CF-7989

MOTHER BOARD

USER'S MANUAL

Copyright Notice

Using This Manual

This manual is designed to help you build a reliable Personal Computer based on the CF-7989 platform.

Chapter 1 - Quick Reference

This chapter is for advanced users who want to quickly assemble a system. The mainboard layout along with jumper and switch settings, and memory configuration are provided.

Chapter 2 - Introduction

This chapter includes an introduction, a checklist of the items that ship with this mainboard, and a summary of the principal features and components.

Chapter 3 - Hardware Installation

This chapter explains how to prepare your mainboard for use and how to make the various connections to other computer components and peripheral items.

Chapter 4 - BIOS Configuration

This chapter explains how to use the system setup utility that is stored in the mainboard′s firmware.

Chapter 5 - Driver and Utility

This chapter briefly describes the drivers and utility programs that are packaged with the mainboard.

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1. CF-7989 Quick Reference

This section is for users to get started using the mainboard straight away.

1.1. Mainboard Layout
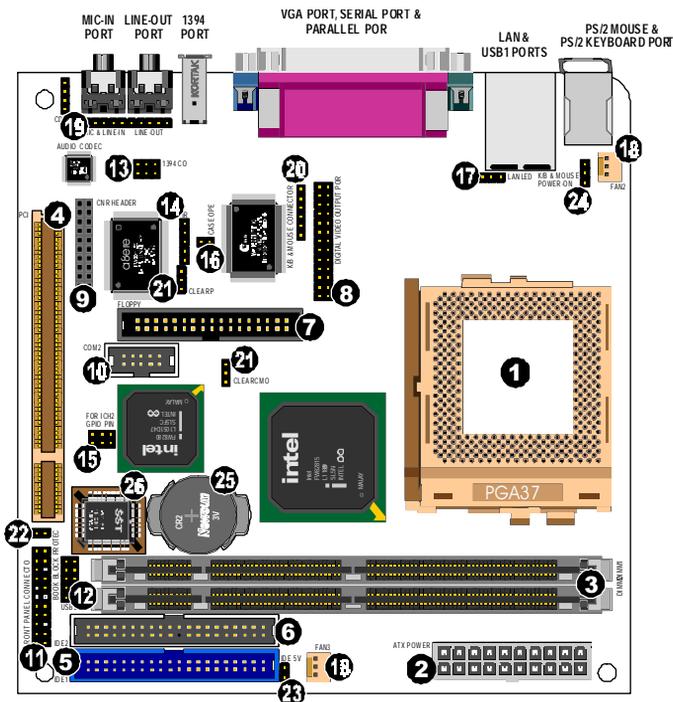
1.	PGA370 CPU socket (PGA370)
2.	ATX power connector (J27)
3.	DIMM module sockets (DIMM1~2)
4.	PCI connector (PCI1)
5.	IDE connector (IDE1)
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1.2. I/O Ports

PS/2 Mouse port LAN port Parallel port

IEEE-139 Connector Line-Out MIC-In

PS/2 Keyboard po USB ports r COM1 port VGA port
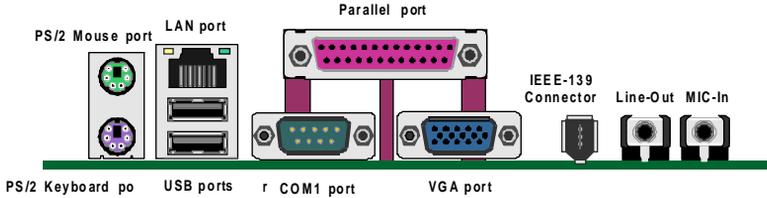
1.3. Front Panel Connector

The following illustration shows the front panel connector pin assignments:

Pin 1

SPEAKER (SPKR) — Speaker-ou — LED cathode — (HLED) HDD LED

Ground — LED anode

Ground

+5V — LED cathode — (GLED) Gree LED

EPMI — LED anode

LED cathode — Reset Single — (RST) RESET BUTTON

POWER LED & KEYLOCK (PLED & keylock) — Non — +5V

LED anode

Keyboard — Power on/off — (PW ON) POWER SWITCH

Ground — Ground
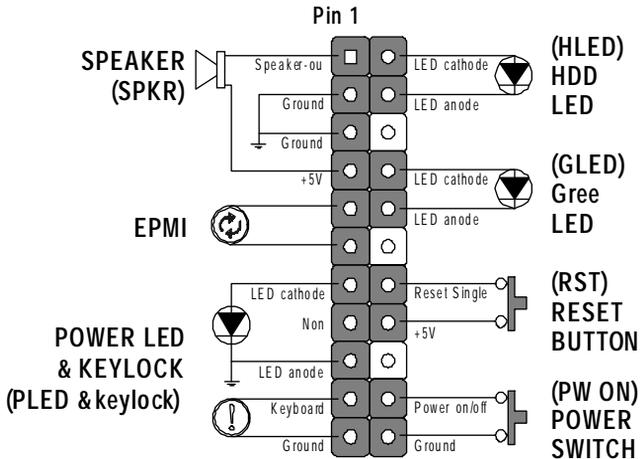
1.4 Jumpers

J3	1-2	Normal Mode
	2-3	Clear Password (PSW)
J9	1-2	Normal Mode
	2-3	Clear CMOS
J34	Open	NC
	Short	Controller Assign Vcc 5V
J8	Open	Book block protect
	Short	Reflashing the BIOS
JP11	1-2	Enabled Mouse & Keyboard Power-O
	2-3	Disabled Mouse & Keyboard Power-On

1.5. PCI and AGP Frequency Setting

The PCI and AGP frequency settings are automatically set by the system

1.6. Memory Installation

Note: The Intel 815EG B-Step chipset family used in this mainboard supports up to two double-sided or three single-sided DIMMs when the SDRAM interface is operating at 133 MHz. Installing DIMM modules that exceed these specifica-tions requires that the BIOS down-shifts the SDRAM clocks to 100 MHz through a two-wire interface of the system clock generator.

168-Pin DIMM SDRAM Memory Configuration

Bank 0 (DIMM1)	8,16,32,64,128,256 MB
Bank 0 (DIMM1)	8,16,32,64,128,256 MB
Total	8 MB to 512 MB

1.7. Connectors

FAN2	**CPU/Chipset FAN Connector:** This 3-pin header is use for connecting a CPU chipset fan.
FAN3	**System Fan Connector:** This 3-pin header is for connecting the case fan that keeps the system cool.
JP7	**1394 Connector:** This 6-pin header is used for connecting a 1394 devices.
JP6	**COM2 Serial Port Connector:** This 10-pin header ar used to connect a serial port extension bracket for addin a second serial port to your system.
J26	**Digital Video Output Port:** This 26-pin header is used for connecting an Video port for use of Video devices.
FLP1	**Floppy Port Connector:** This 34-pin header is used for connecting an Floppy port for use of Floppy devices.
JP12	**CNR Expansion Connector:** This 20-pin header is used for connecting to Communication/Network Riser Card.
J16	**Infrared (IR) Connector:** This 5-pin header is used t connect an infrared (IR) port for use of IR devices.
J17	**Front USB Connectors:** This 10-pin header is used for connecting front panel USB ports 3 and 4.
J35	**ICH2 GPIO Pin Connector:** This 3-pin header is used for connecting ICH2 GPIO pin 12 and 28.
J36	**ICH2 GPIO Pin Connector:** This 3-pin header is used for connecting ICH2 GPIO pin 24 and 27.
JP9	**CD-IN Connect**or: This 4-pin headers is used for connecting the CD ROM audio input to the sound card.
JP4	**LINE-OUT Connector:** This 5-pin header is used for connecting the stereo headphones or to amplified speaker.
JP1	**MIC & LINE-IN Connector:** This 5-pin header is used for connecting the stereo microphone and stereo line-level input on the front panel.

J37	**LAN LED Connector:** This 3-pin header is used for connecting LAN LED cable on the front panel.
JP13	**PS/2 Mouse and Keyboard Connectors:** This 6-pin header is used for connecting cable at the front panel PS/2 Mouse and Keyboard of mainboard.
J25	**Case Open Connector: This 2-pin header is used two warn if the case is not correctly closed.**

2. Introduction

2.1. Overview

The high quality CF-7989 is a high performance, enhanced function mainboard that supports 64-bit Intel FC-PGA, FC-PGA2, and Pentium III/ Cyrix Socket 370 processors. The CF-7989 is based on the Intel® 815EG B-Step chipset. Intel delivers superior high performance with all the innovative features and proven reliability of the Intel® 815EG B-Step chipset family. Pin-to-pin compatible with the Intel® 815EG B-Step chipset.

The mainboard delivers comprehensive multi-media capabilities and bus mastering EIDE (Enhanced IDE) controller, and concurrent PCI bus. The mainboard accommodates SDRAM (Synchronous DRAM) memory and supports ATA33/66/100.

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

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 1394 Port, Digital Video Output Port, Fan Off in sleeping state and BIOS upgradability are provided with this platform.

2.2. Mainboard Specifications and Features

2.2.1. Hardware

CPU	Intel® FC-PGA, FC-PGA2 Pentium® III/Cyrix Socket 370 Processors, Tualatin or other compatible Auto-detection CPU
VRM	Onboard Voltage Regulator Module
	Provides 1.05V to 1.825V operating voltage
Coprocessor Speed	CPU has built-in floating point unit
	System bus clock 66/100/133 MHz
	PCI bus clock 33 MHz
Chipset	Intel® 815EG B-Step AGP set
	82801BA I/O Controller Hub (ICH2)
DRAM	Two 168-pin DIMM sockets, up to 256MB
	Supports 8 MB to 512MB SDRAM memory types
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 two Bus Mastering Ultra DMA-ATA 33/66/100 drives
Enhanced I/O	Supports Iomega ZIP or LS-120 removable drives One floppy disk controller
	One Standard/EPP/ECP parallel port connector
	Two 16550 compatible serial port connectors
	Two USB (Universal Serial Bus) ports on board, two front USB ports by cable
I/O Options	One line-out, mic-in, line-in, LAN, 1394 on board, One IrDA compatible infrared (IR) connector
	One connector for front panel USB ports
	One COM port by cable
Mouse	PS/2 mouse connector and
Keyboard	PS/2 keyboard connector on board

Expansion Slots	One 32-bit PCI slot
	One Digital Video ouptup header
	One CNR header
Power Management	Compliant with EPA, APM 1.2 and ACPI
	Auto Power on
	ATX soft-off power control
	Power – on by keyboard and PS/2 mouse
	Power – on by external modem ring
	Power – on by alarm
	Fan off in sleep mode
System Management	CPU temperature warning and system temperature detection
	CPU and system voltage detection
	CPU and secondary fan RPM detection
	Switching regulator
Voltage Regulator	CPU voltage auto-detection
	Switching regulator
	CPU voltage auto-detection
Form Factor	FATX form factor 17 cm x 17 cm (6.7 x 6.7-inch)

2.2.2.　　Software

BIOS	AWARD AGP/PCI BIOS
	2M-bit Flash BIOS with ESCD (Extended System Configuration Data) block
	Supports APM, Plug and Play, Multi-Boot, DMI and EIDE devices
	Supports ACPI
	Supports high-capacity LS-120 and ZIP removable media drive

Driver and Utility	IDE Bus mastering Ultra DMA driver
	Flash utility for BIOS upgrade
	System Environment Monitoring Utility
	Optional AD1881A audio drivers
Operating System	Operates with MS_DOS, Windows 3.x/9x/ME/XP/ 2000/NT, OS/2, Novell NetWare/UnixWare 1.1, and SCO Unix 4.2

