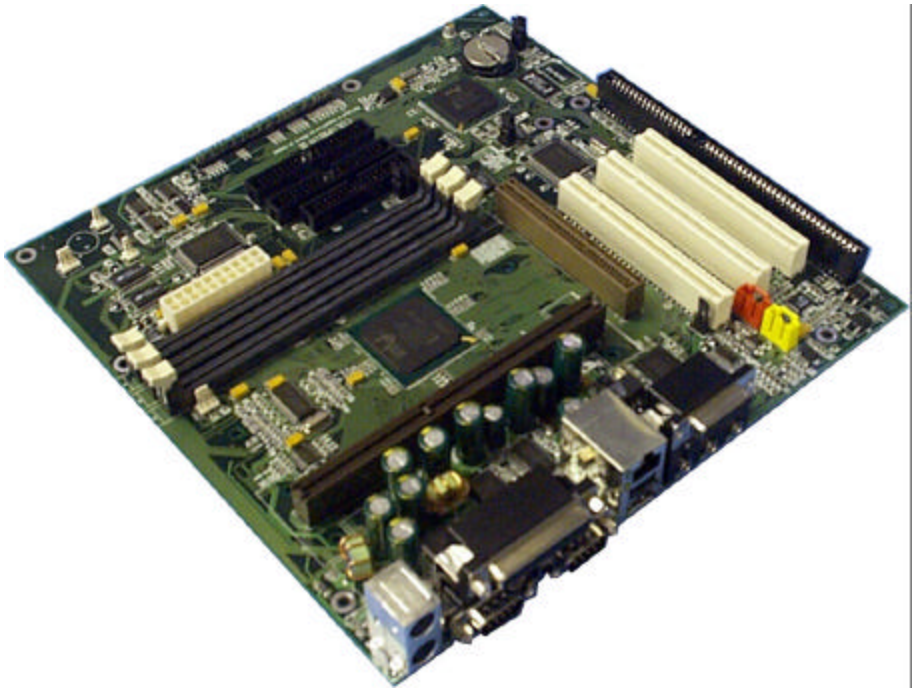
Columbia III
Motherboard



Reference Manual

Version 1.0

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1.Product Description

Pentium® Processor-based Micro ATX motherboard

The Columbia III Motherboard is an innovative, high performance micro ATX platform for the Celeron®, Pentium® II and Pentium® III processors - giving you the performance needed for today's Windows based business applications and providing performance for tomorrow's even more advanced software.

The Accelerated Graphics Port (AGP) is a graphics controller bus, freeing system resources to quickly move memory-intensive graphics data in and out of system memory. This enables a new level of sophisticated lifelike 3-D graphics with higher speeds and resolutions than previously possible. Off-loading bandwidth-intensive graphics from the PCI bus also contributes to an increase in overall system performance.

Features of the Columbia III Motherboard

- Micro ATX form factor of 244mm x 244mm.

Microprocessor:

- Single Intel Celeron, Pentium II or Pentium III processor
- 100MHz and 66MHz host bus speeds
- All current processor speeds, voltages, and bus frequencies
- Slot 1 connector

Main memory:

- Three 168-pin DIMM sockets
- Supports up to 384 MB of synchronous DRAM (SDRAM) memory
- Error checking and correcting (ECC)
- Intel 82443BX peripheral controller (PAC)
- Integrated PCI bus mastering controller
- Integrated Accelerated Graphics Port (A.G.P.) controller
- Intel 82371EB PCI ISA IDE Xcelerator (PIIX4E)
- Supports up to four IDE drives or devices
- Multifunction PCI-to-ISA bridge
- Universal Serial Bus (USB) and DMA controllers
- Two fast IDE interfaces
- Power management logic
- Real-time clock

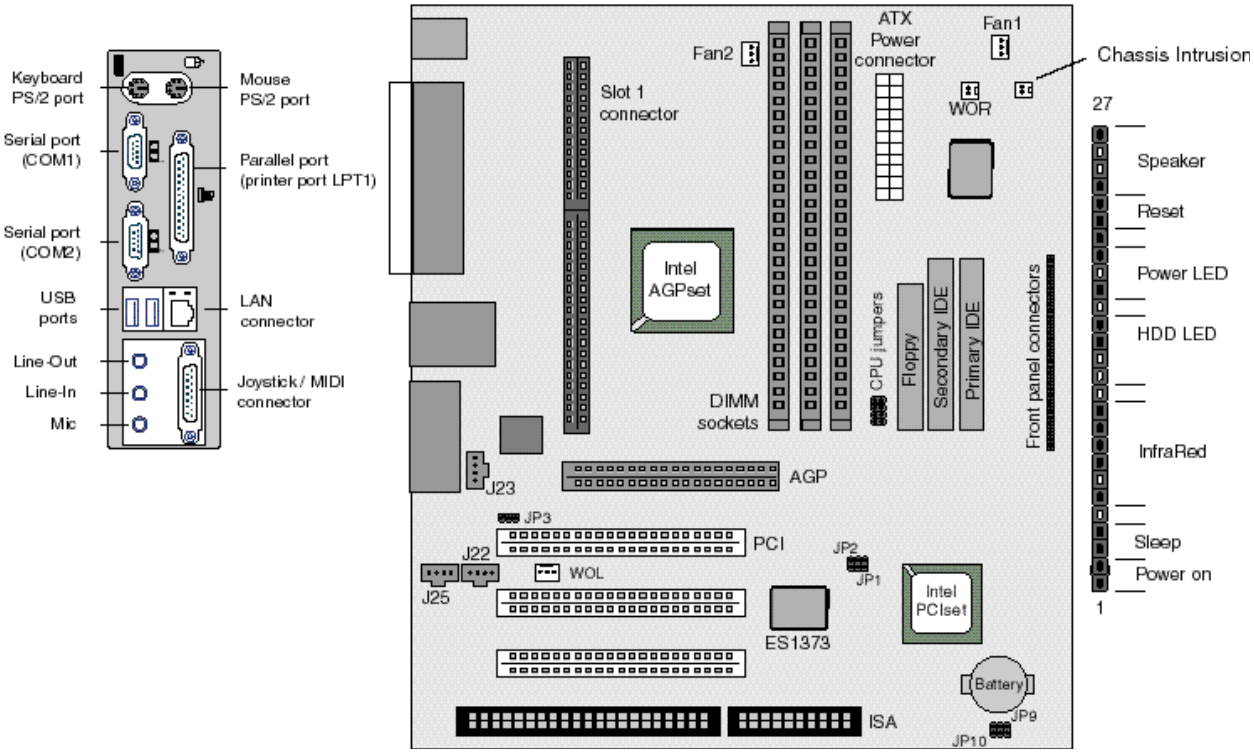
I/O features:

- National Semiconductor PC87351
- Integrates standard I/O functions
- Two USB ports
- Four expansion slots:
    - One AGP slot
    - Two PCI slots
    - One shared PCI/ISA slot

Other features:

- AWARD BIOS
- Plug and Play compatible
- Advanced Power Management (APM) 1.2
- Advanced Configuration and Power Interface (ACPI) 1.0

Motherboard Layout.



Central Processing Unit

This motherboard is designed to operate with a single Intel Celeron®, Pentium® II, or Pentium® III processor. The processor's VID pins automatically program the voltage regulator on the motherboard to the required processor voltage. In addition, the front side bus speed (100 MHz and 66 MHz) is automatically selected.

The Intel processors include the following features:

- Intel's highest performance processor, combining the power of the Pentium® III processor with the capabilities of MMX™ technology and new Katmai instructions.
- Takes advantage of the same high-performance Dual Independent Bus architecture used in the Pentium III processor for high bandwidth and performance.
- Single Edge Contact (S.E.C.) cartridge packaging technology delivers high performance processing and bus technology to mainstream systems. The cartridge includes the processor core, second-level cache, thermal plate, and back cover.
- Optimized for 32-bit applications running on advanced operating systems.
- Data integrity and reliability features include system bus ECC, Fault Analysis, Recovery, and Functional Redundancy Checking.

Memory

The motherboard has three dual inline memory module (DIMM) sockets. Synchronous DRAM (SDRAM) can be installed in any of the 3 sockets. EDO DIMMs are not supported. Minimum memory size is 16 MB; maximum memory size is 384 MB. Memory size can vary between sockets.

The motherboard supports the following memory features:

- 168-pin DIMMs
- 100 or 66 MHz SDRAM
- Non-ECC (64-bit) and ECC (72-bit) memory
- 3.3 V memory only
- Single- or double-sided DIMMs in the following sizes:

DIMM Size	Non-ECC Configuration	ECC Configuration
16 MB	2 Mbit x 64	2 Mbit x 72
32 MB	4 Mbit x 64	4 Mbit x 72
64 MB	8 Mbit x 64	8 Mbit x 72
128 MB	16 Mbit x 64	16 Mbit x 72

NOTE

Processors with 100 MHz front-side bus should be paired only with 100 MHz SDRAM.

Processors with 66 MHz front side bus can be paired with either 66 MHz or 100 MHz SDRAM.

SDRAM

Synchronous DRAM (SDRAM) improves memory performance through memory access that is synchronous with the memory clock. This simplifies the timing design and increases memory speed because all timings are dependent on the number of memory clock cycles.

