ASUS® CUW(E)-FX
Intel® 810 FlexATX Motherboard

USER'S MANUAL

Special Features

CUWE-FX
- Intel 810E Chipset with support for 133/100/66MHz FSB
- 4MB 32-bit 133MHz SDRAM display cache onboard

CUW-FX
- Intel 810 Chipset with support for 100/66MHz FSB
- Optional 4MB 32-bit 100MHz SDRAM display cache onboard

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ASUS CONTACT INFORMATION

ASUSTeK COMPUTER INC. (Asia-Pacific)

Marketing

Address: 150 Li-Te Road, Peitou, Taipei, Taiwan 112
Telephone: +886-2-2894-3447
Fax: +886-2-2894-3449
Email: info@asus.com.tw

Technical Support

MB/Others (Tel):   +886-2-2890-7121 (English)
Notebook (Tel):   +886-2-2890-7122 (English)
Desktop/Server (Tel):+886-2-2890-7123 (English)
Fax: +886-2-2895-9254
Email: tsd@asus.com.tw
WWW: www.asus.com.tw
FTP: ftp.asus.com.tw/pub/ASUS

ASUS COMPUTER INTERNATIONAL (America)

Marketing

Address: 6737 Mowry Avenue, Mowry Business Center, Building 2
                    Newark, CA 94560, USA
Fax: +1-510-608-4555
Email: tmd1@asus.com

Technical Support

Fax: +1-510-608-4555
BBS: +1-510-739-3774
Email: tsd@asus.com
WWW: www.asus.com
FTP: ftp.asus.com/Pub/ASUS

ASUS COMPUTER GmbH (Europe)

Marketing

Address: Harkortstr. 25, 40880 Ratingen, BRD, Germany
Fax: +49-2102-442066
Email: sales@asuscom.de (for marketing requests only)

Technical Support

Hotline: MB/Others: +49-2102-9599-0   Notebook: +49-2102-9599-10
Fax: +49-2102-9599-11
Support (Email):   www.asuscom.de/de/support (for online support)
WWW: www.asuscom.de
FTP: ftp.asuscom.de/pub/ASUSCOM

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FCC & DOC COMPLIANCE

Federal Communications Commission Statement

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING! Any changes or modifications to this product not expressly approved by the manufacturer could void any assurances of safety or performance and could result in violation of Part 15 of the FCC Rules.

Reprinted from the Code of Federal Regulations #47, part 15.193, 1993. Washington DC: Office of the Federal Register, National Archives and Records Administration, U.S. Government Printing Office.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

1. INTRODUCTION

1.1 How This Manual Is Organized

This manual is divided into the following sections:

1) **INTRODUCTION**   Manual information and checklist
2) **FEATURES**   Product information and specifications
3) **HARDWARE SETUP**   Instructions on setting up the motherboard
4) **BIOS SETUP**   Instructions on setting up the BIOS software
5) **SOFTWARE SETUP**   Instructions on setting up the included software
6) **SOFTWARE REFERENCE**   Reference material for the included software
7) **APPENDIX**   Optional items and general reference

1.2 Item Checklist

Check that your package is complete. If you discover damaged or missing items, please contact your retailer.

Package Contents

☑ (1) ASUS Motherboard

☑ (1) 40-pin 80-conductor ribbon cable for internal UltraDMA/ 66 or UltraDMA/33 IDE drives

☑ (1) 40-pin ribbon cable for internal UltraDMA/33 IDE drives

☑ (1) Ribbon cable for (1) 5.25" and (2) 3.5" floppy disk drives

☑ (1) Bag of spare jumper caps

☑ (1) Support CD with drivers and utilities

☑ (1) This Motherboard User's Manual

Optional Items

☐ Serial port connector with bracket (optional)

☐ ASUS LCD-I controller module (for LCD model only)

☐ ASUS TV-out controller module (optional)

☐ ASUS IrDA-compliant infrared module (optional)

☐ ASUS consumer infrared set (optional)

☐ Modem riser card (optional)

☐ USB hub module (optional)

2. FEATURES

2.1 The ASUS CUW(E)-FX Motherboard

The CUW(E)-FX motherboard from ASUS is carefully designed for the demanding PC user who wants many smart features in a small package. So what's so smart about the ASUS CUW(E)-FX motherboard?

2.1.1 Specifications

- **Latest Intel Socket 370 Processor Support!** Supports Intel's Pentium® III Coppermine and Celeron™ Mendocino processors.
- **Form Factor for Easy-to-Use PC!** Designed for small-size easy-to-use PCs. This new highly flexible form factor reduces the motherboard size by as much as 25% over the microATX design.
- **Latest Intel 810 Series Chipset!** Features Intel's 810 Series chipset with the Accelerated Hub Architecture, which provides direct connections between the 810 chipset and subsystems such as IDE controllers, USB controllers, and PCI add-on cards.
- **Integrated Graphics!** The 24-bit 230MHz RAMDAC graphics controller supports 3D hyper pipelined architecture, parallel data processing and compression, precise pixel interpolation, full 2D hardware acceleration, and motion video acceleration. The CUWE-FX comes with 4MB 32-bit 133MHz SDRAM display cache onboard, and the CUW-FX comes with *optional* 4MB 100MHz SDRAM display cache.
- **ASUS Graphics Driver!** You can gain about 12% performance over that of the standard graphics driver (2D high-end graphics WinMark) using ASUS' custom graphics driver. ASUS custom graphics driver also provides more features and provides selection of higher refresh rates and resolutions.
- **3D Positional Audio!** Brings new levels of realism to games with sounds being positioned interactively around the user, making them truly part of the 3D virtual experience. Better music reproduction is possible with MIDI utilizing Wavetable synthesis.
- **Versatile Memory Support!** DRAM controller supports asymmetrical addressing and two DIMM sockets support Intel PC100-compliant SDRAMs (16, 32, 64, 128, or 256MB) up to 512MB. (supports a maximum of 4 sides)
- **JumperFree™!** Allows processor settings and easy overclocking of frequency and Vcore voltage all through BIOS setup.
- **Legacy Free!** Provides one 32-bit PCI (rev 2.2) expansion slot with no ISA, eliminating bottlenecks and system memory management issues. PCI supports up to 133MB/s maximum throughput. Each PCI slot can support a Bus Master PCI card (such as SCSI or LAN cards).
- **Latest Low Pin Count Multi-I/O:** Provides two high-speed UART compatible serial ports and one parallel port with EPP and ECP capabilities.
- **Integrated IDE!** Controller supports UltraDMA/66 up to 66MB/s, UltraDMA/33 up to 33MB/s, and PIO Mode 4 up to 17MB/s.
- **Peripheral Wake-Up!** Supports Wake-On-LAN, Wake-On-Ring, Keyboard Wake-Up, and BIOS Wake-Up.

2. FEATURES

- **AMR Slot!** Audio Modem Riser slot supports a very affordable audio and/or modem riser card.

- **Around-the-Clock Intrusion Detection!** Chassis intrusion circuitry can log chassis panel open events into LDCM (available in near future for this motherboard). The onboard battery supports detection even when normal power is removed and through a new design, battery drain is even lower than the RTC used for keeping time!

- **Firmware Hub!** Provides security and other latest power computing features.

- **Monitoring for your PC's Health!** Provided ASUS PC Probe or Intel LDCM allows PC health monitoring.

- **Enhanced ACPI & Anti-Boot Virus Protection!** Programmable BIOS (Flash EEPROM), offering enhanced ACPI for Windows 98 compatibility, built-in firmware-based virus protection, and autodetection of most devices for virtually automatic setup.

- **Smart BIOS!** 4Mbit firmware gives a new easy-to-use interface which provides more control and protection over the motherboard. Provides Vcore and CPU/ SDRAM frequency adjustments, boot block write protection, and HD/SCSI/MO/ ZIP/CD/Floppy boot selection. Hardware random number generator supports new security software for data protection and secured Internet transactions.

- **Onboard LED!** The onboard LED will light up when there is standby power. This acts as a reminder to the user to turn OFF the power before plugging and unplugging devices so as not to damage the motherboard, peripherals, and/or components.

2.1.2 Optional Components

The following onboard components are optional at the time of purchase:

- **Smart Audio!** Software Audio and Hardware AC'97 V2.1 codec compliant with sample rate conversion form 7kHz to 48kHz. Full audio output can be directed to the chassis' internal speaker in order to save space and money while reducing complications associated with external speakers.

- **Smart Networking!** Features the Intel 82559 Fast-Ethernet LAN Controller (fully integrated 10BASE-T/100BASE-TX). Supports Wired for Management, remote wake-up, and OnNow initiative to reduce the **T**otal **C**ost of **O**wnership (TCO).

- **Space Savings! D**igital **F**lat **P**anel (DFP) Interface (see *7.1 ASUS LCD-I Module*) gives a direct digital connection for connecting a **digital** flat panel (analog flat panel must be connected to the VGA-out connector) to your PC. This interface transmits sharp, bright images by eliminating digital-to-analog and analog-to-digital conversions, which can accumulate noise and degrade image quality.

- **TV Out!** Displays high quality graphics and video on any television (NTSC or PAL) with an optional TV Out module.

- **No Messy Wires!** Integrated Consumer IR and Serial IR supports an optional remote control package for wireless interfacing with external peripherals, personal gadgets, or an optional remote controller.

- **More USB Ports!** An optional USB hub module gives you a total of four USB ports for fast Plug-and-Play connection to your computer.

2. FEATURES

2.1.3 Performance

- **UltraPerformance!** Onboard IDE Bus Master controller with two connectors that support four IDE devices in two channels. Supports UltraDMA/66, UltraDMA/33 (IDE DMA Mode 2), PIO Modes 3 & 4, and supports Enhanced IDE devices, such as Tape Backup, DVD-ROM, CD-ROM, CD-R/RW, and LS-120 drives.

- **Double or Quadruple the IDE Transfer Speed!** IDE transfers using UltraDMA/33 Bus Master IDE can handle rates up to 33MB/s and up to 66MB/s using UltraDMA/66 technology. The best of all is that these new technology is compatible with existing ATA-2 IDE specifications so there is no need to upgrade current IDE devices or cables.

- **Concurrent PCI!** Concurrent PCI optimizes system performance with concurrent PCI and CPU bus activities.

- **SDRAM Optimized Performance!** ASUS smart series motherboards support the new generation memory, Synchronous Dynamic Random Access Memory (SDRAM), which increases the data transfer rate to 800MB/s max using PC100-compliant SDRAM.

- **ACPI Ready!** ACPI (Advanced Configuration and Power Interface) is also implemented on all ASUS smart series motherboards. ACPI provides more Energy Saving Features for future operating systems (OS) supporting OS Direct Power Management (OSPM) functionality. With these features implemented in the OS, PCs can be ready around the clock, yet satisfy all the energy saving standards. To fully utilize the benefits of ACPI, an ACPI-supported OS, such as Windows 98, must be used.

- **Suspend and Go!** Suspend-**T**o-**R**AM (STR) provides maximum power savings as an alternative to leaving the computer ON and QuickStart™ so that you do not fall asleep waiting for system bootup.

- **New Compliancy!** Both the BIOS and hardware levels of the motherboard meet the stringent requirements for Microsoft PC'99 certification. The new PC'99 requirements for systems and components are based on the following high-level goals: Support for Plug and Play compatibility and power management for configuring and managing all system components, and 32-bit device drivers and installation procedures for Windows 95/98/NT. Color-coded connectors and descriptive icons make identification easy as required by PC'99.

- **Highest Audio Quality!** AC'97 DAC/ADC built into the audio CODEC reduces noise to improve audio quality and performance for a SNR (signal to noise ratio) of +90dB. These features greatly improve voice synthesis and recognition.

- **Extreme Graphics!** The integrated motion compensation allows for smooth MPEG1 or MPEG2 video playback. Fast 3D graphics engine allows for an exciting gameplay experience.

2. FEATURES

2.1.4 Intelligence

- **Fan Status Monitoring and Alarm!** To prevent system overheat and system damage, the CPU, power supply, and system fans can be monitored for RPM and failure. All the fans are set for its normal RPM range and alarm thresholds.

- **Temperature Monitoring and Alert!** To prevent system overheat and system damage, this motherboard supports Socket 370 processor thermal sensing and auto-protection.

- **Voltage Monitoring and Alert!** System voltage levels are monitored to ensure stable current to critical motherboard components. Voltage specifications are more critical for future processors, so monitoring is necessary to ensure proper system configuration and management.

- **System Resources Alert!** (Requires the future release of LDCM v6.0) Today's operating systems such as Windows 98, Windows NT, and OS/2, require much more memory and hard drive space to present enormous user interfaces and run large applications. The system resource monitor will warn the user before the system resources are used up to prevent possible application crashes. Suggestions will give the user information on managing their limited resources more efficiently.

- **Dual Function Power Button!** Through the BIOS, the power button can be defined as the "Standby" (a.k.a. Suspend or Sleep) button or as the Soft-Off (see ATX Power Switch Lead in *3.8 External Connectors* for more information) button. Regardless of the setting, pushing the power button for more than 4 seconds will enter the Soft-Off mode.

- **Remote Ring On (requires modem)!** This allows a computer to be turned on remotely through an internal or external modem. With this benefit on-hand, users can access any information from their computers from anywhere in the world!

- **Message LED (requires ACPI OS support)!** Message LEDs now act as information providers. Through the way a particular LED illuminates, the user can determine if a message has been received from a fax/modem. A simple glimpse provides useful information to the user. This function requires ACPI OS and driver support.

- **Peripheral Power Up!** Keyboard and/or CIR power up can be enabled or disabled through BIOS setup to allow the computer to be powered ON using your keyboard and/or Consumer IR device.

2. FEATURES

2.2 ASUS CUW(E)-FX Components

See the opposite page for locations.

		Location
Processor Support	Socket 370 for Coppermine/Mendocino Processors	**3**
Chipsets	Intel 810 Series Chipset	**4**
	Graphics and Memory Controller Hub (GMCH)	
	Intel I/O Controller Hub (ICH)	**8**
	4Mb Firmware Hub (FWH)	**9**
	Low Pin Count Multi-I/O Chipset	**13**
Main Memory	Maximum 512MB support	
	2 DIMM Sockets	**5**
	PC100 SDRAM support	
Expansion Slots	1 PCI Slot	**10**
	1 Audio Modem Riser (AMR) Slot	**19**
System I/O	1 USB Header	**1**
	1 Floppy Disk Driver Connector	**6**
	2 IDE Connectors (UltraDMA33/66 Support)	**7**
	1 Serial COM2 Header	**21**
	1 Parallel Port Connector	**23**
	1 Serial COM1 Connector	**24**
	2 USB Connectors .... **(Bottom) 25**	
	1 PS/2 Mouse Connector .... **(Top) 26**	
	1 PS/2 Keyboard Connector .... **(Bottom) 26**	
3D Graphics	Graphics and Memory Controller Hub (GMCH)	
	1 VGA Monitor Output Connector	**22**
	TV-Out/Digital LCD Module Headers	**15**
	4MB onboard high-speed SDRAM (optional)	**12**
Audio	AC'97 V2.1 Audio Codec	**18**
	1 Joystick/MIDI Connector .... **(Top) 20**	
	1 Line Out Connector (on audio model only) .... **(Bottom) 20**	
	1 Line In Connector (on audio model only) .... **(Bottom) 20**	
	1 Microphone Connector (on audio model only) ... **(Bottom) 20**	
Network Features	Intel 82559 Fast-Ethernet Chipset (on LAN model only)	**16**
	1 LAN (RJ45) Connector (optional) .... **(Top) 25**	
	Wake-On-LAN Connector	**17**
	Wake-On-Ring Connector	**14**
Hardware Monitoring	System Voltage Monitoring (integrated in ASUS ASIC)	**11**
	3 Fan Power and Speed Monitoring Connectors	
Power	ATX Power Supply Connector	**2**
Form Factor	FlexATX	

2. FEATURES

2.3 Component Locations

3. HARDWARE SETUP

3.1 Motherboard Layout

19.0cm (7.48in)
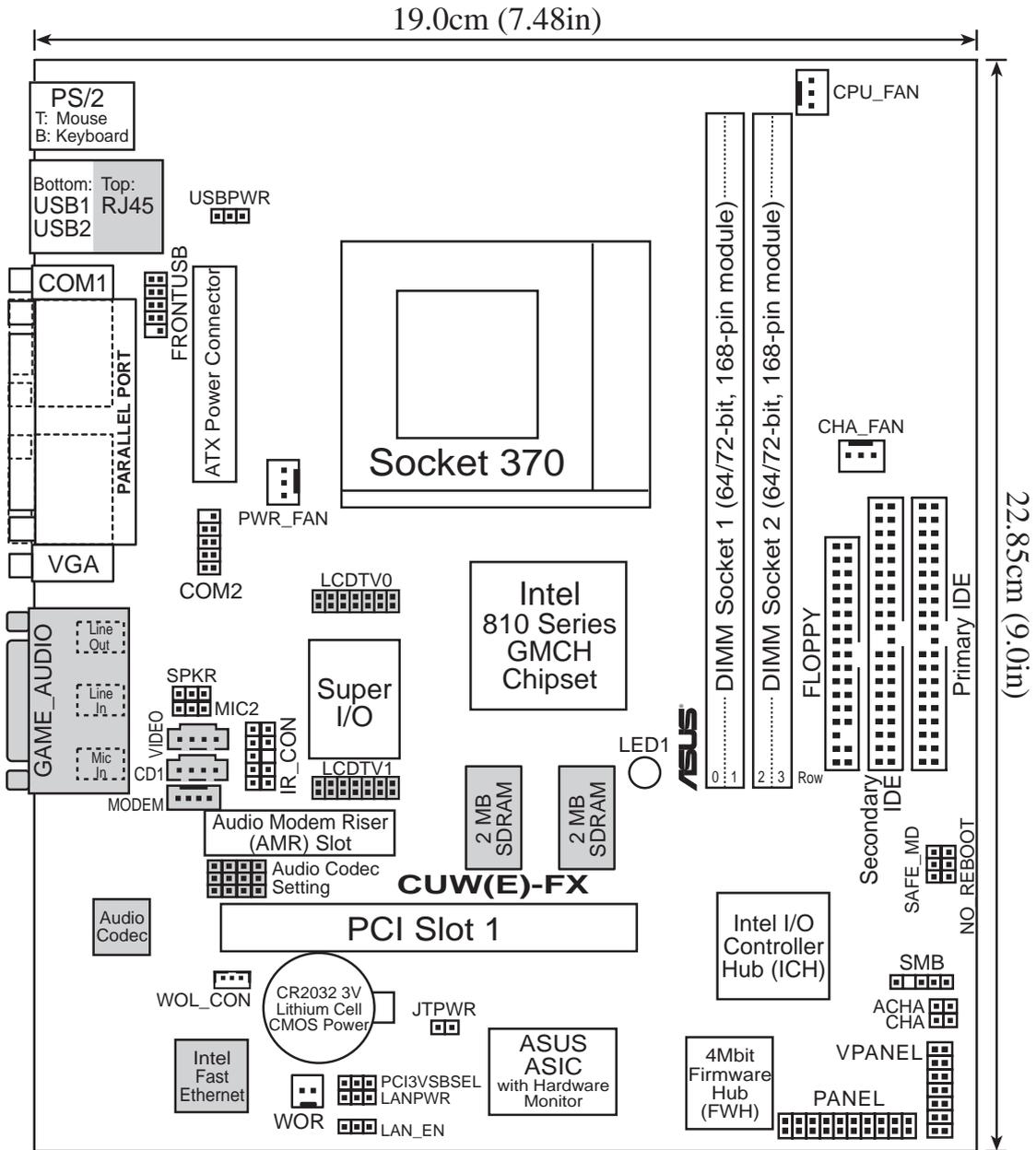
(Grayed items are optional at the time of purchase.)

3. HARDWARE SETUP

3.2 Layout Contents

Motherboard Settings

Expansion Slots

Connectors

3. HARDWARE SETUP

3. H/W SETUP

3.3 Hardware Setup Procedure

Before using your computer, you must complete the following steps:

- **Check Motherboard Settings**
- **Install Memory Modules**
- **Install the Central Processing Unit (CPU)**
- **Install Expansion Cards**
- **Connect Ribbon Cables, Panel Wires, and Power Supply**

WARNING! Make sure that you unplug your power supply when adding or removing system components. Failure to do so may cause severe damage to your motherboard, peripherals, and/or components. The onboard LED (see *3.1 Motherboard Layout* for location) when lit acts as a reminder that the system is in suspend or soft-off mode and not powered OFF.

3.4 Motherboard Settings

This section explains in detail how to change your motherboard's function settings through the use of switches and/or jumpers.

WARNING! Computer motherboards and expansion cards contain very delicate Integrated Circuit (IC) chips. To protect them against damage from static electricity, you should follow some precautions whenever you work on your computer.

1. Unplug your computer when working on the inside.

2. Use a grounded wrist strap before handling computer components. If you do not have one, touch both of your hands to a safely grounded object or to a metal object, such as the power supply case.

3. Hold components by the edges and try not to touch the IC chips, leads or connectors, or other components.

4. Place components on a grounded antistatic pad or on the bag that came with the component whenever the components are separated from the system.

3. H/W SETUP
Motherboard Settings

3. HARDWARE SETUP

1) **Onboard Audio Codec Setting (CODEC)**
   available on audio model only
   The onboard audio CODEC may be enabled or disabled using all of these jumpers. Disable the onboard audio CODEC if you are using a PCI audio card on any of the expansion slots or a primary AMR on the AMR slot (see AMR Slot later in this section). If using a PCI audio expansion card, **Onboard AC'97 Audio Controller** in *4.4.2 I/O Device Configuration* must also be disabled.

Setting	CODEC
Enable	[1-2] [1-2] [1-2] [1-2] (default)
Disable	[2-3] [2-3] [2-3] [2-3]
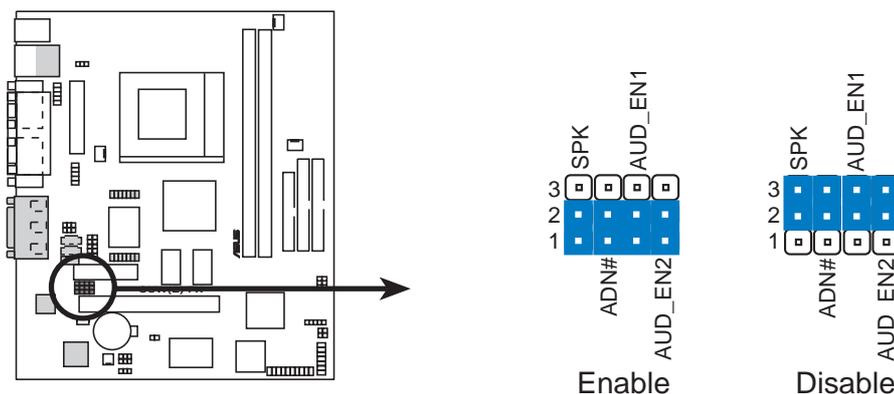
   CUW(E)-FX Audio Codec Setting

2) **PCI 3 Volt Setting (PCI3VSBSEL)**
   This jumper allows you to select the voltage supplied to PCI devices. If you have PCI devices that require auxiliary power, set this jumper to *Enable 3 VSB*.

Setting	PCI3VBSEL
+3 VSB	[1-2] (default)
+3 Volt	[2-3]
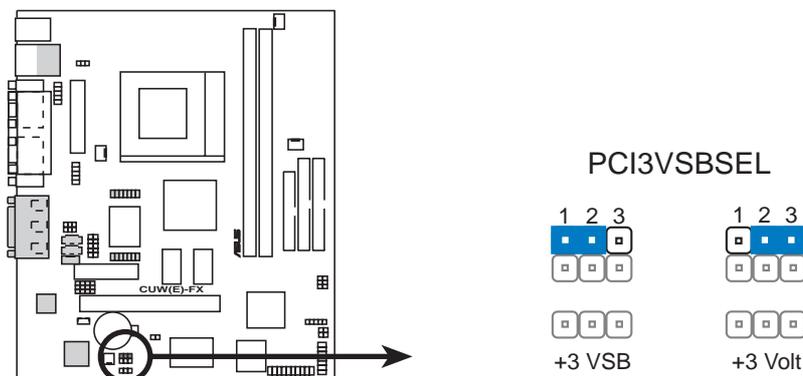
   CUW(E)-FX PCI 3 Volt Selection

3. HARDWARE SETUP

3) Safe Mode Setting (SAFE_MD)

Usually socket 370 processors have locked frequency multiples. In this case, there is no way to exceed the specified multiple whether through motherboard settings or BIOS setup. With unlocked socket 370 processors, exceeding the specified multiple is possible through BIOS setup. Exceeding the specified multiple may result in hanging during bootup. If this occurs, enable Safe Mode to force a multiple of 2 in order to enter BIOS setup to correct the problem.

Setting	SAFE_MD
Disable	[1-2] (default)
Safe Mode	[2-3]

SAFE_MD

Disable (Default)   Safe Mode
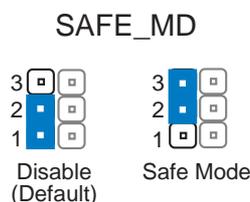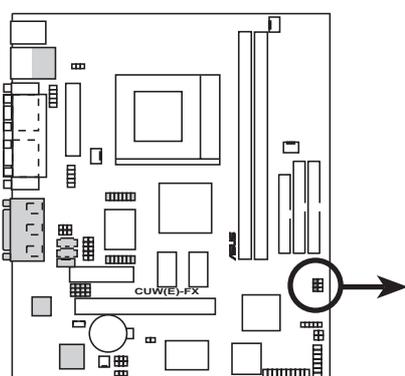
CUW(E)-FX Safe Mode Setting

4) Automatic Timeout Reboot Setting (NO_REBOOT)

The motherboard is set so that when the BIOS detects a hang (timeout) during bootup, the motherboard will automatically reboot. If rebooting is repeating ineffectively, set this jumper to *No Reboot* to disable auto-reboot.

Setting	NO_REBOOT
Disable	[1-2] (default)
No Reboot	[2-3]

NO_REBOOT

Disable (Default)   No Reboot
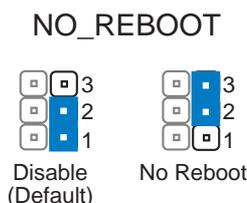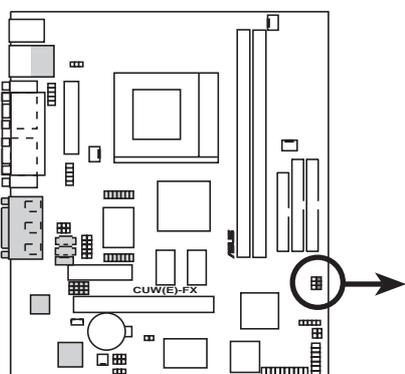
CUW(E)-FX Reboot Setting

3. HARDWARE SETUP

5) Onboard LAN Setting (LAN_EN)

The onboard LAN may be enabled/disabled with this jumper.

Setting	LAN_EN
Enable	[1-2] (default)
Disable	[2-3]

CUW(E)-FX LAN Setting
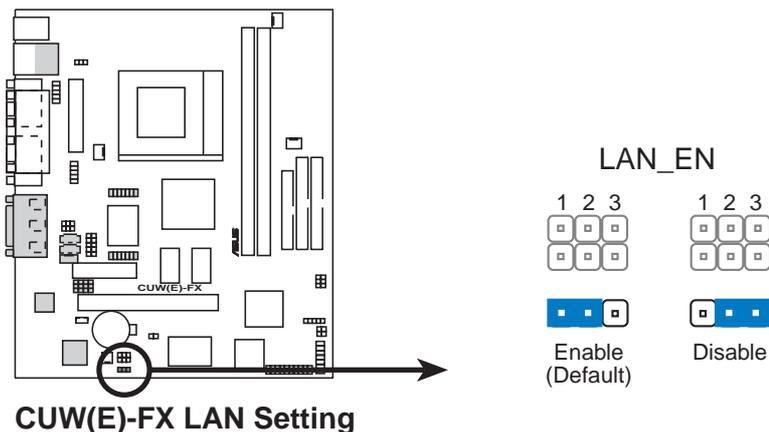
6) Onboard LAN Power Setting (LANPWR)

The onboard LAN power may be set to +3 Volt or +3 VSB. Select **+3 Volt** if you do not have a power supply with 720mA standby power. Selecting **+3 VSB** will allow the use of Wake-on-LAN but may not allow system wakeup if the power supply's standby power is insufficient.

