	15 DAK# 3	15 GND	15 SA16
16 Access Key	16 DRQ3	16 Access Key	16 SA15
17 BE# 2	17 DAK# 1	17 BE# 1	17 SA14
18 BE# 0	18 DRQ1	18 LA# 31	18 SA13
19 GND	19 REFRESH#	19 GND	19 SA12
20 + 5 volts	20 BCLK	20 LA# 30	20 SA11
21 LA# 29	21 IRQ 7	21 LA# 28	21 SA10
22 GND	22 IRQ 6	22 LA# 27	22 SA9
23 LA# 26	23 IRQ 5	23 LA# 25	23 SA8
24 LA# 24	24 IRQ 4	24 GND	24 SA7
25 Access Key	25 IRQ 3	25 Access Key	25 SA6
26 LA16	26 DAK# 2	26 LA15	26 SA5
27 LA14	27 T-C	27 LA13	27 SA4
28 + 5 volts	28 BALE	28 LA12	28 SA3
29 + 5 volts	29 + 5 volts	29 LA11	29 SA2
30 GND	30 OSC	30 GND	30 SA1
31 LA10	31 GND	31 LA9	31 SA0

32-bit EISA Slot Pinout, cont'd

Row H	Row D	Row G	Row C
1 LA8	1 M16#	1 LA7	1 SBHE#
2 LA6	2 IO16#	2 GND	2 LA23
3 LA5	3 IRQ 10	3 LA4	3 LA22
4 + 5 volts	4 IRQ 11	4 LA3	4 LA21
5 LA2	5 IRQ 12	5 GND	5 LA20
6 Access Key	6 IRQ 15	6 Access Key	6 LA19
7 D16	7 IRQ 14	7 D17	7 LA18
8 D18	8 DAK# 0	8 D19	8 LA17
9 GND	9 DRQ 0	9 D50	9 MRDC#
10 D51	10 DAK# 5	10 D52	10 MWTC#
11 D53	11 DRQ 5	11 GND	11 D8
12 D54	12 DAK# 6	12 D55	12 D9
13 GND	13 DRQ# 6	13 D56	13 D10
14 D57	14 DAK# 7	14 D58	14 D11
15 Access Key	15 DRQ# 7	15 Access Key	15 D12
16 D59	16 + 5 volts	16 GND	16 D13
17 + 5 volts	17 MASTER16#	17 D30	17 D14
18 + 5 volts	18 GND	18 D31	18 D15
19 MAXx#		19 MREQx#	

PCI Local Bus Pinout

The first three expansion slots in the Atlas PCI Pentium motherboard are for PCI Local Bus adapter cards, as shown on the graphic on page 16. The PCI bus master slots are P16 (Slot E), P17 (Slot F), and P18 (Slot D).

PCI Local Bus Pinout, cont'd

The 32-bit connector is from Pin 1 through Pin 62.

Pin	5V System Environment	
	Side B	Side A
1	-12V	TRST#
2	TCK	+12V
3	Ground	TMS
4	TDO	TDI
5	+5V	+5V
6	+5V	INTA#
7	INTB#	INTC#
8	INTD#	+5V
9	PRSNT1#	Reserved
10	Reserved	+5V(I/O)
11	PRSNT2#	Reserved
12	Ground	Ground
13	Ground	Ground
14	Reserved	Reserved
15	Ground	RST#
16	CLK	+5V (I/O)
17	Ground	GNT#
18	REQ#	Ground
19	+5V (I/O)	Reserved
20	AD[31]	AD[30]
21	AD[29]	+3.3V
22	Ground	AD[28]
23	AD[27]	AD[26]
24	AD[25]	Ground
25	+3.3V	AD[24]
26	C/BE[3]#	IDSEL
27	AD[23]	+3.3V
28	Ground	AD[22]
29	AD[21]	AD[20]
30	AD[19]	Ground
31	+3.3V	AD[18]
32	AD[17]	AD[16]
33	C/BE[2]#	+3.3V
34	Ground	FRAME#
35	IRDY#	Ground
36	+3.3V	TRDY#
37	DEVSEL#	Ground
38	Ground	STOP#
39	LOCK#	+3.3V
40	PERR#	SDONE

PCI Local Bus Pinout, cont'd

Pin	5V System Environment	
	Side B	**Side A**
41	+3.3V	SBO#
42	SERR#	Ground
43	+3.3V	PAR
44	C/BE[1]#	AD[15]
45	AD[14]	+3.3V
46	Ground	AD[13]
47	AD[12]	AD[11]
48	AD[10]	Ground
49	Ground	AD[09]
50	5V Connector Key	
51	5V Connector Key	
52	AD[08]	C/BE[0]#
53	AD[07]	+3.3V
54	+3.3V	AD[06]
55	AD[05]	AD[04]
56	AD[03]	Ground
57	Ground	AD[02]
58	AD[01]	AD[00]
59	+5V (I/O)	+5V (I/O)
60	ACK64#	REQ64#
61	+5V	+5V
62	+5V	+5V

Step 12 Test and Configure

Review the following points before powering up:

- make sure all adapter cards are seated properly,
- make sure all connectors are properly installed,
- if an upgrade processor is used, make sure it is seated properly,
- make sure no screws or other foreign material are 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 American Megatrends Technical Support at 404-246-8600 if there are problems.

WinBIOS Errors

If the system operates normally, a display should appear on the monitor. WinBIOS 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 (see page 2) indicates the problem. 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 page 13 for information on configuring the system via Standard Setup.

Run the ECU

Run the American Megatrends EISA Configuration Utility (ECU) to properly configure the system. The ECU and the !AMI7171.CFG and AMI7171.OVL. files are shipped on a floppy disk with all Atlas PCI EISA motherboards. The *American Megatrends EISA Configuration Utility User's Guide* provides complete details about running the ECU.

5 WinBIOS Power-On Self Test

WinBIOS provides all IBM-standard POST routines as well as enhanced WinBIOS POST routines and CPU internal diagnostics. WinBIOS POST codes can be accessed via the Manufacturing Test Port (I/O Port 80h). WinBIOS POST checkpoint codes are described in the *ISA and EISA Hi-Flex AMIBIOS Technical Reference.*

POST Phases

When the system is powered on, the WinBIOS executes POST, which has two phases:

- *System Test and Initialization* (test and initialize motherboards for normal operations), and
- *System Configuration Verification* (compare defined configuration with there hardware actually installed).

