AT7-MAX2 Motherboard User's Manual

Index

Chapter 2. Introduction of AT7-MAX2 Features

2-1. Features of AT7-MAX2 Motherboard

This motherboard is designed for AMD Socket A Athlon™ XP, Athlon™ and Duron™ processors. It supports the AMD Socket-A structure, with up to 2 GB **(PC 2700/PC 3200, Unbuffered & Non-ECC DDR DIMM)** or 3.5 GB **(PC 1600/PC 2100, Unbuffered & Non-ECC DDR DIMM)** of memory, super I/O, USB 2.0, IEEE 1394, Serial ATA and Green PC functions.

The AT7-MAX2 uses the VIA KT400 and VT8235 chipsets to make the evolutionary move from PC 100/PC 133 SDRAM to PC 1600/PC 2100/PC 2700/PC 3200 DDR SDRAM, increasing the speed of the system and memory buses from 100 MHz to 200 MHz. Its 200/266/333/400 MHz memory interface supports a wide range of PC 1600/PC 2100/PC 2700/PC 3200 DDR SDRAM memory devices now on the market.

VIA KT400 is a system bus controller, or northbridge, that houses the high-speed system elements critical to overall system performance while also containing the system interface to the processor. The key functions of the KT400 System Controller include the 266 MHz Athlon System Bus, the 400 MHz DDR Memory Subsystem, the AGP 8X/4X modes Graphics Interface (AGP 3.0 Compliant) and the 33 MHz/32-bit PCI Bus Interface (PCI 2.2 Compliant), including arbiter.

DDR SDRAM is the newest memory standard. It provides the maximum translation bandwith and also greatly improves data transaction delays. This feature improves system performance and speed, especially with multimedia environment applications.

The AT7-MAX2 has a built in Ultra DMA 133 function. This means that it provides speedier HDD throughput boosting overall system performance. Ultra DMA 133 is the newest standard for IDE devices. It enhances existing Ultra DMA 33 technology by increasing both performance and data integrity. This new high-speed interface almost doubles the Ultra DMA 66 burst data transfer rate to 133 Mbytes/sec. The result is maximum disc performance using the current PCI local bus environment. Another benefit is the ability to connect four IDE devices to your system, either through Ultra DMA 66, Ultra DMA 100 or Ultra DMA 133. With this, you will have more flexibility to expand your computer system.

AT7-MAX2's built-in HighPoint HPT 374 chipset gives you the capability to support Ultra DMA 133. Ultra DMA 133 is the newest standard for IDE devices. It provides two IDE channels (IDE3, IDE4) that also support Ultra DMA 133 specifications, and it allows for four additional IDE devices in your computer system. It can give you high performance and efficiency data transfer rate through the IDE channels. This also means that your computer, in total, can connect up to eight IDE devices (IDE1 ~ IDE4). This allows for maximum expandability for future hardware demands. This chipset also supports IDE RAID, inlcuding RAID 0, RAID 1 and RAID 0+1. This feature enables you to maximize your data storage performance and security.

AT7-MAX2's built-in two Marvell 88i8030 Controllers can provide two Serial ATA connectors onboard; you can connect one Serial ATA device to each of them, since Serial ATA will be a point to point protocol. What is Serial ATA? Serial ATA is an evolutionary replacement for the Parallel ATA physical storage interface. Serial ATA is scalable and will allow furture enhancements to the computing platform. This new high-speed interface expands data transfer rate to 150 MB/sec (1.5 gigabits/sec). The result is maximum disc performance using the current PCI local bus environment. Other benefits are: more flexible power tolerances, cables can be smaller and more efficient (this can improve the airflow and heat inside the chassis), easy to configure devices, etc. This interface is designed to connect PC internal devices. If you want to connect outside peripherals, IEEE 1394 and USB 2.0 interfaces will be the solution.

AT7-MAX2 provides high flexibility to users building AMD Socket A Athlon™ XP, Athlon™ and Duron™ systems. It provides the option of 133 MHz/133 MHz CPU and memory bus combinations. The AT7-MAX2 has built-in hardware monitoring functions (refer to ***Appendix E*** for detailed information) to ensure a safe computing environment.

Part of the MAX Motherboard Series

The AT7-MAX2 is part of the MAX Series of motherboard products, offering advanced features and extraordinary value. With its legacy-free operation, ABIT's MAX Series frees up system resources to offer users a robust, high-performance computing platform. Moreover, expanded connectivity via USB and Firewire ports gives users an easy way to connect to today's hottest audio and video peripherals. On-board 10/100 LAN provides high-speed networking capabililites, and built in 6-channel audio delivers a rich multimedia experience. Highly integrated with the latest technologies, ABIT's MAX Series looks to the future, giving users a new level of system longevity and flexibility.

2-2. Specifications

1. Processor

- Supports AMD Athlon™ XP 1500+ ~ 2200+ Socket A processors based on 200 MHz/266 MHz (100 MHz/133 MHz Double Data Rate)
- Supports AMD Athlon™ 700 MHz ~ 1.4 GHz Socket A processors based on 200 MHz/266 MHz (100 MHz/133 MHz Double Data Rate)
- Supports AMD Duron™ 600 MHz ~ 1.2 GHz Socket A processors based on 200 MHz (100 MHz Double Data Rate)

2. Chipset (VIA KT400 and VT8235):

- Supports Ultra DMA 33, Ultra DMA 66, Ultra DMA 100 and Ultra DMA 133 IDE protocol
- Supports **A**dvanced **C**onfiguration and **P**ower Management **I**nterface (ACPI)
- AGP (**A**ccelerated **G**raphics **P**ort) connector supports AGP 4X and 8X mode (Sideband) device (AGP 3.0 Compliant)
- Supports High Speed USB (**U**niversal **S**erial **B**us) 2.0
- Supports 200 MHz/266 MHz/333 MHz/400 MHz (100 MHz/133 MHz/166 MHz/200 MHz Double Data Rate) memory bus settings

3. Memory (System Memory)

- Four 184-pin DIMM sockets (Unbuffered & Non-ECC DDR DIMM)
- Supports 2 DIMMs DDR 333/400 (Max. 2GB)
- Supports 4 DIMMs DDR 200/266 (Max. 3.5GB)

4. Serial ATA (Marvell 8030)

- Onboard Marvell 88i8030 Controller x 2
- Supports Serial ATA data transfer rates of 150 MB/sec
- Support S-ATA power save mode

5. Ultra DMA 133/RAID

- HighPoint HPT 374 IDE controller
- Supports Ultra DMA 133MB/sec data transfer rate
- Supports RAID0 (Stripping mode for boosting performance) mode
- Supports RAID1 (Mirroring mode for data security) mode
- Supports RAID 0+1 (Stripping and Mirroring) mode

6. System BIOS

- SOFT MENU™ technology, can easily set the processor parameters
- Award PnP (**P**lug a**n**d **P**lay) BIOS supports APM and DMI (**D**esktop **M**anagement **I**nterface)
- Supports ACPI (**A**dvanced **C**onfiguration **P**ower **I**nterface)
- Write-Protect Anti-Virus function by AWARD BIOS

7. Audio

- Realtek ALC650 (AC-Link)
- Supports 6-CH DAC for AC3 5.1 CH purpose
- Professional digital audio interface supporting 24-bit S/P DIF OUT

8. LAN

- Onboard VIA VT6102 MAC controller and VT 6103 physical layer interface
- 10/100 Mb operation support ACPI and Wake on LAN
- User friendly driver included

9. ABIT Media XP (Optional)

- Supports SONY MS (**M**emory **S**tick™) interface/SD (**S**ecure **D**igital™) memory card interface
- Supports CF (**C**ompact**F**lash™) interface (Both Type I & Type II) and IBM Microdrive™

10. Internal I/O Connectors

- 1 x AGP, 5 x PCI slots
- Floppy port supports up to 2.88 MB
- 4 x Ultra DMA 33/66/100/133 connectors
- 2 x Serial ATA 150 connector
- 2 x USB headers, 1 x IEEE 1394a header
- 1 x CD-IN, 1 x AUX-IN

11. Back Panel I/O

- 1 x PS/2 keyboard, 1 x PS/2 mouse
- 4 x USB, 2 x IEEE 1394
- 1 x S/P DIF output
- Audio connectors (Front Speaker, Line-in, Mic-in, Center/Sub, Surround Speaker)
- 2 x USB, 1 x RJ-45 LAN connector

12. Miscellaneous

- ATX form factor
- Hardware monitoring：Included fan speed, voltages, CPU and system environment temperature

❋   **Supports Wake On LAN, Modem, but your ATX power supply 5V standby power must be able to provide at least a 720mA current capacity. Otherwise, the functions may not work normally.**

❋   **Serial ATA is designed to support high-speed and high performance mass storage devices. You must connect Serial ATA 150 specifications devices to these connectors (J1 and J2).**

❋   **HPT 374 IDE controller is designed to support high-speed and high performance mass storage devices. Thus we suggest that you don't connect non-disk devices that use ATA/ATAPI interfaces, such as CD-ROM to HPT 374 IDE connector (IDE3 and IDE4).**

❋   **This motherboard supports the standard bus speeds of 66 MHz/100 MHz/133 MHz that are used by specific PCI, processor and chipset specifications. Exceeding these standard bus speeds is not guaranteed due to the specific component specifications.**

❋   **Specifications and information contained in this manual are subject to change without notice.**

Note
All brand names and trademarks are the property of their respective owners.

2-3.   Item Checklist

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

☑ One ABIT AT7-MAX2 motherboard

☑ Two 80-wire/40-pin ribbon cable for master and slave Ultra DMA 133, Ultra DMA 100, Ultra DMA 66 or Ultra DMA 33 IDE devices

☑ One ribbon cable for 3.5" floppy disk devices

☑ One Serial ATA cable

☑ One compact disc for support drivers and utilities

☑ One USB 2.0 cable

☑ One DIY bag

☑ One user's manual for the motherboard

☑ One floppy disk of HPT 374 drivers

☑ One I/O shield

2-4. Layout Diagram for AT7-MAX2

Figure 2-1. AT7-MAX2 motherboard component location

Chapter 3. Installing the Motherboard

This AT7-MAX2 motherboard not only provides all standard equipment for classic personal computers, but also provides great flexibility for meeting future upgrade demands. This chapter will introduce step by step all of the standard equipment and will also present, as completely as possible, future upgrade capabilities. This motherboard is able to supports all AMD Socket A Athlon™ XP, Athlon™ and Duron™ processors now on the market. (For details, see specifications in Chapter 1.)

This chapter is organized according the following features:

1. Installation of the AMD Socket A Athlon™ XP, Athlon™ and Duron™ CPU
2. Installing the Motherboard to the Chassis
3. Installing System Memory
4. Connectors, Headers and Switches

☠☠☠☠   **Before Proceeding with the Installation**   ☠☠☠☠

Before you install or unplug any connectors or add-on cards, please remember to turn the ATX power supply switch off (fully turn the +5V standby power off), or take the power cord off. Otherwise, you may cause the motherboard components or add-on cards to malfunction or be damaged.

User Friendly Instructions

Please read our instructions carefully and follow them step-by-step. Our objective is to enable the novice computer user to perform the installation by himself. We have attempted to write this document in a very clear, concise and descriptive manner to help overcome any obstacles you may face during installation.

Diagram and Photos

This chapter contains many color drawings, diagrams and photos, we strongly recommend you read this chapter use the PDF file that is stored on the CD-Title. Color improves the clarity and quality of the diagrams. For the downloadable edition, as files larger than 3 MB are difficult to download, we will cut the graphics and photo resolution to reduce the manual file size. In such this case, if your manual is downloaded from our WEB site and not from a CD-ROM, enlarging graphics or photos will distort the image.

3-1. Installation of the AMD Athlon™ XP, Athlon™ and Duron™ CPU

Note

- Installing a heatsink and cooling fan is necessary for heat to dissipate from your processor. Failing to install these items may result in overheating and processor damage.

- The AMD Socket A processor will produce a lot of heat while operating, so you need to use a large heat sink that is especially designed for the AMD socket A processor. Otherwise, it may result in overheating and processor damage.

- If your processor fan and its power cable are not installed properly, never plug the ATX power cable into the motherboard. This can prevent possible processor damage.

- Please refer to your processor installation manual or other documentation with your processor for detailed installation instructions.

The AMD Socket A Athlon™ XP, Athlon™ and Duron™ processor installation is easy, like Socket 7 Pentium® processors before. Because it uses the "**Socket A**" ZIF (**Z**ero **I**nsertion **F**orce) socket, you can easily fix the processor firmly into position. Figure 3-1 shows you what the socket A looks like, and how to open the lever. The socket A has more pins than the socket 7. Therefore, a Pentium® level processor cannot be inserted into a socket A.
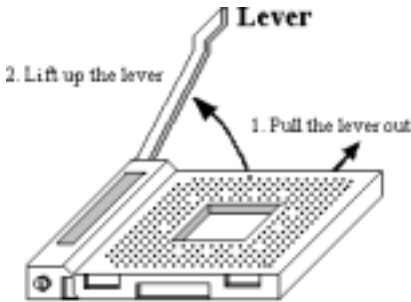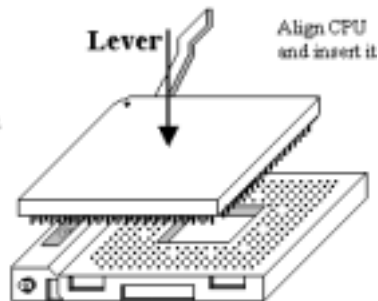

Figure 3-1. Socket A and open its lever

Figure 3-2. Install the CPU into socket A

When you raise the lever, you have to loosen the socket lock. Please raise the lever to the end, and prepare to insert the processor. Next, you need to align the processor pin 1 to the socket pin 1. If you put it in the wrong direction, you will not be able to insert the processor easily, and processor pins will not fully go into the socket. If this is the case, please change the direction, until it easily and fully inserts into the socket A. See Figure 3-2. At the same time check the processor temperature detection thermistor height (if your motherboard has this component), then you can slowly insert the processor into the Scoket A. Finally, you need to check that the processor edge and the Socket A edge is parallel. It should be parallel and not tilted.

When you finish the above, push the lever down to its original position, you should feel the lever lock the socket A. You have then finished the processor installation.

Heatsink Installation Hints

Because the processor will produce a lot of heat while operating, we suggest you use a heatsink approved by AMD to be safe and to keep the processor temperature within normal operation temperatures. The heatsink will be large and heavy, so the fixing plate has a strong tension. When you install the heatsink on to the processor and its socket, you have to very carefully fix the fixing plate to the processor socket hook on both sides. If you do not pay attention to this, you may make the fixing plate scratch the PCB surface and cause circuit damage, break socket hooks or damage the die on the top of processor.

Please follow the sequence metioned below, **Do Not** inverse the sequence. Otherwise, you may have a situation like the photo on the left. Because of the design of the CPU socket, the left side hooks are not as strong as the right side hooks. If you follow our suggestions you will prevent your processor and socket from damage.

Note

Considering the chassis structure problem, please always take off the motherboard from chassis, before adding or removing a heatsink kit.

The proper procedure to install the heatsink kit:

First, install the processor into the processor socket.

Insert the heatsink left side fix plate into the processor socket left side fix hooks. Make sure the fit is very tight. Check the photo on the left.

Insert a flat screwdriver into the middle slot of the right side fix plate and push down. Then you can push the fix plate over the socket hooks on the right side. Check the photo on the left.

Check the photo on the left. You have finished the heatsink installation.

Now hold the whole heatsink and slightly shake it, make sure the buttom right side of the heaksink does not contact the right side of the Socket (see bottom picture). Otherwise, the processor die does not have proper contact with the heatsink. This situation may cause processor damage.

Remember to install the heatsink fan power cable to the CPU fan header on the motherboard.

Now you can reinstall the motherboard back into the chassis.

When all above procedures done, you can connect the ATX power cable to the motherboard.

If you have different types of heatsink kit, please refer to the manual that came with the heatsink kit. The left photo shows another type of heatsink fix plate design. The install sequences are still the same, from right side to left side. Just remember that.

We strongly recommand you to buy a heatsink with three holes in the fix plate. This will provide the best stabability and won't cause the Socket fix hooks to be broken or damaged.

The left photo shows the bottom right side of the heaksink in contact with the right side of the Socket. In this situation, the processor die does not properly contact the heatsink. If you start the computer at this moment, it will immediately cause the processor damage. Always check this place when you finish the heatsink installation.

3-2. Installing the Motherboard to the Chassis

After you install the processor to the motherboard, you can start to fix the motherboard into the chassis. Most computer chassis will have a base on which there will be many mounting holes that allows the motherboard to be securely attached and at the same time, prevents short circuits. There are two ways to attach the motherboard to the base of chassis:

● With studs
● With spacers

Please refer to figure 3-3, which shows the studs and spacers. There may be several types, but all look like the figures below:
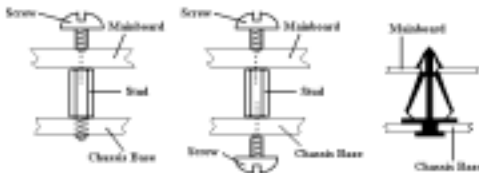

Figure 3-3. The outline of stud and spacer

Figure 3-4. The way we fixed the motherboard

In principle, the best way to attach the motherboard is with studs. Only if you are unable to do this should you attach the board with spacers. Take a careful look at the motherboard and you will see many mounting holes on it. Line these holes up with the mounting holes on the base. If the holes line up and there are screw holes this means you can attach the motherboard with studs. If the holes line up and there are only slots, this means you can only attach the motherboard with spacers. Take the tip of the spacers and insert them into the slots. After doing this to all the slots, you can slide the motherboard into position aligned with the slots. After the motherboard has been positioned, check to make sure everything is OK before putting the casing back on.

