

P6F91BX Quick Reference

intel[®] Pentium II Soft-Menu Settings

- 1) Turn the system on, then press key to access the AWARD BIOS SETUP program. A "CMOS SETUP UTILITY" will display on the screen. Select "LOAD SETUP DEFAULTS" and type "Y" to load BIOS optimal setup.
- 2) After the BIOS optimal setting is set, at the top right hand side of the "Chipset Feature Setup" screen, there is a "CPU Speed" options. Refer to the table below and select the correct CPU speed.
- 3) Select "STANDARD CMOS SETUP" to set the Date /Time, Floppy drive type, and set Hard Disk Type to "Auto".
- 4) Select "SAVE & EXIT SETUP" and press the <Enter> key to save the setting information in the CMOS memory and continue with the booting process.

CPU Bus Clock=100MHz:

CPU SPEED	Soft-Menu Setting	
350MHz	100MHz	3.5
400MHz	100MHz	4.0
450MHz	100MHz	4.5
500MHz	100MHz	5.0

CPU Bus Clock=66MHz:

CPU SPEED	Soft-Menu Setting	
233MHz	66.6MHz	3.5
266MHz	66.6MHz	4.0
300MHz	66.6MHz	4.5
333MHz	66.6MHz	5.0

NOTE:

Some higher frequency CPUs are not available yet, the clock setting for those CPUs are for reference only.



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1 Introduction

1.1 Overview

The P6F91BX is a high quality, high performance, function enhanced mainboard, based on the powerful Intel Pentium II processor operating at 233, 266, 300, 350, 400, 450, 500MHz *. This mainboard is designed around the latest and fastest Intel 82440BX chipset in a standard ATX form factor. The Soft-menu (jumperless) design of the P6F91BX uses the onboard BIOS for clock frequency, and CPU multiplier, jumper settings are no longer needed.

The P6F91BX 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 EDO (Extended Data Out) and SDRAM (Synchronous DRAM) memory. When this high data stream bandwidth mainboard is equipped with a powerful 64-bit Pentium II processor with MMX technology and with a CPU built-in 512KB level 2 cache, 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.

The P6F91BX mainboard achieves the highest reliability by supporting the ECC (Error Checking and Correction) memory protection. This enables the P6F91BX mainboard to achieve superior data integrity and fault-tolerance, in respect to memory errors while running applications.

The P6F91BX 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 EPP/ECP capable bidirectional parallel port connector, an IrDA compatible infrared port, dual USB (Universal Serial Bus) connector, and a PS/2 keyboard connector and a PS/2 mouse connector. One AGP slot, four PCI local bus slots and three ISA bus slots provide expandability for add on peripheral cards.

* Some higher frequency CPUs are not available yet, the clock setting for those CPUs are for reference only.

The P6F91BX mainboard is OnNow PC, Managed PC, ACPI and PC98 compliant. It also offers optimized system performance, integrated power management, system manageability and Creative SoundBlaster Link.

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.

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

Creative SoundBlaster (SB-Link): This 2x3 5 pin header enables the migration of Creative Soundblaster DOS program compatibility to the PCI bus. Some DOS programs require the use of signals which were previously only available to an ISA bus card. These signals have now been made available to a PCI bus card which may require them, through the use of this header.

In addition to superior hardware capabilities, features like bus mastering EIDE driver, Plug and Play, Soft-off, APM (Advanced Power Management), Keyboard Turn On, External Modem Ring On, Wake On LAN (WOL), Watchdog timer wake up, Sleeping state indicator, fan off in sleeping state and BIOS upgradability are provided on the P6F91BX platform.

1.2 P6F91BX Specifications/Features

Hardware

CPU	Supports Intel Pentium II 233, 266, 300 and 333MHz Supports Intel Pentium II 350, 400, 450 and 500MHz. *
VRM	Voltage Regulator Module on board Provides 1.8V to 3.5V operating voltage
Coprocessor	CPU built-in floating point unit
Speed	System bus clock 66/68/75/100/103/112 MHz AGP clock 66/68/75 MHz PCI bus clock 33/34/37 MHz ISA bus clock 8.33~9.35 MHz
Chipset	Intel's 82440BX AGPset Winbond's W83977 I/O chip Winbond's W83781D PC Environment Monitor chip
L2 Cache	CPU built-in or none cache
DRAM	3 x 168-pin DIMM sockets Supports 8MB to 384MB memory Supports 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
Enhanced I/O	One floppy disk controller One Standard/EPP/ECP parallel port connector Two 16550 compatible serial port connectors One IrDA compatible Infrared port Two USB (Universal Serial Bus) connectors
Mouse/Keyboard	PS/2 mouse connector PS/2 keyboard connector

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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 Keyboard Power - On by External Modem Ring Power - On by Alarm Power - On by Wake On LAN (WOL) Sleep state indicator Fan off in sleep mode
System Management	Winbond W83781D PC Environment Monitor CPU temperature warning and System temperature detection CPU and System voltage detection CPU and Secondary FAN RPM detection
Voltage Regulator	Switching regulator CPU voltage auto-detection
Form Factor	ATX Form Factor, 19cm x 30.5cm (7.5"x 12.0")

Software

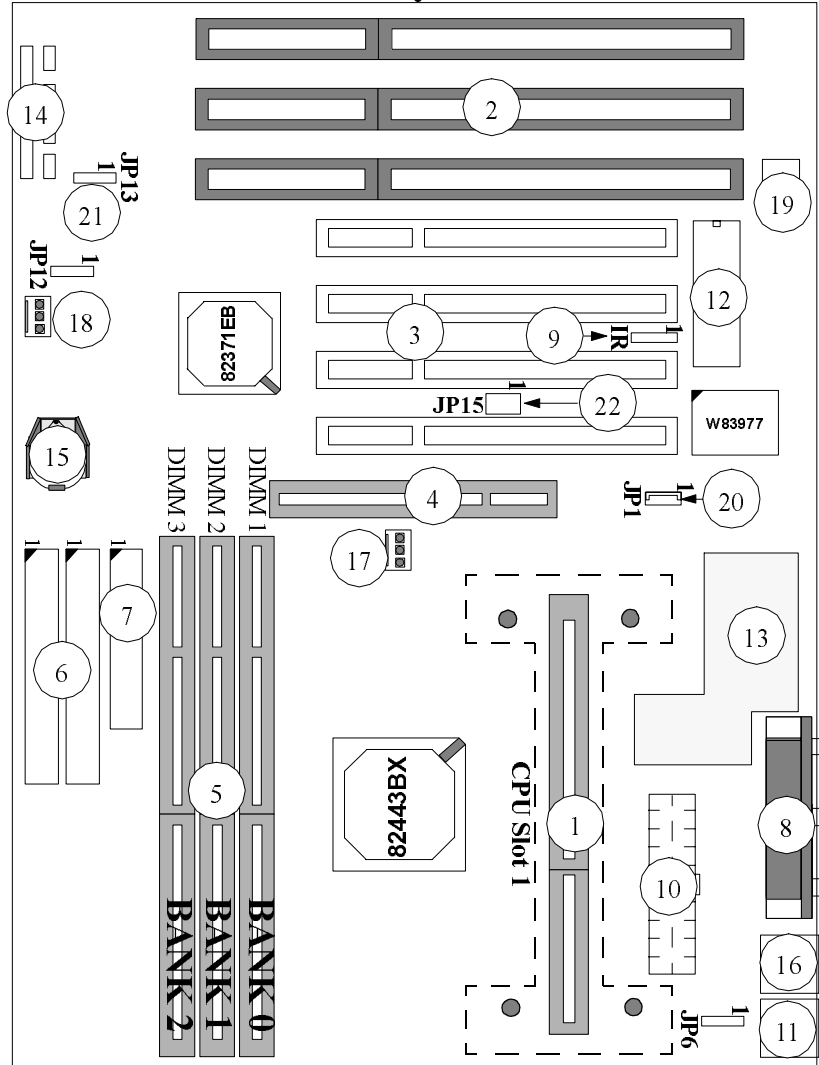
BIOS	Soft-Menu (Jumperless) design AWARD Pentium II AGP/PCI BIOS Flash BIOS with ESCD (Extended System Configuration Data) block Supports APM, PnP, Multi-Boot, DMI and EIDE devices Supports High-Capacity LS-120 and ZIP Removable Media Drive
Driver	IDE Bus mastering Ultra DMA driver
Utility	Flash utility for BIOS upgrade System Environment Monitoring Utility

