

MAINBOARD
User's Manual

REV: 1.01

* All other product names are trademarks or copyrights of their respective owners.

FCC & DOC Compliance Statement

This device complies with Part 15 of the FCC rules, operation is subject to the following two conditions.

1. This device may not cause harmful interference and,
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in residential installations. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interface to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Move the equipment away from the receiver.
- Plug the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for additional suggestions.

The FCC requires the user to be notified that any change or modifications to the equipment by the user not expressly approved by the grantee or manufacturer could void the user's authority to operate such equipment. The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations.



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INTRODUCTION

Product Description

This mainboard represents the highest level of technology available in PC Mainboards today. Designed as a flexible, high-performance and cost-effective solution for System Integrators and End Users alike, this mainboard provides the power and expandability to meet the requirements of the most advanced operating systems and software applications.

This mainboard features “**SLOT 1**” architecture, a modular design that supports Intel® Pentium® II processors (running at 233MHz ~ 333MHz with a 66MHz system bus and 350MHz ~ 450MHz on a 100MHz system bus) as well as Celeron® processors. Leading edge **AGP 2X** graphic capability is provided for the full range of graphic intensive games and programs. The **ATX** form factor design allows for more efficient system assembly with built-in mouse, serial and parallel port connectors. This eliminates the need for separate ribbon cable/connector brackets and speeds the manufacturing process.

This mainboard is designed to provide greater overall system throughput by utilizing the latest in I/O technology. By incorporating such advanced features as **Bus Mastering IDE** and **Universal Serial Bus (USB)** onto the mainboard, optimum system performance is assured and system design and implementation is simplified.

Fully “**Plug & Play**” compatible via an Award BIOS, this mainboard facilitates easy system configuration and peripheral setup. Advanced BIOS features include **Intelligent Hardware Monitoring and Alert functions**. The Award BIOS also supports **ACPI** readiness and is compatible with **PC97** specification. With support for up to 384 MB of System RAM (Type auto-detected by mainboard BIOS), 3.3V 66MHz and **PC100 SDRAM** in mixed combination. This mainboard is the ideal foundation for high-end computer systems.

INTRODUCTION

Item Checklist

Your mainboard package should include the items listed below. Damaged or missing items should be reported to your vendor.

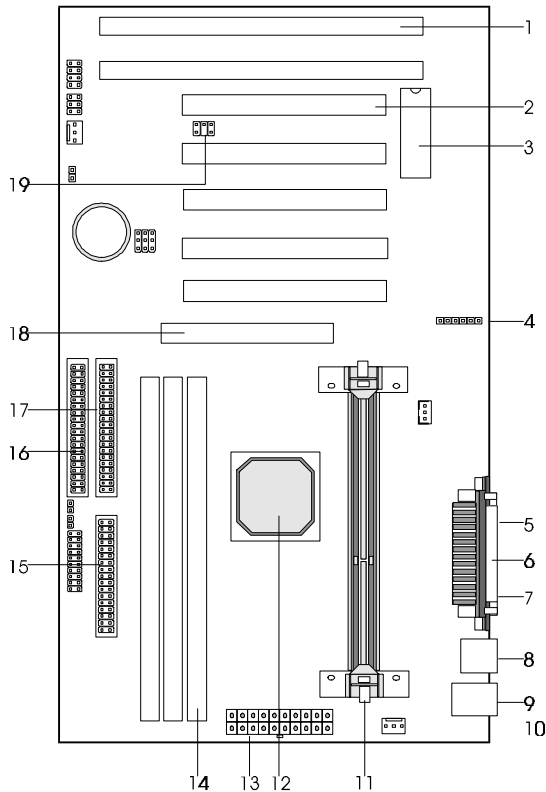
- The mainboard
- Floppy disk ribbon cable
- IDE ribbon cable
- Universal CPU Retention Kit:
 - Retention Mechanism × 2
- This User's Manual
- CD-ROM containing
 - VIA PCI Bridge driver,
 - VIA VxD driver,
 - Bus Master IDE driver,
 - support software for updating the FLASH BIOS and IDE drivers
 - Trend ® PC-cillin Anti-Virus Software

Features & Specifications

Processor	SLOT 1 support Intel Pentium® II processor, 233~333 MHz (FSB 66MHz), 350~450 MHz (FSB 100MHz) and Celeron® processor	
Chipset	VIA® Apollo Pro AGPset	
BIOS	Award® PCI BIOS, support ACPI, DMI, Green PC, Plug-and-Play, Boot from CD-ROM, SCSI, LS-120, and ZIP devices Symbios® SCSI BIOS	
System Memory	3× 168-pin DIMM Sockets support up to 384MB SDRAM memory capacity Support 8/16/32/64/128 MB Memory Module ECC supported	
On-board I/O Features	1×Floppy Port (Up to 2.88MB) 1×Parallel Port (EPP, ECP Port) 2×Serial Ports (16550 Fast UART Compatible)	2×USB Ports 1×IrDA TX/RX Header 1×Wake-On-LAN Header
Advanced Features	Modem Ring-in Remote Power on Wake up on LAN Keyboard Power On Hardware Monitoring function Support X-store Bus Master IDE driver	
PCI Bus Master IDE	2×UltraDMA/33 IDE Ports support UltraDMA/33: 33MB/Sec.	
Expansion Slots	1× 32-bit AGP slot. 5× 32-bit PCI Bus Master slots, 2× 16-bit ISA slots	
ATX Double Decker	2×USB Ports 1×PS/2 Keyboard Port 1×PS/2 Mouse Port	1×Parallel Port 2×COM Ports
ATX Power Connector	3V, 5V and 12V 20-Pin ATX Power connector	
Switching VR	Switching Voltage Regulator to support 1.3V to 3.5V	
Form Factor	ATX Form factor 12" by 6.9" (305mm by 175mm)	
Onboard H/W Monitor Features	H/W Monitor of Fan Status, CPU Voltage, System Temperature S/W LanDesk® Client Manager (LDCM) - Optional	

INTRODUCTION

Board Level Feature



- | | |
|--------------------------------------|-----------------------------|
| 1. ISA slots | 11. SLOT 1 (CPU) |
| 2. PCI slots | 12. VIA® Apollo Pro chipset |
| 3. Mainboard BIOS | 13. Power connector |
| 4. Infrared (IR) connector | 14. DIMM sockets |
| 5. COM2 connector | 15. Floppy connector |
| 6. Printer port connector | 16. Primary IDE connector |
| 7. COM1 connector | 17. Secondary IDE connector |
| 8. USB connectors | 18. AGP slot |
| 9. PS/2 mouse connector (top) | 19. SB-Link |
| 10. PS/2 keyboard connector (bottom) | |

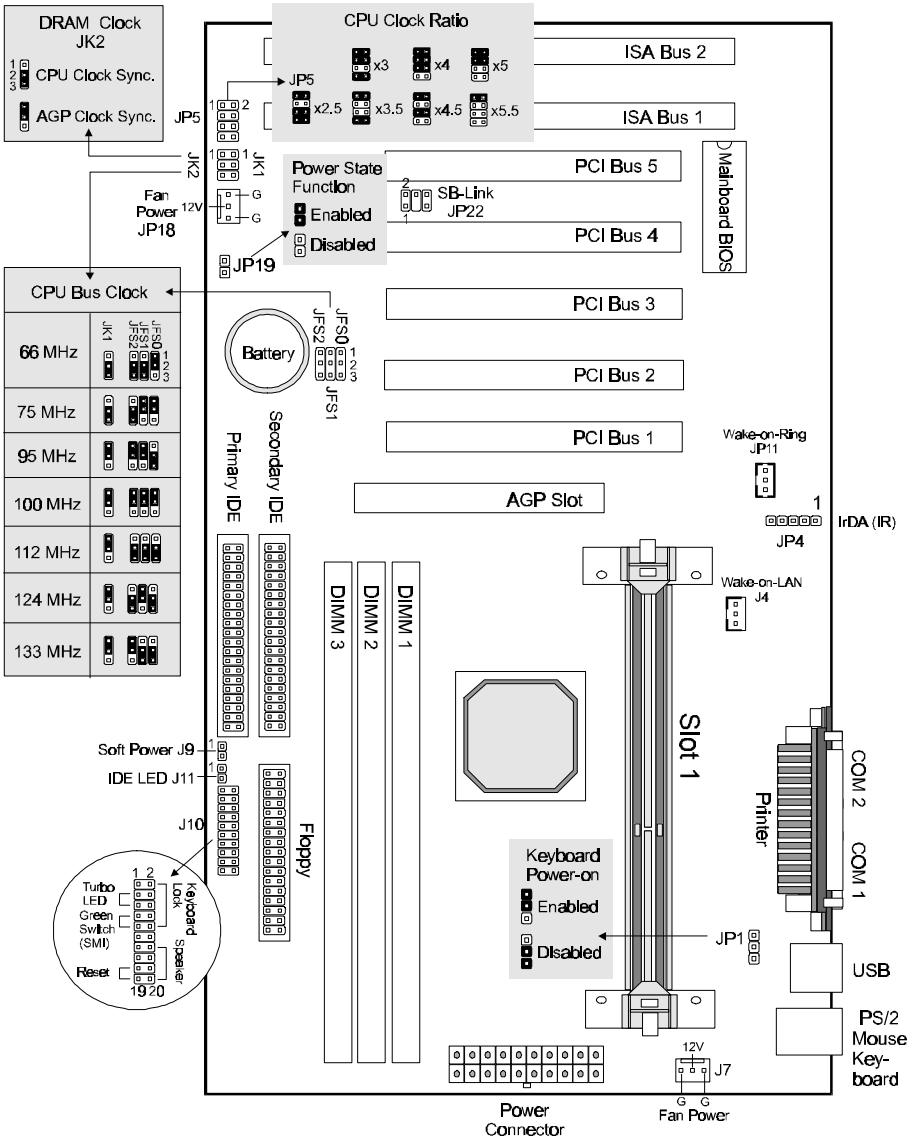
* Board Size: ATX 305 mm x 175 mm (12" x 6.9")

INTRODUCTION

1. **ISA Slots:** (2) 16-bit ISA slots.
2. **PCI Slots:** (5) 32-bit PCI slots are provided.
3. **Mainboard BIOS:** Award BIOS supporting “Plug and Play”, DMI, Green PC specification, on screen setup for Enhanced IDE and Multi-I/O. The BIOS is FLASH Upgradeable via the AWDFLASH Utility.
4. **Infrared (IR) Connector:** UART2 can also be used for the optional Infrared Module, enabling wireless communication capability. A supplied bracket with a single customized cable connects directly to the infrared pin-header on the mainboard.
5. **COM2 Connector:** High-speed UART compatible serial port. COM2 can be directed to the Infrared Module for wireless connection capability.
6. **Printer Port Connector:** EPP and ECP compatible 25-pin D-Sub parallel port.
7. **COM1 Connector:** High-speed UART compatible serial port.
8. **USB Connectors:** These connectors permit the connection of two USB peripheral devices directly to the port without an external hub. USB is a new technology supporting printers, fax modems and other telephony device.
9. **PS/2 Mouse Connector:** Supports PS/2 style mice.
10. **PS/2 Keyboard Connector:** Supports PS/2 style keyboards.
11. **SLOT 1:** Slot 1 CPU socket for Pentium® II and Celeron® CPUs.
12. **VIA® Apollo Pro Chipset:** Features PC100 SDRAM, UDMA and AGP 2x support.
13. **Power Connector:** 20-Pin ATX Power Connector.
14. **DIMM Sockets:** (3) 168-pin DIMM sockets are provided to support a maximum RAM memory capacity of 384 MB. DIMM types of 3.3 Volt true SDRAM is supported and automatically detected by the BIOS.
15. **Floppy Connector:** Built-in floppy controller supports (2) 5.25" or 3.5" (1.44MB or 2.88MB) floppy drives.
16. **Primary IDE Connector:** Connector for first IDE channel. The on-board PCI Bus Mastering IDE controller features support for DMA Mode 2 and PIO Modes 3 and 4 for faster data transfer rates. (2) Connectors are provided for support of up to (4) IDE devices on two channels. ATAPI Tape Drives and CD-ROMs are also supported.
17. **Secondary IDE Connector:** Connector for second IDE channel.
18. **AGP Slot:** AGP (Accelerated Graphics Port) is a new bus interface for high performance graphics capabilities, especially 3D.
19. **SB-Link:** Provides backward compatibility between PCI and ISA audio chips in order to use Creative Sound Blaster Card for earlier DOS games.

