



Mainboard

SL-85DR-C User Manual V1.0

NOTICE

Product Model	: SL-85DR-C
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ITEM LIST CHECKUP

- Mainboard
- Support CD
- Bundled Bonus Pack CD
- Bundled Bonus Pack Manual
- Temperature Sensor Cable (Optional)
- ATA66/100 IDE Cable
- RS232 Cable
- FDD Cable
- User's Manual

Chapter 1 Specification

Introduction

- This chapter introduces the characteristics of this series of mainboards. It includes the information on the chipset, CPU types, built-in functions and layout. Users will have more ideas about this powerful series after reading this chapter.

The topics contained in this chapter are:

1-1 Mainboard Specifications

1-2 Mainboard Layout

1-3 Chipset Diagram

1-1 Mainboard Specifications

1-1.1 CPU Socket

- CPU Socket 478B on board, supporting Intel® Pentium 4 and Northwood processors in the 478-pin package for 400MHz System Bus.

1-1.2 System Chipset Architecture

- INTEL 845-D Chipset Memory Control Hub (MCH):
To work with Intel Pentium 4 Processor for managing and arbitrating between 4 interfaces:
 - the System Bus (Host Interface);
 - the memory Interface;
 - the AGP Port and the Hub Interface;
- MCH Clockings:
 - Asynchronous;
 - System Bus target speed at 400MHz;
 - AGP and Hub Interface constantly at 66MHz base;
- Intel ICH2 Chipset (Second generation I/O Controller Hub):
Communicating with Intel 845-D by the Hub interface at 66MHz/266MB/s;
 - Transmitting Interrupt related messages;
 - Transmitting Power management events;
 - Transmitting SMI, SCI, SERR indication messages;

1-1.3 Memory

2pcs of DIMM on board for single / double sided DIMMs, supported by 2.5V default voltage:

- Intel 845-D MCH directly supporting one channel of DDR SDRAM up to 2GB capacity.

1-1.4 AWARD BIOS V6.0

- Supporting Plug & Play V1.0.
- FLASH MEMORY for easy upgrade.
- Supporting BIOS writing protection.
- Year 2000 compliant.

1-1.5 Hardware Monitoring

- Programmable control, status, to provide monitoring and alarm for flexible desktop management of hardware temperatures. Utility Software is enclosed in Support CD to help display monitoring statuses of:
 - 6 positive voltages, 3 types of hardware temperatures, 3 Fan speeds;

1-1.7 Multi-I/O Function

- Integrated IDE Controller, supporting:
 - 2x Ultra ATA100 / 66 / 33 Connectors
 - Two UARTs for Complete Serial Ports (2x COM).
- Dedicated IR Connector:
 - Third serial port dedicated to IR function either through the two complete serial ports or the third dedicated port Infrared-IrDA (HPSIR) and ASK (Amplitude Shift Keyed) IR.
- Multi-mode parallel connector:
 - Standard mode, ECP and EPP support.
- Floppy Disk connector:
 - One FDD connector with drive swap support.
- Universal Serial Bus connector:
 - USB V1.1 compliant.
 - 2 built-in USB connectors and one USB Header (USB1) which requires an optional USB cable to provide 2 more optional USB ports.
- PS/2 Keyboard connector.
- PS/2 Mouse connector.

1-1.8 Expansion Slots

- Six PCI bus Master slots.
- One AGP 4x mode slot.
- One CNR slot.
- One SCR1 slot.
- Two DIMM slots.
- One CMEM1 slot.

1-1.9 Accelerated Graphics port (AGP) Interface

- One AGP slot on board is supported by the Intel 845-D Chipset MCH AGP Interface in 1.5V mode (with AGP voltage selectable in BIOS Setup):
 - AGP v2.0 compliant.

1-1.10 FORM FACTOR

- ATX form factor.
- This mainboard is compatible with both ATX Power Supply Version 2.03 (with +12V Power Connector) and the older ATX Power Supply (with Peripheral Power Connector).
- Mainboard size: 30.5cm x 21.0cm.

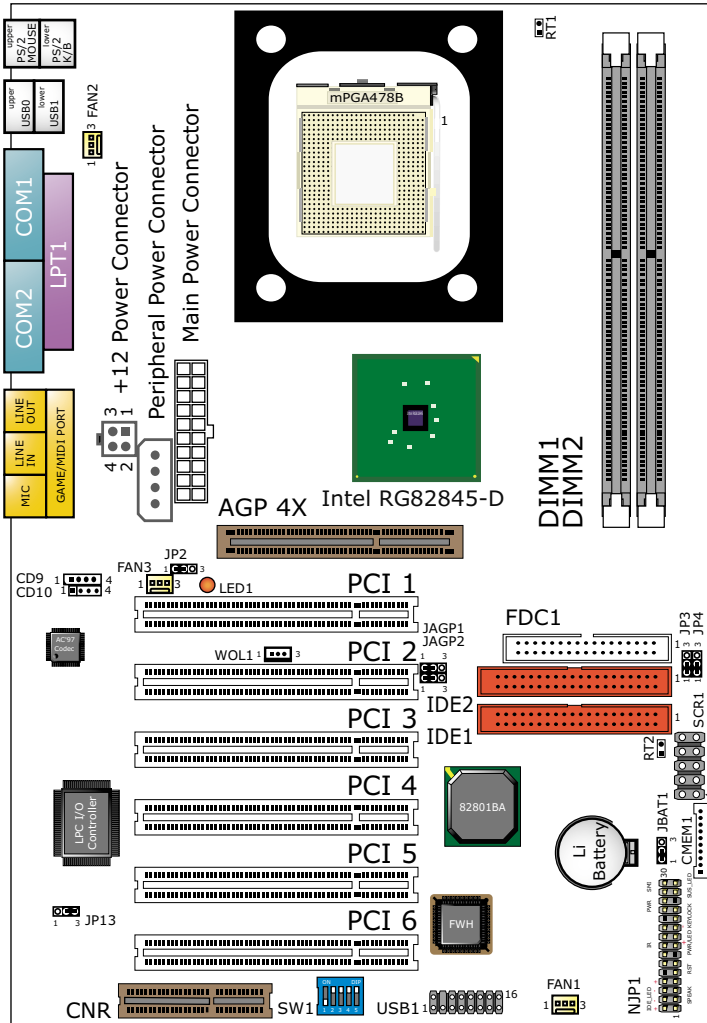
1-1.6 Sound Controller

- SoundBlaster Pro Hardware and Direct Sound Ready AC97 Digital Audio Controller with Codec onboard.

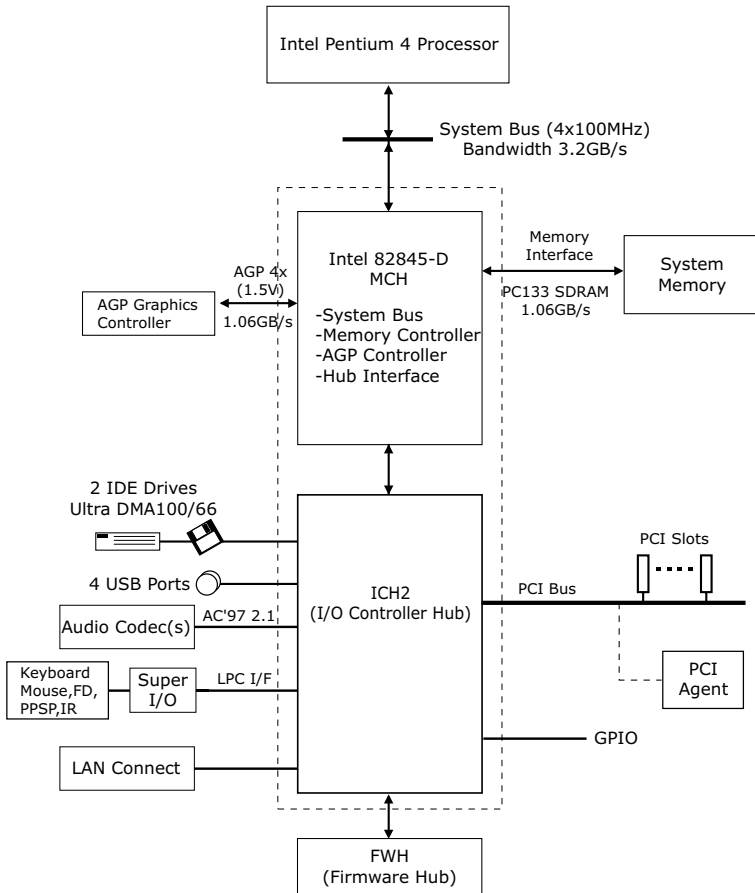
1-1.11 Power Management

- ACPI 1.0B compliant (Advanced Configuration and Power Interface).
- APM V1.2 compliant (Legacy power management).
- Supporting ACPI suspend POS mode (Power On Suspend).
- System event monitoring with two event classes.
- Supporting Wake On LAN (WOL) & Wake On Ring.
- Supporting real time clock (RTC) with date alarm, month alarm, and century field.

1-2 Mainboard Layout



1-3 Chipset System Block Diagram



Intel 82845-DMCH + ICH2 Chipset Diagram

Memo

Chapter 2 Hardware Setup

To Get things ready for Hardware setup !!!

1. We recommend to install your CPU before any other components. For detailed installation instructions of processor, you can also refer to the pamphlet enclosed in your CPU package.
2. Installing a cooling fan with a good heatsink is a must for proper heat dissipation for your CPU. Get ready an appropriate fan with heatsink for proper installation. Improper fan and installation will damage your CPU.
3. In case CPU Vcore, CPU clock or Frequency Ratio is adjustable onboard, please follow the instructions described in the User manual for proper setup. Incorrect setting will cause damage to your CPU.

The following topics are included in this chapter:

2-1 Pentium 4 CPU Installation

2-2 Pentium 4 CPU Fan Installation

2-3 Memory Installation

2-4 AGP 4X (Accelerated Graphics Port) Installation

2-5 HDD/FDD Installation

2-6 Jumper and Switch Settings

2-7 Other Connectors Configuration

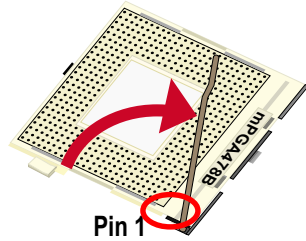
2-8 IRQ Description

2-1 Pentium 4 CPU Installation with Socket 478

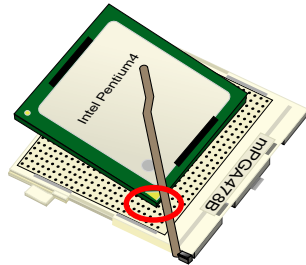
This series of mainboards are built with CPU Socket 478 (with 478 pins) supporting the Intel Pentium 4 CPU:

- Follow the steps described in this section to install the 478-pin Pentium 4 CPU into the on board Socket 478.
- After installation of Pentium 4 CPU, you must also install the specific Pentium 4 CPU fan designed in tandem with this CPU. This CPU Fan installation is described in next section.

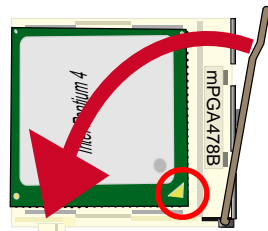
1. First pull sideways the lever of Socket 478, and then turn it up 90-degree so as to raise the upper layer of the socket from the lower platform.



2. Configure Pin 1 of CPU to Pin 1 of the Socket, just as the way shown in the diagram on the left. Adjust the position of CPU until you can feel all CPU pins can get into the socket with ease.

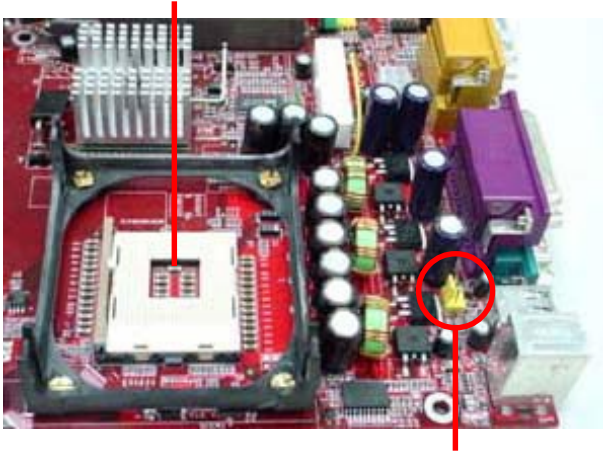


3. Make sure that all CPU pins have completely entered the socket and then lower down the lever to lock up CPU to socket.

