Quick Reference

Quick Jumpers Setup:

Note:

P54C: Pentium Processor

P55C: Pentium Processor with MMX Technology

CPU Type/Speed	DIP Switch 1				DIP Switch 2			
	P1	P2	P3	P4	P1	P2	P3	P4
P54C 120MHz	OFF	ON	OFF	OFF	ON	OFF	ON	OFF
P54C 133MHz	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
P54C 150MHz	OFF	ON	OFF	OFF	ON	ON	ON	OFF
P54C 166MHz	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
P54C 200MHz	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
P55C 166MHz 2.8V	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
P55C 200MHz 2.8V	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
P55C 233MHz 2.8V	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF

The P5F78 only supports 6x86L and 6x86MX dual power plane CPU

CPU Type/Speed	DIP Switch 1				DIP Switch 2			
	P1	P2	P3	P4	P1	P2	P3	P4
6x86L - P133+	OFF	ON	OFF	OFF	ON	OFF	ON	ON
6x86L - P150+	OFF	ON	OFF	OFF	ON	OFF	ON	OFF
6x86L - P166+	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
6x86MX PR166 2.9V	OFF	OFF	ON	OFF	ON	ON	ON	OFF
6x86MX PR200 2.9V	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
6x86MX PR233 2.9V	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF

CPU Type/Speed	DIP Switch 1				DIP Switch 2			
	P1	P2	P3	P4	P1	P2	P3	P4
AMD-K5-PR120	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
AMD-K5-PR133	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
AMD-K5-PR150	OFF	ON	OFF	OFF	ON	ON	ON	OFF
AMD-K5-PR166	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
AMD-K6/166 2.9V	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
AMD-K6/200 2.9V	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
AMD-K6/233 3.2V	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF

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Table Of Contents

1 Introduction

1.1 Overview

The P5F78 is a quality, high performance, function enhanced mainboard based on the Pentium class processor. This mainboard is designed around the latest and fastest Intel 82430TX chipset in a mini-baby ATX form factor.

The P5F78 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 P5F78 mainboard delivers superior performance with its integrated Bus Mastering EIDE (Enhanced IDE) controller, concurrent PCI bus, 256/512KB level 2 Pipelined Burst cache, and its ability to accommodate new technology EDO (Extended Data Out) and SDRAM (Synchronous DRAM) memory.

The P5F78 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, two USB (Universal Serial Bus) port connectors, a PS/2 keyboard connector and a PS/2 mouse connector. five PCI local bus slots and three full length ISA bus slots provide expandability to add on peripheral cards.

P5F78 mainboard is the foundation of OnNow PC, Managed PC and PC97. It offers optimized system performance, integrated power management and manageability.
Optimized System Performance: Ultra DMA/33 speeds disk drive access, Enhanced SDRAM support for fastest access to memory, and Concurrent PCI enables simultaneous data traffic.
Integrated Power Management: ACPI (Advance Configuration and Power Interface) support enables O/S and application to direct the system power management.

System Manageability: Optional SMM (System Management Module) with LDCM (LanDesk Client Manager) enables the ability to monitor and control system features and functionality such as fan speed, system temperature, system operating voltages, and system configuration.

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 and BIOS upgradability are provided on the P5F78 platform.

1.2 P5F78 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 ~ 166MHz. Cyrix/IBM, 6x86MX PR166 ~ 233MHz. AMD K5 PR90 ~ 166MHz, AMD K6 /166 ~ 233 MHz.
Coprocessor	CPU built-in floating point unit
Speed	System bus clock 55/60/66 MHz PCI bus clock 27.5/30/33 MHz ISA bus clock 8.33/9.15 MHz
Chipset	Intel's 82430TX PCIset Winbond's 83877 I/O chip
L2 Cache	Pipelined Burst SRAM 256/512KB
DRAM	4 x 72-pin SIMM and 3 x 168-pin DIMM sockets Supports 8MB to 256MB memory Supports FPM, EDO and SDRAM DRAMs
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 drive
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) port connectors

Mouse/Keyboard	PS/2 mouse connector PS/2 keyboard connector
Expansion Slots	Five 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 Sleeping state indicator Fan off in sleep mode.
Voltage Regulator	Switching regulator CPU single/dual voltage auto-detection
Form Factor	ATX, 8.2” x 12.0”
Options	External Infrared Module with cable and mounting bracket System Management Module