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 4.2

Environment

Ambient Temperature	0°C to 50°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 P6F91BX Mainboard Layout



- | | | |
|--------------------------------|---|---------------------------------|
| 1: CPU Slot 1 | 9: IR Port Header | 16: Dual USB Connector |
| 2: ISA Expansion Slots | 10: ATX Power Connector | 17: CPU FAN Connector |
| 3: PCI Expansion Slots | 11: PS/2 Mouse Connector (T)
PS/2 Keyboard Connector (B) | 18: Secondary FAN Connector |
| 4: AGP Slot | 12: Flash BIOS | 19: System Monitor W83781D |
| 5: DIMM Module Sockets | 13: Switching Regulator | 20: Wake On LAN Header |
| 6: IDE Connectors | 14: Front panel Connectors | 21: Auto Power On (JP13) |
| 7: Floppy Drive Connector | 15: Battery (CR2032 Lithium) | 22: Creative Lab SB-Link (JP15) |
| 8: Parallel Port Connector (T) | | |
| Serial Port Connectors (B) | | |

1.4 Microprocessor

The P6F91BX mainboard is designed to operate with the Intel Pentium II processor that runs at 233, 266, 300, 333, 350, 400, 450 and 500MHz. An on board switching voltage regulator provides the required 1.8 to 3.5 volts for the processor. The Pentium II processor will send 5 VID (Voltage Identification) signals to the switching voltage regulator, and the switching regulator will generate the correct voltage for the processor.

The Pentium II processor implements MMX technology and maintains full backward compatibility with the 486 and Pentium processors. The processor's numeric coprocessor significantly increases the speed of floating-point operations.

1.5 Pentium II Packaging

The Pentium II is packaged in an S.E.C. (Single Edge Connector) cartridge. The S.E.C. cartridge includes the processor core, the second-level cache, a thermal plate, and a back cover. The Pentium II connects to the P6F91BX mainboard through the Slot 1 processor connector, a 242-pin edge connector. When the Pentium II is installed in Slot 1, it is secured by a retention mechanism attached to the mainboard. The Pentium II heatsink is stabilized by a heatsink support, which is attached to the mainboard.

1.6 Chipset

The Intel 82440BX AGPset consists of one 82443BX (PAC) System Controller, and one 82371EB (PIIX4E) PCI ISA/IDE Accelerator.

82443BX (PAC):

- CPU interface controller
- AGP Interface controller
- Integrated DRAM controller
- Fully synchronous PCI 2.1 bus interface
- 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

82371EB (PIIX4E):	<ul style="list-style-type: none">- Interface between the PCI and ISA buses- 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
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1.7 Main Memory

The P6F91BX mainboard provides three 168-pin DIMM sockets to support 64-bit or 72-bit (64-bit memory data plus 8-bit ECC) DRAM array. The total memory size can support from 8MB to 384MB. The sockets support 1M x 64 (8MB), 2M x 64 (16MB), 4M x 64 (32MB), 8M x 64 (64MB) and 16Mx64(128MB) DIMM in single or double-sided modules.

The P6F91BX supports two types of DRAMs, Extended Data Out (EDO) and Synchronous DRAM (SDRAM). Memory Timing requires 60ns or faster for EDO, and SDRAM speed grade needs to match CPU bus clock speed. For example, if the Intel Pentium II 350, 400, 450, 500MHz CPU bus clock is 100MHz, then speed grade for SDRAM is 100MHz. Intel Pentium II 233, 266, 300, 333MHz CPU bus clock is 66.6MHz, then speed grade for SDRAM is 66.6MHz. Each DIMM belongs to different banks, each bank can have different size or speed of memory. **SDRAM and EDO DIMMs can not be mixed within the memory array.** There are no jumper settings required for the memory size and type, which are automatically detected by the BIOS.

The P6F91BX mainboard achieves the highest reliability by supporting the ECC (Error Checking and Correction) memory protection (SDRAM only). 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 SDRAM DIMM memory modules come with parity bits.**

1.8 Accelerated Graphics Port (AGP) Slot

The P6F91BX mainboard is equipped with an Accelerated Graphic Port slot which is compliant to the AGP specification. The AGP runs at 66.6MHz clock and supports both 1x and 2x mode for 66.6MHz and 133MHz 3.3V devices. The data transfer rate on the AGP bus may 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	ISA Clock
100MHz	66MHz	33MHz	8.3MHz
103MHz	68.6MHz	34MHz	8.5MHz
112MHz	74.7MHz	37.5MHz	9.4MHz
66MHz	66MHz	33MHz	8.3MHz
68MHz	68MHz	34MHz	8.5MHz
75MHz	75MHz	37.5MHz	9.4MHz

1.9 Enhanced IDE Support

The P6F91BX 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 Intel 82440BX 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, 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

PS/2 keyboard, PS/2 mouse, and USB connectors are located on the back panel of the P6F91BX mainboard. The 5V line to the PS/2 Keyboard and PS/2 Mouse connectors are protected with a PolySwitch circuit that acts like a rehealing fuse which will re-establishing the connection after an over-current condition is removed. While this device eliminates the possibility of replacing the fuse, you will still need to turn off the system power before connecting or disconnecting a keyboard or a mouse.

The P6F91BX mainboard has a dual USB 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 12Mbps/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. P6F91BX 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 JP12 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 Intel 440BX AGPset 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 P6F91BX 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 external modem ring in or a watchdog timer (Alarm)*
System could be powered on by phone ring, or by software that has requested the PC to wake up at a preset time.

- *Suspend mode indicator*

The power LED becomes dim when system is in suspend mode.

- *Fan off in suspend mode*

The CPU cooling fan will be turned off when the system is in suspend mode.

