SOYO™

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Version 1.0

32 A2/A5/A1M and 33 A2/A5/A1M SERIAL

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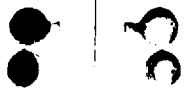
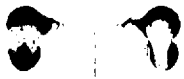




1 Introduction

The Pentium / P54C PCI mainboard is a high-performance system board that supports a Pentium CPU running at 60 / 66MHz or a P54C CPU running at 75 / 90 / 100MHz. You can install 256K to 1M of external cache memory on the mainboard. The mainboard is fully compatible with industry standards, and adds many technical enhancements.

Key Features

- Pentium CPU running at 60MHz or 66MHz bus speed (32 SERIAL)
- P54C CPU running at 75MHz, 90MHz or 100MHz bus speed (33 SERIAL)
- Integrated Second Level (L2) Cache Controller
  - Write Through and Write Back Cache Modes
  - Direct Mapped Organization
  - Supports 256K to 1M cache sizes
- Integrated DRAM Controller
  - Concurrent Write Back
  - CAS#-before-RAS# Transparent DRAM Refresh
  - 256K, 1M, 4M, or 16M x N 70ns Fast Page Mode DRAM (72-pin SIMM)
  - On-board memory configurations up to 128Mbytes
- One Programmable Non-Cacheable Region
- Option to Disable Local Memory in Non-Cacheable Regions
- Shadow RAM in Increments of 16 Kbytes
- Supports Pentium / P54C SMM Mode
- Supports CPU Stop Clock
- Supports High performance PCI Arbiter
- Integrated PCI Bridge
  - Translates the CPU Cycles into the PCI Bus Cycles
  - Provides CPU-to-PCI Read Assembly and Write Disassembly Mechanism
- Four 32-bit PCI slots (Masters) and Four ISA slots
- 4-layer PCB
- System BIOS supports NCR SCSI Card BIOS

Unpacking the Mainboard

The mainboard package contains:

- The Pentium / P54C Mainboard
- This User's Guide

Note: Do not unpack the mainboard until you are ready to install it.

Follow the precautions below while unpacking the mainboard.

1. Before handling the mainboard, ground yourself by grasping an unpainted portion of the system's metal chassis.
2. Remove the mainboard from its anti-static packaging and place it on a grounded surface, component side up.
3. Check the mainboard for damage. If any chip appears loose, press carefully to seat it firmly in its socket.

Do not apply power if the mainboard appears damaged. If there is damage to the board contact your dealer immediately.

Electrostatic Discharge Precautions

Make sure you ground yourself before handling the mainboard or other system components. Electrostatic discharge can easily damage the components. Note that you must take special precaution when handling the mainboard in dry or air-conditioned environments.

Take these precautions to protect your equipment from electrostatic discharge:

- Do not remove the anti-static packaging until you are ready to install the mainboard and other system components.
- Ground yourself before removing any system component from its protective anti-static packaging. To ground yourself grasp the expansion slot covers or other unpainted portions of the computer chassis.
- Frequently ground yourself while working, or use a grounding strap.
- Handle the mainboard by the edges and avoid touching its components.