Setting	LANPWR
+3 Volt	[2-3] (default)
+3 VSB	[1-2]

CUW(E)-FX LAN Power Setting
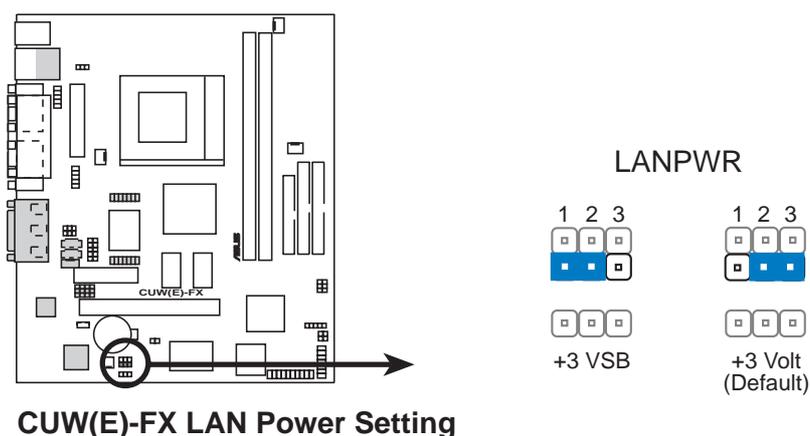
3. HARDWARE SETUP

7) USB Power Selection (USBPWR)

The USB power may be set to +5Volt or +5VSB. Select **+5 Volt** if you do not have a power supply with 1A standby power. Selecting **+5 VSB** will allow wakeup by USB keyboard if the power supply's standby power is sufficient.

<u>Setting</u>	<u>USBPWR</u>
+5 Volt	[1-2] (default)
+5 VSB	[2-3]
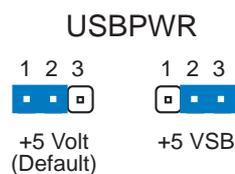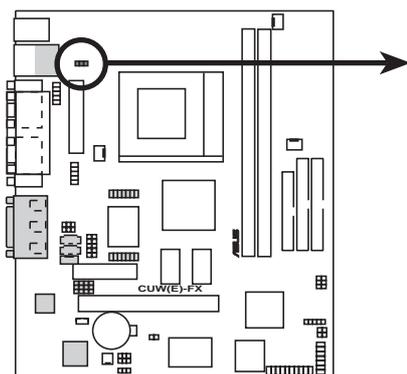
CUW(E)-FX USB Power Selection

3.5 System Memory (DIMM)

NOTE: No hardware or BIOS setup is required after adding or removing memory.

This motherboard uses only Dual Inline Memory Modules (DIMMs). Sockets are available for **3.3Volt** (power level) unbuffered Synchronous Dynamic Random Access Memory (SDRAM) of 16, 32, 64, 128MB, or 256MB (512MB maximum system memory using 128Mb technology).

This chipset does not support ECC. However, ECC memory modules may still be used, but the ECC function will not be available.

Memory speed setup is recommended through **SDRAM Configuration** in *4.4.1 Chip Configuration*.

Install memory in any combination as follows:

Location	168-pin DIMM SDRAM		Total Memory
DIMM1 (Rows 0&1)	Single-Sided/Double-Sided 16, 32, 64, 128MB, or 256MB	x1	
DIMM2 (Rows 2&3)	Single-Sided/Double-Sided 16, 32, 64, 128MB, or 256MB	x1	
	Total System Memory (Max 512MB)	=	

NOTE: Using 2x2x2 SDRAM can greatly improve the onboard graphics' performance.

3.5.1 General DIMM Notes

- ASUS motherboards support SPD (**S**erial **P**resence **D**etect) DIMMs. This is the memory of choice for best performance vs. stability.

- SDRAM chips are generally thinner with higher pin density than EDO (Extended Data Output) chips.

- BIOS shows SDRAM memory on bootup screen.

- Single-sided DIMMs come in 16, 32, 64,128MB; double-sided come in 32, 64, 128, 256MB.

3. HARDWARE SETUP

3.5.2 Memory Installation

WARNING! Make sure that you unplug your power supply when adding or removing memory modules or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards (see *3.3 Hardware Setup Procedure* for more information).

Insert the module(s) as shown. Because the number of pins are different on either side of the breaks, the module will only fit in the orientation shown. DIMM modules are longer and have different pin contact on each side and therefore have a higher pin density. SIMMs have the same pin contact on both sides.

CUW(E)-FX 168-Pin DIMM Sockets

88 Pins

60 Pins

20 Pins

Lock
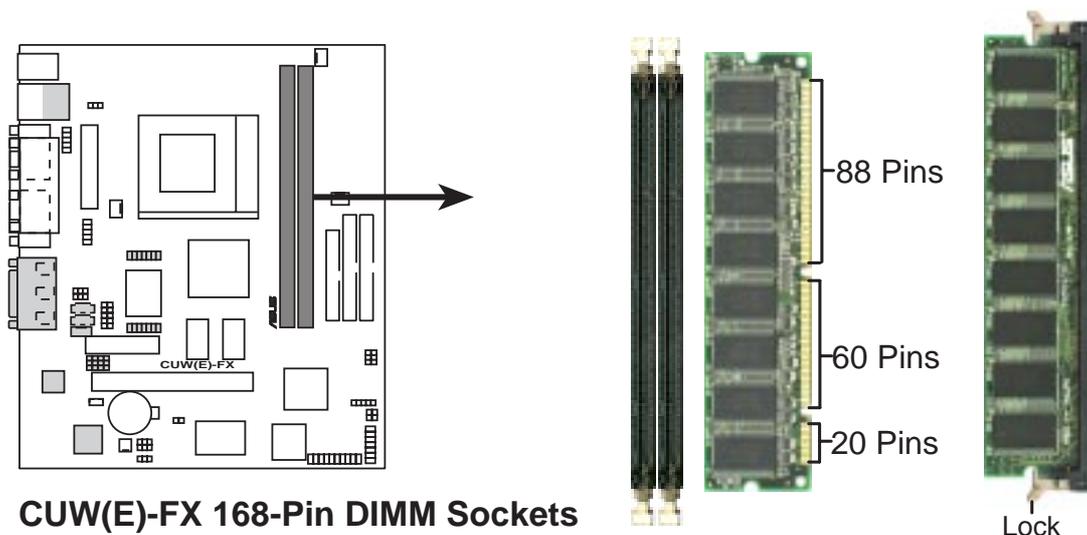
The DIMMs must be **3.3V Unbuffered** for this motherboard. To determine the DIMM type, check the notches on the DIMMs (see figure below).

168-Pin DIMM Notch Key Definitions (3.3V)

DRAM Key Position

Voltage Key Position

RFU — **Unbuffered**
Buffered

5.0V — Reserved
3.3V
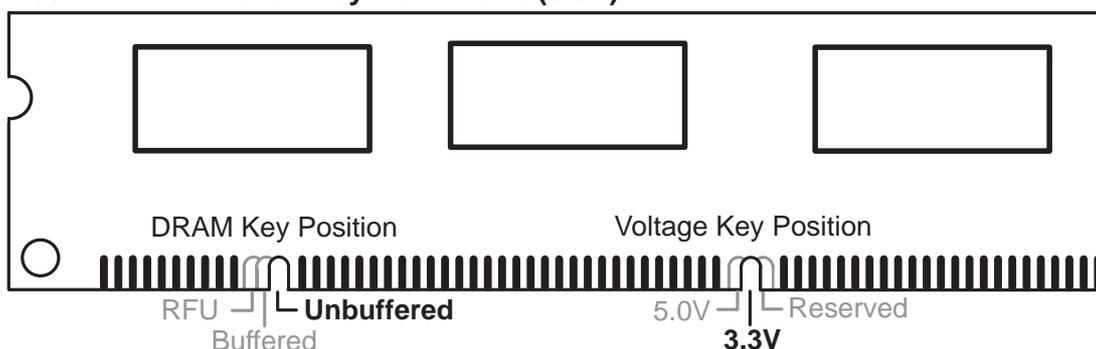
The notches on the DIMM will shift between left, center, or right to identify the type and also to prevent the wrong type from being inserted into the DIMM slot on the motherboard. You must ask your retailer the correct DIMM type before purchasing. This motherboard supports four clock signals per DIMM slot.

3. HARDWARE SETUP

3.6 Central Processing Unit (CPU)

The motherboard provides a ZIF Socket 370. The CPU that came with the motherboard should have a fan attached to it to prevent overheating. If this is not the case, then purchase a fan before you turn on your system.

> **WARNING!** Be sure that there is sufficient air circulation across the processor's heatsink by regularly checking that your CPU fan is working. Without sufficient circulation, the processor could overheat and damage both the processor and the motherboard. You may install an auxiliary fan, if necessary.

To install a CPU, first turn off your system and remove its cover. Locate the ZIF socket and open it by first pulling the lever sideways away from the socket then upwards to a 90-degree angle. Insert the CPU with the correct orientation as shown. The notched corner should point towards the end of the lever. Because the CPU has a corner pin for two of the four corners, the CPU will only fit in the orientation as shown. The picture is for reference only; you should have a CPU fan that covers the face of the CPU. With the added weight of the CPU fan, no force is required to insert the CPU. Once completely inserted, close the socket's lever while holding down the CPU.

NOTE: Do not forget to set the correct Bus Frequency and Multiple (frequency multiple setting is available only on unlocked processors) for your Socket 370 processor or else boot-up may not be possible. Socket 370 processors provide internal thermal sensing so that a socket mounted thermal resistor is not needed.

> **CAUTION!** Be careful not to scrape the motherboard when mounting a clamp-style processor fan or else damage may occur to the motherboard.

CUW(E)-FX Socket 370

Socket 370 CPU (Top)   Socket 370 CPU (Bottom)

Celeron

Notch →

Coppermine

Gold Arrow →
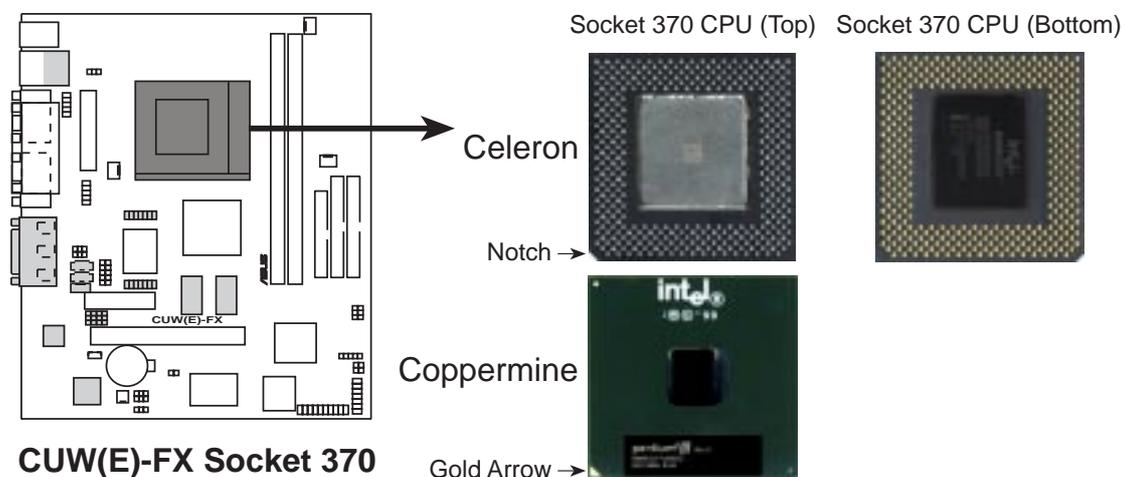
3. HARDWARE SETUP

3.7 Expansion Cards

> **WARNING!** Make sure that you unplug your power supply when adding or removing expansion cards or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards (see *3.3 Hardware Setup Procedure* for more information).

3.7.1 Expansion Card Installation Procedure

1. Read the documentation for your expansion card and make any necessary hardware or software settings for your expansion card, such as jumpers or switches.

2. Remove your computer system's cover and the bracket plate with screw on the slot you intend to use. Keep the bracket for possible future use.

3. Carefully align the card's connectors and press firmly.

4. Secure the card on the slot with the screw you removed above.

5. Replace the computer system's cover.

6. Set up the BIOS if necessary
   (such as *IRQ xx Used By ISA: Yes* in PNP AND PCI SETUP)

7. Install the necessary software drivers for your expansion card.
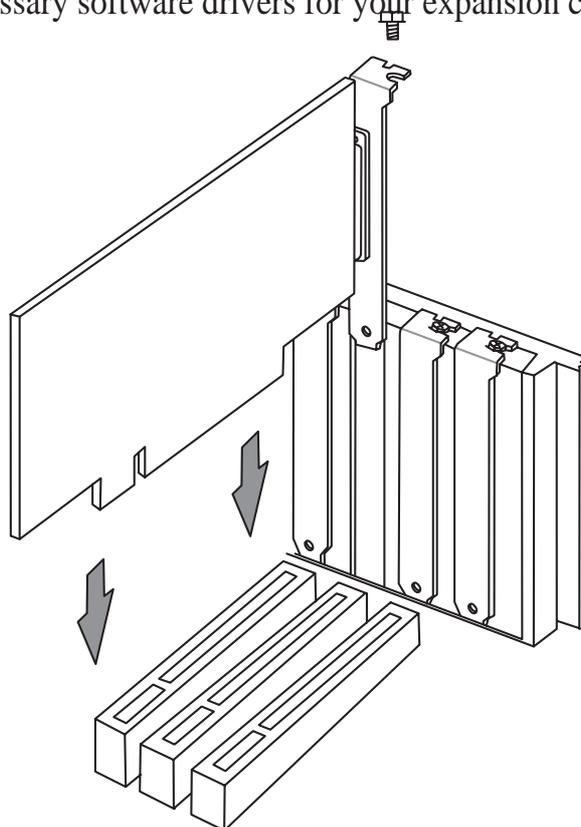
3. HARDWARE SETUP

3.7.2 Assigning IRQs for Expansion Cards

Some expansion cards need an IRQ to operate. Generally, an IRQ must be exclusively assigned to one use. In a standard design, there are 16 IRQs available but most of them are already in use, leaving 6 IRQs free for expansion cards. If your motherboard has **PCI** audio onboard, an additional IRQ will be used. If your motherboard also has **MIDI** enabled, another IRQ will be used, leaving 4 IRQs free.

The following table lists the default IRQ assignments for standard PC devices. Use this table when configuring your system and for resolving IRQ conflicts.

Standard Interrupt Assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	N/A	Programmable Interrupt
3*	11	Communications Port (COM2)
4*	12	Communications Port (COM1)
5*	13	Sound Card (sometimes LPT2)
6	14	Floppy Disk Controller
7*	15	Printer Port (LPT1)
8	3	System CMOS/Real Time Clock
9*	4	ACPI Mode when enabled
10*	5	IRQ Holder for PCI Steering
11*	6	IRQ Holder for PCI Steering
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

*These IRQs are usually available for ISA or PCI devices.

3. HARDWARE SETUP

Interrupt Request Table

	INT-A	INT-B	INT-C	INT-D
PCI slot 1	shared	--	--	--
Onboard VGA	shared	----	--	--
Onboard Audio/AMR/SMBus	--	not shared	--	--
USB	--	--	--	not shared

IMPORTANT: If using PCI cards on shared slots, make sure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Conflicts will arise between the two PCI groups that will make the system unstable or cards inoperable.

3. H/W SETUP
Expansion Cards

3.7.3 Audio Modem Riser (AMR) Slot

This connector supports a specially designed audio and/or modem card called an AMR. Main processing is done through software and controlled by the motherboard's Intel I/O Controller Hub (ICH). This provides an upgradeable audio and/or modem solution at an incredibly low cost. There are two types of AMR, one defined as primary and another defined as secondary. This motherboard uses the primary channel so that a secondary AMR can coexist without the need to disable the optional onboard CODEC. The motherboard's onboard CODEC (on audio model only) must be disabled when using a primary AMR.

NOTE: An AMR is not included with this motherboard.

WARNING! Make sure that you unplug your power supply when adding or removing an AMR or other system components. Failure to do so may cause severe damage to both your motherboard and expansion cards (see *3.3 Hardware Setup Procedure* for more information).
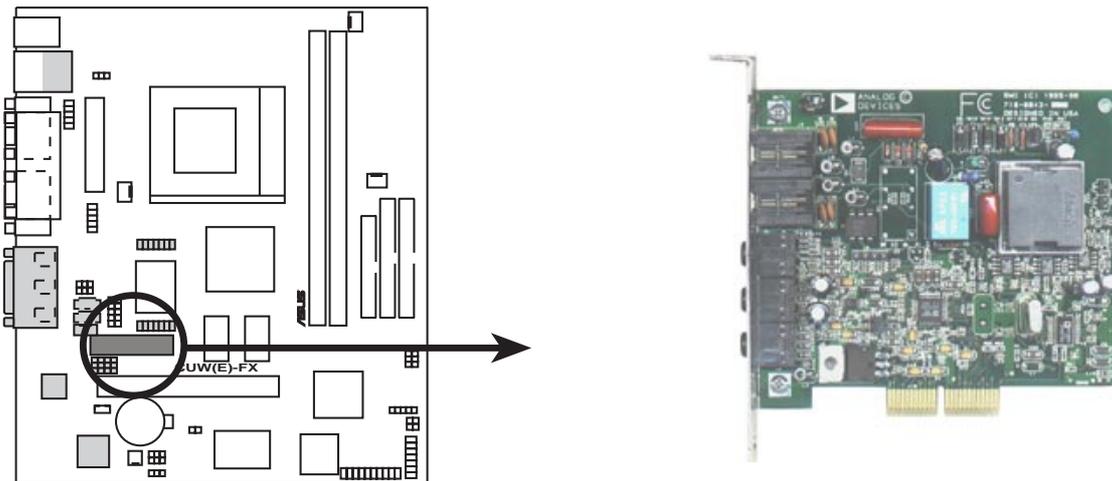
CUW(E)-FX Audio Modem Riser (AMR) Connector

3. HARDWARE SETUP

3.8 External Connectors

WARNING! Some pins are used for connectors or power sources. These are clearly distinguished from jumpers in the Motherboard Layout. Placing jumper caps over these connector pins will cause damage to your motherboard.

IMPORTANT: Ribbon cables should always be connected with the red stripe to Pin 1 on the connectors. Pin 1 is usually on the side closest to the power connector on hard drives and CD-ROM drives, but may be on the opposite side on floppy disk drives. Check the connectors before installation because there may be exceptions. Look on IDE ribbon cable must be less than 46 cm (18 in.), with the second drive connector no more than 15 cm (6 in.) from the first connector.

NOTE: Onboard Fast-Ethernet is optional at the time of purchase. The fast ethernet port connector is available only on the LAN model. The illustrations below are that of the model without the onboard Fast-Ethernet.

1) **PS/2 Mouse Connector (Green 6-pin PS2KBMS)**
   The system will direct IRQ12 to the PS/2 mouse if one is detected. If one is not detected, expansion cards can use IRQ12. See **PS/2 Mouse Function Control** in *4.4 Advanced Menu*.

PS/2 Mouse (6-pin female)
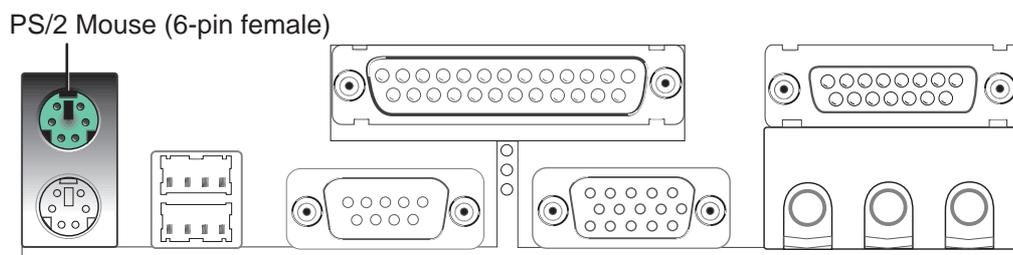
2) **PS/2 Keyboard Connector (Purple 6-pin PS2KBMS)**
   This connection is for a standard keyboard using an PS/2 plug (mini DIN). **This connector will not allow standard AT size (large DIN) keyboard plugs. You may use a DIN to mini DIN adapter on standard AT keyboards.**

PS/2 Keyboard (6-pin female)
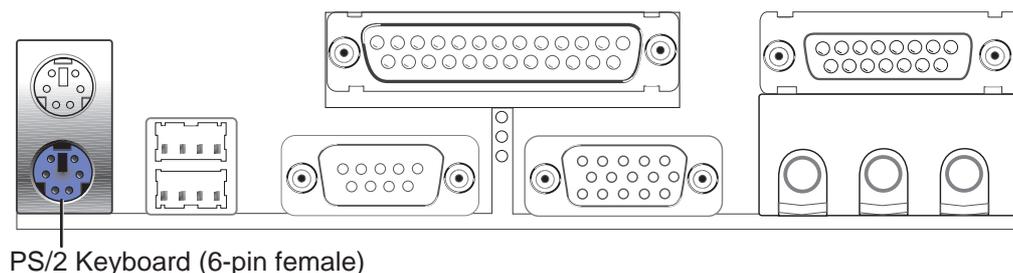
3) Universal Serial Bus Ports 1 & 2 (Two Black 4-pin USB)

Two back panel USB ports are provided for connecting USB devices. If you prefer to use front panel USB ports, you can connect an external connector set to the USB header and mount it on the front panel (see *Front Panel USB Header* later in this section). **NOTE:** The back panel and front panel ports cannot be used at the same time.

USB 1

Universal Serial Bus (USB) 2
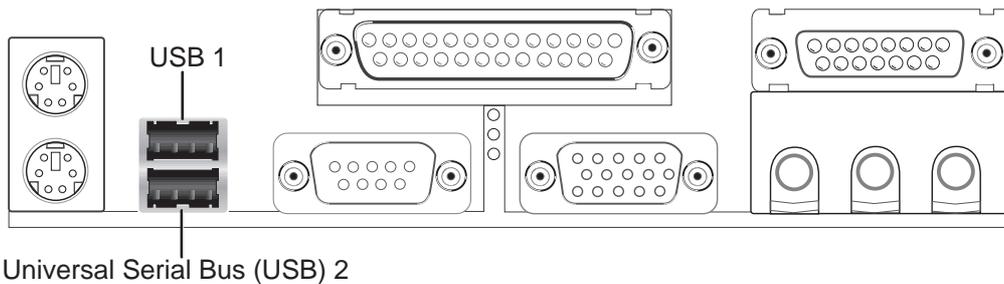
4) Parallel Port Connector (Burgundy 25-pin PRINTER)

You can enable the parallel port and choose the IRQ through **Onboard Parallel Port** (see *4.4.2 I/O Device Configuration)*.
NOTE: Serial printers must be connected to the serial port.

Parallel (Printer) Port (25-pin female)
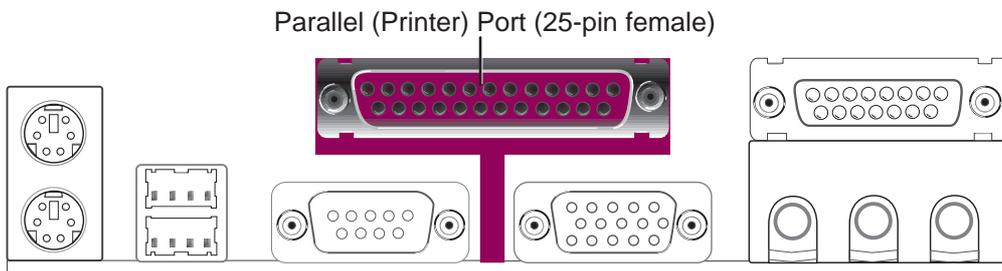
5) Serial Port COM1 Connector (Teal/Turquoise 9-pin COM1)

One serial port is ready for a mouse or other serial devices. A second serial port is available using a serial port bracket connected from the motherboard to an expansion slot opening. See **Onboard Serial Port 1** in *4.2.2 I/O Device Configuration* for settings.

COM 1
Serial Port (9-pin male)
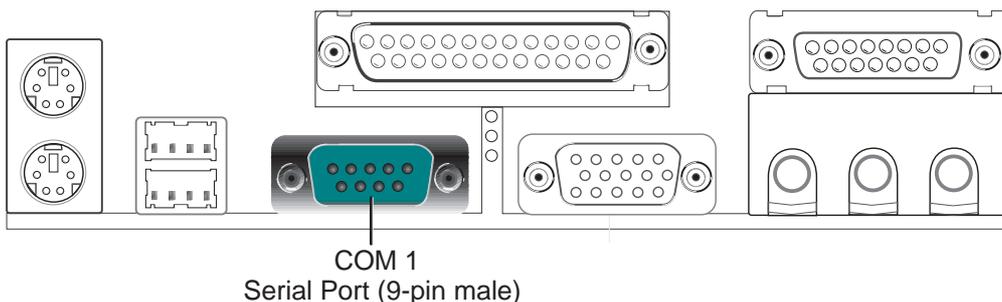
3. HARDWARE SETUP

6) Monitor Output Connector (Blue 15-pin VGA)

This connector is for output to a VGA-compatible device.

VGA Monitor (15-pin female)
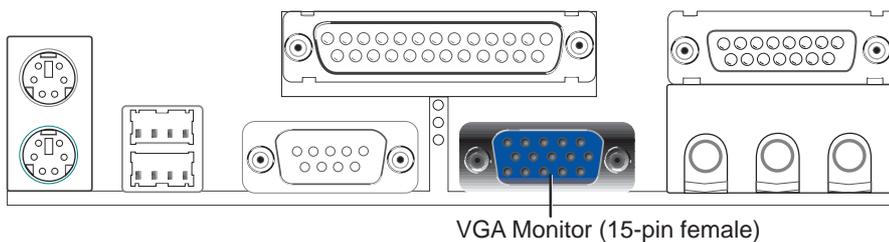
7) Joystick/MIDI Connector (Gold 15-pin GAME_AUDIO) (optional)

You may connect game joysticks or game pads to this connector for playing games. Connect MIDI devices for playing or editing professional audio.

Joystick/MIDI (15-pin female)
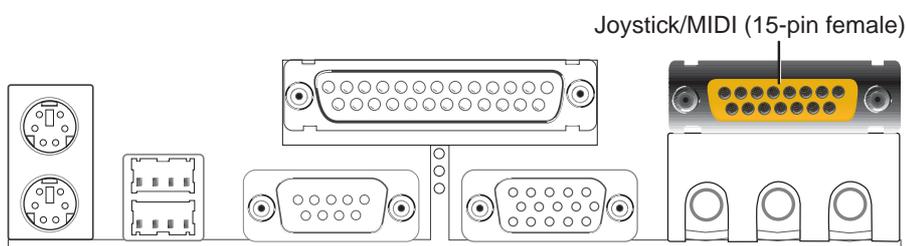
NOTE: The onboard game port is to be used only if you are not using any PCI or ISA audio card with a game port.

8) Audio Port Connectors (Three 1/8" GAME_AUDIO) (optional)

Line Out (lime) can be connected to headphones or preferably powered speakers. **Line In** (light blue) allows tape players or other audio sources to be recorded by your computer or played through the **Line Out** (lime). **Mic** (pink) allows microphones to be connected for inputting voice.

Line Out   Line In   Mic
1/8" Stereo Audio Connectors
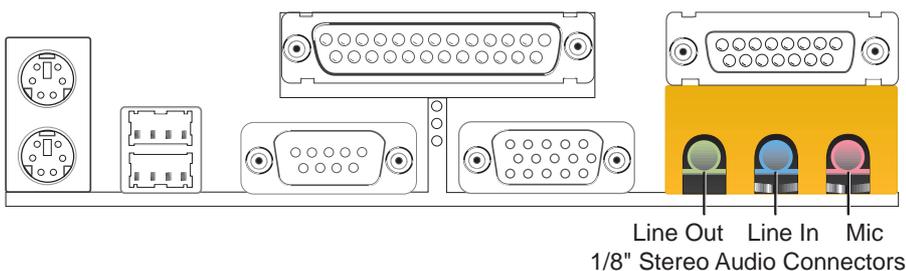
9) Fast-Ethernet Port Connector (RJ45) (optional)

The RJ45 connector is optional at the time of purchase and is located on top of the USB connectors. The connector allows the motherboard to connect to a Local Area Network (LAN) through a network hub.

