



Mainboard

Series SL-85DRV

User Manual V1.1

**SL-85DRV
SL-85DRV⁺**

**SL-85DRV-X
SL-85DRV⁺-X**

NOTICE

Product Model : Series SL-85DRV
Manual Revision : V1.1
Release Date : October 2001



This Users Guide & Technical Reference is to help system manufacturers and end-users set up and install the mainboard.

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ITEM CHECKUP

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

Chapter 1 Specification

Introduction

This series of mainboards features an integration of the powerful processor Intel Pentium 4 and the single-chip North Bridge VIA P4X266. The Intel P4 processor is a rapid execution engine providing 400MHz quadpumped system bus to allow 3.2GB data transfer rates possible, while VIA Apollo P4X266 North Bridge plus VT8233 South Bridge support Intel P4 processor to execute the 400MHz FSB, the AGP 4X external bus, the LPC Super I/O and the DDR SDRAM data transfer. This chapter is to introduce to users every advanced function of this high performance integration.

Topics included in this chapter are:

1-1 Mainboard Specifications

1-2 Mainboard Layout

1-3 Mainboard Specification Table

1-4 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;
 - Hyper pipelined technology;
 - Advanced dynamic execution;
 - Advanced transfer cache;

1-1.2 System Chipsets

- North Bridge VT8753 (P4X266) plus South Bridge VT8233 to work with Intel Pentium 4 Processor for managing and arbitrating operations between all system interfaces:

1-1.3 Memory

- 3 DDR DIMM 184-pin sockets on board for PC2100/1600 DDR SDRAMs, supported by 2.5V default voltage (DIMM voltage selectable in BIOS setup):
- VT8753 directly supporting pseudo-synchronous SDRAM transfer rate 100/133MHz up to 1.5GB unbuffered DDR SDRAMs or 3GB registered DDR SDRAMs.
 - Installation of mixed sizes of DDR SDRAM modules supported .

1-1.4 AWARD BIOS V6.0

- Supporting Plug & Play V1.0;
- Flash Memory for easy upgrade;
- Supporting BIOS writing protection and Year 2000 compliant;
- BIOS Setup supported (Please see Chapter 4 BIOS Setup);

1-1.5 Accelerated Graphics Port (AGP) Interface

AGP Controller is embedded on VT8753, supporting:

- 1.5V/4X, 3.3V/2X power mode , AGP voltage selectable in BIOS Setup;
- 2x/ 4x AD and SBA signalling, AGP pipelined split-transection long-burst transfers up to 1GB/sec.;
- AGP v2.0 compliant;

1-1.6 Advanced system Power Management, supporting:

- ACPI 1.0B compliant (Advanced Configuration and Power Interface);
- APM V1.2 compliant (Legacy power management);
- ACPI STR mode (Suspend To RAM) , POS (Power On Suspend) and STD (Suspend to Disk);
- PS/2 Keyboard & Mouse power on;
- Wake On Modem and Wake On LAN;
- Real time clock (RTC) with date alarm, month alarm, and century field.
- USB wake-up Function;

1-1.7 Multi-I/O Functions:

- PCI EIDE Controller, supporting:
 - 2x Ultra ATA100 / 66 / 33 IDE Connectors supporting up to 4 IDE devices;
- Promise RAID IDE Controller:
 - Supporting other two Ultra ATA-100 / 66/ 33 IDE Connectors up to 2 RAID disks (on SL-85DRV* and SL-85DRV*-X only)
- Dedicated IR Functions:
 - 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 Data transfer:
 - Standard mode, ECP and EPP support;
- Floppy Disk connector:
 - One FDD connector with drive swap support;
- Universal Serial Bus Transfer Mode:
 - USB V1.1 compliant;
 - 2 built-in USB connectors and two USB Headers (USB2, USB3) which require two optional USB cables to provide 4 more optional USB ports;
- PS/2 Keyboard
- PS/2 Mouse
- UARTs (Universal Asynchronous Receiver / Transmitter):
 - Two complete Serial Ports (COM1 & COM2) on board;

1-1.8 Expansion Slots

- Six PCI bus Master slots;
- One AGP 4x/2X slot;
- One CNR slot (supporting Modem / Audio Riser only);
- Three DDR DIMM slots;

1-1.9 Hardware Monitor on board

- 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:
 - 9 voltages, 2 types of hardware temperatures, 2 Fan speeds;

1-1.10 AC'97 Audio Codec on board

- AC'97 Audio codec supported by AC97 Link on chip VT8233;

1-1.11 CNR Slot on board

- CNR Slot on board for Modem Riser card or Audio Riser Card;

1-1.12 Disk RAID (Redundant Array of Independent Disks)

On SL-85DRV⁺ and SL-85DRV⁺-X only.

- Promise FastTrak100-Lite RAID controller on board.
- Supporting striping (RAID 0) and mirroring (RAID 1) Disk Arrays.
- Supporting Ultra ATA/100 / 66 /33 specification up to 100MB/sec.
- Two RAID Connectors IDE3 and IDE4 on board, compatible with Ultra ATA/100/66/33 and EIDE, supporting up to 2 RAID disks.

1-1.13 Voice Diagnostic Technology

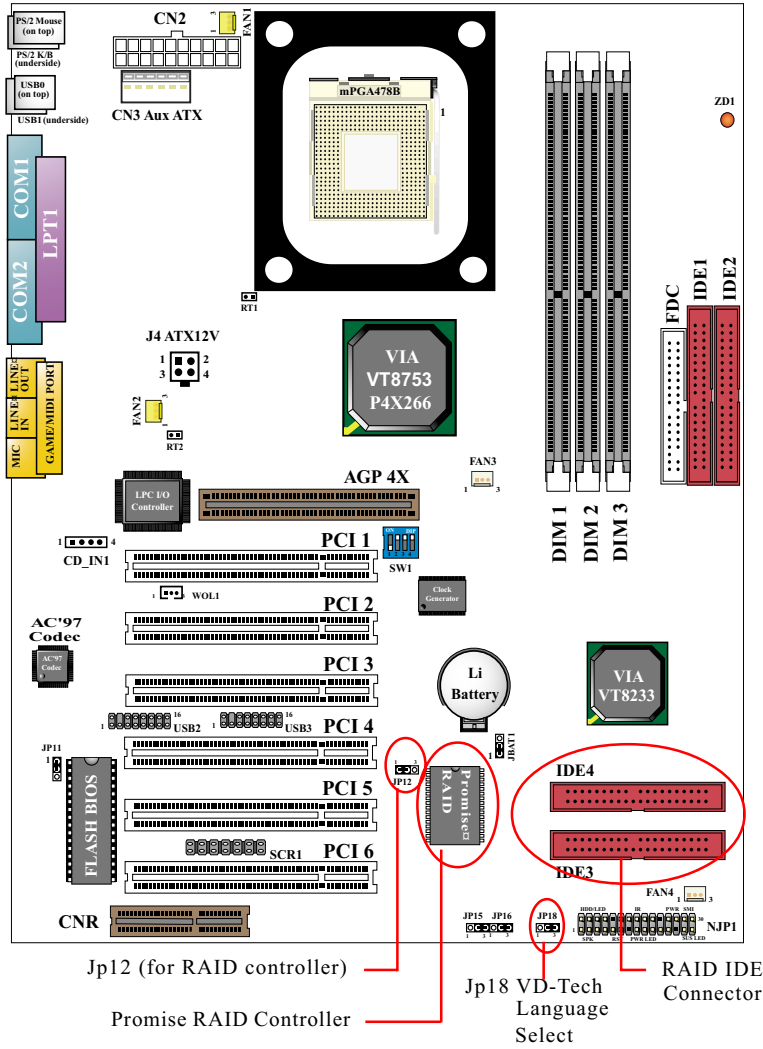
On SL-85DRV-X and SL-85SD⁺-X only:

- A Voice Diagnostic Function is incorporated in "Advanced BIOS Features" of the "Award BIOS Setup" as "VD-Tech II Function". With this function enabled in "Advanced BIOS Features", it will voice out the problems or conflicts whenever user configures the components or boots up the PC system.
- The voice can be in Chinese or English, depending on the setting of Jumper JP18. Changing the setting of JP18 will change the language of the voice.

1-1.14 Form Factor

- ATX form factor, ATX spec. version 2.03 compliant, supported by one Main Power Connector, one +12V Power Connector and one Aux Power Connector;
- Mainboard size: 305mm x 245mm;

1-2 Series SL-85DRV -- Layout with Optional Features



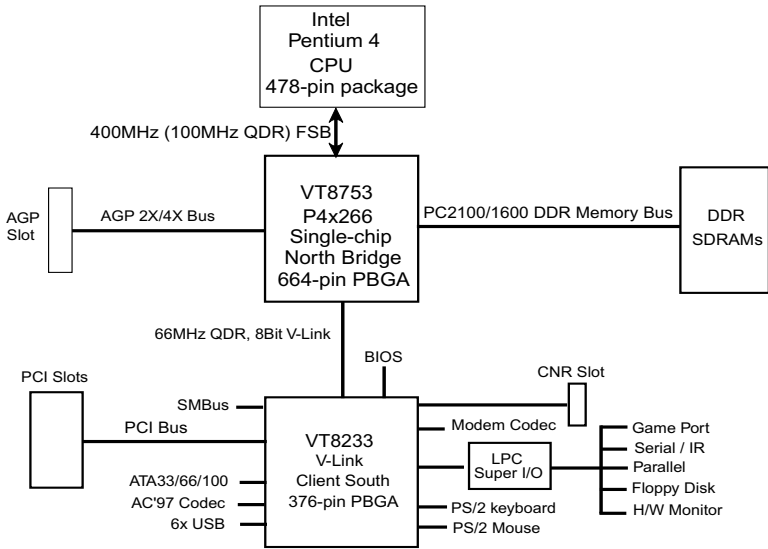
Optional features of Series SL-85DRV:

| Feature | 85DRV | 85DRV-X | 85DRV+ | 85DRV+-X |
|------------|-------|---------|--------|----------|
| VD-Tech II | No | Yes | No | Yes |
| IDE RAID | No | | Yes | |

1-3 Mainboard Specification Table

| Series 85DRV | 85DRV | 85DRV-X | 85DRV ⁺ | 85DRV ⁺ -X |
|--|--|---------|--------------------|-----------------------|
| Memory Controller Hub | VIA VT8753 P4x266 North Bridge | | | |
| I/O Controller Hub | VIA VT8233 South Bridge | | | |
| CPU Socket | Socket PGA478B for Intel Pentium 4 478-pin package CPU | | | |
| Memory | Supporting Registered/3GB or unbuffered/1.5GB DDR SDRAMs with 3 DDR DIMM Slots | | | |
| I/O Chip | ITE IT8705F | | | |
| Audio | AC'97 Audio Codec | | | |
| Onboard IDE | 2 x ATA 33/66/100 IDE ports | | | |
| AGP Interface | AGP 4X Mode | | | |
| Onboard IDE RAID Controller, 2xATA 33/66/100 RAID ports for 2 RAID disks | No | | Yes | |
| I/O Connectors | 6 x USB ports, 1 x FDD port, 2 x COM ports, 1 x LPT port, 1 IrDA, 1 PS/2 Mouse, 1 PS/2 K/B | | | |
| PCI slot | 6 PCI Master Slots | | | |
| CNR slot | 1 x CNR slot | | | |
| Bilingual VD-Tech II (Voice diagnostic Tech.) | No | Yes | No | Yes |
| Hardware Monitoring | Yes to all members | | | |
| BIOS writing Protection | Yes to all members | | | |
| Keyboard power on function & USB wake up Function | Yes to all members | | | |
| SCR Interface | Yes to all members | | | |

1-4 Chipset System Block Diagram
 (with respect to Series SL-85DRV)



Intel Pentium 4 + VIA VT8753 + VT8233 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 on board, 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 HDD/FDD Installation

2-5 AGP 4X (Accelerated Graphic Port) Installation

2-6 ATX 2.03 Power Supply Installation

2-7 Jumper Settings for Devices on board

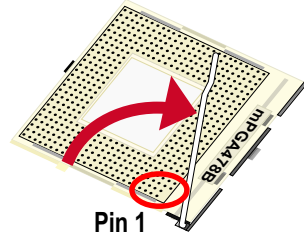
2-8 Other Connectors Configuration

2-1 CPU Pentium 4 Installation with Socket 478

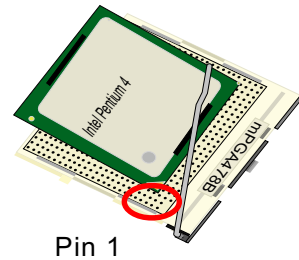
This series of mainboards is built with CPU Socket 478 (with 478 pins) supporting the Intel Pentium 4 CPU:

- 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.

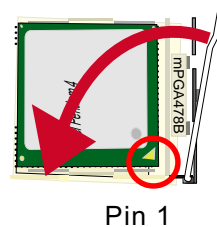
1. First pull sideways the lever of Socket 478, and then turn it up 90° so as to raise the upper layer of the socket from the lower platform.



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 get into the socket with ease.



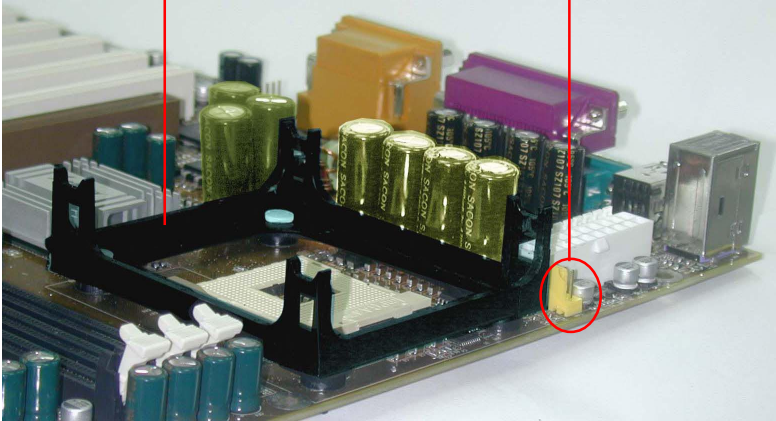
3. Make sure that all CPU pins have completely entered the socket and then lower down the lever to lock up CPU to socket.



