P5F93 Quick Reference

Quick DIP Switch Setup:

INTEL Processor DIP SWITCH Setting

CPU Speed		SW1						SW2			JP2
		P1	P2	P3	P4	P5	P6	P1	P2	P3	
Pentium O.D.P. -150	60MHzx x 2.5	ON	OFF	OFF	ON	ON	ON	ON	ON	ON	Close
Pentium -166	66MHz x 2.5	ON	ON	OFF	OFF	ON	ON	ON	ON	ON	Open
Pentium O.D.P.- 166	66MHz x 2.5	ON	OFF	OFF	OFF	ON	ON	ON	ON	ON	Close
Pentium - 200	66MHz x 3	OFF	ON	OFF	OFF	ON	ON	ON	ON	ON	Open
Pentium O.D.P.- 200	66MHz x 3	ON	ON	OFF	OFF	ON	ON	ON	ON	ON	Close
MMX Pentium - 166	66MHz x 2.5	ON	ON	OFF	OFF	ON	ON	OFF	OFF	OFF	Open
MMX Pentium - 200	66MHz x 3	OFF	ON	OFF	OFF	ON	ON	OFF	OFF	OFF	Open
MMX Pentium - 233	66MHz x 3.5	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	Open

AMD Processor DIP SWITCH Setting

CPU Speed		SW1						SW2			JP2
		P1	P2	P3	P4	P5	P6	P1	P2	P3	
AMD-K6/200	66MHz x 3	OFF	ON	OFF	OFF	ON	ON	ON	OFF	OFF	Open
AMD-K6/233	66MHz x 3.5	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	Open
AMD-K6/266	66MHz x 4	ON	OFF	ON	OFF	ON	ON	OFF	ON	OFF	Open
AMD-K6/300	66MHz x 4.5	ON	ON	ON	OFF	ON	ON	OFF	ON	OFF	Open
AMD-K6-2/250	100MHz x 2.5	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	Open
AMD-K6-2/266	66MHz x 4	ON	OFF	ON	OFF	ON	ON	OFF	ON	OFF	Open
AMD-K6-2/300	100MHz x 3	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	Open
***AMD-K6-2/350**	100MHz x 3.5	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	Open
***AMD-K6-2/400**	100MHz x 4	ON	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	Open

Cyrix/IBM Processor DIP SWITCH Setting

CPU Speed		SW1						SW2			JP2
		P1	P2	P3	P4	P5	P6	P1	P2	P3	
Cyrix/IBM 6x86MX-PR166	60MHz x 2.5	ON	ON	OFF	ON	ON	ON	ON	OFF	OFF	Open
Cyrix/IBM 6x86MX-PR166	66MHz x 2	ON	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	Open
Cyrix/IBM 6x86MX -PR200	66MHz x 2.5	ON	ON	OFF	OFF	ON	ON	ON	OFF	OFF	Open
Cyrix/IBM 6x86MX -PR233	75MHz x 2.5	ON	ON	OFF	ON	ON	OFF	ON	OFF	OFF	Open
Cyrix/IBM 6x86MX -PR233	66MHz x 3	OFF	ON	OFF	OFF	ON	ON	ON	OFF	OFF	Open
Cyrix/IBM MII -PR233	75MHz x 2.5	ON	ON	OFF	ON	ON	OFF	ON	OFF	OFF	Open
Cyrix/IBM MII -PR233	66MHz x 3	OFF	ON	OFF	OFF	ON	ON	ON	OFF	OFF	Open
Cyrix/IBM MII -PR266	83MHz x 2.5	ON	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	Open
Cyrix/IBM MII -PR300	75MHz x 3	OFF	ON	OFF	ON	ON	OFF	ON	OFF	OFF	Open

Note: CPU with * Mark is not available yet, DIP switch setting table is for reference only.

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Table Of Contents

1 Introduction

1.1 Overview

The P5F93 is a high quality, high performance, function enhanced mainboard, based on the powerful Intel Pentium, AMD K6/K6-2 and Cyrix MX/MII processor. This mainboard is designed around the latest ALi (Acer Lab) Aladdin V chipset in a mini baby AT form factor.

The P5F93 mainboard delivers workstation level performance with its integrated AGP (Accelerated Graphics Port), Bus Mastering EIDE (Enhanced IDE) controller, concurrent PCI bus, and its ability to accommodate FPM (Fast Page Mode), EDO (Extended Data Out) and SDRAM (Synchronous DRAM) memory. When this high data stream bandwidth mainboard is equipped with powerful processor with MMX technology, your system has the power to handle future demanding communication, multi-media, multi-tasking and intensive 32-bit applications on advanced 32-bit operating systems.

When P5F93 mainboard equipped with ALi Aladdin V chipset, it can achieves the highest reliability by supporting the ECC (Error Checking and Correction) memory protection. This enables the P5F93 mainboard to achieve superior data integrity and fault-tolerance, in respect to memory errors while running applications.

The P5F93 mainboard offers outstanding I/O capabilities. It contains a full set of PC I/O, such as dual channel PCI EIDE interfaces, a floppy controller, two FIFOed serial port connectors, an SPP/EPP/ECP capable bidirectional parallel port connector, an IrDA compatible infrared port, dual USB (Universal Serial Bus) port, and a AT keyboard connector and a PS/2 mouse header. One AGP slot, Three PCI local bus slots and two ISA bus slots provide expandability for add on peripheral cards.

The P5F93 mainboard offers optimized system performance, integrated power management, Trend Chipaway Virus and system manageability (optional).

Optimized System Performance: AGP improves the Graphics performance dramatically, Ultra DMA/33 speeds up disk drive access, Enhanced SDRAM support for fastest access to memory, and Concurrent PCI enables simultaneous data transfer.

Integrated Power Management: ACPI (Advanced Configuration and Power Interface) support enables O/S and application programs to direct the system power management.

Trend Chipaway Virus(TCAV): This unique, specially designed solution stops boot viruses from infecting the boot sector or partition table during the "threat" period that exists before the boot sector loads and traditional anti-virus protection takes effect. Trend ChipAway Virus resides in the BIOS to prevent boot viruses from causing any damage to computers.

System Manageability: Winbond W83781D Hardware Environment Monitoring chip (optional) enables the ability for system voltage, temperature and fan speed monitoring detection.

In addition to superior hardware capabilities, features like bus mastering EIDE driver, Plug and Play, Soft-off, APM (Advanced Power Management), Sleeping state indicator, fan off in sleeping state (requires Fan with tachometer output) and BIOS upgradability are provided on the P5F93 platform.

1.2 P5F93 Specifications/Features

1.2.1 Hardware

CPU   Supports the following CPUs in a ZIF Socket 7
Intel Pentium 90 ~ 200MHz.
Intel Pentium w/MMX 166 ~ 233MHz.
AMD K5 PR90 ~ 166MHz
AMD K6 /166 ~ 300MHz
AMD K6-2 /250 ~ 300MHz
Cyrix/IBM 6x86 PR133 ~ 166MHz
Cyrix/IBM 6x86L PR133 ~ 166MHz
Cyrix/IBM 6x86MX PR166 ~ PR233MHz
Cyrix/IBM 6x86MII PR233 ~ PR300MHz

VRM   Dual Switching Voltage Regulator on board
Provides 2.0V to 3.5V operating voltage for CPU core.
Provides 3.3V operating voltage for I/O.

Coprocessor   CPU built-in FPU (floating point unit)

Speed   CPU bus clock 60/66/75/83/90/100 MHz
AGP clock 60/66 MHz
PCI bus clock 30/33 MHz
ISA bus clock 8.33/10 MHz

Chipset   ALi Aladdin V (M1543/M1541) Chipset
ALi's Aladdin V (M1543) chipset built in I/O
Winbond's W83781D chip (assembly option)

L2 Cache   Synchronous Pipelined Burst SRAM 512KB

DRAM   2 x 72-pin SIMM and 2 x 168-pin DIMM sockets
Supports 4MB to 768MB memory
Supports FPM, EDO and SDRAM memory

EIDE Controller Supports four IDE devices in two channels
Supports PIO mode 0 through mode 5 drives
Supports Bus Mastering DMA mode 2 drives
Supports Bus Mastering UDMA/33 mode 2 drivers

| Enhanced I/O | One floppy disk controller |
	One Standard/EPP/ECP parallel port connector
	Two 16550 compatible serial port connector
	One IrDA compatible Infrared port
	Two USB (Universal Serial Bus) ports
Mouse/Keyboard	PS/2 mouse connector
	AT keyboard connector
Expansion Slots	One AGP Slot
	Three 32-bit PCI slots
	Two 16-bit ISA slots (one PCI/ISA shared slot)
Power Management	Compliant with EPA, APM 1.2 and ACPI
	Sleep state indicator
	Fan off in sleep mode
System Management	Winbond W83781D PC Environment Monitor
	(Assembly option)
Voltage Regulator	Dual Switching regulator
Form Factor	AT Form Factor, 22cm x 21.1cm (8.66"x 8.30")

1.2.2 Software

BIOS	Built-in Trend Chipaway Virus(TCAV)
	Flash BIOS with ESCD (Extended System Configuration Data) block
	Supports APM, PnP, Multi-Boot, DMI and EIDE devices
	Supports High-Capacity LS-120 and ZIP Removable Media Drive
Driver	IDE Bus mastering Ultra DMA driver
Utility	Flash utility for BIOS upgrade

| O.S. | Operates with MS_DOS, Windows 3.x, Windows for Work Groups 3.x, Windows98, Windows 95, Windows NT, OS/2, Novell Netware, Novell UnixWare 1.1 and SCO Unix 5.x |

1.2.3 Environment

Ambient Temperature	0^0C to 50^0C (Operating)
Relative Humidity	0 to 85% (Operating)
Vibration	0 to 500 Hz
DC Voltage	4.9V to 5.2V
DC Voltage	2.00V to 3.50V
DC Voltage	-5V, +12V, -12V, +5V$_{SB}$ 5% tolerance.

