Chapter 1

Introduction

1-1 Product Specifications

❏ **Processor**
- **-** Supports up to 450 MHz Intel **Pentium® II** processors and **Celeron** processors with MMX technology
- - Slot 1 CPU socket with folding retention mechanism
- - High efficiency **Switching Power Module** (1.8v ~ 3.5v, 0.1v increments)
- - Supports 66/100 MHz system clock speeds
- - Innovative *SeePU* technology (software CPU installation with no jumper settings)

  ⚠ Supports 75/83/103/112//133 MHz system clock speeds for over-clocking possibility.(See Section 2-3 Overclocking)

❏ **Chipset**
- **-** Intel **82440BX** two chip AGPset

❏ **DRAM Memory**
- - Three 3.3V 168-pin DIMM sockets support up to 384 MB
- - Supports 16/32/64/128MB, 64/72-bit unbuffered Synchronous DIMM modules
- - Provides single-bit ECC capability

  ⚠ 10ns or faster SDRAM DIMM modules with SPD are required for 100MHz frequency clock speed

  ⚠ Because 256MB unbuffered DIMM and Registered DIMM modules are not yet mainstream, their compatibility can not be guaranteed. (See Section 2-5 for details.)

❏ **Expansion Slots**
- - One 32-bit AGP slot (Rev 1.0 compliant)
- - Four 32-bit PCI slots (Rev 2.1 compliant)
- - Two 16-bit ISA slots (one PCI/ISA shared slot)

❏ **BIOS**
- - Award System BIOS, supports PnP, APM, DMI & Multi-device booting features i.e. floppy, LS120, CD-ROM, HDD(IDE, SCSI), ZIP-ATAPI etc.
- - Includes Trend **ChipAway Virus** protection for virus-free boot and virus free operating system

✎ The Trend ChipAway Virus is a rule-based anti-virus technology and does not require periodical updates of virus code

❒ **Two Ultra DMA-33 PCI IDE Ports**
- Supports up to PIO Mode 4, Multi-word Mode 2 and Ultra DMA-33 timings
- Bus Mastering software drivers for all well known multi-task operating systems

❒ **On-board Ultra I/O**
- ITE 8671 I/O chip
- 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
- IrDA IR function supports up to 115.2Kbps

❒ **Two Channel USB Ports**

⚠ Now under compatibility testing with different peripherals

❒ **Board Dimensions**
- ATX form factor, 305mm x 190mm, 4 Layers
- Six mounting holes

❒ **Advanced Management Features**
- Software power off control, Power-on by modem, Power on by alarm, Power-on by keyboard, Over-ride power button, Power failure recovery, Blinking LED in Suspend, Power on by mouse, Power on safe guard, **Wake Up On LAN**, etc.
- **Poly-fuse** over-current protection for USB and keyboard
- Flash BIOS protect via BIOS
- Supports **SB-link** header for Creative PCI audio cards
- Supports optional **FAN-II** (EISCA v1.0 compliant cooling fan, see Appedinx III) or on-board Management Extension Hardware and includes system monitoring software to streamline PC management
- Meets EPA Green PC standard: power consumption under 30W in Doze, Standby, and Suspend modes
- **ACPI** features ready when ACPI-enabled O/S is available

❑ **Switching Power Supply Requirement (at least 200 Watts)**

Output Voltage	Max. Regulation Requirement	Min. Current Requirement (Amps)
+12V	+/- 5%	0
+5V	+/- 5%	1
+3.3V	+/- 5%	10*
-5V	+/- 10%	0
-12V	+/- 10%	0
+5VSB	**+/- 5%**	**0.75**

Table 1–1

* 3.3V at 10Amps is necessary too guarantee full loading operation because some AGP cards and memory modules have high current consumption.

✎ The on-board 3.3v regulator provides maximum 6Amp current drive capability for AGP cards and memory modules.

