

American Megatrends, Inc.

Excalibur PCI-II

Pentium® ISA Motherboard

*User's Guide*

MAN-722  
9/9/94

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### **Revision History**

9/9/94 Initial release.

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## Preface

### **To the OEM**

Thank you for purchasing the high performance American Megatrends Excalibur PCI-II ISA Pentium® motherboard. This product is a state of the art Pentium-based motherboard that includes the famous WINBIOS. It is assumed that you have also licensed the rights to use the American Megatrends documentation for the Excalibur PCI-II ISA Pentium 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 Excalibur PCI-II ISA Pentium motherboard. It explains how to assemble a system based on this motherboard and how to use the WINBIOS 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 404-246-8600.

### **Acknowledgments**

This manual was written by Vivek Saxena and Paul Narushoff.

## American Megatrends BBS

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

### Data Transmission Rates

The BBS automatically handles modems with data transmission rates from 1,200 to 28,800 bps.

### 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.

<b>Phone Number</b>	<b>Characteristics</b>
404-246-8780	US Robotics 28,800 bps. Supports every v.xx communications standard.
404-246-8781	US Robotics 28,800 bps. Supports every v.xx communications standard.
404-246-8782	US Robotics dual standard. Can handle 2,400, 9,600, or 14,400 bps. Supports HST or v.32.
404-246-8783	US Robotics 14,400 bps v.32. Supports high speed v.32.



# 1 System Overview

The American Megatrends Excalibur PCI-II motherboard has an Intel® Pentium® CPU operating at 60 or 66 MHz, four ISA expansion slots, and four PCI expansion slots. The motherboard conforms to the PCI Version 2.0 specification and uses the PCI local bus. The PCI slots operate synchronously with the CPU clock, as follows:

<b>CPU Internal Clock Frequency</b>	<b>PCI Expansion Slots Frequency</b>
66 MHz	33 MHz
60 MHz	30 MHz

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

### ***Warning***

The Excalibur PCI-II motherboard supports 66 MHz Pentium CPUs that do not have any special voltage requirements. At the current time, the following 66 MHz versions of the Intel Pentium CPU are available:

- *Intel 66 MHz Pentium, part number SX950, which requires 5V +/-5%. It is fully supported by the Excalibur PCI-II motherboard.*
- Intel part number SX949. The voltage requirements for this part are 5.15 - 5.40 volts. This CPU is not supported by the Excalibur PCI-II motherboard.

If using a 66 MHz Pentium CPU that does not match the above Intel SX part numbers, see the Intel CPU documentation to find out if your Pentium CPU works at 5V +/-5%.

There are no special voltage requirements for 60 MHz Pentium CPUs. All current versions of the 60



MHz Pentium CPUs are supported by the Excalibur  
PCI-II motherboard.

## Introduction, Continued

### **Motherboard Dimensions**

The motherboard is approximately 8.5 inches wide by 13 inches long (the standard Baby AT motherboard size with similar mounting hole locations). The height restrictions are:

## Description

### **Processor Type and Speed**

The motherboard uses an Intel Pentium CPU operating at 60 or 66 MHz. There is one CPU socket on the motherboard.

### **Fan and Heat Sink**

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

Description, Continued

### **Main System Memory**

The motherboard requires Fast Page Mode SIMMs operating at 70 ns (RAS access time) and uses a One level Posted write Memory Write Buffer. The motherboard supports up to 128 MB of onboard system memory via two 64-bit banks with the following types of SIMMs (Single Inline Memory Modules): 256 KB x 36 SIMMs, 512 KB x 36 SIMMs, 1 MB x 36 SIMMs, 2 MB x 36 SIMMs, 4 MB x 36 SIMMs, 8 MB x 36 SIMMs, or 16 MB x 36 SIMMs. Either two or four SIMMs must be mounted.

### **Fast ATA**

This motherboard supports the Fast ATA specification. Fast ATA uses Programmed I/O, IDE mode 3, and multiword DMA mode 1 to achieve higher data transfer rates than possible with standard IDE drives.

## Description, Continued

### L2 Secondary Cache Memory

The motherboard supports 256 KB or 512 KB of direct mapped, write-back or write-through L2 external (secondary) cache memory. 256 KB of SOJ SRAM L2 cache memory is permanently mounted on the motherboard. Sockets exist for an additional 256 KB of DIP L2 cache memory. The external (secondary) cache memory is mounted on the motherboard in two rows of eight SRAMs each. The Data SRAM is 15 ns 32 KB x 8 5V SRAMs.

**Caution**

You must use 5V SRAMs when upgrading from 256 KB to 512 KB of L2 cache memory.

Shadowed ROM areas such as the system BIOS and Video BIOS can be cached and write-protected via Advanced Setup. The cache read wait states are 3-2-2-2. Burst mode is supported (the timings at 66 MHz are: read burst 4-2-2-2, write burst 4-2-2-2). Cache memory is enabled and disabled through WINBIOS Setup Advanced Setup.

### Amount of System Memory That Can be Cached

All installed system memory can be read from or written to L1 internal cache memory. For L2 secondary cache memory:

L2 Secondary Cache Memory on Motherboard	Cacheable System Memory
256 KB	up to 64 MB of system memory can be read from or written to L2 secondary cache memory.
512 KB	up to 128 MB of system memory can be read from or written to L2 secondary cache memory.

### Hardware Reset Switch

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

## Description, Continued

### **Pentium Internal Cache Memory**

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

### **Shadow RAM**

The system BIOS ROM is always copied to RAM location F0000h – FFFFFh. Video BIOS shadowing is enabled via Advanced Setup. Adaptor ROM shadowing is also enabled via Advanced Setup in 16 KB increments.

### **System BIOS**

The Excalibur PCI-II motherboard has a 128 KB WINBIOS at address E0000h through FFFFFh with built-in WINBIOS Setup and user-definable hard disk drive types. The BIOS is stored in Flash EPROMs and can be reprogrammed via software without removing the ROM. WINBIOS includes IDE block mode support, APM hooks, flash BIOS hooks, and the Plug and Play (PnP) BIOS extensions, which are used to automatically configure PnP-compliant ISA adapter card resources, such as: I/O port addresses, memory, DMA, and IRQs).

### **CMOS RAM**

The motherboard has 114 bytes of nonvolatile CMOS RAM contained in a Dallas 1287A chip that also has a built-in battery with an expected life of seven years.

### **Real Time Clock**

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

## Description, Continued

### Onboard I/O

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

### Up to Four IDE Drives

The motherboard supports up to four IDE drives through two 40-pin IDE connectors, marked *Primary* and *Secondary*. The following shows how IDE drives can be configured:

## Description, Continued

### **IDE Autodetect**

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

**Caution**

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

### **Power Management**

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

## Description, Continued

### Seven DMA Channels

The Excalibur PCI-II Pentium motherboard has seven DMA channels.

### I/O Capability

The Excalibur PCI-II motherboard accesses 16- or 8-bit I/O devices on the ISA bus and 32-bit devices on the PCI bus.

### Fifteen Interrupt Levels

The motherboard has 15 hardware interrupt levels. The NMI takes precedence over all hardware interrupts. IRQs 3, 4, 5, 7, 9, 10, 11, 12, 14, or 15 can be allocated for use on either the ISA bus or the PCI bus via Chipset Setup in WINBIOS Setup. The IRQs in priority order are:

Label	Typical Interrupt Source
IRQ 0	Interval Timer 1, Counter 0 OUT
IRQ 1	Keyboard
IRQ 2 (9)	IRQ 2 is really IRQ9.
IRQ 8	Real-Time-Clock
IRQ 9	ISA or PCI Bus, allocated by WINBIOS Setup Chipset Setup. Some EGA and VGA adapter cards use IRQ9. You must disable use of IRQ9 on these adapter cards before using IRQ9.
IRQ 10	ISA or PCI Bus, allocated by WINBIOS Setup Chipset Setup.
IRQ 11	ISA or PCI Bus, allocated by WINBIOS Setup Chipset Setup.
IRQ 12	Onboard PS/2 Mouse <i>or</i> AT bus through a jumper
IRQ 13	Coprocessor Error
IRQ 14	Bus (Hard disk drive controller)
IRQ 15	ISA or PCI Bus, allocated by WINBIOS Setup Chipset Setup.



IRQ 3	Bus (Serial Port 2)
IRQ 4	Bus (Serial Port 1)
IRQ 5	Bus (Parallel Port 2)
IRQ 6	Bus and floppy disk controller
IRQ 7	Bus (Parallel Port 1)

## Description, Continued

### Timer Features

The Excalibur PCI-II Pentium motherboard has three programmable 16-bit counter/timers.

### Refresh Generation

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

### ISA Bus

The ISA bus in the Excalibur PCI-II Pentium motherboard has a system clock that is generated by the bus clock (BCLK) and operates at approximately 8 MHz.

### ISA and PCI Expansion Slots

The Excalibur PCI-II Pentium motherboard has four PCI expansion slots, and four 16-bit expansion slots for ISA adapter cards.

All PCI expansion slots are bus mastering. PCI Master Slot 4 is shared with the first ISA slot. Either a PCI adapter card can be installed in PCI Master Slot 4 or an ISA adapter card can be installed in the first ISA slot.

The PCI slots operate synchronously with the CPU clock, as follows:

<b>CPU Internal Clock Frequency</b>	<b>PCI Expansion Slots Frequency</b>
66 MHz	33 MHz
60 MHz	30 MHz

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

## Description, Continued

### PS/2 Mouse

The Excalibur PCI-II Pentium motherboard has a 10-pin berg header that can be attached via a customized serial cable to a PS/2-type mouse.

### Speaker

The Excalibur PCI-II Pentium motherboard has a standard four-pin speaker connector.

