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Chapter 1

Overview

NX6B is an all-in-one Pentium II based motherboard that features an **onboard video graphics accelerator and a 16-bit sound processor**. It utilizes Intel **82440BX** AGPset on **NLX** PCI/ISA platform. This AGPset is designed for Pentium II CPU, and supports new architectures such as high speed **AGP** graphic port, SDRAM, Ultra DMA/33, Bus master IDE and USB port. It has three Dual in-line Memory Module (DIMM) that allow to install SDRAM memory and expand up to a maximum of **768MB**. Since the cache is on the Pentium II CPU card (connector SLOT1), there is no second level cache onboard. Also, NX6B uses **2M bit Flash ROM** BIOS to reserve for future new functions.

NX6B conforms to the NLX standard form factor. A rear panel for the onboard connectors will be bundled in the package. You need to combine the system board with the **riser card** that comes with your housing. Some housings may differ slightly in design, requiring additional steps to install the board. For more information, please read the documentation of the housing.

Not only the above, NX6B also implements many special features as following.

Jumper-less Design Pentium II VID signal and SMBus clock generator provide CPU voltage auto-detection and allows user to set CPU frequency through CMOS setup, no jumper or switch is needed. The correct CPU information is saved into EEPROM, with these technologies, the disadvantages of Pentium base jumper-less design are eliminated. There will be no worry of wrong CPU voltage detection and no need to re-open the housing if CMOS battery loss. The only jumper left is to clear CMOS, which is a safety hook if you forget the password.

Battery-less Motherboard NX6B implements EEPROM and special circuit (patent applied) that allows you to save your current CPU and CMOS Setup configurations without the need of battery. The RTC (real time clock) can also keep running as long as power cord is plugged. If you lose your CMOS data by accident, you can just reload the CMOS configurations from EEPROM and the system will recover as usual.

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Suspend To Hard Drive "Immediately" turns on system and goes back to the original screen before power down. You can resume your original work directly from hard disk without go through the Win95 booting process and run your application again. Suspend to Hard Drive saves your current work (system status, memory image) into hard disk. Note that you have to use VESA compatible PCI VGA, Sound Blaster compatible sound card with APM driver, for Suspend to Hard Drive to work properly.

Zero Voltage Modem Wake Up In conjunction with ATX soft power On/Off, it is possible to have system totally power off and wakeup to automatically answer a phone call such as answering machine or to send/receive fax. The most important break through is not only external box modem but also internal modem card can be used to support Modem Wake Up. The NX6B and MP56 internal modem card implement special circuit (patent applied) to make sure the modem card work properly without any power.

LAN Wake Up This feature is very similar as Modem Wake Up, but it is through local area network. To use LAN Wake Up function, you must have a network card that supports this feature and also need to install a network management software, such as ADM.

RTC Wake Up Timer The Wake Up Timer is more like an alarm, which wakes up and power on your system at a pre-defined time for specific application. It can be set to wake up everyday or on specific date within a month. The date/time accurate is second.

High Efficient Synchronous Switching Regulator Most of the current switching designs are Asynchronous mode, which from the technical point of view, still consumes very high power as well as heat. NX6B implements high efficient synchronous switching design that the temperature of MOS FET is far less than Schottky diode of Asynchronous design.

Over Current Protection Circuit The Over Current Protection was very popular implemented on the Baby AT or ATX 3.3V/5V/12V switching power supply. But unfortunately, the new generation Pentium II CPU uses different voltage that have regulator to transfer 5V to CPU voltage (for example, 2.8V), and make 5V over current protection useless. NX6B with switching regulator onboard support CPU over current protection, in conjunction with 3.3V/5V/12V power supply provide the full line over current protection.

CPU Fan Monitoring NX6B implements "fan monitoring" function to prevent system overheat. The system will report and alarm fan malfunction though utility software such as Hardware Monitor utility (Small Icon for Hardware Monitoring).

CPU Thermal Protection NX6B has a special thermal detection circuit to have warning through application software when the temperature is higher than a predefined value.

System Voltage Monitoring Further more, NX6B implements a voltage monitoring system, As you turn on your system, this smart design will continue

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to monitor your system working voltage. If any of the system voltage is over the component's standard. There will be alarm though utility software such as Hardware Monitor utility (Small Icon for Hardware Monitoring) for a warning to user.

Full-range CPU core voltage This motherboard supports the CPU core voltage from 1.3V to 3.5V, that can be applied to various CPU type in future.

FCC DoC certificate NX6B has passed FCC DoC test. The radiation is very low, you can use any kind of housing.

Powerful utility softwares supported Motherboard Installation CDROM contains many useful utilities, such as ADM (Advanced Desktop Manager), AOchip, Hardware Monitor utility, AcePhone, EasyAxess, Suspend to Hard Drive utility, and BIOS flash utility.

Multi-language BIOS This breakthrough will help you set BIOS items without the language barrier.

Overview

1.1 Specifications

Form Factor	NLX
Board Size	285 mm x 230 mm
CPU	Intel Pentium II Processor
System Memory	SDRAM or Registered SDRAM, 168-pin DIMM x3, maximum 768MB.
Second-level Cache	On the CPU card (Slot1 connector)
Chipset	Intel 82440BX AGPset
Expansion Slots	Based on the riser card that comes with your housing.
Serial Port	Two serial ports UART 16C550 compatible, and the 3rd UART for IR function.
Parallel Port	One parallel port supports standard parallel port (SPP), enhanced parallel port (EPP) or extended capabilities port (ECP).
Floppy Interface	Floppy interface supports 3.5 inches drives with 720KB, 1.44MB or 2.88MB format or 5.25 inches drives with 360KB, 1.2MB format. The floppy connector is on the riser card.
IDE Interface	Dual-channel IDE interface support maximum 4 IDE hard disks or CDROM, mode 4 , bus master hard disk drives and Ultra DMA/33 mode hard drives are also supported. The IDE connectors are on the riser card.
USB Interface	Two USB ports supported by USB bracket, the BIOS also supports USB driver to simulate legacy keyboard.
PS/2 Mouse	Mini-Din PS/2 mouse connector onboard.
Keyboard	Mini-Din PS/2 keyboard connector onboard.
RTC and Battery	RTC within Intel PIIX4E chipset. Lithium (CR-2032) battery is an option, no battery is needed if power cord is plugged.
BIOS	AWARD Plug-and-Play, 2M bit Flash ROM BIOS. Multi-language versions supported.

Overview

Suspend to Hard Drive	Supported by BIOS, save your work to hard disk and resume within a very short time. VESA compatible VGA and Sound Blaster compatible sound card required.
Zero Voltage Modem Wake Up	Special circuit (patent applied) to support modem ring wake up by external box modem or internal modem card.
LAN Wake Up	By using a network card that supports this feature and a network management software (such as ADM), you can wake up a system through a local area network.
RTC Wake Up Timer	Program the date/time to wake up your system.
Synchronous Switching Regulator	High efficient synchronous switching regulator.
Over-current Protection	CPU core voltage over-current protection to prevent any accident short circuit.
CPU Thermal Protection	Warning when CPU temperature is overheat. Option for OEM to have sensor at CPU heatsink.
Fan Monitoring	Two 3-pin fan connectors, warning when CPU or housing fan is malfunction.
System Voltage Monitoring	Warning when system voltage (5V,12V,3.3V and CPU core) are abnormal
Audio Chip	Sound Blaster 16 onboard.
VGA	ATI 3D Rage Pro 2x AGP onboard.

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1.2 Suspend to Hard Drive

Suspend to Hard Drive saves your current work (system status, memory and screen image) into hard disk, and then the system can be totally power off. Next time, when power is on, you can resume your original work directly from hard disk within few second without go through the Win95 booting process and run your application again. If your memory is 16MB, normally, you need to reserve at least 16MB HDD space to save your memory image. Note that you have to use VESA compatible PCI VGA and Sound Blaster compatible sound card and sound driver that supports APM for Suspend to Hard Drive to work properly.

To use Suspend to Hard Drive:

1. Go into BIOS setup, Power Management → Suspend Mode Option, select "Suspend to Disk".
2. Go into BIOS setup, PNP/PCI Configuration → PnP OS Installed, select "No". This can give BIOS the capability to allocate system resources for Suspend to Hard Drive.
3. Bootup your system into DOS command prompt. If you are Win'95 user, Please restart your Windows 95 under "Command Prompt" by pressing "F8" while system shows "Windows 95 Starting ...". Choose "Safe Mode Command Prompt Only" from selection so that system will start in DOS command prompt.
4. Copy AOZVHDD.EXE to the root directory of your C: drive.
5. Option 1: Use **/file** switch (applied to FAT16 file system):
Please use following command to create a hidden file in the root directory of your hard disk for Suspend to Hard Drive to save the system status and memory image.

```
C:>AOZVHDD /c /file
```

Please make sure that you have enough continuous HDD space for creating this hidden file. For example, if you have 32MB of system memory and 4MB of VGA memory, you need at least 36MB (32MB + 4MB) of continuous HDD space. If AOZVHDD failed to allocate the HDD space, you may run "DEFRAG" Utility or "Disk Defragmenter" which come with MS-DOS or Win'95 to free HDD space.

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Option2: Use **/partiton** switch (applied to FAT16/FAT32 file system):

To create a separate partiton for Suspend to Hard Drive, please make sure you have reserved a free partition. We suggest you reserve the free partition which space is appropriate for your future memory expansion. For example, if you have 32MB of system memory and 4MB of VGA memory currently, but you plan to upgrade system memory to 64MB in the near future, then you may reserve a 68MB (64MB+4MB) space by using a disk utility (such as fdisk). Next, use following command to create a suspend partition:

```
C:>AOZVHDD /c /partition
```

If there is no extra free partition and you don't want your data lost, please do not use this partition method.