NOTE

All memory components and DIMMs used with this motherboard must comply with the PC SDRAM specifications. These include the PC SDRAM Specification (memory component specific), the PC Unbuffered DIMM Specification, and the PC Serial Presence Detect Specification. You can access these documents through the Internet at http://www.intel.com/design/pcisets/memory/

ECC Memory

ECC memory detects multiple-bit errors and corrects single-bit errors. When ECC memory is installed, the BIOS supports both ECC and non-ECC mode. ECC mode is enabled in the Setup program. The BIOS automatically detects if ECC memory is installed and provides the Setup option for selecting ECC mode. If any non-ECC memory is installed, the Setup option for ECC configuration does not appear and ECC operation is not available.

The following table describes the effect of using Setup to put each memory type in each supported mode. Whenever ECC mode is selected in Setup, some performance loss occurs.

Cache Memory

The Intel microprocessors include 32 KB (16K/16K) non-blocking level one cache and up to 1 MB unified, non-blocking level two cache on the substrate in the Single Edge Connector (S.E.C.) cartridge. The size of level two cache varies between the Celeron, Pentium II and Pentium III processors, it could be 0KB, 128KB, 256KB or 512 KB.

Chipset

The Intel 440BX PCIset includes a Host-PCI bridge integrated with both an optimized DRAM controller and an Accelerated Graphics Port (A.G.P.) interface. The I/O subsystem of the 440BX is based on the PIIX4E, which is a highly integrated PCI-ISA/IDE Accelerator Bridge. This chipset consists of the Intel 82443BX PCI/A.G.P. controller (PAC) and the Intel 82371EB PCI/ISA IDE Xcelerator (PIIX4E) bridge chip.

Intel 82443BX PCI/A.G.P. controller (PAC)

The PAC provides bus-control signals, address paths, and data paths for transfers between the processor's host bus, PCI bus, Accelerated Graphics Port (A.G.P.), and main memory. The PAC comes in a 492-pin BGA package and features:

- Processor interface control
  - Support for processor host bus frequencies of 100 MHz or 66 MHz
  - 32-bit addressing
  - Desktop Optimized GTL+ compliant host bus interface
- Integrated DRAM controller, with support for:
  - +3.3 V only DIMM DRAM configurations
  - Up to four double sided DIMMs
  - Synchronous 100-MHz or 66-MHz SDRAM
  - SDRAM 64-bit data interface with ECC support
- A.G.P. interface
  - Complies with the A.G.P. specification (see Section 6.2 for specification information)
  - Support for +3.3 V PCI-66, A.G.P.-66/133 devices
  - Synchronous coupling to the host-bus frequency
- PCI bus interface
  - Complies with the PCI specification Rev 2.1, +5 V 33 MHz interface
  - Asynchronous coupling to the host-bus frequency
  - PCI parity generation support
  - Data streaming support from PCI-to-DRAM
  - Support for concurrent host, A.G.P., and PCI transactions to main memory
- Data buffering
  - DRAM write buffer with read-around-write capability
  - Dedicated host-to-DRAM, PCI0-to-DRAM, and PCI1/A.G.P.-to-DRAM read buffers
  - A.G.P. dedicated inbound/outbound FIFOs (133/66 MHz), used for temporary data storage
- Power management functions

Support for system suspend/resume (DRAM and power-on suspend)

Compliant with ACPI power management

- SMBus support for desktop management functions
- Support for system management mode (SMM)

Intel 82371EB PCI ISA IDE Xcelerator (PIIX4E)

The PIIX4 is a multifunction PCI device implementing the PCI-to-ISA bridge, PCI IDE functionality, Universal Serial Bus (USB) host/hub function, and enhanced power management. The PIIX4E comes in a 324-pin package that features:

- Multifunction PCI-to-ISA bridge

  Support for the PCI bus at 33 MHz

  Complies with the PCI specification (see Section 6.2 for specification information)

  Full ISA bus support
- USB controller

  Two USB ports (see Section 6.2 for specification information)

  Support for legacy keyboard and mouse

  Support for UHCI interface (see Section 6.2 for specification information)
- Integrated dual-channel enhanced IDE interface

  Support for up to four IDE devices

  PIO Mode 4 transfers at up to 16 MB/sec

  Support for Ultra DMA/33 synchronous DMA mode transfers up to 33 MB/sec

  Bus master mode with an 8 x 32-bit buffer for bus master PCI IDE burst transfers
- Enhanced DMA controller

  Two 8237-based DMA controllers

  Support for PCI DMA with three PC/PCI channels and distributed DMA protocols
- Interrupt controller based on 82C59

  Support for 15 interrupts

  Programmable for edge/level sensitivity
- Power management logic

  Sleep/resume logic

  Support for wake-on-modem, Wake on LAN technology, and wake on PME

  Support for ACPI (see Section 6.2 for specification information)
- Real-time Clock

  256-byte battery-backed CMOS SRAM

  Includes date alarm

- 16-bit counters/timers based on 82C54

Accelerated Graphics Port (A.G.P.)

The Accelerated Graphics Port (A.G.P.) is a high-performance interface for graphic-intensive applications, such as 3D applications. A.G.P. is independent of the PCI bus and is intended for exclusive use with graphical-display devices. A.G.P. provides these performance features:

- Pipelined-memory read and write operations that hide memory access latency.
- De-multiplexing of address and data on the bus for near 100 percent bus efficiency.
- AC timing for 133 MHz data transfer rates, allowing data throughput of 500MBYTES/sec.
- A.G.P. complies with the 66 MHz PCI specification.

Universal Serial Bus (USB)

The motherboard has two USB ports; one USB peripheral can be connected to each port. For more than two USB devices, an external hub can be connected to either port. The motherboard fully supports the universal host controller interface (UHCI) and uses UHCI-compatible software drivers. USB features include:

- Self-identifying peripherals that can be plugged in while the computer is running.
- Automatic mapping of function to driver and configuration.
- Supports isonchronous and asynchronous transfer types over the same set of wires.
- Supports up to 127 physical devices.
- Guaranteed bandwidth and low latencies appropriate for telephony, audio, and other applications.
- Error-handling and fault-recovery mechanisms built into the protocol.

IDE Support

The motherboard has two independent bus-mastering PCI IDE interfaces. These interfaces support PIO Mode 3, PIO Mode 4, ATAPI devices (e.g., CD-ROM), and Ultra DMA/33 synchronous-DMA mode transfers. The BIOS supports logical block addressing (LBA) and extended cylinder head sector (ECHS) translation modes. The BIOS automatically detects the IDE device transfer rate and translation mode.

Programmed I/O operations usually require a substantial amount of processor bandwidth. However, in multitasking operating systems, the bandwidth freed by bus mastering IDE can be devoted to other tasks while disk transfers are occurring.

The motherboard also supports laser servo (LS-120) drives. LS-120 technology allows the user to perform read/write operations to LS-120 (120 MB) and conventional 1.44 MB and 720 KB diskettes. An optical servo system is used to precisely position a

dual-gap head to access the diskette's 2,490 tracks per inch (tpi) containing up to 120 MB of data storage. A conventional diskette uses 135 tpi for 1.44 MB of data storage.

LS-120 drives are ATAPI-compatible and connect to the motherboard's IDE interface. (LS-120 drives are also available with SCSI and parallel port interfaces.) Some versions of Windows 95 and Windows NT operating systems recognize the LS-120 drive as a bootable device in both 120 MB and 1.44 MB mode.

Connection of an LS-120 drive and a standard 3.5-inch diskette drive is allowed. The LS-120 drive can be configured as a boot device if selected in the Setup program.

Real-Time Clock, CMOS RAM and Battery

The real-time clock is compatible with DS1287 and MC146818 components. The clock provides a time-of-day clock and a multi-century calendar with alarm features and century rollover. The real-time clock supports 256 bytes of battery-backed CMOS SRAM in two banks that are reserved for BIOS use.

The time, date, and CMOS values can be specified in the Setup program. The CMOS values can be returned to their defaults by using the Setup program.

An external coin-cell battery powers the real-time clock and CMOS content. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the 3.3 V standby current from the power supply extends the life of the battery.

Super I/O Controller

The motherboard uses the NSC PC87351 controller which features:

- Single diskette drive interface
- ISA Plug-and-Play compatible register set
- Two serial ports
- FIFO support on both serial and diskette interfaces
- One parallel port with ECP and EPP support
- PS/2 style mouse and keyboard interfaces
- Intelligent auto power management, including:
  Shadowed write-only registers for ACPI compliance
  Programmable wake-up event interface

The Setup program provides configuration options for the I/O controller.

Serial Ports

The motherboard has two 9-pin D-Sub serial port connectors located on the back panel. The NS16C550-compatible UARTs support data transfers at speeds up to 115.2Kbits/sec with BIOS support.

Parallel Ports

The connector for the multi-mode bi-directional parallel port is a 25-pin D-Sub connector located on the back panel of the motherboard. In the Setup program, there are four options for parallel port operation:

- Compatible (standard mode)
- Bi-directional
- Bi-directional Enhanced Parallel Port (EPP). A driver from the peripheral manufacturer is required for operation.
- Bi-directional high-speed Extended Capabilities Port (ECP)

Floppy disk Controller

In the Setup program, the floppy interface can be configured for the following floppy drive capacities and sizes:

- 360 KB, 5.25-inch
- 1.2 MBYTES, 5.25-inch
- 720 KB, 3.5-inch
- 1.44 MBYTES, 3.5-inch

- 2.88 MBYTES, 3.5-inch

Keyboard and Mouse Interface

PS/2 keyboard and mouse connectors are located on the back panel. The 5 V lines to these connectors are protected with a PolySwitch† circuit that, like a self-healing fuse, re-establishes the connection after an over-current condition is removed.

Power to the computer should be turned off before a keyboard or mouse is connected or disconnected.