RJ45
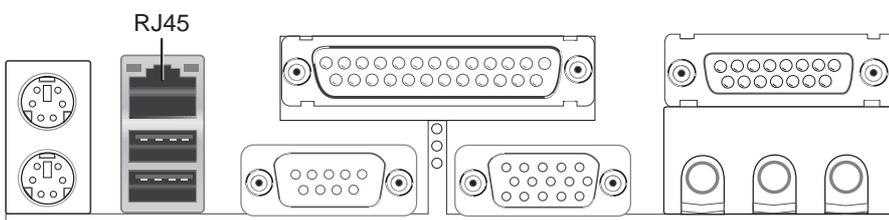
3. HARDWARE SETUP

10) Primary / Secondary IDE Connectors (40-1 pin PRIMARY/SECONDARY)

These connectors support the provided UltraDMA/66 IDE hard disk ribbon cable. Connect the cable's blue connector to the motherboard's primary (recommended) or secondary IDE connector, and then connect the gray connector to your UltraDMA/66 slave device (hard disk drive) and the black connector to your UltraDMA/66 master device. It is recommended that non-UltraDMA/66 devices be connected to the secondary IDE connector. If you install two hard disks, you must configure the second drive to Slave mode by setting its jumper accordingly. Refer to your hard disk documentation for the jumper settings. BIOS now supports specific device bootup (see **Boot Sequence** in *4.6 Boot Menu*). **(Pin 20 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 20 plugged).** If you have more than two UltraDMA/66 devices, you will need to purchase another UltraDMA/66 cable.

NOTE: A small hole near the blue connector on the UltraDMA/66 cable is intentional.

TIP: You may configure two hard disks to be both Masters with two ribbon cables – one for the primary IDE connector and another for the secondary IDE connector. You may install one operating system on an IDE drive and another on a SCSI drive and select the boot disk through **Boot Sequence** in *4.6 Boot Menu*.

> **WARNING!** UltraDMA/66 IDE devices must use an 80-conductor IDE cable.
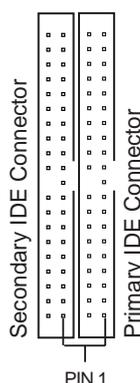
NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1

CUW(E)-FX IDE Connectors

11) Floppy Disk Drive Connector (34-1 pin FLOPPY)

This connector supports the provided floppy drive ribbon cable. After connecting the single end to the board, connect the two plugs on the other end to the floppy drives. **(Pin 5 is removed to prevent inserting in the wrong orientation when using ribbon cables with pin 5 plugged).**

NOTE: Orient the red markings on the floppy ribbon cable to PIN 1

CUW(E)-FX Floppy Disk Drive Connector

12) Wake-On-LAN Connector (3-pin WOL_CON)

This connector connects to a LAN card with a Wake-On-LAN output, such as the ASUS PCI-L101 Ethernet card (not required for onboard LAN model). The connector powers up the system when a wakeup packet or signal is received through the LAN card.

IMPORTANT: This feature requires that **Wake On LAN** is set to *Enabled* (see *4.5.1 Power Up Control*) and that your system has an ATX power supply with at least 720mA +5V standby power.

IMPORTANT: Requires an ATX power supply with at least 720mA +5 volt standby power

WOL_CON

Ground
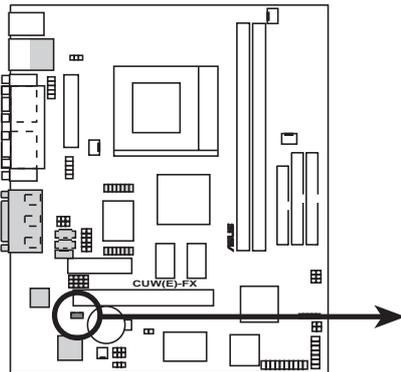
PME   +5 Volt Standby

CUW(E)-FX Wake-On-LAN Connector
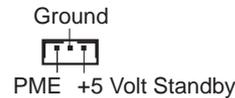
13) Wake-On-Ring Connector (2-pin WOR)

This connector connects to internal modem cards with a Wake-On-Ring output. The connector powers up the system when a ringup packet or signal is received through the internal modem card. **NOTE:** For external modems, Wake-On-Ring is detected through the COM port.

IMPORTANT: This feature requires that **PWR Up On Modem Act** is set to *Enabled* (see *4.5.1 Power Up Control*) and that your system has an ATX power supply with at least 720mA +5V standby power.

WOR

RI# ┐ ┌ Ground

2 [■■] 1
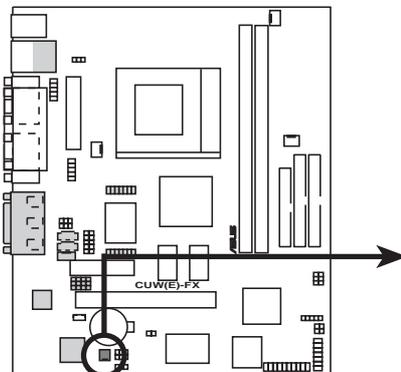
CUW(E)-FX Wake-On-Ring Connector
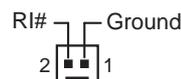
3. HARDWARE SETUP

14) IDE Activity LED Lead (2-pin IDELED)

This connector supplies power to the cabinet's IDE activity LED. Read and write activity by devices connected to the Primary or Secondary IDE connectors will cause the LED to light up.
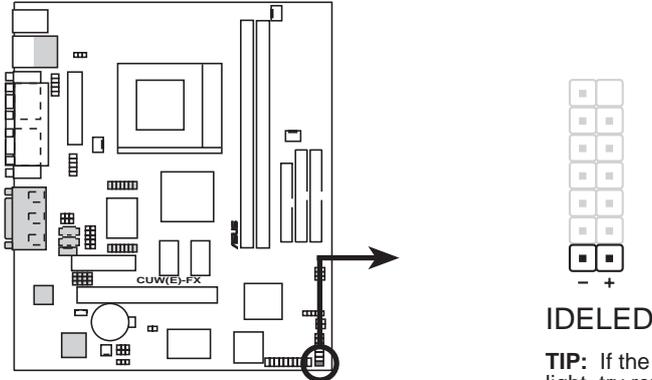
IDELED

TIP: If the case-mounted LED does not light, try reversing the 2-pin plug.

CUW(E)-FX IDE Activity LED

15) Chassis, CPU, & Power Supply Fan Connectors (3-pin CHA_, CPU_, PWR_FAN)

These connectors support cooling fans of 350mA (4.2 Watts) or less. Orientate the fans so that the heat sink fins allow airflow to go across the onboard heat sink(s) instead of the expansion slots. Depending on the fan manufacturer, the wiring and plug may be different. The red wire should be positive, while the black should be ground. Connect the fan's plug to the board taking into consideration the polarity of the connector.

NOTE: The "Rotation" signal is to be used only by a specially designed fan with rotation signal. The Rotations per Minute (RPM) can be monitored using ASUS PC Probe Utility or Intel LDCM Utility (see section 6. SOFTWARE REFERENCE).

WARNING! The CPU and/or motherboard will overheat if there is no airflow across the CPU and onboard heatsinks. Damage may occur to the motherboard and/or the CPU fan if these pins are incorrectly used. **These are not jumpers, do not place jumper caps over these pins.**

CPU Fan Power

GND
+12V
Rotation

Chassis Fan Power

Rotation
+12V
GND

Power Supply Fan Power

Rotation
+12V
GND
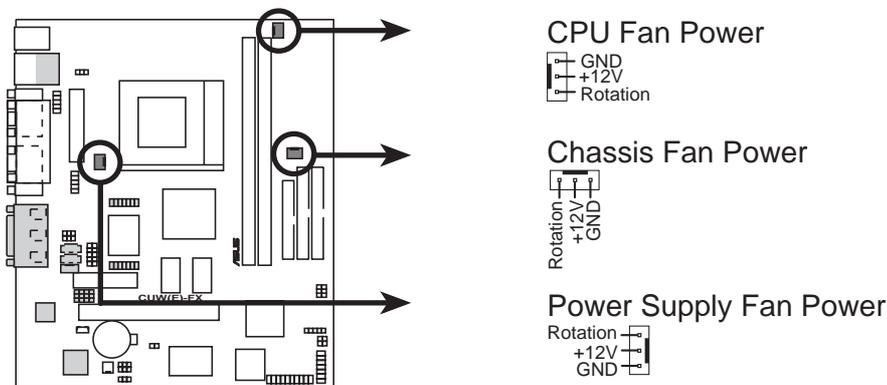
CUW(E)-FX 12-Volt Cooling Fan Power

3. HARDWARE SETUP

16) Serial and Consumer IR Connectors (10-pin IR_CON)

This connector supports an optional wireless transmitting and receiving infra-red module. This module mounts to a small opening on system cases that support this feature. You must also configure the setting through **UART2 Use Infrared** (see *4.4.2 I/O Device Configuration)* to select whether UART2 is directed for use with COM2 or IrDA. Use the five pins as shown in Back View and connect a ribbon cable from the module to the motherboard's SIR connector according to the pin definitions. An optional consumer infrared (CIR) set connects to the CIR and SIR connectors simultaneously for both wireless transmitting and remote control functions through one external infrared module. **Wake On PS2 KB/Mouse** in *4.5.1 Power Up Control* must be Enabled in order to use Consumer Infrared (CIR) power up.
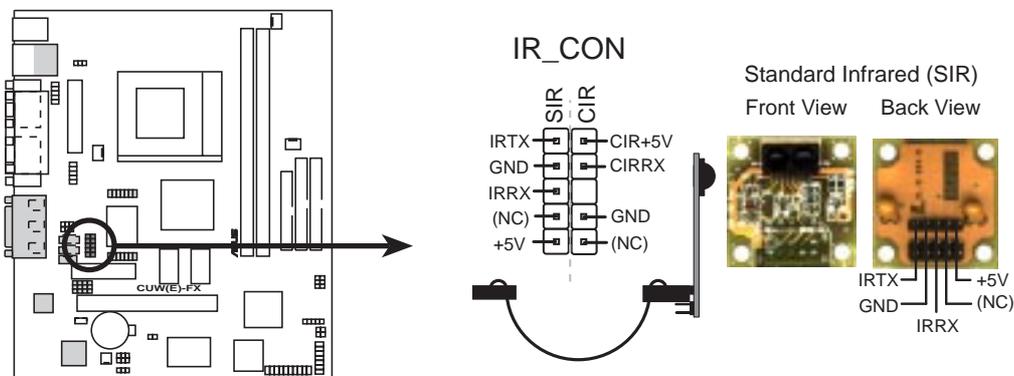
CUW(E)-FX Infrared Module Connector

17) Serial COM 2 Port Header (10-1 pin COM2)

The optional serial port bracket can be used to add a serial port for additional serial devices.
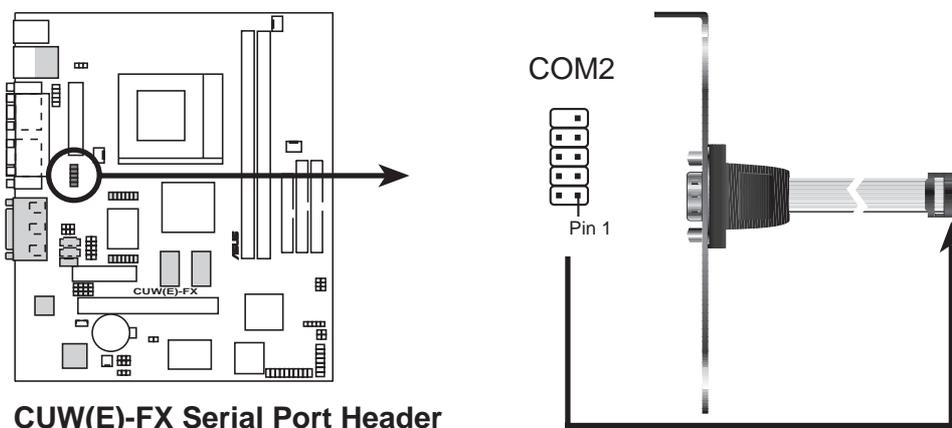
CUW(E)-FX Serial Port Header

3. HARDWARE SETUP

18) SMBus Connector (5-1 pin SMB)

This connector allows you to connect SMBus (System Management Bus) devices. SMBus devices communicate by means of the SMBus with an SMBus host and/or other SMBus devices. SMBus is a specific implementation of an I²C bus, which is a multi-device bus; that is, multiple chips can be connected to the same bus and each one can act as a master by initiating data transfer.

SMB

SMBCLK Ground SMBDATA +5V
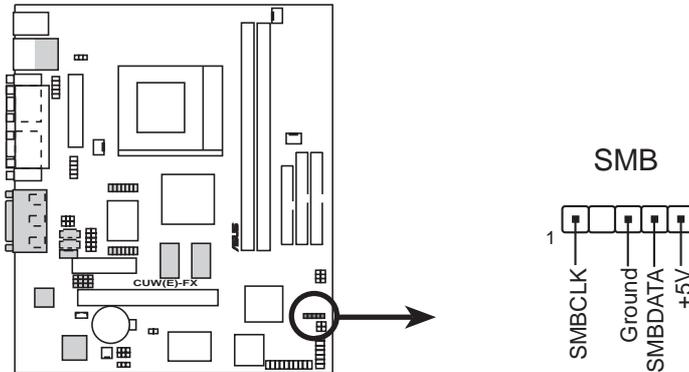
CUW(E)-FX SMBus Connector

19) LCD-TV Headers (14-pin LCDTV0/LCDTV1) (optional)

These headers require an optional LCD module (see *7.1 ASUS LCD-I Controller Module*) for LCD output or a TV-out module for TV output.

LCDTV0

1: GND	2: +1.8V
3: LTVCL	4: LTVDA
5: DMSEN	6: BLANK#
7: TVVSYNC	8: +3V
9: TVHSYNC	10: DD4
11: DD3	12: DD2
13: DD1	14: DD0

LCDTV1

1: +5V	2: +5V
3: DD10	4: DD11
5: GND	6: GND
7: DD10	8: DD11
9: DD6	10: DD7
11: CLKOUT0	12: DD9
13: CLKOUT1	14: DD5
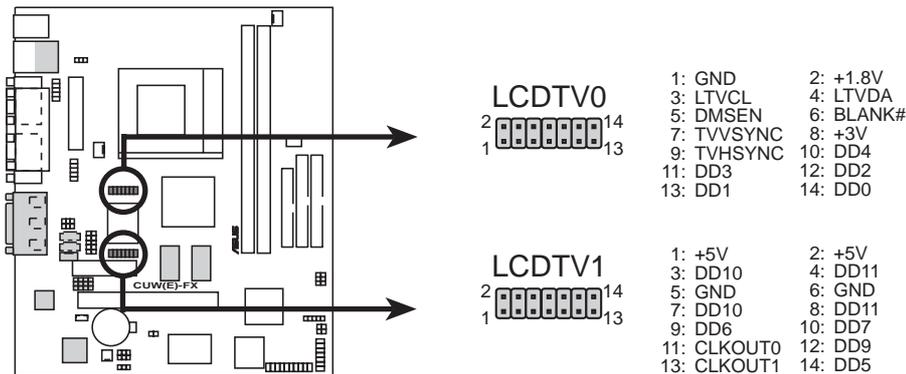
CUW(E)-FX LCD-TV Headers

20) Internal Microphone Connector (3 pin MIC2)

This connector allows you to connect a chassis mounted microphone to the motherboard instead of having to attach an external microphone onto the ATX connectors.

MIC Power MIC Input Ground

MIC2
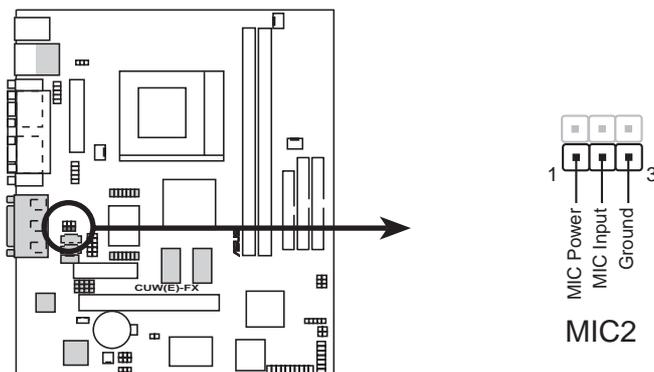
CUW(E)-FX Internal Microphone Connector

3. HARDWARE SETUP

21) Internal Audio Connectors (4-pin VIDEO, CD1, MODEM)

These connectors allow you to receive stereo audio input from such sound sources as a CD-ROM, TV tuner, or MPEG card. The MODEM connector allows the onboard audio to interface with a voice modem card with a similar connector. It also allows the sharing of mono_in (such as a phone) and mono_out (such as a speaker) between the onboard audio and the voice modem card

VIDEO (Green)
— Left Audio Channel
— Ground
— Right Audio Channel

CD1 (Black)
— Left Audio Channel
— Ground
— Right Audio Channel

MODEM
— Modem-In (to Modem)
— Ground
— Modem-Out (from Modem)
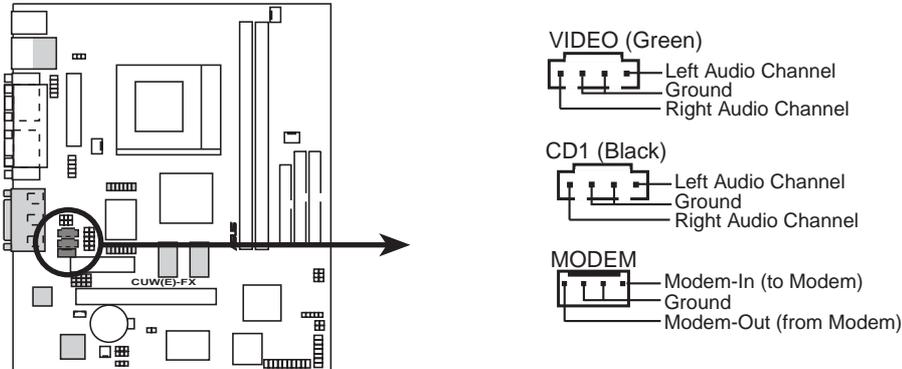
CUW(E)-FX Internal Audio Connectors

22) Front Panel USB Header (10-1 pin FRONTUSB)

If you do not want to use the USB ports on the back panel, a USB header is available midboard. Connect an external connector set to the 10-1 pin block and mount it to the front panel. **NOTE:** The back and front panel ports cannot be used at the same time.

FRONTUSB

6   1

6: USB Power   1: USB Power
7: USBP3–   2: USBP2–
8: USBP3+   3: USBP2+
9: GND   4: GND
                5: NC

10   5

USBPWR

3   3
2   2
1   1

+5V   +5VSB
(Default)

USB Hub Module

USBPWR   FRONTUSB   IDELED

USB Hub
Chip   PANEL

Front View

Back View
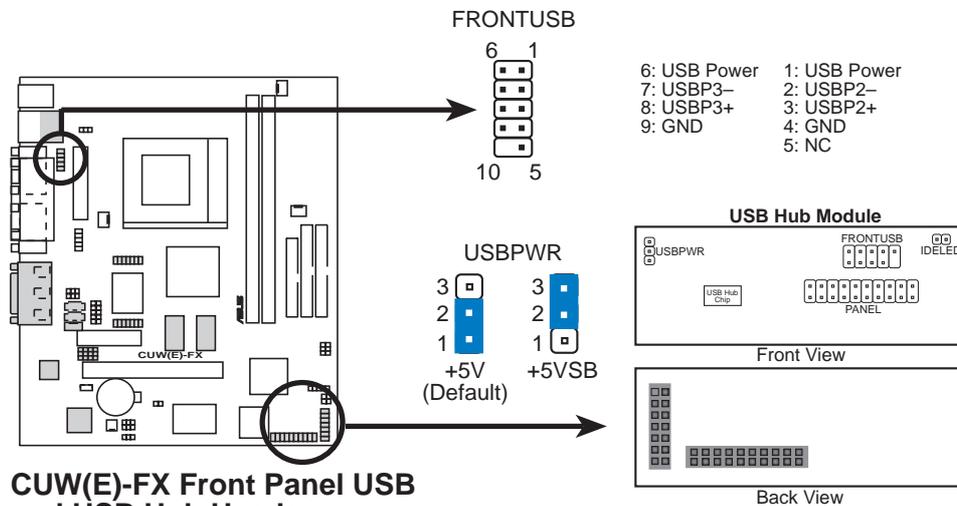
**CUW(E)-FX Front Panel USB
and USB Hub Headers**

If you need additional USB ports, an optional USB hub module is available. Remove the jumpers on the **VPANEL** connector and connect the module directly to the **PANEL** and **VPANEL** connectors. You can then connect an external connector set to the USB Hub header and mount it to either the front or back panel for a total of four USB ports.

23) Headphone True-Level Line Out Header (3-pin SPKR)

This header allows you to connect a chassis mounted headphone to the mother-board instead of having to attach an external headphone to the ATX connectors.

SPKR
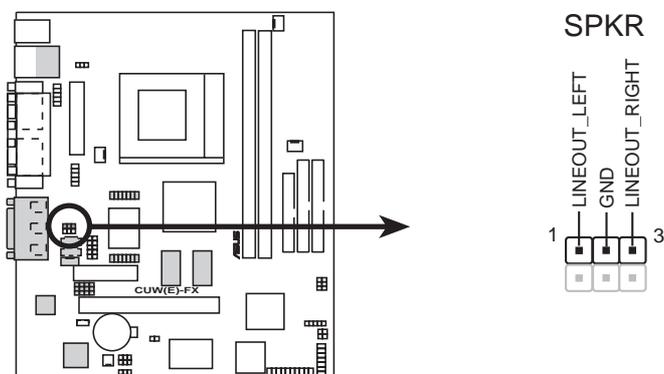
CUW(E)-FX Internal Speaker Connector

24) Chassis Intrusion Lead (2-pin ACHA)

This lead is for a chassis designed for chassis intrusion detection. After-market toggle switches may also be installed to the chassis panel or on any removable components. Two wires should be available from the chassis to connect to this lead. When any chassis component is removed, the contact should open and the motherboard will record a chassis intrusion event. The event can then be processed by software such as LDCM. If the chassis intrusion lead is not used, a jumper cap must be placed over the pins to close the circuit.

ACHA
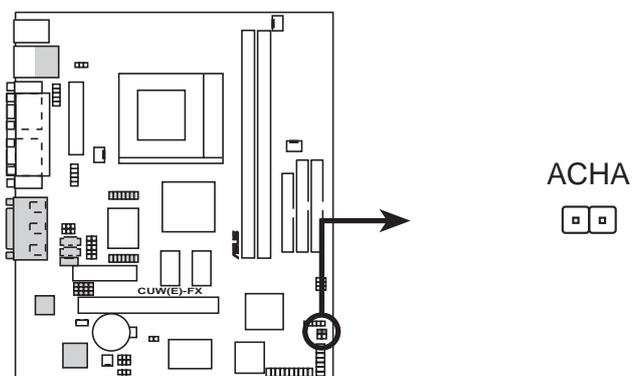
CUW(E)-FX Chassis Open Alarm Lead

3. HARDWARE SETUP

25) ATX Power Supply Connector (20-pin block ATXPWR)

This connector connects to an ATX power supply. The plug from the power supply will only insert in one orientation because of the different hole sizes. Find the proper orientation and push down firmly making sure that the pins are aligned.

IMPORTANT: Make sure that your ATX power supply can supply at least 10mA on the +5-volt standby lead (+5VSB). You may experience difficulty in powering ON your system if your power supply cannot support the load. For Wake-On-LAN support, your ATX power supply must supply at least 720mA +5VSB.

+3.3 Volts — +3.3 Volts
-12.0 Volts — +3.3 Volts
Ground — Ground
Power Supply On — +5.0 Volts
Ground — Ground
Ground — +5.0 Volts
Ground — Ground
-5.0 Volts — Power Good
+5.0 Volts — +5V Standby
+5.0 Volts — +12.0 Volts
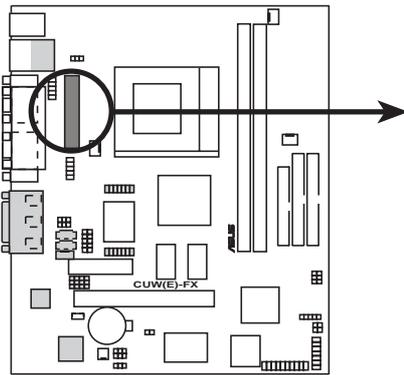
CUW(E)-FX ATX Power Connector
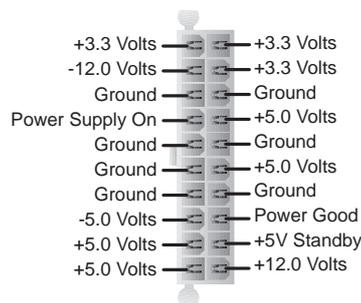
26) Power Supply Thermal Sensor Connector (2-pin block JTPWR)

If you have a power supply with thermal monitoring, connect its thermal sensor cable to this connector.

JTPWR

Power Supply Thermal Sensor
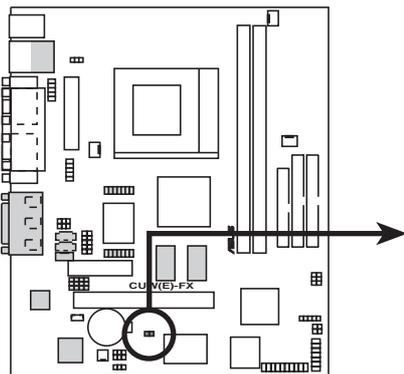
CUW(E)-FX Thermal Sensor Connector

27) System Power LED Lead (3-1 pin KEYLOCK)

This 3-1 pin connector connects the system power LED, which lights when the system is powered on and blinks when it is in sleep mode.

28) Keyboard Lock Switch Lead (2-pin KEYLOCK)

This 2-pin connector connects to the case-mounted key switch to allow keyboard locking.

29) System Warning Speaker Connector (4-pin SPEAKER)

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

30) Reset Switch Lead (2-pin RESET)

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch. This is a preferred method of rebooting to prolong the life of the system's power supply.

31) ATX Power Switch Lead (2-pin PWR)

The system power is controlled by a momentary switch connected to this lead. Pressing the button once will switch the system between ON and SOFT OFF. Pushing the switch while in the ON mode for more than 4 seconds will turn the system off. The system power LED shows the status of the system's power.

32) System Management Interrupt Lead (2-pin SMI)

This allows the user to manually place the system into a suspend mode or "Green" mode, where system activity is decreased to save electricity and expand the life of certain components when the system is not in use. This 2-pin connector connects to the case-mounted suspend switch. Wake-up can be controlled by settings in the BIOS but the keyboard will always allow wake-up (the SMI lead cannot wake up the system).

33) Message LED Lead (2-pin LED)

This indicates whether a message has been received from a fax/modem. The LED will remain lit when there is no signal and blink when there is data transfer or waiting in the inbox. This function requires ACPI OS and driver support.
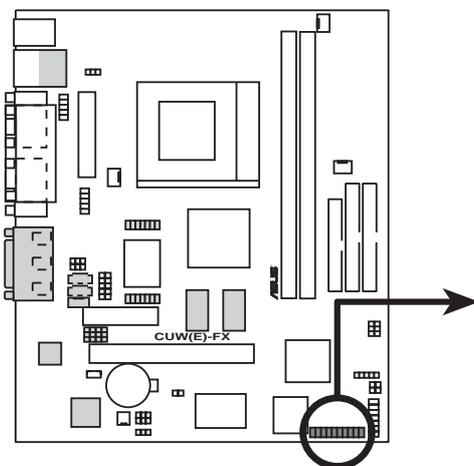
CUW(E)-FX System Panel Connectors
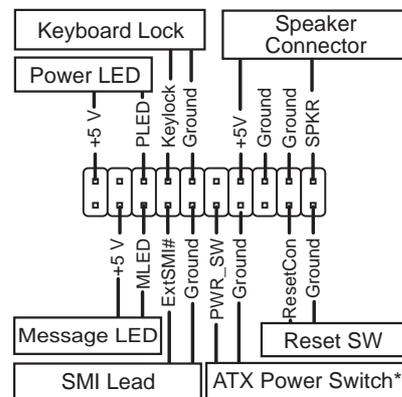
* Requires an ATX power supply.

3. HARDWARE SETUP

3.9 Starting Up the First Time

1. After all connections are made, close the system case cover.

2. Be sure that all switches are off (in some systems, marked with ○).

3. Connect the power supply cord into the power supply located on the back of your system case according to your system user's manual.

