PAM-0054I

High Performance

Pentium PCI Mainboard

EPA POLLUTION PREVENTER

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WARNING

For the system to operate normally, please make sure JP22 of the mainboard is set as below. Refer to Fig. 9 in this manual for the location JP22.

JP22 ◯ ◯

If JP22 is closed, no CMOS data can be retained.

CONTENTS

CHAPTER 1   INTRODUCTION

The motherboard is a 4-layer, 2/3 baby AT size high-performance mainboard. It includes Intel 82430FX system chipset, SMC FDC37C665GT/MC1665IR Super I/O controller.

1.1   GENERAL SPECIFICATION

Processor

! Intel Pentium P54C series - P54C, P54CS, P54C-VR, P54C-VRE, P54CT.

! Cyrix 6x86 and AMD5$_K$86 Series 64-bit microprocessor.

! The mainboard can run with following speeds:
          75, 80, 90, 100, 120, 133, 150 and 166 MHz

Chipset

! Intel 82437FX (Intel 82430FX System Controller)
! Intel 82438FX (Intel 82430FX Data Path Unit)
! Intel 82371FB (PCI ISA IDE Xcelerator)
! SMC FDC37C665GT/MC1665IR (Super I/O Controller)

Cache Size

! Programmable Cache coherent algorithms: WT or WB.
! Cache size option is 256KB/512KB.
! Optional 256KB Pipelined Burst Mode SRAM to achieve the high Pentium system performance.

Main Memory

! Memory configurations from 2MB to 128MB are possible using combination of 256K*36 to 8MB*36 SIMM module. (32Bits non-parity 72-pin SIMM Module also available).
! Support both Fast Page Mode and Extended Data Output (EDO) Mode DRAM Modules.
! Hidden DRAM Refresh for higher system performance.

Multi I/O

! On board Multi-I/O supports two serial, one parallel ports and floppy drive controller.
! Serial ports are 16550 Fast UART compatible.
! Parallel port has EPP and ECP capabilities.

PCI IDE

! On board supports PCI Master IDE Controller, two connectors support up to four IDE devices such as HDD, CD ROM drive and Tape Back-up drives, etc.
! PCI Master IDE controller supports PIO Mode 3 and 4 devices, I/O data transfer rate can be up to 17Mb/s.

System BIOS

! Award/AMI BIOS (128KB Flash EPROM).

Slots

! Three PCI slots
! Five ISA slots

Board

! 4 Layer

Form Factor

! 2/3 Baby AT Size (220 x 300mm)

1.2 MAINBOARD COMPONENTS

This section gives a brief description of key components on the mainboard. Please refer to Fig 1 for component locations.
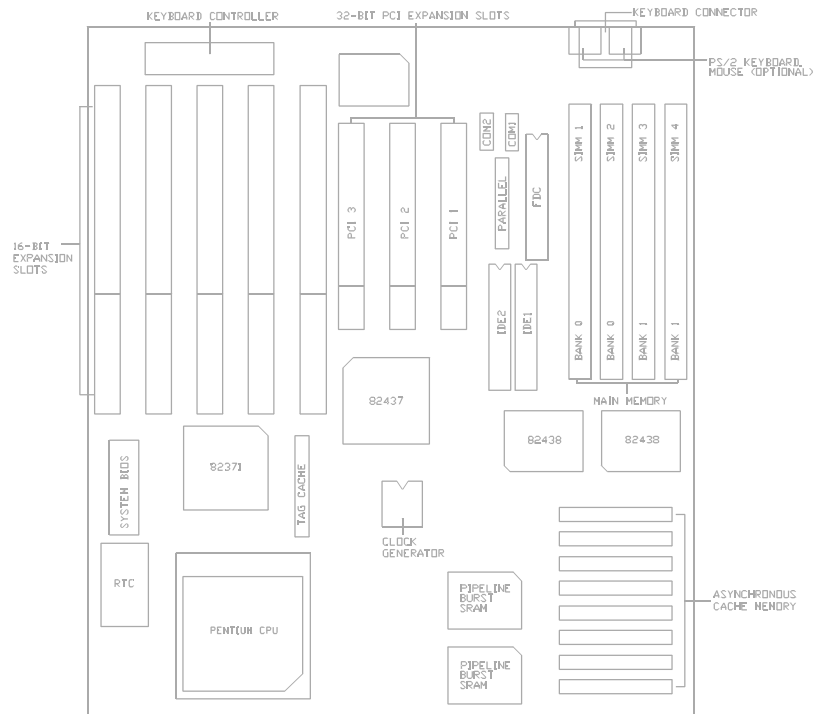
Fig. 1 Key Components of the Mainboard

CHAPTER 2   MEMORY CONFIGURATION

2.1   SYSTEM MEMORY

The Mainboard lets user upgrade system memory via SIMM sockets on the mainboard. On-board memory is located in two banks: Bank 0 and Bank 1.

Two SIMM sockets are provided in each bank. User can install either 1M, 4M, 8M, 16M or 32M SIMM in each bank.

Note: *The type of SIMM1/SIMM2 must be same.*
            The type of SIMM3/SIMM4 must be same.

DRAM Type and Total system memory size:

Bank 0 (SIMM1, 2)	Bank 1 (SIMM3, 4)	Total Size
1Mx36 Single	None	8M
1Mx36 Double	None	16M
4Mx36 Single	None	32M
4Mx36 Double	None	64M
None	1Mx36 Single	8M
None	1Mx36 Double	16M
None	4Mx36 Single	32M
None	4Mx36 Double	64M
To be continue		

Table 1A: Memory Configuration

Bank 0 (SIMM1, 2)	Bank 1 (SIMM3, 4)	Total Size
1Mx36 Single	1Mx36 Single	16M
1Mx36 Single	1Mx36 Double	24M
1Mx36 Single	4Mx36 Single	40M
1Mx36 Single	4Mx36 Double	72M
1Mx36 Single	1Mx36 Single	16M
1Mx36 Double	1Mx36 Single	24M
4Mx36 Single	1Mx36 Single	40M
4Mx36 Double	1Mx36 Single	72M
1Mx36 Double	1Mx36 Single	24M
1Mx36 Double	1Mx36 Double	32M
1Mx36 Double	4Mx36 Single	48M
1Mx36 Double	4Mx36 Double	80M
1Mx36 Single	1Mx36 Double	24M
1Mx36 Double	1Mx36 Double	32M
4Mx36 Single	1Mx36 Double	48M
4Mx36 Double	1Mx36 Double	80M
To be continue		

Table 1B: Memory Configuration

Bank 0 (SIMM1, 2)	Bank 1 (SIMM3, 4)	Total Size
4Mx36 Single	1Mx36 Single	40M
4Mx36 Single	1Mx36 Double	48M
4Mx36 Single	4Mx36 Single	64M
4Mx36 Single	4Mx36 Double	96M
1Mx36 Single	4Mx36 Single	40M
1Mx36 Double	4Mx36 Single	48M
4Mx36 Single	4Mx36 Single	64M
4Mx36 Double	4Mx36 Single	96M
4Mx36 Double	1Mx36 Single	72M
4Mx36 Double	1Mx36 Double	80M
4Mx36 Double	4Mx36 Single	96M
4Mx36 Double	4Mx36 Double	128M
1Mx36 Single	4Mx36 Double	72M
1Mx36 Double	4Mx36 Double	80M
4Mx36 Single	4Mx36 Double	96M
4Mx36 Double	4Mx36 Double	128M

Table 1C: Memory Configuration

**Note: based on above chart, the different types of SIMM can be in different bank, but within same bank, the two SIMM modules must be of _same type and size._

2.2   CACHE MEMORY CONFIGURATION

The mainboard has a built-in cache controller. It requires external SRAM as tag and data memory.

Cache Tag RAM Location: U33
Asynchronous Standard Cache Bank Location: U4 - U11
Pipeline Burst SRAM Location: U19, U20

Cache Type	Cache Size	Tag RAM (U33)	Data RAM Group 1 (U4 - U11)	Data RAM Group 2 (U19, U20)
Asyn	256K	8Kx8	32Kx8	None
		16Kx8		
Asyn	512K	16Kx8	64Kx8	None
		32Kx8		
Pipeline Burst	256K	8Kx8	None	32Kx32
		16Kx8		32Kx36

Table 2: Secondary Cache Configuration

Note: Tag RAM are all 5V device, Asyn. Data RAM are Mix-Voltage device, e.g. Winbond W24M257AK and Pipeline Burst data RAM are 3.3V device e.g. Winbond W259010AF.

