

# **SI54P AIO**

## **User's Manual (for Award BIOS)**

**V2.0**

**Aug. 1995**



This mainboard requires correct configuration information; otherwise, a malfunction may result.



Static electricity can cause serious damage to integrated circuit chips. To avoid building up a static electric charging on your body, be sure you discharge any static electricity by grounding yourself before handling the chips. If chips are handed from one person to another, they should touch hands first, then pass the chips.

Information presented in this publication has been carefully checked for reliability; however, no responsibility is assumed for inaccuracies. The information contained in this document is subject to change without notice.

Contact your dealer for warranty details.

## **Trademarks**

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# 1

## Introduction

The SIS4P AIO is a Pentium™ PCI Bus mainboard. It uses the SiS 5501, 5502, 85C503 system chipset, CMD PCI0646 PCI Bus Master IDE controller, and SMC 37C665 super I/O controller. Other on-board specifications include 4 AT Bus slots and 4 PCI slots, 2 memory banks with memory size up to 128MB, cache size from 256KB to 1MB, and Green features that comply with the standards of Energy Star.

### 1.1 General Specifications

<b>Processor:</b>	Intel Pentium™ 75/90/100/120/133/150 MHz
<b>Chipset:</b>	SiS 5501 (PCI/ISA Cache Memory Controller) SiS 5502 (PCI Local Data Buffer) SiS 85C503 (PCI System I/O) CMD PCI0646 (PCI Bus Master IDE Controller) SMC 37C665 (Super I/O Controller) UMC 82C885 (I/O TTL Integration)
<b>External Cache:</b>	Provides 256KB/512 KB/1MB cache size supporting write-back and write-through architectures
<b>Memory Size:</b>	4 pieces of 72-pin SIMM sockets provide memory size up to 128MB All support double-sided SIMMs
<b>BIOS:</b>	Award BIOS (128K EPROM or Flash ROM)
<b>Slots :</b>	Four 16-bit ISA slots Four PCI slots (with one share slot)
<b>Connectors:</b>	Power Keylock & Power LED Hardware Reset Speaker Turbo LED Turbo Switch Suspend HDD LED
<b>Form Factor:</b>	Baby-AT
<b>PCB :</b>	4 layers

## 1.2 Features

### ■ CPU:

- ZIF socket 5 supports Intel standard Pentium™ (P54C 75/90/100/130/133/150 MHz CPU).

### ■ BIOS:

- Award BIOS with flash ROM supported.
  - APM specification V1.1
  - PCI specification V2.1
  - PNP specification V1.0a (optional)

### ■ Cache:

- Supports the write back/through mode of CPU's internal first level (L1) cache.
- Supports the direct map second level (L2) cache in write back policy.
- L2 cache size: 256K, 512K, 1M.
- 3.3V standard SRAM or 3.3V/5V mixed mode SRAM.

### ■ Memory:

- 4 pieces of 72-pin SIMM sockets provide memory size from 2MB to 128MB. All support double density SIMMs.
- The fastest burst cycle speed for 70ns fast page mode DRAMS and EDO DRAMS are 6-3-3-3 and 6-2-2-2 respectively.
- CAS#-before-RAS# transparent DRAM refresh.

### ■ RTC:

- Provides RTC and NV RAM direct interface.
- Uses Dallas 12887A compatible RTC module (Internal 128 Byte of CMOS RAM) which supports clear CMOS function.

### ■ Slots:

- Four 16-bit ISA slots with 100% ISA compatible functions.
- Four 32-bit PCI slots all support PCI master.

**Note:** If the on-board CMD 0646 PCI IDE chip is set to DMA mode, it will program a PCI master IDE and share the PCI slot 4 as slave PCI slot. On the other hand, the CMD 0646 PCI IDE chip will not share a PCI master slot if it is set to PIO mode.

- PCI specification version 2.1.
- Supports CPU to PCI memory write posting with 4 DWORD deep buffers.
- Supports PCI to DRAM posting of 12 DWORD.

- Converts back-to-back sequential CPU to PCI memory writes to PCI burst writes.

#### ■ IDE:

- CMD IDE 0646 chip.
  - Dual IDE channels support up to 4 PCI IDE devices.
  - Enable/Disable IDE chip or secondary channel by hardware jumper.
  - Supports up to PIO mode 4 and DMA mode 2 timing.
  - Compatible with ATA-2, enhanced IDE, fast IDE, & ATAPI specification.
  - Supports the most complete 32-bit driver in the industry (DOS, Windows 3.1x, Windows NT, OS/2, Novel and SCO Unix).

**Notes** Before installing the driver for on-board PCI IDE (CMD PCI0646), consult the readme file on the CMD Driver Diskette.

#### ■ FDC:

- Two floppy drives support 360K/720K/1.2M/1.44M/2.88MB and 3D mode floppy drives.

#### ■ I/O:

- One multi-mode parallel port with chip-protect circuitry supports standard, enhanced (EPP), high speed (ECP) mode.
- Two high speed 16550 compatible UARTS.

#### ■ Power Management:

- Compatible with EPA "Energy-Star" specification.
- Fully compatible with Microsoft APM.
- Supports SMM function for Intel Pentium/P54C SMM mode.
- Supports 4 power management modes:

Green function	CPU Clock	HDD	Display
Disable	Normal	Normal	on
DOZE	1/2 duty	Idle	on
STANDBY	1/4 duty	Standby	Standby
SUSPEND	0 MHz	Sleep	off



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## 2

## Memory Configurations

## 2.1 System Memory

SIS4P AIO uses SIMM (Single-In-line Memory Module) for its system memory. It accepts a minimum of 2MB and a maximum of 128MB memory size. There are two memory banks which support 1/2/4/8/16/32/64 MB 72-pin type, single- and/or double-density SIMMs.

**Important:** DRAM insertion on every bank should come in pair and of the same type (same size and same density). For instance, if you only have two SIMM modules, you cannot install one module in socket SIMM1 and another module of the same type on SIMM3. Likewise, memory type mixing is NOT allowed within a bank.

The following table lists some possible SIMM module combinations and the total memory amount for each option.

Bank 0		Bank 1		Total Memory Size
SIMM1	SIMM2	SIMM3	SIMM4	
1M (single)	1M (single)	-	-	2MB
1M (single)	1M (single)	1M (single)	1M (single)	4MB
2M (double)	2M (double)	-	-	4MB
2M (double)	2M (double)	2M (double)	2M (double)	8MB
2M (double)	2M (double)	16M (single)	16M (single)	36MB
4M (single)	4M (single)	-	-	8MB
4M (single)	4M (single)	4M (single)	4M (single)	16MB
2M (single)	2M (single)	16M (single)	16M (single)	36MB
8M (double)	8M (double)	-	-	16MB
8M (double)	8M (double)	8M (double)	8M (double)	32MB
8M (double)	8M (double)	16M (single)	16M (single)	48MB
16M (single)	16M (single)	-	-	32MB
16M (single)	16M (single)	16M (single)	16M (single)	64MB
32M (double)	32M (double)	-	-	64MB
32M (double)	32M (double)	32M (double)	32M (double)	128MB

Table 2-1. Memory Configurations and Requirements



## 2.2 Cache Memory Subsystems

Cache Size	Dirty RAM (U28)	TAG RAM (U27)	Data SRAM (U23-U26, U34 - U37)
256KB	32Kx8 (5V)	32Kx8 (5V)	32Kx8 <sup>3.3V</sup>
512KB	32Kx8 (5V)	32Kx8 (5V)	64Kx8 <sup>3.3V</sup>
1MB	32Kx8 (5V)	32Kx8 (5V)	128Kx8 <sup>3.3V</sup>

Table 2-2. Secondary Cache Memory Configurations

**Note:** SI54P AIO mainboard supports either pure 3.3V data SRAM or 3.3V/5V mixed mode data SRAM. Using the wrong type of SRAM could cause severe damage to the mainboard. (Tag and dirty SRAM use the 5V standard SRAM.)

