

# Chapter 1

## Introduction

### 1-1 Product Specifications

#### ❑ Processor

- Supports Intel **Pentium® II/III** processors up to 750 MHz
- Slot 1 CPU socket with universal retention mechanism
- Supports 100/133 MHz system clock speeds
- High efficiency switching power modules with dual power delivery (VRM 8.4v Compliant)

#### ❑ Chipset

- Intel **820 (Camino)** three chip AGPset

#### ❑ Direct Rambus DRAM Memory

- Two 184-pin SRIMM sockets support up to 1GB Direct Rambus RIMMs
- Supports up to 32 DRDRAM devices
- Provides single-bit ECC capability

#### ❑ Expansion Slots

- One AMR slot (v 1.0 compliant)
- Five 32-bit PCI slots (Rev 2.2 compliant)
- One 16-bit ISA slot (Optional)
- One Universal AGP slot for both 2X/4X AGP at 3.3v or 1.5v

#### ❑ Boot-Block Flash ROM

- Intel 4 Mega bit FWH (Firmware Hub)
- Award System BIOS, supports PnP, APM, DMI & Multi-device booting features i.e. floppy, LS120, CD-ROM, HDD(IDE, SCSI), ZIP-ATAPI etc.
- **BIOS Wonder** technology Includes Trend ChipAway Virus, Flash BIOS Protect, Embedded Flash Utility

#### ❑ Embedded USB Controller with two USB ports (UHCI v.1.0 compliant)

❑ **Two Ultra DMA-66 PCI IDE controller**

- Two IDE ports up to 4 ATAPI devices
- Supports up to PIO Mode 4 up to 16.6MBps, Multi Mode 4 up to 66MBps with bus mastering
- Bus Mastering software drivers for all common multi-task operating systems

Blue colored connector for IDE#1, White colored connector for IDE#2



❑ **Onboard LPC I/O**

- WB83627HF LPC I/O chip with SHM (System Health Monitor)
- One Parallel (SPP/ECP/EPP) and two Serial (16550A compliant) ports
- One floppy disk drive connector supports up to 2.88MB, Japanese 3-Mode, and 1Mbps transfer rates
- Supports HPSIR and ASKIR function shared with 2nd serial port
- Supports Game/MIDI port for soft-audio

❑ **Double Stack Back-Panel I/O Connectors**

- PC'99 Compliant color connectors
- PS/2 Mini-DIN keyboard and mouse port
- Two USB ports
- Two 9-pin D-SUB male Serial ports
- One 25-pin D-SUB female Printer port
- One 15-pin D-SUB female Game/MIDI port
- Audio Line-in/out and Mic-in jacks

❑ **Onboard PCI Audio Subsystem**

- Creative CT5880 audio chip
- Advanced 64-voice Wavetable Synthesizer
- Programmable independent sample rate from 4KHz to 48KHz for recording and playback
- Full-duplex operation for simultaneous recording and playback
- Supports Microsoft's DLS (Downloadable sample) level-1 technology with limitless variety of instrument samples using PC RAM
- Supports HRTF 3D positional audio with Microsoft's DirectSound, DirectSound 3D, DirectMusic, Aureal A3D and Creative EAX(Environment Audio Extensions) APIs
- 4-channel speaker audio support is easy to build up a Home Theater environment
- S/PDIF-out provides compressed AC3 data to external Dolby Digital Decoder
- PCI v2.1 compliant and full Legacy DOS software compatible

## ❑ Board Dimensions

- ATX form factor, 305mm x 244mm, 4 Layers

## ❑ Product Features

- Innovative SeePU technology for jumperless CPU installation
- Embedded System Monitor Hardware
- Poly-fuse-over-current protection for USB and keyboard circuitry
- ACPI (v1.0 compliant) **STR** (Suspend To RAM) ready
- Complete Data Security  
Chassis intrusion detection against unauthorized access with Trend ChipAway Virus and PC-cillin98 to ensure virus-free booting procedure