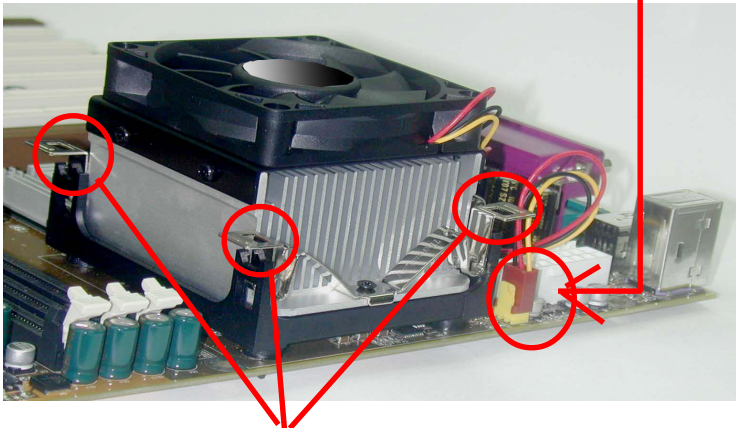
2-2 Pentium 4 CPU Fan Installation:

Pentium 4 Fanbase

CPU Fan Connector



Connect to CPU FAN connector



Press down 4 latches to lock fan to fanbase

2-3 Memory Installation

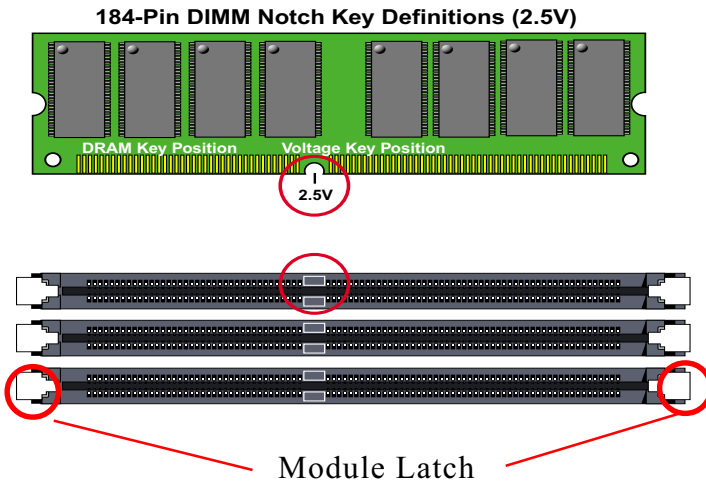
How to tackle with the memory Modules:

- Make sure to unplug your power supply before adding or removing memory module. Failure to do so may cause severe damage to both your main board 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 DDR SDRAM Module for this Series :

- This series of mainboards only supports up to 3GB registered DDR SDRAM or 1.5GB unbuffered DDR SDRAM, with 3 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.



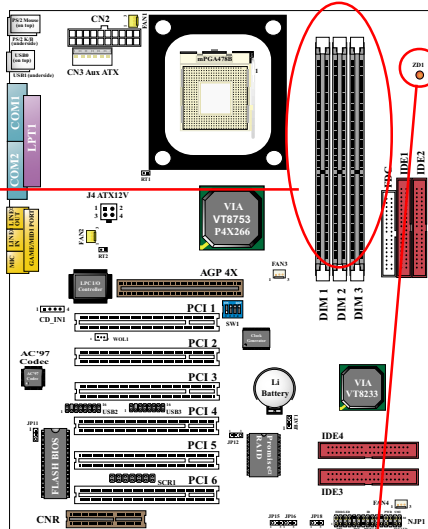
2-3.2 To Remove a DIMM:

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

2-3.3 Indicator ZD1 DIMM Socket On:

An indicator ZD1 is designed on board. Whenever system is started or is in STR status (Suspend to RAM), all the DIMM sockets on board will also get powered on with the set voltage, resulting in ZD1 lighting up. This ZD1 indicator is to warn users that, whenever DIMM socket is powered, no memory module should be removed from or added into it.

DDR DIMM Sock-
ets (184-pin)

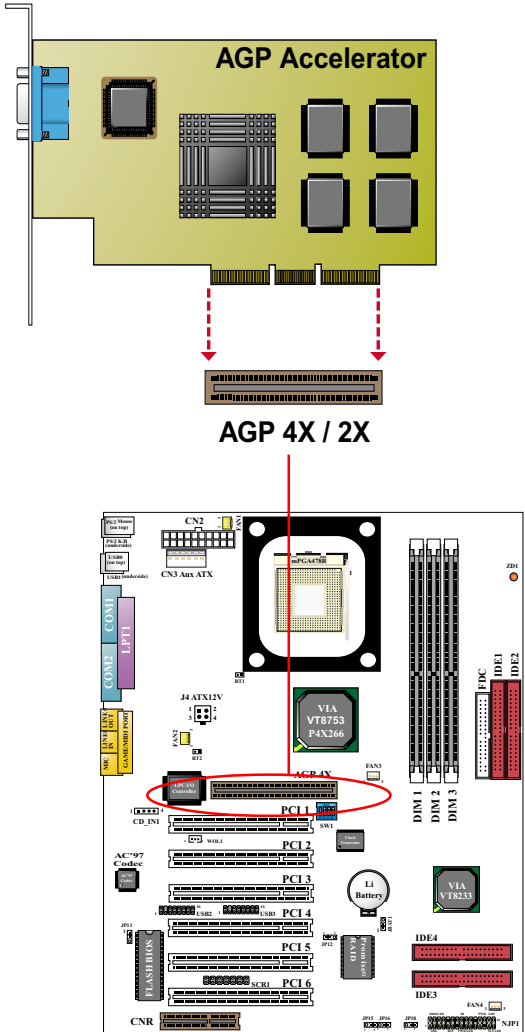


ZD1

DIMM Power On Indicator

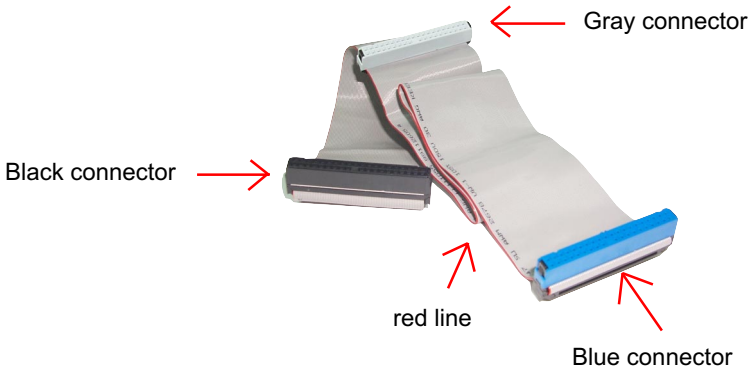
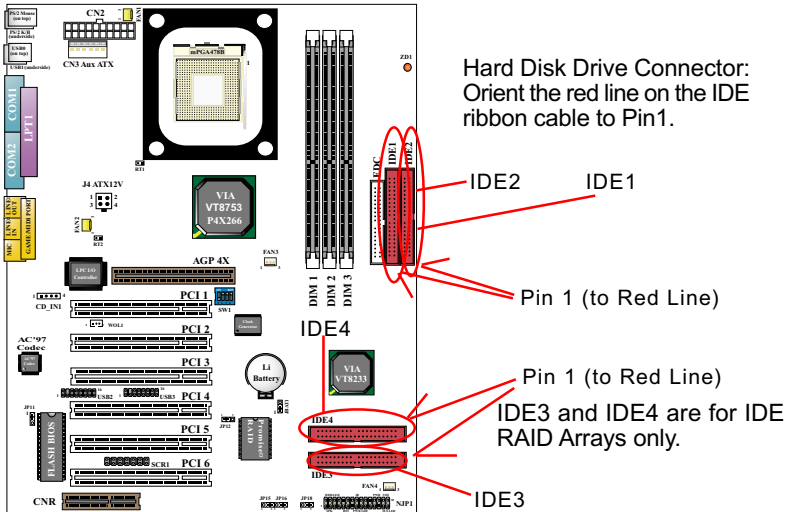
2-4 AGP 4X (Accelerated Graphics Port) Card Installation :

The AGP 4X slot on board supports 4X / 2X AGP card configuration. User can install either a 4X or 2X AGP card.



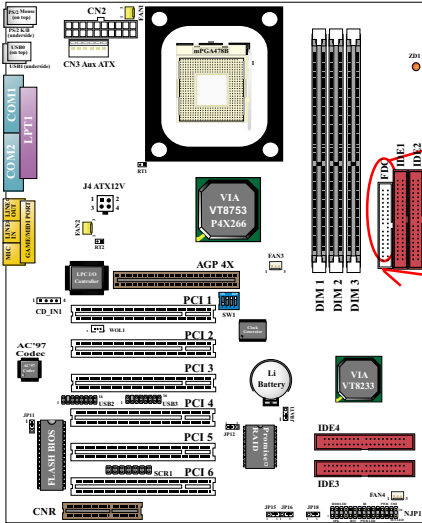
2-5 HDD/FDD Installation

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.



IDE Cable

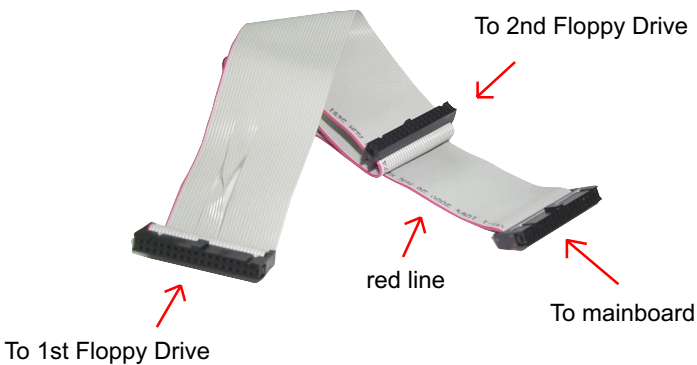
To install FDD (Floppy Disk Drive), you should connect the end of cable with single connector to the board, and connect the other end with two plugs to the floppy drives.



FDC

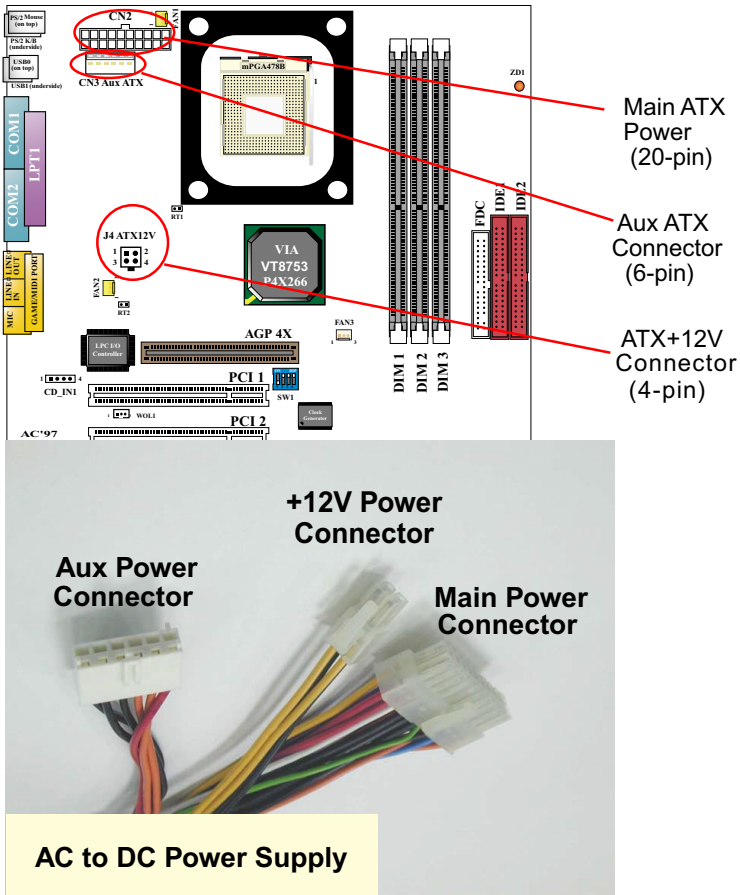
Pin 1 (to Red Line)

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



FDD Cable

2-6 ATX V 2.03 Power Supply Installation



Intel Pentium 4 requires ATX V2.03 Power Supply. To set up ATX2.03 Power Supply on this series, 3 ATX power connectors are needed:

1. Main ATX Power Connector to Main Power DC output of Power Supply;
2. Aux ATX Connector to Aux Power DC output of Power Supply;
3. ATX +12V Connector to +12V DC output of Power Supply;

2-7 Jumper and Switch Settings

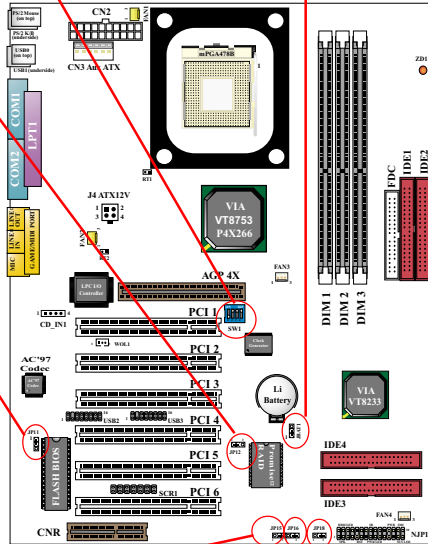
The following diagrams show the locations and settings of jumper blocks on the mainboard.

| | | | | | |
|-----------------|-----|------------------|-----|----|----|
| SW1 | On | CPU Clock Select | | | |
| | Off | 1 2 3 4 | | | |
| | | Off | On | On | On |
| | | (Default) | | | |
| CPU clock (MHz) | S1 | S2 | S3 | S4 | |
| 100 (default) | off | on | on | on | |
| 103 | off | on | off | on | |
| 107 | on | off | off | on | |
| 110 | off | off | off | on | |
| 133 | on | off | on | on | |

| | |
|----------------------------|----------------------|
| JBAT1 | |
| 1 | 2-3 closed |
| To clear CMOS | |
| 1 | 1-2 closed (default) |
| To return to normal status | |

| | |
|------------------------|-------------------|
| Jp12 | |
| RAID Controller Select | |
| 1 | Enabled (default) |
| 1-2 closed | |
| 1 | Disabled |
| 2-3 closed | |

| | |
|----------------------------|-------------------|
| Jp11 | |
| Flash ROM Write Protection | |
| 1 | 1-2 closed |
| | Enabled (default) |
| 1 | 2-3 closed |
| | Disabled |




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.

2-7.1 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 |  | | | |
| | Off | CPU Clock Select | | | |
| | | 1 | 2 | 3 | 4 |
| | | Off | On | On | On |
| | | | | | (Default) |
| CPU clock (MHz) | S1 | S2 | S3 | S4 | |
| 100 (default) | off | on | on | on | |
| 103 | off | on | off | on | |
| 107 | on | off | off | on | |
| 110 | off | off | off | on | |
| 133 | on | off | on | on | |

• Advice from our Engineering Team:



CPU Overclocking should always take all other components on board into account. No matter what Host clock your CPU has, any attempt to set your CPU to higher clock than the host one will get no guaranty of success. Instead, you are taking the risk of breaking the stability of your CPU as well as the mainboard.

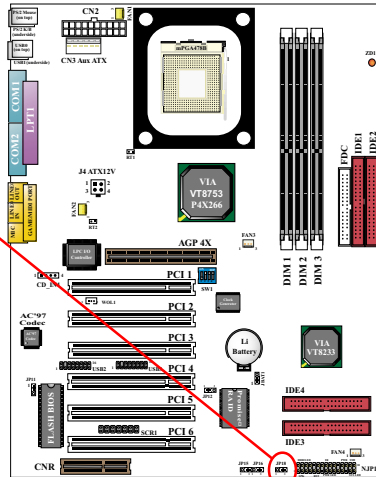
2-7.4 Jp18 Voice Diagnostic Language Select

On board SL-85DRV-X, and 85DRV⁺-X.

- A Voice Diagnostic Function is incorporated in “Advanced BIOS Features” of the “Award BIOS Setup” as “VD-Tech II Function”. With this function enabled in “Advanced BIOS Features”, it will voice out the problems or conflicts whenever user configures the components or boots up the PC system.
- The voice can be in Chinese or English, depending on the setting of Jumper JP18. Changing the setting of JP18 will change the language of the voice.

| English Voice Content | |
|-----------------------|---|
| 1. | The Processor might be damaged or not installed properly. |
| 2. | The memory module might be damaged or not installed properly. |
| 3. | The VGA card might be damaged or not installed properly. |
| 4. | The IDE cable might be damaged or not installed properly. |
| 5. | Please clear CMOS setting. |
| 6. | System available. |
| 國語語音內容 | |
| 1. | 中央處理器可能損壞或未插好 |
| 2. | 記憶體模組可能損壞或未插好 |
| 3. | 顯示卡可能損壞或未插好 |
| 4. | IDE排線可能損壞或未插好 |
| 5. | 請清除CMOS設定 |
| 6. | 系統開機成功 |

| Jp18 VD-Tech II Language Select | |
|---|-------------------|
| 1  | Chinese |
| 1-2 closed | |
| 1  | English (default) |
| 2-3 closed | |



2-7.5 Jp16 Suspend to RAM (STR)

Jp16 is designed to support the S3 mode (Suspend to RAM) of ACPI (Advanced Configuration and Power interface) which is usually integrated in such operating systems as Win 98se or Win 2000.