■ Pure 3.3V SRAM list for reference:

- UMC: 61L256-15 (32Kx8), 61L512-15 (64Kx8)
- Alliance: AS7C3256-15 (32Kx8), AS7C3512-15 (64Kx8), AS7C31024-15 (128Kx8)
- Samsung: KH68V257P-17 (32Kx8)

■ 3.3V/5V mixed mode SRAM list for reference:

- Winbond: W24M257AK-15 (32Kx8), W24M512AK-15 (64Kx8)
- UMC: UM61M256-15 (32Kx8), UM61M512-15 (64Kx8)

## 3

## Jumpers and Connectors

## 3.1 Setting the Jumpers

The table below summarizes the functions and jumper settings of each jumper on the SIS4P AIO. You can refer to the "Graphic Descriptions of Jumper Settings" section.

	Function	Jumper Settings
CPU Type <sup>14bit</sup>	Pentium 75MHz CPU	JP7 short 2-3, 5-6, 7-8 JP17 open
	Pentium 90MHz CPU	JP7 short 2-3, 4-5, 8-9 JP17 open
	Pentium 100MHz CPU	JP7 short 1-2, 5-6, 7-8 JP17 open
	Pentium 120MHz CPU	JP7 short 2-3, 4-5, 8-9 JP17 short 1-2
	Pentium 133MHz CPU	JP7 short 1-2, 5-6, 7-8 JP17 short 1-2
	Pentium 150MHz CPU (Reserved)	JP7 short 2-3, 4-5, 8-9 JP17 short 1-2, 3-4
CPU Voltage	3.3V	JP18 short 1-2
	3.38V	JP18 short 3-4
	3.52V	JP18 short 5-6
CPU Signal Select	Internal Cache Write-Back	JP12 short 1-2
	Internal Cache Write-Through	JP12 short 2-3
	Always invalidated	JP14 short 1-2
	Write to invalidated	JP14 short 2-3
DRAM Parity Check	Enabled	JP9 short
	Disabled	JP9 open
SRAM Type Select	Pure 3.3V SRAM	JP20 short 1-2, 3-4, 5-6
	3.3V/5V Mixed Mode SRAM	JP19 short 1-2, 3-4, 5-6

CONTINUED ....

Function		Jumper Settings
External Cache Memory Size	256KB (with 32Kx8 SRAMs)	JP10 open JP11 open
	512KB (with 64Kx8 SRAMs)	JP10 open JP11 short
	1MB (with 128Kx8 SRAMs)	JP10 short JP11 short
On-board PCI IDE	Enable IDE	JP4 open 1-2 (default)
	Disable IDE	JP4 short 1-2
Second PCI IDE	Enable	JP4 short 3-4 (default)
	Disable	JP4 open 3-4
On-board I/O	Enable	JP3 short 1-2
	Disable	JP3 short 2-3
ECP Mode Parallel Port DRQ & DACK Select	DRQ1, DACK1	JP1 short 1-2 JP2 short 2-3
	DRQ3, DACK3	JP1 short 2-3 JP2 short 1-2
Clear CMOS Setup Value	Clear CMOS Setup Value	JP15 short
	For normal use (default)	JP15 open

Table 3-1. Jumper Settings

**Note 1:**

Function		Jumper Settings
CPU Clock Select	50MHz	JP7 short 2-3, 5-6, 7-8
	60MHz	JP7 short 2-3, 4-5, 8-9
	66MHz	JP7 short 1-2, 5-6, 7-8
CPU Internal Clock	1.5X External Clock	JP17 open
	2X External Clock	JP17 short 1-2
	2.5X External Clock	JP17 short 1-2, 3-4

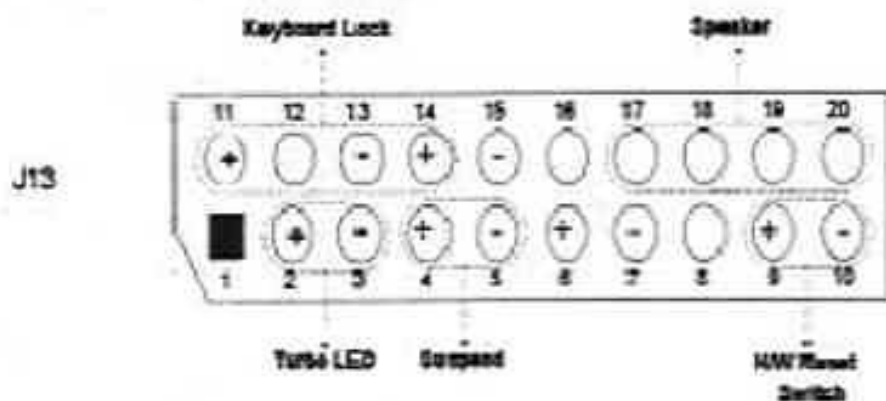
**Note 2:**

*If a flash ROM is installed on the mainboard, please refer to the README.DOC file in the Flash Utility diskette before programming the Flash ROM BIOS.*

## 3.2 Connectors

The connectors located on the SIS4P AIO are listed below. They are used to connect with some peripheral devices to enhance the operating performance of the system. Please refer to the mainboard layout figure on next page for their positions.

Connector	Function
J1	PS/2 Keyboard Connector (option)
J2	AT Keyboard Connector
J3	PS/2 Mouse Connector (option)
JP31	PS/2 Mouse Connector (Header 5x1)
J4	Power Connector
J5	Floppy Connector
J6	COM1 Port Connector
J7	COM2 Port Connector
J8	Printer Port Connector
J9	IDE Primary Connector
J10	IDE Secondary Connector
J11	Power Connector (for 3.3V)
J12	HDD LED Connector