### I/O Address Space

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

Peripheral Device	I/O Port Address Range
Primary IDE Controller	01F0h - 01FFh
Secondary IDE Controller	0170h - 017Fh
Parallel Port	0278h - 027Bh
Serial Port	02E8h - 02EFh
Serial Port	02F8h - 02FFh
Parallel Port	0378h - 037Bh
Parallel Port	03BCh - 03BFh
Serial Port	03E8h - 03EFh
Floppy Disk Controller	03F0h - 03F7h
Serial Port	03F8h - 03FFh

### Memory Address on ISA Bus

Up to 16 MB of memory can be addressed on the ISA bus.

Description, Continued

### **Memory Addresses on PCI Bus**

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

### **I/O Channel Check**

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

### **Keyboard**

The Excalibur PCI-II Pentium motherboard uses a five-pin circular ISA miniDIN connector and has a five-pin keyboard lock connector to prevent unauthorized access.



## 2 PCI Local Bus

The Excalibur PCI-II 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 permits all PCI local bus products to be totally interchangeable. PCI is a multiplexed extension of the CPU bus. In PCI, the CPU bus control mechanisms have been extended to optimize I/O support. PCI 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.

## PCI, Continued

### **PCI Features**

- is processor-independent,
- has a multiplexed address, command, and data bus and supports burst mode operation on reads and writes,
- runs synchronous with the CPU at local bus speeds from 25 MHz 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.

PCI, Continued

### **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, Continued

**Using PCI Adapter Cards**

The Excalibur PCI-II 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

## Unpacking the Motherboard

Step	Action
1	<p>Inspect the cardboard carton for obvious damage. If damaged, call American Megatrends Technical Support at 404-246-8600.</p> <p>Leave the motherboard in its original packing.</p>
2	<p>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.</p> <p>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.</p>
3	<p>Inside the carton, the motherboard is packed in an anti-static bag, sandwiched between sheets of sponge.</p> <p>Remove the sponge and remove the anti-static bag.</p> <p>Place the motherboard on a grounded anti-static surface component side up.</p> <p>Save the original packing material in case of reshipment.</p>
4	<p>Inspect the motherboard for damage. Press down on all ICs mounted in sockets to verify proper seating.</p> <p>Do not apply power to the motherboard if it has been damaged.</p>
5	<p>If the motherboard is undamaged, it is ready to be installed.</p>



## Installation Steps

Step	Action	Turn to
1	Set switch and jumper options	Page
2	Install memory	Page
3	Install CPU	Page
4	Install motherboard	Page
5	Connect the power supply	Page
6	Connect the keyboard	Page
7	Connect the PS/2 mouse	Page
8	Connect cables	Page
9	Connect onboard I/O	Page
10	Install floppy disk drives	Page
11	Install hard disk drive	Page
12	Install adapter cards	Page
13	Test and configure	Page

**Warning**

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

### Step 1 Set Switch and Jumper Options

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

J21, J22, J23	Cache Memory Configuration
J39	Serial Port 1 IRQ Select
J38	Serial Port 2 IRQ Select
J37	Parallel Port IRQ Select
J40	PS/2 Mouse IRQ Enable
J43 and J44	Extended Parallel Port DMA Select
J48	Drain CMOS RAM Power
J29	L1 Cache Write-Back or Write-Through
J25	Green PC Monitor Connector
J1	Green PC Power Switch Connector

## Step 1 Set Switch and Jumper Options, Continued

### **J21, J22, J23 Cache Memory Configuration**

J21, J22 and J23 are three-pin bergs that control the L2 secondary cache memory configuration on the motherboard. See the graphic on page for their location.

<b>Cache Memory</b>	<b>J21</b>	<b>J22</b>	<b>J23</b>
256 KB	Short Pins 1-2	Short Pins 1-2	Short Pins 1-2
512 KB	Short Pins 2-3	Short Pins 2-3	Short Pins 2-3

### **J39 Serial Port 1 IRQ Select**

J39 is a three-pin single-inline berg. Short pins 2-3 to select IRQ3 for serial port 1. Short pins 1-2 (the default) to select IRQ4 for serial port 1.

## Step 1 Set Switch and Jumper Options, Continued

### **J38 Serial Port 2 IRQ Select**

J38 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.

### **J37 Parallel Port IRQ Select**

J37 is a three-pin single-inline berg. Short pins 2-3 to select IRQ5 for the parallel port. Short pins 1-2 (the default) to select IRQ7 for the parallel port.

## Step 1 Set Switch and Jumper Options, Continued

### **J43 and J44 Extended Parallel Port DMA Select**

J43 and J44 are six-pin single-inline bergs that select the EPP (Enhanced Parallel Port) DMA channels, shown below.

<b>DMA Channel</b>	<b>J43</b>	<b>J44</b>
DRQ0	Short Pins 1-2	Short Pins 1-2
DRQ1	Short Pins 3-4	Short Pins 3-4
DRQ3	Short Pins 5-6	Short Pins 5-6.
None (the factory setting)	OPEN	OPEN

### **J40 Onboard PS/2 Mouse IRQ Select**

J40 is a three-pin single-inline berg that selects the mouse IRQ. Short pins 1-2 to select IRQ12 from the onboard PS/2 mouse. Short pins 2-3 to select IRQ12 from a bus mouse. *IRQ12 cannot be used by any ISA or PCI bus adapter card when the onboard mouse is enabled.*



## Step 1 Set Switch and Jumper Options, Continued

### **J48 CMOS RAM Drain**

J48 is a two-pin berg. J48 is OPEN in normal operation. Short the pins to drain CMOS RAM.

#### ***Caution***

Make sure that power is turned off before shorting J48. After draining CMOS RAM, make sure that J48 is OPEN before turning power on again.

If you forget the system password in most computers, you must remove the battery for at least 20 minutes to erase CMOS RAM. J48 provides a quicker method. By shorting the J48 pins together, you can quickly drain power from CMOS RAM. After clearing CMOS RAM, remember to remove the shorting bridge before continuing. Then you must run WINBIOS Setup to reconfigure.

## Step 1 Set Switch and Jumper Options, Continued

### J30 and J32 CPU Output Select

J30 and J32 are two-pin jumpers that control the type of output signal buffer that the CPU uses. *This jumper is set at the factory and should not be changed.*

Type of CPU Output Signal Buffer	J30	J32
Normal system (factory setting)	OPEN	OPEN
Loaded system	SHORTED	OPEN
Extra loaded system	SHORTED	SHORTED

### J29 L1 Cache Mode

J29 is a two-pin jumper that selects the L1 CPU internal cache memory operating mode.

J29 Setting	Description
OPEN	The L1 CPU internal cache memory is in write-back mode.
SHORTED	The L1 CPU internal cache memory is in write-through mode.

#### **Important**

The J29 setting must match the setting of the **Internal Cache** option in Advanced Setup.

### J1 Green PC Power

J1 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 denotes the positive connector.

## Step 1 Set Switch and Jumper Options, Continued

### J25 Green PC Monitor Connector Pinout

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

The J25 pins on the motherboard are arranged as follows:

1	2
3	4
5	6
7	8
9	10

The pinout for the standard VGA monitor connector on the other end of the cable is shown below.

## Step 1 Set Switch and Jumper Options, Continued

### **J25 Green PC Monitor Connector**

Attach a 10-wire 10 to 26-pin flat cable between J25 on the motherboard and the VGA Feature Connector on the VGA adapter card or Graphics Accelerator. J25 is shown below.

The VGA cable is pictured below.

After the timeout period specified in Power Management Setup expires, the motherboard drives the SYNC ENABLE, HSYNC, and VSYNC signals Low through open collector outputs. Monitors that support the Display Power Management Specification (DPMS) can turn power off after examining this condition, saving power.

## Step 2 Install Memory

The main memory subsystem on the Excalibur PCI-II motherboard consists of two 64-bit memory banks. All banks house SIMM (Single Inline Memory Module) DRAM packages. You can use 256 KB x 36, 512 KB x 36, 1 MB x 36, 2 MB x 36, 4 MB x 36, 8 MB x 36, or 16 MB x 36 SIMMs. 16 MB SIMMs may also be sold as *4 by 36 SIMMs*.

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

### Motherboard Memory Configurations

The motherboard supports the following memory configurations on the motherboard. System memory must be populated two modules at a time. *Both of the modules in a memory bank must be the same type of SIMM.*

<b>Bank 0 (two modules)</b>	<b>Bank 1 (two modules)</b>	<b>Total RAM</b>
256 KB x 36	None	2 MB
256 KB x 36	256 KB x 36	4 MB
512 KB x 36	None	4 MB
512 KB x 36	512 KB x 36	8 MB
512 KB x 36	2 MB x 36	20 MB
512 KB x 36	4 MB x 36	36 MB
1 MB x 36	None	8 MB
1 MB x 36	1 MB x 36	16 MB
1 MB x 36	4 MB x 36	40 MB
2 MB x 36	None	16 MB
2 MB x 36	2 MB x 36	32 MB
2 MB x 36	4 MB x 36	48 MB
2 MB x 36	8 MB x 36	80 MB
4 MB x 36	None	32 MB
4 MB x 36	4 MB x 36	64 MB
8 MB x 36	None	64 MB
8 MB x 36	8 MB x 36	128 MB

16 MB x 36-	None	128 MB
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## Step 2 Install Memory, Continued

### Selecting SIMMs

The table on the following page has SIMM part numbers. If using SIMMs other than these, be sure they meet the following specifications:

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



## Step 2 Install Memory, Continued

### **Installing SIMMs**

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

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

The 1 MB x 36 SIMMs look like this:

### **Reporting Memory**

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

### Step 3 Install CPU

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

***Warning***

*Improper CPU installation can damage the CPU and the motherboard. You must follow the procedures in this section exactly as documented.*

The 273-pin PGA (Pin Grid Array) CPU socket is near one edge of the motherboard, as shown below. Make sure Pin 1 of the CPU matches Pin 1 of the CPU socket. The part of the motherboard where the CPU socket is located is shown below.