2.2.3.   Environment

Ambient Temperature	0ºC to 50ºC (operating)
Relative Humidity	0 to 85% (operating)
Vibration	0 to 500 Hz
DC Voltage	4.9V to 5.2V
DC Voltage	1.05V to 1.825V
DC Voltage	-5V, +12V, -12V, +5VSB 5% tolerance

2.3. Mainboard Layout
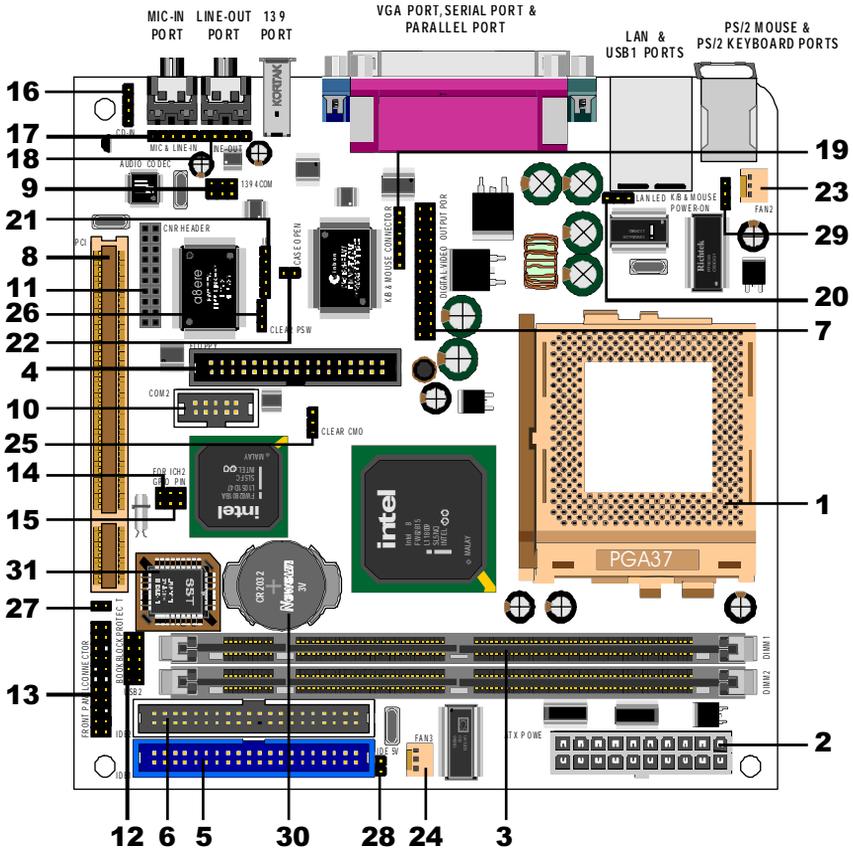
Note: *Because of optional items and design changes, your mainboard may not be identical to the one shown in the illustration.*

Key to Mainboard Components

No.	Name	Function
1	**PGA370**	CPU socket
2	**J27**	ATX power connector
3	**DIMM1~**	Memory module slots
4	**FLP1**	Floppy drive connector
5	**IDE1**	IDE 1 connector (blue)
6	**IDE2**	IDE 2 connector (white)
7	**J26**	Digital Vidio output port
8	**PCI1**	32-bit PCI slot
9	**JP7**	6-pin 1394 header
10	**JP16**	COM2 connector
11	**JP12**	CNR header
12	**J17**	Front USB prot3~4
13	**J29**	Front Panel connector
14	**J35**	ICH2 GPIO pin 12 ,28
15	**J36**	ICH2 GPIO pin 24, 27
16	**JP9**	Audio CD-In header
17	**JP1**	Audio Mic-In and Line-In header
18	**JP4**	Audio Line-Out header
19	**JP13**	PS/2 Keyboard and Mouse headers
20	**J37**	LAN LED header
21	**J16**	IrDA compliant Infrared (IR) connector
22	**J25**	Case Open header
23	**FAN2**	CPU/chipset fan connector
24	**FAN3**	Secondary case fan connector
25	**J9**	Clear CMOS
26	**J3**	Clear Password (PSW)
27	**J8**	BIOS block protect

No.	Name	Function
28	**J34**	IDE VCC
29	**JP11**	PS/2 Mouse and Keyboard Power-O
30	**BT1**	RTX battery
31		Flash BIOS

2.4. Microprocessor

The mainboard is designed to operate with the following processors:

Processor Type	FSB
Intel FC-PGA Celeron	66/100 MHz
Intel FC-PGA Pentium III	100/133 MHz
Intel FC-PGA2 (Tualatin) Pentium III	133 MHz
VIA Cyrix C3	100/133 MHz

An onboard switching voltage regulator provides the required 1.05 to 1.825 volts for the processor. The processor sends five VID (Voltage Identification) signals to the switching voltage regulator. The switch-ing regulator generates the correct voltage for the processor.

2.5. CPU Packaging

PGA370 CPUs are packaged in a FC-PGA, FC-PGA2 configuration.

2.6. Chipset

The CF-7989 supports the Intel 815EG chipset. The 815EG chipset is designed for desktops and workstations that provide internal or external graphics, and provides ATA-100 and SDRAM support.

The 82801BA I/O controller hub makes a direct connection between the graphics system, the IDE controller, and the PCI bus. It uses accelerated hub architecture to effectively double the bandwidth between these components enabling more lifelike audio and video. The 82801BA I/O controller hub includes an integrated audio-codec controller that lets the processor more effectively decode sound generated by the integrated audio system.

The 82802 Firmware Hub allows the system and video BIOS to be stored (eliminating the need for non-volatile CMOS memory) for faster execution, and provides a random number generator to enable strong encryption routines.

This concludes Chapter 2. Chapter 3 covers hardware installation.

3. Hardware Installation

This chapter explains how to use your mainboard to build a powerful computer system. At a minimum, you will need the following components in order to build a fully functioning system.

- ◆ Computer case with ATX power supply
- ◆ PGA370 Processor
- ◆ One SDRAM memory module
- ◆ One floppy disk drive
- ◆ One UDMA-66/100 IDE hard disk drive
- ◆ One CD-ROM drive
- ◆ One display monitor
- ◆ One PS/2 mouse
- ◆ One PS/2 keyboard
- ◆ One set of loudspeakers

Of course, you can use the system I/O ports and expansion slots to add many more features and components to your system than the items listed above.

3.1. Unpacking

The CF-7989 mainboard package contains the following items:

- ❑ One mainboard
- ❑ One IDE 66/100 40-pin ribbon cable
- ❑ One floppy 34-pin ribbon cable
- ❑ Driver and utility CD
- ❑ One dual port USB bracket
- ❑ User's manual

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

3.2. Installation

The CF-7989 is designed to fit into a standard FATX form factor chassis. The pattern of the mounting holes and the position of the back panel connectors meet the FATX system board specification. The chassis comes 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 the CPU and DIMM memory modules, attach the connectors, and set the correct CPU speed in the CMOS setup.

3.3. Safety Measures

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous. Follow the simple guidelines below to avoid damaging your computer:

◆ Always disconnect the mainboard from the ATX power supply, and disconnect the computer from the power outlet whenever you are working inside the computer case.

◆ If possible, wear a grounded wrist strap when you are in-stalling the mainboard or working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the computer case, or the bare metal body of any other grounded appliance.

◆ Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Do not flex or stress the circuit board.

◆ Leave each component inside the static-proof packaging that it ships with until you are ready to use the component for the installation.

3.4. Connector/Jumper Location
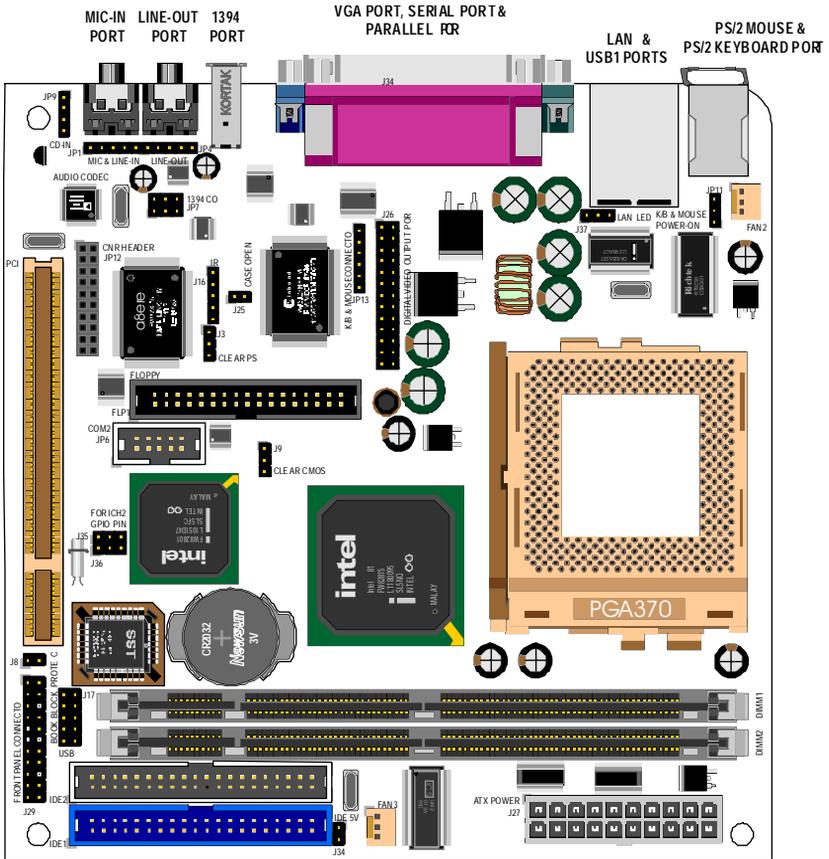
3.5. Attaching Connectors

3.5.1.   Front Panel Connectors (J29)

There are seven connectors on the mainboard for speaker, switches, and indicator lights on the system's front panel.
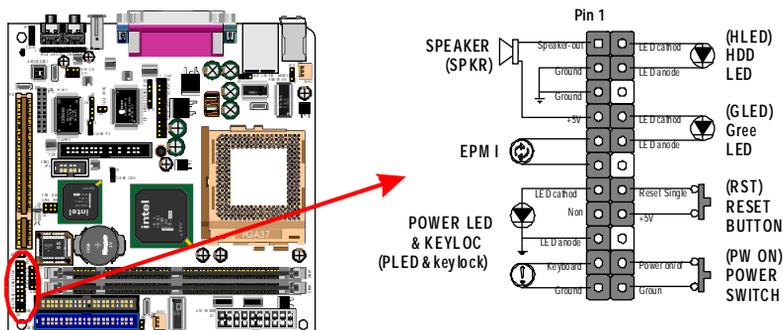
PW ON	This 2-pin connector connects to the case-mounted Power button.
RST	This 2-pin connector connects to the case-mounted reset switch and is used to reboot the system.
GLED	This 2-pin connector connects to the case-mounted Green LED to indicate a standby status. The LED remains lit even when the system is off to indicate that AC power is available. When the system enters standby mode, th LED starts blinking.
HLED	This 2-pin connector connects to the case-mounted HDD LED to indicate hard disk activity.
PLED & keylock	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.
EPMI	This 2-pin connector connects to the case-mounted EPMI. The EPMI switch is used to into power saving and resume.
SPKR	This 4-pin connector connects to the case-mounted speaker.

