P5F88 Quick Reference

Quick DIP Switch Setup:

Note:

P54C: Pentium Processor

P55C: Pentium Processor with MMX Technology

CPU Type/Speed	DIP Switch					
	P1	P2	P3	P4	P5	P6
P54C 120MHz	ON	OFF	OFF	ON	OFF	OFF
P54C 133MHz	ON	OFF	OFF	OFF	OFF	OFF
P54C 150MHz	ON	ON	OFF	ON	OFF	OFF
P54C 166MHz	ON	ON	OFF	OFF	OFF	OFF
P54C 200MHz	OFF	ON	OFF	OFF	OFF	OFF
P55C 166MHz 2.8V	ON	ON	OFF	OFF	OFF	OFF
P55C 200MHz 2.8V	OFF	ON	OFF	OFF	OFF	OFF
P55C 233MHz 2.8V	OFF	OFF	OFF	OFF	OFF	OFF

CPU Type/Speed	DIP Switch					
	P1	P2	P3	P4	P5	P6
AMD-K5-PR120	OFF	OFF	OFF	ON	OFF	OFF
AMD-K5-PR133	OFF	OFF	OFF	OFF	OFF	OFF
AMD-K5-PR150	ON	ON	OFF	ON	OFF	OFF
AMD-K5-PR166	ON	ON	OFF	OFF	OFF	OFF
AMD-K6/166 2.9V	ON	ON	OFF	OFF	OFF	OFF
AMD-K6/200 2.9V	OFF	ON	OFF	OFF	OFF	OFF
AMD-K6/233 3.2V	OFF	OFF	OFF	OFF	OFF	OFF
* AMD-K6/266 2.2V	ON	OFF	ON	OFF	OFF	OFF

CPU Type/Speed	DIP Switch					
	P1	P2	P3	P4	P5	P6
6x86L - P133+	ON	OFF	OFF	ON	ON	OFF
6x86L - P150+	ON	OFF	OFF	ON	OFF	OFF
6x86L - P166+	ON	OFF	OFF	OFF	OFF	OFF
6x86MX PR166 2.9V 60MHz	ON	ON	OFF	ON	OFF	OFF
6x86MX PR166 2.9V 66MHz	ON	OFF	OFF	OFF	OFF	OFF
6x86MX PR200 2.9V 66MHz	ON	ON	OFF	OFF	OFF	OFF
* 6x86MX PR233 2.9V 66MHz	OFF	ON	OFF	OFF	OFF	OFF
* 6x86MX PR266 2.9V 66MHz	OFF	OFF	OFF	OFF	OFF	OFF

Note: 1) CPU with * mark is not available yet, DIP switch setting table is for reference only.
2) VIA's Apollo VP3 is specified up to 66MHz system bus clock only, higher frequency is not guaranteed. For Example, Cyrix 6x86MX PR200 66MHz x 2.5 is supported, and 6x86MX PR200/75MHz x 2 is not guaranteed.

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Table Of Contents

1 Introduction

1.1 Overview

The P5F88 is a quality, high performance, function enhanced mainboard based on the Pentium class processor. This mainboard is designed around the latest and fastest VIA Apollo VP3 chipset in a ATX form factor.

The P5F88 mainboard is a flexible mainboard which is designed to operate with all members of the Pentium class processors: Intel Pentium and Pentium with MMX technology, Cyrix/IBM 6x86L and 6x86MX, AMD K5 and K6.

The P5F88 mainboard delivers superior performance with its integrated Bus Mastering EIDE (Enhanced IDE) controller, concurrent PCI bus, 512KB level 2 Pipelined Burst cache, and its ability to accommodate new technology EDO (Extended Data Out) and SDRAM (Synchronous DRAM) memory. The P5F88 mainboard achieves the highest reliability by supporting the ECC (Error Checking and Correction) memory protections. This enables the P5F88 mainboard to have superior data integrity and be fault-tolerant in respect to memory errors while running applications.

The P5F88 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 ports, an EPP/ECP capable bidirectional parallel port, an IrDA compatible infrared port, two USB (Universal Serial Bus) ports and a PS/2 mouse connector. One AGP slot, four PCI local bus slots and three ISA bus slots provide expandability to add on peripheral cards.

P5F88 mainboard is the foundation of OnNow PC, Managed PC and PC97. It offers optimized system performance and integrated power management.

Optimized System Performance: 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.

In addition to superior hardware capabilities, features like bus mastering EIDE driver, Plug and Play, Soft-off, APM (Advanced Power Management), Modem ring on, Watchdog timer wake up, Sleeping state indicator, fan off in sleeping state, Wake on LAN (WOL) and BIOS upgradability are provided on the P5F88 platform.

1.2 P5F88 Specifications/Features

Hardware

CPU	Supports the following CPUs in a ZIF Socket 7 Intel Pentium 90 ~ 200MHz. Intel MMX Pentium 166 ~ 233MHz. Cyrix/IBM 6x86L PR133+ ~ 166+MHz. Cyrix/IBM 6x86MX PR166 ~ PR200MHz (PR233MHz and PR266MHz are reserved) AMD K5 PR90 ~ 166MHz AMD K6 /166 ~ 233 MHz (K6/266MHz and K6/ 300MHz are reserved)

Note: VIA's Apollo VP3 is specified up to 66MHz system bus clock only, higher frequency is not guaranteed. For Example, Cyrix 6x86MX PR200 66MHz x 2.5 is supported, and 6x86MX PR200/75MHz x 2 is not guaranteed.

Coprocessor	CPU built-in floating point unit
Speed	System bus clock 50/55/60/66/68/75 MHz PCI bus clock 25/27.5/30/33/34/37.5 MHz ISA bus clock 6.3/6.9/7.5/8.3/8.5/9.4 MHz
Chipset	VIA Apollo VP3 Chipset Winbond 83877 I/O chip
L2 Cache	Synchronous Pipelined Burst SRAM 512KB
DRAM	2 x 72-pin SIMM and 3 x 168-pin DIMM sockets Supports 8MB to 1 GB memory Supports FPM, EDO and SDRAM memory
EIDE Controller	Supports four IDE devices in two channels Supports PIO mode 0 through mode 4 drives Supports Bus Mastering DMA mode 2 drives Supports Bus Mastering Ultra DMA/33 drives Supports LS-120 drives

Enhanced I/O	One floppy disk controller One Standard/EPP/ECP parallel port Two 16550 compatible serial ports One IrDA compatible Infrared port Two USB (Universal Serial Bus) ports
Mouse/Keyboard	PS/2 mouse port PS/2 keyboard connector
Expansion Slots	One AGP slot Four 32-bit PCI slots Three 16-bit ISA slots (one PCI/ISA shared slot)
Power Management	Compliant with EPA, APM 1.2 and ACPI ATX soft-off power control Power - On by Ring Power - On by Alarm Power-On by Keyboard Power - On by Wake on LAN Sleep state indicator Fan off in sleep mode
Voltage Regulator	10 Amp Switching regulator CPU voltage auto-detection
Power Supply	ATX power supply
Form Factor	ATX, 12" x 7.3", 305mm x 185mm