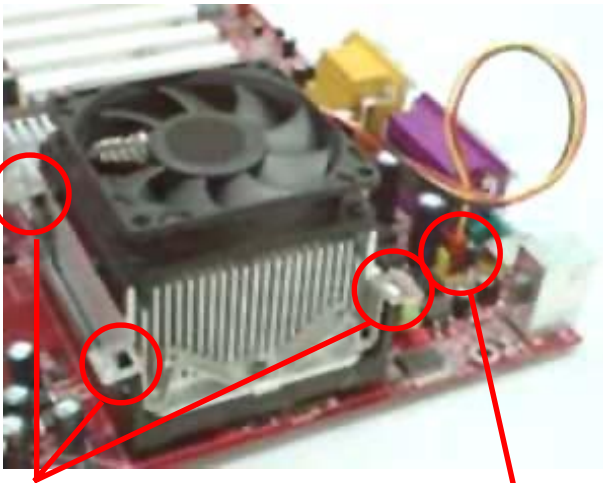


2-2 Pentium 4 CPU Fan Installation:

Pentium 4 Fan Socket



Fan Connector



Press down 4 latches to lock fan to fan socket

Connect to CPU FAN connector

2-3 Memory Installation

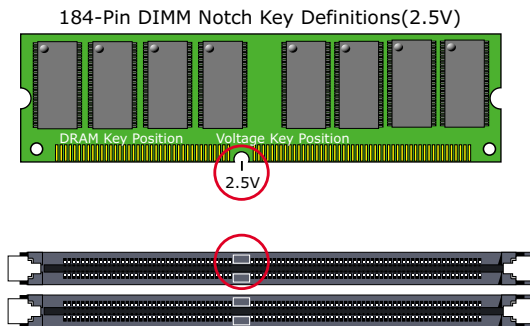
How to tackle with the memory Modules:

- Make sure to unplug your power supply before adding or removing memory module. Failure to do so may cause severe damage to both your mainboard and the memory module.
- Pay attention to the orientation of the DIMM slots. Forcing a DIMM in a socket improperly will damage the memory module and socket.
- Make sure you have the right type of memory module for your mainboard.

2-3.1 To Install DIMM Module

- This series of mainboards only supports up to 2GB unbuffered DDR SDRAM, with 2 DDR DIMM sockets on board. Do not insert other type of modules into these sockets.
- DDR DIMM socket has 184-pins and one notch. Insert a DDR SDRAM vertically into the 184-pin socket with the notch matching the one in the socket. Press the Module down in a gradual way until it surely reaches the bottom and clicks straight up the two latches on the left and right of the socket.

Key Point: Press the module down gradually until it has totally reached the socket bottom and clicked up both two socket latches completely. If any one of the latches has not turned up completely, you should unplug the module and press it down the socket a bit more firmly.



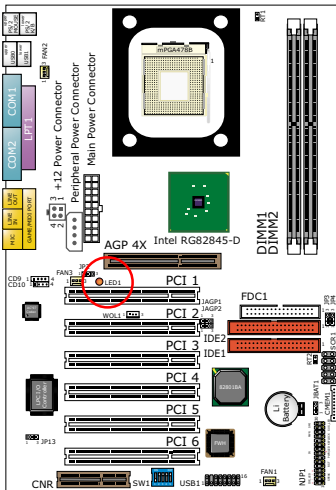
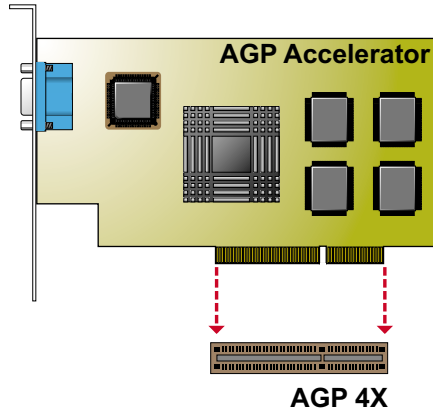
2-3.2 To Remove a DIMM:

- Press down the holding latches on both sides of socket and the module will be released from the DIMM socket.

2-4 AGP 4X (Accelerated Graphics Port) Installation

Warning:

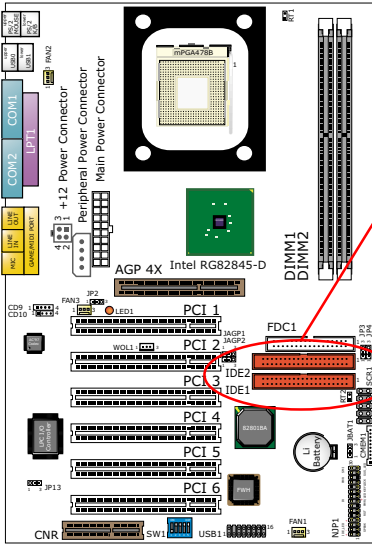
- The AGP 4X slot on board supports solely 4X AGP card configuration. User should not insert 1X / 2X AGP card to this mainboard.
- LED1 AGP Protection Indicator is on board this series. In case inappropriate AGP card (such as AGP 2X) is inserted into this AGP 4X Slot, LED1 will light up to warn that AGP installation is improper. The wrong AGP card should be replaced; otherwise system cannot be booted.



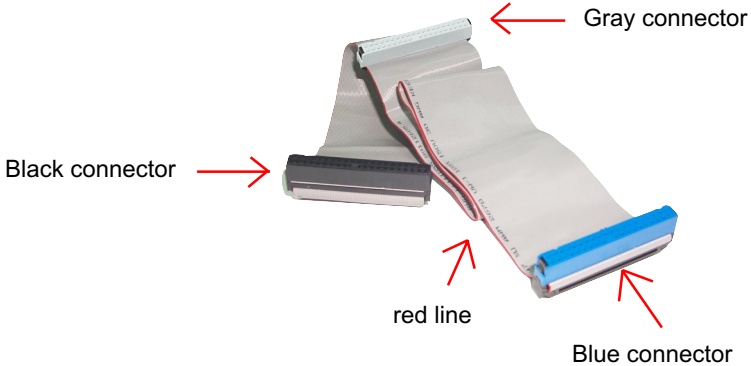
LED1
AGP Protection Indicator

2-5 HDD/FDD Installation

- To install HDD (Hard Disk Drive), you may connect the connector of IDE cable to the primary (IDE1) or secondary (IDE2) connector on board, and then connect the gray connector to your slave device and the black connector to your master device. If you install two hard disks, you must configure the second drive to Slave mode by setting its jumpers correctly. Please refer to your hard disk documentation for the jumper settings.

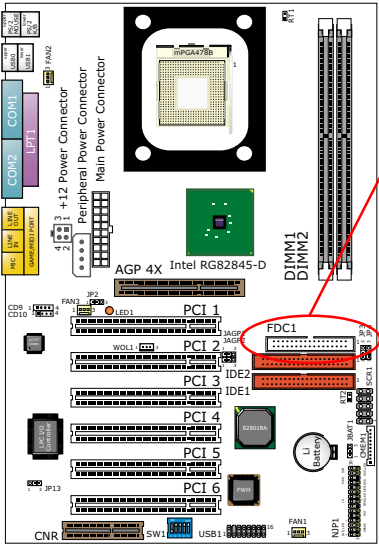


Hard Disk Drive Connector:
Orient the red line on the IDE
ribbon cable to Pin 1.

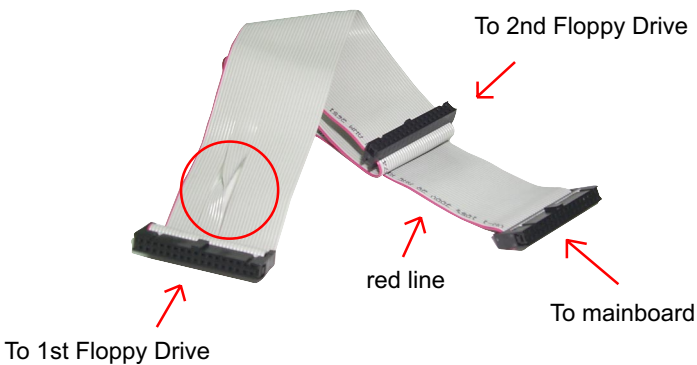


IDE Cable

- To install FDD (Floppy Disk Drive), you should connect the end of cable with single connector to the board, and connect the other end with two plugs to the floppy drives.



Floppy Disk Drive Connector:
Orient the red line on the
floppy ribbon cable to Pin 1.



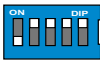
FDD Cable

How to tackle with Jumpers:

- Do not remove the jumper when power is on. Always make sure the power is off before changing any jumper settings. Otherwise, mainboard could be damaged.
- In the Jumper setting diagram, all jumper pins covered with black marks stand for closed pins by jumper caps.

2-6.1 Switch 1 CPU Clock Select


- This Series of mainboards are shipped to users with a 5-DIP Switch 1, by which user can select a CPU clock to match with the Pentium 4 processor selected on board. So users are not recommended to take Switch 1 as a tool for overclocking. It is safer and more advisable for users to select the CPU clock as close as possible to the one marked on the selected CPU.

SW1 On  CPU Clock Select					
Off					
1 2 3 4 5					
* Off On On On On (Default)					
CPU clock (MHz)	S1	S2	S3	S4	S5
100 (Default)	off	on	on	on	on
103	on	off	on	on	on
105	off	off	on	on	on
111	on	off	off	on	on
130	off	off	on	off	on
133	on	on	on	on	off

• Advice from our Engineering Team:





If you insert a Pentium 4 processor of 100MHz to the CPU socket and select 103MHz or any higher Switch setting, you are taking the risk of breaking the stability of your CPU as well as the mainboard. Overclocking should always take all other components on board into account.

2-6.2 Factory Test (By JP2)

Factory Test	
Only for factory test.	 JP2

2-6.3 Memory Module Voltage Select (By JP3/JP4)



This function allows you to select the voltage supplied to the DRAM. The default voltage (2.5V) should be used unless processor overclocking requires a higher voltage.

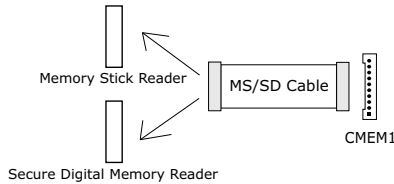
Memory Module Voltage Select	
2.5V (default)	 JP3 JP4
2.6V	 JP3 JP4
2.7V	 JP3 JP4
2.8V	 JP3 JP4

NOTE! Using a higher voltage may help when overclocking but may result in shortening of your computer components's life. It is strongly recommended that you leave this setting at its default.

2-6.4 JP13 Memory Stick/Secure Digital Memory Card Reader Select





This jumper is designed on board for Memory Stick/Secure Digital Memory Card Reader select for CMEM1 connector.

Memory Stick/Secure Digital Memory Card Reader Select		
Memory Stick Reader (Default)		JP13
Secure Digital Memory Card Reader		JP13





Connection between CMEM1 connector and MS/SD Card Reader

2-6.5 AGP Voltage Select (By JAGP1/JAGP2)

Voltage AGP Select		
1.5V (default)		JAGP1 JAGP2
1.6V		JAGP1 JAGP2
1.7V		JAGP1 JAGP2
1.8V		JAGP1 JAGP2

2-6.6 JBAT1 Clear CMOS

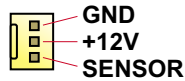
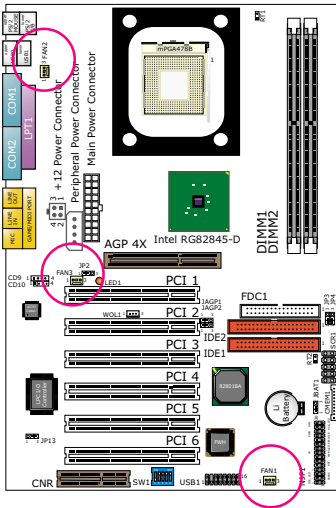
- When you have problem with rebooting your system, you can clear CMOS data and restore it to default value. To clear CMOS with Jumper JBAT1, please follow the steps below:
 - (1) Power off system;
 - (2) Set JBAT1 to Pin 2-3 closed.
 - (3) After 2 or 3 seconds, return the JBAT1 setting to Pin1-2 closed.
 - (4) CMOS data are restored to default. Remember never clear CMOS when system power is on.

Clear CMOS Data	
Clear CMOS Data	 JBAT1
Retain Data (Default)	 JBAT1

2-7 Other Connectors Configuration

- This section lists out all connectors configurations for users' reference.

2-7.1 On Board FAN Connectors (FAN1,FAN2, FAN3)



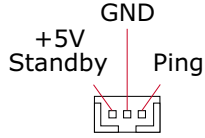
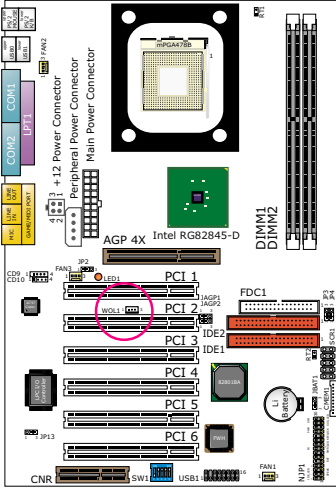
FAN1, FAN2, FAN3: On-Board Fan Connectors		
CPU FAN		FAN2
SYSTEM FAN		FAN3
CHASSIS FAN		FAN1


These fan connectors support CPU/System/chassis cooling fan with +12V. When connecting wire to FAN connectors, users should pay attention that the red wire is for the positive current and should be connected to pin +12V, and the black wire is Ground and should be connected to pin GND. If your mainboard has Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of this function.

For fans with speed sensors, each rotation of the fan blades will send out 2 electric pulses, by which System Hardware Monitor will work out the fan rotation speed by counting the pulses.

NOTE : We use 3 “Yellow” fan connectors to mark that they support fan speed sensor function.