INTRODUCTION

Comprehensive Mainboard View



INSTALLATION

Static Precautions

Static electricity can be a serious danger to the electronic components on this mainboard. To avoid damage caused by electrostatic discharge, observe the following precautions:

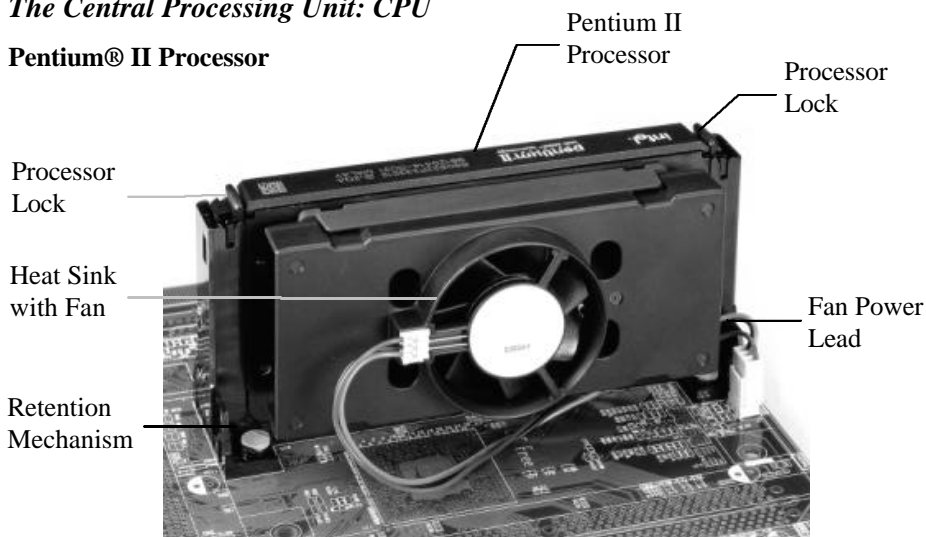
- ✓ Don't remove the mainboard from its anti-static packaging until you are ready to install it into a computer case. Also, handle add-in cards and modules by the edges or mounting bracket.
- ✓ Before you handle the mainboard in any way, touch a grounded, anti-static surface, such as an unpainted portion of the system chassis, for a few seconds to discharge any built-up static electricity.

Installing the CPU

Your mainboard features "SLOT 1" architecture, a modular design that can accommodate Intel® Pentium® II and Celeron® processors. Before installing the CPU, attach the retention mechanism first.

The Central Processing Unit: CPU

Pentium® II Processor

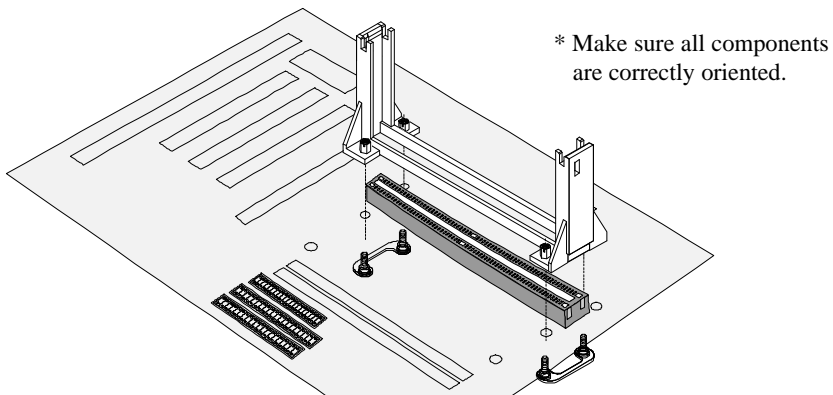


INSTALLATION

Attaching the Retention Mechanism

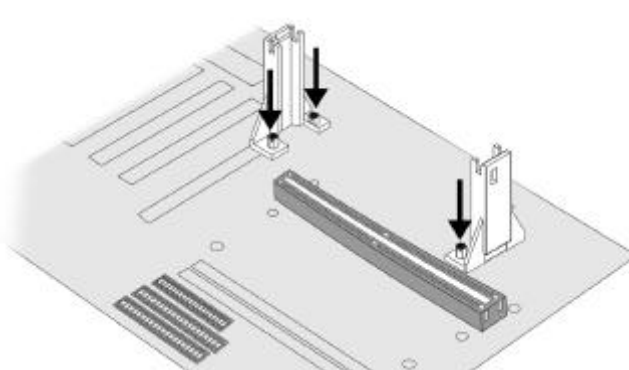
For Pentium II CPUs:

1. Locate SLOT 1.
2. Insert the Attach Mounts from the underside of the mainboard.
3. Attach the Retention Mechanism as illustrated below.
4. Fasten the screws.



For Celeron CPUs:

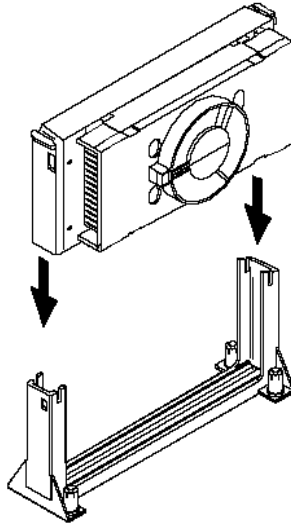
1. Locate SLOT 1.
2. Push the Retention Mechanisms until they are firmly locked into place.



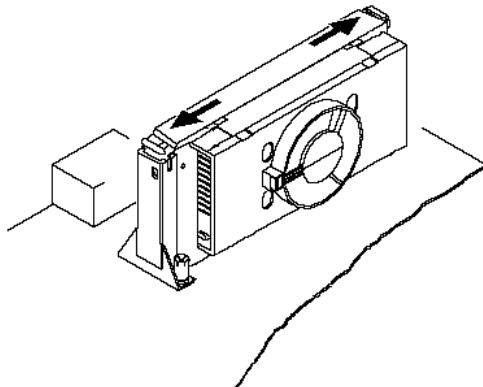
Installing Pentium® II or Celeron® CPU

✓ **Warning:** It is required to use a CPU Cooling Fan to prevent the CPU from overheating. Install the fan first before inserting the CPU into the socket.

1. Slide the CPU down into the retention mechanism. Make sure the CPU is correctly oriented.



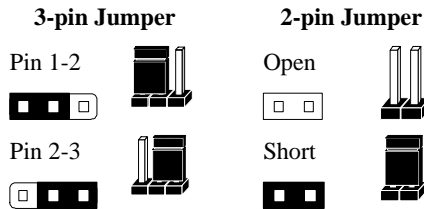
2. Seat the CPU firmly into the slot until the two tabs on the CPU click outwards to lock the CPU in place.



INSTALLATION

Setting the Jumpers

Jumpers are used on this mainboard to select various settings and features. A 2-pin jumper has two settings: Open and Short (or Closed). The jumper is closed by placing the Jumper Cap across the two pins, thereby connecting them. 3-pin jumpers can be set to pins 1-2 or 2-3 connected. Pin-1 is labeled on the circuit board.



Setting the CPU Clock Selection Jumper (JFS0-2, JK1, JP5)

After installing the CPU, you must set the clock selection jumper to match the frequency of the CPU. Find the Jumper Blocks labeled JFS0-2, JK1 and JP5 on the mainboard. Set the jumper according to the table below and the figure next page for the CPU frequency you are using.

CPU Clock	Ratio	Bus Clock
233MHz	x3.5	66MHz
266MHz	x4.0	66MHz
300MHz	x4.5	66MHz
333MHz	x5.0	66MHz
366MHz	x5.5	66MHz
350MHz	x3.5	100MHz
400MHz	x4.0	100MHz
450MHz	x4.5	100MHz
500MHz	x5.0	100MHz
550MHz	x5.5	100MHz

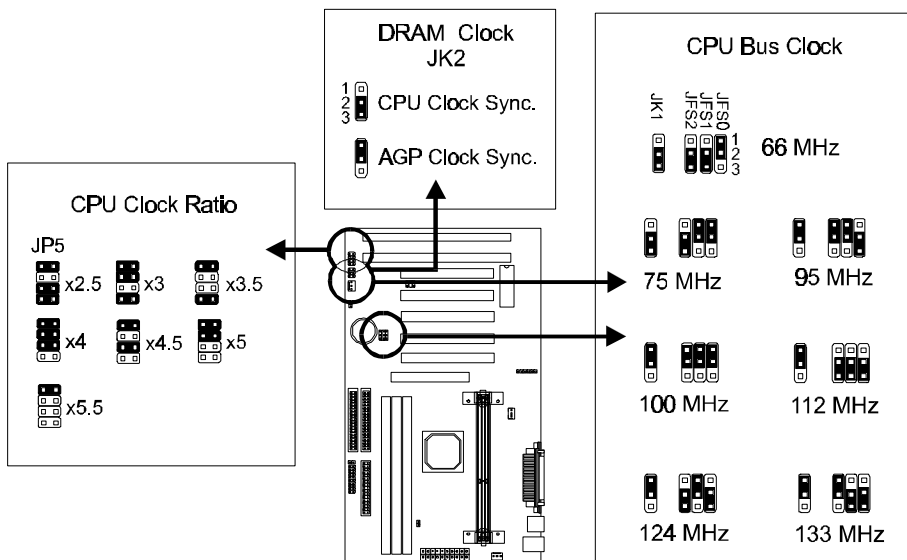
If you are uncertain about the speed requirements of your particular CPU, you should obtain Technical Documentation from the manufacturer. Such information is available via the Intel WWW site.

- The CPU Clock corresponds to the number marked on the CPU. The Bus Clock when multiplied with the Ratio gives the CPU Clock.
- These jumpers automatically set the ISA Clock as well.
- *VIA Apollo Pro chipset supports only 66/100 MHz bus clock. The bus clock can be extended for internal test. Over-clocking may cause serious system damage.*

Setting the DRAM Clock Selection Jumpers (JK2)

If you are using a CPU of 100MHz system bus with PC100 (100MHz clocked) SDRAM, leave JK2 setting as CPU Clock synchronous. However, if you are using non-PC100 SDRAM with 100MHz CPU, you should set JK2 to AGP clock synchronous to ensure stability. Please refer to the figure below.

JK2 setting is not necessary for 66MHz clocked CPU.



INSTALLATION

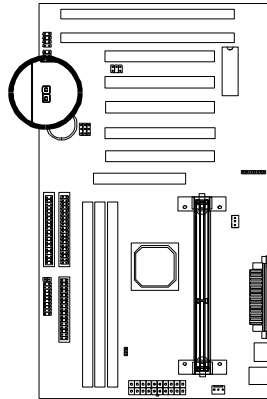
Power State Function (JP19)

This feature will power on the PC when power returns after a power failure.

In addition to the jumper setting, the “**Power ON after Power-Fail**” option in the **Chipset Feature Setup** must be properly set also.

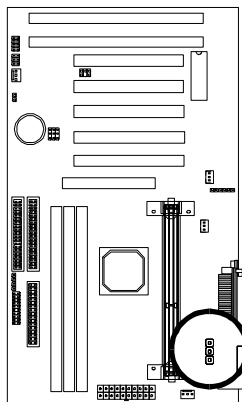
Power State Function JP19

- Enabled
- Disabled



Keyboard Power-on Jumper (JP1)

The Keyboard Power-on function will allow the user to power on the system by simply pressing any key on the keyboard.