## Step 4 Install the Motherboard

The mounting hole pattern on the Excalibur PCI-II Pentium motherboard is the same as the mounting hole pattern on a Baby AT motherboard. Standoffs and mounting screws are not supplied with the motherboard. The following table describes the installation.

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

provided for them and tighten them. If necessary, shift the motherboard slightly to align the mounting holes on the motherboard with the holes on the chassis.

See the graphic on page .

## Step 4 Install the Motherboard, Continued

**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 following graphic.



## Step 5 Connect the Power Supply

The power supply should match the physical configuration of the chassis. Make sure that the power switch is Off before assembly. Before attaching all components, make sure that the proper voltage has been selected. Power supplies often can run on a wide range of voltages and must be set (usually via a switch) to the proper range. Use at least a 230 watt power supply, which should have built-in filters to suppress radiated emissions.

### **Connect to P1 and P2**

Attach the power supply cables to P1 and P2 on the motherboard. See the drawing on page for the power connector location. AT-compatible power supplies have two 6-pin connectors. The 6-pin connector with 3 red wires and 2 black wires is connected to P2 and the remaining 6-pin connector is connected to P1, as shown below.

## Step 5 Connect the Power Supply, Continued

### Power Supply Connectors are Keyed

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

#### P1 Pinout

Pin	Description
1	Power Good (Orange wire)
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)



## Step 5 Connect the Power Supply, Continued

### **P3 Pinout**

P3 is a 3.3V power connector, provided for PCI adapter cards that may need a 3.3V power source.

#### ***Important***

Make sure that jumpers J3 and J34 are configured correctly when you use the 3.3V power connector. See page for the J3 and J34 configuration settings.

<b>Pin</b>	<b>Description</b>
1	Ground (Black wire)
2	Ground (Black wire)
3	Ground (Black wire)
4	3.3V
5	3.3V
6	3.3V

## Step 6 Connect the Keyboard Cable

The keyboard connector is a 5-pin DIN socket labeled KEYBD and J9 on the motherboard. Attach a standard AT-compatible keyboard cable. A 5-pin DIN to 6-pin miniDIN converter is needed to connect a PS/2-type keyboard.

<b>Pin</b>	<b>Assignments</b>
1	Keyboard clock
2	Keyboard data
3	Not used
4	Ground
5	VCC

## Step 7 Connect the PS/2 Mouse Cable

The PS/2 mouse connector (J13) is a ten-pin dual-inline berg. Attach a customized serial cable from the PS/2 mouse connector to a standard DB9 serial port connector mounted externally on the chassis for the PS/2 mouse. You can order this cable from the American Megatrends Sales Department (800-828-9264). Ask for **Cable Assembly DB9, Male, 10-Pin**, part number **CBLSUB1-10**. The pinout for the J13 PS/2 mouse connector and the DB9 connector follow. Cut Pin 10 on J13.

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

The DB9 connector pinout (on the other end of the cable) is:

Pin	Assignment	Pin	Assignment
1	Clock	2	N/C
3	N/C	4	N/C
5	Ground	6	N/C
7	N/C	8	FVcc
9	Data	N/A	N/A

The Atlas ISA PCI Pentium motherboard can be special ordered in a configuration that includes two miniDIN connectors to permit a PS/2-type keyboard and mouse to be directly attached to the motherboard.

## 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.

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

The following cables should be connected to the motherboard:

- Reset Switch cable to J18,
- Speaker cable to J17,
- Keyboard Lock cable to J15,
- Turbo LED cable to J24,
- IDE LED Activity Indicator LED cable to J28, and
- Turbo switch cable to J20.

## Step 8 Connect Cables, Continued

### **J18 Reset Switch Connector**

J18 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.

### **J17 Speaker Connector**

J17 is a four-pin single-inline berg that is attached via a cable to the system speaker. WINBIOS signals hardware problems through the speaker.

<b>Pin</b>	<b>Description</b>
1	Speaker data
2	N/C
3	Ground
4	VCC

## Step 8 Connect Cables, Continued

### **J15 Keyboard Lock Connector**

J15 is a five-pin single-inline berg that is attached via a cable to the keyboard lock connector. The keyboard lock allows the user to lock the keyboard, protecting the system from unauthorized use.

<b>Pin</b>	<b>Description</b>
1	Vcc
2	N/C
3	Ground
4	Keyboard lock (KBDINH)
5	Ground

### **J24 Turbo LED Connector**

J24 is a two-pin berg that is attached via a cable to the turbo LED. This LED lights when the motherboard is running in turbo mode (the default setting).

## Step 8 Connect Cables, Continued

### **J28 IDE Activity Indicator LED**

J28 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.

### **J20 Turbo Switch**

J28 is a two-pin berg that is attached via a cable to the turbo switch mounted on the chassis. This bipolar switch changes the system speed from high speed to low speed and vice versa.





## Step 9 Connect Onboard I/O

### Onboard Adapters

The motherboard has two serial ports (J5 and J4), a parallel port (J7) onboard, and has IDE and floppy controllers. The serial and parallel port connectors are described below. The IDE connectors are described on page . The floppy connector is described on page .

### J5 Serial Port 2 (COM2) and J4 Serial Port 1 (COM1)

J5 and J4 are 10-pin dual-inline bergs that connect via 10-pin double-row ribbons to male 9-pin D-sub connectors fastened to the chassis to provide an AT-compatible serial port interface. The serial port pinout is shown below. Be sure to properly connect the cables to the berg connectors. Pin 1 of each of the bergs is labeled "1". The wire leading to pin 1 on the cable usually has a colored stripe.

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

### Attaching the Serial Port Cables

Two serial port cables are supplied with the motherboard to attach the serial port connectors (J5 and J4) to the external serial port DB25 or DB9 connectors on the chassis. Install the cables as shown below. The connector locations on the motherboard are shown on the following page.



## Step 9 Connect Onboard I/O, Continued

### **Attaching the Parallel Port Cable**

A parallel port cable is supplied with the motherboard to connect the parallel port connector (J7) to the external parallel port connector, as shown below. The parallel port on the motherboard is bidirectional and supports the EPP (Enhanced Parallel Port) and ECP (Extended Capabilities Port) specifications.

The portion of the motherboard where the parallel port connector is located is shown below.

## Step 9 Connect Onboard I/O, Continued

### J7 Parallel Port

J7 is a 26-pin dual-inline berg. Use a 26-pin double-row ribbon cable to connect J7 and a female 25-pin D-sub connector on the chassis. The J7 pinout is:

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

## Step 10 Install Floppy Drive

### **J8 Floppy Disk Drive Connector**

J8 is a 34-pin dual-inline berg. Connect the cable from the floppy drive to J8. The onboard floppy controller cannot be used if a hard disk adapter card with floppy controller is installed. The following graphic depicts a floppy cable and the J8 34-pin floppy connector.

The following illustration shows where J8 is located on the motherboard.

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

## Step 10 Install Floppy Drive, Continued

The connecting cable that attaches to the floppy connector (J8) is a 34-pin ribbon connector with two 34-pin edge connectors for attaching the floppy disk drives. There should be a small twist in the cable between the floppy connectors, and the last (end) connector should be connected to the floppy drive that will be drive A. See the illustration below.

## Step 10 Install Floppy Drive, Continued

### J8 Floppy Connector Pinout

Pin	Use	Pin	Use
1	GND	2	RPM/LC
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 J11**

J11 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 J11, as shown below.

The following graphic shows where J11 is located on the motherboard.



## Step 11 Install Hard Disk, Continued

### J11 IDE Hard Disk Connector

J11 is a 40-pin dual-inline berg that connects a hard disk drive that has an IDE interface to the primary onboard IDE Controller. This motherboard supports IDE Modes 0, 1, 2, and 3, prefetch, LBA (Logical Block Address) mode, high capacity drives (over 528 MB), 32-bit data transfer, and fast IDE transfer. These IDE features are configured in Peripheral Setup in the WINBIOS Setup utility.

Disable the onboard IDE interface in Peripheral Setup to use an ISA ESDI, RLL, MFM, or SCSI hard disk drive controller. The J11 pinout is:

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

39	-IDEACT	40	GND
----	---------	----	-----

## Step 11 Install Hard Disk, Continued

### J10 Secondary IDE Controller

J10, 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 J10 via a standard 40-pin IDE cable as shown on page . The location of J10 is also shown on page .

This motherboard supports IDE Modes 0, 1, 2, and 3, prefetch, LBA (Logical Block Address) mode, high capacity drives (over 528 MB), 32-bit data transfer, and fast IDE transfer. These IDE features are configured in Peripheral Setup in the WINBIOS Setup utility. Disable the onboard IDE interface in Peripheral Setup to use an ISA ESDI, RLL, MFM, or SCSI hard disk drive controller. The J10 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

You can insert up to four ISA (AT-compatible) adapter cards and up to four PCI adapter cards in the expansion slots on the motherboard. If four PCI adapter cards are installed, you can only install three ISA adapter cards and vice versa. See the following illustration. Slot numbering is as follows:

Slot	Description
ISA Slot1 - ISA Slot 4	Standard ISA expansion slots. These slots accept either 8-bit or 16-bit ISA adapter cards.
PCI Master1 - PCI Master4	PCI adapter card expansion slots. These slots accept only PCI adapter cards.  PCI Slot1      is Device Number A PCI Slot2      is Device Number B PCI Slot3      is Device Number C PCI Slot 4     is Device Number D

### PCI Adapter Cards

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

### ISA Expansion Slots

The four ISA expansion slots on the motherboard provide full compatibility with all IBM XT and AT-compatible adapter cards.