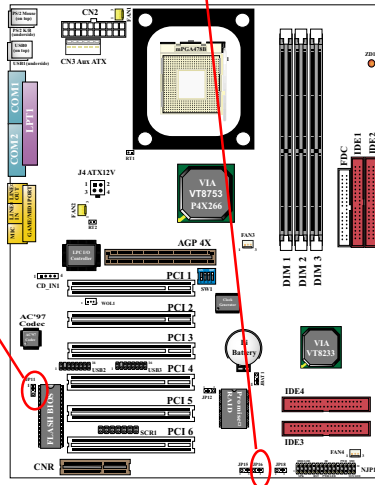
- To enable the STR function, you must first set up Jp16, and then enter "BIOS Setup", then "Power management Setup" to choose the item "ACPI Suspend Type". In this item, choose S3(STR) mode to enable Suspend to RAM function.
- With STR enabled, you power off your system with Standby mode, and you can reboot your system directly to the screen of power-off without going through the reboot procedures.

| Jp16 Suspend to RAM | | |
|------------------------|--|------------------------------|
| 1 | | 1-2 closed Disabled |
| 1 | | 2-3 closed Enabled (default) |

2-7.5 Jp11 Flash ROM Write Protection Select

Jp11 is designed to support the "Flash ROM write Protection" function when you boot your system. Setting Jp11 1-2 closed will protect your Flash ROM from virus attack every time you boot your system.

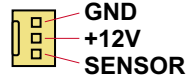
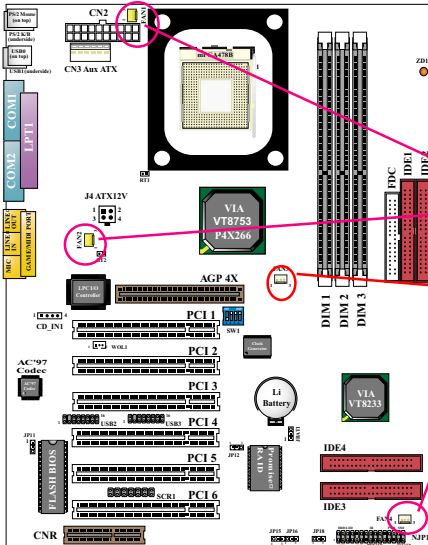
| Jp11 Flash ROM Write Protection | | |
|---------------------------------|--|------------------------------|
| 1 | | 1-2 closed Enabled (default) |
| 1 | | 2-3 closed Disabled |



2-8 Other Connectors Configuration

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

2-8.1 On Board FAN Connectors (FAN1,FAN2, FAN3)



CPU FAN Connector (FAN1, yellow, sensor):

System FAN Connector (FAN2, yellow, sensor):

AGP FAN Connector (FAN3, white, no sensor):

Chassis FAN Connector (FAN4, white, no sensor):

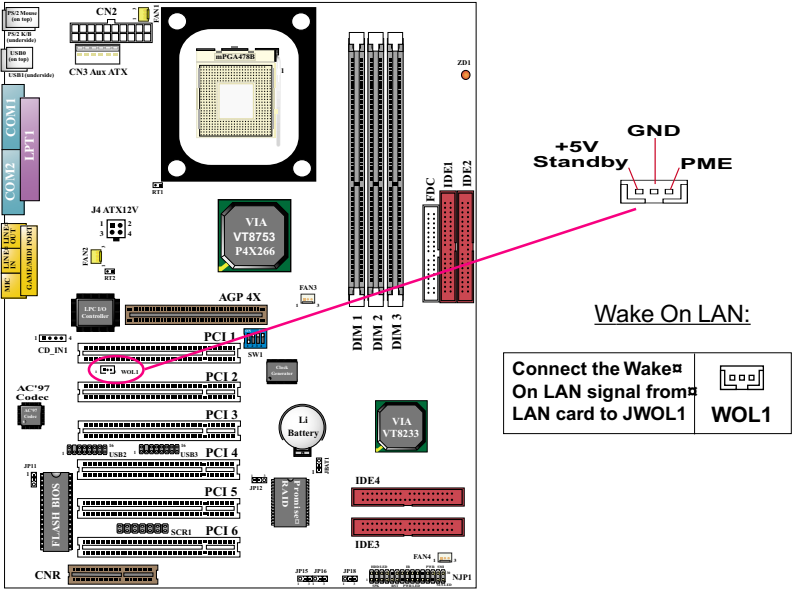
| | | |
|-------------|--|------|
| CPU FAN | | FAN1 |
| SYSTEM FAN | | FAN2 |
| AGP FAN | | FAN3 |
| Chassis FAN | | FAN4 |

These fan connectors support CPU/System/AGP/Chassis cooling fan with +12V. When connecting the wire to FAN connectors, users should make sure 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 the monitoring 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 : 2 “Yellow” fan connectors are used on this series to mark that they support fan speed sensor function. The other two white fan connectors do not support sensor function.

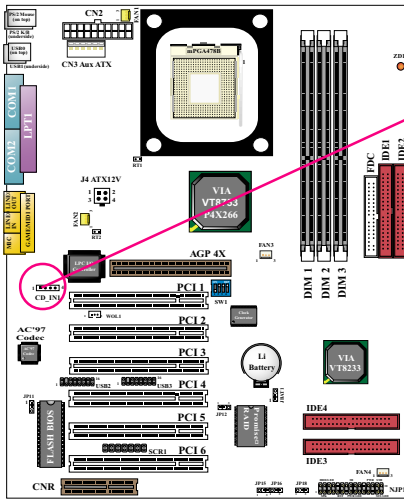
2-8.2 WOL1 Wake On LAN



This connector connects to a LAN card with a Wake On LAN output. The connector powers up the system when it receives a wake-up packet or signal through the LAN card.

This feature requires that Wake On LAN feature is enabled in the BIOS setting called **“Power Management Setup”** and that your system must be on ATX power supply with at least **720mA / +5V** standby power.

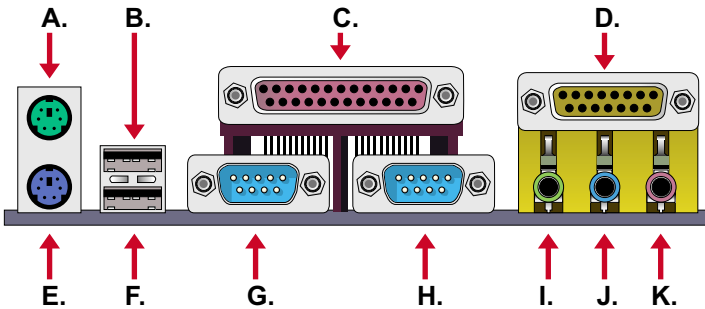
2-8.3 CD-ROM Audio Connector (CD_IN1/CD_IN2)



CD-ROM Audio Pin Assignment

| PIN NO. | CD_IN1 |
|---------|---------------|
| PIN 1 | Left Channel |
| PIN 2 | GND |
| PIN 3 | GND |
| PIN 4 | Right Channel |

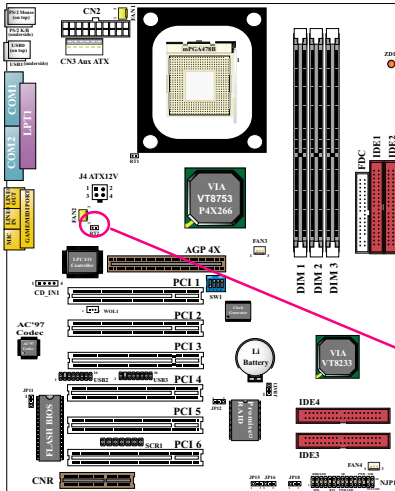
2-8.4 Chassis Panel Connector



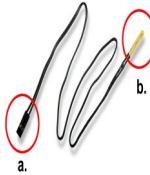
- A : PS/2 MOUSE PORT
- B : USB 0 PORT
- C : LPT1 PORT
- D : GAME/MIDI PORT
- E : PS/2 KEYBOARD PORT
- F : USB 1 PORT

- G : COM1 PORT
- H : COM2 PORT
- I : LINE/SPEAKER OUT
- J : LINE IN
- K : MICROPHONE INPUT

2-8.5 Thermal Sensor Connector (RT2)



Thermal Sensor Connector (RT2):

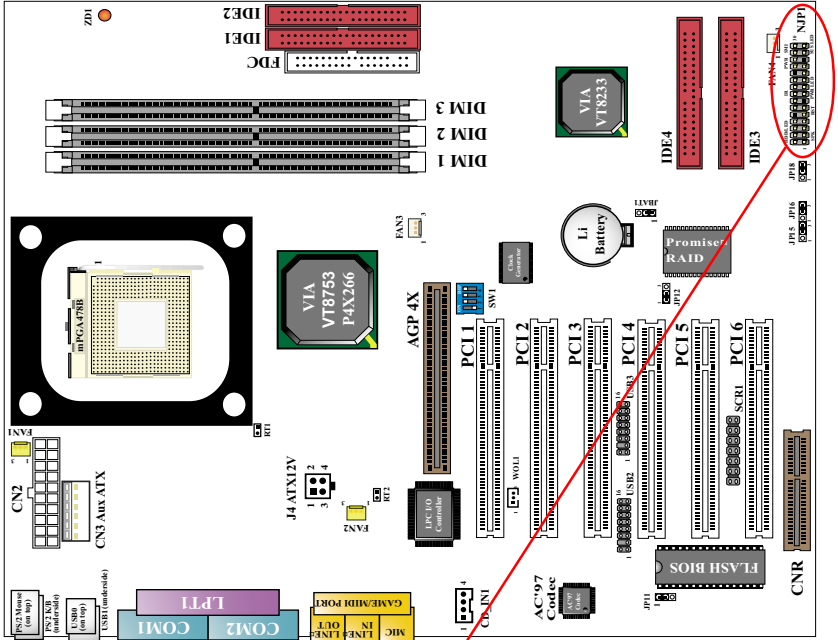
| RT2: THERMAL SENSOR CONNECTOR | |
|---|---|
|  | <p>a: Connect to RT2. b: Connect this thermal sensor to particular device which generates lots of heat such as Hard Driver, VGA chip, etc. When connected, user could observe the temperature change from the BIOS program.</p> |



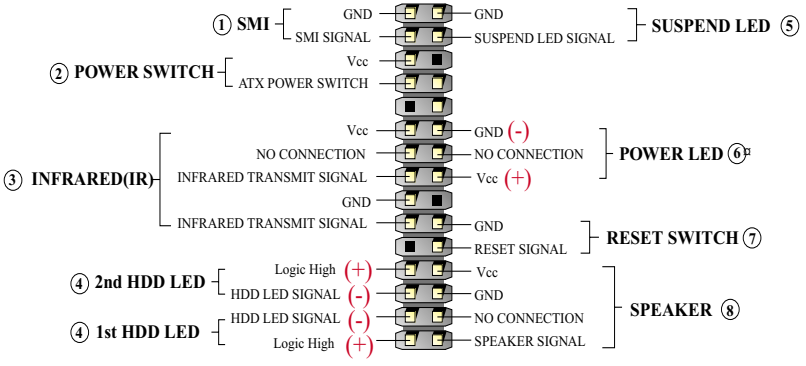
We provide a thermal cable in the mainboard package. This thermal cable is to monitor device generating a lot of heat, such as HDD, Graphics card etc. Please connect the end (a) of the thermal cable to mainboard RT2 header, and tape another end (b) of thermal cable on to the device which you want to monitor. After you have finished the thermal cable installation, you will see the detected temperature in BIOS setup or Hardware monitor utility.

2-8.6 Complex Header NJP1

This complex Header consists of 9 connectors providing various supports:



NJP1



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. Power LED Connector:

CONNECTION: Connected to System Power LED.

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

7. Reset Switch Connector:

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

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

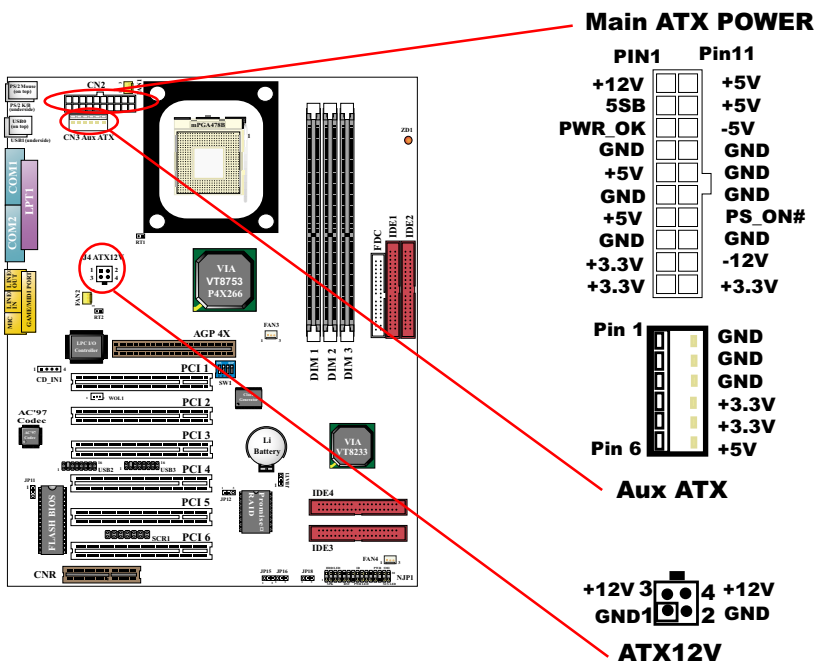
8. Speaker Connector:

CONNECTION: Connected to the case-mounted Speaker.

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

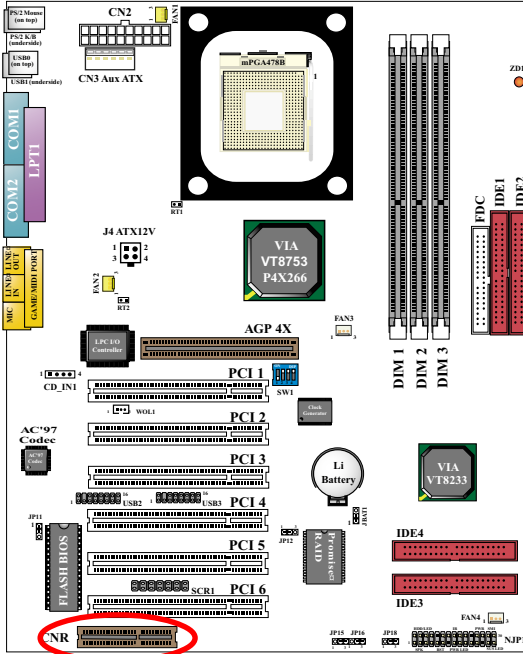
2-8.7 ATX Power Supply Connectors for Pentium 4

- ATX 2.03 Power supply connectors consists of 3 main connectors:
 - (1) Main ATX Power Connector;
 - (2) Aux Power Connector: a 6-pin connector supporting +3.3V and +5V;
 - (3) +12V Power Connector: a 4-pin connector supporting +12V;
- All these three connectors should be connected to an AC to DC Power Supply which supports ATX Power version 2.03.