Software

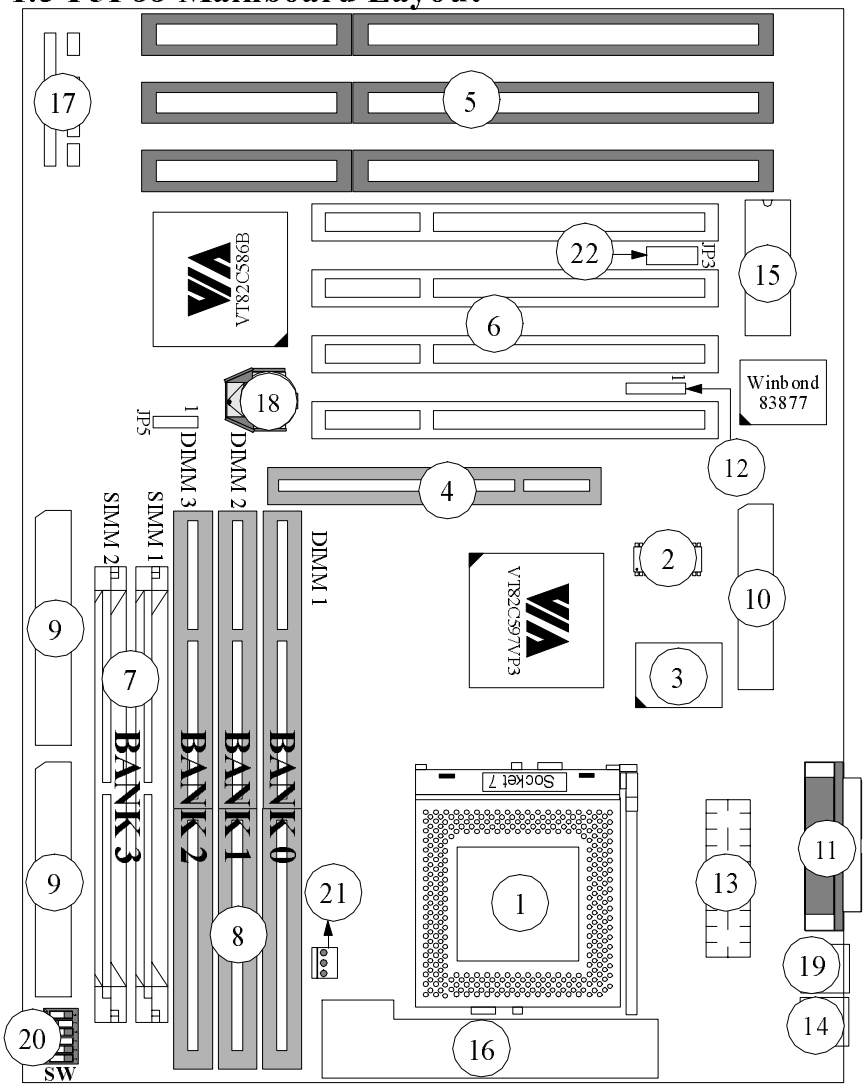
BIOS	AWARD Pentium PCI BIOS Flash BIOS with ESCD (Extended System Configuration Data) block Supports APM, PnP, Multi-Boot, DMI and EIDE devices Built-in SymBIOS (NCR) SCSI BIOS Support High-Capacity LS-120 Removable Media Drive

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, Windows 95, Windows NT, OS/2, Novell Netware, Novell UnixWare 1.1 and SCO Unix 5.0.2

Environment

Ambient Temperature	0^0C to 50^0 C (Operating)
Relative Humidity	0 to 85% (Operating)
Vibration	0 to 500 Hz
DC Voltage	4.9V to 5.2V
DC Voltage	3.15V to 3.50V
DC Voltage	-5V, +12V, -12V, $+5V_{SB}$ 5% tolerance

1.3 P5F88 Mainboard Layout



1:CPU
2:TAG SRAM Chip
3:Cache SRAM Chip
4: AGP Slot
5:ISA Expansion Slots
6:PCI Expansion Slots
7:SIMM Sockets
8:DIMM Sockets
9:IDE Connectors
10:Floppy Drive Connector
11:Serial Port Connectors & Parallel Port Connector
12:IR Port Header
13:ATX Power Connector
14:PS/2 keyboard & PS/2 Mouse Connector
15:Flash BIOS
16:Switching Regulator
17:Front panel Connectors
18:Battery (CR2032 Lithium)
19:Dual USB Connector
20:DIP Switch
21:FAN Connector
22:Wake On LAN Header

1.4 Microprocessor

The P5F88 meets all requirements of a Pentium flexible mainboard which is defined as a mainboard capable of supporting all members of the Pentium class processors.

The requirements for a Pentium flexible mainboard are:

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

The P5F88 mainboard can support the following CPUs

Intel Pentium 90 ~ 200MHz
Intel MMX Pentium 166 ~ 233MHz
Cyrix/IBM 6x86L PR133+ ~ 166+MHz
Cyrix/IBM 6x86MX PR166 ~ PR200MHz
(PR233MHz and PR266MHz are reserved)
AMD K5 PR90 ~ 166MHz
AMD K6 /166 ~ 266 MHz
(K6/300MHz are reserved)

Note: VIA's Apollo VP3 is specified up to 66MHz system bus clock only, higher frequency is not guaranteed. For Example, Cyrix 6x86MX PR200 66MHz x 2.5 is supported, and 6x86MX PR200/75MHz x 2 is not guaranteed.

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 PR166+ can reach the same or better performance than Intel Pentium 166 MHz, but the actual Cyrix/IBM 6x86L PR166+ internal core clock is only 133MHz.

1.5 Level 2 Cache

The P5F88 mainboard provides standard 512KB synchronous pipelined burst SRAM cache on board.

1.6 Chipset

The VIA Apollo VP3 PCIset consists of one VT82C597 system controller and one VT82C586B PCI Integrated peripheral controller.

VT82C597	- CPU interface controller - AGP interface controller - Cache and DRAM controllers - Fully synchronous PCI 2.1 bus interface - Extensive data buffering among CPU, AGP, DRAM and PCI
VT82C586B	- Interface between the PCI and ISA buses - PC97 Compliant - ACPI - Keyboard Controller - 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 - Power Management Logic

1.7 Main Memory

The P5F88 mainboard provides two 72-pin SIMM and three 168-pin DIMM sockets to support 8MB to 1GB 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), 32Mx64(256MB) and 64Mx64(512MB) DIMM in single- or double-sided modules.

The P5F88 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 P5F88 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 P5F88 mainboard is equipped with an Accelerated Graphic Port slot which is compliant to the AGP specification. The AGP runs up to 66MHz clock and supports both 1x and 2x mode for 66MHz/ 133MHz 3.3V devices. The data transfer rate on the AGP bus may be 4 times as fast as on the PCI bus.

1.9 Switching Regulator

The P5F88 mainboard uses 10 Amp switching regulator design instead of a linear one to improve power efficiency and system reliability. There is no hardware or BIOS setting needed for CPU operating voltage. The "SMART" switching regulator can auto-detect the CPU type on the P5F88 mainboard and supply the proper operating voltage for the CPU. This unique design will prevent the CPU from being damaged by the incorrect voltage setting.

1.10 Ultra DMA/33 EIDE Support

The P5F88 mainboard provides two enhanced high performance PCI IDE interfaces capable of supporting four 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 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 VIA Apollo VP3 chipset is intended to reduce the workload of the CPU, hence to increase CPU efficiency. The Bus Master will take care of the data transfer between IDE and memory and let the CPU handle other tasks. In true multi-tasking operating systems such as Windows 95, Windows NT, and OS/2, by using bus-mastering IDE, the CPU bandwidth can be freed up to complete other tasks while disk data transfers are occurring. The driver must be loaded in order to make the EIDE drive operating at 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

1.11 Keyboard, Mouse and USB Interface

PS/2 keyboard, PS/2 mouse, and USB connectors are located on the back panel of the P5F88 mainboard. The P5F88 mainboard has a two USB connectors 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, USB is suitable for devices such as keyboard, mouse, digital joystick, game pad, fax/modem, scanner, printer, ISDN and telephony device.

1.12 Real-time Clock, CMOS RAM and Battery

The integrated real-time clock (RTC) provides a time of day clock, and a 86-year calendar with alarm features. The RTC also has 239 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 content of the CMOS RAM can be cleared by placing a shunt to short pin2 and pin3 of JP5 for 5 seconds when the system power is off.

An external coin-cell style Lithium CR2302 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.

1.13 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 Laplink to transfer files between the computer system and portable devices such as laptops and printers.

1.14 Power Management

The integrated DPMA (Dynamic Power Management Architecture) features in the VIA Apollo VP3 PCISet go far beyond the original vision of the “Green PC” to create exciting new application models for the “OnNow” PC platform. The “OnNow” PC is a PC which is always on and ready for use but appears to be off when not in use. The P5F88 not only complies with EPA, APM1.2 and ACPI

(Advanced Configuration and Power Interface), but also provides the following power management features:

- Power-on by a modem ring, or a keystroke, or watchdog timer
  System could be powered on by phone ring, or by any key of your keyboard, or by software that has requested the PC to wake up at a predetermined time.
- Wake On LAN (WOL)
  Remote wake up of the computer through a network.
- Sleep mode indicator
  The power LED becomes dim when system is in sleep mode.
- Fan off in sleep mode
  The CPU cooling fan will be turned off when system is in sleep mode.