## Step 12 Install Adapter Cards, Continued

### 8-Bit ISA Slot Pinout

Pin	Use	Pin	Use
A1	IOCHCK-	B1	GND
A2	SD07	B2	RSTDRV
A3	SD06	B3	+5
A4	SD05	B4	IRQ9
A5	SD04	B5	-5
A6	SD03	B6	DREQ2
A7	SD02	B7	-12
A8	SD01	B8	OVS-
A9	SD00	B9	+12
A10	IOCHRDY	B10	GND
A11	AEN	B11	SMEMW-
A12	SA19	B12	SMEMR-
A13	SA18	B13	IOW-
A14	SA17	B14	IOR-
A15	SA16	B15	DACK3-
A16	SA15	B16	DREQ3
A17	SA14	B17	DACK1-
A18	SA13	B18	DREQ1
A19	SA12	B19	RESH-
A20	SA11	B20	SYSCLK
A21	SA10	B21	IRQ7
A22	SA09	B22	IRQ6
A23	SA08	B23	IRQ5
A24	SA07	B24	IRQ4
A25	SA06	B25	IRQ3

A26	SA05	B26	DACK2-
A27	SA04	B27	T/C
A28	SA03	B28	BALE
A29	SA02	B29	+5
A30	SA01	B30	OSC
A31	SA00	B31	GND



## Step 12 Install Adapter Cards, Continued

### 16-Bit ISA Extension Pinout

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

Pin	Use	Pin	Use
C1	SBHE-	D1	MEMCS16-
C2	LA23	D2	IOCS16-
C3	LA22	D3	IRQ10
C4	LA21	D4	IRQ11
C5	LA20	D5	IRQ12
C6	LA19	D6	IRQ15
C7	LA18	D7	IRQ14
C8	LA17	D8	DACK0-
C9	MEMR-	D9	DREQ0
C10	MEMW-	D10	DACK5-
C11	SD08	D11	DREQ5
C12	SD09	D12	DACK6-
C13	SD10	D13	DREQ6
C14	SD11	D14	DACK7-
C15	SD12	D15	DREQ7
C16	SD13	D16	+5
C17	SD14	D17	MASTER-
C18	SD15	D18	GND

## Step 12 Install Adapter Cards, Continued

### PCI Local Bus Pinout

The three smaller expansion slots in the Excalibur PCI-II Pentium motherboard are for PCI Local Bus adapter cards, as shown on the graphic on page . The PCI bus master slots are PCI1, PCI2, PCI3, and PCI4.

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

Pin	5V System Environment	
	Side B	Side A
1	-12V	TRST#
2	TCK	+12V
3	Ground	TMS
4	TDO	TDI
5	+5V	+5V
6	+5V	INTA#
7	INTB#	INTC#
8	INTD#	+5V
9	PRSNT1#	Reserved
10	Reserved	+5V(I/O)
11	PRSNT2#	Reserved
12	Ground	Ground
13	Ground	Ground
14	Reserved	Reserved
15	Ground	RST#
16	CLK	+5V (I/O)
17	Ground	GNT#
18	REQ#	Ground
19	+5V (I/O)	Reserved
20	AD[31]	AD[30]

21	AD[29]	+5V
22	Ground	AD[28]
23	AD[27]	AD[26]
24	AD[25]	Ground
25	+5V	AD[24]
26	C/BE[3]#	IDSEL
27	AD[23]	+5V
28	Ground	AD[22]
29	AD[21]	AD[20]
30	AD[19]	Ground
31	+5V	AD[18]
32	AD[17]	AD[16]
33	C/BE[2]#	+5V
34	Ground	FRAME#
35	IRDY#	Ground
36	+5V	TRDY#
37	DEVSEL#	Ground
38	Ground	STOP#
39	LOCK#	+5V
40	PERR#	SDONE
41	+5V	SBO#
42	SERR#	Ground
43	+5V	PAR
44	C/BE[1]#	AD[15]
45	AD[14]	+5V
46	Ground	AD[13]
47	AD[12]	AD[11]
48	AD[10]	Ground
49	Ground	AD[09]
50	5V Connector Key	

51	5V Connector Key	
52	AD[08]	C/BE[0]#
53	AD[07]	+5V
54	+5V	AD[06]
55	AD[05]	AD[04]
56	AD[03]	Ground
57	Ground	AD[02]
58	AD[01]	AD[00]
59	+5V (I/O)	+5V (I/O)
60	ACK64#	REQ64#
61	+5V	+5V
62	+5V	+5V

## Step 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 (see page ) indicates the problem. Make sure the affected part is properly seated and connected. An error message is displayed if the error is less serious. Recheck the system configuration or the connections.

### **Configure the System**

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

## 4 WINBIOS On Self Test

The American Megatrends WINBIOS in the American Megatrends Excalibur PCI-II ISA Pentium motherboard provides all IBM-standard POST routines as well as enhanced WINBIOS POST routines and CPU internal diagnostics. WINBIOS POST codes can be accessed via the Manufacturing Test Port (I/O Port 0080h). WINBIOS POST checkpoint codes are described in the *WINBIOS Technical Reference*.

### POST Phases

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

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

### WINBIOS Error Reporting

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

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

## Beep Codes

Errors may occur during POST (Power On Self Test), which is performed every time the system is powered on. Fatal errors are communicated through a series of audible beeps.

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

### What to Do If the Computer Beeps

If the system	then...
---------------	---------

<b>beeps...</b>	
1, 2, or 3 times...	reseat the memory. If the system still beeps, replace memory.
6 times...	Try a different keyboard or replace the keyboard fuse, if the keyboard has one.
8 times...	there is a memory error on the video adapter. Replace the video adapter, or the RAM on the video adapter.
9 times...	the BIOS ROM chip is bad. The system needs a new BIOS. The ROM can be reprogrammed.
11 times...	reseat the cache memory on the motherboard. If it still beeps, replace the cache memory.
4, 5, 7, or 10 times...	the motherboard must be replaced.



## WINBIOS Displayed Error Messages

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

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

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

<b>Error Message</b>	<b>Explanation</b>
8042 Gate-A20 Error	Gate A20 on the keyboard controller (8042) is not working. Replace the 8042.
Address Line Short!	Error in the address decoding circuitry on the motherboard.
C: Drive Error	No response from drive C:. Run the Hard Disk Utility. Check the C: hard disk type in Standard Setup.
C: Drive Failure	No response from drive C:. It may be necessary to replace the hard disk.
Cache Memory Bad, Do Not Enable Cache!	Cache memory on the motherboard is defective.
CH-2 Timer Error	An error occurred with timer #2.
CMOS Battery State Low	CMOS RAM is powered by a battery. The battery power is low. Replace the battery.
CMOS Checksum Failure	After CMOS RAM values are saved, a checksum value is generated for error checking. This message appears if the previous value is different from the current value. Run WINBIOS Setup.
CMOS System Options Not Set	The values stored in CMOS RAM are either corrupt or nonexistent. Run WINBIOS Setup.
CMOS Display Type Mismatch	The video type in CMOS RAM does not match the type detected by WINBIOS. Run WINBIOS Setup.

CMOS Memory Size Mismatch	The amount of memory on the motherboard is different than the amount in CMOS RAM. Run WINBIOS Setup.
CMOS Time & Date Not Set	Run WINBIOS Setup Standard Setup to set the date and time in CMOS RAM.
D: Drive Error	No response from drive D:. Run the Hard Disk Utility. Check the D: hard disk type in WINBIOS Setup Standard Setup.
D: drive failure	No response from drive D:. It may be necessary to replace the hard disk.
Diskette Boot Failure	The boot diskette in floppy drive A: cannot be used to boot the system. Use another boot diskette and follow the screen instructions.
Display Switch Not Proper	Some systems require video switch on the motherboard be set to either color or monochrome. Turn the system off, set the switch properly, then power on.
DMA Error	Error in the DMA controller on the motherboard.
DMA #1 Error	Error in the first DMA channel on the motherboard.
DMA #2 Error	Error in the second DMA channel on the motherboard.
FDD Controller Failure	WINBIOS cannot communicate with the floppy disk drive controller. Check all appropriate connections after the system is powered down.
HDD Controller Failure	WINBIOS cannot communicate with the hard disk drive controller. Check all appropriate connections after the system is powered down.
INTR #1 Error	Interrupt channel #1 has failed POST.
INTR #2 Error	Interrupt channel #2 has failed POST.
Invalid Boot Diskette	WINBIOS can read the diskette in floppy drive A:, but it cannot boot the system with it. Use another boot diskette and follow the screen instructions.
Keyboard Is Locked...Unlock It	The keyboard lock on the system is engaged. The system must be unlocked to continue the boot process.
Keyboard Error	Timing problem with the keyboard. Make sure

	a keyboard controller WINBIOS is installed. Set the <i>Keyboard</i> option in Advanced Setup to <i>Not Installed</i> to skip the keyboard POST routines.
KB/Interface Error	Error in the keyboard connector on the motherboard.
No ROM BASIC	Cannot find a proper bootable sector on either diskette drive A: or hard disk drive C:. Use a bootable disk.
Off Board Parity Error	Parity error in offboard memory. The format is:  OFF BOARD PARITY ERROR ADDR (HEX) = (XXXX)  XXXX is the hex address where the error occurred. Run AMIDdiag to find and correct memory problems.
Onboard Parity Error	Parity error in motherboard memory. The format is:  Onboard PARITY ERROR ADDR (HEX) = (XXXX)  XXXX is the hex address where the error occurred. Run AMIDdiag to find and correct memory problems.
Parity Error ????	Parity error in system memory at an unknown address. Run AMIDdiag to find and correct memory problems.