Figure 3-4 shows you the way to affix the motherboard using studs or spacers.

Note

If the motherboard has mounting holes, but they don't line up with the holes on the base and there are no slots to attach the spacers, don't worry, you can still attach the spacers to the mounting holes. Just cut the bottom portion of spacers (the spacer they may be a little hard to cut, so be careful with your hands). In this way you can still attach the motherboard to the base without worrying about short circuits. Sometimes you may need to use the plastic springs to isolate the screw from the motherboard PCB surface, because the circuit wire may be near by the hole. Be careful, don't let the screw contact any the printed circuit wire or parts on the PCB that are near the fixing hole, otherwise it may damage the board or cause board malfunctioning.

3-3.   Installing System Memory

This motherboard provides four 184-pin DDR DIMM sites for memory expansion. The DDR SDRAM DIMM sockets support 8 M x 64 (64 MB), 16M x 64 (128 MB), 32 M x 64 (256 MB), 64 M x 64 (512 MB) and 128 M x 64 (1024 MB) or double density DDR SDRAM DIMM modules. Minimum memory is 64 MB and the maximum memory is 2 GB **(Unbuffered, Non-ECC PC 1600 and PC 2100)** or 3.5 GB **(Unbuffered, Non-ECC PC 2700 and PC 3200)** DDR SDRAM. There are four memory module sockets on the system board (for a total of eight banks). In order to create a memory array, the following rules must be followed.

● Supports single and double density DDR DIMMs.

Table 3-1. Valid Memory Configurations

Bank	Memory Module	Total Memory
Bank 0, 1 (DDR DIMM1)	64 MB, 128 MB, 256 MB, 512 MB, 1024 MB	64 MB ~ 1 GB
Bank 2, 3 (DDR DIMM2)	64 MB, 128 MB, 256 MB, 512 MB, 1024 MB	64 MB ~ 1 GB
Bank 4, 5 (DDR DIMM3)	64 MB, 128 MB, 256 MB, 512 MB, 1024 MB	64 MB ~ 1 GB
Bank 6, 7 (DDR DIMM4)	64 MB, 128 MB, 256 MB, 512 MB, 1024 MB	64 MB ~ 1 GB
Total System Memory for Unbuffered & Non-ECC DDR DIMM (PC 1600/PC 2100)		64 MB ~ 2 GB
Total System Memory for Unbuffered & Non-ECC DDR DIMM (PC 2700/PC 3200)		64 MB ~ 3.5 GB

Figure 3-5.   PC1600/2100/2700/3200 DDR Module and Component Mark

Generally, installing DDR SDRAM modules to your motherboard is an easy thing to do. You can refer to Figure 2-5 to see what a 184-pin PC 1600, PC 2100 and PC 2700 DDR SDRAM module looks like.

Unlike installing SIMMs, DIMMs may be "**snapped**" directly into the socket. Note: Certain DDR DIMM sockets have minor physical differences. If your module doesn't seem to fit, please do not force it into the socket as you may damaged your memory module or DDR DIMM socket.

The following procedure will show you how to install a DDR DIMM module into a DDR DIMM socket.

Step 1.   Before you install the memory module, please place the computer power switch in the *off* position and disconnect the AC power cord from your computer.

Step 2.   Remove the computer's chassis cover.

Step 3.   Before touching any electronic components, make sure you first touch an unpainted, grounded metal object to discharge any static electricity stored on your clothing or body.

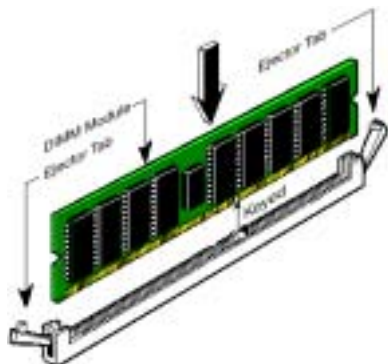**Step 4.**   Locate your computer's 184-pin memory expansion DDR DIMM socket.

Figure 3-6. DDR DIMM module installation

Step 5. Insert the DDR DIMM module into the expansion socket as shown in the illustration. Note how the module is keyed to the socket. You can refer to Figure 3-6 for the details. *This insures the DDR DIMM module will be plugged into the socket in one way only*. Firmly press the DDR DIMM module into DDR DIMM socket, making certain the module is completely seated in the DDR DIMM socket.

Step 6. Once the DDR DIMM module has been installed, the installation is complete and the computer's cover can be replaced. Or you can continue to install other devices and add-on cards that are mentioned in the following section.

Note

When you install a DDR DIMM module fully into the DDR DIMM socket, the eject tab should be locked into the DDR DIMM module very firmly and fit into its indention on the both sides.

It is difficult to differentiate between the PC 1600, PC 2100, PC 2700 and PC 3200 DDR SDRAM modules from the exterior. The only way you can identify them is to look at the sticker on the DDR SDRAM module. The sticker will tell you which kind of structure module the DDR SDRAM is.

3-4. Connectors, Headers and Switches

Inside the case of any computer several cables and plugs have to be connected. These cables and plugs are usually connected one-by-one to connectors located on the motherboard. You need to carefully pay attention to any connection orientation the cables may have and, if any, notice the position of the first pin of the connector. In the explanations that follow, we will describe the significance of the first pin.

We will show you all of the connectors, headers and switches here, and tell you how to connect them. Please pay attention and read the entire section for necessary information before attempting to finish all of the hardware installation inside the computer chassis.

Figure 3-7 shows you all of the connectors and headers that we'll discuss in the next section, you can use this diagram to visually locate each connector and header we describe.

All connectors, headers and switches mentioned here, will depend on your system configuration. Some features you may (or may not) have and need to connect or configure depending on the peripheral. If your system doesn't have such add-on cards or switches you can ignore some special feature connectors.
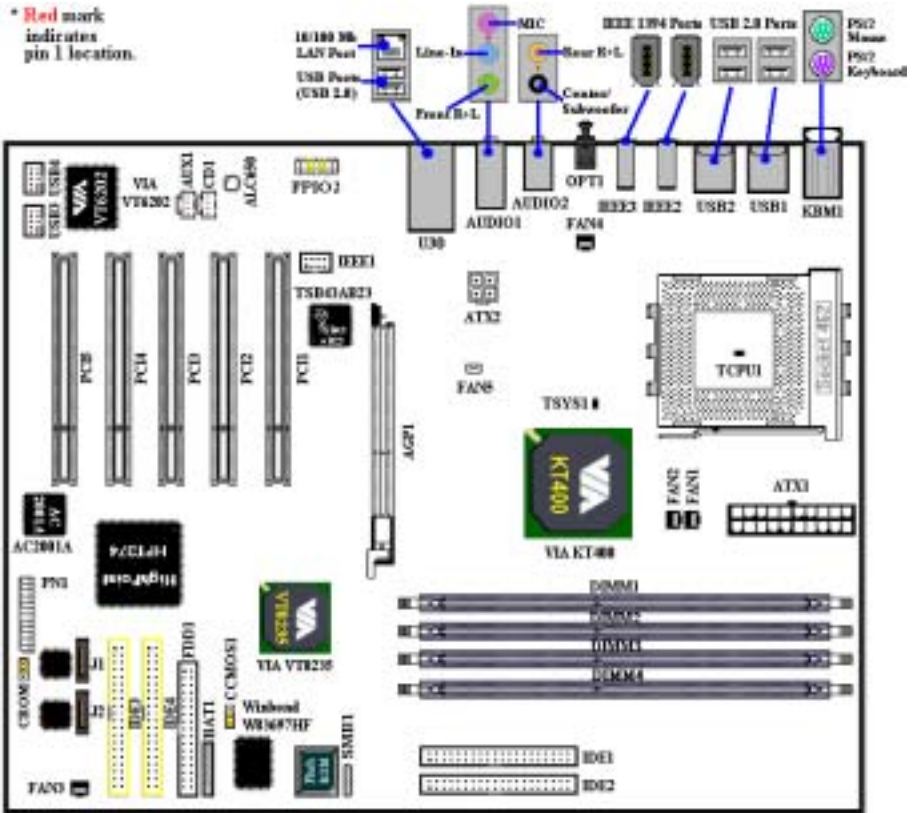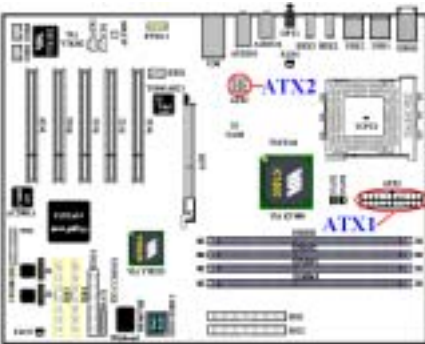
Figure 2-7. All connectors and headers for the AT7-MAX2

First, Let's see the headers that AT7-MAX2 uses, and what their functions are. We will show you all the connectors and headers.

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(1). Plug the Power connectors to the ATX1 and ATX2 Connectors


AT7-MAX2 had designed two power connectors (ATX1 and ATX2), it is different from the regular one. It can provide for power supply designed for Pentium® 4 processors, also can provide for general designed ATX power to connect to AT7-MAX2. It's a newly designed ATX12V1 +12VDC power with 300W, 20A +5VDC capacity at least for heavily loaded system, and 720mA +5VSB at least for supporting some special features.

Attach the connector from the ATX power supply to the ATX1 and ATX2 connectors here (General designed ATX power supply do not have ATX12V1 connector provide, so you don't need to connect

anything to the ATX2 connector). Remember you have to push the connector from the ATX power supply firmly to the end with the ATX1 and ATX2 connectors, insuring that you have a good connection.

*Note: Watch the pin position and the orientation.*

| ATX1 | ATX2 |
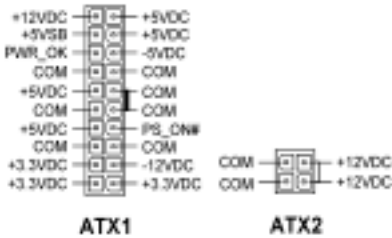
Caution

If the power supply connectors are not properly attached to the ATX power supply, the power supply or add-on cards may be damaged.

One end of AC power core connects to ATX power supply, and the other end (AC plug) will plug into the wall outlet. Be aware that when facing the wall outlet, the round hole is in the middle. The right side slot is called ground wire slot. It has a longer slot length than the left side slot. The left side slot is called the live wire slot. You can use an electroscope to detect its polarity or you can use a voltage meter to measure the voltage of both slot sides. If you insert an electroscope into the live wire slot, the electroscope will light up. Using a voltage meter, you will find that the live wire slot will register a higher voltage.

If you reverse the polarity of AC plug, it may affect the life of computer equipment, or cause an electric shock when you touch the computer chassis. We suggest that you plug the computer AC plug to a three-hole wall outlet for better safety and to avoid electric shock.

## (2). FAN1, FAN2, FAN3, FAN4 and FAN5 Headers
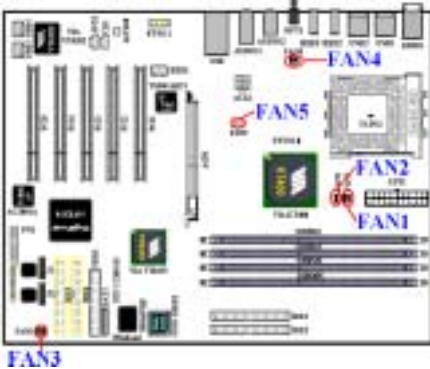
Attach the connector from the processor fan to the header named FAN1 or FAN2 and connector from the front chassis fan to the header FAN3. Attach the connector from the power fan or back chassis fan to FAN4 header and attache the connector from northbridge fan to the header named FAN5. You must attach the processor fan to the processor, or your processor will work abnormally or may be damaged by overheating. To prevent the computer chassis internal temperature from getting too high, also connect the chassis fan.
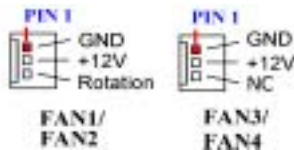
Note: Watch the pin position and the orientation

(3). SMB1: System Management Bus (SM-Bus) Header
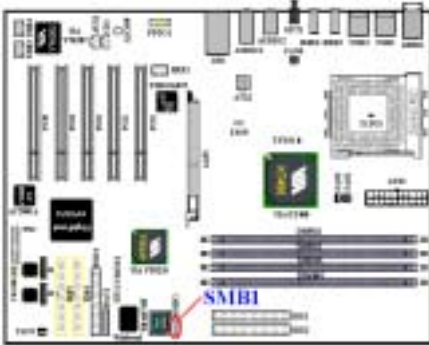
This header is reserved for the system management bus (SM-Bus). The SM-Bus is a specific implementation of an I^2C bus. I^2C is a multi-master bus, this means that multiple chips can be connected to the same bus and each one can act as a master by initiating a data transfer. If more than one master simultaneously tries to control the bus, an arbitration procedure decides which master gets priority. You can connect the devices which utilizes the SM-Bus.

Note: Watch the pin position and the orientation

```
1 ▪ — SMBCLK
  ▫ — No Pin
3 ▪ — GND
4 ▪ — SMBDATA
5 ▪ — +5V
```

SMB1

(4). TCPU1 & TSYS1: Temperature Thermistor
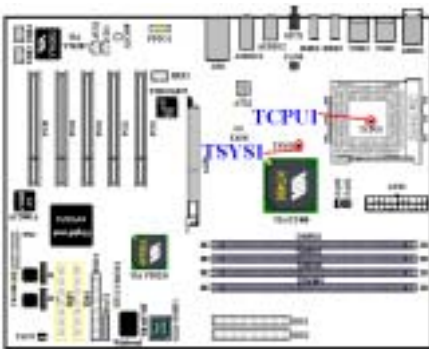
The TCPU1 is used to detect the CPU temperature. The TSYS1 is used to detect the system environment temperature. You can see the readings in the BIOS or in the hardware monitoring application main screen.

(5). USB3 and USB4 Headers: Additional USB Plugs Header

Thess headers are for connecting the additional USB port plugs. Each connector can provides two additional USB plugs. Which means, total you can get two additional USB plugs from each connector. You can use the special USB port expansion cable to connect it (the cable come with the metal plate can fixed on the back panel of computer chassis).
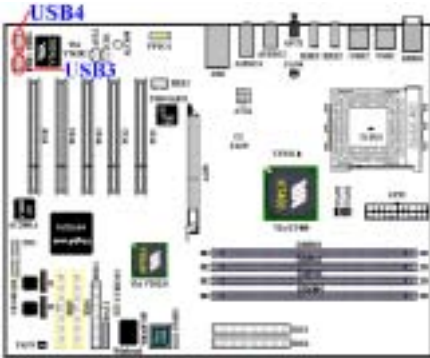
Both USB3 and USB4 are for USB 2.0 device connection.

Note: Watch the pin position and the orientation

GND 10 — 9 No Pin
GND 8 — 7 GND
Data 1+ 6 — 5 Data 0+
Data 1- 4 — 3 Data 0-
VCC1 2 — 1 VCC0
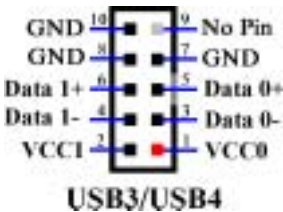
USB3/USB4

Note

The USB3 & USB4 headers supports USB 2.0 specification function, please use the special USB cable design for USB 2.0 specifications. Otherwise, it may cause an unstable or signal error situation.

(6). IEEE1 Header: IEEE 1394 Header
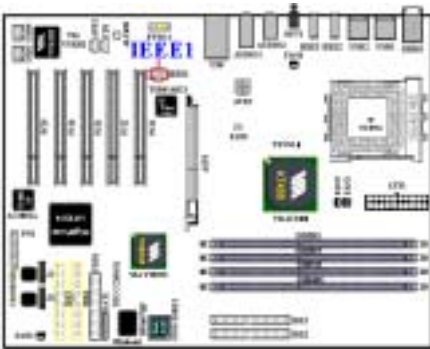
This header is reserved for connection to the **ABIT Media XP** product **(Optional)**. The **Media XP** can provide the total solution for the front panel connections. It provided a various function, like a: SD/MS/CF card reader, USB 2.0/IEEE 1394a connectors, S/P DIF-Out connector and MIC/Earphone connectors. They all designed on one 5.25" diskette size panel, can fit on the chasses front panel 5.25" diskette slot.

For detailed information of **ABIT Media XP/Media XP Pro**, please see its user's manual.