1.15 System Power On/Off Control

System power can be turned on by a power button, a keystroke, a modem ring, or an alarm. To enable the "modem ring on" feature, the option "Modem Ring Resume" in the BIOS Power Management Setup has to be set to "Enabled". To enable the "alarm on" feature, the option "RTC Alarm Resume" in the BIOS Power Management Setup has to be set to "Enabled". To enable the "keyboard power on" feature, the option "Keyboard Resume" in the BIOS Power Management Setup has to be set to "Enabled".

System power can be turned off in one of two ways: a front panel power button or soft-off control. When the option "Power-Off by PWR-BTTN" in the BIOS Power Management Setup is set to "Instant-Off", press the power button will immediately turn off the system power. But if the "Power-Off by PWR-BTTN" option is set to "Delay 4 Sec.",you have to press the power button and hold it for more than 4 seconds to turn off the system power. The system power can also be turned off via software control. The system BIOS will turn the system power off when it receives the proper APM command from the Operating System. For example, Windows 95 will issue Soft Off APM command when the user selects "Shutdown" in Start Menu. In order for the Soft Off feature to work properly, Power Management/APM must be enabled in the system BIOS and Operating System.

1.16 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 “Power-Off by PWR-BTTN” in the BIOS Power Management Setup has to be set to “Delay 4 Sec.”

When the system enters the sleep mode, the CPU stops running, the VIA Apollo VP3 PCIset and related circuits stay in the lower power state, the HDD stops spinning, the monitor screen becomes blank, the power LED indicator on the front panel dims, 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 marked FAN)

1.17 Wake On LAN (WOL)

Wake on LAN (WOL) is a 1x3 pin header for remote wake up of the computer through a network. Wake on LAN requires a PCI add-in network interface card (NIC) with remote wake up capabilities. The remote wake up header on the NIC must be connected to the onboard Wake on LAN header. The NIC monitors network traffic at the MII interface and when it detects a Magic Packet (MP Wake-up) it asserts a wake up signal that powers up the computer.

Note: For Wake on LAN, the 5-V standby line for the power supply must be capable of delivering 5V with 5% tolerance at 720mA.

2 Hardware Installation

2.1 Unpacking

The P5F88 mainboard package contains the following:

* P5F88 mainboard
* One IDE 40-pin ribbon cable
* One floppy 34-pin ribbon cable
* One driver/utility diskette
* User's manual

Before removing the mainboard from its anti-static bag, you need to eliminate any static electricity that may be accumulated on your body by touching a grounded or anti-static surface. If nothing is available, touch the housing of the power supply which is plugged into the AC outlet.

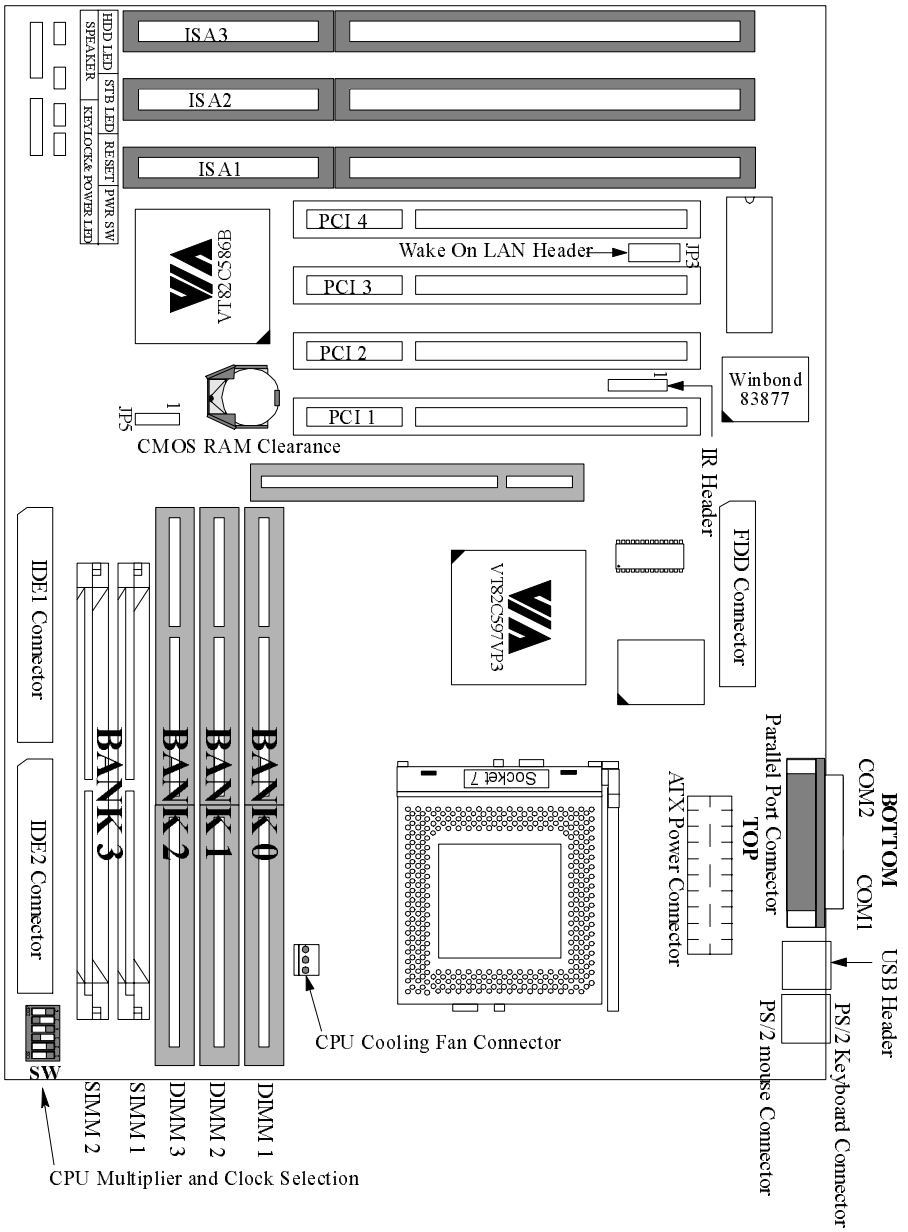
After removing the mainboard from its anti-static bag, place it only on a grounded or anti-static surface, component side up. Inspect the mainboard and call the vendor immediately if it is damaged.

2.2 Installation

The P5F88 is designed to fit into a standard ATX form factor chassis. The pattern of the mounting holes and the position of the keyboard connector meet the ATX system board specification. 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 set DIP switches, attach connectors, install CPU and SIMM/DIMM memory modules.

P5F88 Mainboard DIP Switch and Jumper Location



2.2.1 Setting DIP Switches

This section provides the DIP Switches settings for the P5F88 mainboard.

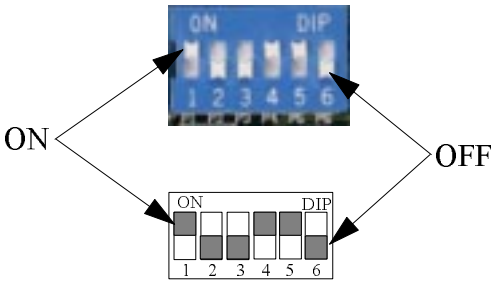
You need to configure DIP Switch to set the
1) CPU core to bus clock multiplier
2) CPU bus clock

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 66MHz and the CPU Core to Bus Multiplier is 3, the actual CPU core clock will be 200MHz.

CPU Bus Clock: The CPU Bus Clock is defined as the CPU input clock. For example: the CPU Bus Clock for Intel Pentium 100, 133 and 166 MHz are 66 MHz.

