MGPT-PNTM-B
System Board
User's Guide

P/N: 771949
Version: D02
September 1995

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The following rules/procedures apply to all RMAs:

1) The product must be returned in original packaging or other suitable materials.

2) Each returned unit will be inspected for damage or other irregularities. It a unit is shown to be modified, the customer will be notified before any action is taken.

3) Mylex will not be responsible for non-Mylex products shipped with an RMA unit. This includes memory, math co-processors and other internal and external peripherals.

Products must be shipped to Mylex with freight paid. Upon completion of service, Mylex will ship the product back UPS Ground or similar service, at no charge, unless prior arrangements have been made.

Customer Service

End users are required to contact their suppliers.

Mylex Technical Support is available 6:00 a.m. to 6:00 p.m. Pacific Standard Time, Monday through Friday except holidays. Contact Mylex Technical Support by voice at **(510) 796-6100** or by fax at **(510) 745-7715**. You can also contact Technical Support through their e-mail service at **tsup@mylex.com.**

Handling Precautions

This product contains electronic components that are highly sensitive to electrostatic discharge. Use extra caution when handling this product to ensure there is adequate grounding around the work area the board is being installed. ALWAYS wear a ground strap or ground your body by touching a grounded object such as an unpainted metal device connected to power ground.

This product has delicate crystal oscillators that can break if subjected to sudden shock such as being tossed on a table. Use care when moving it from point to point.

If Troubles Are Encountered

If this product displays improper operation during the course of installation or operation, make sure that all components are seated tightly and configured correctly. Pay particular attention to the jumper settings and the BIOS setup. If the product continues to operate improperly, contact your dealer or distributor for additional information.

Dealers and Distributors may contact Mylex's Technical Support Department at (510) 796-6100 after first completing the enclosed System Problem Report.

Package Contents

MGPT-PNTM-B System Board
This User's Guide
Warranty Card
Any pertinent release notes available at the time of shipment
System Problem Report Form
Utility Diskette
I/O Cable Set

About This Manual

This manual is arranged to help you set up and run the MGPT-PNTM-B system board.

- Chapter 1, *Introduction*, describes the functions and features of the system board and specifications.
- Chapter 2, *System Board Setup*, includes detailed information on how to install and configure the MGPT system board.
- Chapter 3, *Memory Installation*, describes the size and configuration of the on-board memory and external cache memory, and gives instructions for installing the memory devices on the system board.
- Chapter 4, *BIOS Setup*, explains how to adjust the BIOS setup using the software to make use of the board's multiple features.
- Appendix A, *Upgrading the BIOS*, gives instructions on how to update the BIOS Flash ROM using the manufacturer's latest software.

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Introduction

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Chapter 1

Introduction

Features

The MGPT-PNTM-B system boards combine the advanced capabilities of the latest Intel Pentium processors, peripheral component interconnect (PCI) technology, and high-speed, high-capacity memory and external cache systems in a powerful and feature-rich computing platform. The MGPT-PNTM-B product family provides:

- Flexibility to support varied CPU and memory configurations
- Supports 256KB or 512KB cache implemented with asynchronous SRAMs (MGPT-PNTM-B1), or 256KB cache using pipelined burst SRAMs (MGPT-PNTM-B2)
- VRM (voltage regulator module) and Socket 7 for supporting Pentium OverDrive Processors and the latest Pentium CPUs
- EDO (Extended Data Out) DRAM support for improved DRAM read performance
- On-board I/O for connecting high-performance peripheral devices such as a CD-ROMs, high-speed modems, or printers.

Cache

Two types of cache are available. The B1-series system board supports asynchronous SRAMs for industry-standard external cache performance enhancement. The B2-series system board uses pipelined burst SRAM cache for maximum cache performance. Both cache types support high-speed CPUs coupled with either EDO RAM or standard DRAM.

VRM/Socket 7

Voltage regulator module support and a CPU Socket 7 feature provides variable power options and flexibility for future Pentium CPU upgrades.

The Green PC Function

The Power Management Unit (PMU) controls and dramatically reduces overall system power consumption. This is accomplished by the activity monitors, which detect the system inactivity timer time-out, and signals the power-saving devices to slow down the clock frequency or remove the power sources from various peripherals.

There are four power management modes: Normal, Doze, Standby, and Suspend.

- NORMAL mode: This mode is the normal operation of the PC system. In this mode, the doze timer starts counting if no activity is taking place and the programmable time-out period has expired.
- DOZE mode: In this mode, the CPU clock frequency is slowed to one-half the normal frequency.
- STANDBY mode: This mode scales the CPU and system clock to a lower frequency (8MHz) and turns off the video signal to conserve power to the display monitor.
- SUSPEND mode: In this mode, the PMU stops the CPU clock, slows down the system clock, and powers down the external cache.

The power management setup is described under **BIOS Setup** in Chapter 4.

Identifying the Pentium CPU Family

The Pentium family of CPUs has been divided according to the specifications shown below. The following case markings are used to identify Pentium CPUs:

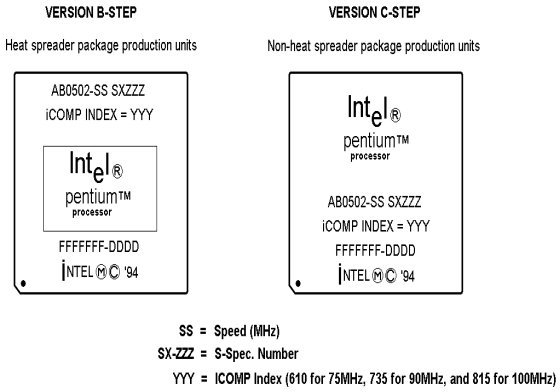


Figure 1-1. Pentium CPU Package Markings

Refer to the listing on page 2-6 for identification of the various Pentium CPU types.

The Pentium family of CPUs has been divided according to the specifications shown below. The case markings shown in Figure 1- are used to identify Pentium CPUs:

- P54C-120 C-Step is not supported in dual processor functions.
- The Pentium CPUs solve FPU faults beginning at B-Step.
- STD/VR/VRE Power Voltage Range:
  STD = 3.135 to 3.6 volts
  VR = 3.3 to 3.465 volts
  VRE = 3.45 to 3.6 volts
- All P54C-100 C2-Step STD voltage range is 3.135 to 3.6 volts.

VRM and Socket 7

The MGPT-PNTM-B provides a flexible system board architecture using a Voltage Regulator Module (VRM) socket and a CPU Socket 7.

Socket 7 has an additional pin (different from Socket 5) that supports Pentium OverDrive Processors.

A Voltage Regulator Module (optional) provides power regulation for voltages different than those of the on-board regulator. For example, the new higher frequency CPUs (such as the P54C OverDrive) operate at lower voltage than the first generation Pentium chips. The low-voltage feature of these chips will reduce power consumption and lower operating temperatures, but requires that a VRM power module be installed.

The on-board voltage regulator is enabled as Default (shorting jumpers are placed across pins P6-P7 and P21-P22 on the VRM socket). To install a VRM module, the jumpers must be removed from these pins.

P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26	P27	P28	P29	P30

EPP, ECP, and 16550

The MGPT-PNTM-B system board provides on-board I/O for connecting high performance external devices. The state of the art I/O includes:

- EPP (Enhanced Parallel Port)
- ECP (Extended Capabilities Parallel Port)
- 16550 UART chip

Both EPP (an IEEE P1284 standard) and ECP (created by Microsoft and Hewlett-Packard) are designed to provide a high-performance standard solution for connecting external devices such as CD-ROMs, HDDs, printers, etc. The high-speed 16550 UART supports high speed modems operating up to 115.2K baud.