CHAPTER 3   JUMPER SETTINGS AND CONNECTORS

3.1   CPU TYPE

The pentium processors have different operation voltage. In order to use the CPU Voltage correctly, the following is the marking for identify the CPU type.

```
XXXXXXXXX
XXXXXXXXX
A80502-MMM


SXXXX/XYZ
```

**Fig.2 CPU Description
(Bottom Side)**

Description :

X = Voltage Specification (S or V)
    S = Standard Voltage (3.4V)
    V = VRE 3.4 - 3.6V (3.5V)

Y = Timing Specification (S or M)
    S = Standard EDS timings
    M = Min Valid Delay Spec.

Z = Dual Processing Support (S or U)
    S = Support DP/MP/UP
    U = Not tested to support DP

3.2   SETTING THE JUMPERS

The table below summaries the functions and settings of each jumper of the motherboard.

Function		Jumper Settings
CPU Voltage Selection	**3.4V** For P54C, P54CS, P54C-VR, P54CT, Cyrix 6x86, AMD5$_K$86(C,F)	JP29: short JP30: open
	3.5V For P54C-VRE, AMD5$_K$86(B)	JP29: open JP30: short

CPU Speed Selection I (U29 use W42C25 Clock Chip)	For 75MHz Intel Pentium, AMD5$_K$86-P100(AMD-K5-75) and AMD5$_K$86-P75(AMD-SSA/5-75) CPU	JP21: open
		JP23: open
		JP9: 1-2 open
		         3-4 open
		         5-6 short

	For 80MHz Cyrix 6x86-P90	JP21: short
		JP23: open
		JP9: 1-2 short
		         3-4 open
		         5-6 short

	For 90MHz Intel Pentium, AMD5$_K$86-P90(AMD-SSA/5-90) and AMD5$_K$86-P120(AMD-K5-90) CPU	JP21: open
		JP23: open
		JP9: 1-2 short
		         3-4 short
		         5-6 open

	For 100MHz Cyrix 6x86-P120 CPU	JP21: short
		JP23: open
		JP9: 1-2 open
		         3-4 open
		         5-6 short

To be continue...		

Table 3A: Jumper Setting

Function		Jumper Setting

CPU Speed Selection I (U29 use W42C25 Clock Chip)	For 100MHz Intel Pentium, AMD5$_K$86-P100(AMD-SSA/5-100) and AMD5$_K$86-P133 (AMD-K5-100) CPU	JP21: open
		JP23: open
		JP9: 1-2 open
		        3-4 short
		        5-6 open

	For 120MHz Intel Pentium, Cyrix 6x86-P150, AMD5$_K$86-P150 (AMD-K5-120) CPU	JP21: short
		JP23: open
		JP9: 1-2 short
		        3-4 short
		        5-6 open

	For 133MHz Intel Pentium, Cyrix 6x86-P166, AMD5$_K$86-P75 (AMD-SSA/5-66) and AMD5$_K$86-P166(AMD-K5-133) CPU	JP21: short
		JP23: open
		JP9: 1-2 open
		        3-4 short
		        5-6 open

	For 150MHz Intel Pentium CPU	JP21: short
		JP23: short
		JP9: 1-2 short
		        3-4 short
		        5-6 open

	For 166MHz Intel Pentium CPU	JP21: short
		JP23: short
		JP9: 1-2 open
		        3-4 short
		        5-6 open

CPU Speed Selection II (U29 use MX8318-01 Clock Chip)	For 75MHz Intel Pentium, AMD5$_K$86-P100(AMD-K5-75) and AMD5$_K$86-P75(AMD-SSA/5-75) CPU	JP21: open
		JP23: open
		JP9: 1-2 open
		        3-4 open
		        5-6 short

To be continue...		

Table 3B: Jumper Setting

Function		Jumper Setting	
CPU Speed Selection II (U29 use MX8318-01 Clock Chip)	For 80MHz Cyrix 6x86-P90 CPU	JP21: JP23: JP9:	short open 1-2 short 3-4 short 5-6 open
	For 90MHz Intel Pentium, AMD5$_K$86-P90(AMD-SSA/5-90) and AMD5$_K$86-P120(AMD-K5-90) CPU	JP21: JP23: JP9:	open open 1-2 open 3-4 short 5-6 open
	For 100MHz Cyrix 6x86-P120 CPU	JP21: JP23: JP9:	short open 1-2 open 3-4 open 5-6 short
	For 100MHz Intel Pentium, AMD5$_K$86-P100(AMD-SSA/5-100) and AMD5$_K$86-P133 (AMD-K5-100) CPU	JP21: JP23: JP9:	open open 1-2 short 3-4 open 5-6 short
	For 120MHz Intel Pentium, Cyrix 6x86-P150 and AMD5$_K$86-P150 (AMD-K5-120) CPU	JP21: JP23: JP9:	short open 1-2 open 3-4 short 5-6 open
	For 133MHz Intel Pentium, Cyrix 6x86-P166, AMD5$_K$86-P75 (AMD-SSA/5-66) and AMD5$_K$86-P166(AMD-K5-133) CPU	JP21: JP23: JP9:	short open 1-2 short 3-4 open 5-6 short
To be continue...			

Table 3C: Jumper Setting

	Function	Jumper Setting
CPU Speed Selection II (U29 use MX8318-01 Clock Chip)	For 150MHz Intel Pentium CPU	JP21: short JP23: short JP9: 1-2 open 3-4 short 5-6 open
	For 166MHz Intel Pentium CPU	JP21: short JP23: short JP9: 1-2 short 3-4 open 5-6 short
CPU Speed Selection III (U29 use IMI464 Clock Chip)	For 75MHz Intel Penium, AMD5$_K$86-P100(AMD-K5-75) and AMD5$_K$86-P75(AMD-SSA/5-75) CPU	JP21: open JP23: open JP9: 1-2 short 3-4 open 5-6 open
	For 80MHz Cyrix 6x86-P90 CPU	JP21: short JP23: open JP9: 1-2 open 3-4 short 5-6 open
	For 90MHz Intel Pentium, AMD5$_K$86-P90(AMD-SSA/5-90) and AD5$_K$86-P120(AMD-K5-90) CPU	JP21: open JP23: open JP9: 1-2 short 3-4 open 5-6 short
	For 100MHz Cyrix 6x86-P120 CPU	JP21: short JP23: open JP9: 1-2 short 3-4 open 5-6 open
To be continue...		

Table 3D: Jumper Setting

Function			Jumper Setting	
CPU Speed Selection III (U29 use IMI464 Clock Chip)	For 100MHz Intel Pentium, AMD5$_K$86-P100(AMD-SSA/5-100) and AMD5$_K$86-P133 (AMD-K5-100) CPU		JP21: JP23: JP9:	open open 1-2 short 3-4 short 5-6 short
	For 120MHz Intel Pentium, Cyrix 6x86-P150 and AMD5$_K$86-P150 (AMD-K5-120) CPU		JP21: JP23: JP9:	short open 1-2 short 3-4 open 5-6 short
	For 133MHz Intel Pentium, Cyrix 6x86-P166, AMD5$_K$86-P75 (AMD-SSA/5-66) and AMD5$_K$86-P166(AMD-K5-133) CPU		JP21: JP23: JP9:	short open 1-2 short 3-4 short 5-6 short
	For 150MHz Intel Pentium CPU		JP21: JP23: JP9:	short short 1-2 short 3-4 open 5-6 short
	For 166MHz Intel Pentium CPU		JP21: JP23: JP9:	short short 1-2 short 3-4 short 5-6 short
Cache Size	256KB	Standard/PB	JP32:	1-2 short
	512KB	Standard	JP32:	2-3 short
Clear RTC CMOS Data	Normal		JP22:	open
	Clear		JP22:	short
To be continue...				