3.5.2. Infrared (IR) Connector (J16)

This 5-pin connector connects to an optional wireless transmitting and receiving infrared module via a cable and a bracket. Configure BIOS to enable the IrDA port if you attach an infrared module to this connector. Refer to Integrated Peripherals in Chapter 4 for details.

Pin 1 — VCC
CIR
IRRX
GND
IRTX
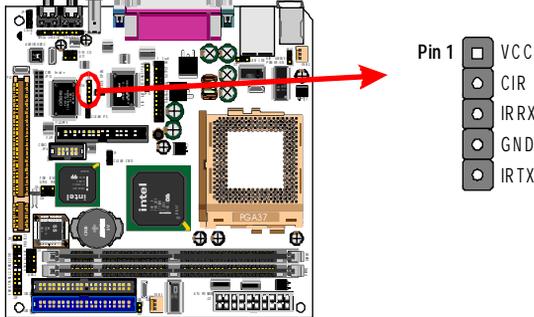
3.5.3. Audio CD-In Connector (JP9)

This connector enable you to connect a CD-ROM to the mainboard and receive stereo audio input.

Pin 1 — Left Channel
GND
GND
Right Channel
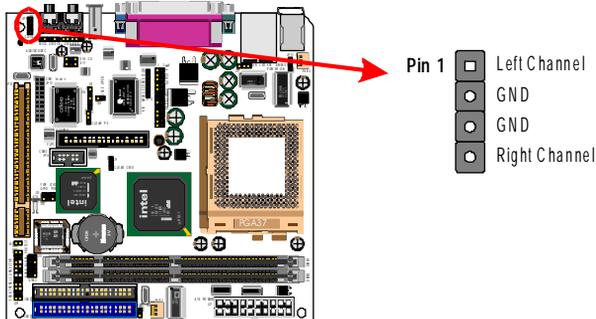
3.5.4. Audio Line-Out Connectors (JP4)

Connect the cable attached to line-out connector on front panel. This header shared same signal whth line-out on back panel.
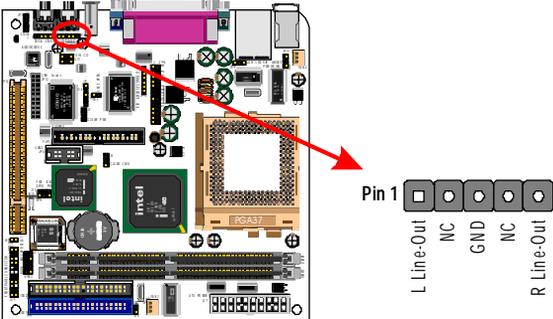
3.5.5. LAN LED Connector (J37)

Connect on set of 3-pin of LAN LED cable to LAN LED header, when detecting the outside signal, the LED head would be light, and the light will besparkle during the transferring data.
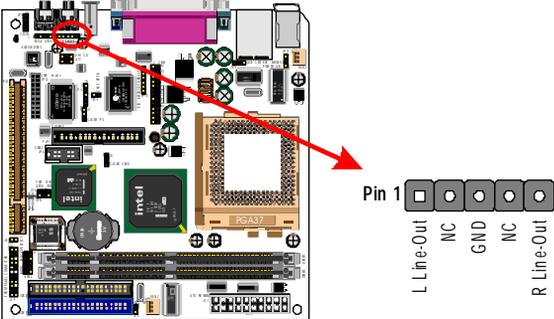
3.5.6. Audio Mic-In and Line-In Connectors (JP1)

Connect a tape player or another audio source to the light blue Line-in connector to record audio on your computer or to play audio through your computer's sound chip and speakers.

Connect a micro-phone to the pink microphone connector to record audio to your computer.
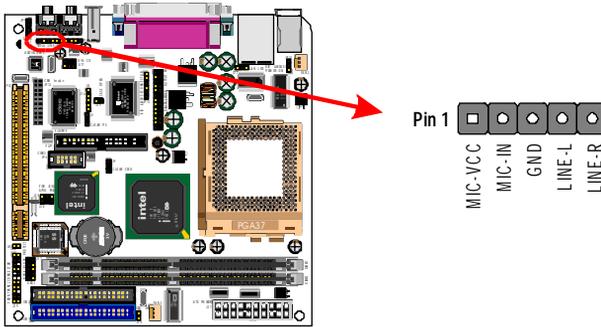
3.5.7. ICH2 GPIO Pin Connectors (J35/J36)

These connectors enable you to connect ICH2 GPIO Pin.
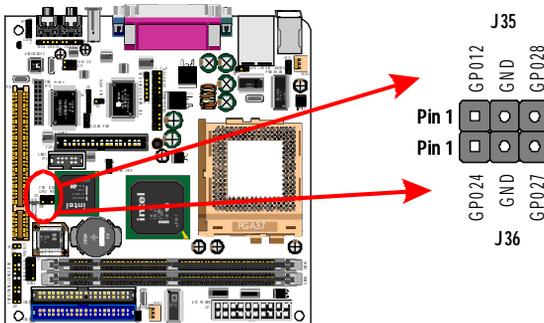
3.5.8.   Case Open Header (J25)

This 2-pin header with chassis cover. This function activate detection any intrusion into the chassis.
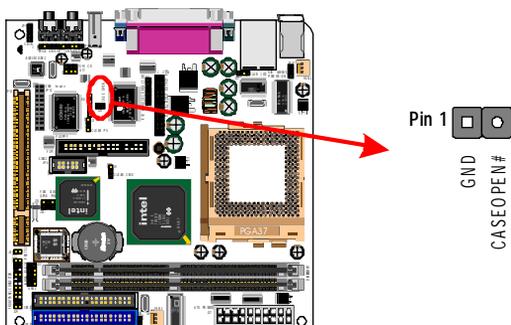
3.5.9.   Serial COM2 Headers (JP6)

The mainboard provides one onboard 10-pin serial headers. The headers on the same signal with COM1 on the back panel.
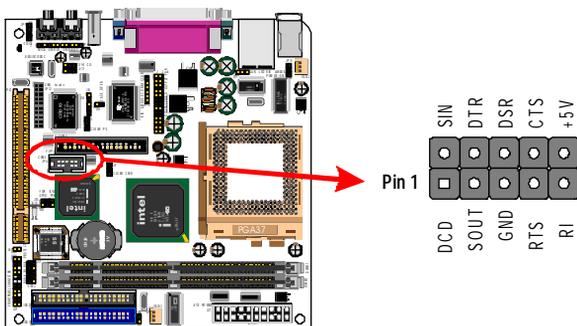
3.5.10. Front USB Header (J17)

The mainboard provides oen onboard 10-pin of dual USB port (port 3 and port 4) headers. The headers on the same signal with USB port 1 and port 2 on the back panel.
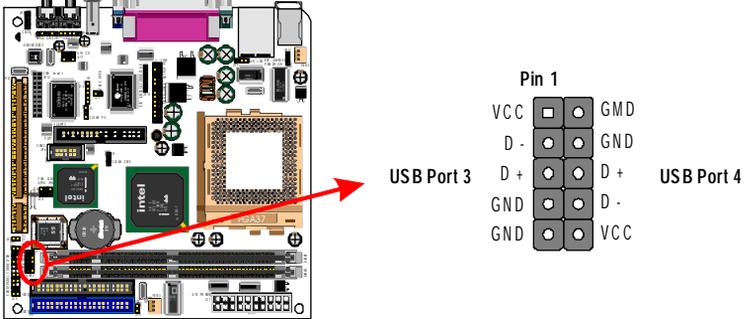
3.5.11. CNR Header (JP12)

The CNR headers Supports the Audio, modem, lan, HomePNA of Intel 82801BA chipset.
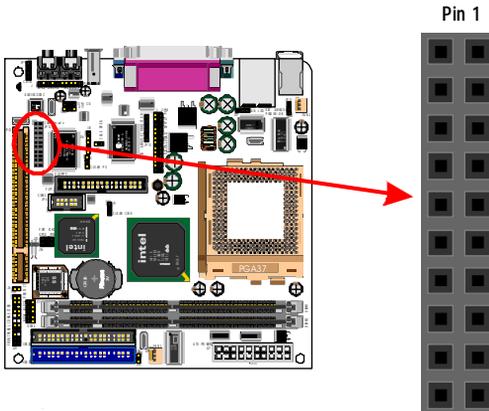
3.5.12. Floppy Drive Header (FLP1)

A floppy disk drive ribbon cable has two connectors to support two floppy disk drives. The connector with twisted wires always connects to drive A; 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 corresponds with pin 1 of the I/O port connector.
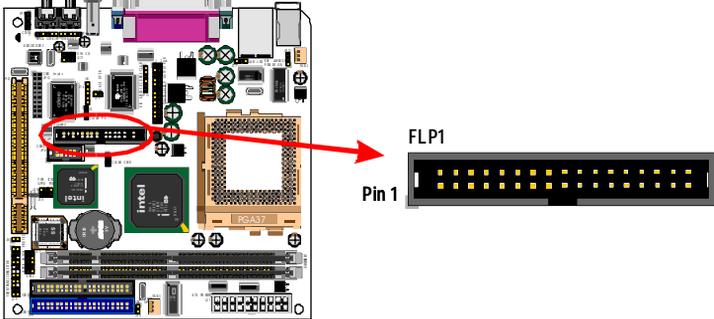
3.5.13. 1394 Header (JP7)

This 6-pin header enable you to connect a 1394 device on the 1394 header.
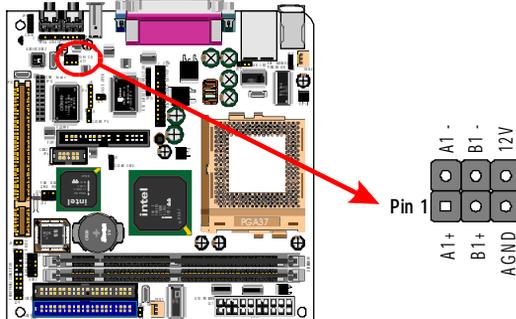
3.5.14. IDE Connectors

An IDE drive ribbon cable has two 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 connec-tor so that the pin 1 (color) edge of the cable corresponds to pin 1 of the I/O port connector.
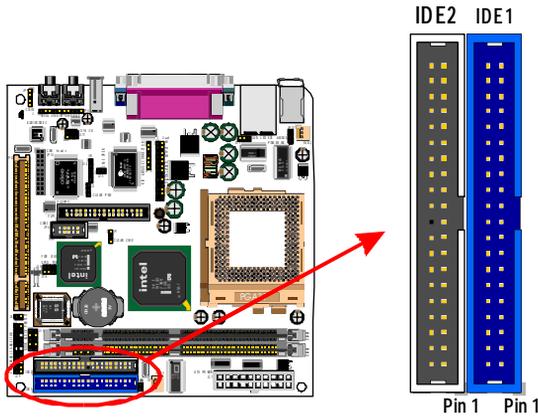
3.5.15. Back Panel Connectors

The back panel provides external access to PS/2 style keyboard and mouse connectors, one serial port, one VGA port, one parallel port, dual USB ports, one LAN port, one 1394 port, and audio Line-out, Mic-in port which are integrated on the mainboard. The figures below show the location of the back panel I/O connectors.

PS/2 Mouse and PS/2 Keyboard Ports
Connect a PS/2 mouse to the green 6-pin mini DIN connector. The system will automatically assign IRQ 12 to the PS/2 mouse if one is connected.