1.3 P5F93 Mainboard Layout
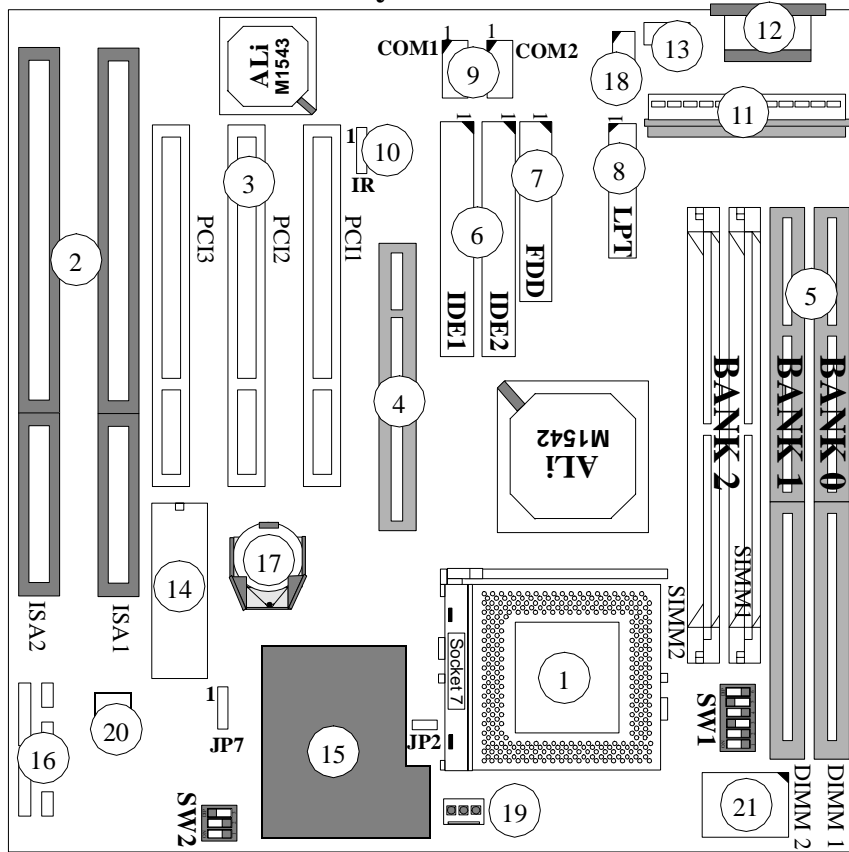
REFERENCE PAGE		REFERENCE PAGE	
1	CPU Soket 7	12	AT Keyboard Connector
2	ISA Expansion Slots	13	PS/2 Mouse Connector
3	PCI Expansion Slots	14	Flash BIOS
4	AGP Slot	15	Dual Switching Regulator
5	DIMM Module Sockets	16	Front panel Connectors
6	IDE Connectors	17	Battery (CR2032 Lithium)
7	Floppy Drive Connector	18	Dual USB Connector
8	Parallel Port Connector	19	CPU FAN Connector
9	Serial Port Connectors	20	Winbond 83781D PC Health Monitor chip (Assemble option)
10	IR Port Header	21	512KB Pipeline Cache Chip
11	AT Power Connector		

1.4 Microprocessor

The P5F93 meets all requirements of a Pentium flexible mainboard which is defined as a mainboard capable of supporting all members of the Pentium class of processors.

The requirements for a Pentium flexible mainboard are:

1. CPU ZIF socket is Socket 7.
2. BIOS can support various Pentium class processors with different CPU core frequency.
3. On-board switching regulators and heat sinks meet CPU's core and I/O voltage/current/thermal specifications.

The P5F93 mainboard can support the following CPUs
Intel Pentium 90 ~ 200MHz.
Intel MMX Pentium 166 ~ 233MHz.
Cyrix/IBM 6x86 PR133 ~ 166MHz
Cyrix/IBM 6x86L PR133 ~ 166MHz
Cyrix/IBM 6x86MX PR166 ~ PR233MHz
Cyrix/IBM M II PR233 ~ PR300MHz
AMD K5 PR90 ~ 166MHz
AMD K6 /166 ~ 300 MHz
AMD K6-2 /250 ~ 300MHz

A cooling fan and heat sink assembly are required to protect the CPU from being damaged due to overheating.

P-rating: The "P-rating" is a performance rating scale. It expresses the performance of AMD or Cyrix/IBM Pentium class CPU relative to Intel Pentium CPU. For example, the Cyrix/IBM 6x86L P166+ can reach the same or better performance than Intel Pentium 166 MHz. But the actual Cyrix/IBM 6x86L P166+ internal core clock is only 133MHz.

1.5 Level 2 Cache

The P5F93 mainboard provides standard 512KB synchronous pipelined burst SRAM cache on board.

1.6 Chipset

The ALi Aladdin V chipset consists of a M1541 System Controller, and a M1543 PCI ISA/IDE Accelerator.

M1541:
- CPU interface controller
- AGP Interface controller
- Integrated DRAM/Cache controller
- Extensive CPU-to-AGP, CPU-to-DRAM, CPU-to-PCI, AGP-to-DRAM, AGP-to-PCI, PCI-to-AGP and PCI-to-DRAM data buffering

M1543:
- Interface between the PCI and ISA buses
- Fully synchronous PCI 2.1 bus interface
- Power Management Logic
- USB controller
- EIDE controller
- Seven DMA channels, one timer/counter, two eight-channel interrupt controllers, NMI logic, SMI interrupt logic, and PCI/ISA bus arbitrator
- SMBus interface
- Real-Time clock
- Super I/O and Keyboard controller

1.7 Main Memory

The P5F93 mainboard provides two 168-pin DIMM sockets and two 72-pin SIMM to support 4MB to 768MB of system memory. The sockets support 1M x 32 (4MB), 2M x 32 (8MB), 4M x 32 (16MB), 8M x 32 (32MB), 16Mx32(64MB) and 32Mx32(128MB) SIMM and 1M x 64 (8MB), 2M x 64 (16MB), 4M x 64 (32MB), 8M x 64 (64MB), 16Mx64(128MB) and 32Mx64(256MB) DIMM in single- or double-sided modules.

The P5F93 supports three types of DRAMs, Fast Page Mode (FPM), Extended Data Out (EDO), and Synchronous DRAM (SDRAM). Memory Timing requires 70ns or faster for FPM and EDO, and the same or a faster than the CPU clock for SDRAMs.

The P5F93 mainboard achieves the highest reliability by supporting the ECC (Error Checking and Correction) memory protections. The ECC is a hardware scheme which detects all single and dual-bit errors, and corrects all single-bit error during main memory access. The ECC can be supported only if all the DIMM/SIMM memory modules come with parity bits and the option "Memory Parity/ECC Check" in the BIOS Features Setup has to be set to "Enabled".

Both SIMMs in a bank must be of the same memory size, type and speed. There are no jumper settings required for the memory size and type, which are automatically detected by the BIOS.

EDO DRAM is designed to improve the DRAM read performance. It holds the memory data valid until the next memory access cycle, unlike FPM DRAM that tri-states the memory data when the precharge cycle occur, prior to the next memory access cycle. SDRAM uses the system clock to synchronize the flow of addresses, data, control and the pipelining of operation. This yields a significant memory performance improvement.

1.8 Accelerated Graphics Port (AGP) Slot

The P5F93 mainboard is equipped with an Accelerated Graphic Port slot which is compliant to the AGP specification. The AGP runs at 66.6MHz (or 60MHz) clock and supports both 1x and 2x mode for 66.6MHz and 133MHz 3.3V devices. The data transfer rate on the AGP bus can be 4 times faster than PCI bus.

The following is a clock frequency for different system clock operating modes:

System Clock	AGP Clock	PCI Clock
60MHz	60MHz	30MHz
66MHz	66MHz	33MHz
75MHz	60MHz	30MHz
83MHz	66MHz	33MHz
90MHz	60MHz	30MHz
100MHz	66MHz	33MHz

1.9 Enhanced IDE Support

The P5F93 mainboard provides two enhanced high performance PCI IDE interfaces capable of supporting four devices with PIO mode 0 through mode 4, bus-mastering DMA mode 2, and bus-mastering Ultra DMA/33 ATAPI devices. Detection of IDE device type and transfer rate is automatically performed by the BIOS. The traditional PIO IDE device requires a substantial amount of CPU bandwidth to handle all the activities of IDE access including waiting for mechanical activities. The Bus Master logic designed in the ALi Aladdin V chipset is intended to reduce the workload of the CPU, hence increasing CPU efficiency. The Bus Master takes care of the data transfer between IDE and memory, and lets the CPU handle other tasks. In true multi-tasking operating systems such as Windows 95, Windows98, Windows NT, and OS/2, by using bus-mastering IDE, the CPU workload can be reduced to complete other tasks while disk data transfers are occurring. The driver must be loaded in order to make the EIDE drive operate in bus-mastering DMA mode.

The following is a data transfer rate comparison table for different IDE operating modes
:

Operating Mode	Maximum Data Transfer Rate
PIO Mode 3	11.1 MB/Second
PIO Mode 4	16.6 MB/Second
DMA Mode 1	13.3 MB/Second
DMA Mode 2	16.6 MB/Second
Ultra DMA/33	33.2MB/Second

1.10 Keyboard, Mouse and USB Interface

The 5V line to the AT keyboard connector, PS/2 mouse port and USB header, are protected with 3Amp/125V fuse.

The P5F93 mainboard has a dual-row 10-pin connector to support two USB ports. The USB is a serial bus interface standard that is

designed to bring the "Plug and Play" concept to the outside of the computer system chassis. The bus allows devices to be attached, configured, used and detached while the host system is in operation.

The USB will allow as many as 63 devices to be daisy chained in any combination per port. With up to 12Mbits/sec transfer rate, the USB is suitable for devices such as keyboard, mouse, digital joystick, game pad, fax/modem, scanner, printer, ISDN and telephony device.

1.11 Real-time Clock, CMOS RAM and Battery

The integrated real-time clock (RTC) provides a time of day clock, and an 85-year calendar with alarm features. P5F93 also has 242 bytes battery backed CMOS RAM which stores the system setup information and password. The RTC and CMOS RAM can be set via the BIOS SETUP program. The contents of the CMOS RAM can be cleared by placing a shunt to short pin2 and pin3 of JP7 for 5 seconds when the system power is off. A coin-cell style Lithium CR2032 battery is used to provide power to the RTC and CMOS memory. The battery has a three year life if the system is not powered up. When the system powers up, the power for the RTC and CMOS RAM is supplied from the 5 V power supply to extend the life of the battery.

1.12 IrDA Infrared Support

A 5-pin header connector is used to connect a Hewlett Packard HSDSL-1000 compatible IrDA or Sharp ASKIR Infrared module. Once the module is installed, the user can use application software such as Microsoft Infrared (MSIR) to transfer files between the computer system and portable devices such as laptops and printers.

1.13 Power Management

The integrated DPMA (Dynamic Power Management Architecture) features in the ALi Aladdin V chipset complies with EPA, APM1.2 and ACPI (Advanced Configuration and Power Interface), but also provides the following power management features.

- *Power Management mode indicator*
 The standby LED will blink once a second when system entering
 DOZE Mode and blink twice a second when system entering
 STANDBY Mode. When system entering SUSPEND Mode, standby
 LED will stop blinking and stay on.
- *Fan off in suspend mode*
 The CPU cooling fan will be turned off when the system is in suspend
 mode. (required cooling FAN cable connect to motherboard FAN
 connector).