Note: Watch the pin position and the orientation

Note

You don't need to install any additional drivers for IEEE 1394 devices. The newest operation system will fully support this feature. For example: Windows® 2000, Windows® XP, etc.
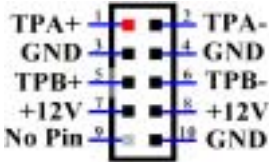
IEEE1

---

(7). CCMOS1 Header: CMOS Discharge Jumper
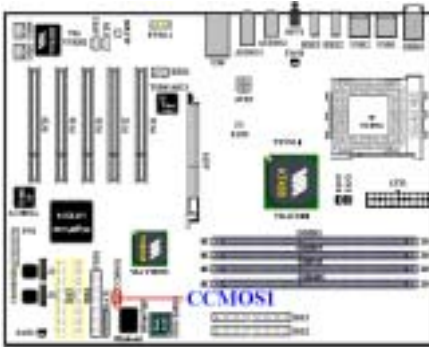
Jumper CCMOS1 used to discharge CMOS memory. When you install the motherboard, make sure this jumper is set for normal operation (pin 1 and 2 shorted). See figure below.

Normal Operation (Default)   Discharge CMOS
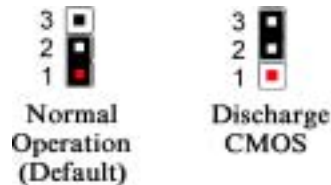
Note: Watch the pin position and the orientation

Note

Before you clear the CMOS, you have to first turn the power off (including the +5V standby power). Otherwise, your system may work abnormally.

After updating your BIOS and before boot up, please clear the CMOS first. Then put the jumper to its default position. After that, you can reboot your system and ensure that your system is working fine.

(8).   PN1 Headers: The Headers for Chassis's Front Panel Indicators and Switches
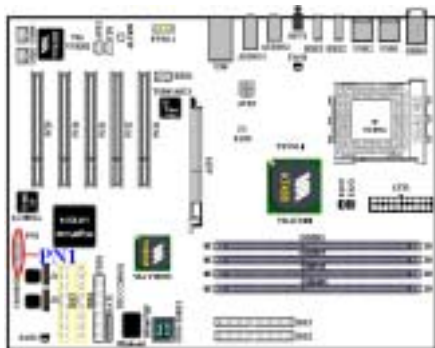
PN1 are for switches and indicators for the chassis's front panel, there are several functions that come from this header. You have to watch the pin position and the orientation, or you may cause LED do not light up. Figure below shows you the PN1 functions of the pins.
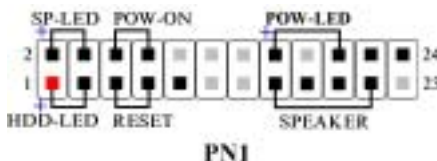
PN1 (Pin 1 & 3): HDD LED Header

Attach the cable from the case's front panel HDD LED to this header. If you install it in the wrong direction, the LED light will not illuminate correctly.

Note: Watch the HDD LED pin position and the orientation.

PN 1 (Pin 5 & 7): Hardware Reset Switch Header

Attach the cable from the case's front panel Reset switch to this header. Press and hold the reset button for at least one second to reset the system.

PN 1 (Pin 15-17-19-21): Speaker Header

Attach the cable from the system speaker to this header.

PN 1 (Pin 2 & 4): Suspend LED Header

Insert the two-threaded suspend LED cable into this header. If you install it in the wrong direction, the LED light will not illuminate correctly.

Note: Watch the Suspend LED pin position and the orientation.

PN 1 (Pin 6 & 8): Power On Switch Header

Attach the cable from the case's front panel power on switch to this header.

PN 1 (Pin 16-18-20): Power On LED Headers

There is a specific orientation for pins 1 through 3. Insert the three-threaded power on LED cable to this header. Check to make sure the correct pins go to the correct connectors on the motherboard. If you install them in the wrong direction, the power LED light will not illuminate correctly.

Note: Watch the power LED pin position and orientation.

For the PN1 pin's count-name list, please refer to table 3-2.

Table 3-2. PN1 pin count name list

PIN Name		Significance of signal	PIN Name		Significance of signal
PN1	PIN 1	HDD LED (+)	PN1	PIN 2	SP-LED (+)
	PIN 3	HDD LED (-)		PIN 4	SP-LED (-)
	PIN 5	Reset SW (-)		PIN 6	PWR-ON (+)
	PIN 7	Reset SW (+)		PIN 8	PWR-ON (-)
	PIN 9	No Connection		PIN 10	No Pin
	PIN 11	No Pin		PIN 12	No Pin
	PIN 13	No Pin		PIN 14	No Pin
	PIN 15	Speaker (+5V)		PIN 16	PWR LED (+)
	PIN 17	Speaker (GND)		PIN 18	No Pin
	PIN 19	Speaker (GND)		PIN 20	PWR LED (-)
	PIN 21	Speaker (Driver)		PIN 22	No Connection
	PIN 23	No Pin		PIN 24	No Connection

(9). FPIO2 Header: Front Panel Input/Output Signals Header
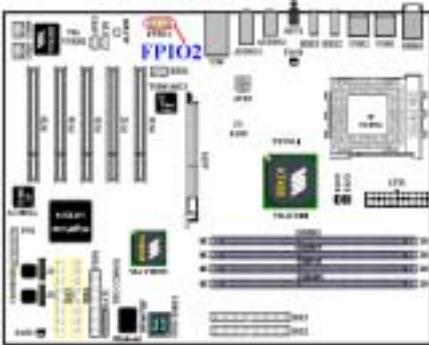
You'll see this header on AT7-MAX2 motherboard. This header is designed to connect the **ABIT Media XP** product. This header can provide the analog audio output signals for front right and front left channel. It also provides one digital S/P DIF output connector.

Note: Watching the pin position and the orientation
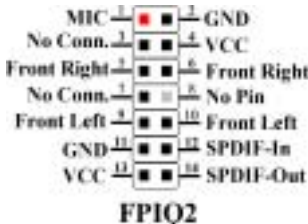
(10). CD1 and AUX1 Headers: CD Audio and Auxiliary audio signal input headers
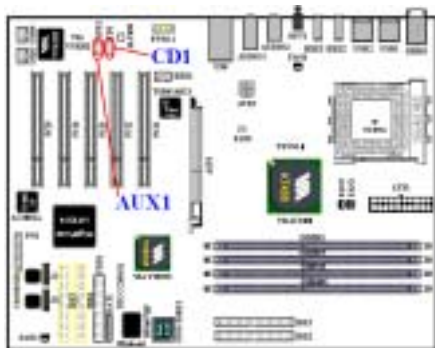
These connectors connect to the audio output of internal CD-ROM drive or add-on card.
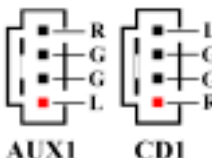
(11). CROM: S2K Mode Select Header
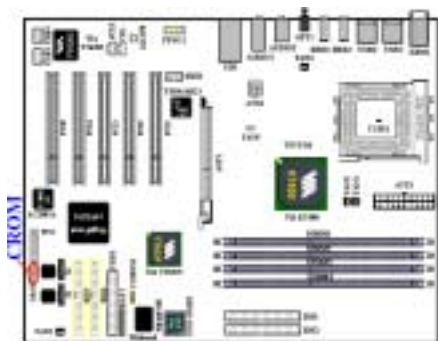
You can set the S2K bus, the bus between CPU and North Brige, operating mode as figure below. When setting jumper CROM to "**Strapping from boot ROM**" (Default), the timing of S2K bus is controlled by the internal boot rom and you enable the option "**CPU Fast Command Decode**" in the BIOS. The system performance will increase. When the jumper is set to "**Strapping from Hardware**", the timing of S2K bus is controlled by CPU hardware and the system has better flexibility.

Strapping from boot ROM (Default)   **Strapping from Hardware**

(12). FDD1 Connector
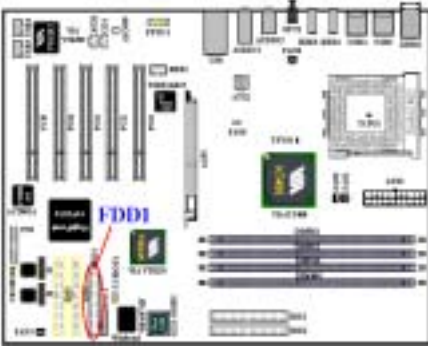
This 34-pin connector is called the "*floppy disk drive connector*". You can connect a 360K, 5.25", 1.2M, 5.25", 720K, 3.5'', 1.44M, 3.5" or 2.88M, 3.5" floppy disk drive.

A floppy disk drive ribbon cable has 34 wires and two connectors to provide the connection of two floppy disk drives. After connecting the single end to the FDD1, connect the two connectors on the other end to the floppy disk drives. In general, people only install one floppy disk drive on their computer system.

Note

A red mark on a wire typically designates the location of pin 1. You need to align the wire pin 1 to the FDD1 connector pin 1, then insert the wire connector into the FDD1 connector.

(13). IDE1, IDE2, IDE3 and IDE4 Connectors

This motherboard provides two IDE ports (IDE1 & IDE2) to connect up to four IDE devices in Ultra DMA 133 mode by Ultra DMA 66 ribbon cables. Each cable has 40-pin 80-conductor and three connectors, providing two hard drive connections with the motherboard. Connect the single end (blue connector) at the longer length of ribbon cable to the IDE port on motherboard, and the other two ends (gray and black connector) at the shorter length of the ribbon cable to the connectors on hard drives.

AT7-MAX2's built-in HighPoint HPT 374 chipset gives you the capability to support Ultra DMA 133. It provides two IDE channels (IDE3 & IDE4) that also support Ultra DMA 133 specifications, and it allows for four additional IDE devices in your computer system. Especially, if you want to connect two or four HDDs to get RAID functions, it is very convenient for you to install the HDDs to IDE3 or IDE4. See the Chapter 4 for detailed information about RAID settings.
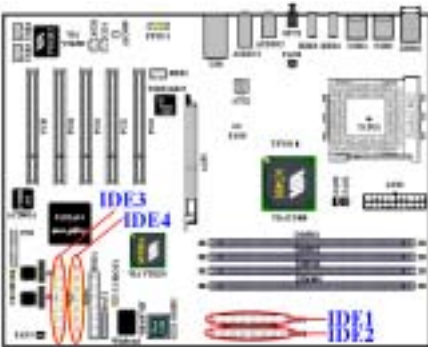
If you want to connect two hard drives together through one IDE channel, you must configure the second drive to Slave mode after the first Master drive. Please refer to the HDD documentation for jumper settings. The first drive connected to IDE1 is usually referred to as "**Primary Master**", and the second drive as "**Primary Slave**". The first drive connected to IDE2 is referred to as "**Secondary Master**" and the second drive as "**Secondary Slave**".

Keep away from connecting one legacy slow speed device, like CD-ROM, together with another hard drive on the same IDE channel, this will decrease your integral system performance.
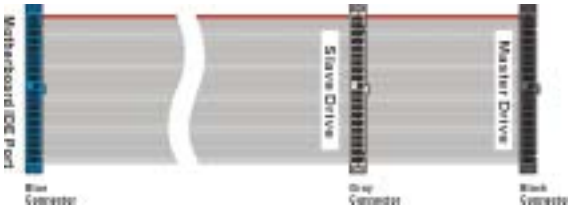
Figure 2-8. Ultra DMA 66 Ribbon Cable Outline

Note

- The Master or Slave status of the hard disk drive is set on the hard disk itself. Please refer to the hard disk drive user's manual.

- To connect Ultra DMA 100 & Ultra DMA 133 devices on IDE1 to IDE4, an Ultra DMA 66 cable is required.

- A red mark on a wire typically designates the location of pin 1. You need to align the wire pin 1 to the IDE connector pin 1, before inserting the wire connector into the IDE connector.

- HPT 374 IDE controller is designed to support high-speed and high performance mass storage devices. Thus, we suggest that you don't connect non-disk devices that use ATA/ATAPI interfaces, such as a CD-ROM to HPT 374 IDE connector (IDE3 and IDE4).

(14). J1 and J2 Connectors (Serial ATA Connectors):

This motherboard provides two Serial ATA ports (J1 & J2) to connect two Serial ATA devices in Serial ATA 150 mode by special Serial ATA ribbon cables. Each cable has 7-pin 7-conductor and two connectors, providing one Serial ATA hard drive connection with the motherboard. Connect the single end of the ribbon cable to the Serial ATA port on the motherboard, and the other end of the ribbon cable to the connector on the Serial ATA hard drive.
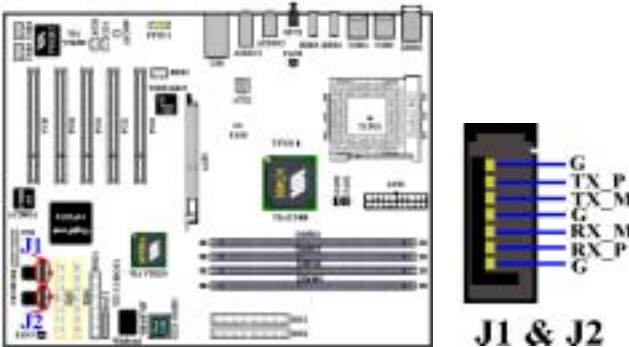
Note

To connect Serial ATA devices on J1 and J2, a Serial ATA cable is required.
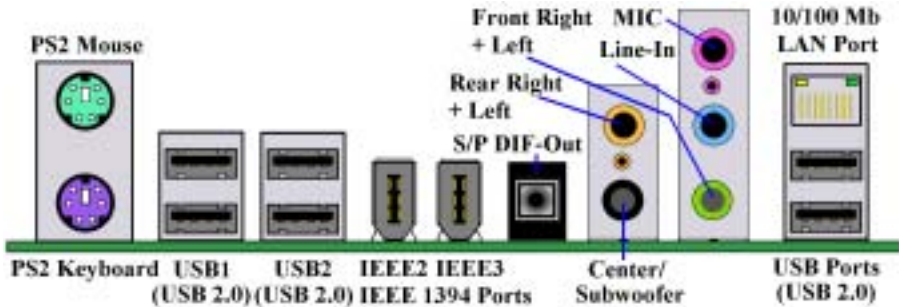
Figure 2-9. AT7-MAX2 back panel connectors

Figure 2-9 shows the AT7-MAX2 back panel connectors, these connectors are for connection to outside devices to the motherboard. We will describe which devices will attach to these connectors below.

(15). PS/2 Keyboard Connector

Attach a PS/2 keyboard connector to this 6-pin Din-connector. If you use an AT keyboard, you can go to a computer store to purchase an AT to ATX converter adapter, then you can connect your AT keyboard to this connector. We suggest you use a PS/2 keyboard for best compatibility.

(16). PS/2 Mouse Connector

Attach a PS/2 mouse to this 6-pin Din-connector.

(17). USB Ports Connectors (Located at USB 1, USB2 and U30)

This motherboard provides six USB ports (on back panel of motherboard). These six USB ports are complient with USB 2.0 specification. Attach the USB cable connector from the individual device to these connectors.

You can attach USB devices such as a, keyboard, mouse, printer, portable HDD, scanner, digital speakers, monitor, hub, digital camera, joystick etc. to one of each USB connector. You must make sure your operating system supports this feature and you may need to install an additional driver for individual devices. Please refer to your device user's manual for detailed information.

Note

Please use the special USB cable designed for USB 2.0 specifications. Otherwise, it may cause not stable or signal error situation.

(18). IEEE 1394 Ports

These two ports supports IEEE 1394 specifications. Attach the IEEE 1394 cable connector from the individual device to these connectors.

The IEEE 1394 high-speed serial bus provides enhanced PC connectivity for consumer electronics audio/video (A/V) appliances, storage peripherals, other PCs, and portable devices. Such as DV recoder, DVD recording, etc.

IEEE 1394 provides a Plug and Play-compatible expansion interface for the PC. The 100 Mbps, 200 Mbps and 400 Mbps transfer rates currently specified in IEEE 1394.a and the enhancements in IEEE 1394.b are well suited to multi-streaming I/O requirements. The Microsoft® Windows® operating system offers strong built-in support for IEEE 1394.

(19). OPT1：S/P DIF-Out Connector

This connector can let you using the optical cable to connection the device, and transfer the digital data through it. You can connect this signal to the digital decoder to decode and transfer the digital signal to the analog signal.

(20). Audio1 and Audio2 Connectors

Audio1 and Audio2 connectors are audio connectors for analog audio signal in or out.

Rear Right + Left Channel Connector: You can connect the plug from the rear channel speakers or rear channel amplifier to this connector. Please make sure you are connect to the rear channel speakers or rear channel amplifier correctly, otherwise you may get the wrong sound positioning.

Center + Subwoofer Channel Connector: You can connect the plug from the center/subwoofer channel speakers or center/subwoofer channel amplifier to this connector. Please make sure you are connect to the center/subwoofer channel speakers or center/subwoofer channel amplifier correctly, otherwise you may get the wrong sound positioning.

Mic In Connector: You can connect the plug from the microphone to this connector. Do not connect other audio (or signal) sources to this connector.