## NMI Messages

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

## BIOS Configuration Summary Screen

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

AMIBIOS System Configuration (C) Copyright 1985-1994 American Megatrends Inc.			
Main Processor	: Pentium™	Base Memory Size	: 640 KB
Numeric Coprocessor	: Present	Ext. Memory Size	: 16000 KB
Floppy Drive A:	: 1.2 MB ½	Hard Disk C: Type	: Type 47
Floppy Drive B:	: 1.44 MB ¼	Hard Disk D: Type	: Type 47
Display Type	: VGA/PGA/EGA	Serial Port(s)	: 3F8, 3E8
WINBIOS Date	: 11/11/92	Parallel Port(s)	: 378

512 KB Cache Memory  
60 MHz CPU Clock

## POST Memory Test

Normally, the only visible POST routine is the memory test. The screen that appears when the system is powered on is shown below.

```
AMIBIOS (C) 1994 American Megatrends Inc.  
xxxxx KB OK  
  
BIOS Release 722092294  
  
Press <DEL> if you want to run SETUP  
  
XX-XXXX-XXXXXX-XXXXXXXX-XXXXX-XXXX-X
```

A BIOS Identification string appears in the left bottom corner of the screen, below the copyright message. Press <Ins> during system boot to display two additional BIOS Identification strings. The BIOS Identification String are described in the *WINBIOS Technical Reference*.

When a problem occurs, freeze the screen by powering on the system and holding a key down, which causes a *Keyboard Error* message. Copy the BIOS Identification Strings and report this information to American Megatrends Technical Support. Press <F1> to continue.

Enable the *Wait for <F1> If any Error* option in Advanced Setup before using this method to freeze the screen.

The following message is displayed after POST is completed:

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

Press the <Del> key to run WINBIOS Setup.

## 5 WINBIOS Setup

The WINBIOS system BIOS on the Excalibur PCI-II ISA Pentium motherboard contains a new American Megatrends Setup utility — WINBIOS Setup.

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

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

### **A New Type of System BIOS Setup Utility**

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

### **Starting WINBIOS Setup**

As POST executes, the following appears:

Hit <DEL> if you want to run SETUP

Press <Del> to run WINBIOS Setup.

## Using a Mouse with WINBIOS Setup

WINBIOS Setup has a built-in mouse driver and can be accessed by either a serial mouse or PS/2-style mice. 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:

<Tab>	Change or select a global field.
→, ←, ↑, ↓	Change or select the current field.
<Enter>	Performs an operation in the current field.
+	Increments a value.
-	Decrements a value.
<Esc>	Aborts any window function.
<PgUp>	Returns to the previous page.
<PgDn>	Advances to the next page.
<Home>	Returns to the beginning of the text.
<End>	Advances to the end of the text.
<Alt>	Used with certain key function, as in <Alt> <key>.

Alphabetic keys A to Z are used in the Virtual Keyboard, and are not case-sensitive.  
Numeric keys 0 to 9 are used in the Virtual Keyboard and Numeric Keypad.

## WINBIOS Setup Menu

The WINBIOS Setup main menu, shown below, is organized into four sections. Each section of this screen corresponds to a section in this chapter. Each section contains several icons. Clicking on each icon activates a specific WINBIOS function. The WINBIOS Setup icons and related functions are described in this chapter.

The screen sections are:

Setup                    see Section 1 on page , 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                see Section 2 beginning on page , has four icons that perform system functions,

Security                see Section 3 beginning on page , has two icons that control WINBIOS security features, and

Default                 see Section 4 beginning on page , this section has three icons that permit you to select a group of settings for all WINBIOS Setup options.





# Section 1

## WINBIOS Setup Screens

### Standard Setup

The WINBIOS Setup options described in this section are selected by choosing the Standard Setup icon from the WINBIOS Setup main menu (see the previous page). All Standard Setup options are described in this section. The Standard Setup screen follows.

#### **Date, Day and Time Configuration**

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

## Standard Setup, Continued

### Primary Master Primary Slave

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

### Entering Drive Parameters

You can also enter the hard disk drive parameters. 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	<i>Not used for IDE drives.</i> 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 recommended cylinder where the heads should normally park when the computer is powered off.
Sectors	The number of sectors per track. MFM drives have 17 sectors per track. RLL drives have 26 sectors per track. ESDI drives have 34 sectors per track. SCSI and IDE drive may have even more sectors per track.
Capacity	The formatted capacity of the drive is (Number of heads) x (Number of cylinders) x (Number of

	sectors per track) x (512 bytes per sector)
--	---

## Standard Setup, Continued

### Standard MFM Hard Disk Drive Types

Type	Cylinders	Heads	Write Precompensation	Landing Zone	Sectors	Capacity
1	306	4	128	305	17	10 MB
2	615	4	300	615	17	20 MB
3	615	6	300	615	17	31 MB
4	940	8	512	940	17	62 MB
5	940	6	512	940	17	47 MB
6	615	4	65535	615	17	20 MB
7	462	8	256	511	17	31 MB
8	733	5	65535	733	17	30 MB
9	900	15	65535	901	17	112 MB
10	820	3	65535	820	17	20 MB
11	855	5	65535	855	17	35 MB
12	855	7	65535	855	17	50 MB
13	306	8	128	319	17	20 MB
14	733	7	65535	733	17	43 MB
16	612	4	0	663	17	20 MB
17	977	5	300	977	17	41 MB
18	977	7	65535	977	17	57 MB
19	1024	7	512	1023	17	60 MB
20	733	5	300	732	17	30 MB
21	733	7	300	732	17	43 MB
22	733	5	300	733	17	30 MB
23	306	4	0	336	17	10 MB
24	925	7	0	925	17	54 MB
25	925	9	65535	925	17	69 MB
26	754	7	754	754	17	44 MB
27	754	11	65535	754	17	69 MB
28	699	7	256	699	17	41 MB
29	823	10	65535	823	17	68 MB
30	918	7	918	918	17	53 MB
31	1024	11	65535	1024	17	94 MB

32	1024	15	65535	1024	17	128 MB
33	1024	5	1024	1024	17	43 MB
34	612	2	128	612	17	10 MB
35	1024	9	65535	1024	17	77 MB
36	1024	8	512	1024	17	68 MB
37	615	8	128	615	17	41 MB
38	987	3	987	987	17	25 MB
39	987	7	987	987	17	57 MB
40	820	6	820	820	17	41 MB
41	977	5	977	977	17	41 MB
42	981	5	981	981	17	41 MB
43	830	7	512	830	17	48 MB
44	830	10	65535	830	17	69 MB
45	917	15	65535	918	17	114 MB
46	1224	15	65535	1223	17	152 MB
47	USER-DEFINED HARD DRIVE - Enter user-supplied parameters.					

## Standard Setup, Continued

### **Using Auto Detect Hard Disk (Only for IDE Drives)**

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

### **Floppy Drive A:**

### **Floppy Drive B:**

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

## Advanced Setup

The WINBIOS Setup options described in this section are selected by choosing the Advanced Setup icon from the WINBIOS Setup main menu (see page ). All Advanced Setup options are described in this section.

### **Typematic Rate (Chars/Sec)**

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

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

### **Mouse Support**

When this option is set to *Enabled*, WINBIOS supports a *PS/2-type* mouse. The settings are *Enabled* or *Disabled*. The Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled*. Pins 1-2 of J40 on the motherboard must be shorted together via a shorting bridge to enable IRQ 12 for use with a *PS/2-type* mouse.



## Advanced Setup, Continued

### **Above 1 MB Memory Test**

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

### **Parity Error Check**

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

### **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*.

## 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 system BIOS area in low memory will be used to store hard disk information. The settings are *Top 1K* or *0:300*. The Optimal and Fail-Safe default settings are *0:300*.

### **Wait for <F1> If Any Error**

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

Press <F1> to continue

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

### **Floppy Drive Seek At Boot**

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

## Advanced Setup, Continued

### System Boot Up Sequence

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

### System Boot Up CPU Speed

This option sets the speed of the CPU at system boot time. The settings are *High* or *Low*. The Optimal and Fail-Safe default settings are *High*.

### Base Memory Size

This option specifies the size of the base memory. The settings are *512 KB* or *640 KB*. The Optimal and Fail-Safe default setting is *640 KB*.

If 512 KB is selected, WINBIOS defines a Non-Cacheable Block-2 area of memory in Chipset Setup by setting the following Chipset Setup options. These three Chipset Setup options cannot be changed by the end user. If the user needs to use both the Non-Cacheable Block-1 and Block-2 Chipset Setup options, then this option must be set to *640 KB*.

Chipset Setup Option	Setting
Non-Cacheable Block-2	<i>AT Bus</i>
Non-Cacheable Block-2 Size	128 KB
Non-Cacheable Block-2 Base	512 KB

## Advanced Setup, Continued

### External Cache Memory

This option specifies the type of caching algorithm used for L2 secondary cache memory. The settings are:

Setting	Description
<i>Disabled</i>	L2 secondary (external) cache memory is disabled.
<i>Wr-Back</i>	L2 secondary (external) cache memory is enabled and a write-back caching algorithm is used.
<i>Wr-Thru</i>	L2 secondary (external) cache memory is enabled and a write-through caching algorithm is used.

The Optimal default setting is *Wr-Back*. The Fail-Safe default setting is *Disabled*.

### Internal Cache Memory

This option specifies the type of caching algorithm used for L1 internal cache memory on the CPU.

**Important**

A shorting bridge must be placed on J29 on the motherboard before the *Wr-Thru* setting is selected for this option.

The settings are:

Setting	Description
<i>Disabled</i>	Both L1 internal cache memory and L2 secondary cache memory are disabled, no matter what the <b>External Cache Memory</b> option setting is.
<i>Wr-Back</i>	L2 internal cache memory is enabled and a write-back caching algorithm is used.
<i>Wr-Thru</i>	L1 internal cache memory is enabled and a write-through caching algorithm is used.