032 Mainboard Layout w/ default settings*

***Default settings: Pentium-66MHz CPU, 256K W/B cache, EPROM BIOS, Bank 0 for single side SIMM.**

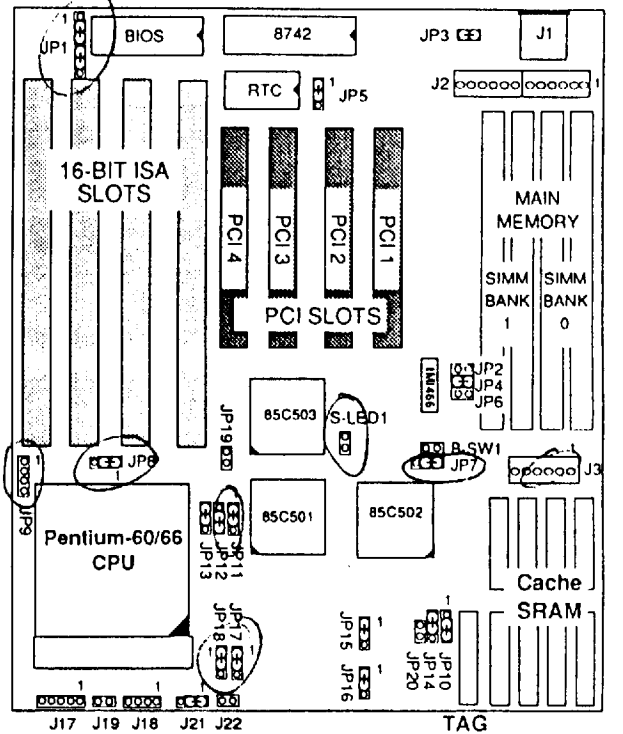


Figure 1-1. Mainboard Layout (032 A2/A5/A1M)

Important: ***Make sure the system is well ventilated to prevent overheating and ensure system stability.***

033 Mainboard Layout w/ default settings*

*Default settings: Pentium-90MHz CPU, 256K W/B cache, EPROM BIOS, Bank 0 for single side SIMM.

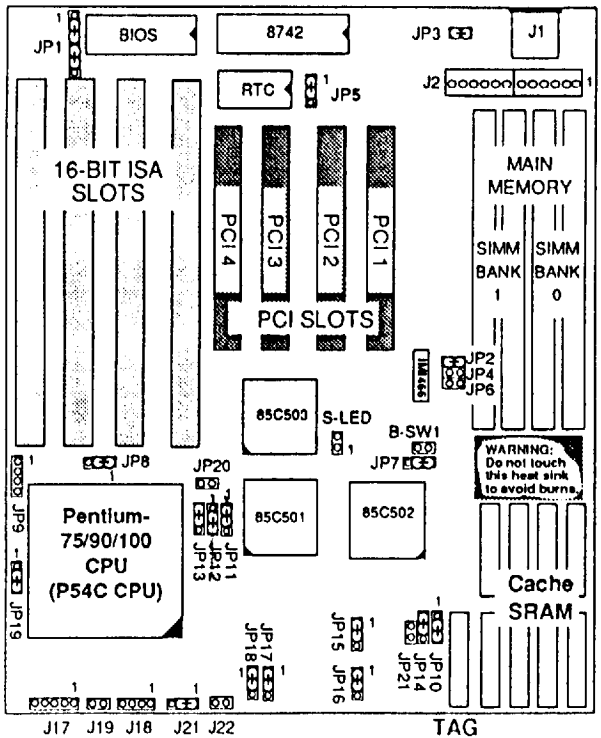


Figure 1-2. Mainboard Layout (033 A2/A5/A1M)

Important: Make sure the system is well ventilated to prevent overheating and ensure system stability.

2 Hardware Setup

This chapter explains how to configure the mainboard's hardware. After you install the mainboard, you can set jumpers, install memory on the mainboard, and make case-connections. Refer to this chapter whenever you upgrade or reconfigure your system.

CAUTION: *Turn off power to the mainboard, system chassis, and peripheral devices before performing any work on the mainboard or system.*

Jumpers

JP1: EPROM / FLASH BIOS Select (Factory fixed at 2-3, 4-5)

Select either EPROM or FLASH memory with jumpers JP1.

Setting	JP1
FLASH	
EPROM (Default)	

JP3: Display Type

Set JP3 to configure the mainboard for use with either a color or monochrome monitor.

Monitor Type	JP3
Monochrome	
EGA/VGA (default)	

JP8: External Fan Control (Factory fixed at 1-2)

Set JP8 for External Fan control by jumper JP18. (See JP18 below)

Setting	JP8
External fan controlled by JP18 signal(Default)	
External fan always on (JP18 void)	

JP9 - External Fan Connector

Attach an External Fan to JP9. Pin description is as follows:

Pin	Description
1	+12V
2, 3	Control Signal or Ground
4	+5V

JP15, JP16: Bank 0 Single / Double Side 72-pin SIMM Select (Blue Caps)

JP15 and JP16 set the system board to recognize either single side or double side SIMM in Bank 0. (Refer to Memory Configuration on page 13)

Bank 0 Setting	JP15	JP16
Single Side 72-pin SIMM (Default)		
Double Side 72-pin SIMM		

JP17: Stopped Clock Generator Select (Factory fixed at 1-2)

JP17 sets STPCLK or SMOUT for stopping the Clock Generator (See JP18 note.)