6. After creating above partition or hidden file, please reboot your system.
7. Push suspend switch (momentary mode) or use Win95 Suspend icon to force system goes into Suspend to Hard Drive mode and then turn system power off by power switch of your power supply.
8. Next time when you turn on your system, it will resume to your original work automatically.



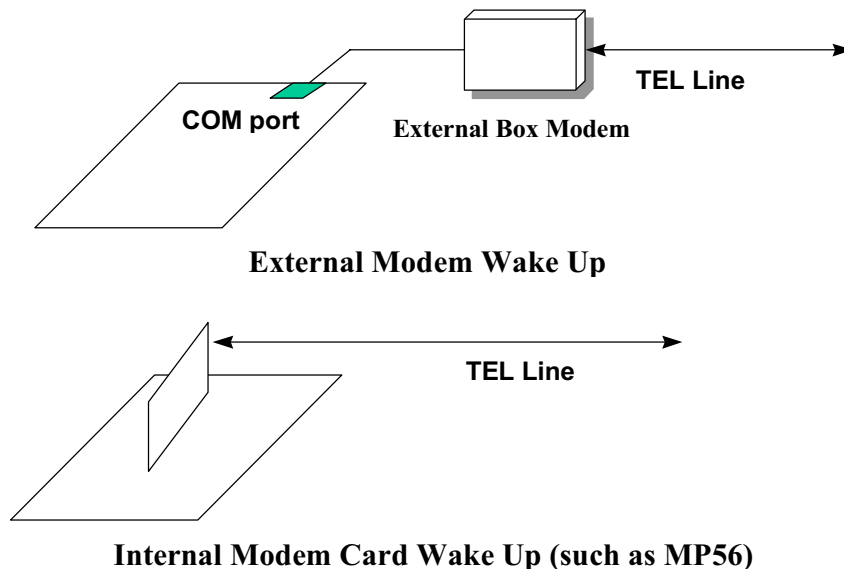
Warning: Note that Intel Bus Master and Ultra DMA/33 IDE driver are not fully compatible with Suspend to Hard Drive function, installing these drivers may cause the system unstable. Under this situation, please uninstall the drivers.

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1.3 Zero Voltage Modem Wake Up

The Modem Wake Up discussed here is to wakeup from true power off (identified by fan of power supply is off), This motherboard still supports traditional green PC suspend mode but it is not discussed here.

With the help ATX soft power On/Off, it is possible to have system totally power off (The traditional suspend mode of power management function does not really turn off the system power supply), and wakeup to automatically answer a phone call such as answering machine or to send/receive fax. You may identify the true power off by checking fan of your power supply. Both external box modem and internal modem card can be used to support Modem Wake Up, but if you use external modem, you have to keep the box modem always power-on. NXRM riser card implement special circuit and make sure modem card works properly without any power. For signal compatibility issue, we suggest you to ask your reseller or distributor for choosing an internal modem card.



Overview

For Internal Modem Card (such as AOpen MP56):

1. Go into BIOS setup , Power Management → Modem Wake Up, select Enable.
2. Setup your application, put into Windows 95 StartUp or use Suspend to Hard Drive function.
3. Turn system power off by soft power switch.
4. Connect 4-pin Modem Ring-On cable from MP56 RING connector to the Modem-WKUP connector on your riser card.
5. Connect telephone line to MP56. You are now ready to use Modem Ring-On.

For External Box Modem:

1. Go into BIOS setup , Power Management → Modem Wake Up, select Enable.
2. Setup your application, put into Windows 95 StartUp or use Suspend to Hard Drive function.
3. Turn system power off by soft power switch.
4. Connect RS232 cable of external box Modem to COM1 or COM2.
5. Connect telephone line to external box Modem. Turn on Modem power (you must keep Modem power always on). You are now ready to use Modem Ring



Tip: External modem wake up signal is detected through COM1 or COM2. Internal modem card wake up signal is detected through cable from connector RING (on modem card) to MODEM-WKUP (on the riser card).

Tip: You can combine Suspend to Hard Drive, Modem Wake Up and the software Acephone for the best solution of answering machine or to send/receive fax.



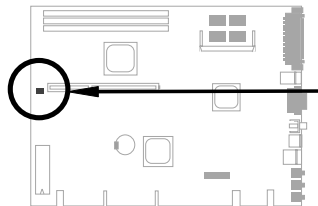
Note: If you use external modem, the power of external modem must be kept on to receive signal from telephone line. Internal modem card has no such limitation.

Overview

1.4 System Voltage Monitoring

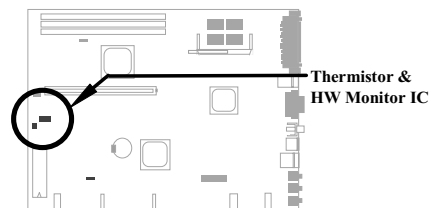
This motherboard implements a voltage monitoring system. As you turn on your system, this smart design will continue to monitor your system working voltage. If any of the system voltage is over the component's standard. There will be alarm through application software such as Hardware Monitor utility for a warning to user. System voltage monitoring function monitors CPU core voltage. It is automatically implemented by BIOS and Hardware Monitor utility (the file name is like aohw120.exe, where 120 means the version number), no hardware installation is needed.

1.5 Fan Monitoring



The fan monitoring function is implemented by connecting fan to 3-pin fan connector **CPUFAN** and installing Hardware Monitor utility.

1.6 CPU Thermal Protection



This mainboard implements special thermal protection circuits. When temperature is higher than a predefined value, there will be warning through application software such as Hardware Monitor utility to notify user. It is automatically implemented by BIOS and Hardware Monitor utility, no hardware installation is needed.

For OEM customer who needs more accurate temperature, NX6B reserves an option to use special CPU heatsink with thermal sensor on it. The CPU thermal sensor should be connected to **CN3**.

1.7 Multi-language BIOS

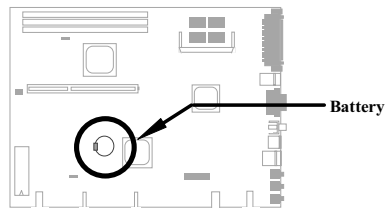
For giving our customers the best support, our software team made every effort to overcome all difficulties and successfully develop a method to provide multi-language BIOS.

You may download and reflash a specified BIOS. After entering BIOS Setup, you can switch to another language by pressing F9. Then pressing F9 again will let you return to English screen.

This breakthrough will help you set BIOS items without the language barrier.

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1.8 Battery-less Design



To preserve the earth, NX6B implements the world first battery-less motherboard design. There is no need to have battery for RTC (real time clock) and CMOS Setup as long as ATX power cable is plugged. In case of the AC power is shutdown or power cord is removed by accident, the CMOS Setup and system configuration can be restored from EEPROM, only the system clock needed to be re-set to current date/time.

For the convenience of end user, NX6B still shipped with one Lithium (CR-2032) battery. If you prefer to use battery, you can still Insert it into battery socket. The RTC will still keep running even power cord is removed.

Chapter 2

Hardware Installation

This chapter gives you a step-by-step procedure on how to install your system. Follow each section accordingly.



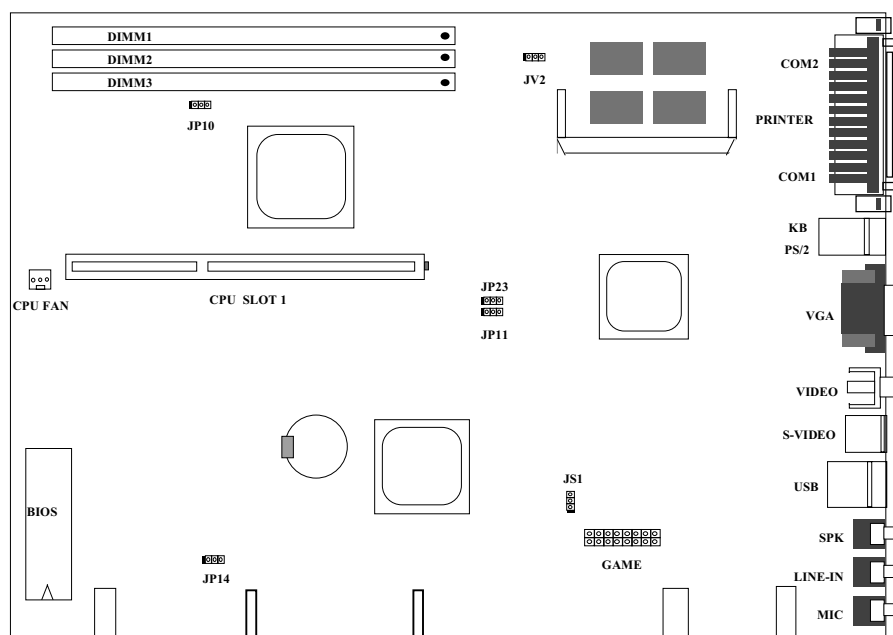
Caution: *Electrostatic discharge (ESD) can damage your processor, disk drives, expansion boards, and other components. Always observe the following precautions before you install a system component.*

1. *Do not remove a component from its protective packaging until you are ready to install it.*
2. *Wear a wrist ground strap and attach it to a metal part of the system unit before handling a component. If a wrist strap is not available, maintain contact with the system unit throughout any procedure requiring ESD protection.*

Hardware Installation

2.1 Jumper and Connector Locations

The following figure shows the locations of the jumpers and connectors on the system board:



Hardware Installation

Jumpers:

JS1:	Disable Onboard Sound Card
JP10:	Disable Onboard AGP
JP14:	Clear CMOS
JP23:	AGP Turbo

Connectors:

PS2:	PS/2 mouse connector
KB:	PS/2 keyboard connector
COM1:	COM1 connector
COM2:	COM2 connector
PRINTER:	Printer connector
PWR2:	ATX power connector
USB:	USB connector
VIDEO:	Video Out connector
S-VIDEO:	S-Video Out connector
CPUFAN:	CPU Fan connector
VGA:	VGA connector
GAME:	Game/MIDI Port



Note: Other jumpers are for internal test only, it is not necessary to do any change .