Specifications

CPU:	Intel Pentium™ Processor P54C-75/90/100/120MHz; P54C-133MHz and Pentium OverDrive CPUs CPU ZIF Socket 7 and VRM socket, on-board regulators installed with separate CPU core and I/O power plane
System Clock:	50/60/66 MHz
Chipset:	Intel Triton Chipset 82437FX, 82438FX, 82371FB
Memory:	Four 72-pin (32- or 36-bit) SIMM sockets, 4, 8, 16, or 32MB SIMMs, 70ns or faster, supports EDO RAM type Maximum on-board system memory is 128MB
Cache Memory:	Supports 256KB and 512KB using 32Kx8 or 64Kx8 DIP standard SRAMs operating at 3.3V or mixed voltage (5V supply, 3.3V output) (MGPT-PNTM-B1) On-board pipelined burst SRAM (MGPT-PNTM-B2)
On-Board I/O	Two RS-232-C serial outputs (COM1 and COM2) that are 16550 compatible, one parallel printer port (SPP/EPP/ECP supported), floppy disk drive controller, and two (primary and secondary) Enhanced IDE HDD ports supporting Mode 4 Timings
Expansion Slots:	ISA bus 16-bit x 4 PCI Local Bus x 4 (all are master mode)
Shadow RAM:	System BIOS, video BIOS and adapter ROM BIOS
BIOS:	Award Pentium™ PCI BIOS with NCR PCI SCSI BIOS and 1MB Flash ROM
PCB Size:	220 x 330 mm 4-layer PCB
Turbo Speed:	Software/hardware toggle controlled
Green PC:	Meets EPA Green PC standard. Power consumption is under 30W during the Doze, Standby or Suspend mode

Jumpers and Connectors

The following is a list of the jumpers and connectors used on the MGPT-PNTM-B system board. The referenced pages provide more details.

Jumper / Connector Number	Function	Ref Page
J1	Power supply connector	2-7
J4	Keyboard connector	2-7
J5	Floppy drive connector	2-8
J7	RS232-2 (COM2) port	2-8
J8	Parallel printer port	2-8
J9	RS232-1 (COM1) port	2-8
J10	Primary IDE HDD connector	2-9
J11	Secondary IDE HDD connector	2-9
JP4, JP6	System clock jumper	2-4
JP10	Cache size jumper	2-3
JP11, JP27	CPU internal speed jumper	2-4
JP12	SRAM type selection jumper	2-4
JP16	CPU power voltage jumper	2-5
JP19	Keyboard lock connector	2-10
JP20	Speaker connector	2-10
JP21	Turbo Switch (not used)	2-10
JP22	Hard disk LED connector	2-11
JP23	Power saving toggle switch connector	2-11
JP24	Turbo LED connector	2-11
JP25	System reset switch connector	2-12

Chapter 2

System Board Setup

This chapter describes the individual jumpers and connectors on the MGPT-PNTM-B system board. If your system board has already been installed by the dealer, you should refer to this chapter if you plan to make any changes or to upgrade your system.

Installing the CPU

The Intel Socket 7 zero insertion force (ZIF) socket, incorporated on the MGPT system board, is designed specifically for the Pentium processor. When inserting the Pentium onto Socket 7, make sure pin 1 is properly aligned with the angled corner of the socket as shown in Figure 2-1.

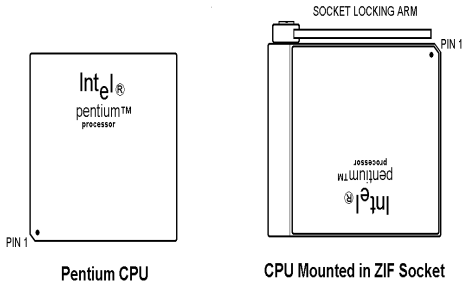


Figure 2-1. Pentium CPU Pin Alignment

Locate the dot and notch Pin 1 on one of the processor's corners and the angled corner of the ZIF socket. Raise the ZIF socket arm and insert the processor into the socket with pin 1 aligned at the angled corner. Fully lower the socket arm to lock the processor in place.

System Board Jumpers

Jumpers are used to select between various operating modes or options. A jumper switch consists of two or three gold pins projecting from the system board. Placing the plastic jumper cap over two pins connects those pins and makes a particular selection. If the cap is not placed over two pins, the pins are open and a connection is not made. This is the general method for storing jumpers when a connection is not required.

For all of the following jumpers,

- 1 – 2 indicates that a jumper is to be installed between pins 1 and 2 (pin 1 is identified only on connectors with 3 or more pins).
- 2 – 3 indicates that a jumper is to be installed between pins 2 and 3.
- "Short" indicates a jumper is installed on a connector with 2 or more pins.
- "Open" or no entry indicates that no jumper is to be installed (store the jumper on one pin only).

Figure 2-2 illustrates the jumper pins and cap, and the schematic equivalent. The Jumpers and Connectors Quick Reference located at the end of this chapter provides a layout of the system board to identify major components, jumpers and connectors.

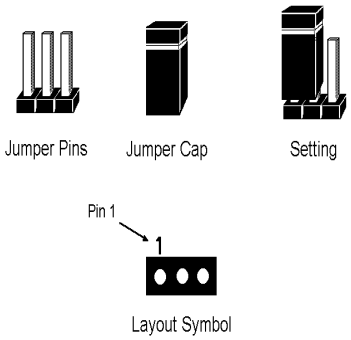


Figure 2-2. Jumper Pins, Cap and Layout

Configuring the System Board for Different Pentium CPUs

The system board supports Intel Pentium P54C-75/90/100/120 MHz CPUs. To install the CPU on this board, you must set the system clock (JP4, JP6), CPU power voltage (JP16) and CPU internal speed (JP11, JP27) to match the CPU specifications. For more information, refer to Chapter 1.

The following jumpers are used on the MGPT-PNTM-B system board. Please see the referenced pages for additional details:

Jumper No.	Function	Ref. Page
JP4, JP6	System Clock Speed	2-4
JP10	Cache Memory Size	3-3
JP11, JP27	CPU Internal Speed	2-4
JP12	Cache SRAM Voltage	3-4
JP16	CPU Power Voltage	2-5

A fold-out **Jumpers & Connectors Quick Reference** is located at the end of this chapter.

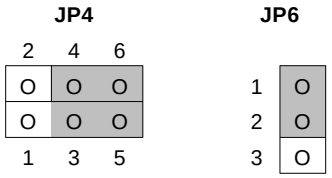
CPU Type

The CPU type must be selected as shown on page 1-2 and installed as shown on the previous pages in this chapter. Additionally, the system clock speed (JP4 and JP6), the CPU Power Voltage (JP16), and the CPU Core Frequency (JP11 and JP27) must be set. These settings are defined in the following paragraphs.

System Clock Speed (JP4, JP6)

The MGPT system board supports Intel 75/90/100/120/133 and 150 MHz Pentium processors (P54C), running at equivalent system clock speeds. You must set the System Clock jumpers (JP4 and JP6) to match the speed of the microprocessor. JP4 (2 pairs of 3-pins each, with pins 4 and 5 shown connected) and JP6 (3-pins with pins 1 and 2 shown connected) are illustrated below.

CPU Type	System Clock	System Clock Speed Jumpers	
		JP4	JP6
P54C-75	50 MHz	4-6, 3-5	1-2
P54C-90/120	60 MHz	2-4, 3-5	2-3
P54C-100/133	66 MHz	4-6, 1-3	2-3
P54C-150	60 MHz	2-4, 3-5	2-3



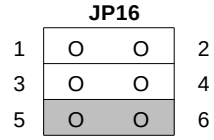
CPU Internal Speed (Core Frequency) (JP11, JP27)

CPU Type	Internal Speed Core Frequency	CPU Internal Speed Jumpers	
		JP11	JP27
P54C-75/90/100	1.5 x system clock	Open	Open
P54C-120/133	2 x system clock	Short	Open
P54C-150-150	2.5 x system clock	Short	Short
NA	3 x system clock	Open	Short

CPU Power Voltage (JP16)

Set jumper JP16 (3 pairs of 2-pins) for the CPU I/O voltage. The following table lists the CPU types and versions, followed by an illustration of the JP16 jumper.

CPU	Version Step	Voltage Version	S-Spec. Number	JP16
P54C-75	B	STD	SZ977	1-2
	C	STD	SX969 SZ944 SX998	1-2
P54C-90	B	STD	SX959 SZ978	1-2
	C	STD	SX968 SZ995	1-2
P54C-100	B	VRE	SX962	5-6
	C	STD	Q0697 SX963 SZ996	1-2
		VRE	SX970	5-6
P54C-120	C	STD/VRE	Q0711 SK086 SX994 QO732	5-6
P54C-133	C	STD/VRE	QO775 QO733 SK098	5-6
P54C-150		STD/VRE		5-6



System Board Connectors

Connectors interface the system board to other parts of the system, including the power supply, drives, keyboard and various controls on the front panel of the system case. Some connectors are polarized and require specific alignment during installation. Polarized connectors are shown with a plus (+) sign to denote the positive pin.