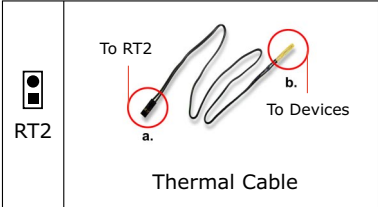
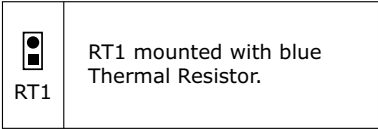
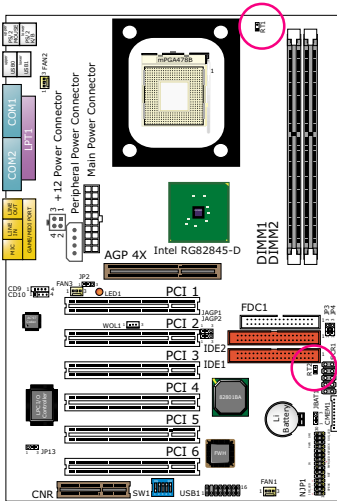
2-7.2 WOL1 Wake On LAN



Wake On LAN	
Connect the Wake On LAN signal from LAN card to WOL1	 WOL1

- (1) This connector connects to a LAN card with a Wake On Ring output. The connector powers up the system when it receives a wake-up packet or signal through the LAN card.
- (2) This feature requires that Ring Power Up Control feature is enabled in the BIOS setting "Power Management Setup" and that your system must be on ATX power supply with at least 720mA / +5V standby power.

2-7.4 Thermal Sensor Connector RT2 (Optional)



1. Connector RT1: A blue thermal resistor is already soldered to connector RT1 so as to sense the temperature round the mainboard. What RT1 does is to transmit the thermal signal to BIOS or Hardware Monitor.
2. Connector RT2: A thermal cable is needed to connect RT2 to on-board devices such as HDD, Graphics card etc., so as to detect the temperature generated therein. Please connect the end (a) of the thermal cable to mainboard RT2 header, and tape another end (b) of thermal cable on to the device which you want to monitor. After you have finished the thermal cable installation, you will **see the detected temperature in BIOS setup or Hardware monitor utility.**

1. SMI Connector (System Management Interrupt):

Connection: This 2-pin connector is connected to the case-mounted Suspend Switch.

Function : Manually placing the system into a Suspend mode or “Green” mode.

2. Power Switch Connector:

Connection: Connected to a momentary button or switch.

Function : Manually switching the system between “On” and “Soft Off”. Pressing the momentary button for more than 4 seconds will also turn the system off.

3. IR Connector (Infrared Connector):

Connection: Connected to Connector IR on board.

Function : Supporting wireless transmitting and receiving module on board.

4. 1st HDD LED Connector / 2nd HDD LED Connector:

Connection: Connected to HDD LED.

Function : To supply power to HDD LED.

5. Suspend LED Connector:

Connection: Connected to Suspend indicator.

Function : To supply power to “Suspend indicator”.

6. Keylock Connector:

Connection: Connected to keylock switch.

Function : To lock keyboard for security purpose.

7. Power LED Connector:

Connection: Connected to System Power LED.

Function : To supply power to “System Power LED”.

8. Reset Switch Connector:

Connection: Connected to the case-mounted “Reset Switch”.

Function : To supply power to “Reset Switch” and support system reboot function.

9. Speaker Connector:

Connection: Connected to the case-mounted Speaker.

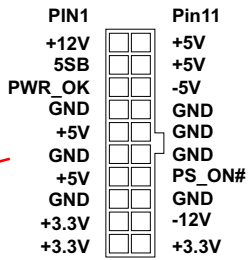
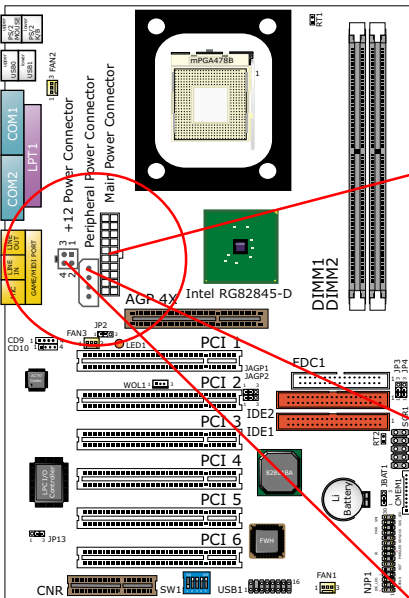
Function : To supply power to the case-mounted Speaker.

2-7.6 ATX Power Supply Connectors version 2.03 for Pentium 4

- This mainboard is compatible with both ATX Power Supply Version 2.03 (with +12V Power Connector) and the older ATX Power Supply (with Peripheral Power Connector):

Important:

1. If users use an older ATX Power Supply with Peripheral Power Connector, please connect both the Main Power Connector and the Peripheral Power Connector to mainboard.
2. If users use the ATX Power Supply Version 2.03 (with a +12V Power Connector), please connect either the +12V Power Connector or Peripheral Power Connector in addition to the Main Power Connector.



Main Power Connector



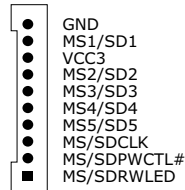
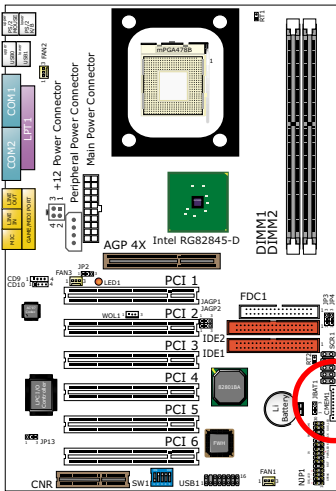
Peripheral Power Connector



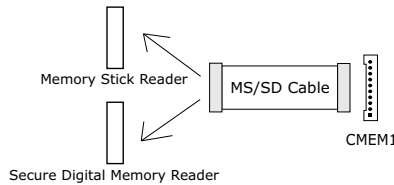
+12V Power Connector

2-7.7 CMEM1 Memory Stick™/Secure Digital Memory Card Reader Connector

- This connector can be connected to a Memory Stick Reader or Secure Digital memory card reader with a Memory Stick/Secure Digital memory card cable connector.
- JP13 is designed on board for Memory Stick/Secure Digital memory card select for this connector. Before you set up connection from CMEM1 to a Memory Stick Reader or a secure Digital Memory Card Reader, you should choose the right setting of Jp13. Please see Jumper setting of Jp13 for more detailed instruction.
- Besides JP13 setting, user should also adjust an option “MS/SD Port Mode” in “Integrated Peripheral” of BIOS setup to select “MS socket” or “SD socket”. (see “Integrated Peripheral” in BIOS setup.)
- Meeting SONY Memory Stick™ specification Version 1.03.



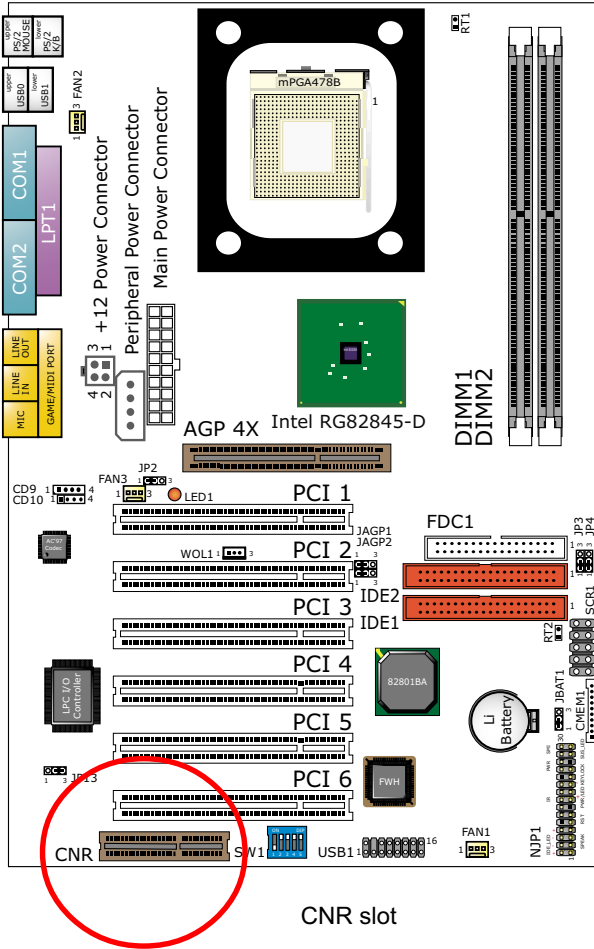
CMEM1 pin assignment



Connection between CMEM1 connector and MS/SD Card Reader

2-7.8 Communication And Networking Riser Slot (CNR)

- This slot allows you to use network, modem or audio riser cards.

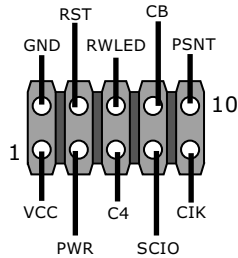
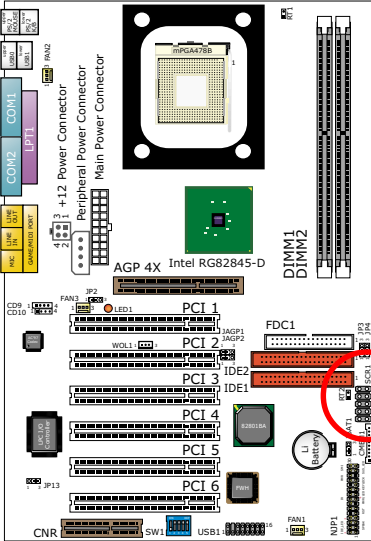


Note:

1. If modem CNR is installed, the modem CNR must be set as primary.
2. Only one LAN CNR can be supported.
3. The audio CNR must be set as secondary, if on-chip AC 97 is enabled.
4. CNR devices are not provided with this mainboard.

2-7.9 Smart Card Reader Connector (SCR1)

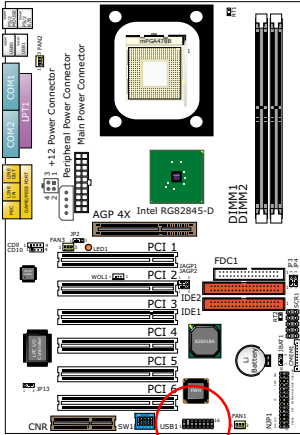
- The connector “SCR1” allows you to use Smart Card Reader. It is compliant with Personal Computer Smart Card (PC/SC) working group standard and smart card (ISO 7816) protocols.



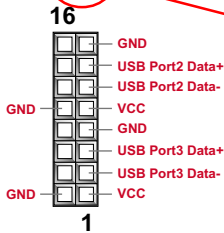
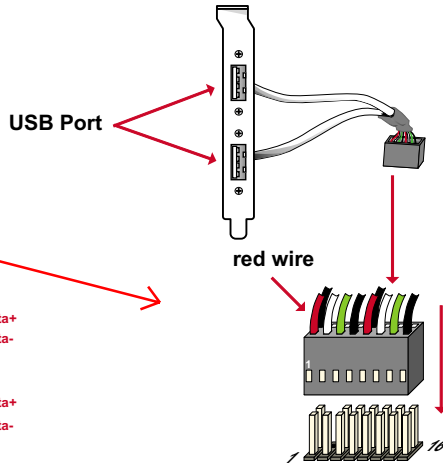
SCR1 pin assignment

2-7.10 USB Header (Header USB1)

- This header is for providing you two additional USB ports by using an additional USB Cable. User can order the additional USB cable from your mainboard dealers and vendors.



Additional USB Cable (Optional)

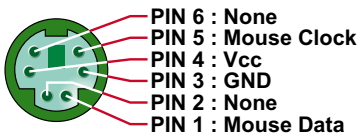


USB Header Pin Assignment

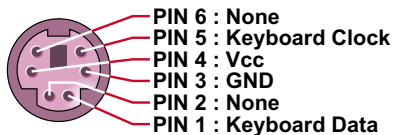
Header USB1

- When plugging the USB cable into Header USB1, users must make sure the red wire is connected to the first pin.