Line In Connector: You can connect the TV adapter audio output signal, or external audio sources, like a CD walkman, video camcorder, VHS recorder audio output signal plug to this connector. Your audio software can control the input level for the line-in signal.

Front Right + Left Channel Connector: You can connect the plug from the front channel speakers or front channel amplifier to this connector. Please make sure you are connect to the front channel speakers or front channel amplifier correctly, otherwise you may get the wrong sound positioning.

(21). 10/100 Mb LAN Port Connector

This motherboard provides one built-in 10/100 Mb LAN port, this jack is for connecting the RJ-45 cable from the local area network hub to your computer. We suggest you use the category 5 UPT (**U**nshielded **T**wisted **P**air) or STP (**S**hielded **T**wisted **P**air) cable to make this connection. The connection length from the hub to the computer is best to be kept under 100 meter.

The green LED shows the connection situation. If the network active well, this LED will light on. The yellow LED shows if the data is active or not. If the computer is translating or receiving data from the network, this LED will flicker.

Note

This chapter contains many color drawing diagram and photos, we strongly recommend you to read this chapter use the PDF file we gave you that store in the CD-Title. It will provide you the better look and clearly color identify.

Chapter 4. Introducing the BIOS

The BIOS is a program located on a Flash Memory chip on the motherboard. This program will not be lost when you turn the computer off. This program is also referred to as the boot program. It is the only channel the hardware circuit has to communicate with the operating system. Its main function is to manage the setup of the motherboard and interface card parameters, including simple parameters such as time, date, hard disk drive, as well as more complex parameters such as hardware synchronization, device operating mode, **SoftMenu III** features and and setup of CPU speed. The computer will operate normally, or will operate at its best, only if all of these parameters are correctly configured through the BIOS.

> **Don't change the parameters inside the BIOS unless you fully understand the meanings and consequences**

The parameters inside the BIOS are used to setup the hardware synchronization or the device-operating mode. If the parameters are not correct, they will produce errors, the computer will crash, and sometimes you will even not be able to boot the computer after it has crashed. We recommend that you do not change the parameters inside the BIOS unless you are very familiar with them. If you are not able to boot your computer anymore, please refer to the section "**CCMOS1 Header**" in Chapter 2 to see how to discharge the CMOS date.

When you start the computer, the BIOS program controls it. The BIOS first operates an auto-diagnostic test called POST (**P**ower **O**n **S**elf **T**est) for all of the necessary hardware. It then configures the parameters of the hardware synchronization, and detects all of the hardware. Only when these tasks are completed does it give up control of the computer to the program to the next level, which is the operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in insuring that your system performs at its best. After the BIOS has achieved the auto-diagnostic and auto-detection operations, it will display the following message:

<center>**PRESS DEL TO ENTER SETUP**</center>

The message will be displayed for three to five seconds, if you press the **Del** key, you will access the BIOS Setup menu. At that moment, the BIOS will display the following message:

<center>**Figure 3-1. CMOS Setup Utility**</center>

In the BIOS Setup main menu of Figure 3-1, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press **Esc** to quit the BIOS Setup.

- Press ↑ ↓ ←→ (up, down, left, right) to choose, in the main menu, the option you want to confirm or to modify.

- Press **F10** when you have completed the setup of BIOS parameters to save these parameters and to exit the BIOS Setup menu.

- Press **Page Up/Page Down** or **+/-** keys when you want to modify the BIOS parameters for the active option.

Note

Parts of the screenshot may not same as you see on your screen, because the BIOS version may change periodically. However, most of the functions covered in this manual will work. We suggest that you go to our WEB site often to see if there are new manual releases. Then you can check the newly updated BIOS items.

Computer Knowledge: CMOS Data

Maybe you have heard somebody saying that his or her CMOS DATA was lost. What is the CMOS? Is it important? The CMOS is the memory used to store the BIOS parameters that you have configured. This memory is passive. You can read its data, and you can also store data in it. But this memory has to be powered by a battery, in order to avoid any loss of its data when the computer is turned off. Since you may have to change the CMOS battery when it is out of power and if doing so, you will loose all CMOS data, therefore, we recommend that you write down all the parameters of your hardware, or to put a label with these parameters on your hard disk.

4-1. CPU Setup [SOFT MENU™ III]

The CPU can be setup through a programmable switch (**CPU SOFT MENU™ III**), that replaces the traditional manual hardware configuration. This feature allows the user to more easily complete the installation procedures. You can install the CPU without configuring any jumpers or switches. The CPU must be setup according its specifications. In the first option, you can press <**Enter**> at any time to display all the items that can be chosen for that option.
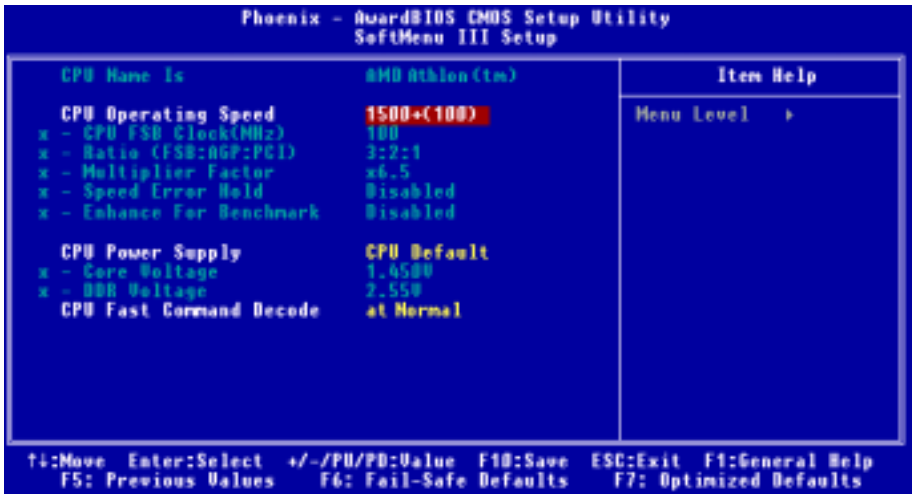
Figure 3-2. CPU SOFT MENU™ III

CPU Name Is:

➤ AMD Athlon (tm) XP
➤ AMD Athlon (tm)
➤ AMD Duron (tm)

CPU Operating Speed:

This option sets the CPU speed. Select the CPU speed according the type and the speed of your CPU. For AMD Athlon™ XP, Athlon™ and Duron™ processors, you can choose the following settings (This example is for AMD Athlon™ XP processor):

➤User Define   ➤1500+ (133)   ➤1600+ (133)   ➤1700+ (133)   ➤1800+ (133)   ➤1900+ (133)
➤2000+ (133)   ➤2100+ (133)   ➤2200+ (133)

Note

The display of this item might be different when you installed the different type of processors. We just show you an example here.

User defined external clock and multiplier factor:

➤ **User Defined**

☠☠☠☠   **Warning**   ☠☠☠☠
The wrong settings of the multiplier and external clock in certain circumstances may cause CPU damage

The wrong settings of the multiplier and external clock in certain circumstances may cause CPU damage. Setting the working frequency higher than the specifications of PCI or of processor may cause abnormal memory module functioning, system hangs, hard disk drive data loss, abnormal functioning of the VGA card, or abnormal functioning with other add-on cards. Using non-specification settings for your CPU is not the intention of this explanation, for which should be used for engineering testing only, not for normal applications.

If you use non-specification settings for normal operation, your system may not be stable, and may effect system reliability. Also, we do not guarantee the stability and compatibility for settings that are not within specification, and any damage of any elements on the motherboard or peripherals, is not our responsibility.

✏ *CPU FSB Clock (MHz):*

You can increase the CPU FSB clock speed here. This means that you can independently increase the CPU FSB clock speed. The DEC (decimal) numbers from 100 to 250 are available, with the default setting at *100*. You can change this setting to increase CPU FSB clock speed. CPU FSB speed above the standard bus speed is supported, but not guaranteed due to the CPUspecs.

✏ *Ratio (FSB:AGP:PCI):*

Three options are available: 3:2:1 ➔ 4:2:1 ➔ 5:2:1. This item lets you set the processor **F**ront **S**ide **B**us, AGP and PCI clock. It correlates with the processor FSB clock you set. Many of options are available, you can choose the divider ratio you want. If the setting is *3:2:1*. In this case, the AGP clock will be the processor FSB clock divided by 3 and times 2. The PCI clock will be the processor FSB clock divided by 3 and times 1.

Note: According your processor FSB frequency, the default values will change also.

✏ *Multiplier Factor:*

Three are several settings, shown as below:

➤x5	➤x5.5	➤x6	➤x6.5	➤x7	➤x7.5	➤x8	➤x8.5	➤x9
➤x9.5	➤x10	➤x10.5	➤x11	➤x11.5	➤x12	➤x12.5	➤ x13	➤x13.5
➤x14	➤x15	➤x16	➤x16.5	➤x17	➤x18			

✏ *Speed Error Hold:*

Two options are available: Disabled ➔ Enabled. The default setting is *Disabled*. If you change the setting to *Enabled* when the CPU speed setting is wrong, the system will hold.

✏ *Enhance For Benchmark:*

Two options are available: Disabled ➔ Enabled. The default setting is *Disabled*. This item can improving your processor and system performance.

Normally, we do not recommend that you use the "**User Define**" option to setup CPU speed and PCI clock. This option is for setup of future CPUs whose specifications are still unknown. The specifications of all present CPUs are included in the default settings. Unless you are very familiar with all CPU parameters, it is very easy to make mistakes when you define the external clock and the multiplier factor by yourself.

Solution in case of booting problem due to invalid clock setup:

Normally, if the CPU clock setup is wrong, you will not be able to boot. In this case, turn the system off then on again. The CPU will automatically use its standard parameters to boot. You can then enter the BIOS Setup again and set up the CPU clock. If you can't enter the BIOS setup, you must try turning the system on a few times (3 ~ 4 times) or press "**INSERT**" key when turning on and the system will automatically use its standard parameters to boot. You can then enter BIOS SETUP again and set up the new parameters.

When you change your CPU:

This motherboard has been designed in such a way that you can turn the system on after having inserted a CPU in the socket without having to configure any jumpers or DIP switches. But if you change your CPU, normally you just have to turn off the power supply (mechanical off), change the CPU and then, set up the CPU parameters through **SOFT MENU™ III**. However, if the new CPU is slower than the old one (and is same brand and type), we offer you two methods to successfully complete the CPU change operation.

Method 1: Setup up the CPU for the lowest speed for its brand. Turn the power supply off (mechanical off) and change the CPU. Then turn the system on again, and set up the CPU parameters through **SOFT MENU™ III**.

Method 2: Since you have to open the computer case when you change the CPU, it could be a good idea to use the CCMOS jumper to erase the parameters of the original CPU and to enter BIOS Setup to set up CPU parameters again.

Attention

After setting up the parameters and leaving the BIOS SETUP, and having verified that the system can be booted, do not press the Reset button or turn off the power supply. Otherwise the BIOS will not read correctly, the parameters will fail and you must enter **SOFT MENU™ III** again to set up the parameters all over again.

CPU Power Supply:

This option allows you to switch between Default and User Define voltages.

➤ **CPU Default:** The system will detect the CPU type and select the proper voltage automatically. When it is enabled, the option "**Vcore Voltage**" will show the current voltage setting that is defined by the CPU and this will not be changeable. We recommend using this CPU default setting and not changing it unless the current CPU type and voltage setting can not be detected or is not correct.

➤ **User Define:** This option lets the user select the voltage manually. You can change values of the "**Core Voltage**" and "**DDR Voltage**" option lists by using the arrow up and arrow down keys.

CPU Fast Command Decode:

Two options are available: at Normal ➤ to Fast or at Fast ➤ to Normal. This will depends which state you choose. If you set this item from "**at Fast**" to "**to Normal**", when you reboot the system and finish the POST process, the state will change to your new setting (Here's *to Normal*). After that, if you go to view the BIOS menu again, you will see this item shows "**at Normal**", if you press the <**Enter**> key, you'll see the two options: at Normal ➤ to Fast, and the default setting is *at Normal*. If you set this item from "**at Normal**" to "**to Fast**", and go through the same process we mentioned before, you will see this item shows "**at Fast**", if you press the <**Enter**> key, you'll see the two options: at Fast ➤ to Normal, and

the default setting is *at Fast*. You can select item if you want CPU decode address is faster or normal speed. We suggest you choose *to Normal* for greatest stability. Should you want increased performance then you can select *to Fast*. You have to set the jumper on the mainboard called "**CROM**" pin 1 and pin 2 short, then you can see this item appear in this menu.

4-2. Standard CMOS Features Setup Menu

This contains the basic configuration parameters of the BIOS. These parameters include date, hour, VGA card, floppy disk and HDD settings.

Figure 3-3A. Standard CMOS Setup Screen Shot

Date (mm:dd:yy):

You can set the date in this item: month (mm), date (dd) and year (yy).

Time (hh:mm:ss):

You can set the time in this item: hour (hh), minute (mm) and second (ss).

IDE Primary Master / Slave and IDE Secondary Master / Slave:

These items have a sub-menu to let you choose further options. You can refer to figure 3-3B to check what options are available.
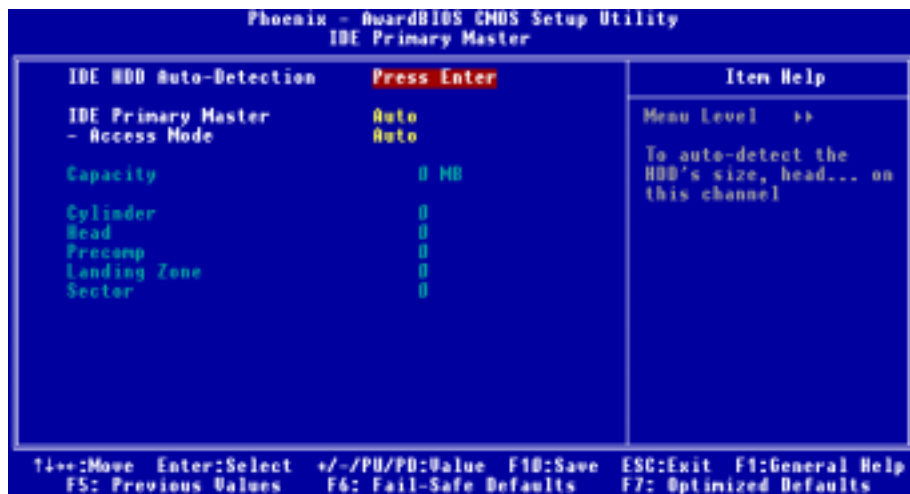
Figure 3-3B. IDE Primary Master Setup Screen Shot

IDE HDD Auto-Detection:

When you press the <**Enter**> key for the BIOS to auto detect all detailed parameters of the hard disk drivers (HDD). If auto detection is successful, the correct values will be shown in the remaining items of this menu.

Note

❶ A new IDE HDD must be first formatted, otherwise it can't be read or write. The basic step in using a HDD is to run FDISK, and then FORMAT the drive. Most current HDDs have already been subjected to low-level format at the factory, so you can probably skip this operation. Remember though, the primary IDE HDD must have its partition set to active within the FDISK procedure.

❷ If you are using an old HDD that is already formatted, auto detection can't detect the correct parameters. You may need to do a low-level format or set the parameters manually, and then check if the HDD is working.

IDE Primary Master:

Three settings are available: None ➔ Auto ➔ Manual. The default setting is *Auto.* If you choose Auto, the BIOS will automatically check what kind hard disk you are using. If you want to set the HDD parameters yourself, make sure you fully understand the meaning of the parameters, and be sure to refer to the manual provided by the HDD manufacture to get the settings right.

☛ *Access Mode:*

Since old operating systems were only able to support HDDs with capacities no bigger than 528 MB, any hard disk with more than 528 MB was unusable. AWARD BIOS features a solution to this problem: you can, according to your operating system, choose four operating modes: CHS ➔ LBA ➔ Large ➔Auto.

The HDD auto detection option in the sub-menu will automatically detect the parameters of your hard disk and the mode supported.

➤ *CHS (Normal mode):*

Standard normal mode supports hard disks of up to 528 MB or less. This mode directly uses positions indicated by Cylinders (CYLS), Heads, and Sectors to access data.

➤ *LBA (Logical Block Addressing) mode:*

The earlier LBA mode can support HDD capacities of up to 8.4 GB, and this mode uses a different method to calculate the position of disk data to be accessed. It translates Cylinders (CYLS), Heads and Sectors into a logical address where data is located. The Cylinders, Heads, and Sectors displayed in this menu do not reflect the actual structure of the hard disk, they are just reference values used to calculate actual positions. Currently, all high capacity hard disks support this mode, that's why we recommend you use this mode. Currently, the BIOS can support the INT 13h extension function, enabling the LBA mode to support hard disk drive capacities exceeding 8.4 GB.

➤ *Large Mode:*

When the number of cylinders (CYLs) of the hard disk exceeds 1024 and DOS is not able to support it, or if your operating system does not support LBA mode, you should select this mode.

➤ *Auto:*
Just let the BIOS detect your HDD access mode and make the decisions.

☛ *Capacity:*

This item auto displays your HDD size. Note that this size is usually slightly greater than the size given by a disk checking program of a formatted disk.