1.14 System Sleep / Resume

When Advanced Power Management (APM) is activated in the system
BIOS and the Operating System's APM/ACPI driver is loaded, Sleep
mode (Suspend) can be entered in one of three ways: press the front
panel power button, select "Suspend" in Windows 95 Start Menu or no
system activity for a pre-defined length of time. To use the power button
to control system sleep/resume, the option "PWR-BTTN" in the BIOS
Power Management Setup has to be set to "Green Mode"

When the system enters the sleep mode, the CPU stops running, the Ali
Aladdin V chipset and related circuits stay in the lowest power state, the
HDD stops spinning, the monitor screen becomes blank, the STB LED
(STANDBY LED) indicator on the front panel turn on, and the CPU
cooling fan is turned off (Note: in order to turn off the fan in sleep mode,
you need to connect the CPU cooling fan to the on-board fan power
connectors).

2 Hardware Installation

☀ Static Electricity Precautions

Before removing the Mainboard from its anti-static bag, you need to eliminate any static electricity that may be accumulated on your body. The charge that can build up in your body may be more than enough to damage integrated circuits on the system board. Therefore, it is important to observe basic precautions whenever you handle or use computer components. Although areas with humid climate are much less prone to static build-up, it is best to always safeguard against accidental damage that may lead to costly repairs. The following measures should be sufficient to protect your equipment from static discharge:

● After removing the system cover, discharge any static electricity that might have accumulated in your body by touching a grounded or anti-static surface (e.g. anti-static pads or using a grounding wrist strap). If nothing is available, touch the power supply housing. This assumes the system unit is plugged into the AC outlet. Be certain to do this before removing components from their anti-static coverings.

● When handling separate cards, boards or modules, be cautious to avoid contacting with the components on them, and also with the "gold finger" connectors that plug into the expansion slot. It is best to handle them either by their edges or by mounting brackets that attach to the slot opening in the system cases. However, the above recommendation are just intended to avoid the static discharge problem.

● Make certain that everything connects to the system case, including the power supply, is unplugged before doing the installation work.

2.1 Unpacking

The P5F93 mainboard package contains the following:

- ☑ P5F93 mainboard
- ☑ One IDE 40-pin ribbon cable
- ☑ One floppy 34-pin ribbon cable
- ☑ Two serial ports cable with a mounting bracket
- ☑ One parallel port cable and one PS/2 mouse port cable with a mounting bracket
- ☑ Driver and Utility diskettes
- ☑ User's manual

2.2 Installation

The P5F93 is designed to fit into a standard AT form factor chassis. The pattern of the mounting holes and the position of the back panel connectors meet the AT system board specification. The chassis may come with various mounting fasteners which are made of metal or plastic. It is highly recommended to use as many metal fasteners as possible to mount the mainboard in the chassis for better grounding.

To install the mainboard you need to install CPU, DIMM memory modules and attach the connectors.

P5F93 Mainboard Connector/Jumper Location
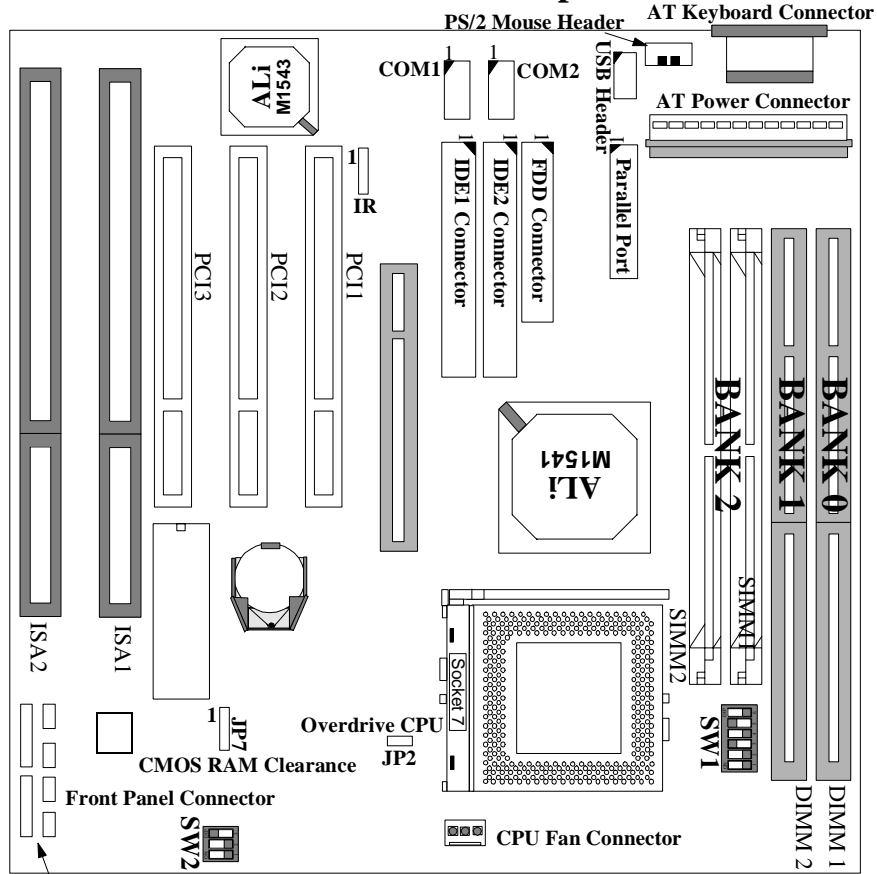
Jumper Quick Reference

Jumper	Function description
JP7	CMOS RAM Clearance. When set to 2-3 CMOS RAM Clearance. Default is 1-2.
JP2	Short this jumper, only when a Pentium Overdrive processor installed. Leave this jumper open for the rest of CPU.

2.2.1 Attaching Connectors

1. Front Panel Connectors

There are 6 connectors on the mainboard for speaker, switches and indicator lights on the system's front panel.

Front Panel Connector
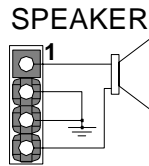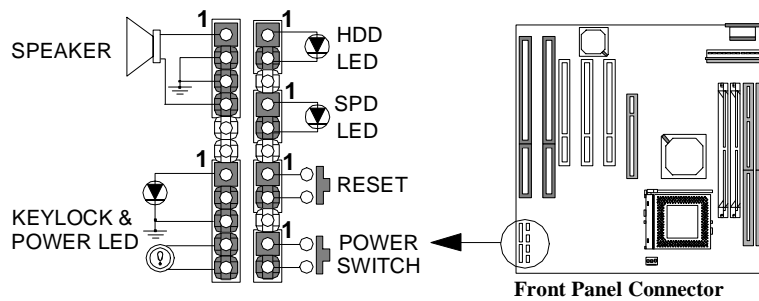
SPEAKER

Pin Assignment
1. Speaker out
2. Ground
3. Ground
4. +5V

This 4-pin connector connects to the case-mounted speaker.

Power LED & Keylock

Pin Assignment
1. LED Cathode
2. N. C.
3. LED Anode (Ground)
4. KEYLOCK
5. Ground

This 5-pin connector connects to the case-mounted keylock switch and the power LED. The keylock switch is used to lock the keyboard for security purposes.

HDD LED Connector

Pin Assignment
1. LED Anode
2. LED Cathode

This 2-pin connector connects to the case-mounted HDD LED to indicate hard disk activity.
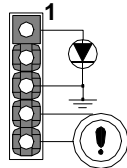
SPD LED Connector

Pin Assignment
1. LED Cathode
2. LED Anode (Ground)

This 2-pin connector connects to the case-mounted STB LED to indicate a standby status. When system entering DOZE mode the standby LED will blink once a second. When system entering STANDBY mode the standby LED will blink twice a second. when system entering SUSPEND Mode, standby LED will stop blinking and keep on.

Reset Connector

Pin Assignment
1. Power Good
2. Ground

This 2-pin connector connects to the case-mounted reset switch and is used to reboot the system.

Power Switch Connector

Pin Assignment
1. Suspend/Wake-Up
2. Ground

This 2-pin connector connects to the case-mounted Power button.

The front panel on your case may have a turbo switch to deactivate the Turbo mode when a slower speed is required for a specific application. The ALi Aladdin V chipset does not support the hardware deturbo function. An alternative method of using <CTRL><ALT><+/-> keys to change the speed may be used if necessary.

2. Fan Connectors

1 2 3
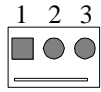
Pin Assignment
1. GND
2. +12V
3. SPEED / RPM
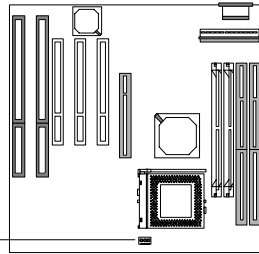
There is a fan connectors on the P5F93 mainboard for the CPU cooling fans. The connectors support fans of 12V DC/500mAMP (6 WATT) or less. When the system goes into sleep state, fan should be shut down to eliminate audible noise and reduce power consumption. You can monitor the fan speed by way of W83781D chip (optional) and the fan must come with a tachometer output.

3. IrDA-compliant IR (Infrared) Connector

This 5-pin connector connects to an optional wireless transmitting and receiving infrared module via a cable and a bracket.

IrDA Module
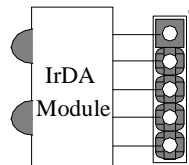
Pin Assignment
1. +5V
2. IRM_IRR
3. IR Receiver
4. Ground
5. IR Transmitter

IR

4. USB Connector

USB Connector

USB Device #1

2 4 6 8 10

1 3 5 7 9

USB Device #0

This dual-row 10 pin connector connects to an optional dual USB ports cable with a mounting bracket.
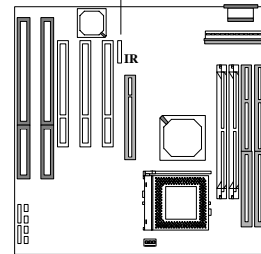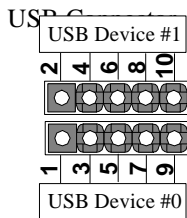
Pin Assignment
1. +5V   2. +5V
3. USB D0-   4. USB D1-
5. USB D0+ 6. USB D1+
7. Ground   8. Ground
9. Ground   10. Ground

5. PS/2 Mouse Connector

Pin Assignment
1. N.C.
2. +5V
3. N.C.
4. MSDATA
5. GND
6. MSCLK
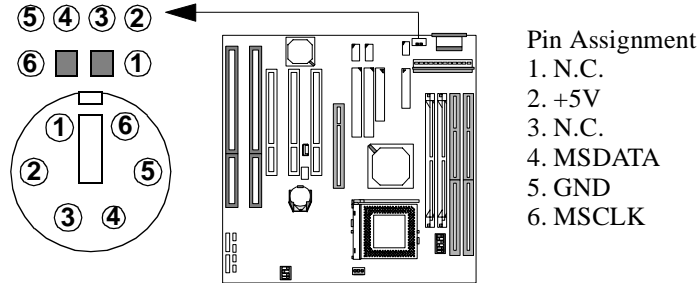
This dual-row 8 pin connector connects to the PS/2 port cable with a mounting bracket.