2-7.11 PS/2 Mouse And PS/2 Keyboard

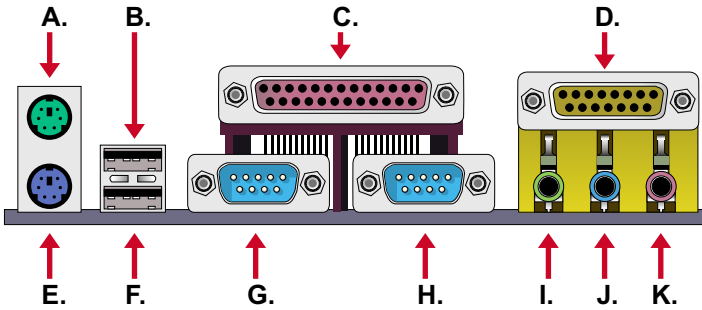


PS/2 MOUSE



PS/2 KEYBOARD

2-7.12 Chassis Panel Connector



- A : PS/2 MOUSE PORT
- B : USB 0 PORT
- C : LPT1 PORT
- D : GAME/MIDI PORT
- E : PS/2 KEYBOARD PORT
- F : USB 1 PORT
- G : COM1 PORT
- H : COM2 PORT
- I : LINE/SPEAKER OUT
- J : LINE IN
- K : MICROPHONE INPUT

2-8 IRQ Description

IRQ	Function Description	Priority
IRQ 0	System Timer	1
IRQ 1	Keyboard Controller	2
IRQ 2	Programmable Interrupt	N/A
IRQ 3	Serial Port (COM 2)	11
IRQ 4	Serial Port (COM 1)	12
IRQ 5		13
IRQ 6	Floppy Disk Controller	14
IRQ 7	Parallel Port (LPT1)	15
IRQ 8	Real Time Clock (RTC)	3
IRQ 9		4
IRQ 10		5
IRQ 11		6
IRQ 12	PS/2 Mouse Port	7
IRQ 13	Coprocessor	8
IRQ 14	Primary IDE Channel	9
IRQ 15	Secondary IDE Channel	10

- Both ISA and PCI expansion cards may require IRQs. System IRQs are available to cards installed in the ISA expansion bus first, then any remaining IRQs are available to PCI cards. Currently, there are two types of ISA cards.
- The original ISA expansion card design, now referred to as “Legacy” ISA card, requires you to configure the card’s jumpers manually and then install it in any available slot on the ISA bus. To see a map of your used and free IRQs in Windows 98, the **Control Panel in My Computer**, contains a **System** icon, which gives you a **Device Manager** tab. Double-Clicking on a specific hardware device gives you a **Resources** tab which shows the Interrupt number and address. Double-Clicking **Computers** to see all the interrupts and addresses for your system. Make sure that each ISA device should be assigned to one IRQ respectively. If ISA device share IRQ with any other device, your computer will easily get into trouble.

Memo

Chapter 3 Software Setup

Drivers, Utilities and Software Installation

- Support CD:
This series of mainboards will always be shipped with a Support CD which contains those necessary driver files, Application Softwares and some helpful utilities. It is a user-friendly, auto-run CD which will open itself up in a CD-ROM automatically.
- Contents of Support CD:
For 85SD-C, user should be able to find in the Supported CD the following drivers and utilities supported by Intel 845 Chipset:
 1. INF Utility (Intel Chipset Software Installation Utility);
 2. Intel Application Accelerator (IAA);
 3. AC'97 Drivers;
 4. Hardware Monitor Utility.

This chapter is devoted to describing the installations of all these essential drivers and utilities on Windows 9X, Windows ME, Windows 2000 and Windows XP. The installation procedures for all these operating systems are all programmed into an auto-run mode. What users have to do is to read and follow the pop-up instructions to carry out the installation. We therefore take the installation on Windows 98 as the general illustration hereby.

The priority of drivers to be installed should also be noted. Users are recommended to take the following installation orders :

3-1 Open up the Support CD and choose Drivers and Utilities

3-2 Intel Chipset Software Installation Utility (INF Utility)

3-3 Intel Application Accelerator (IAA)

3-4 AC'97 Audio Drivers Installation

3-5 Hardware Monitor Utility

3-1 Open up the Support CD and choose Drivers and Utilities

- 1 Please put the Support CD enclosed in your mainboard package into the CD-ROM drive. In a few seconds, the Main Menu will automatically appear, displaying the contents to be installed for this series:

Intel Chipset Software Installation Utility (INF Utility)

Intel Application Accelerator (IAA)

AC'97 Drivers Installation

Hardware Monitor Utility

Install Acrobat Reader

Browse CD-ROM

Exit

- 2 In case your system does not open the Support CD automatically, please click to the following path to enter the Main Installation Menu:

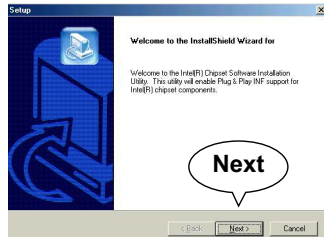
D:\Autorun.exe (assuming that your CD-ROM Drive is Drive D)

- 3 Users are recommended to install all the drivers and utilities at a time, though they can be installed separately. Also, we should take "Intel Chipset Software installation Utility" as first installation priority to optimize the Intel system. From next section, we provide detailed descriptions of all these installations with graphical illustrations.

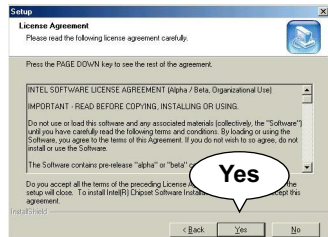
3-2 Install “Intel Chipset Software Installation Utility”

1 Following the procedures of opening the Support CD, click to “Install Intel Chipset software installation Utility” to proceed.

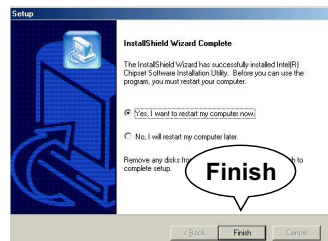
2 The Intel Service Pack InstallShield Wizard will pop up to guide you to the Intel Service pack installation. Press “Next” button to continue.



3 “Intel Software License Agreement” screen will appear, please click the “Yes” button to agree with the Licence Agreement and continue.



4 After all the setup process is finished, please restart your computer by clicking on “Finish” so as to take the Utility into effect.



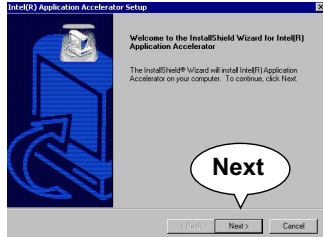
3-3 Install “Intel Application Accelerator”

IAA supports all Windows 98/98se/Mellennium/NT4/2000/XP with Pentium III / 4 processor. Installations of this software for these operating systems are similarly programed to an auto-run mode, and it is typically designed to improve performance of the storage sub-system and overall system performance.

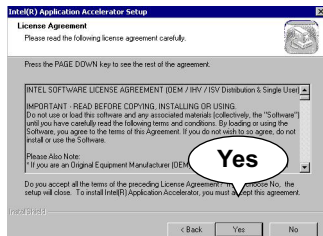
Below is a model installation on Windows 98. Users of Windows Me/NT4/2000/XP can also follow this example for IAA installation.

1 Following the procedures of opening the Support CD, click to “Intel Application Accelerator” to proceed.

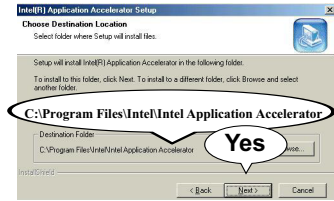
2 On the “InstallShield Wizard” screen, Click on “Next” to continue.



3 On the “Licence Agreement” screen, click on “Yes” to continue.



- 4 On "Choose Destination Location" screen, press "Yes" to continue.



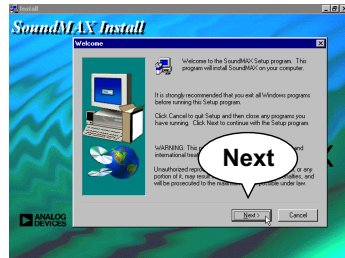
- 5 On "InstallShield Wizard Complete" screen, choose "Yes, I want to restart my computer now" and press "finish" to restart. Remember you must restart computer to put setup into effect.



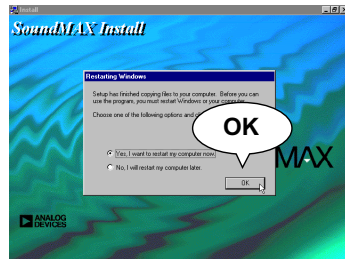
3-4 AC'97 Audio Driver Installation

You can install “AC'97 Audio Driver” on these two members of the series.

- 1 Following the procedures of opening the Support CD, click to “AC'97 Audio Driver” to proceed.
- 2 When the “SoundMAX Install” screen appears, press “Next” to continue.



- 3 After all the setup process is finished, please check the “Yes, I want to restart my computer now.” and click “OK” to restart your system.



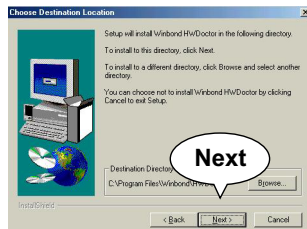
3-5 Install Hardware Monitor Utility

3-5.1 Installation

Hardware Monitor is built on this mainboard. Its installation is programmed to a fully automated mode on Windows 9X/Me/NT4/2000/XP. User can follow the model installation below for its installation on various Windows System.

- 1 Following the procedures of opening the Support CD, click to “Hardware Monitor Utility” to proceed.

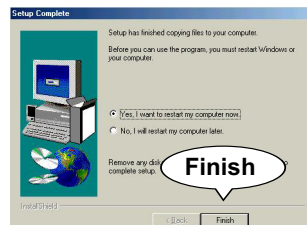
- 2 With the help of InstallShield Wizard, installation program automatically opens the “Choose Destination Location” screen. Click “Next to continue.



- 3 Select the Program folder and click “Next” to continue.

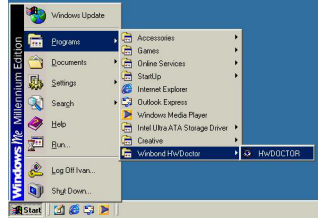


- 4 On the “Setup complete” screen, click “Finish” to restart your computer so that the Utility can be put into effect.

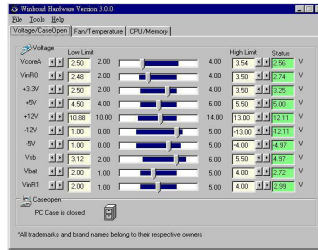


3-5.2 Verification

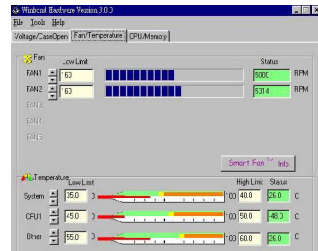
1 After restarting your computer, click “Start” and choose the path Programs \Winbond\Hwdoctor to open the main window of the Hardware Doctor.



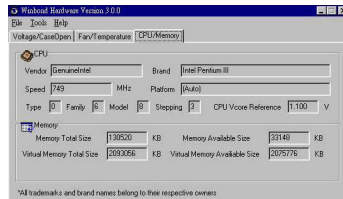
2 The “Voltage/CaseOpen” window is for CPU voltage and temperature information.



3 The “Fan/Temperature” window is for Fan speed and temperature information.



4 The “CPU/Memory” window is for Processor and memory information.



Memo

Chapter 4 BIOS Setup

THE BIOS

- BIOS stands for Basic Input and Output System. It was once called ROM BIOS when it was stored in a Read-Only Memory(ROM) chip Now manufacturers would like to store BIOS in EEPROM which means Electrically Erasable Programmable Memory. BIOS used in this series of mainboard is stored in EEPROM, and is the first program to run when you turn on your computer.
- BIOS performs the following functions:
 1. Initializing and testing hardware in your computer (a process called “POST”, for Power On Self Test).
 2. Loading and running your operating system.
 3. Helping your operating system and application programs manage your PC hardware by means of a set of routines called BIOS Run-Time Service.

The following topics are included in this chapter:

- 4-1 About BIOS Setup**
- 4-2 To run BIOS Setup**
- 4-3 About CMOS**
- 4-4 The POST (Power On Self Test)**
- 4-5 To upgrade BIOS**
- 4-6 BIOS Setup**

4-1 About BIOS Setup

- BIOS setup is an interactive BIOS program that you need to run when:
 1. Changing the hardware of your system. (For example: installing a new Hard Disk etc.)
 2. Modifying the behavior of your computer. (For example: changing the system time or date, or turning special features on or off etc.)
 3. Enhancing your computer's behavior. (For example: speeding up performance by turning on shadowing or cache.)

4-2 To run BIOS Setup

- First access BIOS setup menu by pressing < DEL > key after "POST" is complete (before OS is loaded). BIOS will then display the following message:

Press "DEL" to enter "SETUP"

4-3 About CMOS

- CMOS is the memory maintained by a battery. CMOS is used to store the BIOS settings you have selected in BIOS Setup. CMOS also maintains the internal clock. Every time you turn on your computer, the BIOS Looks into CMOS for the settings you have selected and configures your computer accordingly. If the battery runs out of power, the CMOS data will be lost and POST will issue a "CMOS invalid" or "CMOS checksum invalid" message. If this happens, you have to replace the battery and do some proper settings in BIOS Setup.

4-4 The POST (Power On Self Test)

- POST is an acronym for Power On Self Test. This program will test all things the BIOS does before the operating system is started. Each of POST routines is assigned a POST code, a unique number which is sent to I/O port 080h before the routine is executed.

4-5 To upgrade BIOS

- System BIOS is incorporated into a Flash memory component. Flash BIOS allows user to upgrade BIOS without the need to replace an EPROM component.
- The Upgrade Utility can be loaded on a floppy diskette to execute saving, verifying, and updating the system BIOS. The Upgrade Utility can also be run from a hard disk drive or a network drive.

4-5.1 Before Upgrading BIOS

- It is highly recommended that you save a copy of the original mainboard BIOS along with a Flash EPROM Programming utility (AWDFLASH.EXE) to a bootable floppy disk so that you can reinstall the BIOS when needed.

