American Megatrends, Inc.

Atlas PCI LPX

Pentium

ISA Motherboard

User's Guide

MAN-725
6/6/95

American Megatrends, Inc.
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Revision History

5/30/95 Initial release of preliminary version.

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Preface

To the OEM

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

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

Technical Support

If an American Megatrends motherboard fails to operate as described or you are in doubt about a configuration option, please call technical support at 404-246-8645.

American Megatrends BBS

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

Data Transmission Rates The American Megatrends BBS automatically handles modems with data transmission rates from 1,200 to 14,400 bps.

If using an HST modem, call 404-246-8780. If using a non-HST modem, call 404-246-8782.

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
404-246-8780	Supports HST and v.42.
404-246-8781	Supports HST and v.42.
404-246-8782	Dual standard. Can handle 2400 or 9600 bps. Supports v.32 and v.42. Can handle up to 14,400 baud.
404-246-8783	Supports v.32 and v.42.

Packing List

You should have received the following:

- an Atlas PCI LPX ISA motherboard,
- a Warranty Card,
- The *American Megatrends Atlas PCI LPX ISA Motherboard User's Guide*, and
- three Atlas PCI LPX video driver diskettes.

Contents of DOS/Windows Diskette 1 The DOS/Windows video driver diskette 1 of 2 should contain:

Directory	Subdirectory	Filename
(ROOT)		INSTALL.VSF
		OS2DISG.EXE
		UTILITY.LZH
		VGATEST.EXE
		INSTALL.HLP
		CUSTOM.VDB
		IBM_8514.VDB
		MIT_15.VDB
		MIT_17.VDB
		MIT_21.VDB
		NEC_3FGX.VDB
		NEC_4FG.VDB
		NEC_5FG.VDB
		NEC_6FG.VDB
		VESA75.VDB
		VGA.VDB
		README
		REPORT.TXT
		M64DIAG.EXE
		README.COM
		OS2INST.EXE
		CUSTOM.COM
		INSTALL.EXE
		SUPERVGA.VDB
		DRVRNOTE.LZH
	WINDOWS	WININST.EXE
		WININST.HLP
		MACXS.LZH
		MACXW.LZH
		MACXE.LZH
		ATIDESK.LZH
		README
	USTATION	USINST.EXE
		USINST.HLP
		USDRIVER.LZH

Cont'd

Contents of DOS/Windows Diskette 2 The DOS/Windows video driver diskette 2 of 2 should contain:

Directory	Subdirectory	Filename
(ROOT)		DRVRNOTE.LZH
	PM	PMINST.EXE
		PMINST.HLP
		OS2DRV.LZH
	VIDEO	WINVIDD.LZH
		WINVIDS.LZH
		WINVIDW.LZH
		TIMEWARP.LZH
	WORD	WORDINST.EXE
		WORDINST.HLP
		WORDRVRS.LZH
	ACAD	ACADINST.EXE
		ACADINST.HLP
		RCTRUBOC.LZH

Contents of Windows NT 3.5 Diskette The Windows NT Version 3.5 video driver diskette 2 of 2 should contain:

Directory	Subdirectory	Filename
(ROOT)		REPORT.TXT
	NT35	ATI_VID
		SSDPMS.SCR
		SSDPMS.HLP
		OEMSETUP.INF
		README.INT
		ATI.DLL
		TXTSETUP.OEM
		ATI.SYS

1 System Overview

The American Megatrends Atlas PCI LPX Pentium ISA motherboard is a high performance all-in-one motherboard with integrated local bus video, IDE, and I/O. The Atlas PCI LPX motherboard supports an Intel Pentium® CPU running at 75, 90, 100, and 120 MHz. CPUs running at higher speeds will be supported when available.

Atlas PCI LPX Dimensions

The Atlas PCI LPX motherboard is approximately 9 inches wide by 13 inches long (the standard Western Digital LPX size with similar mounting hole locations).

System Description

CPU Type The Atlas PCI LPX motherboard supports a 75, 90, 100, or 120 MHz Intel Pentium P54C CPU in a single 320-pin ZIF socket. Pentium CPUs running at higher speeds will be supported when available.

CPU SpeedHost Clock RatePCI Clock Rate75 MHz502590 MHz6030100 MHz66.6633.331 20 MHz6030133 MHz66.6633.33		

The Atlas PCI LPX motherboard includes Socket 7 and VRM support.

Programmable Crystal Oscillator The Atlas PCI LPX motherboard has a programmable crystal oscillator that supports all possible motherboard frequencies.

Heat Sink A heat sink or a heat sink and fan are required for every Pentium CPU. If the Atlas PCI LPX motherboard is shipped with a CPU, the following types of cooling are supplied:

CPU Type	Heat Sink
75 MHz	Heat sink
90 MHz	Heat sink
100 MHz	Heat sink and fan
120 MHz	Heat sink and fan
133 MHz	Heat sink and fan

Cont'd

System Description, Continued

CPU Speeds The Atlas PCI LPX motherboard has two clock speeds: high and low. High clock speed is factory-set to the speed of the installed Pentium CPU (50, 60, or 66 MHz). Low clock speed is achieved by adding the appropriate number of software delays, depending on the speed of the processor, and emulates an IBM® AT running at approximately 8 MHz.

Speed selection is through the turbo switch or the keyboard. Press <Ctrl> <Alt> <+> for high speed and <Ctrl> <Alt> <-> for low speed.

Cache Memory The Atlas PCI LPX motherboard supports 256 KB or 512 KB of L2 cache memory through a plug-in cache module. The cache module used must conform to the Intel COAST Version 1.0 specification. A 160-pin cache module connector is mounted on the motherboard.

Supported Cache Modules Supported cache modules include:

L2 Cache Size	Type
256 KB	Asynchronous
512 KB	Asynchronous
256 KB	Pipeline burst
512 KB	Pipeline burst
256 KB	Synchronous burst
512 KB	Synchronous burst

Cache Access Times The access times for L2 secondary cache memory are:

Host Clock Rate	Asynchronous SRAM Access Time	Burst SRAM Clock to Output Access Time
50 MHz	15 ns	13.5 ns
60 MHz	15 ns	10 ns
66.66 MHz	15 ns	8.5 ns

Cont'd

Internal Cache The Intel Pentium CPUs have 16 KB of internal L1 cache memory. All system memory can be cached in internal cache memory.

Main System Memory The Atlas PCI LPX motherboard supports up to 128 MB of DRAM system memory in two memory banks mounted directly on the motherboard.

The memory sockets use SIMM (Single Inline Memory Modules). Standard fast page mode or Extended Data Out (EDO) memory types are supported and can be used together in the same memory bank.

SIMM Types The Atlas PCI LPX motherboard supports fast page mode SIMMs operating at 70 ns (RAS access time). The SIMMs can be single-sided or double-sided. The following SIMM types can be used:

- 256 KB x 32 or 36,
- 1 MB x 32 or 36,
- 4 MB x 32 or 36,
- 8 MB x 32 or 36, and
- 16 MB x 32 or 36 SIMMs

Memory Restrictions The following restrictions apply to motherboard memory:

- System memory slots must be populated one bank at a time. Each bank of memory consists of two SIMM modules.
- The same type of SIMMs must be used within a bank of memory.

Cont'd

Description, Continued

Integrated Video The Atlas PCI LPX motherboard has an ATI 264CT VGA controller and 1 MB of VGA memory on the motherboard. The motherboard provides the following video features:

- expandable to 2 MB of video memory on the motherboard,
- 64-bit VGA memory path support,
- supports fast page mode and EDO VGA memory,
- supports a maximum screen resolution of 1600 x 1200 with eight colors (interlaced),
- includes a 26-pin bidirectional VESA VFAC connector, and
- provides VGA output through a standard DB15 connector.

System BIOS The Atlas PCI LPX motherboard has a 64 KB AMIBIOS at F0000h - FFFFFh with built-in WINBIOS Setup. WINBIOS Setup has a graphical user interface that is extremely easy to use.

WINBIOS Setup allows you to bypass error messages for missing video, keyboard, or floppy drives to facilitate the building of file servers. The system BIOS is stored in a Flash EPROM and can easily be upgraded.

AMIBIOS Features The AMIBIOS features include:

- AMIBIOS WINBIOS Setup stored in a flash EPROM,
- System Information easily accessed by clicking on icon in BIOS Setup,
- PCI to PCI bridge support,
- DMI support,
- APM support,
- DTEP and DTIK-compliant,
- ATAPI support (for IDE CD-ROM),
- supports a bootable CD-ROM,
- supports the VESA DPMS and DDC1 protocols,
- automatically detects the parameters of an IDE hard disk drive.
- supports ATA IDE mode programming,
- supports enhanced IDE,
- supports LBA (Logical Block Addressing) and Block mode,
- prevents any program or virus from writing to the boot sector of the disk drive,
- automatically detects and configures all system memory,
- automatically configures PCI adapter cards, and
- complies with the Plug and Play 1.01A specification.

CMOS RAM The Atlas PCI LPX motherboard has 128 bytes of nonvolatile CMOS RAM for configuration.

Real Time Clock The Atlas PCI LPX motherboard has a real time clock and CMOS RAM.

Cont'd

Description, Continued

Expansion Slots The Atlas PCI LPX motherboard has one LPX 32-bit expansion slot. An LPX riser card fits in this slot. The riser card is supplied by the case manufacturer. The riser card supports up to two PCI adapter cards and up to three ISA cards.

Timer Features The Atlas PCI LPX motherboard has five programmable 16-bit counter/timers.

Refresh Generation The motherboard has a refresh generation feature.

I/O Capability The Atlas PCI LPX motherboard accesses 16- or 8-bit I/O devices on the ISA bus.

PCI Local Bus The Atlas PCI LPX motherboard has VGA and IDE built-in to the PCI local bus.

Keyboard and Mouse The Atlas PCI LPX motherboard has a standard six-pin miniDIN keyboard connector. The PS/2 mouse connector is a standard 6-pin miniDIN connector for a PS/2 mouse. A four-pin berg connector is provided on the motherboard to attach a keyboard lock cable.

Speaker The motherboard has a built-in speaker and a standard speaker attachment.

Power Good The Atlas PCI LPX motherboard can produce the Power Good signal.

3.3V Power The Atlas PCI LPX motherboard includes am additional 3.3V power supply connector and a

3.3V voltage regulator onboard. Either one can be used to provide 3.3V power.

Drivers

The Atlas PCI LPX motherboard includes ATI 264CT video drivers, and Intel IDE drivers.

Onboard I/O Support

Onboard I/O The Atlas PCI LPX motherboard provides the following onboard I/O:

- an ATI mach64 VGA controller,
- two IDE channels on the PCI local bus,
- one bidirectional parallel port with EPP (Enhanced Parallel Port) and ECP (Extended Capabilities Port) mode support,
- two serial ports with 16550 UARTs, and
- a floppy drive interface with support for 1.2 MB, 1.44 MB, and 2.88 MB floppies

VGA Controller The motherboard includes an ATI mach64 VGA controller and graphics accelerator.

1 MB of VGA memory is installed on the motherboard. An additional 1 MB can be installed using 40-pin SOJ 256 KB x 16 dual CAS DRAMs. 64-bit memory paths are available only if 2 MB of VGA memory is installed.

Onboard IDE The onboard IDE is on the PCI local bus. The IDE controller supports IDE Modes 0, 1, 2, 3, and 4.

The motherboard has two IDE channels supporting up to four IDE drives. The motherboard supports IDE busmastering, 32-bit transfer, LBA mode, and the fast ATA specification.

The IDE controller also supports IDE read data prefetch and write posting. 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

IDE Mode	Cycle Time (in nanoseconds)
3	180
4	120

Cont’d

Onboard I/O Support, Continued

Onboard NS16550s The Atlas PCI LPX motherboard has two National Semiconductor NS16550 UARTs for serial port, which provide enhanced serial port features.