4. Connect the power cord into a power outlet that is equipped with a surge protector.

5. You may then turn on your devices in the following order:
   a. Your monitor
   b. External SCSI devices (starting with the last device on the chain)
   c. Your system power. For ATX power supplies, you need to switch on the power supply as well as press the ATX power switch on the front of the case.

6. The power LED on the front panel of the system case will light. For ATX power supplies, the system LED will light when the ATX power switch is pressed. The LED on the monitor may light up or switch between orange and green after the system's if it complies with "green" standards or if it has a power standby feature. The system will then run power-on tests. While the tests are running, the BIOS will alarm beeps or additional messages will appear on the screen. If you do not see anything within 30 seconds from the time you turn on the power, the system may have failed a power-on test. Recheck your jumper settings and connections or call your retailer for assistance.

Award BIOS Beep Codes

Beep	Meaning
One short beep when displaying logo	No error during POST
Long beeps in an endless loop	No DRAM installed or detected
One long beep followed by three short beeps	Video card not found or video card memory bad
High frequency beeps when system is working	CPU overheated System running at a lower frequency

7. During power-on, hold down <Delete> to enter BIOS setup. Follow the instructions in *4. BIOS SETUP*.

* **Powering Off your computer:** You must first exit or shut down your operating system before switching off the power switch. For ATX power supplies, you can press the ATX power switch after exiting or shutting down your operating system. If you use Windows 9X, click the **Start** button, click **Shut Down**, and then click **Shut down the computer?** The power supply should turn off after Windows shuts down.

NOTE: The message "You can now safely turn off your computer" will not appear when shutting down with ATX power supplies.

4. BIOS SETUP

4.1 Managing and Updating Your BIOS

4.1.1 Upon First Use of the Computer System

It is recommended that you save a copy of the original motherboard BIOS along with a Flash Memory Writer utility (AFLASH.EXE) to a bootable floppy disk in case you need to reinstall the BIOS later. **AFLASH.EXE** is a Flash Memory Writer utility that updates the BIOS by uploading a new BIOS file to the programmable flash ROM on the motherboard. This file works only in DOS mode. To determine the BIOS version of your motherboard, check the last four numbers of the code displayed on the upper left-hand corner of your screen during bootup. Larger numbers represent a newer BIOS file.

1. Type **FORMAT A:/S** at the DOS prompt to create a bootable system floppy disk. **DO NOT** copy AUTOEXEC.BAT & CONFIG.SYS to the disk.

2. Type **COPY D:\AFLASH\AFLASH.EXE A:** (assuming D is your CD-ROM drive) to copy AFLASH.EXE to the just created boot disk.

    NOTE: AFLASH works only in DOS mode. It will not work with DOS prompt in Windows and will not work with certain memory drivers that may be loaded when you boot from your hard drive. It is recommended that you reboot using a floppy.

3. Reboot your computer from the floppy disk. **NOTE:** BIOS setup must specify "Floppy" as the first item in the boot sequence.

4. In DOS mode, type **A:\AFLASH <Enter>** to run AFLASH.

> **IMPORTANT!** If "unknown" is displayed after **Flash Memory:,** the memory chip is either not programmable or is not supported by the ACPI BIOS and therefore, cannot be programmed by the Flash Memory Writer utility.

5. Select **1. Save Current BIOS to File** from the Main menu and press <Enter>. The **Save Current BIOS To File** screen appears.
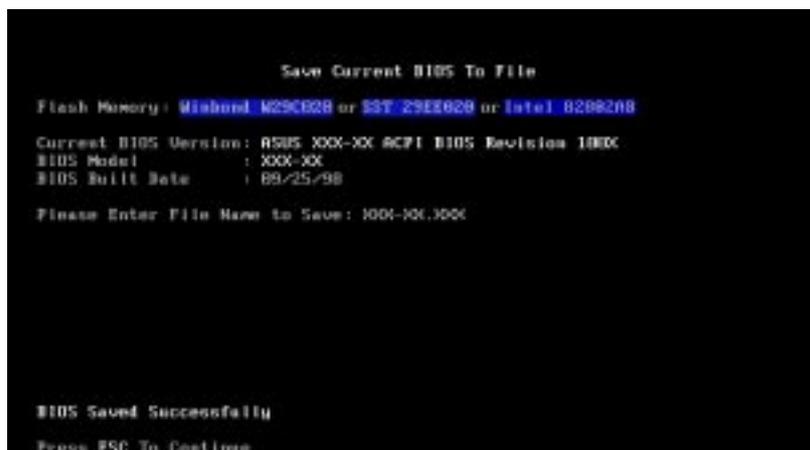
6. Type a filename and the path, for example, **A:\XXX-XX.XXX** and then press <Enter>.

4.1.2 Updating BIOS Procedures

WARNING! Only update your BIOS if you have problems with your motherboard and you know that the new BIOS revision will solve your problems. Careless updating can result in your motherboard having more problems!

1. Download an updated ASUS BIOS file from the Internet (WWW or FTP) (see ASUS CONTACT INFORMATION on page 3 for details) and save to the disk you created earlier.
2. Boot from the disk you created earlier.
3. At the "A:\" prompt, type **AFLASH** and then press <Enter>.
4. At the **Main Menu**, type **2** and then press <Enter>. The **Update BIOS Including Boot Block and ESCD** screen appears.
5. Type the filename of your new BIOS and the path, for example, **A:\XXX-XX.XXX**, and then press <Enter>.
   NOTE: To cancel this operation, press <Enter>.
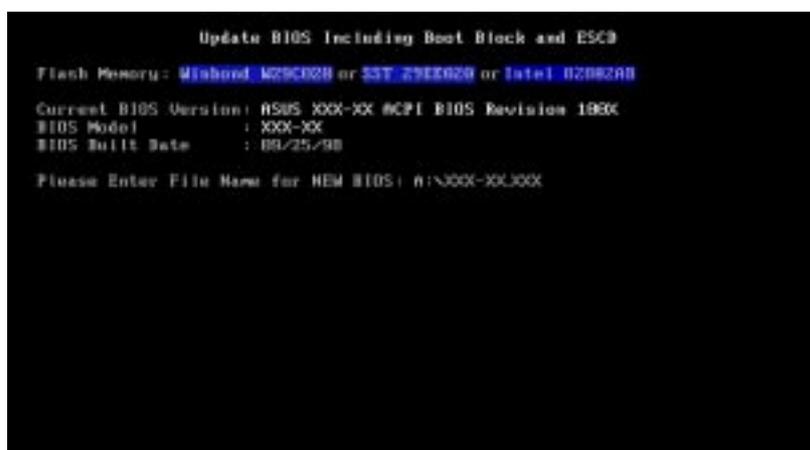
6. When prompted to confirm the BIOS update, press **Y** to start the update.

7. The utility starts to program the new BIOS information into the flash ROM. The boot block will be updated automatically only when necessary. This will minimize the chance that a failed update will prevent your system from booting up. When the programming is finished, *Flashed Successfully* will be displayed.

8. Follow the onscreen instructions to continue.

WARNING! If you encounter problems while updating the new BIOS, DO NOT turn off your system since this might prevent your system from booting up. Just repeat the process, and if the problem still persists, update the original BIOS file you saved to disk above. If the Flash Memory Writer utility was not able to successfully update a complete BIOS file, your system may not be able to boot up. If this happens, your system will need servicing.

4.2 BIOS Setup Program

This motherboard supports a programmable EEPROM that can be updated using the provided utility as described in *4.1 Managing and Updating Your BIOS*.

The utility is used if you are installing a motherboard, reconfiguring your system, or prompted to "**Run Setup**". This section describes how to configure your system using this utility.

Even if you are not prompted to use the Setup program, at some time in the future you may want to change the configuration of your computer. For example, you may want to enable the Security Password Feature or make changes to the power management settings. It will then be necessary to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the EEPROM.

The EEPROM on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. This appears during the Power-On Self Test (POST). Press <Delete> to call up the Setup utility. If you are a little bit late in pressing the mentioned key, POST will continue with its test routines, thus preventing you from calling up Setup. If you still need to call Setup, restart the system by pressing <Ctrl> + <Alt> + <Delete>, or by pressing the Reset button on the system chassis. You can also restart by turning the system off and then back on again. But do so only if the first two methods fail.

The Setup program has been designed to make it as easy to use as possible. It is a menu-driven program, which means you can scroll through the various sub-menus and make your selections among the predetermined choices.

To access the BIOS Setup program, press the <Delete> key after the computer has run through its POST.

NOTE: Because the BIOS software is constantly being updated, the following BIOS screens and descriptions are for reference purposes only and may not reflect your BIOS screens exactly.

4. BIOS SETUP

4.2.1 BIOS Menu Bar

The top of the screen has a menu bar with the following selections:

MAIN Use this menu to make changes to the basic system configuration.

ADVANCED Use this menu to enable and make changes to the advanced features.

POWER Use this menu to configure and enable Power Management features.

BOOT Use this menu to configure the default system device used to locate and load the Operating System.

EXIT Use this menu to exit the current menu or specify how to exit the Setup program.

To access the menu bar items, press the right or left arrow key on the keyboard until the desired item is highlighted.

4.2.2 Legend Bar

At the bottom of the Setup screen you will notice a legend bar. The keys in the legend bar allow you to navigate through the various setup menus. The following table lists the keys found in the legend bar with their corresponding alternates and functions.

Navigation Key(s)	Function Description
<F1> or <Alt + H>	Displays the General Help screen from anywhere in the BIOS Setup
<Esc>	Jumps to the Exit menu or returns to the main menu from a sub-menu
← or → (keypad arrow)	Selects the menu item to the left or right
↑ or ↓ (keypad arrow)	Moves the highlight up or down between fields
- (minus key)	Scrolls backward through the values for the highlighted field
+ (plus key) or spacebar	Scrolls forward through the values for the highlighted field
<Enter>	Brings up a selection menu for the highlighted field
<Home> or <PgUp>	Moves the cursor to the first field
<End> or <PgDn>	Moves the cursor to the last field
<F5>	Resets the current screen to its Setup Defaults
<F10>	Saves changes and exits Setup

4. BIOS SETUP

General Help

In addition to the Item Specific Help window, the BIOS setup program also provides a General Help screen. This screen can be called up from any menu by simply pressing <F1> or the <Alt> + <H> combination. The General Help screen lists the legend keys with their corresponding alternates and functions.

Saving Changes and Exiting the Setup Program

See *4.7 Exit Menu* for detailed information on saving changes and exiting the setup program.

Scroll Bar

When a scroll bar appears to the right of a help window, it indicates that there is more information to be displayed that will not fit in the window. Use <PgUp> and <PgDn> or the up and down arrow keys to scroll through the entire help document. Press <Home> to display the first page, press <End> to go to the last page. To exit the help window, press <Enter> or <Esc>.

Sub-Menu
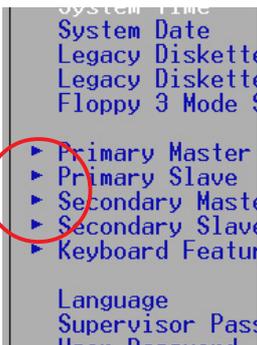
Note that a right pointer symbol (as shown in the left view) appears to the left of certain fields. This pointer indicates that a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. To call up a sub-menu, simply move the highlight to the field and press <Enter>. The sub-menu will then immediately appear. Use the legend keys to enter values and move from field to field within a sub-menu just as you would within a menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with each of the legend keys and their corresponding functions. Practice navigating through the various menus and submenus. If you accidentally make unwanted changes to any of the fields, use the set default hot key <F5>. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right of each menu. This window displays the help text for the currently highlighted field.

NOTE: The item heading in square brackets represents the default setting for that field.

4.3 Main Menu

When the Setup program is accessed, the following screen appears:

```
                    AwardBIOS Setup Utility
   Main    Advanced    Power    Boot    Exit
┌─────────────────────────────────────────────┬──────────────────────┐
│                                              │ Item Specific Help   │
│   System Time          [14:13:46]            │                      │
│   System Date          [02/29/2000]          │ <Enter> to select field;│
│   Legacy Diskette A    [1.44M, 3.5 in.]      │ <+>,<-> to change value.│
│   Legacy Diskette B    [None]                │                      │
│   Floppy 3 Mode Support [Disabled]           │                      │
│                                              │                      │
│ ▶ Primary Master       [Auto]                │                      │
│ ▶ Primary Slave        [Auto]                │                      │
│ ▶ Secondary Master     [Auto]                │                      │
│ ▶ Secondary Slave      [Auto]                │                      │
│ ▶ Keyboard Features                          │                      │
│                                              │                      │
│   Language             [English]             │                      │
│   Supervisor Password  [Disabled]            │                      │
│   User Password        [Disabled]            │                      │
│   Halt On              [All Errors]          │                      │
│   Installed Memory     128MB                 │                      │
│                                              │                      │
├──────────────────────────────────────────────────────────────────┤
│ F1   Help   ↑↓  Select Item   -/+   Change Values   F5  Setup Defaults │
│ ESC  Exit   ↔   Select Menu   Enter Select ▶ Sub-Menu  F10 Save and Exit│
└──────────────────────────────────────────────────────────────────┘
```

System Time [XX:XX:XX]

Sets your system to the time that you specify (usually the current time). The format is hour, minute, second. Valid values for hour, minute and second are **Hour: (00 to 23), Minute: (00 to 59), Second: (00 to 59)**. Use the <Tab> or <Shift> + <Tab> keys to move between the hour, minute, and second fields.

System Date [XX/XX/XXXX]

Sets your system to the date that you specify (usually the current date). The format is month, day, year. Valid values for month, day, and year are **Month: (1** to **12), Day: (1** to **31), Year:** (100 year range). Use the <Tab> or <Shift> + <Tab> keys to move between the month, day, and year fields.

Legacy Diskette A [1.44M, 3.5 in.], Legacy Diskette B [None]

Sets the type of floppy drives installed. Configuration options: [None] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

Floppy 3 Mode Support [Disabled]

This is required to support older Japanese floppy drives. Floppy 3 Mode support will allow reading and writing of 1.2MB (as opposed to 1.44MB) on a 3.5-inch diskette. Configuration options: [Disabled] [Drive A] [Drive B] [Both]

4. BIOS SETUP

4.3.1 Primary & Secondary Master/Slave

```
                          AwardBIOS Setup Utility
 | Main |
 ┌─────────────────────────────────────────────┬─────────────────────────────┐
 │         Primary Master   [Auto]             │    Item Specific Help       │
 │                                             │                             │
 │  Type                        [Auto]         │  <Enter> to select the      │
 │                                             │  type of the IDE drive.     │
 │  Cylinders              [ 1024]             │  [User Type HDD] allows     │
 │  Head                   [255]               │  you to set each entry on   │
 │  Sector                 [63]                │  your own.                  │
 │  CHS Capacity           8422MB              │                             │
 │  Maximum LBA Capacity   25590MB             │                             │
 │                                             │                             │
 │  Multi-Sector Transfers [Maximum]           │                             │
 │  SMART Monitoring       [Disabled]          │                             │
 │  PIO Mode               [4]                 │                             │
 │  ULTRA DMA Mode         [2]                 │                             │
 │                                             │                             │
 │                                             │                             │
 │                                             │                             │
 │                                             │                             │
 ├─────────────────────────────────────────────┴─────────────────────────────┤
 │ F1  Help   ↑↓ Select Item   -/+  Change Values    F5  Setup Defaults      │
 │ ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu F10 Save and Exit     │
 └────────────────────────────────────────────────────────────────────────────┘
```

NOTE: Before attempting to configure a hard disk drive, make sure you have the configuration information supplied by the manufacturer of the drive. Incorrect settings may cause your system to not recognize the installed hard disk. To allow the BIOS to detect the drive type automatically, select [Auto].

Type [Auto]

Select [Auto] to automatically detect an IDE hard disk drive. If automatic detection is successful, the correct values will be filled in for the remaining fields on this sub-menu. If automatic detection fails, your hard disk drive may be too old or too new. You can try updating your BIOS or enter the IDE hard disk drive parameters manually.

NOTE: After the IDE hard disk drive information has been entered into BIOS, new IDE hard disk drives must be partitioned (such as with FDISK) and then formatted before data can be read from and write on. Primary IDE hard disk drives must have its partition set to *active* (also possible with FDISK).

Other options for the **Type** field are:
— —
[None] - to disable IDE devices

IMPORTANT: If your hard disk was already formatted on an older previous system, incorrect parameters may be detected. You will need to enter the correct parameters manually or use low-level format if you do not need the data stored on the hard disk.

If the parameters listed differ from the ones used when the disk was formatted, the disk will not be readable. If the auto-detected parameters do not match the ones that should be used for your disk, you should enter the correct ones manually by setting [User Type HDD].

[User Type HDD]

```
                        AwardBIOS Setup Utility
   Main

        Primary Master    [User Type HDD]         Item Specific Help

      Type                    [User Type HDD]      <Enter> to select the
      Translation Method      [LBA]                type of the IDE drive.
                                                   [User Type HDD] allows
      Cylinders               [ 1024]              you to set each entry on
      Head                    [255]                your own.
      Sector                  [63]
      CHS Capacity            8422MB
      Maximum LBA Capacity    25590MB

      Multi-Sector Transfers  [Maximum]
      SMART Monitoring        [Disabled]
      PIO Mode                [4]
      ULTRA DMA Mode          [2]

   F1   Help    ↑↓  Select Item   -/+    Change Values      F5    Setup Defaults
   ESC  Exit    ↔   Select Menu   Enter  Select ► Sub-Menu  F10   Save and Exit
```

Manually enter the number of cylinders, heads and sectors per track for your drive. Refer to your drive documentation or look on the drive for this information. If no drive is installed or if you are removing a drive and not replacing it, select [None].

Translation Method [LBA]
Select the hard disk drive type in this field. When Logical Block Addressing is enabled, 28-bit addressing of the hard drive is used without regard for cylinders, heads, or sectors. Note that LBA Mode is necessary for drives with greater than 504MB in storage capacity. Configuration options: [LBA] [LARGE] [Normal] [Match Partition Table] [Manual]

Cylinders
This field configures the number of cylinders. Refer to your drive documentation to determine the correct value to enter into this field. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD] and the **Translation Method** field must be set to [Manual].

4. BIOS SETUP
Master/Slave Drives

Head

This field configures the number of read/write heads. Refer to your drive documentation to determine the correct value to enter into this field. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD] and the **Translation Method** field must be set to [Manual].

Sector

This field configures the number of sectors per track. Refer to your drive documentation to determine the correct value to enter into this field. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD] and the **Translation Method** field must be set to [Manual].

CHS Capacity

This field shows the drive's maximum CHS capacity calculated automatically by the BIOS from the drive information you entered.

Maximum LBA Capacity

This field shows the drive's maximum LBA capacity calculated automatically by the BIOS from the drive information you entered.

Multi-Sector Transfers [Maximum]

This option automatically sets the number of sectors per block to the highest number supported by the drive. This field can also be configured manually. Note that when this field is automatically configured, the set value may not always be the fastest value for the drive. Refer to the documentation that came with your hard drive to determine the optimal value and set it manually. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD]. Configuration options: [Disabled] [2 Sectors] [4 Sectors] [8 Sectors] [16 Sectors] [32 Sectors] [Maximum]

SMART Monitoring [Disabled]

This allows the enabling or disabling of the S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology) system which utilizes internal hard disk drive monitoring technology. This feature is normally disabled because system resources used in this feature may decrease system performance. Configuration options: [Disabled] [Enabled]

PIO Mode [4]

This option lets you set a PIO (Programmed Input/Output) mode for the IDE device. Modes 0 through 4 provide successively increased performance. Configuration options: [0] [1] [2] [3] [4]

Ultra DMA Mode [Disabled]

Ultra DMA capability allows improved transfer speeds and data integrity for compatible IDE devices. Set to [Disabled] to suppress Ultra DMA capability. **NOTE:** To make changes to this field, the **Type** field must be set to [User Type HDD]. Configuration options: [0] [1] [2] [3] [4] [Disabled]

Other options for "Type:" are:

[CD-ROM] - for IDE CD-ROM drives

[LS-120] - for LS-120 compatible floppy disk drives

[ZIP-100] - for ZIP-100 compatible disk drives

[MO] - for IDE magneto optical disk drives

[Other ATAPI Device] - for IDE devices not listed here

After using the legend keys to make your selections on this sub-menu, press the <Esc> key to exit back to the Main menu. When the Main menu appears, you will notice that the drive size appear in the field for the hard disk drive that you just configured.

4. BIOS SETUP
Master/Slave Drives

4.3.2 Keyboard Features

```
                    AwardBIOS Setup Utility
 Main

              Keyboard Features              Item Specific Help

  Boot Up NumLock Status      [On]           Select Power-on state
  Keyboard Auto-Repeat Rate   [30/Sec]       for Numlock
  Keyboard Auto-Repeat Delay  [1/2 Sec]




 F1   Help   ↑↓  Select Item  -/+    Change Values     F5   Setup Defaults
 ESC  Exit   ↔   Select Menu  Enter  Select ► Sub-Menu F10  Save and Exit
```
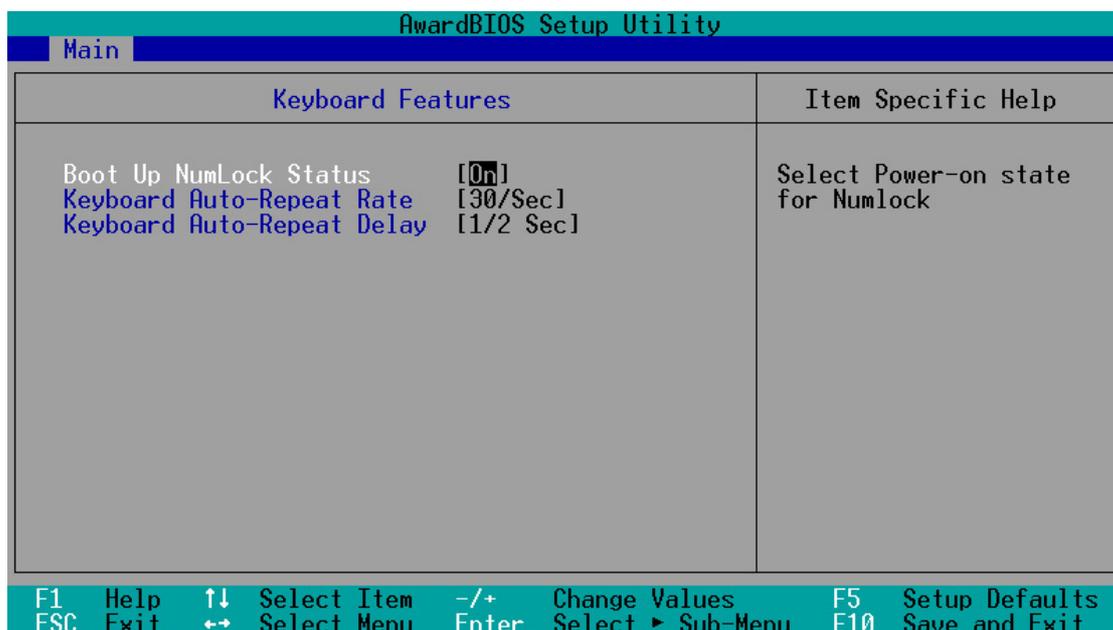
Boot Up NumLock Status [On]

This field controls the state of the NumLock key when the system boots. When switched on, the numeric keypad generates numbers instead of controlling cursor operations. Configuration options: [Off] [On]

Keyboard Auto-Repeat Rate [30/Sec]

This field controls the speed at which the system registers repeated keystrokes. Configuration options: [6/Sec] [8/Sec] [10/Sec] [12/Sec] [15/Sec] [20/Sec] [24/Sec] [30/Sec]

Keyboard Auto-Repeat Delay [1/2 Sec]

This field sets the delay before keystrokes begin to repeat. Configuration options: [1/4 Sec] [1/2 Sec] [3/4 Sec] [1 Sec]

4. BIOS SETUP

Language [English]

This allows selection of the BIOS' displayed language. Currently only English is available.

Supervisor Password [Disabled], User Password [Disabled]

These fields allow you to set the system passwords. To set any of the passwords, select the appropriate field and press <Enter>.

Type in a password and press <Enter>. You can type up to eight alphanumeric characters. Symbols and other keys are ignored. To confirm the password, type the password again and press <Enter>. The password is now set to [Enabled]. When [Enabled], a Supervisor password is required to access the BIOS setup utility and all important menu options while a User password is required to access the computer system.

To clear either password, select the appropriate field and press <Enter>. Press <Enter> again when a dialog box appears. This sets the password field to [Disabled].

A Note about Passwords

The passwords are not case sensitive. In other words, it makes no difference whether you enter a password using upper- or lowercase letters.

The BIOS Setup program allows you to specify two separate passwords: a Supervisor password and a User password. When both of them are disabled, anyone may access all BIOS Setup program functions.

Halt On [All Errors]

This field determines which types of errors will cause the system to halt. Configuration options: [All Errors] [No Error] [All but Keyboard] [All but Disk] [All but Disk/Keyboard]

Installed Memory [XXX MB]

This field displays the amount of conventional memory detected by the system during bootup. You do not need to make changes to this field. This is a display only field.

4. BIOS SETUP

4.4 Advanced Menu

```
                    AwardBIOS Setup Utility
    Main    Advanced    Power    Boot    Exit
  ┌─────────────────────────────────────────┬──────────────────────────┐
  │                                          │  Item Specific Help      │
  │ CPU Internal Frequency      [Manual]     │                          │
  │ CPU Frequency Multiple      [2.0x]       │  To make changes to the  │
  │ FSB/SDRAM/PCI Freq. Ratio   [4/6/2]      │  first 5 fields, the     │
  │ CPU External (FSB) Freq. (MHz)  [ 66]    │  motherboard must be set │
  │ CPU Vcore                   [2.00V]      │  to jumperfree mode.     │
  │ CPU Level 1 Cache           [Enabled]    │                          │
  │ CPU Level 2 Cache           [Enabled]    │  To set the following 3  │
  │ CPU Level 2 Cache ECC Check [Disabled]   │  fields, the CPU Internal│
  │ BIOS Update                 [Enabled]    │  Frequency must be set to │
  │ PS/2 Mouse Function Control [Auto]       │  [Manual].               │
  │ USB Legacy Support          [Auto]       │                          │
  │ OS/2 Onboard Memory > 64M   [Disabled]   │                          │
  │ ► Chip Configuration                     │                          │
  │ ► I/O Device Configuration               │                          │
  │ ► PCI Configuration                      │                          │
  │ ► Shadow Configuration                   │                          │
  │                                          │                          │
  ├──────────────────────────────────────────────────────────────────────┤
  │ F1   Help    ↑↓  Select Item   -/+    Change Values   F5   Setup Defaults│
  │ ESC  Exit    ←→  Select Menu   Enter  Select ► Sub-Menu F10  Save and Exit│
  └──────────────────────────────────────────────────────────────────────┘
```

CPU Internal Frequency [Manual]

When the motherboard is set to JumperFree™ mode, this field allows you to select the internal frequency of your CPU. Select [Manual] if you want to make changes to the subsequent 3 fields.

CPU Frequency Multiple (when CPU Speed is set to [Manual])

This field is for unlocked processors only. If your socket 370 processor's Frequency Multiple is detected locked, you will not be able to access this field. This field sets the frequency multiple between the CPU's *internal* frequency and *external* frequency. This must be set in conjunction with **CPU External (FSB) Frequency** to match the speed of your CPU. Configuration options: [2.0x] [2.5x] [3.0x]...[7.0x] [7.5x] [8.0x]

FSB/SDRAM/PCI Freq. Ratio (when CPU Speed is set to [Manual])

This feature tells the clock generator what frequencies to send to the local bus and PCI devices onboard. The bus frequency (**external frequency**) multiplied by the bus multiple equals the CPU's internal frequency.

CPU External (FSB) Frequency (MHz) (when CPU Speed is set to [Manual])

This feature tells the clock generator what frequency to send to the CPU, DRAM, and chipset. The bus frequency (external frequency) multiplied by the bus multiple equals the CPU's internal frequency (the **CPU speed**). The configuration options vary depending on the **CPU/SDRAM/PCI Freqency Ratio**.

4. BIOS SETUP

CPU Vcore

This field displays the core voltage supplied to the CPU. If you want to set it manually, always refer to the CPU documentation.