The Optimal default setting is *Wr-Back*. The Fail-Safe default setting is *Disabled*.

## Advanced Setup, Continued

### 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 for instructions on changing a password. The Optimal and Fail-Safe default settings are *Setup*.

### Video Shadow C000,32K

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

Setting	Description
<i>Disabled</i>	Video ROM is not shadowed to RAM.
<i>Shadow</i>	Video ROM is shadowed to RAM locations C0000h - C7FFFh.
<i>Cache</i>	Video ROM is shadowed to RAM locations C0000h - C7FFFh and can also be written to or read from secondary cache memory.

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

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

These options enable shadowing of the contents of the ROM area named in the option title. These options are for adaptor ROM on ISA adaptor cards only. Adaptor ROMs on all PCI adaptor cards are automatically shadowed to RAM by WINBIOS. The settings are *Shadow* or *Disabled*.

## Advanced Setup, Continued

### F000 Shadow Cacheable

When this option is set to *Enabled*, accesses to the code portion of the system ROM BIOS in the F0000h memory segment can be read from or written to L1 internal or L2 secondary cache memory. When set to *Disabled*, the contents of the F0000h segment cannot be read from or written to cache memory. The F0000h memory segment contains the system BIOS and is always copied to RAM. The settings are *Enabled* or *Disabled*. The Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled*.

**IRQ 3**            **IRQ 4**            **IRQ 5**  
**IRQ 7**            **IRQ 9**            **IRQ 10**  
**IRQ 11**            **IRQ 12**            **IRQ 14** **IRQ 15**

These options specify the bus that the interrupt request line in the option title can be used on. The settings are *ISA* (the IRQ can only be used on the ISA bus) or *PCI* (the IRQ can only be used on the PCI bus). The Optimal and Fail-Safe default settings are *ISA* (except **IRQ 9** defaults are *PCI*).

#### Caution

If a PCI VGA adapter card is installed and this card requires a free interrupt, you must select the *PCI* setting for at least one of the above IRQ options. If the computer does not work after system boot, press <Ins> during the boot process to load the BIOS Fail-Safe default settings.

#### Important

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

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

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





## Advanced Setup, Continued

### ***Important***

If the primary IDE controller is enabled, IRQ 14 can only be used by the onboard primary IDE controller. IRQ 14 will not be available for any PCI or ISA adapter card.

If IRQ 14 must be used for an ISA adapter card, set the **Onboard Primary/Secondary IDE** option in Peripheral Setup to *Disabled* or *Secondary* and set the IRQ 14 option to *ISA*.

If IRQ 14 must be used for a PCI adapter card, set the **Onboard Primary/Secondary IDE** option in Peripheral Setup to *Disabled* or *Secondary* and set the IRQ 14 option to *PCI*.

### ***Important***

If the secondary IDE controller is enabled, IRQ 15 can only be used by the onboard secondary IDE controller. IRQ 15 will not be available for any PCI or ISA adapter card.

If IRQ 15 must be used for an ISA adapter card, set the **Onboard Primary/Secondary IDE** option in Peripheral Setup to *Disabled* or *Primary* and set the IRQ 15 option to *ISA*.

If IRQ 15 must be used for a PCI adapter card, set the **Onboard Primary/Secondary IDE** option in Peripheral Setup to *Disabled* or *Primary* and set the IRQ 15 option to *PCI*.

## Chipset Setup

The WINBIOS Setup options described in this section are selected by choosing the Chipset Setup icon from the WINBIOS Setup main menu (see page ). All Chipset Setup options are described in this section.

### **CPU To PCI Burst Write**

Set this option to *Enabled* to enable burst writes on the PCI local bus. Contiguous CPU accesses are burst on the PCI local bus. The settings are *Enabled* or *Disabled*. The Optimal and Fail-Safe default settings are *Disabled*.

### **CPU To PCI Posted Writes**

Set this option to *Enabled* to enable the CPU write accesses to PCI slave devices to be posted. The settings are *Enabled* or *Disabled*. The Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled*.

### **Bus Parking At CPU**

Bus arbitration is performed between the CPU, ISA bus, PCI bus, and memory refresh. By setting this option to *Enabled*, the CPU becomes the default owner of the bus after each arbitration in which another device had control of the bus. The settings are *Enabled* or *Disabled*. The Optimal default setting is *Enabled*. The Fail-Safe default setting is *Disabled*.

### **PCI Master Burst Length**

This option specifies the maximum length of the burst cycle transmission that a PCI master is allowed to send before being disconnected. The settings are *512 bytes* or *1 KB*. The Optimal and Fail-Safe default settings are *512 bytes*.

## Chipset Setup, Continued

### **VGA Palette Snooping**

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

### **PCI Master Latency Timer**

This option specifies the amount of time that a PCI master can be active in the system (in units of PCI clocks). Once the latency timer expires, the PCI master must relinquish ownership of the bus and must re-arbitrate bus ownership if it still needs to own the bus.

For systems that only have one PCI master, it is better to set this option to the maximum 240 clocks.

For systems with many PCI/ISA masters, this option should be set to a smaller value to make sure that all PCI devices can gain bus ownership as necessary.

The settings are *40, 80, 100, 120, 160, 200, 220, or 240* PCI clocks. The Optimal default setting is *240* PCI clocks. The Fail-Safe default setting is *40* PCI clocks.

## Chipset Setup, Continued

### **Non-Cacheable Block-1** **Non-Cacheable Block-2**

These options specify how the Block-1 and Block-2 memory areas are used. Block-1 and/or Block-2 can be configured as holes in memory are as non-cacheable areas. The settings are:

<b>Setting</b>	<b>Description</b>
<i>DRAM</i>	Block-1 or Block-2 is an area of system memory whose contents cannot be read from or written to cache memory. No accesses to the contents of Block-1 or Block-2 can be read from or written to L1 internal or L2 secondary cache memory.
<i>AT Bus</i>	Block-1 or Block-2 can become a hole in system memory. All accesses to the contents of the Block-1 or Block-2 memory areas are forwarded to the AT bus.

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

### **Non-Cacheable Block-1 Size** **Non-Cacheable Block-2 Size**

These options specify the size of the Block-1 and Block-2 system memory areas. The settings are *64 KB, 128 KB, 256 KB, 512 KB, 1 MB, 2 MB, 4 MB, or 8 MB*. The Optimal and Fail-Safe default settings are *512 KB*.

### **Non-Cacheable Block-1 Base** **Non-Cacheable Block-2 Base**

These options specify the beginning of the Block-1 and Block-2 system memory areas. The settings are *Disabled*, or any value that is less than the total system memory size and is a multiple of the of the setting of the corresponding **Non-Cacheable Block-x Size** option. The Optimal and Fail-Safe default settings are *Disabled*. The minimum setting for these options is *2 MB*.

# Power Management Setup

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

## Power Management in the Excalibur PCI-II Motherboard

A number of computer components and signals are defined as system events for power management purposes. These are: serial ports, parallel ports, IDE ports, VGA access, ISA/PCI master, Global interrupt activity, IRQ 3, IRQ 4, IRQ 5, IRQ 7, IRQ 9, IRQ 10, IRQ 11, IRQ 12, and IRQ 15. These "events" can be set to Monitor, Break, or Both.

Setting	Description
Monitor	Reload the system event timer when the event occurs.
Break	Leave suspend mode and enter full power on mode when the event occurs.
Both	Reload the system event timer, leave suspend mode, and enter full power on mode when the event occurs.

Suspend state can be entered if all system events that have a setting of *Monitor* are inactive for a period of time equal to the setting in the Power Management Setup **System Event Timer** option.

If any of the events that have a setting of *Monitor* or *Both* occur before the length of the period of system inactivity equals the value specified in the **System Event Timer** Power Management option is reached, the value in the **System Event Timer** Power Management Setup option is set again to its initial value, thus extending the length of time before the system enters suspend state.

Once the system enters suspend state, any activity in any event that has a setting of *Break* or *Both* will return the system to full power on mode.

## Power Management Setup, Continued

### **Power Management**

Set this option to *Enabled* to enable the Excalibur PCI-II motherboard power management features.

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

### **System Event Timer**

The system event timer specifies a length of time. If all monitored system activities are inactive during any period of time equal to the time value specified in this option, the system goes to suspend state.

The settings are *1 Min.*, *2 Min.*, *3 Min.*, *4 Min.*, *5 Min.*, *6 Min.*, *7 Min.*, *8 Min.*, *9 Min.*, *10 Min.*, *11 Min.*, *12 Min.*, *13 Min.*, *14 Min.*, or *15 Min.* The Optimal and Fail-Safe default settings are *1 Min.*

## Power Management Setup, Continued

### **Power Supply Timeout**

This option can be used to control a Green PC-capable power supply (such as the SENSTRON GP2-4200F power supply). When this option is set to *Enabled*, the power supply can be placed in Green PC power savings mode when the timeout period specified in the **System Event Timer** option expires via the J1 output. The settings are *Disabled* or *Enabled*. The Optimal and Fail-Safe default settings are *Disabled*.

This feature is only available if the Power Management option is set to *Enabled* and the System Event Timer option is set to any value other than Disabled.

Power supplies that support a timeout feature provide a cable with a two-pin berg header, often called the Auxiliary Power Connector. Usually, the black wire is Ground and the Green wire is the active signal. Connect the black wire to Pin 1 of J1. Connect the Green wire to Pin 2 of J1 on the motherboard.

If the VGA adapter card and monitor do not support DPMS (the VESA Display Power Management Specification), you can connect the VGA monitor to the auxiliary output of a Green PC power supply. When the length of time specified in the **System Event Timer** option has expired, AMIBIOS turns off any device connected to the auxiliary connector.