WinBIOS Error Reporting

The WinBIOS performs diagnostic when the system is powered up. Error s are reported in one of two ways:

If...	Then...
the error occurs before the display device is initialized,	a series of beeps sound. Beep codes indicate that a fatal error has occurred. The WinBIOS Beep Codes are described on the next page.
the error occurs after the display device is initialized,	the error message is displayed. Displayed error messages are explained below. A prompt to press <F1> can also appear.

Beep Codes

Errors may occur during WinBIOS POST (Power On Self Test). Fatal errors are communicated through a series of audible beeps. All errors except Beep Code 8 are fatal.

Beeps	Error message	Description
1	Refresh Failure	The memory refresh circuitry on the motherboard is faulty.
2	Parity Error	Parity error in the first 64 KB of memory.
3	Base 64 KB Memory Failure	Memory failure in first 64 KB.
4	Timer Not Operational	Memory failure in the first 64 KB or Timer 1 on the motherboard is not functioning.
5	Processor error	The CPU (Central Processing Unit) on the motherboard has generated an error.
6	8042 - Gate A20 Failure	WinBIOS cannot switch to protected mode.
7	Processor Exception Interrupt Error	The CPU on the motherboard generated an exception interrupt.
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty.
9	ROM Checksum Error	The ROM checksum value does not match the value encoded in WinBIOS.
10	CMOS Shutdown Register Read/Write Error	The shutdown register for CMOS RAM failed.

What to Do If the Computer Beeps

If the system beeps...	then...
1, 2, or 3 times...	reseat the memory SIMMs or DIPs. If the system still beeps, replace the memory.
6 times...	reseat the keyboard controller chip. If it still beeps, replace the keyboard controller. If it still beeps, try a different keyboard, or replace the keyboard fuse, if the keyboard has one.
8 times...	memory error on the video adapter. Replace the video adapter, or the RAM on the video adapter.
9 times...	the BIOS ROM chip is bad. The system probably needs a new BIOS ROM chip.
11 times...	reseat the cache memory on the motherboard. If it still beeps, replace the cache memory.
4, 5, 7, or 10 times...	the motherboard must be replaced.

WinBIOS Displayed Error Messages

If POST initializes the system video monitor, errors can be displayed on the screen. These errors usually allow the system to continue. They are listed on Page 3. Error message are displayed as follows:

```
ERROR Message Line 1
ERROR Message Line 2
Press <F1> to RESUME
```

Press <F1> to continue the boot process. The system does not halt if *Wait for <F1> If Any Error* in Advanced Setup is *Disabled.*

Error Message	Explanation
8042 Gate-A20 Error	Gate A20 on the keyboard controller (8042) is not working. Replace the 8042.
Address Line Short!	Error in the address decoding circuitry on the motherboard.
C: Drive Error	No response from drive C:. Run the Hard Disk Utility. Check the C: hard disk type in STANDARD CMOS SETUP.
C: Drive Failure	No response from drive C:. It may be necessary to replace the hard disk.
Cache Memory Bad, Do Not Enable Cache!	Cache memory on the motherboard is defective. Consult the cache memory manufacturer.
CH-2 Timer Error	Most AT motherboards include two timers. An error occurred with timer #2.
CMOS Battery State Low	CMOS RAM is powered by a battery. The battery power is low. Replace the battery.
CMOS Checksum Failure	After CMOS RAM values are saved, a checksum value is generated for error checking. This message appears if the previous value is different from the current value. Run WinBIOS Setup.
CMOS System Options Not Set	The values stored in CMOS RAM are either corrupt or nonexistent. Run WinBIOS Setup.
CMOS Display Type Mismatch	The video type in CMOS RAM does not match the type detected by WinBIOS. Run WinBIOS Setup.
CMOS Memory Size Mismatch	The amount of memory on the motherboard is different than the amount in CMOS RAM. Run WinBIOS Setup.
CMOS Time & Date Not Set	Run the STANDARD CMOS SETUP to set the date and time in CMOS RAM.
D: Drive Error	No response from drive D:. Run the Hard Disk Utility. Check the D: hard disk type in STANDARD CMOS SETUP.
D: drive failure	No response from drive D:. It may be necessary to replace the hard disk.
Diskette Boot Failure	The boot diskette in floppy drive A: cannot be used to boot the system. Use another boot diskette and follow the screen instructions.
Display Switch Not Proper	Some systems require video switch on the motherboard be set to either color or monochrome. Turn the system off, set the switch properly, then power on.
DMA Error	Error in the DMA controller on the motherboard.
DMA #1 Error	Error in the first DMA channel on the motherboard.
DMA #2 Error	Error in the second DMA channel on the motherboard.
FDD Controller Failure	WinBIOS cannot communicate with the floppy disk drive controller. Check all appropriate connections after the system is powered down.
HDD Controller Failure	WinBIOS cannot communicate with the hard disk drive controller. Check all appropriate connections after the system is powered down.

WinBIOS Displayed Error Messages

Error Message	Explanation
INTR #1 Error	Interrupt channel #1 has failed POST.
INTR #2 Error	Interrupt channel #2 has failed POST.
Invalid Boot Diskette	WinBIOS can read the diskette in floppy drive A:, but it cannot boot the system with it. Use another boot diskette and follow the screen instructions.
Keyboard Is Locked...Unlock It	The keyboard lock on the system is engaged. The system must be unlocked to continue the boot process.
Keyboard Error	Timing problem with the keyboard. Make sure a keyboard controller WinBIOS is installed. Set the *Keyboard* option in STANDARD CMOS SETUP to *Not Installed* to skip the keyboard POST routines.
KB/Interface Error	Error in the keyboard connector on the motherboard.
No ROM BASIC	Cannot find a proper bootable sector on either diskette drive A: or hard disk drive C:. Use a bootable disk.
Off Board Parity Error	Parity error in offboard memory. The format is: `OFF BOARD PARITY ERROR ADDR (HEX) = (XXXX)` *XXXX* is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.
Onboard Parity Error	Parity error in motherboard memory. The format is: `Onboard PARITY ERROR ADDR (HEX) = (XXXX)` *XXXX* is the hex address where the error occurred. Run AMIDiag to find and correct memory problems.
Parity Error ????	Parity error in system memory at an unknown address. Run AMIDiag to find and correct memory problems.

Other Messages

ISA NMI Messages

ISA NMI Message	Explanation
Memory Parity Error at *xxxxx*	Memory failed. If the memory location can be determined, it is displayed as *xxxxx*. If not, the message is *Memory Parity Error ????*.
I/O Card Parity Error at *xxxxx*	An adapter card failed. If the address can be determined, it is displayed as *xxxxx*. If not, the message is *I/O Card Parity Error ????*.
DMA Bus Time-out	A device other than the CPU has driven the bus signal for more than 7.8 microseconds.