Setting	JP17
Stopped by STPCLK (Default)	
Stopped by SMOUT	

JP18: FAN Control Signal (Factory fixed at 1-2)

JP18 selects STPCLK or SMOUT for controlling the Fan Signal.

Note: STPCLK *is sent when the CPU enters Suspend Mode.* SMOUT *is sent when the CPU enters DOZE mode.*

Setting	JP18
Controlled by STPCLK (Default)	
Controlled by SMOUT	

S-LED1: RESERVED

JP7: (Factory Fixed at 2-3)

JP11: (Factory Fixed at 1-2)

JP12: (Factory Fixed at 2-3)

JP13: (Factory Fixed at 1-2)

JP19: RESERVED - [32 A2/A5/A1M Serial] version

JP19: (Factory Fixed at 2-3)- [33 A2/A5/A1M Serial] version

JP20: RESERVED - [33 A2/A5/A1M Serial] version

CPU Type Configuration

Set the 032 A2/A5/A1M mainboard's CPU jumpers as described below.

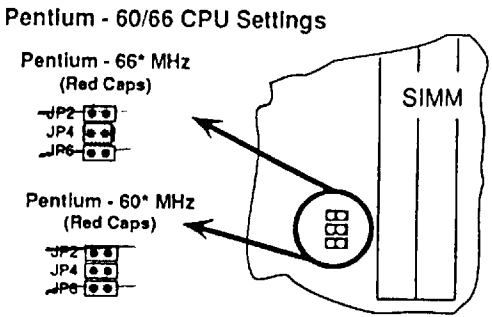


Figure 2-1. Pentium Jumper Settings (032 A2/A5/A1M)

Set the 033 A2/A5/A1M mainboard's CPU jumpers as described below.

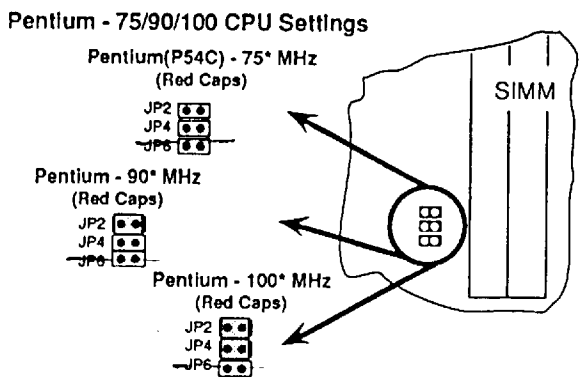


Figure 2-2. Pentium Jumper Settings (033 A2/A5/A1M)

* You must equip the CPU with a fan and heat sink for system stability.

Cache Configuration

The mainboard has a write-back caching scheme. You can configure the mainboard's cache by installing cache chips in the sockets noted below, and then setting jumper JP20 (*JP21 on the 033 A2/A5/A1M version*), JP14, and JP10. See Figures 2-2, 2-3, and 2-4 for cache configurations.

Cache Size and RAM Locations

Cache Size	Cache RAM	TAG RAM	Cacheable Range
256KB	32K x 8 / U17-U20, U25-U28	8K x 8 / U29	32MB
512KB	64K x 8 / U17-U20, U25-U28	16K x 8 / U29	64MB
1M	128K x 8 / U17-U20, U25-U28	32K x 8 / U29	128MB

Note: For the 033 A2/A5/A1M version of the mainboard, you must use 3.3V SRAM (8 pcs) in sockets U17-U20 and U25-U28.