Software

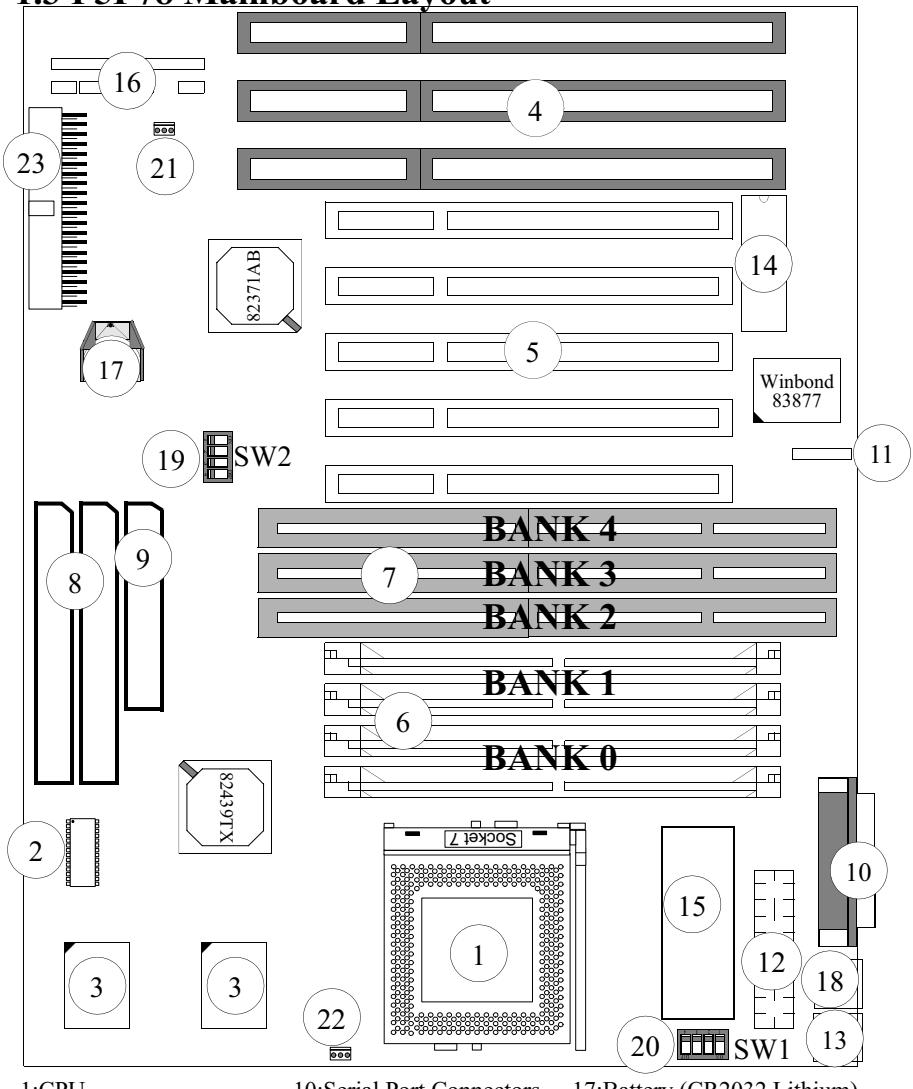
BIOS	AWARD Pentium PCI BIOS Flash BIOS with ESCD (Extended System Configuration Data) block Supports APM, PnP, Multi-Boot, DMI and EIDE devices Built-in NCR SCSI BIOS Support High-Capacity LS-120 Removable Media Drive
Driver	Bus mastering EIDE driver
Utility	Flash utility for BIOS upgrade DMI browser

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	0^0C 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 P5F78 Mainboard Layout



1:CPU
2:TAG SRAM Chip
3:Cache SRAM Chips
4:ISA Expansion Slots
5:PCI Expansion Slots
6:SIMM Module Sockets
7:DIMM Module Sockets
8:IDE Connectors
9:Floppy Drive Connector
10:Serial Port Connectors
Parallel Port Connector
11:IR Port Header
12:ATX Power Connector
13:PS/2 keyboard and
PS/2 Mouse Connector
14: Flash BIOS
15:Switching Regulator
16:Front panel Connectors
17:Battery (CR2032 Lithium)
18:USB Connector
19:DIP Switch 2
20:DIP Switch 1
21:FAN Connector 2
22:FAN Connector 1
23:LM78 Module Socket

1.4 Microprocessor

The P5F78 meets the requirements of a Pentium flexible mainboard. A Pentium flexible mainboard 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 ZIF socket is Socket 7.
2. BIOS can supports various Pentium class processors with different CPU core frequency.
3. On-board switching regulators and heat sinks meet CPU's core and I/O voltage/current/thermal specifications.

The P5F78 mainboard can support the following CPUs

Intel Pentium 90 ~ 200MHz.
Intel MMX Pentium 166 ~ 233MHz.
Cyrix/IBM 6x86L PR133 ~ 166MHz.
AMD K5 PR90 ~ 166MHz,
AMD K6 /166 ~ 233 MHz.

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

1.5 Level 2 Cache

The P5F78 mainboard provides standard 256KB or 512KB synchronous pipelined SRAM cache on board.

1.6 Chipset

The Intel 82430TX PCIset consists of one 82439TX (MTXC) System Controller, and one 82371AB (PIIX4) PCI ISA/IDE Accelerator.

82439TX (MTXC):
- CPU interface controller
- Cache and DRAM controllers
- Fully synchronous PCI 2.1 bus interface
- Extensive CPU-to-DRAM, PCI-to-DRAM and CPU-to-PCI data buffering
- Power Management Logic

82371AB (PIIX4):
- 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

1.7 Main Memory

The P5F78 mainboard provides four 72-pin SIMM and three 168-pin DIMM sockets to support 8MB to 256MB of system memory. The sockets support 1M x 32 (4MB), 2M x 32 (8MB), 4M x 32 (16MB), 8M x 32 (32MB), 16Mx32(64MB) and 32Mx32(128MB) SIMM and 1M x 64 (8MB), 2M x 64 (16MB), 4M x 64 (32MB), 8M x 64 (64MB), 16Mx64(128MB) and 32Mx64(256MB) DIMM single- or double-sided modules.

The P5F78 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 66.7MHz speed grade for SDRAMs.

The four SIMM sockets are divided into two banks of two sockets each. The sockets are designated Bank 3 and Bank 4. **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 occurs, 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 increase.

1.8 Switching Regulator

The P5F78 mainboard uses switching regulator design instead of a linear one to improve power efficiency. The Switching regulator can automatically switch to single voltage (V_{core} equals to $V_{I/O}$) supply or dual voltage (V_{core} not equal to $V_{I/O}$) supply depending on which type of CPU (single power plane or dual power plane) is installed on the mainboard.