6. Floppy Drive Connector (One 34-pin Block)

A floppy disk drive ribbon cable has 34 wires and 2 connectors to support 2 floppy disk drives. The connector with twisted wires always connects to drive A, and the connector with untwisted wires connects to drive B. You must orient the cable connector so that the pin 1(color) edge of the cable is at the pin 1 of the I/O port connector.
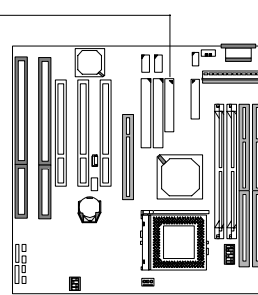
7. IDE Connectors (Two 40-pin Block)

An IDE drive ribbon cable has 40 wires and 2 connectors to support two IDE drives. If a ribbon cable connects to two IDE drives at the same time, one of them has to be configured as Master and the other has to be configured as Slave by setting the drive select jumpers on the drive. Consult the documentation that came with your IDE drive for details on jumper locations and settings. You must orient the cable connector so that the pin 1(color) edge of the cable is at the pin 1 of the I/O port connector.
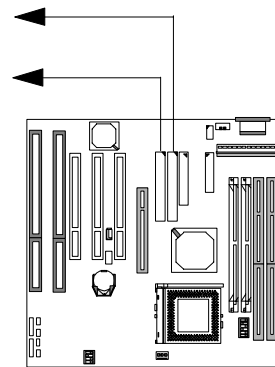
8. Power Supply Connector

The P5F93 mainboard provides an AT power supplies connectors for AT chassis. In the future P5F93 may have both AT and ATX power connector available.

AT Power Connector
Most AT power supplies have two con-
nectors. Each connector has six wires, two of which are black. Orient the two connectors so the black wires are along side each other, making the black wires plug in the middle of the connector. Align the plastic guide pins on the lead cables with the connector on the main-board. Press the lead connector so that its plastic clips snap into place and secure the leads in the connector.

Power Good(Orange)
+5V(Red)
+12V(Yellow)
-12V(Blue)
Ground (Black)
Ground (Black)
Ground (Black)
Ground (Black)
-5V(White)
+5V(Red)
+5V(Red)
+5V(Red)
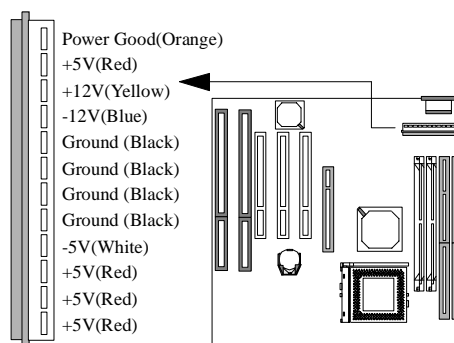
♦ *Incorrect installation of the power supply could result in serious damage to the mainboard and connected peripherals. Make sure the power supply is unplugged from the AC outlet before connecting the leads from the power supply.*

2.2.2 Setting DIP Switches

This section provides the DIP Switches settings for the P5F93 mainboard.

You need to configure DIP Switch to set the
1) CPU core to bus clock multiplier
2) CPU bus clock
3) CPU Core and I/O Voltage

CPU Core to Bus Clock Multiplier: The CPU internal core clock is equal to the "CPU Bus Clock" times the "CPU Core to Bus Clock Multiplier". For example, if the CPU Bus Clock is 100MHz and the CPU Core to Bus Multiplier is 3, the actual CPU core clock will be 300MHz.
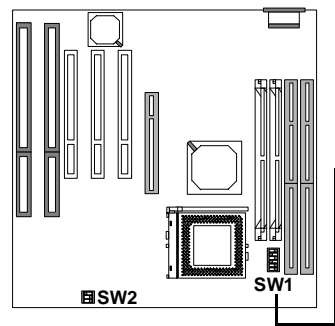
DIP Switch (SW1) selects Bus Clock Multiplier

Multiplier	SW1-P1	SW1-P2	SW1-P3
x 2.0	ON	OFF	OFF
x 2.5	ON	ON	OFF
x 3.0	OFF	ON	OFF
x 3.5	OFF	OFF	OFF
x 4.0	ON	OFF	ON
x 4.5	ON	ON	ON
x 5.0	OFF	ON	ON
x 5.5	OFF	OFF	ON

CPU Bus Clock: The CPU Bus Clock is defined as the CPU input clock. For example: the CPU Bus Clock for AMD K6, 266 and 300 MHz are 66 MHz and 100MHz for K6-2, 250 and 300MHz.
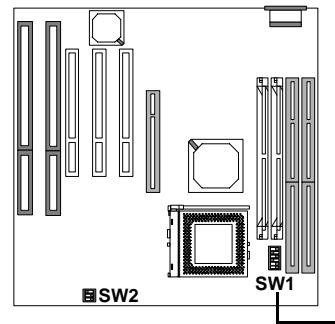
DIP Switch (SW1) selects CPU Bus Clock

Bus Clock	SW1-P4	SW1-P5	SW1-P6
60MHz	ON	ON	ON
66MHz (default)	OFF	ON	ON
75MHz	ON	ON	OFF
83MHz	OFF	ON	OFF
90MHz	ON	OFF	OFF
100MHz	OFF	OFF	OFF

CPU Core and I/O Voltages: Two voltages V_{CORE} and $V_{I/O}$ are required for Pentium class CPUs. The V_{CORE} is used for CPU internal operation and the $V_{I/O}$ is used to supply the voltage for external interface. The P5F93 mainboard has a jumper (JP2) which connect between Vcore and Vi/o. You need to short JP2 only when a Intel Pentium O.D.P. (Overderiv processor) is installed.
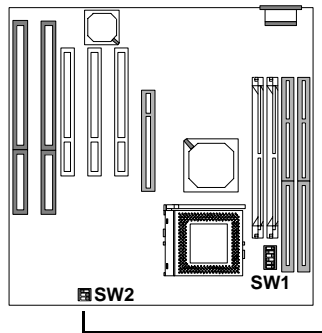
DIP Switch (SW2) selects CPU voltage

CPU Voltage	SW2-P1	SW2-P2	SW2-P3
2.0V	OFF	OFF	OFF
2.1V	ON	OFF	OFF
2.2V	OFF	ON	OFF
2.3V	ON	ON	OFF
2.4V	OFF	OFF	ON
2.5V	ON	OFF	ON
2.6V	OFF	ON	ON
2.7V	ON	ON	ON
2.8V	OFF	OFF	OFF
2.9V	ON	OFF	OFF
3.0V	OFF	ON	OFF
3.1V	ON	ON	OFF
3.2V	OFF	OFF	ON
3.3V	ON	OFF	ON
3.4V	OFF	ON	ON
3.5V	ON	ON	ON

Note: Different voltage may have the same DIP switch setting. For example the DIP switch for 2.2V and 2.9V are identical same. The "SMART" switching regulator design can auto-detect the CPU type and generate the proper operating voltage for the CPU. For example, with the same DIP switch setting, when a AMD K6-266 or 300MHz CPU plug-in, switching regulator will set to 2.2V and if an AMD K6-200MHz CPU plug-in, switching regulator will set to 2.9V.

intel® Pentium CPU Clock DIP Switch Setting

CPU Speed	SW1						SW2			JP2
	P1	P2	P3	P4	P5	P6	P1	P2	P3	
Pentium -90 60MHz x 1.5	OFF	OFF	OFF	ON	ON	ON	ON	OFF	ON	Open
Pentium -100 66MHz x 1.5	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	ON	Open
Pentium -120 60MHz x 2	ON	OFF	OFF	ON	ON	ON	ON	OFF	ON	Open
Pentium -133 66MHz x 2	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON	Open
Pentium -150 60MHx x 2.5	ON	ON	OFF	ON	ON	ON	ON	OFF	ON	Open
Pentium Overdrive -150 60MHx x 2.5 (P54CTB)	ON	OFF	OFF	ON	ON	ON	ON	ON	ON	Close
Pentium -166 66MHz x 2.5	ON	ON	OFF	OFF	ON	ON	ON	ON	ON	Open
Pentium Overdrive-166 66MHz x 2.5 (P54CTB)	ON	OFF	OFF	OFF	ON	ON	ON	ON	ON	Close
Pentium - 200 66MHz x 3	OFF	ON	OFF	OFF	ON	ON	ON	ON	ON	Open
Pentium Overdrive- 200 66MHz x 3 (P54CTB)	ON	ON	OFF	OFF	ON	ON	ON	ON	ON	Close
MMX Pentium - 166 66MHz x 2.5	ON	ON	OFF	OFF	ON	ON	OFF	OFF	OFF	Open
MMX Pentium - 200 66MHz x 3	OFF	ON	OFF	OFF	ON	ON	OFF	OFF	OFF	Open
MMX Pentium - 233 66MHz x 3.5	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	Open

Note:
You need to shunt JP2 only when a Intel Pentium Overdrive processor installed.
For AMD/Cyrix/IBM CPU, this jumper should leave it open (default).

AMD® CPU Clock DIP Switch Setting

CPU Speed	SW1						SW2		
	P1	P2	P3	P4	P5	P6	P1	P2	P3
AMD-K5-PR120 60MHz x 1.5	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
AMD-K5-PR133 66MHz x 1.5	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON
AMD-K5-PR150 60MHz x 1.75	ON	OFF	OFF	ON	ON	ON	ON	ON	ON
AMD-K5-PR166 66MHz x 1.75	ON	OFF	OFF	OFF	ON	ON	ON	ON	ON
AMD-K6/166 66MHz x 2.5	ON	ON	OFF	OFF	ON	ON	ON	OFF	OFF
AMD-K6/200 66MHz x 3	OFF	ON	OFF	OFF	ON	ON	ON	OFF	OFF
AMD-K6/233 66MHz x 3.5	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	ON
AMD-K6/266 66MHz x 4	ON	OFF	ON	OFF	ON	ON	OFF	ON	OFF
AMD-K6/300 66MHz x 4.5	ON	ON	ON	OFF	ON	ON	OFF	ON	OFF
AMD-K6-2 /250 100MHz x 2.5	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
AMD-K6-2/266 66MHz x 4	ON	OFF	ON	OFF	ON	ON	OFF	ON	OFF
AMD-K6-2/300 100MHz x 3	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
*AMD-K6-2/350 100MHz x 3.5	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
*AMD-K6-2/400 100MHz x 4	ON	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF

Note: CPU with * Mark is not available yet, DIP switch setting table is for reference only.