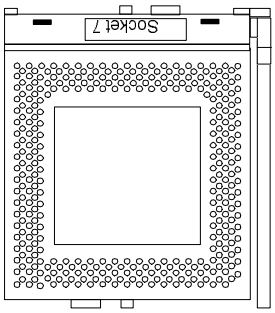
CPU Voltage: There is no hardware or BIOS setting needed for CPU operating voltage. The switching regulator circuit can auto-detect the CPU type on the P5F88 mainboard and generate the proper operating voltage for the CPU.

The following diagram should be used to clarify how DIP switch settings are to be interpreted.



DIP Switch (SW) selects CPU clock

Bus Clock	SW-P4	SW-P5	SW-P6
50MHz	ON	ON	ON
55MHz	ON	ON	OFF
60MHz	ON	OFF	OFF
66MHz(default)	OFF	OFF	OFF
68MHz	OFF	OFF	ON
75MHz	OFF	ON	OFF

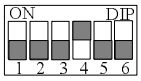
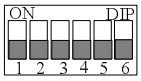
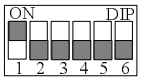
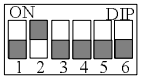
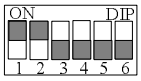
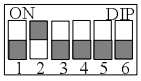
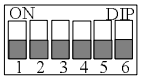


SW

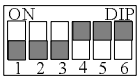
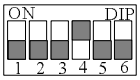
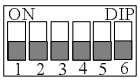
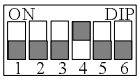
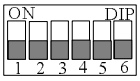
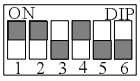
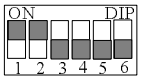
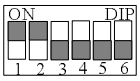
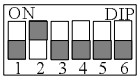
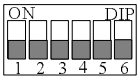
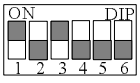
The P5F88 mainboard uses 10 Amp switching regulator design instead of a linear one to improve power efficiency and system reliability. There is no hardware or BIOS setting needed for CPU operating voltage. The "SMART" switching regulator circuit can auto-detect the CPU type on the P5F88 mainboard and generate the proper operating voltage for the CPU. This unique design will prevent the CPU from being damaged by the incorrect voltage.

Note: VIA's Apollo VP3 is specified up to 66MHz system bus clock only, higher frequency is not guaranteed. For Example, Cyrix 6x86MX PR200 66MHz x 2.5 is supported, and 6x86MX PR200/75MHz x 2 is not guaranteed.

intel® Pentium CPU Clock DIP Switch Setting

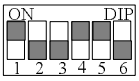
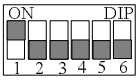
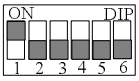
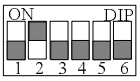
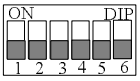
CPU Speed	SW
Pentium -75 50MHz x1.5	
Pentium -90 60MHz x1.5	
Pentium -100 66MHz x 1.5	
Pentium -120 60MHz x 2	
Pentium -133 66MHz x 2	
Pentium -150 60MHx x 2.5	
Pentium -166 66MHz x 2.5	
Pentium - 200 66MHz x 3	
MMX Pentium - 166 66MHz x 2.5	
MMX Pentium - 200 66MHz x 3	
MMX Pentium - 233 66MHz x 3.5	

AMD® CPU Clock DIP Switch Setting

CPU Speed	SW
AMD-K5-PR75 50MHz x 1.5	
AMD-K5-PR90 60MHz x 1.5	
AMD-K5-PR100 66MHz x 1.5	
AMD-K5-PR120 60MHz x 1.5	
AMD-K5-PR133 66MHz x 1.5	
AMD-K5-PR150 60MHz x 1.75	
AMD-K5-PR166 66MHz x 1.75	
AMD-K6/166 66MHz x 2.5	
AMD-K6/200 66MHz x 3	
AMD-K6/233 66MHz x 3.5	
AMD-K6/266 66MHz x 4	
* AMD-K6/300 66MHz x 4.5	

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

Cyrix® IBM® 6x86 CPU Clock DIP Switch Setting

CPU Speed	SW
Cyrix/IBM 6x86L -PR133+ 55MHz x 2	
Cyrix/IBM 6x86L -PR150+ 60MHz x 2	
Cyrix/IBM 6x86L -PR166+ 66MHz x 2	
Cyrix/IBM 6x86MX-PR166 60MHz x 2.5	
Cyrix/IBM 6x86MX-PR166 66MHz x 2	
Cyrix/IBM 6x86MX -PR200 66MHz x 2.5	
* Cyrix/IBM 6x86MX -PR233 66MHz x 3	
* Cyrix/IBM 6x86MX -PR266 66MHz x 4	

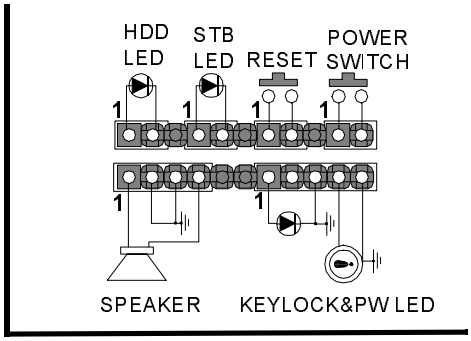
Note:
CPU with * mark is not available yet, DIP switch setting table is for reference only.

Note: VIA's Apollo VP3 is specified up to 66MHz system bus clock only, higher frequency is not guaranteed. For Example, Cyrix 6x86MX PR200 66MHz x 2.5 is supported, and 6x86MX PR200/75MHz x 2 is not guaranteed.

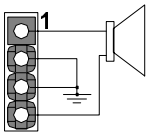
2.2.2 Attaching Connectors

1. Front Panel Connectors

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



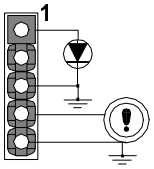
SPEAKER



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

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

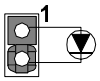
KEYLOCK&PW LED



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 purpose.

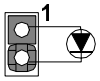
HDD LED Connector



Pin Assignment
1. LED Anode
2. LED Cathode

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

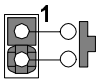
STB LED Connector



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

This 2-pin connector connects to the case-mounted STB LED which indicated the ATX power supply's standby +5V power status.

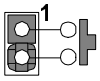
Reset Connector



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

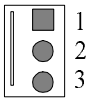


Pin Assignment
1. Power On/Off
2. Ground

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

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 VIA Apollo VP3 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.

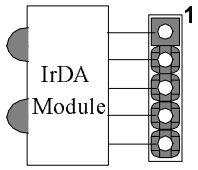
2. Fan Connectors



Pin Assignment
1. GND
2. +12V
3. SPEED / RPM

There is a fan connector on the P5F88 mainboard for the CPU cooling fan. The connector support fans of 500mAMP (6 WATT) or less. When the system goes into sleep state, fan will be shut down to eliminate audible noise and reduce power consumption.

3. IrDA-compliant IR (Infrared) Connector



Pin Assignment
1. +5V
2. N. C.
3. IR Receiver
4. Ground
5. IR Transmitter

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

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

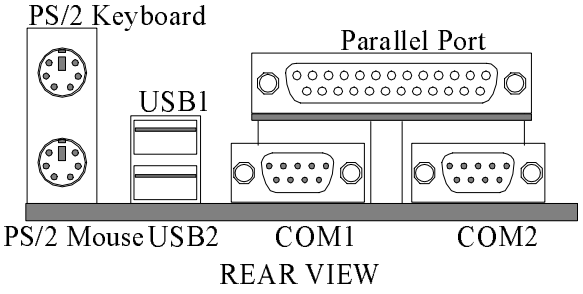
A floppy disk drive ribbon cable has 34 wires and 2 connectors to support 2 floppy disk drives. The connector with twisted wires always connects to drive A, and the connector whit untwisted wires connects to drive B. You must orient the cable connector so that the pin 1(color) edge of the cable is at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

5. IDE Connectors (Two 40-pin Block)

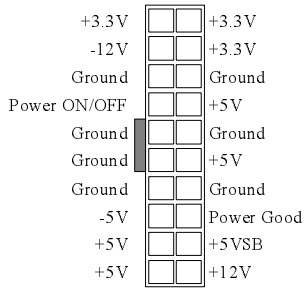
An IDE drive ribbon cable has 40 wires and 2 connectors to support two IDE drives. If a ribbon cable connects to two IDE drives at the same time, one of them has to be configured as Master and the other has to be configured as Slave by setting the drive select jumpers on the drive. Consult the documentation that comes 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.