EISA WinBIOS Error Messages

Error Message	Explanation
EISA CMOS Checksum Failure	The Checksum for EISA CMOS is incorrect. Replace the EISA Extended CMOS RAM battery.
EISA CMOS inoperational	Read/Write error in extended CMOS RAM. The battery may need to be replaced.
Expansion Board not ready at Slot *X, Y, Z*	Cannot find the adapter card in Slot *X, Y*, or *Z*. Make sure the adapter card is in the correct slot and is seated correctly.
Fail-Safe Timer NMI Inoperational	Devices that depend on the fail-safe NMI timer will not operate correctly.
ID information mismatch for Slot *X, Y, Z*.	The ID of the EISA Adapter Card in Slot *X, Y*, or *Z* does not match the ID in EISA CMOS RAM.
Invalid Configuration Information for Slot X, Y, Z.	The configuration information for EISA Adapter Cards *X, Y*, or *Z* is not correct. The adapter card in this slot cannot be configured. Run the ECU.
Software Port NMI Inoperational	The software port NMI is not working.

EISA NMI Messages

EISA NMI Message	Explanation
BUS Timeout NMI at Slot *n*	Bus Timeout NMI at Slot *n*.
(E)nable (D)isable Expansion Board?	Type *E* to enable the adapter card that had an NMI or *D* to disable it.
Expansion Board Disabled at Slot *n*	The adapter card in Slot *n* is disabled.
Expansion Board NMI at Slot *n*	An expansion board NMI occurred in Slot *n*.
Fail-Safe Timer NMI	Fail-safe timer NMI generated.
Software Port NMI	Software port NMI generated.

WinBIOS Configuration Summary Screen

WinBIOS displays the following screen when the POST routines are successfully completed.

```
WinBIOS System Configuration (C) Copyright 1985-1993 American Megatrends Inc.

Main Processor      :  P54C          Base Memory Size      :  640 KB
Numeric Coprocessor :  Present       Ext. Memory Size      :  7808 KB
Floppy Drive A:     :  1.2 MB ½      Hard Disk C: Type     :  Type 47
Floppy Drive B:     :  1.44 MB ¼     Hard Disk D: Type     :  Type 47
Display Type        :  VGA/PGA/EGA   Serial Port(s)        :  3F8, 3E8
WinBIOS Date        :  08/08/93      Parallel Port(s)      :  378
```

```
256 KB Cache Memory
90 MHz CPU Clock
```

POST Memory Test

Normally, the only visible POST routine is the memory test. shown below.

```
WinBIOS (C) 1993 American Megatrends Inc.
XXXXX KB OK

      BIOS Release 717070894


      Press <DEL> if you want to run SETUP


40-0100-0046717-00111111-121593-AMIS717-H
```

The WinBIOS Identification string appears in the left bottom corner of the screen. Press <Ins> during system boot to display two additional BIOS Identification strings. These strings contain system information and are described in the *AMIBIOS Technical Reference*.

When a problem occurs, freeze the screen by powering on the system and holding a key down, which causes a *Keyboard Error* message. Copy the BIOS Identification Strings and report this information to American Megatrends Technical Support. Press <F1> to continue. Enable the *Wait for <F1> If any Error* option in Advanced Setup before using this method to freeze the screen. The following message is displayed after POST completes:

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

Press <Del> to access WinBIOS Setup.

WinBIOS Features

The WinBIOS for the American Megatrends Atlas PCI Pentium EISA motherboard has several features that can be accessed from the keyboard at any time.

Keyboard Speed Switching

You can increase the processor speed at any time by pressing <Ctrl><Alt><+>. Processor speed can be decreased by pressing <Ctrl><Alt><->. The above values are the default settings.

Enable Cache Memory

Secondary (external) cache memory can be enabled by pressing <Ctrl><Alt><Shift><+> or disabled by pressing <Ctrl><Alt><Shift><->. The above values are the default settings.

---

6 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 has user interfaces that were not very intuitive.

A New Type of System BIOS Setup Utility

American Megatrends has now made available a new type of system BIOS Setup utility. 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.

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 mouses. WinBIOS Setup supports Microsoft-Compatible serial mouses and all PS/2-type mouses.

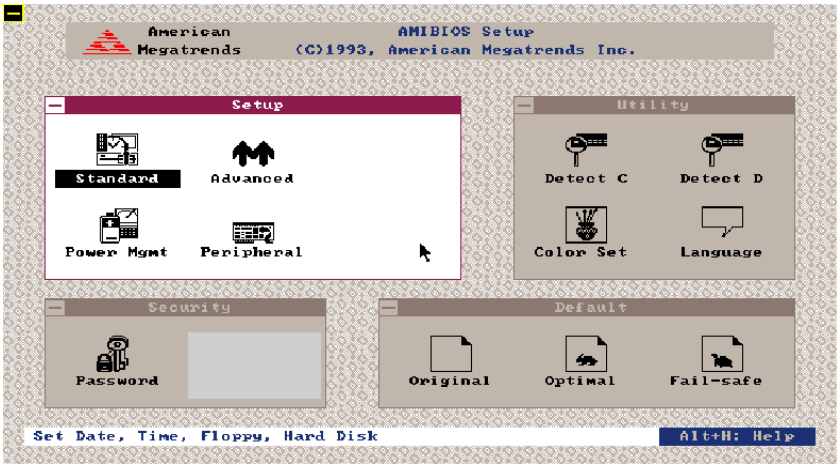
The mouse click functions are: single click to change or select both global and current fields and double clock to perform an operation in the selected field.

Using the Keyboard with WinBIOS Setup

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

<Tab>	Change or select a global field.
→, ←, ↑, ↓	Change or select the current field.
<Enter>	Performs an operation in the current field.
+	Increments a value.
-	Decrements a value.
<Esc>	Aborts any window function.
<PgUp>	Returns to the previous page.
<PgDn>	Advances to the next page.
<Home>	Returns to the beginning of the text.
<End>	Advances to the end of the text.
<Alt>	Used with certain key function, as in <Alt> <key>.
Alphabetic keys	A to Z are used in the Virtual Keyboard, and are not case-sensitive.
Numeric keys	0 to 9 are used in the Virtual Keyboard and Numeric Keypad.