The keyboard controller also supports the hot-key sequence <Ctrl><Alt><Del> for a software reset. This key sequence resets the computer's software by jumping to the beginning of the BIOS code and running the Power-On Self Test (POST).

Infrared Support

On the front panel I/O connector (pins 6-11), there are six pins that support Hewlett Packard HSDL-1000 compatible infrared (IR) transmitters and receivers. In the Setup program, Serial Port 2 can be directed to a connected IR device. The connection can be used to transfer files to or from portable devices like laptops, PDAs, and printers. The Infrared Data Association (IrDA) specification supports data transfers of up to 115 Kbaud at a distance of 1 meter.

BIOS System Support

BIOS, an acronym for Basic Input Output System, acts as the first link between hardware and software in coordinating the startup configuration of computers. Plug and play ready, AWARD BIOS automatically configures the computer's hard drives, disk drives, processors, chipsets, memory, and boot-up of the operating system.

The system BIOS, from AWARD, provides ISA PnP and PCI PnP compatibility. The BIOS is contained in a flash memory device. The BIOS provides the power-on self test (POST), the system Setup program, a PCI and IDE auto-configuration.

The system BIOS is always shadowed. Shadowing allows any BIOS routines to be executed from fast 32-bit onboard DRAM instead of from the slower 8-bit flash device.

1. Plug and Play Rev 1.0A support.
2. Boot Block Protection.
3. Auto detects Pipeline Burst SRAM and Cache size, IDE mode type and size.
4. Supports APM 1.2.
5. Supports DMI 2.0.
6. Supports USB.
7. Supports Booting from a Floppy drive, IDE device, CD-ROM, SCSI, Floptical or Network.
8. 1MBYTES/2MBYTES flash EEPROM for easy BIOS upgrade.

PCI IDE

1. “Ultra DMA/33” Synchronous DMA IDE support.
2. Meets Microsoft requirement for PC97/PC98.
3. Fully compatible with PCI spec.V2.1.
4. Supports PCI Bus Mastering.
5. Supports Mode 3 and Mode 4 for Enhanced IDE specification.
6. Supports Multi-word DMA mode 0,1,2.
7. Supports PCI burst Read/Write.
8. Supports Primary and Secondary IDE for a total of 4 drives.
9. IDE CD-ROM support.

PCI Auto-configuration

The PCI auto-configuration works in conjunction with the Setup program to support using PCI add-in boards in the system. When you turn on the system power after installing a PCI board, the BIOS automatically configures interrupts, DMA channels, I/O

space, and so on. Since PCI add-in boards use the same interrupt resources as ISA add-in boards, you must specify the interrupts used by non PnP ISA boards in the Setup program. Chapter 3 tells how to use the Setup program. The PCI auto-configuration program complies with version 2.1 of the PCI BIOS specification.

IDE Auto-configuration

When an IDE drive is installed in the system, the IDE auto-configuration function automatically detects and configures the drive for operation in the system. This function eliminates the need to enter the Setup program after you install an IDE drive.

ISA Plug and Play Capability

This provides auto-configuration of Plug and Play ISA cards and resource management for legacy (non Plug and Play) ISA cards.

Universal Serial Bus (USB) Support

The USB technology enables users to quickly and easily attach and reconfigure a wide range of peripheral devices, from keyboards to printers to telephony devices. With comprehensive support for both USB host controllers and USB devices, AWARD BIOS offers the ability to fully utilize USB technology. The motherboard features two USB ports as a factory installed option. The ports permit the direct connection of two USB peripherals without an external hub. If more devices are required, an external hub can be connected to either of the built-in ports This motherboard fully supports the standard Universal Host Controller Interface (UHCI) and uses standard software drivers that are UHCI compatible. Features of the USB include:

- Self-identifying, hot pluggable peripherals.
- Automatic Mapping of function to driver and configuration.
- Support for Isochronous and Asynchronous transfer types over the same set of wires.
- Support for up to 127 physical devices.
- Guaranteed bandwidth and low latencies appropriate for telephony, audio, and other applications.

Error handling and fault recovery mechanisms built into protocol.

BIOS Upgrades

Because the BIOS is stored in a flash memory device, you can easily upgrade the BIOS without having to disassemble the system. The flash upgrade process can be done by running a utility from a diskette or hard disk, or over a network.

WARNING

For information about the latest BIOS update for the Columbia III, contact your service representative.

Expansion Slots

This motherboard has one 16-bit ISA slots, three PCI expansion slots and one AGP slot.

PCI Slots:

The PCI bus transfers data at 132 MB/second. Part of the reason for high transfer rates is the PCI bus can operate concurrently with the processor bus; it doesn't override it. The CPU can be processing data in an external cache while the PCI bus is busy transferring information between other parts of the system. Another key feature of the PCI bus is it's plug and play capabilities. This eliminates the need for jumper and dip switches for configuring a PCI card.

The PCI slots on the Columbia III motherboard are numbered 1-3, with 1 being closest to the AGP slot. All PCI slots are fully functional bus-mastering slots.

PCI 1:

This slot shares the PCI Interrupt used by the AGP slot.

PCI 2:

This slot shares the PCI Interrupt used by the integrated on-board sound

PCI 3:

This slot shares the PCI interrupt used by the integrated on-board LAN.

Hardware Monitor

The optional hardware monitor subsystem provides the instrumentation capabilities. The features of the hardware monitor subsystem include:

- Support for an optional chassis intrusion sensor.
- An integrated ambient temperature sensor or mechanical switch.
- Fan speed sensors, which monitor the fan 1 and fan 2 connectors (see motherboard layout for the location of these connectors).
- Power supply voltage monitoring to detect levels above or below acceptable values.

When suggested ratings for temperature, fan speed, or voltage are exceeded, an interrupt is activated. The hardware monitor component connects to the SMBUS.

Onboard LAN

The optional onboard LAN for the Columbia III motherboard is driven by the Intel 82559 chipset. The Intel82559 is a 10/100 MBps PCI Ethernet LAN Controller. It automatically detects between 10 Base-T or 100 Base-TX Fast Ethernet connections. This function is a manufacturing option, if it is not installed the JP3 jumper will also NOT be installed.

The LAN LEDs which are mounted next to the LAN connector indicate the following:

Red LED (Speed)	On status indicates a 100 MBps connection.
	Off status indicates a 10 MBps connection.
Green LED (ACT)	Indicates there is activity on the LAN.
Yellow LED (LNK)	Indicates if the LAN cable is connected (linked).

Remote reset capabilities are possible from a remote peer or server using the LANDesk Client Manager and service layers (when available)

Onboard Sound

The onboard sound is powered by the Creative Ensoniq AudioPCI ES1373 chipset. For music playback, the Ensoniq synthesis engine provides 32 voices of great wave-table sounds. Now the instruments sound just like their real life counterparts, not a poor facsimile. Utilizing the PCI bus, the Ensoniq AudioPCI uses far less CPU overhead than traditional sound cards. This equates to better performance in multimedia titles and terrific audio quality with very little processor usage.

It supports three rear jacks and three connectors on the motherboard. Refer to the layout diagram for the location of each one.

Rear jacks:

Line-in

Line-out

Microphone

Joystick/MIDI connector

Motherboard connectors:

Headphone output – J25 (yellow connector)

Microphone input – J22 (red connector)

CD audio input – J23 (green connector)

Wake On LAN Header (WOL)

The WOL header is used to implement the Wake on LAN feature when the onboard LAN is not installed. Connect this header to a PCI LAN adapter that supports the Wake on LAN feature. The adapter monitors network traffic. When the adapter detects a 'Magic Packet', it asserts a signal through the Wake on LAN header to wake up the computer. This signal can wake up the computer only when the AC power cord is still plugged into the wall socket and the computer is turned off using the Standby Power button.

Note: WOL requires an ATX power supply that can supply 720 mA current at the 5V standby output.

Front Panel Connector

PWR ON Pins 1 & 2, connected to Standby Power On/Off Switch via twisted pair cable.

SLEEP Pins 3 & 4, connected to Sleep Switch via twisted pair cable (orange/white).

INFRARED Pins 6-11, not currently used.

HD LED Pins 15 & 16, connected to the HDD LED via twisted pair cable (red/white).

PWR LED Pins 18 & 20, connected to the Power LED via twisted pair cable (white/green respectively).

RESET Pins 22 & 23, connected to Reset Switch via twisted pair cable (orange/white).

SPEAKER Pins 24, & 27, connected to the case speaker via twisted pair cable (red/black).

Headphone Connector

The headphone connector, J25, is connected to the front panel connector intended for headphone output on the TCO Slimline desktop case.

Microphone Connector

The microphone connector, J22, is connected to the front panel connector intended for microphone input on the TCO Slimline desktop case.

CD Audio in Connector

The CD audio in connector, J23, is connected to the audio output of the CD-ROM.

Fan Connectors

Two fan connectors are provided, Fan 1 is recommended for the CPU heat-sink fan, Fans 2 can be used for any other case or heat-sink fan, however fan 2 does not have the fan speed monitoring capability.

The pin assignment for these connectors are as follows:

Pin 1 – Ground.

Pin 2 - +12V.

Pin 3 – Sensor

Main Power Connector

When used with an ATX-compliant power supply that supports remote power on/off, the motherboard can turn off the system power through software control.

To enable soft-off control in software, advanced power management must be enabled in the Setup program and in the operating system. When the system BIOS receives the correct APM command from the operating system, the BIOS turns off power to the computer.