Note

All the items below are available when you set the item *Primary IDE Master* to *Manual*.

☛ *Cylinder:*

When disks are placed directly above one another along the shaft, the circular vertical "slice" consisting of all the tracks located in a particular position is called a cylinder. You can set the number of cylinders for a HDD. The minimum number you can enter is 0, the maximum number you can enter is 65535.

☛ *Head:*

This is the tiny electromagnetic coil and metal pole used to create and read back the magnetic patterns on the disk (also called the read/write head). You can configure the number of read/write heads. The minimum number you can enter is 0, the maximum number you can enter is 255.

☛ *Precomp:*

The minimum number you can enter is 0, the maximum number you can enter is 65535.

☞ *Landing Zone:*

This is a non-data area on the disk's inner cylinder where the heads can rest when the power is turned off. The minimum number you can enter is 0, the maximum number you can enter is 65535.

☞ *Sector:*

The minimum segment of track length that can be assigned to stored data. Sectors usually are grouped into blocks or logical blocks that function as the smallest units of data permit. You can configure this item to sectors per track. The minimum number you can enter is 0, the maximum number you can enter is 255.

Driver A & Driver B:

If you have installed the floppy disk drive here, then you can select the type of floppy drive it can support. Six options are available: None ➔ 360K, 5.25 in. ➔ 1.2M, 5.25in. ➔ 720K, 3.5 in. ➔ 1.44M, 3.5 in. ➔ 2.88M, 3.5 in.

Floppy 3 Mode Support:

Four options are available: Disabled ➔ Driver A ➔ Driver B ➔ Both. The default setting is *Disabled*. 3 Mode floppy disk drives (FDD) are 3.5" drives used in Japanese computer systems. If you need to access data stored in this kind of floppy, you must select this mode, and of course you must have a 3 Mode floppy drive.

Video:

You can select the VGA modes for your video adapter, four options are available: EGA/VGA ➔ CGA 40 ➔ CGA 80 ➔ MONO. The default setting is *EGA/VGA*.

Halt On:

You can select which type of error will cause the system to halt. Five options are available: All Errors ➔ No Errors ➔ All, But Keyboard ➔ All, But Diskette ➔ All, But Disk/Key. The default setting is *All, But Keyboard*.

You can see your system memory list in the lower right box, it shows the *Base Memory*, *Extended Memory* and *total Memory size* configurations in your system. It is detected by the system during boot-up procedure.

4-3.   Advanced BIOS Features Setup Menu

In each item, you can press <**Enter**> at any time to display all the options for this item.

Attention

Advanced BIOS Features Setup Menu has already been set for maximum operation. If you do not really understand each of the options in this menu, we recommend you use the default values.
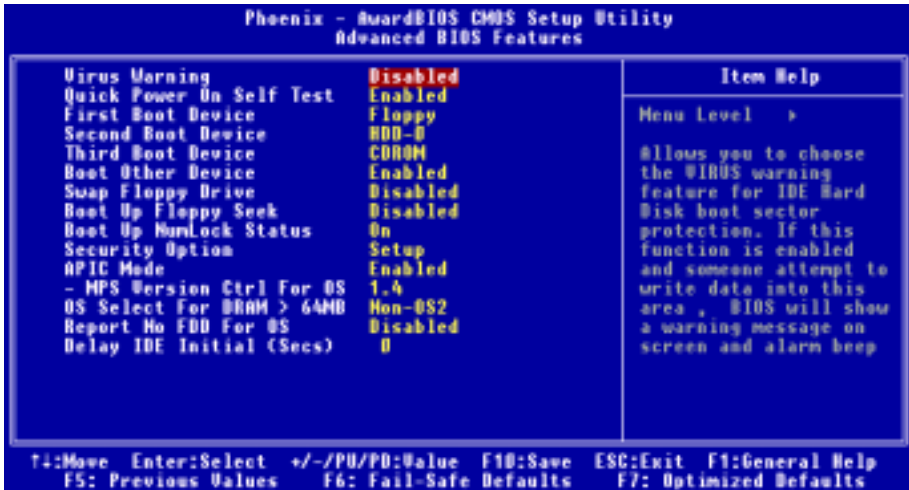
Figure 3-4A. Advanced BIOS Features Setup Screen

Virus Warning:

Two options are available: Enabled or Disabled, the default setting being *Disabled*.

When this feature is enabled, if there is any attempt from a software or an application to access the boot sector or the partition table, the BIOS will warn you that a boot virus is attempting to access the hard disk.

Quick Power On Self Test:

Two options are available: Enabled or Disabled, the default setting is *Enabled*. After the computer has been powered on, the BIOS of the motherboard will run a series of tests in order to check the system and its peripherals. If the Quick Power on Self-Test feature is enable, the BIOS will simplify the test procedures in order to speed up the boot process.

First Boot Device:

When the computer boots up, the BIOS attempts to load the operating system from the devices in the sequence selected in these items: floppy disk drive A, LS120, ZIP100 devices, hard drive C, SCSI hard disk drive or CD-ROM. There are ten options for the boot sequence that you can choose (The default setting is *Floppy*.):

Twelve options are available: Floppy ➔ LS120 ➔ HDD-0 ➔ SCSI ➔ CDROM ➔ HDD-1 ➔ HDD-2 ➔ HDD-3 ➔ ZIP100 ➔ LAN ➔ ATA133RAID ➔ Disabled ➔ Back to Floppy. The default setting is *Floppy*.

Second Boot Device:

Description is the same as the *First Boot Device,* the default setting is *HDD-0*.

Third Boot Device:

Description is same as the *First Boot Device,* the default setting is *CDROM.*

Boot Other Device:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. This setting allows the BIOS to try to boot devices other than the three which are listed in the above First, Second and Third Boot Devices. If you set to Disabled, the BIOS will boot from only the three kinds of boot devices that are set above.

Swap Floppy Drive:

Two options are available: Disabled or Enabled. The default setting is *Disabled.* When this feature is enabled, you don't need to open the computer case to swap the position of floppy disk drive connectors. Drive A can be set as drive B and drive B can be set as drive A.

Boot Up Floppy Seek:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. When the computer boots up, the BIOS detects if the system has a FDD or not. When this item is set to *Disabled*, if the BIOS detects no floppy drive, it will display a floppy disk drive error message. If this item is disabled, the BIOS will skip this test.

Boot Up NumLock Status:

➤ Off: At boot up, the Numeric Keypad is in cursor control mode.
➤ On: At boot up, the Numeric Keypad is in numeric mode. (Default Settings)

Security Option:

This option can be set to System or Setup. The default setting is *Setup*. After you have created a password through *Set Password* at the CMOS setup main menu, this option will deny unauthorized users access to your system (System) or the ability to modify your computer setup (BIOS Setup).

➤**SETUP:**   When you choose Setup, a password is required only when accessing the BIOS Setup. If the correct password is not given, you can't enter the BIOS setup menu. (Default setting)

➤**SYSTEM:**   When you choose System, a password is required each time the computer boots up. If the correct password is not given, the system will not start.

To disable security, select *Set Password* at main menu and then you will be asked to enter password. Do not type anything and just press the *Enter* key and it will disable security. Once security is disabled, the system will boot and you can enter the *BIOS setup menu* freely.

Note

Don't forget your password. If you forget the password, you will have to open the computer case and clear all information in the CMOS before you can start up the system. But by doing this, you will have to reset all previously set options.

APIC Mode:

Two options are available: Disabled or Enabled. If you set to *Enabled*, the next item will be available to choose. When you set it to *Disabled*, the system will use the default six PCI IRQs for all devices, and will not increase the number of PCI IRQs.

Note

Assume you enable this item then installing the Windows® 2000 or Windows® XP operating system, after that, if you disable this item then reboot your system, your operating system will hang. You have to change this item setting to *Enabled* then your operating system will back to normal.

✏ *MPS Version Ctrl For OS:*

This option specifies which version of MPS the motherboard will use.

Two options available: 1.1 ➔ 1.4. MPS stands for **M**ulti-**P**rocessor **S**pecification. If you use an older OS for multi-processors executing, please set this option to 1.1.

OS Select For DRAM > 64MB:

Two options are available: Non-OS2 or OS2. The default setting is *Non-OS2*. When the system memory is bigger than 64MB, the communication method between the BIOS and the operating system will differ from one operating system to another. If you use OS/2, select *OS2*; if you are using another operating system, select *Non-OS2*.

Report No FDD For OS:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. When you are running an older Windows operating system (such as Windows® 95) without a floppy drive, set this item to *Enabled*. Otherwise, set it to *Disabled*.

Delay IDE Initial (Secs):

This item is used to support some old models or special types of hard disks or CD-ROMs. They may need a longer amount of time to initialize and prepare for activation. Since the BIOS may not detect those kinds of devices during system booting. You can adjust the value to fit such devices. Larger values will give more delay time to the device. The minimum number you can enter is 0, the maximum number you can enter is 15. The default setting is *0*.

4-4. Advanced Chipset Features Setup Menu

The Chipset Features Setup Menu is used to modify the contents of the buffers in the chipset on the motherboard. Since the parameters of the buffers are closely related to hardware, if the setup is not correct or is false, the motherboard will become unstable or you will not be able to boot up. If you don't know the hardware very well, use default values (i.e. use the "**Load Fail-Safe Defaults**" or "**Load Optimized Defaults**" option).
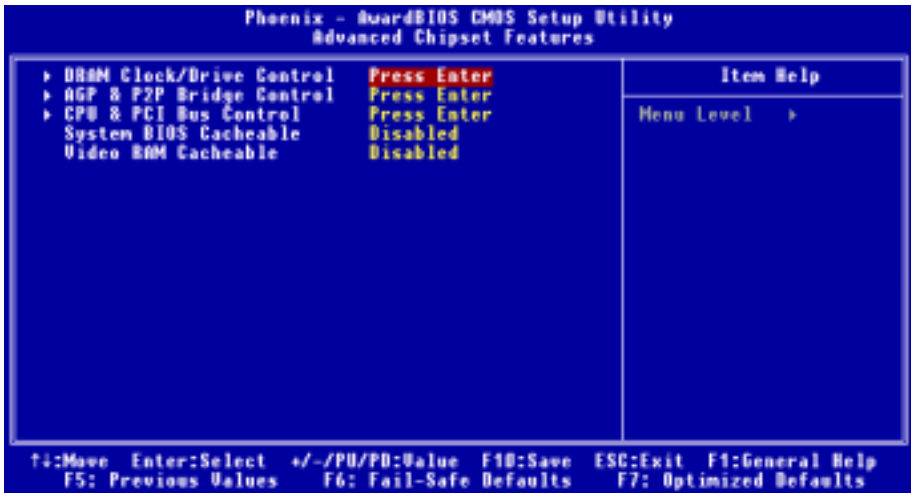
Figure 3-5A. Advanced Chipset Features Setup Screen

You can use the arrow keys to move between the items. Use **PgUP**, **PgDn**, **+** or **-** key to change the values. When you have finished setting up the chipset, press <**ESC**> to go back to the main menu.

Note

The parameters in this screen are for system designers, service personnel, and technically competent users only. Do not reset these values unless you understand the consequences of your changes.

DRAM Clock/Drive Control:

This item can let you set several items concerning the DRAM parameters. If you do not understand what each item does, please keep the default settings. Wrong settings may cause system unstablity, data loss or even prevent boot up!
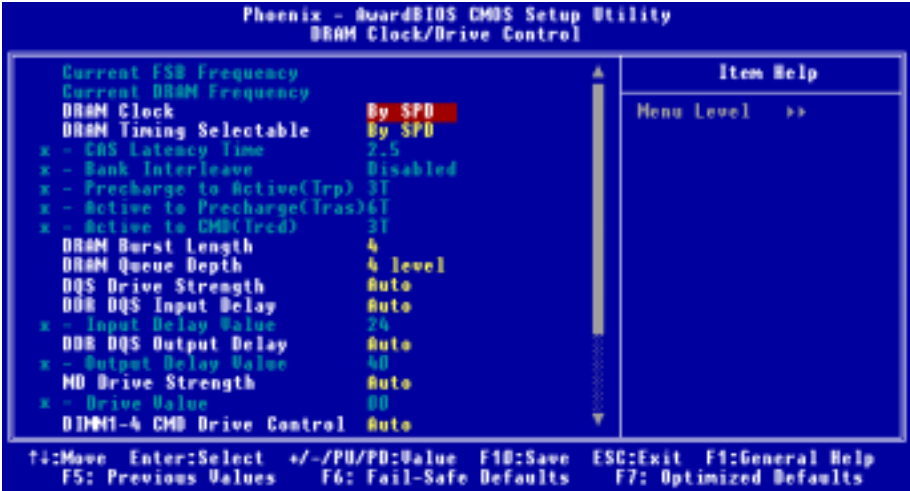
Figure 3-5B. DRAM Clock/Drive Control Upper Screen
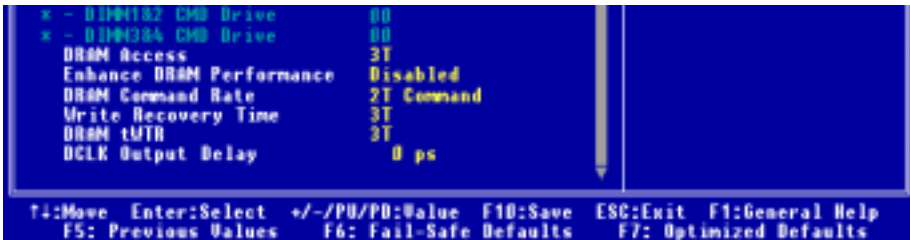
Figure 3-5C. DRAM Clock/Drive Control Lower Screen

Current FSB Frequency:

This item will show you the current system front side bus speed.

Current DRAM Frequency:

This item will show you the current DRAM bus speed.

DRAM Clock:

Five options are available: By SPD ➔ 100 MHz ➔ 133 MHz ➔ 166 MHz ➔ 200 MHz. The default setting is *By SPD*. You can set the DRAM running speed, but if your DRAM module does not support the set speed, the system may be unstable or unable to boot up! If you set to *By SPD*, the BIOS will read the DRAM module SPD data and automatically set the DRAM running speed to the value stored in it.

Note

The display of this item might be different when you installed the different type of DDR SDRAM. We just show you an example here.

What's SPD?

SPD (Serial Presence Detect) is a feature available on a number of SDRAM/DDR SDRAM DIMM modules that solves industry-wide compatibility problems by making it easier for the BIOS to properly configure the system to fit SDRAM performance profiles. The SPD device is a small serial EEPROM chip that stores various information about the DIMM module's size, speed, voltage, drive strength, latency timing and the number of row and column addresses. When the BIOS reads these parameters during POST, it automatically adjusts the values in the CMOS Advanced Chipset Features screen for maximum reliability and performance. Without SPD, the BIOS (or user) must make assumptions about the DIMM's parameters. Many users have found that their system will not boot if they are using non-SPD SDRAM DIMMs. As SDRAM and DDR SDRAM DIMM's is running at very fast clock speed and there is less room for error. An incorrect BIOS assumption about an SDRAM and DDR SDRAM DIMM's parameters can have serious consequences (e.g. failure to boot or fatal exception errors).

DRAM Timing Selectable:

Four options are available: Manual ➔ By SPD ➔ Turbo ➔ Ultra. The default setting is *By SPD*. When set to "**By SPD**", the BIOS will read the DRAM module SPD data and automatically set to the values stored in it. If you set to "**Manual**", the following five items will be available to let you make adjustments.

☞ *CAS Latency Time:*

Four options are available: 1.5 ➔ 2 ➔ 2.5 ➔ 3. The default setting is *2.5*. You can select SDRAM CAS (**C**olumn **A**ddress **S**trobe) latency time according your SDRAM specification.

☞ *Bank Interleave:*

Three options are available: Disabled ➔ 2 Bank ➔ 4 Bank. The default setting is *Disabled*. Depending on your SDRAM module structure, the 4-Way setting can offer the best performance. If you choose the wrong setting, the computer system will not run in a stable manner. For detailed information on your SDRAM module, please ask your SDRAM module manufacturer.

☞ *Precharge to Active (Trp):*

Two options are available: 2T or 3T. The default setting is *3T*.

Trp timing value (Precharge time – time from precharge command to when back can be activated).

☞ *Active to Precharge (Tras):*

Two options are available: 5T or 6T. The default setting is *6T*.

Tras timing value = Minimum bank active time from activate to precharge of same bank.

☞ *Active to CMD (Trcd):*

Two options are available: 2T or 3T. The default setting is *3T*.

Trcd timing value = RAS to CAS latency + rd/wr command delay

DRAM Burst Length

DDR SDRAM modules provide a Burst mode that means an auto precharge function for programmable READ or WRITE burst lengths of 2, 4 or 8 locations.

This means that if we set burst length to 8, the address bus will acesss 8 bytes each cycle to precharge, etc.

DRAM Queue Depth:

Three options are available: 2 Level ➔ 4 Level ➔ 3 level. The default setting is *4 Level*. This item sets DRAM queue depth to accommodate maximum memory throughput.