The end user can enable FIFO for Serial ports 1 and 2 through Peripheral Setup in WINBIOS Setup. The FIFO queues should not be enabled if a mouse is connected to the COM port.

Floppy Drive Support The motherboard supports up to two floppy drives.

Support is included for 720 KB, 1.44 MB, and 2.88 MB 3½" drives and 1.2 MB 5¼" drives.

Memory Addresses The motherboard uses 32-bit memory addresses to access 4 gigabytes of memory address space on the PCI expansion slots.

The ISA expansion slots on the riser card use the 16-bit memory addresses to access up to 24 MB.

I/O Channel Check The motherboard supports the use of the I/O channel check to generate NMIs.

I/O Wait State Generation The Atlas PCI LPX motherboard has an open bus structure, allowing multiple processors to share system resources, including memory.

The motherboard supports system memory refresh from channel processors.

I/O Address Space The Atlas PCI LPX motherboard uses I/O addresses 0100h through 03FFh for ISA-compatible I/O.

Seven DMA Channels The motherboard has seven DMA channels.

Any DMA channel can be set for 8 or 16-bit DMA device sizes.

Cont'd

Onboard I/O, Continued

Fifteen Interrupt Levels The NMI takes precedence over all 15 hardware interrupts.

Priority	Label	Typical Interrupt Source
1	IRQ 0	Interval Timer 1, Counter 0 OUT
2	IRQ 1	Keyboard
3-10	IRQ 2	Used internally for IRQ 8 through IRQ 15
3	IRQ 8	Real-Time-Clock
4	IRQ 9	PCI/PnP or ISA
5	IRQ 10	PCI/PnP or ISA
6	IRQ 11	PCI/PnP or ISA
7	IRQ 12	Onboard PS/2 Mouse *or* PCI/PnP or ISA
8	IRQ 13	Coprocessor Error (internal)
9	IRQ 14	Hard disk drive, local bus IDE controller, or PCI/PnP. or ISA
10	IRQ 15	PCI/PnP or ISA
11	IRQ 3	Serial Port 2, PCI/PnP, or ISA
12	IRQ 4	Serial Port 1, PCI/PnP, or ISA
13	IRQ 5	Parallel Port 2, PCI/PnP or ISA
14	IRQ 6	Floppy disk controller
15	IRQ 7	Parallel Port 1, PCI/PnP or ISA

Green PC Features

The American Megatrends Atlas PCI LPX motherboard has been designed with the EPA Green PC specifications in mind. The Green PC features include:

- TTL output to control Green PC power supplies,
- SMI support,
- APM support,
- stop clock support,
- support for an external SMI switch,
- Sleep Mode, which allows the system to go to a low power consumption mode of operation when the PC is idle,
- onboard VGA and monitor is switched off according the VESA DPMS (Display Power Management Specification).

Compliance with EPA Green PC Specifications

To meet the Green PC specifications, a computer system must be able to enter an idle state (Sleep Mode) that reduces the total system power use to 30 watts or less on the input - AC side. The monitor and printer must also use no more than 30 watts.

Responsibility

The system integrator is ultimately responsible for meeting all Green PC specifications and performing the tests necessary to obtain Energy Star approval.

The motherboard is only one component in the system. Other components have a major impact on system power use.

Green PC Implementation Disclaimers

Green PC Responsibility The system integrator must be responsible for Green PC compliance.

American Megatrends has simply supplied the means to meet the Green PC requirements and cannot be held responsible for final system assembly.

Disabling Sleep Mode If a computer will be running an application that requires long periods of CPU activity with no input from the keyboard, mouse, COM1, or COM2, Sleep Mode should be disabled in WINBIOS Setup.

If Sleep Mode is not disabled, the system will switch to Sleep Mode and the system performance will be greatly decreased. Some examples of such applications are: file servers, CAD systems, software compilers, screen savers, and many more.

No Need for Screen Savers

Important

Screen saver software should not be used with Sleep Mode enabled.

Sleep Mode serves the same purpose as a screen saver and obviates the need for a screen saver.

2 PCI Local Bus

The Atlas PCI LPX motherboard conforms to the PCI Version 2.0 specification. This motherboard has expansion slots for four PCI adapter cards. The PCI slots are automatically configured by the WINBIOS system BIOS.

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

The 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 permit 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 establishes a local bus standard where 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 computers based on the EISA, ISA, or MCA® architectures.

PCI decouples the CPU from the expansion bus, works at 30 or 33 MHz,

and uses a 32-bit data connection path to the CPU.

Cont‘d

PCI Features PCI:

- 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 for 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.

Cont'd

Buffered Reads and Writes The PCI Controller buffers reads and writes between the memory/CPU and 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 data transfer rate improvements 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 control mechanisms have been modified and extended to optimize I/O support.

PCI Adapter Cards The Atlas PCI LPX Pentium motherboard has four PCI expansion slots. The PCI expansion

slots can accept any adapter card that complies with the PCI Revision 2.0 specification.

All PCI expansion slots are bus mastering slots.

3 Installation

Installation Steps

The steps for assembling a system that uses the Atlas PCI LPX motherboard are shown in the following table. Each step is discussed in detail in the following pages.

Step	Action	Turn to
1	Unpack the motherboard	Page 25
2	Set jumpers.	Page 26
3	Install memory	Page 33
4	Install motherboard	Page 37
5	Connect the power supply	Page 39
6	Connect the keyboard	Page 42
7	Connect the mouse	Page 43
8	Connect cables	Page 43
9	Connect onboard I/O	Page 47
10	Install floppy disk drives	Page 48
11	Install IDE hard disk drives	Page 53
12	Install riser card and adapter cards	Page 57
13	Test and configure	Page 58

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.

Atlas PCI LPX Motherboard Layout

Step 1 Unpack the Motherboard

Step	Action
1	Inspect the cardboard carton for obvious damage. If damaged, call 404-246-8600. Leave the motherboard in its original packing.
2	Perform all unpacking and installation procedures on a ground-connected anti-static mat. Wear an anti-static wristband grounded at the same point as the anti-static mat. Or use a sheet of conductive aluminum foil grounded through a 1 megohm resistor instead of the anti-static mat. Similarly, a strip of conductive aluminum foil wrapped around the wrist and grounded through a 1 megohm resistor serves the same purpose as the wristband.
3	Inside the carton, the motherboard is packed in an anti-static bag, and sandwiched between sheets of sponge. Remove the sponge and the anti-static bag. Place the motherboard on a grounded anti-static surface component side up. Save the original packing material.
4	Inspect the motherboard for damage. Press down on all ICs mounted in sockets to verify proper seating. Do not apply power to the motherboard if it has been damaged.
5	If the motherboard is undamaged, it is ready to be installed.

Step 2 Set Jumpers

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

Jumper	Description
J12	Serial Port 1 IRQ Select
J11	Serial Port 2 IRQ Select
J13	Parallel Port IRQ Select
J20	Enable Onboard PS/2 Mouse
J29	CMOS RAM Drain
J33	Enable Onboard VGA Interrupt
J27	Disable Onboard VGA Interrupt
J34	Enable CPU Fan
J46, 48	Select CPU Clock Ratio
J21, 22	Select Host Clock Rate
J38	Select CPU Voltage
J47, 39	Enable Voltage Regulator
J40	Enable 3.3V Power Supply
J43	Select PCI Clock
J8	Serial Port 2 Functionality

J12 Serial Port 1 IRQ Select J12 is a three-pin single-inline berg.

Short pins 1-2 to select IRQ4 for serial port 1 (the factory setting). Short pins 2-3 to select IRQ3 for serial port 1.

J11 Serial Port 2 IRQ Select J11 is a three-pin single-inline berg.

Short pins 2-3 to select IRQ4 for serial port 2. Short pins 1-2 (the default) to select IRQ3 for serial port 2.

Cont'd

Step 2 Set Jumpers, Continued

J13 Parallel Port IRQ Select J13 is a three-pin berg that selects the IRQ for the parallel port.

Short pins 1-2 to select IRQ7 (the factory setting). Short pins 2-3 to select IRQ5, as shown below.

J20 Onboard PS/2 Mouse Enable J20 is a three-pin single-inline berg.

Short pins 2-3 to disable the onboard PS/2 mouse. Short pins 1-2 to enable the onboard PS/2 mouse (the default). *IRQ12 cannot be used by any ISA or PCI adapter card when the onboard mouse is enabled.*

The WINBIOS Setup Mouse Support option in Advanced Setup must be set to *Enabled* before the PS/2 mouse can be used.

Cont'd

Step 2 Set Jumpers, Continued

J29 CMOS RAM Drain J29 is a two-pin single-inline berg. In normal operation, J29 is OPEN. Short pins 1-2 to drain CMOS RAM.

Step	Action
1	Turn power off.
2	Place a shorting bridge on J29 for several seconds to quickly drain CMOS RAM.
3	Turn the power on for five seconds.
4	Turn power off again.
5	Remove the shorting bridge from J29.
6	Turn power on again and boot the computer normally.
7	Press <Del> to run WINBIOS Setup. Load the Optimal default settings by clicking on the Optimal icon on the WINBIOS Setup screen (see page 92).
8	Modify the WINBIOS Setup Standard Setup, Advanced Setup, Chipset Setup, Power Management Setup, and Peripheral Setup options as appropriate.
9	Choose *Save and Exit* when leaving WINBIOS Setup.

J33 Onboard VGA Interrupt Enable J33 is a two-pin berg that enables use of a hardware interrupt by the onboard VGA controller. Place a shorting bridge on J33 to enable the VGA interrupt. This interrupt is generated by the VGA controller during vertical retrace.

Leave J33 OPEN to disable the VGA interrupt.

J27 Onboard VGA Disable J27 is a three-pin berg that enables the onboard VGA controller.

Short Pins 1-2 of J27 for normal operation. Short Pins 2-3 to disable the onboard VGA controller.

Cont'd

Step 2 Set Jumpers, Continued

J46 J48 Select CPU Clock Ratio J46 and J48 are two-pin bergs that together select the CPU clock ratio, as follows:

J48	J46	Ratio	Host Clock	CPU Speed
OPEN	OPEN	2/3	60 MHz 66.66 MHz 50 MHz	90 MHz 100 MHz 75 MHz
OPEN	Shorted	1/2	50 MHz 60 MHz 66.66 MHz	100 MHz 120 MHz 133 MHz
Shorted	OPEN	1/3	50 MHz	150 MHz
Shorted	Shorted	2/5	60 MHz	150 MHz

J21 J22 Select Host Clock Rate J21 and J22 are two-pin bergs that together set the host clock, as follows:

J21	J22	Host Clock
Shorted	Shorted	50 MHz
Shorted	OPEN	60 MHz
OPEN	Shorted	66.66 MHz

J38 Select CPU Voltage J38 is a three-pin berg that selects the type of voltage used by the CPU, as follows:

Voltage Type	Voltage Range	J38 Setting
Standard – 3.3V ±5%	3.135V – 3.45V	Short Pins 1-2
VRE Voltage	3.45V – 3.6V	Short Pins 2-3

J47 J39 Enable Voltage Regulator J47 and J39 are six-pin bergs that enable the voltage regulator on the motherboard, as follows:

Action	J47 Setting	J39 Setting
Enable voltage regulator	Short Pins 1-2 Short Pins 3-4 Short Pins 5-6	Short Pins 1-2 Short Pins 3-4 Short Pins 5-6

Action	J47 Setting	J39 Setting
Disable voltage regulator	OPEN	OPEN

Cont'd

Step 2 Set Jumpers, Continued

J40 Enable 3.3V Power Supply J40 is a six-pin berg that enables the 3.3V power supply on the motherboard.

Short Pins 1-2, 3-4, and 5-6 of J40 to enable the 3.3V power supply.

3.3V Power Source The settings of J47, J39, and J40 control the source of 3.3V power.