With soft-off enabled, if power to the computer is interrupted by a power outage or a disconnected power cord, when power resumes, the computer returns to the power state it was in before power was interrupted (on or off).

Management Extension Hardware

The optional Management Extension component (National Semiconductor LM81 provides the instrumentation capabilities designed to reduce the total cost of owning a PC when used with Intel LANDesk Client Manager. Feature include:

- Integrated temperature monitoring.
- Fan speed monitoring.
- Power supply voltage monitoring to detect levels above or below acceptable values.
- Registers for storing POST hardware test results and error codes.
- Chassis Intrusion - This is carried out by the installation of a light sensitive device on the motherboard (close to the BIOS). This will detect the presence of light if the chassis cover is removed. Alternatively, a header (close to the BIOS) is installed on the motherboard for the connection of a micro switch to detect chassis intrusion.

When suggested ratings for temperature, fan speed, or voltage are exceeded, an interrupt is activated to report the status.

LS-120 Support

LS-120 MB Diskette technology enables users to store 120 MB of data on a single, 3.5 Inch removable diskette. LS-120 technology is backward (both read and write) compatible with 1.44 MB and 720 KB DOS-formatted diskettes and is supported by Windows 95 and Windows NT operating systems.

The Columbia motherboard allows connection of an LS-120 compatible drive and a standard 3.5-inch diskette drive. The LS-120 drive can be configured as a boot device, if selected in the BIOS setup utility.

System Security

The BIOS provides Supervisor level and User level passwords that you can enable through the Setup program.

Chassis Intrusion Detection is also available as a manufacturing option.

2.Installation and Settings

CAUTION

Electrostatic discharge (ESD) can damage components. Perform the procedures described in this chapter only at an ESD workstation. If such a station is not available, you can provide some ESD protection by wearing an anti-static wrist strap and attaching it to a metal part of the computer.

Jumper Settings

The motherboard contains configuration jumpers that make it possible to change the system configuration. Normally, the only time you will ever change a jumper is if you need to:

- Change the system operating speed
- Clear CMOS
- Clear Password
- Change the Onboard LAN Power Supply voltage source

NOTE

A jumper is a small plastic-encased conductor that slips over jumper pins. To change a jumper setting, use a pair of fine needle-nosed pliers to remove the jumper from its current location and slide it onto the new pins to obtain the desired setting.

CAUTION

Do not squeeze the pliers or other tool you use to remove a jumper, or you might bend or break the pins.

CPU Speed Setting

66 MHz bus:

	JP8	JP7	JP6	JP5
233 MHz	ON	OFF	OFF	ON
266 MHz	ON	ON	ON	OFF
300 MHz	ON	OFF	ON	OFF
333 MHz	ON	ON	OFF	OFF
366 MHz	ON	OFF	OFF	OFF
400 MHz	OFF	ON	ON	ON
433 MHz	OFF	OFF	ON	ON

466 MHz	OFF	ON	OFF	ON

100 MHz bus:

	JP8	JP7	JP6	JP5
350 MHz	ON	OFF	OFF	ON
400 MHz	ON	ON	ON	OFF
450 MHz	ON	OFF	ON	OFF
500 MHz	ON	ON	OFF	OFF

Onboard LAN Power Supply Voltage Source – JP3:

	JP3
Standby 3.3V	1-2*
3.3V	2-3

Clear CMOS – JP2:

	JP2
Normal	1-2*
Clear CMOS	2-3

To clear the CMOS do the following:

- Power down the system.
- Remove the system cover to access the motherboard.
- Change the setting of JP2 to 2-3 (see the motherboard layout for it's location).
- Turn on the system, wait until you see video and turn the system off again.
- Change the setting of JP2 back to 1-2 (the default).
- Replace the system cover.
- Turn on the system and change the BIOS settings according to your preferences.

Clear Password – JP1:

	JP1
Normal	1-2*

Clear Password	2-3

To clear the password, do the following:

- Power down the system.
- Remove the system cover to access the motherboard.
- Change the setting of JP1 to 2-3 (see the motherboard layout for it's location).
- Turn on the system, wait until you see video and turn the system off again.
- Change the setting of JP1 back to 1-2 (the default).
- Replace the system cover.

Flash Device Mode Settings – JP9 and JP10:

	JP9	JP10
Program Device	1-2	1-2*
Write Protect	2-3	2-3

*** = Default setting**

CPU Installation

Upgrading the CPU

Seanix computers are equipped with Intel® CPUs only. The installation procedures shown below are for the Intel® Pentium and Intel® Celeron CPUs.

Pentium II, Pentium III and Celeron CPUs are of the modular type that plug into a slot on the motherboard, called slot 1. Refer to the layout diagram for the location of slot 1.

Removing a Pentium II / III CPU

1. Unplug the CPU fan connector from the motherboard.

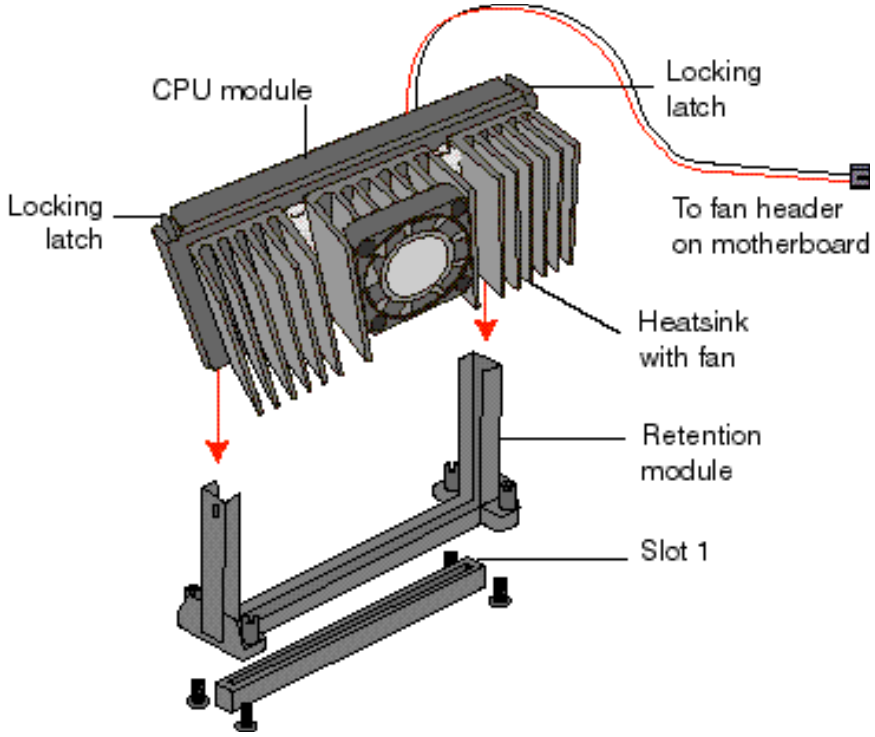
2. Press the two locking latches inward to release the CPU from the retention module. Slide the CPU upward and out of the retention module.

Installing a Pentium II / III CPU

1. Slide the CPU into the retention module. Press the CPU down firmly into the slot 1 until the two locking latches clip in place.

2. Connect the CPU fan plug to the Fan1 header on the motherboard.

3. Change the CPU speed jumpers on the motherboard to match the speed of CPU you installed. The jumper settings are shown in the previous chapter.



Removing a Celeron CPU

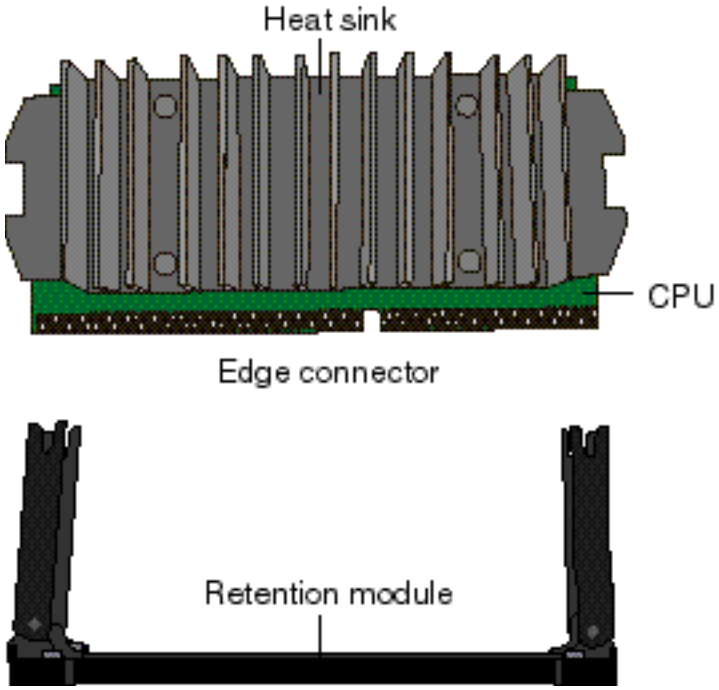
1. Spread the upright sides if the retention module outwards and lift the CPU upwards and out of the retention module.

Installing a Celeron CPU

1. Slide the CPU into the retention module from above such that the edge connector will slide into the slot1 connector on the motherboard.

2. Push the CPU module down firmly until the notches on the sides of the heat sink clip into place on the retention module.

3. Change the CPU speed jumpers on the motherboard to match the speed of CPU you installed. The jumper settings are shown in the previous chapter.



Note: It is possible that your retention module may be different to the one shown, however the basics of removal and installation will be the same.