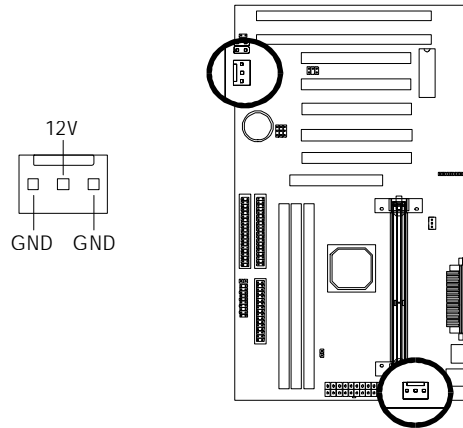
Keyboard Power-on JP1

- 1 Enabled
- Disabled

Connections

Cooling Fan (J7 and JP18)

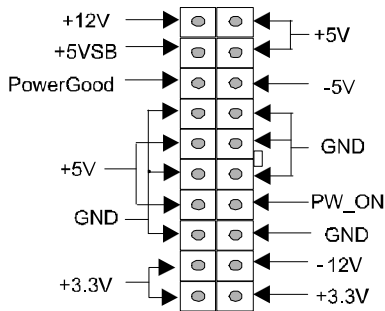
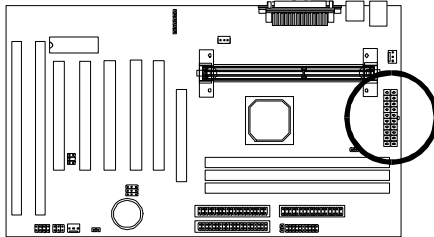
J7 and JP18 are small 3-pin Header Connectors that provide 12-Volt power for CPU and chassis cooling fans. Plug in the fan cable to the connector. Pin-2 corresponds to the RED power lead as shown:



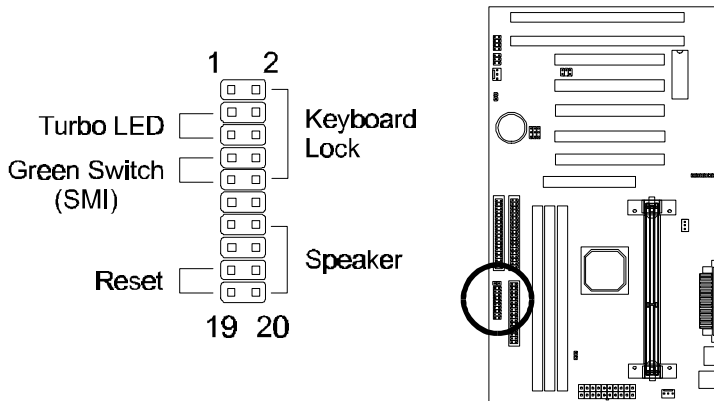
INSTALLATION

Power Supply Connector

This mainboard features an ATX-style Power Supply Connector. This connector is keyed to prevent connection in the wrong direction. Line up the locking mechanism on the connector from the Power Supply with the tab on the mainboard connector. Press down until the two connectors are locked.



System Function Connector Block (J10)



Pins [3 & 5] Turbo LED switch - The Turbo function is not supported by this mainboard. Therefore, the Turbo LED will always remain lit as long as the system power is on.

Pins [7 & 9] SMI suspend switch lead - If your system's case has a suspend switch, hook the lead from the switch to pins 7 & 9. A suspend switch is used to save electricity by putting the system into a suspend mode when the computer is not being used. This switch could also be used by the Turbo switch on the front of the system, since this mainboard does not support that function. For this switch to be functional, it must first be enabled in the Power Management Setup in the BIOS Setup utility.

Pins [17 & 19] Reset switch lead - Connects to the Reset Switch lead from the system's case. The reset switch is used to "cold-boot" the system without actually turning off the power, reducing wear and tear on the power supply.

Pins [2, 6, 8 & 10] Keyboard lock switch lead - Pins 2 & 6 connect to the power LED from the system's case. Pins 8 & 10 connect to the case-mounted keylock switch.

Pins [14 & 20] Speaker connector - Connects to the Speaker lead from the system's case.

INSTALLATION

IDE Activity LED (J11)

Hook the IDE LED lead to this connector, with the RED lead corresponding to Pin-1.

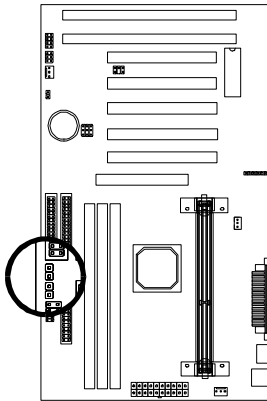
Soft Power Switch (J9)

Connects to the Power Switch featured on ATX case designs. This switch must be hooked up before the system can be powered on, unlike traditional “Baby-AT” designs where the power switch is located on the Power Supply itself.

Note: Under the following two conditions, you have to press and hold the switch for longer than 4 seconds to power off your system, regardless of the BIOS setting (Refer to page 42).

- Shortly after the system is powered on, when the BIOS message is not yet appear.
- When CPU hangs.

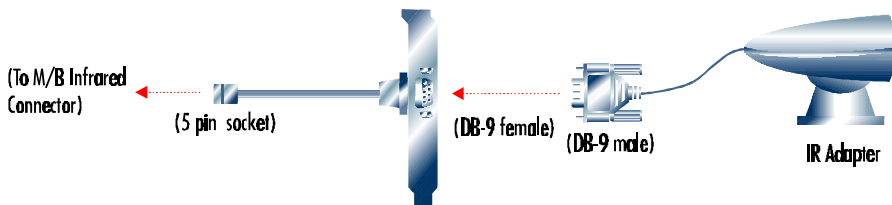
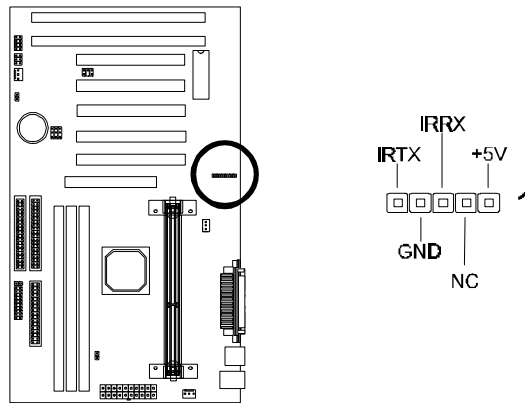
Soft Power J9 1 □ □
IDE LED J11 1 □ □



IrDA-Compliant Infrared Module Connector (JP4)

The IrDA connector bracket hooks directly to this connector on the mainboard. This connector provides support for the optional wireless transmitting and receiving infrared module. You must first configure through the BIOS setup where UART2 is directed, COM2 or IrDA.

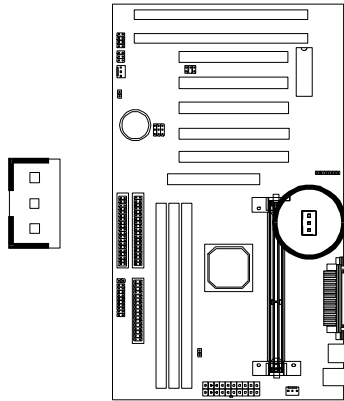
* Pin 6 is reserved for consumer IR.



INSTALLATION

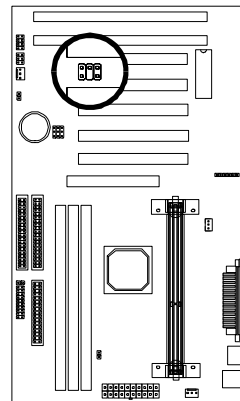
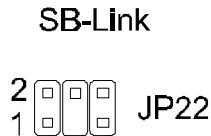
Wake-up On LAN Connector (J4)

The Wake-up On LAN function will allow the network to wake up a Soft Power Down (Soft-Off) PC. However, if your system is in the Suspend mode, you can wake-up the system only through an IRQ or DMA interrupt. To use the Wake-up On LAN function, you must enable the “Power On By Ring/LAN” field in the Power Management Setup of the Award BIOS. Connect the cable that comes with your LAN card to location J12 on the system board. Refer to the add-in card’s manual for details. Note: Your LAN card must support Magic Packet in order to use the Wake-up On LAN function.



SB-Link (JP22)

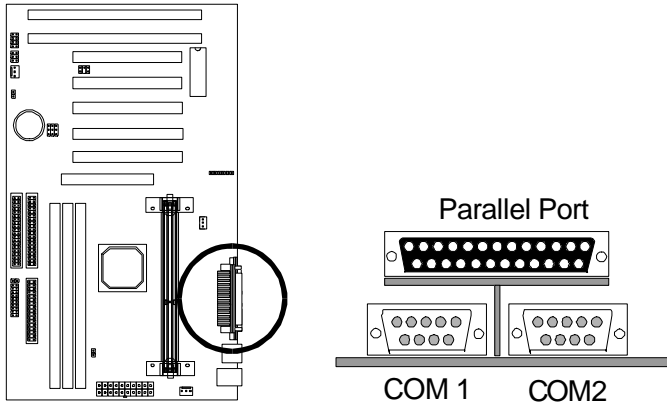
Connect SB-Link cable on the Creative Sound Blaster Card to this connector. This PC to PCI bridge provides backward compatibility between PCI and ISA audio chips for earlier DOS games.



Serial and Parallel Ports

A 25-pin D-Sub header is provided on the back panel for a multi-mode bi-directional parallel port.

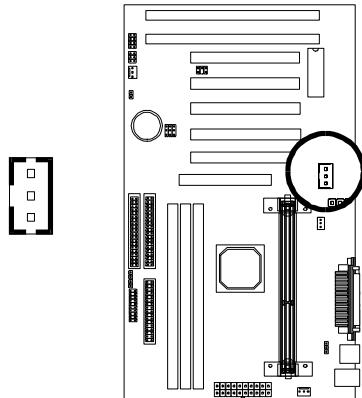
Two 9-pin D-Sub headers are also provided on the back panel for Serial ports.



Wake-on-Ring Function

The Wake-on-Ring function allows the modem to remotely power on the system. Install an external modem (normally to COM2) and enable **Power On by Ring/LAN** function from BIOS setup. (Please refer to page 42).

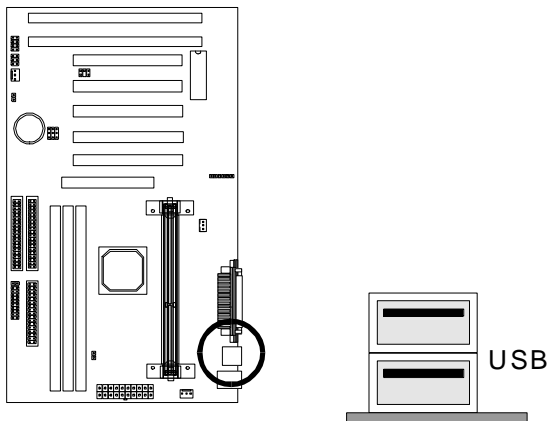
For the function to work for an *internal modem card*, you must also connect the Wake-on-Ring cable on the modem card to the *Wake-on-Ring function connector (JP11)* on the mainboard.



INSTALLATION

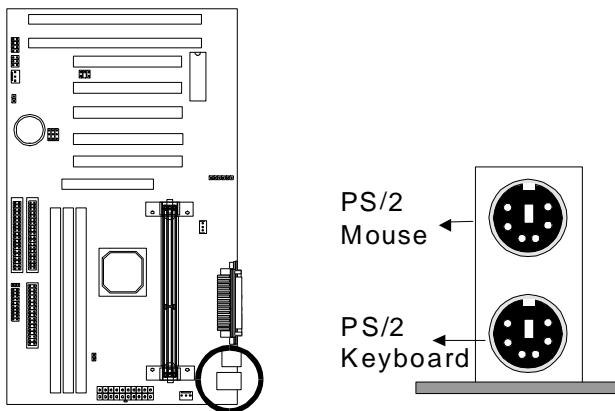
USB Connector

This 8-pin connector permits connection of two USB peripheral devices directly to the system without an external hub.



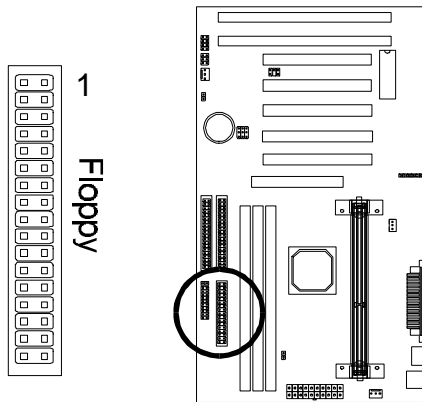
PS/2 Keyboard and Mouse Connectors

These two connectors are located on the back panel of the mainboard.