## ⚡ Advanced Management Features

- Power-on events: Mouse movement or clicks, Keyboard password, WOL (Wake On LAN) network card, Modem ring, RTC-Alarm, USBs
- Software power-off control for Win98
- Over-ride power button
- Enhanced Power failure recovery  
\* Three states selectable once Vsb loose: Always On, Always Off and Last state
- System lockup recovery  
\* Once software or hardware lockups, system will causes an SMI# or a system Reset to recover from system hang
- Blinking Power-LED in suspend
- FAN power OFF control in suspend

## ❑ Switching Power Supply Requirement

Output Voltage	Max. Regulation Requirement	Min.Current Requirement(Amps)
+12V	+/- 5%	5.5
+5V	+/- 5%	15
+3.3V	+/- 5%	15
-5V	+/- 10%	0.5
-12V	+/- 10%	0.5
+5VSB	+/- 5%	0.75

**Table 1-1**



- \* 3.3V at 15Amps is necessary too guarantee full loading operation because some AGP cards and memory modules have high current consumption.

## 1-2 Package Contents

This product comes with the following components:

- One mainboard
- Onboard Slot 1 foldable retention mechanism and four screws
- One 40-pin Ultra DMA-66 IDE connector ribbon cable (Figure 1-1)
  - \* **Color coded connection for UDMA/66 cable**
    - Blue to mainboard, Ground in blue, Gray to Master and Black to slave
- One 34-pin floppy disk drive ribbon cable (Figure 1-2a) or (Figure 1-2b)
- One User's Manual
- One CD-ROM that includes
  - Acrobat Reader
  - Award Flash EPROM Utility, Award DMI Utility for DOS
  - Intel Security Driver
  - System Health Monitoring Software
  - Sound Driver and Utility for Win95/98/NT
  - Trend PC-cillin 98 Anti-virus Utility (eight different languages)
  - Optional AIRBAG software group including AntiVirus programs and other helpful utilities