PS/2 Mouse port
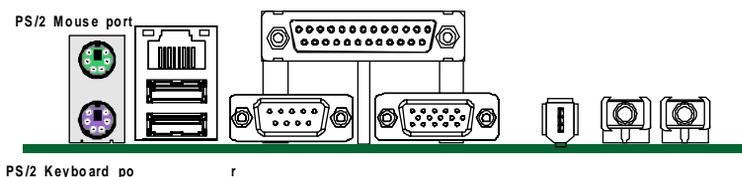
PS/2 Keyboard po   r

Connect a PS/2 keyboard to the purple 6-pin mini DIN connector. If you want to connect a standard AT size (large DIN) connector, you must use an adapter.

Universal Serial Bus Ports
You can connect two USB devices or USB hubs to the USB ports.
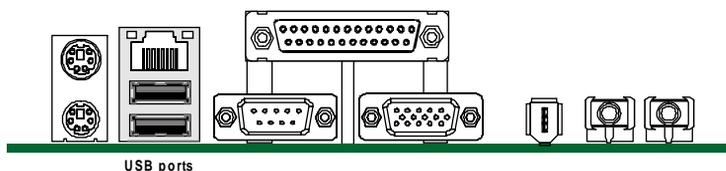
USB ports

The USB ports provide a hardware interface for low-speed peripher-als such as the keyboard, mouse, joystick, scanner, printer and telephony devices, and also support MPEG-1 and MPEG-2 digital video. The USB ports have a maximum bandwidth of 12 Mbits/sec (equivalent to 1.5 Mbytes/sec), and up to 127 devices can be attached. Fast devices can use the full bandwidth, while lower-speed ones can transfer data using a 1.5 Mbits/sec sub-channel.

LAN Port

Connect a device to the LAN port on the back panel.
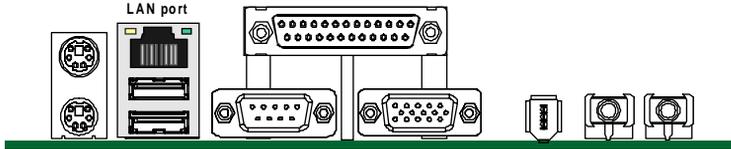
Parallel Port

Connect a printer or other parallel device to the burgundy-colored 25-pin parallel port. You can set the parallel port IRQ and parallel port mode in BIOS. Refer to Integrated Peripherals in Chapter 4 for details.
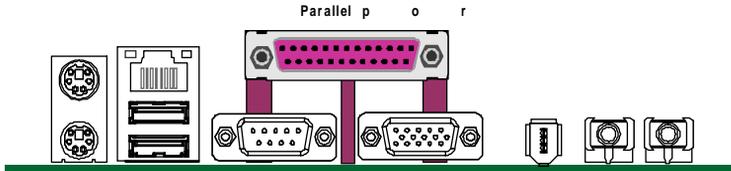
VGA Port

Connect an external monitor to the blue 15-pin VGA port.
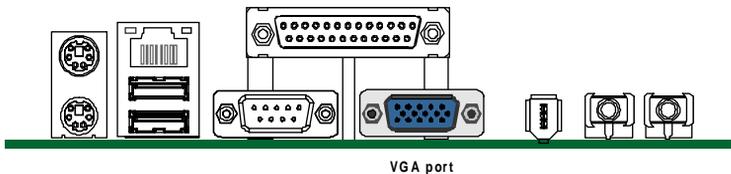
Serial Port

Connect a serial device such as a mouse or modem to the turquoise 9-pin serial port. You can set the serial port IRQs in BIOS. Refer to In-tegrated Peripherals in Chapter 4 for details.

COM1 port
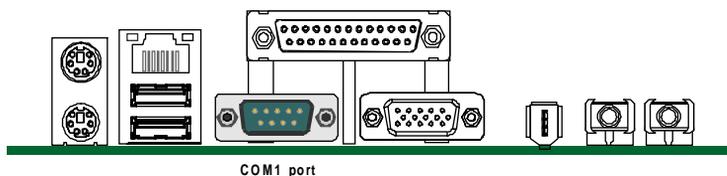
Note: Serial printers must be connected to the serial port.

1394 Port Connector
You can connect 1394 devices to 1394 port on the back panel.

1394 por
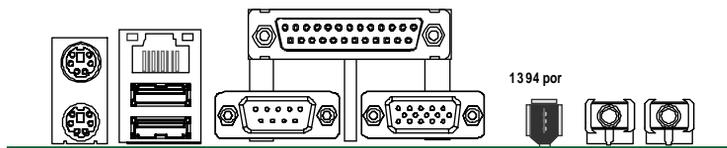
Audio Line-Out Port Connectors
You can connect various audio devices to this audio jacks. Connect headphones or powered speakers to the lime-colored lineout connector.

Line-Out
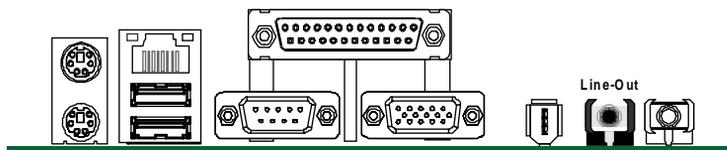
Audio Mic-In Port Connectors
You can connect dynamic mono or stereo microphone to the mic-in connector.

Mic-In
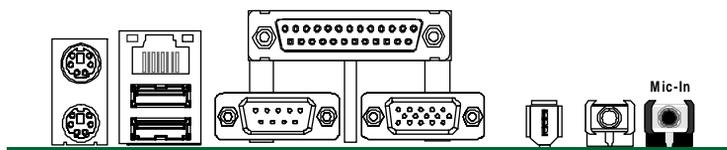
3.5.16. Power Supply Connector (J27)

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.
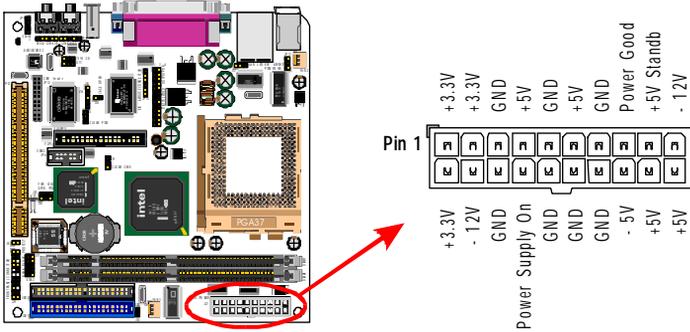
> **Warning:** Incorrect installation of the power supply could result in serious damage to the mainboard and connected peripherals. Make sure the power supply is unplugged from the AC outlet before connecting the leads from the power supply.

3.5.17. CPU/System Fan Power Supplies (FAN2/3)

There are two fan connectors on the mainboard for the cooling fans. The connectors support fans of 12V DC/500mAMP (six watt) or less. When the system goes into sleep state, fans should be shut down to eliminate audible noise and reduce power consumption. You can monitor the fan speed by way of the 82801BA chip (providing the fan comes with a tachometer output).

CPU FAN
Pin 1
Speed/RPM
+12V
GND

System FAN
Pin 1
Speed/RPM
+12V
GND
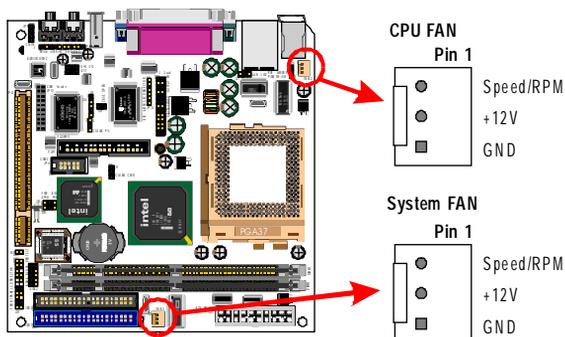
3.5.18. Digital Video Output Port (J26)

The mainboard provide one 26-pin header enable you to connect a Digital Video devices on the digital video port.

Pin 1
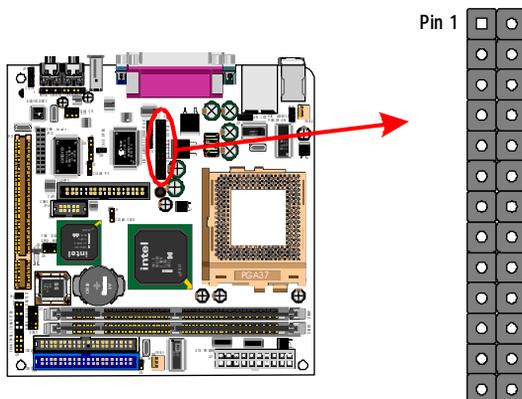
3.5.19.   PS/2 Mouse & Keyboard Connector (JP13)

Attach PS/2 Mouse & Keyboard device cable to the PS/2 Mouse & Keyboard header at the front panel of your computer.
This 6-pin header shares the same signal with PS/2 Mouse and PS/2 Keyboard on back panel.

Pin 1 K/B CLK
K/B DATA
VCC
MOUSE CLK
MOUSE DATA
GND
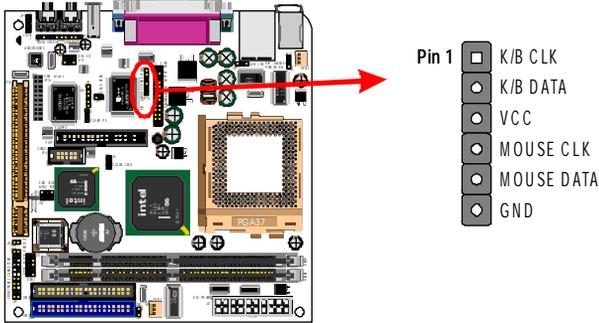
3.5.20.   PCI Connector (PCI1)

PCI connector is one of equipment interfaces that connects pheripheral equipment and motherboard. Its transfer speed is faster than traditional ISA. PCI is the mainstream transfer interface for extra adopter.

PCI   Pin 1
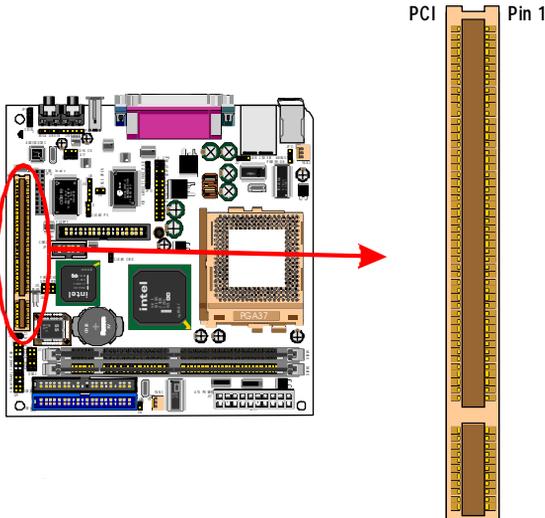
3.6. Installing the CPU

3.6.1.   Before You Begin

1. Be sure that your processor kit includes the following items:

    ❑ One processor with the fan or heat sink attached
    ❑ One power cable (for CPU with cooling fan attached)

2. Place the mainboard on a workbench (not in a chassis). Be sure that
    the mainboard is empty (that is, no DIMMs, ca-bles, or cards are
    installed) and that the holes for the fan or heat sink support pegs are
    empty.