Floppy drives

The on-board floppy controller supports (2) floppy disk drives with the floppy ribbon cable provided. Make sure the RED stripe on the ribbon cable is oriented towards Pin-1. Notice the “twist” between the sets of connectors on the floppy cable. The floppy drive “A” position is at the END of the cable, whereas floppy drive “B” is hooked to one of the connectors on the other side of the twist. The cable provides both “Edge” and “Pin” connectors for both the A and B positions to match the connector on your floppy drives.



INSTALLATION

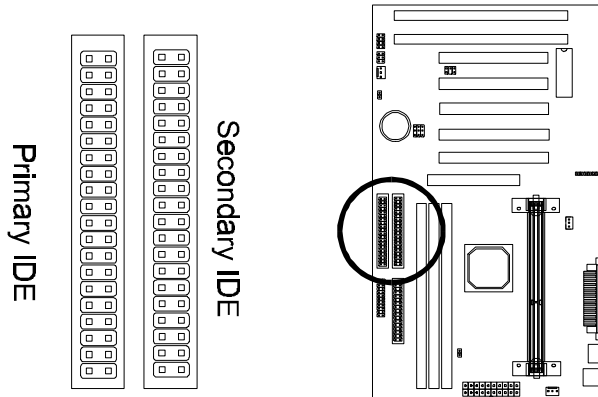
IDE Hard Drives and CD-ROMs

The on-board Enhanced IDE controller can support up to (4) IDE hard drives or other ATAPI devices, such as CD-ROMs. This controller, as with all Enhanced IDE controllers, consists of both Primary and Secondary ports. Each port has an associated connector and cable which can support up to (2) ATAPI devices each.

All IDE devices have jumpers which allow the user to configure the device as either “Master” or “Slave”. A Master device is one that is ALONE on the IDE cable, whereas a Slave device is installed as a SECOND device on the same cable. Keep in mind that the Master device will appear before the Slave device in the CMOS Setup, as well as the Operating System software. *Refer to the device documentation for jumper settings.

The Secondary IDE port can be used for up to (2) additional ATAPI devices. Normally it’s recommended that you connect your first hard drive to the Primary port, and the first CD-ROM to the Secondary.

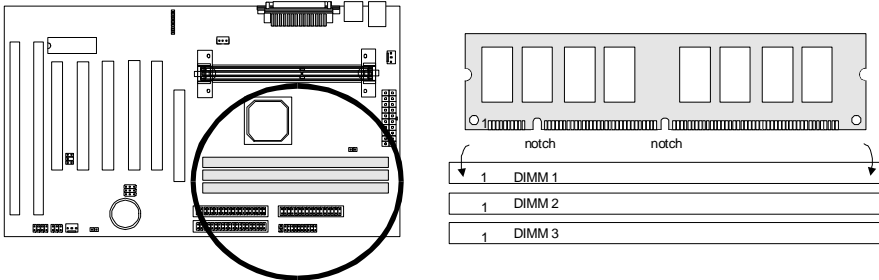
Make sure to align the RED stripe on the ribbon cable with Pin-1 on the mainboard IDE connector. On most hard drives and CD-ROMs, the RED stripe should be oriented towards the power connector of the device.



Installing the Memory (DIMM)

- This mainboard has three sockets available for **168-pin DIMMs**. They must be 3.3 volt Unbuffered Synchronous DRAMs (SDRAM).
 - *If you are using a 100MHz CPU with 66MHz SDRAMs, you should set the DRAM clock to AGP synchronous (please refer to the jumper setting on page 15).*
 - *To ensure reliability, it is recommended to use **PC100 SDRAM** for your 100MHz clocked SDRAM performance requirement.*
- DIMM Sizes supported: **8MB, 16MB, 32MB, 64MB, and 128MB**
- A total of **(3)** DIMMs can be installed for a maximum RAM capacity of **384MB**.

To insert the DIMMs, the modules must be oriented in the correct way. Notice the notches of the DIMM. Align these notches as shown in the diagram below. Gently push the DIMM until the retainers on both sides of the socket lock the module in place. To remove a DIMM, push the retainers outwards to release the module then pull the module out of the socket.

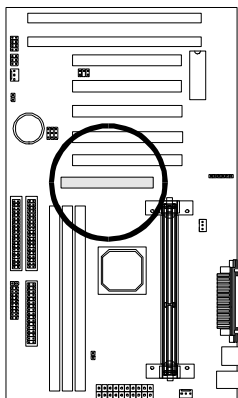


INSTALLATION

Installing an AGP Card

This mainboard provides an AGP slot to support a new generation of graphics cards with high performance graphics capability.

Note: Make sure that the AGP card is firmly seated in the AGP slot. For the card that complies with the *AGP 1.x specifications*, a slightly more force may be required to fully insert the card into the slot. For cards that comply with *AGP 2.0* and later specifications, the installation should be relatively easy.



MAINBOARD BIOS SETUP

About the BIOS

The Mainboard BIOS (Basic Input/Output System) acts as the bridge between your Hardware (CPU, Disk Drives, Video, etc.) and Operating System Software (Windows 95, OS/2 and so on...) The BIOS Setup (also called CMOS Setup) is where many hardware configuration options are set and stored. This configuration information will remain in the BIOS until it is changed, or cleared by removing the battery for a while then reinstalling it back.

CMOS (Complementary Metal Oxide Semiconductor) refers to the chip in which the BIOS information is stored.

This mainboard features Award BIOS, which provides an easy to use Setup program to aid in hardware configuration. In this section we will look at the various menus and options contained in the Award BIOS Setup Program. This mainboard also features a "Flash" BIOS. A Flash BIOS can be upgraded via software, thereby eliminating the need to actually replace the "BIOS Chip" on the mainboard. Procedures for updating the BIOS follow this section.

The Award BIOS installed in your computer system's ROM (Read Only Memory) is a custom version of an industry standard BIOS. This means that it supports Intel processor in a standard IBM-AT compatible input/output system.

Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit.

Getting Help

Pressing F1 will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc>.

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A Final Note about Setup

Not all systems have the same Setup. While the basic look and function of the Setup program remains the same for all systems, individual motherboard and chipset combinations require custom configurations. For example, you may find that your Setup main menu has a different number of entries from the main menu displayed in this manual. These are simply features not supported (or not user configurable) on your system.

The final appearance of the Setup program also depends on the Original Equipment Manufacturer (OEM) who built your system. If your OEM has decided that certain items should only be available to their technicians, those items may very well be removed from the Setup program.

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Main Menu

Shortly after the system is powered on, provided a CPU and sufficient RAM are installed, you will see the message:

Press DEL to enter SETUP

- Press the **DEL** key to enter the Award BIOS Setup program.

Once you enter the Award BIOS CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

ROM PCI/ISA BIOS (xxxxxxxx)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP / PCI CONFIGURATION	SAVE & EXIT SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
Esc : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color

Note that a brief description of each highlighted selection appears at the bottom of the screen.

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Standard CMOS Setup

This first menu is where the most basic hardware options are set. Information regarding the system clock, IDE hard disks and floppy drives is stored and configured in this section. To enter the Standard CMOS Setup, press the [ENTER] key with this menu highlighted.

Upon entering the Standard CMOS Setup screen, you will see a screen like that below:

Date (mm:dd:yy) : Fri, Dec 18 1998								
Time (hh:mm:ss) : 00:00:00								
<u>HARD DISKS</u>	<u>TYPE</u>	<u>SIZE</u>	<u>CYLS</u>	<u>HEAD</u>	<u>PRECOMP</u>	<u>LANDZ</u>	<u>SECTOR</u>	<u>MODE</u>
Primary Master	: Auto	0	0	0	0	0	0	Auto
Primary Slave	: Auto	0	0	0	0	0	0	Auto
Secondary Master	: Auto	0	0	0	0	0	0	Auto
Secondary Slave	: Auto	0	0	0	0	0	0	Auto
Drive A : 1.44M , 3.5in.								
Drive B : None								
Floppy 3 Mode Support: Disabled								
Video : EGA / VGA								
Halt On : All Errors								
					Base Memory : 640K			
					Extended Memory : 15360K			
					Other Memory : 384K			
					Total Memory : 16384K			
ESC : Quit			↑ ↓ → ← : Select Item			PU / PD / + / - : Modify		
F1 : Help			(Shift) F2 : Change Color					

First, let's set the system **Date**. Use the arrow keys to move to and highlight the "Date" option. Select the Month by using the PgDn and PgUp keys. This is how most settings will be configured. Then, move to the day, year and time via the arrow keys to finish setting the system date and time.

Keep in mind that the system time is set in 24-hour time. With this method, 1PM is represented as 13:00, 2PM as 14:00 and so on, with 00:00 corresponding to Midnight.

Pri Master, Pri Slave, Sec Master, Sec Slave - These four options relate to the (4) IDE hard drives, CD-ROMs or other ATAPI devices that can be controlled via the on-board IDE controller (review IDE Hard Drives and CD-ROMs on page 26). The "Pri Master" setting specifies the first device on the primary IDE channel, "Pri

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Slave” - the second. Sec Master and Sec Slave specify the devices on the secondary channel.

The first option available is the most important: **Type**. This is where you will specify the type of device and how it is represented in the BIOS Setup. If the device is a hard disk or CD-ROM, generally the Auto option is the best choice for fast and easy setup of the hard disk parameters. Let’s take a look at the difference between the Auto, User and Types (1-45) options:

- **Auto** - This option instructs the BIOS to automatically configure the hard disk by reading the parameters (cylinders, sectors, etc.) directly from the hard disk’s firmware. Use this option if you are configuring a new hard drive, or one that has already been formatted using the *Auto* option. Keep in mind that a hard drive is configured using a certain set of parameters, those same parameters must be used for the life of the drive, unless the drive is re-FDISKed using a different parameter set. (This procedure deletes the old partition(s) on the drive and creates a new one, using the new parameters).

- **User** - This option allows you to manually enter in the parameters of the hard drive. Generally, this option would be used only if the hard drive has already been formatted with a certain set of parameters, and assured consistency between the old and new parameters is desired.

TYPE	drive type
CYLS.	number of cylinders
HEADS	number of heads
PRECOMP	write precomp
LANDZONE	landing zone
SECTORS	number of sectors
MODE	mode type

- **Types 1-45** - Similar to the *User* option, these types should only be used if the exact parameters for the hard drive are already entered as a specific type stored in the Setup Program. Again, this would only be needed to assure that the parameters the drive was formatted with and those it is using now, are identical. For new hard drives, the *Auto* option is the preferred choice.

Mode - One of Enhanced IDE’s most important features is LBA (Logical Block Addressing) Mode. This feature allows the use of larger hard drives by providing a way to bypass the cylinder limitations imposed by many Operating Systems. LBA Mode is used to extend a hard drive’s useable capacity by “remapping” the cylinders in a way that is acceptable to these operating systems. For instance, a hard drive with the parameters of 2100 Cylinders, 16 Heads and 63 Sectors would be represented by LBA Mode as 525 Cylinders, 64 Heads and 63 Sectors. (Notice

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that the Cylinders have been divided, and the Heads have been multiplied, by a factor of 4)

On hard drives smaller in capacity than 528MB, LBA support is not needed. The option on these devices is ignored, even if enabled. For hard drives greater than 528MB, LBA mode should be enabled. The following rules apply:

- Operating Systems that do not use the FAT file system do not need LBA Mode, and can use the Normal or Large Modes. Examples would be Netware and Unix.
- When configuring a new hard drive greater than 528MB in capacity, always make sure LBA mode is enabled.
- If you are using a hard drive that is over 528MB in capacity, but was already formatted without using LBA mode, LBA support will be ignored even if it is enabled. This assures correct access to the drive's data.
- **SCSI Hard Drives** are NOT entered into the Mainboard BIOS Setup in any way. The hard drive settings in the Standard CMOS Setup are only for drives connected to the IDE Controller. So, if only SCSI drives were installed, all these settings would be set to **Type: None**. SCSI Devices are configured via the SCSI controller's BIOS.