1-2 Package Contents

This product comes with the following components:

❒ One mainboard

❒ On-board Slot 1 foldable retention mechanism and four screws

❒ One 40-pin IDE connector ribbon cable (Figure 1-1)

❒ 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

  - Audio Driver and Utility

 - Award Flash EPROM Utility, Award DMI Utility for DOS

  - Intel Bus Master IDE drivers for Win95, WinNT, and OS/2

  - Exclamation Mark Remover Utility

  - System Health Monitoring Software

  - Trend **PC-cillin** Anti-virus v3.0(OEM version) Utility in eight different
    languages

IDE cable
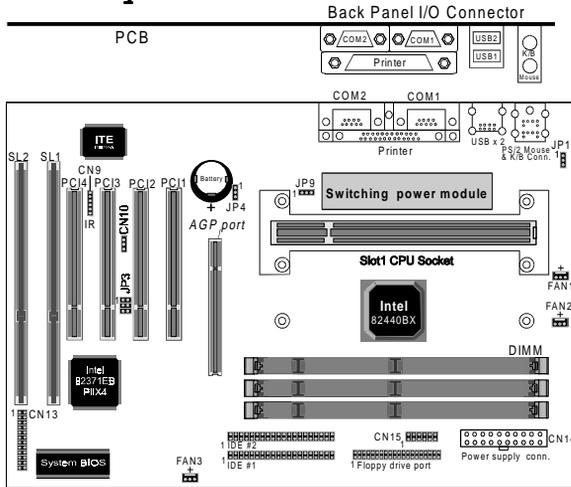
Figure 1–1

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	Page
CN9	Infrared connector	14
CN10	WOL (Wake on LAN) connector	14
CN13	Keyboard lock & Power indicator LED connector	12
	System reset switch connector	13
	Speaker connector	13
	Green switch & Green LED connector	13
	Turbo LED connector	13
	IDE activity LED connector	13
	Over ride power button (for ATX power supply)	12
CN14	ATX Power supply connector	11
CN15	FAN-II connector	53
CN22	Modem telephony connector	16
FAN1	CPU cooling fan connector	14
FAN2/FAN3	System cooling fan connector	14
JP1	Power on by keyboard jumper	15
JP3	Creative's SB-LINK connector	15
JP4	Clear CMOS data jumper	15
JP9	External clock frequency jumper	10
Ports	PS/2 mouse and keyboard ports	16
Ports	USB (Universal Serial Bus) ports	16

Memo

Chapter 2

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.
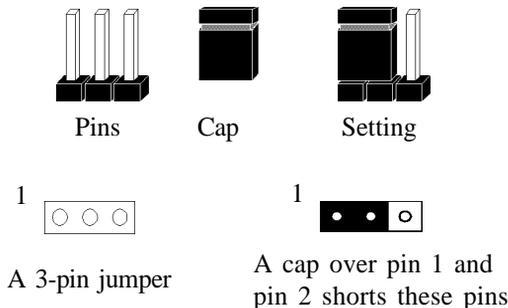
Pins   Cap   Setting

1   A 3-pin jumper

1   A cap over pin 1 and pin 2 shorts these pins

Figure 2–1

2-2 Installing an S.E.C. Processor in Slot 1

1. Insert the Pentium II 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 can 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 and cooling fan is necessary for proper heat dissipation from your CPU. Failing to install these items may result in overheating and possible burn-out 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 & Chipset Setup menu and press Enter. Find the CPU Setup commands at the right hand part of the BIOS screen (Figure 2-2) Commands for operating the cursor in BIOS are found at the lower right of the BIOS screen.

```
               ROM PCI / ISA BIOS (2A69KC39)
                  SeePU & CHIPSET SETUP
                   AWARD SOFTWARE, INC.

 SDRAM CAS latency Time    : 3        Power Failure Recovery      : Disabled
 DRAM Data Integrity Mode  : Non-ECC  Spectrum Spread             : Disabled
 System BIOS Cacheable     : Disabled Flash BIOS Protection       : Disabled
 Video BIOS Cacheable      : Disabled
 Video RAM Cacheable       : Disabled
 8 Bit I/O Recovery Time   : 1
 16 Bit I/O Recovery Time  : 1
 Memory Hole At 15M-16M    : Disabled     *****   CPU Setup   *****
 Passive Release           : Enabled   CPU Type            :350MHz (100*3.5)
 Delayed Transaction       : Enabled
 AGP Aperture Size (MB)    : 64


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

Figure 2–2

3. Change the CPU Type according to the speed of your Pentium II processor. See Figure 2-3 for frequency specifications.

CPU Type	CPU Speed		
	External Clock	Frequency Ratio	Internal Clock
Pentium II processor	66	3.5	233
		4	266
		4.5	300
		5	333
	100	3.5	350
		4	400
		4.5	450

Figure 2-3

4. Use the User Define option to custom set your CPU's parameters. Set the frequency ratio (also known as external clock multiplier factor) and CPU bus frequency according to your processor's specifications. See Figure 2-4.

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