1.9 Enhanced IDE Support

TheP5F78 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 activity. The Bus Master logic designed in the Intel 82430TX chipset is intended to reduce the workload of the

CPU, and 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 operate 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

1.10 Keyboard, Mouse, and USB Interface

PS/2 keyboard, PS/2 mouse, and USB connectors are located on the back panel of the P5F78 mainboard. The 5V line to the connector is protected with a PolySwitch circuit that acts much like a self-healing fuse, re-establishing the connection after an over-current condition is removed. While this device eliminates the possibility of having to replace a fuse, you still need to be sure to turn off the system power before installing or removing a keyboard or mouse.

The P5F78 mainboard has 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. Up to 12Mbits/sec transfer rate, makes it 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 a 100-year calendar with alarm features. The RTC 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 content of the CMOS RAM can be cleared by placing a shunt to short pin2 and pin3 of JP3 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.

1.12 IrDA Infra-red Support

A 5-pin header connector is used to connect a Hewlett Packard HSDSL-1000 compatible IrDA 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. The Serial port 2 must be configured to support an IrDA module via the BIOS SETUP program.

1.13 Power Management

The integrated DPMA (Dynamic Power Management Architecture) in the Intel 430TX PCISet features goes 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 P5F78 is not only compliant 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 watchdog timer (Alarm)
  System could be powered on by phone ring, or by software that has requested the PC to wake up at some predetermined time.

- Sleep mode indicator
  The power LED becomes dim when system is in sleep mode.

- Fan off in sleep mode
  The CPU cooling fan and system secondary fan will be turned off when system is in sleep mode.

1.14 System Power On/Off Control:

System power can be turned on by a power button, a modem ring, or an alarm. 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 “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”, 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.”, to turn off the system power you have to press the power button and hold it for more than 4 seconds. The system power can also be turned off via software control with ATX power supply. 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 this Soft Off APM command when the user selects “Shutdown” in Start Menu. In order

for the Soft Off feature to work correctly, Power Management/APM must be enabled in the system BIOS and Operating System.

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 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 82430TX PCIset and cache PBSRAMs stay in the lower power state, the HDD stops spinning, the monitor screen becomes blank, the brightness of the power LED indicator on the front panel dims out, and the CPU cooling fan and system secondary fan are turned off (Note: in order to turn off fans in sleep mode, you need to connect the CPU cooling fan and system secondary fan to the on-board fan power connectors marked FAN1 and FAN2)

1.16 System Manageability

An optional System Management Module with software LDCM (LandDesk Client Manager) allows the local client or system administrator to monitor and control system features and functionality such as fan speed (requires fan with tachometer output), system temperature, system operating voltages and system configuration.

2 Hardware Installation

2.1 Unpacking

The P5F78 mainboard package contains the following:

* P5F78 mainboard
* One IDE 40-pin ribbon cable
* One floppy 34-pin ribbon cable
* One 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.

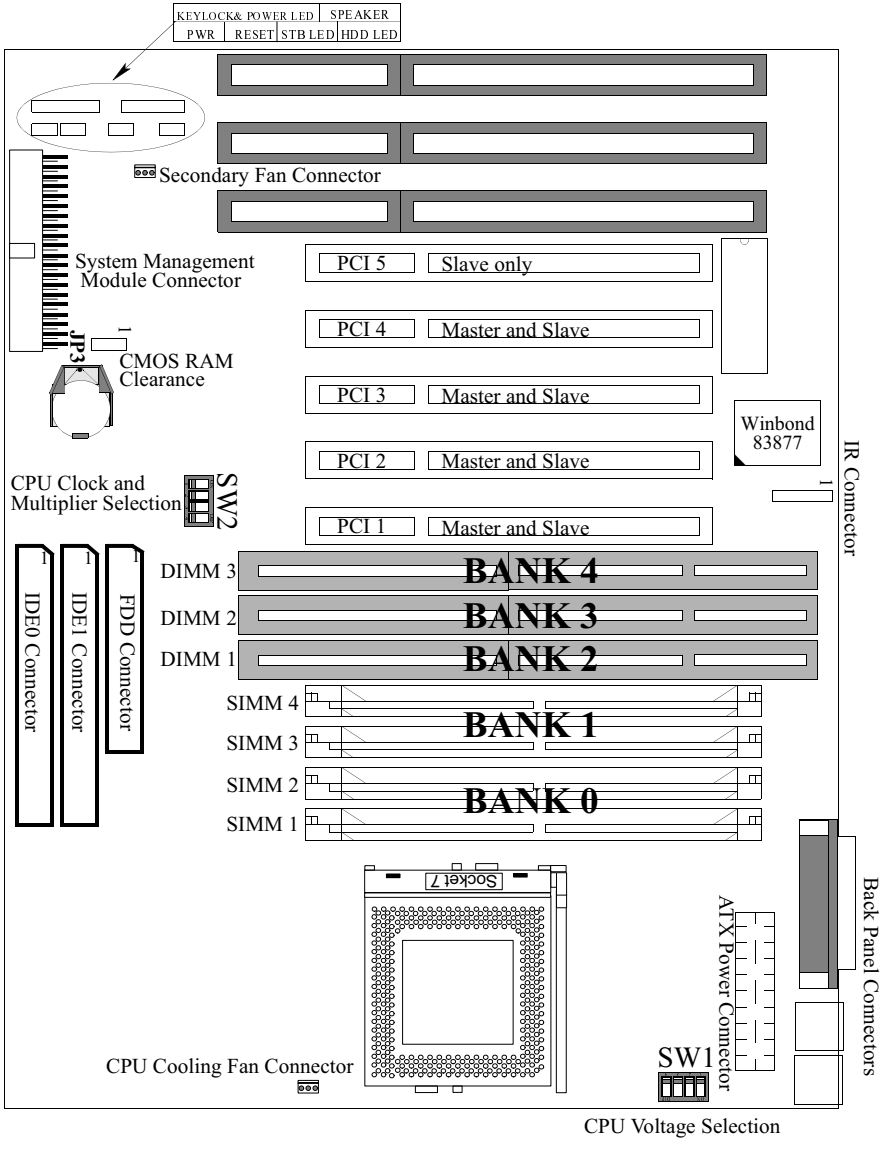
After removing the mainboard from its anti-static bag, place it only on a grounded or anti-static surface, component side up. Inspect the mainboard to see if it is damaged, call the vendor immediately if it is damaged.