Table 3E: Jumper Setting

Function		Jumper Setting	
System ROM Selection	5V Flash EPROM	JP19:	1-2 short
	12V Flash EPROM	JP19:	1-2 short
Onboard I/O Chip Selection	Enabled	JP4:	1-2 short
	Disabled	JP4:	2-3 short
Onboard 2.5V for CPU (optional)	3.4V CPU For P54C, P54CS, P54C-VR, P54CT, Cyrix 6x86, AMD5$_K$86(C,F)	J14: JP29: JP30: JP33:	6-7, 21-22 short short open open
	3.5V CPU For P54C-VRE, AMD5$_K$86(B)	J14: JP29: JP30: JP33:	6-7, 21-22 short open short open
	3.3V/2.5V Mixed CPU	J14: JP29: JP30: JP33:	6-7, 21-22 open short open short

Table 3F: Jumper Setting

3.3 CONNECTION THE MOTHERBOARD

Once the mainboard have been fastened into the system case, the next step is to connect the internal cables. The internal cables are wire leads with plastic female connectors that attach to the connectors. The mainboard connectors have varying numbers of pins and are the points of contact between the mainboard and other parts of the computer.
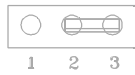
A description of each connector and its connector pins follows. See Fig. 3 for the location of the connectors on the mainboard.

Note: Before making connectors on the board, make sure that power to the system is turned off.

3.3.1 JUMPER PRESENTATION

Pins 1 and 2 are shorted with a jumper cap.

Pins 2 and 3 are shorted with a jumper cap.

The jumper is shorted when the jumper cap is placed over the two pins of the jumper.

The jumper is open when the jumper cap is removed from jumper.

3.3.2 JUMPER CONVENTION OF THE MOTHERBOARD

Different colour of jumper caps (mini-jumpers) are used on the board to represent different usage of the jumpers:

Red : CPU Clock setting
Yellow : Cache Setting
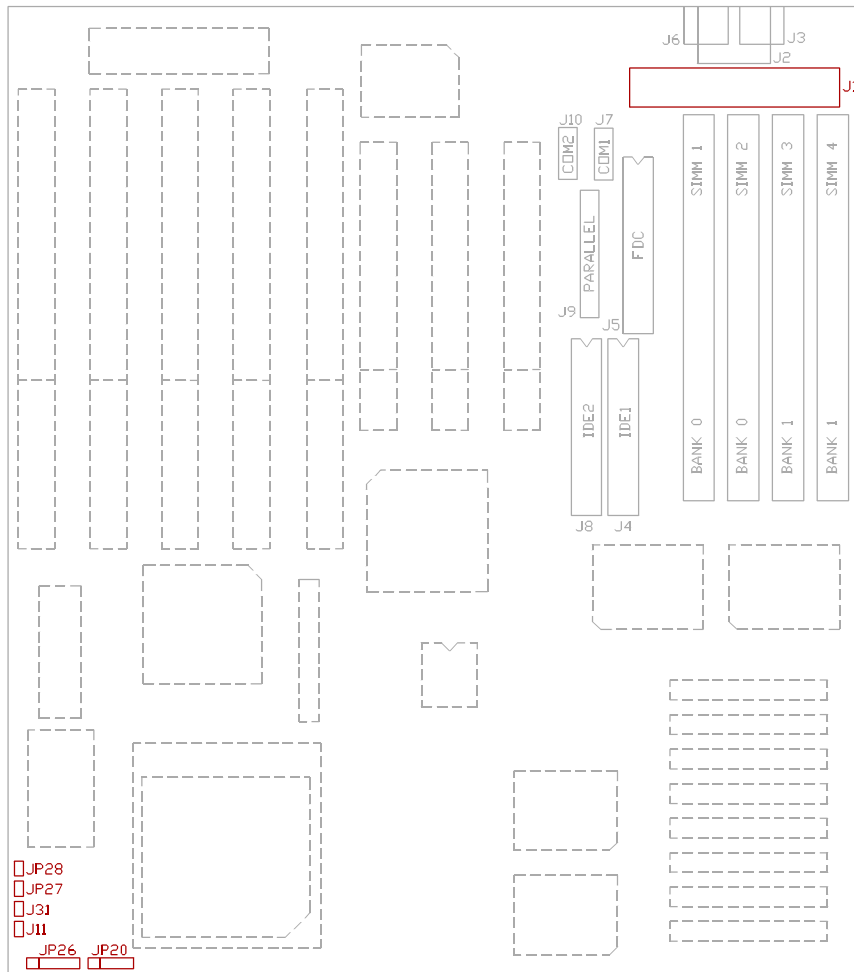Black: Other

3.3.3   CONNECTOR LOCATIONS

Fig.3 Connector Location

3.4 CONNECTORS

3.4.1 J1 - POWER SUPPLY CONNECTOR

The power supply connector has two six-pin male header connectors. Plug the dual connectors from the power directly onto the board connector.

Pin	Description
1	Power Good (Orange)
2	+5 VDC (Red)
3	+12 VDC (Yellow)
4	-12 VDC (Blue)
5	Ground (Black)
6	Ground (Black)
7	Ground (Black)
8	Ground (Black)
9	-5 VDC (White)
10	+5 VDC (Red)
11	+5 VDC (Red)
12	+5 VDC (Red)

Table 4: J1 - Power Supply Connector

3.4.2   J26 - KEYLOCK CONNECTOR

J26 is a keylock connector that enables and disables the keyboard.

```
1 ○ LED  Power
  ○ Not  Used
  ○ Ground
  ○ Keyboard  Inhibitor
  ○ Ground
```
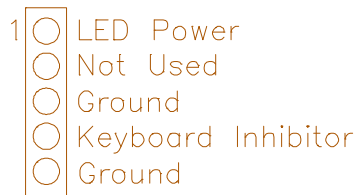
Fig. 4 J26 - Keyboard Connector

3.4.3   JP31 - TURBO LED CONNECTOR

JP31 is usually connected to a Turbo LED on front of the system case. If the system board select is in Turbo mode, the indicator lights during high-speed operation. This motherboard always operate at high-speed.

```
○ +  Anode
○ −  Cathode
```

Fig. 5 JP31 Turbo LED

3.4.4 JP20 - SPEAKER CONNECTOR

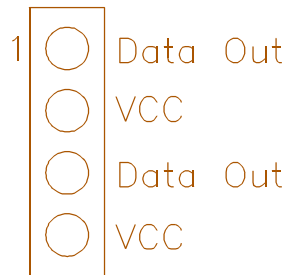Following is the system speaker to connector JP20.

Fig. 6 JP20 Speaker Connector

3.4.5 J11 - HDD LED CONNECTOR

J11 is usually connected to a HDD LED on front of the system case. If the HDD is in operation, the indicator lights during operation.

Fig. 7 J11 HDD LED

3.4.6 JP27 - RESET SWITCH CONNECTOR

Attach the Reset switch cable to this connector. The Reset switch restarts the system.

JP27	Description
▢	Reset
◯◯	Normal (default)

Table 5: JP27 Reset Switch Connector

3.4.7 J2 - KEYBOARD CONNECTOR

A standard five-pin female DIM keyboard connector is located at the rear of the keyboard. Plug the jack on the keyboard cable into this connector.
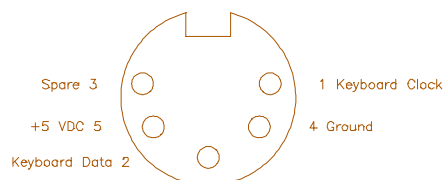

Spare 3   1 Keyboard Clock
+5 VDC 5   4 Ground
Keyboard Data 2

Fig. 8 J2 - Keyboard Connector

3.4.8 J7 - SERIAL PORT 1

Both COM1 and 2 are 16550 fast UART compatible. J7 is located right beside J1 Power Connector. Pin 1 is on the up left hand side.

3.4.9   J10 - SERIAL PORT 2

J10 is right to J7. Pin 1 is on the up left hand side.

3.4.10   J9 - PARALLEL PORT

J9 is right beneath J7 and J10. Pin 1 is on the up left hand side.

3.4.11   J5 - FLOPPY DRIVE CONTROLLER

J5 locates between DRAM SIMM Module connectors and J9 Parallel port. This Floppy drive controller also supports 2.88M FDD format.

3.4.12   J4 - PRIMARY IDE CONNECTOR

The bootable Hard Disk must connect to this Primary IDE Connector, it locates right beneath J9 parallel port connector.

3.4.13   J8 - SECONDARY IDE CONNECTOR

J8 locates left to J4, the primary IDE connector

3.4.14   J3 - PS/2 STYLE KEYBOARD CONNECTOR (OPTIONAL)

A PS/2 Standard six-pin female DIM connector for keyboard is located at left to J2.

3.4.15   J6 - PS/2 STYLE MOUSE CONNECTOR (OPTIONAL)

A PS/2 Standard six-pin female DIM connector for mouse is located at right the J2.