DQS Drive Strength:

Four options are available: Auto ➔ Low ➔ Medium ➔ High. The default setting is *Auto*. This item can adjust the DQS signal drive strength for data sent to DDR SDRAM. More DDR SDRAM DIMM installed, you may set it to *High*.

DDR DQS Input Delay:

Two options are available: Auto or Manual. The default setting is *Auto*. If you set to *Manual*, then the next item will be available.

✏ *Input Delay Value:*

> This item allows you to adjust the data input strobe delay time of memory. You can key in the HEX number into this section. The minimum number is 0000, and maximum number is 00FF.

DDR DQS Output Delay:

Two options are available: Auto or Manual. The default setting is *Auto*. If you set to *Manual*, then the next item will be available.

✏ *Output Delay Value:*

> This item allows you to adjust the data output strobe delay time of memory. You can key in the HEX number into this section. The minimum number is 0000, and maximum number is 00FF.

MD Drive Strength:

Two options are available: Auto or Manual. The default setting is *Auto*. If you set to *Manual*, then the next item will be available.

✏ *Drive Value:*

> This item allows you to adjust the memory data drive strength. You can key in the HEX number into this section. The minimum number is 0000, and maximum number is 00FF.

DIMM1-4 CMD Drive Control:

Two options are available: Auto or Manual. The default setting is *Auto*. This item can allow you to use auto or manual method to control the DIMM1 to DIMM4 command drive strength. If you set to *Manual*, then the next item will be available.

DIMM1&2 CMD Drive:

This item allows you to adjust the memory data drive strength. You can key in the HEX number into this section. The minimum number is 0000, and maximum number is 00FF. Adjust the drive strength for command sent to DDR SDRAM (This adjustment for DIMM 1 and DIMM 2 only). This will depend on your DDR SDRAM specification and numbers to set. More DDR SDRAM DIMM installed, you may set it to higher values.

DIMM3&4 CMD Drive:

This item allows you to adjust the memory data drive strength. You can key in the HEX number into this section. The minimum number is 0000, and maximum number is 00FF. Adjust the drive strength for command sent to DDR SDRAM (This adjustment for DIMM 3 and DIMM 4 only). This will depend on your DDR SDRAM specification and numbers to set. More DDR SDRAM DIMM installed, you may set it to higher values.

DRAM Access:

Two options are available: 2T ➔ 3T. The default setting is *3T*. This item allow you to choose the DRAM access time cycle, 2T can let you get quick DRAM acess time than 3T, and 3Tis a general DRAM setting.

Enhance DRAM Performance:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. This item can improve your system DRAM performance.

DRAM Command Rate:

Two options are available: 2T Command or 1T Command. The default setting is *2T Command*. When the host (northbridge) locates the desired memory address, it then processes the wait state of commands. Set it to *2T Command* for system compatibility or to *1T Command* for system performance.

Write Recovery time

Two options are available: 2T or 3T. The default setting is *3T*. This is the period between two write times.

DRAM tWTR:

Two options are available: 1T or 3T. The default setting is *3T*. This is the Internal WRITE to READ command delay time period.

DCLK Output Delay:

Eight options are available: 0 ps ➔ 150 ps ➔ 300 ps ➔ 450 ps ➔ 600 ps ➔ 750 ps ➔ 900 ps ➔ 1050 ps. The default setting is *0 ps*. The northbridge will send an output signal to clock buffer of DRAM module, then clock buffer will feedback a signal to northbridge. The value you set will effect the delay time for DCLK output signal. This item will effect the DRAM module's stability, we suggestion you set to *0 ps*.

AGP & P2P Bridge Control:

This item can let you sets several items concerning the AGP parameters. If you do not understand what each item doing, please keep the default settings as well. Wrong settings will cause system unstablity or even prevent boot up!
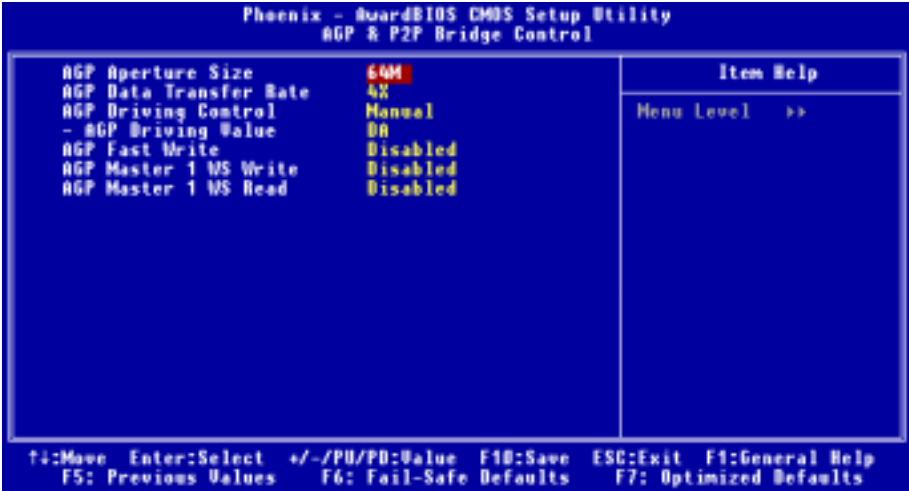

Figure 3-5D. AGP & P2P Bridge Control Screen

AGP Aperture Size:

Seven options are available: 256M ➔ 128M ➔ 64M ➔ 32M ➔ 16M ➔ 8M ➔ 4M ➔Back to 256M. The default setting is *64M*. If you installed the AGP adapter that supports AGP 3.0 specifications, this item will show you the additional two items 1G and 2G. This option specifies the amount of system memory that can be used by the AGP device. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation.   See www.agpforum.org for AGP information.

AGP Data Transfer Rate:

Two options are available: 4X ➔ 2X. The default setting is *4X* (When you installed AGP 4X adapter, If you installed the AGP adapter that supports AGP 3.0 specifications, this item will disappear.

Note

The 2X mode here means you are using the AGP 4X adapter, but set it to 2X mode via software or applications AGP concerning settings.

AGP Driving Control:

Two options are available: Auto or Manual. The default setting is *Manual*. Choosing *Manual* to key in an AGP Driving Value is described within the next section. It is recommended this field be set to *Auto* in order to avoid any errors in your system.

☞ *AGP Driving Value:*

This item allows you to adjust the AGP driving force. You can key in the HEX number into this section. The minimum number is 0000, and maximum number is 00FF.

AGP Fast Write:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. If your AGP adapter can support this function, then you can choose *Enabled*. Otherwise, choose *Disabled*.

AGP Master 1 WS Write:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. This implements a single delay when writing to the AGP Bus. When you set it to *Enabled*, two-wait states are used by the system, allowing for greater stability.

AGP Master 1 WS Read:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. This implements a single delay when reading to the AGP Bus. When you set it to *Enabled*, two-wait states are used by the system, allowing for greater stability.

CPU & PCI Bus Control:

This item can let you sets several items concerning the PCI parameters. If you do not understand what each item does, please keep the default settings as well. Wrong settings will cause system unstablity.
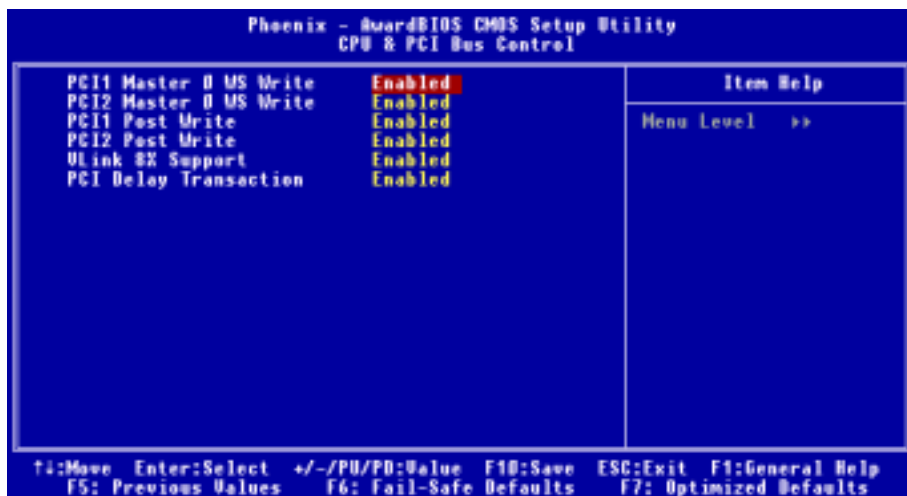

Figure 3-5E. CPU & PCI Bus Control Screen

PCI1 Master 0 WS Write:

Two options are available: Enabled or Disabled. The default setting is *Enabled*. When *Enabled,* writes to the PCI1 bus are executed with zero wait state (immediately) when PCI1 bus is ready to receive data. If it is set to *Disabled*, the system will wait one state before data is written to the PCI1 bus.

PCI2 Master 0 WS Write:

Two options are available: Enabled or Disabled. The default setting is *Enabled*. When *Enabled,* writes to the PCI2 bus are executed with zero wait state (immediately) when PCI2 bus is ready to receive data. If set to *Disabled*, the system will wait one state before data is written to the PCI2 bus.

PCI1 Post Write:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. When you set it to *Enabled*, it can enable PCI post write buffers to minimize PCI1 master read latency.

PCI2 Post Write:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. When you set it to *Enabled*, it can enable PCI post write buffers to minimize PCI2 master read latency.

Vlink 8X Support:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. This item can let you enable the Vlink bus data transfer between northbridge and southbridge.

PCI Delay Transaction:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select *Enabled* to support compliance with PCI specification version 2.1.

Back to Advanced Chipset Features Setup Menu Here:

System BIOS Cacheable:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. When you select *Enabled*, you get faster system BIOS executing speed via the L2 cache.

Video RAM Cacheable:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. When you select *Enable*, you get faster video RAM executing speed via the L2 cache. You must check your VGA adapter manual to find out if any compatibility problems will occur.

4-5. Integrated Peripherals

In this menu, you can change the onboard I/O device, I/O port address and other hardware settings.
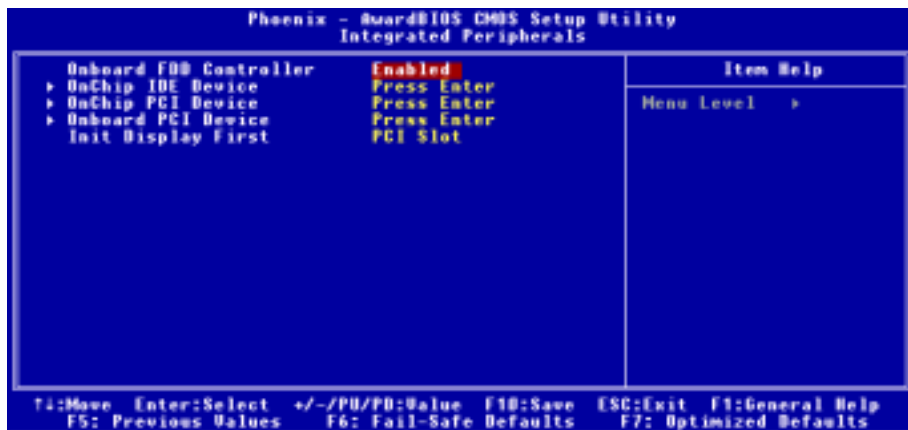
Figure 3-6A. Integrated Peripherals Menu Default Screen

Onboard FDD Controller:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. This is used to enable or disable the Onboard FDD Controller. If you add a higher performance controller, you will need to *Disable* this feature.

VIA OnChip IDE Device:

This item can let you sets several items concerning the VIA OnChip IDE device parameters.

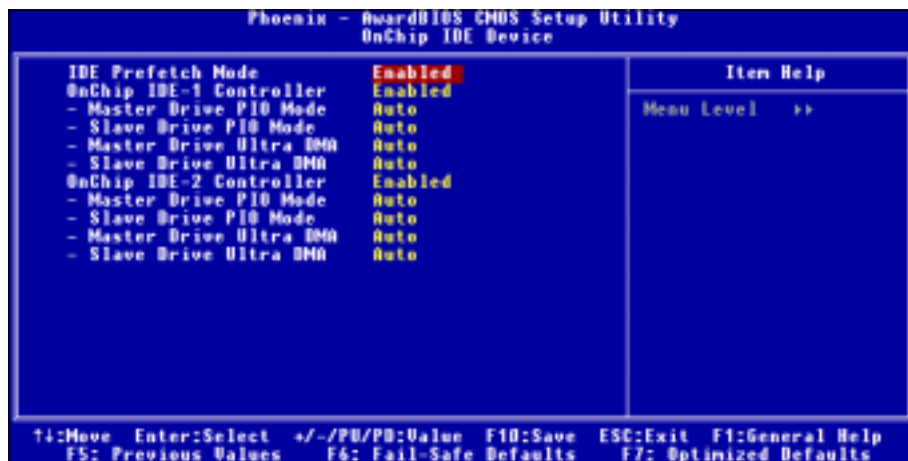**Figure 3-6B. OnChip IDE Device Screen**

IDE Prefetch Mode:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. The onboard IDE drive interfaces supports IDE prefetching for faster drive accesses. If you install a primary and/or secondary add-in IDE interface, set this field to *Disabled* if the interface does not support prefetching.

OnChip IDE-1 Controller:

The OnChip IDE 1 controller can be set as Disabled or Enabled. The default setting is *Enabled*.

☞ ***Master Drive PIO Mode:***

➤Auto: The BIOS can auto-detect the transfer mode of the IDE devices in order to set its data transfer rate (Default). You can select the PIO mode from 0 to 4 of the IDE devices in order to set its data transfer rate.

☞ ***Slave Drive PIO Mode:***

➤Auto: The BIOS can auto-detect the transfer mode of the IDE devices in order to set its data transfer rate (Default). You can select the PIO mode from 0 to 4 of the IDE devices in order to set its data transfer rate.

☞ ***Master Drive Ultra DMA:***

Ultra DMA is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 133 MB/sec.

➤Disabled: If you encounter the problem of using Ultra DMA devices, you can try to set this item to *Disabled*.

➤Auto: When you select Auto, the system automatically determines the optimal data transfer rate for each IDE device. (Default)

☞ ***Slave Drive Ultra DMA:***

➤Disabled: If you encounter the problem of using Ultra DMA devices, you can try to set this item to *Disabled*.

➤Auto: When you select Auto, the system automatically determines the optimal data transfer rate for each IDE device. (Default)

OnChip IDE-2 Controller:

The OnChip IDE 2 controller can be set as Enabled or Disabled. Description is the same as the item "**OnChip IDE-1 Controller**". You can refer the above description.

PIO MODE 0 ~ 4 reflects the IDE device data transfer rate. The higher the MODE value is, the better the IDE device data transfer rate. However, it does not mean that the highest MODE value can be selected. You first have to be sure that your IDE device supports this MODE. Otherwise, the hard disk will not be able to operate normally.
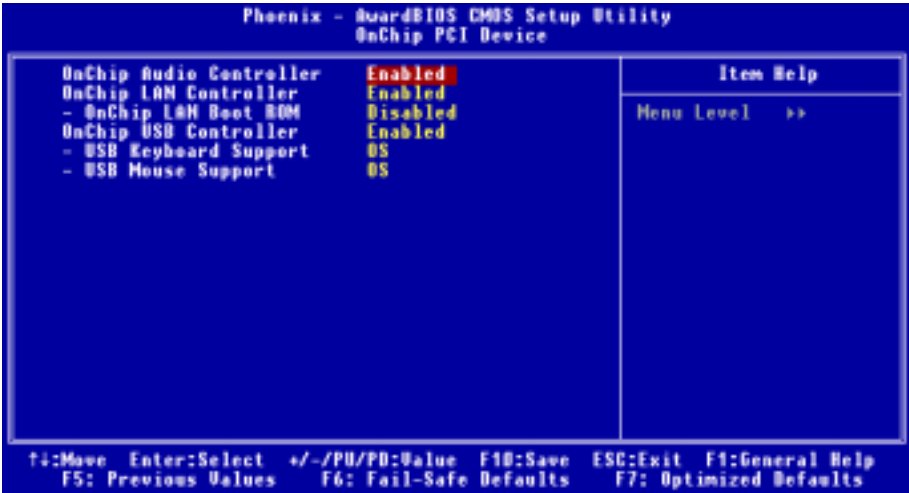
OnChip PCI Device:

Figure 3-6C. OnChip PCI Device Screen

OnChip Audio Controller:

Two options are available: Enabled or Disabled. The default setting is *Enabled*. Your motherboard has the built-in audio controller. If you set this controller to *Enabled*, you can use onboard audio functions.

OnChip LAN Controller:

Two options are available: Enabled or Disabled. The default setting is *Enabled*. Your motherboard has the built-in LAN chipset that can support LAN functions. If you set this controller to *Enabled*, you can use LAN functions.

☞ *OnChip LAN Boot ROM:*

Two options are available: Enabled or Disabled. The default setting is *Disabled*. When you set to *Enabled*, even you do not connect bootable devices on your computer system, the system will searching the bootable file through the local network. If system fined the bootable file on local network, it will load it and use it to boot your computer system.