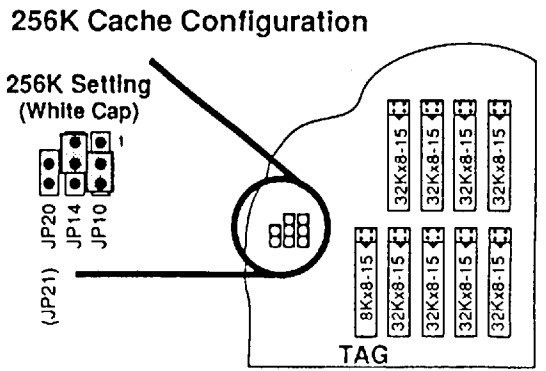


Figure 2-3. 256K Cache Configuration with 32K x 8

512K Cache Configuration

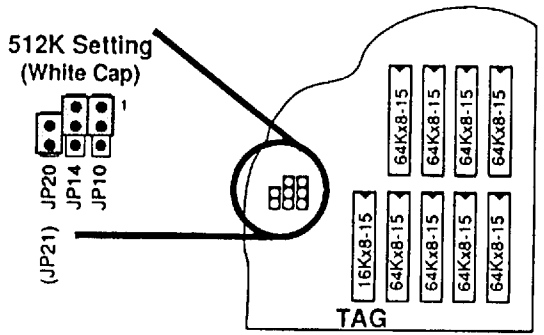


Figure 2-4. 512K Cache Configuration with 64K x 8

1M Cache Configuration

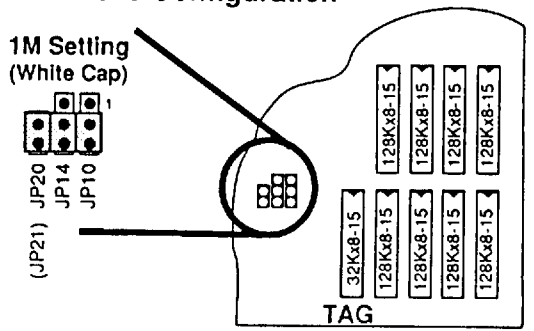


Figure 2-5. 1M Cache Configuration with 128K x 8

Connectors

Attach the Pentium mainboard to case devices, or an external battery, via connectors on the mainboard. Refer to Figure 1-1 for connector locations and connector pin positions.

B-SW1 - Sleep Switch Connector (see page 22)

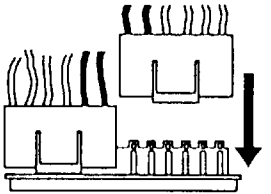
Attach a sleep switch to this connector. Closing the Sleep switch forces the system to enter Suspend mode. This switch can be enabled or disabled by the BIOS.

J1 - Keyboard Connector

A five-pin female DIN keyboard connector is located at the rear of the board. Plug the keyboard jack into this connector.

J2 - Power Supply Connectors

The mainboard requires a power supply with at least 200 watts and a "power good" signal. J2 has two six-pin male header connectors. Plug the dual connectors from the power directly onto the board connector while making sure the black leads are in the center.



J3 - 3.3V Power Connector : RESERVED

J17 - Keylock & Power LED Connector

J17 is a connector for a lock that may be installed on the system case for enabling or disabling the keyboard. J17 also attaches to the case's Power LED.

J18 - Speaker Connector

Attach the system speaker to connector J18.

J19 - Hardware Reset Control

Attach the Reset switch to J19. Closing the Reset switch restarts the system.

J21 - Turbo Switch Connector

J21 is connected to a Turbo switch on the front of the system case. The connector pins 1-2 are shorted for turbo operation and pins 2-3 are shorted for normal operation.

J22 - Turbo LED Connector

Attach the sleep LED to J22. The LED lights when the system is in Turbo mode.

Memory Configuration

The mainboard supports two banks of 64-bit wide DRAMs with 256K, 1M, 2M, 4M, 8M and 16M x 36 page-mode 72-pin SIMM — **you *must* use parity SIMM.** The mainboard requires SIMM of at least 70ns access time.

Single-side SIMM	Double-side SIMM
1MB = 256K x 36(32)	2MB = 512K x 36(32)
4MB = 1MB x 36(32)	8MB = 2MB x 36(32)
16MB = 4MB x 36(32)	32MB = 8MB x 36(32)
64MB = 16MB x 36(32)	

On-board memory is located in two banks: Bank 0, and Bank 1. See Figure 1-1. Each bank has two sockets. **72-pin SIMM modules are required.**

Note. You must install two 72-pin SIMM modules in each bank.