CPU Level 1 Cache, CPU Level 2 Cache [Enabled]

These fields allow you to choose from the default of [Enabled] or choose [Disabled] to turn on or off the CPU's Level 1 and Level 2 built-in cache. Configuration options: [Disabled] [Enabled]

CPU Level 2 Cache ECC Check [Disabled]

This function controls the ECC capability in the CPU level 2 cache. Configuration options: [Disabled] [Enabled]

BIOS Update [Enabled]

This functions as an update loader integrated into the BIOS to supply the processor with the required data. In the default position of [Enabled], the BIOS will load the update on all processors during system bootup. Configuration options: [Disabled] [Enabled]

PS/2 Mouse Function Control [Auto]

The default of [Auto] allows the system to detect a PS/2 mouse on startup. If detected, IRQ12 will be used for the PS/2 mouse. IRQ12 will be reserved for expansion cards only if a PS/2 mouse is not detected. [Enabled] will always reserve IRQ12, whether on startup a PS/2 mouse is detected or not. Configuration options: [Enabled] [Auto]

USB Legacy Support [Auto]

This motherboard supports Universal Serial Bus (USB) devices. The default of [Auto] allows the system to detect a USB device on startup. If detected, the USB controller will be enabled. If not detected, the USB controller will be disabled. When this field is set to [Disabled], the USB controller is disabled no matter whether you are using a USB device or not. Configuration options: [Disabled] [Enabled] [Auto]

OS/2 Onboard Memory > 64M [Disabled]

When using OS/2 operating systems with installed DRAM of greater than 64MB, you need to set this option to [Enabled]; otherwise, leave this on [Disabled]. Configuration options: [Disabled] [Enabled]

4. BIOS SETUP

Notes for JumperFree Mode
CPU Upgrade/Reinstallation

To ensure that your system can enter BIOS setup after the processor has been changed or reinstalled, your system will start up running at a bus speed of 66MHz and a fail-safe CPU internal frequency (4x66MHz for the Intel Coppermine processor or 2x66MHz for non-Coppermine processors). It will then automatically take you to the Advanced menu with a popup menu of all the officially possible CPU speeds.

For processors with locked frequency multiplier

For processors with unlocked frequency multiplier

4. BIOS SETUP

System Hangup

If your system crashes or hangs due to improper frequency settings, power OFF your system and restart. The system will start up in safe mode running at a bus speed of 66MHz and enter BIOS setup.

```
                    AwardBIOS Setup Utility
   Main    Advanced    Power    Boot    Exit

                                          Item Specific Help
   CPU Internal Frequency      [ 933MHz]
   CPU Frequency Multiple      [7.0x]
   FSB/SDRAM/PCI Freq. Ratio   [8/6/2]     During the last boot-up,
   CPU External (FSB) Freq. (MHz)  [133]   your system hung for an
   CPU Vcore                   [2.00V]     improper CPU Internal
   CPU Level 1 Cache           [Enabled]   Frequency setting. Your
   CPU Level 2 Cache           [Enabled]   system is now working in
```

Cause for Hangup: Improper *CPU Internal Frequency*

```
                    AwardBIOS Setup Utility
   Main    Advanced    Power    Boot    Exit

                                          Item Specific Help
   CPU Internal Frequency      [Manual]
   CPU Frequency Multiple      [8.0x]
   FSB/SDRAM/PCI Freq. Ratio   [8/6/2]     During the last boot-up,
   CPU External (FSB) Freq. (MHz)  [133]   your system hung for an
   CPU Vcore                   [2.00V]     improper CPU Frequency
   CPU Level 1 Cache           [Enabled]   Multiple. Your system is
   CPU Level 2 Cache           [Enabled]   now working in safe
```

Cause for Hangup: Improper *CPU Frequency Multiple*
(For processors with unlocked frequency multiplier only)

```
                    AwardBIOS Setup Utility
   Main    Advanced    Power    Boot    Exit

                                          Item Specific Help
   CPU Internal Frequency      [ Manual]
   CPU Frequency Multiple      [7.0x]
   FSB/SDRAM/PCI Freq. Ratio   [8/6/2]     During the last boot-up,
   CPU External (FSB) Freq. (MHz)  [153]   your system hung for
   CPU Vcore                   [2.00V]     improper FSB/SDRAM/PCI
   CPU Level 1 Cache           [Enabled]   Frequency Ratio or/and
   CPU Level 2 Cache           [Enabled]   CPU External Frequency
```

**Cause for Hangup: Improper *FSB/SDRAM/PCI Freq. Ratio*
or *CPU External (FSB) Freq. (MHz)***

4.4.1 Chip Configuration

```
                         AwardBIOS Setup Utility
        Advanced

                     Chip Configuration              Item Specific Help

      SDRAM Configuration            [By SPD]      <Enter> to select SDRAM
      SDRAM CAS Latency              [3T]          configuration.
      SDRAM RAS to CAS Delay         [3T]          [By SPD] is recommended.
      SDRAM RAS Precharge Time       [3T]          [User Define] allows you
      SDRAM Cycle Time (Tras,Trc)    [6T,8T]       to set each
      SDRAM Page Closing Policy      [All Banks]   configuration on your
      CPU Latency Timer              [Enabled]     own.
      Onboard VGA                    [Enabled]
      Display Cache                  [Enabled]
      Display Cache CAS Latency (DCCAS) [2T]
      Display Cache RAS to CAS Delay [Determine]
      Display Cache RAS Precharge Time [2T]
      Display Cache Cycle Time (Tras,Trc) [5T,8T]
      Display Cache Paging Mode      [Page Open]
      Graphics Window Size           [64MB]
      Memory Hole At 15M-16M         [Disabled]
      PCI 2.1 Support                [Enabled]
      High Priority PCI Mode         [Enabled]
      Onboard PCI IDE Enable         [Both]

      F1   Help   ↑↓  Select Item   -/+    Change Values   F5   Setup Defaults
      ESC  Exit   ←→  Select Menu   Enter  Select ► Sub-Menu  F10  Save and Exit
```
(scroll down to see more items, as shown here)

SDRAM Configuration [By SPD]

This sets the optimal timings for items 2–4, depending on the memory modules that you are using. Default setting is [By SPD], which configures items 2–4 by reading the contents in the SPD (Serial Presence Detect) device. The EEPROM on the memory module stores critical parameter information about the module, such as memory type, size, speed, voltage interface, and module banks. Configuration options: [User Define] [7ns (143MHz)] [8ns (125MHz)] [By SPD]

SDRAM CAS Latency

This controls the latency between the SDRAM read command and the time that the data actually becomes available. **NOTE:** To make changes to this field, the **SDRAM Configuration** field must be set to [User Define].

SDRAM RAS to CAS Delay

This controls the latency between the SDRAM active command and the read/write command. **NOTE:** To make changes to this field, the **SDRAM Configuration** field must be set to [User Define].

SDRAM RAS Precharge Time

This controls the idle clocks after issuing a precharge command to the SDRAM. **NOTE:** To make changes to this field, the **SDRAM Configuration** field must be set to [User Define].

SDRAM Cycle Time (Tras, Trc) [6T, 8T]

This feature controls the number of SDRAM clocks used per access cycle. Configuration options: [5T, 7T] [6T, 8T]

SDRAM Page Closing Policy [All Banks]

This feature controls whether the graphic and memory controller hub will precharge one or all banks after a page miss. Configuration options: [One Bank] [All Banks]

CPU Latency Timer [Enabled]

Configuration options: [Disabled] [Enabled]

Onboard VGA [Enabled]

Leave on default setting if you want to use the onboard VGA. If this field is disabled, all **Display Cache** configurations will not be available. Configuration options: [Disabled] [Enabled]

Display Cache [Enabled]

Load default settings if you want to use the onboard display cache. If this field is disabled, all the other **Display Cache** configurations will not be available. Configuration options: [Disabled] [Enabled]

Display Cache CAS Latency (DCCAS) [2T]

Configuration options: [2T] [3T]

Display Cache RAS to CAS Delay [Determined by DCCAS]

With the default setting [Determined by DCCAS], this field has the same configuration as **Display Cache CAS Latency (DCCAS)**. Configuration options: [Determined by DCCAS] [2T]

Display Cache RAS Precharge Time [2T]

Configuration options: [2T] [3T]

Display Cache Cycle Time (Tras, Trc) [5T, 8T]

Configuration options: [5T, 8T] [7T, 10T]

Display Cache Paging Mode [Page Open Mode]

Configuration options: [Page Open Mode] [Page Close Mode]

Graphics Window Size [64MB]

This feature allows you to select the size of mapped memory for AGP graphic data. Configuration options: [64MB] [32MB]

4. BIOS SETUP
Chip Configuration

Memory Hole At 15M-16M [Disabled]

This field allows you to reserve an address space for ISA expansion cards that require it. Setting the address space to a particular setting will make that memory space unavailable to the system. Expansion cards can only access memory up to 16MB. Configuration options: [Disabled] [Enabled]

PCI 2.1 Support [Enabled]

This function allows you to enable or disable PCI 2.1 features including passive release and delayed transaction. Configuration options: [Disabled] [Enabled]

High Priority PCI Mode [Enabled]

This field allows you to give PCI slot 1 a higher priority. You may want to leave on the default setting if you are using an IEEE-1394 PCI card. Configuration options: [Disabled] [Enabled]

Onboard PCI IDE Enable [Both]

You can select to enable the primary IDE channel, secondary IDE channel, both, or disable both channels. Configuration options: [Both] [Primary] [Secondary] [Disabled]

4. BIOS SETUP

4.4.2 I/O Device Configuration

```
                        AwardBIOS Setup Utility
        Advanced

           I/O Device Configuration                    Item Specific Help

     Onboard AC97 Modem Controller   [Auto]            <Enter> to select.
     Onboard AC97 Audio Controller   [Auto]

     Onboard FDC Swap A & B          [No Swap]
     Floppy Disk Access Control      [R/W]

     Onboard Serial Port 1           [3F8H/IRQ4]
     Onboard Serial Port 2           [2F8H/IRQ3]
     UART2 Use Standard Infrared     [Disabled]

     Onboard Parallel Port           [378H/IRQ7]
     Parallel Port Mode              [ECP+EPP]
     ECP DMA Select                  [3]

     Onboard Game Port               [200H-207H]
     Onboard MIDI I/O                [Disabled]

     Onboard CIR I/O                 [Disabled]

  F1   Help    ↑↓  Select Item   -/+     Change Values    F5   Setup Defaults
  ESC  Exit    ←→  Select Menu   Enter   Select ► Sub-Menu F10  Save and Exit
```
(scroll down to see more items, as shown here)

Onboard AC97 Modem Controller, Audio Controller [Auto]
[Auto] allows the motherboard's BIOS to detect whether you are using any modem/ audio device. If a modem/audio device is detected, the onboard modem/audio controller will be enabled; if no modem/audio device is detected, the onboard modem/audio controller will be disabled. If you have conflicts with the onboard modem/audio controller, you may set the appropriate field to [Disabled]. Configuration options: [Disabled] [Auto]

Onboard FDC Swap A & B [No Swap]
This field allows you to reverse the hardware drive letter assignments of your floppy disk drives. Configuration options: [No Swap] [Swap AB]

Floppy Disk Access Control [R/W]
When set to [Read Only], this field protects files from being copied to floppy disks by allowing reads from the floppy disk drive but not writes. The setup default [R/W] allows both reads and writes. Configuration options: [R/W] [Read Only]

Onboard Serial Port 1 [3F8H/IRQ4], Onboard Serial Port 2 [2F8H/IRQ3]
These fields allow you to set the addresses for the onboard serial connectors. Serial Port 1 and Serial Port 2 must have different addresses. Configuration options: [3F8H/IRQ4] [2F8H/IRQ3] [3E8H/IRQ4] [2E8H/IRQ10] [Disabled]

UART2 Use Standard Infrared [Disabled]

When enabled, this field activates the onboard standard infrared feature and sets the second serial UART to support the infrared module connector on the motherboard. If your system already has a second serial port connected to the onboard COM2 connector, it will no longer work if you enable the infrared feature. See **IrDA-Compliant Infrared Module Connector** in *3.8 External Connectors*. Configuration options: [Disabled] [Enabled]

Onboard Parallel Port [378H/IRQ7]

This field sets the address of the onboard parallel port connector. If you disable this feature, **Parallel Port Mode** and **ECP DMA Select** configurations will not be available. Configuration options: [Disabled] [378H/IRQ7] [278H/IRQ5]

Parallel Port Mode [ECP+EPP]

This field allows you to set the operation mode of the parallel port. [Normal] allows normal-speed operation but in one direction only; [EPP] allows bidirectional parallel port operation; [ECP] allows the parallel port to operate in bidirectional DMA mode; [ECP+EPP] allows normal speed operation in a two-way mode. Configuration options: [Normal] [EPP] [ECP] [ECP+EPP]

ECP DMA Select [3]

This field allows you to configure the parallel port DMA channel for the selected **ECP** mode. This selection is available only if you select [ECP] or [ECP+EPP] in **Parallel Port Mode** above. Configuration options: [1] [3] [Disabled]

Onboard Game Port [200H-207H]

This field sets the address of the onboard game port connector. Configuration options: [Disabled] [200H-207H] [208H-20FH]

Onboard MIDI I/O [Disabled]

This field sets the address of the onboard MIDI connector. Configuration options: [Disabled] [330H-331H] [300H-301H]

Onboard MIDI IRQ [xx]

This field is not available if you select [Disabled] for the **Onboard MIDI I/O** field. Configuration options: [3] [4] [5] [7] [9] [10] [11] [12] [14] [15]

Onboard CIR I/O [Disabled]

This field sets the address of the onboard Consumer IR connector. Configuration options: [Disabled] [2E0-2E8H] [3E0-3E8H]

Onboard CIR IRQ [xx]

This field is not available if you select [Disabled] for the **Onboard CIR I/O** field. Configuration options: [3] [4] [5] [7] [9] [10] [11] [12] [14] [15]

4. BIOS SETUP

4.4.3 PCI Configuration

```
                    AwardBIOS Setup Utility
        Advanced

            PCI Configuration                    Item Specific Help

 Slot 1 IRQ                        [Auto]        <Enter> to select an
                                                 IRQ.
   PCI/VGA Palette Snoop           [Disabled]
   PCI Latency Timer               [ 32]
   SYMBIOS SCSI BIOS               [Auto]
   USB Function                    [Enabled]
   ONB VGA BIOS First              [No]
   Onboard LAN Boot ROM            [Disabled]

 ▶ PCI/PNP ISA IRQ Resource Exclusion
 ▶ PCI/PNP ISA DMA Resource Exclusion
 ▶ PCI/PNP ISA UMB Resource Exclusion


 F1   Help    ↑↓   Select Item   -/+     Change Values    F5   Setup Defaults
 ESC  Exit    ←→   Select Menu   Enter   Select ▶ Sub-Menu F10  Save and Exit
```

Slot 1 IRQ [Auto]

This field sets how IRQ use is determined for the PCI slot. The default setting for each field is [Auto], which utilizes auto-routing to determine IRQ use. Configuration options: [Auto] [NA] [3] [4] [5] [7] [9] [10] [11] [12] [14] [15]

PCI/VGA Palette Snoop [Disabled]

Some nonstandard VGA cards, such as graphics accelerators or MPEG video cards, may not show colors properly. The setting [Enabled] should correct this problem. Otherwise, leave this on the default setting of [Disabled]. Configuration options: [Disabled] [Enabled]

PCI Latency Timer [32]

Leave on default setting for best performance vs. stability.

SYMBIOS SCSI BIOS [Auto]

[Auto] allows the motherboard's BIOS to detect whether you have a Symbios SCSI card. If the Symbios SCSI card is detected, the motherboard's Symbios BIOS will be enabled; if no Symbios SCSI card is detected, the onboard Symbios SCSI BIOS will be disabled.

[Disabled] will disable the motherboard's Symbios SCSI BIOS so that the BIOS on an add-on Symbios SCSI card can be used. If your Symbios SCSI card does not have a BIOS, the Symbios SCSI card will not function. Configuration options: [Auto] [Disabled]

USB Function [Enabled]

This motherboard supports Universal Serial Bus (USB) devices. Set to [Enabled] if you want to use USB devices. Configuration options: [Disabled] [Enabled]

ONB VGA BIOS First [No]

This field, when set to [Yes], gives priority to the onboard VGA BIOS over other VGA controllers. Configuration options: [No] [Yes]

Onboard LAN Boot ROM [Disabled]

When the onboard LAN boot ROM is enabled, you may choose to boot from an Intel UNDI PXE-compliant network that your system is connected to. To do so, you must restart the system after setting this field to [Enabled], enter BIOS Setup, go to the Boot menu, and select the option that contains *Intel UNDI, PXE* under **Other Boot Device**. Configuration options: [Disabled] [Enabled]

PCI/PNP ISA IRQ Resource Exclusion

```
                        AwardBIOS Setup Utility
          ┌ Advanced ┐

     ┌─── PCI/PNP ISA IRQ Resource Exclusion ───┐  ┌─ Item Specific Help ─┐

       IRQ  3 Used By ISA    [No/ICU]              Select [Yes] if this IRQ
       IRQ  4 Used By ISA    [No/ICU]              is required by a legacy
       IRQ  5 Used By ISA    [No/ICU]              ISA card and you are not
       IRQ  7 Used By ISA    [No/ICU]              using ICU; otherwise,
       IRQ  9 Used By ISA    [No/ICU]              select [No/ICU].
       IRQ 10 Used By ISA    [No/ICU]
       IRQ 11 Used By ISA    [No/ICU]
       IRQ 12 Used By ISA    [No/ICU]
       IRQ 14 Used By ISA    [No/ICU]
       IRQ 15 Used By ISA    [No/ICU]



     F1   Help   ↑↓  Select Item   -/+    Change Values     F5   Setup Defaults
     ESC  Exit   ←→  Select Menu    Enter  Select ► Sub-Menu F10  Save and Exit
```

IRQ XX Used By ISA [No/ICU]

These fields indicate whether or not the displayed IRQ for each field is being used by a legacy (non-PnP) ISA card. The default value indicates either that the displayed IRQ is not used or that ISA Configuration Utility (ICU) is being used to determine if an ISA card is using that IRQ. If you install a legacy ISA card that requires a unique IRQ and you are not using an ICU, you must set the field for that IRQ to [Yes]. For example: If you install a legacy ISA card that requires IRQ 10, then set **IRQ10 Used By ISA** to [Yes]. Configuration options: [No/ICU] [Yes]

4. BIOS SETUP

PCI/PNP ISA DMA Resource Exclusion

```
                    AwardBIOS Setup Utility
         Advanced

     PCI/PNP ISA DMA Resource Exclusion         Item Specific Help

    DMA  1 Used By ISA    [No/ICU]         Select [Yes] if this DMA
    DMA  3 Used By ISA    [No/ICU]         channel is required by a
    DMA  5 Used By ISA    [No/ICU]         legacy ISA card and you
                                           are not using ICU;
                                           otherwise, select
                                           [No/ICU].












 F1   Help   ↑↓  Select Item   -/+    Change Values     F5   Setup Defaults
 ESC  Exit   ←→  Select Menu   Enter  Select ► Sub-Menu F10  Save and Exit
```

DMA x Used By ISA [No/ICU]

These fields indicate whether or not the displayed DMA channel for each field is being used by a legacy (non-PnP) ISA card. The default setting indicates either that the displayed DMA channel is not used or an ICU is being used to determine if an ISA card is using that channel. If you install a legacy ISA card that requires a unique DMA channel, and you are not using an ICU, you must set the field for that channel to [Yes]. Configuration options: [No/ICU] [Yes]

PCI/PNP ISA UMB Resource Exclusion

```
                    AwardBIOS Setup Utility
         Advanced

     PCI/PNP ISA UMB Resource Exclusion         Item Specific Help

    ISA MEM Block BASE    [No/ICU]         This is for some ISA
                                           add-on cards whose UMB
                                           can't be auto-detected.













 F1   Help   ↑↓  Select Item   -/+    Change Values     F5   Setup Defaults
 ESC  Exit   ←→  Select Menu   Enter  Select ► Sub-Menu F10  Save and Exit
```

4. BIOS SETUP
PCI Configuration

ISA MEM Block BASE [No/ICU]

This field allows you to set the base address and block size of a legacy ISA card that uses any memory segment within the C800 and DFFF address range. If you have such a card and you are not using an ICU to specify its address range, select a base address from the six available options; the **ISA MEM Block SIZE** field will then appear for selecting the block size. If you have more than one legacy ISA card in your system that requires the use of this address range, you can increase the block size to 8K, 16K, 32K, or 64K. If you are using an ICU to accomplish this task, leave **ISA MEM Block BASE** to its default setting of [No/ICU]. Configuration options: [No/ICU] [C800] [CC00] [D000] [D400] [D800] [DC00]

4.4.4 Shadow Configuration

```
                    AwardBIOS Setup Utility
        Advanced

            Shadow Configuration              │  Item Specific Help

    Video ROM BIOS Shadow    [Enabled]           Select [Enabled] to move
    D0000-D7FFF Shadow       [Disabled]          video BIOS from ROM to
    D8000-DBFFF Shadow       [Disabled]          RAM.
    DC000-DFFFF Shadow       [Disabled]




    F1   Help    ↑↓  Select Item   -/+    Change Values    F5   Setup Defaults
    ESC  Exit    ←→  Select Menu    Enter  Select ► Sub-Menu F10  Save and Exit
```
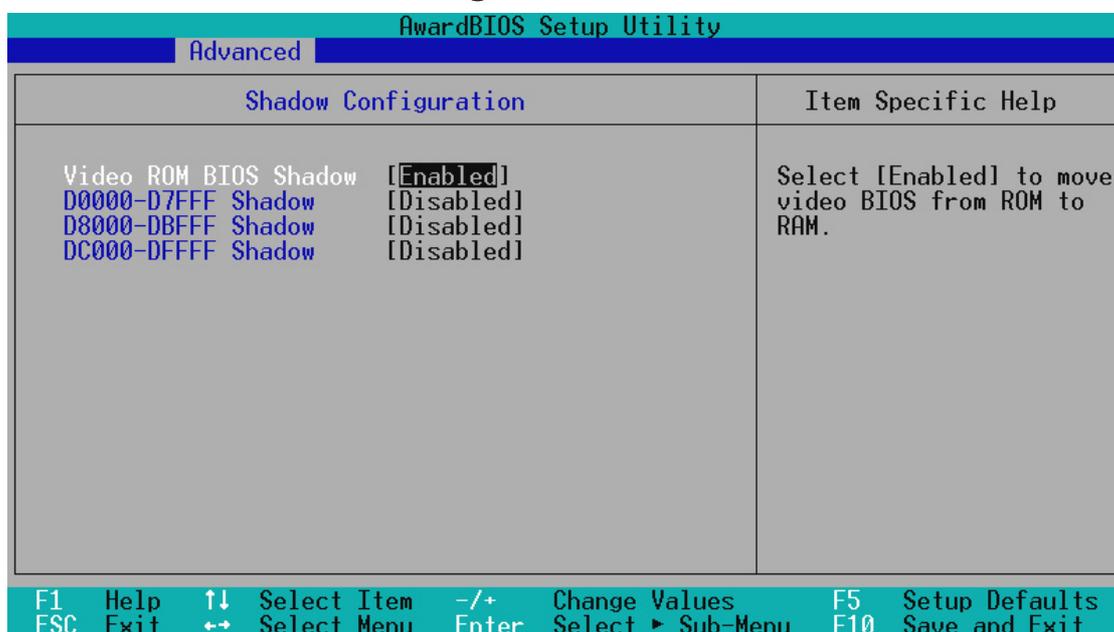
Video ROM BIOS Shadow [Enabled]

This field allows you to change the video BIOS location from ROM to RAM. Relocating to RAM enhances system performance, as information access is faster than the ROM. Configuration options: [Disabled] [Enabled]

**D0000-DFFFF Shadow [Disabled]**

These fields are used for shadowing other expansion card ROMs. If you install other expansion cards with ROMs on them, you will need to know which addresses the ROMs use to shadow them specifically. Shadowing a ROM reduces the memory available between 640K and 1024K by the amount used for this purpose. Configuration options: [Disabled] [Enabled]

4.5 Power Menu

The Power menu allows you to reduce power consumption. This feature turns off the video display and shuts down the hard disk after a period of inactivity.

```
                        AwardBIOS Setup Utility
    Main     Advanced    Power     Boot     Exit
  ┌─────────────────────────────────────────┬────────────────────────┐
  │                                          │   Item Specific Help   │
  │ Power Management        [User Define]    │                        │
  │ Video Off Option        [Suspend -> Off] │                        │
  │ Video Off Method        [DPMS OFF]       │ <Enter> to select the  │
  │ HDD Power Down          [Disabled]       │ power saving mode. You  │
  │ Suspend-to-RAM Capability [Disabled]     │ can select [User Define]│
  │                                          │ to go to the suspend   │
  │ Suspend Mode            [Disabled]       │ mode entry below.      │
  │ PWR Button < 4 Secs     [Soft Off]       │                        │
  │                                          │                        │
  │ ▶ Power Up Control                       │                        │
  │ ▶ Hardware Monitor                       │                        │
  │                                          │                        │
  │                                          │                        │
  │                                          │                        │
  │                                          │                        │
  ├──────────────────────────────────────────────────────────────────┤
  │ F1   Help   ↑↓  Select Item  -/+   Change Values   F5  Setup Defaults│
  │ ESC  Exit   ←→  Select Menu  Enter Select ▶ Sub-Menu F10 Save and Exit│
  └──────────────────────────────────────────────────────────────────┘
```

Power Management [User Define]

This option must be enabled to use any of the automatic power saving features. If this menu item is set to [Disabled], power management features will not function regardless of other field settings on this menu. The [User Define] option allows you to make your own selections in the Power menu. When set to [Max Saving], system power will be conserved to its greatest amount. The **Suspend Mode** field will then be set to predefined value that ensures maximum power savings.

This field acts as the master control for the power management modes. [Max Saving] puts the system into power saving mode after a brief period of system inactivity; [Min Saving] is almost the same as [Max Saving] except that the system inactivity period is longer; [Disabled] disables the power saving features; [User Define] allows you to set power saving options according to your preference. Configuration options: [User Define] [Disabled] [Min Saving] [Max Saving]

IMPORTANT: Advanced Power Management (APM) should be installed to keep the system time updated when the computer enters suspend mode activated by the BIOS Power Management. For DOS environments, you need to add the statement, DEVICE=C:\DOS\POWER.EXE, to your CONFIG.SYS file. For Windows 3.x and Windows 95, you need to install Windows with the APM feature. For Windows 98 and later, APM is automatically installed. A battery and power cord icon labeled "Power Management" will appear in the "Control Panel." Choose "Advanced" in the Power Management Properties dialog box.