### 3.3 Board Layout

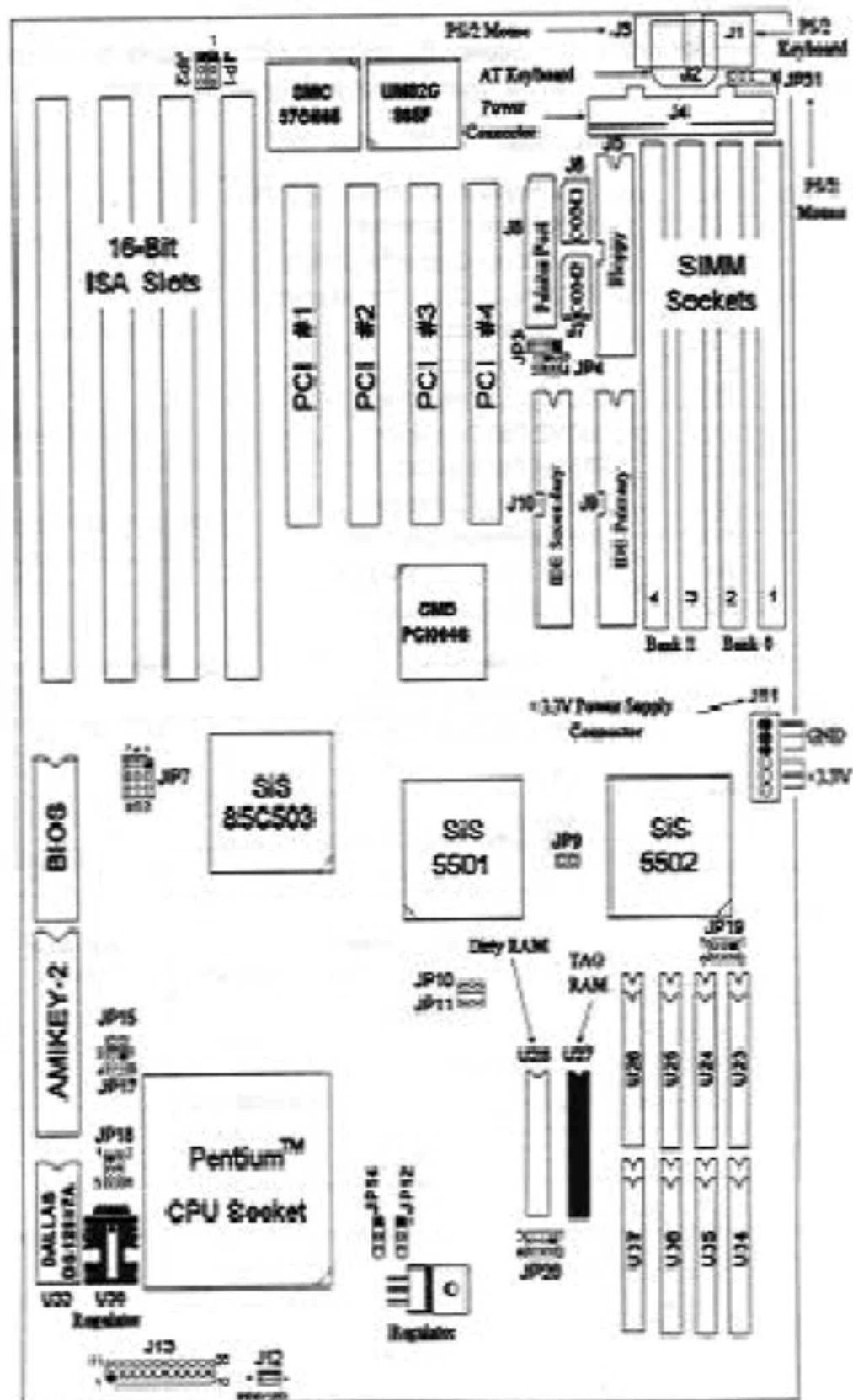

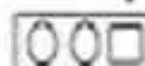


Figure 3-1. SIS4P AIO Mainboard Layout

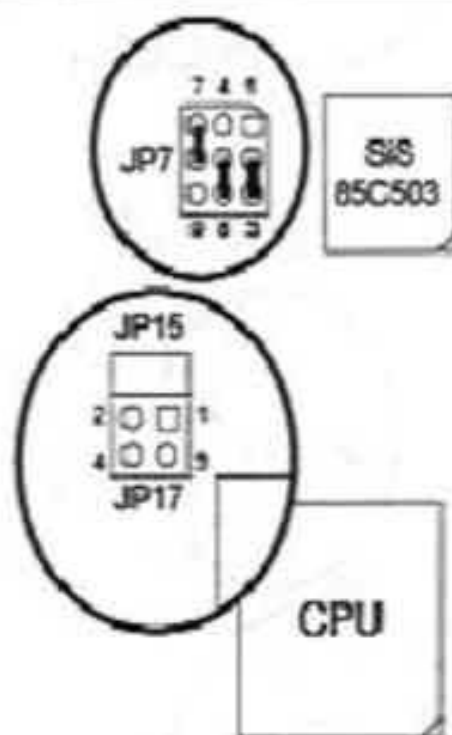
### 3.4 Graphic Descriptions of Jumper Settings

 means pins 1 & 2 are set as "short."

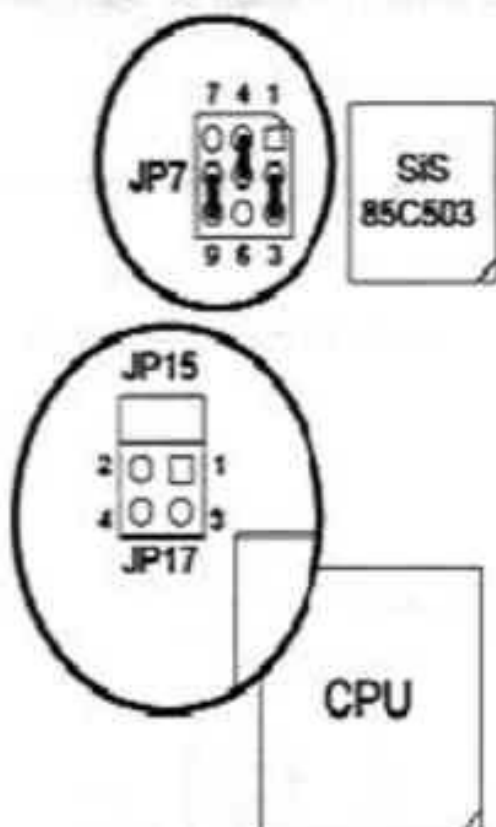
 means that this jumper is set as "open."