1.14 System Power On/Off Control

System power can be turned on by a power button, an external modem ring, an alarm, or a PS/2 Keyboard. To enable the “modem ring on” feature, the option “Power-On by Ring” in the BIOS Power Management Setup has to be set to “Enabled”. To enable the “alarm on” feature, the option “Power -On by Alarm” in the BIOS Power Management Setup has to be set to “Enabled”. To enable the “Power - On by PS/2 Keyboard” feature, you need to short JP6 2-3 and set “Power On Function” in the BIOS Integrated Peripherals Setup accordingly.

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”, pressing 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.

The P6F91BX Auto Power On feature gives you the option to turn on the system power automatically after the AC power comes back, which is especially useful for the server application. To enable this feature, you need to shunt JP13 to 1-2. The default for JP13 is 2-3.

1.15 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 82440BX AGPset and related circuits stay in the lowest 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 and secondary fan are turned off (Note: in order to turn off the fan in sleep mode, you need to connect the CPU cooling fan or Chassis fan to the on-board fan power connectors marked FAN1 or FAN2).

1.16 System Manageability

The System Management Chip (Winbond W83781D) with software, allows user to monitor system environment such as system and CPU fan speed (requires fan with tachometer output), CPU warning temperature, system temperature and system operating voltages.

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 of the power supply must be capable of delivering 5V with 5% tolerance at 720mA.

2 Hardware Installation

2.1 Unpacking

The P6F91BX mainboard package contains the following:

- ☑ P6F91BX mainboard
- ☑ One IDE 40-pin ribbon cable
- ☑ One floppy 34-pin ribbon cable
- ☑ Driver and Utility diskettes
- ☑ User's manual
- ☑ CPU retention mechanism

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.

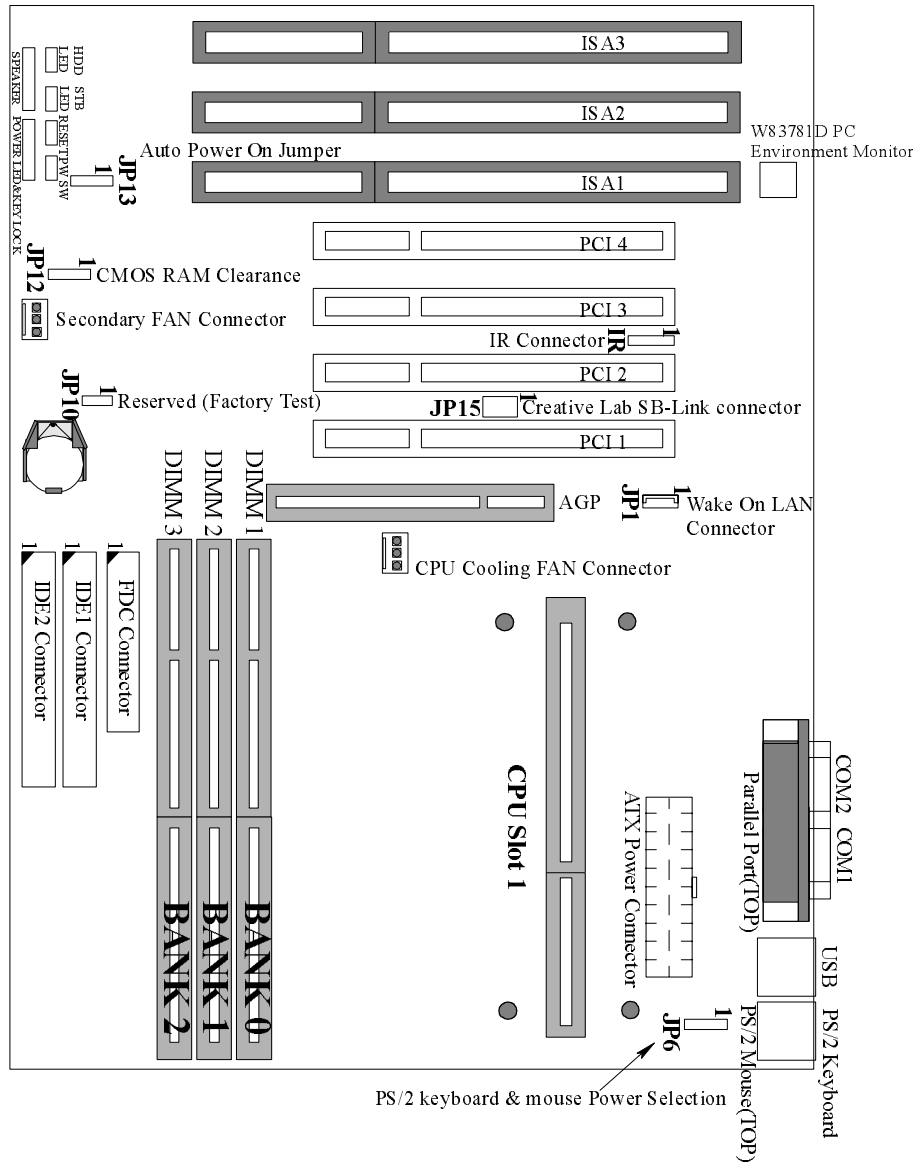
After removing the mainboard from its anti-static bag, place it only on a grounded or anti-static surface, component side up. Inspect the mainboard and call the vendor immediately if it is damaged.

2.2 Installation

The P6F91BX is designed to fit into a standard ATX form factor chassis. The pattern of the mounting holes and the position of the back panel connectors meet the ATX 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.

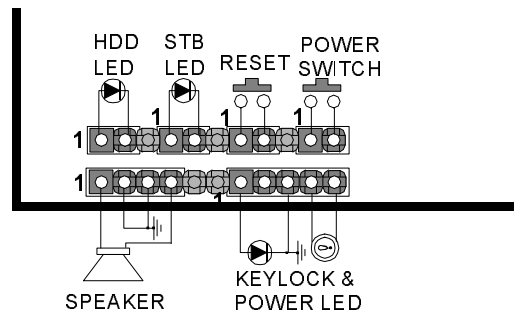
P6F91BX Mainboard Connector/Jumper Location



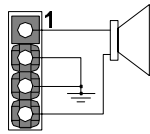
2.2.1 Attaching Connectors

1. Front Panel Connectors

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



SPEAKER

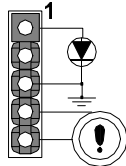


Pin Assignment

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

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

KEYLOCK & Power 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 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.

STB 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.

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



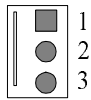
Pin Assignment

1. Power On/Off
2. Ground

This 2-pin connector connects to the case-mounted Power 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 Intel 82440BX 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

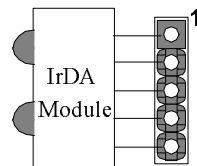


Pin Assignment

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

There are two fan connectors on the P6F91BX mainboard for the 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 and the fan must come with a tachometer output.