6. Back Panel Connectors

The back panel provides external access to PS/2 style keyboard and mouse connectors as well as two serial ports, and one parallel port which are integrated on the mainboard. The figure below shows the location of the back panel I/O connectors.



7. Power Supply Connector

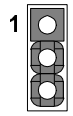


The ATX power supply has a single lead connector with a clip on one side of the plastic housing. There is only one way to plug the lead into the ATX power connector. Press the lead connector down until the clip snaps into place and secures the lead onto the connector.

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.

8. Wake on LAN Connector:

This 3-pin header for remote wake up of the computer through a network.



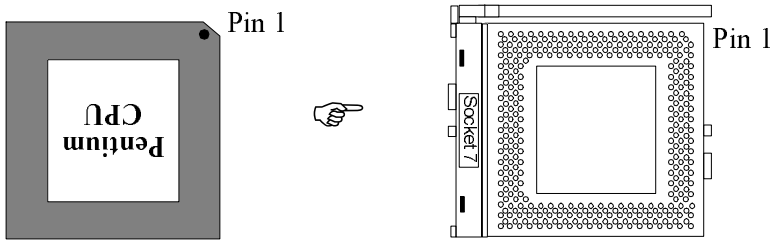
JP3

Pin Assignment
1. +5VSB
2. GND
3. Wake-up signal

2.2.3 Installing CPU

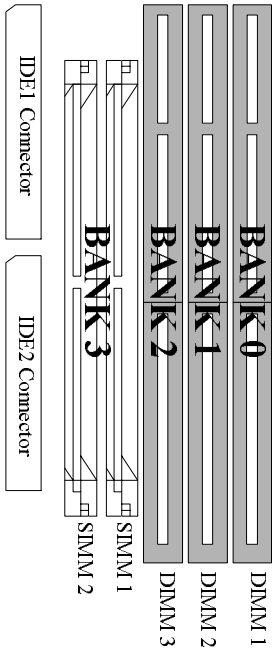
To avoid being damaged by the pressure of CPU insertion, the mainboard must be placed on a flat anti-static surface when the CPU is installed. Do not touch the CPU pins with your fingers during the installation.

1. Push the CPU ZIF socket's lever to the side a little and lift it as far as it can go.
2. Align the CPU with the ZIF Socket 7 so that the pin 1 (with cut corner) of CPU is at the pin 1 of the Socket 7 as shown in the figure below, then insert the CPU into the socket.
3. Press the lever down to snap it into place at the side of socket. You will feel some resistance as the pressure starts to secure the CPU in the socket.
4. Install a heatsink with a cooling fan which are required to protect the CPU from being damaged due to overheating.



CPU SOCKET 7

2.2.4 Installing System Memory



The maximum system memory supported by the VIA Apollo VP3 PCIset is 1GB. If more than 1GB memory are populated on the P5F88 mainboard, the portion of the memory which exceed the 1GB boundary will be invalidated.

The P5F88 Mainboard has two SIMM Sockets and three DIMM Sockets to support up to 1GB of system memory. The three DIMM socket are Bank0, Bank1 and Bank2. The two SIMM sockets (SIMM1 & SIMM2) are Bank3. Two SIMM modules at the same Bank 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.

The P5F88 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”.

Due to the P5F88 Mainboard high speed design, the memory modules for the P5F88 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: 1Mx32, 2Mx32, 4Mx32, 8Mx32, 16Mx32 Double-Sided Symmetric: 2Mx32, 8Mx32, 32Mx32 Asymmetric: 1Mx32, 2Mx32, 4Mx32, 8Mx32, 16Mx32, 32Mx32	Single-sided Asymmetric: 1Mx64, 2Mx64, 4Mx64, 8Mx64, 16Mx64, 64Mx64 Double-Sided Asymmetric: 2Mx64, 4Mx64, 8Mx64, 16Mx64, 32Mx64, 64Mx64
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: same or high than the CPU Bus clock. CAS latency: 3 or faster

Install 72-pin SIMM modules in any combination as follows:

Memory Configuration for 72-Pin SIMM Module installed with no DIMM installed

BANK 3 (SIMM1 & SIMM2)	EDO/FPM 4MB, 8MB, 16MB, 32MB, 64MB, 128MB
Total System Memory	8MB to Max. 256MB

Install 168-pin DIMM modules in any combination as follows:

168-Pin DIMM Modules only Memory Configuration.

BANK 0 (DIMM1)	SDRAM/EDO 8MB, 16MB, 32MB, 64MB, 128MB, 256MB, 512MB
BANK 1 (DIMM2)	SDRAM/EDO 8MB, 16MB, 32MB, 64MB, 128MB, 256MB, 512MB
BANK 2 (DIMM3)	SDRAM/EDO 8MB, 16MB, 32MB, 64MB, 128MB, 256MB, 512MB
Total System Memory	8MB to Max. 1GB

Install 72-pin SIMM and 168-pin DIMM mix memory configuration as follows:

72-Pin SIMM and 168-Pin DIMM Mix Memory Configuration

BANK 0 (DIMM1)	8MB, 16MB 32MB 64MB, 128MB 256MB, 512MB	8MB, 16MB 32MB 64MB, 128MB 256MB, 512MB
BANK 1 (DIMM2)	8MB, 16MB 32MB 64MB, 128MB 256MB, 512MB	8MB, 16MB 32MB 64MB, 128MB 256MB, 512MB
BANK 2 (DIMM3)	Empty	**see *Note at next page**
BANK 3 (SIMM1&2)	4MB, 8MB, 16MB, 32MB, 64MB, 128MB	**see *Note at next page**
Total System Memory	8MB to Max. 1GB	8MB to Max. 1GB

***Note:**
The following restrictions for SIMM/DIMM mixed memory configuration are for users who can distinguish a double-sided (two Row Address Strobes) memory module from a single-sided (one Row Address Strobe) memory module.

1. If Bank 2 (DIMM 3) is populated with double-sided DIMM, Bank 3 (SIMM 1 & 2) is not allowed to have SIMM.
2. If Bank 3 (SIMM 1&2) is populated with double-sided SIMM, Bank 2 (DIMM 3) is not allowed to have DIMM.
4. If Bank 3 (SIMM 1&2) is populated with single-sided SIMM, Bank 2(DIMM 3) is only allowed to have single-sided DIMM.

2.2.5 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 JP5 for 5 seconds
3. Put the shunt back to pin1 and pin2 of JP5
4. Power on the system

3 BIOS Configuration

After hardware configuration of P5F88 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.

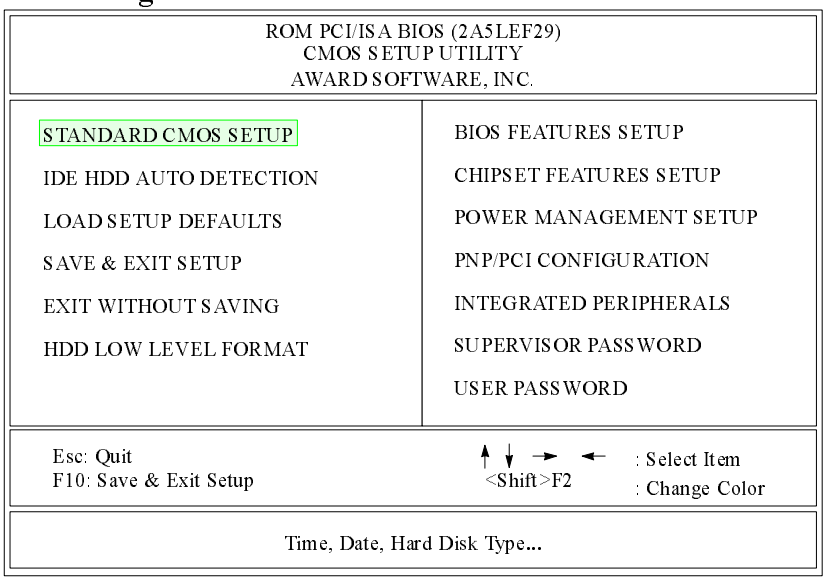
After the POST routines are completed, the following message appears:

"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



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 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 (2A5LEF29)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy): Sun, Mar 23 1997
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
Floppy 3 Mode Support: Disabled

Video: EGA/VGA
Halt On: All Errors

Base Memory: 640K
Extended Memory: 15360K
Other Memory: 384K

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 following 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.