4-5.2 Upgrade Process

- Normally, to upgrade BIOS is unnecessary if the system is working fine. Users should only upgrade the BIOS when you experience incompatible problems or need to create new features.
- “AWDFLASH.EXE” is a Flash EPROM Programming utility that updates the BIOS by uploading a new BIOS file to the programmable flash ROM on the mainboard. This program only works in **DOS environment, the utility can not be executed in win95/98, ME, NT or WINDOWS 2000 environment.**
- Please follow the steps below for upgrading the system BIOS:

Step 1. Please visit the board maker’s website, download latest BIOS file and award flash utility “AWDFLASH.EXE”. The BIOS file format will be *.bin, of which “*” stands for the specific BIOS file name.

Step 2. Create a bootable diskette. Then copy the BIOS file and award flash utility “AWDFLASH.EXE” into the diskette.

Step 3. Insert the diskette into drive A, reboot your system and boot from the diskette.

Step 4. Type **awdf flash *.bin /sn/py/cc** and then press <Enter> to run BIOS upgrade program. (*.bin depends on your mainboard model and version code. Instead of typing "*", you should type specific file name for your specific mainboard).

Step 5. Please press <F1> or <F10> to exit or reset your system.

Warning! *If the message "Write Fail" appears while Award "FLASH MEMORY WRITER" is verifying Flash memory, just repeat the process. Please DO NOT reset or turn off the system. If the award memory flash utility is not able to update the BIOS successfully, your system may not be able to boot up.*

Step 6. You will need a message "CMOS checksum error-Default loaded" during booting the system. Press to run CMOS setup utility, then reload "LOAD SETUP DEFAULTS" or "**Load Optimized Defaults**" and save this change.

The parameters of AWDFLASH.EXE

/sn: No original BIOS backup

/py: Program flash memory

/cc: Clear CMOS data (and update data automatically) after programming

Users can type AWDFLASH /? to get further details about the parameters. Incorrect usage of the parameter will damage the BIOS information, so we strongly recommend user to leave parameters alone unless you fully understand their function.

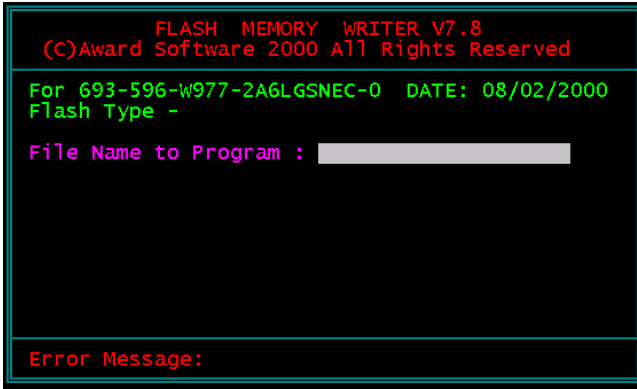


Figure 1 : Award Flash Memory Writer Start Screen

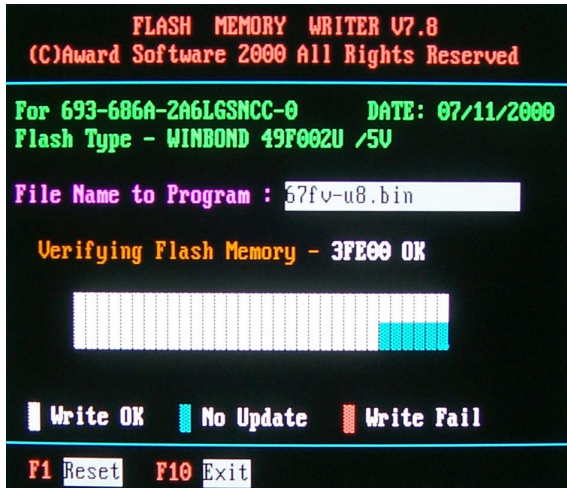


Figure 2 : Award Flash Memory Writer Start Screen

4-6.2 Standard CMOS Setup

- Standard CMOS Setup records some basic system hardware configuration and sets the system clock and error handling. You only need to modify the configuration values of this option if you want to change your system hardware configuration or when the data stored in the CMOS memory gets lost or damaged.

Run the STANDARD CMOS SETUP as follows:

1. Choose "STANDARD CMOS SETUP" from the Main Menu and a screen with a list of options will appear:

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

Date (mm:dd:yy)	Tue, Nov 13 2001	Item Help
Time (hh:mm:ss)	9 : 52 : 15	Menu Level ▶
▶ IDE Primary Master	Press Enter 13022 MB	Change the date month, year and century
▶ IDE Primary Slave	Press Enter None	
▶ IDE Secondary Master	Press Enter None	
▶ IDE Secondary Slave	Press Enter None	
Drive A	1.44M, 3.5 in.	
Drive B	None	
Video	EGA/VGA	
Halt On	All, but Keyboard	
Base Memory	640K	
Extended Memory	65472K	
Total Memory	66112K	

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

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys.
3. Press <ESC> to return to the Main Menu when you finish setting up all items. Now please read the following explanatory information for your Standard CMOS Features Setup.

Date (mm:dd:yy) The BIOS determines the day of the week from the other date information. This field is for information only.

Press the left or right arrow key to move to the desired field (date, month, year). Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

Time (hh:mm:ss) The time format is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Press the left or right arrow key to move to desired field. Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

Primary / Secondary Master / Slave This field records the specifications for all non-SCSI hard disk drives installed in your system. Refer to the respective documentation on how to install the drives.

CMOS Setup Utility - Copyright (C) 1984 - 2001 Award Software
IDE Primary Master

IDE HDD Auto-Detection	Press Enter	Item Help
IDE Primary Master	Auto	Menu Level ▶▶
Access Mode	Auto	
Capacity	13022 MB	
Cylinder	25232	
Head	16	
Precomp	0	
Landing Zone	25231	
Sector	63	

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

Drive A / Drive B Select this field to the type(s) of floppy disk drive(s) installed in your system. The choices are:
360KB, 5.25in;
1.2MB, 5.25in;
720KB, 3.5in;
1.44MB, 3.5in;
2.88MB, 3.5in;
None.

Video Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. The BIOS supports a secondary video subsystem, but you do not select it in setup.

Halt On During the power-on self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors during POST and continue the boot-up process.

Base Memory Typically 640KB. Also called conventional memory. The DOS operating system and conventional applications use this area.

Extended Memory Above the 1MB boundary. Early IBM personal computers could not use memory above 1MB, but current PCs and their software can use extended memory.

Total Memory This option shows system memory capacity.

4-6.3 Advanced BIOS Features

- ADVANCED BIOS FEATURES improves your system performance or sets up system features according to your preference.

Run the ADVANCED BIOS FEATURES as follows:

1. Choose “ADVANCED BIOS FEATURES” from the Main Menu and a screen with a list of options will appear:

CMOS Setup Utility - Copyright (C) 1984 - 2001 Award Software
Advanced BIOS Features

Virus Warning	Disabled	Item Help
CPU L1 & L2 Cache	Enabled	Menu Level ▶
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	
Second Boot Device	HDD-0	
Third Boot Device	CDROM	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Disabled	
Boot Up NumLock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
× Typematic Rate (Chars/Sec)	6	
× Typematic Delay (Msec)	250	
Security Option	Setup	
OS Select For DRAM > 64MB	Non-OS2	
Report No FDD For WIN95	No	

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

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys. An explanation of the <F> keys follows:

<F1>: "Help" gives options available for each item.

<F5>: Get the previous values. These values are the values with which the user starts the current session.

<F6>: Load all options with the BIOS default values.

<F7>: Load all options with the Setup default values.

3. Press <ESC> to return to the Main Menu when you finish setting up all items. Now please read the following information for the "Advance BIOS Features " setup:

Virus Warning When enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. You should then run an antivirus program. Keep in mind that this feature protects only the boot sector, not the entire hard drive.

NOTE: *Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you disable the virus warning.*

CPU L1 & L2 Cache Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type up contain internal cache memory (L1), and most, but not all, modern PCs have external cache memory (L2). When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for faster access by the CPU.

- Quick Power On Self Test** Select Enabled to reduce the amount of time required to run the power-on self-test (POST). A quick POST skips certain steps. We recommend that you normally enable quick POST.
- First/Second/Third/Other Boot Device** The BIOS attempts to load the operating system from the devices according to your selected priority. The choices: Floppy; LS120; HDD-0;SCSI; CDROM;HDD-1;HDD-2;HDD-3; ZIP100;LAN;RAID;Disabled.
- Boot Other Device** When enabled, this item allows you to select other boot device. The choices: Enabled; Disabled
- Swap Floppy Drive** When enabled, floppy drives A and B will be exchanging without any physical connection and modification on the cables.
- Boot Up Floppy Seek** When enabled, the BIOS tests (seeks) floppy drives to determine whether they have 40 or 80 tracks. Only 360-KB floppy drives have 40 tracks; drives with 270KB, 1.2MB, and 1.44MB capacity all have 80 tracks. Because very few modern PCs have 40-track floppy drives, we recommend that you set this field to disabled to save time.
- Boot Up NumLock Status** Toggle between On or Off to control the state of the NumLock key when the system boots. If On, the numeric keypad is in numeric mode. If off, the numeric keypad is in cursor control mode.
- Gate A20 Option** Gate A20 refers to the way the system addresses memory above 1 MB (extended memory). When set to *Fast*, the system chipset controls Gate A20. When set to *Normal*, a pin in the keyboard controller controls Gate A20. Setting Gate A20 to Fast improves system speed, particularly with OS/2 and Windows.

Typematic Rate Setting When *Disabled*, the following two items (Typematic Rate and Typematic Delay) are irrelevant. Keystroke repeats at a rate determined by the keyboard controller in your system.

When *Enabled*, you can select a typematic rate and typematic delay.

Typematic Rate (Chars / Sec) When the typematic rate setting is enabled, you can select a typematic rate (the rate at which character repeats when you hold down a key) of 6, 8, 10, 12, 15, 20, 24, or 30 characters per second. Default is "disabled".

Typematic Delay (Msec) Choices: 250; 500; 750; 1000. This option sets the time interval for displaying the first and the second characters. If enabled, the time interval is optional.

Security Option If you have set a password, select whether the password is required every time the System boots, or only when you enter setup.
The choices: system; setup (default).

OS Select For DRAM > 64MB Select OS2 only if you are running OS/2 operating system with greater than 64MB of RAM on your system. Default is "Non-OS2".

Report No FDD For Win95 Yes: BIOS reports "NO FDD" to Win95.
No (default): BIOS will not report "NO FDD" to Win95.

4-6.4 Advanced Chipset Features

- ADVANCED CHIPSET FEATURES is used to modify the values of chipset buffers. These buffers control the system options.

Run the ADVANCED CHIPSET FEATURES as follows:

1. Choose "ADVANCED CHIPSET FEATURES" from the Main Menu and a list of option will appear:

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Advanced Chipset Features

		Item Help
DRAM Timing Selectable	Manual	Menu Level ▶
CAS Latency Time	2.5	
Active to Precharge Delay	7	
DRAM RAS# to CAS# Delay	3	
DRAM RAS# Precharge	3	
DRAM Data Intergrity Mode	Non-ECC	
Memory Frequency For	Auto	
DRAM Read Thermal Mgmt	Disabled	
System BIOS Cacheable	Disabled	
Video BIOS Cacheable	Disabled	
Video RAM Cacheable	Disabled	
Memory Hole At 15M-16M	Disabled	
Delay Prior to Thermal	16 Min	
AGP Aperture Size(MB)	64	

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

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys. An explanation of the <F> keys follows:

<F1>: "Help" gives options available for each item.

<F5>: Get the previous values. These values are the values with which the user starts the current session.

<F6>: Load all options with the BIOS default values.

<F7>: Load all options with the Setup default values.

3. Press <ESC> to return to the Main Menu when you finish setting up all items. Now please read the following information for the “Advanced Chipset Features” setup:

DRAM Timing Selectable The value in this field depends on performance parameters of the installed memory chips (DRAM). Do not change the value from the factory setting unless you install new memory that has a different performance rating than the original DRAMs.

CAS Latency Time When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing. Do not reset this field from the default value specified by the system designer.

Active to Precharge Delay This field allows you to select a CAS Precharge delay timing.
Choices are: 7; 6; 5

DRAM RAS# to CAS# Delay This field lets you insert a timing delay between the CAS and RAS strobe signals, used when DRAM is written to, read from, or refreshed. Fast gives faster performance and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.
The Choices: 2; 3

DRAM RAS# Precharge If an insufficient number of cycles is allowed for the RAS to accumulate its charge before DRAM refresh, the refresh may be incomplete and the DRAM may fail to retain data. Fast gives faster performance; and Slow gives more stable performance. This field applies only when synchronous DRAM is installed in the system.
The Choices: 2; 3

DRAM Data integrity mode This item is to choose or not the Error Check and Correction mode.
Choices are: ECC; Non-ECC (default).

Memory Frequency For The value represents the performance parameters of the installed memory chips (DRAM). Do not change the value from the factory setting unless you install new memory that has a different performance rating.