> ***Caution***
>
> *J47 and J40 must not be shorted at the same time.*

3.3V Source	J47 Setting	J39 Setting	J40 Setting
Voltage Regulator	Short Pins 1-2 Short Pins 3-4 Short Pins 5-6	Short Pins 1-2 Short Pins 3-4 Short Pins 5-6	OPEN
Power Supply	OPEN	Short Pins 1-2 Short Pins 3-4 Short Pins 5-6	Short Pins 1-2 Short Pins 3-4 Short Pins 5-6

J43 Select PCI Clock Rate J43 is a three-pin berg that sets the PCI clock rate, as follows:

Host Clock Setting	J43 Setting	PCI Clock Setting
50 MHz	Short Pins 2-3	25 MHz
60 MHz	Short Pins 1-2	30 MHz
66.66 MHz	Short Pins 1-2	33.33 MHz

J8 Serial Port 2 Functionality J8 is a three-pin berg that determines how serial port 2 is used.

Short Pins 1-2 of J8 to use serial port 2 for infrared devices.

Short Pins 2-3 to use serial port 2 for standard serial devices.

Step 3 Install Memory

The main memory subsystem on the Atlas PCI LPX motherboard has two 32-bit SIMM (Single Inline Memory Module) memory sockets.

Each socket can hold one SIMM unit. You can use:

- 256 KB x 32 or 36,
- 1 MB x 32 or 36,
- 4 MB x 32 or 36,
- 8 MB x 32 or 36, or
- 16 MB x 32 or 36 SIMMs.

The motherboard supports banks of fast page mode and EDO (Extended Data Out) memory together operating at 70 ns (RAS access time).

Reporting Memory The system memory is reported by AMIBIOS as it boots and again when the AMIBIOS System Configuration Screen is displayed just before DOS is booted.

The memory displayed by AMIBIOS on the System Configuration Screen is 384 KB less than the total memory installed.

Selecting SIMMs Make sure SIMMs meet the following specifications:

Parameter	Specification
Page Mode	FAST
Refresh	CAS before RAS
t_{CAC}	≤ 20 ns
t_{RAC}	≤ 80 ns
t_{AA}	≤ 45 ns
t_{RP}	70 ns
t_{CPA}	≤ 45 ns

Cont’d

Step 3 Install 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
1 MB x 36	Micron	MT12D136M-7
	Mitsubishi	MH1M36ADJ-7
	PNY	P361000-70
	Motorola	MCM36100AS-70
	Oki	MSC2355-70YS12
	Samsung	KMM5361000AV-7
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

Cont’d

Step 3 Install Memory, Continued

Installing SIMMs There are four x 36 SIMM sockets located on the Atlas PCI LPX motherboard. These sockets can be filled with either 256 KB x 32 or 36, 1 MB x 32 or 36, 4 MB x 32 or 36, 8 MB x 32 or 36, or 16 MB x 32 or 36 SIMMs.

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

Cont'd

Step 3 Install Memory, Continued

Cache memory is provided on a standard cache module. The Atlas PCI LPX motherboard supports 256 KB or 512 KB of L2 cache memory through a plug-in cache module. The cache module used must conform to the Intel COAST Version 1.0 specification. A 160-pin cache module connector is mounted on the motherboard.

To upgrade cache memory from 256 KB to 512 KB, remove the 256 KB cache module and insert a 512 KB cache module, as shown below:

Step 4 Install the Motherboard

The motherboard mounting hole pattern is the same as the mounting hole pattern on the standard Western Digital LPX motherboard. Standoffs and mounting screws are not supplied with the motherboard. The chassis manufacturer should supply these parts.

Step	Action
1	Place the chassis on an anti-static mat. Connect the chassis to ground to avoid static damage during installation. Connect an alligator clip with a wire lead to any unpainted part of the chassis. Ground the other end of the lead at the same point as the mat and the wristband.
2	Rotate the chassis so that the front is to the right, and the rear is to the left. The side facing you is where the motherboard is mounted. The power supply is mounted at the far end of the chassis.
3	Hold the motherboard, component-side up, with the edge with the SIMM sockets toward you and the edge with the power supply connector away from you. The keyboard, mouse, and video connectors should be to the left.
4	Carefully slide the motherboard into the chassis. Make certain that the edge connectors fit the ports in the rear of the chassis. The motherboard should rest level with the chassis.
5	Place the mounting screws in the holes provided for them and tighten them. If necessary, shift the motherboard slightly to align the mounting holes on the motherboard with the holes on the chassis. See the drawing on the next page.

Warning

If using metallic screws, make sure that you use them only in the plated mounting holes.

If using metallic screws, make sure that the head of the screw fits completely inside the plated mounting holes.

See the graphic on the following page.

Cont'd

Step 4 Install Motherboard, Continued

Step 5 Connect the Power Supply

The power supply should match the physical configuration of the chassis. Make sure that the power switch is Off before assembly.

Before attaching all components, make sure that the proper voltage has been selected. Power supplies often can run on a wide range of voltages and must be set (usually via a switch) to the proper range. Use at least a 200 watt power supply, which should have built-in filters to suppress radiated emissions.

Connect to P1 and P2 Attach the power supply cables to P1 and P2 on the motherboard. AT-compatible power supplies have two 6-pin connectors.

The six-pin connector with three red wires and two black wires is connected to P2 and the remaining six-pin connector is connected to P1, as shown below.

Cont'd

Step 5 Connect the Power Supply, Continued

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.

P1 Pinout

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

P2 Pinout

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

Cont'd

Step 5 Connect the Power Supply, Continued

P3 Pinout P3 provides 3.3V power.

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

Step 6 Connect the Keyboard Cable

The keyboard attaches via a standard 6-pin miniDIN keyboard connector. Adjacent to the keyboard connector is a 6-pin miniDIN connector for a PS/2-type mouse.

The keyboard connector is a 6-pin miniDIN socket labeled KEYBRD and J6 on the motherboard. The keyboard connector position is shown on page 24. Use a standard PS/2 keyboard interface or use a keyboard connector converter to attach an AT-compatible keyboard.

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

Step 7 Connect the Mouse Cable

Attach a PS/2-type mouse to the 6-pin miniDIN mouse connector (J9). You can use a standard PS/2-compatible mouse or use a cable converter to attach another type of mouse to the mouse miniDIN connector. The J9 pinout is:

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

Step 8 Connect Cables

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

Cont'd

Step 8 Connect Cables, Continued

List of Connectors The following cables should be connected to the motherboard:

- Green PC power switch to J44,
- Reset Switch cable to J28,
- Speaker cable to J31,
- Keyboard Lock Power LED cable to J26,
- Turbo LED cable to J32, and
- IDE LED Activity Indicator LED cable to J36.

J44 Green PC Power J44 is a two-pin berg that attaches to the Green PC power switch. This switch can be used to turn power off during Green PC mode.

The + on Pin 2 identifies the positive connector.

J28 Reset Switch Connector J28 is a two-pin single-inline berg that is attached via a cable to an externally-mounted reset switch.

When the reset switch is pressed, the system performs a hard reset. Pin 1 is ground and Pin 2 is Hard Reset.

J31 Speaker Connector J31 is a four-pin single-inline berg that is optionally attached via a cable to a standard system speaker. AMIBIOS signals hardware problems through the speaker. Pin 1 on the motherboard is identified by the arrow on the white box around the berg. The Atlas PCI LPX motherboard also has a built-in speaker mounted on the motherboard.

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

Cont'd

Step 8 Connect Cables, Continued

J26 Keyboard Lock J26 is a four pin single-inline berg that is attached via a cable to the keyboard lock connector (or separate keyboard lock and Power LED connectors). The computer chassis may not include the keyboard lock and Power LED on a single connector. The keyboard lock allows the user to lock the keyboard, protecting the system from unauthorized use. Pin 1 on the motherboard is identified by the broad arrow.

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

J32 Turbo LED J32 is a two-pin berg that is attached via a cable to the externally-mounted bipolar Turbo LED. The LED lights when the motherboard is running at high speed.

J36 IDE Indicator LED J36 is a two-pin berg that is attached via a cable to the externally-mounted IDE Activity LED. This LED lights when the IDE drive is running.

Warning

In some IDE drives, you may have to disable the IDE LED mounted on the drive by changing a jumper or setting a switch on the IDE drive itself, before the IDE drive sends a signal to J36.

Step 9 Connect Onboard I/O

Onboard Adapters

The Atlas PCI LPX motherboard has:

- two serial ports (J14 and J19),
- a parallel port (J37),
- a VGA connector (J41) on the PCI local bus,
- a VGA Feature Connector (J42),
- an IDE controller on the PCI bus (Primary drive - J2; Secondary drive - J4, and
- a floppy controller (J1).

The serial and parallel port connectors are described below. The IDE connector is described on page 53. The floppy connector is described on page 52.

Conflicts

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

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

Cont'd

Step 9 Connect Onboard I/O, Continued

J14 Serial Port 1 (COM1) and J19 Serial Port 2 (COM2) J14 and J19 are 9-pin DB9 male connectors that provide an AT-compatible serial port interface. The DB9 connector pin placement is shown below.

The DB9 serial port pinout is shown below.

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

Cont'd

Step 9 Connect Onboard I/O, Continued

J37 Parallel Port J37 is a DB25 female connector. The J40 pin placement is shown below. The J37 pinout is shown below.

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

Step 9 Connect Onboard I/O, Continued

J45 VGA Connector J45 is a standard 15-pin DB15 VGA connector. The J45 pin placement is shown below.

The J45 VGA Connector pinout follows:

Pin	Signal Description
1	Red Video Signal
2	Green Video Signal
3	Blue Video Signal
4	Monitor ID Bit 2
5	Ground
6	Red return
7	Green Return
8	Blue Return
9	N/C
10	Sync Return
11	Monitor ID Bit 0
12	Monitor ID Bit 1
13	Horizontal Sync
14	Vertical Sync
15	N/C

Cont'd

Step 9 Connect Onboard I/O, Continued

J42 VGA Feature Connector J42 is a VGA Feature connector or a pass-through connector. J42 is a 26-pin dual-inline berg mounted on the motherboard. The pass-through feature permits an 8514-compatible graphics coprocessor adapter card to use the built-in VGA DAC (Digital to Analog Converter) and VGA connector on the motherboard. When an 8514-compatible graphics coprocessor card wants to drive the onboard VGA, it activates the ESYNC# and ENVIDE0# signals to the motherboard. The onboard VGA disables its VGA output buffers. Video data from the 8514-compatible graphics coprocessor can then drive the DAC.

The J42 pin placements and pinout is:

Pin	Signal Description	Pin	Signal Description
Y1	Pixel Data 0	Z1	Ground
Y2	Pixel Data 1	Z2	Ground
Y3	Pixel Data 2	Z3	Ground
Y4	Pixel Data 3	Z4	ENVIDE0#
Y5	Pixel Data 4	Z5	ENABLE SYNC
Y6	Pixel Data 5	Z6	External Pixel Clock
Y7	Pixel Data 6	Z7	N/C
Y8	Pixel Data 7	Z8	Ground
Y9	Pixel Clock	Z9	Ground
Y10	Blanking	Z10	Ground
Y11	Horizontal Synch	Z11	Ground
Y12	Vertical Sync	Z12	N/C
Y13	Ground	Z13	KEY PIN

Step 10 Install Floppy Drive

J1 Floppy Connector J1 is a 34-pin dual-inline berg. Connect the cable from the floppy drive to J1, as shown below. The onboard floppy controller cannot be used if a hard disk adapter card with floppy controller is installed.

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

Cont'd

Step 10 Install Floppy Drive, Continued

J1 Floppy Connector Pinout

Pin	Use	Pin	Use
1	GND	2	DENSE1
3	GND	4	N/C
5	GND	6	DRATE0
7	GND	8	-INDEX
9	GND	10	-MOTOR0
11	GND	12	-FDSEL1
13	GND	14	-FDSEL0
15	GND	16	-MOTOR1
17	GND	18	DIR
19	GND	20	-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 11 Install Hard Disk

Attach IDE Cable to J2 J2 is the primary IDE (Integrated Drive Electronics) hard disk drive connector. Both the primary master and the primary slave IDE drives must be connected by cable to J2, as shown below.