Floppy Drives A: and B: - Select the Type for the A: and/or B: floppy drives. Remember, floppy drive A: is the first drive, hooked to the END of the floppy ribbon cable. Floppy drive B: is hooked up after the twist. Available settings are listed below:

None	No floppy drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5 in	3-1/2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3-1/2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3-1/2 inch double-sided drive; 2.88 megabyte capacity

Floppy 3 Mode Support: - Enable this option ONLY for floppy drive(s) that support the Japanese standard (1.2MB on 3.5" Diskette). Options: Disabled (Default), Both, Drive A / B.

Video - This category selects the type of video adapter used for the primary system monitor. Although secondary monitors are supported, you do not have to select their type in Setup.

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EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

Halt On - Determines whether or not the system will prompt you if an error is detected during POST.

No Errors	The system boot will not be stopped for any error that may be detected.
All Errors	Whenever the BIOS detects a non-fatal error the system will be stopped and you will be prompted.
All, But Keyboard	The system boot will not stop for a keyboard error; it will stop for all other errors.
All, But Diskette	The system boot will not stop for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error; it will stop for all other errors.

Memory - This category is display-only. All memory detected by the POST (Power On Self Test) of the BIOS is shown as the following types:

Base Memory is the amount of conventional memory installed in the system. This value is typically 640K for systems with 640K or more memory installed on the motherboard. The **Extended Memory** is the amount of memory located above 1MB in the CPU's memory address map. **Other Memory** refers to the memory located in the region between 640K and 1MB. This region can be used for *shadowing* as well as *expanded memory* in DOS.

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BIOS Features Setup

This menu provides access to more advanced BIOS configuration settings that deal with overall performance of the system and peripheral setup. This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

Anti-Virus Protection	: Enabled	OS Select For DRAM > 64MB	: Non-OS2
CPU Internal Cache	: Enabled	HDD S.M.A.R.T. Capability	: Disabled
External Cache	: Enabled	Report No FDD For WIN 95	: No
CPU L2 Cache ECC Checking	: Enabled	Video BIOS Shadow	: Enabled
Quick Power On Self Test	: Enabled	C8000-CBFFF Shadow	: Disabled
Hard Disk Boot From	: Pri-IDE-M	CC000-CFFFF Shadow	: Disabled
Boot Sequence	: C, A	D0000-D3FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D4000-D7FFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled	D8000-DBFFF Shadow	: Disabled
Boot Up NumLock Status	: On	DC000-DFFFF Shadow	: Disabled
Gate A20 Option	: Fast		
Memory Parity/ECC Check	: Enabled		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Msec)	: 250		
Security Option	: System	ESC : Quit	↑ ↓ → ← : Select Item
IDE Second Channel Control	: Enabled	F1 : Help	PU/PD/+/- : Modify
PCI / VGA Palette Snoop	: Disabled	F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Anti-Virus Protection – Enables/Disables the built-in anti-virus for protection against **boot virus** infection. Unlike traditional BIOS protection which generally consists of simply write protecting the hard disk partition table, this Anti-Virus protection provides more complete virus protection by taking control early in the boot process, detecting boot viruses before they have a chance to load.

CPU Internal Cache - Enables or Disables the Level-1 Internal Cache memory. Generally, this would only be *Disabled* for troubleshooting purposes.

External Cache - Enables or Disables the Level-2 External Cache memory. Generally, this would only be *Disabled* for troubleshooting purposes.

CPU L2 Cache ECC Checking - Enables or Disables ECC (Error Checking and Correcting) for the CPU's Level 2 built-in cache.

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Quick Power on Self Test - Speeds up Power On Self Test (POST) after the computer is powered on. When set to Enabled, the BIOS will shorten or skip some checks during POST.

Hard Disk Boot From - This option lets you choose to boot from Primary IDE Master (Pri-IDE-M), Primary IDE Slave (Pri-IDE-S), Secondary IDE Master (Sec-IDE-M), Secondary IDE Slave (Sec-IDE-S), or SCSI hard disk. Same as IDE options, the Boot Sequence in the next field is set to C, A when the SCSI is chosen.

Boot Sequence - When your system is powered on, the BIOS performs a variety of operations, then attempts to boot an Operating System from either a hard drive, floppy drive, CD-ROM or LS-120/ZIP. This setting determines the sequence that the BIOS will follow when searching devices for a bootable disk. Most users find the C, A setting to be most beneficial, since it takes the least amount of time to boot the system. If however, you want the ability to boot from a Floppy or CD-ROM drive, you would need to choose either the A, C or CDROM, C, A setting. For instance, if your boot sequence was set to C, A and for some reason you wanted to boot to your Floppy A: Drive, it would not be possible, since the BIOS would always boot from the C: drive first. In this case, this setting would need to be changed to A, C so that the system would first check the floppy drive for a bootable disk. This would slow bootup speed, however, since the floppy would be checked on every boot.

A,C	System will first search for boot sector on floppy disk, then hard disk.
C, A	System will first search hard disk drive then floppy disk drive for boot sector.
C, CDROM, A	System will first search for boot sector on hard disk drive , then CDROM drive, and then floppy disk drive.
CDROM, C, A	System will first search the CDROM drive, then hard disk drive and then floppy disk drive for boot sector.
C only	System will search for boot sector on hard disk drive only.
LS/ZIP, C	System will first search for boot sector on LS-120 IDE floppy drive or ZIP ATAPI drive, then hard disk.

Swap Floppy Drive - The hardware connections determine which floppy is configured as drive A: and drive B: “Swapping” the floppy drives can be useful if your system has two floppy drives, and you want the ability to boot from both. For example: Since a PC cannot boot from the B: Floppy, you would need to “Swap” floppy drives A: and B: in order to set the second floppy drive to drive A:, thereby making it bootable.

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Boot Up Floppy Seek - When enabled, BIOS will attempt to move the head of the floppy disk drive forth and back once during POST to see if the drive is working properly.

Boot Up NumLock Status - When On, the NumLock key will be automatically enabled when the system boots.

Gate A20 Option - This entry allows you to select how the gate A20 is handled. The gate A20 is a device used to address memory above 1 Mbytes. Initially, the gate A20 was handled via a pin on the keyboard (Normal). Today, while keyboards still provide this support, it is more common, and much faster, for the system chipset (Fast; default) to provide support for gate A20.

Memory Parity/ECC Check - When *Disabled*, there will be no memory errors shown on the monitor for **Memory parity SERR# (NMI)**. When parity DRAM modules are used, select *Parity* or *ECC* (Error Checking and Correcting) to correct 1 bit memory errors in the memory.

Typematic Rate Setting - Determines if the typematic rate is to be used. When disabled, continually holding down a key on your keyboard will generate only one instance. In other words, the BIOS will only report that the key is down. When the typematic rate is enabled, the BIOS will report as before, but it will then wait a moment, and, if the key is still down, it will begin to report that the key has been depressed repeatedly. This feature is used to accelerate cursor movements with the arrow keys.

Typematic Rate (Chars/Sec) - When the typematic rate is enabled, this selection allows you to select the rate at which the keys are accelerated: Options are 6 (default), 8, 10, 12, 15, 20, 24 and 30.

Typematic Delay (Msec) - When the typematic rate is enabled, this selection allows you to select the delay (in msec) between when the key was first depressed and when the acceleration begins. Options are 250 (default), 500, 750 and 1000.

Security Option - This option enables password checking every time the computer is powered on or every time BIOS Setup is executed. If System is chosen, a user password prompt appears every time the computer is turned on. If Setup is chosen, the password prompt appears only when the BIOS Setup program is executed. Refer to the section Supervisor Password for more information.

IDE Second Channel Control - This item enables (default) or disables the secondary channel of the add-on PCI IDE controller.

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PCI / VGA Palette Snoop - This option must be set to Enabled if any ISA MPEG card installed requires VGA palette snooping.

OS Select For DRAM > 64MB - This should be set to OS2 if you are running IBM OS/2 with more than 64MB of RAM in the system. Otherwise, the setting should be Non-OS2.

HDD S.M.A.R.T. Capability - The default is Disabled. If you are using hard drives that support S.M.A.R.T., set this field to Enabled. SMART (Self-Monitoring, Analysis and Reporting Technology) is a reliability prediction technology for ATA/IDE and SCSI drives. The drive will provide sufficient notice to the system or user to backup data prior to the drive's failure. SMART is supported in ATA-3 or later hard drives.

Report No FDD For WIN95 - While the FDD in "STANDARD CMOS SETUP" is set to NONE, set this option to No to release IRQ6 for passing Win95 logo. This option is irrelevant under normal operation.

Video BIOS Shadow - This option controls the location of the contents of the 32KB of Video ROM beginning at the C0000h memory location. The settings are:

Enabled	The contents of C0000h-C7FFFh are written to the same address in system memory (RAM) for faster execution.
Disabled	The video ROM is not copied to RAM. The contents of the video ROM cannot be read from or written to cache memory.

C8000-DFFFF Shadow - These options control the location of the contents of the 16KB expansion card ROMs beginning at the specified memory location. If no adapter ROM is using the named ROM area, this area is made available to the local bus. Shadowing a ROM reduces the memory available between 640KB and 1024KB by the amount used for this purpose.

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Chipset Features Setup

This setup menu contains advanced configuration options relating to the mainboard chipset. These options are rarely changed by the user.

Bank 0/1 DRAM Timing	: FP/EDO 70 ns	Current CPU Temperature	: 47°C/116°F
Bank 2/3 DRAM Timing	: FP/EDO 70 ns	Current CPU Fan Speed	: 5400 RPM
Bank 4/5 DRAM Timing	: FP/EDO 70 ns	Current System Fan Speed	: 0 RPM
SDRAM Cycle Length	: 3	Vcore	: 2.81V +3.3V : 3.36V
Memory Hole At 15M-16M	: Disabled	+ 5V	: 5.14V +12V : 12.16V
Read Around Write	: Disabled	-12V	: -12.35V -5V : - 5.04V
DRAM PostWrite Bfr. Depth	: 1 level	CPU Warning Temperature	: Disabled
Concurrent PCI/Host	: Disabled	CPU FAN Warning Speed	: Disabled
Video RAM Cacheable	: Enabled	System 5V Alarm	: Disabled
AGP Aperture Size	: 64M	Auto Disable Unused Clock	: Disabled
AGP-2X Mode	: Enabled		
Power ON after Power-Fail	: ON		
OnChip USB	: Disabled		
		ESC : Quit ↑ ↓ → ← : Select Item	
		F1 : Help PU/PD/+/- : Modify	
		F5 : Old Values (Shift) F2 : Color	
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Bank 0/1, 2/3, 4/5 DRAM Timing – DRAM timing is controlled by the DRAM timing registers. The timings programmed into this register are dependent on the system design. The slower timing may be required in certain system designs to support loose layouts or slower memory. Options are Turbo, Fast, Medium, Normal, FP/EDO 60 ns, FP/EDO 70 ns, SDRAM 10ns and SDRAM 8ns.

SDRAM Cycle Length - This item allows you to set the SDRAM Latency Timer. Options are 2, 3 (default).

Memory Hole At 15M-16M - In order to improve compatibility, certain space in memory can be reserved for old style ISA cards that map memory between 15M-16M. Do not enable this feature unless you use the old style ISA card, otherwise the memory size may be reduced to 15 MB for some O.S.

Read Around Write – DRAM optimization feature: If a memory read is addressed to a location whose latest write is being held in a buffer before being written to memory, the read is satisfied through the buffer contents, and the read is not sent to the DRAM.

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DRAM PostWrite Bfr. Depth – The 4 level option results in higher system efficiency but stability may not be ensured depending on system design.

Concurrent PCI/Host – When *Disabled*, CPU bus will be occupied during the entire PCI operation period.

Video RAM Cacheable - *Enabled* allows caching of the video RAM, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

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 AGP information. Options are 4, 8, 16, 32, 64, 128 and 256 MB.

AGP-2X Mode – Set to *Enabled* if your AGP card supports the 2X mode, which uses a double-clocked data technique to transfer twice the data per each AGP clock.

Power ON after Power-Fail – This feature will power-on the PC when power returns after a power failure. The table on the next page lists the options available and the corresponding “System State” when power returns.