The following connectors are available on the MGPT system board:

Conn. No.	Function	Ref. Page
J1	Power Supply	2-7
J4	Keyboard Interface	2-7
J5	Floppy Drive Controller	2-8
J7	RS-232 (COM2) Serial Port-2	2-8
J8	Parallel Printer Port	2-8
J9	RS-232 (COM1) Serial Port-1	2-8
J10	Primary IDE Controller	2-9
J11	Secondary IDE Controller	2-9
JP19	Keyboard Lock	2-10
JP20	External Speaker	2-10
JP21	Turbo Switch (not used)	2-10
JP22	HDD Activity LED	2-11
JP23	Power Saving Switch	2-11
JP24	Turbo LED	2-11
JP25	System Reset Switch	2-12

A fold-out **Jumpers & Connectors Quick Reference** is located at the end of this chapter.

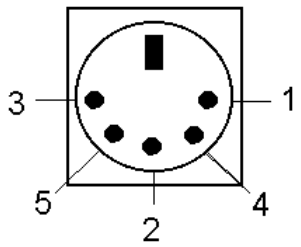
Power Supply (J1)

Most power supplies have two 6-wire plugs that must be connected to the system board. There are two black wires on each plug. Align the plugs so that the two black wires on each plug are positioned in the middle of the P1 connector as illustrated below. Before connecting to the power supply, make sure it is not connected to the AC power source.

J1-	Description	Wire Color
1	Power Good	Orange
2	+5V	Red
3	+12V	Yellow
4	–12V	Blue
5	Ground	Black
6	Ground	Black
7	Ground	Black
8	Ground	Black
9	–5V	White
10	+5V	Red
11	+5V	Red
12	+5V	Red

Keyboard Interface (J4)

This 5-pin DIN connector interfaces the keyboard to the system board.



J4-	Description
1	Keyboard Clock
2	Keyboard Data
3	No Connection
4	Ground
5	+5Vdc

Floppy Drive Controller (J5)

A floppy disk drive controller adapter card is not required with the MGPT system board. Connect a 5.25" or 3.5" floppy disk drive to this on-board controller. Two floppy disk drives can be connected on a standard drive cable in the same manner as when using a controller adapter card.

RS-232 (COM2) Serial Port-2 (J7)

Use this I/O serial port to interface a variety of devices, such as a mouse, modem, etc.

Parallel Printer Port (J8)

This I/O port supports SPP/EPP/ECP protocols. SPP (Standard Parallel Port) and EPP (Enhanced Parallel Port) are IEEE standards; ECP (Extended Capabilities Parallel port) is a protocol developed by Microsoft and Hewlett-Packard to provide high performance and standard solution for devices such as a CD-ROM drive, HDD, or parallel printer.

RS-232 (COM1) Serial Port-1 (J9)

Use this I/O serial port to interface a variety of devices, such as a serial mouse, modem, etc.

Enhanced IDE Hard Disk Drive Controller (J10, J11)

A hard disk drive controller adapter card is not required with the MGPT system board. Connect a hard disk drive to the on-board primary and secondary Enhanced IDE controller. Two hard disk drives can be connected through the cable assembly to the primary IDE controller and two to the secondary IDE controller for a total of four E-IDE drives.

Keyboard Lock Switch and Power-On LED (JP19)

When connected to a key switch on the front panel of the system case, turning and removing the key will disable the keyboard to prevent other users from operating your computer when you are not present. Orient the cable correctly when connecting the key switch to the main board; pin 1 is located on the left when viewing the board as shown in the Quick Reference at the end of this chapter.

JP19-	Description
1	+5Vdc (Power-On LED)
2	No Connection
3	Ground
4	Keylock Switch
5	Ground

External Speaker (JP20)

An external speaker can be interfaced to the system board through this connector. Pin 1 is located on the left when viewing the board as shown in the Quick Reference at the end of this chapter.

JP20-	Description
1	Speaker Signal
2	No Connection
3	Ground
4	+5Vdc

Turbo Switch (JP21)

Jumper JP21, which is reserved for connecting a toggle switch to change the CPU speed, is not supported on this system board. Use the CMOS Setup Utility (described in chapter 4) and select the BIOS Features Setup page to set the Boot Up System Speed to either High or Low.

HDD Activity Indicator (JP22)

This 4-pin connector can interface an LED on the front panel of the system case to indicate the activity status of the hard disk drive. The connector has two sets of pins (1-2 and 3-4); either set may be used for the respective LED (pins 1 and 4 are positive). Connect an LED between pins 1 and 2, or pins 3 and 4 of JP22 to indicate the activity status of the hard disk drive.

Power Management Mode Control (JP23)

By connecting JP23 to a control switch on the front panel of the system case, you can directly trigger the system into the Suspend mode. This will reduce the CPU clock to zero MHz and power down the external cache. The system can be resumed by again pressing the power saving control switch or by using the auto-wake-up feature (pressing any key or moving the mouse).

The system will go into its power saving mode when the connector is shorted by the mode control switch, and revert to normal operation when the connector is open.

Turbo LED (JP24)

Install the turbo LED to this connector to indicate when the turbo function is turned on. Observe polarity of the connector when installing the LED.

JP24	Description
1	System Reset
2	Ground

System Reset Switch (JP25)

This connector interfaces the system reset switch on the front panel of the system cabinet. The switch causes the system board to perform a cold start from the power-on self test without turning off power to certain components, such as the hard disk drive.

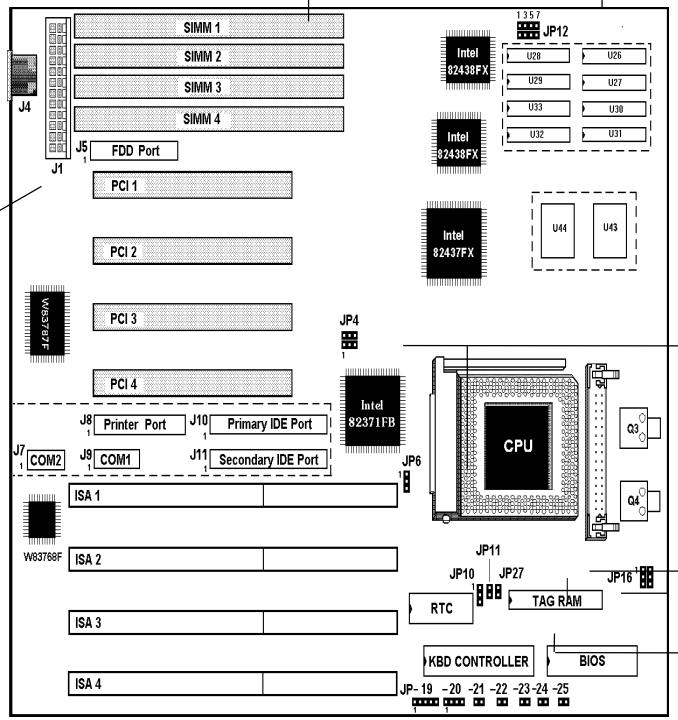
JP25	Description
1	Reset
2	Ground

Jumpers & Connectors Quick Reference

Main Memory SIMMs

SRAM Voltage:

	Mixed Voltage	3.3V Mode
JP12:	1-2, 3-4	5-6, 7-8



Asynchronous SRAM cache (U26-U33) (MGPT-PNTM-B1)

Pipelined Burst Cache (U43-U44) (MGPT-PNTM-B2)

VRM Socket:

On-board regulator enabled

Short: Pins 6-7 21-22

J6-J11: On-board I/O

J19: Keyboard Lock/Power-on LED
J20: External Speaker
J21: Turbo Switch (not used)
J22: HDD Activity LED
J23: Power Saving Toggle
J24: Turbo LED Connector

Cache Size:

	0KB	256KB	512KB
JP10:	Open	2-3	1-2

CPU Type:

CPU	Voltage Version	S-Spec. Number	I/O Vcc	System Clock			CPU Int. Speed	
			JP16	Freq	JP4	JP6	JP11	JP27
P54C-75	STD	SZ977 SX969 SZ944 SX998	1-2	50MHz	3-5 4-6	1-2	Open	Open
P54C-90	STD	SX959 SZ978 SX968 SZ995	1-2	60MHz	2-4 3-5	2-3	Open	Open
P54C-100	STD	Q0697 SX963 SZ996	5-6	66MHz	1-3 4-6	2-3	Open	Open
	VRE	SX962 SX970						
P54C-120	VRE	QO711 QO732 SX994 SK086	5-6	60MHz	2-4 3-5	2-3	Short	Open

MGPT-PNTM-B System Board

Chapter 3

Memory Installation

The MGPT-PNTM-B system boards provide SIMM installation slots for 8MB to 128MB of system memory. There is also external cache memory availability on the system board that provides for 0KB up to 512KB installed. This chapter describes the types of memory devices that should be used with the system board and explains how to install the memory.