J2 is a 40-pin dual-inline berg that connects an IDE drive to the primary onboard IDE connector. This motherboard supports IDE Modes 0, 1, 2, 3, and 4, IDE prefetch, LBA (Logical Block Address) mode, high capacity drives (over 528 MB), 32-bit data transfer, and fast IDE transfer. These IDE features are configured in Peripheral Setup in the WINBIOS Setup utility.

Disable the onboard IDE interface in Peripheral Setup to use an ISA ESDI, RLL, MFM, or SCSI hard disk drive controller.

Cont'd

Step 11 Install Hard Disk, Continued

J2 Pinout The J2 pinout is:

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

J4 Secondary IDE Controller J4, the secondary IDE connector, is a 40-pin dual-inline berg that connects the secondary primary and slave IDE drives to the secondary onboard IDE controller.

Attach the secondary master and slave IDE drives to J4 via a standard 40-pin IDE cable as shown on page 54. The location of J10 is also shown on page 54.

Cont'd

Step 11 Install Hard Disk, Continued

J4 Pinout The J4 pinout is:

Pin	Use	Pin	Use
1	-RESET	2	GND
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	GND	20	KEY (N/C)
21	N/C	22	GND
23	-IOW	24	GND
25	-IOR	26	GND
27	IDERDY	28	ALE
29	N/C	30	GND
31	INT15	32	-IOCS16
33	HA1	34	N/C
35	HA0	36	HA2
37	-CS2	38	-CS3
39	N/C	40	GND

Step 12 Install Adapter Cards

The Atlas PCI LPX motherboard has only a single expansion slot. Install a riser card in this expansion slot, as shown below. Up to two PCI expansion slots and three ISA expansion slots are provided on a riser card. PCI adapter cards are automatically configured by WINBIOS.

NCR SCSI BIOS The NCR SCSI BIOS for PCI SCSI Host Adapter cards is part of the Atlas PCI Pentium ISA motherboard WINBIOS.

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

ISA Expansion Slots The ISA expansion slots on the riser card provide full compatibility with all IBM XT and AT-compatible adapter cards.

Step 13 Test and Configure

Review the following points before powering up:

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

Start the Test

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

BIOS Errors

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

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

Configure the System

Run WINBIOS Setup. You must enter the requested information and save the configuration data in CMOS RAM. The system will then reset, run POST, and boot the operating system. See page 94 for information on configuring the

computer.

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4 Video Drivers

Overview

The Atlas PCI LPX ISA motherboard offers the most advanced 64-bit graphics and multimedia video acceleration technology available. The ATI Atlas PCI LPX video graphics accelerator provides high performance 64-bit graphics. The Atlas PCI LPX video accelerator display up to 16.7 million colors at a screen resolution of 1280 x 1024 and 65,000 colors at a screen resolution of 1600 x 1200. See page 89 for information about display modes.

In This Chapter The following topics are discussed in this chapter:

- video driver installation,
- types of video drivers,
- Windows and Windows NT drivers,
- Windows NT Version 3.5 drivers,
- AutoCAD R10 386, R11, R12, and R13 drivers,
- OS/2 2.1 and OS/2 Warp drivers,
- Intergraph Microstation drivers,
- Microsoft Word for DOS drivers, and
- WordPerfect drivers,
- VESA BIOS extensions,
- Monitor Power Management,
- diagnostics and troubleshooting,
- video specifications, and
- supported video modes.

When displaying 16.7 million colors, the Atlas PCI LPX video drivers outperform previous generations of accelerators displaying only 256 colors. Availability of colors and resolutions is determined by the amount of memory installed.

Cont'd

Overview, Continued

Video Memory The Atlas LPX ATI graphics accelerator includes high-bandwidth VRAM memory and delivers instant response and superior image definition without compromising performance.

The AT graphics accelerator provides fast 64-bit graphics acceleration in DOS, Windows, Windows NT, and OS/2.

Refresh Rates The Atlas PCI LPX graphics accelerator provides flicker-free graphics at refresh rates up to 100 Hz. See page 88 for refresh rate information.

Colors Atlas PCI LPX video supports up to 16.7 million colors. See page 89 for color information.

Video Requirements Use DOS 5.0 or later, Windows 3.1, Windows NT, OS/2 2.1 or OS/2 Warp.

Use a VGA monitor that supports at least the 640 x 480 screen resolution. A Plug-and-Play compatible monitor that supports the VESA Display Data Channel 1 (DDC1) specifications is required to take advantage of the DDC1 features. Any standard VGA or VESA drivers normally supplied with your software can be used. For best performance, install the Atlas PCI LPX video drivers.

Resource Conflicts If you launch applications automatically during system bootup and you use special drivers that are not a 640 x 480 VGA screen resolution, system resource conflicts can occur.

Reconfigure the application to use standard VGA driver or do not launch applications during bootup.

Video Driver Installation

Make Backups The hardware is configured using the INSTALL program on the Atlas PCI LPX installation diskettes. Make working copies of the diskettes and store the original diskettes in a safe place.

README Display the README file on the first driver installation diskette before installing the Atlas PCI LPX video drivers.

The README file contains information that was not available at press time for this manual. Insert diskette 1 in drive A: (or B:). Type

```
A: (or B:)README
```

at the DOS prompt and press <Enter>.

Attach Monitor Attach the monitor power plug cable. Attach the monitor video cable to the 15-pin VGA connector on the back of the Atlas PCI LPX motherboard, which should be on the back of the computer chassis.

Make sure all other devices have been properly installed and configured and the computer is ready to run. Turn power on to the computer and monitor. The computer should boot normally. If it does not, see Chapter 2 Installation, beginning on page 23.

Cont'd

Video Driver Installation, Continued

Run INSTALL Insert Atlas PCI LPX video driver diskette 1 in drive A: and type

```
A:INSTALL
```

at the DOS prompt and press <Enter>.The INSTALL main menu options are:

- System Information,
- Quick Setup,
- Drivers Installation,
- Utilities Installation,
- Diagnostics, and
- Advanced Setup.

Warning

Your monitor can be damaged if you select an incorrect monitor type. Make sure you select the correct monitor type.

Do not set driver specifications that exceed the monitor specifications. Using a refresh rate (vertical frequency) that is higher than the rate that the monitor is capable of may damage the monitor. The manufacturer will not be responsible for damage resulting from improper use.

If the screen display is scrambled, your monitor does not support the screen resolution that you selected. Press <Esc> to exit the screen.

Cont'd

Quick Installation To install video drivers quickly:

Step	Action
1	Run the INSTALL program at the DOS prompt. Type A:INSTALL and press <Enter>. Select *System Information* from the menu and press <Enter>. INSTALL resolves system resource conflicts. A warning appears if a conflict is found. INSTALL automatically configures system resources and resolves conflicts. *Caution:* Resource conflict may still occur if you have installed older ISA adapter cards that are not PnP-aware. INSTALL cannot determine the resources used by older ISA adapter cards.
2	After the System Information phase completes, select Quick Setup from the INSTALL main menu and press <Enter>. Select the type of monitor used in your computer. The specifications of the monitor you select appear on the screen. Select a monitor from the displayed list if your monitor appears on the list. Select DDC1 monitor if your monitor supports the VESA Display Data Channel1 specifications. If you have a DDC1-type monitor, the onboard Atlas PCI LPX video adapter detects incoming monitor data and configures all display modes to optimal settings for screen resolution, refresh rate, display size, and position. Select VDIF if you monitor is not listed and is not DDC1-compliant. and you have a VDIF (VESA Display Information Format) file for your monitor. VDIF files contain all information necessary to configure your monitor. Insert the floppy diskette that contains the VDIF file. Select READ VDIF and press <Enter>. Type A: (or B:) when prompted for the VDIF file location. If your monitor is not listed, is not DDC1-compliant, and you have no CDIF file, select the CUSTOM option. Select a screen resolution and refresh rate. Adjust the size and position of the box outline that appears on the screen. Press <Enter> to select.

Step	Action
	Repeat this procedure for each screen resolution to be installed. Exit and save the changes when finished by pressing <F10>.
3	After you have selected a driver, select Driver Installation from the INSTALL main menu. The Install Enhanced Driver menu appears.

Installing Utilities Select *Utilities Installation* from the INSTALL program main menu to copy the video driver utilities to the hard disk drive.

Running Diagnostics Select *Diagnostics* from the INSTALL main menu to test video circuitry. You can display the diagnostics screen at any supported resolution.

Follow the directions that appear on the screen to complete these tests.

Running Advanced Setup Select Advanced Setup from the INSTALL main menu to configure the video accelerator more accurately for your monitor and computer.

Follow the screen directions to run Advanced Setup.

Factory Default Settings You can press <Shift> <F7> at any time when running the INSTALL utility to revert to the factory default settings for the Atlas PCI LPX video graphics accelerator.

Saving Configuration Save the configuration settings that you have specified in the INSTALL program by pressing <F10>.

Types of Video Drivers

Video drivers are provided for:

- Microsoft Windows and Windows NT,
- Windows NT Version 3.5,
- AutoCAD R10 386, 11, 12, and 13,
- IBM OS/2 V.2.1 and Warp,
- Intergraph Microstation V.4.0 and 5.0,
- DOS Word V.5.x and 6.0, and
- DOS WordPerfect 5.1 and 6.0.

Windows 3.1 and Windows NT Video Drivers

The video drivers for Windows and Windows NT provide improved performance at high resolutions and color depths. An ATI program group is installed automatically when you install the enhanced driver for Windows.

Installation Procedure

Step	Action
1	Make sure Microsoft Windows is properly installed by running Windows. Exit Windows.
2	Insert Atlas PCI LPX video driver diskette 1 in drive A: (or B:). Type A: (or B:)INSTALL at the DOS prompt and press <Enter>. Select Drivers Installation from the Main Menu.
3	Select *Microsoft Windows* from the list of applications.
4	When the menu appears, select Read Installation Notes for help and tips on the installation. Select Install Windows 3.1 driver and read the notes. Follow the screen instructions to completion.
5	After file copying is done, note the Windows setup instructions on the screen, then press <Esc> to exit. Exit the INSTALL program and restart Windows.

The ATI icon is created automatically during driver installation. Select the ATI

icon to customize the Windows video display.

Cont'd

Windows 3.1 and Windows NT Drivers, Continued

ATI Program Group Configure the features of the Windows driver by selecting the icons in the Microsoft Windows ATI program group.

You can display helpful information and configuration tips by clicking on the Readme icon.

Icons The icons in the ATI program group are:

Icon	Description
	Click here to report a problem. System configuration data is automatically included in the problem report.
	This logo shows the ATI video driver that is installed.
 Flexdesk	Click on this icon to change the color depth, screen size, and size attributes of the Windows video driver.
 DPMS	Click on this icon to save power use by a DPMS-compatible monitor.
 DeskScan	Click on this icon to pan and scroll in off-screen workspaces up to 2048 x 1536. You can also zoom in/out when using smaller monitors.
 WinSwitch	Click on this icon to change display modes instantly without quitting Windows.
 Color Correction	Click on this icon to adjust screen colors to match printed material.
 Screen Adjustment	Click on this icon to adjust screen size, center, and monitor configuration when Windows is running.
 Motion Video Acceleration	Click on this icon to enable Windows Motion Video Acceleration (MVA). MVA enhances Indeo and QuickTime video clips by increasing the image size and eliminating pixel blockiness.
 Help	Click on this icon to display Help screens.
 README	Click on this icon, then click on a product icon to display the README file for that product.
 Exit	Click on this icon to exit the ATI program group.

Cont'd

Windows NT V.3.5 Video Driver

The Atlas PCI LPX ATI video driver for Windows NT video driver is shipped with Windows NT. Before installing the Windows NT video driver, install Windows NT. See the Microsoft Windows NT technical documentation for additional information about the Windows NT ATI video driver.