**Figure 1-1** UDMA66 IDE cable

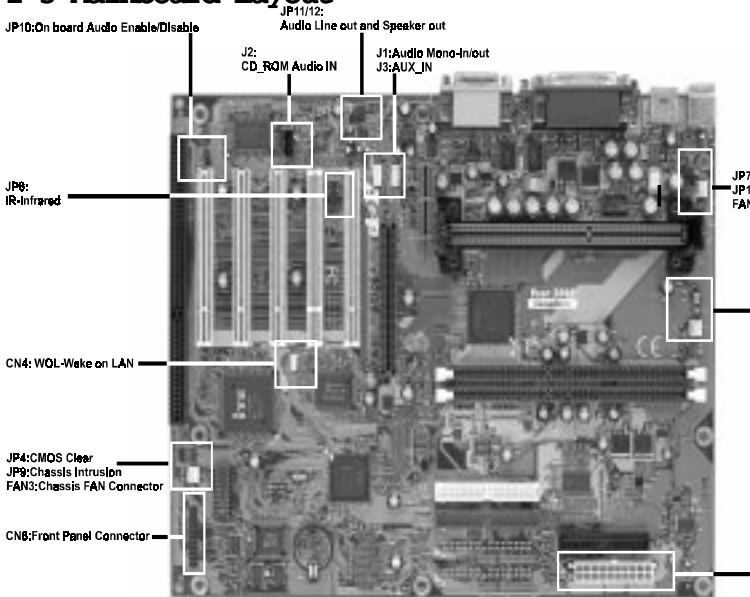


**Figure 1-2a** Standard Floppy cable



**Figure 1-2b** Optional 5.25 in. floppy cable

## 1-3 Mainboard Layout



## 1-4 Connector and Jumper Reference Chart

Jumper & Connector No.	Function	Ref. Page
J1	Audio Mono-in/out Connector	17
J2	CD-ROM Audio-in Connector	17
J3	Auxiliary CD-ROM Audio-in Connector	17
CN4	WOL(Wake-on-LAN) Connector	19
CN6	Green Switch Connector	13
	Green LED Connector	13
	System Reset Switch Connector	13
	Turbo LED Connector	13
	Keyboard Lock & Power Indicator LED Connector	12
	Speaker Connector	13
	IDE Activity LED Connector	13
	Over-ride Power Button Connector	12
CN7	ATX Power Supply Connector	11
JP1	External Clock Frequency Jumper	14
JP4	Clear CMOS Data Jumper	14
JP7	PS/2 Keyboard/Mouse Power-on Function Jumper	14
JP8	Infrared Connector	15
JP9	Chassis Intrusion Monitoring Connector	15
JP10	On Board Audio Jumper	15
JP11/JP12	Audio Line out and Speaker out Jumper	16
JP13	USB Device Power On Function Jumper	16
FAN1/2/3	System/CPU/Chassis Cooling FAN Connector	16
PS/2 Ports	PS/2 Mouse and Keyboard Ports	18
USB Ports	USB (Universal Serial Bus) Ports	18



# *Memo*

## Hardware Setup

If your mainboard has already been installed in your computer you may still need to refer to this chapter if you plan to upgrade your system's hardware.

**! Be sure to disconnect the power cable from the power source before performing any work on your mainboard, i. e. installing a CPU, memory module, changing a jumper setting, etc. Not doing so may result in electrical shock!**

### 2-1 Introduction to Jumpers

Jumpers are used to select between various operating modes. A jumper consists of a row of gold colored pins that protrude from the surface of the mainboard. It is important not to confuse jumpers with connectors or headers.

**! Putting jumper caps on anything that is not a jumper may result in damaging your mainboard. Please refer to Section 1-3, Mainboard Layout, for the location of jumpers on your mainboard.**

As indicated in Figure 2-1 below, a cap is used to cover the pins of a jumper, resulting in shorting those pins that it covers. If the cap is removed from the top of the pins, the jumper is left "open." The number 1 shown both in the diagram below and in all multiple pin jumper and header diagrams in this manual indicates the pin designated with the number 1. The numbering of the remaining pins follows in sequence.

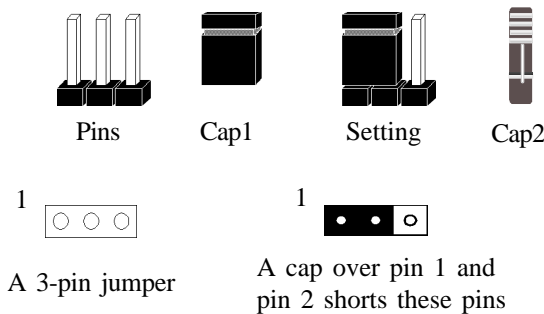


Figure 2-1

## 2-2 Installing an Intel Processor in Slot 1

1. Insert the Intel Pentium II/III/Coppermine/Celeron processor into the retention mechanism. Press evenly and gently until the snaps on the upper side of the processor have been inserted into the holes at the top of the retention mechanism.
2. Note that when removing the processor, these snaps should be clicked into a completely vertical position, leaving your hands free to stabilize the board. Pull the processor evenly and gently out of the retention mechanism.
3. Also note that like PCI and ISA slots, Slot 1 has a divider that prevents backwards insertion of the CPU.



Installing a heat sink with cooling fan is necessary for proper heat dissipation from your CPU. Failing to install these items may result in overheating and possible burnout of your CPU.

## 2-3 Setting Your CPU's Parameters(*SeePU* Technology)

*SeePU* is a new user friendly technology that enables the user to setup a mainboard's CPU parameters through an easy to use BIOS setup procedure. It is no longer necessary to make many jumper settings as on conventional mainboards.

1. After installing all your hardware into your PC system, turn on your system's power. Enter the CMOS Setup Utility by pressing the Delete key when your BIOS identification screen appears.
2. Move the cursor to *SeePU* Setup menu and press Enter. Find the CPU Host/PCI Clock option. Commands for operating the cursor in BIOS are found at the Bottom of the BIOS screen (Figure 2-2).
3. Use the CPU Host/PCI Clock option to select your CPU's parameters. Set the clock ratio (also known as external clock multiplier factor) according to your processor's specifications (See Figure 2-3).