2-8.8 Communication And Networking Riser Slot (CNR)

This slot on this series of mainboards allows you to use modem or audio riser card only.



CNR slot

Note:

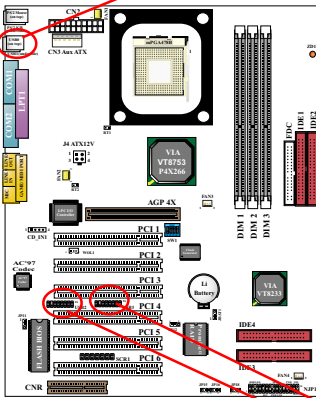
1. If modem CNR card is installed, it must be set as "primary" mode.
2. LAN CNR is not supported on this series of mainboards.
3. If audio CNR card is installed and the on chip AC'97 is enabled at the same time, the Audio CNR must be set as "secondary".
4. CNR card is not to be included in the package of this series.

2-8.9 USB Ports and USB Headers (Header USB 2 & 3)

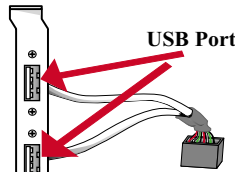
This series of mainboards provides two USB ports USB0 and USB1 on board supporting various USB devices. In addition, 2 USB headers are added on board to provide four additional USB ports by using two additional USB Cables. User can order the additional USB cables from your mainboard dealers or venders.

When plugging the USB cable into Header USB2 / 3, user must make sure the red wire is connected to Pin 1.

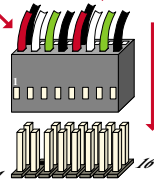
USB Ports USB 0 & 1



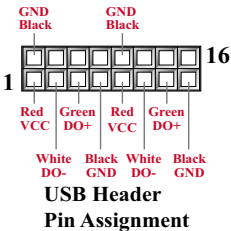
Additional USB Cable (Optional)



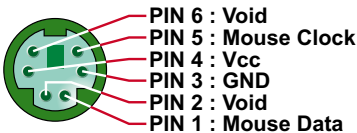
Red wire



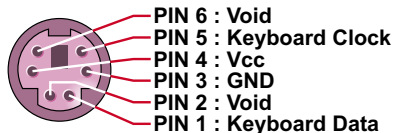
Header USB 2 & 3



2-8.10 PS/2 Mouse And PS/2 Keyboard



PS/2 MOUSE



PS/2 KEYBOARD

2-9 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 | Free | 13 |
| IRQ 6 | Floppy Disk Controller | 14 |
| IRQ 7 | Parallel Port (LPT1) | 15 |
| IRQ 8 | Real Time Clock (RTC) | 3 |
| IRQ 9 | Free | 4 |
| IRQ 10 | Free | 5 |
| IRQ 11 | Free | 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 this series, user will be able to find in the Support CD the following drivers and utilities supported by Chipset VIA Apollo P4X266:

1. VIA 4-in-1 Drivers;
2. AC'97 Drivers;
3. Hardware Monitor Utility;

- Optional Floppy Diskette:

For SL-85DRV⁺ and SL-85DRV⁺-X, a floppy diskette containing Promise RAID Drivers will also be added to the package for the IDE RAID setup.

This chapter is devoted to describing the installations of all these essential drivers and utilities on Windows 9X, Windows ME and Windows 2000. The installation procedures for all these operating systems are programed into an auto-run mode. What users have to do is 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. On occasion of RAID Drivers installation where different status of your operating systems requires different installation procedures, we also insert respective installation procedures for various operating systems.

The priority of driver installation should also be noted. Users are recommended to take the following installation order:

3-1 Open Support CD and choose your drivers

3-2 4-in-1 Drivers Installation

3-3 AC'97 Audio CODEC Drivers Installation

3-4 Hardware Monitor Utility Installation

3-5 Promise RAID Drivers Installation

(for SL-85DRV⁺ and SL-85DRV⁺-X only)

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:

Install VIA 4in1 Driver
Install VIA AC'97 Audio Driver
Install 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:

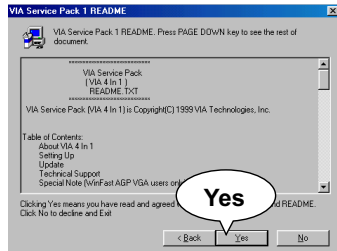
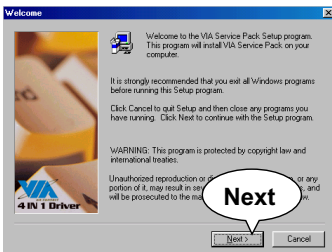
D:\Autorun.exe (assuming that your CD-ROM Drive is Drive D)

- (3) Users are recommended to install all the drivers and utilities at a time, though they can be installed separately. Also, we should take "VIA 4in1 Driver" as first installation priority to optimize the VIA system.

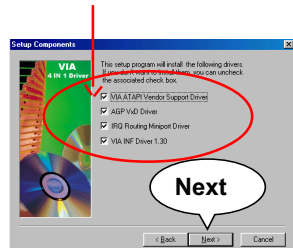
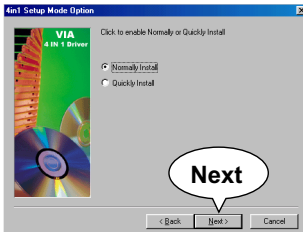
From next section, we provide detailed descriptions of all these installations with graphical illustrations.

3-2 Proceed to VIA 4-IN-1 Drivers Installation

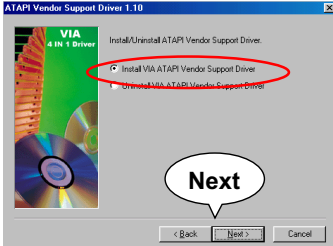
1. Following the procedures of opening the Support CD, click to “VIA 4in1 Drivers” to proceed.
2. The VIA Service Pack InstallShield Wizard will pop up to guide you to the VIA Service pack installation. Click “Next” button to continue.
3. “VIA Service Pack README” screen will appear, please click the “Yes” button to agree with the Licence Agreement and continue.



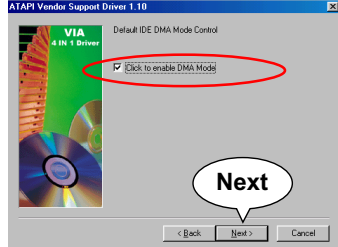
4. On the screen below, check “Normally Install” and click “Next” to continue. (If you check “Quickly Install”, you will skip the detailed procedures of the VIA 4in1 Setup.)
5. Select the checkbox as below and click “Next” to continue:
 - VIA ATAPI Vendor Support Driver
 - AGP VxD Driver
 - IRQ Routing Miniport Driver
 - VIA Chipset Function's Registry



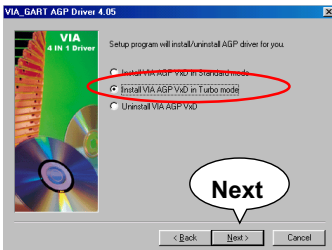
6. Select “Install VIA ATAPI Vendor Support Driver” checkbox, then click the “Next” button to continue.



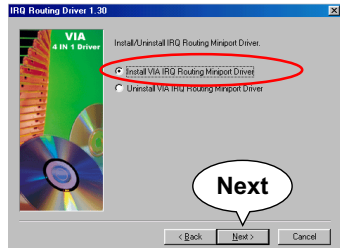
7. Click on “Click to enable DMA Mode” checkbox to enable DMA function, then click the “Next” button to continue.



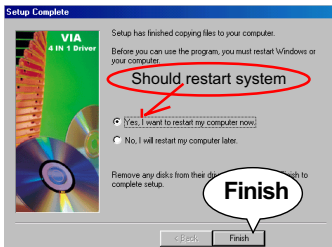
8. Select “Install VIA AGP VxD” in turbo mode and press “Next” button to continue.



9. Select “Install VIA IRQ Routing Miniport Driver” checkbox, then click the “Next” button to continue.



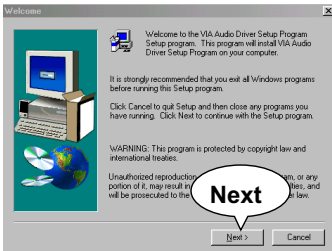
10. After all these setup procedures have finished, you should restart your computer by clicking on “Finish” so as to put VIA 4in1 drivers into effect and proceed to second driver installation.



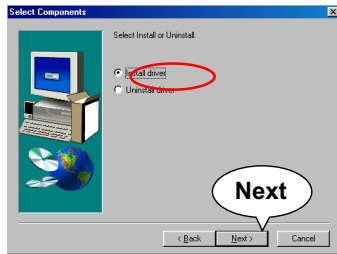
3-3 Proceed to AC'97 AUDIO DRIVER Installation

1. Following the installation of VIA 4in1 drivers, you have to restart system so that your system can be reconfigured with VIA 4in1. When restarting procedures finish, please open the Support CD with your CD-ROM to enter the Main Installation Menu. Then click to "Install VIA AC'97 Audio Driver".

2. The VIA Audio Driver Setup InstallShield Wizard will pop up to guide you to the VIA Audio Driver installation. Press "Next" button to continue.



3. When asked to install or remove the audio driver, please select "Install" and press "Next" button to continue.



4. After all these setup procedures have completed, click to "Finish" button to exit the Installation program.



3-4 Proceed to HARDWARE MONITOR Installation

1. Following the installation of AC'97 driver, you have to install Hardware Monitor manually. Please click to the following path to execute Hardware Monitor installation:

D: \ Hardwaremonitor\ ITE2 \ Install.exe
(assuming that your CD-ROM Drive is Drive D)

2. In case you are already on the Installation Main Menu of the Support CD, please click to the "Install Hardware Monitor". Instantly, a message shows up to inform you of the correct path of installing "Hardware Monitor". Please Exit the message and follow the path as instructed:

For user who wants to install Hardware monitor utility, please install it through this path:

D:\hardwaremonitor\ITE2\install.exe
(assuming that your CD-ROM Drive is Drive D)

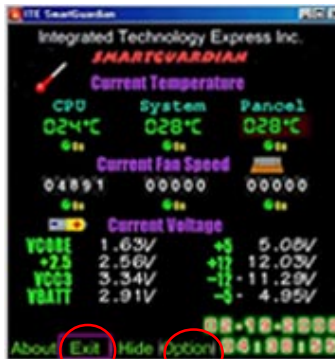
3. Once you enter the path and click to the file "Install.exe". Instantly the "ITE SmartGuardian Install" pops up. Please click to "Install" to continue.



4. In a few seconds, installation of Hardware Monitor is complete. Please click on the “OK” Dialog Box to finish installation.



5. To display the Hardware Monitor Utility, just click on the “ITE SMARTGUARDIAM” icon in your program file, and the following screen of Smartguardian Control Panel will show up, displaying the information about system temperatures, voltages and Fan speed. Clicking to the “Option” menu of the Control Panel, you can also change some Value settings for your system to optimize its performance.





“Exit”

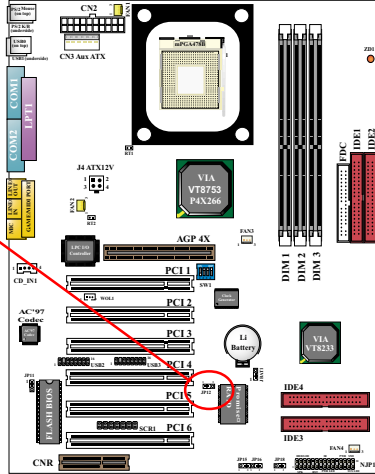
“Option”

3-5 Install Driver for Promise RAID Controller

Promise RAID Controller is built on SL-85DRV⁺ and SL-85DRV⁺-X. Before installing the driver for Promise RAID Controller, please check the following points:

- (1) Set up Jumper Jp12 on board to enable Promise RAID Controller.

| Jp12 | |
|---|------------------------------|
| RAID Controller Select | |
|  | Enabled (default) |
|  | Disabled |



- (2) Get ready the floppy diskette containing the FastTrak100-Lite Drivers for various Windows systems.
- (3) The RAID Controller Drivers installation procedures will differ among different operating systems and situations. Please refer to Chapter 5 of this manual to install your RAID drivers and disk arrays.

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.

This Chapter includes the following topics :

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 **awdflash *.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.

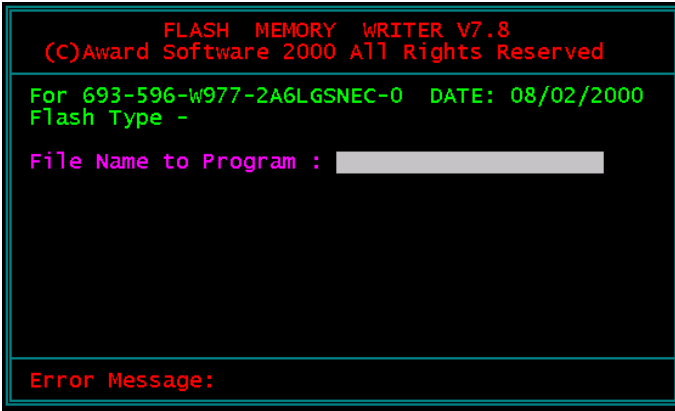
The parameters of AWDFLASH.EXE

/sn: No original BIOS backup

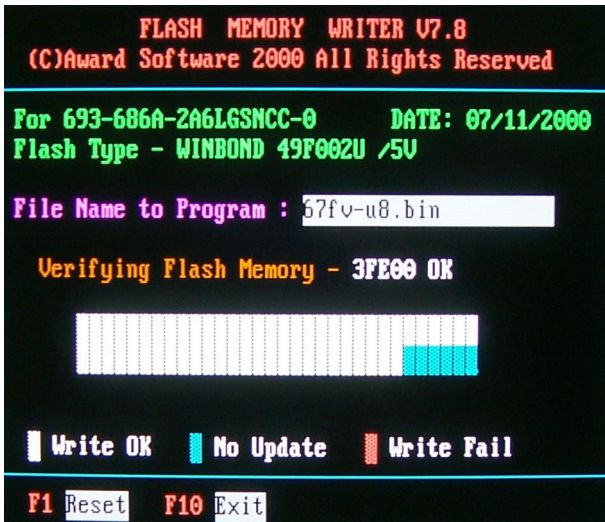
/py: Program flash memory

/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



Award Flash Memory Writer Start Screen



Award Flash Memory Writer Complete Screen

The parameters of AWDFLASH.EXE

/sn: No original BIOS backup

/py: Program flash memory

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

NOTE: 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.

4-6 BIOS SETUP --- CMOS Setup Utility

4-6.1 CMOS Setup Utility

- This Series of mainboards comes with the AWARD BIOS from AWARD Software

Inc. Enter the CMOS Setup Utility Main Menu by:

1. Turn on or reboot your system. After a series of diagnostic checks, the following message will appear:

PRESS TO ENTER SETUP

2. Press the key and the main program screen will appear as follows.

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

| | |
|--|--|
| <ul style="list-style-type: none"> ▶ Standard CMOS Features☐ ▶ Advanced BIOS Features☐ ▶ Advanced Chipset Features☐ ▶ Integrated Peripherals☐ ▶ Power Management Setup☐ ▶ PnP/PCI Configurations☐ ▶ SmartDoc Anti-Burn Shield | <ul style="list-style-type: none"> ▶ Frequency/Voltage Control Load Optimized Defaults Set Supervisor Password Set User Password Save and Exit Setup Exit without Saving |
| <p>Esc☐ : Quit F9 : Menu in BIOS ↑↓→← : Select Item F10☐ : Save & Exit Setup</p> | |
| <p>Time, Date, Hard Disk Type...</p> | |

3. Use the arrow keys on your keyboard to select an option, and press <Enter>. Modify the system parameters to reflect the options installed in your system.
4. You may return to the Main Menu anytime by pressing <ESC>.
5. In the Main Menu, "SAVE AND EXIT SETUP" saves your changes and reboots the system, and "EXIT WITHOUT SAVING" ignores your changes and exits the program.