Main Memory

The system board supports combinations of 72-pin (32- or 36-bit) SIMMs x 4 up to 128MB. The DRAM or EDO RAM is interleaved, requireing that you install two SIMM modules for each bank used (either bank may be installed first). The DRAM modules must be of the same size, speed, and may be either single- or double-sided. The on-board SIMM sockets are illustrated in the ***Jumpers and Connectors Quick Reference*** fold-out page at the end of Chapter 2. The socket pin arrangements and possible configurations are shown on the next page.

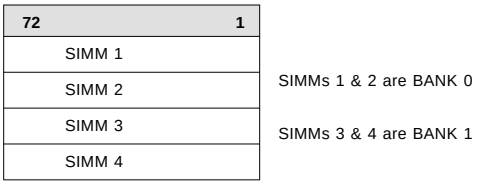
DRAM Installation

BANK 0		BANK 1	
SIMM 1	SIMM 2	SIMM 3	SIMM 4
S/S	S/S	—-	—-
S/S	S/S	S/S	S/S
S/S	S/S	D/S	D/S
—-	—-	S/S	S/S
D/S	D/S	—-	—-
D/S	D/S	S/S	S/S
D/S	D/S	D/S	D/S
—-	—-	D/S	D/S

S/S = Single-side 72-pin SIMMs are 4MB, or 16MB modules
D/S = Double-side 72-pin SIMMs are 8MB, or 32MB modules
—- = Empty

DRAM Specifications:
Speed = 70-ns or faster for 75 or 90 MHz Pentiums
60-ns for 100 MHz Pentium
Parity = Either parity or non-parity

SIMM Pin Arrangement



Possible Configurations

BANK 0 SIMMs 1 & 2	BANK 1 SIMMs 3 & 4	Total Memory Size
4MB x 2	None	8MB
8MB x 2	None	16MB
16MB x 2	None	32MB
32MB x 2	None	64MB
None	4MB x 2	8MB
None	8MB x 2	16MB
None	16MB x 2	32MB
None	32MB x 2	64MB
4MB x 2	4MB x 2	16MB
4MB x 2	8MB x 2	24MB
4MB x 2	16MB x 2	40MB
4MB x 2	32MB x 2	72MB
8MB x 2	4MB x 2	24MB
8MB x 2	8MB x 2	32MB
8MB x 2	16MB x 2	40MB
8MB x 2	32MB x 2	80MB
16MB x 2	4MB x 2	40MB
16MB x 2	8MB x 2	48MB
16MB x 2	16MB x 2	64MB
16MB x 2	32MB x 2	96MB
32MB x 2	4MB x 2	72MB
32MB x 2	8MB x 2	80MB
32MB x 2	16MB x 2	96MB
32MB x 2	32MB x 2	128MB

External Cache Memory

Two types of cache are available for this board. The MGPT-PNTM-B1 uses asynchronous SRAM external cache, which provides industry-standard performance enhancement. The MGPT-PNTM-B2 uses pipelined burst SRAM for maximum cache performance. Both cache systems support high-speed CPUs coupled with either EDO DRAM or standard DRAM system memory.

The pipelined burst mode cache is soldered on the board and has no user changeable settings. Asynchronous SRAM mode allows you to set the cache size and operating voltage for the specific SRAM type being used.

When you first install the asynchronous cache memory on your system board (and each time you upgrade or modify it), you will need to adjust the cache memory jumper settings. The cache size is controlled by jumper JP10. The SRAM Voltage is selected with jumper JP12.

Asynchronous Cache Size (JP10)

Set jumper JP10 for the proper size of external cache. This jumper is used only on MGPT-PNTM-B1 series system boards.

Cache Size	Tag RAM (U38)	Data RAM (U26-U33)	JP10
256KB	8K x 8	32Kx8	2-3
512KB	16K or 32K x 8	64Kx8	1-2

* **Note:** To disable the external cache, use the BIOS Features Setup Screen in the System BIOS setup options.

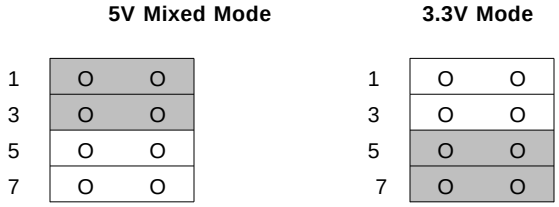
Asynchronous SRAM Voltage (JP12)

Set jumper JP12 to select the operating voltage for the type of SRAM installed. This jumper is used only on MGPT-PNTM-B1 series system boards.

Jumper JP12 consists of 4 sets of 2-pin jumpers.

For 5V mixed mode cache, place shorting jumpers between pins 1 & 2, and pins 3 & 4.

For 3.3V SRAM cache, place shorting jumpers between pin 5 & 6 and pins 7 & 8.



Chapter 4

BIOS Setup

The Award BIOS ROM used on the MGPT-PNTM-B system boards has a setup program that allows you to modify the basic system configuration. The BIOS data are stored in CMOS RAM so that the setup configuration will be retained when the power is turned off. After you complete the setup configuration, you should only need to access the BIOS Setup program if you want to change this setup, or reset the date or time.

CMOS Setup Utility

Power on the computer and press **Del** immediately to enter the Setup program. The CMOS Setup Utility (Initial) menu is shown in Figure 4-.

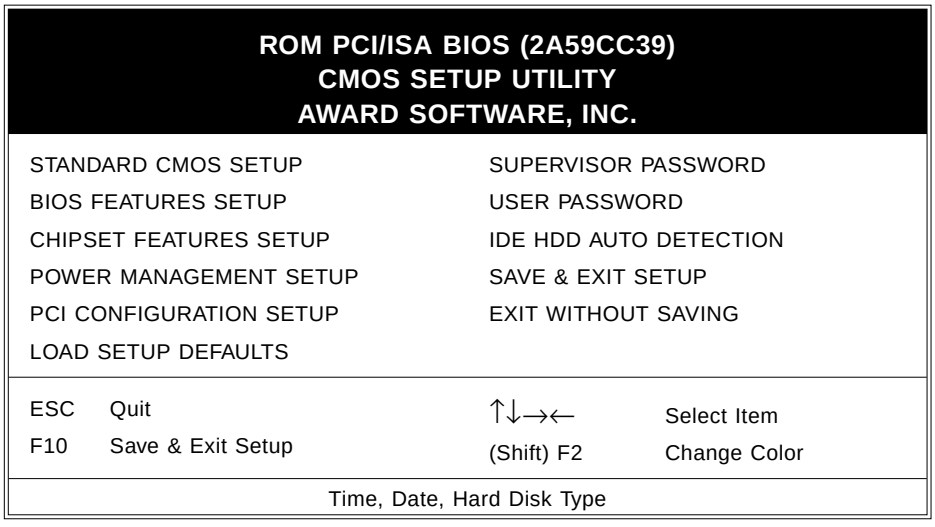


Figure 4-1. BIOS Setup Program Initial Menu

Standard CMOS Setup

Choose the **Standard CMOS Setup** option from the CMOS Setup Utility menu. The menu in Figure 4- allows you to configure date, time, hard disk drive, floppy disk drive, display and memory. When a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen. Cursor movement directions are at the bottom of the screen.