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 WinBIOS function. The WinBIOS Setup icons and related functions are described in this chapter. The screen sections are:

Setup described in Section 1 on page 13, this section has five icons that permit you to set system configuration options such as date, time, hard disk type, floppy type, and many others,

Utilities described in Section 2 beginning on page 31, has four icons that perform system functions,

Security described in Section 3 beginning on page 33, has two icons that control WinBIOS security features, and

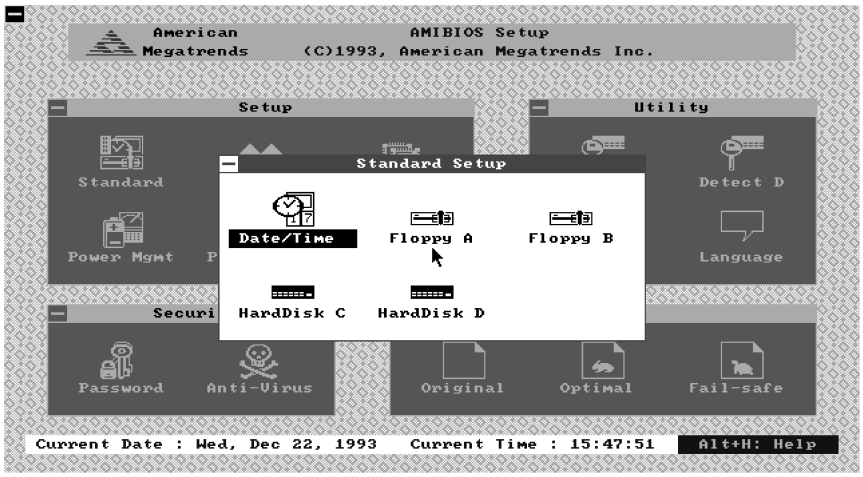
Default described in Section4 beginning on page 35, this section has three icons that permit you to select a group of settings for all WinBIOS Setup options.

Section 1

WinBIOS Setup Screens

Standard Setup

The WinBIOS Setup options described in this section are selected by choosing the appropriate high-level icon from the Standard Setup screen. Standard Setup is selected from the Setup section on the WinBIOS Setup main menu (see the previous page). All displayed icons are described in this section, although the screen display is often all you need to understand how to set the option. The Standard Setup screen follows.



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.

Hard Disk C: Type
Hard Disk D: Type

Select one of these hard disk drive icons to configure the drive named in the option. A scrollable screen that lists all valid disk drive types is displayed. Select the correct type and press <Enter>. If the hard disk drive is an IDE drive, select Detect C: or Detect D: 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. 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 (Number of heads) x (Number of cylinders) x (Number of sectors per track) x (512 bytes per sector)

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
47	USER-DEFINED HARD DRIVE - Enter user-supplied parameters.					

Using Auto Detect Hard Disk (Only for IDE Drives)

If you select Detect C: or Detect D: from the Utility section of the WinBIOS Setup main menu, WinBIOS automatically finds all IDE hard disk drive parameters. WinBIOS places the hard disk drive parameters that it finds in the Drive C: Type or Drive D: Type fields 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 appropriate high-level icon from the Advanced Setup screen. Advanced Setup is selected from the Setup section on the WinBIOS Setup main menu (see page 11). All displayed icons are described in this section, although the screen display is often all you need to understand how to set the option.

Typematic Rate (Chars/Sec)

Typematic Rate sets the rate at which characters on the screen repeat when a key is pressed and held down. The settings are 15, 20, 24, or 30 characters per second.

System Keyboard

This option does not specify if a keyboard is attached to the computer. Rather, it specifies if error messages are displayed if a keyboard is not attached. This option permits you to configure workstations with no keyboards. The settings are Absent or Present. The Optimal and Fail-Safe default settings are Present.

Primary Display

Select this icon to configure the type of monitor attached to the computer. The settings are *Mono, CGA40x25, CGA80x25, VGA/EGA,* or *Absent*. The Optimal and Fail-Safe default settings are *VGA/EGA*.

Mouse Support

When this option is enabled, WinBIOS supports a PS/2-type mouse. The settings are *Enabled* or *Disabled.*

Above 1 MB Memory Test

When this option is enabled, the BIOS memory test is performed on all system memory. When this option is disabled, the memory test is done only on the first 1 MB of system memory. The settings are *Enabled* or *Disabled.*

Memory Test Tick Sound

This option enables (turns on) or disables (turns off) the ticking sound during the memory test. The settings are *Enabled* or *Disabled.*

Memory Parity Error Checking

This option 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).

Hit <DEL> Message Display

Disabling this option prevents

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

from appearing when the system boots. The settings are *Enabled* or *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 BIOS area in low memory will be used to store hard disk information. The settings are *Top 1K* or *0:300.*

Wait for <F1> If Any Error

WinBIOS POST runs system diagnostic tests that can generate a message followed by:

```
Press <F1> to continue
```

If this option is enabled, WinBIOS waits for the end user to press <F1> before continuing. If this option is disabled, WinBIOS continues the boot process without waiting for <F1> to be pressed. The settings are *Enabled* or *Disabled.*

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 settings are *On* or *Off.*

Floppy Drive Seek At Boot

When this option is enabled, WinBIOS performs a Seek command on floppy drive A: before booting the system. The settings are *Enabled* or *Disabled.*

System Boot Up Sequence

This option sets the sequence of boot drives (either floppy drive A: or hard disk drive C:) that the WinBIOS attempts to boot from after WinBIOS POST completes. The settings are *C:,A:* or *A:,C:*.

System Boot Up CPU Speed

This option sets the speed of the CPU at system boot time. The settings are *High* or *Low.*

Internal/External Cache Memory

This option enables internal (L1) and secondary (L2) cache memory. The settings are:

Setting	Optimal default setting	Fail-Safe defaul setting	Description
Both	_		Enable both internal L1 cache memory on the CPU and secondary (external) L2 cache memory.
Internal			Enable only internal L1 cache memory on the CPU.
Disabled		_	Disable both internal L1 cache memory on the CPU and secondary (external) L2 cache memory.

External Cache Mode

This option selects the type of caching algorithm used by WinBIOS and the computer for L2 (external) secondary cache memory. The settings are *Wr-Thru* or *Wr-Back*.

Internal Cache Mode

This option selects the type of caching algorithm used by WinBIOS and the computer for L1 internal cache memory. The settings are *Wr-Thru* or *Wr-Back*.