DRAM Read Thermal Mgmt Selecting Enabled is to activate the DRAM Read Thermal management function. default: Ddisabled.

System BIOS Cacheable Selecting Enabled allows caching of the system BIOS ROM at F0000h to FFFFFh, resulting in better system performance.
Default: Disabled

Video BIOS Cacheable Selecting Enabled allows caching of the system BIOS ROM at C0000h to C7FFFh, resulting in video performance. However, if any program writes to this memory area, a system error may result.

Video RAM Cacheable Selecting Enabled allows caching of the video memory (RAM) at A0000h-AFFFFh, resulting in better video performance. However, check your AGP manual to find out if any compatibility problem exists.

Memory Hole At 15M-16M You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached.

Delay Prior to Thermal The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles.
This item allows you to choose a delay timing before a new Thermal reading is taken.

AGP Aperture Size Choices: 32; 64 MB. Memory mapped and graphics data structures can reside in a Graphics Aperture. This area is like a linear buffer. BIOS will automatically report the starting address of this buffer to the O.S.

4-6.5 Integrated Peripherals

- INTEGRATED PERIPHERALS option allows you to get some information inside your system when it is working.

Run the INTEGRATED PERIPHERALS as follows:

1. Choose "INTEGRATED PERIPHERALS" from the Main Menu and a list of options will appear:
2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys. An explanation of the <F> keys follows:

<F1>: "Help" gives options available for each item.

<F5>: Get the previous values. These values are the values with which the user starts the current session.

<F6>: Load all options with the BIOS default values.

<F7>: Load all options with the Setup default values.

3. Press <ESC> to return to the Main Menu when you finish setting up all items. please read the following "Integrated Peripherals" menu and the explanatory information for your "Integrated peripherals" setup:

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

		Item Help
On-Chip Primary PCI IDE	Enabled	Menu Level ▶
IDE Primary Master PIO	Auto	
IDE Primary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
On-Chip Secondary PCI IDE	Enabled	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
USB Controller	Enabled	
USB Keyboard Support	Disabled	
AC97 Audio	Auto	
AC97 Modem	Disabled	
Init Display First	AGP	
IDE HDD Block Mode	Enabled	
POWER ON Function	BUTTON ONLY	
KB Power ON Password	Enter	
Hot Key Power ON	Ctrl - F1	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	Auto	
Onboard Serial Port 2	Auto	
UART Mode Select	Normal	
RxD, TxD Active	Hi, Lo	
IR Transmission Delay	Enabled	
UR2 Duplex Mode	Half	
Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
EPP Mode Select	EPP1.9	
ECP Mode Use DMA	3	
PWRON After PWR-Fail	Off	
Game Port Address	201	
Midi Port Address	330	
Midi Port IRQ	10	
SCR Port Address	Disabled	
× SCR Port IRQ	11	
MS/SD Port Address	Disabled	
× MS/SD Port Mode	MS Socket	
× MS/SD Port IRQ	11	
× MS/SD Port DMA	1	

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

- On-Chip Primary/ Secondary PCI IDE** The chipset contains a PCI IDE interface with support from two IDE channels. Select Enabled to activate the first and/or the second IDE interface. Select Disabled to inactivate an interface if you install a primary and/or second add-on IDE interface. The choices: Enabled; Disabled.
- Primary Master / Slave PIO Secondary Master / Slave PIO** Choose Auto or Mode 0~4. The BIOS will detect the HDD mode type automatically when you choose Auto. You need to set to a lower mode than Auto when your hard disk becomes unstable. The choices: Auto; Mode 0; Mode 1; Mode 2; Mode 3; Mode 4.
- Primary Master / Slave UDMA Secondary Master / Slave UDMA** Ultra DMA33/66/100 implementation is possible only if your IDE hard drive supports it, if the operating environment includes a DMA drive, and if your system software supports Ultra DMA33/66/100. Select "Auto" to enable BIOS support. The choices: Auto; Disabled.
- USB Controller** Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.
- USB Keyboard Support** Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.
- AC'97 Audio/Modem** This option allows you to decide to enable/disable the 845 chipset to support AC'97 Modem. The choices: Auto; Disabled (default).
- Init Display First** Initialize the AGP or PCI slot before initializing any other display device on the system. The Coices are: AGP; PCI Slot.

IDE HDD Block Mode Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/write per sector the drive can support.
The choices: Enabled; Disabled.

Power ON Function This option allows you to select <KB Power ON Password> , <Hot-Key Power ON> or others.
The choices: Any Key, Button only, Keyboard 98, Password, Hot-Key, Mouse Move, Mouse Click.

KB Power ON Password When user sets a password for keyboard, the password user set that return the system to Full On state.

Hot-Key Power ON Boot up the system via predetermined keyboard hot key.
The choices: <Ctrl>+<F1>...<F12>

Onboard FDC Controller Select Enabled if your system has a floppy drive controller (FDC) installing in the system board and you want to use it. If you install add-in FDC or your system has no floppy drive, select Disabled.
The choices: Enabled (default); Disabled.

Onboard Serial Port 1 / Port 2 Select a logical COM port name and matching address for the first and second serial ports. Select an address and corresponding interrupt for the first and second serial ports. Choices: Auto(default); Disabled; 3F8/IRQ4; 2F8/IRQ3; 2E8/IRQ3.

UART Mode Select The serial ports on your system offer a variety of infrared port modes of the Universal Asynchronous Receiver/Transmitter.
The choices: Normal; IrDA; ASKIR.

- RxD, TxD Active** This item allows you to select the correct setting of the Receive Data and Transmit Data signals for your IR peripherals.
The choices: Hi,Lo (default); Lo, Hi; Lo, Lo; Hi, Hi.
- IR Transmission delay** This item allows you to Enable/Disable the IR Transmission Delay.
The choices: Enabled (default); Disabled.
- UR2 Duplex Mode** This item allows you to select the IR half / full duplex function.
The choices: Half; Full.
- Use IR Pins** To select the correct setting of RxD, TxD signals of your IR peripherals. You may also refer to your IR peripherals document for the correct setting.
The choices: IR-Rx2Tx2 (default); Rx2, Tx2;
- Onboard Parallel Port** This item allows you to determine onboard parallel port controller I/O address setting.
The choices: 378H/IRQ7; 278H/IRQ5; 3BC/IRQ7;
Disabled.
- Parallel Port Mode** Select an operating mode for the on-board parallel (printer) port. Select Normal, Compatible, or SPP unless you are certain your hardware and software both support one of the other available modes.
- EPP Mode Select** Select a mode of data transfer of the Enhanced Parallel port for your parallel devices.
Choices: EPP1.7(default); EPP1.9;
- ECP Mode Use DMA** Select a DMA channel for the Enhanced Communication port. Choices: 3 (default); 1.

- PWRON After PWR-Fail** Off: Disable Power Lost Resume function.
On: Enable Power Lost Resume function.
Former Sts: Use Former status.
The choices: Off(default); On; Former Sts.
- Game Port Address** This item allows you to select the Game Port Address.
The choices: Disabled; 201(default); 209.
- MIDI Port Address** Select a DMA channel for the parallel port for use during ECP mode.
The choices: Disabled; 330(default); 300.
- MIDI Port IRQ** This item allows you to select the MIDI Port IRQ.
Choices: 10(default); 5.
- SCR Port Address** This item allows you to the SCR (Smart Card Reader) Port Address.
- SCR Port IRQ** This item allows you to the SCR (Smart Card Reader) Port IRQ.
- MS/SD Port Address** This item allows you to the MS/SD (Memory Stick/ Secure Digital Memory Card Reader) Port Address.
- MS/SD Port Mode** This item allows you to the MS/SD (Memory Stick/ Secure Digital Memory Card Reader) Port Mode.
- MS/SD Port IRQ** This item allows you to the MS/SD (Memory Stick/ Secure Digital Memory Card Reader) Port IRQ.
- MS/SD Port DMA** This item allows you to the MS/SD (Memory Stick/ Secure Digital Memory Card Reader) Port DMA.

4-6.6 Power Management Setup

- POWER MANAGEMENT SETUP allows you to set the system’s power saving functions.

Run the POWER MANAGEMENT SETUP as follows:

1. Choose “POWER MANAGEMENT SETUP” from the Main Menu and a list of options will appear:

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Power Management Setup

ACPI Function	Enabled	Item Help
ACPI Suspend Type	S1(POS)	Menu Level ▶
×Run VGABIOS if S3 Resume	Auto	
Power Management	User Define	
Video Off Method	V/H SYNC+Blank	
Video Off In Suspend	Yes	
Suspend Type	Stop Grant	
MODEM Use IRQ	3	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
Wake-up by PCI card	Enabled	
Power On by Ring	Disabled	
USB KB WakeUp From S3(S4)	Disabled	
Resume by Alarm	Disabled	
×Date (of Month) Alarm	0	
×Time (hh:mm:ss)	0 0 0	
** Reload Global Timer Events **		
Primary IDE 0	Disabled	
Primary IDE 1	Disabled	
Secondary IDE 0	Disabled	
Secondary IDE 1	Disabled	
FDD, COM, LPT Port	Disabled	
PCI PIRQ[A-D] #	Disabled	

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

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys. An explanation of the <F> keys follows:

<F1>: "Help" gives options available for each item.

<F5>: Get the previous values. These values are the values with which the user starts the current session.

<F6>: Load all options with the BIOS default values.

<F7>: Load all options with the Setup default values.

3. Press <ESC> to return to the Main Menu when you finish setting up all items. Please read the following explanatory information for your Power management Setup.

ACPI Function Select Enabled only if your computer's operating system supports the Advanced Configuration and Power Interface (ACPI) specification.

ACPI Suspend Type This item allows you to select the ACPI suspend type. You can select S1(POS) for power on suspend under Windows 98 ACPI mode.
The choices: S1(POS).

Run VGABIOS if S3 Resume This item allows you to select for Run VGABIOS if system resumes from S3 (STR) mode.

Power Management This option allows you to select the type (or degree) of power saving for Doze, Standby, and Suspend modes.

This table describes each power management mode. Default: User Define.

Max Saving	Maximum power savings. Only Available for SL CPUs. Inactivity period is 1 minute in each mode.
User Define	Set each mode individually. Select time-out period in the section for each mode stated below.
Min Saving	Minimum power savings. Inactivity period is 1 hour in each mode (except the hard drive).

Video Off Method This determines the manner by which the monitor is blanked. Default: V/H Sync+Blank

V/H SYNC + Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS Supports	Select this option if you monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards to select video power management values.

Video Off in Suspend This determines the manner in which the monitor is blanked.

The choices: Yes(default); No.

Suspend Type Select the Suspend Type.

The choices: PWRON Suspend; StopGrant (default).

MODEM Use IRQ Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

The choices: 3 (default); 4; 5; 7; 9; 10; 11; NA.

- Suspend Mode** After the selected period of system inactivity, the chipset enters a hardware suspend mode, stopping the CPU clock and possibly causing other system devices to enter power management modes.
Choices: Enabled; Disabled (default)
- HDD Power Down** When enabled and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.
Choices: Enabled; Disabled (default)
- Soft-Off by PWRBTN** When Enabled, turning the system off by pressing the on/off button places the system in a very low-power-usage state.
Choices: Instant-off (default); Delay 4 sec.;
- Wake-Up by PCI card** This function allows you to enabled the system by wake-up by PCI card.
The choices: Enabled(default); Disabled.
- Power On by Ring** An input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.
The choice: Enabled; Disabled (default).
- USB KB WakeUp From S3 (S4)** This item will enable you to wake-up the system by USB keyboard when you shut down the computer in S3 mode.
The choices: Enabled, Disabled.
- Resume by Alarm** When Enabled, you can set the data and time at the which the RTC (Real Time Clock) alarm awakens the system from suspend mode. default: Disabled.
- Date (of Month) Alarm** Set a certain date when RTC Alarm Resume option is Enabled to awaken the system. This option is concurrent with Resume Time option.

Time (hh:mm:ss) Set a certain time when RTC Alarm Resume option is Enabled to awaken the system. This option is concurrent with Date option.

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

Primary IDE 0

Primary IDE 1

Secondary IDE 0

Secondary IDE 1

FDD, COM, LPT Port

PCI PIPQ[A-D]

Default: All disabled

4-6.7 PNP / PCI Configuration

- PNP/PCI CONFIGURATION allows you to modify the system's power saving functions.

Run the PNP/PCI CONFIGURATION as follows:

1. Choose "PNP/PCI CONFIGURATION" from the Main Menu and a screen with a list of options will appear:

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PnP/PCI Configurations

Reset Configuration Data	Disabled	Item Help
Resources Controlled By × IRQ Resources	Auto(ESCD) Press Enter	Menu Level ▶
PCI/VGA Palette Snoop	Disabled	
PCI Slot1 IRQ Assigned	Auto	
PCI Slot2 IRQ Assigned	Auto	
PCI Slot3 IRQ Assigned	Auto	
PCI Slot4 IRQ Assigned	Auto	
PCI Slot5 IRQ Assigned	Auto	
PCI Slot6 IRQ Assigned	Auto	

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

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys. An explanation of the <F> keys follows:

<F1>: "Help" gives options available for each item.

<F5>: Get the previous values. These values are the values with which the user starts the current session.

<F6>: Load all options with the BIOS default values.