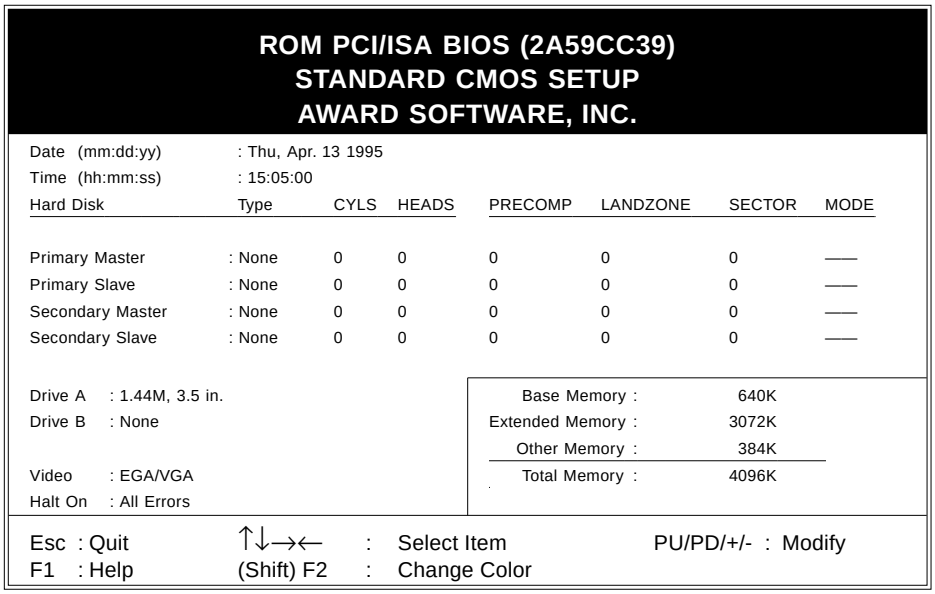


Figure 4-2. Standard CMOS Setup Menu

Specifications for hard disk drives such as MFM, ESDI, or IDE, must be recorded here. SCSI drives operate with device drivers and are not supported directly by BIOS. The BIOS provides three modes to support IDE hard disks:

- **Normal** - for IDE drives smaller than 528MB, or as defined by your controller or HDD specifications.
- **LBA** - for drives larger than 528MB and up to 8.4GB that use Logic Block Addressing (LBA) mode.
- **Large** - for drives larger than 528MB that do not use LBA mode. The Large mode is a new specification which may not be fully

supported by all operation systems. Presently, it can only be used with MS-DOS.

BIOS Features Setup

Select the **BIOS Features Setup** option from the CMOS Setup Utility menu to display the screen in Figure 4-. This menu contains the system board's default values. The values shown are manufacturer's defaults; they can be changed as needed for your system.

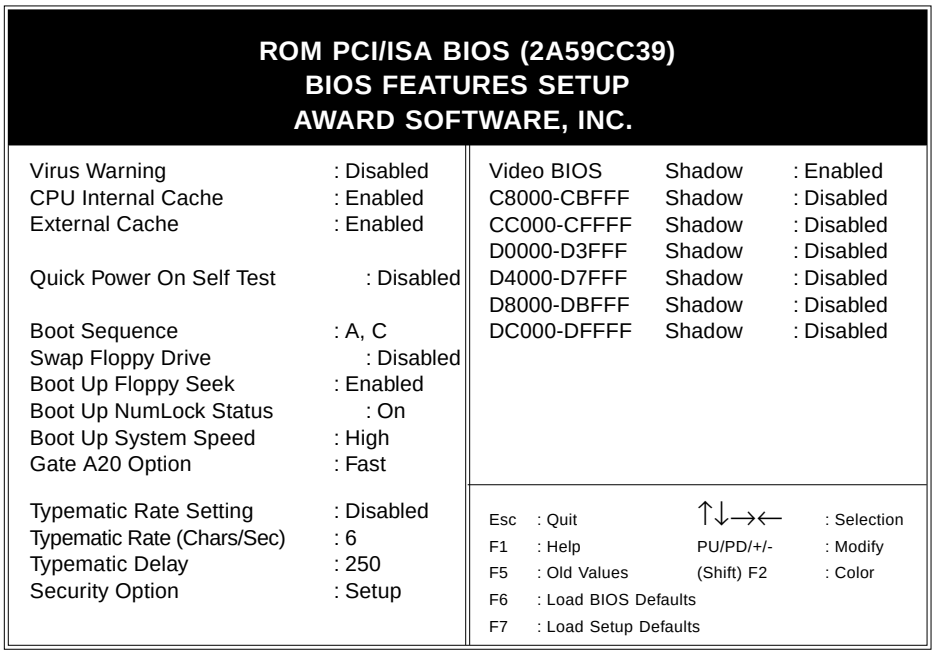


Figure 4-3. Standard CMOS Setup Screen

Virus Warning

☐ **Disabled** ☐ **Enabled**

When enabled, this feature protects the boot sector and partition table of your hard disk. Any attempt to write to them will halt the system

and cause a warning message to appear. If this happens, you can either allow the operation to continue or stop it.

Cache Control

CPU Internal Cache: ☐ **Disabled** ☐ **Enabled**
External Cache: ☐ **Disabled** ☐ **Enabled**

Boot Up Features

Boot Sequence: ☐ **A,C** ☐ **C,A**

This selects the drive for the system to search first for boot data. If your system boots from the hard disk, you should select to search it first and eliminate the time spent searching for the data in drive A.

Swap Floppy Drive: ☐ **Disabled** ☐ **Enabled**

Enabling this feature swaps the floppy drive assignment so that drive A will function as drive B, and drive B will function as drive A.

Boot Up Floppy Seek: ☐ **Enabled** ☐ **Disabled**

During POST Procedure, the BIOS will determine if the installed floppy disk drive is 40 or 80 tracks (360KB is 40 tracks; 760KB, 1.2MB and 1.44MB are all 80 tracks). If this function is enabled, there will be a warning message when a 360K floppy drive is installed.

Boot Up NumLock Status: ☐ **On** ☐ **Off**

ON: Keypad is set to number-mode keys following.
Off: Keypad is set to arrow-mode keys.

Boot Up System Speed: ☐ **High** ☐ **Low**

If set to high speed, the system will run at high speed immediately after power on.

Gate A20 Option

☐ **Fast** ☐ **Slow**

Gate A20 controls the ability to access memory addresses above 1MB. It speeds up programs that constantly change from addressing conventional memory to addressing memory above 1MB (between real and protected address modes). For example, setting this option to fast makes programs such as network operating systems execute faster.

Typematic Rate Setting

☐ **Disabled** ☐ **Enabled**

This feature defines the keyboard's Typematic Rate and Typematic Delay. When disabled, the default values of 6 characters/sec and 250ms delay are used.

Typematic Rate (Chars/Sec): The values are 6, 15, 20, 24, and 30 characters per second.

Typematic Delay (key repeat rate): The values are 250, 500, 750, and 1000 milliseconds

Security Option

System: ☐ **Setup** ☐ **System**

Setup: The system will boot but access to the BIOS setup will be denied until the correct password is entered.

System: The system will not boot and access to the BIOS setup will be denied until the correct password is entered.

When either selection is enabled, a prompt will display for you to enter and confirm your own password. If a password is totally lost, you will need to reinstall the operating system in order to circumvent the password requirement.

System BIOS Shadow

This option enables the system shadow to achieve the best performance of the system.

Video BIOS Shadow:	☐ **Disabled**	☐ **Enabled**
C8000-CBFFF:	☐ **Disabled**	☐ **Enabled**
CC000-CFFFF:	☐ **Disabled**	☐ **Enabled**
D0000-D3FFF:	☐ **Disabled**	☐ **Enabled**
D4000-D7FFF:	☐ **Disabled**	☐ **Enabled**
D8000-DBFFF:	☐ **Disabled**	☐ **Enabled**
DC000-DFFFF:	☐ **Disabled**	☐ **Enabled**

If you shadow the BIOS at any of the above segments, you can set the appropriate memory cacheable function to **Enabled.**

Chipset Features Setup

Choose **Chipset Features Setup** from the CMOS Setup Utility menu to display the screen in Figure 4-. This sample screen contains the manufacturer's default values for the system board.