Green PC power supplies usually identify the power connectors that can be turned off in Green PC mode.

### **IDE Power Down**

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



## Power Management Setup, Continued

### VGA Power Down

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

### Serial Ports

This option is defined as a system event and encompasses any activity on the serial ports. The settings are:

Setting	Description
<i>Ignore</i>	Any activity involving I/O port addresses 3F8h, 2F8h, 3E8h, or 2E8h is ignored. The system event timer is not reset to its original value.
<i>Monitor</i>	Any activity on the serial ports will reload the original setting of the <b>System Event Timer</b> Power Management Setup option.

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

### Parallel Ports

This option is defined as a system event and encompasses any activity on the parallel ports. The settings are:

Setting	Description
<i>Ignore</i>	Any activity involving I/O port addresses 378h or 278h is ignored. The system event timer is not reset to its original value.
<i>Monitor</i>	Any activity on the parallel ports will reload the original setting of the <b>System Event Timer</b> Power Management Setup option.

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

## Power Management Setup, Continued

### IDE Ports

This option is defined as a system event and encompasses any activity on the IDE I/O port addresses. The settings are:

Setting	Description
<i>Ignore</i>	Any activity involving I/O port addresses 1F0 - 1F7h, 3F6h - 3F7h, 170 - 17Fh, or 320 - 32Fh is ignored. The system event timer is not reset to its original value.
<i>Monitor</i>	Any activity on the IDE ports will reload the original setting of the <b>System Event Timer</b> Power Management Setup option.

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

### VGA Access

This option is defined as a system event and encompasses any VGA activity. The settings are:

Setting	Description
<i>Ignore</i>	Any activity involving memory addresses A0000h - AFFFFh or B0000h - BFFFFh is ignored. The system event timer is not reset to its original value.
<i>Monitor</i>	Any activity involving memory addresses A0000h - AFFFFh or B0000h - BFFFFh reloads the original setting of the <b>System Event Timer</b> Power Management Setup option.

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

## Power Management Setup, Continued

### ISA/PCI Master

This option is defined as a system event and encompasses any ISA or PCI bus master activity. The settings are:

Setting	Description
<i>Ignore</i>	Any ISA or PCI bus master activity is ignored. The system event timer is not reset to its original value.
<i>Monitor</i>	Any activity involving any ISA or PCI bus master reloads the original setting of the <b>System Event Timer</b> Power Management Setup option.
<i>Break</i>	While in the suspend state, any ISA or PCI bus master activity returns the system to full power on mode.
<i>Both</i>	In normal operation, any ISA or PCI bus master activity will reload the system event timer. In suspend state, any ISA or PCI bus master activity will return the system to full power on mode.

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

### Global Interrupt Activity

This option is defined as a system event and encompasses all of the following IRQ options. You can just set this option instead of all the following Power Management Setup options The settings are:

Setting	Description
<i>Disabled</i>	Interrupts can be selected individually.
<i>Monitor</i>	Any interrupt activity reloads the original setting of the <b>System Event Timer</b> Power Management Setup option.
<i>Break</i>	While in the suspend state, any interrupt activity returns the system to full power on mode.
<i>Both</i>	In normal operation, any interrupt activity will reload the system event timer.  In suspend state, any interrupt activity will return the system to full power on mode.

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

## Power Management Setup, Continued

**IRQ 3**  
**IRQ 4**  
**IRQ 5**  
**IRQ 7**  
**IRQ 9**  
**IRQ 10**  
**IRQ 11**  
**IRQ 12**  
**IRQ 15**

These options are defined as system events. The settings are:

<b>Setting</b>	<b>Description</b>
<i>Ignore</i>	Ignore interrupt activity.
<i>Monitor</i>	Any interrupt activity reloads the original setting of the <b>System Event Timer</b> Power Management Setup option.
<i>Break</i>	While in the suspend state, any interrupt activity returns the system to full power on mode.
<i>Both</i>	In normal operation, any interrupt activity will reload the system event timer.  In suspend state, any interrupt activity will return the system to full power on mode.

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

# Peripheral Setup

The WINBIOS Setup options described in this section are selected by choosing the Peripheral Setup icon from the WINBIOS Setup main menu (see page ). All Peripheral Setup options are described in this section.

## Onboard FDC

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

## Onboard Primary/Secondary IDE

This option specifies which IDE controller is enabled. The settings are:

Setting	Description
<i>Disabled</i>	The IDE controller is disabled and both IRQ 14 and IRQ 15 are free. You can set the <b>IRQ 14</b> and <b>IRQ 15</b> options in Advanced Setup to <i>ISA</i> or <i>PCI</i> if you wish.
<i>Primary</i>	The primary IDE controller is enabled and IRQ 14 is not available. IRQ 15 is available and can be set via the <b>IRQ 15</b> option in Advanced Setup to <i>ISA</i> or <i>PCI</i> .
<i>Secondary</i>	The secondary IDE controller is enabled and IRQ 15 is not available. IRQ 14 is available and can be set via the <b>IRQ 14</b> option in Advanced Setup to <i>ISA</i> or <i>PCI</i> .
<i>Both</i>	Both the primary and secondary IDE controllers are enabled. IRQ 14 and 15 are not available.

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

## Peripheral Setup, Continued

### Primary IDE Block Mode

This option specifies the IDE drives attached to the primary IDE controller that support block mode. The settings are:

Setting	Description
<i>Disabled</i>	Block mode is not enabled for either drive.
<i>Master</i>	Block mode is enabled for the primary master IDE drive.
<i>Slave</i>	Block mode is enabled for the primary slave IDE drive.
<i>Both</i>	Block mode is enabled for both the primary master and the primary slave IDE drive.

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

The method of data transfer between IDE drives and the host computer is called PIO (Programmed I/O). The original IDE specification only permitted single transfers. The drive would transfer only 512 bytes of data at one time before raising an interrupt to the CPU.

In IDE block mode, the IDE drive can be programmed to read  $n$  number of 512 byte blocks of data at one time before raising and interrupt to the CPU. IDE drives capable of using IDE block mode use the Set Multiple and Read/Write Multiple IDE commands.

Some operating systems (such as Unix) have to be modified before IDE block mode is supported. Enabling this option is only effective if the IDE drives in the computer support IDE block mode, but IDE block mode can be used with any IDE controller if the IDE drive supports IDE block mode.

## Peripheral Setup, Continued

### Primary IDE 32-Bit Transfer

This option specifies the IDE drives attached to the primary IDE controller that support 32-bit transfers. The settings are:

Setting	Description
<i>Disabled</i>	32-bit transfers are not enabled for either drive.
<i>Master</i>	32-bit transfers are enabled for the primary master IDE drive.
<i>Slave</i>	32-bit transfers are enabled for the primary slave IDE drive.
<i>Both</i>	32-bit transfers are enabled for both the primary master and the primary slave IDE drive.

32-bit data accesses improve drive performance. When 32-bit access is enabled for IDE drives, doubleword (32-bit) operations are used. Before 32-bit access can be enabled, the IDE controller must be on a 32-bit wide local bus, such as the PCI bus. The Optimal and Fail-Safe default settings are *Disabled*.

### Primary IDE LBA Mode

This option specifies the IDE drive attached to the primary IDE controller that support LBA mode. The settings are:

Setting	Description
<i>Disabled</i>	IDE LBA mode is not enabled for either drive.
<i>Master</i>	IDE LBA mode is enabled for the primary master IDE drive.
<i>Slave</i>	IDE LBA mode is enabled for the primary slave IDE drive.
<i>Both</i>	IDE LBA mode is enabled for both the primary master and the primary slave IDE drive.

New IDE drives support a new way to access data on the drive - Logical Block Addressing (LBA), which allows IDE drives to have capacities greater than 528 MB. The traditional CHS (Cylinder, Head, Sector) type of disk access defined in the AT and ATA specifications only permitted a maximum of 1,024 cylinders, 16 heads, and 63 sectors, limiting drive capacity to 528 MB. The IDE drives in the computer must support LBA mode. The Optimal and Fail-Safe default settings are *Disabled*.



## Peripheral Setup, Continued

### Primary Master Drive Mode

This option specifies the IDE mode used by the master IDE drive attached to the primary IDE controller. *Selecting a mode not supported by the primary master IDE drive will cause data loss.* The settings are:

Setting	Minimum Cycle Time
Auto	WINBIOS automatically determines the IDE mode that the master IDE drive attached to the primary IDE controller supports.
Mode 0	600 ns
Mode 1	383 ns
Mode 2	240 ns
Mode 3	180 ns

### Primary Slave Drive Mode

This option specifies the IDE mode used by the slave IDE drive attached to the primary IDE controller. *Selecting a mode not supported by the primary slave IDE drive will cause data loss.* The settings are:

Setting	Minimum Cycle Time
Auto	WINBIOS automatically determines the IDE mode that the slave IDE drive attached to the primary IDE controller supports.
Mode 0	600 ns
Mode 1	383 ns
Mode 2	240 ns
Mode 3	180 ns

## Peripheral Setup, Continued

### Secondary IDE Block Mode

This option specifies the IDE drives attached to the onboard secondary IDE controller that support block mode. The settings are:

Setting	Description
<i>Disabled</i>	Block mode is not enabled for either drive.
<i>Master</i>	Block mode is enabled for the secondary master IDE drive.
<i>Slave</i>	Block mode is enabled for the secondary slave IDE drive.
<i>Both</i>	Block mode is enabled for both the secondary master and the secondary slave IDE drive.

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

The method of data transfer between IDE drives and the host computer is called PIO (Programmed I/O). The original IDE specification only permitted single transfers. The drive would transfer only 512 bytes of data at one time before raising an interrupt to the CPU.