3.4.16   J28 - SMI SWITCH

J28 is for SMI Break Switch Setting. When J28 is trigger from OPEN to CLOSE and back to OPEN, the system would suspend immediately.
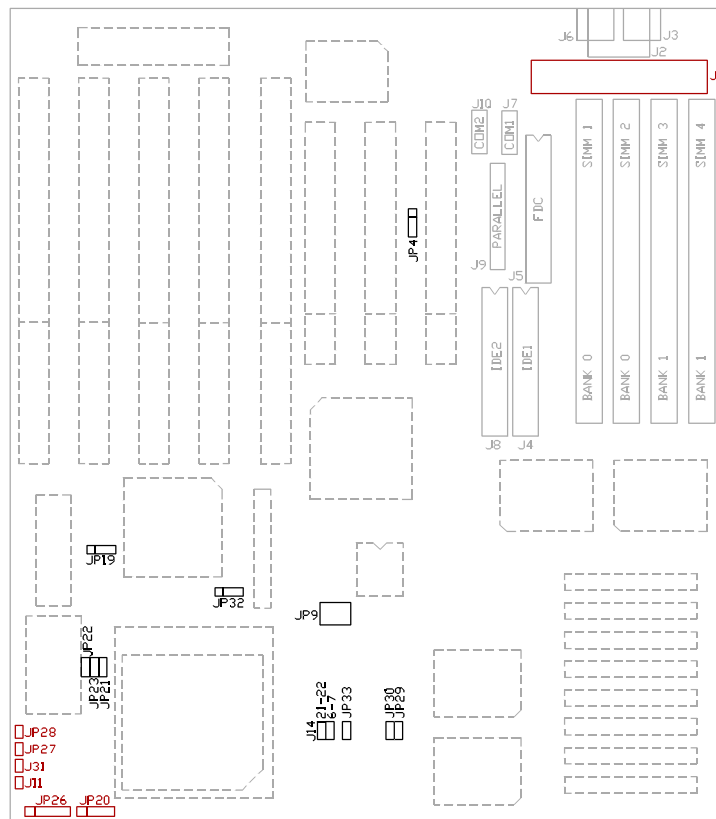
3.5   BOARD LAYOUT

Fig. 9 Board Layout

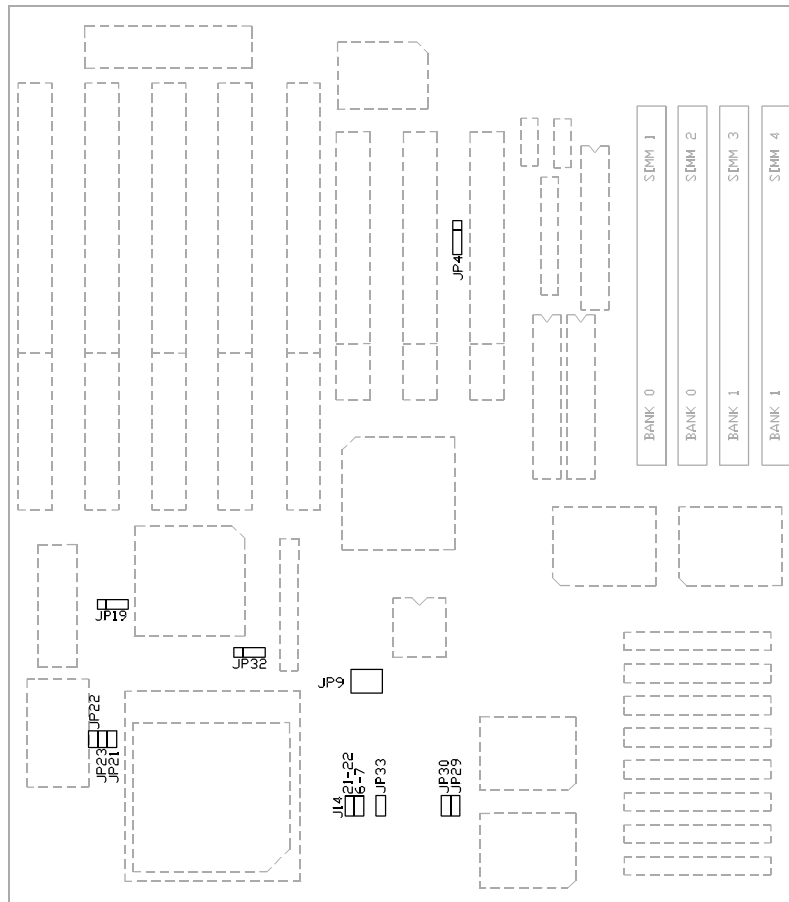# 3.6 GRAPHICAL DESCRIPTIONS OF JUMPER SETTINGS

Fig. 10 Jumper Location

3.6.1 CPU TYPE (VOLTAGE) SELECTION - SINGLE VOLTAGE SUPPLY

The Q5 supplies the CPU voltage.

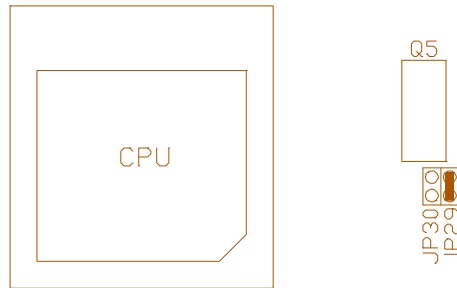1.   3.4V for P54C, P54CS, P54C-VR, P54CT, Cyrix 6x86, AMD5$_K$86(C,F)

Fig. 11A CPU Type - 3.4V

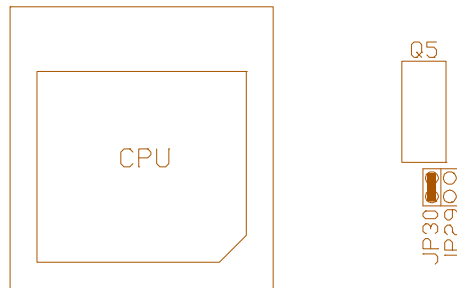2.   3.5V for P54C-VRE, AMD5$_K$86(B)

Fig. 11B CPU Type - 3.5V

3.6.2 3.3V/2.5V CPU VOLTAGE SELECTION (OPTIONAL)

Q4 is a optional 2.5V Regulator for Advanced CPU used.

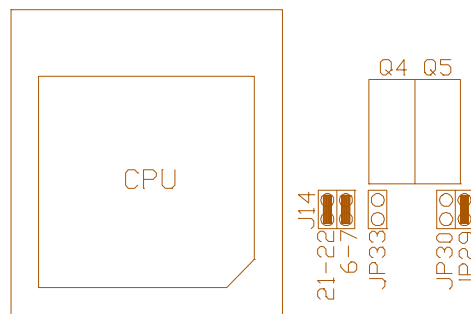1.   Single Voltage CPU used (JP29, 30 setting refer to Section 3.6.1).

Fig. 12A CPU Type - Single Voltage CPU

2.   3.3V/2.5V mixed CPU used
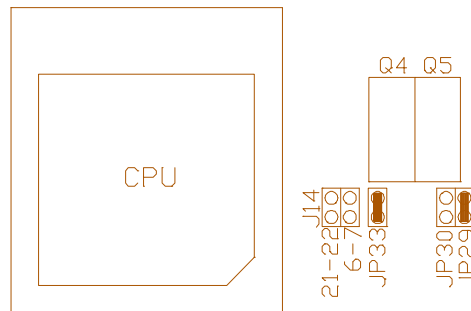
Fig. 12B CPU Type-3.3V/2.5V Mixed CPU