#### CPU Type

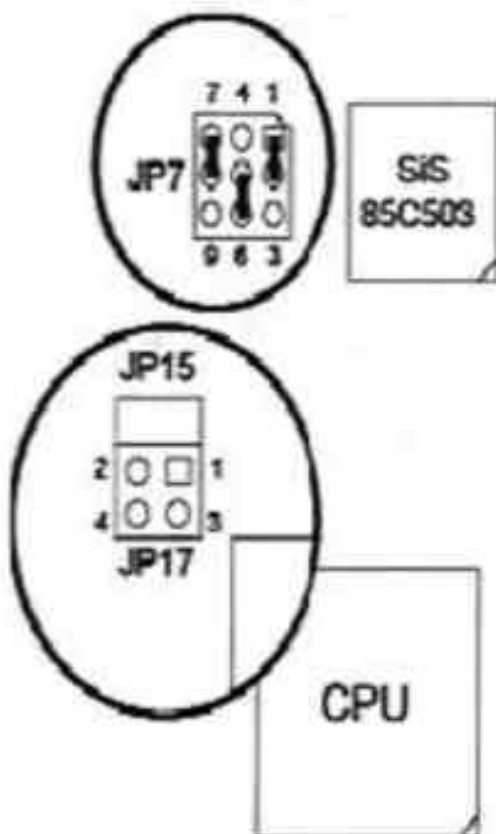
1. Pentium 75MHz CPU installed on board



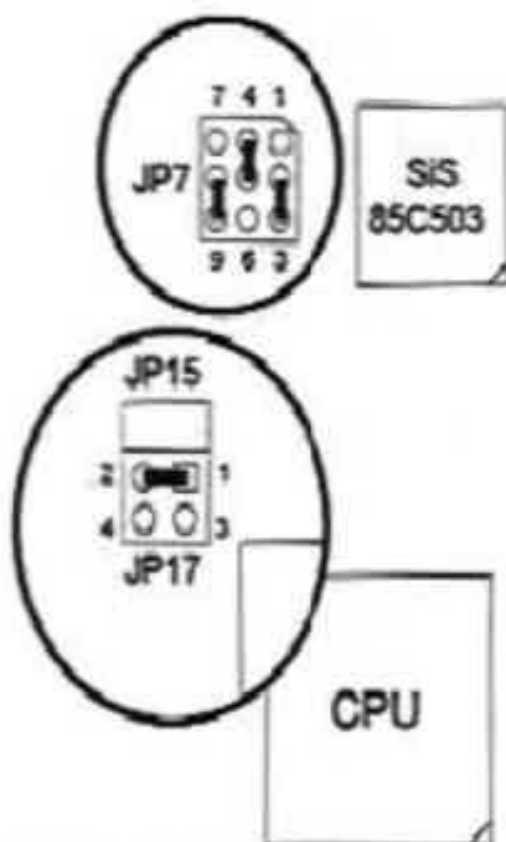
2. Pentium 90MHz CPU installed on board



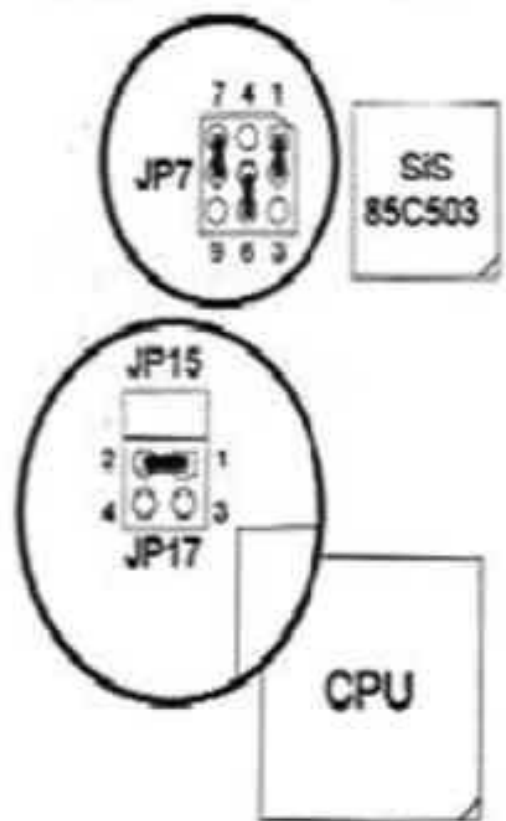
3. Pentium 100MHz CPU installed on board



4. Pentium 120MHz CPU installed on board

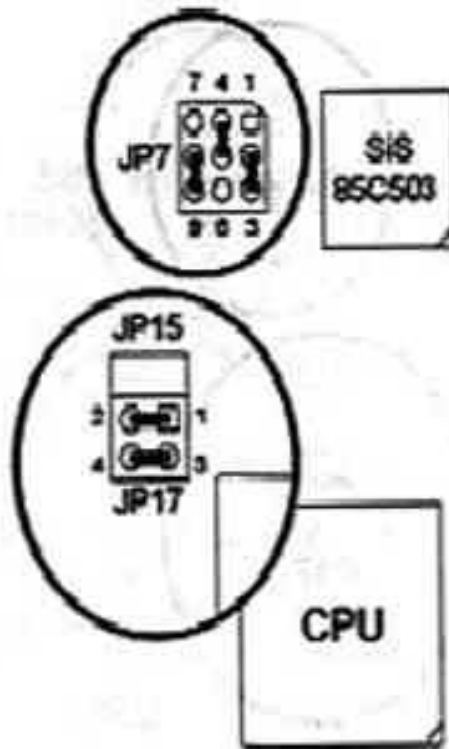


5. Pentium 133MHz CPU installed on board





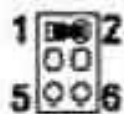
6. Pentium 150MHz CPU installed on board (Reserved)



**CPU Voltage**

1. 3.3V

JP18



Pentium™  
CPU Socket

2. 3.38V

JP18



Pentium™  
CPU Socket

3. 3.52V

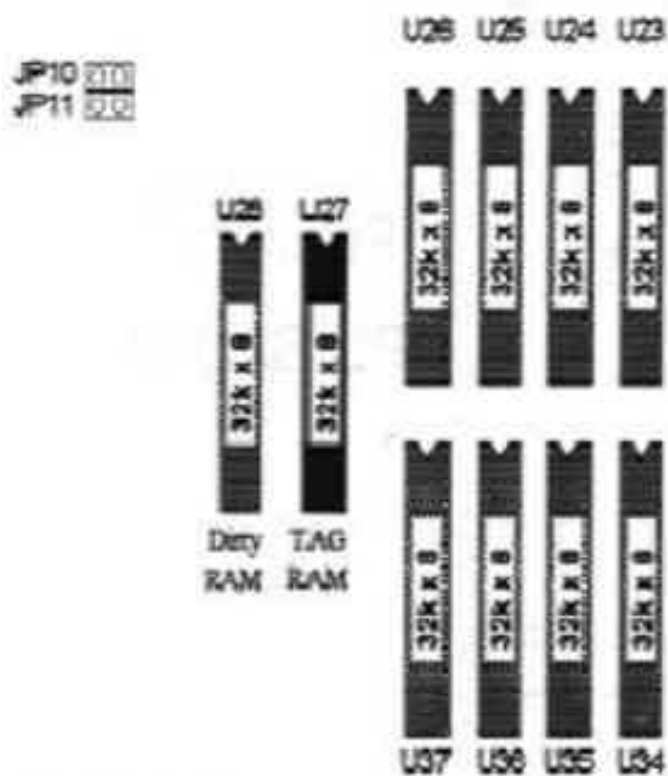
JP18



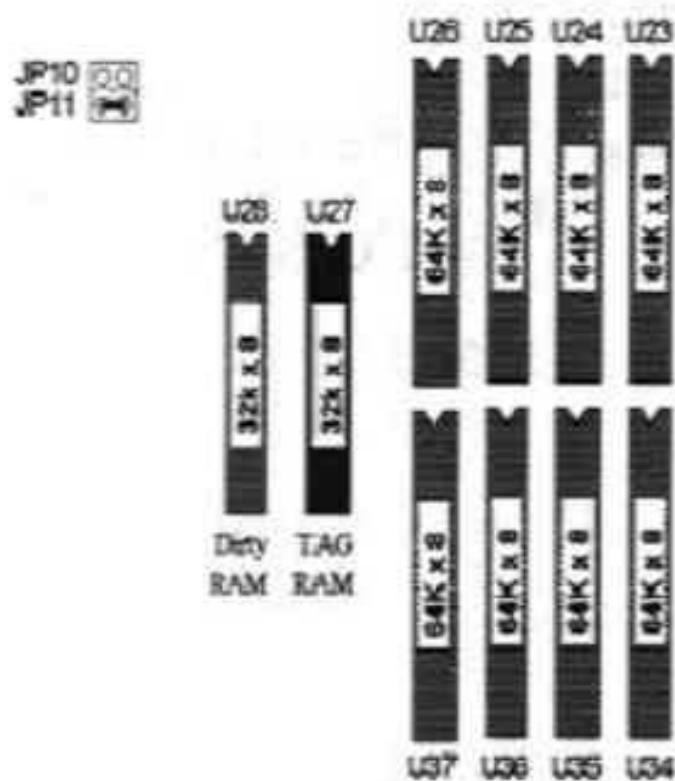
Pentium™  
CPU Socket

## External Cache Memory Size

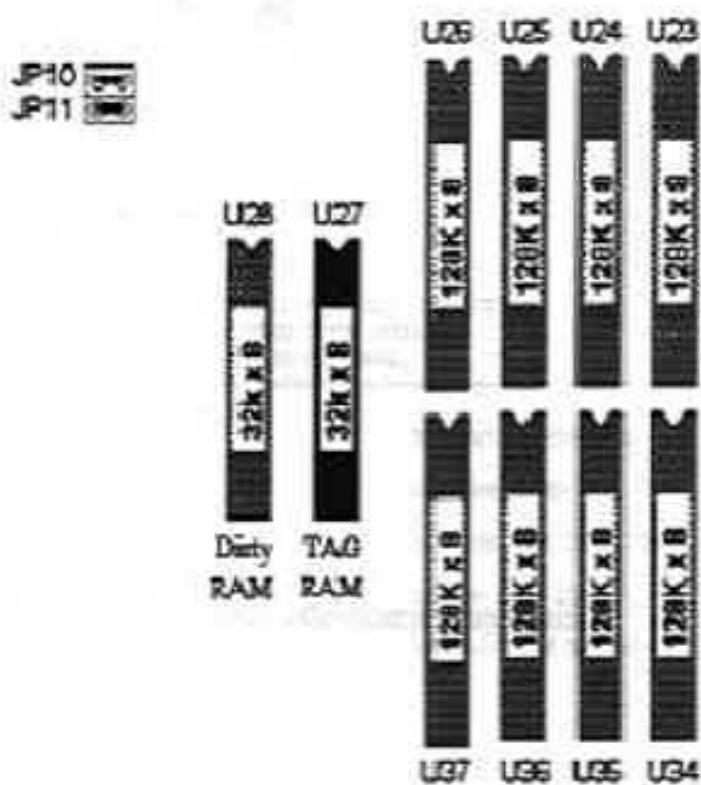
### 1. 256KB (with 32Kx8 SRAMs)