Cyrix® IBM® CPU Clock DIP Switch Setting

CPU Speed	SW1						SW2		
	P1	P2	P3	P4	P5	P6	P1	P2	P3
Cyrix/IBM 6x86L -PR150+ 60MHz x 2	ON	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
Cyrix/IBM 6x86L -PR166+ 66MHz x 2	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
Cyrix/IBM 6x86L -PR200+ 75MHz x 2	ON	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
Cyrix/IBM 6x86MX-PR166 60MHz x 2.5	ON	ON	OFF	ON	ON	ON	ON	OFF	OFF
Cyrix/IBM 6x86MX-PR166 66MHz x 2	ON	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
Cyrix/IBM 6x86MX -PR200 66MHz x 2.5	ON	ON	OFF	OFF	ON	ON	ON	OFF	OFF
Cyrix/IBM 6x86MX -PR233 75MHz x 2.5	ON	ON	OFF	ON	ON	OFF	ON	OFF	OFF
Cyrix/IBM 6x86MX -PR233 66MHz x 3	OFF	ON	OFF	OFF	ON	ON	ON	OFF	OFF
Cyrix/IBM MII -PR233 75MHz x 2.5	ON	ON	OFF	ON	ON	OFF	ON	OFF	OFF
Cyrix/IBM MII -PR233 66MHz x 3	OFF	ON	OFF	OFF	ON	ON	ON	OFF	OFF
Cyrix/IBM MII -PR266 83MHz x 2.5	ON	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
Cyrix/IBM MII -PR300 75MHz x 3	OFF	ON	OFF	ON	ON	OFF	ON	OFF	OFF

2.2.3 Installing System Memory

The maximum system memory supported by the P5F93 is 768MB. If more than 768MB memory are populated on the mainboard, the portion of the memory which exceed the 768MB boundary will be invalidated.

The P5F93 Mainboard has two SIMM Sockets and two DIMM Sockets to support up to 768MB of system memory. The two SIMM sockets (SIMM1, SIMM2) is Bank2. Two SIMM modules must be installed at a time, and each pair of modules must be of the same size, type and speed.
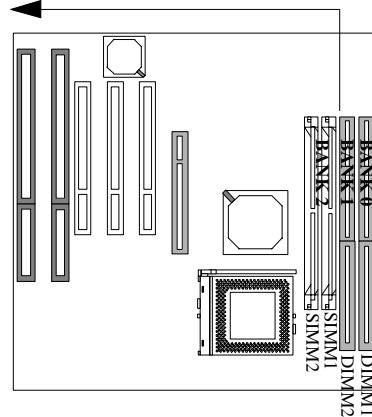
Memory can be installed by using 72-pin EDO/FPM SIMM and/or 168-pin SDRAM/EDO DIMM memory modules. There are no jumper settings required for the memory size or type, which is automatically detected by the BIOS. Due to the P5F93 Mainboard high speed design, the memory modules for the P5F93 must meet all of the following requirement:

DRAM TYPE	EDO (Extended Data Output) FPM (Fast Page Mode)	SDRAM (Synchronous DRAM)
Module Size	Single-Sided Symmetric: 1Mx32, 4Mx32, 16Mx32 Asymmetric: 512Kx32, 1Mx32, 2Mx32, 4Mx32, 8Mx32 Double-Sided Symmetric: 2Mx32, 8Mx32, 32Mx32 Asymmetric: 1Mx32, 2Mx32, 4Mx32, 8Mx32, 16Mx32	Single-sided Asymmetric: 1Mx64, 2Mx64, 4Mx64, 8Mx64, 16Mx64, Double-Sided Asymmetric: 2Mx64, 4Mx64, 8Mx64, 16Mx64, 32Mx64
Requirements	DRAM Speed: 60ns or 70ns RAS Access Time : 60ns ~70ns CAS Access Time: 10ns ~20ns Two SIMM modules must be installed at a time, and each pair of modules must be the same size, type and speed.	**3.3V unbuffered DIMM module** Speed grade: Faster than the CPU clock CAS latency: 3 or faster

Memory Configuration.

BANK 0 (DIMM1)	EDO/SDRAM 4MB, 8MB, 16MB, 32MB, 64MB, 128MB, 256MB
BANK 1 (DIMM2)	EDO/SDRAM 4MB, 8MB, 16MB, 32MB, 64MB, 128MB, 256MB
BANK 2 (SIMM1 & SIMM2)	EDO/FPM 4MB, 8MB, 16MB, 32MB, 64MB, 128MB
Total System Memory	8MB to Max. 768MB

2.2.4 Clear CMOS and Password

If your system can not boot up because you forget your password, or the CMOS settings need to be reset to default values after the system BIOS has been updated, the following instructions can be performed to clear the CMOS and password.

1. Power off the system
2. Place a shunt to short pin2 and pin3 of JP7 for 5 seconds
3. Put the shunt back to pin1 and pin2 of JP7
4. Power on the system

3 BIOS Configuration

After hardware configuration of P5F93 Mainboard is completed, and system hardware has been assembled, the completed system may be powered up. At this point, CMOS setup should be run to ensure that system information is correct.

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

3.1 ENTERING SETUP

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways. If the error occurs before the display device is initialized, a series of beeps will be transmitted. If the error occurs after the display device is initialized, the screen will display the error message.

After the POST routines are completed, the following message appears:

"Press DEL to enter SETUP"

To access the AWARD BIOS SETUP program, press the <DEL> key. The "CMOS SETUP UTILITY" screen will be displayed at this time.

3.2 CMOS SETUP UTILITY

Main Program Screen

```
              ROM PCI/ISA BIOS (2A5KKF29)
                 CMOS SETUP UTILITY
                 AWARD SOFTWARE, INC.

  STANDARD CMOS SETUP           BIOS FEATURES SETUP

  IDE HDD AUTO DETECTION        CHIPSET FEATURES SETUP

  LOAD SETUP DEFAULTS           POWER MANAGEMENT SETUP

  SAVE & EXIT SETUP             PNP/PCI CONFIGURATION

  EXIT WITHOUT SAVING           INTEGRATED PERIPHERALS

                                SUPERVISOR PASSWORD

                                USER PASSWORD

  Esc: Quit                     ↑ ↓ → ←      : Select Item
  F10: Save & Exit Setup        <Shift>F2    : Change Color
```

This screen provides access to the utility's various functions.

Listed below are explanations of the keys displayed at the bottom of the screen:

<ESC>: Exit the utility.

ARROW KEYS: Use arrow keys to move cursor to the desired selection.

<F10>: Saves all changes made to Setup and exits program.

<Shift> <F2>: Changes background and foreground colors.

3.3 STANDARD CMOS SETUP

Selecting "STANDARD CMOS SETUP "on the main program
screen displays this menu:

Standard CMOS Setup Screen

```
ROM PCI/ISA BIOS (2A5KKF29)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy): Mon, Mar 23 1998
Time (hh:mm:ss): 10:10:10

HARD DISKS        TYPE   SIZE   CYLS  HEAD  PRECOMP  LANDZ  SECTOR  MODE
Primary Master    : Auto   0      0     0       0       0      0     Auto
Primary Slave     : Auto   0      0     0       0       0      0     Auto
Secondary Master  : Auto   0      0     0       0       0      0     Auto
Secondary Slave   : Auto   0      0     0       0       0      0     Auto

Drive A: 1.44M, 3.5 in.
Drive B: None                              Base Memory:      640K
Floppy 3 Mode Support: Disabled        Extended Memory: 15360K
                                           Other Memory:     384K
Video:   EGA/VGA
Halt On:   All Errors But Keyboard         Total Memory:   16384K

ESC: Quit        ↑ ↓ → ←  : Select Item      PU/PD/+/-:Modify
F1: Help         (Shift) F2   : Change Color
```

The Standard CMOS Setup utility is used to configure the follow-
ing features:

Set Date: Month, Day, Year.

Set Time: Hour, Minute, and Second. Use 24 Hour clock format
(for PM numbers, add 12 to the hour, you would enter 4:30 p.m.
As 16:30).

Hard Disks:
There are four hard disks listed: "Primary Master", "Primary
Slave", "Secondary Master" and "Secondary Slave". For Each

IDE channel, the first device is the "Master" and the second
device is "Slave".

Hard disk Types from 1 to 45 are standard ones; Type "Auto" is
IDE HDD auto detection; Type "User" is user definable, and
Type "None" is not installed (e.g. SCSI).

There are six categories of information you must enter for a HDD:
"CYLS" (number of cylinders), "HEAD" (number of heads),
"PRECOMP" (write pre-compensation), "LANDZ" (landing zone),
"SECTOR" (number of sectors) and "MODE" (Normal, LBA,
LARGE and AUTO). The hard disk vendor's or system
manufacturer's documentation should provide you with the
information needed. The "MODE" option is for IDE hard disk
drives only. The "MODE" has four options: NORMAL, LBA,
LARGE and AUTO. Set MODE to NORMAL for IDE hard disk
drives smaller than 528MB. Set MODE to LBA for IDE hard disk
drives over 528MB which support Logical Block Addressing mode.
Set MODE to LARGE for IDE hard disk drives over 528MB which
do not support LBA mode. The LARGE type of drive is very
uncommon and can only be used under MS-DOS. Currently most
IDE hard disk drives over 528MB support LBA mode. Set MODE
to AUTO to enable auto detection of your IDE hard disk drive
during bootup.

Floppy Drive A and Floppy Drive B: The options are: "360K,
5.25 in.", "1.2M, 5.25in.", "720K, 3.5in.", "1.44M, 3.5in.",
"2.88M, 3.5in." and "None (Not Installed)". Not Installed could
be used as an option for diskless workstations.

Floppy 3 Mode Support: The options are "Disabled" (default),
"Drive A", "Drive B" and "Both". This is the Japanese standard
floppy drive which stores 1.2MB in a 3.5" diskette.

Video: Set it to the type of graphics card installed in your system. If you are using a VGA or higher resolution card, choose the "EGA/VGA" option. The options are "EGA/VGA" (default), "MONO", "CGA 40" and "CGA 80".

Halt On: The options are "All Errors" (default), "No Errors", "All, But Keyboard", "All, But Diskette" and "All, But Disk/Key". This setting determines which type of errors will cause the system to halt during bootup.

3.4 IDE HDD AUTO DETECTION

If your system has an IDE hard drive, you can use this utility to detect its parameters and enter them into the Standard CMOS Setup automatically.

If the auto-detected parameters displayed do not match the ones that should be used for your hard drive, do not accept them. Press the <N> key to reject the values and enter the correct ones manually on the Standard CMOS Setup screen.

Note: If you are setting up a new hard disk drive (nothing on it) that supports LBA mode, more than one line will appear in the parameter box, choose the line that lists LBA for an LBA drive.