4. BIOS SETUP

Video Off Option [Suspend -> Off]

This field determines when to activate the video off feature for monitor power management. Configuration options: [Always On] [Suspend -> Off]

Video Off Method [DPMS OFF]

This field defines the video off features. The DPMS (Display Power Management System) feature allows the BIOS to control the video display card if it supports the DPMS feature. [Blank Screen] only blanks the screen (use this for monitors without power management or "green" features. If set up in your system, your screen saver will not display with [Blank Screen] selected). [V/H SYNC+Blank] blanks the screen and turns off vertical and horizontal scanning. Configuration options: [Blank Screen] [V/H SYNC+Blank] [DPMS Standby] [DPMS Suspend] [DPMS OFF] [DPMS Reduce ON]

HDD Power Down [Disabled]

Shuts down any IDE hard disk drives in the system after a period of inactivity as set in this user-configurable field. This feature does not affect SCSI hard drives. Configuration options: [Disabled] [1 Min] [2 Min] [3 Min]...[15 Min]

Suspend-to-RAM Capability [Disabled]

Suspend-to-RAM (STR) is an energy-saving feature. In Suspend-to-RAM state, all devices on the computer are turned off, except for the system RAM. Thus, the PC consumes less than 5 Watts of power. [Auto] allows the BIOS to detect if your power supply can supply at least 720mA on the +5VSB lead to support the STR function. If the power supply meets the requirement, the STR function will be enabled; if not, this function will be disabled. If the expansion cards you use on the motherboard do not support the STR function, you must leave this field on the default setting [Disabled]. Configuration options: [Auto] [Disabled]

Suspend Mode [Disabled]

Sets the time period before the system goes into suspend mode. Configuration options: [Disabled] [1~2 Min] [2~3 Min] [4~5 Min] [8~9 Min] [20 Min]...[1 Hour]

PWR Button < 4 Secs [Soft off]

When set to [Soft off], the ATX switch can be used as a normal system power-off button when pressed for less than 4 seconds. [Suspend] allows the button to have a dual function where pressing less than 4 seconds will place the system in sleep mode. Regardless of the setting, holding the ATX switch for more than 4 seconds will power off the system. Configuration options: [Soft off] [Suspend]

4. BIOS SETUP

4.5.1 Power Up Control

```
                    AwardBIOS Setup Utility
                    │    Power    │
┌─────────────────────────────────────────┬──────────────────────────┐
│       Power Up Control                   │    Item Specific Help    │
│                                          │                          │
│  AC PWR Loss Restart          [Disabled] │   <Enter> to select      │
│  PWR Up On Modem Act          [Disabled] │   whether or not to      │
│  Wake On LAN                  [Disabled] │   restart the system after│
│  Wake On PS2 KB/PS2 Mouse/CIR [Disabled] │   AC power loss.         │
│  Wake Up By Keyboard          [Space Bar]│                          │
│                                          │                          │
│  Automatic Power Up           [Disabled] │                          │
│                                          │                          │
│                                          │                          │
│                                          │                          │
│                                          │                          │
│                                          │                          │
│                                          │                          │
├──────────────────────────────────────────┴─────────────────────────┤
│  F1   Help   ↑↓  Select Item  -/+    Change Values   F5   Setup Defaults │
│  ESC  Exit   ←→  Select Menu  Enter  Select ► Sub-Menu F10  Save and Exit │
└─────────────────────────────────────────────────────────────────────┘
```

AC PWR Loss Restart [Disabled]

This allows you to set whether you want your system to reboot after the power has been interrupted. [Disabled] leaves your system off and [Enabled] reboots your system. [Previous State] sets your system back to the state it is before the power interruption. Configuration options: [Disabled] [Enabled] [Previous State]

PWR Up On Modem Act [Disabled]

This allows either settings of [Enabled] or [Disabled] for powering up the computer when the modem receives a call while the computer is in Soft-off mode. **NOTE:** The computer cannot receive or transmit data until the computer and applications are fully running. Thus connection cannot be made on the first try. Turning an external modem off and then back on while the computer is off causes an initialization string that will also cause the system to power on. Configuration options: [Disabled] [Enabled]

Wake On LAN [Enabled]

Wake-On-LAN allows your computer to be booted from another computer via a network by sending a wake-up frame or signal. Configuration options: [Disabled] [Enabled]

IMPORTANT: This feature requires an optional network interface with Wake-On-LAN and an ATX power supply with at least 720mA +5V standby power.

Wake On PS2 KB/PS2 Mouse/CIR [Disabled]

Set this field to [Enabled] if you wish to use your PS2 keyboard, PS2 mouse, or Consumer IR device to power up your computer. This feature requires an ATX power supply that can supply at least 300mA on the +5VSB lead. The default is set to [Disabled] because not all computers have the appropriate ATX power supply. Your computer will not power ON if you set this to [Enabled] and do not have the appropriate ATX power supply. Configuration options: [Disabled] [Enabled]

Wake Up By Keyboard [Space Bar]

When the previous setup item **Wake On PS2 KB/PS2 Mouse/CIR** is enabled, you may specify the key(s) to press to power up the computer. Configuration options: [Space Bar] [Ctrl-Esc] [Power Key]

Automatic Power Up [Disabled]

This allows an unattended or automatic system power up. You may configure your system to power up at a certain time of the day by selecting [Everyday] or at a certain time and day by selecting [By Date]. Configuration options: [Disabled] [Everyday] [By Date]

4. BIOS SETUP

4.5.2 Hardware Monitor

```
                    AwardBIOS Setup Utility
                  Power

        HardWare Monitor                      Item Specific Help

   MB Temperature         33°C/91°F           <Enter> to switch
   CPU Temperature        61°C/141°F          between monitoring or
                                              ignoring.
   CPU Fan Speed          7670RPM
   Power Fan Speed        7500RPM
   Chassis Fan Speed      N/A

   VCORE Voltage           2.0V
   +3.3V Voltage           3.3V
   +5V   Voltage           5.0V
   +12V  Voltage          12.0V
   -12V  Voltage         -12.0V
   -5V   Voltage         - 5.0V



   F1   Help    ↑↓  Select Item   -/+    Change Values    F5   Setup Defaults
   ESC  Exit    ←→  Select Menu    Enter  Select ► Sub-Menu  F10  Save and Exit
```

MB Temperature, CPU Temperature [xxxC/xxxF]

The onboard hardware monitor is able to detect the MB (motherboard) and CPU temperatures. Set to [Ignore] only if necessary.

CPU Fan, Power Fan, Chassis Fan Speed [xxxxRPM]

The onboard hardware monitor is able to detect the CPU fan speed, power supply fan speed, and the chassis fan speed in rotations per minute (RPM). The presence of the fans is automatically detected. Set to [Ignore] only if necessary.

VCORE Voltage, +3.3V Voltage, +5V Voltage, +12V Voltage, -12V Voltage, -5V Voltage [xx.xV]

The onboard hardware monitor is able to detect the voltage output by the onboard voltage regulators. Set to [Ignore] only if necessary.

NOTE: If any of the monitored items is out of range, an error message will appear: "Hardware Monitor found an error. Enter Power setup menu for details". You will then be prompted to "Press **F1** to continue, **DEL** to enter SETUP".

4.6 Boot Menu

```
                    AwardBIOS Setup Utility
   Main      Advanced     Power     Boot     Exit
┌──────────────────────────────────────────┬─────────────────────┐
│                                          │ Item Specific Help  │
│ 1. Removable Device    [Legacy Floppy]   ├─────────────────────┤
│ 2. IDE Hard Drive      [None]            │                     │
│ 3. ATAPI CD-ROM        [ASUS CD-S500/A]  │ Boot Sequence       │
│ 4. Other Boot Device   [INT18 Device (Networ]                  │
│                                          │ <Enter> to select the│
│ Plug & Play O/S        [No]              │ device.             │
│ Boot Virus Detection   [Enabled]         │                     │
│ Quick Power On Self Test [Enabled]       │ To select the boot  │
│ Boot Up Floppy Seek    [Enabled]         │ sequence, use the up or│
│ Full Screen Logo       [Enabled]         │ down arrow. Press <+> to│
│                                          │ move the device up the│
│                                          │ list, or <-> to move it│
│                                          │ down the list.      │
│                                          │                     │
├──────────────────────────────────────────┴─────────────────────┤
│ F1   Help   ↑↓  Select Item   -/+    Change Values   F5  Setup Defaults│
│ ESC  Exit   ↔   Select Menu   Enter  Select ► Sub-Menu F10 Save and Exit│
└─────────────────────────────────────────────────────────────────┘
```

Boot Sequence

The Boot menu allows you to select among the four possible types of boot devices listed using the up and down arrow keys. By using the <+> or <Space> key, you can promote devices, and by using the <-> key, you can demote devices. Promotion or demotion of devices alters the priority which the system uses to search for a boot device on system power up. Configuration options: [Removable Devices] [IDE Hard Drive] [ATAPI CD-ROM] [Other Boot Device]

Removable Device [Legacy Floppy]

Configuration options: [Disabled] [Legacy Floppy] [LS120] [ZIP-100] [ATAPI MO]

IDE Hard Drive

This field allows you to select which IDE hard disk drive to use in the boot sequence. Pressing [Enter] will show the product IDs of all connected IDE hard disk drives.

ATAPI CD-ROM

This field allows you to select which ATAPI CD-ROM drive to use in the boot sequence. Pressing [Enter] will show the product IDs of all your connected ATAPI CD-ROM drives.

Other Boot Device [INT18 Device (Network)]

Configuration options: [Disabled] [SCSI Boot Device] [INT18 Device (Network)]

Plug & Play O/S [No]

This field allows you to use a Plug-and-Play (PnP) operating system to configure the PCI bus slots instead of using the BIOS. When [Yes] is selected, interrupts may be reassigned by the OS. When a non-PnP OS is installed or you want to prevent reassigning of interrupt settings, select the default setting of [No]. Configuration options: [No] [Yes]

Boot Virus Detection [Enabled]

This field allows you to set boot virus detection, ensuring a virus-free boot sector. The system halts and displays a warning message when it detects a virus. If this occurs, you can either allow the operation to continue or use a virus-free bootable floppy disk to restart and investigate your system. Configuration options: [Disabled] [Enabled]

Quick Power On Self Test [Enabled]

This field speeds up the Power-On-Self Test (POST) routine by skipping retesting a second, third, and fourth time. Configuration options: [Disabled] [Enabled]

Boot Up Floppy Seek [Enabled]

When enabled, the BIOS will seek the floppy disk drive to determine whether the drive has 40 or 80 tracks. Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

Configuration options: [Disabled] [Enabled]

4. BIOS SETUP
Boot Menu

4.7 Exit Menu

Once you have made all of your selections from the various menus in the Setup program, you should save your changes and exit Setup. Select **Exit** from the menu bar to display the following menu:

```
                      AwardBIOS Setup Utility
    Main     Advanced     Power      Boot     Exit

                                              ┌─────────────────────┐
                                              │  Item Specific Help │
   Exit Saving Changes                        │                     │
   Exit Discarding Changes                    │ Exit setup utility and
   Load Setup Defaults                        │ save your changes to
   Discard Changes                            │ CMOS.
   Save Changes                               │









   F1   Help    ↑↓  Select Item   -/+   Change Values     F5   Setup Defaults
   ESC  Exit    ←→  Select Menu    Enter Select ► Sub-Menu F10  Save and Exit
```
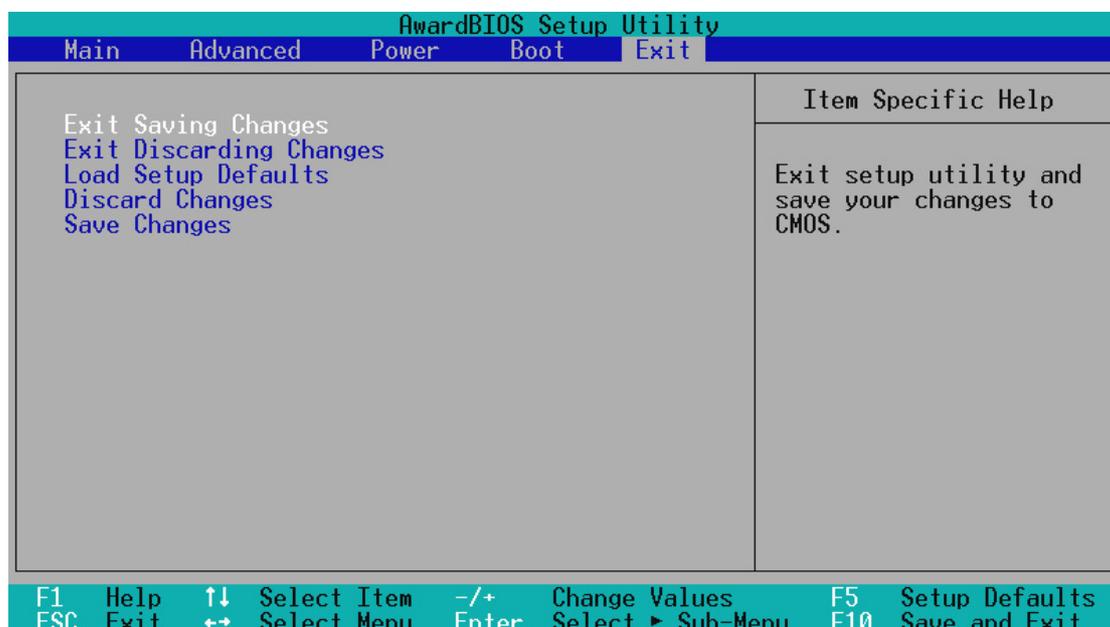
NOTE: Pressing <Esc> does not exit this menu. You must select one of the options from this menu or <F10> from the legend bar to exit this menu.

Exit Saving Changes

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. Once this option is selected, a confirmation is asked. Select [Yes] to save changes and exit.

NOTE: If you attempt to exit the Setup program without saving your changes, the program will prompt you with a message asking if you want to save your changes before exiting. Pressing <Enter> will then save changes while exiting.

Exit Discarding Changes

This option should only be used if you do not want to save the changes you have made to the Setup program. If you have made changes to fields other than system date, system time, and password, the system will ask for confirmation before exiting.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When this option is selected or if <F5> is pressed, a confirmation is requested. Select [Yes] to load default values. You can now select **Exit Saving Changes** or make other changes before saving the values to the non-volatile RAM.

Discard Changes

This option allows you to discard the selections you made and restore the values you previously saved. After selecting this option, a confirmation is requested. Select [Yes] to discard any changes and load the previously saved values.

Save Changes

This option saves your selections without exiting the Setup program. You can then return to other menus and make changes. After selecting this option, all selections are saved and a confirmation is requested. Select [Yes] to save any changes to the non-volatile RAM.

4. BIOS SETUP
Exit Menu

(This page was intentionally left blank.)

5. SOFTWARE SETUP

5.1 Operating Systems

Although ASUS motherboards passed testing on several operating systems, the operating system shown in these sections will be that of Microsoft's Windows 98. You should always use the latest operating system and updates when using new hardware to ensure full compliancy. For Windows 95, you must use OSR 2.0 or later. For Windows NT 4.0, you must use Service Pack 3.0 or later.

5.2 Starting Windows For the First Time

When you start Windows 98 for the first time after installing your motherboard, Windows will detect all plug-and-play devices. You can either follow the Add New Hardware Wizard to install the device drivers or click **Cancel**. When prompted to restart, select **No** and then follow the normal setup procedures later in this section.

IMPORTANT: Selecting **No** for the initial restart prompt is a necessary step because Windows may load an older display driver that is incompatible with the integrated VGA. Always use the driver available on the ASUS Support CD or an applicable driver update from your ASUS vendor or the ASUS web site.

NOTE: Because there are various motherboard settings, options, and expansion cards, the following can only be used as a general reference and not an exact reflection of your system.

5. SOFTWARE SETUP

5.2.1 PCI Ethernet Controller Found

Add New Hardware Wizard

This wizard searches for new drivers for:

PCI Ethernet Controller

A device driver is a software program that makes a hardware device work.

(1) Click here.

[Back] [Next>] [Cancel]

Add New Hardware Wizard

What do you want Windows to do?

⦿ Search for the best driver for your device. (Recommended).

○ Display a list of all the drivers in a specific location, so you can select the driver you want.

(2) Click here and then click *Next*.

[Back] [Next>] [Cancel]

Add New Hardware Wizard

Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected locations.

(3) Insert your ASUS Support CD, browse to here, and then click *Next*.

☑ Specify a location:

E:\Lan

[Browse...]

[Back] [Next>] [Cancel]

Add New Hardware Wizard

Windows driver file search for the device:

Intel 8255x based PCI Ethernet Adapter (10/100)

Windows is now ready to install the best driver for this device. Click Back to select a different driver, or click Next to continue.

Location of driver:

E:\LAN\

(4) Click here.

[Back] [Next>] [Cancel]

Insert Disk

Please insert the disk labeled "Windows 98 CD-ROM", and then click OK.

[OK]

(5) Insert your Windows 98 CD, and then click here.

Copying Files...

(6) Enter E:\WIN98 here and then click *OK*.

Copy files from:

E:\WIN98

[OK] [Cancel] [Skip File] [Details...]

Add New Hardware Wizard

Intel 8255x based PCI Ethernet Adapter (10/100)

Windows has finished installing the software that your new hardware device requires.

(8) Click here.

[Back] [Finish] [Cancel]

Insert Disk

Please insert the disk labeled 'Intel PRO Adapter CD-ROM or floppy disk', and then click OK.

[OK]

(7) Insert your ASUS Support CD, and then click here.

System Settings Change

(9) Click here.

To finish setting up your new hardware, you must restart your computer.

Do you want to restart your computer now?

[Yes] [No]

5. SOFTWARE SETUP

5.3 ASUS Smart Motherboard Support CD

NOTE: The support CD contents are subject to change at any time without notice.

To begin using your support CD disc, just insert it into your CD-ROM drive and the support CD installation menu should appear. If the menu does not appear, double click or run **E:\ASSETUP.EXE** (assuming that your CD-ROM drive is drive **E:**).

5.3.1 Support CD Main Menu
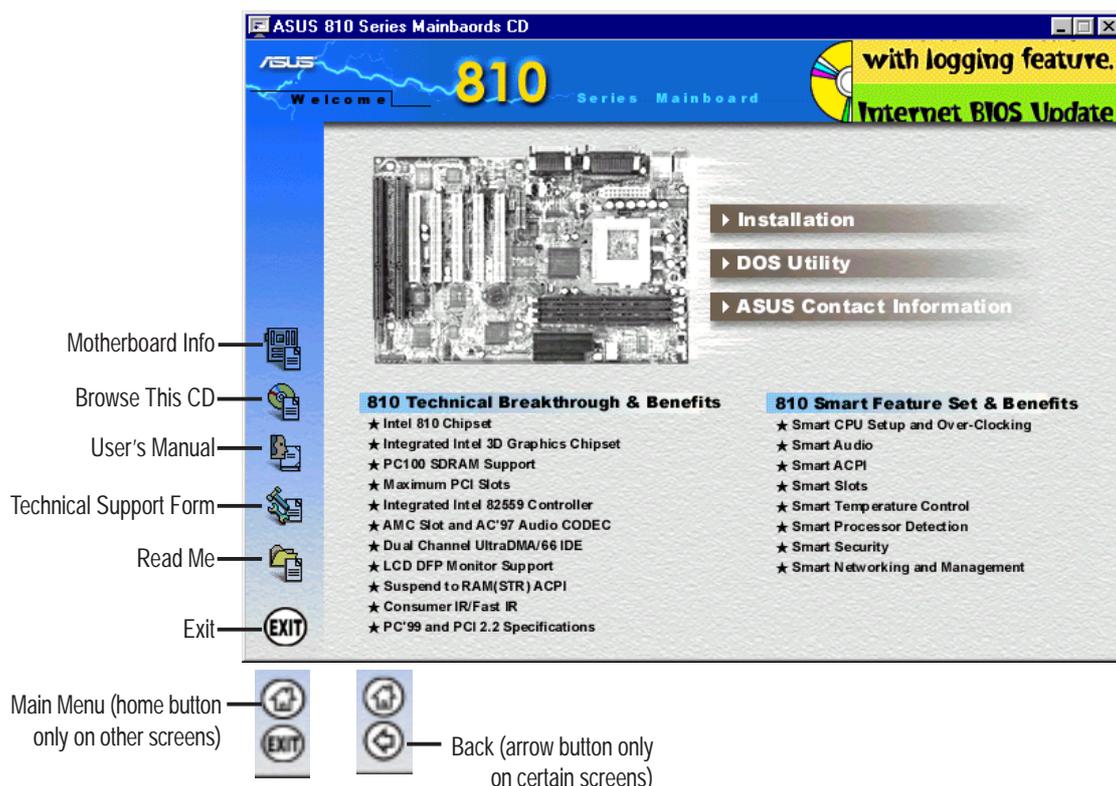
Navigation Button Descriptions

Motherboard Info displays information on your motherboard, BIOS, and CPU.

Browse This CD allows you to see the contents of the ASUS Support CD.

User's Manual displays the motherboard user's manual in pdf format.

Technical Support Form opens up a blank Technical Support Request Form for you to fill and print out when you run into technical difficulties and need technical assistance.

Read Me opens up a file containing additional notes.

Home returns you to the main menu of the support CD. (only on other screens)

Exit allows you to close the support CD.

Back returns you one screen back on the support CD.

5.4 LDCM Local Setup

System Requirements

- Intel® Pentium® microprocessor or higher.
- Operating system: Microsoft Windows 95 (can be OEM Service Release 2), or Windows 98, or Windows NT 4.0 (Service Pack 4 or later).
- Microsoft Internet Explorer 4.01 or higher.
- Memory: 16 MB of RAM for Windows 95/98; 24 MB of RAM for Windows NT (32 MB recommended).
- Disk storage space: 100 MB of available hard disk space to install; 40-100 MB of available hard disk space to run (depending on cluster size).
- Hardware system: DM or SM BIOS is required for full LDCM functionality.
- Protocols: IP (Winsock-enabled) communication protocol loaded on the client. An IP stack is required on the client, regardless of whether the client accesses the network.
- Monitor resolution of 600x800, 256 colors or greater.

Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the setup screen.

NOTE: LDCM will not run if another hardware monitoring utility, such as ASUS PC Probe, is installed. To uninstall any program, see *5.10 Uninstalling Programs*.

(1) Click here.

(2) Click here.

(3) Click here.

(4) Click here.

5. SOFTWARE SETUP

(5) Click here.

(6) Click here.

(7) Click here.

(8) Click here.

(9) Click here.

(10) Click here and then follow the online instruction to finish installing.

5. S/W SETUP
Windows 98

5.5 LDCM Administrator Setup

System Requirements

• Intel® Pentium® microprocessor or higher.

• Operating system: Microsoft Windows 95 (can be OEM Service Release 2), or Windows 98, or Windows NT 4.0 (Service Pack 4 or later).

• Microsoft Internet Explorer 4.01 or higher.

• Memory: 16 MB of RAM for Windows 95/98; 24 MB of RAM for Windows NT (32 MB recommended).

• Disk storage space: 100 MB of available hard disk space to install; 40-100 MB of available hard disk space to run (depending on cluster size).

• Hardware system: DM or SM BIOS is required for full LDCM functionality.

• Protocols: IP (Winsock-enabled) communication protocol loaded on the client. An IP stack is required on the client, regardless of whether the client accesses the network.

• Monitor resolution of 600x800, 256 colors or greater.

Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the setup screen.

NOTE: LDCM will not run if another hardware monitoring utility, such as ASUS PC Probe, is installed. To uninstall any program, see *5.10 Uninstalling Programs*.

(1) Click here.

(2) Click here.

(3) Click here.

(4) Click here.

5. S/W SETUP
Windows 98

5. SOFTWARE SETUP

Software License Agreement

Please read the following License Agreement. Press the PAGE DOWN key to see the rest of the agreement.

Intel LANDesk Client Manager v6.0
SOFTWARE LICENSE AGREEMENT

IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.

Do not use or load this software and any associated materials (collectively, the Software) until you have...

(5) **Click here only after you have carefully read the license agreement.**

Do you accept all the terms of the preceding License Agreement? If you choose No, Setup will close. To install Client Manager, you must accept the agreement.

Choose Destination Location

Setup will install Client Manager in the following folder.

To install to this folder, click Next.

To install to a different folder, click Browse and select another folder.

You can choose not to install Client Manager by clicking Cancel to exit Setup.

(6) **Click here.**

Destination Fo
C:\Program Files\Intel\LDCM

Select Components

Select the components you want to install, clear the components you do not want to install.

Components

Backward Compatibility Console
Alert On LAN Proxy

Description:
Enables this computer to manage computers running Client...

(7) **Click here.**

Space Required:
Space Available:

Additional Language Support

If non-English computers need to connect to this computer, you need to install language support for those computers so they can view this client in their native language. Select the language(s) you want to install.

French
German
Italian
Japanese
Spanish

(8) **Click here.**

English is always installed.

Select Program Folder

Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing Folders list. Click Next to continue.

Program Folders:
Intel LANDesk Management

Existing Folders:
Accessories
ASUS Utility
Internet Explorer
Online Services
StartUp
YAMAHA SoftSynth
YAMAHA YStudio

(9) **Click here.**

Add User

Enter the username and password for the Client Manager Administrator Account.

Username: Administrator

(10) **Enter a username and a password. Confirm password and then click here.**

Warning

Setup has detected that Adobe Acrobat reader is not installed on this system or there are no viewers associated with Acrobat files. Acrobat reader is required in order to view the LDCM documentation.

OK

(11) **Click here.**

Setup Complete

Setup has finished copying files to your computer.

Before you can use the program, you must restart Windows or your computer.

Yes, I want to restart my computer now.

No, I will restart my computer later.

Remove any disks fr
complete setup. **(12)** **Click here.**

Finish

5.6 ASUS PC Probe

Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the setup screen.

NOTE: ASUS PC Probe will not run if another hardware monitoring utility, such as LDCM, is installed. To uninstall any program, see *5.10 Uninstalling Programs*.

(1)   Click here.

(2)   Click here.

(3)   Click here.

(4)   Click here.

(5)   Click here.

(6)   Click here.

5. S/W SETUP
Windows 98

5. SOFTWARE SETUP

(7) Click here.

(8) Click here.

(9) Click here.

(10) Click here.
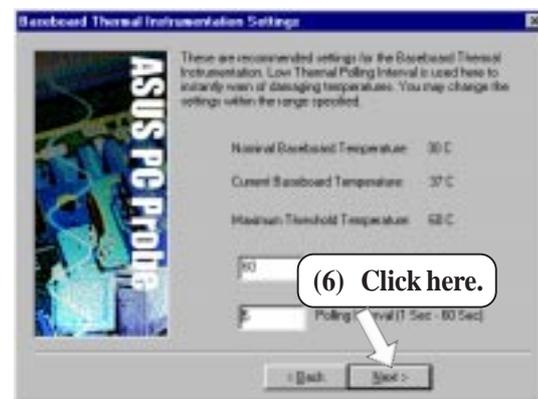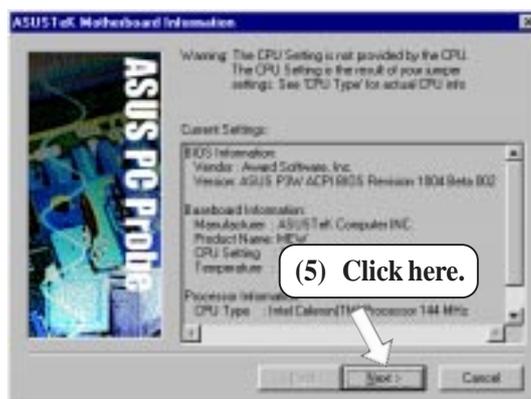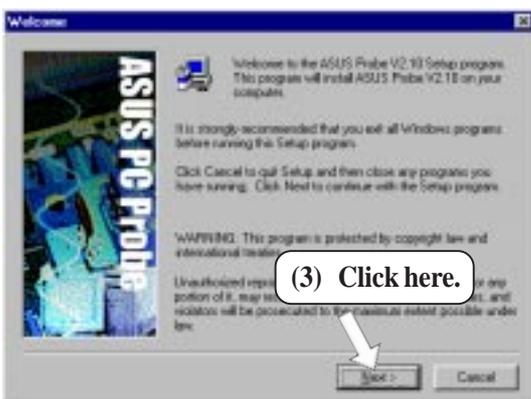
5.7 ASUS LiveUpdate

Insert the Support CD that came with your motherboard into your CD-ROM drive or
double-click the CD drive icon in **My Computer** to bring up the setup screen.

(1) Click here.

(2) Click here.

(3) Click here.

(4) Click here.

(5) Click here.

(6) Click here.
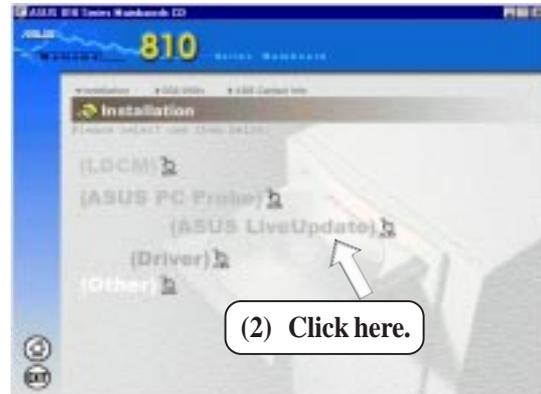
5. SOFTWARE SETUP

5.8 Drivers

5.8.1 VGA Driver Setup

Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the setup screen.

NOTE: Before you install the VGA driver, make sure that the INF Update Utility is installed (see *5.9.1 INF Update Utility for 810 Chipset*)

(1) After your computer has re-started, double-click the CD drive icon and then click here.

(2) Click here.

(3) Click here.

(4) Click here.

(5) Click here.

(6) Click here.

(7) Click here.

(8) Browse to E:\VGA\WIN98 and then click here.

(9) To install other drivers or software, click here, and then click *Finish*.

5. SOFTWARE SETUP

5.8.2 Audio Driver Setup

Insert the Support CD that came with your motherboard into your CD-ROM drive
or double-click the CD drive icon in **My Computer** to bring up the setup screen.

(1) Click here.

(2) Click here.

(3) Click here.

(4) Click here.