You ***must*** use a memory combination from the table below. Unlisted combinations are **invalid.** The board supports the following configurations:

Memory Size	Bank 0	Bank 1
2 MB	1MB x2	—
4 MB	1MB x2	1MB x2
4 MB	2MB x2 *	—
8 MB	2MB x2 *	2MB x2
8 MB	4MB x2	—
12 MB	2MB x2	4MB x2
16 MB	4MB x2	4MB x2
16 MB	8MB x2 *	—
20 MB	2MB x2 *	8MB x2
24 MB	4MB x2	8MB x2
32 MB	8MB x2 *	8MB x2
32 MB	16MB x2	—
36 MB	2MB x2 *	16MB x2
40 MB	4MB x2	16MB x2
48 MB	8MB x2 *	16MB x2
64 MB	16MB x2	16MB x2
64 MB	32MB x2 *	—
72 MB	4MB x2	32MB x2
80 MB	8MB x2 *	32MB x2
96 MB	16MB x2	32MB x2
128 MB	32MB x2 *	32MB x2
128 MB	64MB x2	—

Table 2-1. On-board Memory Configurations

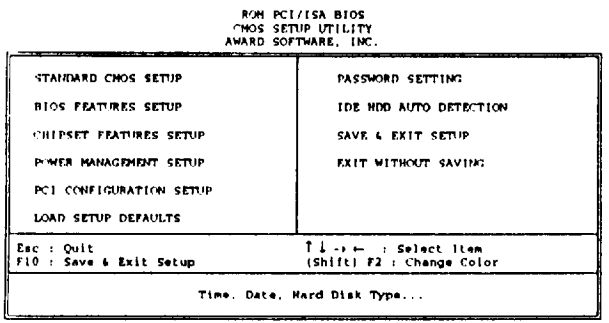
* For these configurations you must set jumpers JP15 and JP16 for 2-3.

3 BIOS Setup

The mainboard's BIOS setup program is the ROM PCI/ISA BIOS from Award Software Inc. Enter the Award BIOS program's Main Menu as follows:

1. Turn on or reboot the system. After a series of diagnostic checks, you are asked to press DEL to enter Setup.

2. Press the <DEL> key to enter the Award BIOS program and the main screen appears:



3. Choose an option and press <Enter>. Modify the system parameters to reflect the options installed in the system. (See the following sections.)

4. Press <ESC> at anytime to return to the Main Menu.

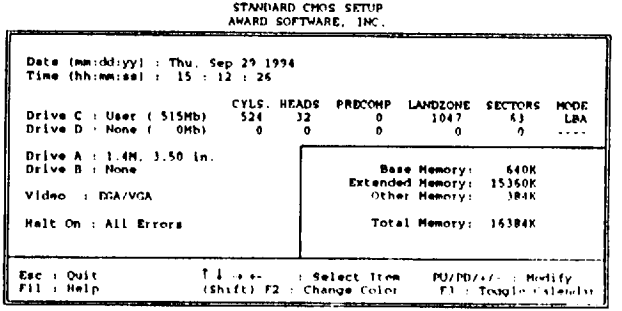
5. In the Main Menu, choose "SAVE AND EXIT SETUP" to save your changes and reboot the system. Choosing "EXIT WITHOUT SAVING" ignores your changes and exits the program.

The Main Menu options of the Award BIOS are described in the sections that follow.

Standard CMOS Setup

Run the Standard CMOS Setup as follows.

1. Choose "STANDARD CMOS SETUP" from the Main Menu. A screen appears.



2. Use arrow keys to move between items and select values. Modify selected fields using PgUp/PgDn/+/– keys. Some fields let you enter values directly.

Date (mm/dd/yy) Type the current date.

Time (hh:mm:ss) Type the current time.