Installation Procedure

Step	Action
1	Run the Windows NT Display program located in the Control Panel.
2	Select *Change Display Type*. Select *Change.* Select *Other.*
3	Specify the location of the ATI driver. For example, type A:\ NT35.
4	Select *ATI Graphics Accelerators*.
	Select *Install* and confirm.
5	Restart Windows NT 3.5 to use this *mach64* driver. Select a desired display mode in the Display applet. Select List All Modes... to see all supported modes.

Deinstalling

Uninstall the video driver for Windows NT by running the Windows NT Display program in the Control Panel.

Select a non-ATI driver. For example: select a VGA-Compatible driver. When you restart Windows NT, it will boot with the non-ATI driver you just selected.

AutoCAD R10 386, R11, R12, and R13 Drivers

Installation Procedure

Step	Action
1	Run AutoCAD in protected mode to make sure that it is properly installed. Note the location of the AutoCAD program files before you start video driver installation. You will need this information.
2	Run the INSTALL program. Select *Drivers Installation* from the INSTALL Main Menu.
3	Select AutoCAD from the list. Type the source drive and directory. Insert the Atlas PCI LPX video driver diskette. When the menu appears, select Read Installation Notes.
4	Follow the screen instructions to install the enhanced driver.
5	When driver installation is complete, exit the installation program. MANUAL.TXT and README.DLD are copied to your AutoCAD Drivers directory. You can read or print these files using any word processor.
6	Run ADIACAD.BAT to set the necessary driver parameters in the DOS environment. Type `ADIACAD` at the DOS prompt and press <Enter>. The parameters it sets must be in the DOS environment before you start AutoCAD. If you are already using a batch file to start AutoCAD, add the contents of ADIACAD to your batch file.
7	Start AutoCAD and reconfigure AutoCAD to use the new enhanced display list driver. Please refer to your AutoCAD manuals for information on how to select/change a video driver.

IBM OS/2 2.1 and OS/2 Warp Video Drivers

Installation Procedure

Step	Action
1	Start OS/2. Make sure that it is using the Video Graphics Array driver and that no other OS/2, DOS, or Windows applications are running. Open an OS/2 full-screen command prompt. Insert the Atlas PCI LPX video installation disk 1 in a floppy drive. Type `A:(or B:)OS2INST` and press <Enter>
2	Select Install Device Drivers from the Main Menu. Select IBM OS/2 from the list of applications.
3	Select Read Installation Notes for help and tips. Then select *Install* to copy the mach64 driver and related files to C:\MACH_OS2, the default directory.
4	Open an OS/2 Window or OS/2 full-screen command prompt. Type `DSPINSTL` and press <Enter>.
5	Select *Primary Display* when the Display Driver Install panel appears. Choose OK to display the driver selection list.
6	Select *ATI mach64 (Enhanced)* from the list. Choose OK.
7	When the source directory panel appears, choose *CHANGE* and specify the location of the mach64 driver. For example: C:\MACH_OS2. Select *SET*, then *INSTALL.*
8	After the driver is installed, do an OS/2 shut down.
9	Re-start OS/2. It will default to the 640 x 480 screen resolution with 256 colors. To change screen resolution and/or color depth: open the OS/2 System folder, open the System Setup folder, open the System object, select Screen tab in the System-Settings notebook, and select a desired resolution and color depth from the list. Close the System-Settings notebook.
10	Do an OS/2 shutdown, then restart OS/2.
11	See the README.OS2 file in the C:\MACH_OS2 directory for mach64 configuration details.

Cont'd

IBM OS/2 2.1 and OS/2 Warp Video Drivers,
Continued

Uninstalling the OS/2 2.1 Driver

Step	Action
1	Open an OS/2 window or OS/2 full-screen command prompt. Type `DSPINSTL` and press <Enter>.
2	When the Display Driver Install panel appears, select *Primary Display* and choose OK to display the driver selection list.
3	Select Video Graphics Array (VGA) from the list. When prompted, insert the requested IBM OS/2 Display Driver disk into the drive and specify the VGA driver source directory. Select INSTALL.
4	After the driver is installed, do an OS/2 shutdown.
5	Continue to remove mach64 files from your hard disk. Restart OS/2.
	Open an OS/2 full-screen command prompt.
6	Insert the Atlas PCI LPX video driver installation diskette in the floppy drive and type `A: (or B:) OS2INST` and press <Enter>.
7	Select *Install Device Drivers* from the Main Menu.
8	Select IBM OS/2 from the list of applications.
9	Select UNINSTALL OS/2 Driver. Follow the screen instructions.

Cont'd

IBM OS/2 2.1 and OS/2 Warp Video Drivers, Continued

Uninstalling the OS/2 Warp Driver

Step	Action
1	Open the OS/2 System folder.
2	Open the System Setup folder and the Selective Install object.
3	Select Primary Display. The Display Driver Install panel appears.
4	Select the Video Graphics Array (VGA) driver and choose OK. The OS/2 Setup and Installation panel appears. Select INSTALL. Specify the VGA driver source directory and follow the screen instructions.
5	When the VGA driver is installed, do an OS/2 shutdown.
6	Continue with the following steps if you wish to remove mach64 files from your hard disk.
7	Restart OS/2.
8	Open an OS/2 full-screen command prompt. Type `A:(or B:)OS2INST` and press <Enter>.
9	Select Install Device Drivers from the Main Menu.
10	Select IBM OS/2 from the list of applications.
11	Select UNINSTALL OS/2 Driver. Follow the instructions on the screen.

Intergraph MicroStation V.4.0 and 5.0 Drivers

Installation Procedure

Step	Action
1	Make sure that MicroStation is properly installed.
2	Run the *mach64* installation program and select Drivers Installation from the Main Menu.
3	From the list of applications, select MicroStation. Enter the source drive and directory information. Insert Atlas PCI LPX video driver installation diskette 1 as prompted. When the menu appears, select Read Installation Notes for help and tips.
4	Follow the screen instructions to complete the installation.
5	When driver installation is completed, press <Esc> to exit.
6	A MicroStation driver reference document and an information file called README.USD are copied to the MicroStation Drivers directory on your hard disk. You may read or print these files using your favorite word processor.

Microsoft Word for DOS V.5.x and 6.0 Drivers

The Atlas PCI LPX video drivers for Microsoft Word support 640 x 480, 800 x 600, and 1024 x 768 screen resolutions in 16 colors.

Installation Procedure

Step	Action
1	Make sure that Word is properly installed on your system before continuing with this procedure.
2	Run the INSTALL program. Select *Driver Installation* from the Main Menu.
3	From the list of applications, select Microsoft Word.
4	Select an appropriate Word program version. Select Read Installation Notes for tips and additional details.
5	Follow the screen instructions to complete the driver installation.
6	When driver installation is complete, press <Esc> to exit. See README.WRD in the Word directory for instructions and driver configuration details.

DOS WordPerfect V.5.1 and 6.0 Drivers

WordPerfect 5.1 Driver Installation Procedure

The Atlas PCI LPX video drivers for WordPerfect 5.1 support 800 x 600 and 1024 x 768 screen resolutions in 16 colors.

Step	Action
1	Run WordPerfect to make sure that it is properly installed.
2	Run the INSTALL program. Select *Drivers Installation* from the Main Menu. From the list of applications, select WordPerfect.
3	Insert the Atlas PCI LPX video driver diskette. Enter the source drive and directory as prompted. Select Read Installation Notes.
4	Select *Install WordPerfect 5.x driver*. Type the directory where WordPerfect is installed. Press <Enter> to copy the driver files to that directory.
5	When driver installation is completed, press <Esc> to exit.
6	Run the WordPerfect Setup program to select this enhanced driver, as follows: Run WordPerfect, press **< Shift > + < F1 >** for the Setup option. Press **< D >** for Display. Press **< G >** for Graphics Screen Type. Select the *mach64* driver and press **< Enter >**. Refer to the README.WP file that has been copied into your WordPerfect directory for instructions and driver configuration details.

Cont'd

WordPerfect Version 6.0 Driver Installation

The Atlas PCI LPX video drivers support the VESA BIOS Extension. The VESA BIOS extension supports several VESA display modes.

Step	Action
1	The Atlas PCI LPX video must be configured for the resolution you intend to use.
2	Run the WordPerfect Setup program to select a VESA display mode. Run WordPerfect. Press <Shift> + <F1> to run Setup. Press <D> for Display. Press <G> for Graphics Screen Type. Press <S> for Screen Type. Select VESA VBE (VESA BIOS Extension) and press <S>. Select a display mode and press <S>.
3	A Driver Warning dialog may appear; if so, consult the WordPerfect documentation for information. Press <Enter> as prompted. When you exit Setup, the selected mode should be displayed. If not, repeat Step 1 to make sure the Atlas PCI LPX video is correctly configured for this resolution.

VESA BIOS Extension

The VESA BIOS Extension is provided by M64VBE.COM. This program supports software that uses VESA modes using the unique Atlas PCI LPX video driver features, beyond those provided by standard VGA hardware. You can run software that conforms to the VESA BIOS extensions standard by first loading M64VBE.COM.

MV64VBE.COM is on Atlas PCI LPX video driver diskette #1. It is copied to the C:\MACH64 directory during utilities installation. To load this utility, change directories to the directory containing M64VBE.COM. Type

```
M64VBE
```

and press <Enter>.

MV64VBE Parameters To display the MV64VBE parameters, type

```
M64VBE ?
```

and press <Enter>.

Unloading MV64VBE To unload M64VBE, type

```
M64VBE U
```

and press <Enter>.

Monitor Power Management

The Atlas PCI LPX video accelerator supports the VESA Display Power Management Signaling (DPMS) specification. Display monitors that comply with the DPMS specification can provide energy savings up to 80% compared to non-DPMS compliant monitors. DPMS-compliant monitors also last longer.

DPMS control functions are provided for DOS and Windows operations. The DOS version is a Terminate-and-Stay-Resident program. The Windows version provides control via a Windows control panel in the ATI program group.

DPMS for DOS When you run DPMS for the first time without parameters, DPMS sets the Standby, Suspend, and Off timers to default values. If DPMS has been loaded, running it again without parameters will display the current timer values:

```
Standby timer: 15 minutes
Suspend timer: 30 minutes
Off timer: 60 minutes
```

Example If you run DPMS with at least one timer parameter, DPMS set that value and disables the unspecified timers. For example: to set the Standby timer to 5 minutes and disable the Suspend and Off timers, type

```
DPMSSTBY5
DPMS Parameters
```

and press <Enter>.

Cont'd

Monitor Power Management, Continued

DPMS Parameters The DPMS utility parameters are:

Parameter	Description
stby *x*	When this parameter is added, DPMS places the monitor in Standby mode after *x* minutes and seconds. For example, two minutes and ten seconds is specified as 2:10. Standby is the first level of power conservation. The monitor is instantly ready if screen activity is detected.
susp *x*	When this parameter is added, DPMS places the monitor in Suspend mode after *x* minutes and seconds. The monitor conserves more energy when in Suspend mode than when it is in Standby mode.
off *x*	When this parameter is added, the monitor goes to Off mode after *x* minutes and seconds. In Off mode, the monitor is at the highest level of energy conservation.
nomouse	When this parameter is added, DPMS does not detect mouse activity.
quiet	When this parameter is added, no DPMS messages appear.
unload	When this parameter is added, DPMS is uninstalled.
Help	When this parameter is added, DPMS Help message are displayed.

Diagnostics and Troubleshooting

Diagnostics

All installed graphics modes in the *Atlas PCI LPX video* accelerator can be viewed and tested, by running the INSTALL program from the DOS prompt, or by running a diagnostics program called M64DIAG.EXE. Do not run it in a windowed or full-screen DOS box. In the INSTALL program, select Test Graphics Adapter from the Diagnostics option on the INSTALL program Main Menu. The Test Graphics Adapter menu options are:

```
VGA Tests ...
Accelerator Tests ...
```

Run these tests when you suspect there is a problem, especially during installation.