<F7>: Load all options with the Setup default values.

3. Press <ESC> to return to the Main Menu when you finish setting up all items. please read the following explanatory information for your PnP/PCI configuration.

Reset Configuration Data Normally, you leave this Disabled. Select Enabled to reset Extended System Configuration Data (ESCD), when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system cannot boot.

Resource Controlled By The Plug and Play AwardBIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select *Auto*, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.
 Choices: Auto(ESCD) (default); Manual)

IRQ RESOURCES If "Resource Controlled By" is set at "Manual", this IRQ Resources option will appear for your configuration. Press Enter. Please refer to the list below:

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 IRQ Resources

IRQ-3 assigned to	PCI Device	Item Help
IRQ-4 assigned to	PCI Device	Menu Level ▶
IRQ-5 assigned to	PCI Device	
IRQ-7 assigned to	PCI Device	
IRQ-9 assigned to	PCI Device	
IRQ-10 assigned to	PCI Device	
IRQ-11 assigned to	PCI Device	
IRQ-12 assigned to	PCI Device	
IRQ-14 assigned to	PCI Device	
IRQ-15 assigned to	PCI Device	

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

PCI/VGA Palette Snoop This option allows the BIOS to preview VGA status, and to modify the information delivered from the feature Connector of the VGA card to MPEG card. This option can solve the display inversion to black after you have used MPEG card.
Choices: Disabled (default); Enabled

PCI Slot1~6 IRQ Assigned to Set to Auto, this option allows the BIOS to assign IRQ to PCI slot.
Choices: Auto (default); 3; 4; 5; 6; 7; 8; 9; 10; 11; 12; 14; 15.

4-6.8 SmartDoc Anti-Burn Shield

- This section helps you to get more information about your system including CPU temperature, FAN speed and voltage. It is recommended that you contact your mainboard supplier to get proper values about the setting of the CPU temperature.

To enter SmartDoc Anti-Burn Shield:

1. Choose "SmartDoc Anti-Burn Shield" from the Main Menu and a screen with a list of options will appear:

CMOS Setup Utility - Copyright (C) 1984 - 2001 Award Software
SmartDoc Anti-Burn Shield

Shutdown Temperature	Disabled	Item Help
Current CPU2 Temp.		Menu Level ▶
Current CPU1 Temp.		
Current System Temp.		
FAN1 Speed		
FAN2 Speed		
FAN3 Speed		
Vcore		
+1.5 V		
+2.5 V		
+3.3 V		
VBAT (V)		
5VSB (V)		

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

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys.

<F1>: "Help" gives options available for each item.

<F5>: Get the previous values. These values are the values with which the user starts the current session.

<F6>: Load all options with the BIOS default values.

<F7>: Load all options with the Setup default values.

3. Press <ESC> to return to the Main Menu when you finish setting up all items. please read the following explanatory information for your SmartDoc Anti-Burn Shield Configuration:

Shutdown Temperature This feature prevents your CPU from damage by over heat. If the CPU's temperature is higher than "CPU warning temperature" that you select in this field, the BIOS will shut down your system within 3 seconds.

Current CPU1/2 Temp. Showing the working CPU temperature.

Current System Temp. Showing the working System temperature.

FAN1/2/3 Speed Showing the working CPU Fan speed.

Vcore Shows CPU core actual voltage value.

+5V/+2.5V/+3.3V Showing the working voltage on board.

VBAT Showing the working battery voltage on board.

5VSB Showing the working standby voltage on board.

4-6.9 Frequency/Voltage Control

Run the "FREQUENCY/VOLTAGE CONTROL" as following:

1. Choose "FREQUENCY/VOLTAGE CONTROL" from the Main Menu and a screen with a list of options will appear:

CMOS Setup Utility - Copyright (C) 1984 - 2001 Award Software
 Frequency/Voltage Control

		Item Help
RedStorm Overclocking Tech	Press Enter	Menu Level ▶
CPU Vcore Select	Default	
AGP Voltage Select	1.5V	
DIMM Voltage Select	2.5V	
× CPU Clock Ratio	8X	
Use CPU Linear Freq	Default	
CPU Clock	100MHz	
AGP Div Freq	Default	
Auto Detect PCI clk	Enabled	
Spread Spectrum	Disabled	
CPU0 Skew Adjust	Disabled	
CPU1 Skew Adjust	Disabled	
CPU2 Skew Adjust	Disabled	
3V66 Skew Adjust	Disabled	
PCI Skew Adjust	Disabled	
PCI_F Skew Adjust	Disabled	
PCI_3V66 Skew Adjust	2.0ns	

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

2. Use one of the arrow keys to move between options and modify the selected options by using PgUp / PgDn / + / - keys.

<F1>: "Help" gives options available for each item.

<F5>: Get the previous values. These values are the values with which the user starts the current session.

<F6>: Load all options with the BIOS default values.

<F7>: Load all options with the Setup default values.

3. Press <ESC> to return to the Main Menu when you finish setting up all items. please read the following explanatory information for your Frequency/Voltage Control configuration:

Redstorm Overclocking Tech Please press <Enter> to start *RED STORM OVERCLOCKING TECH*, this option helps user an easy way to overclocking, it will increase CPU external clock automatically, when CPU external clock increasing to unacceptable value, BIOS will restart your system, then running at acceptable CPU external clock.

CPU Vcore Select This item allows users to adjust the CPU Vcore voltage. The instant damage of CPU is due to the wrong Vcore voltage setting, so we highly recommend that user should leave this item to Default setting unless you fully understand it.

AGP Voltage Select This item allows users to adjust the AGP voltage. The instant damage of Graphics card is due to the wrong AGP voltage setting, so we highly recommend that user should leave this item to Default setting unless you fully understand it.

DIMM Voltage Select This item allows users to adjust the DIMM voltage. The instant damage of DIMM is due to the wrong Vcore voltage setting, so we highly recommend that user should leave this item to Default setting unless you fully understand it.

CPU Clock Ratio This item allows you to select the CPU clock ratio so as to change or overclock the CPU frequency. However, if CPU clock Ratio is locked, this function is invalid.

Use CPU Linear Frequency This item allows you to adjust the CPU clock by 1MHz stepping. Default CPU clock is 100MHz. Any overclocking is taking the risk of unstabilizing the CPU and system performance.
Choices: Default; Use linear (1MHz stepping).

- CPU Clock** If “Use CPU Linear Frequency” is set at “Use linear”, you can adjust the CPU clock by 1MHz stepping up or down.
Choices: 1MHz stepping.
- AGP Div Freq.** This item allows you to adjust the AGP Frequency by fraction of your CPU Host clock. Default AGP frequency is 66MHz. The choices (fraction of CPU clock): Default; 2/2; 2/3; 2/4; 2/5; 2/6; 2/7; 2/8.
- Auto Detect PCI CLK** To reduce the occurrence of electromagnetic interference (EMI), the BIOS detects the presence or absence of components in PCI slots and turns off system clock generator pulses against empty slots.
Choices: Enabled (default); Disabled.
- Spread Spectrum** When the system clock generator pulses, the extreme values of the pulse generate excess EMI. Enabling pulse spectrum spread modulation changes the extreme values from spikes to flat curves, thus reducing EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.
Choices: Disabled (default); enabled.
- CPU0/1/2 Skew Adjust** This item allows you to reduce CPU transfer rate. Users should leave this item at default value.
The choices: Disabled (default); 500ps; 1000ps; 1500ps.
- 3V66 Skew Adjust** This item allows you to reduce the 3V66 transfer rate.
Choices: Disabled (default); 500ps; 1000ps; 1500ps.
- PCI Skew Adjust** This item allows you to reduce PCI transfer rate. Users should leave this item at default value.
Choices: Disabled (default); 500ps; 1000ps; 1500ps.

PCI_F Skew This item allows you to reduce PCI transfer rate.
Adjust Users should leave this item at default value.
Choices: Disabled (default); 500ps; 1000ps; 1500ps.

PCI_3V66 Skew This item allows you to reduce PCI transfer rate.
Adjust Choices: 2.0ns (default); 3.0ns.

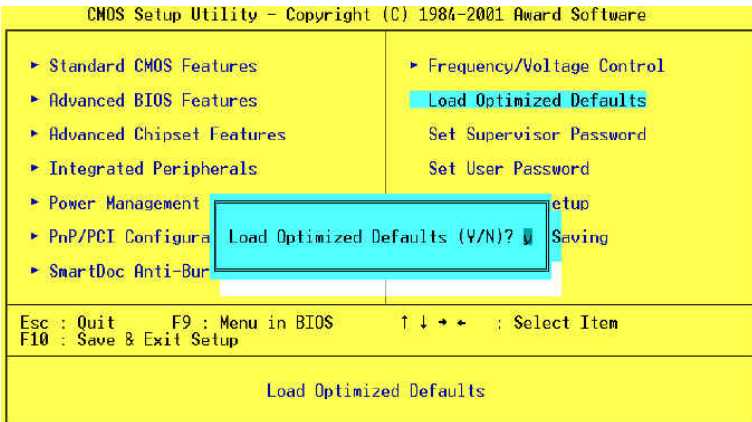
4-6.10 Load Optimized Default

- When you press <Enter> on this item, you will get a confirmation dialog box with a message similar to:

“ Load Optimized Defaults (Y/N) ? N ”

“Y” is for “Yes”, and “N” is for “No”.

Pressing “Y” loads the BIOS default values that are factor settings for optimal performance of system operations.



4-6.11 Set Supervisor / User Password

- These two options allow you to set your system passwords. Normally, the supervisor has a higher priority to change the CMOS setup option than the users. The way to set up the passwords for both Supervisor and Users are as follows:

1. Choose "Change Password" in the Main Menu and press <Enter>. Then following message appears:

`"Enter Password : "`

2. The first time you run this option, enter your password up to 8 characters and press <Enter>. (The screen does not display the entered characters.)
3. After you enter the password, the following message appears prompting you to confirm the password:

`"Confirm Password : "`

4. Enter the same password "exactly" the same as you have just typed to confirm the password and press <Enter>.
5. Move the cursor to Save & Exit Setup to save the password.
6. If you need to delete the password entered before, choose the Supervisor Password and press <Enter>. It will delete the password that you have entered before.
7. Move the cursor to Save & Exit Setup to save the option you have just configured; otherwise the old password will still be there the next time you turn your system on.
8. Press <Enter> to exit to the Main Menu.

NOTE: *If you forget or lose the password, the only way to access the system is to clear the CMOS RAM. All setup informations will be lost and you need to run the BIOS setup program again.*

4-6.12 Save & Exit Setup

- SAVE & EXIT SETUP allows you to save all modifications you have specified into the CMOS memory. Highlight this option on the Main Menu and the following message appears:

```
  ` SAVE to CMOS and EXIT (Y/N) ? Y `
```

“Y” is for “Yes”, and “N” is for “No”.

Press <Enter> key to save the configuration changes.

4-6.13 Exit Without Saving

- EXIT WITHOUT SAVING option allows you to exit the Setup Utility without saving the modifications that you have specified. Highlight this option on the Main Menu and the following message appears:

```
  ` Quit Without Saving (Y/N) ? N `
```

“Y” is for “Yes”, and “N” is for “No”.

You may change the prompt to “Y” and press <Enter> key to leave this option.

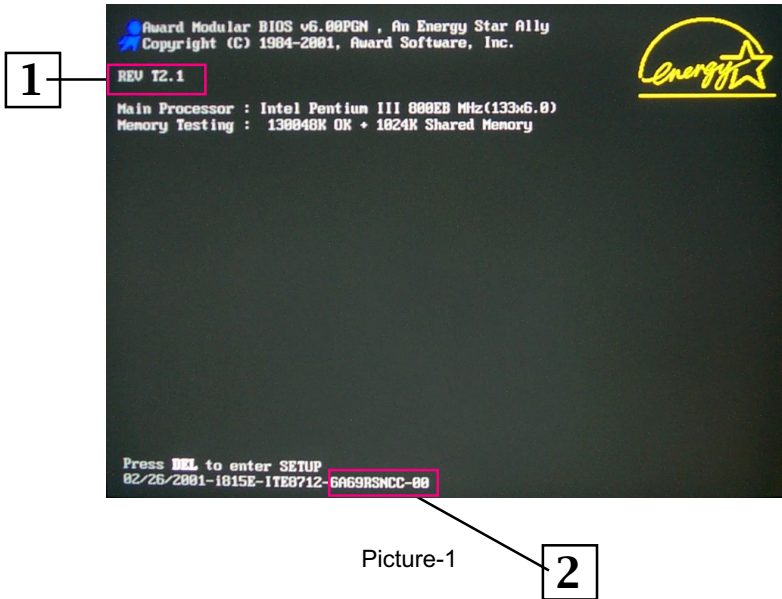
Memo

Appendices

APPENDIX-1 TECHNICAL TERMS
**APPENDIX-2 IDENTIFYING BIOS VERSION/
BIOS PART NUMBER**
**APPENDIX-3 IDENTIFYING MAINBOARD
MODEL NUMBER**

Appendix-1 Identifying BIOS version and BIOS part Number

- See Picture-1 below for BIOS version and BIOS part number identification.