Options Available	System State When Power Failure Occurred	System State When Power Returns
Former-State	On	On
	Off	Off
Off	On	Off
	Off	Off
On	On	On
	Off	On

OnChip USB - If your system contains a Universal Serial Bus controller and you have a USB peripheral, select *Enabled*. The next option will become available:

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

System Hardware Monitor - The onboard hardware monitor allows you to observe the current temperature of the CPU, current speeds (in RPM, rotation per minute) of the system and CPU fans, as well as the various operating voltages. (If the fan is not installed, 0 RPM will be shown.)

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CPU Warning Temperature - Once the CPU temperature exceeds the temperature specified, a warning will be issued via the speaker and the operating CPU speed will be slowed down to ease the situation. Options are Disabled, 50°C/122°F - 70°C/158°F.

CPU FAN Warning Speed - Once the speed of the CPU cooling fan falls below the speed specified (in RPM, rotation per minute), a warning will be issued via the speaker. Options are Disabled, 1000, 2000, 3000 RPM.

System 5V Alarm – When <4.75V or >5.25V is selected, a warning beep will be issued via the speaker once the system board operating voltage falls below 4.75V or rises above 5.25V.

Auto Disable Unused Clock - When *enabled*, any clock not in use will be disabled to reduce EMI radiation.

Power Management Setup

This menu contains configuration options that reduce power consumption when the system is not in use. Other “Green-PC” compliant peripherals are also supported. Power Management allows you to configure you system to use energy most efficiently, and still in a manner consistent with your own style of computer use.

ACPI function	: Enabled	Primary INTR	: ON
Power Management	: User Define	IRQ3 (COM 2)	: Primary
PM Control by APM	: Yes	IRQ4 (COM 1)	: Primary
Video Off Option	: Suspend -> Off	IRQ5 (LPT 2)	: Primary
Video Off Method	: DPMS Support	IRQ6 (Floppy Disk)	: Primary
MODEM Use IRQ	: 3	IRQ7 (LPT 1)	: Primary
Soft-Off by PWRBTN	: Instant-Off	IRQ8 (RTC Alarm)	: Disabled
** PM Timers **		IRQ9 (IRQ2 Redir)	: Secondary
HDD Power Down	: Disabled	IRQ10 (Reserved)	: Secondary
Doze Mode	: Disabled	IRQ11 (Reserved)	: Secondary
Suspend Mode	: Disabled	IRQ12 (PS/2 Mouse)	: Primary
** PM Events **		IRQ13 (Coprocessor)	: Primary
VGA	: OFF	IRQ14 (Hard Disk)	: Primary
LPT & COM	: LPT/COM	IRQ15 (Reserved)	: Disabled
HDD & FDD	: ON		
DMA/master	: OFF	ESC : Quit	↑ ↓ → ← : Select Item
Power On by Ring/LAN	: Disabled	F1 : Help	PU/PD/+/- : Modify
Power On by RTC Alarm	: Disabled	F5 : Old Values (Shift)	F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

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ACPI Function – This option allows you to enable/disable the Advanced Configuration and Power Interface which offers improved power management.

Power Management – This category allows you to select the type (or degree) of power saving and is directly related to the following modes: Doze Mode, Standby Mode, Suspend Mode and HDD Power Down. There are four selections for Power Management, three of which have fixed mode settings:

Min Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max Saving	Maximum power management – ONLY AVAILABLE FOR SL CPUs. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Set each mode individually. When Enabled, each range is from 1 min. to 1 hr., except for HDD Power Down which ranges from 1 min. to 15 min.

PM Control by APM – When set to Yes, an Advanced Power Management device will be activated to enhance the Max. Power Saving mode and stop the CPU internal clock. If the Max. Power Saving is not enabled, this will be preset to No.

Video Off Option – When enabled, this feature allows the VGA adapter to operate in a power saving mode.

Always On	Monitor will remain on during power saving modes.
Suspend → Off	Monitor blanked when the systems enters the Suspend mode.
All Modes → Off	Monitor blanked when the system enters any power saving mode.

Video Off Method – This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports, writing blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS Support	Initial display power management signaling.

MODEM Use IRQ – This item tells the Power Management BIOS which IRQ is assigned to the installed MODEM. Options are NA, 3, 4, 5, 7, 9, 10, and 11.

Soft-Off by PWRBTN – With *Instant-Off* selected, the ATX switch functions like a normal system power off button. With *Delay 4 Sec.* selected, you must hold down the ATX switch for more than 4 seconds to power off the system.

PM Timers – The following four modes are Green PC power saving functions which are only user configurable when *User Defined* Power Management has been selected. See below for available selections.

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HDD Power Down	When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.
Doze Mode	When enabled and after the set time of system inactivity, the CPU clock will run at slower speed while all other devices still operate at full speed.
Suspend Mode	When enabled and after the set time of system inactivity, all devices except the CPU will be shut off.

PM Events

VGA - When set to *On*, any event occurring at a VGA port will awaken a system which has been powered down.

LPT & COM - When set to *On*, any event occurring at a LPT (printer) /COM(serial) port will awaken a system which has been powered down.

HDD & FDD - When set to *On*, any event occurring at a hard or floppy drive port will awaken a system which has been powered down

DMA/master - When set to *On*, any event occurring to the DMA controller will awaken a system which has been powered down.

Power on by Ring/LAN – An input signal on the serial Ring Indicator (RI) line in other words, an incoming call on the modem (either external modem or internal modem card) power on the system. Refer to “Wake-on-Ring Function” on page 23 for more information. With a LAN card installed, the Wake-up On LAN function allows the network to wake up a Soft Power Down (Soft-Off) PC. Refer to “Wake-up On LAN Connector” on page 22 for more information.

Power on by RTC Alarm - When *enabled*, the system will automatically power on or returns to full power out of suspend/standby mode at the time and date of the month (0 for daily) specified.

Primary INTR - When set to *On* (default), any primary interrupt request (see below) will awake the system which has been powered down.

Following this option is a list of IRQs (Interrupt ReQuests). You can set each IRQ to be *Primary*, *Secondary* or *Disabled*. When set to *Secondary*, the interrupt request will neither prevent the system from going into a power management mode nor awaken it.

MAINBOARD BIOS SETUP

PNP/PCI Configuration Setup

The PCI **P**ersonal **C**omponent **I**nterconnect **B**us was developed by Intel and other industry leader partners primarily to address two important issues faced by PC hardware designers today: a) How to allow peripheral devices to take the fullest advantage of the power of Pentium and Pentium Pro chip technology, and b) Provide a simpler installation process for peripheral devices, such as Network cards, EIDE or SCSI controllers.

PCI accomplishes these goals with its 32-bit Data path Local Bus design, and support for Plug & Play. Unlike older expansion bus architectures, PCI provides peripherals with a direct connection to the CPU and memory. The PCI bus runs at 33Mhz and has a maximum transfer capability of 132MBps. With Plug & Play, the system BIOS automatically determines hardware resources for new peripherals, simplifying installation of multiple interface cards.

This Setup Menu provides configuration options for the PCI Bus and its assigned resources.

PNP OS Installed	: No	CPU to PCI Write Buffer	: Enabled
Resources Controlled by	: Manual	PCI Dynamic Bursting	: Enabled
Reset Configuration Data	: Enabled	PCI Master 0 WS Write	: Enabled
IRQ-3 assigned to	: PCI/ISA PnP	PCI Delay Transaction	: Enabled
IRQ-4 assigned to	: PCI/ISA PnP	PCI#2 Access #1 Retry	: Disabled
IRQ-5 assigned to	: PCI/ISA PnP	AGP Master 1 WS Write	: Enabled
IRQ-7 assigned to	: PCI/ISA PnP	AGP Master 1 WS Read	: Disabled
IRQ-9 assigned to	: PCI/ISA PnP	SYMBIOS SCSI BIOS	: Auto
IRQ-10 assigned to	: PCI/ISA PnP	PCI IRQ Activated By	: Level
IRQ-11 assigned to	: PCI/ISA PnP	Assign IRQ For USB	: Enabled
IRQ-12 assigned to	: PCI/ISA PnP	Assign IRQ For VGA	: Enabled
IRQ-14 assigned to	: PCI/ISA PnP	Assign IRQ For ACPI	: IRQ9
IRQ-15 assigned to	: PCI/ISA PnP		
DMA-0 assigned to	: PCI/ISA PnP		
DMA-1 assigned to	: PCI/ISA PnP	ESC : Quit	↑ ↓ → ← : Select Item
DMA-3 assigned to	: PCI/ISA PnP	F1 : Help	PU/PD/+/- : Modify
DMA-5 assigned to	: PCI/ISA PnP	F5 : Old Values (Shift)	F2 : Color
DMA-6 assigned to	: PCI/ISA PnP	F6 : Load BIOS Defaults	
DMA-7 assigned to	: PCI/ISA PnP	F7 : Load Setup Defaults	

PNP OS Installed - Set to Yes if your operating system supports Plug & Play, such as Windows® 95.

MAINBOARD BIOS SETUP

Resources Controlled By - The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. This capability is specifically designed for a Plug and Play operating system such as Windows® 95. Choices are *Auto* and *Manual*.

Reset Configuration Data - Reset Configuration Data: When set to Enabled, ESCD (Extended System Configuration Data) is cleared. This setting will automatically be set back to Disabled when the system reboots. *Enabled* and *Disabled*.

IRQ3/4/5/7/9/10/11/12/14/15, DMA0/1/3/5/6/7 assigned to – These options are available when the above **Resources Controlled by** option is set to *Manual*. By default, all resources are assigned to the PCI Bus. If an ISA card requires a particular IRQ or DMA channel, those resources should be set to Legacy ISA so that the PCI Bus will not try to use them. Choices are *Legacy ISA* and *PCI/ISA PnP*.

CPU to PCI Write Buffer - When enabled, up to four D words of data can be written to the PCI bus without interrupting the CPU. When disabled, a write buffer is not used and the CPU read cycle will not be completed until the PCI bus signals that it is ready to receive the data.

PCI Dynamic Bursting - When Enabled, data transfers on the PCI bus, where possible, make use of the high-performance PCI bus protocol, in which greater amounts of data are transferred at a single command.

PCI Master 0 WS Write - When Enabled, writes to the PCI bus are command with zero wait states.

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

PCI#2 Access #1 Retry - This item allows you enable/disable the PCI #2 Access #1 Retry.

AGP Master 1 WS Write - This implements a single delay when writing to the PCI Bus. By default, two-wait states are used by the system, allowing for greater stability.

MAINBOARD BIOS SETUP

AGP Master 1 WS Read - This implements a single delay when reading to the PCI Bus. By default, two-wait states are used by the system, allowing for greater stability.

SYMBIOS SCSI BIOS - When set to *Auto* (Default), the system will automatically sense the presence of any SCSI adapter that uses a Symbios SYM53C8XX SCSI chip:

If the SCSI adapter installed has its own BIOS on board:	The on-board SCSI BIOS will not be loaded. The adapter's own SCSI BIOS will be used.
If the SCSI adapter installed doesn't have its own BIOS and the card uses or is compatible with the SYM53C8XX chip:	The on-board SCSI BIOS will load and control the SCSI adapter.

**Disabling*, the onboard SCSI BIOS prevents it from being active in any way.

PCI IRQ Activated By - This sets the method by which the PCI bus recognizes that an IRQ service is being requested by a device. Under all circumstances, you should retain the default configuration unless advised otherwise by your system's manufacturer. The choices are *Level* (default) and *Edge*.

Assign IRQ For USB - When *Enabled*, the system automatically assigns an IRQ for the USB device connected to your system. However, if you are not using USB devices and an ISA slot requires an IRQ address, set this function to Disabled. The IRQ address previously occupied by the USB device will be available for the ISA slot.

Assign IRQ For VGA - The *Enabled* option allows the BIOS to auto-route an IRQ for use by a VGA card. While most of the VGA cards do not need the IRQ assignment, certain VGA cards may need it.

Assign IRQ For ACPI - The *Enabled* option allows the BIOS to route the specified IRQ for use by ACPI devices connected to your system.