Troubleshooting

Because a typical computer consists of many different parts, difficulties can arise from a combination of items, from software or hardware installation, to monitor compatibility. Some common problems are listed below:

Problem	Suggested Solution
The computer locks up.	If using a memory manager (such as EMM386, QEMM or 386MAX), modify CONFIG.SYS to exclude the video BIOS area (C000 - C7FF). For example, add EXCLUDE = C000 - C7FF to the command line in CONFIG.SYS. Remove all unnecessary adapter cards. Disable shadow RAM. Run INSTALL and select the factory default settings.
The test pattern is OK but applications do not run.	You selected the wrong monitor type. Change settings in the INSTALL program.
The Windows driver does not install properly.	Windows must be running in 386 Enhanced Mode. Some programs prevent Windows from starting in enhanced mode. Remove the

Problem	Suggested Solution
	offending driver or program
The AutoCAD driver does not install properly.	The protected mode driver requires extended memory.

Common Problems

Problem	Solution
Memory aperture test failure. Or the Diagnostics program locks or reboots during the aperture test.	If an error message that the memory aperture conflicts with system memory, restart the INSTALL program by typing `INSTALL APMAP` at the DOS prompt and pressing <Enter> When you enable memory Aperture, select a location *above but not overlapping* system memory, the BIOS, and Reserved locations.
The desired resolution is disabled and displayed in gray.	A mode in gray means that the BIOS thinks this mode is not available. Reinstall the video driver and select custom monitor.
A menu item is disabled and displayed in gray.	The mode or test is not available in the current configuration. Aperture tests are not available if the aperture is disabled. CRT mode and pixel depth are determined by current installation, DAC type, memory size, and memory type.
`Adapter not detected` appears.	An I/O conflict between the Extended Memory Manager (EMM) and the video ROM occurred. Remove all adapter cards and boot from a plain DOS disk. Exclude the video BIOS address (C0000-C7FFF) from the memory manager.
A FIFO test error occurred.	The effects of a bad command FIFO should be visible. The screen is not displayed or garbage appears on the screen.
A quick memory test error occurred.	Run the Detailed RAM Test to confirm the error and identify the address of the error.
A detailed memory test error occurred.	Run the Detailed RAM Test several times to confirm the error. Note any messages or error codes.
A DAC LUT test failure error occurred.	An error has occurred while testing the DAC Lookup Table. The problem should be visible on the top color bar

Problem	Solution
	of any 8bpp mode.
A ROM checksum error occurred.	A ROM error occurred. Call technical support.
The draw sequence failed.	An error occurred in the draw engine. If the error is intermittent, it might indicate a marginal RAM failure. The effects of this failure may not be immediately apparent.

Video Specifications

Specification	Description
Operating Environments	Use DOS 5.0 or later, Windows 3.1, Windows NT, OS/2 2.1, or OS/2 Warp.
Video Display Buffer	Either 1 MB or 2 MB of DRAM.
Sync Signals	Separate horizontal and vertical sync at TTL levels.
Video Memory Address	A000 - BFFF plus the memory aperture address enabled through the INSTALL program.
Video BIOS Address	C000 - C7FF.
Video Port Addresses	102, 1CE, 1CF, 2E8, 2EC, 2ED, 2EE, 2EF, 3?4, 3?5, 3?8, 3?9, 3?A, 3?B, 3C0, 3C1, 3C2, 3C3, 3C4, 3C5, 3C6, 3C7, 3C8, 3C9, 3CA, 3CC, 3CE, 3CF, 3DC, and all aliases; 46E8. (?=B for monochrome, ?=D for color operation)
Video Output Connector	15-pin D shell (Female), IBM standard.
VGA Feature Connector	26-pin header, VGA Out only, VESA standard.
Video interrupt	PCI — system auto-configurable.
Power	+5V ±5%, @ 1.3A typical.
Ambient Temperature	Operating — 50· to 122· F (10· to 50· C). Storage — 32· to 162· F (0· to 70· C).
Relative Humidity	Operating — 5% to 90% non-condensing. Storage — 0% to 95%.
MTBF	120,000 hours.

Supported Video Modes

The supported video modes are shown in the table below. The following table only shows supported modes when 1 MB of video DRAM is installed on the motherboard.

Screen Resolution	Refresh Rate	Hor. Freq.	Pixel Clock	8 BPP	16 BPP	24 BPP
640 x 480	60	31.4	25.2	X	X	X
640 x 480	72	37.7	31.2	X	X	X
640 x 480	75	37.5	31.5	X	X	X
640 x 480	90	47.9	39.9	X	X	
640 X 480	100	52.9	44.9	X	X	
800 X 600	48 int	33.8	36.0	X	X	
800 X 600	56	35.1	36.0	X	X	
800 X 600	60	37.8	40.0	X	X	
800 X 600	70	44.5	44.9	X	X	
800 X 600	72	48.0	50.0	X	X	
800 X 600	75	46.8	49.5	X	X	
800 X 600	90	57.0	56.6	X		
800 X 600	100	62.5	67.5	X		
1024 x 768	43 int	35.5	44.9	X		
1024 x 768	60	48.3	65.0	X		
1024 x 768	70	56.4	75.0	X		
1024 x 768	72	58.2	75.0	X		
1024 x 768	75	60.0	78.8	X		
1024 x 768	90	76.2	100			
1024 x 768	100	79.0	110			
1152 x 864	43 int	45.9	65.0	X		
1152 x 864	47 int	44.8	65.0	X		
1152 x 864	60	54.9	80.0	X		
1152 x 864	70	66.1	1100			
1152 x 864	75	75.1	110			
1280 X 1024	43 int	50.0	80.0			
1280 X 1024	47 int	50.0	80.0			
1280 X 1024	60	63.9	110			
1280 X 1024	70	74.6	126			
1280 X 1024	74	78.8	135			
1280 X 1024	75	79.9	135			

Cont’d

Supported Video Modes, Continued

The following table only shows supported modes when 2 MB of video DRAM is installed on the motherboard.

Screen Resolution	Refresh Rate	Hor. Freq.	Pixel Clock	8 BPP	16 BPP	24 BPP
640 x 480	60	31.4	25.2	X	X	X
640 x 480	72	37.7	31.2	X	X	X
640 x 480	75	37.5	31.5	X	X	X
640 x 480	90	47.9	39.9	X	X	X
640 X 480	100	52.9	44.9	X	X	X
800 X 600	48 int	33.8	36.0	X	X	X
800 X 600	56	35.1	36.0	X	X	X
800 X 600	60	37.8	40.0	X	X	X
800 X 600	70	44.5	44.9	X	X	X
800 X 600	72	48.0	50.0	X	X	X
800 X 600	75	46.8	49.5	X	X	X
800 X 600	90	57.0	56.6	X		
800 X 600	100	62.5	67.5	X		
1024 x 768	43 int	35.5	44.9	X	X	
1024 x 768	60	48.3	65.0	X	X	
1024 x 768	70	56.4	75.0	X	X	
1024 x 768	72	58.2	75.0	X	X	
1024 x 768	75	60.0	78.8	X	X	
1024 x 768	90	76.2	100	X		
1024 x 768	100	79.0	110	X		
1152 x 864	43 int	45.9	65.0	X	X	
1152 x 864	47 int	44.8	65.0	X	X	
1152 x 864	60	54.9	80.0	X	X	
1152 x 864	70	66.1	1100	X		
1152 x 864	75	75.1	110	X		
1280 X 1024	43 int	50.0	80.0	X		
1280 X 1024	47 int	50.0	80.0	X		
1280 X 1024	60	63.9	110	X		
1280 X 1024	70	74.6	126	X		
1280 X 1024	74	78.8	135	X		
1280 X 1024	75	79.9	135	X		

Color Depth The relation between bits per pixel and colors is:

Bits Per Pixel	Maximum Colors Supported
8	256
15	65,000
16	65,000
24	16,700,000

5 WINBIOS Setup

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

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

A New Kind of BIOS Setup 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 mouse. WINBIOS Setup supports Microsoft-Compatible serial mice and all PS/2-type mice.

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

Using the Keyboard with WINBIOS Setup

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

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

WINBIOS Setup

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

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

WINBIOS Setup Main Windows The WINBIOS Setup main windows are:

- Setup, described in Section 1 on page 94, 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 122, has four icons that perform system functions,
- Security, described in Section 3 beginning on page 123, has two icons that control AMIBIOS security features, and
- Default, described in Section 4 beginning on page 126, this section has three icons that permit you to select a group of settings for all AMIBIOS WINBIOS Setup options.

Section 1 Setup

Standard Setup

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

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

Floppy Drive A: and B: Move the cursor to these fields via ↑ and ↓ and select the floppy type. The settings are *360 KB 5¼ inch*, *1.2 MB 5¼ inch*, *720 KB 3½ inch*, *1.44 MB 3½ inch*, or *2.88 MB 3½ inch.*

Master Disk, Slave Disk Select one of these hard disk drive icons to configure the hard disk 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 AMIBIOS automatically detect the IDE drive parameters and report them to this screen.

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, AMIBIOS automatically finds all IDE hard disk drive parameters. AMIBIOS places the hard disk drive parameters that it finds in the Drive C: Type or Drive D: Type fields in Standard Setup.

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

Parameter	Description
	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)

Cont'd

Hard Disk Drive Types

Type	Cylinders	Heads	Write Precompensation	Landing Zone	Sectors	Capacity
1	306	4	128	305	17	10 MB
2	615	4	300	615	17	20 MB
3	615	6	300	615	17	31 MB
4	940	8	512	940	17	62 MB
5	940	6	512	940	17	47 MB
6	615	4	65535	615	17	20 MB
7	462	8	256	511	17	31 MB
8	733	5	65535	733	17	30 MB
9	900	15	65535	901	17	112 MB
10	820	3	65535	820	17	20 MB
11	855	5	65535	855	17	35 MB
12	855	7	65535	855	17	50 MB
13	306	8	128	319	17	20 MB
14	733	7	65535	733	17	43 MB
16	612	4	0	663	17	20 MB
17	977	5	300	977	17	41 MB
18	977	7	65535	977	17	57 MB
19	1024	7	512	1023	17	60 MB
20	733	5	300	732	17	30 MB
21	733	7	300	732	17	43 MB
22	733	5	300	733	17	30 MB
23	306	4	0	336	17	10 MB
24	925	7	0	925	17	54 MB
25	925	9	65535	925	17	69 MB
26	754	7	754	754	17	44 MB
27	754	11	65535	754	17	69 MB
28	699	7	256	699	17	41 MB
29	823	10	65535	823	17	68 MB
30	918	7	918	918	17	53 MB
31	1024	11	65535	1024	17	94 MB
32	1024	15	65535	1024	17	128 MB
33	1024	5	1024	1024	17	43 MB
34	612	2	128	612	17	10 MB
35	1024	9	65535	1024	17	77 MB
36	1024	8	512	1024	17	68 MB
37	615	8	128	615	17	41 MB
38	987	3	987	987	17	25 MB
39	987	7	987	987	17	57 MB
40	820	6	820	820	17	41 MB
41	977	5	977	977	17	41 MB
42	981	5	981	981	17	41 MB
43	830	7	512	830	17	48 MB
44	830	10	65535	830	17	69 MB
45	917	15	65535	918	17	114 MB
46	1224	15	65535	1223	17	152 MB
47	USER-DEFINED HARD DRIVE - Enter user-supplied parameters.					

Advanced Setup

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

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

The Optimal default setting is *30.* The Fail-Safe default setting is *Disabled.*

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 This option configures 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, AMIBIOS supports a PS/2-type mouse. Pins 1-2 of J20 on the motherboard must be shorted together to enable PS/2 mouse support. The settings are *Enabled* or *Disabled.*

The Optimal default setting is *Enabled.* The Fail-Safe default setting is *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.*

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

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.*

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

Parity Error Check This option enables parity error checking for system memory. The settings are *Enabled* (the parity for all system memory is checked) or *Disabled* (parity is checked only on the first 1 MB of system RAM).