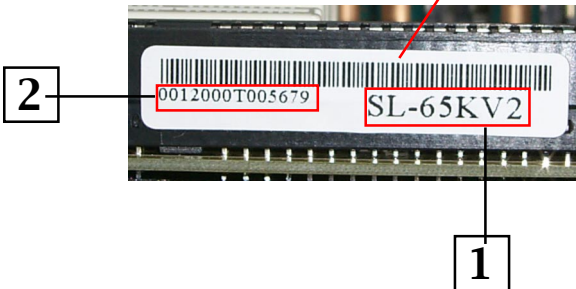
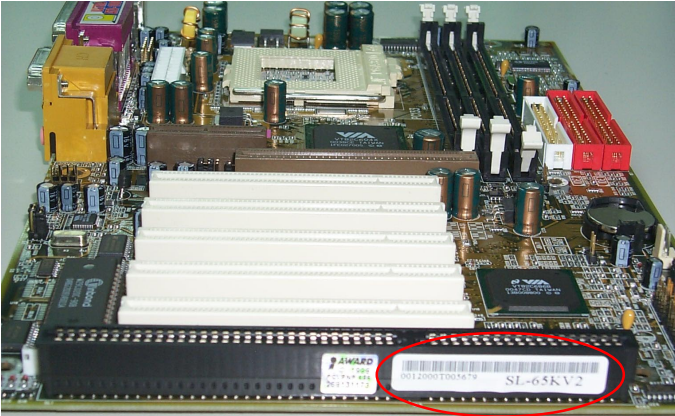


Picture-1

1. BIOS VERSION
example: REV T2.1
2. BIOS ID STRING
example: 6A69RSNCC

Appendix-2 Identifying Mainboard model Number

- Usually the mainboard model number is labeled on the side of ISA side of slot or PCI slot. Please see the picture below as an illustration:



1. MAINBOARD MODEL NUMBER
example: SL-65KV2
2. MAINBOARD SERIAL NUMBER
example: 0012000T005679

Appendix-3 Technical Terms

AC'97

AC'97 is a device designed to include a digital processor for modem and an audio CODEC for analog I/O. These two parts are linked together by AC'97 link bus. Putting the digital processor into the main system chipset will reduce the cost of sound/modem onboard solution.

ACPI (Advanced Configuration & Power Interface)

ACPI is developed together by Intel, Microsoft and Toshiba. This interface provides a channel of management of the PC system and its hardware such as CPU and BIOS, pushing the PC power management to a more advanced and user-friendly level.

AGP (Accelerated Graphic Port)

AGP is a bus interface targeted for high-performance 3D graphics. AGP takes advantage of both rising and falling edge of the 66MHz clock. For 2X AGP, the data transfer rate is $66\text{MHz} \times 4\text{byte} \times 2 = 528\text{MB/s}$. AGP 4X mode is $66\text{MHz} \times 4\text{byte} \times 4 = 1056\text{MB/s}$.

AMR (Audio/Modem Riser)

AMR is an interface to connect the CODEC circuit of AC'97 sound/modem solution to the mainboard through an AMR card and an AMR connector.

APM (Advanced Power Management)

APM is developed by Intel and Microsoft, intending for PC power management through the system BIOS. Through APM, the PC power consumption can be reduced to 5W or lower.

ATA (AT Attachment), ATA/66, ATA/100

ATA is the specification of disk drive interface, that integrates the controller on the disk drive itself with the IDE technology.

ATA/66 uses both rising edge and falling edge to provide a data transfer rate $16.6\text{MB/s} \times 4 = 66\text{MB/s}$. To use ATA/66, you need special ATA/66 IDE cable.

ATA/100 also uses both rising edge and falling edge as ATA/66, but clock cycle time is reduced to 40ns. The data transfer rate is $(1/40\text{ns}) \times 2 \text{ bytes} \times 2 = 100\text{MB/s}$. To use ATA/100, you need special 80-wire IDE cable, the same as ATA/66.

ATAPI (AT Attachment Packet Interface)

This is the extension of the EIDE (extended IDE) that enables the interface to support CD-ROM players and tape drives.

BIOS (Basic Input/Output System)

BIOS is a set of assembly routine/program that resides in EPROM or Flash ROM. BIOS controls Input/output devices and other hardware devices of the mainboard. Generally, operation system and drivers will access BIOS before accessing hardware devices so as to enhance the portability of the hardware devices.

Bus Master IDE (DMA mode)

An IDE interface is an interface for mass storage devices, in which the controller is integrated into the disk or CD-ROM itself. To reduce the workload of the CPU, the bus master IDE device transfers data from/to memory without interrupting CPU, and releases CPU to operate concurrently while data is transferring between memory and IDE device. You need the bus master IDE driver and the bus master IDE HDD to support bus master IDE mode.

CAS (Column Address Strobe)

CAS is a technology of DRAM writes and reads. The number of clock cycles of the CAS signals is depending on the DRAM timing.

CNR (Communication and Networking Riser)

CNR interface provides a cost reducing method of implementing LAN, home networking, DSL, USB, wireless, audio and modem subsystems through a CNR card and a CNR connector.

CODEC (Coder and Decoder)

Normally, CODEC means a circuit that can do digital to analog conversion and vice versa. It is part of AC'97 sound/modem solution.

DDR (Double Data Rated) SDRAM

DDR SDRAM essentially doubles the memory speed of SDRAMs without increasing the clock frequency.

DIMM (Dual In Line Memory Module)

DIMM socket is built with a 168-pin assignment and supports 64-bit data. DIMM can be single or double sided. The golden finger signals on each side of the module are different, and that is why it is called Dual In Line. Almost all DIMMs are made with SDRAM now, which operate at 3.3V. Some old DIMMs are made by FPM/EDO and only operate at 5V.

DMA (Direct Memory Access)

Channel for communications between memory and surrounding devices.

ECC (Error Checking and Correction)

The ECC algorithm has the ability to detect double-bit error and automatically correct single-bit error while parity mode can only detect single-bit error.

ECP (Enhanced Communication Port)

ECP is a technology designed to improved I/O for parallel ports.

EPP (Enhanced Parallel Port)

EPP is a standard that supports data transfer rates of up to 500 kps for parallel printers

EDO (Extended Data Output) Memory

Unlike traditional FPM (Fast Page Mode) memory that tri-states the memory output data to start the pre-charge activity, EDO DRAM holds the memory data valid until the next memory access cycle, which is similar to pipeline effect in reducing one clock state.

EEPROM (Electronic Erasable Programmable ROM)

Both EEPROM and Flash ROM can be re-programmed by electronic signals, but the interface technology is different. Size of EEPROM is much smaller than flash ROM. BIOS is now generally stored in EEPROM or Flash ROM.

EPROM (Erasable Programmable ROM)

Traditional mainboard stores BIOS codes in EPROM which can only be erased by ultra-violet (UV) light. If BIOS has to be updated, you need to remove EPROM from mainboard, clear data by UV light, re-program, and then insert it back to socket.

FC-PGA (Flip Chip-Pin Grid Array)

FC means Flip Chip, while FC-PGA is a new package of Intel for Pentium III CPU. It is compatible with SKT370 socket, but requires mainboard to add some signals on socket 370.

Flash ROM

Flash ROM can be re-programmed by electronic signals. It is easier for BIOS to upgrade by a flash utility, but it is also easier to be infected by virus. Because of increase of new functions, BIOS size is increased from 64KB to 256KB (2M bit) or more.

FSB (Front Side Bus)

FSB is the data channel connecting the Processor to chipset, RAM, mainboard buses, AGP socket etc. Its speed is in terms of MHz and is talked to as FSB clock:

FSB Clock means CPU external bus clock.

CPU internal clock = CPU FSB Clock x CPU Clock Ratio

IEEE 1394

IEEE 1394 is a low-cost digital transfer interface with transfer rate at 100, 200 or 400 Mbps. It provides solutions of connecting digital television devices and Serial Bus Management. There are two type of IEEE 1394 data transfer: asynchronous and isochronous. Isochronous data channels provide guaranteed data transport at a pre-determined rate. This is especially important for time-critical multimedia data where just-in-time delivery eliminates the need for costly buffering.

Parity Bit

The parity bit mode of error detection uses 1 parity bit for each byte. Normally it is even parity mode, that is, each time the memory data is updated, parity bit will be adjusted to have even count “1” for each byte. Next time when memory is read with odd number of “1”, the parity error is occurred and this is called single bit error detection.

PC-100 DIMM

SDRAM DIMM that supports 100MHz CPU FSB bus clock.

PC-133 DIMM

SDRAM DIMM that supports 133MHz CPU FSB bus clock.

PC-1600 or PC-2100 DDR SDRAM

PC-1600 DDR SDRAM with a 64-bit data bus doubles the data transfer rate of PC100 SDRAM and hence provides data transfer bandwidth up to $100 \times 64 / 8 \times 2 = 1600 \text{MB/s}$. PC2100 DDR SDRAM doubles the data transfer rate of PC-133 and hence provides data transfer bandwidth up to $133 \times 64 / 8 \times 2 = 2100 \text{MB/s}$.

PCI (Peripheral Component Interface) Bus

A high speed data channel for the internal connection of peripheral devices and the computer system through a PCI expansion card.

PnP (Plug and Play)

The PnP specification suggests a standard register interface for both BIOS and operating system (such as Windows 95). These registers are used by BIOS and operating system to configure system resource and prevent any conflicts. PnP BIOS or operating system will automatically allocate the IRQ/DMA/Memory. Currently, almost all the PCI cards and most ISA cards are already PnP compliant.

POST (Power-On Self Test)

The BIOS self-test procedure after power-on. It is generally the first or the second program shown on your monitor screen during system boot.

RAS (Row Address Strobe)

RAS is a technology that DRAM writes and reads to the Row addresses, while a CAS (Column Address Strobe) signal is used to validate the column address. The signals are generally sent CAS before RAS.

(in Network field, RAS stands for Remote Access Services).

RDRAM (Rambus DRAM)

Rambus DRAM is a memory technology that uses large burst mode data transfer of up to 1.6GHz. It is import to know that RDRAM technology helps set up a system level improvement, not just a component upgrade.

RIMM (Rambus Inline Memory Module)

RIMM is built with a 184-pin architecture module that supports RDRAM memory technology. A RIMM memory module may contain up to maximum of 16 RDRAM devices.

SDRAM (Synchronous DRAM)

SDRAM is one of the Dynamic Random Access Memory (DRAM) technologies that allow DRAM to use the same clock as the CPU host clock (EDO and FPM are asynchronous and do not have clock signal). SDRAM comes in 64-bit 168-pin DIMM and operates at 3.3V.

SIMM (Single In Line Memory Module)

SIMM socket is only 72-pin, and is only single side. The golden finger signals on each side of PCB are identical. That is why it is called Single In Line. SIMM is made of FPM or EDO DRAM and supports 32-bit data. SIMM is phased out in current mainboard design.

SPD (Serial Presence Detect)

SPD is a small ROM or EEPROM device resided on the DIMM or RIMM. Memory module information such as DRAM timing and chip parameters can be stored into SPD so that BIOS can access it and use it to decide best timing for this DIMM or RIMM.

UART (Universal Asynchronous Receiver/transmitter)

UART is built in a chip that controls the data sent to and received from a serial port. A 16550 UART is now standard in most PCs, and supports modem speed up to 57,600 bps and beyond and direct connect speed of 115,200 bps. Many UARTs have built-in errors in the internal code and just do not work correctly with many external modems. UART is also found as the serial interface on internal modem.

Ultra DMA

Ultra DMA (or, more accurately, Ultra DMA/33) is a protocol for transferring data at 33.3MB/s between a hard disk drive through the computer's data path (or bus) to the computer's random access memory (RAM). The transfer data is twice as fast as the previous Direct Access Memory (DMA) interface. The latest Ultra DMA has advanced to Ultra DMA/66 and Ultra DMA/100.

16.6MB/s x2 = 33MB/s

16.6MB/s x4 = 66MB/s

16.6MB/s x6 = 100MB/s

USB (Universal Serial Bus)

USB is a 4-pin serial peripheral bus that is capable of cascading low/medium speed peripherals (less than 10Mbit/s) such as keyboard, mouse, joystick, scanner, printer and modem.

VCM (Virtual Channel Memory)

NEC's Virtual Channel Memory (VCM) is a new DRAM core architecture that dramatically improves the memory system's ability to service multimedia requirements. VCM increases memory bus efficiency and performance of any DRAM technology by providing a set of fast static registers between the memory core and I/O pins. Using VCM technology results in reduced data access latency and reduced power consumption.

VRM (Voltage regulator Module)

This is a small module installed on a mainboard to regulate the voltage fed to the processor on board. Voltage regulator can be built on board in various way. VRM is a socketed type of regulator module which is easier to change when needed.

Zero Wait State

When memory is operating at its fastest speed in its course of fetching and yielding data, it allows no "no-op" cycle and is called in a zero wait state. On the other hand, a memory is in a wait state, after it gets a command to fetch data, it waits for one, two or more cycles to assure that the expected data is in the buffer.

ZIP file

Zip file is a compressed file with a reduced file size.

Zoom

To zoom is to make a window or screen larger or smaller in a Graphical User Interface of a computer system. Usually, to "zoom in" means to enlarge, and to "zoom out" means to reduce size.

Memo