Do not choose Large or Normal if the hard disk drive is already fully formatted when you install it, choose the mode which is used to format it.

3.5 LOAD SETUP DEFAULTS

"LOAD SETUP DEFAULTS" loads optimal settings which are stored in the BIOS ROM.

The defaults loaded only affect the BIOS Features Setup, Chipset Features Setup, Power Management Setup, PnP/PCI configuration setup and Integrated Peripherals Setup.There is no effect on the Standard CMOS Setup. To use this feature, highlight on the main screen and press <Enter>. A line will appear on the screen asking if you want to load the Setup default values. Press the <Y> key and then press the <Enter> key if you want to load the Setup defaults. Press <N> if you don't want to proceed.

3.6 SAVE & EXIT SETUP

Selecting this option and pressing the <Enter> key will save the new setting information in the CMOS memory and continue with the booting process.

3.7 EXIT WITHOUT SAVING

Selecting this option and pressing the <Enter> key will exit the Setup Utility without recording any new values or changing old ones.

3.8 BIOS FEATURES SETUP

Selecting "BIOS FEATURES SETUP" on the main program screen displays this menu:

BIOS Features Setup Screen

```
ROM PCI/ISA BIOS (2A5KKF29)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Trend Chipaway Virus        :  Enabled      Video BIOS Shadow           : Enabled
                                            C8000 - CBFFF Shadow        : Disable
CPU Internal Cache          : Enabled       CC000 - CFFFF Shadow        : Disable
External Cache              : Enabled       D0000 - D3FFF Shadow        : Disable
                                            D4000 - D7FFF Shadow        : Disable
Quick Power On Self Test    : Enabled       D8000 - DBFFF Shadow        : Disable
Boot Sequence               : C, A, SCSI    DC000 - DFFFF Shadow        : Disable
Swap Floppy Drive           : Disabled
Boot Up Floppy Seek         : Disabled
Boot Up NumLock Status      : On            OS Select For DRAM > 64MB   : Non-OS2

Gate A20 Option             : Fast          Report No FDD For Win 95    :  Yes

Typematic Rate Setting      : Disabled      Assign IRQ For VGA          :  Enabled
Typematic Rate (Chars/Sec)  : 6
Typematic Delay (Msec)      : 250
                                            ESC: Quit       ↑↓ → ←   :Select Item
Security Option             : Setup         F1: Help           PU/PD/+/-:Modify
                                            F5: Old Values     (Shift) F2: Color
PCI/VGA Palette Snoop       : Disable       F7: Load Setup Defaults
```

The following explains the options for each feature:

Trend Chipaway Virus: The Trend Chipaway Virus's default setting is "Enabled". Presently, one solution provided by some BIOS venders to protect against boot viruses involves a BIOS function used to write-protect the partition table. This solution prevents viruses from writing to the partition table but also prevents computer users from doing legitimate modifications e.g. using FDISK to re-configure hard drive partitions. Also this function will be disabled whenever the BIOS has been reset. Trend ChipAway Virus (TCAV) is unique, specially designed solution stops boot viruses from infecting the boot sector or partition table during the "threat" period that exists before the boot sector loads and traditional anti-virus protection takes effect. Trend ChipAway Virus resides in the BIOS to prevent boot viruses from causing any damage to computers.

CPU Internal Cache: The default setting is "Enabled". This Setting enables the CPU internal cache.

External Cache: The default setting is "Enabled". This setting enables the Level 2 cache.

Quick Power On Self Test: The default setting is "Enabled". This will skip some diagnostic checks during the Power On Self Test (POST) to speed up the booting process.

Boot Sequence: The default setting is "C, A, SCSI"; the other options are "CDROM, C, A", "C, CDROM, A", "A, C, SCSI", "D, A, SCSI", "E, A, SCSI", "F, A, SCSI", "SCSI, A, C", "SCSI, C, A", "LS/ZIP, C" and "C only". The BIOS will load the operating system from the disk drives in the sequence selected here. You can bootup system from an LS-120 or ATAPI ZIP driver, if you set the boot sequence to "LS/ZIP, C".

Swap Floppy Drive: The default setting is "Disable". This setting gives you an option to swap A and B floppy disks. Normally the floppy drive A is the one at the end of the cable, if you set this option to "Enabled", the drive at the end of the cable will be swapped to B.

Boot Up Floppy Seek: The default setting is "Disable". If set to "Enabled", during bootup the BIOS will check for installed bootup disk in the floppy disk drives.

Boot Up Numlock Status: The default setting is "On". If set to "Off", the cursor controls will function on the numeric keypad.

Gate A20 Option: the defaults setting is "Fast". This is the optimal setting for the Mainboard. The other option is "Normal".

Typematic Rate Setting: The default setting is "Disable". If set to "Enabled", you can set the typematic Rate and typematic Delay.

Typematic Rate (Chars/Sec): This setting controls the speed at which the system registers repeated keystrokes. The choices range from 6 to 30 Chars/Sec. The default setting is "6" Chars/Sec.

Typematic Delay (Msec): This setting controls the time between the display of the first and second characters. There are four delay choices: 250ms, 500ms, 750ms and 1000ms. The default setting is "250" ms.

Security Option: This setting controls the password feature. The options are "Setup" and "System". Selecting "Setup" will protect the configuration settings from being tampered with. Select "System" if you want to use the password feature every time the system boots up. The default setting is "Setup". You can create your password by using the "SUPERVISOR/USER PASSWORD" utility on the main program screen.

PCI/VGA Palette Snoop: If there are two VGA cards in your system (one PCI and one ISA) and this option is set to "Disable", data read and written by CPU is only directed to the PCI VGA card's palette registers. If set to "Enabled", data read and written by CPU will be directed to both the palette registers of the PCI VGA and ISA VGA cards. This option must be set to "Enabled" if any ISA VGA card installed in your system requires VGA palette snooping to fix improper color problem.

Video BIOS Shadow: The default setting is "Enabled" which will copy the VGA BIOS into system DRAM.

C8000-CBFFF Shadow to DC000-DFFFF Shadow: The default setting for the shadow feature is "Disable". When set to enable, the ROM with the specific address is copied into system DRAM. It will also reduce the size of memory available to the system.

OS Select For DRAM > 64MB: The default setting is "Non-OS2". Set to "OS2" if the system memory size is greater than 64MB and the operating system is OS/2.

Report No FDD For Win95: The default setting is "Yes". Set this option to "Yes" to request BIOS to report the FDD status to Windows 95.

Assign IRQ For VGA: The default setting is "Enabled". When set to "Disable" BIOS will not assign any IRQ (Interrupt request line) for PCI VGA card. If your VGA card requires IRQ then set this option to "Enabled".

After you have made your selection(s) in the BIOS FEATURES SETUP, press the <ESC> key to go back to the main program screen.

3.9 CHIPSET FEATURES SETUP

Selecting "CHIPSET FEATURES SETUP" on the main program
screen displays this menu:

Chipset Features Setup Screen

```
                    ROM PCI/ISA BIOS (2A5KKF29)
                    CHIPSET FEATURES SETUP
                      AWARD SOFTWARE, INC.

 Auto Configuration          :  Enabled      CPU Warning Temperature  :  66⁰C/151⁰F

 DRAM Timing                 :  Normal       Current System Temp.      :  48⁰C/120⁰F
 DRAM Data Integrity Mode    :  Disabled     Current CPU FAN Speed     :  4383
 Host Read DRAM Command Mode :  Bypass       Current FAN2 Speed        :  4353
 SDRAM Burst X-1-1-1-1-1-1-1 :  Disabled      Vcc3   :  +3.32   Vccp  :  +2.80
 Pipeline Function           :  Enabled       + 12V  :  +12.01  +5V   :  +5.01
                                              - 5V   :  -4.98   - 12V :  -11.96
 Memory Hole At 15M-16M      :  Disabled
 IO Recovery Period          :  1 us

 Graphics Apeture Size       :  64MB
 Primary Frame Buffer        :  ALL
 VGA Frame Buffer            :  Enabled
 Data Merge                  :  Disabled
                                           ESC: Quit      ↑↓ → ←   :Select Item
 Passive Release             :  Enabled    F1: Help                 PU/PD/+/-:Modify
 ISA Line Buffer             :  Enabled    F5: Old Values            (Shift) F2: Color
 Delay Transaction           :  Disabled   F7: Load Setup Defaults
 AT Bus Clock                :  CLK2/3
```

This screen controls the settings for the board's chipset. All entries
related to the DRAM timing on the screen are automatically config-
ured. Do not make any change unless you are familiar with the
chipset.

Auto Configuration: This feature will set pre-determined optimal
timing for DRAM, cache according to CPU type and system clock.
The option are "Enabled" or "Disabled", default is "Enabled".

DRAM Timing: The DRAM timing depends on performance param-
eters of installed memory chips (DRAM). The options are "Normal",
"Fast" and "Slow". Do not change the value from the factory setting
unless you installed new memory that has a different performance rat-
ing than the original DRAMs.

DRAM Data Integrity Mode: The options are "ECC" and "Parity" and "Disabled". Set to "ECC" or "Parity" only when DIMM modules with parity bits are used. "ECC" will enable the Error Checking and Correction function to ensure the DRAM data integrity.

Host Read DRAM Command Mode: The options are "Syn." or "Bypass". This option sets type of Host Read DRAM Command Mode.

SDRAM Burst X-1-1-1-1-1-1-1: The options are "Disabled" and "Enabled". This feature set the DRAM Back-to-back burst read/ write timing. This timing depends on performance parameters of installed memory chips (DRAM). The default setting is "Disabled".

Pipelined Function: When set to "Enabled", the controller signals of the CPU will latch a new memory address before all data transfers for the current cycles are complete, resulting in a faster performance.

Memory Hole At 15M-16M: The default setting is "Disable". Set to "Enabled" means that when the system memory size is equal to or greater than 16M bytes, the physical memory address from 15M to 16M will be passed to PCI or ISA and there will be 1MBytes hole in your system memory. This option is designed for some OS with spe- cial add-in cards which need 15M-16M memory space.

I/O Recovery Period: This option sets the delay between back-to- back 8-bit and 16-bit I/O instructions. The options are "0us" and "1us". The default setting is "1us".

Graphics Aperture Size: This option determines the effective size of the AGP Graphic Aperture, which memory-mapped graphic data structures can reside in. The options are "16M", "32M", "64M", 128M" and "256M". The default is "64M".

Primary Frame Buffer: This option selects the size of PCI frame buffer. The size of the buffer should not impinge on local memory. The options are "All", "1M", "2M", "4M", "8M", "16M" and "Disabled".

VGA Frame Buffer: When set to "Enabled", a fixed VGA frame buffer from A000h to BFFFh and a CPU-to-PCI write buffer are implemented. the options are "Enabled" (default) and "Disabled".