2.2 Installation

The P5F78 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 match 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.

P5F78 Mainboard DIP Switch and Jumper Location



Note: The PCI card with bus mastering capability such as SCSI or LAN will not work on PCI Slot 5

2.2.1 Setting DIP Switches

This section provides the DIP Switches settings for the P5F78 mainboard.

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

CPU Core to Bus Clock Multiplier: The CPU internal core clock is equal to the "CPU Bus Clock" times the "CPU Core to Bus Clock Multiplier". For example, if the CPU Bus Clock is 66.6MHz and the CPU Core to Bus Multiplier is 3, the actual CPU core clock will be 66.6 x 3 = 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 66.6 MHz.

CPU Core and I/O Voltages: Two voltages V_{CORE} and $V_{I/O}$ are required for Pentium class CPUs. The V_{CORE} is used for CPU internal operation and the $V_{I/O}$ is used to supply the voltage for external interface.

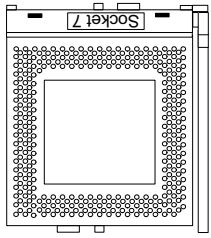
DIP Switch 2 (SW2) selects CPU clock and multiplier

Bus Clock	SW2-P3	SW2-P4
55MHz	ON	ON
60MHz	ON	OFF
66MHz	OFF	OFF

DIP Switch 1 (SW1) selects CPU operating voltage

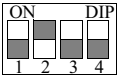
Voltage	SW1-P1	SW1-P2	SW1-P3	SW1-P4
3.3V/3.5V	X	X	X	X
3.2V	OFF	OFF	OFF	ON
2.9V	OFF	OFF	ON	OFF
2.8V	OFF	ON	OFF	OFF
2.5V	ON	OFF	OFF	OFF

X: Don't Care

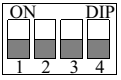


The P5F78 mainboard uses switching regulator design instead of a linear one to improve power efficiency. The Switching regulator can automatically switch to single voltage (V_{core} equal to $V_{I/O}$) supply or dual voltage (V_{core} not equal to $V_{I/O}$) supply depending on which type of CPU (single power plane or dual power plane) is installed on the mainboard. when a single power plane CPU is installed on the mainboard, the switching regulator will always supply 3.52 Volts for V_{core} and $V_{I/O}$ no matter how the DIP switch SW1 is set. The default SW1 is set to 2.8 V, this allows most CPUs be installed without changing the SW1 setting.

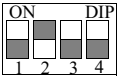
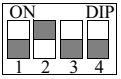
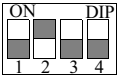
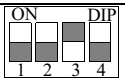
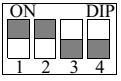
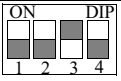
intel® Pentium CPU Clock/Voltage DIP Switch Setting

CPU Speed	SW1	SW2
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/Voltage DIP Switch Setting

CPU Speed	SW1	SW2
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		

Cyrix® IBM® 6x86L/6x86MX CPU clock/voltage DIP switch setting

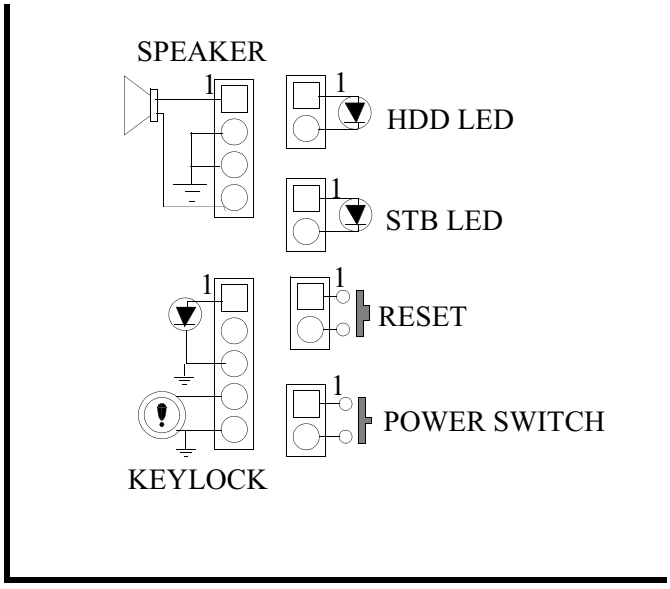
CPU Speed	SW1	SW2
Cyrix/IBM 6x86L -P133+ 55MHz x 2		
Cyrix/IBM 6x86L -P150+ 60MHz x 2		
Cyrix/IBM 6x86L -P166+ 66MHz x 2		
Cyrix/IBM 6x86MX-PR166 60MHz x 2.5		
Cyrix/IBM 6x86MX -PR200 66MHz x 2.5		
Cyrix/IBM 6x86MX -PR233 66MHz x 3		

The P5F78 mainboard does not support Cyrix/IBM 6x86 (single power plane) CPU, only 6x86L and 6x86MX (dual power plane) CPUs are supported.