3. IrDA-compliant IR (Infrared) Connector



Pin Assignment

1. +5V
2. IRM_IRR
3. IR Receiver
4. Ground
5. IR Transmitter

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

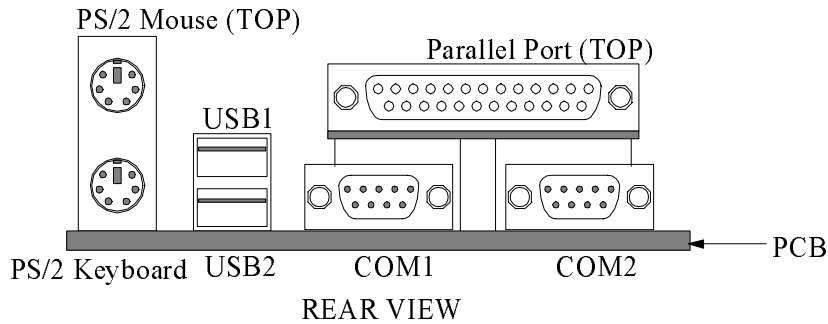
5. IDE Connectors (Two 40-pin Block)

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.

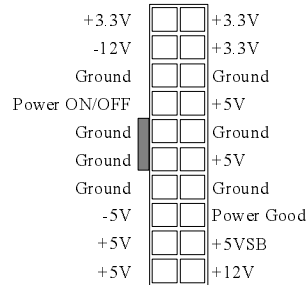
Consult the documentation that came with your IDE drive for details on jumper locations and settings. You must orient the cable connector so that the pin 1 (color) edge of the cable is at the pin 1 of the I/O port connector.

6. Back Panel Connectors

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



7. Power Supply Connector

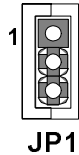


The ATX power supply has a single lead connector with a clip on one side of the plastic housing. There is only one way to plug the lead into the ATX power connector. Press the lead connector down until the clip snaps into place and secures the lead onto the connector.

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:

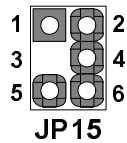
This 3-pin header is used for remote wake up of the computer through a network.



- Pin Assignment
- 1. +5V_{SB}
 - 2. GND
 - 3. Wake-up signal

9. Creative Lab SB (Sideband)-Link Connector:

This 2x3 ways, straight-3 header is used for Creative Lab PCI sound card (Ex. AWE64D PCI Audio Wave Table Card). In order to migrate the legacy Sound Blaster compatible audio to the PCI bus, the following signals have to be delivered to the PCI audio card through a flat cable.



- Pin Assignment
- 1. PCI_Grant
 - 2. GND
 - 3. N.C.(Key Pin)
 - 4. PCI_Request
 - 5. GND
 - 6. SER_IRQ

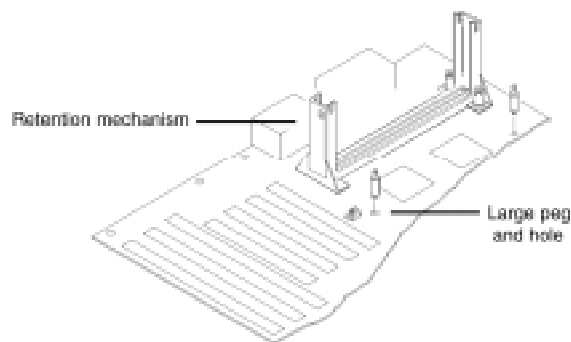
2.2.2 Installing CPU

Before You Begin

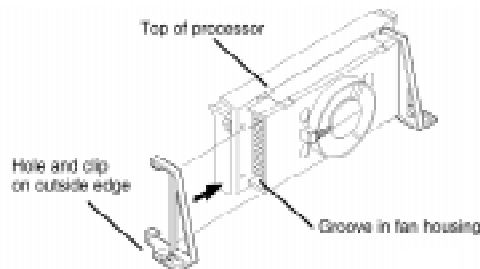
1. Be sure that your Intel boxed processor kit includes the following items:
 - the processor with the fan or heatsink attached
 - one heatsink support set containing two black plastic pegs and two black plastic supports.
 - one power cable (for CPU with cooling fan attached only)
 - one Intel Inside ® Pentium II processor program label
2. Place the motherboard on a workbench (not in a chassis). Be sure that the motherboard is bare (that is, no DIMMs, cables, or cards are installed) and that the holes for the fan or heatsink support pegs are empty.
3. Install the retention mechanism onto the motherboard by following the manufacturer's instructions. (Shown installed in the following figure.)

Installing the Boxed Processor

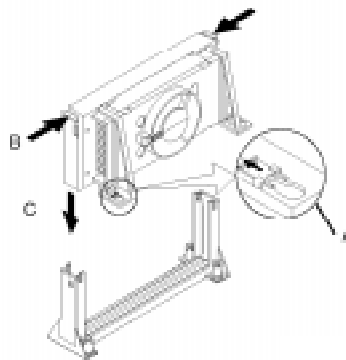
1. Mount the two black plastic pegs onto the motherboard. These pegs will be used to attach the fan or heatsink supports. Notice that one hole and the base of one peg are larger than the other hole and peg base. Push each peg into its hole firmly until you hear it “click” into place.



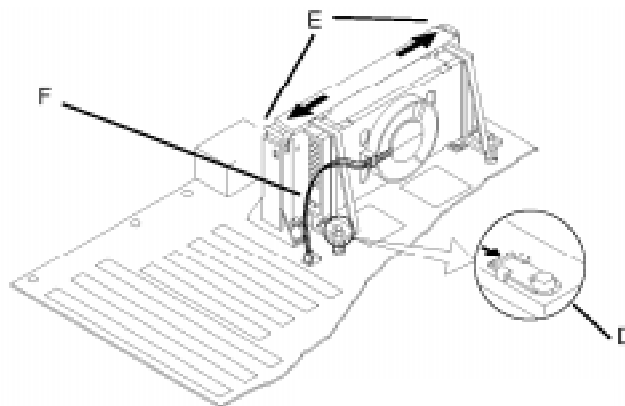
- Slide a black plastic support onto each end of the fan or heatsink, making sure that the hole and clip are on the outside edge of the support. (If supports are reversed, the holes will not line up with the pegs on the motherboard.) Slide each support toward the center of the processor until the support is seated in the outside groove of the fan housing.



- Slide the clip (A) on each support toward the processor, exposing the hole that will fit over the peg on the motherboard. Push the latches (B) on the processor toward the center of the processor until they click into place. (Refer to the figure below.)
- Hold the processor so that the fan shroud is facing toward the pegs on the motherboard. Slide the processor (C) into the retention mechanism and slide the supports onto the pegs. Ensure that the pegs on the motherboard slide into the holes in the heatsink support and that the alignment notch in the processor fits over the plug in Slot 1. Push the processor down firmly, with even pressure on both sides of the top, until it is seated.



5. Slide the clips on the supports (D) forward until they click into places to hold the pegs securely. (Apply slight pressure on the peg and push the peg toward the clip while pushing the clip forward.) Push the latches on the processor (E) outward until they click into place in the retention mechanism. The latches must be secured for proper electrical connection of the processor.
6. Attach the small end of the power cable (F) to the three-pin connector on the processor, then attach the large end to the three-pin connector on the motherboard, which is marked FAN1.