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) | Wed, Aug 22 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. The following item descriptions are provided as a quick guide to your 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

| | | Item Help |
|------------------------------|----------|--------------|
| VD-Tech II | Enabled | Menu Level ▶ |
| Virus Warning | Disabled | |
| CPU L1 & L2 Cache | Enabled | |
| CPU L2 Cache ECC Checking | Enabled | |
| 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 | Enabled | |
| Boot Up NumLock Status | On | |
| Typematic Rate Setting | Disabled | |
| × Typematic Rate (Chars/Sec) | 6 | |
| × Typematic Delay (Msec) | 250 | |
| Security Option | Setup | |
| OS Select For DRAM > 64MB | Non-OS2 | |
| video BIOS Shadows | Enabled | |
| Small Logo (EPA) Show | 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. The following item descriptions are provided as a quick guide to your 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 additional (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.

- CPU L2 Cache ECC Checking** When you select *Enabled*, it will speed up memory checking when the external cache contains ECC SRAMs.
The choices: Enabled; Disabled.
- 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 in the sequence selected in these items.
The choices: Floppy; LS/ZIP; HDD; SCSI; CDROM; 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.

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.

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.

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.

Video BIOS Shadow Performance will be improved by copying Video BIOS to Shadow RAM.

Small Logo(EPA) Show Enable this item to display the EPA logo (Environmental Protection Association) on the boot up screen.
Default: Disabled.

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:

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

| | | |
|----------------------------|-------------|--------------|
| ▶ DRAM Colck/Drive Control | Press Enter | Item Help |
| ▶ AGP & P2P Bridge Control | Press Enter | Menu Level ▶ |
| ▶ CPU & PCI Bus Control | Press Enter | |
| Memory Hole | Disabled | |
| System BIOS Cacheable | Disabled | |
| Video RAM Cacheable | Disabled | |
| Delay Prior to Thermal | 16 Min | |

↑ ↓ → ← : 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. The following item descriptions are provided as a quick guide to your setup.

DRAM CLOCK/DRIVE CONTROL

- When this option is chosen, the following item appears for user's configuration.

CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
 DRAM Clock/Drive Control

| | | Item Help |
|----------------------------|------------|--------------|
| Current FSB Frequency | | Menu Level ▶ |
| Current DRAM Frequency | | |
| DRAM Clock | By SPD | |
| DRAM Timing | By SPD | |
| × SDRAM CAS Latency | 2 | |
| × Bank interleave | Disabled | |
| × Precharge to Active(Trp) | 3T | |
| × Active to Precharge | 6T | |
| × Active to CMD(Trcd) | 3T | |
| × DRAM Burst Len | 4 | |
| DRAM Command Rate | 2T Command | |

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

* **Current FSB / DRAM Frequency** This item is to show the current FSB / SDRAM Frequency.

* **DRAM Clock** 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 Timing** When this item Enabled, DRAM Timing is set by SPD.
 SPD (Serial Presence Detect) is located on the memory modules, BIOS reads information coded in SPD during system boot up.

* **DRAM Command Rate** The choices: 1T Command; 2T Command.

AGP & P2P BRIDGE CONTROL

- When this option is chosen, the following item appears for user's configuration.

CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
AGP & P2P Bridge Control

| | | |
|-----------------------|----------|--------------|
| AGP Aperture Size | 64M | Item Help |
| AGP Mode | 2X | Menu Level ▶ |
| AGP Driving Control | Auto | |
| × AGP Driving Value | DA | |
| AGP Fast Write | Disabled | |
| AGP Master 1 WS Write | Disabled | |
| AGP Master 1 WS Read | Disabled | |

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

- * **AGP Aperture Size** Series of options are available: 4, 8, 16, 32, 64, 128 or 256 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. The default setting is 64MB.
- * **AGP Mode** This item allows you to select AGP Mode. The choices: 1x, 2x, 4x.
- * **AGP Driving Control** This item allows you to adjust the AGP driving force. Choose Manual to key in a AGP Driving Value in the next selection. This field is recommended to set in Auto for avoiding any error in your system. The choices: Manual; Auto.
- * **AGP Driving Value** This item allows you to adjust the AGP driving force. The choices: Min=0000 ~ Max=00FF.

* **AGP Fast Write** This item will enable the AGP model into fast write mode. If your graphics card does not support this function, please do not enable this function.

* **AGP Master 1 write** Leave this field at default.

* **AGP Master 1 read** Leave this field at default.

CPU & PCI BUS CONTROL

- When this option is chosen, the following item appears for user's configuration.

CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
CPU & PCI Bus Control

| | | |
|-------------------------|---------|--------------|
| CPU to PCI Write Buffer | Enabled | Item Help |
| PCI Master 0 WS Write | Enabled | Menu Level ▶ |
| PCI Delay Transaction | Enabled | |

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

* **CPU to PCI Write Buffer** When this field is Enabled, writes from the CPU to the PCI bus are buffered, to compensate for the speed differences between the CPU and the PCI bus. When Disabled, the writes are not buffered and the CPU must wait until the write is complete before starting another write cycle.
The choices: Enabled; Disabled.

- * PCI Master 0 WS Write** When Enabled, writes to the PCI bus are executed with zero wait states.
The choices: Enabled, Disabled
- * PCI Delay Transaction** Leave this field at default
- Memory Hole** In order to improve performance, certain space in memory is reserved for ISA cards. This memory must be mapped into the memory space below 16MB.
The choices: 15M-16M; Disabled
- System BIOS Cacheable** Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance.
- 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.
- Delay Prior to Thermal** This item is to set the delay time before the function of CPU Therm-Throttling is to be executed.
Choices: 4min; 8min; 16min (default); 32min
-

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:

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

| | | |
|-------------------------|-------------|--------------|
| ▶ VIA OnChip IDE Device | Press Enter | Item Help |
| ▶ VIA OnChip PCI Device | Press Enter | Menu Level ▶ |
| ▶ SuperIO Device | Press Enter | |
| Init Display First | PCI Slot | |
| OnChip USB Controller | All Enabled | |
| USB keyboard Support | Disabled | |
| IDE HDD Block Mode | Enabled | |

↑ ↓ → ←: 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. The following item descriptions are provided as a quick guide to your setup.

VIA ONCHIP IDE DEVICE

- When this option is chosen, the following item appears for user's configuration.

CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
 VIA OnChip IDE Device

| | | |
|-----------------------|---------|--------------|
| OnChip IDE Channel0 | Enabled | Item Help |
| OnChip IDE Channel1 | Enabled | Menu Level ▶ |
| IDE Prefetch Mode | Enabled | |
| Primary Master PIO | Auto | |
| Primary Slave PIO | Auto | |
| Secondary Master PIO | Auto | |
| Secondary Slave PIO | Auto | |
| Primary Master UDMA | Auto | |
| Primary Slave UDMA | Auto | |
| Secondary Master UDMA | Auto | |
| Secondary Slave UDMA | Auto | |

↑↓ → ←: 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 IDE channel 0/1** 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.

- * **IDE Prefetch Mode** The on-board IDE drive supports IDE perfecting for faster drive accesses. If the IDE device doesn't support perfecting, set this field to Disabled.
 The choices: Enabled; Disabled.

*** Primary** Choose Auto or Mode 0~4. The BIOS will detect the
Master / Slave PIO HDD mode type automatically when you choose
Secondary Auto. You need to set to a lower mode than Auto
Master / Slave PIO when your hard disk becomes unstable.
 The choices: Auto; Mode 0; Mode 1; Mode 2; Mode
 3; Mode 4.

*** Primary** Ultra DMA33/66/100 implementation is possible only
Master / Slave UDMA if your IDE hard drive supports it, if the operating
Secondary environment includes a DMA drive, and if your system
Master / Slave UDMA software supports Ultra DMA33/66/100. Select
 "Auto" to enable BIOS support.
 The choices: Auto; Disabled.

VIA ONCHIP PCI DEVICE

- When this option is chosen, the following item appears for user's configuration.

CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
 VIA OnChip PCI Device

| | | |
|----------------------|----------|--------------|
| VIA-3058 AC'97 Audio | Auto | Item Help |
| VIA-3068 MC97 Modem | Disabled | Menu Level ▶ |

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

*** VIA-3058 AC'97 Audio** Select "Disabled" to use the on-chip audio capability of
 your system. Most of the field do not appear when this
 field is "Disabled", for user who wants to use add-on sound
 card, this item must be disabled.

*** VIA-3068 MC97 Modem** This option allows you to decide to enable/disable
 the Onchip Modem.
 The choices: Auto; Disabled.

VIA SUPER IO DEVICE

- When this option is chosen, the following item appears for user's configuration.

CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
VIA SuperIO Device

| | | |
|------------------------|----------|--------------|
| Onboard FDC Controller | Enabled | Item Help |
| Onboard Serial Port 1 | Auto | Menu Level ▶ |
| Onboard Serial Port 2 | Auto | |
| UART Mode Select | Normal | |
| UR2 Duplex Mode | Half | |
| Onboard Parallel Port | 378/IRQ7 | |
| Parallel Port Mode | SPP | |
| ECP Mode Use DMA | 3 | |
| Game Port Address | 201 | |
| Midi Port Address | 330 | |
| Midi Port IRQ | 10 | |

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

- * **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 the system has no floppy drive, select Disabled in this field.
The choices: Enabled; 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.

- * UART Mode Select** The second serial port on your system may offer a variety of infrared port modes. Click here for a description of various modes. (Click your browser's Back button, or your right mouse button, to return to this page.)
The choices: Standard; HPSIR; ASKIR
 - * UR2 Duplex Mode** This item allows you to select the IR half / full duplex function.
The choices: Half; Full.
 - * 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.
 - * ECP Mode Use DMA** Select a DMA channel for the port.
 - * Game Port Address** This item allows you to select the Game Port Address.
The choices: Disabled, 201, 209
 - * MIDI Port Address** Select a DMA channel for the parallel port for use during ECP mode.
The choices: Disabled, 330, 300
 - * MIDI Port IRQ** This item allows you to select the MIDI Port IRQ.
The choices: 5, 10
-

Init Display First Initialize the AGP video display before initializing any other display device on the system. Thus the AGP display becomes the primary display.

OnChip 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.

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.

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:

CMOS Setup Utility - Copyright (C) 1984-2001 Award Software[®]
Power Management Setup

| | | |
|-----------------------------|----------------|--------------|
| ACPI Function | Enabled | Item Help |
| ACPI Suspend Type | S1(POS) | Menu Level ▶ |
| Power Management Option | User Define | |
| HDD Power Down | Disabled | |
| Suspend Mode | Disabled | |
| Video Off Option | Suspend->Off | |
| Video Off Method | V/H SYNC+Blank | |
| MODEM Use IRQ | 3 | |
| Soft-Off by PWRBTN | Instant-Off | |
| PWRON After PWR-Fail | Off | |
| ▶ IRQ/Event Activity Detect | Press Enter | |

↑ ↓ → ← : 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. The following item descriptions are provided as a quick guide to your setup.

ACPI Function Select Enabled only if your computer's operating system supports the Advanced Configuration and Power Interface (ACPI) specification. Currently, Windows NT 5.0 supports ACPI.

ACPI Suspend Type This item allows you to select the ACPI suspend type. You can select S3(STR) for suspending to DRAM or S1(POS) for power on suspend under Windows 98 ACPI mode.
The choices: S1(POS), S3(STR).

Power Management Option 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:

| | |
|-------------|--|
| 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). |

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.

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.

Video Off Option When enabled, this feature allows the VGA adapter to operate in a power saving mode.

| | |
|-------------------|---|
| Always On | Monitor will remain on during power saving modes. |
| Suspend --> Off | Monitor blanked when the systems enters the Suspend mode. |
| All Modes --> Off | Monitor blanked when the system enters either Suspend or Standby modes. |

Video Off Method This determines the manner by which the monitor is blanked.

| | |
|------------------|---|
| 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. |

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; 4; 5; 7; 9; 10; 11; NA.

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.

State After Power Failure This field lets you determine the state that your PC returns to after a power failure.
The choices: On, Off, Auto

IRQ/EVENT ACTIVITY DETECT

- When this option is chosen, the following item appears for user's configuration.

CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
 IRQ/Event Activity Detect

| | | |
|----------------------------|-------------|--------------|
| VGA | OFF | Item Help |
| LPT & COM | LPT/COM | Menu Level ▶ |
| HDD & FDD | ON | |
| PCI Master | OFF | |
| PowerOn by PCI Card | Disabled | |
| Modem Ring Resume | Disabled | |
| RTC Alarm Resume | Disabled | |
| × Date (of Month) | 0 | |
| × Resume (hh:mm:ss) | 0 0 0 | |
| ▶ IRQs Activity Monitoring | Press Enter | |

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

- * **VGA** When Enabled, you can set the VGA awakens the system
- * **LPT & COM** When LPT & COM is ON, any activity from one of the listed system peripheral devices or IRQs wakes up the system.
- * **HDD & FDD** When HDD & FDD is ON, any activity from one of the listed system peripheral devices wakes up the system.
- * **PCI Master** When PCI Master is ON, any activity from one of the listed system peripheral devices wakes up the system.

- * **PowerOn by PCI Card** This item allows system wake up by PCI Device.

 - * **Modem Ring Resume** 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.

 - * **RTC Alarm Resume** When Enabled, you can set the data and time at which the RTC (Real Time Clock) alarm awakens the system from suspend mode.
The choices: Disabled (default); Enabled.
 - * **Date (of Month)** Set a certain date when RTC Alarm Resume option is Enabled to awaken the system. This option is concurrent with Resume Time option.

 - * **Resume 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.
-

* IRQ ACTIVITY MONITORING

- When this option is chosen, the following item appears for user's configuration.

CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
 IRQ Activity Monitoring

| | | |
|----------------------|----------|--------------|
| Primary INTR | ON | Item Help |
| IRQ-3 (COM2) | Enabled | Menu Level ▶ |
| IRQ-4 (COM1) | Enabled | |
| IRQ-5 (LPT2) | Enabled | |
| IRQ-6 (Floppy Disk) | Enabled | |
| IRQ-7 (LPT1) | Enabled | |
| IRQ-8 (RTC Alarm) | Disabled | |
| IRQ-9 (IRQ2 Redir) | Disabled | |
| IRQ-10 (Reserved) | Disabled | |
| IRQ-11 (Reserved) | Disabled | |
| IRQ-12 (PS/2 Mouse) | Enabled | |
| IRQ 13 (Coprocessor) | Disabled | |
| IRQ 14 (Hard Disk) | Enabled | |
| IRQ 15 (Reserved) | Disabled | |

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

IRQ Activity Monitoring - The following is a list of IRQ's (Interrupt Requests), which can be exempted much as the COM ports and LPT ports above can. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service. When set On, activity will neither prevent the system from going into a power management mode nor awaken it.