In IDE block mode, the IDE drive can be programmed to read  $n$  number of 512 byte blocks of data at one time before raising and interrupt to the CPU. IDE drives capable of using IDE block mode use the Set Multiple and Read/Write Multiple IDE commands.

Some operating systems (such as Unix) have to be modified before IDE block mode is supported. Enabling this option is only effective if the IDE drives in the computer support IDE block mode, but IDE block mode can be used with any IDE controller if the IDE drive supports IDE block mode.

## Peripheral Setup, Continued

### Secondary IDE 32-Bit Transfer

This option specifies the IDE drives attached to the secondary IDE controller that support 32-bit transfers. The settings are:

Setting	Description
<i>Disabled</i>	32-bit transfers are not enabled for either drive.
<i>Master</i>	32-bit transfers are enabled for the secondary master IDE drive.
<i>Slave</i>	32-bit transfers are enabled for the secondary slave IDE drive.
<i>Both</i>	32-bit transfers are enabled for the master and slave IDE drive.

32-bit data accesses improve drive performance. When 32-bit access is enabled for IDE drives, doubleword (32-bit) operations are used. Before 32-bit access can be enabled, the IDE controller must be on a 32-bit local bus, such as the PCI bus. The Optimal and Fail-Safe settings are *Disabled*.

### Secondary IDE LBA Mode

This option specifies the IDE drives attached to the onboard secondary IDE controller that support IDE LBA mode. The settings are:

Setting	Description
<i>Disabled</i>	IDE LBA mode is not enabled for either drive.
<i>Master</i>	IDE LBA mode is enabled for the secondary master IDE drive.
<i>Slave</i>	IDE LBA mode is enabled for the secondary slave IDE drive.
<i>Both</i>	IDE LBA mode is enabled for both the master and slave IDE drive.

New IDE drives support a new way to access data on the drive - Logical Block Addressing (LBA), which allows IDE drives to have capacities greater than 528 MB. The traditional CHS (Cylinder, Head, Sector) type of disk access defined in the AT and ATA specifications only permitted a maximum of 1,024 cylinders, 16 heads, and 63 sectors, limiting drive capacity to 528

MB. The IDE drives in the computer must support LBA mode. The Optimal and Fail-Safe default settings are *Disabled*.

## Peripheral Setup, Continued

### Secondary Master/Slave Drive Mode

This option specifies the IDE mode used by the master and slave IDE drives attached to the secondary IDE controller. *Selecting a mode not supported by the secondary master IDE drive will cause data loss.* The settings are:

Setting	Minimum Cycle Time
Auto	WINBIOS automatically determines the IDE mode that the slave IDE drive attached to the primary IDE controller supports.
Mode 0	600 ns
Mode 1	383 ns
Mode 2	240 ns
Mode 3	180 ns

Since the same timings are used for both the secondary master and secondary slave drive, this option should be set to the lowest IDE mode supported by the two IDE drives attached to the secondary IDE controller. The Optimal and Fail-Safe default settings are *Mode 0*.

### Secondary Master Drive Installed

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

### Secondary Slave Drive Installed

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

### PCI IDE Card Present In

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

## Peripheral Setup, Continued

### **PCI IDE IRQ Connected To**

This option specifies the PCI interrupt the PCI IDE IRQ is connected to. The settings are *INTA*, *INTB*, *INTC*, or *INTD*. *Always uses INTA for single-function devices*. If an offboard PCI IDE adapter card that has multiple PCI devices is installed, select the INT pin that connects to the IDE controller. The Optimal and Fail-Safe defaults are *INTA*.

### **Serial Port 1**

This option specifies the base I/O port address used for onboard serial port 1. The serial port uses eight consecutive I/O port addresses. The settings are *Disabled*, *3F8h*, or *2F8h*. The Optimal and Fail-Safe default settings are *3F8h*.

### **Serial Port 1 FIFO**

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

### **Serial Port 2**

This option specifies the base I/O port address used for onboard serial port 2. The serial port uses eight consecutive I/O port addresses. The settings are *Disabled*, *3E8h*, or *2E8h*. The Optimal and Fail-Safe default settings are *3E8h*.

### **Serial Port 2 FIFO**

Set this option to *Enabled* to enable the FIFO (First In, First Out) buffer for serial port 2. The settings are *Enabled* or *Disabled*. The Optimal and Fail-Safe default settings are *Disabled*. *The FIFO buffer should never be enabled for serial ports connected to a mouse*.

## Section 2

### Utility

The following icons appear in this section:

**Detect Master** 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 Slave** 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.

**Language** permits you to select a foreign language-specific screen character set.





## Section 3

### Security

#### WINBIOS Password Support

WINBIOS Setup has an optional password feature. The system can be configured so that all users must enter a password every time the system boots or when WINBIOS Setup is executed.

#### Setting a Password

The password check option is enabled in Advanced Setup (see page ) by choosing either *Always* (the password prompt appears every time the system is powered on) or *Setup* (the password prompt appears only when WINBIOS is run). The password is stored in CMOS RAM.

The system asks for a password.

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

#### **If You Do Not Want to Use a Password**

Just press <Enter> when the password prompt appears.

## Changing a Password

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

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

### **Remember the Password**

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

## Anti-Virus

When this icon is selected from the Security section of the WINBIOS Setup main menu, WINBIOS 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 is displayed 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 the Default section of the WINBIOS Setup screen are described in this section.

### **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 Flash Programming

The American Megatrends Excalibur PCI-II ISA PCI Pentium motherboard uses Flash EPROM to store the system BIOS. The advantage of using a Flash EPROM is that the EPROM chip does not have to be replaced to update the BIOS. The end user can actually reprogram the BIOS, using a ROM file supplied by American Megatrends.

### Programming the Flash EPROM

Step	Action
1	Turn system power off.
2	Place the floppy disk that has the latest S722P.ROM BIOS file in floppy drive A:.
3	Make sure that the system has a speaker that is connected.
4	Turn system power on while pressing and holding down the <Ctrl> and <Home> keys.

### Programming from System Boot

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

1. reads S722P.ROM from the root directory of the floppy disk in drive A:,
2. erases the Flash EPROM,
3. programs the Flash EPROM with the data read from the floppy disk in drive A:, and
4. generates a CPU reset, rebooting the system.

The Flash portion of Flash EPROM is not programmed.

## Flash Programming, Continued

### **S722P.ROM**

S722P.ROM resides on a floppy disk and contains the updated main BIOS code. American Megatrends will provide this file when the WINBIOS for the Excalibur PCI-II ISA Pentium motherboard must be updated.

S722P.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 S722P.ROM.

### **Sequence of Operation**

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

<b>Step</b>	<b>Action</b>	<b>Expected behavior</b>
1	Look for floppy disk.	The system beeps one time before the BIOS attempts to read from floppy drive A:.
2	Look for S722P.ROM on the floppy disk.	S722P.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 Flash Code begins reprogramming the Flash EPROM.
8	Continue programming the Flash EPROM.	Four beeps sound when reprogramming has been successfully completed.
9	Flash does a reset.	A CPU reset is generated (the system reboots).



10	Reboot	Reboot the system.
----	--------	--------------------

## Flash Programming, Continued

### Beep Codes

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

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

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

Step	Beeps	Description
—	None	Successful completion.
1	Continuous Single Beep	There is no floppy disk in Drive A:.
2	Five Beeps	S722P.ROM is not present in the root directory of the floppy disk in the A: drive.
3	Seven Beeps	Floppy Read Error.
4	Six Beeps	BIOS File Size Error.
5	Eight Beeps	An Intel i28F001BX-T Flash EPROM is not present.
6	Continuous Two Beeps	There is a problem in erasing the Flash EPROM.
7	Continuous Three Beeps	There is a problem in programming the Flash EPROM.
9	Continuous Four Beeps	The BIOS is not able to reset the CPU or J2 is still shorted.



# A Upgrading Cache Memory

L2 secondary (external) cache memory on the American Megatrends Excalibur PCI-II Pentium ISA motherboard can be upgraded from 256 KB to 512 KB by adding eight 32 KB x 8 15 ns 5V SRAM DIPs.

## Recommended Parts

Manufacturers of the 32 KB x 8 15 ns 5V SRAMs are:

Manufacturer	Part Number
Paradigm	PDM41256SA15P
Samsung	KM68257BP-15
Motorola	MCM6206CP15

## How to Upgrade Cache Memory

Step	Action
1	Turn the system off. If the motherboard is already installed in a computer case, remove the cover and expose the motherboard.
2	<i>Make sure you are properly grounded to prevent electrostatic discharge.</i>
3	Install the new 32 KB x 8 5V SRAM DIPs in sockets U4, U8, U15, U19, U22, U28, U30, and U33. Make sure that Pin 1 of the sockets matches Pin 1 of the SRAM DIPs. See the following page for the SRAM socket locations.
4	Jumper Pins 2-3 on J21, J22, and J23 on the motherboard.

Reinstall the motherboard and turn system power on. The system BIOS should report 512 KB of secondary cache memory now after the computer boots. If it does not, repeat the cache memory installation procedure above.



## B Engineering Specifications

### Temperature Ranges

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

Frequency	Heat Sink	Airflow over CPU	Airflow over other components	Temperature Range
60 or 66 MHz	YES	200 feet per minute	Not critical	0 ° through 50 ° C.

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

### Humidity

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

## Engineering Specifications, Continued

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

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

The +5V supply current to the ISA Bus is limited by the power connector.

### **Power Consumption**

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

Each ISA expansion slot is rated at 3.0 Amps maximum. There are four ISA-only expansion slots. Each PCI expansion slot is rated at 3.0 Amps maximum. There are four PCI expansion slots.

The total maximum power consumption for the ISA and PCI expansion slots is 27 Amps.

### **Conclusion**

The minimum rating of the power supply should be 220 Watts for a fully loaded motherboard, including a 12V power source.



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