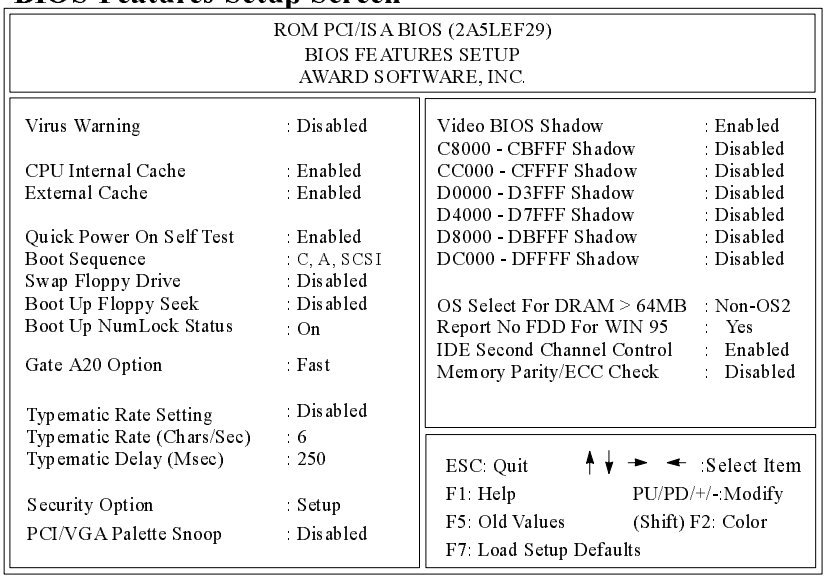
3.8 HDD LOW LEVEL FORMAT

Selecting this option and pressing the <Enter> key will enable you to perform a low level format of the hard disk drive.

3.9 BIOS FEATURES SETUP

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

BIOS Features Setup Screen



The following explains the options for each feature:

Virus Warning: The Virus Warning's default setting is "Disabled". When enabled, any attempt to write to the boot sector or partition table will halt the system and cause a warning message to appear. If this happens, you can use an anti-virus utility on a virus free, bootable floppy diskette to reboot and clean your system.

CPU Internal Cache: Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU.The default setting is "Enabled". This Setting enables the CPU internal cache.

External Cache: The default setting is "Enabled". This setting enables the external 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 option 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.

Swap Floppy Drive: The default setting is "Disabled". 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 "Disabled". If set to "Enabled" during bootup the BIOS will check for an installed floppy disk drive.

Boot Up System Speed: The default setting is "High". When set to "High", the system will bypass unnecessary POST check, and boot up system fast. Another option is "Low" which will go through all the POST check and bring up system slow. This option will not influence on the system performance.

Boot Up Numlock Status: the defaults setting is "On". This setting toggle between On or Off to control the state of the NumLock key when the system boots. When toggled On, the numeric keypad generates numbers instead of controlling cursor operations.

Gate A20 Option: the defaults setting is "Fast". Gate A20 refers to the way the system addresses memory above 1 MB (extended memory). When set to Fast, the system chipset controls Gate A20. When set to Normal, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows. The other option is "Normal".

Typematic Rate Setting: The default setting is "Disabled". When Disabled, the Typematic Rate and Typematic Delay are irrelevant. Keystrokes repeat at a rate determined by the keyboard controller in your system. When Enabled, you can select a 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 "Disabled", 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 "Disabled". 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: Set this option to "Enabled" to request BIOS to report the FDD status to Windows 95.

IDE Second Channel Control: The default setting is "Enabled". This option enables the Secondary PCI IDE controller of the PCI IDE adapter.

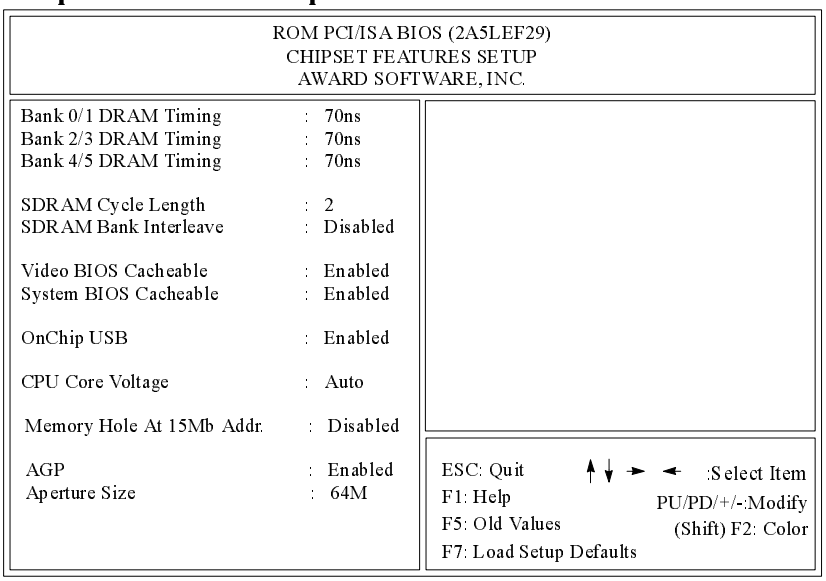
Memory Parity/ECC Check: The default setting is "Disabled". The ECC can be supported only if all the DIMM/SIMM memory modules come with parity bits and this option has to be set to "Enabled"

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

3.10 CHIPSET FEATURES SETUP

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

Chipset Features Setup Screen



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

Bank 0/1, 2/3, 4/5 DRAM Timing: The options are "60ns"(Auto), "70ns(Auto)", "Normal", "Medium", "Fast", and "Turbo". If set to "60ns"" or "70ns", the pre-determined optimal DRAM timing will be set automatically according to the speed of the DRAM and the CPU bus clock.

Options	Column Address to CAS Delay	CAS Write Pulse	CAS Read Pulse	RAS Precharge	RAS Pulse
Turbo	2T	1T	2T/1T	3T	4T
Fast	2T	2T	2T/1T	4T	4T
Medium	2T	2T	3T/2T	4T	5T
Normal	2T	2T	4T/3T	6T	6T

Note: T equals to a clock width period.

SDRAM Cycle Length: This options is used to set the SDRAM CAS latency time. The options are "3" and "2".

SDRAM Bank Interleave: This option is used to enable the VIA VP3 chipset to support Bank Interleave feature for the system memory with 64Mbit SDRAM chips. The options are "2 Bank", "4Bank" and "Disabled" (default).

Video BIOS Cacheable: When set to "Enabled", the Video BIOS will be cached for faster execution. The default setting is "Enabled".

System BIOS Cacheable: When set to "Enabled", the System BIOS will be cached for faster execution. The default setting is "Enabled".

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

CPU Core Voltage: This option is used to set the CPU Core logic voltage. The options are "Auto", "2.1V", "2.8V", "2.9V", "3.2V", "3.3V", and "3.52V". When set to "Auto" the switching regulator circuit can auto-detect the CPU type on the mainboard and generate the proper operating voltage for the CPU Core logic. For AMD K6/ 266MHz or 300MHz CPU, when this option is set to "auto", the CPU core voltage will be set to 2.2V. you must set this option to "2.1V", if a 2.1V version AMD K6/266MHz or K6/300MHz CPU is used in your system. The default setting is "Auto".

Memory Hole at 15Mb Addr: This option is used to reserve area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

AGP: When enabled, the AGP (Accelerated Graphics Port) function is utilized. The options are Enabled (Default) or Disabled.

Aperture Size: This option determines the effective size of the AGP Graphic Aperture which memory-mapped, graphics data structures can reside in.