2.2.3 Removing the Processor

First, remove the motherboard from the chassis. To remove the processor from the motherboard, follow these steps (the reverse of the installation procedure).

1. Disconnect the fan power cable from the motherboard. (We recommend that you leave the cable connected to the processor.)
2. Slide the clips on the supports backward to release the pegs in the motherboard. Push the latches on the processor toward the center of the processor until they click into place.
3. Lift one end of the processor until it is freed from Slot 1. Lift the other end of the processor until it is freed from Slot 1. Lift the entire processor (with the fan or heatsink supports attached) until it is free from the retention mechanism.
4. Remove the heatsink support pegs from the motherboard and discard them. With one hand, squeeze together the two halves of the peg on the bottom side of the motherboard. With the other hand, pull the peg out of the hole in the motherboard. Do not reuse the pegs.



When handling the processor, avoid placing direct pressure on the label area of the fan.

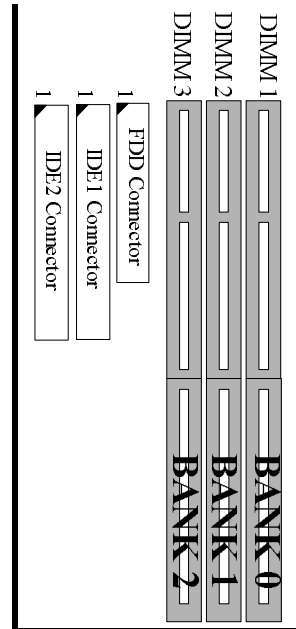


When removing the processor, avoid pressing down on the motherboard or components. Instead, press down on plastic connectors.

2.2.4 Installing System Memory

The maximum system memory supported by the P6F91BX is 384MB. If more than 384MB memory are populated on the P6F91BX mainboard, the portion of the memory which exceed the 384MB boundary will be invalidated.

The P6F91BX Mainboard has three DIMM Sockets. Memory can be installed by using 168-pin SDRAM DIMM or 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 P6F91BX Mainboard high speed design, the memory modules for the P6F91BX must meet all of the following requirement:



DRAM TYPE	EDO (Extended Data Output)	SDRAM (Synchronous DRAM)
Module Size	Single-Sided Symmetric: 1Mx64, 4Mx64, 16Mx64 Asymmetric: 1Mx64, 2Mx64, 4Mx64, 8Mx64 Double-Sided Symmetric: 2Mx64, 8Mx64 Asymmetric: 2Mx64, 4Mx64, 8Mx64, 16Mx64, 32Mx64	Single-sided Asymmetric: 1Mx64, 2Mx64, 4Mx64, 8Mx64, 16Mx64, Double-Sided Asymmetric: 2Mx64, 4Mx64, 8Mx64, 16Mx64, 32Mx64
Requirements	DRAM Speed: 60ns or faster RAS Access Time: 60ns or faster CAS Access Time: 20ns or faster	3.3V unbuffered DIMM module Speed grade: Have to match the CPU Bus clock speed (66MHz or 100MHz) or faster. CAS latency: 3 or faster

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

168-Pin DIMM Modules Memory Configuration.

BANK 0 (DIMM1)	SDRAM/EDO 8MB, 16MB, 32MB, 64MB, 128MB
BANK 1 (DIMM2)	SDRAM/EDO 8MB, 16MB, 32MB, 64MB, 128MB
BANK 2 (DIMM3)	SDRAM/EDO 8MB, 16MB, 32MB, 64MB, 128MB
Total System Memory	8MB to Max. 384MB

NOTE:

1. P6F91BX does not support mixing of SDRAM and EDO memory
2. When using SDRAM with 4Mx4 and 16Mx4 chips, only registered DIMMs can be used.

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 JP12 for 5 seconds
3. Put the shunt back to pin1 and pin2 of JP12
4. Power on the system

2.2.6 Auto Power On

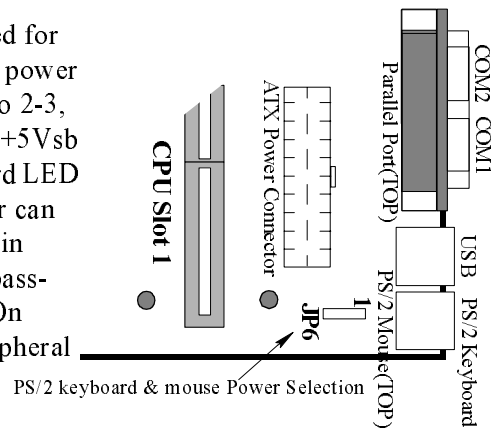
After losing AC power, the system will not turn on automatically when power comes back unless you set the Auto Power On jumper (JP13) to 1-2. Out of safety consideration the default setting on JP13 is 2-3, which avoid system turn on by itself when plug in the power cole.

JP13 shunt 1-2: Auto Power On feature is On

JP13 shunt 2-3: Auto Power On feature is Off (Default).

2.2.7 PS/2 keyboard & mouse Power Selection

The 3 pin jumper JP6 is used for PS/2 keyboard and mouse's power selection. When JP6 is set to 2-3, the keyboard is powered by +5Vsb which will keep the keyboard LED always lit and indicates user can power on computer by key-in password. You can set the password in the BIOS "Power On function" of "Integrate Peripheral Screen".



JP6 shunt 1-2: PS/2 keyboard & mouse use power supply's +5V.

JP6 shunt 2-3: PS/2 keyboard & mouse use power supply's +5Vsb (+5 volt standby). This is the default setting.

2.2.8 Intel Pentium II CPU Soft-Menu Setting

The Soft-Menu (jumperless) design of the P6F91BX allows the user to set CPU Bus Clock and CPU core to Bus clock multiplier through the BIOS.

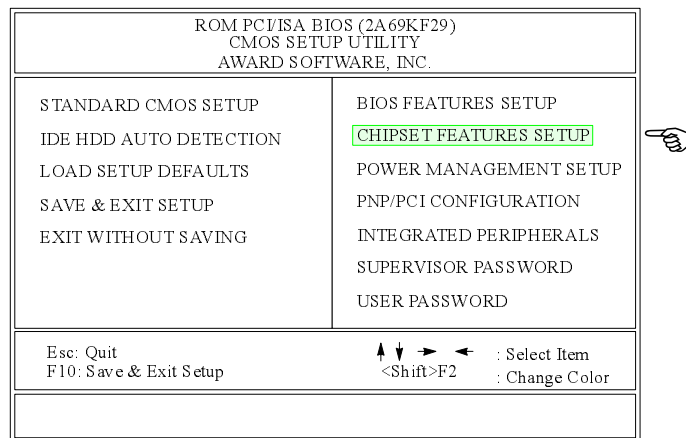
CPU Bus Clock: The CPU Bus Clock is defined as the CPU input clock. For example; the CPU Bus Clock for Intel Pentium II 350, 400, 450 and 500MHz is 100MHz and the CPU Bus Clock for Intel Pentium II 233, 266, 300 and 333MHz is 66.6MHz.