MAINBOARD BIOS SETUP

Load BIOS Defaults

Loads “Fail Safe” settings into the BIOS Setup program. These options are designed to slow the system down for troubleshooting purposes. To load the default values, highlight this option and press [ENTER]. Enter “Y” in the confirmation screen and press [ENTER] again. User-defined options in the **Standard CMOS Setup** are not affected.

Load Setup Defaults

Loads the default values for best system performance into the BIOS Setup program. To load the default values, highlight this option and press [ENTER]. Enter “Y” in the confirmation screen and press [ENTER] again. User-defined options in the **Standard CMOS Setup** are not affected.

Integrated Peripherals Setup

This menu is used to configure the integrated IDE subsystem and other peripherals.

OnChip IDE First Channel 0	: Enabled	Onboard Parallel Port	: 378/IRQ7
OnChip IDE Second Channel 1	: Enabled	Onboard Parallel Mode	: ECP/EPP
IDE Prefetch Mode	: Enabled	ECP Mode Use DMA	: 3
IDE HDD Block Mode	: Enabled	Parallel Port EPP Type	: EPP 1.9
Primary Master PIO	: Auto		
Primary Slave PIO	: Auto		
Secondary Master PIO	: Auto		
Secondary Slave PIO	: Auto		
Primary Master UDMA	: Auto		
Primary Slave UDMA	: Auto		
Secondary Master UDMA	: Auto		
Secondary Slave UDMA	: Auto		
Init Display First	: PCI Slot		
Onboard FDD Controller	: Enabled		
Onboard Serial Port 1	: 3F8/IRQ4	ESC: Quit	↑ ↓ → ←: Select Item
Onboard Serial Port 2	: 2F8/IRQ3	F1 : Help	PU/PD/+/- : Modify
InfraRed/COM2 Selected	: UART COM2	F5 : Old Values (Shift) F2: Color	
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

MAINBOARD BIOS SETUP

On-Chip IDE First Channel 0 - Enables or Disables the primary controller. Situations where this controller would be disabled are: a) *You are not using any IDE Drives* or b) *You are using an add-on IDE controller in a PCI Slot.*

On-Chip IDE Secondary Channel 1 - Enables or Disables the secondary controller. Situations where this controller would be disabled are: a) *You are not using any IDE Drives* or b) *You are using IDE Drives ONLY on the primary controller* or c) *You are using an add-on IDE controller in a PCI Slot.*

IDE Prefetch Mode - Enable prefetching for IDE drive interfaces that support its faster drive accesses. If you are getting disk drive errors, change the setting to omit the drive interface where the errors occur. Depending on the configuration of your IDE subsystem, this field may not appear, and it does not appear when the Internal PCI/IDE field, above, is Disabled

IDE HDD Block Mode - This allows your hard disk controller to use fast block mode to transfer data to and from your hard disk drive (HDD). *Enabled* or *Disabled*. *Enabled* is the default.

- **IDE PIO Mode** - IDE Programmed I/O Mode -

This setting relates to the speed at which the hard drive is able to transfer data, up to 16.6MB/second for Mode 4 drives. Available settings are *Auto*, *0*, *1*, *2*, *3*, or *4*. As with the **Type** setting, *Auto* is the preferred choice, in that the supported PIO Mode is read directly from the

PIO Mode	Timing
0	600 ns
1	383 ns
2	240 ns
3	180 ns
4	120 ns

hard drive. Be sure not to use a PIO Mode higher than what the drive actually supports. This could result in loss of data.

- **IDE UDMA (Ultra DMA) Mode** - The chipset used for this mainboard improves the IDE performance by implementing UltraDMA/33 Bus Mastering IDE which can handle data transfer up to 33 Mbyte/sec. This UDMA technology is downward compatible with existing ATA-2 IDE. So there is no upgrade required for current hard drives and cabling. **Auto is default.*

Init Display First - When your system has an AGP card coexisting with other PCI or ISA display cards, choose AGP Slot to tell your system to use the AGP card.

Onboard FDD Controller - Set to Enabled if you have a floppy disk drive installed on the system board and you wish to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature.

MAINBOARD BIOS SETUP

Onboard Serial Port 1 - With this option, the on-board Serial Port 1 can be Disabled, or set to Auto, 3F8/IRQ4 (Default), 2F8/IRQ3, 3E8/IRQ4 or 2E8/IRQ3.

Onboard Serial Port 2 - With this option, the on-board Serial Port 2 can be Disabled, or set to Auto, 3F8/IRQ4, 2F8/IRQ3 (Default), 3E8/IRQ4 or 2E8/IRQ3.

InfraRed/COM2 Mode Selected - By default, this field is set to UART COM2, which directs the second serial port UART to support the COM2 serial port. Choosing SHARP IR (ASKIR), IrDA SIR (HPSIR), CIR or FIR will activate the on-board infrared feature and redirect the second serial port UART to support the infrared module connector on the mainboard.

Onboard Parallel Port - With this option, the on-board Parallel Port can be Disabled, or set to 378/IRQ7 (*Default), 3BC/IRQ7 or 278/IRQ5.

Onboard Parallel Mode - Sets the operating mode of the parallel port. Options are: *SPP (Standard Parallel Port)*, *EPP (Enhanced Parallel Port)+SPP*, *ECP (Extended Capability Port)* and *ECP+EPP (default)*.

ECP Mode Use DMA - Options are 1 and 3. This field is available only when one of the two following options in **Parallel Port Mode** is selected: ECP or ECP/EPP.

Parallel Port EPP Type - Options are 1.7 and 1.9 (default ; IEEE 1284 compliant).

Supervisor Password and User Password Setting

Passwords can be set to provide protection for the BIOS configuration options, or to restrict access to the computer itself.

When enabled, User Password will require all users to enter a password in order to use the system, and/or enter the BIOS setup (but can't change its contents). A Supervisor Password is used to protect the stored CMOS options from being changed by unauthorized users.

Keep in mind that when set, a password is required only when booting the system. It will not provide protection to a system that is already booted.

The password check option is set in **BIOS FEATURES SETUP** by choosing either System (the password prompt appears every time the system is powered on) or Setup (the password prompt appears only when the user enters the BIOS Setup). The password is stored in CMOS RAM, and can be cleared by removing the battery for a while and then re-installing it back.

To set a password:

1. You must first set the *Supervisor* password by choosing *Supervisor Password* and pressing [ENTER]. Setup prompts for a password.
2. Enter a 1-8 character password using letters, numbers, or a combination of both. The specific characters are not shown as you enter them. Press [ENTER].
3. A confirmation box appears asking you to re-enter the password. Enter the password again. Press [ENTER]. Follow the same procedure to set the *User Password*.

Changing a Password:

Select the appropriate password option (Supervisor or User) from the main menu and press [ENTER]. Enter the current password and press [Enter]. The screen does not display the characters entered. Enter in the new password, then the confirmation. You cannot change the current password unless you know it.

MAINBOARD BIOS SETUP

Erasing a Password:

1. If you know the current password, but want to disable password checking, follow the procedure for changing the password. When Setup prompts for the new password, simply press [ENTER]. You will see a message indicating that the password is disabled.
2. If you do not know the current password, the CMOS must be cleared by removing the battery for a while and then re-installing it back. *This will clear all user-defined BIOS Setup options.

IDE HDD Auto Detection

Automatically detect and configure hard disk parameters. The Award BIOS includes this ability in the event you are uncertain of your hard disk's parameters. See also "Standard CMOS Setup".

Save & Exit Setup / Exit Without Saving

Select *Save & Exit Setup* to save into the CMOS memory all modifications specified during the current session. To save the configuration changes, highlight this option in the main menu and press [ENTER]. The system displays a confirmation message on the screen. Press the "Y" key and then [Enter]. Press the "N" key and then the [Enter] key to abort. The *Exit Without Saving* option allows the user to exit the BIOS Setup without updating any changes made during the current session.

PCI Device Listing

This list of installed PCI devices appears after the **System Configuration** screen:

PCI device listing						
Bus No.	Device No.	Func No.	Vender ID	Device ID	Device Class	IRQ
0	7	1	1106	0571	IDE Controller	
14/15						
0	7	2	8086	8829	Serial bus controller	11
0	9	0	1013	7333	Display controller	NA

- Bus No.** Encoded value indicating 1 of 256 possible buses in a system.
- Device No.** Encoded value indicating 1 of 32 possible devices on a given bus.
- Func No.** Encoded value indicating 1 of 8 possible functions on a multifunction device.
- Vender ID** Identifies the manufacturer of the device. Valid vendor identifiers are allocated by the PCI SIG (Special Interest Group) to ensure uniqueness.
- Device ID** Identifies the particular device. This identifier is allocated by the vendor.
- Device Class** Specifies one of the following device classes: Mass storage controller, Network controller, Display controller, Multimedia device, Bridge device, Simple communication controller, Base system peripherals, Input device, Docking station, Processor and Serial bus controller.

The PCI device listing is useful for troubleshooting purposes. More detailed information for each field may be obtained through the PCI specification documentation.

BUILT-IN SYMBIOS SCSI BIOS

To provide easy to use and cost effective support for adapters using or compatible with the Symbios Logic 53C8XX SCSI chips, this mainboard features built-in Symbios SCSI BIOS.

In most cases you should not need to change the default configuration of your host adapter. You may decide to alter these default values if there is a conflict between device settings, or if you need to optimize system performance. A message appears on your computer monitor (for about 5 seconds) during boot that looks like this:

Press Ctrl-C to start Symbios Configuration Utility

If you decide to press Ctrl-C during boot, the following message appears:

Please wait, invoking Symbios Configuration Utility ...

After a brief pause, your computer will display the Main Menu of the utility.

The Symbios SCSI Configuration Utility

This menu driven utility allows you to view and change the default configuration settings for host adapters using Symbios 53C8XX chips.

Note: Pressing **Ctrl-A** after memory count during re-boot allows you to recover the default settings and reconfigure.

The following tables list the configuration settings you can change:

- Global: Affects both the adapter and all SCSI devices
- Device: Affects only the individual SCSI devices

BUILT-IN SYMBIOS SCSI BIOS

Global Default Settings	
Settings	Default
SCAM Support	On
Parity Checking	Enabled
Host Adapter SCSI ID	7
Scan Order	Low to High (0-Max)

Device Default Settings	
Settings	Default
Synchronous Transfer Rate (MB/sec)	20
Data Width	8
Disconnect	On
Read Write I/O Timeout (secs)	10
Scan for Devices at Boot Time	Yes
Scan for SCSI LUNs	Yes
Queue Tags	Enabled

Main Menu

MAIN MENU					
	Port	Irq	-----Status-----		NvRAM
	Num	Level	Current	Next-Boot	Found
SYM53C860	FC00	9	On	On	Yes
SYM53C820	0	0	Off	Off	?
SYM53C825	FD00	9	On	On	Yes
SYM53C815	FE00	10	On	On	No
Change Adapter Status					
Adapter Boot Order					
Additional Adapter Configuration					
Display Mode = Terse					
Mono/Color					
Language					
Help					
Quit					

You can select an adapter only if the current status is “On”. **Changes are only possible with SCSI adapters that support NVRAM (non-volatile memory)**. Check the “NvRAM Found” column to see if NVRAM is present on your adapter. If you choose to alter any of these settings, exit via the **Quit** option and the system will reboot.

Change Adapter Status - Allows you to activate or deactivate a host adapter and all SCSI devices attached to it. The change takes place after a reboot, which is automatic upon exit from the utility when this option is changed.

BUILT-IN SYMBIOS SCSI BIOS

Adapter Boot Order - Allows you to set the order in which host adapters will boot when more than one Symbios host adapter is present in the system. To change an adapter's boot order, select it and press <Enter>. You are then prompted to enter the new boot sequence number. When the adapters are ordered properly, press the <Esc> key to exit this menu.

	Port Num	Irq Level	-----Status-----		NVRAM Found
			Current	Next-Boot	
SYM53C860	FC00	9	On	On	Yes
SYM53C820	0	0	Off	Off	?
SYM53C825	FD00	9	On	On	Yes
SYM53C815	FE00	10	On	On	No

Display Mode - Determines how much information about your host adapters and SCSI devices is displayed on your computer monitor during boot:

- *verbose*: for more complete information
- *terse*: for a faster boot

Mono/Color - Allows you to choose between a black and white or color display for the SCSI Configuration utility.