External clock frequency (JP1) must be selected according to you processor. Failing to set these jumpers may resulted in system not booting. (See Section 2-4)



You do not need to make voltage settings because *SeePU* automatically sets your CPU voltage.

4. Press Esc to return to the CMOS Setup Utility, press F10 to Save and Exit Setup and choose 'Y' to confirm. The system will automatically reboot and during startup you will see the correct CPU type shown on the screen.



CPU Type	CPU Speed		
	External Clock	Frequenc Ratio	Internal Clock
Intel Pentium II/III & Celeron Processors	100	3.5	350
		4	400
		4.5	450
		5	500
		5.5	550
		6	600
		6.5	650
		7	700
Intel Pentium III	133	4	533
		4.5	600
		5	667
		5.5	733

Figure 2-2

**CMOS Setup Utility - Copyright (C) 1984-1999 Award Software**  
**SeePU Setup**

Auto Detect PCI Clock Spread Spectrum HOST CPU/PCI Clock CPU Clock Ratio	Enabled Disabled Default X 3	Items Help Menu Level ▶
---	---------------------------------------	----------------------------

← →: Move    Enter: Select    +/-/PU/PD: Value    F10: Save    ESC: Exit    F1: General Help  
 F5: Previous Values    F6: Fail-Safe Defaults    F7: Optimized Defaults

Figure 2-3

## **Overclocking**

Operating a CPU at a higher frequency than its specification allows is called overclocking. If the CPU frequency is set at a higher frequency than its specification allows, it may or may not run at that frequency, depending on the quality of your CPU and the extent to which the frequency has been overset. The mainboard manufacturer highly discourages overclocking as it may result in data loss, CPU burnout, system failure, etc.

Many Intel processors are frequency locked processors and are not able to perform overclocking. Regardless of whether the processor is a frequency locked, overclocking may cause some processors to hang when turning on the system. When the processor hangs, the screen remains blank and the system does not boot. To solve this problem, do the following.

1. Turn off the computer and then press the Home key on your keyboard
2. Turn on your computer, wait for five seconds and then release the Home key.
3. Enter BIOS and reconfigure your CPU parameters as described in this section.

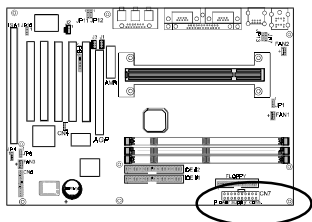
## 2-4 Connector and Jumper Settings

Connectors are used to link the system board with other parts of the system, including the power supply, the keyboard, and the various controllers on the front panel of the system case.



**The power supply connector is the last connection to be made while installing a mainboard. Before connecting the power supply, please make sure it is not connected to the power source.**

### ATX Power Supply Connector (CN7)



The power cord leading from the system's power supply to the external power source must be the very last part connected when assembling a system.



To support this function, a switching power supply with a minimum of **750mA 5VSB** is required.

12V	Ⓜ	Ⓜ	5V
5VSB	Ⓜ	Ⓜ	5V
PW-OK	Ⓜ	Ⓜ	-5V
Ground	Ⓜ	Ⓜ	Ground
5V	Ⓜ	Ⓜ	Ground
Ground	Ⓜ	Ⓜ	Ground
5V	Ⓜ	Ⓜ	PS-ON
Ground	Ⓜ	Ⓜ	Ground
3.3V	Ⓜ	Ⓜ	-12V
3.3V	Ⓜ	Ⓜ	3.3V

The ATX power supply provides a single 20-pin connector interface which incorporates standard +/-5V, +/-12V, optional 3.3V and Soft-power signals. The Soft-power signal, a 5V trickle supply is continuously supplied when AC power is available. When the system is in the Soft-Off mode, this trickle supply maintains the system in its minimum power state.

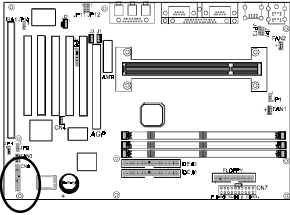
### Power-On By Modem

While in Soft-off state, if an external modem ring-up signal occurs, the system wakes up and can be remotely accessed. You may enable this function in BIOS's Power Management Setup menu.