```
           ROM PCI / ISA BIOS (2A69KC39)
              SeePU & CHIPSET SETUP
               AWARD SOFTWARE, INC.

  SDRAM CAS latency Time   : 3          Power Failure Recovery   : Disabled
  DRAM Data Integrity Mode : Non-ECC    Spectrum Spread          : Disabled
  System BIOS Cacheable    : Disabled   Flash BIOS Protection    : Disabled
  Video BIOS Cacheable     : Disabled
  Video RAM Cacheable      : Disabled
  8 Bit I/O Recovery Time  : 1
  16 Bit I/O Recovery Time : 1
  Memory Hole At 15M-16M   : Disabled     *****    CPU Setup    *****
  Passive Release          : Enabled    CPU Type            : User's Define
  Delayed Transaction      : Enabled    Frequency Ratio     : 3.5X
  AGP Aperture Size (MB)   : 64         CPU Bus Frequency   :100MHz



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

Figure 2-4

5. 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 indicated on the start-up screen screen.

External Clock Frequency Jumper (JP9)
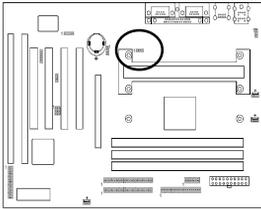
1 ▪▪▫ (Default)   1 ▫▪▪

  CPU   100MHz

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 automatic determines the external clock speed. If set to pins 2-3, the external clock is always 100MHz.

Overclocking

Operating a CPU at a higher frequency than it's specification allows is called overclocking. If the CPU frequency is set at a higher frequency than it's specification allows, it may or may not run at that freqency, 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 burn-out, system failure, etc.

Many Pentium II 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. (Pressing the Home key allows the computer to boot at a low system speed. For example, for 66MHz external clock CPUs, the CPU boot-up speed is 233MHz. For 100MHz external clock CPUs, the CPU boot-up speed is 350MHz.)

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 (CN14)
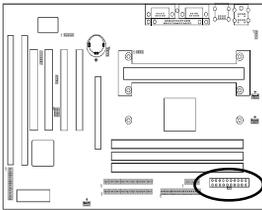
This mainboard requires a power supply of at least 200 watts. **The power cord leading from the system's power supply to the external power source must be the very last part connected when assembling a system.**
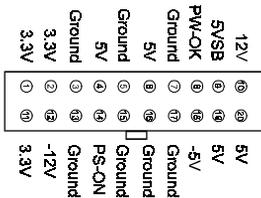
The ATX power supply provides a single 20-pin connector interface which incorporates standard +/-5V, +/-12V, optional 3.3V and Soft-power signals. The Soft-power signal, a 5V trickle supply is continuously supplied when AC power is available. When the system is in the Soft-Off mode, this trickle supply maintains the system in it's minimum power state.

Software Power-Off Control

This mainboard can be powered down using theWindows 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.