(5) Click here and then click *OK* to install other drivers and software.
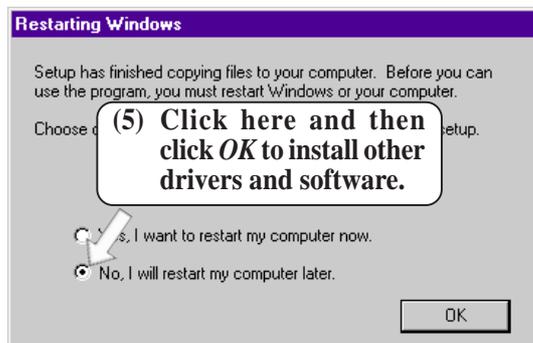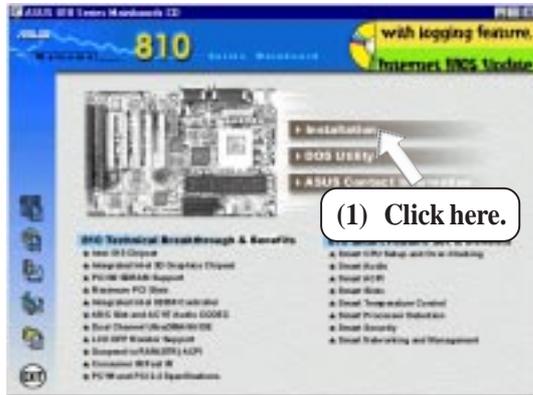
5. S/W SETUP
Windows 98

5.9 Other

5.9.1 INF Update Utility for 810 Chipset

Insert the Support CD that came with your motherboard into your CD-ROM drive
or double-click the CD drive icon in **My Computer** to bring up the setup screen.

(1) Click here.

(2) Click here.

(3) Click here.

(4) Click here.

(5) Click here only after you have read the license agreement.

(6) Click here.

(7) Click here to install the driver to the default folder.

(8) Click here and then follow the online instructions. Restart when prompted
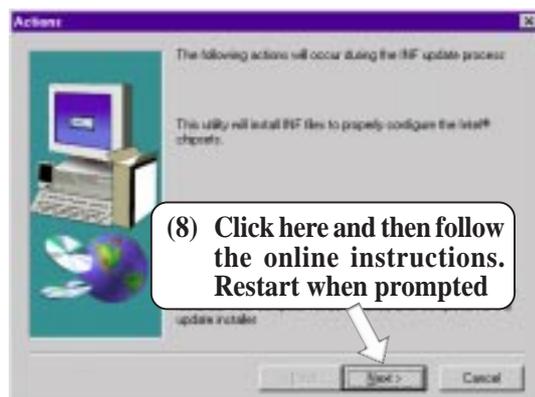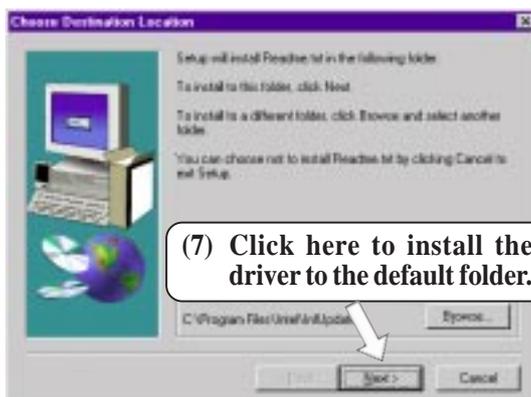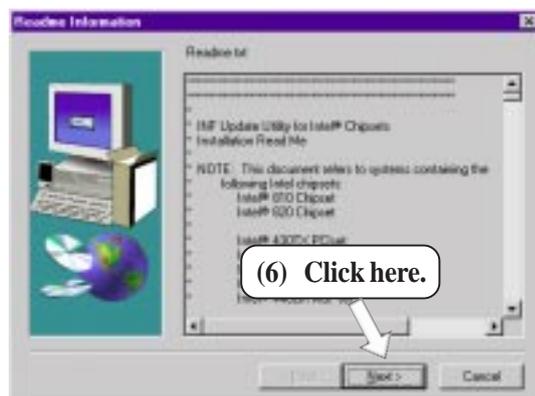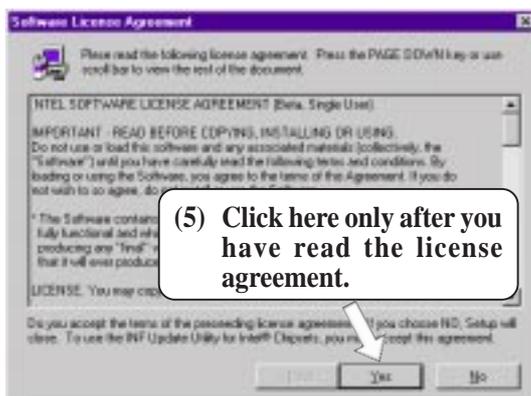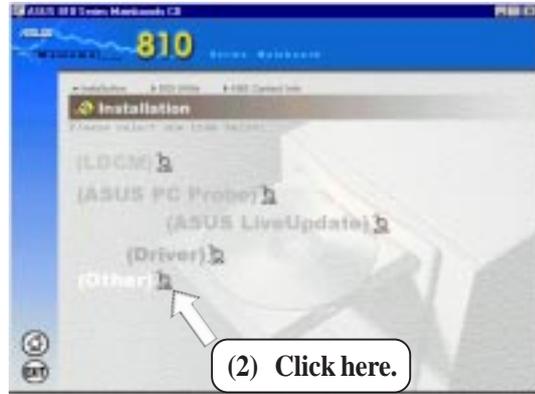
5. S/W SETUP
Windows 98

5. SOFTWARE SETUP

5.9.2 Intel Security Driver

Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the setup screen.

(1) Click here.

(2) Click here.

(3) Click here.

(4) Click here.

(5) Click here.

(6) Click here.

(7) Click here.

(8) Click here and then follow the online instructions.
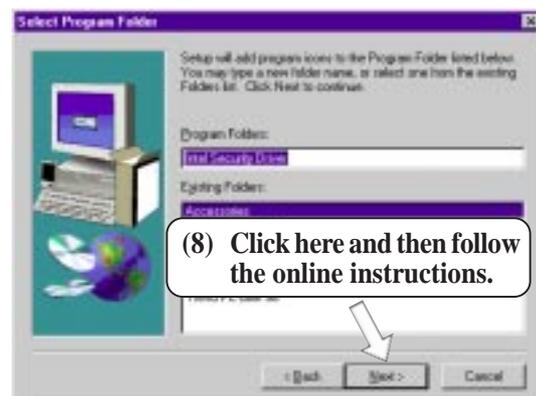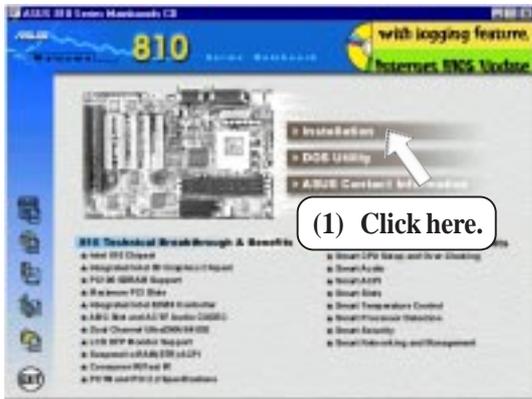
5. SOFTWARE SETUP

5.9.3 YAMAHA S-YXG50

Insert the Support CD that came with your motherboard into your CD-ROM drive
or double-click the CD drive icon in **My Computer** to bring up the setup screen.

(1) Click here.

(2) Click here.

(3) Click here.

(4) Click here.

(5) Enter the information requested and the click here* .

(6) Click here.

* The serial number can be found on the software license
   agreement card.

(7) Click here only if you accept the terms of the agreement.

(8) Click here and follow the online instructions to complete installation.

5. S/W SETUP
Windows 98

5. SOFTWARE SETUP

5.9.4 YAMAHA XGStudio

Insert the Support CD that came with your motherboard into your CD-ROM drive
or double-click the CD drive icon in **My Computer** to bring up the setup screen.

(1) Click here.

(2) Click here.

(3) Click here.

(4) Click here.

(5) Click here only after you have carefully read the license agreement.

(6) Click here.

(7) Click here.

(8) Click here.

(9) Click here.
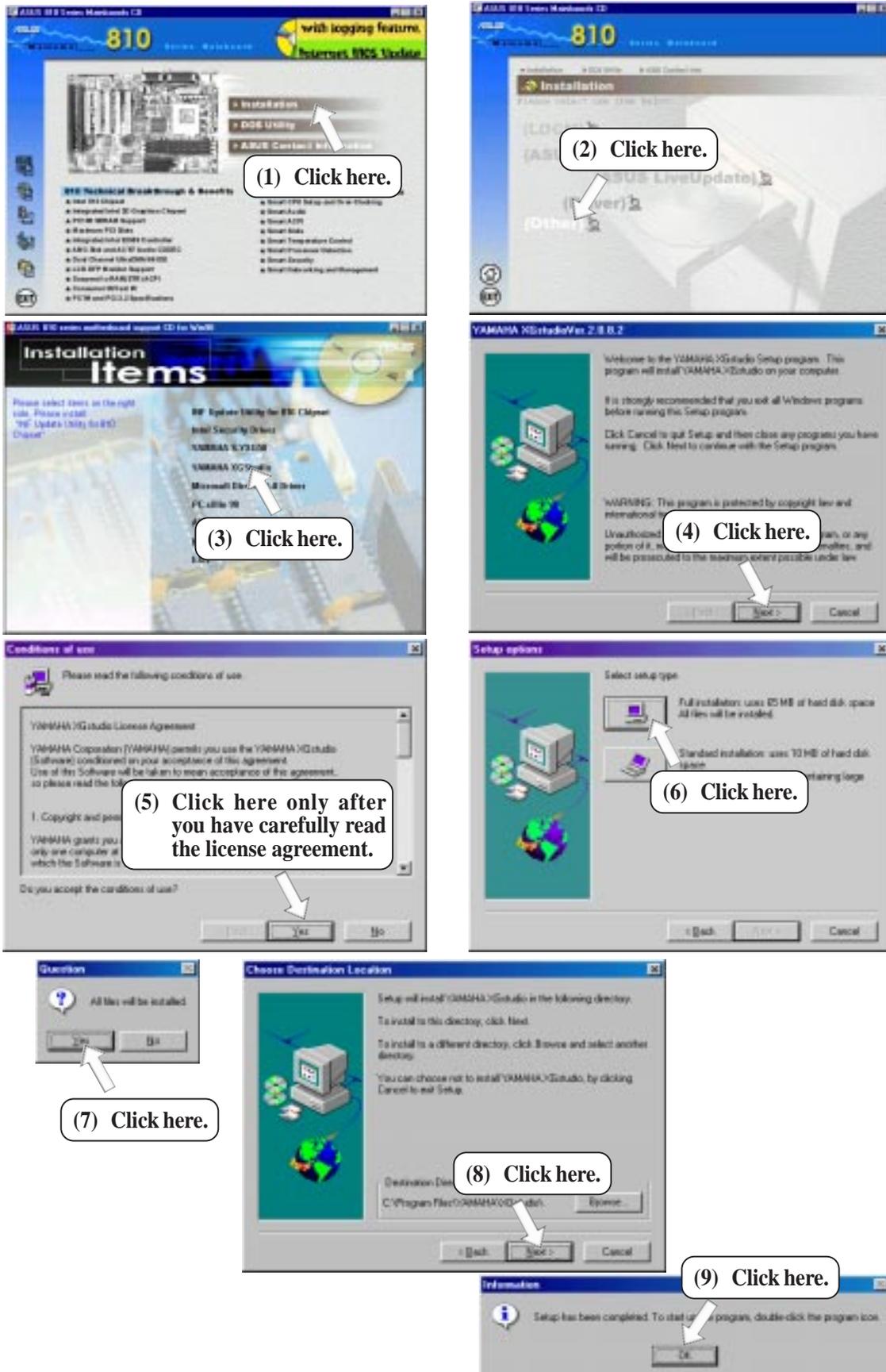
5.9.6 PC-cillin 98

Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the setup screen.

(1) Click here.

(2) Click here.

(3) Click here.

(4) Click here.

(5) Click here only if you accept the terms of the license agreement.

(6) Click here.

(7) Click here.

(8) Click here and then follow the online instructins to finish installation.
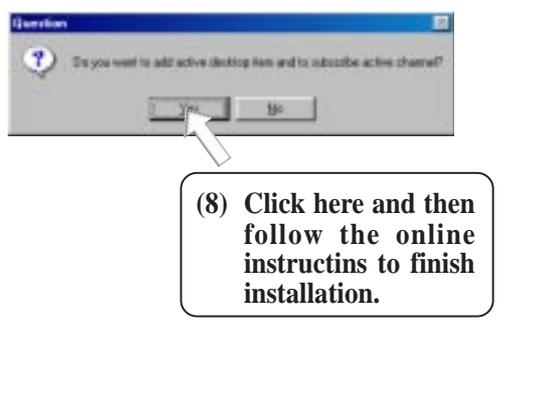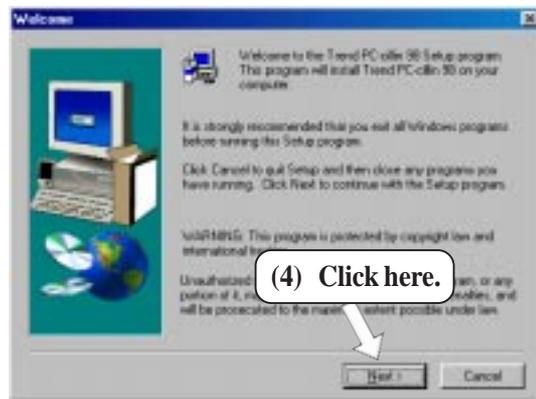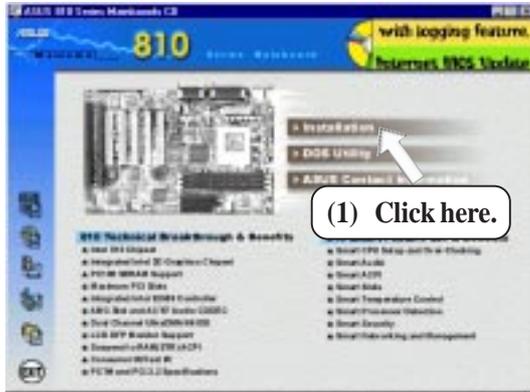
5. S/W SETUP
Windows 98

5.9.7 Adobe Acrobat Reader V4.0

Insert the Support CD that came with your motherboard into your CD-ROM drive or double-click the CD drive icon in **My Computer** to bring up the setup screen.

(1) Click here.

(2) Click here.

(3) Click here.

(4) Click here.

(5) Click here only if you accept the terms of the license agreement.

(6) Click here.

(7) To install other drivers or programs, click here and then click *Finish*.

5. S/W SETUP
Windows 98

5.10 Uninstalling Programs

Add/Remove Programs is a basic component within Windows. You may use this function if a program does not provide its own uninstall program.

(1) **Double-click here to open the *Add/Remove Programs* Properties dialog box.**

(2) **Select the program to remove and click here.**

(3) **Click here.**

5. S/W SETUP
Windows 98

5. SOFTWARE SETUP

(This page was intentionally left blank.)

5. S/W SETUP
Windows 98

6. SOFTWARE REFERENCE

6.1 Display Properties

The motherboard's built-in 2D/3D AGP VGA supports professional graphics design, gaming, learning, and business applications.

NOTE: Depending on your system configuration, components, and options, your system may not show all of the settings displayed in the following pictures.

To open the Properties dialog box, right-click the desktop and select **Properties**, the **Settings** tab, and then the **Advanced** button.

General

The **Display box** displays the current font size of the selected monitor. To use a different font size, click the arrow, and then click the font size you want.

The **Compatibility** box allows you to specify when to apply changes to system color settings. **NOTE:** Some programs might not display colors correctly without being restarted after you make changes. To avoid this problem, close the program, change the color settings, and then open the program again.
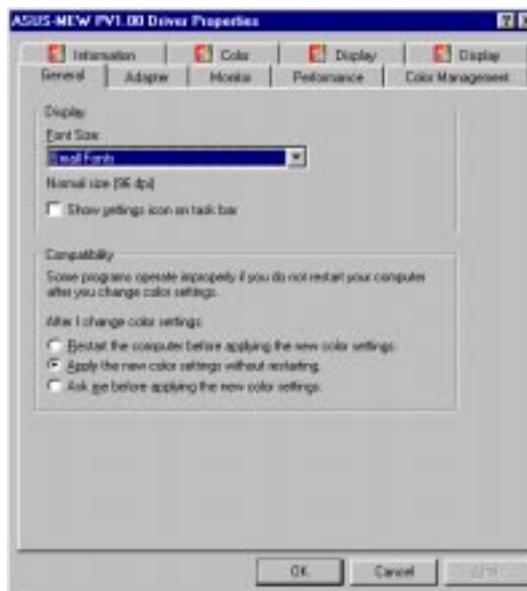
Adapter

Shows what type of display adapter you are currently using. To install the software for a new display adapter, click **Change**.

6. SOFTWARE REFERENCE

Monitor

Shows what type of monitor you are currently using. To install the software for a new monitor, click **Change**.
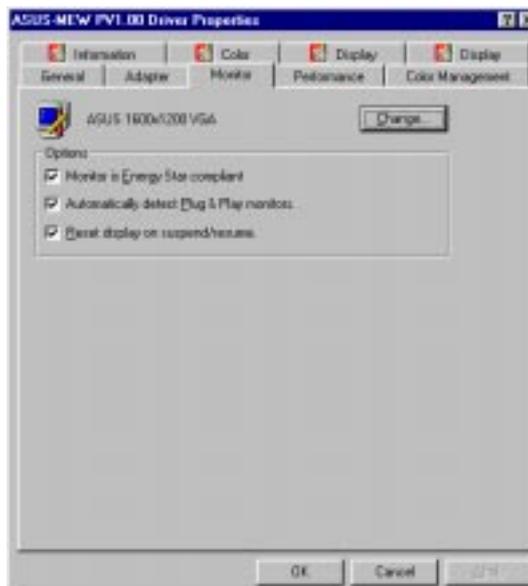
Performance

Specifies the degree of acceleration you want for your graphics hardware. Full acceleration is the fastest and is recommended for most computers. If your ocmputer is having problems and you suspect graphics acceleration to be the cause, use the highest setting at which you do not have problems.

Color Management

Lists all the color profile currently associated with your monitor. Click a profile to make it the active profile. Otherwise, the default profile is the active profile.

6. SOFTWARE REFERENCE

Information

Gives information on your graphics device such as chipset, memory, BIOS, and drivers. Internet links are also available for easy access to the ASUS Web page for new updated drivers and notices.

Color (Desktop)

Allows you to adjust the quality of your display according to your preference. Gamma correction is available only in 16-bit color and 24-bit color (true color, 16.7M-color) modes. In 16-color and 8-bit color (standard color, 256-color) modes, the gamma correction function is not supported.

Color (Direct3D/Game)

This is the same as the color adjustments for the desktop but this applies to direct3D applications and games.
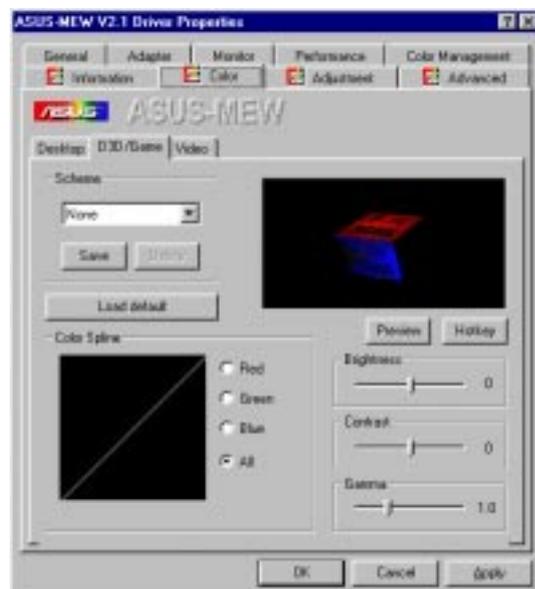
6. SOFTWARE REFERENCE

Color (Video)

Lets you make color settings for videos.
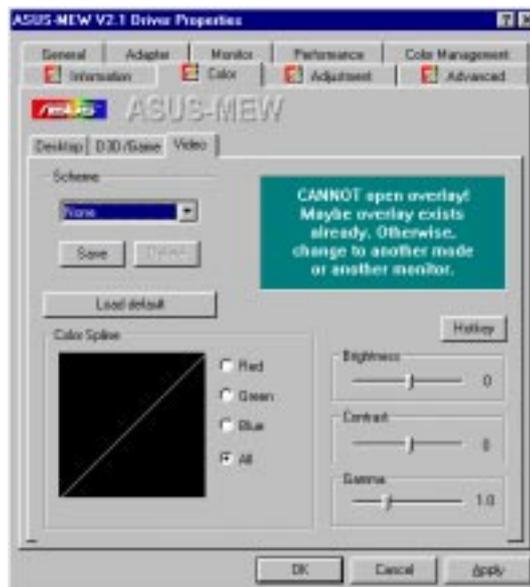
Adjustment

Allows you to adjust the display position, size, and refresh rate.

Change refresh rate

Allows you to adjust the default refresh rates for each resolution and color settings.

Change current refresh rate

Allows you to adjust the currently displayed resolution refresh rate.
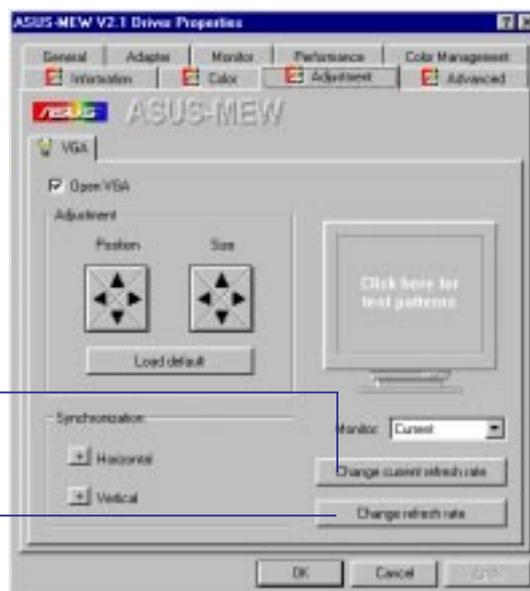
Advanced

Allows you to assign hot keys to enable the **On**Screen **D**isplay (OSD). To use this function, select **Enable OSD**. You may want to change the default hot key (CTRL+ALT+O) if it conflicts with the hot keys of other games, video players, or Windows programs.

6.2 ASUS PC Probe

ASUS PC Probe is a convenient utility to continuously monitor your computer system's vital components, such as fan rotations, Voltages, and temperatures. It also has a utility that lets you review useful information about your computer, such as hard disk space, memory usage, and CPU type, CPU speed, and internal/external frequencies through the DMI Explorer.

6.2.1 Starting ASUS PC Probe

When ASUS PC Probe starts, a splash screen appears allowing you to select whether or not to show the screen the next time you open PC Probe. To bypass this startup screen, clear the **Show up in next execution** check box.
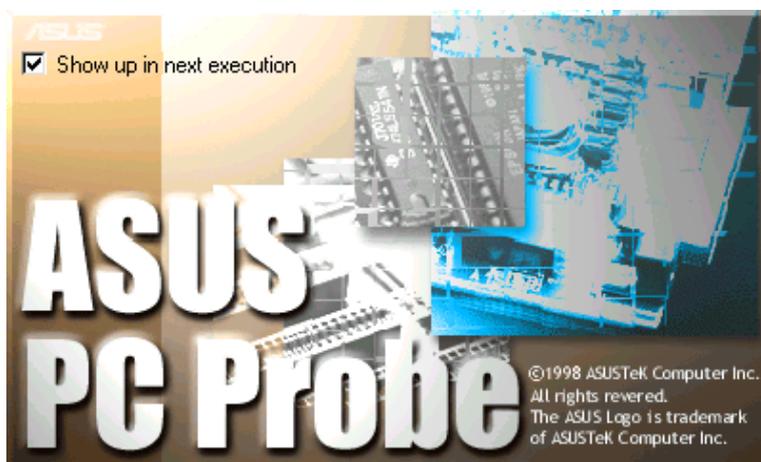
To open **ASUS PC Probe**, click the Windows **Start** button, point to **Programs**, and then **ASUS Utility**, and then click **Probe Vx.xx**.

The PC Probe icon will appear on the taskbar's system tray indicating that ASUS PC Probe is running. Clicking the icon will allow you to see the status of your PC.

6. S/W REFERENCE
Windows 98

6. SOFTWARE REFERENCE

6.2.2 Using ASUS PC Probe
Monitoring

Monitor Summary
Shows a summary of the items being monitored.
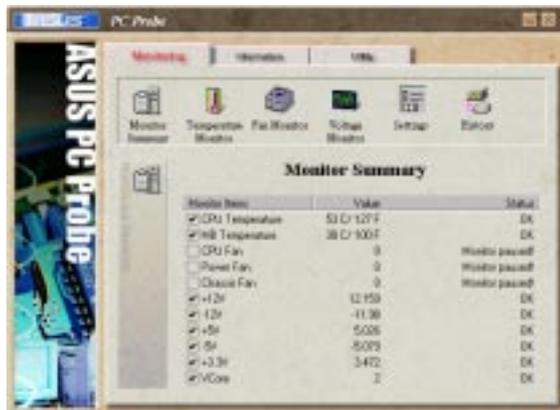
Temperature Monitor
Shows the PC's temperature.

Temperature Warning
threshold adjustment
(Move the slider up to increase the
threshold level or down to decrease
the threshold level)
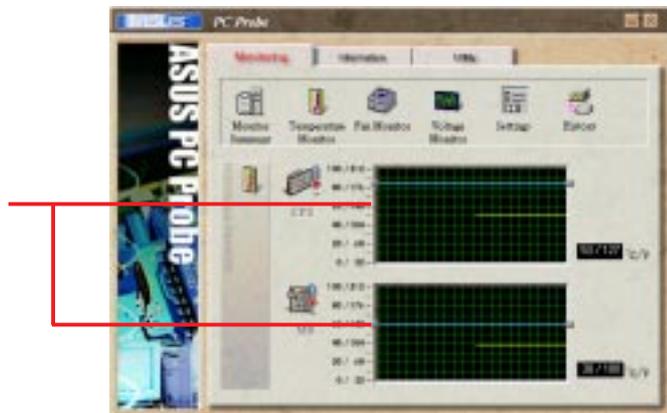
Fan Monitor
Shows the PC's fan rotation.

Fan Warning
threshold adjustment
(Move the slider up to increase the
threshold level or down to decrease
the threshold level)
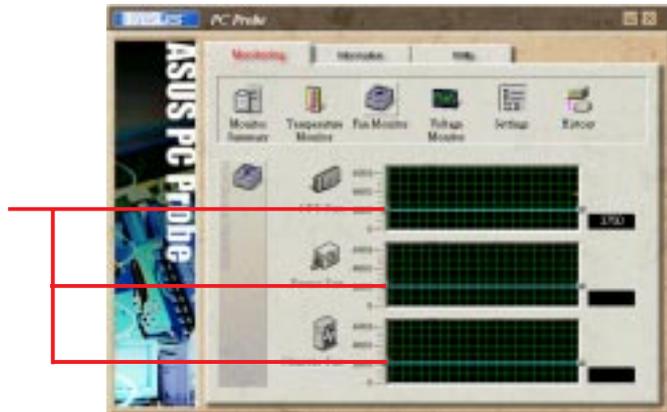
Voltage Monitor
Shows the PC's voltages.
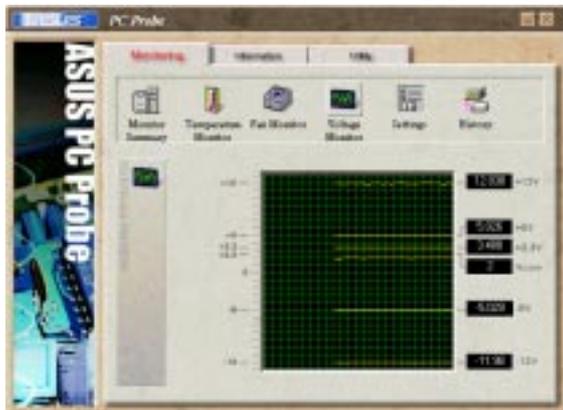
6. SOFTWARE REFERENCE

Settings
Lets you set threshold levels and polling intervals or refresh times of the PC's temperature, fan rotation, and voltages.