### Poly-fuse Over Current Protection

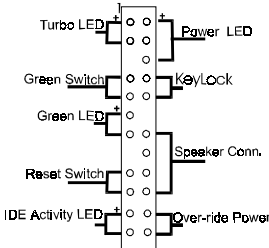
The poly-fuse protects the system from dangerous voltages the system might be exposed to via the keyboard or USB connectors. In case of such exposure, the poly-fuse will immediately be disconnected from the circuit, just like a normal fuse. After being disconnected for a certain period of time, the poly-fuse will return to its normal state, after which the keyboard or USB can function properly again. Unlike conventional fuses, the poly-fuse does not have to be replaced, relieving the user wasted time and inconvenience.

## Front Panel Connector Set (CN6) A through F

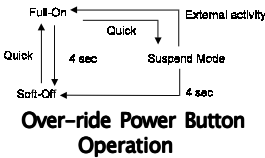


### A. Over-ride Power Button Connector

The power button on the ATX chassis can be used as a normal power switch as well as a device to activate Advanced Power Management Suspend mode. This mode is used for saving electricity when the computer is not in use for long periods of time. The Soft-OFF by PWR-BTTN function in BIOS's Power Management Setup menu must be set to "Delay 4 Sec." to activate this function.



When the Soft-OFF by PWR-BTTN function is enabled, pushing the power button rapidly will switch the system to Suspend mode. Any occurrence of external activities such as pressing a key on the keyboard or moving the mouse will bring the system back to Full-On. Pushing the button while in Full-On mode for more than 4 seconds will switch the system completely off. See Over-ride Power Button Operation diagram.



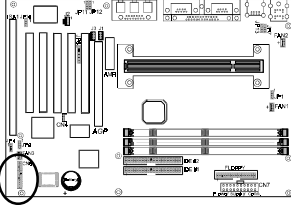
### B. Keyboard Lock & Power Indicator LED Connector

Plugging this connector into the lock on the front panel of the system case allows the lock to enable or disable the keyboard. This function provides limited security against casual intruders. The power indicator LED shows the system's power status. It is important to pay attention to the correct cables and pin orientation (i.e., not to reverse the order of these two connectors.)

	Pin	Definition
Power Good LED	1	+5V DC
	2	No Connect
	3	Ground
Keyboard Lock	4	Keylock
	5	Ground

## Software Power-Off Control

This mainboard can be powered down using the Windows 95 Software Power-Off function. To power down your computer, click the START button on the Windows 95 task bar. Select "Shut Down The Computer" and the system turns off. The message "It is now safe to turn off your computer" will not be shown when using this function.



### C. Green Switch/Green LED Connector

Some ATX cases provide a Green switch which is used to put the system in Suspend mode. In Suspend mode, the power supply to the system is reduced to a trickle, the CPU clock is stopped, and the CPU core is in its minimum power state. The system is woken up whenever the keyboard or mouse is touched. The system resumes in different ways as defined by Power Management Setup screen in BIOS.

### D. System Reset Switch Connector

This connector should be connected to the reset switch on the front panel of the system case. The reset switch allows you to restart the system without turning the power off.

Pin	Definition
1	System
2	GND

### E. Speaker Connector

PIN	Definition
1	Speaker Signal
2	NC
3	NC
4	+5V DC

### F. IDE Activity LED Connector

The IDE activity LED lights up whenever the system reads/writes to the IDE devices.

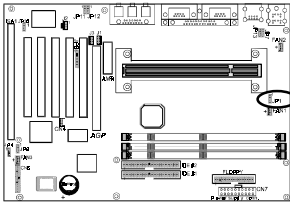
### G. Turbo LED Connector

The message indicator LED lights up whenever the system went on suspend mode.