Language - English mode only.

Help - Brings up a help screen with information about the Main menu.

Quit - Exits the SCSI Configuration utility.

Adapter Utilities Menu

When you select a host adapter from the main menu, the following screen is displayed:

SYM53C860
Adapter Setup
Device Selections
Help
Exit this menu

BUILT-IN SYMBIOS SCSI BIOS

- **Adapter Setup:** Adapter settings are viewed and changed.

SYM53C860 Adapter Setup	
SCAM Support	On
Parity	On
Host SCSI ID	7
Scan Order	Low to High (0..Max)
Removable Media Support	None
CHS Mapping	SCSI Plug and Play Mapping
Spinup Delay (Secs)	2
Help	
Restore Default Setup	
Exit this menu	

SCAM Support - SCAM (SCSI Configured AutoMatically) is the SCSI Plug and Play protocol supported by Symbios BIOS version 4.X.

Parity - The Symbios host adapters always generate parity, but some SCSI devices do not. Therefore, you are offered the option of disabling parity checking.

Note: When disabling parity checking, it is also necessary to disable disconnect for all devices, as parity checking for the reselection phase will not be disabled. If a device does not supporting parity disconnects, the I/O will never complete because the reselection phase will halt.

Host SCSI ID - The host adapter SCSI ID should remain on 7 (default), as this setting gives the adapter the highest priority on the SCSI bus. However, if you have two adapters on the same SCSI bus, you should give one of them an unassigned ID to avoid duplication of SCSI IDs.

Scan Order - This option allows you to tell the host adapter BIOS and your device drivers to scan the SCSI bus from low to high (0 to max) SCSI IDs, or from high to low (max to 0) SCSI IDs. If you have more than one device on the SCSI bus, changing the scan order changes the order in which drive letters are assigned by the system.

Removable Media Support - Determine if the removable media will be used as BIOS device. A BIOS device here is a device that can be controlled via BIOS INT 13H, i.e. it does not need a device driver and can be bootable. However, when used as a BIOS device, the full removability of removable media devices is not preserved. The following constraints apply:

- a) The device can only work as a fixed disk, i.e. media change is not allowed.

BUILT-IN SYMBIOS SCSI BIOS

- b) The media must be inserted before the system boot-up.
- c) Only media with 512Bytes/sector is supported.

None	The removable media devices will not be used as BIOS devices.
Boot Drive Only	Allows only the removable media installed as Drive C: to work as a BIOS device.
With Media Installed	Enables all removable disk drives to work as BIOS devices.

CHS Mapping – Cylinder, Head, Sector mapping. Options are “SCSI Plug and Play Mapping” (default) and “Alternate CHS Mapping”.

Spinup Delay – 1-10 seconds. The default is a 2-second delay before the BIOS starts to scan for SCSI devices during initialization. This amount of time is enough for most devices to get ready for proper operation. Since some older hard drives may need more time to spin up, you may need to extend the delay for those devices.

- **Device Selections:** Settings for the devices attached to the selected adapter are viewed and changed.

SYM53C860 Devices 0 to 7									
	Sync Rate	Data Width	Disc	Time Out	Scan Bus	Scan LUNS	Queue Tags	Init	Boot
Dev0 N/A	20	8	On	10	Yes	Yes	On	No	
Dev1 N/A	20	8	On	10	Yes	Yes	On	No	
Dev2 N/A	20	8	On	10	Yes	Yes	On	No	
Dev3 N/A	20	8	On	10	Yes	Yes	On	No	
Dev4 N/A	20	8	On	10	Yes	Yes	On	No	
Dev5 N/A	20	8	On	10	Yes	Yes	On	No	
Dev6 N/A	20	8	On	10	Yes	Yes	On	No	
SYM53C860	20	8	On	10	Yes	Yes	On	No	
Devices 8 to15									
Help									
Exit this menu									

The above menu provides information about individual SCSI devices attached to the selected host adapter, as well as the adapter itself. To make changes to these settings select a device from this display and press <Enter> to bring up the individual **Device Setup** menu.

Device Setup Menu

When you select a specific device from the Device Selection menu, your computer displays the following Device Setup menu. The settings in this menu effect individual SCSI devices attached to the selected host adapter. Changes made from this menu will require a system reboot upon exit from the SCSI Configuration utility.

SYM53C860 Setup for All devices on this adapter	
Sync Rate (MBytes/sec)	20
Width (bits)	8
Disconnect	On
Read Write I/O Timeout (secs)	10
Scan for Device at Boot Time	Yes
Scan for SCSI LUNS	Yes
Queue Tags	On
Initial Boot Device	No
Format	
Verify	
Help	
Restore Default Setup	
Exit this menu	

Sync Rate (Mega Bytes/sec) - Defines the maximum transfer rate the host adapter attempts to negotiate. The host adapter and a SCSI device must agree to a rate they can both handle.

Width (bits) - Sets the maximum data width the host adapter will attempt to negotiate. The host adapter and a SCSI device must agree to a width they can both handle. Only those host adapters that support 16 bit data transfers will show this option as enabled.

Disconnect - SCSI devices have the ability to disconnect from the bus during an I/O transfer. This option tells the host adapter whether or not to allow a device to disconnect. Some devices run faster with disconnect enabled (mostly newer devices), while some run faster with disconnect disabled (mostly older devices).

Read Write I/O Timeout (secs) - This option sets the time the host adapter waits for a read, write, verify, or seek command to complete before trying the I/O transfer again. Since this provides a safeguard allowing the system to recover if an I/O operation fails, it is recommended that you always set the time-out to a value greater than zero (no time-out).

BUILT-IN SYMBIOS SCSI BIOS

Scan for Device at Boot Time - When there is a device you do not wish to make available to the system, set this option to No for that device. Also, on a bus with only a few devices attached, you can speed up boot time by changing this setting to No for unused SCSI IDs.

Scan for SCSI LUNs - You can set this option to No if you have problems with a device that responds to all LUNs whether they are occupied or not.

Queue Tags - If your device driver can issue queue tags, this option allows you to enable or disable the issuing of queue tags during I/O requests.

Format - Low level format the selected device. All information on the drive will be erased.

Verify – This command is used to detect bad blocks on the chosen disk. With your confirmation, the bad blocks detected can be reassigned for future operations. This command is non-destructive, and therefore won't destroy the data on the drive.

Since some changes only take effect after your system reboots, it is important that you quit this Configuration utility properly. You should return to the Main Menu and exit via the **Quit** option. If you reboot the system without properly exiting the utility, some changes may not be saved.

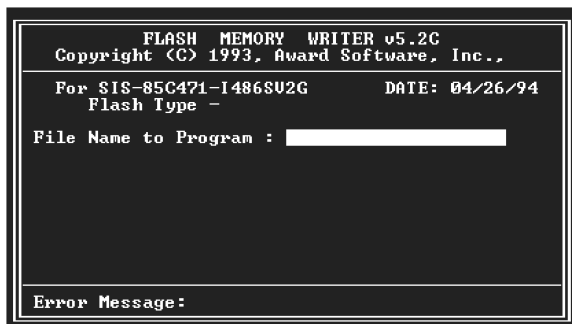
Device Drivers

To function properly with different SCSI devices under different operating systems you'll need to install **device drivers**. The device driver information should be available in your SCSI adapter's package.

FLASH BIOS PROGRAMMING UTILITY

Updating the Award BIOS Code is made easy with the AWDFLASH Utility. Since this mainboard features FLASH BIOS, it is not necessary to change the actual BIOS chip in order to upgrade the System BIOS. The user can simply re-program the old BIOS using the AWDFLASH Utility as follows:

1. First, boot the system with DOS or to “Safe Mode” under Windows 95. If you are booting DOS from a hard drive or floppy disk, press [F5] when the message “Starting MS-DOS...” appears on the screen. If you are booting Windows 95, press the [F8] key, and select the “Safe mode command prompt” option. This will assure that the system is running in “*real mode*” with **no device drivers loaded**. *This is the only correct way to run the AWDFLASH Utility program.*
2. There are (2) important files needed to re-program the BIOS. The first is “AWDFLASH.EXE” which is the FLASH BIOS Programming Utility. The second file needed is the updated “BIN” file which contains the actual BIOS code. This file will have the extension [.bin], such as “P598GH.BIN”. Make sure these files are on the diskette or hard drive in the same directory.
3. Start the AWDFLASH Utility by changing to the directory where the two required files exist and typing: AWDFLASH and pressing [ENTER].



4. The AWDFLASH Utility Screen appears. You will be asked for the file name to program. Type in the name of the new BIOS (.bin) file and hit [ENTER].

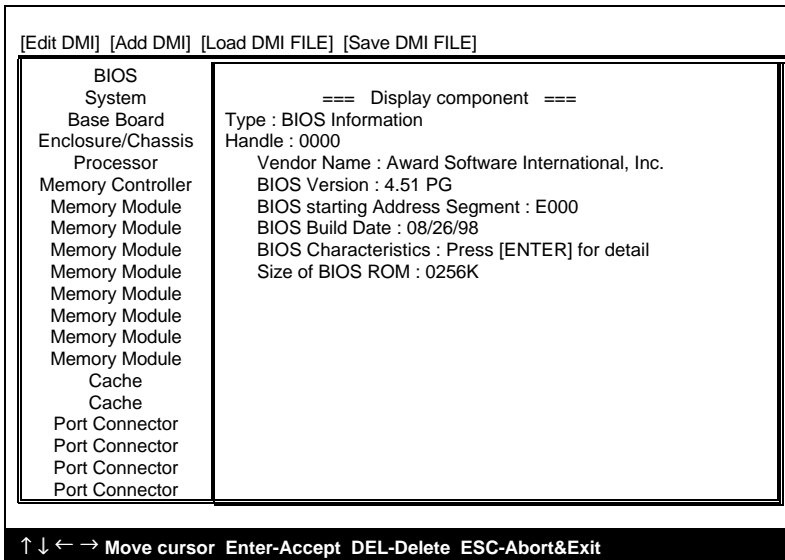
FLASH BIOS PROGRAMMING UTILITY

5. The program will then ask if you want to backup the old BIOS. This is recommended in case there are any problems with the new “.bin” file. Enter the name of the new backup file (such as “backup.bin”) and press [ENTER].
6. At this time the system will prompt you for final confirmation before beginning programming. The Utility can be aborted at this time by hitting “n”. To begin programming, hit “y”...
7. When the Flash programming starts, a bar indicator will show the progress of the programming operation. After successful completion, hit the reset button or power off the computer.

DMI UTILITY

This mainboard supports the **Desktop Management Interface (DMI)**, which is a new method of providing enterprise management for personal computers. The main component of DMI is the Management Information Format Database (MIF), which contains information about the computer system and its components, such as BIOS version/vendor, CPU speed/type, memory size/type, L1/L2 cache, port connectors (IDE, floppy, 2S/1P, USB, keyboard, mouse,), slots ... etc. Using DMI, remote PC management software is able to obtain various information about the system, including hardware profiles, capabilities, operational status, installation dates, and other information about the system and its components.

This DMI utility, DMICFG.EXE, allows you to add additional information, such as serial numbers, vendor information, and enclosure/chassis configurations, into the MIF.



Note: The DMI utility must be run in real mode without the EMM386 memory manager loaded.

APPENDIX A

VIA Apollo Pro Driver Installation for AGP Implementation

Before installing the AGP drivers under Windows 95/98, specific software support must be included in your system first:

Note: If your AGP card uses *Intel I740 AGP chip*, its driver must be v1.5 or later to be compatible with this mainboard.

Windows 95

- A. Though Windows 95 OSR2.0 supports AGP, it is necessary that you first *upgrade OSR2.0 to OSR2.1 with a USB upgrade* to take full advantage of the AGP features.
- B. To access the advanced 3D features in Windows 95, you also need to first *install the Microsoft DirectX 5.0*.
- C. Then install the following VIA drivers:
 - 1) VIA PCI Bridge driver.
 - 2) VIA Bus Master driver.
 - 3) VIA VxD driver.

Make sure all the above are included in your system before you install the display driver.

Windows 98

Install VIA VxD driver before you install the display driver.