CPU Cooling System Setup
Lets you select when to enable software CPU cooling. When **When CPU Overheated** is selected, the CPU cooling system is enabled whenever the CPU temperature reaches the threshold value.
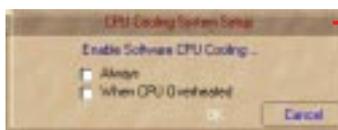
History
Lets you record the current monitoring activity of a certain component of your PC for future reference.

Information

Hard Drives
Shows the used and free space of the PC's hard disk drives and the file allocation table or file system used.

6. SOFTWARE REFERENCE

Memory
Shows the PC's memory load, memory usage, and paging file usage.

Device Summary
Shows a summary of devices in your PC.

DMI Explorer
Shows information pertinent to the PC, such as CPU type, CPU speed, and internal/external frequencies, and memory size.

Utility
Lets you run programs outside of the ASUS Probe modules. To run a program, click **Execute Program**.

6. SOFTWARE REFERENCE

6.2.3 ASUS PC Probe Task Bar Icon

Right-clicking the PC Probe icon will bring up a menu to open or exit ASUS PC Probe and pause or resume all system monitoring.

When the ASUS PC Probe senses a problem with your PC, portions of the ASUS PC Probe icon changes to red, the PC speaker beeps, and the ASUS PC Probe monitor is displayed.
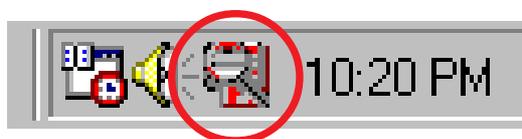
6. SOFTWARE REFERENCE

6.3 ASUS LiveUpdate

ASUS LiveUpdate is a utility that allows you to update your motherboard's BIOS and drivers. The use of this utility requires that you are properly connected to the Internet through an **I**nternet **S**ervice **P**rovider (ISP).

1. Start ASUS Update V2.00.
Launch the utility from **Start | Programs | ASUS Utility | ASUS LiveUpdate V1.00.**
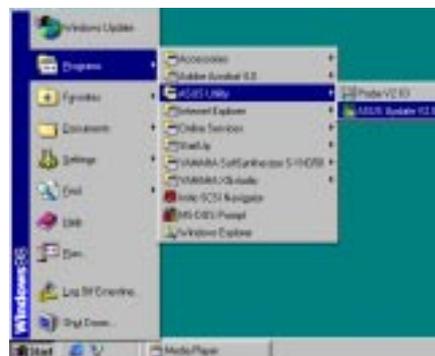
2. Select an update method.

3. If you selected updating/downloading from the Internet, you will need to select an Internet site. Choose the site that is closest to you or click **Auto Select**.

   If you selected **Update from a file**, you will be prompted to locate the file.

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6. SOFTWARE REFERENCE

6.4 Using Yamaha XGstudio Player

To start the Yamaha XGstudio, click **Start**, point to **Programs**, point to **YAMAHA XGstudio**, and then click **XGstudio Player**.

6.4.1 Yamaha XGstudio Player Control Panel

POWER
Closes the player. **NOTE:** You can also close the player by pressing <Alt>+<F4>.

Minimizes the player to an icon.

SONG
Displays the *Set Play List* dialog box where you can create a list of songs to play automatically. NOTE: You can also display the Set Play List dialog box by pressing <Ctrl>+<O>.

Loads and plays the MIDO file currently selected in *Play List*. When all the songs in the Play List have finished, playing stops automatically and the song at the beginning of the list is designated as the current-play song.

Pauses the playing of a song. Click this button again or click [►] to resume playing.

Stops the playing of a song and returns the start-play location to the beginning of the song.

Designates the first song in the Play List as the new current-play song.

Designates the song just before the currently playing song as the new current-play song.

Designates the song after the song currently playing as the new current-play song.

Designates the last song in the Play List as the new current-play song.

Soft Synthesizer
Displays the control panel for the Soft Synthesizer features.

Speeds up the tempo of the song being played.

Slows down the tempo of the song being played.
NOTE: The tempo is reset to 0 for each new song.

SET
Displays the *Set Sound Source* dialog box.

Displays Help. **NOTE:** You can also display Help by pressing <F1>.

Increases/decreases the volume level of the song being played by dragging the slider up/down.

For detailed instructions and references to software and utilities, use the programs' online help and electronic documentations.

6. SOFTWARE REFERENCE

6.5 Using Yamaha XGstudio Mixer

To start the Yamaha XGstudio, click **Start**, point to **Programs**, point to **YAMAHA XGstudio**, and then click **XGstudio Mixer**.

6.5.1 Yamaha XGstudio Mixer Control Panel
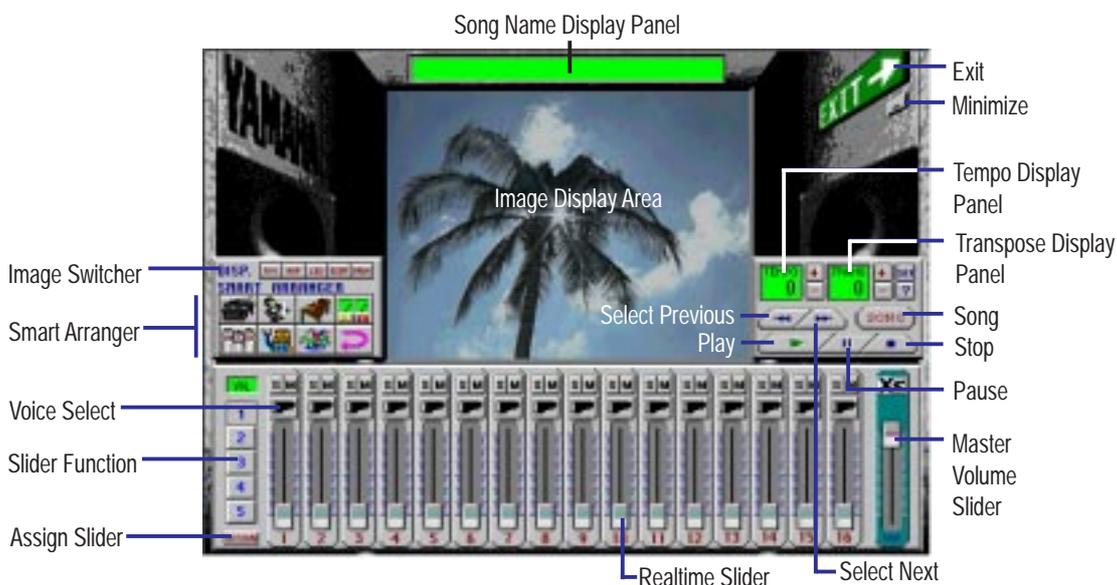
Image Switcher

AVI	**(AVI file): Video image**
	Displays the AVI file with the same name as the MIDI file being played. If one is not available, the preset DEFAULT.AVI file is played.
BMP	**(BMP file): Still image**
	Displays the BMP file with the same name as the MIDI file being played. If one is not available, the preset DEFAULT.BMP file is played
LED	**(LED velocity meter): Animation**
	Displays the volume (amount of velocity) of each MIDI channel.
SCOP	**(SCOPE velocity meter): Animation**
	Displays the volume (amount of velocity) of each MIDI channel graphically in a radio chart.
DRUM	**(drum and percussion): Animation**
	Displays animation with lights that match the drums and percussion used in the drum channel (10ch).

6. SOFTWARE REFERENCE

Smart Arranger

The Smart Arranger allows you to easily change the mood of a song. You can switch between seven ensemble voice sets with these buttons. To return to the original voice set, click ⮌.

Piano   Orchestra   Mallet   Techno

Choir   Robot   Nature   Return

6. SOFTWARE REFERENCE

6.6 Hardware Information

(1) Click here.

7. APPENDIX

7.1 ASUS LCD-I Controller Module

The ASUS LCD-I controller module allows you to connect a digital flat panel to your PC. This controller module transmits sharp, bright images by eliminating digital-to-analog and analog-to-digital conversions, which can accumulate noise and degrade image quality.

7.1.1 Installation Procedure

1. You must have an ASUS motherboard with a pair of LCD-TV headers.
2. Align the LCD-I module's **LCDTV0** and **LCDTV1** connectors over the motherboard's LCD-TV headers, and press firmly.
3. Connect the digital LCD cable from the LCD and serial combination bracket to the **DFP** connector on the LCD-I module.
4. Secure the bracket to the system chassis with a screw.
5. Plug the signal cable of your digital flat panel into the DFP connector on the bracket (as shown below).

Digital Flat Panel

to LCD-I Card

to COM2 Header

(Front View)
DFP Connector

LCD-I Module
LCDTV0

LCDTV1
(Back View)
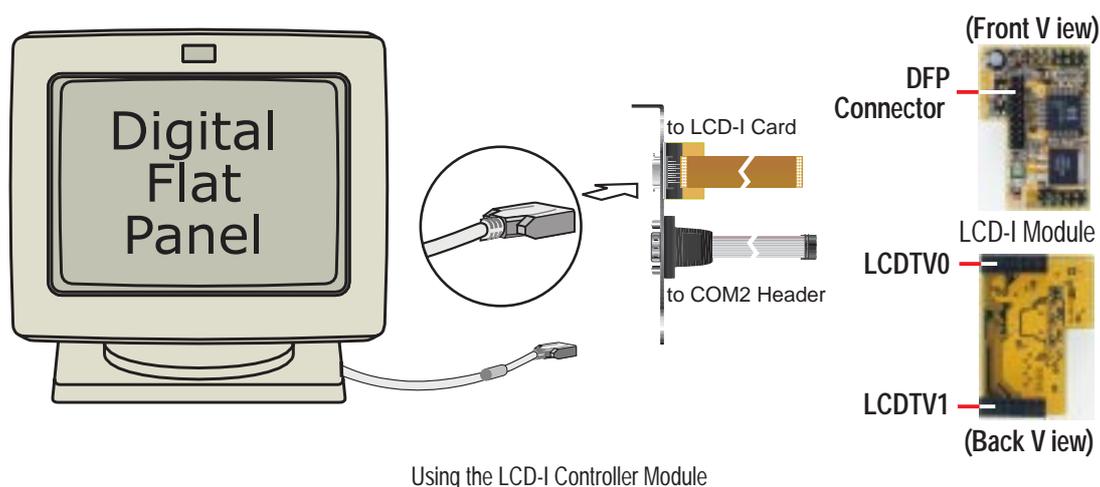
Using the LCD-I Controller Module

NOTE: The LCD-I controller module can work with your LCD panel without any driver. However, if you want to have full-screen display, please set up the VGA driver that comes with your motherboard's support CD.

7. APPENDIX

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7. APPENDIX

7.2 Modem Riser

7.2.1 56K Software Modem

The Modem Riser (MR) is a high-speed PC communication peripheral which works with AMC'97/MC'97 compliant codecs. With this software modem, you can connect your computer to a remote location, receiving data at up to 56 Kbps in V.90 or K56flex modes.

Layout of Primary MR

7.2.2 Primary/Seconday MR

There are two types of modem risers: primary MR and secondary MR. In appearance, the primary MR has a crystal onboard but the secondary does not. If your motherboard has an audio codec and no PCI audio chipset onboard, you may use the secondary MR; otherwise, you should use the primary MR.
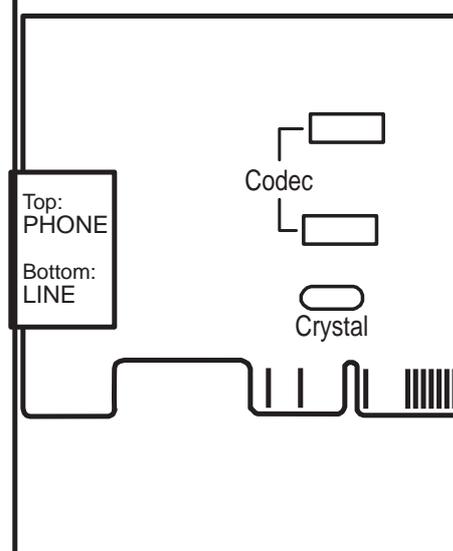
7.2.3 Hardware Installation Procedure

1. Power OFF your computer.
2. Open the computer chassis and re-move the metal plate on the AMR ex-pansion slot.
3. Carefully align the MR card's connec-tor to the AMR slot and press firmly.
4. Secure the MR card onto the chassis with the screw removed in step 2.
5. Connect the MR card's **LINE** connec-tor to a telephone wall jack. Connect the **PHONE** connector to a telephone (optional).
6. Replace the computer chassis.

7. APPENDIX

7.2.4 Software Setup in Windows 98

The Modem Riser supports the Plug and Play feature. It allows your computer to automatically set the optimal configurations for the MR and communication software. Follow the procedure below to install the modem driver.

1. Power ON the computer after the hardware installation is completed.

2. Windows 98 will automatically detect the modem and display a "PCI Card" message under "Add New Hardware Found".

3. Select **Search for the best driver for your device** and click **Next**.

4. Insert the Support CD that came with your motherboard into your CD-ROM drive. Enter the path **E:\Modem\Win98** (assuming that your CD-ROM drive is drive E:) for the MR driver.

5. After the driver is located, click **Next** and then click **Finish**.

6. Restart your computer. Double click the modem icon at the bottom-right corner of the window.

7. Click the **Settings** tab. Select your country and language. Click **OK**.

8. Click **Start**, point to **Settings**, click **Control Panel**, double click **Modems**, click the **General** tab, and click **Motorala SM56 AC-L Modem**.

9. Click **Diagnostic** and then click the designated COM port as shown.

10. Click **More Info...**. If the computer system successfully communicates with the modem, responses will be displayed as shown.

7. APPENDIX

7.3 Glossary

1394
1394 is the IEEE designation for the high performance serial bus at 12.5, 25 or 50MBytes/sec speeds. This serial bus defines both a back plane physical layer and a point-to-point cable-connected virtual bus. The primary application of the cable version is the integration of I/O connectivity at the back panel of personal computers using a low-cost, scalable, high-speed serial interface. The 1394 standard also provides new services such as live connect/disconnect capability for external devices including disk drives, printers and hand-held peripherals such as scanners and cameras. This is a new standard to complement the slower USB interface and to compete with the more expensive SCSI interface.

AC97 (Audio Codec '97)
AC '97 is the next step in enabling PCs with audio quality comparable to consumer electronics devices. The specification defines new cost-effective options to help integrate the components necessary to support next-generation auto-intensive PC applications such as DVD, 3-D multiplayer gaming and interactive music. The specification also defines new extensions supporting modem and docking to help both desktop and mobile manufacturers adopt these new technologies more quickly and cost-effectively. This specification uses software emulation to compete with the PCI SoundBlaster specification.

ACPI (Advanced Configuration and Power Interface)
The ACPI specification defines a cross-platform interface designed to support many operating systems. ACPI defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including hardware, operating system and application software. This enables the system to automatically turn ON and OFF peripherals such as CD-ROMs, network cards, hard disk drives, and printers, as well as consumer devices connected to the PC such as VCRs, TVs, phones, and stereos. With this technology, peripherals will also be able to activate the PC. For example, inserting a tape into a VCR can turn on the PC, which could then activate a large-screen TV and high-fidelity sound system.

AGP (Accelerated Graphics Port)
An interface specification that enables high-performance 3D graphics on mainstream PCs. AGP was designed to offer the necessary bandwidth and latency to perform texture mapping directly from system memory.

Bus	Bus Frequency	Bandwidth	Data Transfer Rate
PCI	33MHz	33MHz	133MByte/sec
AGP 1X	66MHz	66MHz	266MByte/sec
AGP 2X	66MHz	133MHz	512MByte/sec
AGP 4X	66MHz	266MHz	1024MByte/sec

BIOS (Basic Input/Output System)
BIOS is a set of routines that affect how the computer transfers data between computer components, such as memory, disks, and the display adapter. The BIOS instructions are built into the computer's read-only memory. BIOS parameters can be configured by the user through the BIOS Setup program. The BIOS can be updated using the provided utility to copy a new BIOS file into the EEPROM.

Bit (Binary Digit)
Represents the smallest unit of data used by the computer. A bit can have one of two values: 0 or 1.

7. APPENDIX

Boot
Boot means to start the computer operating system by loading it into system memory. When the manual instructs you to "boot" your system (or computer), it means to turn ON your computer. "Reboot" means to restart your computer. When using Windows 95 or later, selecting "Restart" from "Start | Shut Down..." will reboot your computer.

Bus Master IDE
PIO (Programmable I/O) IDE requires that the CPU be involved in IDE access and waiting for mechanical events. Bus master IDE transfers data to/from the memory without interrupting the CPU. Bus master IDE driver and bus master IDE hard disk drives are required to support bus master IDE mode.

Byte (Binary Term)
One byte is a group of eight contiguous bits. A byte is used to represent a single alphanumeric character, punctuation mark, or other symbol.

COM Port
COM is a logical device name used by to designate the computer serial ports. Pointing devices, modems, and infrared modules can be connected to COM ports. Each COM port is configured to use a different IRQ and address assignment.

Concurrent PCI
Concurrent PCI maximizes system performance with simultaneous CPU, PCI and ISA bus activities. It includes multi-transaction timing, enhanced write performance, a passive release mechanism and support for PCI 2.1 compliant delayed transactions. Concurrent PCI provides increased bandwidth, reduced system latencies, improves video and audio performance, and improves processing of host based applications.

CPU (Central Processing Unit)
The CPU, sometimes called "Processor," actually functions as the "brain" of the computer. It interprets and executes program commands and processes data stored in memory. Currently, there are socket 370 (for Pentium Celeron-PPGA), socket 7 (for Pentium, AMD, Cyrix, IBM), slot 1 (for Pentium II and III), slot 2 (for Xeon), and slot A (for AMD) processors.

Device Driver
A device driver is a special set of instructions that allows the computer's operating system to communicate with devices such as VGA, audio, printer, or modem.

DOS (Disk Operating System)
DOS is the foundation on which all other programs and software applications operate, including Windows. DOS is responsible for allocating system resources such as memory, CPU time, disk space, and access to peripheral devices. For this reason, DOS constitutes the basic interface between you and your computer.

DRAM (Dynamic Random Access Memory)
There are several different types of DRAM such as, EDO DRAM (Extended Data Output DRAM) and SDRAM (Synchronous DRAM).

Flash ROM
The flash ROM is designed to be a resident program and can be updated by a specific programming method. Normally, the flash ROM is used for system BIOS which initiates hardware devices and sets up necessary parameters for the OS. Since the contents of flash ROM can be modified, users are able to update the BIOS by themselves.

IDE (Integrated Drive Electronics)
IDE devices integrate the drive control circuitry directly on the drive itself, eliminating the need for a separate adapter card (in the case for SCSI devices). UltraDMA/33 IDE devices can achieve up to 33MB/Sec transfer.

7. APPENDIX

LPT Port (Line Printer Port)
Logical device name reserved by DOS for the computer parallel ports. Each LPT port is configured to use a different IRQ and address assignment.

MMX
A set of 57 new instructions based on a technique called Single Instruction, Multiple Data (SIMD), which is built into the new Intel Pentium PP/MT (P55C) and Pentium II (Klamath) CPU as well as other x86-compatible microprocessors. The MMX instructions are designed to accelerate multimedia and communications applications, such as 3D video, 3D sound, video conference.

OnNow
The OnNow design initiative is a comprehensive, system-wide approach to system and device power control. OnNow is a term for PC that is always ON but appears OFF and responds immediately to user or other requests. The OnNow design initiative involves changes that will occur in the Microsoft Windows operating system, device drivers, hardware, and applications, and also relies on the changes defined in the Advanced Configuration and Power Interface (ACPI) specification.

PC100
SDRAM is Intel's goal is to ensure that memory subsystems continue to support evolving platform requirements and to assure that memory does not become a bottleneck to system performance. It is especially important to ensure that the PC memory roadmap evolves together with the performance roadmaps for the processors, I/O and graphics.

PCI Bus (Peripheral Component Interconnect Local Bus)
PCI bus is a specification that defines a 32-bit data bus interface. PCI is a standard widely used by expansion card manufacturers.

PCI Bus Master
The PCI Bus Master can perform data transfer without local CPU help and furthermore, the CPU can be treated as one of the Bus Masters. PCI 2.1 supports concurrent PCI operation to allow the local CPU and bus master to work simultaneously.

Plug and Play BIOS
The ISA bus architecture requires the allocation of memory and I/O address, DMA channels and interrupt levels among multiple ISA cards. However, configuration of ISA cards is typically done with jumpers that change the decode maps for memory and I/O space and steer the DMA and interrupt signals to different pins on the bus. Further, system configuration files may need to be updated to reflect these changes. Users typically resolve sharing conflicts by referring to documentation provided by each manufacturer. For the average user, this configuration process can be unreliable and frustrating. Plug and play (PnP) BIOS eliminates the ISA add-on card hardware conflict problem. The PnP BIOS uses a memory block to define and remember each card's configuration, which allows the user to change the card's IRQs and DMA in BIOS either automatically or manually.

POST (Power On Self Test)
When you turn ON the computer, it will first run through the POST, a series of software-controlled diagnostic tests. The POST checks system memory, the motherboard circuitry, the display, the keyboard, the diskette drive, and other I/O devices.

PS/2 Port
PS/2 ports are based on IBM Micro Channel Architecture. This type of architecture transfers data through a 16-bit or 32-bit bus. A PS/2 mouse and/or keyboard may be used on ATX motherboards.

ROM (Read Only Memory)
ROM is nonvolatile memory used to store permanent programs (called firmware) used in certain computer components. Flash ROM (or EEPROM) can be reprogrammed with new programs (or BIOS).

SCSI (Small Computer System Interface)
High speed multi-threaded I/O interface defined by the X3T9.2 committee of the American National Standards Institute (ANSI) for connecting many peripheral devices. The standard started from 10MBytes/sec to 160MBytes/sec available today.

SDRAM (Synchronous DRAM)
The SDRAM features a fully synchronous operation referenced to a positive edge clock whereby all operations are synchronized at a clock input which enables the coexistence of high performance and a simple user interface. SDRAM takes memory access away from the CPU's control; internal registers in the chips accept the request, and let the CPU do something else while the data requested is assembled for the next time the CPU talks to the memory. As they work on their own clock cycle, the rest of the system can be clocked faster. There is a version optimized for video cards, and main memory for motherboards.

SPD for SDRAM module
Serial Presence Detect (SPD) is most like an ID detect for SDRAM module, it using a EEPROM component on DIMM module for storing module configuration information inside. The Serial Presence Detect function is implemented using a 2048 bit EEPROM component. This nonvolatile storage device contains data programmed by the DIMM manufacturer that identifies the module type and various SDRAM organization and timing parameters.

System Disk
A system disk contains the core file of an operating system and is used to boot up the operating system.

UltraDMA
Ultra DMA/33 is a "synchronous DMA" protocol designed by Intel. This function is included into Intel's PIIX4 chipset. The traditional IDE transfer only uses one edge of the data stroke as the data transfer. Ultra DMA/33 uses both edges of data strobe when the data is transferred. Hence, the data transfer rate is double of the PIO mode 4 or DMA mode 2 (16.6MB/s x2 = 33MB/s) on ATA-2 devices.

Ultra ATA/66, also known as Ultra DMA/66, is an extension of current Ultra ATA/33 interface. This new high-speed interface has doubled the Ultra ATA/33 burst data transfer rate to 66.6 Mbytes/sec and maximized disk performance under current PCI local bus environment

USB (Universal Serial Bus)
A 4-pin serial cable bus that allows up to 127 plug and play computer peripherals such as keyboard, mouse, joystick, scanner, printer, modem, and monitor to share a bandwidth through a host scheduled token based protocol. This allows attaching or detaching while the host and other peripherals are in operation. Supports synchronous and asynchronous transfer types over the same set of wires up to 12Mbit/sec. USB 2.0 provides twice the transfer rate compared to USB 1.0 and competes with the 1394 standard.

Wake-On-Lan
Computer will automatically wake-up upon receiving a wake-up packet through a Network interface when it is under power soft-off, suspend or sleep mode.

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M8300/8200 Series

Thin & Light Convertible Notebook PC

13.3" or 12.1" TFT Color Display
233/266/300/333/366/400+MHz

F7400 Series

Professional Notebook PC

14.1" TFT Color Display
300/333/366/400+MHz
Built-in DVD/MPEG2 Decoder

L7300/7200 Series

All-in-One Compact Notebook PC

13.3" or 12.1" TFT Color Display
300/333/366/400+MHz

/SUS® Ultra-Fast CD-ROM

50xmax

- Supports high speed CD-Audio playback
- Supports high speed digital audio extraction
- Supports UltraDMA/33 transfer mode
- Compatible with all CD formats
- Supports multi-read function (CD-R/CD-RW)

45xmax

40xmax

Drive Interface Type:	ATAPI/Enhanced IDE supporting PIO mode 4, multi-word DMA mode 2, UltraDMA/33
Disc Formats:	Audio CD, CD-ROM (mode 1 & mode 2), Mixed mode, CD-ROM/XA (mode 2, form 1 & form 2), Video CD, CD-I, Photo CD (single & multi-session), Karaoke CD, CD Extra, I-Trax, CD-R, CD-RW
Disk Size:	8 cm and 12 cm
OS Compatibility:	DOS 6.xx, Windows 3.x/95/98, OS/2 Warp, Netware, SCO UNIX
Cache Buffer Size:	128KB
Data Transfer Rate:	CD-S500 7500 KBps maximum CD-S450 6750 KBps maximum CD-S400 6000 KBps maximum
Access Time:	75ms

⅍SUS® Barebone Servers

	Pentium® III Pentium® II Support	PC100 ECC Max. Memory (GB)	Ultra2 SCSI Onboard (Channels)	5.25" Fixed Storage Devices	Hot-Swap Trays
AP100	1	1	1	3	0
AP200	2	1	1	3	0
AP2000	2	1	1	4	3 or 5*
AP2500	2	1	1	4	3 or 5*
AP3000	2 Xeon™	2	2	4	3 or 5*
AP6000	2	1	1	4	8**
AP7500	2	1	1	4	8**
AP8000	2 Xeon™	2	2	4	8**

*   Three 1.6-inch or five 1-inch SCA-2 SCSI hard drives
**   Eight 1.6-inch or 1-inch SCSI hard drives

Mid-Range Servers
AP6000
AP7500
AP8000

Value Servers
AP2000
AP2500
AP3000

Group Servers
AP100
AP200

Rack Mountable

ASUS AR1000 RAID Sub-system
with DA3000 SCSI-to-SCSI RAID Controller

- Supports 5x86 RAID processor and two 72-pin SIMM sockets for up to 128MB cache memory
- Supports three Ultra2 SCSI channels; up to 80MB/sec data transfer rate
- Supports multiple Host/Drive channel capacity
- Redundant controller capacity
- Supports non-RAID, RAID levels 0, 1, 0+1, 3, 5
- On-line failure drive rebuilding
- Automatic rebuilding — supports local/global spare drive
- On-line expansion capacity
- Supports SAF-TE (SCSI Accessed Fault-Tolerant Enclosure) feature
- Provides LCD panel and RS-232 port to configure RAID
- Ten 1.0" or six 1.6" Ultra2 SCSI SCA-2 hot-swappable drive bays
- 19" rack mountable (height: 5U)
- LED for hard disk power and working status
- Two 8cm system fans and four 6cm drive fans
- Aluminum disk arrays for easy heat dissipation
- 350W redundant power supply
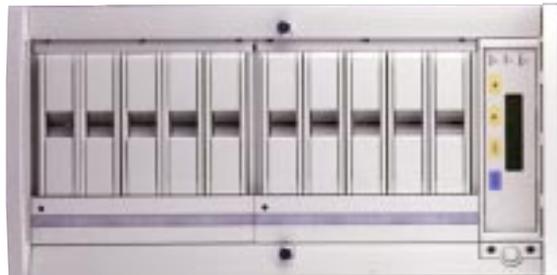
ASUS PCI-DA2100/2200 Series SCSI RAID Card

- PCI-DA2100 series support 4x86 DX4-100 processor
- PCI-DA2200 series support 5x86-133 processor
- One 72-pin SIMM socket supports up to 128MB cache memory
- RAID levels 0, 0+1, 3, 5, non-RAID
- PCI-DA2100A supports Ultra Wide SCSI interface and dual channels
- PCI-DA2200A supports Ultra2 SCSI interface and single channel
- PCI-DA2200B supports Ultra2 SCSI interface and dual channels
- Automatic bad sector reassignment
- Supports both global and local spare drive operation
- Background rebuilding
- PCI rev. 2.1 compliant
- Up to 8 logical drives and 8 partitions per logical drive; number of drives for each logical drive has no limitation