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 clock Multiplier is 3.5, the actual CPU core clock will be 350MHz.

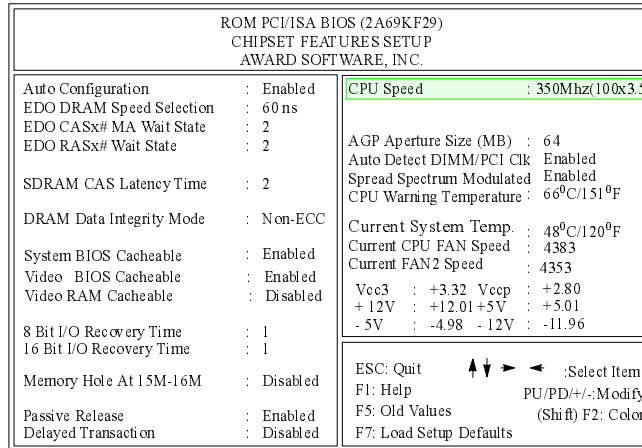
CPU Voltage: There is no hardware or BIOS settings needed for CPU operating voltage. The switching regulator circuit can auto-detect the CPU type on the P6F91BX mainboard and generate the proper operating voltage for the CPU.

Follows these three steps to setup CPU speed.

- 1) Turn the system on, then press key to access the AWARD BIOS SETUP program. A “CMOS SETUP UTILITY” will display on the screen. At “CMOS SETUP UTILITY” screen selects “Chipset Features Setup” and press <Enter>.



2) On the top right hand side of the “Chipset Feature Setup” screen, there is a “CPU Speed” option. Refer to the table below and select the correct CPU speed.



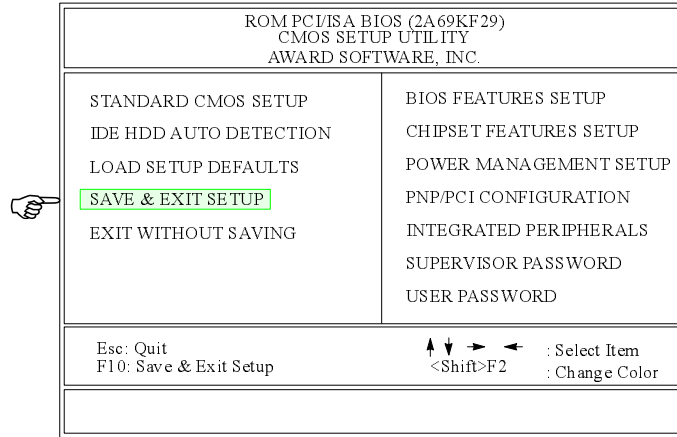
CPU Bus Clock=100MHz:

CPU SPEED	Soft-Menu Setting	
	Bus Clock	Core to Bus Clock Multiplier
350MHz	100MHz	3.5
400MHz	100MHz	4.0
450MHz	100MHz	4.5
500MHz	100MHz	5.0

CPU Bus Clock=66MHz:

CPU SPEED	Soft-Menu Setting	
	Bus Clock	Core to Bus Clock Multiplier
233MHz	66.6MHz	3.5
266MHz	66.6MHz	4.0
300MHz	66.6MHz	4.5
333MHz	66.6MHz	5.0

- 3) After the “CPU Speed” is set, go back to “CMOS SETUP UTILITY” screen and select “SAVE & EXIT SETUP” and press the <Enter> key to save the setting information in the CMOS memory and continue with the booting process.



2.2.9 System Clock (CPU Bus Clock)

When “CPU SPEED” set to “manual”, which allow user to set “CPU Ratio” and “CPU Frequency” manually. The available options for “CPU Frequency” are “66MHz”, “68MHz”, “75MHz” when a Intel Pentium II 233, 266, 300, 333MHz CPU installed. And “100MHz”, “103MHz” and “112MHz” when an Intel Pentium II 350, 400, 450, 500MHz CPU installed

Installed CPU	Intel Pentium II 233, 266, 300, 333MHz	Intel Pentium II 350, 400, 450, 500MHz
Available Options for CPU Frequency	66MHz (default)	100MHz (default)
	68MHz	103MHz
	75MHz	112MHz

NOTE:

Over clock may caused system hang or fail to boot-up (no video). If this happens there are two methods you can reset your CMOS setting and get your system back again.

Method 1:

Press and hold the <INS> key before power on the computer. Once BIOS detect the <INS> key is pressed, it will clear CMOS RAM and reset CMOS setting to default values.

Method 2:

Set jumper to clear CMOS RAM

1. Power off the system
2. Place a shunt to short pin2 and pin3 of JP12 for 5 seconds
3. Put the shunt back to pin1 and pin2 of JP12
4. Power on the system

3 BIOS Configuration

After hardware configuration of P6F91BX 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 key. The “CMOS SETUP UTILITY” screen will be displayed at this time.

3.2 CMOS SETUP UTILITY

Main Program Screen

ROM PCI/ISA BIOS (2A69KF29) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP IDE HDD AUTO DETECTION LOAD SETUP DEFAULTS SAVE & EXIT SETUP EXIT WITHOUT SAVING	BIOS FEATURES SETUP CHIPSET FEATURES SETUP POWER MANAGEMENT SETUP PNP/PCI CONFIGURATION INTEGRATED PERIPHERALS SUPERVISOR PASSWORD USER PASSWORD
Esc: Quit F10: Save & Exit Setup	↑ ↓ → ← : Select Item <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 (2A69KF29) 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									
Floppy 3 Mode Support: Disabled									
Video: EGA/VGA									
Halt On: All Errors But Keyboard									
					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 BIOS FEATURES SETUP

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

BIOS Features Setup Screen

ROM PCI/ISA BIOS (2A69KF29) BIOS FEATURES SETUP AWARD SOFTWARE, INC.			
Virus Warning	: Disable	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000 - CBFFF Shadow	: Disable
External Cache	: Enabled	CC000 - CFFFF Shadow	: Disable
Quick Power On Self Test	: Enabled	D0000 - D3FFF Shadow	: Disable
Boot Sequence	: C, A, SCSI	D4000 - D7FFF Shadow	: Disable
Swap Floppy Drive	: Disable	D8000 - DBFFF Shadow	: Disable
Boot Up Floppy Seek	: Disable	DC000 - DFFFF Shadow	: Disable
Boot Up NumLock Status	: On	OS Select For DRAM > 64MB	: Non-OS2
Gate A20 Option	: Fast	CPU L2 Cache ECC Checking	: Disabled
Typematic Rate Setting	: Disable	Assign IRQ For VGA	: Enabled
Typematic Rate (Chars/Sec)	: 6	ESC: Quit ↑ ↓ → ← :Select Item F1: Help PU/PD/+/-:Modify F5: Old Values (Shift) F2: Color F7: Load Setup Defaults	
Typematic Delay (Msec)	: 250		
Security Option	: Setup		
PCI/VGA Palette Snoop	: Disable		

The following explains the options for each feature:

Virus Warning: The Virus Warning’s default setting is “Disable”. 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: 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.