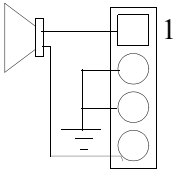
2.2.2 Attaching Connectors

1. Front Panel Connectors

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



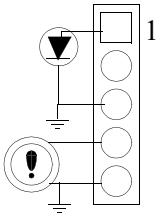
Speaker Connector



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

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

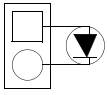
Keylock Connector



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. The brightness of the power LED becomes dim when system is in sleep mode.

HDD LED Connector



Pin Assignment
1. LED Anode
2. LED Cathode

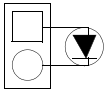
This 2-pin connector connects to the case-mounted HDD LED to indicate the hard disk activity.

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.

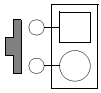
STB LED Connector



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

This 2-pin connector connects to the case-mounted standby power LED. The standby power LED is used to indicate that the power supply is in standby mode or completely off.

Power Switch Connector

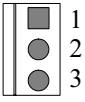


Pin Assignment
1. Power On/Off
2. Ground

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 Intel 82430TX 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.

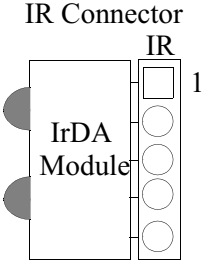
2. Fan Connectors



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

There are two fan connectors on the P5F78 mainboard for the CPU cooling fan and system secondary fan. These connectors support fans of 500mAMP (6 WATT) or less. When the system goes into its sleep state, those fans will be shut down to eliminate audible noise and reduce power consumption. To give the ability to the P5F78 to monitor the fan speed, you need an optional System Management Module, and the fan must come with a tachometer output.

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 a cable and a bracket. You must also configure the setting through BIOS setup to direct UART2 for use with IrDA.

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 which does not have twisted 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.

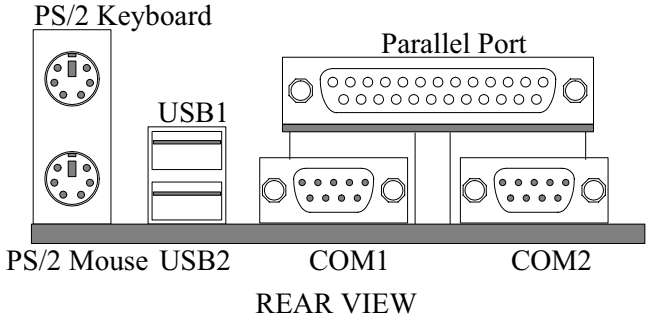
5. IDE Connectors (Two 40-pin Block)

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 one 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

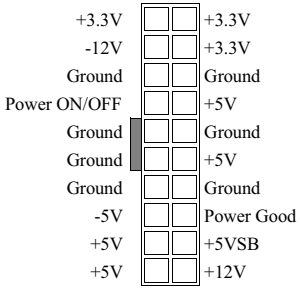
The back panel provides external access to PS/2 style keyboard and mouse connectors as well as two serial ports, one parallel port, and two USB ports, which are integrated on the mainboard. The figure below shows the location of the back panel I/O connectors.



7. Power Supply 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 before connecting the leads from the power supply.

ATX Power Connector

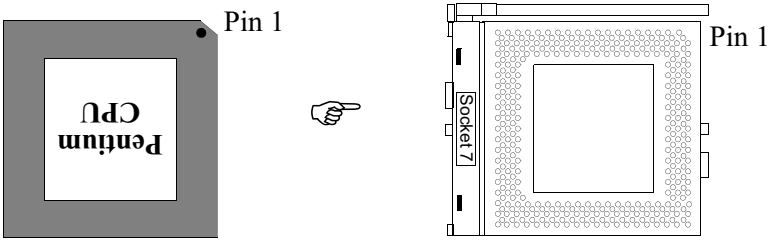


The ATX power supply has a single lead connector with a clip on one side of the plastic housing. There is only one way to plug the lead into the ATX power connector. Press the lead connector down until the clip snaps into place and secures the lead onto the connector.

2.2.3 Installing CPU

To avoid being broken by the pressure of CPU insertion, the mainboard must be placed on a flat anti-static surface before 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 raise it as far as it can go.
2. Align the CPU with the ZIF Socket 7 so that the pin 1 (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.



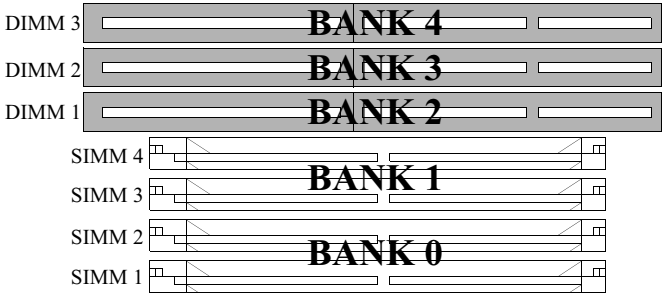
CPU SOCKET 7

2.2.4 Installing System Memory

The maximum system memory supported by the Intel 430TX PCIset is 256 MB. If more than 256MB memory are populated on the P5F78 mainboard, the portion of the memory which exceed the 256MB boundary will be invalidated.