Hardware Installation

2.2 Jumpers

With the help of Pentium II VID signal and SMBus, this motherboard is jumper-less design.

2.2.1 Selecting the CPU Frequency

Pentium II VID signal and SMBus clock generator provide CPU voltage auto-detection and allow user to set CPU frequency through CMOS setup, no jumper or switch is needed. The correct CPU information is saved into EEPROM, with these technologies, the disadvantages of Pentium base jumper-less design are eliminated. There will be no worry of wrong CPU voltage detection and no need to re-open the housing if CMOS battery loss.

The CPU frequency selection is set by going into:

BOIS Setup → Chipset Features Setup → CPU Clock Frequency

(The possible setting is 66, 68.5, 75, 83.3, 100, 103, 112 and 133.3 MHz)

BOIS Setup → Chipset Features Setup → CPU Clock Ratio

(The possible setting is 1.5x, 2x, 2.5x, 3x, 3.5x, 4x, 4.5x, 5x, 5.5x, 6x, 6.5x, 7x, 7.5x, and 8x)

Core frequency = Ratio * External bus clock

INTEL Pentium II	CPU Core Frequency	Ratio	External Bus Clock
Pentium II - 233	233MHz =	3.5x	66MHz
Pentium II - 266	266MHz =	4x	66MHz
Pentium II - 300	300MHz =	4.5x	66MHz
Pentium II - 333	333MHz =	5x	66MHz
Pentium II - 350	350MHz=	3.5x	100MHz
Pentium II - 400	400MHz=	4x	100MHz
Pentium II - 450	450MHz=	4.5x	100MHz



Warning: INTEL 440BX chipset supports maximum 100MHz external CPU bus clock, the 103, 112 and 133.3MHz are for internal test only. **These settings exceed the specification of BX chipset, which may cause serious system damage.**

Hardware Installation

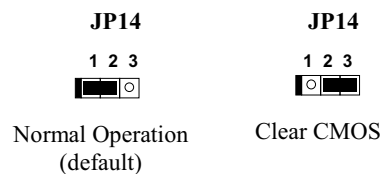
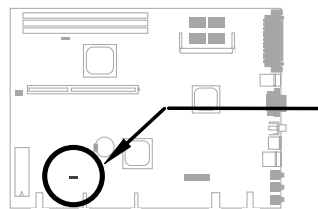
2.2.2 Setting the CPU Voltage

This motherboard supports Pentium II VID function, the CPU core voltage is automatically detected, the range is from 1.3V to 3.5V.

2.2.3 Clearing the CMOS

JP14	Clear CMOS
1-2	Normal operation (default)
2-3	Clear CMOS

You need to clear the CMOS if you forget your system password. To clear the CMOS, follow the procedures listed below:



The procedure to clear CMOS:

1. Turn off the system and unplug the AC power.
2. Remove the power cable from connector PWR2.
3. Locate **JP14** and short pins 2-3 for a few seconds.
4. Return **JP14** to its normal setting by shorting pins 1-2.
5. Connect ATX power cable back to connector PWR2.
6. Turn on the system power.
7. Press **[DEL]** during bootup to enter the BIOS Setup Utility and specify a new password, if needed.



Tip: If your system hangs or fails to boot because of over-clocking, please clear CMOS and the system will go back to default setting (233MHz).

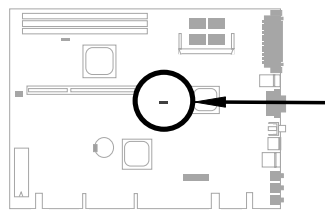
Tip: Except using JP14, you may also press <Home> key. By this smart design, it would be more convenient to clear CPU frequency setting. For using this function, you just need to press <Home> key first and then press Power button at the same time. Note that do not release <Home> key until POST screen appearing.

Hardware Installation

2.2.4 AGP Turbo

<u>JP23</u>	<u>AGP Turbo</u>
1-2	Disabled (default)
2-3	Enabled

Although the specification of AGP is maximum 66Mhz clock, you still could set this jumper to Enabled to force it synchronize with bus clock. However, doing so may probably cause your system unstable.



JP23



Disabled (default)

JP23



Enabled

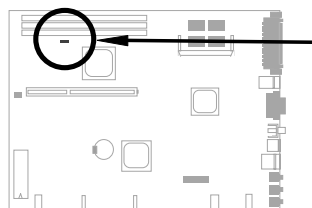


Warning: The specification of AGP is maximum 66Mhz clock. If the bus clock is larger than 66MHz, setting this item to Enabled may cause serious system damage.

2.2.5 Disable Onboard AGP

<u>JP10</u>	<u>Disable Onboard AGP</u>
1-2	Disabled
2-3	Enabled (default)

If you want to install other VGA card, you may disable the onboard AGP card by setting this jumper to Disabled.



JP10



Disabled

JP10



Enabled (default)

2.2.6 Disable Onboard Sound Card

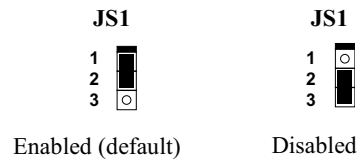
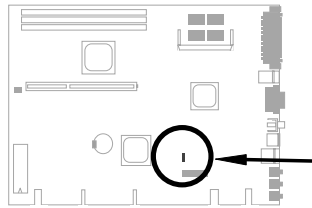
<u>JS1</u>	<u>Disable Onboard</u>
------------	------------------------

If you want to install other sound card, you

Hardware Installation

Sound Card	
1-2	Enabled (default)
2-3	Disabled

may disable the onboard sound card by setting this jumper to Disabled.

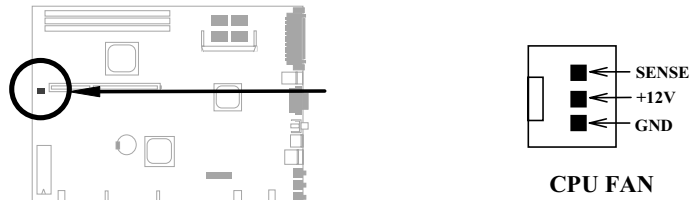


Hardware Installation

2.3 Connectors

2.3.1 CPU Fan

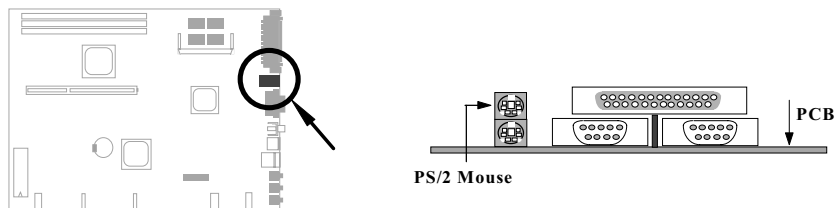
Plug in the fan cable to the 3-pin fan connector onboard. The fan connector is marked **CPU FAN FAN** on the system board.



Note: Attach fan cable to either CPU FAN connector or FAN connector. Both of these two fans connectors can support hardware monitoring function, however, you can only use the CPU FAN connector to control the fan power ON/OFF.

2.3.2 PS/2 Mouse

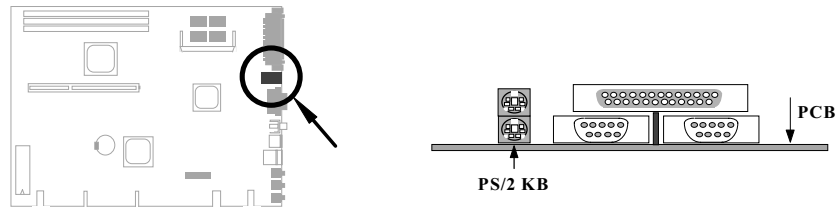
The onboard PS/2 mouse connector is a 6-pin Mini-Din connector marked **PS2**. The view angle of drawing shown here is from back panel of the housing.



Hardware Installation

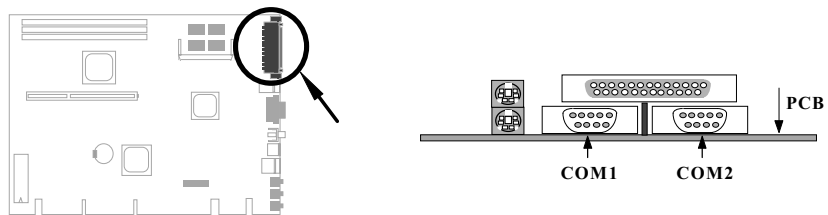
2.3.3 Keyboard

The onboard PS/2 keyboard connector is a 6-pin Mini-Din connector marked **KB2**. The view angle of drawing shown here is from back panel of the housing.



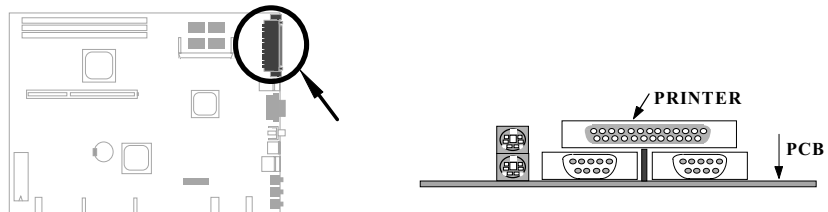
2.3.4 Serial Devices (COM1/COM2)

The onboard serial connectors are 9-pin D-type connector on the back panel of mainboard. The serial port 1 connector is marked as **COM1** and the serial port 2 connector is marked as **COM2**.