System Memory Installation

You can install from 16 MB to 384 MB of memory in the motherboard DIMM sockets. The board has DIMM sockets arranged as banks 0, I, and 2. The motherboard supports the following memory features:

- 168-pin SDRAM DIMMs.
- 100 MHz or 66 MHz unbuffered SDRAM DIMMs.
- Non-ECC (64-bit) or ECC (72-bit) memory.
- 16 MB, 32 MB, 64 MB, and 128 MB modules.

When adding memory, follow these guidelines:

- You can install DIMMs in any of the three banks.
- You can use different size DIMMs in different banks.
- The BIOS detects the size of installed memory.
- For ECC operation to be available, all installed memory must be ECC and you must enable the ECC Configuration feature in the Setup program (see chapter 3).

The motherboard layout at the beginning of this manual shows the location of the DIMM sockets. To install DIMMs, follow these steps:

1. Turn off all peripheral devices connected to the computer. Turn off the computer.

2. Remove the computer cover and locate the DIMM sockets.

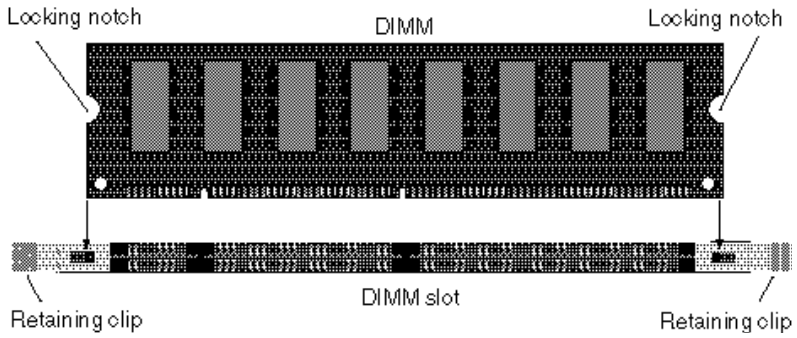
3. Holding the DIMM by the edges, remove it from its anti-static package.

4. Make sure the clips at either end of the socket are pushed away from the socket.

5. Position the DIMM above the socket. Align the two small notches in the bottom edge of the DIMM with the keys in the socket.

6. Insert the bottom edge of the DIMM into the socket.

7. When the DIMM is seated, push down on the top edge of the DIMM until the retaining clips at the ends of the socket snap into place. Make sure the clips are firmly in place.



8. Replace the computer cover.

9. If you installed a DIMM with ECC memory, start the computer and use the ECC Configuration feature in Setup to enable the use of ECC.

Removing Memory

To remove a DIMM, follow these steps:

1. Gently spread the retaining clips at each end of the socket. The DIMM pops out of the socket.

2. Hold the DIMM by the edges, lift it away from the socket, and store it in an anti-static package.

3. Reinstall and reconnect any parts you removed or disconnected to reach the DIMM sockets.

Battery Replacement

When your computer is turned off, a lithium battery keeps the time-of-day clock and the values in CMOS RAM current.

The battery should last about seven years. When the battery begins to die, it loses voltage; when the voltage drops below a certain level, the Setup program settings stored in CMOS RAM (for example, the date and time) might not be accurate. Replace the battery with an equivalent one.

If your local ordinances permit, you may dispose of individual batteries as normal trash. Do not expose batteries to excessive heat or fire. Keep all batteries away from children.

CAUTION

Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

Expansion Card Installation

The computer system should be switched off and the power cord removed before installing any expansion cards into the system. Failure to do so may cause severe damage to both your motherboard and expansion cards.

Before installing an expansion card, read it's documentation regarding any hardware or software settings that may be required to set up your specific card.

- Set any necessary jumpers on the expansion card.
- Remove your computer system's cover.
- Identify the type of slot where the expansion card will be installed and isolate one of the vacant slots for your card.
- Remove the blanking bracket for that slot and retain for possible future use.
- Carefully align the cards edge connector with the motherboard slot and press down firmly to seat the card in the slot, a rocking motion usually makes this easier.
- Secure the cards' back-plate with the screw you removed earlier.
- Replace the computer system's cover.
- Plug in the power cord and proceed to install any drivers or software needed for that card.

3.Using the BIOS Setup Program

This chapter tells how to use the Setup program that is built into the BIOS. The Setup program makes it possible to change configuration information (such as the types of peripherals that are installed) and the boot-up sequence for the system. The Setup information is stored in CMOS random access memory (RAM) and is backed up by a battery when power is off.

Record the Setup Configuration

To make sure you have a reference to the Setup values for your system, we recommend you to write down the current settings and keep this record up-to-date.

AWARD BIOS Setup Menu Overview

The AWARD BIOS Setup program is easy to use and can be controlled by the keyboard. Enter the AWARD BIOS Setup main menu as follows:

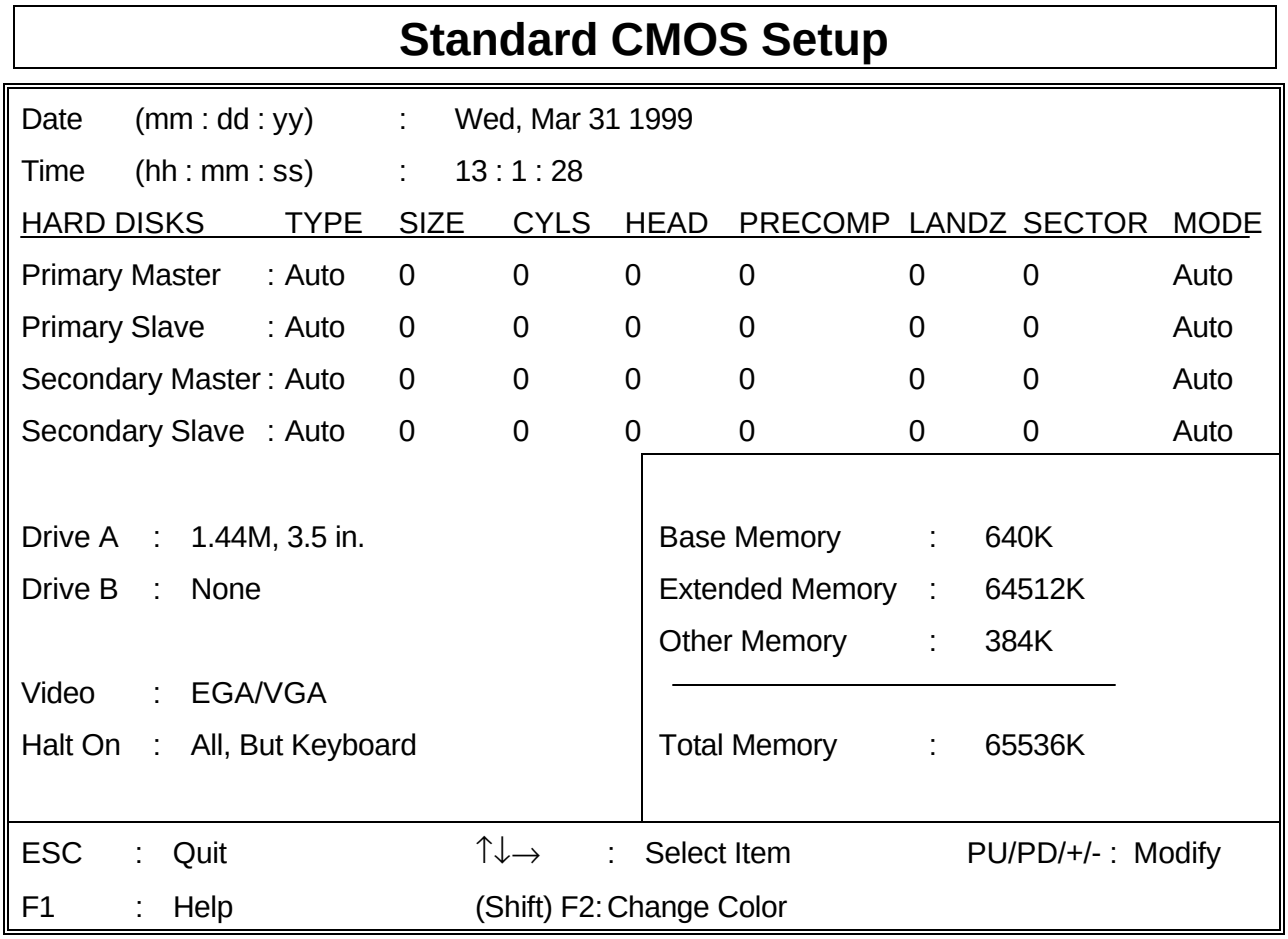
1. Turn on or reboot your system.
2. When the message “Hit <DEL>, if you want to run SETUP” appears, press the <DEL> key to enter the BIOS setup program. The CMOS Setup Utility screen, as illustrated below, will appear.

ROM PCI/ISA BIOS (2A69KSAA) CMOS Setup Utility AWARD Software, Inc.	
Standard CMOS Setup BIOS Features Setup Chipset Features Setup Power Management Setup PNP/PCI Configuration Load BIOS Defaults Load Setup Defaults	Integrated Peripherals Supervisor Password User Password IDE HDD Auto Detection Save and Exit Setup Exit Without Saving
ESC : Quit F10 : Save & Exit Setup	↑↓→ : Select Item (Shift) F2 : Change Color
Onboard I/O, IRQ, DMA Assignment …	

Overview of the Setup Keys

The following keys have special functions in the AWARD BIOS Setup Utility.