The P5F78 Mainboard has four SIMM Sockets and three DIMM Sockets to support up to 256MB of system memory. The four SIMM sockets (SIMM1 ~ SIMM4) are divided into 2 Banks, Bank0 (SIMM1, SIMM2) and Bank1 (SIMM3, SIMM4). Two SIMM modules must be installed at a time, and each pair of modules must be the same size, type and speed.

Memory can be installed by using 72-pin EDO/FPM SIMM and/or 168-pin SDRAM/EDO DIMM memory modules. There are no jumper settings required for the memory size or type, which is automatically detected by the BIOS. Due to the P5F78 Mainboard high speed design, the memory modules for the P5F78 must meet all of the following requirements



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 Double-Sided Symmetric: 2Mx32, 8Mx32, 32Mx32 Asymmetric: 1Mx32, 2Mx32, 4Mx32, 8Mx32, 16Mx32.	Single-sided Asymmetric: 1Mx64, 2Mx64, 4Mx64, 8Mx64, 16Mx64, Double-Sided Asymmetric: 2Mx64, 4Mx64, 8Mx64, 16Mx64, 32Mx64
Requirements	DRAM Speed: 60ns or 70ns RAS Access Time : 60ns ~70ns CAS Access Time: 10ns ~20ns Two SIMM modules must be installed at a time, and each pair of modules must be the same size, type and speed.	**3.3V unbuffered DIMM module** Speed grade: 66.7MHz CAS latency: 3 or faster

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

72-Pin SIMM Modules only Memory Configuration

BANK 0 (SIMM1 & SIMM2)	EDO/FPM 4MB, 8MB, 16MB, 32MB, 64MB
BANK 1 (SIMM3 & SIMM4)	EDO/FPM 4MB, 8MB, 16MB, 32MB, 64MB
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 2 (DIMM1)	SDRAM/EDO 8MB, 16MB, 32MB SDRAM/EDO 64MB, 128MB - Bank4 must be empty
BANK 3 (DIMM2)	SDRAM/EDO 8MB, 16MB, 32MB SDRAM/EDO 64MB, 128MB - Bank4 must be empty
BANK 4 (DIMM3)	SDRAM/EDO 8MB, 16MB, 32MB - Bank2 or Bank3 must not have 64MB or 128MB SDRAM/EDO installed
Total System Memory	8MB to Max. 256MB

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 (SIMM1, 2)	4MB, 8MB, 16MB 32MB, 64MB	Empty	4MB, 8MB, 16MB 32MB, 64MB
BANK 1 (SIMM3, 4)	4MB, 8MB, 16MB 32MB, 64MB	4MB, 8MB, 16MB 32MB, 64MB	Empty
BANK 2 (DIMM1)	Empty	Empty	8MB, 16MB, 32MB, 64MB 128MB
BANK 3 (DIMM2)	Empty	8MB, 16MB, 32MB, 64MB 128MB	Empty
BANK 4 (DIMM3)	8MB, 16MB, 32MB	8MB, 16MB, 32MB	8MB, 16MB, 32MB
Total System Memory	8MB to Max. 256MB	8MB to Max. 256MB	8MB to Max. 256MB

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

1. If Bank 2 (DIMM 1) is populated with double-sided DIMM, Bank 1 (SIMM 3 & 4) is not allowed to have SIMM.
2. If Bank 2 (DIMM 1) is populated with single-sided DIMM, Bank 1 (SIMM 3 & 4) is only allowed to have single-sided SIMM.
3. If Bank 3 (DIMM 2) is populated with double-sided DIMM, Bank 0 (SIMM 1 & 2) is not allowed to have SIMM.
4. If Bank 3 (DIMM 2) is populated with single-sided DIMM, Bank 0 (SIMM 1 & 2) is only allowed to have single-sided SIMM.
5. If Bank 1 (SIMM 3 & 4) is populated with double-sided SIMM, Bank 2 (DIMM 1) is not allowed to have DIMM.
6. If Bank 1 (SIMM 3 & 4) is populated with single-sided SIMM, Bank 2 (DIMM 1) is only allowed to have single-sided DIMM.
7. If Bank 0 (SIMM 1 & 2) is populated with double-sided SIMM, Bank 3 (DIMM 2) is not allowed to have DIMM.
8. If Bank 0 (SIMM 1 & 2) is populated with single-sided SIMM, Bank 3 (DIMM 2) is only allowed to have single-sided DIMM.
9. Bank4 (DIMM 3) does not support 64MB or 128MB DIMMs with 64Mbit SDRAM memory chips.
10. If Bank2 (DIMM 1) and/or Bank3 (DIMM 2) has 64MB or 128MB DIMMs with 64Mbit SDRAM memory chips, Bank 4 (DIMM 3) must be empty.

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 JP3 for 5 seconds
3. Remove the shunt
4. Power on the system

3 BIOS Configuration

After hardware configuration of P5F78 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.