2.3.5 Printer

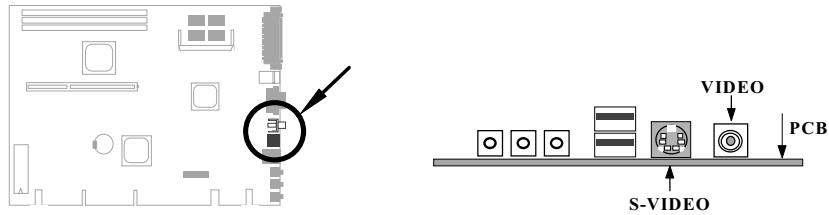
The onboard printer connector is a 25-pin D-type connector marked **PRINTER**. The view angle of drawing shown here is from back panel of the housing.



Hardware Installation

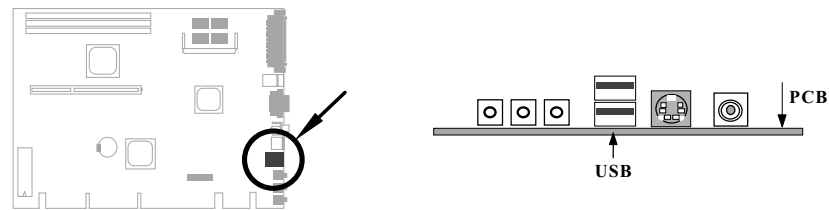
2.3.6 TV Output

This motherboard supports TV Output, you can attach the TV connector to the **VIDEO** or **S-VIDEO** connector.

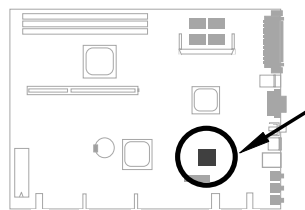


2.3.7 USB Device

You can attach USB devices to the USB connector. The motherboard contains two USB connectors, which are marked as **USB**.



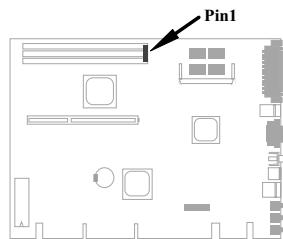
2.3.8 Audio



This motherboard is Creative audio chip onboard. For detailed information about audio, please see to "Chapter 4 Audio" and online help.

Hardware Installation

2.4 Configuring the System Memory



The DIMM types supported are SDRAM (Synchronous DRAM) and Registered SDRAM. This motherboard has three 168 pin DIMM sockets (Dual-in-line Memory Module) that allow you to install system memory up to **768MB**. But note that mixing SDRAM and Registered SDRAM is not allowed, you can install one of the DRAM types only.



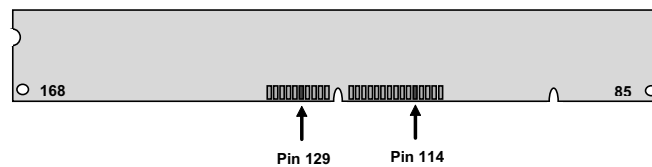
Warning: This motherboard does not support EDO DRAM.

DIMM modules can be identified by following factors:

- I. **Size:** single side, 1Mx64 (8MB), 2Mx64 (16MB), 4Mx64 (32MB), 8Mx64 (64MB), 16Mx64 (128MB), and double side, 1Mx64x2 (16MB), 2Mx64x2 (32MB), 4Mx64x2 (64MB), 8Mx64x2 (128MB).



Tip: Here is a trick to check if your DIMM is single-side or double-side -- if there are traces connected to golden finger pin 114 and pin 129 of the DIMM, the DIMM is probably double-side; otherwise, it is single-side. Following figure is for your reference.



Note: 768MB memory is achieved by using 64M bit Registered SDRAMs.

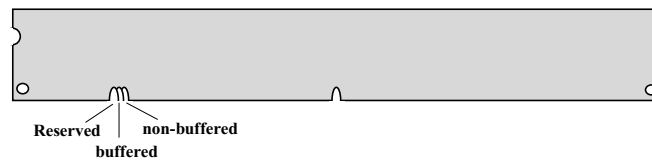
- II. **Speed:** Normally marked as -12, which means the clock cycle time is 12ns and maximum clock of this SDRAM is 83MHz. Sometimes you can also find the SDRAM marked as -67, which means maximum clock is 67MHz.

Hardware Installation



Caution: Some SDRAMs marked as -10 may work fine with 100 MHz CPU clock, but not all this kind of modules can work properly under 100MHz external clock. We suggest you choose and install SDRAMs that match **PC 100** specification if 100MHz or above CPU clock is selected.

- III. Buffered and non-buffered:** This motherboard supports non-buffered DIMMs. You can identify non-buffered DIMMs and buffered DIMMs according to the position of the notch, following figure is for your reference:



Because the positions are different, only non-buffered DIMMs can be inserted into the DIMM sockets on this motherboard. Although most of DIMMs on current market are non-buffered, we still recommend you to ask your dealer for the correct type.

- IV. 2-clock and 4-clock signals:** Although both of 2-clock and 4-clock signals are supported by NX6B, we strongly recommend you to choose 4-clock SDRAM in consideration of reliability.



Tip: To identify 2-clock and 4-clock SDRAM, you may check if there are traces connected to golden finger pin 79 and pin 163 of the SDRAM. If there are traces, the SDRAM is probably 4-clock; Otherwise, it is 2-clock.

- V. Parity:** This motherboard supports standard 64 bit wide (without parity) and 72-bit wide (with parity) DIMM modules.

- VI. SPD support:** BIOS will automatically detect DIMM with SPD, and set to appropriate timing. DIMMs without SPD are still able to work fine on this board, but BIOS POST screen will give you a warning message that you use a DIMM without SPD.

There is no jumper setting required for the memory size or type. It is automatically detected by the system BIOS, and the total memory size is to add them together.

Hardware Installation

Total Memory Size = Size of DIMM1 + Size of DIMM2 + Size of DIMM3

Following table list the recommended SDRAM combinations of DIMM:

DIMM Data chip	Bit size per side	Single/ Double side	Chip count	DIMM size	Recommended
1M by 16	1Mx64	x1	4	8MB	Yes
1M by 16	1Mx64	x2	8	16MB	Yes
2M by 8	2Mx64	x1	8	16MB	Yes
2M by 8	2Mx64	x2	16	32MB	Yes

DIMM Data chip	Bit size per side	Single/ Double side	Chip count	DIMM size	Recommended
2M by 32	2Mx64	x1	2	16MB	Yes, but not tested.
2M by 32	2Mx64	x2	4	32MB	Yes, but not tested.
4M by 16	4Mx64	x1	4	32MB	Yes, but not tested.
4M by 16	4Mx64	x2	8	64MB	Yes, but not tested.
8M by 8	8Mx64	x1	8	64MB	Yes, but not tested.
8M by 8	8Mx64	x2	16	128MB	Yes, but not tested.

Following table are possible SDRAM combinations that is **NOT** recommended:

DIMM Data chip	Bit size per side	Single/ Double side	Chip count	DIMM size	Recommended
4M by 4	4Mx64	x1	16	32MB	No
4M by 4	4Mx64	x2	32	64MB	No
16M by 4	16Mx64	x1	16	128MB	No

Hardware Installation

For getting the best performance and stability under 100MHz or above external clock, we strongly recommend you use PC 100 SDRAM. The PC 100 SDRAM that we had tested are listed below.

Size	Vendor	Model	Single/Double	Chip Count
16M	Micron	MT48LC2M8A1-08	x1	8
16M	TI	TMX626812BDGE-10A	x1	8
16M	Hyundai	HY57V168010CTC-10	x1	8
32M	Micron	MT48LC2M8A1-08	x2	16
32M	Hyundai	HY57V168010CTC-10	x1	16
32M	NEC	D4516821AG5-A10-7JF	x1	16
32M	SEC	KM48S2020CT-GH	x1	16
128M	Simens	HYS72V16220GU	x2	18

Memory error checking is supported by parity check. To use parity check you need 72 bit DIMM (64+8 bit parity), which are automatically detected by BIOS.



Warning: The driving capability of new generation chipset is limited because the lack of memory buffer (to improve performance). This makes DRAM chip count an important factor to be taking into consideration when you install DIMM. Unfortunately, there is no way that BIOS can identified the correct chip count, you need to calculate the chip count by yourself. The simple rule is: **By visual inspection, use only DIMM which is less than 16 chips.**



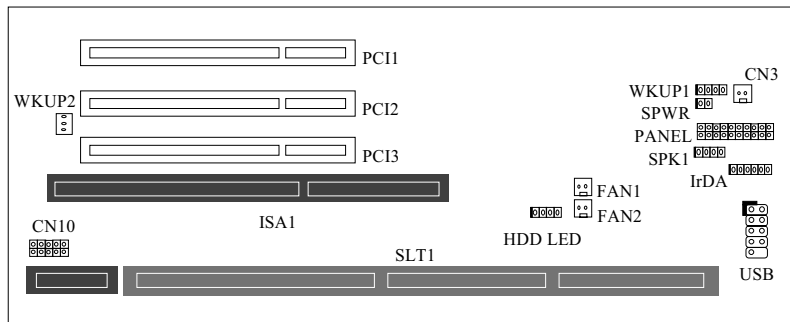
Tip: The parity mode uses 1 parity bit for each byte, normally it is even parity mode, that is, each time the memory data is updated, parity bit will be adjusted to have even count "1" for each byte. When next time, if memory is read with odd number of "1", the parity error is occurred and this is called single bit error detection.

Hardware Installation

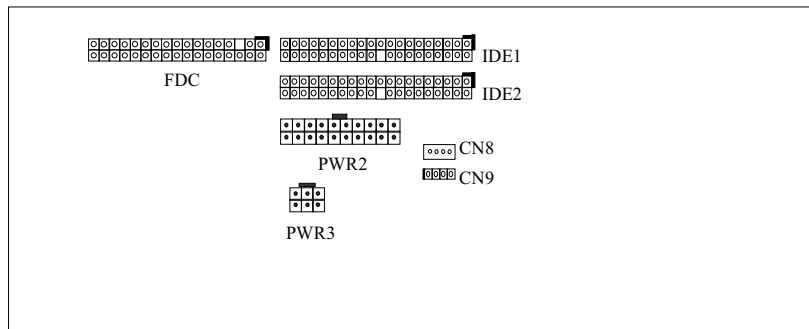
2.5 Installing a riser card

A riser card always comes with a NLX housing. There is a system board slot on the riser card, you need to gently insert the golden edge of the motherboard into the slot until it fits.