## Blinking LED in Suspend Mode

While in Suspend mode, the LED light on the front panel of your computer will flash. Suspend mode is entered by pressing the Override Power Button, pushing the Green button on your ATX case, or enabling the Power Management and Suspend Mode options in BIOS's Power Management menu. (See section 3-4)

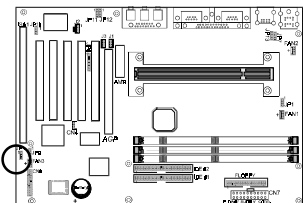
## External Clock Frequency (JP1)



1 ● ● ○ (Default)      1 ○ ● ●  
CPU                      133MHz

This jumper allows the external clock frequency to be determined either by the CPU or the user. If set to pins 1-2, the CPU determines the external clock speed. If set to pins 2-3, the external clock is always 133MHz.

## Clear CMOS Data Jumper (JP4)

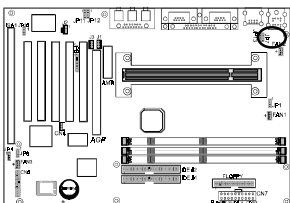


1 ● ● ○ Normal (default)      1 ○ ● ● Clear CMOS data

To clear the contents of the CMOS, please follow the steps below.

1. Disconnect the system power supply from the power source.
2. Set the jumper cap at location 2~3 for 5 seconds, then set it back to the default position.
3. Connect the system's power and then start the system.
4. Enter BIOS's CMOS Setup Utility and choose Load Setup Defaults. Type Y and press enter.
5. Set the system configuration in the Standard CMOS Setup menu.

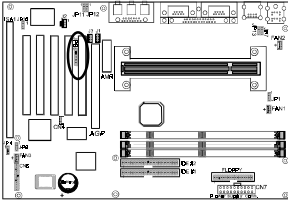
## PS/2 Keyboard/Mouse Power-on Function (JP7)



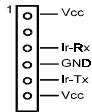
1 ● ● ○ Disabled      1 ○ ● ● Enabled

This board is able to be turned on by the PS/2 keyboard (hot key/Password) or a PS/2 mouse click. To use this function, select a device of your choice at the Power on Function option in BIOS's Integrated Peripherals screen. You must also set this jumper's cap to pins 2-3 to use this function.

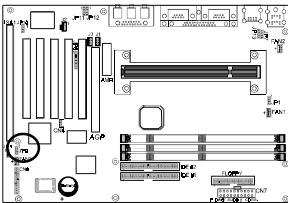
## Infrared Connector (JP8)



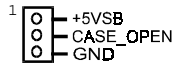
If you enable the IR Address Select in BIOS's Integrated Peripherals menu the IR port will support IR functions.



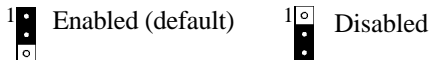
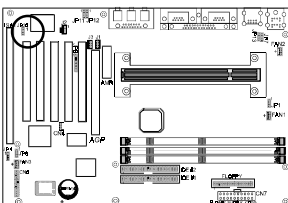
## Chassis Intrusion Monitoring Connector (JP9)



This board supports the chassis instruction detection feature of the management extension hardware by means of a mechanical or photo sensor switch attached to the motherboard through this 1x3-pin chassis security header. The mechanical switch is set to open for normal computer operation.

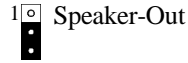
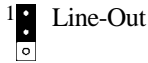
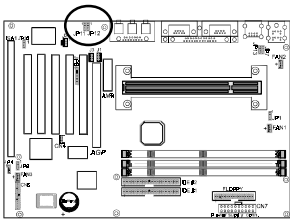


## Onboard Audio Jumper(JP10)



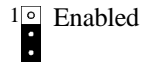
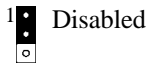
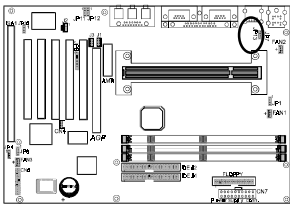
This function allows you to enable and disable the on board audio. You must set the jumper's cap to pins 1-2 to enable or set pins 2-3 to disable this function.