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

3.11 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 (2A5LEF29)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	:	User Define	IRQ3 (COM2)	:	Disabled
PM Control by APM	:	Yes	IRQ4 (COM1)	:	Disabled
Video Off Method	:	V/H SYNC+Blank	IRQ5 (LPT 2)	:	Disabled
MODEM Use IRQ	:	3	IRQ6 (Floppy Disk)	:	Disabled
Soft-Off by PWRBTN	:	Instant - Off	IRQ7 (LPT 1)	:	Disabled
			IRQ8 (RTC Alarm)	:	Disabled
Doze Mode	:	Disable	IRQ9 (IRQ2 Redir)	:	Disabled
Suspend Mode	:	Disable	IRQ10 (Reserved)	:	Disabled
HDD Down in Suspend	:	Disable	IRQ11 (Reserved)	:	Disabled
** PM Events **			IRQ12 (PS/2 Mouse)	:	Disabled
VGA	:	OFF	IRQ13 (Coprocessor)	:	Disabled
LPT & COM	:	None	IRQ14 (Hard Disk)	:	Disabled
HDD & FDD	:	OFF	IRQ15 (Reserved)	:	Disabled
DMA / master	:	OFF	Mouse Break Suspend	:	Yes
Keyboard Resume	:	Disabled			
Modem Ring Resume	:	Disabled			
RTC Alarm Resume	:	Disabled			

ESC: Quit ↑↓→← :Select Item
F1: Help PU/PD/+/-:Modify
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 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 Widows 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 Method: This setting controls the video off method in power saving mode. The default setting is "DPMS" (Display Power Management System) which allows the BIOS to control the video card if it has the DPMS feature. Other options are "V/H SYNC+Blank" and "Blank Screen". The "V/H SYNC+Blank" option disables V/H SYNC signals and blanks the screen. The "Blank Screen" option is used when you do not have a "Green" monitor.

Modem Use IRQ: To enable the internal PnP modem ring wake up your system from sleep mode, the IRQ assigned to the modem has to the same as the setting in this option. The default setting is "3"

Soft-Off by PWRBTTN: The options are "Instant-Off" and "Delay 4 Sec.". When set to "Instant-Off", pressing the power button will turn off the system power. When set to "Delay 4 Sec.", you have to press the power button and hold it for more than 4 seconds to turn off the system power. Otherwise the system just go to the sleep mode. Note: During the booting process, the power button is ignored. The default setting is "Instant-Off".

Doze Mode: Options are from "30 Sec" 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.

Suspend Mode: Options are from "30 Sec" 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.

HDD Down in Suspend: If set to "Enabled", the HDD will spin down when system is in sleep mode.

PM Event: VGA, LPT&COM, HDD&FDD, DMA/Master: When any above PM event is set to "ON" the occurrence of a corresponding event will prevent the system from entering any power management mode. The options are "OFF", "ON" and "None".

Keyboard Resume: If set to "Enabled", you may press any key of your keyboard to turn on your system power. (Note: you need to use ATX power supply to have this feature on P5F88). The default setting is "Disabled".

Modem Ring Resume: If "Enabled" the system power will be turned on if an FAX/Modem receives an incoming telephone ringing. (Note: you need to use ATX power supply to have this feature on P5F88). The default setting is "Enabled".

RTC Alarm Resume: If "Enabled" you may set the date (day of month), hour, minute and second to turn on your system. When you set "0" (zero) for the day of the month, the alarm will power on your system every day at the time of day specified. (Note: you need to use ATX power supply to have this feature on P5F88)

IRQ3~IRQ15: When a hardware event is "ON", the occurrence of a corresponding event will prevent the system from entering any Power Management mode.

Mouse Break Suspend: The options are "Yes", "No(COM1), "No(COM2) and "No(PS/2). When set to "Yes", the mouse activity can wake up your system from sleep mode. If you do not want the mouse wake up the system due to the sensitivity of the mouse, set this option to "No(COM1" or "No(COM2" depending on which COM port is connected to your serial mouse, set to "No(PS/2)" if you use a PS/2 mouse.

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

3.12 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:

ROM PCI/ISA BIOS (2A5LEF29)
PNP / PCI CONFIGURATION
AWARD SOFTWARE, INC.

PNP OS Installed	: No	CPU to PCI Write Buffer	: Enabled
Resources Controlled By	: Manual	PCI Dynamic Bursting	: Enabled
Reset Configuration Data	: Disabled	PCI Master 0 WS Write	: Enabled
		PCI Master Read Prefetch	: Enabled
IRQ-3 assigned to	: Legacy ISA	PCI Delay Transaction	: Enabled
IRQ-4 assigned to	: Legacy ISA	PCI #2 Access #1 Retry	: Disabled
IRQ-5 assigned to	: PCI / ISA PnP	AGP Master 1 WS Write	: Enabled
IRQ-7 assigned to	: Legacy ISA	AGP Master 1 WS Read	: Disabled
IRQ-9 assigned to	: PCI / ISA PnP	Assign IRQ For USB	: Enabled
IRQ-10 assigned to	: PCI / ISA PnP		
IRQ-11 assigned to	: PCI / ISA PnP	PCI IRQ Actived By	: Level
IRQ-12 assigned to	: PCI / ISA PnP	PCI IDE IRQ Map To	: PCI - AUTO
IRQ-14 assigned to	: Legacy ISA	Primary IDE INT#	: A
IRQ-15 assigned to	: Legacy ISA	Secondary IDE INT#	: B
DMA-0 assigned to	: PCI / ISA PnP		
DMA-1 assigned to	: PCI / ISA PnP		
DMA-3 assigned to	: PCI / ISA PnP		
DMA-5 assigned to	: PCI / ISA PnP		
DMA-6 assigned to	: PCI / ISA PnP		
DMA-7 assigned to	: PCI / ISA PnP		

ESC: Quit ↑↓→← :Select Item
F1: Help PU/PD/+/-:Modify
F5: Old Values (Shift) F2: Color
F7: Load Setup Defaults

PNP OS Installed: Set this option to "Yes", to allow 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 "Auto" which will detect the system resources and automatically assign the relative IRQs and DMAs for each peripheral. The other option is "Manual" which allows you to control IRQs and DMAs individually.

Reset Configuration Data: The system BIOS supports the Plug and Play feature so the resource assigned to each peripheral has to be recorded to prevent resources 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 "Disabled" 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 auto set this option to "Disabled".

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.

CPU to PCI Write Buffer: When set to "enabled" up to four double words of data can be written to the PCI bus without interrupting the CPU. When set to "Disabled", a write buffer is not used and the CPU read cycle will not be completed until the PCI bus signals that it is ready to receive the data.

PCI Dynamic Bursting: When enabled, the PCI controller allows bursting PCI transfer if the consecutive PCI cycles come with the address falling in the same 1KB space. The options are Enabled or Disabled (Default).

PCI Master 0 WS Write: When enabled, the system will allows a zero-wait-state cycle delay when the PCI master drive writes data to DRAM. The options are Enabled or Disabled (Default).

PCI Master Read Prefetch: When enabled, the memory controller will prefetch data from DRAM if the PCI bus master reads data from DRAM. The options are Enabled (Default) or Disabled.

PCI Delay Transaction: When set to "Disable" will add one wait state to PCI bus master write cycle. The default setting is "Enabled".

PCI #2 Access #1 Retry: When enabled, PCI#2 Access#1 attempt will try again. The options are Enabled or Disabled (Default)

AGP Master 1WS Write: When enabled, the system allows a one-wait-state TRDY# response if PCI bus master writes data to target. The options are enabled or Disabled (Default).

AGP Master 1WS Read: When enabled, the system allows a one-wait-state TRDY# response if PCI bus master reads data to target. The options are enabled or Disabled (Default).

Assign IRQ For USB: When enabled, system will assign IRQ11(Interrupt request line) to the USB device. When disabled, IRQ11 can be use for the other device which need IRQ. The default setting is "Enabled"

PCI IRQ Actived By: This option is used to set the method by which the PCI bus recognizes that an IRQ service is being requested by a device. The options are "Level(default)" or "Edge".

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 an 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 or PCI-SLOT 3) depending on which slot the PCI IDE Card is installed.