Setup Key	Description
← → ↑ ↓	Moves to the next item to the left, right, up or down.
Esc	Main menu: Quit and not save changes into CMOS RAM. Other pages: Exit current page and return to main menu.
PgUp	Increase the numeric value or makes changes.
PgDn	Decrease the numeric value or makes changes.
+	Increase the numeric value or makes changes.
-	Decrease the numeric value or makes changes.
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu.
F2	Change color from total 16 colors. F2 to select color forward, Shift-F2 to select color backward.
F3	Calendar, only for Status Page Setup Menu.
F4	Reserved.
F5	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu.
F6	Load the default CMOS RAM value from BIOS default table, only for Option Page Setup Menu.
F7	Load the default.
F8	Reserved.
F9	Reserved.
F10	Save all the CMOS changes, only for Main Menu.



This section describes the Setup options found on the Standard CMOS Setup menu. It is used to set the time and date and to configure the disk drives. If you select certain options from the main screen (e.g., Primary IDE Master), the Setup program switches to a sub-screen for the selected option.

Date / Time

Select the Date/Time option to change the date or time. The current date and time are displayed. Enter new values through the displayed window.

Floppy Drive A, B

Choose the Floppy Drive A or B option to specify the floppy drive type. The settings are 360 KB 5.25-inch; 1.2 MB 5.25-inch; 720 KB 3.5-inch; 1.44 MB 3.5-inch; and 2.88 MB, 3.5-inch. The default is 1.44 MB, 3.5-inch.

Primary Master, Primary Slave, Secondary Master, Secondary Slave

Choose these options to configure the hard disk drive shown in the field. When you select an option, the following parameters are listed: Type, LBA/Large Mode, Block

Mode, 32Bit Mode, and PIO Mode. Use the cursor to highlight “Type” and then choose “Auto” or other options. If you choose “Auto”, the BIOS will automatically detect the type of HDD before booting the operating system. You can press <enter> again, then the BIOS will show the complete parameters of HDD type.

The BIOS automatically detects the IDE drive parameters (including ATAPI CD-ROM drives) and displays them. Click on the OK button to accept these parameters Or you can set the parameters manually if you are absolutely certain that you know the correct IDE drive parameters.

Click on LBA/Large Mode and choose ‘On’ to enable support for IDE drives with capacities greater than 528 MB.

Click on Block Mode and choose ‘On’ to support IDE drives that use Block Mode.

Click on 32Bit Mode and click on ‘On’ to support IDE drives that permit 32-bit accesses.

Click on PIO Mode to select the IDE Programmed I/O mode. PIO programming also works with ATAPI CD-ROM drives. The settings are Auto, 0, 1, 2, 3, 4, or 5. Click on ‘Auto’ to allow the BIOS to automatically find the PIO mode that the IDE drive being configured uses. If you select 0-5 you must make absolutely certain that you are selecting the PIO mode supported by the IDE drive being configured.

Configuring a CD-ROM Drive Select the appropriate drive icon (Pri Master, Pri Slave, Sec Master, or Sec Slave). Choose the Type parameter and select CDROM. You can boot the computer from a CD-ROM drive. You can also choose Auto and let the BIOS automatically set the correct drive parameters.

BIOS Features Setup

Virus Warning	:	Disabled	Video BIOS Shadow	:	Enabled
CPU Internal Cache	:	Enabled	C8000-CBFFF Shadow	:	Disabled
External Cache	:	Enabled	CC000-CFFFF Shadow	:	Disabled
CPU L2 Cache ECC Checking	:	Enabled	D0000-D3FFF Shadow	:	Disabled
Quick Power On Self Test	:	Disabled	D4000-D7FFF Shadow	:	Disabled
Boot From LAN First	:	Disabled	D8000-DBFFF Shadow	:	Disabled
Boot Sequence	:	A, C, SCSI	DC000-DFFFF Shadow	:	Disabled
Swap Floppy Drive	:	Disabled			
Boot Up Floppy Seek	:	Enabled			
Hard Disk Write Protect	:	Disabled			
Floppy Disk Access Control	:	R/W			
Boot Up Numlock Status	:	On			
Gate A20 Option	:	Fast			
Typematic Rate Setting	:	Disabled			
Typematic Rate (Chars/Sec)	:	6			
Typematic Delay (Msec)	:	250			
Security Option	:	Setup	ESC : Quit	↑↓→	: Select Item
PCI/VGA Palette Snoop	:	Disabled	F1 : Help	PU/PD/+/-	: Modify
OS Select For DRAM > 64MB	:	Non-OS2	F5 : Old Values	(Shift) F2	: Color
HDD SMART capability	:	Enabled	F6 : Load BIOS Defaults		
Report No FDD For Win 95	:	Yes	F7 : Load Setup Defaults		

This section describes the options available in the BIOS Feature Setup menu which are used to configure basic system performance parameters. If you select certain options the setup program switches to a sub-screen for the selected option.

Virus Warning

When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an anti-virus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

Note: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.

CPU Internal Cache / External Cache

Cache memory is additional memory that is much faster than conventional DRAM. CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional external cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU.

CPU L2 Cache ECC Checking

When you select Enabled, memory checking is enable when the external cache contains ECC SRAMs.

Quick Power On Self Test

Select Enabled to reduce the amount of time required to run the power-on self-test (POST). A quick POST skips certain steps. We recommend that you normally disable quick POST. Better to find a problem during POST than lose data during your work.

Boot From LAN First

When Enabled, the BIOS attempts to boot from a LAN boot image before it attempts to boot from a local storage device.

Boot Sequence

The original IBM PCs loaded the DOS operating system from drive A (floppy disk), so IBM PC-compatible systems are designed to search for an operating system first on drive A, and then on drive C (hard disk). However, modern computers usually load the operating system from the hard drive, and may even load it from a CD-ROM drive.

Boot Up Floppy Seek

When Enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360-KB floppy drives have 40 tracks; drives with 720 KB, 1.2 MB, and 1.44 MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend that you set this field to Disabled to save time.

Boot Up NumLock Status

Toggle between On or Off to control the state of the NumLock key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operations.

Swap Floppy Drive

This field is effective only in systems with two floppy drives. Selecting Enabled assigns physical drive B to logical drive A, and physical drive A to logical drive B.

Gate A20 Option

Gate A20 refers to the way the system addresses memory above 1 MB (extended memory). When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows.

Typematic Rate Setting

When Disabled, the following two items (Typematic Rate and Typematic Delay) are irrelevant. Keystrokes repeat at a rate determined by the keyboard controller in your system. When Enabled, you can select a typematic rate and typematic delay.

Typematic Rate (Chars/Sec)

When the typematic rate setting is enabled, you can select a typematic rate (the rate at which character repeats when you hold down a key) of 6, 8, 10,12, 15, 20, 24 or 30 characters per second.

Typematic Delay (Msec)

When the typematic rate setting is enabled, you can select a typematic delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 1000 milliseconds.

Security Option

If you have set a password, select whether the password is required every time the System boots, or only when you enter Setup.

PCI/VGA Palette Snoop

Leave this field at Disabled.

OS Select for DRAM > 64MB

Select OS2 only if you are running OS/2 operating system with greater than 64 MB of RAM on your system.

HDD S.M.A.R.T capability

SMART is an acronym for Self Monitoring Analysis and Reporting Technology system. SMART is a hard drive self diagnostic feature available on some IDE hard drives.

Report No FDD For WIN 95

Select yes to release IRQ6 when the system contains no floppy drive, for compatibility with Windows 95 logo certification. In the integrated peripherals screen, select *Disabled* for the Onboard FDC Controller field.

Chipset Features Setup

Auto Configuration	:	Enabled
EDO DRAM Speed Selection	:	60 ns
EDO CASx# MA Wait State	:	2
EDO RASx# MA Wait State	:	2
SDRAM RAS to CAS Delay	:	3
SDRAM RAS Precharge Time	:	3
SDRAM CAS Latency Time	:	3
SDRAM Precharge Control	:	Disabled
DRAM Data Integrity Mode	:	Non-ECC
System BIOS Cacheable	:	Enabled
Video BIOS Cacheable	:	Enabled
Video RAM Cacheable	:	Disabled
8 Bit I/O Recovery Time	:	1
16 Bit I/O Recovery Time	:	1
Memory Hole At 15M-16M	:	Disabled
Passive Release	:	Enabled
Delayed Transaction	:	Disabled
AGP Aperture Size (MB)	:	64

ESC	: Quit	↑↓→	: Select Item
F1	: Help	PU/PD/+/-	: Modify
F5	: Old Values	(Shift) F2	: Color
F6	: Load BIOS Defaults		
F7	: Load Setup Defaults		

This section describes the options available in the Chipset Feature Setup menu which are used to configure the features specific to the chipset used on this motherboard. If you select certain options the setup program switches to a sub-screen for the selected option.

Auto Configuration

Auto Configuration selects predetermined optimal values of chipset parameters. When Disabled, chipset parameters revert to setup information stored in CMOS. Many fields in this screen are not available when Auto Configuration is Enabled.

EDO DRAM Speed Selection

The value in this field must correspond to the speed of the DRAM installed in your system. DO NOT change the default setting of this field, as determined by the system board manufacturer for the installed DRAM. This value is access speed, so a lower value means a faster system. This field applies only if EDO DRAM is installed in the system.

EDO CASx# MA Wait State

The board designer may elect to insert one additional wait state before the assertion of the first CASx# for page hit cycles, thus allowing one additional clock of MA setup time to the CASx# for the leadoff page hit cycle. Do not change from the manufacturer's default unless you are getting memory addressing errors. This field applies only if EDO DRAM is installed in the system.