Data Merge: This option set the word-merge feature for the frame buffer cycles. When "Enabled", this controller checks the eight CPU Byte Enabled signals to determine if data words read from the PCI bus by the CPU can be merged. The default setting is "Disabled".

Passive Release: When set to "Enabled", CPU-to PCI bus accesses are allowed during passive release. When set to "Disable", only PCI bus-master access to local DRAM is allowed during passive release.

ISA Line Buffer: The PCI to ISA Bridge has an 8-byte bi-directional line buffer for ISA or DMA bus master memory reads from or writes to PCI bus. When "Enabled", an ISA or DMA bus master can prefetch two doublewords to the line buffer for a read cycle. The default is "Enabled". The other option is "Disabled".

Delayed Transaction: This termination is used by targets that can't complete the initial data phase within the requirement of this specification. One advantage of a Delay Transaction is that the bus is not held in wait states while completing an access to a slow device. While the originating master rearbitrates for the bus, other bus masters are allowed to use the bus bandwidth that would normally be wasted holding the master in wait states. Another advantage is that all posted memory write data is not required to be flushed before the request is accepted. Chipset has an embedded 32-bit post write buffer to support delay transactions cycles. Select "Enabled" to support compliance with PCI specification version 2.1.

AT Bus Clock: You can set the speed of the AT bus in the terms of a fraction of the CPU clock speed (CLK2). The options are "CLK2/2", "CLK2/3", "CLK2/4", "CLK2/5", "CLK2/6" and "7.16MHz". The default setting is "CLK2/4".

CPU Warning Temperature: This feature gives you the ability to set warning temperature for CPU. When the CPU temperature exceeds the set temperature, the PC speaker will beep. The beep sound will not off unless you turn off computer and change your CPU cooling condition. This feature gives you CPU overheat protection. This feature required W83781D chip install.

Current System Temperature: This is the current system temperature reading. This feature gives you the ability to monitor your system's temperature without opening the chassis. This feature required W83781D chip install.

Current CPU FAN/FAN2 SPEED: This is CPU FAN or FAN2 RPM (Revolution Per Minute) reading. This feature gives you the ability to monitor conditions of CPU FAN and FAN2. This feature required W83781D chip install.

Vcc3, Vccp, +5V, -5V, +12V, -12V: This is Vcc3(onboard 3.3 volt), Vccp (CPU Core voltage), +5V(power supply's +5 volt), -5V(power supply's -5 volt), +12V(power supply's +12 volt) and -12V(power supply's -12 volt) reading. This feature gives you the ability to monitor condition of system's power. This feature required W83781D chip install.

After you have made your selections in the CHIPSET FEATURES SETUP, press the <ESC> key to go back to the main program screen.

3.10 POWER MANAGEMENT SETUP

The "Power Management Setup" controls the mainboard's "Green" features. Selecting "POWER MANAGEMENT SETUP" on the main program screen displays this menu:

Power Management Setup Screen

```
ROM PCI/ISA BIOS (2A5KKF29)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management     : User Define        PWR-BTTN            :  Power - Off
PM Control by APM    : Yes
Video Off Option     : Susp, Stby -> Off
Video Off Method     : V/H SYNC+Blank

    **   PM Monitor   **
Doze Mode            : Disable            Modem Use IRQ       :  3
Standby Mode         : Disable
Suspend Mode         : Disable
HDD Power Down        : Disable
Throttle Duty Cycle  :  75.0%


    **   PM Monitor   **
Primary HDD          : Disabled
Floppy               : Disabled
COM Ports            : Disabled           ESC: Quit       ↑↓ → ←   :Select Item
Keyboard             : Enabled            F1: Help            PU/PD/+/-:Modify
LPT Ports            : Disabled           F5: Old Values     (Shift) F2: Color
                                          F7: Load Setup Defaults
```

Power Management: This setting controls the System Doze Mode, Standby Mode and Suspend Mode Timer features. There are four options:

User Define: Allows you to customize all power saving timer features.

Optimize: This is the recommended setting for general use.

Test/Demo: This is for test/demonstration purposes.

Disable: Disables the power management features.

PM Control by APM: The default setting is "Yes". When set to "Yes", system BIOS will wait for APM's prompt before it enters any PM mode. If your system power management is controlled by APM and there is a task running, the APM will not prompt the BIOS to enter any power saving mode after time out. Note: If APM is not installed, this option has no effect.

APM (Advanced Power Management) should be installed to keep the system's time updated when the computer enters suspend mode activated by the BIOS Power Management. For DOS environments, you need to add DEVICE=C:\DOS\POWER.EXE in your CONFIG.SYS. For Windows 3.1x and Windows 95, you need to install Windows with the APM feature. Double-click a battery and power cord icon labeled "Power" in the "Control Panel" and choose "Advanced" in the Power Management field.

Video Off Option: When enabled, this feature allows the VGA adapter to operate in a power saving mode. When this option set to "Always on" system monitor will remain on during power saving modes. When set to "Suspend -> off", system monitor will blanked out when system enters the suspend mode. When set to "Susp, Stby ->off" system monitor blanked out when enter either suspend mode or standby mode.

Video Off Method: This setting controls the video off method in power saving mode. The default setting is "V/H SYNC+Blank" which will disable V/H SYNC signals and blanks the screen. Other options are "DPMS" and "Blank Screen". The "DPMS" option allows the BIOS to control the video card if it has the DPMS (Display Power Management System) feature. The "Blank Screen" option is used when you do not have a "Green" monitor.

Doze Mode: Options are from "1 Min" to "1 Hour" and "Disable". The system speed will change from turbo to slow if no Power Management events occur for a specified length of time. Full power function will return when a Power Management event is detected. When system entering DOZE Mode the STB LED will start blinking once a second, indicates your system at DOZE Mode.

Standby Mode: Options are from "1 Min" to "1 Hour" and "Disable". The system speed will change from turbo to slow and the video signals will be suspended if no Power Management events occur for a specified length of time. Full power function will return when a Power Management event is detected. When system entering Standby Mode the STB LED will start blinking twice a second, indicates your system at Standby Mode.

Suspend Mode: Options are from "1 Min" to "1 Hour" and "Disable". The CPU clock will be stopped and the video signal will be suspended if no Power Management events occur for a specified length of time. Full power function will return when a Power Management event is detected. When system entering Suspend Mode the STB LED will stop blinking and stay on, indicates your system at Suspend Mode.

HDD Power Down: Options are from "1 Min" to "15 Min" and "Disable". The IDE hard drive will spin down if it is not accessed within a specified length of time.

Throttle Duty Cycle: Options are "12.5%", "25%", "37.5%", "50%", "62.5%" and "75%".

PM Events (Primary HDD/Floppy/COM Ports/Keyboard/LPT Ports): When a PM event (Primary HDD/Floppy/COM port/ Keyboard/LPT ports) is enabled, the occurrence of a corresponding event will reload global timer to prevent the system from entering any Power Management mode.

PWR-BTTN: The options are "Disabled", "Green Mode" . When set to "Disabled.", you have to press the power button and hold it for more than 4 seconds to turn off the system power. When set to "Green Mode", pressing the power button will force your system entering suspend mode which will turn off CPU FAN and HDD spin if there are no PM Events active. *Note: During the booting process, the power button is ignored. The default setting is "Disabled".*

Modem Use IRQ: To enable the internal PnP modem ring to wake up your system from suspend mode, the IRQ assigned to the modem has to be the same as the setting in this option.

Press the <ESC> key to go back to the main program screen, after you have made your selections in the POWER MANAGEMENT SETUP.

3.11 PnP / PCI CONFIGURATION

Both the ISA and PCI buses on the Mainboard use system IRQs & DMAs. You must set up the IRQ and DMA assignments correctly thru the PnP/PCI Configuration Setup utility, otherwise the Mainboard will not work properly.

Selecting "PnP / PCI CONFIGURATION" on the main program screen displays this menu:

PnP / PCI Configuration

```
                      ROM PCI/ISA BIOS (2A5KKF29)
                       PNP / PCI CONFIGURATION
                         AWARD SOFTWARE, INC.

 PNP OS Installed          : No        PCI IDE  2nd Channel   : Disabled
 Resources Controlled By   : Manual    PCI IRQ Actived By     : Level
 Reset Configuration Data  : Disabled  PCI IDE IRQ Map To     : ISA

 IRQ-3 assigned to    : Legacy ISA
 IRQ-4 assigned to    : Legacy ISA
 IRQ-5 assigned to    : PCI / ISA PnP
 IRQ-7 assigned to    : Legacy ISA
 IRQ-9 assigned to    : PCI / ISA PnP
 IRQ-10 assigned to   : PCI / ISA PnP
 IRQ-11 assigned to   : PCI / ISA PnP
 IRQ-12 assigned to   : PCI / ISA PnP
 IRQ-14 assigned to   : Legacy ISA
 IRQ-15 assigned to   : Legacy ISA
 DMA-0 assigned to    : PCI / ISA PnP
 DMA-1 assigned to    : PCI / ISA PnP
 DMA-3 assigned to    : PCI / ISA PnP   ESC: Quit        ↑↓ → ←    :Select Item
 DMA-5 assigned to    : PCI / ISA PnP   F1: Help              PU/PD/+/-:Modify
 DMA-6 assigned to    : PCI / ISA PnP   F5: Old Values          (Shift) F2: Color
 DMA-7 assigned to    : PCI / ISA PnP   F7: Load Setup Defaults
```

PnP OS Installed: Setting this option to "Yes" allows the PnP OS, instead of BIOS to assign the system resources such as IRQ and I/O address to the ISA PnP device. The default setting is "No"

Resources Controlled By: The default setting is "Manual" which allows you to control IRQs and DMAs individually. The other option is "Auto" which will detect the system resources and automatically assign the relative IRQs and DMAs for each peripheral.

Reset Configuration Data: The system BIOS supports the Plug and Play feature so the resources assigned to each peripheral have to be recorded to prevent them from conflicting. The location to store the assigned resources is called ESCD which is located in the system flash EEPROM. If this option is set to "Disable" the ESCD will update automatically when the new configuration varies from the last one. If set to "Enabled", the ESCD will be cleared and forced to update and then automatically set this option to "Disable".

IRQ and DMA Assigned to.: If there is a legacy ISA device which uses an IRQ or a DMA, set the corresponding IRQ or DMA to "Legacy ISA", otherwise you should set to PCI/ISA PnP.

PCI IDE IRQ Map To, Primary IDE INT#, Secondary IDE INT#: If you disable onboard PCI IDE controller and install a PCI IDE card on the Mainboard, you need to set this option. If a PCI IDE Card uses ISA IRQ directly thru a paddle card installed on an ISA slot, select "ISA" for the option "PCI IDE IRQ Map To". If a PCI IDE Card uses PCI "INT" and is compliant to PCI Plug and Play specification, select "PCI-AUTO" for the option "PCI IDE IRQ Map To". Otherwise select "PCI-SLOT n" (PCI-SLOT 1, PCI-SLOT 2, PCI-SLOT 3 or PCI-SLOT4) depending on which slot the PCI IDE Card is installed.