## Audio Line out and Speaker out Jumper(JP11/JP12)



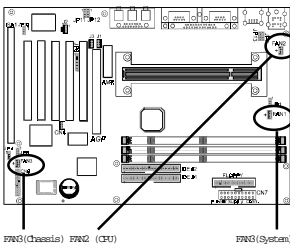
This jumper allows you to select between audio line-out or speaker out function. Set both JP11 and JP12 pins to 1-2 for line-out function or set both JP11 and JP12 pins to 2-3 for speaker out function..

## USB Device Power On Jumper (JP13)

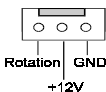


This board is able to be turned on by a USB keyboard (hot key/Password) or a USB mouse click. To use this function, select a device of your choice at the Power on Function option in BIOS's Integrated Peripherals screen. You must also set this jumper's cap to pins 2-3 to use this function.

## System/CPU/Chassis Cooling Fan Connectors (FAN1/FAN2/FAN3)



FAN3 (Chassis) FAN2 (CPU) FAN1 (System)

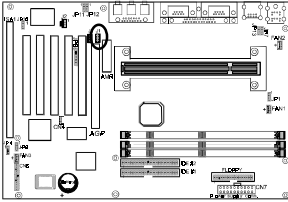


These added connectors allow the fan to draw their power from the mainboard instead of the disk drive connector. The board's management extension hardware is able to detect the CPU and system fan speed in rpm (revolutions per minute). These connectors supports 3-pin cooling fans with minimum of 3500RPM. The wiring and plug may vary depending on the manufacturer. On standard fans, the red is positive (+12V), the black is ground, and the yellow wire is the rotation signal.

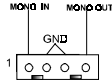
! FAN3 is an independent power line that is not control by system health monitor and power management.



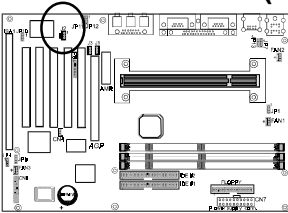
## Audio Mono -in/out (J1)



Use the mono audio cable enclosed with your CD-ROM disk drive to connect the CD-ROM to your mainboard. This will enable mono audio in/out function.



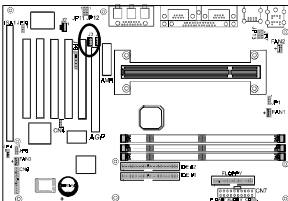
## CD-ROM Audio-in (J2)



Use the audio cable enclosed with your CD-ROM disk drive to connect the CD-ROM to your mainboard. This will enable your CD-ROM's audio function.



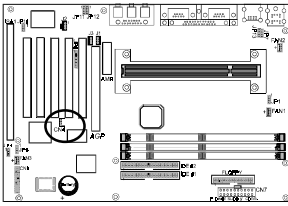
## Auxiliary CD-ROM Audio-in (J3)



Use the auxiliary audio cable enclosed with your CD-ROM disk drive to connect the CD-ROM to your mainboard. This will enable your CD-ROM's audio function.

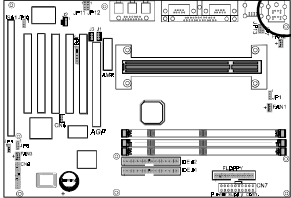


## WOL (Wake-on-LAN) Connector (CN4)



Enable the Wake Up On LAN selection in BIOS's Power Management Menu to use this function. The capability to remotely manage PCs on a network is a significant factor in reducing administrative and ownership costs. Magic Packet technology is designed to give WOL (Wake-on-LAN) capability to the LAN controller. When a PC capable of receiving wake up command goes to sleep, the Magic Packet mode in the LAN controller is enabled. When the LAN controller receives a Magic Packet frame, the LAN controller will wake up the PC. This header is used to connect an add-in NIC (Network Interface Card) which gives WOL capability to the mainboard.

## PS/2 Mouse and Keyboard Ports

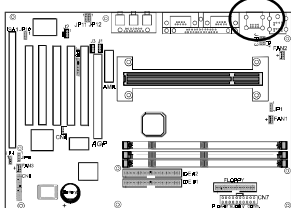


If a PS/2 mouse is used, BIOS will automatically detect and assign IRQ12 to the PS/2 mouse.