PCI slots, ISA slots, IDE connectors, FDC connector and some other connectors are on the riser card. Some housings may differ slightly in design, requiring additional steps to install the board. Following is NXRM riser card.



<Front>



<Back>

For more information, please read the documentation that comes with your housing.

Chapter 3

Award BIOS

This chapter tells how to configure the system parameters. You may update your BIOS via AWARD Flash Utility.

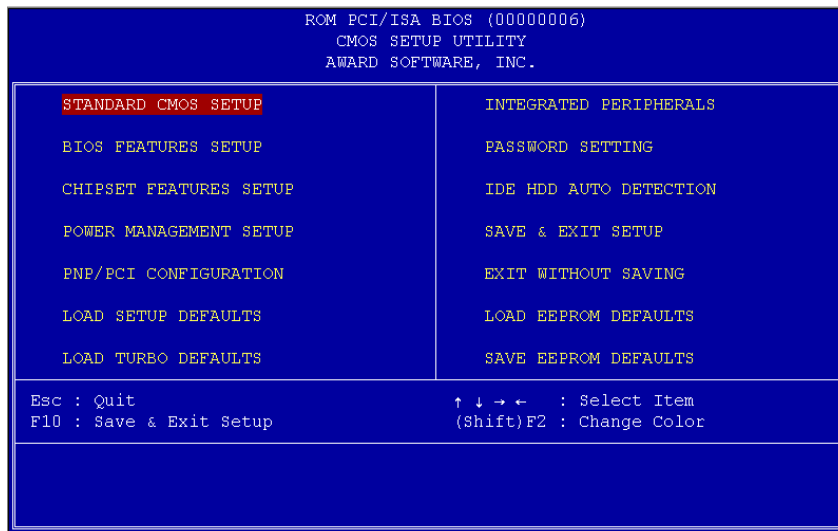


Important: Because the BIOS code is the most often changed part of the mainboard design, the BIOS information contained in this chapter (especially the Chipset Setup parameters) may be a little different compared to the actual BIOS that came with your mainboard.

AWARD BIOS

3.1 Entering the Award BIOS Setup Menu

The BIOS setup utility is a segment of codes/routines residing in the BIOS Flash ROM. This routine allows you to configure the system parameters and save the configuration into the 128 byte CMOS area, (normally in the RTC chip or directly in the main chipset). To enter the BIOS Setup, press **[DEL]** during POST (Power-On Self Test). The BIOS Setup Main Menu appears as follows.



Tip: Choose "Load Setup Defaults" for recommended optimal performance. Choose "Load Turbo Defaults" for best performance with light system loading. Refer to section 3.7.

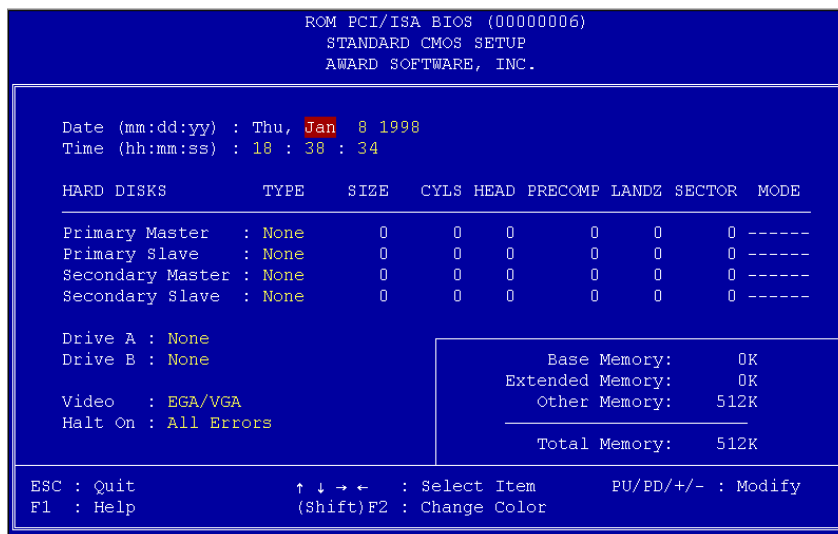
The section at the bottom of the screen tells how to control the screen. Use the arrow keys to move between items, **[SHIFT] [F2]** to color scheme of the display, **[ESC]** to exit, and **[F10]** to save the changes before exit. Another section at the bottom of the screen displays a brief description of the highlighted item.

After selecting an item, press **[ENTER]** to select or enter a submenu.

AWARD BIOS

3.2 Standard CMOS Setup

The "Standard CMOS Setup" sets the basic system parameters such as the date, time, and the hard disk type. Use the arrow keys to highlight an item and **PGUP** or **PGDN** to select the value for each item.



Standard CMOS → Date

To set the date, highlight the Date parameter. Press **PGUP** or **PGDN** to set the current date. The date format is month, date, and year.

Standard CMOS → Time

To set the time, highlight the Time parameter. Press **PGUP** or **PGDN** to set the current time in hour, minute, and second format. The time is based on the 24 hour military clock.

AWARD BIOS

Standard CMOS → Primary Master → Type

Standard CMOS → Primary Slave → Type

Standard CMOS → Secondary Master → Type

Standard CMOS → Secondary Slave → Type

Type
Auto
User
None
1
2
...
45

This item lets you select the IDE hard disk parameters that your system supports. These parameters are Size, Number of Cylinder, Number of Head, Start Cylinder for Pre-compensation, Cylinder number of Head Landing Zone and Number of Sector per Track. The default setting is **Auto**, which enables BIOS to automatically detect the parameters of installed HDD at POST (Power-On Self Test). If you prefer to enter HDD parameters manually, select **User**. Select **None** if no HDD is connected to the system.

The IDE CDROM is always automatically detected.



***Tip:** For an IDE hard disk, we recommend that you use the "IDE HDD Auto Detection" to enter the drive specifications automatically. See the section "IDE HDD Auto Detection".*

Standard CMOS → Primary Master → Mode

Standard CMOS → Primary Slave → Mode

Standard CMOS → Secondary Master → Mode

Standard CMOS → Secondary Slave → Mode

Mode
Auto
Normal
LBA
Large

The enhanced IDE feature allows the system to use a hard disk with a capacity of more than 528MB. This is made possible through the Logical Block Address (LBA) mode translation. The LBA is now considered as a standard feature of current IDE hard disk on the market because of its capability to support capacity larger than 528MB. Note that if HDD is formatted with LBA On, it will not be able to boot with LBA Off.

AWARD BIOS

Standard CMOS → Drive A

Standard CMOS → Drive B

Drive A

None
360KB 5.25"
1.2MB 5.25"
720KB 3.5"
1.44MB 3.5"
2.88MB 3.5"

These items select floppy drive type. The available settings and types supported by the mainboard are listed on the left.

Standard CMOS → Video

Video

EGA/VGA
CGA40
CGA80
Mono

This item specifies the type of video card in use. The default setting is VGA/EGA. Since current PCs use VGA only, this function is almost useless and may be disregarded in the future.

Standard CMOS → Halt On

Halt On

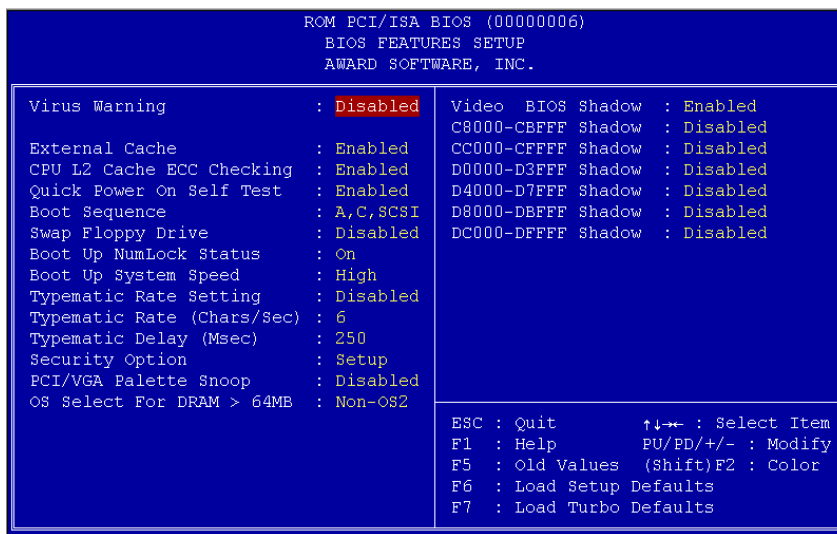
No Errors
All Errors
All, But Keyboard
All, But Diskette
All, But Disk/Key

This parameter enables you to control the system stops in case of Power-On Self Test (POST) error.

AWARD BIOS

3.3 BIOS Features Setup

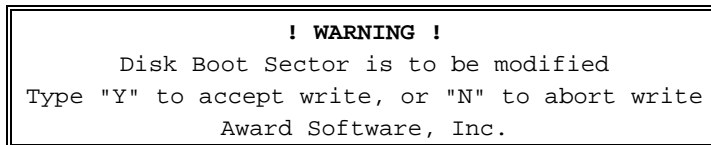
This screen appears when you select the option "BIOS Features Setup" from the main menu.



BIOS Features → Virus Warning

Virus Warning
Enabled
Disabled

Set this parameter to Enabled to activate the warning message. This feature protects the boot sector and partition table of your hard disk from virus intrusion. Any attempt during boot up to write to the boot sector of the hard disk drive stops the system and the following warning message appears on the screen. Run an anti-virus program to locate the problem.