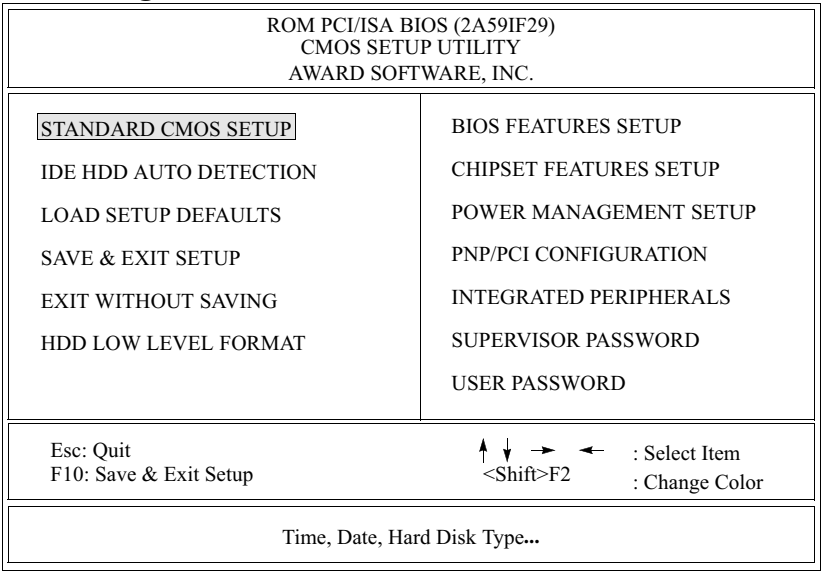
After the POST routines are completed, the following message appears:

"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 (2A59IF29)
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

ROM PCI/ISA BIOS (2A59IF29)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	: Disabled
CPU Internal Cache	: Enabled
External Cache	: Enabled
Quick Power On Self Test	: Enabled
Boot Sequence	: C, A, SCSI
Swap Floppy Drive	: Disabled
Boot Up Floppy Seek	: Disabled
Boot Up NumLock Status	: On
Gate A20 Option	: Fast
Typematic Rate Setting	: Disabled
Typematic Rate (Chars/Sec)	: 6
Typematic Delay (Msec)	: 250
Security Option	: Setup
PCI/VGA Palette Snoop	: Disabled

Video BIOS Shadow	: Enabled
C8000 - CBFFF Shadow	: Disabled
CC000 - CFFFF Shadow	: Disabled
D0000 - D3FFF Shadow	: Disabled
D4000 - D7FFF Shadow	: Disabled
D8000 - DBFFF Shadow	: Disabled
DC000 - DFFFF Shadow	: Disabled
OS Select For DRAM > 64MB	: Non-OS2

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

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

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

Typematic Rate Setting: The default setting is "Disabled". 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 “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.

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

ROM PCI/ISA BIOS (2A59IF29)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

Auto Configuration	:	Enabled	Memory Hole At 15M-16M	:	Disabled
DRAM Timing	:	60 ns	PCI 2.1 Compliance	:	Enabled
DRAM Leadoff Timing	:	10 / 6 / 3			
DRAM Read Burst (EDO/FP)	:	x222/x333			
DRAM Write Burst Timing	:	x222			
Fast EDO Lead Off	:	Disabled			
Refresh RAS# Assertion	:	4 Clks			
Fast RAS To CAS Delay	:	3			
DRAM Enhanced Paging	:	Disabled			
SDRAM (CAS Lat/RAS-to-CAS)	:	3/3			
SDRAM Speculative Read	:	Disabled			
System BIOS Cacheable	:	Enabled			
Video BIOS Cacheable	:	Enabled			
8 Bit I/O Recovery Time	:	1			
16 Bit I/O Recovery Time	:	1			

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 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.

Auto Configuration: The default setting is "Enabled" which will set optimal DRAM timing automatically depending on whether the DRAM used is 70ns or 60ns. The other option is "Disabled" which allows you to change DRAM timing manually.

DRAM Timing: This option should be set according to the speed of the DRAM in the system. The options are "60ns" and "70ns".

DRAM Leadoff Timing: The options are "11/7/3", "10/6/3", "11/7/4" and "10/6/4". This option controls additional DRAM timings for Read leadoff, Write leadoff, RAS# precharge and RAS-to-CAS delay. Slower leadoffs may be required in a system that uses slower memory. Normally Set this option to "10/6/3" for 60ns DRAMs and set to "10/6/4" for 70ns DRAMs.

DRAM Read Burst (EDO/FP): The options are "x444/x444", "x333/x444" and "x222/x333". The timing used depends on the type of DRAM on per-bank basis. Slower rates may be required for slower memories. Normally set this option to "x222/x333" for 60ns DRAMs and set to "x333/x444" for 70ns DRAMs.

DRAM Write Burst Timing: The options are "x444", "x333" and "x222". The timing used depends on the type of DRAM on per-bank basis. Slower rates may be required for slower memory. Normally set this option to "x222" for 60ns DRAMs and set to "x333" for 70ns DRAMs.

Fast EDO Lead Off: If set to "Enabled", this enables fast timing EDO read cycles. This results in a 1 hclk pull-in for all read leadoff latencies for EDO DRAMs. This option has to be set to "Disabled", if any of the DRAMs rows is populated with FPM DRAMs. The default setting is "Disabled".

Refresh RAS# Assertion: The options are "4 Clks" and "5 Clks". This option controls the number of clocks RAS# is asserted for refresh cycles. The default setting is "4 Clks".

Fast RAS to CAS Delay: The options are "2" and "3". This option controls the number of clocks for row miss leadoff timing delay. The default setting is "3".

DRAM Enhanced Paging: If set to "Enabled", the memory controller will keep the page open until a page/row miss. This option should be set to "Disabled" for normal operation. The default setting is "Disabled".