EDO RASx# Wait State

The board designer may elect to insert one additional wait state before RAS# is asserted for row misses, thus allowing one additional MAX[13:0] setup time to RASx# assertion. This field applies only if EDO DRAM is installed in the system.

SDRAM RAS to CAS Delay

This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

SDRAM RAS Precharge Time

If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain data. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.

SDRAM CAS Latency Time

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

SDRAM Precharge Control

When Enabled, all CPU cycles to SDRAM result in an All Banks Precharge Command on the SDRAM interface.

DRAM Data Integrity Mode

Select Parity or ECC (error-correcting code), according to the type of installed DRAM.

System BIOS Cacheable

Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable

Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

V 8/16 Bit I/O Recovery Time

The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus.

These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

Memory Hole at 15M-16M

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

Passive Release

When *Enabled*, CPU to PCI bus accesses are allowed during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with the PCI specification version 2.1.

AGP Aperture Size (MB)

Select the size of the Accelerated Graphics Port (AGP) aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. See www.agpforum.org for APG information.

Power Management Setup

Power Management	:	User Define	** Reload Global Timer Events **		
PM Control By APM	:	Yes	IRQ [3-7,9-15], NMI	:	Disabled
Video Off Method	:	V/H SYNC+Blank	Primary IDE 0	:	Disabled
Video Off After	:	Standby	Primary IDE 1	:	Disabled
Modem Use IRQ	:	3	Secondary IDE 0	:	Disabled
Doze Mode	:	Disable	Secondary IDE 1	:	Disabled
Standby Mode	:	Disabled	Floppy Disk	:	Disabled
Suspend Mode	:	Disable	Serial Port	:	Enabled
HDD Power Down	:	Disable	Parallel Port	:	Disabled
Throttle Duty Cycle	:	62.5%			
PCI/VGA Act-Monitor	:	Disabled			
Soft-Off by PWR-BTTN	:	Instant-Off			
PWRON After PWR-Fail	:	Former-Sts			
Power on by Ring	:	Enabled	ESC : Quit	↑↓→	: Select Item
Wake Up On LAN	:	Enabled	F1 : Help	PU/PD/+/-	: Modify
IRQ 8 Break Suspend	:	Disabled	F5 : Old Values	(Shift) F2	: Color
			F6 : Load BIOS Defaults		
			F7 : Load Setup Defaults		

This section describes the options available in the Power Management Setup menu used to configure the power conservation features. If you select certain options the setup program switches to a sub-screen for the selected option.

Power Management

This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes.

This table describes each power management mode:

Max Saving	Maximum power savings. Only Available for SL CPUs.
User Define	Set each mode individually.
Min Saving	Minimum power savings.

PM Control by APM

If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings.

Video Off Method

Determines the manner in which the monitor is blanked.

V/H SYNC+Blank	System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.
DPMS Support	Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.
Blank Screen	System only writes blanks to the video buffer.

Video Off After

As the system moves from lesser to greater power-saving modes, select the mode in which you want the monitor to blank.

MODEM Use IRQ

Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

Doze Mode

After the selected period of system inactivity, the CPU clock runs at slower speed while all other devices still operate at full speed.

Standby Mode

After the selected period of system inactivity, the CPU clock stops, the hard drive enters an idle state, and the L2 cache enters a power-save mode. All other devices still operate at full speed.

Standby Mode

After the selected period of system inactivity, the fixed disk drive and the video shut off while all other devices still operate at full speed.

Suspend Mode

After the selected period of system inactivity, all devices except the CPU shut off.

HDD Power Down

After the selected period of drive inactivity, the hard disk drive powers down while all other devices remain active.

Throttle Duty Cycle

When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

PCI/VGA Active Monitor

When Enabled, any video activity restarts the global timer for Standby mode.

Soft-Off by PWR-BTTN

When Enabled, turning the system off with the on/off button places the system in a very low-power-usage state, with only enough circuitry receiving power to detect power button activity or Resume by Ring activity.

Power on by Ring

An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

Wake Up On Ring

When enabled, an input signal from a local area network (LAN) awakens the system from a soft off state.

IRQ8 Break Suspend

You can Enable or Disable monitoring of IRQ8 (the Real Time Clock) so it does not awaken the system from Suspend mode.

PNP/PCI Configuration

PNP OS Installed	:	Yes
Resources Controlled By	:	Auto
Reset Configuration Data	:	Disabled

ESC	: Quit	↑↓→	: Select Item
F1	: Help	PU/PD/+/-	: Modify
F5	: Old Values	(Shift) F2	: Color
F6	: Load BIOS Defaults		
F7	: Load Setup Defaults		

This section describes the options available in the PNP/PCI Configuration menu to configure the PCI and Plug & Play features. If you select certain options the setup program switches to a sub-screen for the selected option.

PNP OS Installed

Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 95).

Resources Controlled By

The Plug and Play Award BIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

Integrated Peripherals

IDE HDD Block Mode	:	Enabled	UR2 Mode	:	Standard
IDE Primary Master PIO	:	Auto	Onboard Parallel Port	:	378/IRQ7
IDE Primary Slave PIO	:	Auto	Parallel Port Mode	:	SPP
IDE Secondary Master PIO	:	Auto			
IDE Secondary Slave PIO	:	Auto	Onboard Sound Chip	:	Enabled
IDE Primary Master UDMA	:	Auto	Onboard LAN Chip	:	Enabled
IDE Primary Slave UDMA	:	Auto			
IDE Secondary Master UDMA	:	Auto			
IDE Secondary Slave UDMA	:	Auto			
On-Chip Primary PCI IDE	:	Enabled			
On-Chip Secondary PCI IDE	:	Enabled			
USB Keyboard Support	:	Disabled			
Init Display First	:	AGP			
Power On Function	:	Button Only	ESC : Quit	↑↓→	: Select Item
			F1 : Help	PU/PD/+/-	: Modify
KBC input clock	:	8 MHz	F5 : Old Values	(Shift) F2	: Color
Onboard FDC Controller	:	Enabled	F6 : Load BIOS Defaults		
Onboard Serial Port 1	:	Auto	F7 : Load Setup Defaults		
Onboard Serial Port 2	:	Auto			

This section describes the options available in the Integrated Peripherals menu to configure the peripheral support. If you select certain options the setup program switches to a sub-screen for the selected option.

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

IDE Primary/ Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

IDE Primary/ Secondary Master/Slave UDMA

UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 33 MB/s. When you select Auto in the four IDE UDMA fields (for each of up to four IDE devices that the internal PCI IDE interface supports), the system automatically determines the optimal data transfer rate for each IDE device.

On-Chip Primary/ Secondary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.

USB Keyboard Support

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

Init Display First

Initialize the AGP video display before initializing any other display device on the system. Thus the AGP display becomes the primary display.

Onboard FDC Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.

Onboard Serial Ports (1/2, A/B)

Select a logical COM port name and matching address for the first and second serial ports. Select an address and corresponding interrupt for the first and second serial ports.

Load BIOS Defaults

BIOS defaults are factory settings for the most stable, minimal performance system operations.

Load Setup Defaults

Setup defaults are factory settings for optimal performance system operations.

Auto-Detect Hard Disks

This “Auto-Detect Hard Disks” option detects the parameters of IDE hard disk drives, and automatically enters them into the standard CMOS setup screen.

Supervisor Password and User Password settings

Change, set, or disable a password. In BIOS versions that allow separate user and supervisor passwords, only the supervisor password permits access to Setup. The user password generally allows only power-on access.

IDE HDD Auto Detection

Automatically detect and configure IDE hard disk parameters.

Save and Exit Setup

Save settings in non-volatile CMOS RAM and exit Setup.

Exit Without Saving

Abandon all changes and exit Setup.

Upgrading the BIOS

The system BIOS resides on a flash component. You can upgrade a flash BIOS through software, without taking the system apart or replacing the flash component. This appendix tells how to upgrade your system BIOS from a diskette particular for your motherboard. Your service representative can provide you with the latest BIOS upgrade for your system.

⚠ WARNING

Upgrading with a BIOS other than the one provided by Seanix will automatically void the product warranty. Upgrading with the incorrect BIOS might cause permanent unrecoverable damage to the motherboard.

Flashing the BIOS

1. Insert the BIOS diskette into your floppy drive. At A:\, type

   "awdflash <*BIOS filename*>" and hit <enter>

2. A Flash EPROM Programming Utility screen pops up. Press "Y" to continue.

⚠ WARNING

System must NOT be turned off during the programming operation. The system will re-boot if programming is successfully completed.

3. Please wait for the programming operation to complete. Once completed, take the BIOS diskette out from the floppy drive and press any key to restart the computer.
4. Once the system has re-booted, go into the CMOS Setup main. Select "Load Setup Defaults". You can change this CMOS setting at a later time if you want to customize your settings.
5. Save and exit the BIOS Setup Program.

4.Error and Information Messages

During the power-on self test (POST), the BIOS either sounds a beep code or displays a message when it detects a correctable error.

Following is a list of POST messages for the ISA BIOS kernel. Specific chipset ports and BIOS extensions may include additional messages. An error message may be followed by a prompt to press F1 to continue or press DEL to enter Setup.

Beep

Currently the only beep code indicates that a video error has occurred and the BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps. Any other beeps are probably a RAM problem.

BIOS ROM checksum error - System halted

The checksum of the BIOS code in the BIOS chip is incorrect, indicating the BIOS code may have become corrupt. Contact your system dealer to replace the BIOS.