OnChip USB Controller:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. This should be enabled if your system has a USB device installed on the motherboard and you wish to use it. If you add a higher performance controller, you will need to disable this feature. If you choose disable this item, the "**USB Keyboard Support**" and "**USB Mouse Support**" items will not able to select in *Integrated Peripherals* menu.

☞ *USB Keyboard Support:*

Two options are available: OS and BIOS. The default setting is *OS.* If your operating system supports a USB keyboard, please set it to *OS*. Only in some situations, such as in a pure DOS environment that

does not support a USB keyboard, should you set it to BIOS.

☞ *USB Mouse Support:*

Two options are available: OS ➔ BIOS. The default setting is *OS*. If your operating system supports a USB mouse, please set it to *OS*. Only in some situations, such as in a pure DOS environment that does not support a USB mouse, should you set it to BIOS.

Onboard PCI Device:
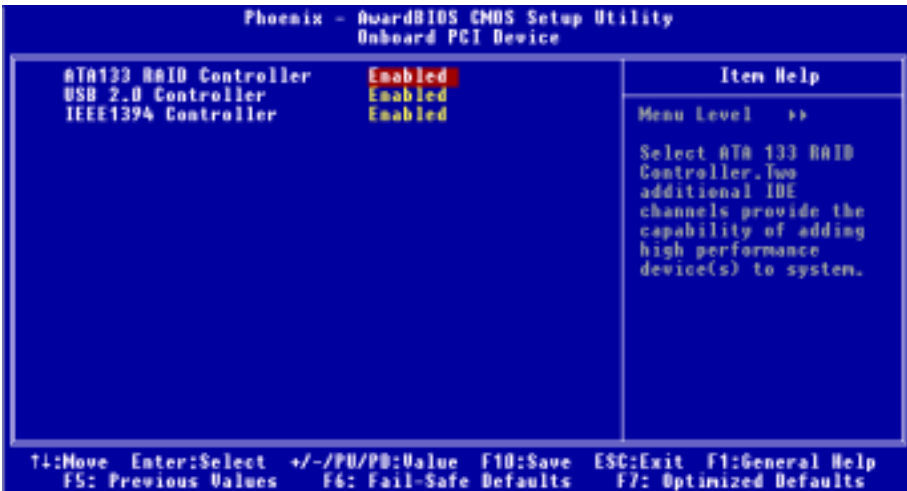
Figure 3-6D. Onboard PCI Device Screen

ATA133 RAID Controller:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. This motherboard has the built-in HighPoint 374 chipset that can support Ultra ATA 133 specifications. If you set this controller to *Enabled*, you can use IDE RAID functions, inlcuding RAID 0, RAID 1 and RAID 0+1. This feature enables you to maximize your data storage performance and security. For detailed information, please refer to the Chapter 4.

USB 2.0 Controller:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. This motherboard has the built-in USB 2.0 chipset that can support USB 2.0 specifications. If you set this controller to *Enabled*, you can use USB 2.0 functions.

IEEE1394 Controller:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. This motherboard has the built-in IEEE 1394 chipset that can support IEEE 1394 specifications. If you set this controller to *Enabled*, you can use IEEE 1394 functions.

Back to Integrated Peripherals Setup Menu Here:

Init Display First:

Two options are available: PCI Slot or AGP. The default setting is *PCI Slot.* When you install more than one display card, you can choose either a PCI display card (PCI Slot) or an AGP display card (AGP) to display the boot-up screen. If you have only installed one display card, the BIOS will detect which slot (AGP or PCI) you installed it, and everything will be taken care of by the BIOS.

4-6. Power Management Setup Menu

When the computer operates normally, it is in Normal mode. In this mode, the Power Management Program will monitoring the access to video, I/O ports and drives, and the operating status of the keyboard, mouse and other device. These are referred to as Power Management Events. In cases where none of these events occur within setting time, the system enters the power saving mode. When one of the controlled events occurs, the system immediately returns to normal mode and operates at its maximum speed.

1. In the Main Menu, select "**Power Management Setup**" and press <**Enter**>. The following screen is displayed:
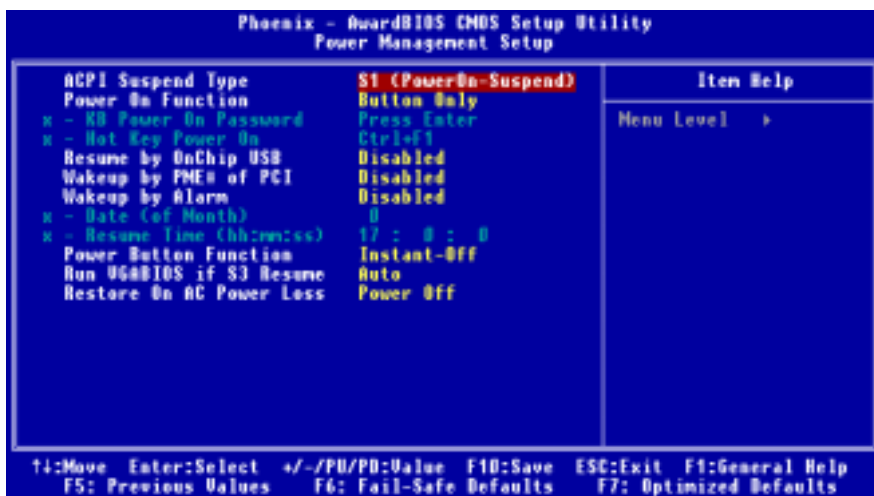
Figure 3-7A. Power Management Setup Main Menu

2. You can use the arrow keys to move between the items. Use **PgUP**, **PgDn**, **+** or **-** key to change the values. When you have finished setting up the chipset, press <**Esc**> to go back to the main menu.

3. After you have configured the Power Management feature, press <**Esc**> to go back to the Main Menu.

We are now going to briefly explain the options in this menu:

ACPI Function (Advanced Configuration and Power Interface):

ACPI gives the operating system direct control over the power management and Plug and Play functions of a computer. The BIOS is fully support the ACPI functions. If you want ACPI functions to work normally, you should notice two things. One is your operating system must support ACPI, as of now only Microsoft® Windows® 2000, Windows® ME and Windows® XP supports these functions. The second thing is that all devices and add-on cards in your system must fully support ACPI, both hardware and software (drivers). If you want to know if your devices or add-on cards support ACPI or not, please contact the device or add-on card manufacture for more information. If you want to know more about ACPI specifications, please go to the address below for more detailed information: http://www.acpi.info/

ACPI requires an ACPI-aware operating system. ACPI features include:

- Plug and Play (including bus and device enumeration) and APM functionality normally contained in the BIOS.
- Power management control of individual devices, add-in cards (some add-in cards may require an ACPI-aware driver), video displays, and hard disk drives.
- A Soft-off feature that enables the operating system to power off the computer.
- Support for multiple wake-up events (see Table 4-6-1).
- Support for a front panel power and sleep mode switch. Table 4-6-2 describes the system states based on how long the power switch is pressed, depending on how ACPI is configured with an ACPI-aware operating system.

System States and Power States

Under ACPI, the operating system directs all system and device power state transitions. The operating system puts devices in and out of low-power states based on user preferences and knowledge of how devices are being used by applications. Devices that are not being used can be turned off. The operating system uses information from applications and user settings to put the system as a whole into a low-power state.

The table below describes which devices or specific events can wake the computer from specific states.

Table 4-6-1: Wake Up Device and Events

These device/events can wake up the computer	from this state
Power switch	Sleeping mode or power off mode
RTC alarm	Sleeping mode or power off mode
PCI Card (PME)	Sleeping mode or power off mode
USB	Sleeping mode

Table 4-6-2: Effect of Pressing the Power Switch

If the system is in this state……	……and the power switch is pressed for	……the system enters this state
Off	Less than four seconds	Power on
On	More than four seconds	Fail safe power off
On	Less than four seconds	Soft off/Suspend
Sleep	Less than four seconds	Wake up

ACPI Suspend Type:

Three options are available: S1 (PowerOn-Suspend) ➔ S3 (Suspend-To-RAM) ➔ Auto. The default

setting is *S1 (PowerOn-Suspend)*. POS is "**P**ower **O**n **S**uspend", and STR is "**S**uspend **T**o **R**AM". Generally, ACPI has six states: System S0 state, S1 state, S2 state, S3 state, S4 state, S5 state. S1 and S3 states are described below:

The S1 (POS) State (POS means Power On Suspend):

While the system is in the S1 sleeping state, its behavior is as described below:

● The processor is not executing instructions. The processor's complex context is maintained.

● Dynamic RAM context is maintained.

● Power Resources are in a state compatible with the system S1 state. All Power Resources that supply a System Level reference of S0 are in the OFF state.

● Devices states are compatible with the current Power Resource states. Only devices which solely reference Power Resources which are in the ON state for a given device state can be in that device state. In all other cases, the device is in the D3 (off) state.

● Devices that are enabled to wake the system and that can do so from their current device state can initiate a hardware event which transitions the system state to S0. This transition causes the processor to continue execution where it left off.

To transition into the S1 state, the operating software does not have to flush the processor's cache.

The S3 (STR) State (STR means Suspend to RAM):

The S3 state is logically lower then the S2 state and is assumed to conserve more power. The behavior of this state is defined as follows:

● Processor is not executing instructions. The processor complex context is not maintained.

● Dynamic RAM context is maintained.

● Power Resources are in a state compatible with the system S3 state. All Power Resources that supply a System Level reference of S0, S1, or S2 are in the OFF state.

● Devices states are compatible with the current Power Resource states. Only devices which solely reference Power Resources which are in the ON state for a given device state can be in that device state. In all other cases, the device is in the D3 (off) state.

● Devices that are enabled to wake the system and that can do so from their current device state can initiate a hardware event which transitions the system state to S0. This transition causes the processor to begin execution at its boot location. The BIOS performs initialization of core functions as required to exit an S3 state and passes control to the firmware resume vector. Please see the ACPI Specification Rev. 1.0 book section 9.3.2 for more details on BIOS initialization.

From the software point of view, this state is functionally the same as the S2 state. The operational difference can be that some Power Resources that could be left ON in the S2 state might not be available to the S3 state. As such, additional devices can be required to be in logically lower D0, D1, D2, or D3 state for S3 than S2. Similarly, some device wake events can function in S2 but not S3.

Because the processor context can be lost while in the S3 state, the transition to the S3 state requires that the operating software flush all dirty cache to DRAM.

✦ *Above information for system S1 were refer to ACPI Specification Rev. 1.0.*

Power On Function:

Four options are available: Hot Key ➔ Password ➔ Mouse ➔ Button Only. The default setting is *Button Only*. This iten allow you to choose the computer power turn on method you like. Some item you choose, some of the following items will be available to let you making further setting. For instance, when you set this item to *Password*, the item of "**KB Power On Password**" will allow you to enter password. When you set this item to *Hot Key*, the item of "**Hot Key Power On**" will allow you to choose the hot key you want. If you choose *Mouse*, you can press any key on mouse to turn on the computer power.

✏ *KB Power On Password:*

> When you perss the <**Enter**> key, then you can enter the password you want. When set be done, you need to saving and leave the BIOS setting menu to reboot your computer system. **Next time when you shutdown your computer, you can't use the power button to turn on the computer power anymore.** You need to press the password to turn on your computer power.

✏ *Hot Key Power On:*

> Fifteen options are available: Ctrl+F1 ~ Ctrl+F12, Power, Wake and Any Key. The default setting is *Ctrl+F1*. You can choose the hot key that you want it to turn on your computer power.

Resume by OnChip USB:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. When set to *Enabled*, any event affecting from onchip USB will awaken a system that has powered down.

Wakeup by PME# of PCI:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. When set to *Enabled*, any event affecting from PCI card (PME) will awaken a system that has powered down.

Wake by Alarm:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. When set to *Enabled*, you can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

✏ *Date (of Month) / Resume Time (hh:mm:ss):*

> You can set the Date (month) Alarm and Time Alarm (hh:mm:ss). Any event occurring will awaken a system that has powered down.

Power Button Function:

Two options are available: Delay 4 Sec or Instant-Off. The default setting is *Instant-Off*. It is activated when the user presses the power button for more than four seconds while the system is in the working state, then the system will transition to the soft-off (Power off by software). This is called the power button over-ride.

Run VGABIOS if S3 Resume:

Three options are available: Auto ➔ Yes ➔ No. The default setting is *Auto*. This item can let you choose when S3 resume active, the VGA BIOS need to be initiative or not.

Restore On AC Power Loss:

Three options are available: Auto ➔ Power On ➔ Power Off. The default setting is *Power Off*. This
setting lets you set the system action after a power failure. This item lets you set the system power state
when power recovers. If you set it to *Power Off*, when power returns, whatever state your computer was
in before the power failure, the system will always turn off. If you set it to *Power On,* when power returns,
whatever state your computer was in before the power failure, the system will always turn on. If you set it
to *Auto*, when the power returns, the computer return to the previous power state.

4-7. PnP/PCI Configurations Setup Menu

In this menu, you can change the INT# and IRQ# of the PCI bus and other hardware settings.
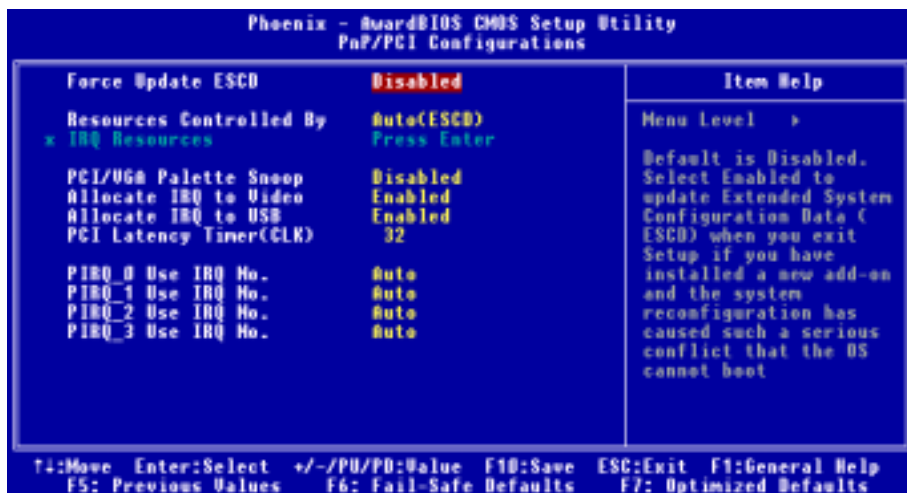

Figure 3-8A. PnP/PCI Configurations Setup Menu

Force Update ESCD:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. Normally, you should
leave this field 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 a serious conflict
that prevents the operating system from booting.

Computer Knowledge: ESCD (Extended System Configuration Data)

The ESCD contains the IRQ, DMA, I/O port, memory information of the system. This is a specification and a feature specific to the Plug & Play BIOS.

Resources Controlled By:

When resources are controlled manually, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:

Legacy devices compliant with the original PC AT bus specification require a specific interrupt. PCI PnP devices comply with the Plug and Play standard, whether designed for the PCI or legacy bus architecture.

Two options are available: Auto (ESCD) or Manual. The default setting is *Auto (ESCD)*. The Award Plug and Play BIOS has the capability to automatically configure all boot and Plug and Play compatible devices. If you select Auto (ESCD), all of the interrupt request (IRQ) fields become unselectable, as the BIOS automatically assigns them.

☛ *IRQ Resources:*

If you have trouble in assigning the interrupt resources automatically, you can select *Manual* to set which IRQis assigned to which *PCI Device* or *Reserved* it. See the screen shot below.IRQ Resources:

If you have trouble in assigning the interrupt resources automatically, you can select *Manual* to set which IRQis assigned to which PCI device or reserve it. See the screen shot below.
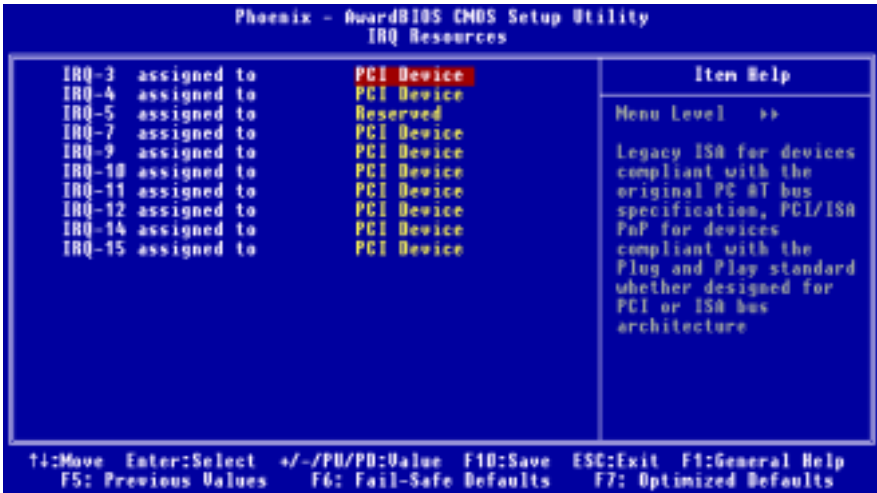

Figure 3-8B. IRQ Resources Setup Menu

Back to PnP/PCI Configurations Setup Menu Here:

PCI /VGA Palette Snoop:

Two options are available: Disabled or Enabled. The default setting is *Disabled*. This option allows the BIOS to preview VGA Status, and to modify the information delivered from the Feature Connector of the VGA card to the MPEG Card. This option can set the display inversion to black after you have used the MPEG card.