Pin	Definition
1	Data
2	No Connect
3	Ground
4	+5V (fused)
5	Clock
6	No Connect

## USB(Universal Serial Bus) Ports



If you want to use a USB keyboard, you must enable the USB keyboard support function in BIOS's Integrated Peripherals menu. USB is an open industry standard, providing a simple and inexpensive way to connect up to 125 devices to a single computer port. Keyboards, mice, tablets, digitizers, scanners, bar-code readers, modems, printers and many more can all be used at the same time.

USB is a dynamically reconfigurable serial bus with an elementary data rate of 12Mbps. Based on off the shelf, low cost micro-controller technology, its modular layered software protocol supports sophisticated devices and application programs.

## 2-5 Direct Rambus Memory Subsystem

The Direct Rambus Memory Subsystem consists two banks and the memory size ranges from **64~512MBytes** with supports up to 32 DRDRAM devices . It does not matter which bank to use but need to fill in the rest of the banks with CRIMMs.(see figure 2-5)

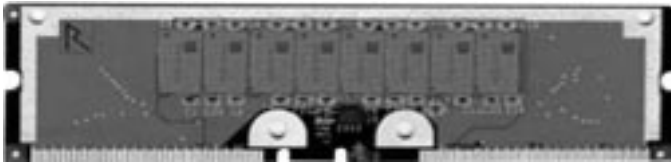
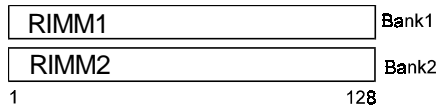


Figure 2-4 Direct RDRAM Module



Figure 2-5 CRIMM Module



The compatibility with 512MB and up Direct RDRAM is still under testing and cannot be guaranteed.



All unused banks must be filled with CRIMM in order the Direct Rambus Memory Subsystem to function.

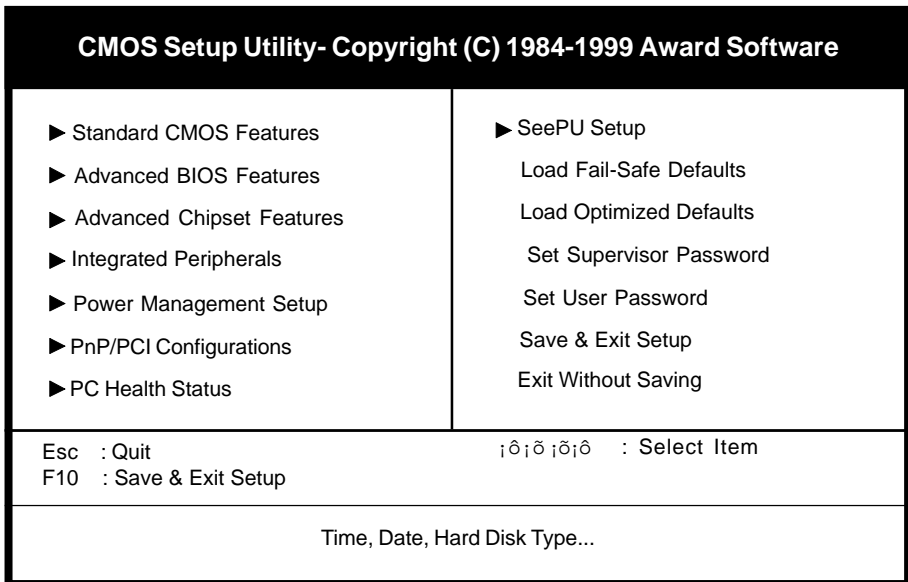


# *Memo*

## Award BIOS Setup Program

Award's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This information is stored in CMOS RAM so that it can retain the setup information, even when the power is turned off.

When you turn on or restart the system, press the Delete key to enter the Award BIOS setup program. The primary screen as shown in Figure 3-1 is a list of the menus and functions available in the setup program. Select the desired item and press enter to make changes. Operating commands are located at the bottom of this and all other BIOS screens. *When a field is highlighted, on-line help information is displayed on the right side of the screen.*



**Figure 3-1 Setup Program Initial Screen**



# ***Memo***