Adaptor Shadow Cacheable

When this option is set to *Enabled,* the contents in system DRAM memory of any ISA adaptor ROM that has been shadowed to RAM will also be copied to cache memory. The setting are *Enabled* or *Disabled.*

System BIOS Cacheable

When this option is set to *Enabled,* the contents in system DRAM memory of the system BIOS ROM that has been shadowed to RAM will also be copied to cache memory. The setting are *Enabled* or *Disabled.*

Password Checking

This option enables the password check option every time the system boots or the end user runs Setup. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if WinBIOS is executed. See page 33 for instructions on changing a password. The Optimal and Power-On defaults are *Setup.*

Video ROM Shadow C000,32K

When this option is set to *Enabled,* the video ROM area from C0000h - C7FFFh is copied (shadowed) to RAM for faster execution. The settings are *Absent, Present,* or *Shadow.*

ISA Adaptor ROM at C800,16K
ISA Adaptor ROM at CC00,16K
ISA Adaptor ROM at D000,16K
ISA Adaptor ROM at D400,16K
ISA Adaptor ROM at D800,16K
ISA Adaptor ROM at DC00,16K

These options enable shadowing of the contents of the ISA Adaptor ROM area named in the option title. The settings are *Absent, Present,* or *Shadow.* The ROM area that is set to *Absent* will be allocated to PCI adapter cards.

Chipset Setup

The WinBIOS Setup options described in this section are selected by choosing the appropriate high-level icon from the Chipset Setup screen. Chipset Setup is selected from the Setup section on the WinBIOS Setup main menu (see page 11). All displayed icons are described in this section, although the screen display is often all you need to understand how to set the option.

Base Memory Size

This option sets the size of the base system memory. The settings are *512 KB* or *640 KB*.

ISA VGA Frame Buffer Size

This option must be set to *Enabled* if the VGA card installed in the system requires a frame buffer. This option sets the size of the VGA frame buffer. The settings are *Disabled, 1 MB, 2 MB,* or *4 MB*.

ISA VGA Frame Buf. Base Addr

This option automatically sets the base address (or starting point) of the ISA VGA frame buffer according to the size of the VGA frame buffer.

ISA IRQ 9

At least one IRQ must be free for each PCI Card in the system. If the PCI Card includes a multifunction device, at least two or more IRQs must be free. This option specifies if IRQ 9 is used on the ISA bus. If not used, it may be allocated to the PCI bus. The settings are *ISA* or *PCI.*

ISA IRQ 10

At least one IRQ must be free for each PCI Card in the system. If the PCI Card includes a multifunction device, at least two or more IRQs must be free. This option specifies if IRQ 10 is used on the ISA bus. If not used, it may be allocated to the PCI bus. The settings are *ISA* or *PCI.*

ISA IRQ 11

At least one IRQ must be free for each PCI Card in the system. If the PCI Card includes a multifunction device, at least two or more IRQs must be free. This option specifies if IRQ 11 is used on the ISA bus. If not used, it may be allocated to the PCI bus. The settings are *ISA* or P*CI.*

ISA IRQ 15

At least one IRQ must be free for each PCI Card in the system. If the PCI Card includes a multifunction device, at least two or more IRQs must be free. This option specifies if IRQ 15 is used on the ISA bus. If not used, it may be allocated to the PCI bus. The settings are *ISA* or *PCI.* The Optimal and Power-On defaults are *PCI.*

PCI IRQ

This option specifies if ISA IRQs 9, 10, 11, and 15 assigned to PCI are edge-triggered or level-triggered. The settings are *Level* or *Edge.*

Offboard NCR 53C810 SCSI BIOS

Set this option to *Enabled* when a PCI adapter card with an NCR 53C810 SCSI controller is installed in any PCI expansion slot on the motherboard. These adapter cards do not have an onboard PCI SCSI BIOS and must use the PCI SCSI BIOS on the Atlas PCI EISA motherboard. The settings are *Enabled* or *Disabled.*

PCI VGA Palette Snooping

This option must be set to *Enabled* if any EISA or ISA adapter card installed in the system requires VGA palette snooping. The settings are *Enabled* or *Disabled.*

Power Management Setup

The WinBIOS Setup options described in this section are selected by choosing the appropriate high-level icon from the Power Mgmt Setup screen. Power Mgmt Setup is selected from the Setup section on the WinBIOS Setup main menu (see page 11). All displayed icons are described in this section, although the screen display is often all you need to understand how to set the option.

Aux Power Off Timeout

This option specifies the length of time of keyboard, mouse, COM1, and COM2 inactivity that must expire before the auxiliary power is shut off. Power supplies that support this feature can attach its two-wire cable to J8 and shut off auxiliary power. The settings are *Disabled* and *1 Min* through *255 Min* in one minute intervals. The Optimal and Fail-Safe settings are *Disabled.*

Monitor Low Power Mode

This option specifies the length of time of keyboard, mouse, COM1, and COM2 inactivity that must expire before the motherboard drives the SYNC ENABLE, HSYNC, and VSYNC signals Low through open collector outputs. The 10 to 26-wire cable must be connected between P19 and the VGA adapter card feature connector. The signals on the feature connector must not be output only.

Monitors that support the display power management specification (DPMS) will switch the power off looking at this condition, thereby saving power. The settings are *Disabled* or *1 Min* through *255 Min* in one minute intervals. The Optimal and Fail-Safe settings are *Disabled.*

Peripheral Setup

The WinBIOS Setup options described in this section are selected by choosing the appropriate high-level icon from the Peripheral Setup screen. Peripheral Setup is selected from the Setup section on the WinBIOS Setup main menu (see page 11). All displayed icons are described in this section, although the screen display is often all you need to understand how to set the option.

Programming Mode

The settings are *Auto* or *Manual.* When set to *Auto,* the BIOS automatically detects all adapter cards installed in the system and configures the onboard I/O (serial ports, parallel ports, floppy controllers, and IDE controller) automatically. All other Peripheral Setup option settings are ignored. Any serial port, parallel port, floppy controller, or IDE (Integrated Drive Electronics) controller on an adapter card in an expansion slot is configured before onboard I/O. If *Auto* is selected, the BIOS also attempts to avoid IRQ conflicts.

If the offboard serial ports are configured to specific starting I/O ports via jumper settings, the BIOS will configure the onboard serial ports to avoid conflicts. For example, if the default serial port starting I/O ports (serial port1 - 3F8h, serial port2 - 2F8h, serial port3 - 3E8h, serial port4 - 2E8h) are used, the following configurations are possible:

If there are...	the ports are configured as...	and the two onboard serial ports are configured as...
two offboard serial ports	3E8h and 2F8h	3E8h and 2E8h
two offboard serial ports	3F8h and 3E8h	3F8h and Disabled
one offboard serial port	2F8h	3F8h and Disabled
one offboard serial port	3F8h	2F8h and Disabled

If *Manual* is selected, the settings chosen by the end user in Peripheral Setup apply. WinBIOS reports any I/O conflicts after displaying the BIOS Configuration Summary Screen, but only if *Manual* is chosen.