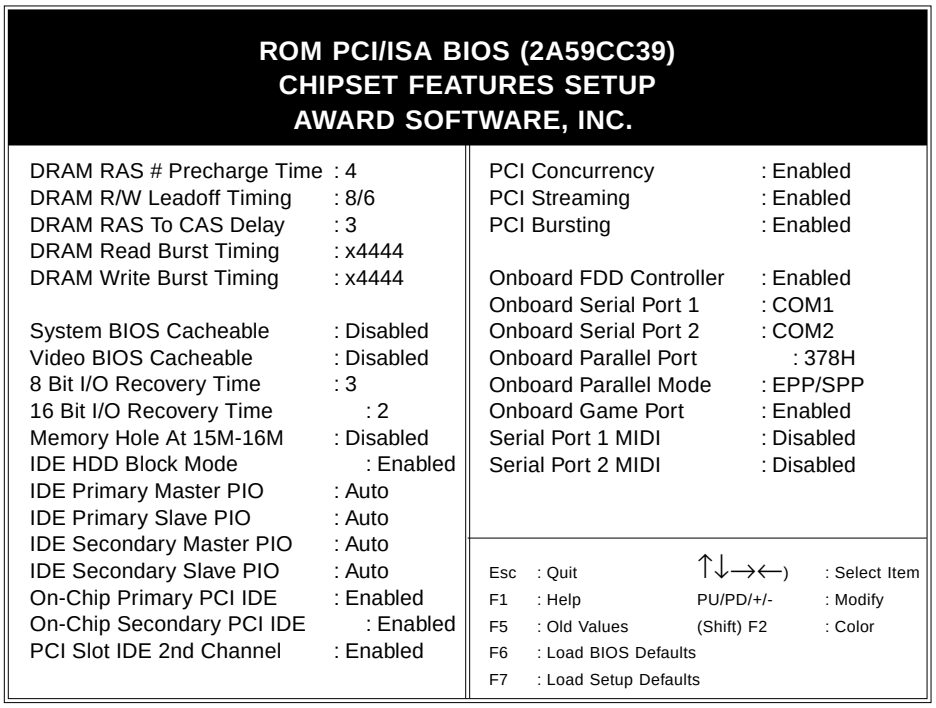


Figure 4-4. Chipset Features Setup Menu

All entries shown in this menu are optimal settings for the system board's chipset; the entries should not be changed.

IDE HDD Block Mode:

☐ Disabled ☐ Enabled

This feature enhances hard disk performance by making multisector transfers instead of one sector per transfer.

On-Board I/O Controller

Onboard FDD controller:	☐	**Enable**	☐	**Disable**				
Onboard Parallel Mode:	☐	**EPP/SPP**	☐	**ECP/EPP**				
Onboard Parallel Port:	☐	**278H**	☐	**378H**				
Onboard Serial Port 1:	☐	**COM1**	☐	**COM3**	☐	**COM4**	☐	**None**
Onboard Serial Port 2:	☐	**COM2**	☐	**COM3**	☐	**COM4**	☐	**None**
Onboard Game Port:	☐	**Enable**	☐	**Disable**				

I/O ADDRESSES

Port	I/O Add	IRQ #
COM1	**3F8H**	**IRQ4**
COM2	**2F8H**	**IRQ3**
COM3	**3E8H**	**IRQ4**
COM4	**2E8H**	**IRQ3**
LPT1	**378H**	**IRQ7**
LPT2	**278H**	**IRQ5**

Power Management Setup

Choose **Power Management Setup** from the CMOS Setup Utility menu to display the screen in Figure 4-. This menu provides the Green PC power management features.

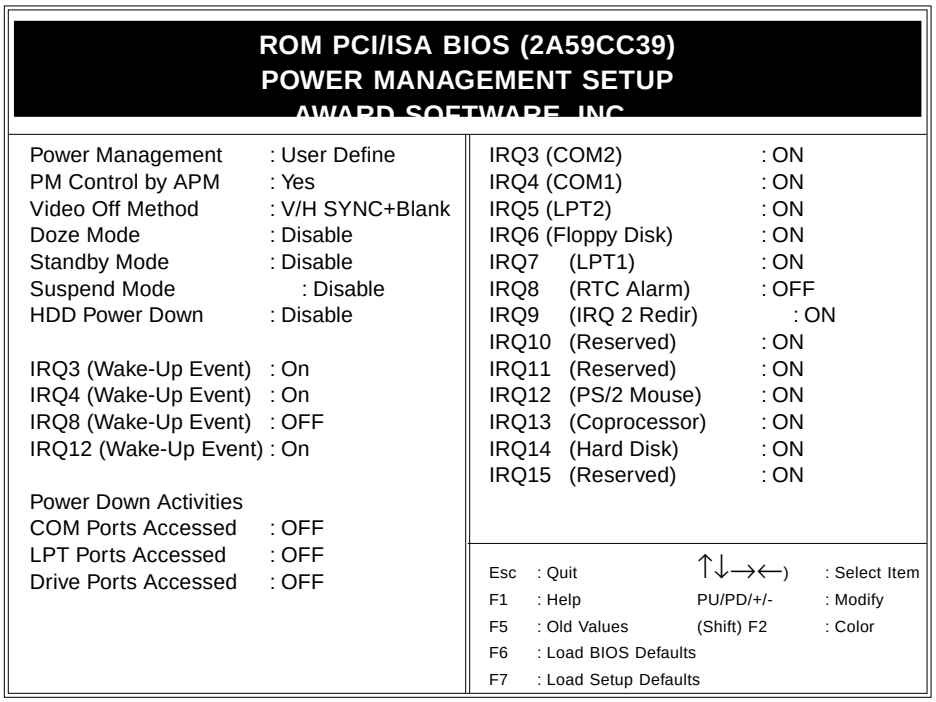


Figure 4-5. Power Management Setup Menu

Power Management Mode

The four Power Management timer modes are set by pressing the directional arrow keys (↑↓→←). The four modes are:

- Disable
- Max. Saving
- Min. Saving
- User Define

Disable Mode

This mode disables the power management function; the system will be in the non-green operation mode.

Max. Saving Mode

When you select this mode, you will be presented the system maximum values of four related timers (1 hour).

Min. Saving Mode

When you select this mode, you will be presented the system minimum values of four related timers (2 minutes).

User Define

You can define your own required power management delay values by setting up the following four PM timers:

a. HDD Power Down Timer

☐ **Disabled** ☐ **1, 5, 10, 15min.**

The range of this flexible HDD Off timer is 1 to 15 minutes. Once the system stops reading from or writing to the HDD, the standby timer starts counting. If there is no activity and the defined timeout period expires, the system will shut off the HDD power. The HDD will not resume its function until a read/write command is executed.

b. Doze Timer

☐ **Disabled** ☐ **2, 3, 5, 7, 9, 11, 21, 31, 41 min, 1 hr.**

The Doze Timer starts counting at the end of each activity, If there is no further activity during the defined period, the timer will scale the CPU and system clock at the lower frequency (8MHz), and motivate the enabled PM Events. When you press any keyboard key or move the mouse, the CPU and system clock will auto-wake-up to a normal operation.

The range of the Doze mode timer is 2 minutes to 1 hour.

c. Standby Timer

☐ **Disabled** ☐ **2, 3, 5, 7, 9, 11, 21, 31, 41 min, 1 hr.**

The Standby timer starts counting at the end of each activity. If there's no further activity during the defined period, the system will scale the CPU and system clock at the lower frequency (8MHz) and motivate the enabled PM Events. It will enable the monitor to enter an inactive mode with a blank screen. The monitor will not display again until you press any key or move the mouse.

The range of the Standby mode timer is 2 minutes to 1 hour.

d. Suspend Timer

☐ **Disabled** ☐ **2, 3, 5, 7, 9, 11, 21, 31, 41 min, 1 hr.**

The Suspend timer will be functional only if your system uses the Intel SL-Enhanced series CPU. The Suspend timer starts counting at the end of each activity. If there's no further activity during the defined period, the system will shut off the CPU, HDD, and monitor power to enter the Suspend mode.The power consumption in this mode is even lower than that of the Standby mode.

The range of the Suspend mode timer is 2 minutes to 1 hour.

Power Management Events

Power Management Events include:

- Local Master
- Local Device
- Video Activities
- DMA Activities
- IRQ1 through IRQ15

The IRQ8 (RTC Alarm) default setting is disabled in order to make sure that the Power Management mode can be executed under OS2. You can customize a combination of PM Events by selecting “Enable”, which will determine whether or not the related function is still working before the respective defined power management mode is executed.

PM Control by APM

☐ **Yes** ☐ **No**

Supports the Intel and MicroSoft INT 15h Advanced Power Management BIOS function, which creates an interface for the OS to communicate with the SMM code. If the APM is not installed, this option has no effect.