3.6.3 CPU SPEED SELECTION I (U27 USE W42C25)

1.   For 75MHz Intel Pentium, AMD5$_K$86-P100(AMD-K5-75) and AMD5$_K$86-P75(AMD-SSA/5-75) CPU

Fig. 13A CPU Speed

2.   For 80MHz Cyrix 6x86-P90 CPU

Fig. 13B CPU Speed

3. For 90MHz Intel Pentium, AMD5$_K$86-P90(AMD-SSA/5-90) and AMD5$_K$86-P120(AMD-K5-90) CPU

Fig. 13C CPU Speed

4. For 100MHz Intel Pentium, AMD5$_K$86-P100(AMD-SSA/5-100) and AMD5$_K$86-P133(AMD-K5-100) CPU

Fig. 13D CPU Speed

5.   For 100MHz Cyrix 6x86-P120 CPU

Fig. 13E CPU Speed

6.   For 120MHz Intel Pentium, Cyrix 6x86-P150 and AMD5$_K$86-P150(AMD-K5-120) CPU

Fig. 13F CPU Speed

7.   For 133MHz Intel Pentium, Cyrix 6x86-P166, AMD5$_K$86-P75(AMD-SSA/5-66)
        and AMD5$_K$86-P166(AMD-K5-133) CPU

Fig. 13G CPU Speed

8.   For 150MHz Intel Pentium CPU

Fig. 13H CPU Speed

9.   For 166MHz Intel Pentium CPU
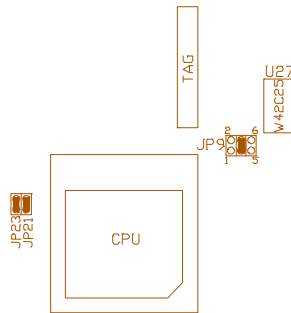
Fig. 13I CPU Speed

3.6.4 CPU SPEED SELECTION II (U29 USE MX8318-01)

1.   For 75MHz Intel Pentium, AMD5$_K$86-P100(AMD-K5-75) and AMD5$_K$86-P75(AMD-SSA/5-75) CPU
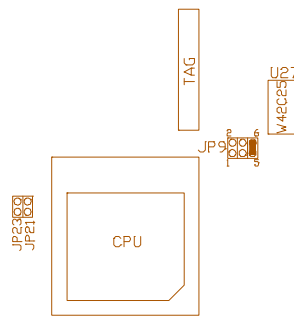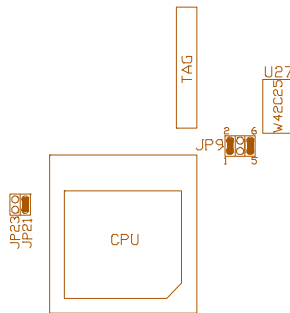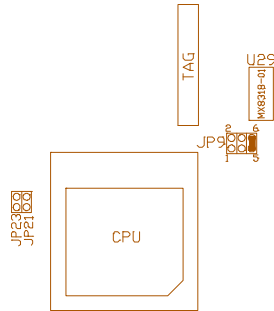

Fig. 14A CPU Speed
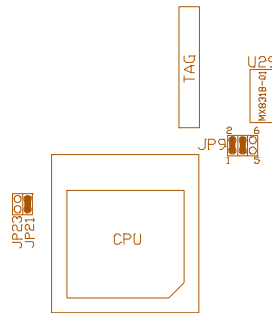
2. For 80MHz Cyrix 6x86-P90 CPU

Fig. 14B CPU Speed

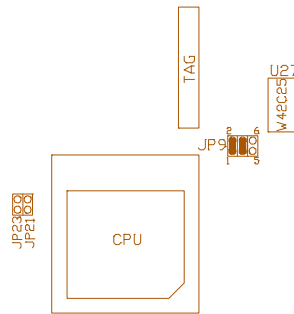3. For 90MHz Intel Pentium, AMD5$_K$86-P90(AMD-SSA/5-90) and AMD5$_K$86-P120(AMD-K5-90) CPU
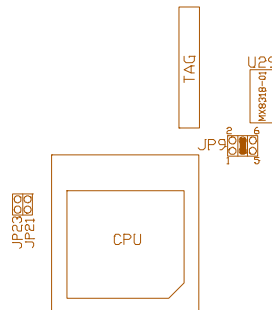
Fig. 14C CPU Speed

4.   For 100MHz Intel Pentium, AMD5$_K$86-P100(AMD-SSA/5-100) and AMD5$_K$86-
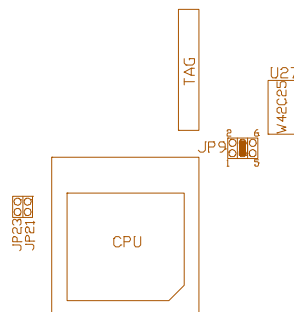   P133(AMD-K5-100) CPU
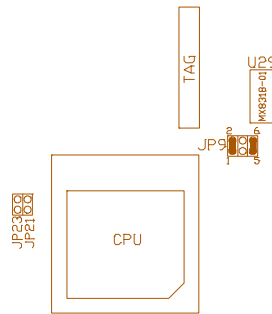
Fig. 14D CPU Speed

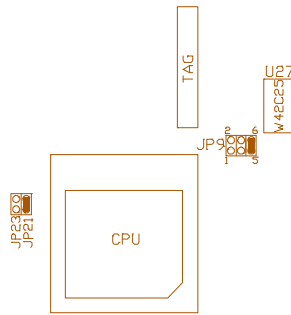5.   For 100MHz Cyrix 6x86-P120 CPU
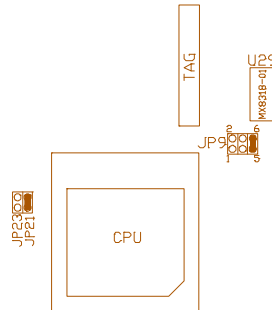
Fig. 4E CPU Speed
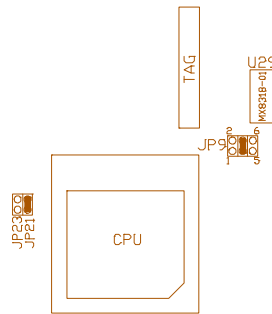
6.   For 120MHz Intel Pentium, Cyrix 6x86-P150, AMD5$_K$86-P150(AMD-K5-120) CPU
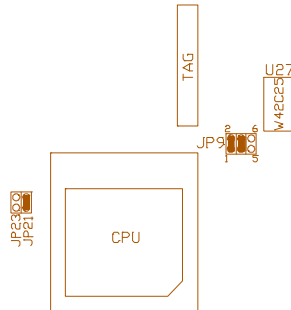
Fig. 14F CPU Speed

7.   For 133MHz Intel Pentium, Cyrix 6x86-P166, AMD5$_K$86-P75(AMD-SSA/5-66) and AMD5$_K$86-P166(AMD-K5-133) CPU
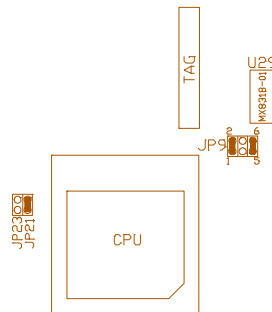
Fig. 14G CPU Speed

8.   For 150MHz Intel Pentium CPU
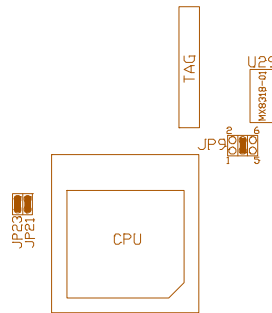
Fig. 14H CPU Speed

9.   For 166MHz Intel Pentium CPU
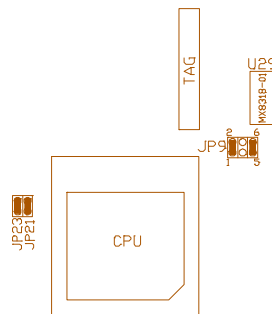
Fig. 14I CPU Speed

3.6.5 CPU SPEED SELECTION III (U30 USE IMI464)

1.   For 75MHz Intel Pentium, AMD5$_K$86-P100(AMD-K5-75) and AMD5$_K$86-P75(AMD-SSA/5-75) CPU
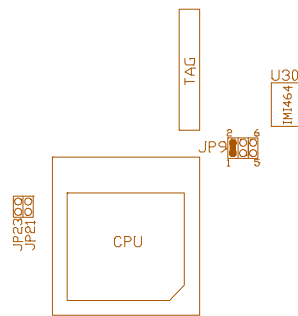
Fig. 15A CPU Speed

2.   For 80MHz Cyrix 6x86-P90 CPU
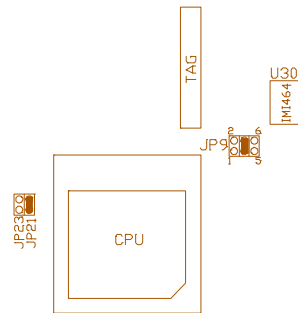
Fig. 15B CPU Speed

3.   For 90MHz Intel Pentiium, AMD5$_K$86-P90(AMD-SSA/5-90) and AMD5$_K$86-P120(AMD-K5-90) CPU
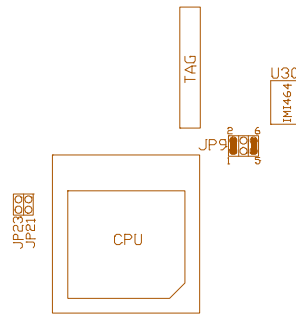
Fig. 15C CPU Speed