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 default 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.

CPU L2 Cache ECC Checking: The default setting is “Disable”. Set to “Enabled” only if CPU L2 cache has ECC (Error Checking and Correction).

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 (2A69KF29) CHIPSET FEATURES SETUP AWARD SOFTWARE, INC.			
Auto Configuration	: Enabled	CPU Speed	: 350Mhz(100x3.5)
EDO DRAM Speed Selection	: 60 ns	CPU Ratio	: x 4.0
EDO CAS# MA Wait State	: 2	CPU Frequency	: 100MHz
EDO RAS# Wait State	: 2	AGP Aperture Size (MB)	: 64
SDRAM CAS Latency Time	: 2	Auto Detect DIMM/PCI Clk	: Enabled
DRAM Data Integrity Mode	: Non-ECC	Spread Spectrum Modulated	: Enabled
System BIOS Cacheable	: Enabled	CPU Warning Temperature	: 66°C/151°F
Video BIOS Cacheable	: Enabled	Current System Temp.	: 48°C/120°F
Video RAM Cacheable	: Disabled	Current CPU FAN Speed	: 4383
8 Bit I/O Recovery Time	: 1	Current FAN2 Speed	: 4353
16 Bit I/O Recovery Time	: 1	Vcc3	: +3.32 Vccp : +2.80
Memory Hole At 15M-16M	: Disabled	+12V	: +12.01 +5V : +5.01
Passive Release	: Enabled	-5V	: -4.98 -12V : -11.96
Delayed Transaction	: Disabled	ESC: Quit ↑ ↓ → ← :Select Item F1: Help PU/PD/+/-:Modify F5: Old Values (Shift) F2: Color F7: Load Setup Defaults	

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

Auto Configuration: The default setting is “Enabled” which will set optimal DRAM timing automatically depending on whether the DRAM used is 50ns or 60ns. The other option is “Disabled” which allows you to change DRAM timing manually.

EDO DRAM Speed Selection: This option should be set according to the speed of the EDO DRAM in the system. The options are “50ns” and “60ns”.

EDO CASx# MA Wait State: This option selects “1” or “2” memory MA bus timing. For EDO, the “2” is one more wait state than the “1”. For SDRAM, Fast timing means “1” MA wait state.

EDO RASx# Wait State: The options are “1” or “2”. This option sets the length of time in terms of number of clocks required for the RAS# precharge. The default setting is “2”.

SDRAM CAS Latency Time: The options are “2” and “3”. Slower rate “3” may be required for slower SDRAMs or more than 2 banks of SDRAM DIMMs are installed. The default setting is “3”.

DRAM Data Integrity Mode: The options are “ECC” and “Non-ECC”. Set to “ECC” only when DIMM modules with parity bits are used. This will enable the Error Checking and Correction function to ensure the data integrity

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

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

Video RAM Cacheable: When set to “Enabled”, the Graphics card’s local memory will be cached for faster execution. The default setting is “Disable”.

8 Bit I/O Recovery Time: This option sets the delay between back-to-back 8-bit I/O instructions. The options are 1, 2, 3, 4, 5, 6, 7, 8 Sysclks and NA. The default setting is “1”.

16 Bit I/O Recovery Time: This option sets the delay between back-to-back 16-bit I/O instructions. The options are 1, 2, 3, 4 Sysclks and NA. The default setting is “1”.

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 special add-in cards which need 15M-16M memory space.

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.

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 re-arbitrates 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.

CPU SPEED: This option sets the CPU speed. There are two major category of this option.

A. When a 100MHz Bus clock CPU is installed

The default setting is “350MHz (100x3.5)”. The other options are “300MHz (100x3.0)”, “400MHz (100x4.0)”, “450MHz (100x4.5)”, “500MHz (100x5.0)” and “Manual”.

B. When a 66MHz Bus clock CPU is installed

The default setting is “Manual”. The other options are “200MHz (66x3.0)”, “233MHz (66x3.5)”, “266MHz (66x4.0)”, “300MHz (66x4.5)” and “333MHz (66x5.0)”.

When set to “Manual” two more options “CPU Ratio” and “CPU Frequency” will pop up to let user set the CPU core to bus clock ratio (CPU Ratio) and CPU Bus clock (CPU Frequency) manually.

CPU Ratio: This option sets the CPU Core to Bus Clock Multiplier. The options are “3”, “3.5”, “4”, “4.5”, “5” and “5.5”.

CPU Frequency: This option sets the CPU Bus Clock. The options are “66MHz”, “68MHz”, “75MHz” when a 66MHz Bus Clock CPU is installed. And “100MHz”, “103MHz” and “112MHz” when a 100MHz Bus Clock CPU is installed.

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

Auto Detect DIMM/PCI Clk: When set to “Enabled”, system will automatically turn off PCI and DIMM clock which is not use and reduce electromagnetic interference.

Spread Spectrum Modulated: When set to “Enabled”, system clock frequency will automatically be modulated which helps reducing electromagnetic interference. Default is “Enabled”.

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.

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.

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.

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.

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 (2A69KF29) POWER MANAGEMENT SETUP AWARD SOFTWARE, INC.	
Power Management : Disable	** Reload Global Timer Events **
PM Control by APM : Yes	VGA Active Monitor : Enabled
Video Off Method : V/H SYNC+Blank	IRQ [3-7, 9-15], NMI : Enabled
Doze Mode : Disable	Primary IDE 0 : Disabled
Standby Mode : Disable	Primary IDE 1 : Disabled
Suspend Mode : Disable	Secondary IDE 0 : Disabled
HDD Power Down : Disable	Secondary IDE 1 : Disabled
Throttle Duty Cycle : 75.0%	Floppy Disk : Disabled
CPUFAN off In Suspend : Enabled	Serial Port : Disabled
Soft-Off by PWR-BTTN : Instant - Off	Parallel Port : Disabled
Resume by Ring : Enabled	Mouse Break Suspend : No(PS/2)
Resume by Alarm : Disabled	Modem Use IRQ : 3
Wake Up On LAN : Enabled	IRQ 8 Break Suspend : Disable
	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’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 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 “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.

Standby Mode: Options are from “30 Sec” 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.

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 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%”.

FAN off in Suspend: If set to “Enabled” CPU fan and Secondary fan will be turned off in Suspend Mode.

Soft-Off by PWR-BTTN: 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 goes to the suspend mode. Note: During the booting process, the power button is ignored. The default setting is “Instant-Off”.

Resume by Ring: If “Enabled”, the system power will be turned on if the FAX/Modem receives an incoming telephone call.

Resume by Alarm: If “Enabled”, you may set the date (day of the 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 specified time.

Wake Up On LAN: If “Enabled”, the system power will be turned on if the network card receives an incoming Wake On LAN(WOL) signal.

Reload Global Timer Events: When a hardware event is enabled, the occurrence of a corresponding event will reload global timer to 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 to wake up the system due to the sensitivity of the mouse, you can set this option to “No(COM1)” or “No(COM2)” depending on which COM port is connected to your serial mouse or set to “No(PS/2)” if you are using a PS/2 mouse.