Drive C & D Choose from the standard hard disk types 1 to 46. Type 47 is user definable. If a hard disk is not installed choose "Not installed." (default)

Drive A & B Choose 360KB , 5 1/4",
1.2MB , 5 1/4"
720KB , 3 1/2"
1.4M , 3 1/2" (default)
2.88 MB, 3 1/2" or
Not installed

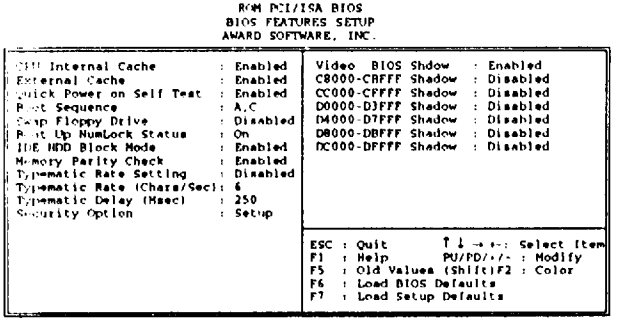
Video Choose Monochrome,
Color 40x25,
VGA/EGA (default)
Color 80x25

3. When you finish, press the <ESC> key to return to the Main Menu.

BIOS Features Setup

Run the BIOS Features Setup as follows.

1. Choose "BIOS FEATURES SETUP" from the Main Menu and a screen with a list of items appears. **(The screen below shows the BIOS default settings.)**



2. Use the arrow keys to move between items and to select values. Modify the selected fields using the PgUp/PgDn/+/– keys. <F> keys are explained below:

<F1>: "Help" gives options available for each item.

Shift <F2>: Change color.

<F5>: Get the old values. These values are the values with which the user started the current session.

<F6>: Load all options with the BIOS Setup default values.

<F7>: Load all options with the Power-On default values.

A short description of screen items follows:

CPU Internal Cache — This option enables/disables the CPU's internal cache. (The Default setting is Enabled.)

External Cache — This option enables/disables the external cache memory. (The Default setting is Enabled.)

Quick Power On Self Test — Enabled provides a fast POST at boot-up.

Boot Sequence — The default setting attempts to first boot from drive A: and then from hard disk C:. You can reverse this sequence with "C: A:", but then drive A: cannot boot directly.

Swap Floppy Drive — Enabled changes the sequence of the A: and B: drives. (The Default setting is Disabled.)

Boot Up Num Lock Status — Choose On or Off. On puts numeric keypad in Num Lock mode at boot-up. Off puts this keypad in arrow key mode at boot-up.

IDE HDD Block Mode — This option enables/disables the IDE HDD Block Mode function. Not all HDDs support this function. (The Default setting is Enabled.)

Memory Parity Check — Choose Enabled or Disabled. This item enables/disables the Memory Parity check option.

Typematic Rate Setting — Enable this option to adjust the keystroke repeat rate.

Typematic Rate (Chars/Sec) — Choose the rate a character keeps repeating.

Typematic Delay (Msec) — Choose how long after you press a key that a character begins repeating.

Security Option Choose Setup or System. Use this feature to prevent unauthorized system boot-up or use of BIOS Setup.

"System" – Each time the system is booted the password prompt appears.

"Setup"– If a password is set, the password prompt only appears if you attempt to enter the Setup program.

Video or Adaptor BIOS Shadow BIOS shadow copies BIOS code from slower ROM to faster RAM. BIOS can then execute from RAM. These 32K segments can be shadowed from ROM to RAM. BIOS is shadowed in a 32K segment if it is enabled and it has BIOS present.

3. After you have finished with the BIOS Features Setup program, press the <ESC> key and follow the screen instructions to save or disregard your settings.

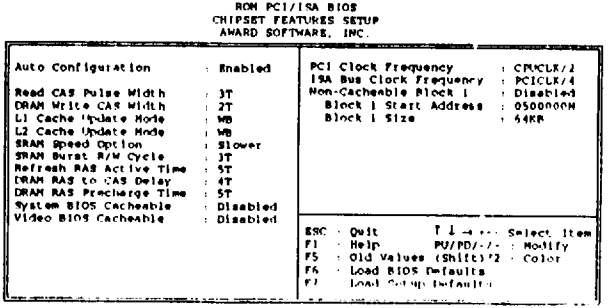
Chipset Features Setup

The Chipset Features Setup option changes the values of the chipset registers. These registers control system options in the computer.

Note: Change these settings only if you are familiar with the Chipset.

Run the Chipset Features Setup as follows.