4.   For 100MHz Intel Pentium, AMD5$_K$86-P100(AMD-SSA/5-100) and AMD5$_K$86-P133(AMD-K5-100) CPU
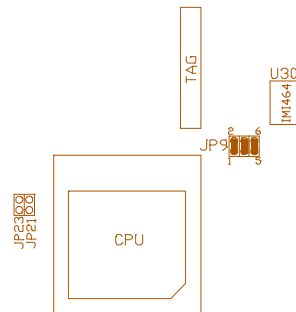
Fig. 15D CPU Speed

5.   For 100MHz Cyrix 6x86-P120 CPU
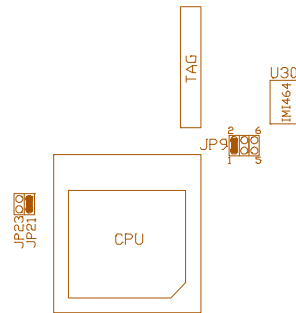
Fig. 15E CPU Speed

6.   For 120MHz Intel Pentium, Cyrix 6x86-P150, AMD5$_K$86-P150(AMD-K5-120) CPU
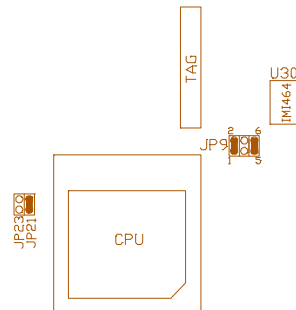
Fig. 15F CPU Speed

7.   For 133MHz Intel Pentium, Cyrix 6x86-P166, AMD5$_K$86-P75(AMD-SSA/5-66)
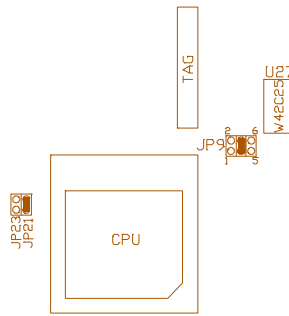   and AMD5$_K$86-P166(AMD-K5-133) CPU
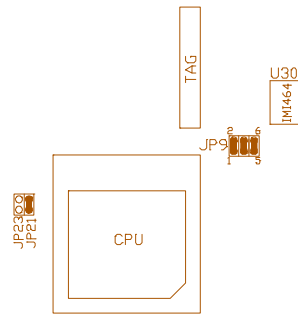
Fig. 15G CPU Speed
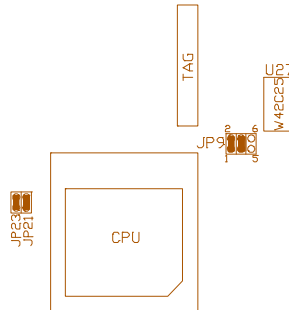
8.   For 150MHz Intel Pentium CPU
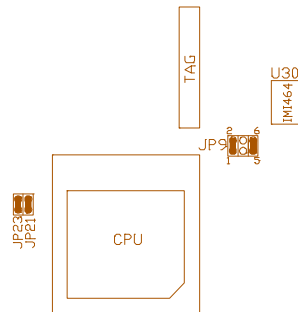
Fig. 15H CPU Speed

9.   For 166MHz Intel Pentium CPU
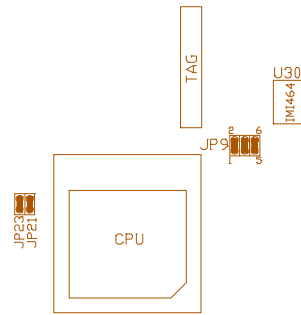
Fig. 15I CPU Speed

3.6.6 CACHE SIZE SETTING

1.   256K (32K x 8) Cache Size
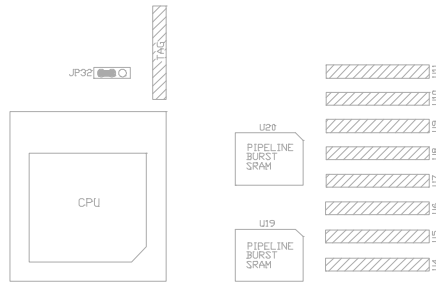
Fig. 16A Standard 256KB Cache

2.   512K (64K x 8) Cache Size
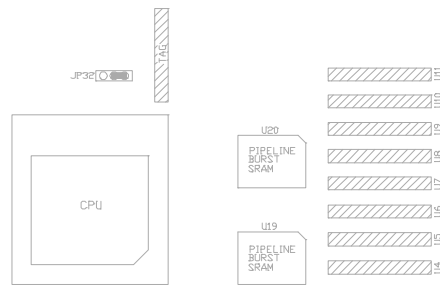
Fig. 16B Standard 512KB Cache

3.   256K (32K x 32) Cache Size - Pipeline Burst Mode
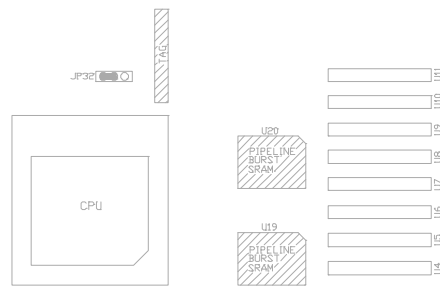
Fig. 16C PB Mode 256KB Cache

3.6.7 DISHARGE CMOS

JP22 is used to clear the content of the CMOS Data in the RTC chip DS12887A/DS12B887. Refer to Fig. 9 for the location.

JP22	Description
⬛	Clear CMOS
◯ ◯	Normal (default)

Table 6: JP22 Discharge CMOS

Different RTC chip needs a special sequence of Clear CMOS.

For DS12887A: Power Off 6 Clear CMOS 6 Power On
For DS12B887: Power On 6 Clear CMOS 6 H/W Reset

CHAPTER 4 AWARD BIOS
SETUP GUIDE

This following manual is specially provided for the BIOS supported system. After the configuration of the mainboard, and have assembled the components, user can turn on the completed system. At this point, run the software setup to ensure that the system information is correct.

The software setup of the system board is achieved through Basic Input-Output System (BIOS) programming. Use the BIOS setup program to tell the operating system what type of devices (such as disk drives) are connected to the system board.

The system setup is also called CMOS setup. Normally, users need to run system setup if either the hardware configuration is not identical with information contained in the CMOS RAM, or the CMOS RAM has lost power.

4.1   AWARD BIOS SETUP

The setup program provided with the mainboard is the Award BIOS from Award Software, Inc. Enter the AWARD Setup program's Main Menu as follows:

1.   Turn on or reboot the system. After a series of diagnostic check, the following message appear:

"Press DEL to enter SETUP"

2.   Press the <DEL> key to enter the AWARD BIOS setup program and the following screen appears:

```
                    ROM PCI/ISA BIOS (2A59CD1_ )
                       CMOS SETUP UTILITY
                      AWARD SOFTWARE, INC.
┌─────────────────────────────────────────────────────────────────────┐
│                                  │                                    │
│  STANDARD CMOS SETUP             │   PASSWORD SETTING                 │
│                                  │                                    │
│  BIOS FEATURES SETUP             │   IDE HDD AUTO DETECTION           │
│                                  │                                    │
│  CHIPSET FEATURES SETUP          │   SAVE & EXIT SETUP                │
│                                  │                                    │
│  POWER MANAGEMENT SETUP          │   EXIT WITHOUT SAVING              │
│                                  │                                    │
│  PCI CONFIGURATION SETUP         │                                    │
│                                  │                                    │
│  LOAD SETUP DEFAULTS             │                                    │
├─────────────────────────────────┴────────────────────────────────────┤
│  Esc : Quit                             8 9 6 7 : Select Item         │
│  F10 : Save & Exit Setup        (Shift)F2 : Change Color              │
├───────────────────────────────────────────────────────────────────────┤
│                                                                        │
│                    Time, Data, Hard Disk Type...                       │
└───────────────────────────────────────────────────────────────────────┘
```

Fig. 16

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

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

5.   In the Main Menu, choose "SAVE AND EXIT SETUP" to save change and reboot the system. Choosing "EXIT WITHOUT SAVING' to ignore all changes and exists the program.