Video Off Method

☐ **V/H SYNC+Blank** ☐ **Blank Screen**

Blank – The BIOS will blank the screen when the video is disabled. V/H-SYNC+Blank – The BIOS will blank the screen and turn off V/H-SYNC signals from VGA cards to the monitor.

If a Green monitor detects no V/H-SYNC signals, it turns off the electron gun to save power.

Power Management Mask Control

Wakeup Events

If an interrupt request is generated by a device using that IRQ, it will wake up the system to normal mode (supported by any green modes).

Power Down Activities

If any event occurs while the system is in a power down mode, the system will return to the normal mode.

Timer Modes

If any event occurs while the system is in a Doze, Suspend or Standby mode, the system will return to the normal mode.

PCI Configuration Setup

This section provides information for configuring the PCI and Onboard I/O features. Choose **PCI Configuration Setup** option from the CMOS Setup Utility to display the menu shown in Figure 4-.

Set all INT#'s to Auto. All PCI adapters should use INTA. The BIOS will route each INTA to correspond to the IRQ automatically.

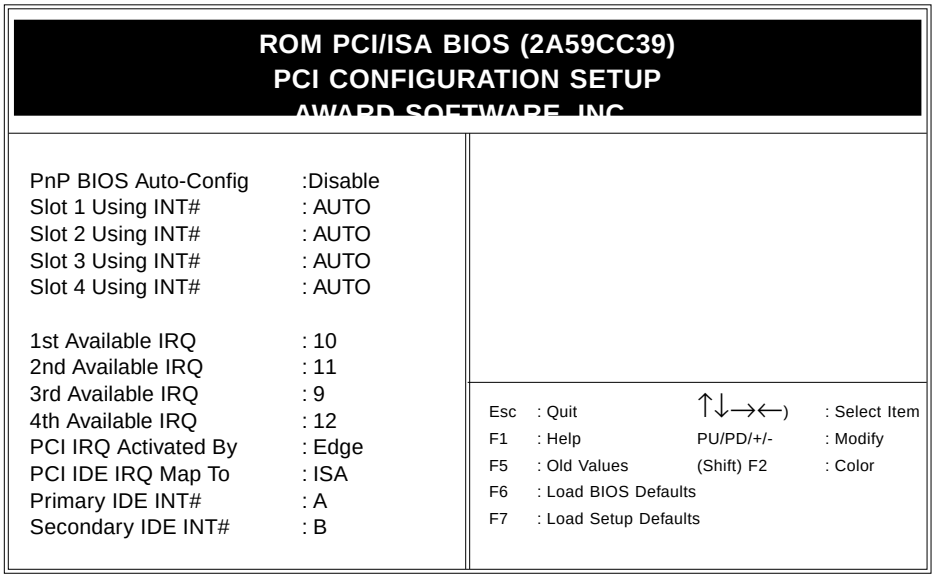


Figure 4-6. PCI Configuration Setup Menu

If PnP BIOS Auto-Config is set to enable, all IRQs are set automatically by the BIOS. If PnP Auto-Config is set to disable, the IRQs can be set manually.

Set all INT # to AUTO and all PCI adapters to use INTA. The BIOS will automatically route each INTA to correspond with the IRQ.

PCI's INT Routing Setup

Slot 1 Using INT#: ☐ Auto ☐ A ☐ B ☐ C
Slot 2 Using INT#: ☐ Auto ☐ A ☐ B ☐ C
Slot 3 Using INT#: ☐ Auto ☐ A ☐ B ☐ C
Slot 4 Using INT#: ☐ Auto ☐ A ☐ B ☐ C

1at Available IRQ: ☐ 3 ☐ 4 ☐ 5 ☐ 7 ☐ 9 ☐ 10
☐ 11 ☐ 12 ☐ 14 ☐ 15 ☐ NA

2nd Available IRQ: ☐ 3 ☐ 4 ☐ 5 ☐ 7 ☐ 9
☐10
☐ 11 ☐ 12 ☐ 14 ☐ 15 ☐ NA

3rd Available IRQ: ☐ 3 ☐ 4 ☐ 5 ☐ 7 ☐ 9 ☐ 10
☐ 11 ☐ 12 ☐ 14☐ 15 ☐ NA

4th Available IRQ: ☐ 3 ☐ 4 ☐ 5 ☐ 7 ☐ 9 ☐ 10
☐ 11 ☐ 12 ☐ 14 ☐ 15 ☐ NA

Slot 1	Slot 2	Slot 3	Slot 4	
A	**D**	**C**	**B**	1st Available IRQ
B	**A**	**D**	**C**	2nd Available IRQ
C	**B**	**A**	**D**	3rd Available IRQ
D	**C**	**B**	**A**	4th Available IRQ

The PCI Local Bus specifies four INTs (A-D) for each PCI slot.

The INTA of slot 1, INTD of slot 2, and INTC of slot 3 are connected together and directed to the first available IRQ. Also, the 2nd, 3rd, and 4th available IRQ's are also shared by the INT's of different slots.

Most PCI devices use INTA for their interrupt pins and choose “AUTO” for the BIOS to automatically assign an INT number to different IRQ's. When using a PCI IDE adapter IRQ Paddle board, set IRQ=NA, otherwise, to IRQ=14 or 15.

PCI IRQ Activated By

☐ **Level** ☐ **Edge**

Tells the chipset if the IRQ signals input is level or edge trigger.

Note: Most PCI controllers use **LEVEL** to activate the PCI IRQ.

PCI IDE IRQ Map To

☐ **PCI-AUTO** ☐ **PCI-SLOT x** ☐ **ISA**

a. PCI AUTO

The BIOS will scan for PCI IDE devices to determine their location and assign IRQ14 as the primary IDE INT #, and IRQ15 for the secondary IDE INT #.

b. PCI-SLOT x

Assign IRQ14 for the primary IDE INT # for the specified slot number.

c. ISA

The BIOS will not assign any IRQs to IDE INT for some PCI IDE card which use a paddle card to connect ISA IRQ or using the on-board controller.

Load Setup Defaults

Select the **Load Setup Defaults** option from the CMOS Setup Utility menu to configure the BIOS to load the system defaults directly from CMOS. If the configured setup record created by the Setup program becomes corrupted (and therefore unusable), the system defaults will be loaded automatically when you turn the computer on.

When you select this option, you will be prompted to "Load Setup Defaults". Respond with Y or N as appropriate.

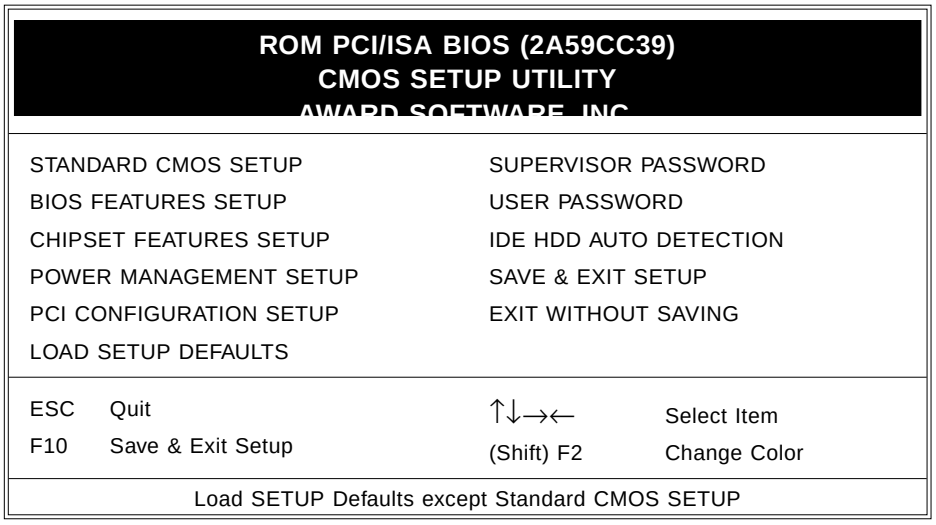


Figure 4-7. BIOS Setup Program Initial Menu

Supervisor/User Password

Select either the **Supervisor Password** or the **User Password** option from the CMOS Setup Utility menu when you want to initially set the password, and when you want to change or delete an existing password.