CMOS battery failed

CMOS battery is no longer functional. Contact your system dealer for a replacement battery.

CMOS checksum error - Defaults loaded

Checksum of CMOS is incorrect, so the system loads the default equipment configuration. A checksum error may indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

CPU at nnnn

Displays the running speed of the CPU.

Display switch is set incorrectly.

The display switch on the motherboard can be set to either monochrome or color. This message indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, and then either turn off the system and change the jumper, or enter Setup and change the VIDEO selection.

Press ESC to skip memory test

The user may press Esc to skip the full memory test.

Floppy disk(s) fail

Cannot find or initialize the floppy drive controller or the drive. Make sure the controller is installed correctly. If no floppy drives are installed, be sure the Diskette Drive selection in Setup is set to NONE or AUTO.

Hard Disk initializing, Please wait a moment...

Some hard drives require extra time to initialize.

Hard Disk Install Failure

Cannot find or initialize the hard drive controller or the drive. Make sure the controller is installed correctly. If no hard drives are installed, be sure the Hard Drive selection in Setup is set to NONE.

Hard disk(s) diagnosis fail

The system may run specific disk diagnostic routines. This message appears if one or more hard disks return an error when the diagnostics run.

Keyboard error or no keyboard present

Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are pressed during POST. To purposely configure the system without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. The BIOS then ignores the missing keyboard during POST.

Keyboard is locked out - Unlock the key

This message usually indicates that one or more keys have been pressed during the keyboard tests. Be sure no objects are resting on the keyboard.

Memory Test:

This message displays during a full memory test, counting doom the memory areas being tested.

Memory test fail

If POST detects an error during memory testing, additional information appears giving specifics about the type and location of the memory error.

Override enabled - Defaults loaded

If the system cannot boot using the current CMOS configuration, the BIOS can override the current configuration with a set of BIOS defaults designed for the most stable, minimal-performance system operations.

Press TAB to show POST screen

System OEMs may replace the Phoenix Technologies Award BIOS POST display with their own proprietary display. Including this message in the OEM display permits the operator to switch between the OEM display and the default POST display.

Primary master hard disk fail

POST detects an error in the primary master IDE hard drive.

Primary slave hard disk fail

POST detects an error in the secondary master IDE hard drive.

Resuming from disk, Press TAB to show POST screen

Phoenix Technologies offers a save-to-disk feature for notebook computers. This message may appear when the operator re-starts the system after a save-to-disk shut-down. See the Press TAB ... message above for a description of this feature.

Secondary master hard disk fail

POST detects an error in the primary slave IDE hard drive.

Secondary slave hard disk fail

POST detects an error in the secondary slave IDE hard drive.

5.Glossary

ADDRESS:

A specific location in the memory of the computer where information about programs, data and software drivers is stored. Peripheral devices such as mouse, modems, etc. require a specific I/0 port address and interrupt in order to function properly.

BIOS: (BASIC INPUT OUTPUT SYSTEM)

That part of a ROM that is the interface between the system hardware and the operating system. The ROM BIOS is a group of low level programs responsible for interfacing the computer to peripheral devices, such as disk drives, serial and parallel ports, keyboard, and video display. Low-level BIOS routines are common to all operating systems and are generally resident in ROM. High-level BIOS routines are specific to the particular operating system in use and are therefore generally stored on disk, and loaded only when the operating system is booted.

BIT:

A binary digit that is the most reducible element of computer information. Eight bits make one byte.

BOOT or BOOTSTRAP:

A small ROM-based program which is automatically loaded when the system is first powered up (or "booted), in order to load and execute an operating system or other large program from disk. Also, the process of starting the computer, either by turning on the power, pressing the Reset switch or by pressing the CTRL + ALT + DEL keys simultaneously. The latter is known as a "warm boot".

BYTE:

Smallest unit of storage required to hold a character of information in memory or on a disk.

BUS CLOCK:

The speed at which data is transferred between the microprocessor and the I/O channel.

CMOS:

Acronym for Complementary Metal Oxide Semiconductor. CMOS integrated circuitry uses very little electrical power. Hence CMOS RAM is ideal for storing system configuration information that cannot be stored permanently in ROM.

COM PORT:

Communication port where devices such as a mouse or an external modem are attached.

CONFIG.SYS:

A file usually located in the root directory of the boot disk that contains information required to load installable device drivers and other system configuration parameters.

CONVENTIONAL MEMORY:

System main memory from 0 to 640KB. Many programs run in this area.

COPROCESSOR:

An auxiliary processor that reduces microprocessor overhead and increases system speed by executing certain math related functions. In Pentium systems the math coprocessor is built into the microprocessor.

CPU: (CENTRAL PROCESSING UNIT)

Also called the microprocessor. The “brain" of the computer, where program instructions and arithmetic operations are executed.

CPU CLOCK:

The speed at which the microprocessor executes its instructions.

DOS: (DISK OPERATING SYSTEM)

Software that controls the activities performed by the computer. DOS sets up an environment under which application software can load and function. It is an interface between the system and application software.

DRAM: (DYNAMIC RANDOM ACCESS MEMORY)

A type of RAM that requires a refresh cycle to keep information valid. Main system memory uses DRAM.

EXPANSION SLOT:

A connector on the system board into which an adapter card can be inserted.

EXTENDED MEMORY:

Memory beyond the 1 MBYTES limit that is accessed by programs such as Windows.

HERTZ:

A unit of frequency which is equivalent to one cycle per second.

INTERFACE:

The connection between the system board and a peripheral.

INTERLEAVING:

A technique for improving system performance by speeding up memory access. Successive memory locations are assigned to different memory banks. Then, when the system requires the information, it accesses both banks simultaneously rather than having to access a single bank sequentially.

INTERRUPT:

Special operation used by hardware peripheral devices to allow them to communicate with the Central Processing Unit. Each peripheral device is allocated a unique interrupt number which the CPU recognizes when talking to the device.

ISA:

Industry Standard Architecture.

JUMPER:

A patch cable, wire or other such device used to establish a circuit.

MEMORY:

RAM and ROM are devices used to hold information and programs while they are being accessed by the system.

MICROPROCESSOR:

Also known as the CPU. The "brain" of the system, which contains the circuitry used for calculation and communication with the rest of the system.

PAGE MODE:

Special function in DRAM that saves cycle time by not re-loading the “Row Address strobe bits”.

PARALLEL PORT:

Also called "printer port", or LPT 1:, the parallel port is used to attach a printer or other peripheral using a Centronics† parallel cable.

PARITY BIT:

An additional non-informational bit appended to a group of 8 bits to make the number of ones in the group of bits either even or odd. This is an elementary error correction mechanism. Example: During a subsequent read from a memory location, and using odd parity, the system will check the sum of ones. If the sum of ones is NOT still odd then the system knows that the information at that location has been corrupted.

SERIAL PORT:

Communication port used by the computer to communicate with the outside world. An IBM PC compatible normally recognizes four standard serial ports: COM1, COM2, COM3 and COM4 which are used to attach a mouse, modems, serial printers, plotters and other serial devices

SHADOW RAM:

Refers to the technique of copying BIOS routines from slower ROM chips to faster RAM, thereby increasing system performance

6. Specifications

This motherboard complies with the following specifications:

Specification	Description	Revision Level
A.G.P.	Accelerated Graphics Port Interface Specification	Revision 1.0, July, 1996, Intel Corporation. The specification is available through the Accelerated Graphics Implementers Forum at http://www.agpforum.org/.
APM	Advanced Power Management BIOS interface specification.	Revision 1.2, February, 1996. Intel Corporation, Microsoft Corporation.
ACPI	Advanced Configuration and Power Interface specification.	Revision 1.0, December 22, 1996, Intel Corporation, Microsoft Corporation, and Toshiba Corporation.
ATA-3	Information Technology –AT Attachment-3 Interface.	X3T10/2008D Revision 6 ATA Anonymous FTP site: fission.dt.wdc.com
ATAPI	ATA Packet Interface for CD-ROMs.	SFF-8020I Revision 2.5 (SFF) Fax Access: (408) 741-1600
ATX	ATX Form Factor Specification	Revision 2.01, February 1997, Intel Corporation. The specification is available at: http://www.intel.com/
DMI	Desktop Management Interface BIOS specification.	Version 2.0, October 16, 1995, American Megatrends Inc., Award Software International Inc., Dell Computer Corporation, Intel Corporation, Phoenix Technologies Ltd., SystemSoft Corporation.
El Torito	Bootable CD-ROM format specification.	Version 1.0, January 25, 1995, Phoenix Technologies Ltd., IBM Corporation. The El Torito specification is available on the Phoenix web site at http://www.ptltd.com/techs/specs.html
EPP	Enhanced Parallel Port	IEEE 1284 standard, Mode [1 or 2], v1.
IrDA	Serial Infrared Physical Layer Link specification.	Version 1.1, October 17, 1995 Infrared Data Association.
PCI	PCI Local Bus specification.	Revision 2.1, June 1, 1995, PCI Special Interest Group.
Plug and Play	Plug and Play BIOS specification.	Version 1.0a, May 5, 1994, Compaq Computer Corporation, Phoenix Technologies Ltd., Intel Corporation.
SDRAM DIMMs (64 and 72 bit)	PC SDRAM Unbuffered DIMM specification.	Revision 0.9, October 22, 1997, Intel Corporation.
USB	Universal Serial Bus specification.	Revision 1.0, January 15, 1996, Compaq Computer Corporation, Digital Equipment Corporation, IBM PC Company, Intel Corporation, Microsoft Corporation, NEC, Northern Telecom.

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