### 2. 512KB (with 64Kx8 SRAMs)



3. 1MB (with 128Kx8 SRAMs)



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## 4

## Built-in BIOS Setup Program

## 4.1 SETUP Program

AMI PCI/ISA BIOS (M51CEM) CMOS SETUP UTILITY AMI SOFTWARE, INC.	
STANDARD CMOS SETUP	SUPERVISOR PASSWORD
BIOS FEATURES SETUP	USER PASSWORD
CHIPSET FEATURES SETUP	IDE HDD AUTO DETECTION
POWER MANAGEMENT SETUP	SAVE & EXIT SETUP
PCI & ONBOARD I/O SETUP	EXIT WITHOUT SAVING
LOAD BIOS DEFAULTS	
LOAD SETUP DEFAULTS	
Esc : Quit	F10 : Select Item
F20 : Save & Exit Setup	Shift/F2 : Change Color
Time, Date, Hard Disk Type...	

Figure 4-1, SETUP Main Menu

It is highly recommended that you list down all the values of the SETUP program before making any changes. Doing so will save a lot of time restoring the system back in the event of a configuration memory loss.

**Note:** *On-screen instructions at the bottom of each screen explain how to use the program.*

- **Standard CMOS SETUP** - allows checking or modification of general configuration information.
- **BIOS Features SETUP** - used to set the various system options for the user, including the virus warning, internal/external cache memory functions, quick power on self test, boot operations, gate A20 option, memory parity, security option, typematrix rate settings, and BIOS shadowing.
- **Chipset Features SETUP** - dedicated for the user who wishes to program the chipset registers of the DRAM, cache, cacheable BIOS, non-cacheable block size/start address etc.

- **Power Management Setup** - allows the programming of the timeout functions of six devices. If the device is not active, Power Management Function will slow down the CPU speed to 8 MHz and both IDE and monitor will be put into standby mode.
- **PCI & Onboard I/O SETUP** - used to set the various system functions and internal addresses of the PCI devices and onboard PCI IDE controller.
- **Load BIOS Defaults** - allows for automatic configuration of all the options in the Standard CMOS SETUP/BIOS Features SETUP/Chipset Features SETUP with the BIOS defaults.
- **Load SETUP Defaults** - loads the SETUP default values which would allow safe booting of the system in the event a BIOS configuration memory loss.
- **Supervisor Password** - required when entering and changing the SETUP option or booting your system. The supervisor can change the current password stored in the CMOS by accessing the option.
- **User Password** - required when entering the SETUP program or booting your system. The user can change the current password stored in the CMOS by accessing this option.
- **IDE HDD Auto Detection** - allows for automatic detection of the hard disk drive type(s) including the number of cylinders and heads, write pre-compensation time, read/write head landing zone, and number of sectors per track.
- **Save & Exit SETUP** - saves the changes you have made in the SETUP program, then exits and reboots the system.
- **Exit Without Saving** - abandons all previous settings then exits and reboots the system.

To choose an item from the SETUP main menu, move the cursor using the <Left/Right> and <Up/Down> arrow keys and press <Enter>. To modify the setting of an option, simply press the <PgUp> or <+> and the <PgDn> or <-> keys. Press the <F2> key when changing the color setting, <F1> for a context sensitive help function, and the <ESC> key when quitting SETUP.

## 4.2 Standard CMOS SETUP

```

                                NON FL/SH DISK CONFIGESAD
                                CMOS SETUP Utility
                                HARD DISKING, INC.
  
```

Date (mm/dd/yyyy) : Fri, Jan 26 1994						
Time (hh:mm:ss) : 7 : 38 : 25						
Primary HDDs	CYLS.	HEADS	PRECOMP	LANDZONE	SECTORS	MODE
Master : None ( 0MB)	0	0	0	0	0	---
Slave : None ( 0MB)	0	0	0	0	0	---
Secondary HDDs						
Master : None ( 0MB)	0	0	0	0	0	---
Slave : None ( 0MB)	0	0	0	0	0	---
Drive A : 1.44M, 3.5 in.						
Drive B : None						
Video : VGA/VGA						
Halt On : All Errors						
				Base Memory: 640K Extended Memory: 31740K Other Memory: 309K <hr/> Total Memory: 32680K		
ESC : Quit		F 1 = : Select Item		F5/F6/F7 : Modify		
F2 : Help		ESC/F10/F12 : Change Color				

Figure 4-2. Standard CMOS SETUP Screen

**Date** - allows manual setting of the electronic calendar on the mainboard.

**Time** - sets the system's internal clock which includes hour, minutes, and seconds.

**Primary/Secondary Master and Slave:** - specify the physical and electronic properties of the standard hard disk drives installed. Relevant specifications include the type, number of cylinders (CYLS.), heads (HEADS), write pre-compensation time (PRECOMP), read/write head landing zone (LANDZONE), number of sectors per track (SECTORS), and HDD mode (MODE). Selecting "AUTO" in the hard disk type item avoids the necessity of loading the HDD specifications and the function of the IDE HDD Auto Detection option in the main menu. The system BIOS will automatically detect the hard drive(s) installed on the system upon bootup.

**Drive A/B:** - specify the capacity and format of the floppy drives installed in your system.

**Video** - specifies the display adapter installed.

**Halt On** - enables the system to halt on several conditions/options. The default value is set at "All Errors".

**Base/Extended/Other Memory** - A small section in the lower right corner of the screen displays important information about your system which includes the base, extended, and other memory sizes. They are updated automatically by the SETUP



program according to the status detected by the BIOS self-test. This section of the Standard CMOS SETUP screen is for viewing purpose only and manual modifications are not allowed.

### 4.3 BIOS Features SETUP

NEW PCL-15A BIOS (CMOS) BIOS FEATURES SETUP  
AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C0000-C0FFF Shadow	: Disabled
External Cache	: Enabled	C8000-CFFFF Shadow	: Disabled
Quick Power On Self Test	: Disabled	D0000-DFFFF Shadow	: Disabled
Boot Sequence	: A,C	E0000-EFFFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	F0000-FFFFF Shadow	: Disabled
Boot up floppy seek	: Enabled	16000-16FFF Shadow	: Disabled
Boot up Harddisk Status	: On		
Boot up System Speed	: High		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars/Sec)	: 6		
Typematic Delay (Chars)	: 250		
Security Option	: Setup		
Time Out (Sec.) For IDE Auto	: 30	ESC : Exit	F4 -- Select Item
IDE Second Channel Control	: Enabled	F1 : Help	F5/F6/F7/F8 : Modify
PCL/15A Feature Swap	: Disabled	F9 : Old Values (CMOS) F2 : Color	
		F3 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Figure 4-3. BIOS Features SETUP Screen

**Virus Warning** - allows the virus warning feature for the hard disk boot sector to display a warning message and produce a beep sound whenever an attempt is made to write on the hard disk's boot sector. The default value for this option is "Disabled."

**CPU Internal Cache** - enables the internal 16KB code/data cache of the Intel Pentium™ CPU when set to "Enabled" (default).

**External Cache** - enables the on-board secondary cache (either standard non-burst or burst cache) when set to "Enabled" (default).

**Quick Power On Self Test** - allows the power on self test to run at either a fast or a normal speed. The available options are:

- Disabled (default)
- Enabled

**Boot Sequence** - selects the drive where the system would search for the operating system to run with. The available options are:

- A,C (default)
- C,A

**Swap Floppy Drive** - "Enabled" will effectively change the A: drive to B: and the B: to A: drive. "Disabled" (default) sets the floppy drives in their default states.