4.2   STANDARD CMOS SETUP

ROM PCI/ISA BIOS (2A59CD1_)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

```
Date (mm:dd:yy) : Thu, Jan 31 1991
Time (hh:mm:ss) : 15 : 23 : 15

HARD DISKS       TYPE SIZE CYLS HEAD PRECOMP LANDZ SECTOR  MODE

Primary Master   : Auto     0    0    0     0       0      0  AUTO
Primary Slave    : None     0    0    0     0       0      0  --------
Secondary Master : None     0    0    0     0       0      0  --------
Secondary Slave  : None     0    0    0     0       0      0  --------


Drive A : 1.44M , 3.5in.                        Base Memory:      640K
Drive B : None                             Extended Memory:     7168K
                                              Other Memory:      384K
Video  : EGA/VGA
Halt On : All Errors                          Total Memory:      8192K


Esc : Quit            8 9 6 7 : Select Item      PU/PD/+/- : Modify
F1  : Help           (Shift)F2 : Change Color
```

Fig. 17

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

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

Hard Disks	Choose from the standard hare disk types 1 to 45. Type 47 is user definable. Type Auto is for auto detect the hard disk type.
Drive A&B	Choose 360K, 5.25 in. 1.2M, 5.25 in. 720K, 3.5 in. 1.44M, 3.5 in. 2.88MB 3.5 in. or None
Video	Choose EGA/VGA, CGA 40, CGA 80, or MONO,
Halt On	Choose All Errors No Errors, All, But Keyboard, All, But Diskette, or All, But Disk/Key

4.3   BIOS FEATURES SETUP

```
ROM PCI/ISA BIOS (2A59CD1_ )
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.
```

Virus Warning	: Disabled	Video BIOS Shadow : Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow: Disabled
External Cache	: Enabled	CC000-CFFFF Shadow: Disabled
Quick Power On Self Test	: Disabled	D0000-D3FFF Shadow: Disabled
Boot Sequence	: A,C,CD-Rom	D4000-D7FFF Shadow: Disabled
Swap Floppy Drive	: Disabled	D8000-DBFFF Shadow: Disabled
Boot Up Floppy Seek	: Enabled	DC000-DFFFF Shadow:Disabled
Boot Up Numlock Status	: On	
Boot Up System Speed	: High	
Gate A20 Option	: Fast	
Typematic Rate Setting	: Disabled	
Typematic Rate (Chars/Sec)	: 6	
Typematic Delay (Msec)	: 250	
Security Option	: Setup	
PCI/VGA Palette Snoop	: Disabled	ESC: Quit 896 7: Select Item
		F1: Help PU/PD/+/-: Modify
		F5: Old Values (Shift)F2: Color
		F7: Load Setup Defaults

Fig. 18 BIOS Setup Defaults

A short description of the screen items follows:

Virus Warning: Enable Virus from invading the Boot area in either Hard Disk or Floppy Drive.

CPU Internal Cache: Choose Enabled or Disabled. This option lets user choose whether to use CPU internal cache memory. The default is Enabled.

External Cache: Choose Enabled or Disabled. This option lets user choose whether to use secondary cache memory. The default is Enabled.

Quick Power On Self Test: Choose Enabled or Disabled. This option let the POST sequence runs longer for through tests.

Boot Sequence: With the default setting the BIOS first attempts to boot from drive A: and then, if unsuccessful, from hard disk C: then from CD-Rom. User can reverse this sequence with "C: A: CD-Rom" or others, but then drive A: cannot boot directly.

Swap Floppy Drive: Choose Enabled or Disabled. This option lets end users to change the Drive A: or B: to others.

Boot Up Floppy Seek: Choose Enabled or Disabled. "Disabled" provides a fast boot and reduces the possibility of damage to the heads.

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

Boot Up System Speed: Choose High or Low. Set the CPU timing at Boot Up, the default is high.

Gate A20 Option: Choose Fast or Slow. The system switch back an forth from real mode to virtue mode, fast means the system will switch through logic, slow through keyboard. The default is Fast.

Typematic Rate Setting: Choose Enabled or Disabled. Enabled will determines the typematic rate defined by following two options.

Typematic Rate: The number selected 6,8,10... indicates how fast the number of characters can response in one second.

Typematic Delay (Msec): The number selected indicates the time period between two identical keys appear.

Security Option: Choose Setup or System. If system is selected, the password should be set.

PCI/VGA Palette Snoop: Select Disabled or Enabled. If Enabled the MPEG Card can synchronised with PCI/VGA.

Video BIOS Shadow: ROM Shadow copies Video BIOS code from slower ROM to faster RAM. Video BIOS can then execute from RAM.

C8000-CFFFF Shadow: If enabled and BIOS is present in this segment, then the BIOS is shadowed.

D0000-DFFFF Shadow: If enabled and BIOS is present in this segment, then the BIOS is shadowed.

4.4   CHIPSET FEATURES SETUP

The Advanced Chipset Setup option is used to change the values of the chipset registers. These registers control most of the system options in the computer.

Note: Change these Settings only if user is familiar with the Chipset.

```
                    ROM PCI/ISA BIOS (2A59CD1_ )
                      CHIPSET FEATURES SETUP
                       AWARD SOFTWARE, INC.

 DRAM RAS# Precharge Time : 4      PCI Concurrency      : Enabled
 DRAM R/W Leadoff Timing  : 7/5    PCI Streaming        : Enabled
 DRAM RAS To Cas Delay    : 3      PCI Bursting         : Enabled
 DRAM Read Burst Timing   : x3333  Onboard FDC Control  : Enabled
 DRAM Write Burst Timing  : x3333  Onboard Serial Port 1 : COM1
                                   Onboard Serial Port 2 : COM2
 System BIOS Cacheable    : Disabled  Onboard Parallel Port : 378H
 Video BIOS Cachable      : Disabled  Onboard Parallel Mode : EPP/SPP
 Memory Hole At 15M-16M   : Disabled  ECP Mode DMA Select  : DMA 1

 IDE HDD Block Mode       : Enabled
 IDE Primary Master PIO   : Auto
 IDE Primary Slave PIO    : Auto     ESC: Quit    896 7: Select Item
 IDE Secondary Master PIO : Auto     F1: Help      PU/PD/+/-: Modify
 IDE Secondary Slave PIO  : Auto     F5: Old Values  (Shift)F2: Color
 On-Clip Primary PCI IDE  : Enabled  F7: Load Setup Defaults
 On-Clip Secondary PCI IDe : Enabled
 PCI Slot IDE 2nd Channel : Enabled
```

Fig. 19

A short description of the screen items follows:

DRAM RAS# Precharge Time/DRAM R/W Leadoff Timing/DRAM RAS to CAS Delay: The default setting of these items is as following, when EDO RAM used it can be set faster:

	Default	EDO RAM Used
DRAM RAS# Precharge Time	4	3
DRAM R/W Leadoff Timing	8/6	7/5
DRAM RAS to CAS Delay	3	2

Table 7

DRAM Read Burst Timing: When there is cache miss the cache controller tries to read data from DRAM, the option x2222, x3333 and x4444 should depend on CPU clock speed, following is the best choice:

CPU Speed	DRAM Read Burst Timing
75 MHz	x2222
90 MHz	x3333
100 MHz or above	x4444
EDO RAM Used	x2222

Table 8

DRAM Write Burst Timing: When there is cache miss the cache controller try to write data from cache to DRAM, the option x2222, x3333 and x4444 should depend on system board clock speed, following is the best choice:

CPU Speed	DRAM Write Burst Timing
75 MHz	x2222
90 MHz	x3333
100 MHz or above	x4444
EDO RAM Used	x2222

Table 9

System BIOS Cacheable: Choose Enabled or Disabled. "Enabled" allows system BIOS be cacheable.

Video BIOS Cacheable: Choose Enabled or Disabled. "Enabled" allows Video BIOS to be cacheable.

Memory Hole At 15M-16M: Choose Enabled or Disabled. "Enabled" allows some linear VGA Cards to run larger frame port, or it can be reserved or some operating system.

On-Chip primary PCI IDE: Choose Enabled or Disabled. "Enabled" allows onboard IDE to be functioned, otherwise the users should use other sources.

On-Chip secondary PCI IDE: Choose Enabled or Disabled. "Enabled" allows onboard IDE to be functioned, otherwise the users should use other sources.

Onboard FDC Controller: Choose Enabled or Disabled. "Enabled" allows onboard Floppy Drive Controller to be functioned, otherwise the users should use other sources.