3.6.2.   Installation Procedure

1. On the motherboard, identify the CPU Socket 370 and the cooling fan

CPU FAN Power Supply

Pin 1

CPU SOCKET370
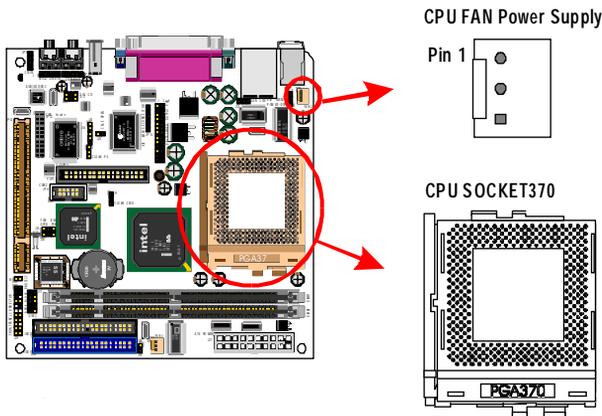
PGA370

    power-supply connector CPU FAN.
2. Push the CPU socket lever slightly to the side and then raise it as far as
    it can go.
3. Identify the pin-1 corner of the PGA370. The pin-1 corner is on the
    same side as the locking lever, as shown in the illustration below.
4. Identify the pin-1 corner of the processor (the pin-1 corner on the
    processor has a beveled edge).

5. Align the pin-1 corners and drop the processor into the PGA370. The processor should drop into place without any force. If it doesn't seat
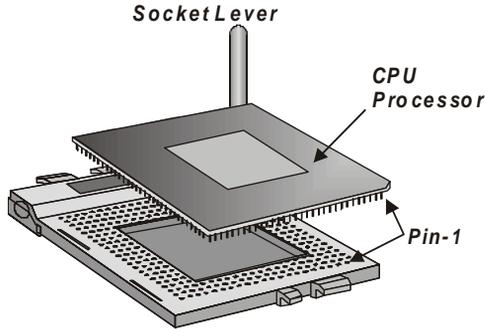
properly, check that you have the pin-1 corner in the correct position.
6. Swing the locking lever down to lock the processor in place and latch the lever under the catch on the side of the socket.
7. Plug the cable from the heat sink/cooling fan assembly into the processor cooling fan power supply CPU FAN.
8. Configuration of the processor is carried out using the sys-tem setup utility as described in Chapter 4. Configure the processor the first time you turn on the assembled computer.

3.6.3. Removing the Processor

First, remove the mainboard from the chassis. To remove the proces-sor from the mainboard, follow these steps:
1. Disconnect the fan power cable from the mainboard.
2. Push the CPU socket lever slightly to the side and then raise it as far as it can go. You will feel a resistance as the processor is freed from the socket.
3. Remove the processor.

3.6.4.   Installing System Memory

Maximum system memory supported by the mainboard is 512 GB.

The mainboard has two DIMM Sockets. Memory can be installed using 168-pin SDRAM DIMM memory modules. There are no jumper settings required for the memory size or type, which is automatically detected by the BIOS.

DIMM1

DIMM2

Lock   Lock

20 pins   60 pins   88 pins
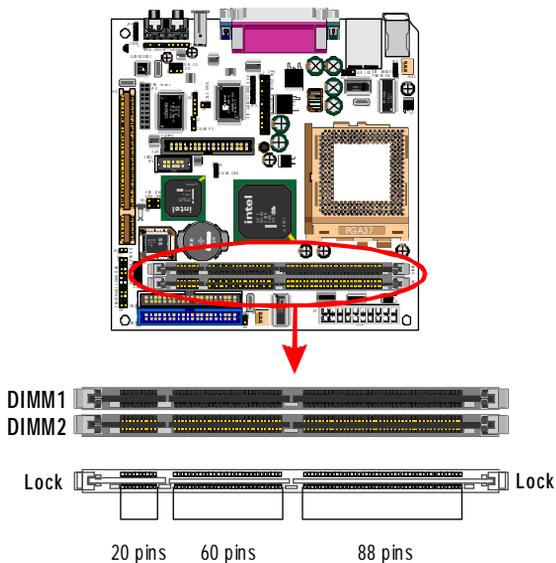
You must use 3.3V unbuffered DIMMs in the mainboard. To deter-mine the DIMM type, check the notches on the DIMMs.

168-pin DIMM

DRAM key position   Voltage key position

RFU   Unbuffered   5.0 V   Reserved

Buffered   3.3 V
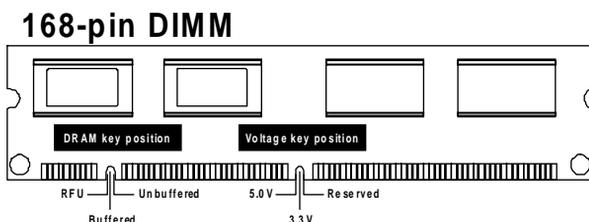
Due to the high-speed design of the mainboard, the memory modules must meet the following requirements:

DRAM TYPE	SDRAM (Synchronous DRAM	
Module Size	Single Sided Asymmetric 1Mx64, 4Mx64, 8Mx64, 16Mx64	
	Double-Sided Asymmetric 2Mx64, 4Mx64, 8Mx64, 16Mx64, 32Mx64	
Requirements	**EDO** **Extended Data Outpu**	**SDRAM** **Synchronous DRAM**

	DRAM Speed
	  60 ns or faster
	RAS Access Tim
	  60 ns or faster
	CAS Access Tim
	  20 ns or faster
		DIMM modul
		  3.3V unbuffered
		Speed Grade
		  66.6 MHz or faster
		CAS latency
		  3 or faster

Install the 168-pin SDRAM modules in any combination as follows:

Bank 0 (DIMM1)	8/16/32/64/128/256 M
Bank 1 (DIMM2)	8/16/32/64/128/256 M
Total System Memory	8 MB ~ 512 MB

3.6.5.   Setting Jumpers

Refer to the following illustration and instructions to set the jumpers on your mainboard.
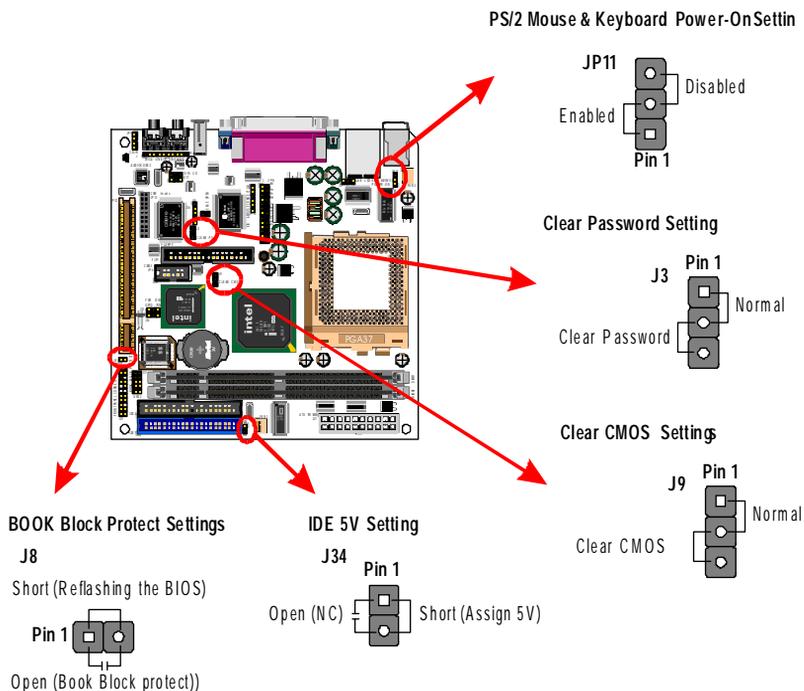
PS/2 Keyboard & Mouse Power-On Jumper (JP11)

You can place jumper to set PS/2 Keyboard & Mouse which connect to back panel to Power-On system from ACPI S3 to S5 stage.

And must set the "POWER ON Function" in the BIOS setup if you use this feature.

Refer to the Integrated Peripherals section in Chapter 4 for details.

Clear CMOS/Password Jumper (J9/J3)

You may need to clear the CMOS if your system cannot boot up because you forgot your password, the CPU clock setup is incorrect, or the CMOS settings need to be reset to default values after the system BIOS has been updated.

Refer to the following solutions to reset your CMOS setting:

Solution A

1. Power off the system and disconnect the power cable.
2. Place a shunt to short pin 2 and pin 3 of J9 for five seconds.
3. Place the shunt back to pin 1 and pin 2 of J9.
4. Power on the system.

Solution B

If the CPU clock setup is incorrect, you may not be able to boot up. In this case, follow these instructions:

1. Turn the system off, then on again. The CPU will auto-matically boot up using standard parameters.
2. As the system boots, enter BIOS and set up the CPU clock.

Note: *If you are unable to enter BIOS setup, turn the system on and off a few times, or press <INSERT> when booting up to have the system boot up with standard parameters.*

IDE 5V Jumper

The 2-pin header is used for offering 5V voltage for the demanding with 2.5" HD.

BIOS Block Protect Jumper

The 2-pin header is used to flash all block or lock top block.

3.6.6.   Auto Power On

After losing AC power, the system will not turn on automatically when the power comes back unless you set the options in BIOS.

This concludes Chapter 3. Chapter 4 covers the BIOS setup program.

---

4. BIOS Configuration

After the hardware configuration of the mainboard is finished, and the system hardware has been assembled, the system may be pow-ered up. At this point, CMOS setup should be run to ensure that system information is correct.

The mainboard employs the latest Award BIOS CMOS chip with support for Windows Plug and Play. This CMOS chip contains the ROM Setup in-structions for configuring the mainboard's BIOS. The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system pa-rameters. These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is config-ured with the values found in CMOS.

Using easy-to-use pull down menus, you can configure such items as:

> ▶ Hard drives, diskette drives, and peripherals
> ▶ Video display type and display options
> ▶ Password protection from unauthorized use
> ▶ Power management features

The settings made in the Setup program intimately affect how the com-puter performs. It is important, therefore, first to try to under-stand all the Setup's options, and second, to make settings appropriate for the way you use the computer. This chapter provides clear explanations for all Setup options.

This program should be executed under the following conditions:

▶ When changing the system configuration
▶ When a configuration error is detected by the system and you are prompted to make changes to the Setup program
▶ When resetting the system clock
▶ When setting the CPU clock speed so that it automatically runs either fast or slow
▶ When redefining the communication ports to prevent any conflicts
▶ When making changes to the Power Management configu-ration
▶ When changing the password or making other changes to the security setup

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.