**Boot Up Floppy Seek** - checks whether the floppy drives installed on the system are correct or not. This option's operation usually occurs when the magnetic heads of the floppy drives produce a sound during power on self test. The available options are:

- Enabled (default)
- Disabled

**Boot Up NumLock Status** - sets the Num Lock key to either on or off during system boot-up. The available options are:

- On (default)
- Off

**Boot Up System Speed** - sets the speed of the system during power on self test sequence. The available options are:

- High (default)
- Low

**Gate A20 Option** - boosts the performance of systems with softwares using the 80286 protected mode such as OS/2 or UNIX. This option determines the accessibility of the extended memory. The available options are:

- Fast (default)
- Normal

**Typematic Rate Setting** - defines the setting of the keyboard's typematic rate. The available options are:

- Enabled
- Disabled (default)

**Typematic Rate (Chara/Sec)** - specifies the key repeat rate, in seconds, of keyboard characters. The available options are:

- 2/sec
- 6/sec (default)
- 10/sec
- 13.3/sec
- 18.5/sec
- 21.8/sec
- 26.7/sec
- 30/sec

**Typematic Delay (Msec)** - selects the delay, in milliseconds, before a key repeats itself. The available options are:

- 1/4 sec (default)
- 1/2 sec
- 3/4 sec
- 1 sec

**Security Option** - determines whether the password will be asked for in every boot (System), or when entering into the SETUP program (Setup - default). Refer to the section entitled Password Setting for the password setting procedure.

**Time Out (Sec.) For IDE Auto** - The available options are:

- 2
- 6
- 10 (default)
- 4
- 8
- 12

**IDE Second Channel Control** - The available options are:

- Enabled (default)
- Disabled

**PCI/VGA Palette Snoop** - select **"Enabled"** to solve the abnormal color in Windows while using ISA MPEG and PCI VGA card. The available options are:

- Enabled
- Disabled (default)

**Video BIOS Shadow** - enables the system shadowing and achieve the best performance of the system. The available options are:

- Enabled (default)
- Disabled

**C8000-CBFFF, CC000-CFFFF, D0000-D3FFF, D4000-D7FFF, DB000-DBFFF, DC000-DFFFF Shadow** - if you have a shadowing of the BIOS at any of the above segments, you may set the appropriate memory cacheable function to **"Enabled"**. Otherwise, select **"Disabled"** (default).

## 4.4 Chipset Features SETUP

WIN PCI/ISA BIOS (2051032A)  
 CHIPSET FEATURES SETUP  
 AWARD SOFTWARE, INC.

Auto Configuration	: Disabled	Latency from AGP states	: 2T
Read CAS Pulse Width	: 4T	Refresh when CPU Hold	: Disabled
DRAM Write CAS Width	: 2T	Post Write CAS active	: 1T
L1 Cache Update Mode	: 00	CPU/PCI Post Write Delay	: 1T
L2 Cache Update Mode	: 00	PCI Clock Frequency	: CPUCLK/2
L3 Cache Update Mode	: 00	CPU/PCI Burst Bus. Write	: Disabled
DRAM Speed Option	: Slower	CPU/PCI Post Bus. Write	: Disabled
DRAM Burst 3/4 Cycle	: 3T	ISA Bus Clock Frequency	: PCICLK/4
Memory Hole At 15M-16M	: Disabled	DRAM Type of Bank 0 & 1	: 7T DRAM
Refresh M0 Active Time	: 5T	DRAM Type of Bank 2 & 3	: 7T DRAM
DRAM RD to CAS Delay	: 4T	EDO DRAM Timing	: 7T DRAM
DRAM RD Precharge Time	: 5T	EDO RDL Timing	: 7T DRAM
Gate A0B Emulation	: Enabled	EDO CAS RD Pulse Width	: 2T
Fast Refresh Emulation	: Enabled	EDO CAS WR Pulse Width	: 1T
Slow Refresh (1:4)	: Disabled		
System BIOS Cacheable	: Disabled	ESC : Quit	F1 =: Select Item
Video BIOS Cacheable	: Disabled	F2 : Help	F3/F4/F5 : Modify
Turbo/De turbo Switch	: Disabled	F5 : Old Values (Shift)F2 : Color	
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Figure 4-4. Chipset Features SETUP Screen

**Auto Configuration** - loads the default values, if **"Enabled"** (default), for the following DRAM and cache options. Otherwise, **"Disabled"** allows you to program each option as required.

**Read CAS Pulse Width** - determines the pulse width length of the CAS during DRAM read cycles. The available options are:

- 2T
- 3T
- 4T (default)

**DRAM Write CAS Width** - determines the pulse width length of the CAS during DRAM write cycles. The available options are:

- 2T (default)
- 3T

**L1 Cache Update Mode** - The available options are:

- WB (default)
- WT

**L2 Cache Update Mode** - determines the mode wherein the external (L2) cache will operate. Choosing "WB" will set the cache in its fastest mode since writes as well as reads are cached. The available options are:

- WT
- WB (default)

**L1 Cache Update Mode** - sets the state of the (L1) internal cache of the Pentium™ CPU and determines the mode wherein data will be updated. The available options are:

- WB (default)
- WT

**SRAM Speed Option** - specifies the speed of the standard SRAM cache during normal read/write operations. The available options are:

- Slower (default)
- Faster
- Fastest

**SRAM Burst R/W Cycle** - defines the speed of the cache SRAM burst read/write cycles. The available options are:

- 3T (default)
- 2T

**Memory Hole At 15M-16M** - The available options are:

- Disabled (default)
- Enabled

**Refresh RAS Active Time** - defines the amount of active time needed for the row address strobe (RAS), during DRAM refresh time, to be refreshed. The available options are:

- 5T (default)
- 6T

**DRAM RAS to CAS Delay** - defines the amount of time required after which a CAS# will be succeeded by RAS# signal during normal DRAM operations. The available options are:

- 3T
- 4T (default)

**DRAM RAS Precharge Time** - sets the amount of time for DRAM RAS recovery. The available options are:

- 4T
- 5T (default)

**Gate A20 Emulation** - allows access and increases the speed of the Gate A20 feature incorporated in the on-board chipset. When enabled, the SiS85C501 responds the cycle by asserting DEVSEL# in slowest timing. Otherwise, the cycle is subtractively decoded by SiS85C503, and then is passed to 80-42 on the ISA Bus. The available options are:

- Enabled (default)
- Disabled

**Fast Reset Emulation** - enhances the speed of the software reset by delaying the assertion of INIT or CPUST by 2 $\mu$ s or 6 $\mu$ s, and holding them for 25 CPUCLK. The available options are:

- Enabled (default)
- Disabled

**Slow Refresh (1:4)** - allows you to turn the DRAM's slow refresh feature to on or off. The available options are:

- Enabled
- Disabled (default)

**System BIOS Cacheable** - allows caching of the different segments where there is system BIOS shadowing. The available options are:

- Enabled
- Disabled (default)

**Video BIOS Cacheable** - allows caching of the different segments where there is video BIOS shadowing. The available options are:

- Enabled
- Disabled (default)

**Turbo/DeTurbo Switch** - enables the hardware turbo switch on-board and/or the keyboard control when changing the system speed.

- Enabled (default)
- Disabled

**Latency from ADS# status** - determines the CPU to PCI Post write speed. When this is set to "3T", the Post write rate is 5T for each double word. When this option is set to "2T" (default), the rate is 4T per double word. For a Qword PCI memory write, the post write rate is 7T (2T) or 8T (3T).