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.

IRQ 8 Break Suspend: When this option and the option of “Power-On by alarm” are both set to “Enabled”, you may set the date (day of month), hour, minute and second to wake up your system from suspend mode.

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 (2A69KF29) PNP / PCI CONFIGURATION AWARD SOFTWARE, INC.			
PNP OS Installed	: No	PCI IDE IRQ Map To	: PCI - AUTO
Resources Controlled By	: Manual	Primary IDE INT#	: A
Reset Configuration Data	: Disabled	Secondary IDE INT#	: B
IRQ-3 assigned to	: Legacy ISA	Used MEM base addr.	: N/A
IRQ-4 assigned to	: Legacy ISA	Assign IRQ For USB	: Enabled
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		
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: 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 (2A69KF29) INTEGRATED PERIPHERALS AWARD SOFTWARE, INC.	
IDE HDD Block Mode	: Enabled
IDE Primary Master PIO	: Auto
IDE Primary Slave PIO	: Auto
IDE Secondary Master PIO	: Auto
IDE Secondary Slave PIO	: Auto
IDE Primary Master UDMA	: Auto
IDE Primary Slave UDMA	: Auto
IDE Secondary Master UDMA	: Auto
IDE Secondary Slave UDMA	: Auto
On-Chip Primary PCI IDE	: Enabled
On-Chip Secondary PCI IDE	: Enabled
USB Keyboard Support	: Disable
Onboard FDD Controller	: Enabled
Onboard Serial Port 1	: 3F8 / IRQ4
Onboard Serial Port 2	: 2F8 / IRQ3
UART Mode Select	: Normal
Onboard Parallel Port	: 378 / IRQ7
Parallel Port Mode	: Normal
Power On Function	: Button Only
ESC: Quit ↑ ↓ → ← :Select Item F1: Help PU/PD/+/-:Modify F5: Old Values (Shift) F2: Color F7: Load Setup Defaults	

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”.

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

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”.

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)

UART 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.

RxD, TxD Active: The options are “Hi, Hi” (default), “Hi, Lo”, “Lo, Hi” and “Lo, Lo”. It will define voltage level for your Infrared module RxD (receive) mode and TxD (transmit) mode. This setting has to match the infrared module used in the system.

IR Transmission Delay: The options are “Enabled” and “Disable”. When set to “Enabled”, you will utilize the capability of your board to allow for faster infrared transmission rates.

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.

EPP Mode Select: There are two options “EPP1.9” (default), “EPP1.7”.

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”.

Power On Function: There are five options “Button Only” (default), “Password”, “Hot KEY”. When set to “Button Only”, system power can be turned on by power button. When set to “Password”, system power can be turned on by entering password. You have to enter “password” to activate this option.

Note: If “Password” is selected for this option, the power button will not be able to turn on the system. If you forget the password, then you need to clear CMOS RAM. (see section 2.2.5 for detail).

When set to “Hot KEY”, system power can be turned on by pressing keyboard function key, i.e., <Ctrl>+<F1> through <Ctrl>+<F12>.

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

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 JP12 to short pin 2 and pin 3 for 5 seconds, then putting the shunt back to pin1 and pin2 of JP12.

4 Driver and Utility

4.1 Flash Utility

The BIOS of the P6F91BX 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 Intel 82440BX 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.

There are three self-extracting archive files in the BMIDE directory.

BMIDE_95.EXE	For Windows 95
BMIDE_NT.EXE	For Windows NT
BMIDEOS2.EXE	For OS/2

Execute the BMIDE_95.EXE to extract files for driver and installation instructions for Windows 95. Execute the BMIDE_NT.EXE to extract files for driver and installation instructions for Windows NT. Execute the BMIDEOS2.EXE to extract files for driver and installation instructions for OS/2.

4.3 System Environment Monitor

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 windowsNT)

4.3.1 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



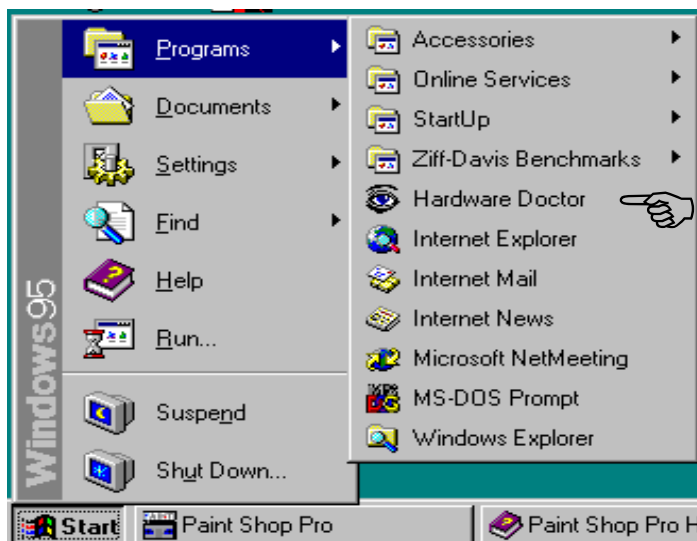
Click "OK" and continue setup procedure.

- 3) Select the directory to install Hardware Doctor program. The default directory is “:\Program Files\Hardware Doctor\”



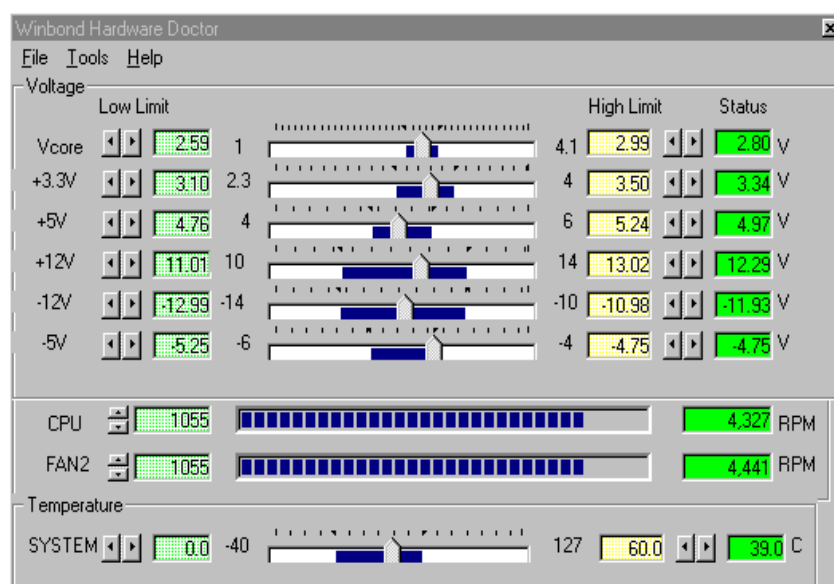
Follow the instructions on the screen to complete the installation. After setup is completed, you need to restart the computer before you can activate the program.

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



4.3.2 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



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