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:

CMOS Setup Utility - Copyright (C) 1984-2001 Award Software
PnP/PCI Configurations

| | | |
|--|---------------------------|--------------|
| PNP OS Installed | No | Item Help |
| Reset Configuration Data | Disabled | Menu Level ▶ |
| Resources Controlled By × IRQ Resources | Auto(ESCD) Press Enter | |
| PCI/VGA Palette Snoop | Disabled | |
| Assign IRQ For VGA | Enabled | |
| Assign IRQ For USB | Enabled | |
| PCI Latency Timer(Clk) | 32 | |

↑↓→←: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. The following item descriptions are provided as a quick guide to your setup.

PNP OS Installed Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows95).

***NOTE:** BIOS will automatically disable all PnP resources except the boot device card when you select Yes on Non-PnP operating system.*

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 Award BIOS 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.

IRQ RESOURCES Press Enter. Please refer to the list below:

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

Assign IRQ for VGA Select *Enabled* if you system has a VGA controller and you have one or more VGA devices connected. If you are not using your system's VGA controller, select *Disabled* to free the IRQ resource.

Assign IRQ for USB Select *Enabled* if you system has a USB controller and you have one or more USB devices connected. If you are not using your system's USB controller, select *Disabled* to free the IRQ resource.

PCI Latency Timer(Clk) This item is to set the PCI Latency clock. Default is "32".
Choices: 0~255

4-6.8 SmartDoc Anti-burn Shield (PC Health status)

- 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.

Run the “SMARTDOC ANTI-BURN SHIELD” as follows:

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 |
| CPU Vcore | 0 | Menu Level ▶ |
| DDR DIMM | 1 | |
| 3.3V | 2 | |
| +5V | 3 | |
| +12V | 4 | |
| -12V | 5 | |
| -5V | 6 | |
| 5VSB | 7 | |
| Voltage Battery | | |
| Temperature 1 | | |
| Temperature 2 | | |
| Temperature 3 | | |
| Fan 1 Speed | | |
| Fan 2 Speed | | |

↑ ↓ → ← :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. The following item descriptions are provided as a quick guide to your setup.

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.

CPU Vcore Shows CPU core actual voltage value.

DDR DIMM Shows DDR DIMM actual voltage value.

Voltage Shows power supply actual voltage value.

System Temperature Shows current system temperature.

CPU Temperature Shows current CPU temperature.

FAN 1 Speed These fields display the current speed of the CPU fan, if your computer contains a monitoring system.

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

| | | |
|--------------------------|----------|--------------|
| CPU Vcore Select | Default | Item Help |
| AGP Vcore Select | 1.5V | Menu Level ▶ |
| DIMM Vcore Select | 2.5V | |
| Auto Detect DIMM/PCI CLK | Enabled | |
| Spread Spectrum | Disabled | |
| CPU Clock | 100MHz | |
| CPU Ratio | X 8 | |

↑ ↓ → ← : 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. The following item descriptions are provided as a quick guide to your setup.

CPU Vcore This item allows you to adjust the CPU core Voltage.
Select Using higher CPU core Voltage may help CPU overclocking but may shorten the life of your processor. It is strongly recommended that you leave this item at default.
Choices: 1.100V ~ 1.850V in 0.025 stepping.

AGP Vcore This item allows you to adjust the AGP core Voltage so as to match with the higher voltage need (such as CPU overclocking), when the default 1.5V is considered not enough.
Select age so as to match with the higher voltage need (such as CPU overclocking), when the default 1.5V is considered not enough.
Choices: 1.5V ~ 1.8V in 0.1V stepping.

DIMM Vcore This item allows you to adjust the DIMM core Voltage so as to match with the higher voltage need (such as CPU overclocking), when the default 2.5V is considered not enough.
Select age so as to match with the higher voltage need (such as CPU overclocking), when the default 2.5V is considered not enough.
Choices: 2.5V ~ 2.8V in 0.1v stepping.

Auto Detect DIMM/PCI CLK To reduce the occurrence of electromagnetic interference (EMI), the BIOS detects the presence or absence of components in DIMM and PCI slots and turns off system clock generator pulses to empty slots.

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.

CPU Clock This items allows users to adjust CPU frequency.

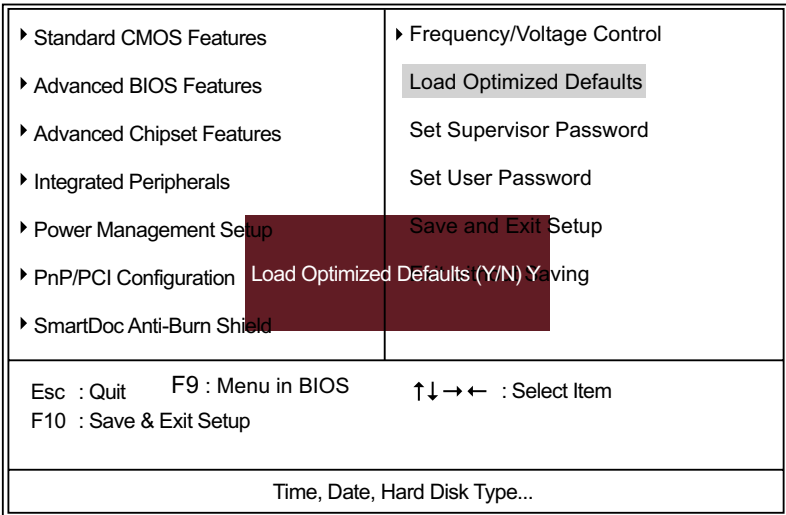
CPU Ratio This item allows you to select the CPU ratio, if CPU clock Ratio is locked, the function will have no effect.

4-6.10 Load Optimized Defaults

- 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 ”

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

Pressing “Y” loads the BIOS Optimized default values to restore the BIOS to its original status.

4-6.12 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 information will be lost and you need to run the BIOS setup program again.*

4-6.13 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.

4-6.14 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

Chapter 5 RAID Controller

The following topics and Appendices are included in this chapter:

5-0 Before Creating Disk Array

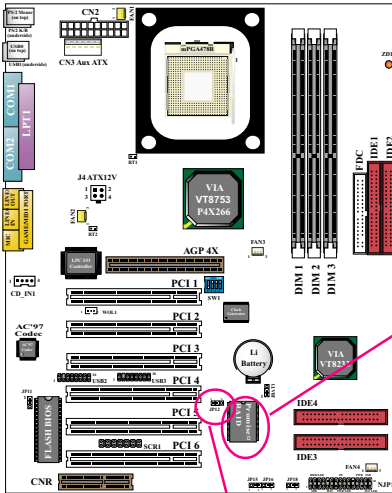
5-1 Creating your Disk Array

5-2 Using FASTBUILD™ Configuration Utility

5-3 Installing FAST TRAK100-LITE Driver

5-0 Before Creating Disk Array:

- (1) Please locate the Promise RAID Controller on your mainboard to make sure that you are using the right board.
- (2) Locate the RAID Controller Select Jumper JP12 on board, and make sure this Jumper is set at Pin 1-2 closed for enabling IDE RAID controller. Please refer to the following Setup illustration of JP12 on board:



On-Board RAID Controller

| | |
|--|------------------------------|
| Jp12 | |
| RAID Controller Select | |
| 1 <input checked="" type="checkbox"/> <input type="checkbox"/> | Enabled (default) |
| 1-2 closed | |
| 1 <input type="checkbox"/> <input checked="" type="checkbox"/> | Disabled |
| 2-3 closed | |

5-1 Creating Your Disk Array

To create your disk array, you have to open the FastBuild Utility, which should have already been built in your system BIOS through the Promise Controller. You can create two types of array with the help of FastBuild Utility.

- (1) An array for Performance in Striping type with 1 or 2 drives (or called RAID 0).
- (2) An array for Data Security in Mirroring type with 2 drives treated as one disk array (or called RAID 1).

WARNING : To create a Security array using an existing hard drive, backup any necessary data. Failure to follow this could result in data loss.

5-1.1 Creating An Array For Performance

FastTrak100-Lite allows users to create striped arrays with 1 or 2 drives.

1. Boot your system with FastTrak100-Lite Controller enabled by JP12 and your hard drive(s) connected to IDE3/IDE4. Suppose this is the first time to create a Disk Array. The Promise BIOS on board with FastBuild Utility built in will scan the IDE devices and display the result as below:

FastTrak100-Lite (tm) BIOS Version 1.xx (Build xxxx)
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

No array is defined...

Press <Ctrl-F> to enter FastBuild (tm) Utility
Or press <ESC> key to continue booting the system.

2. Press <Ctrl-F> keys to display the FastBuild (tm) Utility Main Menu.

3. Press “1” to display the Auto Setup Menu below. This is the fastest and easiest method to create your first array.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
[Auto Setup Options Menu]

Optimize Array for:           Performance
Typical Application usage:   Desktop

[Array Setup Configuration]

Mode ..... Stripe
Spare Drive .....0
Drives used in Array .....1
Array Disk Capacity .....38166

[Keys Available]

[↑] Up [↓] Down [←,→, Space] Change Option
[ESC] Exit [Ctrl-Y] Save
```

4. Using Spacebar, choose “Performance” under “**Optimize Array**” for “**Typical Application usage**” section.
5. Select how you will use your PC under the **Typical Application usage** section The choices are A/V Editing, Server, and Desktop (the default).
6. Press <Ctrl-Y> keys to save and create the array.
7. Reboot your system.
8. Once the array has been created on new drive(s), you would need to run FDISK and format the array as if it were a new single hard drive.
9. Also proceed to “Installing Drivers” section of this Chapter (see Section 5-3) for system and FastTrak100 Driver setup.

5-1.2 Creating A Security (Mirror) Array With New Drives

FastTrak100-Lite on board permits only two drives to be used for a single Mirroring array with FastBuild Utility.

1. Boot your system with FastTrak100-Lite Controller enabled by JP12 and your hard drive(s) connected to IDE3/IDE4. Suppose this is the first time to create a Disk Array. The Promise BIOS on board with FastBuild Utility built in will scan the IDE devices and display the result as below:

```
FastTrak100-Lite (tm) BIOS Version 1.xx (Build xxxx)
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

      No array is defined...

Press <Ctrl-F> to enter FastBuild (tm) Utility
Or press <ESC> key to continue booting the system.
```

2. Press <Ctrl-F> keys to display the FastBuild (tm) Utility Main Menu.
3. Press "1" to display the Auto Setup Menu below. This is the fastest and easiest method to create your first array.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
      [Auto Setup Options Menu]

Optimize Array for:           Performance
Typical Application usage:    Desktop

      [Array Setup Configuration]

Mode ..... Stripe
Spare Drive .....0
Drives used in Array .....1
Array Disk Capacity .....38166

      [Keys Available]

[↑] Up [↓] Down [←,→, Space] Change Option
[ESC] Exit [Ctrl-Y] Save
```

- Using the Spacebar, choose “Security” under the “**Optimize Array for**” section.
- Press <Ctrl-Y> keys to save and create the array.
- The window below will appear:

Do you want the disk image to be duplicated to another? (Yes/No)
Y - Create and Duplicate
N - Create Only

- Press “N” for the Create Only option.
- A window will appear almost immediately confirming that your Security array has been created. Press any key to reboot the system.

Array has been created.
<Press Any key to Reboot>

- Proceed with normal FDISK and format procedures as if you had just installed a new hard drive.
- Once the arrayed drives have been formatted, proceed to Section 5-3 “**Installing Driver**” to install your operating system and FastTrak100-Lite driver.

5-1.3 Creating Security Array With Existing Data Drive

FastTrak100-Lite on board permits only two drives to be used for a single Mirroring (Security) array with FastBuild Utility.

Checkpoints before creating a Security Array:

- (1) You may use a drive that is containing data or a bootable O/S. Then you will need another new drive of identical or larger storage capacity.
 - (2) Backup any necessary data before proceeding. Failure to follow this accepted PC practice could result in data loss.
 - (3) If you wish to include your current bootable drive holding Window NT 4.x or Windows 2000 O/S as part of a bootable Mirroring (RAID 1) array on your FastTrak100-Lite controller, you SHOULD first install the Windows NT4 or 2000 driver software to this drive while it is still attached to your system hard drive controller (e.g. IDE1/IDE2). For all other Operating Systems except Win NT4.0 and 2000, you can proceed with your hard driver(s) connected to IDE3/DIE4.
1. Boot your system with FastTrak100-Lite Controller enabled by JP12 and your hard drive(s) connected to IDE3/IDE4. Suppose this is the first time to create a Disk Array. The Promise BIOS on board with FastBuild Utility built in will scan the IDE devices and display the result as below:

FastTrak100-Lite (tm) BIOS Version 1.xx (Build xxxx)
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

No array is defined...

Press <Ctrl-F> to enter FastBuild (tm) Utility
Or press <ESC> key to continue booting the system.

2. Press <Ctrl-F> keys to display the FastBuild (tm) Utility Main Menu.

3. Press "1" to display the Auto Setup Menu below. This is the fastest and easiest method to create your first array.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
[Auto Setup Options Menu]

Optimize Array for:           Performance
Typical Application usage:    Desktop

[Array Setup Configuration]

Mode ..... Stripe
Spare Drive .....0
Drives used in Array .....1
Array Disk Capacity .....38166

[Keys Available]

[↑] Up [↓] Down [←,→, Space] Change Option
[ESC] Exit [Ctrl-Y] Save
```

4. Using the Spacebar, choose "Security" under the **Optimize Array for** section.
5. Press <Ctrl-Y> keys to Save your selection. The window below will appear:

```
Do you want the disk image to be duplicated to another? (Yes/No)
Y - Create and Duplicate
N - Create Only
```

6. Press “Y” for the “Create and Duplicate” option. The window below will appear asking you to select the Source drive to use.

| Channel: ID | Source Disk Drive Model | Capacity (MB) |
|---|--|---------------|
| Channel: ID | Target Disk Drive Model | Capacity(MB) |
| Channel: ID | [Please Select A Source Disk] Drive Model | Capacity (MB) |
| 1 : Master | QUANTUMCR8.4A | 8063 |
| 2 : Master | QUANTUMCR8.4A | 8063 |
| [↑] Up [↓] [ESC] Exit [Ctrl-Y] Save | | |

7. Use the arrow keys to choose which drive contains the existing data to be copied. FastBuild will copy all data from the Source drive to the Target drive.
8. Press [Ctrl-Y] keys to save selection and start duplication. The following progress screen will appear:

| |
|--|
| <p>Start to duplicate the image</p> <p>Do you want to continue? (Yes/No)</p> <p>Y - Continue N - Create Only</p> |
|--|

9. Select “Y” to continue. If you choose “N”, you will return to step 4.
10. Once complete, the following screen will appear confirming that your Security array has been created. Press any key to reboot the system.

| |
|---|
| <p>Array has been created.</p> <p><Press Any key to Reboot></p> |
|---|

11. Proceed to Section **5-3 Installing Driver** to install the FastT rak100-Lite driver and/or operating system.

5-2 Using FASTBUILD™ Configuration Utility

The FastBuild™ Configuration Utility offers several menu choices to create and configure the drive array on the Promise FastTrak100-Lite. In this Section, it is assumed you have already created an array in the previous Section and now wish to make a change to the array or view other status .

5-2.1 Viewing FastTrak100-Lite BIOS Screen

When you boot your system with the FastTrak100-Lite Controller enabled and drives connected to RAID IDE3 / IDE4, the Promise BIOS on board will detect the drives attached and show the following screen.

```
FastTrak100-Lite (tm) BIOS Version1.xx (Build xx)
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

Scanning IDE drives .....
```

If an array exists already, the BIOS will display the following screen showing the Promise BIOS version and status of the array.