AWARD BIOS

BIOS Features → External Cache

<u>External Cache</u> Enabled Disabled	Enabling this parameter activates the secondary cache (currently, PBRAM cache). Disabling the parameter slows down the system. Therefore, we recommend that you leave it enabled unless you are troubleshooting a problem.
---	--

BIOS Features → CPU L2 Cache ECC Checking

<u>CPU L2 Cache ECC Checking</u> Enabled Disabled	This item lets you enable or disable L2 Cache ECC checking.
--	---

BIOS Features → Quick Power On Self Test

<u>Quick Power on Self test</u> Enable Disabled	This parameter speeds up POST by skipping some items that are normally checked.
--	---

BIOS Features → Boot Sequence

<u>Boot Sequence</u> A,C,SCSI C,A,SCSI C,CDROM,A CDROM,C,A D,A,SCSI E,A,SCSI F,A,SCSI SCSI,A,C SCSI,C,A C only LS/ZIP,C	This parameter allows you to specify the system boot up search sequence. The hard disk ID are listed below: C: Primary master D: Primary slave E: Secondary master F: Secondary slave LS: LS120 Zip: IOMEGA ZIP Drive
---	---

AWARD BIOS

BIOS Features → Swap Floppy Drive

<u>Swap Floppy Drive</u>
Enabled
Disabled

This item allows you to swap floppy drives. For example, if you have two floppy drives (A and B), you can assign the first drive as drive B and the second drive as drive A or vice-versa.

BIOS Features → Boot Up NumLock Status

<u>Boot Up NumLock Status</u>
On
Off

Setting this parameter to On enables the numeric function of the numeric keypad. Set this parameter to Off to disregard the function. Disabling the numeric function allows you to use the numeric keypad for cursor control.

BIOS Features → Boot Up System Speed

<u>Boot Up System Speed</u>
High
Low

Select High or Low system speed after boot.

BIOS Features → Typematic Rate Setting

<u>Typematic Rate Setting</u>
Enabled
Disabled

Set this parameter to Enable/Disable the keyboard repeat function. When enabled, continually holding down a key on the keyboard will generate repeatedly keystrokes.

BIOS Features → Typematic Rate (Chars/Sec)

<u>Typematic Rate</u>
6
8
10
12
15
20
24
30

This item allows you to control the speed of repeated keystrokes. The default is 30 characters/sec.

AWARD BIOS

BIOS Features → Typematic Delay (Msec)

<u>Typematic Delay</u>
250
500
750
1000

This parameter allows you to control the delay time between the first and the second keystroke (where the repeated keystrokes begin). The typematic delay settings are 250, 500, 750, and 1000 msec.

BIOS Features → Security Option

<u>Security Option</u>
Setup
System

The **System** option limits access to both the System boot and BIOS setup. A prompt asking you to enter your password appears on the screen every time you boot the system.

The **Setup** option limits access only to BIOS setup.

To disable the security option, select Password Setting from the main menu, don't type anything and just press <Enter>.

BIOS Features → PCI/VGA Palette Snoop

<u>PCI/VGA Palette Snoop</u>
Enabled
Disabled

Enabling this item informs the PCI VGA card to keep silent (and to prevent conflict) when palette register is updated (i.e., accepts data without responding any communication signals). This is useful only when two display cards use the same palette address and plugged in the PCI bus at the same time (such as MPEQ or Video capture). In such case, PCI VGA is silent while MPEQ/Video capture is set to function normally.

BIOS Features → OS Select for DRAM > 64MB

<u>OS Select for DRAM > 64MB</u>
OS/2
Non-OS/2

Set to OS/2 if your system is utilizing an OS/2 operating system and has a memory size of more than 64 MB.

AWARD BIOS

BIOS Features → Video BIOS Shadow

<u>Video BIOS</u>
<u>Shadow</u>
Enabled
Disabled

VGA BIOS Shadowing means to copy video display card BIOS into the DRAM area. This enhances system performance because DRAM access time is faster than ROM.

BIOS Features → C800-CBFF Shadow

BIOS Features → CC00-CFFF Shadow

BIOS Features → D000-D3FF Shadow

BIOS Features → D400-D7FF Shadow

BIOS Features → D800-DBFF Shadow

BIOS Features → DC00-DFFF Shadow

<u>C800-CBFF</u>
<u>Shadow</u>
Enabled
Disabled

These six items are for shadowing ROM code on other expansion cards. Before you set these parameters, you need to know the specific addresses of that ROM code. If you do not know this information, enable all the ROM shadow settings.



Note: The F000 and E000 segments are always shadowed because BIOS code occupies these areas.

AWARD BIOS

3.4 Chipset Features Setup

The "Chipset Features Setup" includes settings for the chipset dependent features. These features are related to system performance.

```
ROM PCI/ISA BIOS (00000006)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

SDRAM CAS Latency      : 3 T
SDRAM RAS# to CAS# Delay : 3 T
SDRAM RAS# Precharge   : 3 T
DRAM ECC Function      : Disabled
Video BIOS Cacheable   : Disabled
Video RAM Cacheable    : Disabled
8 Bit I/O Recovery Time : 4
16 Bit I/O Recovery Time : 1
Memory Hole At 15M-16M : Disabled
Passive Release        : Enabled
Delayed Transaction    : Enabled
AGP Aperture Size (MB) : 64
Pentium II Micro Codes : Enabled

***** Jumpless Setup *****
Manufacture Freq Default :
System Frequency         : 233 MHz

ESC : Quit          ↑↓←→ : Select Item
F1  : Help          PU/PD/+/− : Modify
F5  : Old Values   (Shift)F2 : Color
F6  : Load Setup Defaults
F7  : Load Turbo Defaults
```



Caution: Make sure you fully understand the items contained in this menu before you try to change anything. You may change the parameter settings to improve system performance. However, it may cause system unstable if the setting are not correct for your system configuration.

AWARD BIOS

Chipset Features → SDRAM CAS Latency

Chipset Features → SDRAM RAS# to CAS# Delay

<u>SDRAM CAS</u> <u>Latency</u> 2T 3T Auto
--

These are timing of SDRAM CAS Latency and RAS to CAS Delay, calculated by clocks. They are important parameters affects SDRAM performance, default is **Auto**. If you install DIMMs with SPD and set this item to Auto, BIOS will automatically detect your DIMMs and then set to a appropriate timing; If you use DIMMs without SPD and set this item to Auto, BIOS will set it to 3/3. To make sure all of these settings in BIOS are correct, it is recommended to use DIMMs with SPD.

Chipset Features → SDRAM RAS# Precharge

<u>SDRAM RAS#</u> <u>Precharge</u> 2T 3T Auto

The RAS Precharge means the timing to inactive RAS and the timing for DRAM to do precharge before next RAS can be issued. RAS is the address latch control signal of DRAM row address. The default setting is **Auto**.

Chipset Features → DRAM ECC Function

<u>DRAM ECC</u> <u>Function</u> Auto Disabled
--

This lets you enable or disable DRAM ECC function. The ECC algorithm has the ability to detect double bit error and automatically correct single bit error.

Chipset Features → Video BIOS Cacheable

<u>Video BIOS</u> <u>Cacheable</u> Enabled Disabled
--

Allows the video BIOS to be cached to allow faster video performance.

Chipset Features → Video RAM Cacheable

<u>Video RAM</u> <u>Cacheable</u> Enabled Disabled

This item lets you cache Video RAM A000 and B000.

AWARD BIOS

Chipset Features → 8 Bit I/O Recovery Time

<u>8 Bit I/O Recovery Time</u>
1
2
3
4
5
6
7
8
NA

For some old I/O chips, after the execution of an I/O command, the device requires a certain amount of time (recovery time) before the execution of the next I/O command. Because of new generation CPU and mainboard chipset, the assertion of I/O command is faster, and sometimes shorter than specified I/O recovery time of old I/O devices. This item lets you specify the delay of 8-bit I/O command by count of ISA bus clock. If you find any unstable 8-bit I/O card, you may try to extend the I/O recovery time via this item. The BIOS default value is **4 ISA clock**. If set to NA, the chipset will insert 3.5 system clocks.

Chipset Features → 16 Bit I/O Recovery Time

<u>16 Bit I/O Recovery Time</u>
1
2
3
4
NA

The same as 16-bit I/O recovery time. This item lets you specify the recovery time for the execution of 16-bit I/O commands by count of ISA bus clock. If you find any of the installed 16-bit I/O cards unstable, try extending the I/O recovery time via this item. The BIOS default value is **1 ISA clocks**. If set to NA, the chipset will automatically insert 3.5 system clocks.

Chipset Features → Memory Hole At 15M-16M

<u>Memory Hole At 15M-16M</u>
Enabled
Disabled

This option lets you reserve system memory area for special ISA cards. The chipset accesses code/data of these areas from the ISA bus directly. Normally, these areas are reserved for memory mapped I/O card.

Chipset Features → Passive Release

<u>Passive Release</u>
Enabled
Disabled

This item lets you control the Passive Release function of the PIIX4E chipset (Intel PCI to ISA bridge). This function is used to meet latency of ISA bus master. Try to enable or disable it, if you have ISA card compatibility problem.