SDRAM (CAS Lat/RAS-to-CAS): The options are "2/2" and "3/3". This option controls the number of clocks required for CAS latency,

RAS-to-CAS delay, RAS# precharge, RAS# active-to-precharge and Refresh-to-RAS# for all SDRAM cycles. Slower rate "3/3" may be required for slower SDRAMs or more than two banks of SDRAM DIMMs installed. The default setting is "3/3".

SDRAM Speculative Read: When set to "Enabled", the SDRAM speculative read logic is enabled. This option should be set to "Disabled": when both EDO/FPM and SDRAM are populated in the system or more than one row of memory is used in the system. The default setting is "Disabled".

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".

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 "Disabled". 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.

PCI 2.1 Compliance: When set to "Enabled", the Passive Release and Delay Transactions mechanisms designed for complying with PCI 2.1 specification are enabled. The default setting is "Enabled".

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 (2A59IF29)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	:	User Define
PM Control by APM	:	Yes
Video Off Method	:	V/H SYNC+Blank
Doze Mode	:	Disable
Standby Mode	:	Disable
Suspend Mode	:	Disable
HDD Power Down	:	1 Min.
Fan Off in Suspend	:	Enabled
Power - Off by PWR-BTTN	:	Instant - Off
Power-On by Ring	:	Enabled
Power-On by Alarm	:	Disabled

** Reload Global Timer Events **

IRQ [3-7, 9-15], NMI	:	Enabled
Primary IDE 0	:	Disabled
Primary IDE 1	:	Disabled
Secondary IDE 0	:	Disabled
Secondary IDE 1	:	Disabled
Floppy Disk	:	Disabled
Serial Port	:	Disabled
Parallel Port	:	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 "V/H SYNC+Blank" This setting disables V/H SYNC signals and blanks the screen in power saving mode. Other options are "Blank Screen" and "DPMS".

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 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.

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.

FAN off in Suspend: If set to "Enabled" CPU fan will be turned off in Suspend Mode.

Power-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 go to the sleep mode. Note: During the booting process, the power button is ignored. The default setting is "Instant-Off".

Power-On by Ring: 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 P5F79)

Power-On by Alarm: If "Enabled" you may set date (of month), hour, minute and second to turn on your system. (Note: you need to use ATX power supply to have this feature on P5F79)

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.

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

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:

PNP / PCI Configuration

ROM PCI/ISA BIOS (2A59IF29)
PNP / PCI CONFIGURATION
AWARD SOFTWARE, INC.

Resources Controlled By	:	Manual
Reset Configuration Data	:	Disabled
IRQ-3 assigned to	:	Legacy ISA
IRQ-4 assigned to	:	Legacy ISA
IRQ-5 assigned to	:	PCI / ISA PnP
IRQ-7 assigned to	:	Legacy ISA
IRQ-9 assigned to	:	PCI / ISA PnP
IRQ-10 assigned to	:	PCI / ISA PnP
IRQ-11 assigned to	:	PCI / ISA PnP
IRQ-12 assigned to	:	PCI / ISA PnP
IRQ-14 assigned to	:	Legacy ISA
IRQ-15 assigned to	:	Legacy ISA
DMA-0 assigned to	:	PCI / ISA PnP
DMA-1 assigned to	:	PCI / ISA PnP
DMA-3 assigned to	:	PCI / ISA PnP
DMA-5 assigned to	:	PCI / ISA PnP
DMA-6 assigned to	:	PCI / ISA PnP
DMA-7 assigned to	:	PCI / ISA PnP

PCI IDE IRQ Map To	:	PCI - AUTO
Primary IDE INT#	:	A
Secondary IDE INT#	:	B
PNP OS Installed	:	No

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

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.

PCI IRQ Actived By: Options are "Level" or "Edge". The default setting is "Level". This option is used to select the IRQ's trigger method.

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.

PNP OS Installed: Set this option to "Yes", if your system is running under a Plug and Play Operating System such as Windows 95 and Windows NT. The default setting is "Yes"

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

ROM PCI/ISA BIOS (2A59IF29)
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	:	Disabled
Onboard FDD Controller	:	Enabled
Onboard Serial Port 1	:	3F8 / IRQ4
Onboard Serial Port 2	:	2F8 / IRQ3
UART 2 Mode	:	Normal

Onboard Parallel Port	:	378 / IRQ7
Onboard Parallel Mode	:	Normal

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.

PCI Slot IDE 2nd Channel
The default setting is "Enabled". This option enables the Secondary PCI IDE controller of the PCI IDE adapter.

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 a Universal Serial Bus (USB) keyboard is used in your system. The default setting is "Disabled".

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 "Normal" (default), "AKSIR" and "HPSIR". When set to "AKSIR" or "HPSIR" (depends on the type of infrared module), the UART 2 is used to support the infrared module connected on the mainboard. If this option is not set to "Normal", a device connected to the COM2 port, will no longer work.

Onboard Parallel Port: This option is used to assign the I/O address for the onboard parallel port. The options are "378/IRQ7" (defaults), "278/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 JP3 to short pin 2 and pin 3 for 5 seconds, then removing the shunt.

4 Driver and Utility

4.1 Flash Utility

The BIOS of the P5F78 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 nor AUTOEXEC.BAT files. If you are using MS-DOS 6.x, you can press <F5> function key while the “Starting MS-DOS...” appears 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 82430TX chipset is intended to reduce the workload of the CPU and make the CPU run 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 operate at bus-mastering DMA or Ultra DMA33 mode.

There are three self-extracting archives 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.

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