The default settings are *Enabled.*

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

Cont'd

Advanced Setup, Continued

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.*

The default settings are *0:300.*

Wait for <F1> If Any Error AMIBIOS POST runs system diagnostic tests that can generate a message followed by:

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

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

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.* The Optimal default setting is *Off.* The Fail-Safe default setting is *On.*

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

The default settings are *Disabled.*

Floppy Drive Swapping Set this option to *Enabled* to permit drives A: and B: to be swapped. The settings are *Enabled* or *Disabled*. The default settings are *Disabled.*

Cont'd

Advanced Setup, Continued

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

The Optimal default setting is *C:,A:*. The Fail-Safe default setting is *A:,C:*.

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 123 for instructions on changing a password.

The Optimal and Power-On defaults are *Setup.*

Cache Memory This option enables L1 internal cache memory and L2 secondary cache memory. The settings are:

Setting	Description
Disabled	Neither L1 internal cache memory on the CPU or L2 secondary cache memory is enabled.
Internal	L1 internal cache memory on the CPU is enabled. L2 secondary cache memory is disabled.
Both	Both L1 internal cache memory on the CPU and L2 secondary cache memory are enabled.

System BIOS Shadow Cacheable When this option is set to *Enabled,* the contents of the F0000h system memory segment can be read from or written to L2 secondary cache memory. The contents of the F0000h memory segment are always copied from the BIOS ROM to system RAM for faster execution.

The settings are *Enabled* or *Disabled.* The default setting is *Enabled.*

Cont'd

System Using Cache Controller *Set this option to Enabled if a cache controller is installed in the computer.*

Setting	Description
No (the default setting)	To comply with the PCI specifications, PCI adapter cards must be reset every time the CPU is reset. When the end user forces a soft reset by pressing <Ctrl> <Alt> <Del>, only the CPU is reset. When this option is set to No, all soft resets are converted to hard resets, so that all PCI adapter cards are reset when the CPU is reset.
Yes	Soft resets still behave like soft resets when Yes is selected. Select this option if a caching controller is installed in the computer. Soft resets must not generate a hard reset if a caching controller is used. If a hard reset is generated, a PCI caching controller card cannot flush data from cache memory to a hard disk drive before the reset.

Video ROM C000,32K This option controls the location of the contents of video ROM. The settings are:

Setting	Description
Shadow	The contents of the video ROM area (C0000h - C7FFFh) are written to the same address in system memory (RAM) for faster execution.
Cache	The contents of the video ROM area (C0000h - C7FFFh) are written to the same address in system memory (RAM) for faster execution. Also, the contents of the C0000h – C7FFFh RAM area can be read from and written to cache memory.
Disabled	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

The default setting is *Cache.*

Cont'd

Advanced Setup, Continued

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

Setting	Description
Shadow	The contents of the video ROM area (C0000h - C7FFFh) are written to the same address in system memory (RAM) for faster execution.
Cache	The contents of the video ROM area (C0000h - C7FFFh) are written to the same address in system memory (RAM) for faster execution. Also, the contents of the C0000h – C7FFFh RAM area can be read from and written to cache memory.
Disabled	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

The default setting is *Disabled.*

IRQ 3
IRQ 4
IRQ 5
IRQ 7
IRQ 9
IQR 10
IRQ 11
IRQ 12
IRQ 14
IRQ 15 These options specify the bus that the specified IRQ can be used on. The settings are *PCI/PnP* or *ISA.* The default is *PCI/PnP* for all options except IRQ 5 and IRQ12.

The default is *PCI* for IRQ5 and IRQ12.

Memory Hole Use this option to specify an area in memory that cannot be addressed on the ISA bus. The settings are *Disabled, 512-640K,* or *15-16MB.* The default setting is *Disabled.*

DRAM Speed Specify the RAS access speed of the SIMMs installed in the motherboard as system memory. The settings are *60ns* or *70 ns.* The default is *70ns.*

> ***Caution***
>
> If you have installed SIMMs with different speeds in the motherboard, select the speed of the slowest SIMM.
>
> You must always use SIMMs that have the same speed within a memory bank.

8 Bit I/O Recovery This option specifies the length of the delay that is added to the CPU cycle after an 8-bit I/O operation. The length of the delay is related to the CPU type and frequency. The settings are *Disabled, 1 SYSCLK, 2 SYSCLKs, 3 SYSCLKs, 4 SYSCLKs, 5 SYSCLKs, 6 SYSCLKs,* or *7 SYSCLKs.*

The default setting is *Disabled.*

16 Bit I/O Recovery This option specifies the length of the delay that is added to the CPU cycle after a 16-bit I/O operation. The length of the delay is related to the CPU type and frequency. The settings are *Disabled, 1 SYSCLK, 2 SYSCLKs, 3 SYSCLKs,* or *4 SYSCLKs.*

The default setting is *Disabled.*

PCI VGA Palette Snooping This option must be set to *Enabled* if any ISA adapter card installed in the computer requires VGA palette snooping.

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

Power Management Setup

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

Advanced Power Management Set this option to *Enabled* to enable the Atlas PCI LPX APM (Advanced Power Management) features.

The settings are *Enabled* or *Disabled*. The default setting is *Disabled*. If set to *Disabled,* no other Power Management Setup option is available.

Full On to Standby Timeout Value This option specifies the length of the period of system inactivity when in Full On mode before the computer is placed in Standby mode. In Standby mode, power consumption is minimized but the computer returns to Full On mode when any activity occurs.

The settings are *Disabled, 1 Min, 2 Min,* and all one minute intervals up to and including *255 Min*. The default setting is *Disabled.*

Standby to Suspend Timeout Value This option specifies the length of the period of system inactivity when the computer is already in Standby mode before the computer is placed in Suspend mode. In Suspend mode, nearly all power use is curtailed.

The settings are *Disabled, 1 Min, 2 Min,* and all one minute intervals up to and including *255 Min*. The default setting is *Disabled.*

IDE Drive Power Down In Specify the power saving mode that is entered when the IDE hard disk drive is powered down. The settings are *Disabled* (no power savings), *Standby*, or *Suspend*. The default setting is *Disabled.*

Cont'd

VESA Video Power Down In Specify the power saving mode that is entered when no video signal is being supplied to the video monitor. The settings are *Disabled* (no power savings), *Standby*, or *Suspend*. The default setting is *Disabled.*

VESA Power Down Mode Specify the power saving mode that is entered when the video monitor is powered down. The settings are *Off* (no power savings), *Standby*, or *Suspend*. The default setting is *Disabled.*

Slow Clock Ratio This option specifies the speed at which the system clock runs in power saving modes. The settings are expressed as a ratio between the normal clock speed and the power down clock speed.

The settings are *1:1*, *1:2* (half as fast as normal), *1:4* (¼ the normal clock speed*)*, *1:8*, *1:16*, *1:32*, *1:64*, or *1:128*. The default setting is *1:1.*

IRQ 3 Break Event
IRQ 4 Break Event
IRQ 5 Break Event
IRQ 7 Break Event
IRQ 9 Break Event
IRQ 10 Break Event
IRQ 11 Break Event
IRQ 12 Break Event
IRQ 14 Break Event
IRQ 15 Break Event These options enable event monitoring by AMIBIOS. When the computer is in a power saving mode, activity on the named interrupt request line is monitored by AMIBIOS. When any activity occurs, the computer enters Full On mode.

Each of these options can be set to *Enabled* or *Disabled*. The default setting for all options is *Disabled,* except for IRQ

12 Break Event, which has a default setting of *Enabled.*

Peripheral Setup

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

IDE Terminology Peripheral Setup includes 24 options related to IDE controllers and IDE drives. First, definitions for IDE terms are provided.

Term	Description
Onboard	The IDE controllers on the Atlas PCI LPX motherboard. There is a primary and a secondary IDE controller on the motherboard. Each IDE controller supports up to two IDE devices.
Offboard	The IDE controllers on an IDE controller adapter card inserted in an ISA or PCI expansion slot. AMIBIOS supports primary and a secondary offboard IDE controller. Each IDE controller supports up to two IDE devices.
Primary Controller	Whether using an oboard or an offboard IDE controller, one of the IDE controllers is the primary controller.
Secondary Controller	The second IDE controller is the secondary controller.
Master Drive	Each IDE controller can have two drives attached to it. The first drive is the Master drive.
Slave Drive	Each IDE controller can have two drives attached to it. The second drive is the Slave drive.

Cont'd

Peripheral Setup, Continued

IDE Controller Settings The following characteristics can be selected for the Onboard Primary, Onboard Secondary, Offboard Primary, and Offboard Secondary IDE controllers:

Peripheral Setup Option	Description
IDE LBA Mode	Use this option to enable IDE LBA (Logical Block Addressing) mode. Older hard disk drives use the CHS (Cylinder-Head-Sector) addressing scheme that limits hard disk drives to 528 MB. LBA permits drives capacities up to 5 GB. **Setting** **Description** *Disabled* Do not enable IDE LBA mode (Default). *Master* Enable IDE LBA mode for the master IDE drive attached to the primary IDE controller. *Slave* Enable IDE LBA mode for the slave IDE drive attached to the primary IDE controller. *Both* Enable IDE LBA mode for both the Primary and Secondary IDE controller are enabled.
IDE Block Mode	IDE Block mode enables higher data transfer rates. **Setting** **Description** *Disabled* Do not enable IDE Block Mode (Default). *Master* Enable IDE Block Mode for the master IDE drive attached to the primary IDE controller. *Slave* Enable IDE Block Mode for the slave IDE drive attached to the primary IDE controller. *Both* Enable IDE Block IDE Mode for both the

Peripheral Setup Option	Description
	Primary and Secondary IDE controller are enabled.
IDE 32-Bit Transfer	32-bit data transfers move twice as much data to and from the IDE drives. **Setting** **Description** *Disabled* Do not enable IDE 32-bit transfers (Default). *Master* Enable IDE 32-bit transfers for the master IDE drive attached to the primary IDE controller. *Slave* Enable IDE 32-bit transfers for the slave IDE drive attached to the primary IDE controller. *Both* Enable IDE 32-bit transfers for both the primary and secondary IDE controllers.
IDE Prefetch	*Not available for Offboard Primary and Offboard Secondary IDE Controller.* IDE prefetch mode reads part of the data from the IDE drive before the CPU actually asks for the data. This mechanism makes data reads faster when large blocks of data are read. **Setting** **Description** *Disabled* Do not enable IDE prefetch mode (Default).. *Master* Enable IDE prefetch mode for the master IDE drive attached to the primary IDE controller. *Slave* Enable IDE prefetch mode for the slave IDE drive attached to the primary IDE controller.