Onboard Serial Port 1: Choose None or from COM1, COM3, COM4 with different I/O Address. While choosing proper I/O Address, be sure not to cause Address conflict with other I/O devices.

Onboard Serial Port 2: Choose None or from COM1, COM2, COM3, COM4 with different I/O Address. While choosing proper I/O Address, be sure not to cause Address conflict with other I/O devices.

Onboard parallel Port: Choose None or with four different I/O Address and corresponding IRQx. While choosing proper I/O Address, be sure not to cause Address conflict with other I/O devices.

Onboard Printer Mode: Choose EPP/SPP, ECP, ECP+EPP Mode. Make proper selection with the attached printer port device.

ECP Mode DMA Select: When you choose the ECP mode, you can select DMA 1/ DMA 3 for it.

4.5   POWER MANAGEMENT SETUP MENU

The Power Management Setup option is used to change the values of the chipset registers for system power management functions.

```
                    ROM PCI/ISA BIOS (2A59CD1_ )
                      POWER MANAGEMENT SETUP
                       AWARD SOFTWARE, INC.
┌──────────────────────────────────────┬──────────────────────────────────────┐
│ Power Management  : Disabled          │ **Power Down & Resume Events**       │
│ PM Control by APM : Yes               │ IRQ3  (COM 2)              : ON       │
│ Video Off Method   : V/H SYNC+Blank   │ IRQ4  (COM 1)              : ON       │
│                                       │ IRQ5  (LPT 2)             : ON       │
│ Doze Mode          : Disabled         │ IRQ6  (Floppy Disk)       : ON       │
│ Standby Mode      : Disabled          │ IRQ7  (LPT 1)             : ON       │
│ Suspend Mode      : Disabled          │ IRQ8  (RTC Alarm)         : OFF      │
│ HDD Power Down  : Disabled            │ IRQ9  (IRQ2 Redir)        : ON       │
│                                       │ IRQ10 (Reserved)          : ON       │
│ **Wake Up Events In Doze & Standby**  │ IRQ11 (Reserved)          : ON       │
│ IRQ3  (Wake-up Event) : ON            │ IRQ12 (PS/2 Mouse)        : ON       │
│ IRQ4  (Wake-up Event) : ON            │ IRQ13 (Coprocessor)       : ON       │
│ IRQ8  (Wake-up Event) : ON            │ IRQ14 (Hard Disk)         : ON       │
│ IRQ12 (Wake-up Event) : ON            │ IRQ15 (Reserved)          : ON       │
│                                       ├──────────────────────────────────────┤
│ Power Down Activities                 │ ESC: Quit      896 7: Select Item     │
│ COM Ports Accessed    : ON            │ F1: Help      PU/PD/+/-: Modify       │
│ LPT Ports Accessed    : ON            │ F5: Old Values  (Shift)F2: Color      │
│ Drive Ports Accessed    : ON          │ F7: Load Setup Defaults               │
│                                       │                                       │
└──────────────────────────────────────┴──────────────────────────────────────┘
```

Fig. 20

Note: Change these Settings only if user is familiar with the Chipset and system power management functions.

A short description of the screen items follows:

Power Management: Choose Disable, User Define, Max Saving or Min Saving. Disabled will disable all the power saving functions. User define means the power management time period of each I/O device can be programmed. Max and Min saving of each I/O device are list below.

	Max Saving	**Min Saving**
Doze Mode	1 Min	1 Hour
Standby Mode	1 Min	1 Hour
Suspend Mode	1 Min	1 Hour
HDD Power Down	1 Min	15 Min

Table 10

PM Control by APM: Choose Yes or No. Yes means the Power Management Function can be controlled by MS APM software.

Video Off Method: Choose V/H SYNC+Blank, DPMS or Blank Screen. This is monitor Power Saving Method. V/H SYNC+Blank means turn off Vertical, Horizontal scanning and blank the screen. Blank Screen will blank the display screen. DPMS (Display Power Management System) can allow the System BIOS control the Display Card to turn off the Display.

Doze, Standby and Suspend Mode: Different level of Power Management stage.

HDD Power Down: To select the time period will turn the HDD off. Access the HDD again will take a few seconds for HDD to spin back to normal speed for data.

IRQx (Wake-up Event): When it is enabled, the system will monitor each ON event which also is "ON" on the right side device, once one of those device (IRQx) is triggered the system will go back from Doze, Standby Mode to normal state.

Monitor IRQ 3 - 15: When it is enabled, the system will monitor system IRQ's activities, once one of these IRQx in triggered the system will go back from Suspend Mode to normal state.

4.6   PCI CONFIGURATION SETUP

The PCI Configuration Setup option is used to configure the PCI add-on Cards on PCI Slots. Without proper setup the PCI Add-on Cards might not function properly.

```
                  ROM PCI/ISA BIOS (2A59CD1_ )
                    PCI CONFIGURATION SETUP
                     AWARD SOFTWARE, INC.
┌─────────────────────────────────┬──────────────────────────────┐
│ PnP BIOS Auto-Config    : Disabled │                              │
│                                   │                              │
│ Slot 1 Using INT#           : AUTO │                              │
│ Slot 2 Using INT#  : AUTO         │                              │
│ Slot 3 Using INT#         : AUTO  │                              │
│                                   │                              │
│ 1st Available IRQ      : 10       │                              │
│ 2nd Available IRQ      : 11       │                              │
│ 3rd Available IRQ      : 9        │                              │
│ 4th Available IRQ      : 12       ├──────────────────────────────┤
│ PCI IRQ Active By      : Level    │ ESC: Quit      896 7: Select Item │
│ PCI IDE IRQ Map To    : PCI-AUTO  │ F1: Help       PU/PD/+/-: Modify │
│ Primary IDE INT#       : A        │ F5: Old Values  (Shift)F2: Color │
│ Secondary IDE INT#      : B       │ F7: Load Setup Defaults       │
│                                   │                              │
└─────────────────────────────────┴──────────────────────────────┘
```

Fig. 21

Note: Change these Settings only if user is familiar with the Chipset and all the PCI Add-on Cards functions.

A short description of the screen items follows:

PnP BIOS Auto-Config: Choose Enabled or Disabled. When Disabled, the following items will be displayed. The available IRQ sequence can be set manually.

> 1st Available IRQ : 10
> 2nd Available IRQ : 11
> 3rd Available IRQ : 9
> 4th Available IRQ : 12

Slot 1/2/3 Using INT#: Choose Auto/A/B/C/D. This is the interrupt sequence for the PCI slot.

PCI IRQ Active By: Choose Level or Edge. The default setting is Level.

PCI IDE IRQ Map To: Choose PCI-AUTO, PCI-SLOT1, PCI-SLOT2, PCI-SLOT3, ISA. The default setting is PCI-AUTO.

4.7   LOAD SETUP DEFAULTS MENU

This Main Menu item uses the default setup values. Use this option as a diagnostic aid if the system behaves erratically. Choose this item and the following message appears:

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

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

4.8   PASSWORD SETTING

The Main Menu item lets user to 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 the Password and press <Enter>. The following message appears:

"CONFIRM PASSWORD:"

Important: *Keep a safe record of the new password. If forget or lose the password, the only way to access the system is to disconnect the CMOS batteries and then re-enter the password.*

4.9   IDE HDD AUTO DETECTION

When users can not find the Hard Disk information, it is very helpful to use his option.

1.   Choose this item and press <Enter>.

2.   After couple seconds, the screen will appear the Hard Disk information and following message:

"SELECT PRIMARY MASTER OPTION(N=SKIP): N"

3.   Enter Y or N to confirm the acceptance then enter.

4.   The process will repeat for Primary Slave, Secondary Master and Secondary Slave Hard Disks.

4.10 SCSI HARD DISK INSTALLATION

In Standard CMOS Setup Utility, select hard disk type to be "Not Installed". In Advanced CMOS Setup Utility, Disable "Adapter ROM Shadow DC00". On the SCSI Controller card, set the jumpers which configure the SCSI card BIOS segment address located at DC00 or DE00. Format the SCSI disk by the Formatter provided in the SCSI BIOS.

4.11 SAVE & EXIT SETUP MENU

When you select this function, the following message will appear at the centre of the screen to assist you to Save data to CMOS and Exit the Setup.

Save to CMOS and Exit (Y/N)?

4.12 EXIT WITHOUT SAVING MENU

When you select this function, the following message will appear at the centre of the screen to assist you to Abandon all Data and Exit Setup.

Quit Without Saving (Y/N)?