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. Enable this function in BIOS's Power Management Setup menu. (See section 3-4)

Front Panel Connector Set (CN13) A through G

Over–ride Power Button Operation
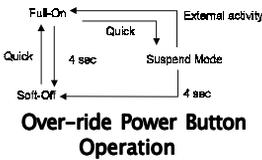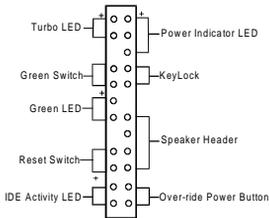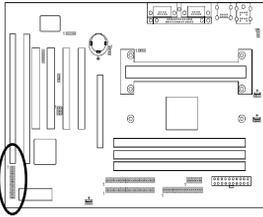
A. Over-ride Power Button Connector

The power button on the ATX chassis can be used as a normal power switch as well as a button 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. (See section 3-4)

When the Soft-OFF by PWR-BTTN function is enabled, pushing the power button rapidly will switch the system to Suspend mode. Any occurence of external activity 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 cable and pin orientation (i.e., not to reverse the order of these two connectors.)

Pin	Definition
1	+5V DC
2	No Connect
3	Ground
4	Keylock
5	Ground

Power Good LED — Pins 1, 2, 3
Keyboard Lock — Pins 4, 5

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)
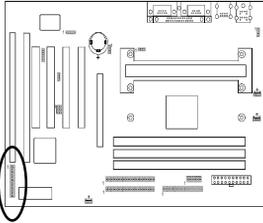
C. Green Switch/Green LED Connector

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 it's 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.
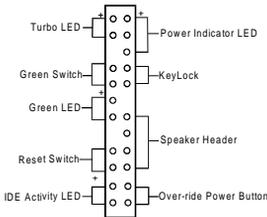
D. System Reset Switch Connector

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

This mainboard does not have a Turbo/De-turbo speed modes. Even though this function does not exist, the turbo LED will light when the LED is connected and turbo button pressed.

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. Unlike conventional fuses, the poly-fuse does not have to be replaced, relieving the user wasted time and inconvenience.
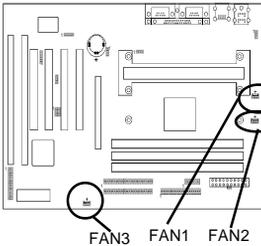
Infrared Connector (CN9)
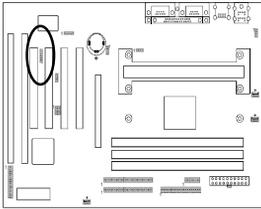
If you enable the COM2 Mode in BIOS's Integrated Peripherals menu the COM2 port will support IR functions. (See section 3-7)

```
Vcc ──── ○
Ir-Rx ──── ○
GND ──── ○
Ir-Tx ──── ○
Vcc ──── ○
```

CPU/System1/System2 Cooling Fan Connectors (FAN1/FAN2/FAN3)

FAN3   FAN1   FAN2

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 3500 RPM. 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.

```
○ ── GND
○ ── +12V
○ ── Rotation
```

WOL (Wake-on-LAN) Connector (CN10)

```
1
○ ── 5VSB
○ ── GND
○ ── Wakeup
```
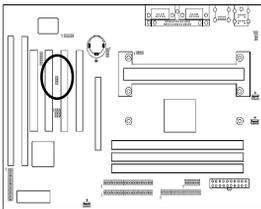
Enable the Wake Up On LAN selection in BIOS's Power Management Menu to use this function. The capability to remotely manage PCs on a network is a significant factor in reducing administrative and ownership costs. Magic Packet technology is designed to give WOL (Wake-on-LAN) capability to the LAN controller. 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.
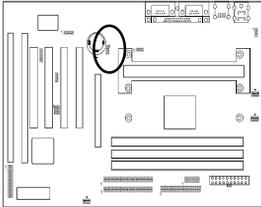
To support this function, a switching power supply with a minimum of **750mA** 5VSB is required.

Creative's SB-LINK Sound Connector (JP3)
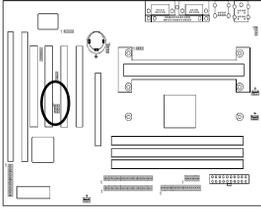
The SB-LINK serves as a bridge between the mainboard and Creative's PCI sound card. This connector delivers Sound Blaster 16 compatibility for real-mode DOS games.