Peripheral Setup Option	Description
	Both Enable IDE prefetch mode for both the Primary and Secondary IDE controller.
IDE PIO	*Not available for Offboard Primary and Offboard Secondary IDE Controller.* The IDE PIO (Programmed I/O) mode is a standard for information storage and rerieval. In general, higher modes provided better performance than lower modes. The PIO mode for all IDE drives is set at the factory and cannot be changed. You must choose the proper PIO mode or your IDE drive will not work and may be damaged. If you choose Auto, AMIBIOS will automatically select the correct IDE PIO mode. **Setting** **Description** *Auto* Permit AMIBIOS to determine the optimal IDE mode supported by the IDE drive installed as the primary IDE master drive (Default). *Mode 0* Specify IDE mode 0. *Mode 1* Specify IDE mode 1. *Mode 2* Specify IDE mode 2. *Mode 3* Specify IDE mode 3. *Mode 4* Specify IDE mode 4.
Offboard PCI/ISA IDE	Use this option if you want to use an IDE controller card installed in an ISA or PCI expansion slot. The settings are *Absent, ISA, Slot 1,* or *Slot 2*. The default setting is *Absent.* If ISA is selected the Offboard Primary/Secondary IDE option becomes available.
Offboard IDE INT# Line	*Only available for Offboard Primary and Offboard Secondary IDE Controller.* Use this option to specify the PCI interrupt used by the offboard PCI IDE controller (if installed). The settings are *INTA, INTB, INTC, INTD*, or *Not Used.* The

Peripheral Setup Option	Description
	default setting is *INTA.*

Cont'd

Peripheral Setup, Continued

Onboard Primary/Secondary Controllers The Peripheral Setup IDE options that become available depends on the onboard IDE controllers that you enable:

Controller	Peripheral Setup IDE Options
Only Primary	Set **Onboard Primary/Secondary IDE** to *Primary.* The following options become available: Onboard Primary LBA Mode, Onboard Primary Block Mode, Onboard Primary 32-Bit Transfer, Onboard Primary Prefetch, Onboard Primary Master PIO, and Onboard Primary Slave PIO.
Primary and Secondary (Both)	Set **Onboard Primary/Secondary IDE** to *Both.* The **Onboard Secondary Drives Present** option will be available if the secondary IDE controller is used and the **Onboard Primary/Secondary IDE option** is set to *Secondary* or *Both.* Specify the number of IDE drives attached to the Secondary IDE controller. The settings are *None, 1 Drive*, or *2 Drives*. The default setting is *None.* If *1 Drive* or *2 Drives* is selected, the following options become available: Onboard Primary LBA Mode, Onboard Primary Block Mode, Onboard Primary 32-Bit Transfer, Onboard Primary Prefetch, Onboard Primary Master PIO, Onboard Primary Slave PIO. Onboard Secondary Drives Present, Onboard Secondary LBA Mode, Onboard Secondary Block Mode, Onboard Secondary 32-Bit Transfer, Onboard Secondary Prefetch, Onboard Secondary Master PIO, and Onboard Secondary Slave PIO.
Secondary	Set **Onboard Primary/Secondary IDE** to *Secondary.* The **Onboard Secondary Drives Present** option will be available if the secondary IDE controller is used and the **Onboard Primary/Secondary IDE**

Controller	Peripheral Setup IDE Options
	option is set to *Secondary.* Specify the number of IDE drives attached to the Secondary IDE controller. The settings are *None, 1 Drive*, or *2 Drives*. The following options become available: Onboard Secondary Drives Present, Onboard Secondary LBA Mode, Onboard Secondary Block Mode, Onboard Secondary 32-Bit Transfer, Onboard Secondary Prefetch, Onboard Secondary Master PIO, and Onboard Secondary Slave PIO.

Peripheral Setup, Continued

Offboard Primary/Secondary Controllers The IDE options that become available depend on the enabled offboard IDE controllers. Set **Onboard Primary/Secondary IDE** to *Disabled.* Set **Offboard PCI/ISA IDE** to:

- *ISA* if an ISA IDE card is installed in an ISA expansion slot.
- *Slot 1* if a PCI IDE card is installed in PCI expansion slot 1.
- *Slot 2* if a PCI IDE card is installed in PCI expansion slot 2.

Controller	Peripheral Setup IDE Options
Primary	Set **Offboard Primary/Secondary IDE** to *Primary.* The following options become available: Offboard Primary LBA Mode, Offboard Primary Block Mode, Offboard Primary 32-Bit Transfer, and Offboard Primary IDE INT# Line.
Primary and Secondary (Both)	Set **Offboard Primary/Secondary IDE** to *Both.* Set **Offboard Secondary Drives Present** to *1 Drive* or *2 Drives.*The following options become available: Offboard Primary LBA Mode, Offboard Primary Block Mode, Offboard Primary 32-Bit Transfer, Offboard Primary IDE INT# Line, Offboard Secondary LBA Mode, Offboard Secondary Block Mode, Offboard Secondary 32-Bit Transfer, Offboard Secondary IDE INT# Line.
Secondary	Set **Onboard Primary/Secondary IDE** to *Secondary.* Set **Offboard Secondary Drives Present** to *1 Drive* or *2 Drives.*The following are available: Offboard Secondary LBA Mode, Offboard Secondary Block Mode, Offboard Secondary 32-Bit Transfer, Offboard Secondary IDE INT# Line.

Cont'd

PCI IDE Controller Only The following Peripheral Setup options only appear if an offboard PCI IDE controller card is used:

- Offboard Primary 32-Bit Transfer,
- Offboard Secondary 32-Bit Transfer,
- Offboard Primary INT# Line, and
- Offboard Secondary INT# Line.

Onboard Primary/Offboard Secondary The following Peripheral Setup options become available if you enable the onboard Primary IDE controller and an offboard Secondary IDE Controller:

- Onboard Primary LBA Mode,
- Onboard Primary Block Mode,
- Onboard Primary 32-Bit Transfer,
- Onboard Primary Prefetch,
- Onboard Primary Master PIO,
- Onboard Primary Slave PIO,
- Offboard Secondary LBA Mode,
- Offboard Secondary Block Mode,
- Offboard Secondary 32-Bit Transfer, and
- Offboard Secondary IDE INT# Line.

Offboard Primary/Onboard Secondary The following Peripheral Setup options become available if you enable the offboard Primary IDE controller and an onboard Secondary IDE Controller:

- Offboard Primary LBA Mode,
- Offboard Primary Block Mode,
- Offboard Primary 32-Bit Transfer,
- Offboard Primary IDE INT# Line,
- Onboard Secondary Drives Present,
- Onboard Secondary LBA Mode,
- Onboard Secondary Block Mode,
- Onboard Secondary 32-Bit Transfer,
- Onboard Secondary Prefetch,
- Onboard Secondary Master PIO, and
- Onboard Secondary Slave PIO.

Cont'd

Peripheral Setup, Continued

OnBoard Floppy Controller This option enables the floppy drive controller on the motherboard. The settings are *Enabled* or *Disabled.* The default is *Enabled.*

Serial Port1 IRQ4 is used for the first serial port (COM1). This option enables serial port 1 on the motherboard and specifies the base I/O port address.

The settings are *3E8h*, *3F8h*, or *Disabled.* The default setting is *3F8h.*

Serial Port1 FIFO *This option enables the FIFO buffer for the first serial port. The settings are Enabled or Disabled. The default setting is* Disabled.

> ***Caution***
> Do not enable the Serial Port 1 FIFO option if a mouse is attached to COM1.

Serial Port2 IRQ3 is used for the second serial port (COM2). This option enables serial port 2 on the motherboard, if installed. The settings are *2F8h, 2E8h,* or *Disabled.* The Optimal and Fail-Safe default settings are *Disabled.*

Serial Port2 FIFO *This option enables the FIFO buffer for the second serial port. The settings are Enabled or Disabled. The default setting is* Disabled.

> ***Caution***
> Do not enable the Serial Port2 FIFO option if a mouse is attached to COM2.

Parallel Port 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 *378h, 278h,* or *Disabled.*

The default setting is *378h.*

Cont'd

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

Setting	Description
Normal	The normal parallel port mode is used. This is the default setting.
Extended	Use this setting to support bidirectional transfers on the parallel port.
EPP	The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bidirectional data transfer driven by the host device.
ECP	The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve transfer rates of approximately 2.5 Mbs. ECP provides symmetric bidirectional communications.

Parallel Port DMA This option is only available if the setting for the Parallel Port Mode option is *ECP*.

The settings are *Disabled, DMA CH (channel) 0, DMA CH 1, DMA CH 3, DMA CH 5, DMA CH 6,* or *DMA CH 7*. The default setting is *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 Security

AMIBIOS 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 102) 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. AMIBIOS will erase the password.

Anti-Virus

When this icon is selected from the Security section of the WINBIOS Setup main menu, AMIBIOS issues a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The settings are *Enabled* or *Disabled.* If enabled, the following appears when a write is attempted to the boot sector. You may have to type *N* several times to prevent the boot sector write.

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

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

```
Format!!!
```

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

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.

6 Programming the Flash ROM

All versions of the Atlas PCI LPX motherboard use Flash EPROM to store the system BIOS. The advantage of Flash EPROM is that the EPROM chip does not have to be replaced to update the BIOS. The end user can actually reprogram the BIOS, using a ROM file supplied by American Megatrends..

Programming the Flash EPROM

Step	Action
1	Turn power off. Make sure that the computer has a working speaker.
2	Insert the floppy disk with the S725P.ROM file in drive A:.
3	Before DOS boots, press and hold down the <Ctrl> and <Home> keys to reprogram the Flash EPROM-based AMIBIOS. The bootblock code immediately reads the A: drive, looking for the new BIOS information.
4	When the flash ROM has successfully been programmed, the computer will reboot.

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

1. Reads S725P.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:.
4. Generates a CPU reset, rebooting the computer.

The bootblock part of the Flash EPROM is not programmed. Should you inadvertently open the disk drive door or turn power off to the computer while programming the Flash EPROM, the

bootblock will be unaffected. Simply turn power back on and begin the Flash ROM programming process again.

Cont'd

S725P.ROM S725P.ROM resides on a floppy disk and contains the updated main BIOS code. American Megatrends will provide this file when the AMIBIOS for the Atlas PCI LPX ISA motherboard must be updated.

S725P.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 S725P.ROM.

Sequence of Operation The sequence of operation and expected behavior of the boot block BIOS codeis:

Step	Expected behavior
1 Look for floppy disk.	The system beeps one time before the BIOS attempts to read from floppy drive A:.
2 Look for S725P.ROM on the floppy disk.	S725P.ROM must be in the root directory of the floppy disk in drive A:. There is no beep if successful.
3 Read the floppy disk.	The floppy disk is read. There is no beep if this step is successful.
4 Check for BIOS file size.	The BIOS file size is checked. There is no beep if this step is successful.
5 Check for Flash EPROM.	The BIOS looks for an Intel i28F001BX-T Flash EPROM. It does not beep if this step is successful.
6 Erase the Flash EPROM.	Two beeps sound when the BIOS begins erasing the Flash EPROM.
7 Program the Flash EPROM.	Three beeps sound when the AMIFlash Code begins reprogramming the Flash EPROM.
8 Continue programming the Flash EPROM.	Four beeps sound when reprogramming has been successfully completed.
9 AMIFlash does a reset.	A CPU reset is generated to reboot the computer.

Beep Codes

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

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

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

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

BootBlock Code Checkpoint Codes

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

Code	Description
	region.
FFh	Flash programming is successful. The computer reboots.

A Upgrading Cache Memory

L2 secondary cache memory on the American Megatrends Atlas PCI LPX motherboard can be upgraded from 256 KB to 512 KB by removing the 256 KB cache module and inserting a 512 KB cache module, as shown below:

Cache Modules The cache module used must conform to the Intel COAST Version 1.0 specification. A 160-pin cache module connector is mounted on the motherboard. See the motherboard drawing on the next page.

Supported Cache Modules Supported cache modules include:

L2 Cache Size	Type
256 KB	Asynchronous
512 KB	Asynchronous
256 KB	Pipeline burst
512 KB	Pipeline burst
256 KB	Synchronous burst
512 KB	Synchronous burst

B Upgrading VGA Memory

The Atlas PCI LPX motherboard is shipped with 1 MB of VGA memory. You can install an additional 1 MB of VGA memory to provided even better video performance. To add VGA memory:

Step	Action
1	Order the proper VGA memory parts.
2	Make sure you follow antistatic procedures (see page 25). Turn power off and remove the computer cover.
3	Locate the VGA memory locations. See the motherboard drawing on the following page.
4	Carefully insert the additional ICs. Make sure Pin 1 of the IC is installed in Pin1 of the socket. Carefully press down gently on each IC to make sure it is properly installed.
5	Replace the computer cover and reboot the computer.

Atlas PCI LPX VGA Memory Location

The part of the Atlas PCI LPX motherboard that has the VGA memory sockets is shown below. Insert the additional VGA memory ICs as shown below:

Index

—E—

—F—

—G—

—H—

—I—

—J—

—T—

—U—

—V—

—W—