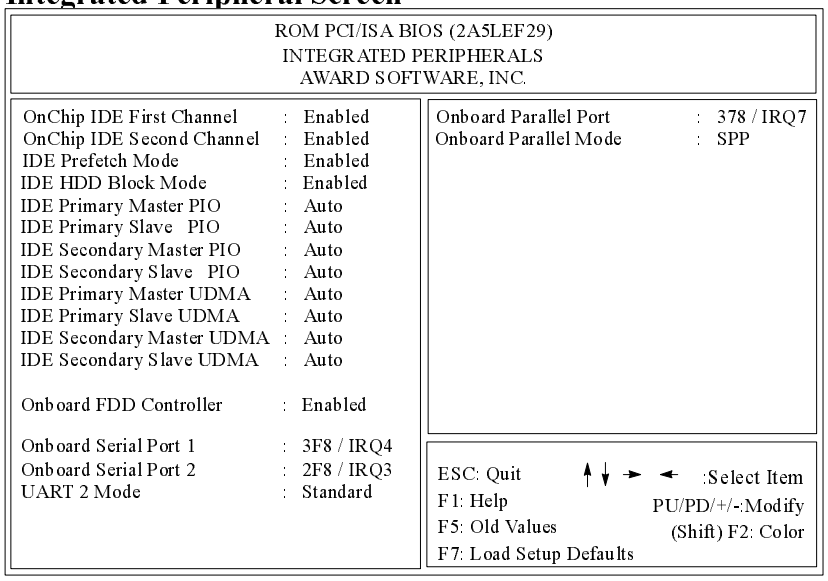
Only INT A and INT B are available for a PCI IDE Card, therefore you must set the PCI IDE Card's primary interrupt to INT A and secondary interrupt to INT B. The INT A is routed to IRQ 14 and the INT B is routed to IRQ 15 thru a hardware router in the chipset.

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

3.13 INTEGRATED PERIPHERALS

Selecting "INTEGRATED PERIPHERIALS" on the main program screen displays this menu

Integrated Peripheral Screen



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

IDE Prefetch Mode: IDE prefetch buffer can allow chipset to prefetch IDE data in advanced and enhance IDE data transfer rate. The options are "Disabled" and "Enabled(default)".

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.

IDE Primary Master PIO, IDE Primary Slave PIO, IDE Secondary Master PIO, IDE Secondary Slave PIO: There are six options "Auto", "Mode 0", "Mode 1", "Mode 2", "Mode 3" and "Mode 4". The default setting is "Auto". When set to "Auto" the BIOS will automatically set the 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 Primary Master UDMA, IDE Primary Slave UDMA, IDE Secondary Master UDMA, IDE Secondary Slave UDMA: The options are "Auto" (default) and "Disabled". When set to "Auto" the BIOS will automatically load Ultra DMA 33 driver to match the transfer rate of IDE hard disk drive which supports Ultra DMA 33 mode. The default setting is "Auto".

Onboard FDD Controller: The default setting is "Enabled". This option enables the onboard FDD controller.

Onboard Serial Port 1 and Onboard Serial Port 2: These options are used to assign the I/O addresses for the 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)

UART 2 Mode: The options are "Standard" (default), "AKSIR" and "HPSIR". 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 UART2 mode setting depending on which type of infrared module is used in the system. When set to "AKSIR" or "HPSIR", the UART 2 is used to support the infrared module connected on the mainboard. If this option is not set to "Standard", a device connected to the COM2 port, will no longer work.

IR Function Duplex: The options are "Half" and "Full(default)". This setting set "Half-Duplex" or "Full-Duplex" for your infrared module. The duplex setting has to be correspond to the infrared module that use in the system. When "Full-Duplex" module is used, you can transmit and receive data at the same time.

RxD, TxD Active: The options are "Hi, Hi" (default), "Hi, Lo", "Lo, Hi" and "Lo, Lo". It will define voltage level for you Infrared module RxD (receive) mode and TxD (transmit) mode. This setting has to be correspond to the infrared module that use in the system.

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/IRQ7", "3BC/IRQ7" and "Disabled" (disable the onboard parallel port). Note: Printer port always use IRQ7 when set "378/IRQ7" or "278/IRQ7" or "3BC/IRQ7" to "Enabled".

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

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

If you make any changes to the onboard FDD controller, serial ports or parallel port in this setup, save the change and turn off the system. After turning the system on again the change will be effective.

3.14 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 JP5 to short pin 2 and pin 3 for 5 seconds, then putting the shunt back to pin1 and pin2 of JP5.

4 Driver and Utility

4.1 Flash Utility

The BIOS of the P5F88 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 disk 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..." 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 VIA Apollo VP3 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. The driver must be loaded in order to make the EIDE drive operating at bus-mastering DMA or Ultra DMA33 mode.

1) Bus Mastering files:
There are two files in the BMIDE directory: 580_213.EXE and README.TXT

580_213.EXE	A self-extracting archive file for drivers

README.TXT A text file of instructions

Execute the 580_213.EXE to extract files for Windows 95 and Windows NT.

2) Driver Installation

Click the SETUP.EXE program and select "Install" button then it will install the "VIA IDE Bus Master Driver" automatically on your Windows 95 system.

3) Enable/Disable DMA

The default setting is the PIO mode for the safety. You should turn on the DMA settings by using the "Enable/Disable DMA" button after the "VIA IDE Bus Master Driver" is installed if your hard disks or CD-ROM are DMA capable.

4) Driver Un-installation

You could remove the "VIA IDE Bus Master Driver" by selecting the "Un-install" button. The instructions for un-installing VIA Bus Master IDE driver are listed below:

1. Run setup then select un-install and click Next.
2. Click Finish when "Yes, I want to restart my computer now" appears. Then Window 95 will restart and build default driver information database.
3. Click Next after the update device driver wizard appears.
4. Click Finish for Standard Dual IDE controller.
5. Click "No" for primary IDE Controller (single fifo).
6. Click "Yes" for Secondary IDE Controller (single fifo).Windows 95 will automatically restart.

After the booting the Microsoft default driver will be selected.

5) Package Version Identify

You could check this distribution version by using the DATE\TIME displayed by using dir/p command, e.g:

SETUP EXE 59,392 09-12-97 2:13a SETUP.EXE

The time column is 2:03a which means the package distribution version is 2.1.3 and is released on the Sep.12.

4.3 ACPI Utility

The ACPI.exe patch file is provided by VIA and fixes all versions of Win 95. This patch file adds files to Windows. These files allow Windows to correctly identify and configure the PCI Bridge device for a VIA chipset motherboard. There is a "README.TXT" file after extract ACPI.exe. You can follow the instructions at the readme.txt to install ACPI utility. Please follow these steps to install and configure the ACPI PCI Bridge patch file.

1. Click on the "Start" button on the desktop.
2. Select "Settings" then "Control panel".
3. Open the "System" icon.
4. You should now be in the "System properties" window, click on the "Device manager" tab.
5. Open the "Other devices" listing.
6. If you do not see an "Other devices" listing you do not need to continue with this installation.
7. If you do not see a "PCI Bridge" device listed you do not need to continue with this installation.
8. Close all of the windows on the desktop and any programs that are currently running.
9. Click on the "Start" button on the desktop.
10. Select "Run".
11. Browse for the setup.exe file that extracted from the Acpi.exe file when you executed the Acpi.exe file.
12. Click on the "OK" button to run the setup.exe file.
13. Use the utility to install the "VIA ACPI patch" and restart your computer.
14. When your computer has returned to the desktop, click on the "Start" button.
15. Select "Settings" then "Control panel".
16. Open the "System" icon.
17. You should now be in the "System properties" window, click on the "Device manager" tab.
18. Open the "Other devices" listing.
19. Open the "PCI Bridge" listing.
20. Click on the "Driver" tab.
21. Click on the "Update driver" or "Change driver" button.
22. Click on "No, select driver from list" or "other devices".
23. Click on the "Next" or "OK" button.
24. Click to choose the "Show compatible hardware" or "Show compatible devices" option.
25. Click on the "VIA Power management controller".
26. Click on the "Finish" or "OK" button.
27. Click on the "Close" or "OK" button.
28. Click on the "OK" button.

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http://www.freetech.com/