1. Choose "CHIPSET FEATURES SETUP" from the Main Menu and the following screen appears. (The screen below shows default settings.)



2. Use the arrow keys to move between items and select values. Modify selected fields using the PgUp/PgDn/+/– keys.

A short description of screen items follows:

Auto Configuration Enable this option (strongly recommended) and the system automatically sets all options on the left side of the screen (except cache update mode & BIOS cacheable).

If this option is Enabled you must boot from Turbo mode.

Read CAS Pulse Width Use the default setting.

DRAM Write CAS Width Use the default setting.

L1 (L2) Cache Update Mode Choose WB or WT. The default setting is WB (Write Back). WB offers better performance than WT.

SRAM Speed Option Use the default setting.

SRAM Burst R/W Cycle Use the default setting.

Refresh RAS Active Time Use the default setting.

DRAM RAS to CAS Delay Use the default setting.

DRAM RAS Precharge Time Use the default setting.

System BIOS Cacheable Disabled: The ROM area F0000H-FFFFFH is not cached.

Enabled: The ROM area F0000H-FFFFFH is cacheable if cache controller is enabled.

Video BIOS Cacheable Disabled: The video BIOS C0000H-C7FFFH is not cached.

Enabled: The video BIOS C0000H-C7FFFH is cacheable if cache controller is enabled.

PCI Clock Frequency According to PCI specifications, the PCI clock should be less than or equal to 33MHz. So the BIOS setting is for 30MHz or 33MHz (half the CPU frequency.)

ISA Bus Clock Frequency The default setting is the PCI Clock (the item above) divided by 4. — i.e. 7.5 MHz (30/4) or 8 MHz (33/4).

Non-Cacheable Block 1 Choose Enabled or Disabled (default). Select whether the DRAM non-cache area functions are enabled or not.

Block 1 Start Address Select the non-cache area start address depending on your requirements.

Block 1 Size Select the non-cache area length depending on your area requirements.

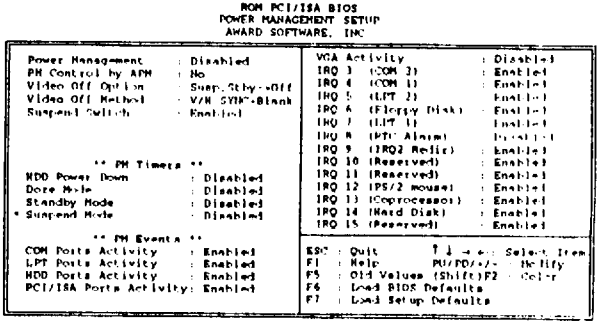
3. After you have finished with the Chipset Features Setup, press the <ESC> key and follow the screen instructions to save or disregard your settings.

Power Management Setup

The Power Management Setup option sets the system's power saving functions

Run the Power Management Setup as follows.

1. Choose "POWER MANAGEMENT SETUP" from the Main Menu and a screen with a list of items appears.



* This item is only for the P54C CPU (SY-033 SERIAL).

2. Use the arrow keys to move between items and to select values. Modify the selected fields using the PgUp/PgDn/+/- keys.

A short description of selected screen items follows:

Power Management Options are as follows:

User Define Let's you define the HDD and system power down times.

Disabled Disables the Green PC Features.

Min Saving Doze timer = 40 Min
Sleep timer = 40 Min
Inactive timer = 40 Min

Max Saving Doze timer = 20 Sec
Sleep timer = 20 Sec
Inactive timer = 20 Sec

PM Control by APM Choose Yes or No (default). APM stands for Advanced Power Management. To use APM you must run "power.exe" under DOS v6.0 or later version.

Video Off Option When the selected PM mode occurs, the monitor screen shuts off. If any IRQ event occurs, the screen comes back on.

Video Off Method Choose V/H Sync+Blank (default) o Blank screen for the selected PM mode. (See the Video Off Option.)

Suspend Switch Choose Enabled (default) o Disabled. This option enables or disables B-SW1 (see page 11).

PM Timers:

HDD Power Down When the set time has elapsed, the BIOS sends a command to the HDD to power down, which turns off the motor. Time is adjustable from 1 to 15 minutes. The default setting is Disabled. Some older model HDDs may not support this advanced function.