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.

Power-on by Keyboard Jumper (JP1)
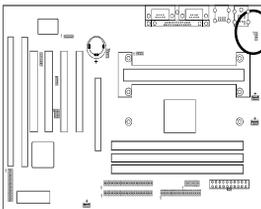
1 ▪ Disabled (default)   1 ▫ Enabled

This board is able to be turned on by the keyboard (hot key/Password) or mouse click. To use this function, select a device of your choice at the Power on Function option in BIOS's Integrated Peripherals screen (See section 3-7). You must also set this jumper's cap to pins 2-3 to use this function. Some out-of-date keyboards may require larger current than supplied by the Suspend 5V of modern power supplies. When using older keyboards disable this function.
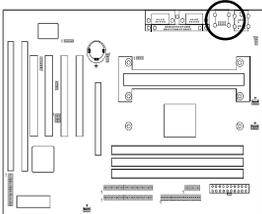
PS/2 Mouse and Keyboard Ports
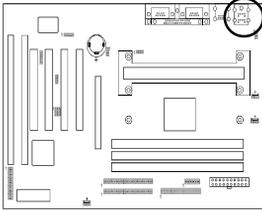
If a PS/2 mouse is used, BIOS will automatically detect and assign IRQ12 to the PS/2 mouse.

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 (See Section 3-7). 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.

This board contains a USB Host controller and includes a root hub with two USB ports (meets USB Rev 1.0 spec.). Two USB peripherals or hub devices are able to be connected.

Compatibility with different USB peripherals is still being tested.

Modem `Telephony Connector`(CN22)
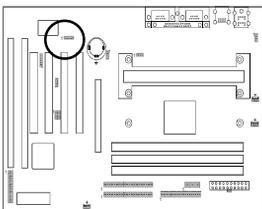
This connector supports modem telephony input and mono audio output for modem telephony device.

2-5 Main Memory Configuration

The DRAM memory system consists of three banks and the memory size ranges from **16~384 MBytes**. If you only use one bank it does not matter which one you use and if you use two or more banks, it does not matter which bank you install first.

DIMM 1	Bank0
DIMM 2	Bank1
DIMM 3	Bank2

1   128
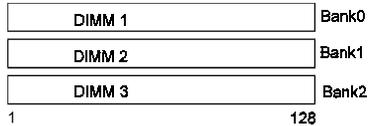
DRAM Specifications

	System Frequency	SDRAM Type	Max Mem
3 unbuffered DIMM Modules	66MHz	12ns or faster	384ME
	100MHz	10ns or faster	
3 Registered DIMM Modules	66MHz	12ns or faster	768ME
	100MHz	10ns or faster	

DIMM type: 3.3V, unbuffered, registered, 64/72-bit Synchronous
                    DRAM with SPD*

Module size: Single/double-side 16/32/64/128 MBytes

Parity: Either parity or non-parity

⚠ The compatibility of 256MB and Registered DIMM is still under testing and cannot be guaranteed.

⚠ This mainboard supports 3.3v, unbuffered, 4-clock, SDRAM DIMM only. Buffered, 5V, or 2-clock SDRAM DIMMs should not be used.

⚠ Due to loading anomalies, using DIMM with an 'n x 4' DRAM base on this mainboard is not recommended. For example, a DIMM that uses sixteen 16Mb x 4 devices should not be used.

SPD (Serial Presence Detect)

This is an EPROM that contains speed and design information about the memory module. The mainboard queries the module and makes adjustments to system operation based on what it finds.

ECC DRAM Capability

This mainboard can be configured to support ECC (Error Check and Correct) function when utilizing parity DIMM modules. To utilize the chipset's ECC features, you must use a 72-bit DIMM module.These modules are automatically detected during bootup. However, the user must configure the DRAM Data Integrity Mode to "ECC" in BIOS's Chipset Features Setup menu to enable the ECC function. ECC detects double bit errors and detects and corrects single bit memory errors on the fly without user intervention. Errors may be generated by a defective memory module, conflicting memory speeds between different banks, DMA, etc.