On-Board Floppy Drive

This option enables the use of the floppy drive controller on the motherboard (if installed). The settings are *Enabled* or *Disabled.*

On-Board IDE Drive

This option enables the use of the IDE controller on the motherboard (if installed). The settings are *Enabled* or *Disabled.*

First Serial Port Address

IRQ4 is used for the first serial port (COM1). This option enables serial port 1 on the motherboard (if installed). The settings are *2E8h.*

Second Serial Port Address

IRQ3 is used for the second serial port (COM2). This option enables serial port 2 on the motherboard, if installed. The settings are *2E8h*.

Parallel Port Address

IRQ7 is used for the parallel port (LPT1). The IRQ can be changed to IRQ5. This option enables the parallel port on the motherboard, if installed. The settings are *278h*.

IRQ Active State

This option specifies if the parallel and serial port IRQs are active high or active low. The settings are *Low* or *High*.

Parallel Port Mode

This option specifies the parallel port Mode. The settings are *Normal* or *Extended.*

PCI IDE Card Present In

Set this option when installing a PCI IDE adapter card. This option specifies the PCI slot occupied by a PCI IDE adapter card. The settings are *Absent, Slot D, Slot E,* or *Slot F.*

PCI IDE IRQ Connected to

This option specifies the way in which the PCI IDE IRQ in any of the PCI slots is connected. The settings are *INTA, INTB, INTC,* or *INTD.*

IDE 32 Bit Transfer

This option enables 32-bit data transfers on the IDE data port. If disabled, 16-bit data transfer is used by the BIOS. 32-bit data transfers can only be enabled if IDE prefetch mode is also enabled. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

IDE LBA Mode

Set this option to *Enabled* if using an IDE drive that supports LBA (Logical Block Address) mode. IDE drives with a capacity greater than 500 MB support LBA mode. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

IDE Block Mode

This option enables multiple sector reads and writes for IDE drives. The settings are *Enabled* or *Disabled.* The Optimal and Power-On defaults are *Disabled.*

PCI IDE Host Timing

The settings are *Slow* or *Fast.* The *Fast* setting saves one clock on the lead-off cycle of the onboard PCI IDE. The Optimal and Fail-Safe default settings are *Slow.*

PCI IDE Prefetch Mode

Enabling this option enables this performance enhancement feature on the onboard PCI IDE. IDE data prefetch, when enabled, saves valuable CPU time by taking the data from the IDE drive ahead of the CPU request. The settings are *Enabled* or *Disabled.* The Optimal and Fail-Safe default settings are *Enabled.*

PCI IDE 0 Transfer Mode

This option sets the data transfer mode for the PCI IDE circuitry on hard disk drive C: (disk 0). The settings are *Auto, Mode 0, Mode 1,* or *Mode 2.* If *Auto* is selected, WinBIOS automatically determines the optimal mode. The WinBIOS Auto Detect Hard Disk feature can detect and report all IDE drive parameters. The Optimal and Fail-Safe default settings are *Mode 0.*

PCI IDE 1 Transfer Mode

This option sets the data transfer mode for the PCI IDE circuitry on hard disk drive D: (disk 1). The settings are *Auto, Mode 0, Mode 1,* or *Mode 2.* If *Auto* is selected, WinBIOS automatically determines the optimal mode. The WinBIOS Auto Detect Hard Disk feature can detect and report all IDE drive parameters. The Optimal and Fail-Safe default settings are *Mode 0.*

Secondary IDE Drive

Set this option to *Enabled* when using the secondary IDE controller to control the third and fourth IDE drives installed in the computer. The settings are *Enabled* or *Disabled.*

Section 2

Utility

The following icons appear in this section:

Detect C:	if drive C: is an IDE drive, the hard disk drive parameters for drive C: are automatically detected and reported to the Hard Disk Drive C: screen in Standard Setup, so you can easily configure drive C:.
Detect D:	if drive D: is an IDE drive, the hard disk drive parameters for drive D: are automatically detected and reported to the Hard Disk Drive D: screen in Standard Setup, so you can easily configure drive D:.
Color Set	sets the WinBIOS Setup screen colors.

Section 3

WinBIOS Password Support

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 (see page 21) 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 stored in CMOS RAM.

The system asks for a password.

Enter a 1 – 6 character password. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain CMOS RAM and reconfigure the system.

If You Do Not Want to Use a Password

Just press <Enter> when the password prompt appears.

Changing a Password

Select the *Password* icon from the Security section of the WinBIOS Setup main menu. Enter the password and press <Enter>. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press <Enter>.

If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press <Esc> to return to the WinBIOS Main Menu. The password is stored in CMOS RAM after WinBIOS completes. The next time the system boots, you are prompted for the password if the password function is present and is enabled.

Remember the Password

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

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 CMOS RAM 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.

7 Flash ROM Programming

The American Megatrends Atlas PCI Pentium 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.

There are three methods for programming the Flash EPROM:

- program from system boot,
- set U86 switch 2 ON, or
- run the AMIFlash utility.

Programming Flash from System Boot

Using the floppy disk with the new BIOS file, press and hold down the <Home> key to reprogram the Atlas PCI Pentium motherboard Flash EPROM-based WinBIOS before DOS boots.

Using AMIFlash

AMIFlash is a DOS utility that is executed from the DOS command line. You can reprogram the Atlas PCI Pentium motherboard Flash EPROM-based WinBIOS from the DOS command prompt using AMIFlash.

Set U86 Switch 2

Insert the floppy disk with the new BIOS in floppy drive A:. Set U86 switch 2 ON to program the Flash EPROM.

Reprogramming from System Boot

When you reprogram from system boot, the American Megatrends Flash utility:

1. reads S717P.ROM from the root directory of the floppy disk in drive A:,
2. erases the Flash EPROM,
3. programs the Flash EPROM with the data read from the floppy disk in drive A:, and
4. generates a CPU reset, rebooting the system.

The AMIFlash portion of Flash EPROM is not programmed.

S717P.ROM

S717P.ROM resides on a floppy disk and contains the updated main BIOS code. American Megatrends will provide this file when the WinBIOS for the Atlas PCI Pentium motherboard must be updated.

S717P.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 S717P.ROM.