```
FastTrak100-Lite (tm) BIOS Version1.xx (Build xxxx)
(c) 1995-2000 Promise Technology, Inc. All Rights Reserved.

ID      MODE SIZE      TRACK-MAPPING      STATUS
1*     2+0 Stripe  16126M   611/128/32   Functional

Press <Ctrl-F> to enter FastBuild (tm) Utility .....
```

The array status consists of three possible conditions: Functional, Critical, Off-line.

Functional - The array is operational.

Critical - A mirroring array contains a drive that has failed or disconnected. The remaining drive member in the array is functional. However, the array has temporarily lost its ability to provide fault tolerance. The user should identify the failed drive through the FastBuild™ Setup utility, and then replace the problem drive.

Off-line - A striped array having only 1 drive has failed or been disconnected. When the array condition is “Off-line”, the user must replace the failed drive (s) , then restore data from a backup source.

5-2.2 Navigating the FastBuild™ Setup Menu

When using the menus, there are some of the basic navigation tips: Arrow keys highlights through choices; [ESC] key is used to abort or exit the current menu.

5-2.3 Using the Main Menu

This is the first option screen when entering the FastBuild™ Setup.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
                               [Main Menu]

Auto Setup .....[1]
View Drive Assignments .....[2]
View Array .....[3]
Delete Array .....[4]
Rebuild Array .....[5]
Controller Configuration .....[6]

                               [Keys Available]
                               Press 1...6 to Select Option [ESC] Exit
```

To create a new array automatically, follow the setups under “Creating Arrays Automatically” in Section 5-1. Promise recommends this option for most users.

To view drives assigned to arrays, see “Viewing Drive Assignments” in Section 5-2.5.

To delete an array (but not delete the data contained on the array), select “Deleting An Array” in Section 5-2.12.

To rebuild a mirroring array, see “Rebuilding an Array” in Section 5-2.13.

To view controller settings, see “Viewing Controller Configuration” in Section 5-2.14.

NOTE: After configuring an array of new blank drive(s) using FastBuild, you should FDISK and format the arrayed drive(s) , in a way depending on the type of system you are using.

5-2.4 Creating Arrays Automatically

The Auto Setup <1> selection from the Main Menu can intuitively help create your disk array. It will assign all available drives appropriate for the disk array you are creating. After making all selections, use Ctrl-Y to save selections. FastBuild will automatically build the array.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
[Auto Setup Option Menu]

Optimize Array for:                Performance
Typical Application usage:         A/V Editing

[Auto Setup Option Menu]

Mode ..... Stripe
Spare Drive Count ..... 1
Drives used in Array ..... 2
Array Disk Capacity ..... 16126

[Keys Available]

Press 1...6 to Select Option [ESC] Exit
```


5-2.4-1 Optimize Array For

Select whether you want Performance (RAID 0), or Security (RAID 1) under the “Optimize Array for” setting.

(1) Performance (RAID 0 Striping)

Supports the maximum performance. The storage capacity equals the number of drives times the capacity of the smallest drive in the disk array.

NOTE: FastTrak100-Lite permits striped arrays of 1 or 2 drives attached in Auto Setup mode.

(2) Security (RAID 1 Mirroring)

Creates a mirrored (or fault tolerant) array for data security.

NOTE: Under the Security setting, FastTrak100-Lite permits two drives to be used for a single Mirrored array.

5-2.4-2 Defining Typical Application Usage

Allows the user to choose the type of PC usage that will be performed in order to optimize how FastTrak100-Lite handles data blocks to enhance performance. Your choice will determine the block size used. You may choose from: A/V Editing (for audio/video applications, or any similar application that requires large file transfers), Server (for numbers of small file transfers), or Desktop (a combination of large and small file sizes).

5-2.5 Viewing Drive Assignments

The View Drive Assignments <2> option in the Main Menu displays whether drives are assigned to a disk array or are unassigned.

Under the “Assignment” column, drives are labeled with their assigned disk array or shown as “Free” if unassigned. Such “Free” drives can be used for a future array or used as a spare drive when a drive fails in a mirrored array. Unassigned drives are not accessible by the OS. The menu also displays the data transfer mode that relates to speed used by each drive (U5 refers to 100MB/sec transfers, U4 refers to 66MB/sec transfers, etc ...)

```

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
[View Drive Assignments]

Channel: ID Drive Model Capacity (MB) Assignment Mode
1: Master QUANTUMCR8.4A 8063 Array 1 U5
1: Slave QUANTUMCR8.4A 8063 Free U5
2: Master QUANTUMCR8.4A 8063 Array 1 U5

[Keys Available]

[↑] Up [↓] Down [ESC] Exit Mode (U=UDMA, P=PIO, D=DMA)
    
```

5-2.6 View an Array

The View Array <3> option from the Main Menu allows users to view the defined elements and RAID status that have already been defined by FastBuild Utility.

```

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
[View Array Menu]

Array No RAID Mode Total drv Capacity(MB) Status
*Array 1 Stripe 2 16126 Functional
Array 2 _____
Array 3 _____
Array 4 _____

[Keys Available]

Note:* ---Bootable Array

[↑] Up [↓] Down [ESC] Exit [Enter] Select
[Space] Change Boot Drive
    
```

5-2.7 Adding Fault Tolerance to an Existing Drive

FastTrak100-Lite will create a mirroring array using an existing system drive with data. You must assign the existing drive and another drive of same or larger capacity to the Mirroring array. The BIOS will send the existing data to the new blank drive.

WARNING :

- Backup any necessary data before proceeding. Failure to follow this practice will result in data loss.
 - If you wish to include your current bootable drive using Windows NT 4.x or Window 2000 operating system as part of a bootable Mirrored (RAID 1) array on your FastTrak100-Lite, do NOT connect the hard drive to the FastTrak100-Lite Controller yet. You MUST install the drive of Fast Trak100-Lite Controller first (see Section 5-3) to this drive while it is still attached to your existing hard drive controller. For all other Operating System proceed like here.
1. After assigning the drives to a Mirroring array, press <Ctrl-Y> key to save your selection. The window below will appear.

Do you want the disk image to be duplicated to another? (Yes/No)
 Y - Create and Duplicate
 N - Create Only

2. Press “Y” for the Create and Duplicate option. The window below will appear asking you to select the Source drive to use. FastBuild will copy all data from the Source drive to the Target drive.

| Source Disk | | |
|---|---------------|---------------|
| Channel: ID | Drive Model | Capacity (MB) |
| Target Disk | | |
| Channel: ID | Drive Model | Capacity (MB) |
| [Please Select A Source Disk] | | |
| Channel: ID | Drive Model | Capacity (MB) |
| 1: Master | QUANTUMCR8.4A | 8063 |
| 2: Master | QUANTUMCR8.4A | 8063 |
| [↑] Up [↓] [ESC] Exit [Ctrl-Y] Save | | |

3. Use the arrow keys to choose which drive containing the existing data to be copied.

WARNING : All target drive data will be erased. Make sure you choose the correct drive.

4. Press <Ctrl-Y> keys to save selection and start duplication. The following confirmation screen will appear.

Start to duplicate the image ...
Do you want to continue? (Yes/No)
Y - Continue N - Abort

5. Select “Y” continue. If you choose “N”, you will be returned to step 1.
6. Once “Y” is selected, the following progress screen will appear. The process will take a few minutes.

Please Wait While Duplicating The Image

Complete

10%

7. Once mirroring is complete, the following screen will appear confirming that your Security array has been created. Press any key to reboot the system.

Array has been created.
<Press Any key to Reboot>

5-2.8 Making a FastTrak100-Lite Disk Array Bootable

WARNING : In order for you to boot from an array on the FastTrak100-Lite, your PC or server must be configured in the CMOS Setup to use the FastTrak100-Lite as a bootable device (versus the on board controller or another add-in card). This option is not available if the FastTrak100-Lite is being used as a secondary controller.

1. Once you have returned to the Define Array Menu window (below), you will see the array(s) you have created. You now may use the menu to select which previously-defined array will be used as the bootable array.

| FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc. [Define Array Menu] | | | | |
|---|-----------|-----------|--------------|------------|
| Array No | RAID Mode | Total Drv | Capacity(MB) | Status |
| * Array 1 | Stripe | 2 | 13044 | Functional |
| Note: * --- Bootable Array | | | | |
| [↑] Up [↓] Down [ESC] Exit [Enter] Select [Space] Change Boot Drive | | | | |

2. Use the [↑] Up [↓] Down keys to highlight the array which you want to from boot.
3. Press the [Space] bar.
4. An* asterisk will appear next to the array number indicating it as bootable. The system will now recognize this array as the first array seen.
5. The system will then use this bootable array as the (fixed) boot C: drive.

NOTE: *The bootable array must contain your configured operating system.*

5-2.9 Creating a “Hot” Spare Drive for Mirroring Arrays

For automatic rebuilds of a mirroring array, attach an extra “spare” drive to the FaskTrak100-Lite. Drives that are not assigned to an array and are the same size or larger than the original will be used for the automatic rebuild. This is performed in the background under all supported operating systems, except DOS. At a later time, the system can be turned off and the failed drive can be physically removed.

5-2.10 How FastTrak100-Lite Orders Arrays

During startup, the disk arrays on the FastTrak100-Lite are recognized in this order: 1) The array set to bootable in the FastBuild™ Setup, and 2) the Array number (i.e. Array 0, Array 1 ...). This would involve determining which drive letters will be assigned to each disk array.

5-2.11 How FastTrak100-Lite Saves Array Information

All disk array data are saved into the reserved sector on each array member. Promise suggests that users record their disk array information for future reference.

Another feature of the FastTrak100-Lite disk array system is to recognize drive members even if drives are moved between different FastTrak100-Lite card connectors. Since each drive's array data identifies itself to the array, it is possible to move or swap drives without modifying the array setup. This is valuable when adding drives, or during a rebuild.

5-2.12 Deleting An Array

The Delete Array <4> Menu option allows for deletion of disk array assignments. This is not the same as deleting data from the drives themselves. If you delete an array by accident (and before it be used again), the array can normally be recovered by defining the array identically as deleted array (by Using Auto Setup).

WARNING: *Deleting an existing disk array could result in its data loss. Make sure to record all array information including the array type, the disk members, and stripe block size in case you wish to undo a deletion.*

```

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
[ Delete Array Menu ]

Array No   RAID Mode   Total Drv   Capacity(MB)   Status
Array 1     Stripe             2              16126            Functional
Array 2     -----            -----            -----            -----
Array 3     -----            -----            -----            -----
Array 4     -----            -----            -----            -----

[ Keys Available ]
[↑] Up [↓] Down [Esc] Exit [Del] Delete
    
```

1. To delete an array, highlight the Array you wish to delete and press the [Del] key.
2. The View Array Definition menu will appear (see below) showing which drives are assigned to this array.

```

FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
[ Delete Array Menu ]

Array No   RAID Mode   Total Drv   Capacity(MB)   Status
Array 1     -----            -----            -----            -----

Stripe Block: 64 KB
[ Drive Assignments ]

Channel : ID   Drive Model   Capacity (MB)   Assignment
1 : Master     QUANTUMCR8.4A   8063              Y
2 : Master     QUANTUMCR8.4A   8063              Y
    
```

3. Confirm yes to the follow warning message with the <Ctrl-Y> key to continue array deletion:

```

Are you sure you want to delete this array ?
Press Ctrl-Y to Delete, others to Abort
    
```

4. After deleting the array, you should create a new array using Auto Setup.

5-2.13 Rebuilding A Mirroring Array

The Rebuild Array <5> Menu option is necessary for recovering from an error in a mirrored disk array. You will receive an error message when booting your system from the FastTrak BIOS.

NOTE: Drives *MUST* be replaced if they contain any physical errors.

Follow these steps BEFORE using the Rebuild Array menu option:

1. On bootup, the FastTrak100-Lite Startup BIOS will display an error message identifying which drive has failed.
2. Press <Ctrl-F> keys to enter FastBuild Main Menu.
3. Select submenu Define Array <3>.
4. Select the failed array and identify the Channel and ID of the failed drive.
5. Power off and physically remove the failed drive.
6. Replace the drive with an identical model.
7. Reboot the system and enter the FastBuild Main Menu.
8. Select the <5> Rebuild Array option. The following screen will appear.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
[ Delete Array Menu ]
  Array No  RAID Mode  Total Drv  Capacity(MB)  Status
Array 1    Mirror      2          16126         Critical
Array 1    -----      --          -----         -----
Array 1    -----      --          -----         -----
Array 1    -----      --          -----         -----

[ Keys Available ]
[°Ù] Up [°i] Down [Esc] Exit [Del] Delete
```

9. Highlight the array whose Status is "Critical".
10. Press [Enter]. The following screen will then appear (see next page).

5-2.14 Viewing Controller Settings

The Controller Configuration <6> menu selection allows you to enable or disable the halting function of FastTrak100-Lite BIOS (the default) if it detects an error on boot up. You may also view the system resources (Interrupt and I/O port address) of FastTrak's data channels.

```
FastBuild (tm) Utility 1.xx (c) 1995-2000 Promise Technology, Inc.
      [ Adapter Configuration - Options ]

      Halt On Error:          Enable

      [ System Resources Configuration ]

Channel 1 (IDE1)      Interrupt : A      I/O Port : FFF0
Channel 2 (IDE2)      Interrupt : A      I/O Port : FFA8

      [ Keys Available ]
      [←, →, Space] Change Option  [Esc] Exit
```

5-2.15 Halting FastTrak BIOS On Bootup Errors

The [Adapter Configuration ---- Options] section allows you to enable or disable FastTrak100-Lite to Halt operation at the BIOS startup screen should an error be detected. This is the only option that can be changed on this screen.

5-3 Installing Drivers

This section details the FastTrak100-Lite driver installation for various operating systems. The driver should have been included either into the Support CD or into a Support Floppy Diskette.

Checkpoints for the driver installation:

- (1) To install FastTrak100-Lite Driver for an operating system, you must use the driver in Floppy Diskette instead of the one in CD. If you are not provided with a Driver Diskette, you should create one by copying the driver files through the support CD with the path:
"E \Driver\Promise\FastTrak100-Lite. (Suppose that CD-ROM title is E).
- (2) Set JP9 on board enabled (Pin 1-2 closed) for RAID Controller Select. The following sections describe the detailed procedures of installing FastTrak 100-Lite Driver for windows 2000, Windows 95/98, Windows NT4.0, and Windows 3.1 / DOS.

5-3.1 For Windows 2000

5-3.1-1 Installing Driver During New Windows 2000 Installation

1. Connect your hard driver(s) for RAID Array to IDE3/IDE4, and enable FastTrak100-Lite Controller with JP12.
 - 1a. Bootable floppy: Boot from bootable floppy and type "WINNT".
After files have been copied, the system will reboot. On the reboot, press <F6> after the message "Setup is inspecting your computer's hardware configuration..." appears.
 - 1b. CD-ROM Install: Boot from the windows 2000 CD. Press <F6> after the message " Press F6 if you need to install third party SCSI or RAID driver" appears.
2. When the "Windows 2000 Setup" window is generated, Press "S" to Specify an Additional Device(s).
3. Press "O" to select "Other" and press the "Enter" key.
4. Insert into drive A the Promise Technology ® driver diskette that you have made from your support CD: and press "Enter" key.
5. Choose "Win2000 Promise FastTrak100-Lite Controller" from the list that appears on screen, then press the "Enter" key.

6. The Windows 2000 Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "Win2000 Promise FastTrak100-Lite controller".

Note: *If you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, continue to step 7.*

7. From the Windows 2000 Setup screen, press the Enter key. Setup will now load all device files and then continue the Windows 2000 installation.