Allocate IRQ to Video:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. Name the interrupt

request (IRQ) line assigned to the VGA on your system. Activity of the selected IRQ always awakens the system.

You can assign an IRQ for the either PCI or AGP VGA or *Disabled*.

Allocate IRQ to USB:

Two options are available: Disabled or Enabled. The default setting is *Enabled*. If you need free up another IRQ, you can choose to disable this item to an IRQ. However, some situations in Windows® 95 may cause the USB port to malfunction or experience other problems!

PCI Latency Timer(CLK):

The options are: 32, 64, 96, 128, 160, 192, 224, and 248. The default setting is *32*. This option selects the controls for the amount of time that the VIA 8235 arbiter allows a PCI initiator to perform multiple back-to-back transactions on the PCI bus.

PIRQ_0 Use IRQ No. ~ PIRQ_3 Use IRQ No.:

Eleven options are available: Auto, 3, 4, 5, 7, 9, 10, 11, 12, 14, 15. Default setting is *Auto.* This item allows the system to automatically specify the IRQ number for the device installed on PCI slots. This means that the system can specify the fixed IRQ number for the device installed on the PCI slots (or onboard PCI devices). This is a useful function for when you want to fix the IRQ for a specific device.

For example, if you want to move your hard disk to another computer and don't want to re-install Windows® NT or Windows® 2000, you can simply specify the IRQ for the device installed on the new computer to fit the original computer settings.

This feature is for the operating system that will record and fix the PCI configuration status if you want to change it.

For the relations between the hardware layout of PIRQ (the signals from the VIA VT8235 chipset), INT# (means PCI slot IRQ signals) and devices, please refer to the table below:

SIGNALS	PCI Slot 1	PCI Slot 2	PCI Slot 3	PCI Slot 4	PCI Slot 5	USB 2.0	IEEE 1394	HPT 374	AGP
PIRQ_0 Assignment	INT D	INT C	INT B	INT A	INT D	x	INT A	x	INT A
PIRQ_1 Assignment	INT A	INT D	INT C	INT B	INT A	INT B	x	x	INT B
PIRQ_2 Assignment	INT B	INT A	INT D	INT C	INT B	INT C	x	INT A	x
PIRQ_3 Assignment	INT C	INT B	INT A	INT D	INT C	INT A	x	x	x

Note

- PCI slot 2 shares IRQ signals with HPT 374.
- PCI slot 1 and 5 share an IRQ.
- PCI slot 3 and USB 2.0 controllers share an IRQ.
- PCI slot 4, IEEE1394 controllers and the AGP slot share an IRQ.
- If you want to install two PCI cards into those PCI slots that share IRQ with one another at the same time, you must make sure that your OS and PCI devices' driver supports the IRQ sharing function.

4-8. PC Health Status

You can set the warning and shutdown temperatures for your computer system, and you can check the fan speeds and power supply voltages of your computer system. The features are useful for monitoring all the important parameters within your computer system. We call it the *PC Health Status*.
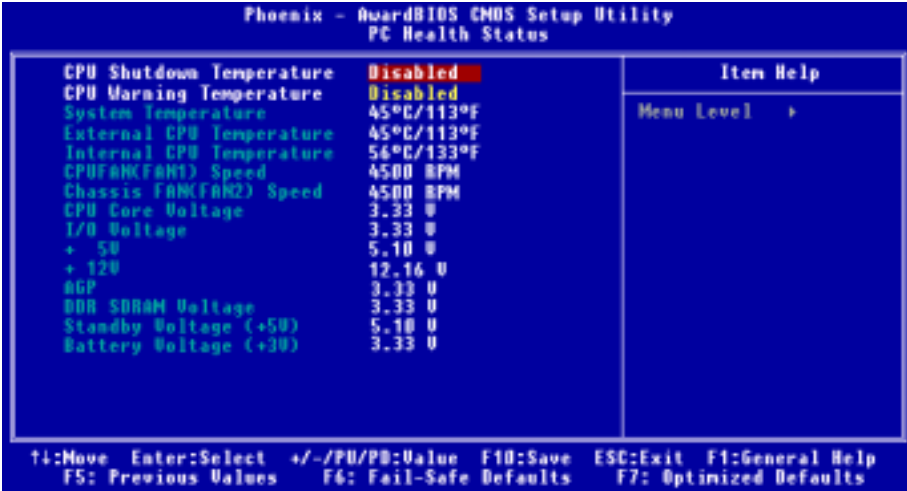
Figure 3-9. PC Health Status Screen Shot

<u>**CPU Shutdown Temperature:**</u>

Five options are available: Disabled ➔ 60℃/140℉ ➔ 65℃/149℉ ➔ 70℃/158℉ ➔ 75℃/167℉. The default setting is *Disabled*. You can set the processorshutdown temperature here. If the processor temperature exceeds the settings value, system will force to shutdown to protect the processor not overheat.

<u>**CPU Warning Temperature:**</u>

Eight options are available: Disabled ➔ 50℃/122℉ ➔ 53℃/127℉ ➔ 56℃/133℉ ➔ 60℃/140℉ ➔ 63℃/145℉ ➔ 66℃/151℉ ➔ 70℃/158℉. The default setting is *Disabled*. You can set the processor warning temperature here. If the processor temperature exceeds the settings value, the system will give you an alarm message or sound to remind you that the processor is overheating.

<u>**All Voltages, Fans Speed and Thermal Monitoring:**</u>

These items list the current states of the CPU and environment temperatures as well as fan speeds (CPU fan and chassis fan). It cann't be changed by the user. The following items list the voltage states of the system power. It is also unchangeable.

Note

The hardware monitoring features for temperatures, fans and voltages will occupy the I/O address from 294H to 297H. If you have a network adapter, sound card or other add-on cards that might use those I/O addresses, please adjust your add-on card I/O address, to avoid the use of those addresses.

4-9.   Load Fail-Safe Defaults

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

Load Fail-Safe Defaults (Y/N)? N

Pressing "**Y**" loads the BIOS default values for the most stable, minimal-performance system operations.

4-10. Load Optimized Defaults

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

Load Optimized Defaults (Y/N)? N

Pressing "**Y**" loads the default values that are factory settings for optimal performance system operations.

4-11. Set Password

Set Password: Can enter but do not have the right to change the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

ENTER PASSWORD:

Type the password, up to eight characters in length, and press **<Enter>**. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press **<Enter>**. You may also press **<Esc>** to abort the selection and not enter a password.
To disable a password, just press **<Enter>** when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED.

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration. Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer. You determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to *System*, the password will be required both at boot and at entry to Setup. If set to *Setup*, prompting only occurs when trying to enter Setup.

4-12. Save & Exit Setup

Pressing **<Enter>** on this item asks for confirmation:

Save to CMOS and EXIT (Y/N)? Y

Pressing "**Y**" stores the selections made in the menus in CMOS - a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

4-13. Exit Without Saving

Pressing **<Enter>** on this item asks for confirmation:

Quit without saving (Y/N)? Y

This allows you to exit Setup without storing in CMOS any change. The previous selections remain in effect. This exits the Setup utility and restarts your computer.

Chapter 5. RAID Setting Guide

For detail RAID introduce and concept, you can found it on our WEB site "**Technological Terms**", or you can search the concerning information on Internet. We do not description it on this manual.

5-1.   The features of RAID on the AT7-MAX2

The AT7-MAX2 supports Striping (RAID 0), Mirroring (RAID 1), or Striping/Mirroring (RAID 0+1) operation. For the striping operation, the identical drives can read and write data in parallel to increase performance. The Mirroring operation creates a complete backup of your files. Striping with Mirroring operation offers both high read/write performance and fault tolerance although requiring 4 hard disks in order to do so.

5-2.   RAID SETUP on the AT7-MAX2

Enter Advanced BIOS Features in the BIOS setup. Change the settings of "**First Boot Device**", "**Second Boot Device**" and "**Third Boot Device**" to read *ATA133RAID*. See Figure 4-1.
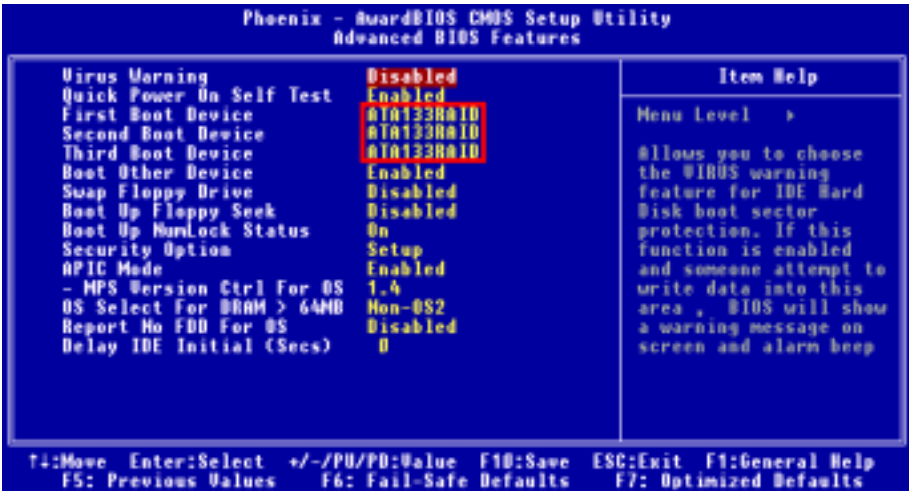

Figure 4-1. RAID settings in BIOS

5-3.   The BIOS Setting Menu

Reboot your system. Press <*CTRL*> and <*H*> key while booting up the system to enter the BIOS setting menu. The main menu of BIOS Setting Utility appears as below:
For selecting the option in the menu, you may:

● Press **F1** to view array status.

● Press ↑↓ (up, down arrow) to choose the option you want to confirm or to modify.

● Press **Enter** to confirm the selection.

● Press **Esc** to return to top menu.

NOTE

If you want to create a RAID 0 (striping) array or RAID 0+1 array, all data in your hard disk will first be erased! Please backup the hard disk data before creating a RAID array. If you want to create a RAID 1 (mirroring) array, please be sure which hard disk is the source disk and which one is the destination disk. If you make a mistake, you may copy the blank data to the source disk, which will result in both hard disks becoming blank!

4-3-1. OPTION 1: Create Array

This item allows you to create a RAID array.

After you had selected the function from the main menu, press the <**Enter**> key to enter the sub menu as shown below:
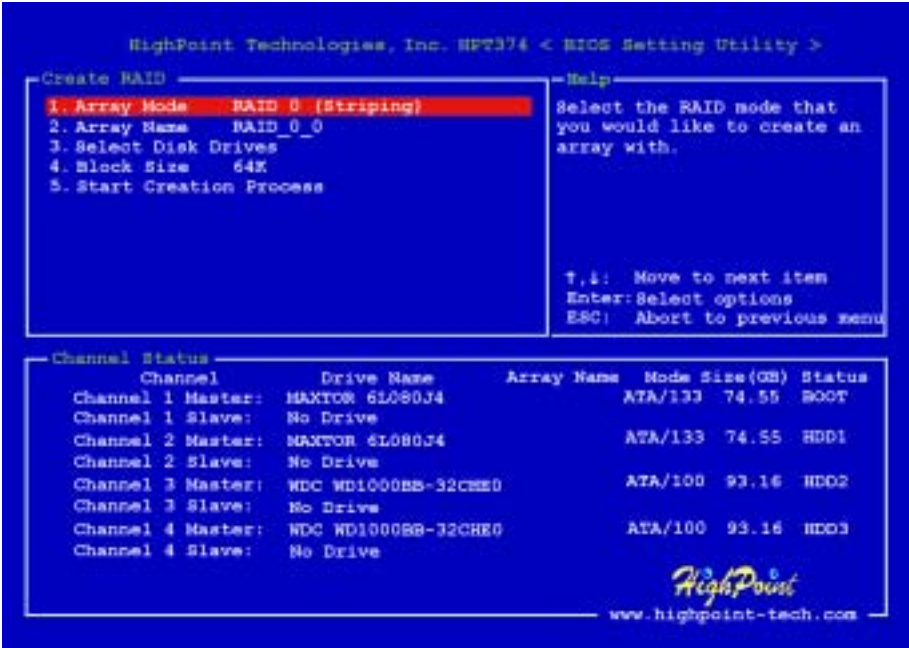
Array Mode:

This item allows you to select the appropriate RAID mode for the desired array. There are four modes to choose.

Note

It is highly recommended to attach hard disks with the same brand and same model when defining a RAID array.

✏ *RAID 0 (Striping) for Performance:*

This item is recommended for high performance usage. Requires at least 2 disks.

✏ *RAID 1 (Mirroring) for Data Protection:*

This item is recommended for data security usage. Requires at least 2 disks.

✏ *RAID 0/1 (Mirrored Striping):*

This item is recommended for data security and high performance usage. Allows Mirroring with a Strip Array. Require four drives.

☛ *JBOD (Volume):*

> This item is recommended for high capacity without redundancy or performance features usage. Requires at least 2 disks.

Array Name:

You can give a name of your array here.

Select Disk Drives:

This item allows you to select the disk drives to be used with the RAID array.

Block Size:

There are eight options available: 16K, 32K, 64K, 128K, 256K, 512K, 1M and 2M. This item allows you to select the block size of the RAID array.

Start Creation Process:

After you have made your selection, choose this item and press <**Enter**> to start creation.

4-3-2. OPTION 2: Delete Array

This item allows you to remove a RAID Array on this onboard IDE RAID controller.
Note: After you have made and confirmed this selection, all the data stored in the hard disk will be lost. (The entire partition configuration will be deleted too.)

4-3-3. OPTION 3: Create/Delete Spare

Create Spare:

In the menu zone, select item "**3. Create/Delete Spare**" and press <**Enter**> to confirm.

If you are not creating the RAID system yet, screen will show you the warning message, tell you the current system do not create the RAID system. If you choose create the RAID system, then you can select the spare disk you want to creat.

In the validated channel status zone, select the spare disk to be added and press <**Enter**> to confirm.

Delete Spare:

In the menu zone, select item "**3. Create/Delete Spare**" and press <**Enter**> to confirm.

In the validated channel status zone, select the spare disk to be removed and press <**Enter**> to confirm.

Note

You can creat more than one spare disk in the system, if you want to removed them, do the step mentioned in "**Delete Spare**" several times, then you can delete all the spare disks you created.

4-3-4. OPTION 4: Select Boot Disk
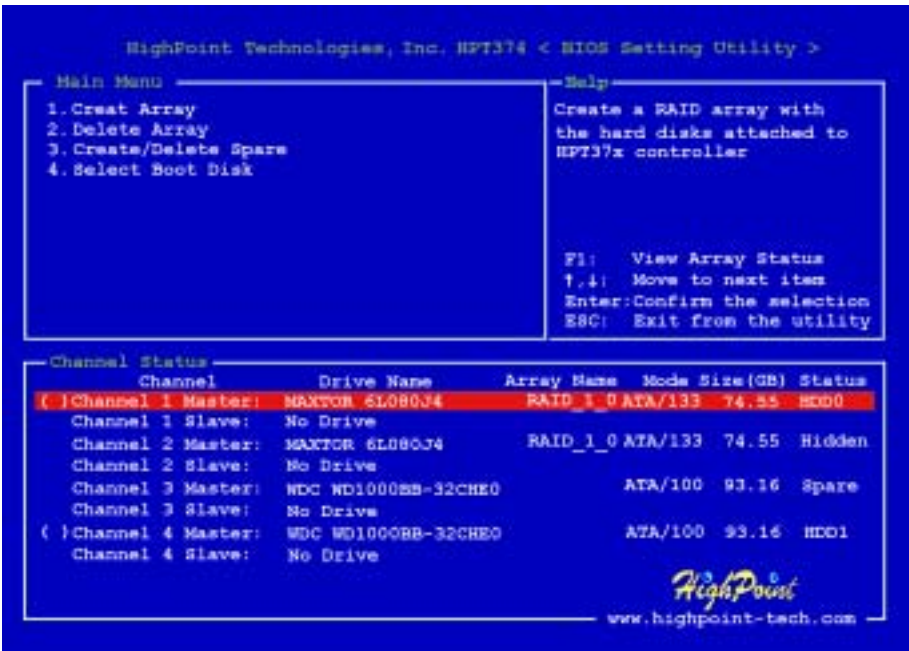
This item allows you to select the boot disk among the hard disk(s).

Use the up/down arrow to select the menu option to "**Select Boot Disk**" and press <**Enter**>. In the Channel Status, select the channel you would like to set as bootable disk and press <**Enter**>, an asterisk appears in the parentheses to indicate that the channel has been selected.

Tips

We suggestion you to set the RAID function use "**RAID Management Software**" provide on the product CD-ROM, it will give you more convenience and more help information to show you how to create the RAID system. The detailed of software operation, you can refer the software "**Help**" menu.