Only INT A and INT B are available for a PCI IDE Card, therefore you must set the PCI IDE Card's primary interrupt to INT A and secondary interrupt to INT B. The INT A is routed to IRQ 14 and the INT B is routed to IRQ 15 thru a hardware router in the chipset.

After you have made your selections in the PnP / PCI Configuration SETUP, press the <ESC> key to go back to the main program screen.

3.12 INTEGRATED PERIPHERALS

Selecting "INTEGRATED PERIPHERALS" on the main program
screen displays this menu:

Integrated Peripherals Screen

```
        ROM PCI/ISA BIOS (2A5KKF29)
          INTEGRATED PERIPHERALS
            AWARD SOFTWARE, INC.

On-Chip Primary IDE      : Enabled    Onboard Parallel Port     : Normal
Master PIO               : Auto       Parallel Port Mode        : SPP
Slave  PIO               : Auto       ECP Mode Use DMA          : 3
Master Ultra DMA         : Auto
Slave  Ultra DMA         : Auto       On-Chip USB Controller    : Enabled
                                      USB Keyboard Support      : Disabled
On-Chip Secondary IDE    : Enabled
Master PIO               : Auto       Init Display First        : AGP
Slave  PIO               : Auto
Master Ultra DMA         : Auto
Slave  Ultra DMA         : Auto
IDE HDD Block Mode       : Enabled

Onboard FDD Controller   : Enabled

Onboard Serial Port 1    : 3F8 / IRQ4   ESC: Quit        ↑↓→←  :Select Item
Onboard Serial Port 2    : 2F8 / IRQ3   F1: Help         PU/PD/+/-:Modify
                                        F5: Old Values   (Shift) F2: Color
UR2 Mode                                F7: Load Setup Defaults
Half Duplex time-out     : Enabled
```

On-Chip Primary/Secondary PCI IDE: The default setting is
"Enabled". This option enables the onboard Primary / Secondary PCI IDE
controller.

Master PIO, Slave PIO, Master Ultra DMA, Slave Ultra DMA: There
are six options "Auto", "Mode 0", "Mode 1", "Mode 2", "Mode 3" and
"Mode 4" for PIO Mode HDD. There are two options "Enabled" or "Dis-
abled" for the Ultra DMA Hard Disk. The default setting is "Auto". When
set to "Auto" the BIOS will automatically set the PIO or Ultra DMA
mode to match the transfer rate of hard disk. If the system won't boot up
when set to "Auto", set it manually to the lower mode, e.g, from Mode 3
to Mode 2. All IDE drives should work with PIO mode 0.

IDE HDD Block Mode: The Default setting is "Enabled". This feature
enhances hard disk performance by making multi-sector transfers instead
of one sector per transfer. Most IDE drives, except very early design, have
the Block Mode transfer feature.

Onboard FDC Controller: The default setting is "Enabled". This option enables the onboard floppy disk drive controller.

Onboard Serial Port 1 and Onboard Serial Port 2: These options are used to assign the I/O addresses for two onboard serial ports. They can be assigned as follows:

> 3F8/ IRQ4 (Serial Port 1 default)
> 2F8/ IRQ3 (Serial Port 2 default)
> 3E8/ IRQ4
> 2E8/ IRQ3
> Auto
> Disabled (Disable the onboard serial port)

UR2 Mode: The options are "Normal" (default), "IrDA" and "ASKIR". The IrDA is Hewlett Packard infrared communication protocol with maximum baud rate up to 115.2K bps, and the ASKIR is Sharp infrared communication protocol with maximum baud rate up to 57.6K bps. The UART mode setting depends on which type of infrared module is used in the system. When set to "ASKIR" or "IrDA", the UART 2 is used to support the infrared module connected on the mainboard. If this option is not set to "Normal", a device connected to the COM2 port, will no longer work.

Onboard Parallel Port: This option is used to assign the I/O address for the onboard parallel port. The options are "378/IRQ7" (defaults), "278/IRQ5", "3BC/IRQ7" and "Disabled" (disable the onboard parallel port).

Parallel Port Mode: There are four options "Normal" (default), "EPP", "ECP", "ECP+EPP". Change the mode from "Normal" to the enhanced mode only if your peripheral device can support it.

ECP Mode Use DMA: When set on-board parallel port to ECP mode, the parallel port has option to use DMA "3"(default) or "1".

On-chip USB Controller: Set this option to "Enabled" to activate the on-chip USB function. The default setting is "Enabled".

USB Keyboard Support: Set this option to "Enabled" if an Universal Serial Bus (USB) keyboard is used in your system. The default setting is "Disable".

Init Display First: The options are "AGP" and "PCI-Slot". When set to "AGP", system BIOS will initial VGA from AGP to PCI-slot. When set to "PCI-slot" system BIOS will initial VGA from PCI-slot to "AGP".

3.13 SUPERVISOR / USER PASSWORD

The "SUPERVISOR/USER PASSWORD" utility sets the password. The Mainboard is shipped with the password disabled. If you want to change the password, you must first enter the current password, then at the prompt enter your new password. The password is case sensitive and you can use up to 8 alphanumeric characters, press <Enter> after entering the password. At the next prompt, confirm the new password by typing it and pressing <Enter> again.

To disable the password, press the <Enter> key instead of entering a new password when the "Enter Password" dialog box appears. A message will appear confirming that the password is disabled.

If you have set both supervisor and user password, only the supervisor password allows you to enter the BIOS SETUP PROGRAM.

Note:
If you forget your password, the only way to solve this problem is to discharge the CMOS memory by turning power off and placing a shunt on the JP7 to short pin 2 and pin 3 for 5 seconds, then putting the shunt back to pin1 and pin2 of JP7.

4 Driver and Utility

4.1 Flash Utility

The BIOS of the P5F93 mainboard can be upgraded by using a Flash utility. A new version of the BIOS can be downloaded from the factory's BBS and Web site. The system BIOS is stored in a 1M-bit Flash EEPROM which can be erased and reprogrammed by the Flash utility.

There are two files in the FLASH directory.

FLASH.EXE	The Flash utility for AWARD BIOS upgrade
README.TXT	A text file of instructions

The Flash utility will not work with any memory manager software running in the system. In order to make sure no memory manager software is running, boot your system from a bootable floppy diskette which does not contain CONFIG.SYS and AUTOEXEC.BAT files. If you are using MS-DOS 6.x, you can press <F5> function key while the "Starting MS-DOS..." message appearing on the screen to bypass the CONFIG.SYS and AUTOEXEC.BAT.

4.2 EIDE Bus Master Driver

The Bus Master EIDE logic designed in the ALi Aladdin V chipset is intended to reduce the workload of the CPU and make the CPU running more efficiently. It will take care the data transfer between IDE drives and system memory and let CPU handle other tasks.

There is a self-extracting archive file in the IDE directory "V280.exe". Make copy of this file into your hard disk and run it. It will create several sub-directory under V280 directory which will have Bus-mastering driver for each O.S.

DOSWIN	For DOS and Windows3.1x
Novell	For Novell 3.x and 4.x
OS/2	For IBM OS/2 Warp4.0

Win95   For early version of windows95
WinNT3.5   For Windows NT 3.5x
WinNT4.0   For Windows NT 4.0

Note:
You don't need to install the Bus-Mastering driver for Windows95
(OSR2.1 or later version) and Windows98 which will install bus-
mastering driver during the Windows installation.

4.3 AGP Driver

There is a self-extracting archive file in the AGP directory "AGP.xx".
Make copy of this file into your hard disk and run it. It is a patch code
that help windows95 understand the AGP VGA chip

System Environment Monitor (optional)

The System Environment Monitoring utility with the onboard Winbond 83781D system monitor chip allow you to monitor your system's temperature, Fan speed and CPU voltage. Using this utility, you can setup the upper and lower limits of these monitored parameters. A pre-warning message will pop up on the screen when the monitored parameters is out of the preset range. This software have to be installed under Windows95, the feature version may run on different OS.(like windows NT)
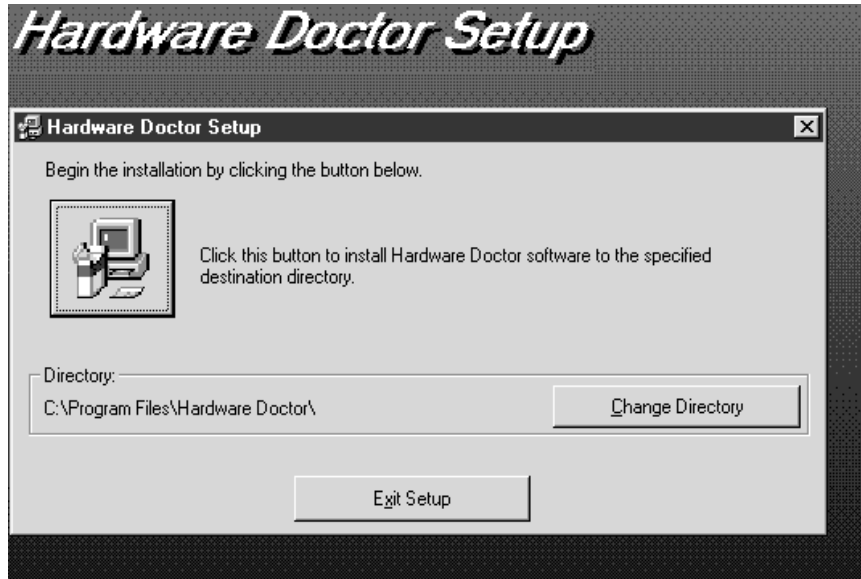
1.0.1 Hardware Doctor Setup

There are two diskettes for the Hardware Doctor software.

1) Insert the diskette label with DISK1 into the 1.44M floppy drive and run setup.exe under Windows95.

2) The following screen will appear

Click "OK" and continue setup procedure.

3) Select the directory to install Hardware Doctor program. The default directory is **":\Program Files\ Hardware Doctor\"**

Follow the instructions on the screen to complete the installation. After setup is completed, you need to restart the computer before you can activate the program.

4) The "Hardware Doctor" option will be added to the "program" directory. Click on the "Hardware Doctor" icon to access the program.

1.0.2 Setting the Threshold:

Set the threshold you want for system temperature, voltages and FAN
speeds, by moving the slide bars or by clicking the increase/decrease
buttons

Voltage detection items. Vcore stands for voltage for CPU core.
Increase low margin.
Decrease low margin.

Increase high margin.
Decrease high margin.

System Temperature detection

CPU Fan RPM detection

Secondary FAN(FAN2) RPM detection

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