Programming the Flash EPROM

Step	Action
1	Turn system power off.
2	Place the floppy disk that has the latest S717P.ROM BIOS file in floppy drive A:.
3	Make sure that the system has a speaker that is connected.
4	Turn system power on while pressing and holding down the <Ctrl> and <Home> keys.

Sequence of Operation

The following table lists the sequence of operation and the expected behavior of the AMIFlash Code.

Step	Action	Expected behavior
1	1 Look for floppy disk.	The system beeps one time before the BIOS attempts to read from floppy drive A:.
2	Look for S717P.ROM on the floppy disk.	S717P.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 the BIOS file size.	The BIOS file size is checked. There is no beep if this step is successful.
5	Check for a 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 (the system reboots).
10	Reboot	Reboot the system.

Beep Codes

During normal operation, the Flash utility produces a series of beeps to:

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

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

Step	Beeps	Description
—	None	Successful completion.
1	Continuous Single Beep	There is no floppy disk in Drive A:.
2	Five Beeps	S717P.ROM is not present in the root directory of the floppy disk in the A: drive.
3	Seven Beeps	Floppy Read Error.
4	Six Beeps	BIOS File Size Error.
5	Eight Beeps	An Intel i28F001BX-T Flash EPROM is not present.
6	Continuous Two Beeps	There is a problem in erasing the Flash EPROM.
7	Continuous Three Beeps	There is a problem in programming the Flash EPROM.
9	Continuous Four Beeps	The BIOS is not able to reset the CPU.

AMIFlash Checkpoint Codes

Code	Description
02h	Verify the AMIFlash BIOS checksum and disable internal cache memory.
0Eh	Make the CMOS RAM checksum bad and initialize the CMOS RAM status registers.
10h	Disable DMA Controllers 1 and 2 and Interrupt Controllers 1 and 2.
13h	Initialize the chipset registers.
18h	If the main BIOS is good, transfer control to the main BIOS.
1Bh	Initialize the system timer.
1Dh	Begin the refresh test.
20h	Begin the 16 KB base memory test.
23h	Initialize the interrupt vectors.
28h	Determine the CPU clock frequency.
30h	Program the system speed-dependent parameters according to the CPU clock frequency.
40h	Begin the memory test.
50h	The memory test has completed.
65h	Initialize the DMA controller.
67h	Initialize the interrupt controller.
80h	Initialize the I/O chipset, if any.
85h	Enable the appropriate IRQs.
86h	Enable the internal cache memory.
88h	Initialize the floppy drives.
90h	Indicate an error. The BIOS stops here if there is an error.
A0h	Reading the floppy disk in drive A: to program the Flash EPROM.
E0h	Configure the proper stack.
E3h	Display a message to ask the user to insert the AMIFlash Floppy Disk in drive A:.
E4h	Floppy read error.
E5h	Begin the search for the S717P.ROM file in the floppy root directory.
E6h	The S717P.ROM file not present in the floppy disk root directory.
E7h	Begin reading the File Allocation Table.
E8h	Begin reading S717P.ROM, sector by sector.
E9h	S717P.ROM is not the proper size.
EFh	Disable internal cache memory.
F0h	Enable and reset flash memory.
F1h	Detect the flash type if present.
F2h	Flash memory not detected.
F3h	Begin erasing flash blocks.
F4h	Begin programming flash blocks.
FFh	Flash programming successful and the system reboots, if possible.

AMIFlash

Starting AMIFlash

Type

```
AMIFlash
```

and press <Enter> at the DOS prompt. AMIFlash will prompt for the filename. Type

```
S717P.ROM
```

and press <Enter>. Pressing <Esc> exits AMIFlash any time before Flash EPROM reprogramming begins.

General Operation

If Flash EPROM is present, AMIFlash asks if you want to save the existing BIOS file. If you choose to save the BIOS, enter the filename where the existing BIOS will be saved.

Enter the filename with which Flash EPROM will be reprogrammed (S717P.ROM). AMIFlash reads the file and displays a startup message. A Press any key to continue. After Flash programming starts, programming activity is indicated by a rotating / character. AMIFlash informs you when Flash programming is successful (as shown below). Press any key to reboot the system.

Errors During Flash Programming

If an error occurs during programming, an error messages is displayed and the system halts. Turn power off and replace the Flash EPROM with a new programmed Flash EPROM to make the system usable.

AMIFlash Messages

Message	Explanation
Save Existing BIOS ?	Press Y to save the existing BIOS.
Enter Filename:	Enter the filename in which the existing BIOS will be saved in the following format: Drive:\Pathname\Filename.Ext and press <Enter>.
Enter BIOS Filename:	Enter the filename with which the Flash EPROM will be programmed in the following format: Drive:\Pathname\Filename.Ext and press <Enter>.
Programming Flash EPROM	Displayed when the Flash EPROM is being programmed.
Saving BIOS File in Disk	Displayed when the existing BIOS is saved to disk.
Reading BIOS File from Disk	Displayed when the file with which Flash EPROM will be programmed is being read from the disk.
Press <ESC> to Exit	When this message is displayed, you can exit AMIFlash by pressing <Esc>.
Press Any Key to Exit	Usually displayed below another message when a fatal error occurs, for example, no Flash EPROM present in system or the hardware is not accessible.
Press Any Key to ReBoot	Displayed after successful Flash EPROM programming.
Want to Continue?	Displayed after an error message.
Want to Exit (Y/N)?	Displayed when you press <Esc>.
Please Wait..	Displayed when Flash programming is occurring.
Put Off System Power	Displayed if there is an error during Flash programming. Replace the Flash EPROM with a new programmed Flash EPROM.
No Flash EPROM present	Displayed if no Flash EPROM is present in the system.
Memory Allocation Error	Displayed when scratch memory is not available.
File Creation Error	Displayed when the specified BIOS save file could not be created.
File Does Not Exist	Displayed when the Flash EPROM program file could not be found.
File I/O Error	Displayed during a read or write error.
Disk Full	Displayed when the disk where the existing BIOS was to be saved has no space.
Flash EPROM Programming Error.	Displayed if an error occurs during Flash programming. The system is not usable unless the existing Flash EPROM is replaced with the new Programmed Flash EPROM.
BIOS File Not Of Proper Size	Displayed when the file size of the new program does not match the Flash EPROM size.
Flash EPROM Programming is going to start	The system is not usable until Flash EPROM programming is completed successfully. If an error occurs, the existing Flash EPROM must be replaced by a new programmed Flash EPROM. The system must not be turned off during programming. The system reboots if programming is completed successfully.

A Temperature and Power

Temperature Ranges

The maximum motherboard temperature is limited by the Intel Pentium CPU and the 3.3V voltage regulator. These parts use the most power and are the hottest components.