5-3.1-2 Installing Driver To Existing Windows 2000 System

WARNING: You must first complete installing the driver before moving the boot drive containing the existing Windows 2000 operating system on to the FastTrak100-Lite controller (e.g. IDE3/IDE4). On mainboard 85DRV, IDE1/0 are for system IDE controller, while IDE3 & IDE4 are for RAID IDE controller.

At booting with Windows 2000 system and your hard drive(s) connected to IDE1/2, Windows 2000 setup will show a "New Hardware Found" dialog box. Under Windows 2000, the "PCI RAID Controller" will be displayed.

1. In the dialog box, choose "Driver from disk provided by hardware manufacturer" button.
2. In the A: drive, insert the FastTrak100-Lite driver diskette.
3. Type "A:\WIN2000" in the text box. Press "Enter".
4. Choose "Win2000 Promise FastTrak100-Lite Controller" from the list that appears on screen, then press the "Enter" key.
5. The Windows 2000 setup screen will appear again saying "Setup will load support for the following mass storage device - Win2000 Promise FastTrak100-Lite controller. The FastTrak100-Lite driver will now be copied on to the system and entered into the Windows 2000 driver database.
6. When the "System Setting Change" dialog box appears, remove the floppy diskette and click on "Yes" to restart the system. Windows 2000 will then restart for the driver installation to take effect.

7. Power off your system, then attach your hard drive to the FastTrak100-Lite controller card, e.g. IDE3/IDE4.

5-3.1-3 Confirming Windows 2000 Installation

1. From Windows 2000, open the Control Panel from “ My Computer” followed by the System icon.
2. Choose the “Hardware” tab, then click the “Device Manager” tab.
3. Click the “+” in front of “SCSI & RAID Controllers hardware type.” The driver “Win2000 Promise FastTrak/FastTrak100-Lite Controller” should appear, informing user that the controller driver is already installed.

5-3.2 Windows 95/98

5-3.2-1 Installing Drivers During Windows 95/98 Installation

The following three sections detail the installation of the FastTrak100-Lite drivers while installing Windows 95/98 (with the FastTrak100-Lite controller card already in place). If you're installing the FastTrak100-Lite drivers on a system with Windows 95/98 already installed, see “Installing Drivers with Existing Windows 95/98”.

5-3.2-2 Windows 98

1. Connect your hard drive(s) for RAID Array to IDE3/IDE4, and enable FastTrak100-Lite Controller with JP12. Configure the hard drive(s), partition and format your hard driver(s).
2. Install Windows 98 normally.
3. After installation, go to “Start” menu and choose “Settings.”
4. Form the “Settings” menu, choose “Control Panel.”
5. In the “Controller Panel” window, double-click on the “System” icon.
6. In the “System” window, choose the “Device Manager” tab.
7. In the hierarchical display under “Other Devices” is a listing for “PCI RAID Controller.” Choose it and then press the “Properties” button.
8. Choose the “Driver” tab in the “Properties” window, choose “Update Driver,” and then press “Next.”
9. Choose “Search for a better driver than the one your device is using now (recommended),” then press “Next”.

10. Choose "Specify Location," and then type "A:\WIN95-98" in the text box.
11. Insert the "FastTrak100-Lite Driver" diskette into the A: drive.
12. Press the "Next" button. A message informing you that Windows 98 has found "Win95-98 Promise FastTrak100-Lite (tm) Controller" should appear.
13. Press "Next," then "Finish," then "Yes" when asked if you want to restart your computer. Be sure to remove the diskette from drive A:.

5-3.2-3 Windows 95

1. Connect your hard drive(s) for RAID Array to IDE3/IDE4, and enable FastTrak100-Lite Controller with JP12. Configure the hard drive(s) for RAID Array, partition and format your hard driver(s).
2. Install Windows 95 normally.
3. After installation, go to "Start" menu and choose "Settings."
4. From the "Settings" menu, choose "Control Panel."
5. In the "Control Panel" window, double-click on the "System" icon,
6. In the "System" window, choose the "Device Manager" tab.
7. In the hierarchical display under "Other Devices" is a listing for "PCI RAID Controller." Choose it and then press the "Properties" button.
8. Choose the "Driver" tab in the "Properties" window, and then press the "Update Driver" button.
9. When asked if you want Windows to research for the driver, choose "Yes (recommended)."
10. Insert the "FastTrak100-Lite Driver" diskette into the A: drive, then press "Next."
11. When Windows informs you that it was unable to find the drivers, press "Other Locations..."
12. In the "Select Other Location" dialog box, type "A:\WIN9x-ME".
13. Press "Next" button. A message informing you that Windows 95 has found "Win95-98 Promise FastTrak100-Lite (tm) Controller" should appear.
14. Press "Finish." (If Windows can't find the "FastTrak100-Lite.MPD" file, type "A:\WIN9x-ME" in the copy files from:" text box).
15. Choose "Yes" when asked if you wish to restart the system, and remove the diskette from Drive A.

5-3.2-4 Installing Drivers With Existing Windows 95/98

The following three sections detail the installation of the FastTrak100-Lite drivers on a system that has Windows 95/98 already installed. If you're installing the FastTrak100-Lite drivers on a system during a Windows 95/98 installation, see "Installing Drivers During Windows 95/98 Installation".

5-3.2-5 Windows 98

1. Connect your hard drive(s) for RAID Array to IDE3/IDE4, and enable FastTrak100-Lite Controller with JP12. Configure the hard drive(s) for RAID Array, power up the system and boot Windows.
2. The "Add New Hardware Wizard" will appear, informing you that it has found a "PCI RAID Controller."
3. Check the "Search for the best driver for your device" box and click the Next button.
4. Check the "Specify a Location" box and click the Next button.
5. Type "A:\WIN9x-ME" in the text box that appears.
6. Insert the "FastTrak100-Lite Driver" diskette in drive A:.
7. Click on "Next." The Add New Hardware wizard will say it has found "Win95-98 Promise FastTrak100-Lite Controller".
8. Click on "Next," and then on "Finish."
9. Choose "Yes" when asked if you want to restart your computer. Be sure to remove the diskette from drive A:.

5-3.2-6 Windows 95

1. Connect your hard drive(s) for RAID Array to IDE3/IDE4, and enable FastTrak100-Lite Controller with JP9. Configure the hard drive(s) for RAID Array, power up the system and boot Windows.
2. The "Update Device Drive Wizard" will appear, informing you that it has found a "PCI Mass Storage Controller."
3. Insert the "FastTrak100-Lite Driver" diskette in drive A:.
4. Type "A:\WIN9x-ME" in the text box, then click on "Next." Windows will inform you that it has found the "Win95/98 Promise FastTrak100-Lite controller".
5. Click on "Finish," and when prompted to insert the "FastTrak100-Lite Driver" diskette, click on "OK."

6. If a message informing you that the file "Win95/98 Promise FastTrak100-Lite.MPD" cannot be found, go to the "Copy files from:" text box and type: "A:\WIN9x-ME".
7. Choose "Yes" when asked whether you want to start your computer. Be sure to remove the diskette from drive A.

5-3.2-7 Confirming Driver Installation in Windows 98/95

To confirm that the driver has been properly loaded in Win 95/98, perform the following steps:

1. Choose "Settings" from the "Start" menu.
2. Choose "Controller Panel", and then double-click on the "System" icon.
3. Choose the "Device Manager" tab, and click the "+" in front of "SCSI & RAID controllers." "Win95-98 Promise FastTrak100-Lite controller" should appear.

5-3.3 DOS/Windows 3.1x

For first-time installation, follow the standard procedure of installing DOS on to your hard disk (partition all hard drive with FDISK and format before performing the following procedure):

1. Insert "Disk 1" of your DOS installation diskettes into drive A:.
2. Type "A:\SETUP" at the "A:\>" prompt.
3. Continue with normal DOS installation procedure, and refer to your DOS manual for additional details.

Note: *The FastTrak100-Lite BIOS supports both DOS and Windows 3.1x without software drivers installed.*

5-3.4 Windows NT4.0

5-3.4-1 Installing Drivers During Windows NT 4.0 Installation

1. Connect your hard drive(s) for RAID Array to IDE3/IDE4, and enable FastTrak100-Lite Controller with JP12. Start the system installation by booting from the Windows NT disk:
 - a) Floppy install: boot the system with the Windows NT installation diskettes.
 - b) Other bootable Floppy: boot from the bootable floppy and type "WINNT /B". After files have been copied, the system will reboot. On the reboot, press the "F6" key when the message "Setup is inspecting your computer's hardware configuration..." appears.
 - c) CD-ROM disk install: boot from the CD-ROM disk and press the "F6" key when the message "Setup is inspecting your computer's hardware configuration..." appears.
2. When the "Windows NT Setup" windows is generated, press "S" to specify an Additional Device(s).
3. Press "O" to select "Other" and press the "Enter" key.
4. Insert into drive A the Promise Technology ® FastTrak100-Lite driver diskette that you have made from the support CD: and press "Enter" key.
5. Choose "Win NT Promise FastTrak100-Lite (tm) Controller" from the list that appears on screen, then press the "Enter" key.
6. The Windows NT Setup screen will appear again saying "Setup will load support for the following mass storage devices:" The list will include "Win NT Promise FastTrak100-Lite (tm) controller".

Note: *If you need to specify any additional devices to be installed, do so at this time. Once all devices are specified, continue to step 7.*

7. From the Windows NT Setup screen, press the Enter key. Setup will now load all device files and then continue the Windows NT installation.
8. After a successful installation, the "SCSI Adapter Setup" box will show that the "Win NT Promise FastTrak100-Lite (tm) Controller" driver has been installed.

5-3.4-2 Installing Drivers With Existing Windows NT4.0

WARNING: You must first complete installing the driver before moving the boot drive containing the existing Windows 2000 operating system on to the FastTrak100-Lite controller (e.g. IDE3/IDE4). On mainboard 85DRV, IDE1/0 are for system IDE controller, while IDE3 & IDE4 are for RAID IDE controller.

With your bootable hard drive connected to IDE1/IDE2 and FastTrak100-Lite enabled by JP12, boot Win NT4.0.

1. Choose "Settings" from the "Start" menu.
2. Choose "Controller Panel" from the "Settings" menu.
3. Double-click on the "SCSI Adapters" icon, which generates the "SCSI Adapters" dialog box.
4. Choose "Drivers," and then press "Add."
5. In the "Install Drivers" dialog box, press "Have Disk..."
6. When the "Install From Disk" appears, insert into Drive A the "FastTrak100-Lite Driver" diskette that you have made from support CD:.
7. Type "A:\NT4" in the text box window, then choose "OK."
8. When the "Install Driver" dialog box appears, select "Win NT Promise FastTrak100-Lite controller" and then press "OK."
9. When the "Select SCSI Adapter Option" dialog box appears, press "Install".
10. After a successful installation, the "SCSI Adapter Setup" box will show that the "Win NT Promise FastTrak100-Lite (tm) Controller" driver has been installed.
11. Power off your system.
12. Now you can move the boot drive to the FastTrak100-LiteController.

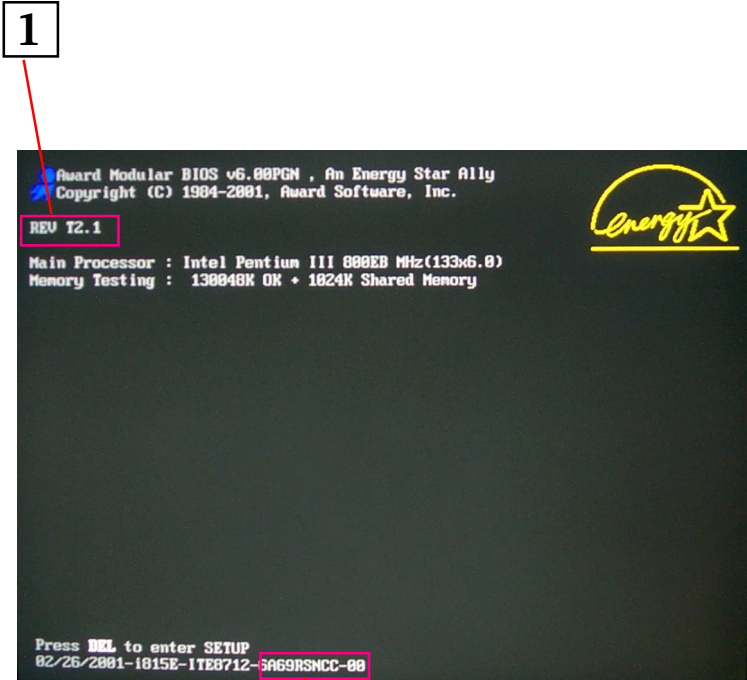
MEMO

APPENDICES

- Appendix-1 Identifying BIOS Version and
BIOS Part Number**
 - Appendix-2 Identifying Mainboard Model
Number**
 - Appendix-3 Technical Terms**
-

Appendix-1 Identify BIOS Version & BIOS Part Number

- When you boot up your computer, the first screen popping up will show you the BIOS version and BIOS part number identification as below:

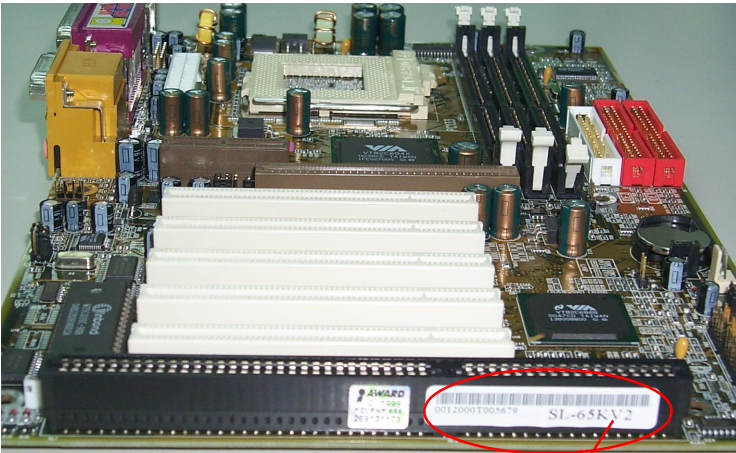


Picture 1

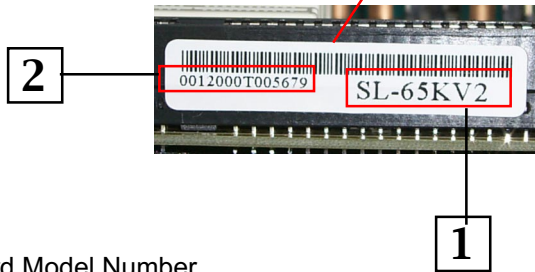
1. BIOS Version
example: REV T2.1
2. BIOS ID String
example: 6A69RSNCC

Appendix-2 Identify Mainboard Model Number

- Usually the mainboard model number is labeled on the side of ISA side of slot or PCI slot. Please see Picture 2 below as an illustration:



Picture 2 (The mainboard in this picture is taken as an example only, and may not be of the same model as yours.)



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.

RAID (Redundant Array of Independent Disks)

A group of hard disks set up in PC system for data fault tolerance and better performance. RAID is usually more used in servers than in personal computers. Different level of RAID stands for different function and performance:

Level 0 provides data striping or spreading out blocks of files across multiple disks, and so improvement of performance but no fault tolerance.

Level 1 provides disk mirroring, and so data backup.

Level 3 provides a dedicated disk for error correction of data, and so better performance and some fault tolerance.

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