- 2T (default)
- 3T

**Refresh When CPU Hold** - enables the refresh cycle when the CPU is in HOLD state. The available options are:

- Enabled
- Disabled (default)

**Post Write CAS Active** - defines the pulse width of CAS# when the PCI master writes to DRAM. The available options are:

- 1T (default)
- 2T

**CPU/PCI Post Write Delay** - pertains to the delay time before the CPU writes data into the PCI Bus. The available options are:

- 1T (default)
- 2T

**PCI Clock Frequency** - selects the timing of the PCI Bus clock. The available options are:

- CPUCLK/1.5
- CPUCLK/2 (default)
- 14Mhz

**CPU/PCI Burst Mem. Write** - If enabled, back-to-back sequential CPU memory write cycles to PCI are translated to PCI burst memory write cycles. If disabled, each single write to PCI will have an associated FRAME# sequencer. The available options are:

- Enabled
- Disabled (default)

**CPU/PCI Post Mem. Write** - *enabling* allows up to 4 Dwords of data to be posted to PCI. *Disabling* this option not only disables the buffering but also limits the completion of CPU write (CPU write does not complete until the PCI transaction completes). In general, this option enhances the performance of the PCI slots when "Enabled" (default).

- Enabled
- Disabled (default)

**ISA Bus Clock Frequency** - specifies the speed of the ISA Bus clock of the system. The available options are:

- PCICLK3
- PCICLK4 (default)
- 7.156MHz

**EDO Type Of Bank 0 & 1** - The available options are:

- FP DRAM ☆ (default)
- EDO

**EDO Type Of Bank 2 & 3** - The available options are:

- FP DRAM ☆ (default)
- EDO

**EDO BRDY# Timing** - The available options are:

- 6-2-2-2
- 1-2-2-2
- FP DRAM ☆ (default)

**EDO MDLE Timing** - The available options are:

- 7-2-2-2
- 6-2-2-2
- FP DRAM ☆ (default)

☆ "FP DRAM" means the standard DRAM.

EDO CAS RD Pulse Width - The available options are:

- 1T
- 2T (default)

EDO CAS WR Pulse Width - The available options are:

- 1T (default)

## 4.5 Power Management Setup

NON-PCL/ISA BUSES (MS-DOS/386)  
POWER MANAGEMENT SETUP  
MANSOURI SOFTWARE, INC.

POWER MANAGEMENT	: Disabled	DMA Activity	: Disabled
PM Control by APM	: Yes	IRQ3 (IRQ3)	: Enabled
Video Off Option	: Suspend->Off	IRQ4 (IRQ4)	: Enabled
Video Off Method	: V/H SYNC+Blank	IRQ5 (IRQ5)	: Enabled
Suspend Switch	: Enabled	IRQ6 (Floppy Disk)	: Enabled
Spin Speed (dir sp):	: 2	IRQ7 (LPT1)	: Enabled
Stalling Speed (dir sp):	: 3	IRQ8 (RTC Alarm)	: Disabled
		IRQ9 (IRQ9 Scalar)	: Enabled
		IRQ10 (Reserved)	: Enabled
		IRQ11 (Reserved)	: Enabled
		IRQ12 (PS/2 Mouse)	: Enabled
		IRQ13 (Coprocessor)	: Enabled
		IRQ14 (Hard Disk)	: Enabled
		IRQ15 (Reserved)	: Enabled
		ESC : Quit	Tab : Select Item
		F1 : Help	Alt/Shift : Modify
		F5 : Old Values	Ctrl/Prt : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Figure 4-5. Power Management Screen

Power Management - The available options are:

- Disabled (default)
- Min Saving
- Max Saving
- User Define

PM Control By APM - sets the power management (PM) control by the APM. The available options are:

- Yes (default)
- No

Video Off Option - The available options are:

- Suspend->Off (default)
- Susp. Stby->Off
- All Modes->Off
- Always On

Video Off Method - selects the video off method in standby mode. The available options are:

- V/H SYNC+Blank (default)
- Blank Screen

**Suspend Switch** - sets the system of the suspend switch. The available options are:

- Enabled (default)
- Disabled

**Doze Speed (div by)** - The available options are:

- 2 (default)
- 1/3/4/5/6/7/8

**Stdby Speed (div by)** - The available options are:

- 3 (default)
- 1/2/4/5/6/7/8

**HDD Power Down** - sets the time to power down HDD in standby mode. The available options are:

- Disabled (default)
- 1/2/3/4/5...15 Min
- When Suspend

**Doze Mode** - sets the time interval after system inactivity when the system enters DOZE mode. The available options are:

- Disabled (default)
- Enabled

**Standby Mode** - sets the timer interval after system inactivity when the system events enters STANDBY mode. The options are:

- Disabled (default)
- Enabled

**Suspend Mode** - sets the time interval after system inactivity when the system enters SUSPEND mode. The available options are:

- Disable (default)
- Enabled

The menu also lists the Power Management SETUP (PM) events by which the system wakes up from STANDBY or SUSPEND modes. Switch the following parameters to disabled or enabled:

- COM Ports Activity
- HDD Ports Activity
- IRQ1-15 Activity
- IRQ3 (COM2)
- IRQ5 (LPT2)
- IRQ7 (LPT1)
- IRQ9 (IRQ2 Rear)
- IRQ11 (Reserved)
- IRQ13 (Coprocessor)
- IRQ15 (Reserved)
- LPT Ports Activity
- PCI/ISA Master Act
- VGA Activity
- IRQ4 (COM1)
- IRQ6 (Floppy Disk)
- IRQ8 (RTC Alarm)
- IRQ10 (Reserved)
- IRQ12 (PS/2 Mouse)
- IRQ14 (Hard Disk)



## 4.6 PCI Configuration SETUP

NON PCI/ISA BIOS (SIS/ICE)ia)  
 PCI & onboard I/O SETUP  
 BIOS SETUP, INC.

PnP BIOS Auto-Config: Disabled	Onboard FDC Controller : Enabled
Slot 1 Using INT# : AUTO	Onboard Serial Port 1 : COM1
Slot 2 Using INT# : AUTO	Onboard Serial Port 2 : COM2
Slot 3 Using INT# : AUTO	Onboard Parallel Port : EPP
Slot 4 Using INT# : AUTO	Parallel Port Mode : NORMAL
1st Available IRQ : 9	IDE HDD Block Mode : Disabled
2nd Available IRQ : 10	Onboard CD/DVD IDE Mode 3 : Disabled
3rd Available IRQ : 11	
4th Available IRQ : NA	
PCI IRQ Assignment By : Edge	
PCI IDE IRQ Map To : ISA	
Primary IDE INT# : A	
Secondary IDE INT# : B	
Internal PCI/IDE : Enabled	
Auto Power Down Mode: Disabled	ESC : Quit F10 : Select Item
Enhance Speed Mode : Enabled	F1 : Help F2/F5/F6 : Modify
Head Prefetch Buffer: Enabled	F7 : Old Values CTRL+F2 : Color
	F8 : Load BIOS Defaults
	F9 : Load Setup Defaults

Figure 4-5. PCI Slot Configuration Screen

**PnP BIOS Auto-Config** - If user selects "Enabled", the "1st/2nd/3rd/4th Available" IRQ options will disappear and the system will auto configure the available IRQ(s).

- Disabled (default)
- Enabled

**PCI Slot 1/2/3/4 Using INT#** - defines the INTx# assigned to every PCI slot. The available options are:

- AUTO (default)
- A
- B
- C
- D

**1st/2nd/3rd/4th Available IRQ** - specify the IRQ for the PCI device. The end user should assign an available IRQ if the PCI device needs an IRQ service. The available options are:

- NA (4th Available IRQ default)
- 3
- 4
- 5
- 7
- 9 (1st Available IRQ default)
- 10 (2nd Available IRQ default)
- 11 (3rd Available IRQ default)
- 12
- 14
- 15

**PCI IRQ Activated By** - programs the PCI IRQ to single edge or logic level. Level/Edge sensitivity is programmed per controller. Every IRQ input for a given bank is either "Edge" or "Level" (default) triggered.