4.1. 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:

1. If the error occurs before the display device is initialized, a series of beeps will be transmitted.
2. 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 to display the **"CMOS SETUP UTILITY"** screen:
These screens provide access to the utility's various functions.
Listed below are explanations of the keys displayed at the bottom of the screen:

```
CMOS Setup Utility - Copyright (C) 1984-2001 Award Software

  ▶ Standard CMOS Features          ▶ Frequency/Voltage Control

  ▶ Advanced BIOS Features            Load Fail-Safe Defaults

  ▶ Advanced Chipset Features         Load Optimized Defaults

  ▶ Integrated Peripherals            Set Supervisor Password

  ▶ Power Management Setup            Set User Password

  ▶ PnP/PCI Configurations           Save & Exit Setup

  ▶ PC Health Status                 Exit Without Saving

  Esc : Quit       F9 : Menu in BIOS        ↑ ↓ → ←   : Select Item
  F10 : Save & Exit Setup

                  Time, Date, Hard Disk Type...
```

Key	Function
Esc	**Escape key:** Exits the current menu
↑↓→←	**Cursor keys:** Scroll through the items on a menu
+/-/PU/PD	**Plus, minus, Page Up and Page Down keys:** Modify the selected field's values
F10	**F10 key:** Saves the current configuration and exits setup
F1	**F1 key:** Displays a screen that explains all key functions
F5	**F5 key:** Loads previously saved values to CMOS
F6	**F6 key:** Loads a minimum configuration for troubleshooting.
F7	**F7 key:** Loads optimum set of values for peak performance

4.2. **Standard CMOS Features**

Standard CMOS Features is the same for all three chipsets. Selecting **"Standard CMOS Features"** on the main program screen displays the following menu:

```
CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                     Standard CMOS Features
┌─────────────────────────────────────────────┬──────────────────────┐
│ Date (mm:dd:yy)        Thu, Oct  4 2001      │      Item Help       │
│ Time (hh:mm:ss)        10 : 25 :  8          ├──────────────────────┤
│                                              │ Menu Level    ▶      │
│ ▸ IDE Primary Master                         │                      │
│ ▸ IDE Primary Slave                          │ Change the day, month,│
│ ▸ IDE Secondary Master                       │ year and century     │
│ ▸ IDE Secondary Slave                        │                      │
│                                              │                      │
│ Drive A                [1.44M, 3.5 in.]      │                      │
│ Drive B                [None]                │                      │
│                                              │                      │
│ Video                  [EGA/VGA]             │                      │
│ Halt On                [All , But Keyboard]  │                      │
│                                              │                      │
│ Base Memory                     640K         │                      │
│ Extended Memory               65472K         │                      │
│ Total Memory                   1024K         │                      │
├─────────────────────────────────────────────┴──────────────────────┤
│ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help│
│   F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults    │
└─────────────────────────────────────────────────────────────────────┘
```

The Standard CMOS Setup utility is similar for all three chipsets and is used to configure the following features:

Date: Month, Day, Year

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).

IDE Devices: Your computer has two IDE channels (Primary and Secondary) and each channel can be installed with one or two devices (Master and Slave). Use these items to configure each device on the IDE channel. Press **Enter** to display the IDE sub-menu:

▶ **IDD HDD Auto-Detection:** Press **<Enter>** while this item is high lighted if you want the Setup Utility to automatically detect and configure a hard disk drive on the IDE channel.

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 in the Standard CMOS Setup screen.

Note: **If you are setting up a new hard disk drive that supports LBA mode, more than one line will appear in the param eter 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 installed it. Select the mode that was used to format it.

▶ **Access Mode:** This item defines some special ways that can be used to access IDE hard disks such as LBA (Large Block Addressing). Leave this value at "Auto" and the system will automatically decide the fastest way to access the hard disk drive.

Press **<Esc>** to close the IDE device sub-menu and return to the Standard CMOS Features page.

Floppy Drive A and Floppy Drive B: Options for these fields are:

△ 360K, 5.25 in.
△ 1.2M, 5.25in.
△ 720K, 3.5in.
△ 1.44M, 3.5in. (Drive A default)
△ 2.88M, 3.5in.
△ None (Not Installed) (Drive B default)

The "Not Installed" option could be used as an option for diskless workstations.

Video: Set this field 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

△ CGA 80

Halt On: This setting determines which type of errors will cause the system to halt during bootup. The options are:

△ All Errors

△ No Errors

△ All, But Keyboard (default)

△ All, But Diskette

△ All, But Disk/Key

Base/Extended/Total Memory: These items are automatically detected by the system at start up time. These are display-only fields. You cannot make changes to these fields.

After you have made your selections in the Standard CMOS Setup screen, press **<ESC>** to go back to the main screen.

4.3. Advanced BIOS Features

Selecting **"Advanced BIOS Features"** on the main program screen displays this menu, which allows you to define advanced information about your system. You can make modifications to most of these items without introducing fatal errors to your system. Note that the page has a scroll-bar to scroll down to more items.

```
         CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                           Advanced BIOS Features
     Virus Warning              [Disabled]      ▲  ┌─────────────────┐
     CPU Internal Cache         [Enabled]          │    Item Help    │
     External Cache             [Enabled]          ├─────────────────┤
     CPU L2 Cache ECC Checking  [Enabled]          │ Menu Level  ▶   │
     Processor Number Feature   [Enabled]          │                 │
     Quick Power On Self Test   [Enabled]          │ Allows you to choose│
     First Boot Device          [Floppy]           │ the VIRUS warning│
     Second Boot Device         [HDD-0]            │ feature for IDE Hard│
     Third Boot Device          [LS120]           │ Disk boot sector │
     Boot Other Device          [Enabled]          │ protection. If this│
     Swap Floppy Drive          [Disabled]         │ function is enabled│
     Boot Up Floppy Seek        [Enabled]          │ and someone attempt to│
     Boot Up NumLock Status     [On]               │ write data into this│
     Gate A20 Option            [Fast]             │ area , BIOS will show│
     Typematic Rate Setting     [Disabled]         │ a warning message on│
   x Typematic Rate (Chars/Sec) 6                  │ screen and alarm beep│
   x Typematic Delay (Msec)     250                │                 │
     Security Option            [Setup]         ▒  │                 │
     OS Select For DRAM > 64MB  [Non-OS2]       ▼  └─────────────────┘
   ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
        F5: Previous Values    F6: Fail-Safe Defaults   F7: Optimized Defaults
```

The following explains the options for each feature:

Virus Warning: 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. The default setting is "Disabled."

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

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

CPU L2 Cache ECC Checking: This item enables or disables ECC (Error Correction Code) error checking on the CPU cache memory. The default setting is "Enabled."

Processor Number Feature: Some new processors are installed with a unique processor number. This unmber may be used for verification in Internet transactions and e-commerce. If you prefer not to use or distribute the unique processor number, set this item to Disabled to suppress the processor number. The default setting is "Enabled."

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

1st/2nd/3rd/Boot Other Device: Use these four items to select the priority and order of the devices that your system searches for an operating system at start-up time. The default settings are "Floppy," "HDD-0," "LS120," and "Enabled." respectively.

Swap Floppy Drive: If you have two floppy diskette drives in your system, this item allows you to swap the assigned drive letters so that drive A becomes drive B, and drive B becomes drive A. The default setting is "Disabled."

Boot Up Floppy Seek: If this item is enabled, it checks the geometry of the floppy disk drives at start-up time. You don't need to enable this item unless you have an old diskette drive with 360K capacity. The default setting is "Enabled."

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

Gate A20 Option: This option accesses memory above 1 MB using the fast gate A20 line when set to "Fast" (default). The other option is "Normal."

Typematic Rate Setting: If set to "Enabled," enables you to set the Typematic Rate and Typematic Delay. The default setting is "Disabled."

> ▶ **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 in the main program screen.

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

Report No FDD For WIN 95: If you are running a system with no floppy drive and using the Windows 95 OS, select Yes for this item to ensure compatibility with the Windows 95 logo certification. The default setting is "No."

Small Logo (EPA) Show: This setting enables or disables the EPA logo. The default setting is "Disabled."

After you have made your selections in the BIOS Features Setup screen, press **<ESC>** to go back to the main screen.

4.4. **Advanced Chipset Features**

Selecting **"Advanced Chipset Features"** on the main program screen displays this menu:

```
       CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                         Advanced Chipset Features
   SDRAM CAS Latency Time    [3]                    Item Help
   SDRAM Cycle Time Tras/Trc [Auto]
   SDRAM RAS-to-CAS Delay    [Auto]        Menu Level    ▶
   SDRAM RAS Precharge Time  [Auto]
   System BIOS Cacheable     [Disabled]
   Video BIOS Cacheable      [Disabled]
   CPU Latency Timer         [Enabled]
   Delayed Transaction       [Enabled]
   AGP Graphics Aperture Size[64MB]
   Display Cache Frequency   [100 MHz]
   System Memory Frequency   [Auto]
   On-Chip Video Window Size [64MB]

   * Onboard Display Cache Setting *
     CAS# Latency            [3]
     Paging Mode Control     [Open]
     RAS-to-CAS Override     [by CAS# LT]
     RAS# Timing             [Fast]
     RAS# Precharge Timing   [Fast]

 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
    F5: Previous Values     F6: Fail-Safe Defaults   F7: Optimized 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 changes unless you are familiar with the chipset.

SDRAM CAS Latency Time: Enables you to select the CAS latency time in HCLKs of 2/2 or 3/3. The value is set at the factory depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU. The options are "2" and "3" (default).

SDRAM Cycle Time Tras/Trc: This field enables you to set the CAS latency time in HCLKs of 7/9 , 5/7 or Auto (default). The system board designer should have set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

SDRAM RAS-to-CAS Delay: This sets the relative delay between the Row Address Strobe (RAS) and the Column Address Strobe (CAS). Options are "2", "3" and "Auto" (default).

SDRAM RAS Precharge Time: Defines the length of time that the Row Address Strobe (RAS) is allowed to precharge. Options are "2" , "3" and "Auto" (default).

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

Video BIOS Cacheable: When set to "Enabled," the graphics card's local memory will be cached for faster execution. The default setting is "Disabled."

CPU Latency Timer: This item sets a timing parameter for CPU access. Since the CPU timing is determined by the system hardware, leave this item at the default value. The default is "Enabled."

Delayed Transaction: The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Enable to support compliance with PCI specification version 2.1. The default is "Enabled."

AGP Graphics Aperture Size: This option determines the effective size of the AGP Graphic Aperture, where memory-mapped graphic data structures are located.

Display Cache Frequency: This item sets the main memory frequency. When you use an external graphics card, you can adjust this to enable the best performance for your system.

System Memory Frequency: This item sets the frequency for the system memory bus. If you have installed 133 MHz memory, you can change the frequency to 133 MHz.

On-Chip Video Window Size: This item defines the size of the aperture if you use an AGP graphics adapter. It refers to a section of the PCI memory address range used for graphics memory. We recommend that you leave this item at the default value.

Onboard Display Cache Setting

The items under this heading are used to set the parameters for display cache memory that may be optionally installed on your mainboard. If you have display cache memory, we recommend that you leave these items at the default settings.

▶ **CAS# Latency:** This item sets a timing parameter for the Column Address Strobe memory access. Leave this item at the default setting "3" so that the system autodetects the correct timing.

▶ **Paging Mode Control:** This item allows you to enable and disable page open mode. If set to "open," the GMCH memory controller tends to leave the page open.

▶ **RAS-to-CAS Override:** This item sets the timing parameters for the system memory such as the CAS (Column Address Strobe) and RAS (Row Address Strobe). We recommend that you set RAS-to-CAS to "byCAS# LT" (default) so that the memory timing is automatically detected.

▶ **RAS# Timing:** Sets the Row Address Strobe (RAS) timing. Leave this at the default setting "Fast."

▶ **RAS# Precharge Timing:** DRAM must continually be refreshed or it will lose its data. Normally, DRAM is refreshed entirely as the result of a single request. This option allows you to determine the number of CPU clocks allocated for the Row Address Strobe (RAS) to accumulate its charge before the DRAM is refreshed. If insufficient time is allowed, refresh may be incomplete and data lost. Options are "Slow" and "Fast" (default).

4.5. Integrated Peripherals

Selecting **"Integrated Peripherals"** on the main program screen displays this menu:

```
             CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                              Integrated Peripherals
    On-Chip Primary   PCI IDE  [Enabled]  ▲          Item Help
    On-Chip Secondary PCI IDE  [Enabled]
    IDE Primary Master PIO     [Auto]          Menu Level    ▶
    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]
    USB Controller             [Enabled]
    USB Keyboard Support       [Disabled]
    USB Mouse Support          [Disabled]
    Init Display First         [PCI Slot]
    AC97 Audio                 [Auto]
    AC97 Modem                 [Auto]
    IDE HDD Block Mode         [Enabled]
    POWER ON Function          [BUTTON ONLY]
    KB Power ON Password       [Enter]     ▼
    ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
        F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults
```

On-Chip Primary/Secondary PCI IDE: These options enable or disable the primary and secondary onboard IDE controllers. The default settings are "Enabled."

IDE Primary/Secondary Master/Slave PIO: When set to "Auto" the BIOS will automatically set the mode to match the transfer rate of the hard disk. If the system won't boot up when set to "Auto" set it manually to a lower mode, e.g., from Mode 3 to Mode 2. All IDE drives should work with PIO mode 0. There are six options:

- △ Auto (default)
- △ Mode 0
- △ Mode 1
- △ Mode 2
- △ Mode 3
- △ Mode 4

IDE Primary/Secondary Master/Slave UDMA: When set to "Auto" the BIOS will automatically load the Ultra DMA 33 driver to match the transfer rate of IDE hard disk drives that support Ultra DMA 33 mode. The options are "Auto" (default) and "Disabled."

USB Controller: This should be enabled if your system has a USB installed on the system board and you wish to use it. Options are "Disabled" and "Enabled" (default).

USB Keyboard Support: Enabled this function when a USB keyboard is used. Set to "Disable" (default) when an AT keyboard is being used.

USB Mouse Support: Enabled this function when a USB mouse is used. Set to "Disabled" (default) when an PS/2 mouse is being used.

Init Display First: This item sets whether the PCI Slot or AGP is activated first. The options are "PCI Slot" (default) and "Onboard AGP".

AC97 Audio: Set these items to "Auto" when you are using the on-board AC'97 audio chip. If you are using an audio add-in card, you should disable this item.

AC97 Modem: Set these items to "Auto" when you are using the on-board Modem chip. If you are using an add-in card, you should disable this item.

IDE HDD Block Mode: Enable this field if your IDE hard drive supports block mode. Block mode enables BIOS to automatically de-tect the optimal number of block read and writes per sector that the drive can support. The default setting is "Enabled."

POWER ON Function: Enables you to set keyboard or mouse events, or a password to power on the computer. When set to "Password," you must key in your password before pressing any keyboard key to start the computer. The password is set in the "KB Power ON Password" field.

If you set this field to "Hot KEY," you can press a hot key combination to power on the computer. The hot key is set in the "Hot Key Power ON" field. Options are:

△ BUTTON ONLY (default)
△ Keyboard 98

    △ Password

    △ Hot KEY

    △ Mouse Left

    △ Mouse Right

    △ Any KEY

KB Power ON Password: This field becomes available when you select "Password" in the POWER ON Function field. Select this field and press ENTER. You are prompted to input a password. Type in your password and press ENTER. You are prompted to confirm your password. Retype your password and press ENTER. Your password is saved. The next time you power on your computer, you must type in your password before you can power the computer on. After you type your password, press any key or the power button.

Hot Key Power ON: This field becomes available when you select "Hot Key" in the POWER ON Function field. Options for this field are "Ctrl-F1" ~ "Ctrl-F12."

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

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

    △ 3F8/ IRQ4 (Port 1 default)

    △ 2F8/ IRQ3 (Port 2 default)

    △ 3E8/ IRQ4

    △ 2E8/ IRQ3

    △ Auto

    △ Disabled (disables the onboard serial port)

UART Mode Select: Enables you to select the infrared communication protocol-Normal (default), IrDA, or ASKIR. IrDA is Hewlett Packard's infrared communication protocol with a maximum baud rate up to 115.2K bps. ASKIR is Sharp's infrared communication protocol with a maximum baud rate up to 57.6K bps.

RxD , TxD Active: Defines the voltage level for Infrared module RxD (receive) mode and TxD (transmit) mode. This setting has to match the requirements of the infrared module used in the system. The options are:

△ Hi, Lo (default)

△ Lo, Hi

△ Lo, Lo

△ Hi, Hi

IR Transmission Delay: When set to "Enabled"(default), utilizes the capability of the mainboard to allow faster infrared transmission rates. The options are "Enabled" and "Disabled."

UR2 Duplex Mode: This field is available when UART Mode Select is set to either ASKIR or IrDA. This item enables you to determine the infrared (IR) function of the onboard infrared chip. The options are "Full" and "Half" (default). Full-duplex means that you can transmit and send information simultaneously. Half-duplex is the transmission of data in both directions, but only one direction at a time.

Use IR Pins: Use this item to set the IR pins. The options are "IR-Rx2Tx2" (default) and "RxD2,TxD2".

Onboard Parallel Port: This option is used to assign the I/O address for the onboard parallel port. The options are:

△ 378/IRQ7 (default)

△ 278/IRQ5

△ 3BC/IRQ7

△ Disabled (disables the onboard parallel port).

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

EPP Mode Select: Sets the EPP specification. There are two op-tions- "EPP1.7" (default) and "EPP1.9."

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

Game Port Address: Enables you to specify the I/O address of the game port. Options are "Disabled," "201" (default), and "209."

MIDI Port Address: Enables you to specify the I/O address of the MIDI port if installed. Options are "Disabled", "330" (default), "300", and "290".

MIDI Port IRQ: Enables you to specify the IRQ of the MIDI port if installed. Options are "5" and "10" (default).

If you make any changes to the onboard FDD controller, serial ports or parallel ports in this setup, save the changes and turn off the system. After powering up the system, ensure that the changes have taken effect.

4.6. Power Management Setup

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

```
        CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                          Power Management Setup
   ┌─────────────────────────────────────────────────┬──────────────────┐
   │ ACPI Function              [Enabled]           ▲ │   Item Help      │
   │ ACPI Suspend Type          [S1(POS)]             ├──────────────────┤
   │ Power Management           [User Define]         │ Menu Level    ▶  │
   │ Video Off Method           [DPMS]                │                  │
   │ Video Off In Suspend       [Yes]                 │                  │
   │ Suspend Type               [Stop Grant]          │                  │
   │ MODEM Use IRQ              [NA]                   │                  │
   │ Suspend Mode               [Disabled]            │                  │
   │ HDD Power Down             [Disabled]            │                  │
   │ Soft-Off by PWR-BTTN       [Instant-Off]         │                  │
   │ Wake-Up by PCI card        [Disabled]            │                  │
   │ Power On by Ring           [Enabled]             │                  │
   │ Wake Up On LAN             [Enabled]           ▒ │                  │
   │ USB KB WakeUp From S3(S4)   [Disabled]           │                  │
   │ CPU Thermal-Throttling     [50.0%]               │                  │
   │ Resume by Alarm            [Disabled]            │                  │
   │ x  Date(of Month) Alarm        0                 │                  │
   │ x  Time(hh:mm:ss) Alarm        0 :  0 :  0     ▼ │                  │
   ├─────────────────────────────────────────────────┴──────────────────┤
   │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help │
   │    F5: Previous Values    F6: Fail-Safe Defaults  F7: Optimized Defaults     │
   └──────────────────────────────────────────────────────────────────────┘
```

ACPI Function: When set to "Enabled," turns on the ACPI Function. The default setting is "Enabled."

> **Note:** ACPI (Advanced Configuration and Power Interface) is a power management specification that makes hardware status information available to the operating system. ACPI enables a PC to turn its peripherals on and off for improved power man-agement. It also allows the PC to be turned on and off by external devices, so that mouse or keyboard activity wakes up the computer.

ACPI Suspend Type: Use this item to define how your system suspends. If set to S1(POS) (default), the suspend mode is equivalent to a software power down. If set to S3(STR), the suspend mode is a suspend to RAM the system shuts down with the exception of a refresh current to the system memory.

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

△ Max Saving: recommended setting for general use

△ Min Saving: sets power saving at minimum values

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

Video Off In Suspend: Set this to "Yes" (default) if you want the Video display to turn off during suspend mode.

Suspend Type: Enables you to select the Suspend type. Options are "Stop Grant" (default) and "PwrOn Suspend."

MODEM Use IRQ: If you want an incoming call on a modem to automatically resume the system from a power-saving mode, use this item to specify the interrupt request line (IRQ) that is used by the modem. You might have to connect the fax/modem to a mainboard Wake On Modem connector for this feature to work. Options are:

△ 3
△ 4
△ 5
△ 7
△ 9
△ 10
△ 11
△ NA (default)

Suspend Mode: 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. Options are from "1 Min" to "1 Hour" and "Disable." The default is "Disabled."

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

Soft-Off by PWRBTN: When set to "Instant-Off" (default), 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 into suspend mode. The options are "Instant-Off" and "Delay 4 Sec."

Wake-Up by PCI card: This setting enables/disables PCI card wakeup for PCI spec2.2. The default is "Disabled."

Power On by Ring: When set to "Enabled," any activity on the Modem port will wake up the system from a power saving mode. The options are "Disabled" and "Enabled" (default).

Wake-Up on LAN: When set to "Enabled", the system power will be turned on if the LAN port receives an incoming signal. Default setting is "Enabled."

USB KB Wake-Up From S3: Use this item to enable USB activity to wakeup the system from a power saving mode. The default setting is "Disabled."

CPU Thermal-Throttling: This item sets the percentage of time that the CPU is idled if CPU throttling is initiated by excess heat. The options are:

△ 50.0% (default)
△ 37.5%
△ 25.0%
△ 12.5%
△ 87.5%

△ 75.0%

△ 62.5%

Resume by Alarm: When set to "Enabled," you may set the date (day of the month), hour, minute and second to turn on your system. When set to set "0" (zero) for the day of the month, the alarm will power on your system every day at the specified time. The default setting is "Disabled."

Reload Global Timer Events

Global Timer (power management) events are I/O events whose occurrence can prevent the system from entering a power saving mode or can awaken the system from such a mode. In effect, the system remains alert for anything that occurs to a device that is configured as Enabled, even when the system is in a power down mode.

Primary/Secondary IDE 0/1: When enabled, any activity on the primary or secondary IDE channels will wake up the system from a power saving mode.

FDD, COM, LPT Port: When enabled, any activity on the floppy disk drive (FDD), serial ports (COM), or parallel ports (LPT) will wake up the system from a power saving mode.

PCI PIRQ[A-D]#: When enabled, any activity on the PCI card channels will wake up the system from a power saving mode.

Press **ESC** to return to the main menu.

4.7. PnP/PCI Configurations

Both the ISA and PCI buses on the Mainboard use system IRQs (Interrupt ReQuests) and DMAs (Direct Memory Access). You must set up the IRQ and DMA assignments correctly through the PnP/PCI Configuration Setup utility; otherwise, the mainboard will not work properly.

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

```
          CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                           PnP/PCI Configurations
 ┌──────────────────────────────────────────────┬───────────────────────────┐
 │  Reset Configuration Data   [Disabled]        │        Item Help          │
 │                                               ├───────────────────────────┤
 │  Resources Controlled By    [Auto(ESCD)]      │  Menu Level    ▶          │
 │ x IRQ Resources             Press Enter       │                           │
 │                                               │  Default is Disabled.     │
 │  PCI/VGA Palette Snoop       [Disabled]       │  Select Enabled to        │
 │                                               │  reset Extended System    │
 │                                               │  Configuration Data       │
 │                                               │  ESCD) when you exit      │
 │                                               │  Setup if you have        │
 │                                               │  installed a new add-on   │
 │                                               │  and the system           │
 │                                               │  reconfiguration has      │
 │                                               │  caused such a serious    │
 │                                               │  conflict that the OS     │
 │                                               │  cannot boot              │
 │                                               │                           │
 └──────────────────────────────────────────────┴───────────────────────────┘
    ↑↓←+:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
         F5: Previous Values     F6: Fail-Safe Defaults   F7: Optimized Defaults
```

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 (Extended System Configuration Data) 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 "Enable," the ESCD will be cleared and updated and then this option will automatically be set to "Disabled."

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

IRQ Resources: These fields only become available if the Resources Controlled By field is set to "Manual." If there is a legacy ISA for device compliant with the original PC AT bus specification, PCI/ISA PnP for devices complint with the Plug and play standard whether designed for PCI or ISA bus architecture. The options are "PCI Device" (default) and "Reserved".

PCI/VGA Palette Snoop: This item is designed to overcome some problems that can be caused by some non-standard VGA cards. This board includes a built in VGA system that does not require palette snooping so you must leave this item disabled. The default setting is "Disabled."

4.8. PC Health Status Option

On mainboards that support hardware monitoring, this item lets you monitor the parameters for critical voltages, critical temperatures, and fan speeds. Selecting **"PC Health Status"** on the main program screen displays this menu:

```
          CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                              PC Health Status
  ┌──────────────────────────────────────────────┬────────────────────────┐
  │ CPU Warning Temperature    [Disabled]         │       Item Help        │
  │ Current System Temp.                          ├────────────────────────┤
  │ Current CPU1 Temperature                      │ Menu Level    ▶        │
  │ Current CPU2 Temperature                      │                        │
  │ Current CPUFAN1 Speed                         │                        │
  │ Current CPUFAN2 Speed                         │                        │
  │ Current CPUFAN3 Speed                         │                        │
  │ IN0(V)                                        │                        │
  │ IN1(V)                                        │                        │
  │ IN2(V)                                        │                        │
  │ + 5 V                                         │                        │
  │ +12 V                                         │                        │
  │ -12 V                                         │                        │
  │ - 5 V                                         │                        │
  │ VBAT(V)                                       │                        │
  │ 5VSB(V)                                       │                        │
  │ Shutdown Temperature       [Disabled]         │                        │
  │                                               │                        │
  ├──────────────────────────────────────────────┴────────────────────────┤
  │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help │
  │       F5: Previous Values     F6: Fail-Safe Defaults   F7: Optimized Defaults │
  └────────────────────────────────────────────────────────────────────────┘
```
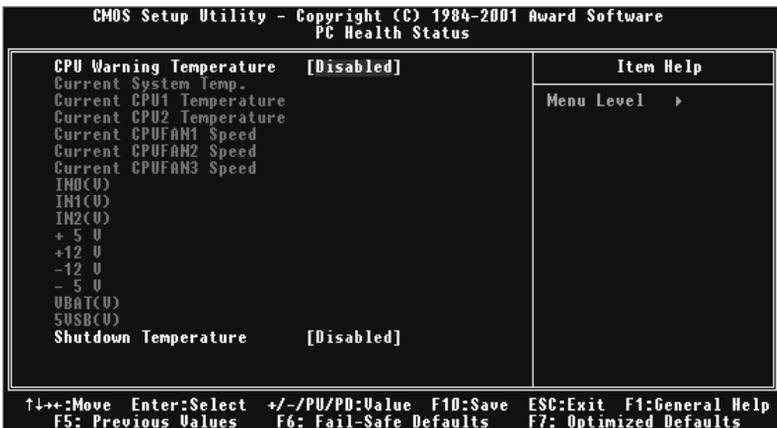
CPU Warning Temperature: This feature enables you to set the warning temperature for CPU overheating. When the CPU temperature exceeds the set temperature, the PC speaker will beep. The beep sound will not turn off unless you power down the computer and allow your CPU to cool down.

System Component Characteristics: These fields provide you with information about the systems current operating status. You cannot make changes to these fields. The following information is displayed:

△ Current System temp.

△ Current CPU 1 temperature

△ Current CPU 2 temperature

△ Current CPUFAN1 speed (in RPMs)

△ Current CPUFAN2 speed (in RPMs)

△ Current CPUFAN3 speed (in RPMs)

△ IN0 (V)

△ IN1 (V)

△ IN2 (V)

△ +5 V

△ +12 V (power supply's +12 volt)

△ -12 V (power supply's -12 volt)

△ -5 V

△ VBAT (V)

△ 5VSB (V)

Shutdown Temperature: Enables you to set the maximum temperature the system can reach before powering down. Options are:

△ Disabled (default)

△ 60ºC/140ºF

△ 65ºC/149ºF

△ 70ºC/158ºF

△ 75ºC/167ºF

After you have made your selections in the PC Health Status Setup, press the **<ESC>** key to go back to the main program screen.

4.9. Frequency/Voltage Control

This item enables you to set the clock speed and system bus for your system. The clock speed and system bus are determined by the kind of processor you have installed in your system.

```
        CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
                         Frequency/Voltage Control
 ┌──────────────────────────────────────────────┬──────────────────────┐
 │ Auto Detect DIMM/PCI Clk    [Enabled]         │      Item Help        │
 │ Spread Spectrum             [Disabled]        ├──────────────────────┤
 │ CPU Host/PCI Clock          [Default]         │ Menu Level    ▶       │
 │ CPU Clock Ratio             [X 3]             │                      │
 │                                               │                      │
 │                                               │                      │
 │                                               │                      │
 │                                               │                      │
 │                                               │                      │
 │                                               │                      │
 │                                               │                      │
 │                                               │                      │
 ├───────────────────────────────────────────────┴──────────────────────┤
 │ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help │
 │    F5: Previous Values      F6: Fail-Safe Defaults   F7: Optimized Defaults   │
 └───────────────────────────────────────────────────────────────────────┘
```

Auto Detect DIMM/PCI Clk: When set to "Enabled", the system will automatically turn off the PCI and DIMM clock when not in use to reduce electromagnetic interference.

Spread Spectrum: If you enable spread spectrum, it can significantly reduce the EMI (Electro-Magnetic Interference) generated by the system. The default setting is "Disabled."

CPU Host/PCI Clock: This item can be used to set the system bus frequency for the installed processor. The options are:

   △ Default (default)
   △ 66/33 MHz
   △ 70/35 MHz
   △ 75/38 MHz
   △ 80/40 MHz
   △ 83/42 MHz
   △ 100/33 MHz
   △ 103/34 MHz

△ 105/35 MHz

△ 110/37 MHz

△ 115/38 MHz

△ 133/33 MHz

△ 137/34 MHz

△ 140/35 MHz

△ 145/36 MHz

△ 150/38 MHz

CPU Clock Ratio: Use this item to select a multiplier for the system frontside bus (FSB) frequency. The value of the multiplier must be set so that:

Multiplier x Front Side Bus Frequency = CPU Clock Speed

For example, if you have a processor that is rated to run at 450 MHz and the system is running a front side bus frequency of 100 MHz, you should select a multiplier of 4.5 so that:

4.5 (Multiplier) x 100 MHz (front side bus) = 450 MHz (CPU clock)

After you have made your selections in the Frequency/Voltage Control Setup, press the **<ESC>** key to go back to the main program screen.

4.10. Load Optimized Defaults Option

This option opens a dialog box that lets you install optimized defaults for all appropriate items in the whole Setup Utility.

Press the **<Y>** key and then **<Enter>** to install the defaults.

Press the **<N>** key and then **<Enter>** to not install the defaults.

The optimized defaults place demands on the system that may be greater than the performance level of the components, such as the CPU and the memory. You can cause fatal errors or instability if you install the optimized defaults when your hardware does not support them. If you only want to install setup defaults for a specific option, select and display that option, and then press the **<F7>** key.

4.11. Set Supervisor/User Password

The **" Set Supervisor/User Password"** utilities set the passwords.

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. You can use up to eight alphanumeric characters.

Press **<Enter>** after entering the password. At the next prompt, confirm the new password by retyping it and pressing **<Enter>** again.

To disable the password, press **<Enter>** instead of entering a new password when the "Enter Password" dialog box appears. A message appears confirming that the password has been disabled.

If you have set supervisor and user passwords, 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 jumper J9 to short pin 2 and pin 3 for five seconds, then putting the shunt back to pin 1 and pin 2 of J9.

4.12. Save & Exit Setup

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

4.13. Exit Without Saving

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

This concludes Chapter 4. Chapter 5 describes the drivers and utility programs that are packaged with the mainboard.

5. Driver and Utility

5.1. Flash Utility

The BIOS of the CF-7989 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 1 M-bit Flash EEPROM that can be erased and reprogrammed by the Flash utility.

There are two files in the D:\DRIVER\FLASH directory:

    △ FLASH.EXE   Flash utility for AWARD BIOS upgrade
    △ README.TXT   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 the <F5> function key when the "Starting MS-DOS." message appears on the screen to by-pass the CONFIG.SYS and AUTOEXEC.BAT.

5.2. CD Driver Overview

To start your mainboard CD disc, insert into your CD-ROM drive and the CD AutoRun screen should appear. If the AutoRun screen does not appear, duble click or run D:\ Autorun.exe (assuming that your CD-ROM drive is drive D:)

The CF-7989 CD include
1. Install Mainboard Software (Intel 81x)
2. Install Mainboard Software (Intel 815E/EG Video)
3. Install LAN Driver (Intel DA82562)
4. Install Audio Device Software (AD1881A)
5. Install HWDoctor

5.2.1. Intel 81x Installation Utility

This folder has IDE drivers for Windows Millennium/2000/98/95/NT.

The folder include:
  △ Intel chipset INF upgrade
  △ Intel Ultra ATA storage driver
  △ Intel Security driver

The Installation Steps:

1. Insert the manufacturer's CD-ROM into your CD-ROM drive.
2. Click **Driver** Install.
3. Select the folder **Driver\Intel\81x\INF** driver for WIN2000/9X/ ME or XP to start the installation:
4. Scroll to and click the **Driver\Intel\81x** to Install Intel 81x Installation utility to start the installation:
5. Follow the instructions on the screen to complete the installation. After setup is completed, you need to restart the computer.

5.2.2 . Intel 81x AGP Installation

This folder has the software and drivers for the graphics system built into the 81x chipset.

The Installation Steps:

1. Insert the manufacturer's CD-ROM into your PC's CD-ROM drive.
2. Click **Driver** Install.
3. Select the folder **Driver\Intel\81x\AGP** driver for WIN2000/9X/ NT40 or OS2 to start the installation:
4. Follow the instructions on the screen to complete the installation. After setup is completed, you need to restart the computer.

5.2.3. LAN Driver

Software and drivers are provided for the IEEE 1394 controller that is integrated on this mainboard. The IEEE 1394 controller allows the system to generate transmit effects. Drivers are provided for Windows NT/2000/ 98/95.

The Installation Steps:
1. Insert the manufacturer's CD-ROM into your PC's CD-ROM drive.
2. Click **Driver** Install.
3. Select the folder **Driver\Intel\LAN** driver for WIN98, WIN2000/ WIN95/WINNT to start the installation:
4. Follow the instructions on the screen to complete the installation. After setup is completed, you need to restart the computer.

5.2.4. AD1881A Audio Driver

Software and drivers are provided for the AD1881A codec sound system that is integrated on this mainboard. The AD1881A codec allows the system to generate optimal sound effects. Drivers are provided for Windows NT/2000/98/95.

The manual Installation Steps:

1. Insert the manufacturer's CD-ROM into your PC's CD-ROM drive.
2. Click **Driver** Install.
3. Select the folder **Driver\Sound\AD1881** driver for WIN98, WIN2000/WIN95/WINNT to start the installation:
4. Follow the instructions on the screen to complete the installation. After setup is completed, you need to restart the computer.