The temperature range specifications depend on the CPU frequency, the size of the heat sink, the ambient temperature requirements, and airflow.

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. See the specifications for the Intel P54C CPU for additional information.

Frequency	0.65" Heat Sink	Airflow over CPU	Airflow over other components	Temperature Range
60 or 90 MHz	YES	600 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 Atlas EISA Pentium motherboard is 20% to 80% non-condensing.

Power Requirements

The Atlas EISA Pentium motherboard requires +5V ~9A. The ISA bus requirements are:

+3.3V ~13A
+5V ~24A
-5V 1.6A
+12V 5A
-12V 2.4A

The +12V power supply to the EISA bus is limited by the power connector.

The +5V supply current to the EISA bus is limited by the power connectors. If the third power connector is used, ~24 Amps can be used by EISA and PCI adapter cards.

If the third power connector is not used, only ~11 Amps can be used by EISA and PCI adapter cards.

Conclusion

The minimum rating of the power supply should be 230 Watts for a fully loaded motherboard, including a 12V power source.

B EISA Configuration Worksheets

Two-page worksheets for six EISA adapter cards follow. Complete a worksheet for each EISA adapter card in the system to simplify the EISA configuration process. These worksheets can be used in conjunction with the American Megatrends EISA Configuration Utility (ECU) and the Atlas PCI EISA motherboard EISA configuration files — !AMI7171.CFG and AMI7171.OVL.

Motherboard Configuration

Serial Number _____

Revision Number _____

ECN Number _____

Memory Type for Bank1: ___ 256 KB x 36 SIMMs
(check the type used) ___ 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

Memory Type for Bank2, Bank3 ___ 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

Memory Installed: ___ Bank1
(check the banks installed) ___ Bank2
___ Bank3

Total Amount of Memory: _____ MB

EISA Slot 1

Card Description: _____

Manufacturer: _____

EISA Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B___ Type C

Share: ___ Yes ___ No

EISA Slot 1, cont'd

Interrupt Description

Edge-Triggered Interrupts:

Interrupt line used: ___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Share: ___ Yes ___ No

Level-Triggered Interrupts

Interrupt line used: ___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA Slot 2

Card Description: _____

Manufacturer: _____

EISA Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B___ Type C

Share: ___ Yes ___ No

EISA Slot 2, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used:	___ IRQ3 ___ IRQ4	
	___ IRQ5 ___ IRQ6	
	___ IRQ7 ___ IRQ9	
	___ IRQ10	___ IRQ11
	___ IRQ12	___ IRQ14
		___ IRQ15
Share:	___ Yes	___ No

Level-Triggered Interrupts

Interrupt line used:	___ IRQ3 ___ IRQ4	
	___ IRQ5 ___ IRQ6	
	___ IRQ7 ___ IRQ9	
	___ IRQ10	___ IRQ11
	___ IRQ12	___ IRQ14
		___ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA Slot 3

Card Description: _____

Manufacturer: _____

EISA Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B___ Type C

Share: ___ Yes ___ No

EISA Slot 3, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used:	___ IRQ3 ___ IRQ4	
	___ IRQ5 ___ IRQ6	
	___ IRQ7 ___ IRQ9	
	___ IRQ10	___ IRQ11
	___ IRQ12	___ IRQ14
		___ IRQ15
Share:	___ Yes	___ No

Level-Triggered Interrupts

Interrupt line used:	___ IRQ3 ___ IRQ4	
	___ IRQ5 ___ IRQ6	
	___ IRQ7 ___ IRQ9	
	___ IRQ10	___ IRQ11
	___ IRQ12	___ IRQ14
		___ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA Slot 4

Card Description: _____

Manufacturer: _____

EISA Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B___ Type C

Share: ___ Yes ___ No

EISA Slot 4, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used:

___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Share: ___ Yes ___ No

Level-Triggered Interrupts

Interrupt line used:

___ IRQ3 ___ IRQ4
___ IRQ5 ___ IRQ6
___ IRQ7 ___ IRQ9
___ IRQ10 ___ IRQ11
___ IRQ12 ___ IRQ14
___ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA Slot 5

Card Description: _____

Manufacturer: _____

EISA Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B___ Type C

Share: ___ Yes ___ No

EISA Slot 5, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used:	___ IRQ3	___ IRQ4
	___ IRQ5	___ IRQ6
	___ IRQ7	___ IRQ9
	___ IRQ10	___ IRQ11
	___ IRQ12	___ IRQ14
		___ IRQ15

Share: ___ Yes ___ No

Level-Triggered Interrupts

Interrupt line used:	___ IRQ3	___ IRQ4
	___ IRQ5	___ IRQ6
	___ IRQ7	___ IRQ9
	___ IRQ10	___ IRQ11
	___ IRQ12	___ IRQ14
		___ IRQ15

Switch and Jumper Settings

_____

_____

_____

EISA Slot 6

Card Description: _____

Manufacturer: _____

VL-Bus Master: ___ Yes ___ No
___ 16-bit ___ 32-bit

ISA Master: ___ Yes ___ No
___ 8-bit ___ 16-bit

Memory Description

Space is provided below for configuration information for two memory banks. Some EISA adapter cards have up to eight memory banks. Duplicate this sheet if there are more than two memory banks.

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

Amount of Memory: _____

Starting Address (hex): _____

Cacheable: ___ Yes ___ No

Type: ___ RAM ___ ROM

Use: ___ System ___ Expanded ___ Virtual ___ Other

DMA Channel Description

DMA channels used: ___ 0 ___ 1 ___ 2 ___ 3
___ 5 ___ 6 ___ 7

Data size ___ 8-bit ___ 16-bit ___ 32-bit

Timing: ___ Compatible ___ Type A
___ Type B ___ Type C

Share: ___ Yes ___ No

EISA Slot 6, cont'd

Interrupt Description

Edge-Triggered Interrupts

Interrupt line used:	___ IRQ3 ___ IRQ4	
	___ IRQ5 ___ IRQ6	
	___ IRQ7 ___ IRQ9	
	___ IRQ10	___ IRQ11
	___ IRQ12	___ IRQ14
		___ IRQ15
Share:	___ Yes	___ No

Level-Triggered Interrupts

Interrupt line used:	___ IRQ3 ___ IRQ4	
	___ IRQ5 ___ IRQ6	
	___ IRQ7 ___ IRQ9	
	___ IRQ10	___ IRQ11
	___ IRQ12	___ IRQ14
		___ IRQ15

Switch and Jumper Settings

_____

_____

_____

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