AWARD BIOS

Chipset Features → Delayed Transaction

<u>Delayed Transaction</u> Enabled Disabled	This item lets you control the Delayed Transaction function of the PIIX4E chipset (Intel PCI to ISA bridge). This function is used to meet latency of PCI cycles to or from ISA bus. Try to enable or disable it, if you have ISA card compatibility problem.
--	---

Chipset Features → AGP Aperture Size (MB)

<u>AGP Aperture Size (MB)</u> 4 8 16 32 64 128 256	This item lets you determine the effective size of the AGP Graphic Aperture.
--	--

Chipset Features → Pentium II Micro Codes

<u>Pentium II Micro Codes</u> Enabled Disabled	The micro codes are used to fix bugs of Pentium II CPU, we strongly recommend to enable this item for system reliability reason. However, this microcode may slightly reduce CPU performance. We provide this option for your convenience if you like to test it.
---	---

Chipset Features → Manufacture Frequency Default

<u>Manufacture Frequency Default</u> Depends on the CPU type	This item only reminds you of the actual CPU frequency while clearing CMOS or pressing "Home" key. The default setting is 233 Mhz, you can modify it to match the actual CPU frequency by using the utility - flash.exe.
--	--

AWARD BIOS

Chipset Features → System Frequency

System Frequency

233 Mhz
266 Mhz
300 Mhz
333 Mhz
350 Mhz
400 Mhz
450 Mhz
Manual

This item lets you set CPU frequency. If you want to set other value, please choose "Manual " to set CPU clock frequency and clock ratio manually.

Chipset Features → CPU Clock Frequency

CPU Clock Frequency

66.8 Mhz
68.5 Mhz
75.0 Mhz
83.3 Mhz
100 Mhz
103 Mhz
112 Mhz
133.3 Mhz

This item lets you set external clock (bus clock). The correct setting may vary because of different CPU products, refer to your CPU specification for more details.

Chipset Features → CPU Clock Ratio

CPU Clock Ratio

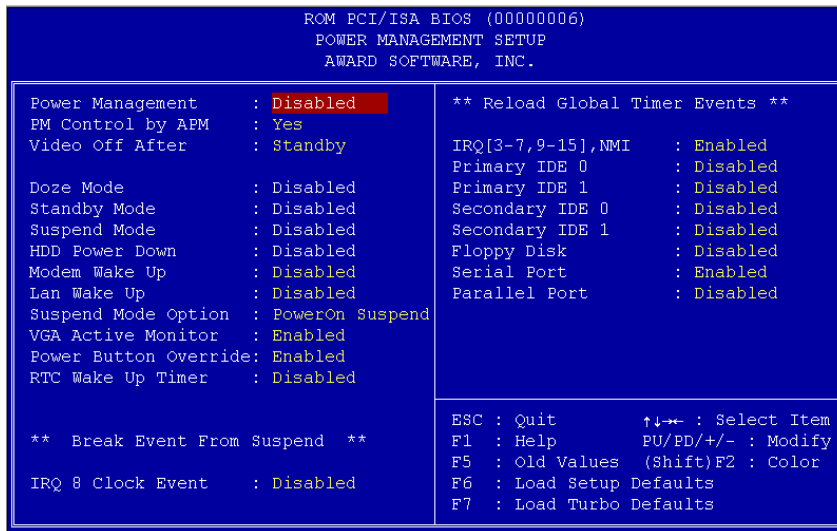
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
7.5
8.0

Intel Pentium II is designed to have different Internal (Core) and External (Bus) frequency. This item lets you select the ratio of Core/Bus frequency. The default value is 3.5x.

AWARD BIOS

3.5 Power Management Setup

The Power Management Setup screen enables you to control the mainboard green features. See the following screen.



Power Management → Power Management

<p>Power Management</p> <p>Max Saving</p> <p>Mix Saving</p> <p>User Define</p> <p>Disabled</p>	<p>This function allows you to set the default parameters of power-saving modes. Set to Disable to turn off power management function. Set to User Define to choose your own parameters.</p>
---	---

Mode	Doze	Standby	Suspend	HDD Power Down
Min Saving	1 hour	1 hour	1 hour	15 min
Max Saving	1 min	1 min	1 min	1 min

AWARD BIOS

Power Management → PM Controlled by APM

<u>PM Controlled by</u> <u>APM</u> Yes No	If "Max Saving" is selected, you can turn on this item, transfer power management control to APM (Advanced Power Management) and enhance power saving function. For example, stop CPU internal clock.
--	---

Power Management → Video Off After

<u>Video Off After</u> N/A Doze Standby Suspend	To turn off video monitor at which power down mode.
--	---

Power Management → Doze Mode

<u>Doze Mode</u> Disabled 1 Min 2 Min 4 Min 8 Min 12 Min 20 Min 30 Min 40 Min 1 Hour	This item lets you set the period of time after which the system enters into Doze mode. The system activity (or event) is detected by monitoring the IRQ signals or other events (such as I/O).
---	---

AWARD BIOS

Power Management → Standby Mode

<u>Standby Mode</u>
Disabled
1 Min
2 Min
4 Min
8 Min
12 Min
20 Min
30 Min
40 Min
1 Hour

This item lets you set the period of time after which the system enters into Standby mode. In this mode, the monitor power-saving feature activates. Any activity detected returns the system to full power. The system activity (or event) is detected by monitoring the IRQ signals or other events (such as I/O).

Power Management → Suspend Mode

<u>Suspend Mode</u>
Disabled
1 Min
2 Min
4 Min
8 Min
12 Min
20 Min
30 Min
40 Min
1 Hour

This item lets you set the period of time after which the system enters into Suspend mode. The Suspend mode can be Power On Suspend or Suspend to Hard Drive, selected by "Suspend Mode Option".

Power Management → HDD Power Down

<u>HDD Power Down</u>
Disabled
1 Min
.....
15 Min

This option lets you specify the IDE HDD idle time before the device enters the power down state. This item is independent from the power states previously described in this section (Standby and Suspend).

AWARD BIOS

Power Management → Modem Wake Up

<u>Modem Wake Up</u> Enabled Disabled	This option lets you specify enable or disable Modem Wake Up function.
--	--

Power Management → LAN Wake Up

<u>LAN Wake Up</u> Enabled Disabled	This option lets you specify enable or disable LAN Wake Up function.
--	--

Power Management → Suspend Mode Option

<u>Suspend Modem Option</u> PowerOn Suspend Suspend to Disk	You can select suspend mode by this item. Power On Suspend is the traditional Green PC suspend mode, the CPU clock is stop, all other devices are shut off. But power must be kept On to detect activities from modem, keyboard/mouse and returns the system to full power. The system activities is detected by monitoring the IRQ signals or I/O. Suspend to Hard Drive saves system status, memory and screen image into hard disk, then the power can be totally Off. Next time, when power is turned On, the system goes back to your original work within just few seconds, which depending on your memory size. You need utility AOZVHDD to reserve disk space.
--	--

Power Management → VGA Active Monitor

<u>VGA Active Monitor</u> Enabled Disabled	To enable or disable the detection of VGA activity for power down state transition.
---	---

AWARD BIOS

Power Management → Power Button Override

<u>Power Button Override</u> Enabled Disabled
--

This is a specification of ACPI and supported by hardware. When **Enabled**, the soft power switch on the front panel can be used to control power On, Suspend and Off. If the switch is pressed less than 4 sec during power On, the system will go into Suspend mode. If the switch is pressed longer than 4 sec, the system will be turned Off. The default setting is **Disabled**, soft power switch is only used to control On and Off, there is no need to press 4 sec, and there is no Suspend.

Power Management → RTC Wake Up Timer

<u>RTC Wake Up Timer</u> Enabled Disabled
--

This option lets you enable or disable the RTC Wake Up function.

Power Management → WakeUp Date (of Month)

<u>WakeUp Date (of Month)</u> 0 1 31

This item is displayed when you enable the RTC Wake Up Timer option. Here you can specify what date you want to wake up the system. For Example, setting to 15 will wake up the system on the 15th day of every month.



Note: Setting this item to 0 will wake up the system on the specified time (which can be set in the WakeUp Time item) every day.

AWARD BIOS

Power Management → WakeUp Time (hh:mm:ss)

WakeUp Time
(hh:mm:ss)
hh:mm:ss

This item is displayed when you enable the RTC Wake Up Timer option. Here you can specify what time you want to wake up the system.

Power Management → IRQ 8 Clock Event

IRQ 8 Clock Event
Enabled
Disabled

To enable or disable the detection of IRQ8 (RTC) event for power down state transition. OS2 has periodically IRQ8 (RTC) interruptions, If IRQ8 is not set to **Disabled**, OS/2 may fail to go into Doze/Standby/Suspend mode.

Power Management → IRQ [3-7,9-15],NMI

IRQ [3-7,9-15],NMI
Enabled
Disabled

To enable or disable the detection of IRQ3-7, IRQ9-15 or NMI interrupt events for power down state transition.

Power Management → Primary IDE 0

Power Management → Primary IDE 1

Power Management → Secondary IDE 0

Power Management → Secondary IDE 1

Power Management → Floppy Disk

Power Management → Serial Port

Power Management → Parallel Port

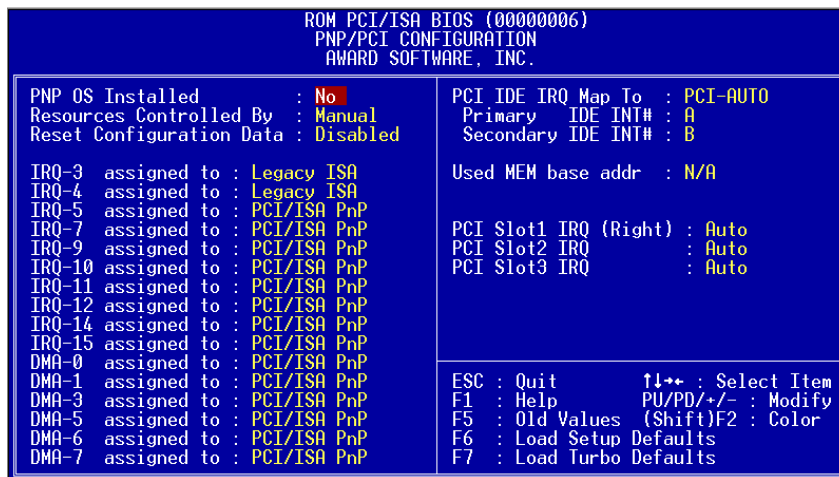
Primary IDE 0
Enabled
Disabled

These items enable or disable the detection of IDE, floppy, serial and parallel port activities for power down state transition. Actually it detects the read/write to/from I/O port.