Doze Mode When the set time has elapsed, the BIOS sends a command to the system to enter doze mode (system clock drops to 8MHz). Time is adjustable from 20 seconds to 40 minutes.

Standby Mode The default is Disabled. Time is adjustable from 20 seconds to 40 minutes.

Suspend Mode The default is Disabled. Only an SL-Enhanced (or SMI) CPU can enter this mode. Time is adjustable from 20 seconds to 40 minutes. Under inactive mode, the CPU stops completely (no instructions are executed.)

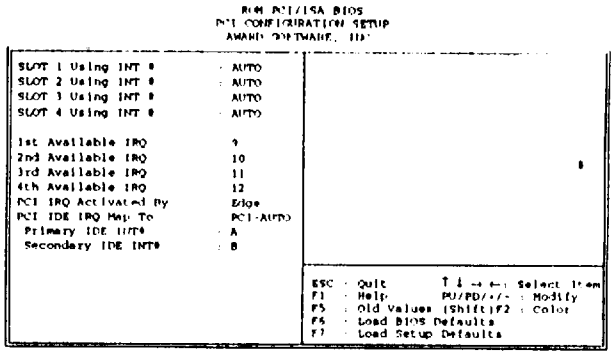
PM Events The BIOS monitors these items for activity. If activity occurs from the Enabled item the system will not enter Green mode (power saving), or the system wakes up.

3. After you have finished with the Power Management Setup, press the <ESC> key to return to the Main Menu.

PCI Configuration Setup

This option sets the mainboard's PCI Slots. Run this option as follows:

1. Choose "PCI CONFIGURATION SETUP" from the Main Menu and the following screen appears. (The screen below shows default settings.)



2. Use the arrow keys to move between items and select values. Modify selected fields using the PgUp/PgDn/+/- keys.

A short description of screen items follows:

Slot 1 (2) (3) (4) Using INT# Choose AUTO or assign PCI INT# number A, B, C, or D. The default setting is AUTO.

1st (2nd) (3rd) (4th) Available IRQ If slot 1~4 is set to AUTO in the item above, then the BIOS automatically routes the INT# to the specified IRQ following the 1st (2nd) (3rd) (4th) IRQ order you assign.

PCI IRQ Activated By Choose Edge or Level. Most PCI trigger signals are Level. This setting must match the PCI card.

PCI IDE IRQ Map To	Select PCI-AUTO, ISA, or assign a PCI SLOT number (depending on which slot the PCI IDE is inserted). The default setting is PCI-AUTO. If PCI-AUTO does not work, then assign an individual PCI SLOT number.
Primary IDE INT#	Choose INTA#, INTB#, INTC#, or INTD#. The default setting is INTA#.
Secondary IDE INT#	Choose INTA#, INTB#, INTC#, or INTD#. The default setting is INTB#.

3. After you have finished with the PCI Slot Configuration, press the <ESC> key and follow the screen instructions to save or disregard your settings.

Load Setup Defaults

This item loads the system values you have previously saved. Choose this item and the following message appears:

"Load SETUP Defaults (Y/N)? N"

To use the SETUP defaults, change the prompt to "Y" and press <Enter>.

This item is recommended if you need to reset the system setup.

Password Setting

This Main Menu item lets you configure the system so that a password is required every time the system boots or an attempt is made to enter the Setup program. Change the password as follows:

1. Choose "PASSWORD SETTING" in the Main Menu and press <Enter>. The following message appears:

   "Enter Password:"

2. Enter a password and press <Enter>.

   (If you do not wish to use the password function, you can just press <Enter> and a "Password disabled" message appears.)

3. After you enter your password, the following message appears prompting you to confirm the new password:

   "Confirm Password:"

4. Re-enter your password and then Press <ESC> to exit to the Main Menu.

Important: If you forget or lose the password, the only way to access the system is to set jumper JP5 to clear the CMOS RAM. All setup information is lost and you must run the BIOS setup program again.

IDE HDD Auto Detection

This Main Menu item automatically detects the hard disk type and configures the STANDARD CMOS SETUP accordingly.

Note: This function is only valid for **IDE** *hard disks.*