**PCI IDE IRQ Map To** - defines the CMD PCI0640B IRQ Routing either from the PCI Bus or the ISA Bus. The default setting of this option is "ISA."

**Primary/Secondary IDE INT#** - defines the primary/secondary IDE INT# of the PCI IDE card. The available options are:

- A (default of Primary IDE INT#)
- B (default of Secondary IDE INT#)
- C
- D

**Internal PCI/IDE** - sets the on-board PCI IDE to "Enabled" (default) or "Disabled".

**Auto Power Down Mode** - The available options are:

- Enabled
- Disabled (default)

**Enhance Speed Mode** - The available options are:

- Enabled (default)
- Disabled

**Read Prefetch Buffer** - The available options are:

- Enabled (default)
- Disabled

**Onboard FDC Controller** - sets the diskette controller mode of the CMD PCI0640B PCI Bus IDE controller chip to either on or off. The available options are:

- Enabled (default)
- Disabled

**Onboard Serial Port 1/2** - assign the addresses of the primary and secondary serial ports on-board. The available options are:

- COM1 (default of Onboard Serial Port 1)
- COM3
- COM2 (default of Onboard Serial Port 2)
- COM4
- Disabled

**Onboard Parallel Port** - assigns the address of the LPT port (printer port) on-board. This option also prevents the system from encountering any conflict when an add-on card with parallel port is installed in the future. The available options are:

- 278H
- 3BCH
- Disabled
- 378H (default)

**Parallel Port Mode** - specifies the mode under which the parallel port is assigned to operate. In "ECP+EPP" mode, EPP can be selected through the ECR register of ECP

mode 100. "Normal" (default) however can be selected through the ECR register as mode 000. The available options are:

- Normal (default)
- ECP+EPP
- EPP
- ECP

**IDE HDD Block Mode** - sets the IDE block mode which is dependent on the size of the hard drive cache. Enabling this option prevents multiple IRQ request lines to be sent in order to read more than 512 bytes. The available options are:

- Enabled
- Disabled (default)

**Onboard CMD IDE Mode 3** - permits access into the option ROM at segment E800 of the system BIOS. The option ROM then programs the timing registers of the CMD PCB0640B into a faster speed (minimum of 180ns - to IDE Mode 3 hard drives only), and turns on the Mode 3 feature of the installed hard drive. In the event that the installed hard disk drive does not support Mode 3, the option ROM will still program the timing registers to an acceptable rate compared to the chip's default timings. In general, this option enhances the hard drive's performance. The available options are:

- Enabled
- Disabled (default)

## 4.7 Load BIOS Defaults

In the event of a loss in memory on the configuration **SETUP**, the user can restore the information on the BIOS by loading its default values. Loading the BIOS defaults provides safe booting of the system.

**Important :** *This option may not be able to configure all the values within the **SETUP** program according to the installed equipments (i.e., floppy drives A: & B:, hard disk drives C: & D:).*

## 4.8 Load SETUP Defaults

SETUP defaults are considered default values with which the system will be enabled to perform better. This is due to the enabling of some options within the SETUP program. However, if problems are encountered after loading the SETUP defaults, reboot the system and load the BIOS defaults instead.

## 4.9 Supervisor & User Password

The Password Setting utility allows you to set, change, and disable the password stored in the BIOS. To change the password setting, press <Enter> on the Password Setting option of the main menu and then type the new password.

The password can be at most 6 characters long. The program will require you to confirm the new password before it exits and enables the utility. To disable the password setting, press the <F1> once the program asks you to enter the new password.

**Note :** Configure the Security Option within the BIOS Features Setup corresponding to the setting in this utility.

## 4.10 IDE HDD Auto Detection

The IDE HDD Auto Detection provides auto configuration of the hard drive installed in the system. It supports LBA, Large, and Normal modes. If the system's hard disk drive has a capacity of over 528MB and supports LBA functions, you may enable either the LBA mode or the Large mode. On the other hand, if the hard disk drive's capacity is over 528MB but does not support LBA functions, you may enable the Large mode in order to use over 528MB.

- Note:**
- The LBA and Large modes will only appear on the screen when the installed hard disk drive is specified to support the LBA mode.
  - In the case when a hard disk drive's cylinder specification exceeds 1024, and does not support the LBA functions, only the Large mode will be displayed on the screen.
  - With a hard disk drive supporting cylinders below 1024, only the Normal mode will appear on the screen. The Normal mode will also be shown on the screen under conditions a & b above.
  - Hard disk drives with less than 528MB total capacity must be set to Normal mode when combined with either old BIOS versions or the Award BIOS.

**Warning:** LBA and Large modes are new specifications which may not be fully supported by all operating systems. An example of which is the current version of UNIX System (R3.2.4) which is still unable to support the LBA function. Therefore, determine the specifications of your hard disk drive and operating system before selecting the drive's mode.

After pressing the <Enter> key on this item of the main menu, the display screen will show the following screen.

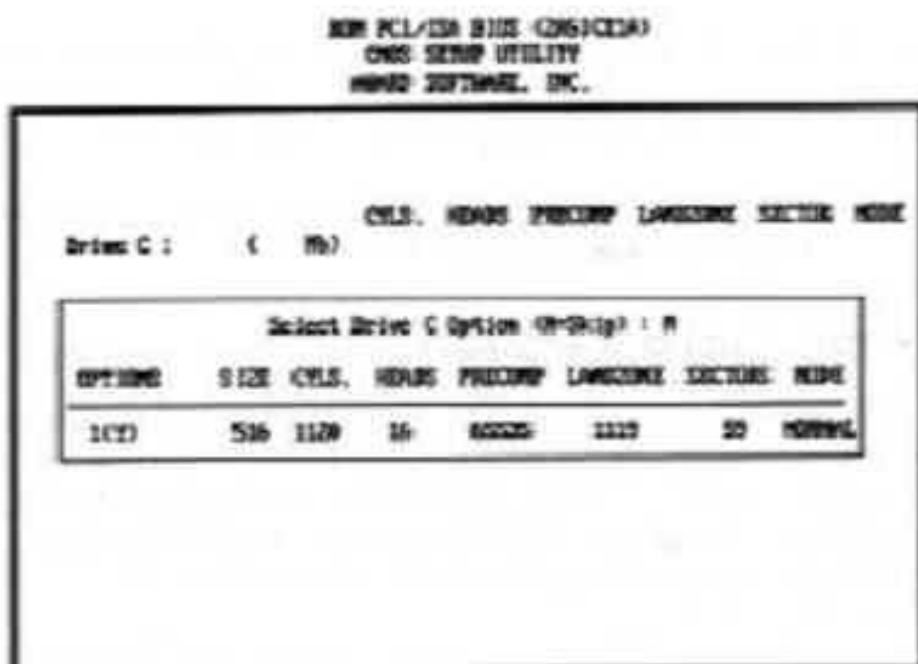


Figure 4-7. IDE HDD Auto Detection Screen

Once the program detects the type of hard disk installed, it will display the relative information such as the type, cylinders, heads, write pre-compensation, landing zone, number of sectors per track, size and mode. A message asking you to accept the IDE HDD detected will also be flashed on the screen.

#### 4.11 Quitting SETUP

After making all modifications in the SETUP program, go to the option "Save & Exit SETUP" then press the <Enter> key. The program will display the following screen.

Press <Y> to confirm the changes made, and the <N> or the <ESC> keys if further modifications are still necessary before exiting the SETUP program. Once the <Y> key is pressed, the system will automatically exit the program and reboot. However, if you want to cancel all changes made under the SETUP program, go to the option "Exit Without Saving".

Press <Y> and the system will exit the SETUP program then reboot without saving any of the changes made.

**Note:** You may also use the <F10> key to save the new settings.

# ECS SI54P AIO