When you use this option to initially set a password, you will be prompted to "Enter Password". Press **Enter** (this is the ROM default password) and continue to set up the initial password. At other times, the prompt will require the valid password to be entered.

After the ROM password (Enter) or valid password has been entered, you can either accept the existing password, set up a new one, or delete the password entirely. A password can be from three to eight characters in length.

The Supervisor Password controls the system setup to prevent unauthorized changes to the computer system. The User Password option controls the system bootup process to prevent unauthorized uses of the computer. Either or both passwords may be enabled or disabled.

You may need to set the "Security Option" in the BIOS Features menu to either "System" or "Setup" so that a password will be required to run the system, or to access the BIOS setup only.

IDE Hard Disk Auto Detection

This utility automatically detects the IDE hard disk type; use this to confirm your hard disk data when it is unknown.

Select the **IDE HDD Auto Detection** from the CMOS Setup Utility menu. Upon detection, the HDD type and peripheral data will be displayed. A message prompt will display in the center of the menu asking you to accept or disregard the detected drive.

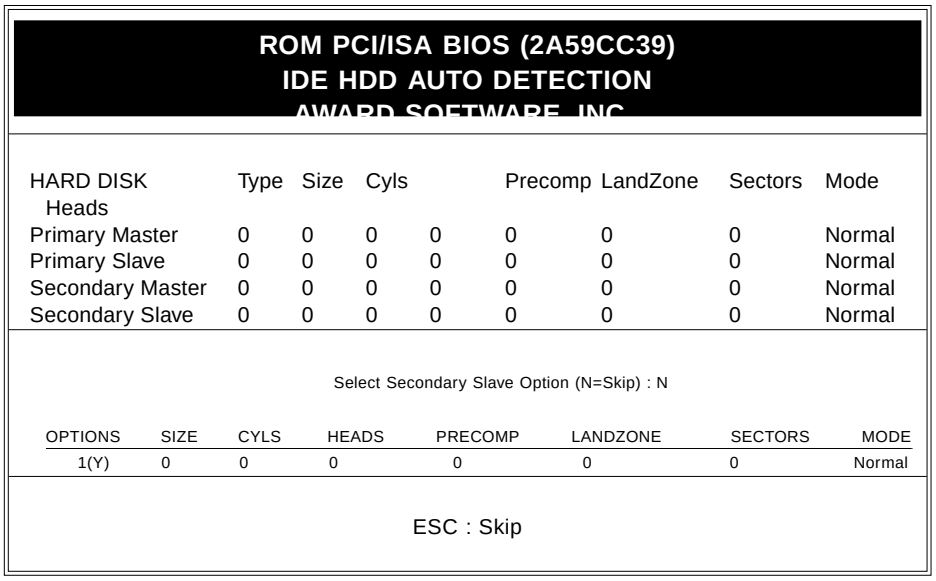


Figure 4-8. IDE HDD Auto Detection Menu

Save and Exit Setup

If you select this option and press the [Enter] key, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The microprcessor will check these values whenever you turn on your system, and compare them to what it finds as it checks the system. This record is required for the system operation.

Exit Without Saving

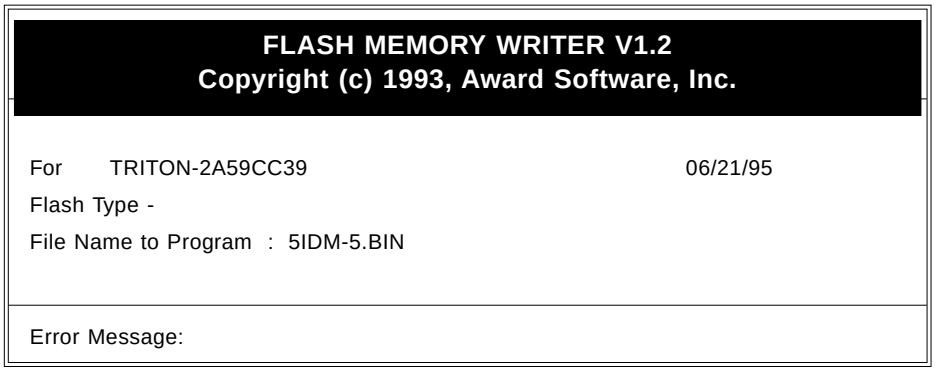
Selecting this option and pressing the [Enter] key lets you exit the Setup program without recording any new values or changing the old ones.

Appendix A

Updating the System BIOS

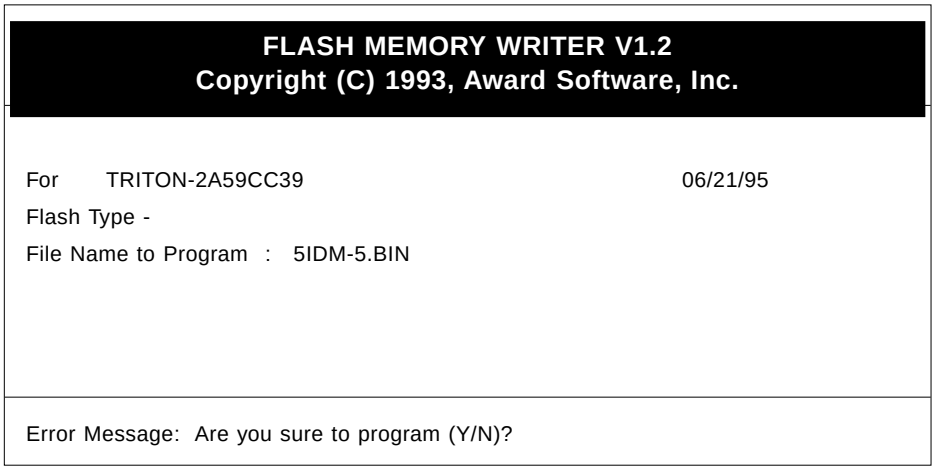
This appendix provides instructions on how to update the system BIOS using the FLASH ROM BIOS feature, which permits you to update the BIOS without exchanging EPROM chips. Upon receipt of a manufacturer's or dealer's diskette containing the BIOS update data, perform the following procedure to update the BIOS:

1. Insert the BIOS data diskette in drive A or B. Make that drive active and type “AWD FLASH” at the DOS command line and press **Enter**. The following screen will be displayed.



2. Type in the BIOS file name to program, which will be furnished by your dealer when a new BIOS update is released. In the screen above, the file name **5IDM-5.BIN** is shown already typed in. As soon as you enter the file name and press **Enter**, a message will appear at the bottom of the screen to prompt if you want to save the (current) BIOS data.

3. Press **Y** if you want to save the previous BIOS to the BIOS data diskette. Press **N** if you do not want to save the previous BIOS data. Press **Enter**. A prompt will display the Error Message window to confirm that you want to proceed with the update ("Are you sure to program (Y/N)")



4. Press **Y** for Yes if you want to continue the BIOS update. Press **N** for No if you want to quit without programming the BIOS update. The following screen will display to show the status of the update routine:
5. Following successful update, the computer will auto-restart.
6. Enter the CMOS Setup and load setup defaults.

System Problem Report

Customer Identification	SPR/Product Identification
Name: Company: Address Country: Phone Number: FAX Number:	Date: Purchase Date: Invoice Numbr: Serial Number: Product Name: Model Number:

System Configuration

Host Computer System:
System Clock Rate:
Memory Installed:

BIOS Name/Rev:
Operating System:
Application S/W:

	Product Name	I/O Address	RAM Address	ROM Address	IRQ Line	DMA Chan
Graphics:						
Disk Controller:						
LAN:						
Other I/O Board:						

Problem Description

Instructions

This SPR form has been included with your Mylex product as a convenience to both you and our Technical Services Department. If filled out completely, this will greatly assist Mylex personnel in quickly resolving any technical problem or question.

1. Use a separate sheet for each product. Photocopy as necessary, keep a copy fo ryour own records.

2. If possible, include version numbers of any products mentioned in the system configuration.

3. Report the minimum configuration in which the reported problem appears.

4. Attach any relavent printouts or copies of manual pagees to this report.

5. Use Mylex FAX number (510) 745-7715 to transmit to the Technical Services Department, or mail to Mylex Corporation, Technical Services Department, P.O. Box 5035, Fremont, CA, 94537-5035.

6. This form is not an RMA. An RMA number must be obtained before shipping any products to Mylex for any reason.

P/N: 772014-B