AWARD BIOS

3.6 PNP/PCI Configuration Setup

The PNP/PCI Configuration Setup allows you to configure the ISA and PCI devices installed in your system. The following screen appears if you select the option "PNP/PCI Configuration Setup" from the main menu.



PNP/PCI Configuration → PnP OS Installed

<u>PnP OS Installed</u> Yes No

Normally, the PnP resources are allocated by BIOS during POST (Power-On Self Test). If you are using a PnP operating system (such as Windows 95), set this item to **Yes** to inform BIOS to configure only the resources needed for booting (VGA/IDE or SCSI). The rest of system resources will be allocated by PnP operating system.

PNP/PCI Configuration → Resources Controlled By

<u>Resources Controlled by</u> Auto Manual

Setting this option to **Manual** allows you to individually assign the IRQs and DMAs to the ISA and PCI devices. Set this to **Auto** to enable the auto-configuration function.

AWARD BIOS

PNP/PCI Configuration → Reset Configuration Data

<u>Reset Configuration Data</u> Enabled Disabled	In case conflict occurs after you assign the IRQs or after you configure your system, you can enable this function, allow your system to automatically reset your configuration and reassign the IRQs, DMAs, and I/O address.
---	---

- PNP/PCI Configuration → IRQ3 (COM2)
- PNP/PCI Configuration → IRQ4 (COM1)
- PNP/PCI Configuration → IRQ5 (Network/Sound or Others)
- PNP/PCI Configuration → IRQ7 (Printer or Others)
- PNP/PCI Configuration → IRQ9 (Video or Others)
- PNP/PCI Configuration → IRQ10 (SCSI or Others)
- PNP/PCI Configuration → IRQ11 (SCSI or Others)
- PNP/PCI Configuration → IRQ12 (PS/2 Mouse)
- PNP/PCI Configuration → IRQ14 (IDE1)
- PNP/PCI Configuration → IRQ15 (IDE2)

<u>IRQ 3</u> Legacy ISA PCI/ISA PnP	If your ISA card is not PnP compatible and requires a special IRQ to support its function, set the selected IRQ to Legacy ISA . This setting informs the PnP BIOS to reserve the selected IRQ for the installed legacy ISA card. The default is PCI/ISA PnP . Take note that PCI cards are always PnP compatible (except old PCI IDE card).
--	---

- PNP/PCI Configuration → DMA 0
- PNP/PCI Configuration → DMA 1
- PNP/PCI Configuration → DMA 3
- PNP/PCI Configuration → DMA 5
- PNP/PCI Configuration → DMA 6
- PNP/PCI Configuration → DMA 7

<u>DMA 0</u> Legacy ISA PCI/ISA PnP	If your ISA card is not PnP compatible and requires a special DMA channel to support its function, set the selected DMA channel to Legacy ISA . This setting informs the PnP BIOS to reserve the selected DMA channel for the installed legacy ISA card. The default is PCI/ISA PnP . Take note that PCI card does not require DMA channel.
--	---

AWARD BIOS

PNP/PCI Configuration → PCI IDE IRQ Map To

<u>PCI IDE IRQ Map To</u>
ISA
PCI-Slot1
PCI-Slot2
PCI-Slot3
PCI-Slot4
PCI-Auto

Some old PCI IDE add-on cards are not fully PnP compatible. These cards require you to specify the slot in use to enable BIOS to properly configure the PnP resources. This function allows you to select the PCI slot for any PCI IDE add-on card present in your system. Set this item to **Auto** to allow BIOS to automatically configure the installed PCI IDE card(s).

PNP/PCI Configuration → Primary IDE INT#

PNP/PCI Configuration → Secondary IDE INT#

<u>Primary IDE INT#</u>
A
B
C
D

These two items, in conjunction with item "PCI IDE IRQ Map To", specify the IRQ routing of the primary or secondary channel of the PCI IDE add-on card (not the onboard IDE). Each PCI slot has four PCI interrupts aligned as listed in the table below. You must specify the slot in the "PCI IDE IRQ Map To", and set the PCI interrupt (INTx) here according to the interrupt connection on the card.

AWARD BIOS

PCI Slot	Location 1 (pin A6)	Location 2 (pin B7)	Location 3 (pin A7)	Location 4 (pin B8)
Slot 1	INTA	INTB	INTC	INTD
Slot 2	INTB	INTC	INTD	INTA
Slot 3	INTC	INTD	INTA	INTB
Slot 4	INTD	INTA	INTB	INTC
Slot 5 (if any)	INTD	INTA	INTB	INTC

PNP/PCI Configuration → Used MEM Base Addr

<u>Used MEM base addr</u>
N/A
C800
CC00
D000
D400
D800
DC00

This item, in conjunction with the "Used MEM Length", lets you set a memory space for non-PnP compatible ISA card. This item specifies the memory base (start address) of the reserved memory space. The memory size is specified in the "Used MEM Length" .

PNP/PCI Configuration → Used MEM Length

<u>Used MEM Length</u>
8K
16K
32K
64K

If your ISA card is not PnP compatible and requires special memory space to support its function, specify the memory size in this parameter to inform the PnP BIOS to reserve the specified memory space for installed legacy ISA card.

AWARD BIOS

PNP/PCI Configuration → PCI Slot1 IRQ (Right)

PNP/PCI Configuration → PCI Slot2 IRQ

PNP/PCI Configuration → PCI Slot3 IRQ

<u>PCI Slot1 IRQ</u>
3
4
5
7
9
10
11
12
14
15
Auto

This item is reserved for engineering purpose to let you assign an IRQ manually to the add-on card on each PCI slot. If you select Auto, system will automatically assign an available value to the device.

It is suggested to use default setting, which is Auto, in order to comply with PnP specification completely.

AWARD BIOS

3.7 Load Setup Defaults

The "Load Setup Defaults" option loads optimized settings for optimum system performance. Optimal settings are relatively safer than the Turbo settings. We recommend you to use the Optimal settings if your system has large memory size and fully loaded with add-on card (for example, a file server using double-sided 8MB DIMM x4 and SCSI plus Network card occupying the PCI and ISA slots).

Optimal is not the slowest setting for this mainboard. If you need to verify a unstable problem, you may manually set the parameter in the "BIOS Features Setup" and "Chipset Features Setup" to get slowest and safer setting.

3.8 Load Turbo Defaults

The "Load Turbo Defaults" option gives better performance than Optimal values. However, Turbo values may not be the best setting of this mainboard but these values are qualified by the our RD and QA department as the reliable settings especially if you have limited loading of add-on card and memory size (for example, a system that contains only a VGA/Sound card and two DIMMs).

To attain the best system performance, you may manually set the parameters in the "Chipset Features Setup" to get proprietary setting. Make sure that you know and understand the functions of every item in Chipset Setup menu. The performance difference of Turbo from Optimal is normally around 3% to 10%, depending on the chipset and the application.

AWARD BIOS

3.9 Integrated Peripherals

The following screen appears if you select the option "Integrated Peripherals" from the main menu. This option allows you to configure the I/O features.

```
ROM PCI/ISA BIOS (00000006)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

IDE HDD Block Mode      : Disabled
Onboard IR Controller   : Disabled

IDE Primary Master UDMA : Disabled
IDE Primary Slave UDMA  : Disabled
IDE Secondary Master UDMA: Disabled
IDE Secondary Slave UDMA: Disabled
On-Chip Primary PCI IDE: Disabled
On-Chip Secondary PCI IDE: Disabled
USB Legacy Support      : Disabled
USB IRQ Released       : Yes

Onboard FDC Controller  : Disabled
Onboard Serial Port 1   : Disabled
Onboard Serial Port 2   : Disabled
Onboard Parallel Port   : Disabled

ESC : Quit          ↑↓←→ : Select Item
F1  : Help          PU/PD/+/- : Modify
F5  : Old Values   (Shift)F2 : Color
F6  : Load Setup Defaults
F7  : Load Turbo Defaults
```

Integrated Peripherals → IDE HDD Block Mode

IDE HDD Block Mode
Enabled
Disabled

This feature enhances disk performance by allowing multisector data transfers and eliminates the interrupt handling time for each sector. Most IDE drives, except with old designs, can support this feature.

AWARD BIOS

Integrated Peripherals → IDE Primary Master UDMA
Integrated Peripherals → IDE Primary Slave UDMA
Integrated Peripherals → IDE Secondary Master UDMA
Integrated Peripherals → IDE Secondary Slave UDMA

**IDE Primary Master
UDMA**

Auto
Disabled

This item allows you to set the Ultra DMA/33 mode supported by the hard disk drive connected to your primary IDE connector.

Integrated Peripherals → On-Chip Primary PCI IDE
Integrated Peripherals → On-Chip Secondary PCI IDE

**On-Chip Primary
PCI IDE**

Enabled
Disabled

This parameter lets you enable or disable the IDE device connected to the primary IDE connector.

Integrated Peripherals → USB Legacy Support

USB Legacy Support

Enabled
Disabled

This item lets you enable or disable the USB keyboard driver within the onboard BIOS. The keyboard driver simulates legacy keyboard command and let you use USB keyboard during POST or after boot if you don't have USB driver in the operating system.



Caution: You can not use both USB driver and USB legacy keyboard at the same time. Disable "USB Legacy Support" if you have USB driver in the operating system.

Integrated Peripherals → USB IRQ Released

USB IRQ Released

Yes
No

USB device is default to use PCI INTD#, the same as PCI slot4. If you installed PCI card on slot4 and require to use INTD#, set this item to Yes. The USB device will then be disabled.

AWARD BIOS



Note: Normally, PCI VGA does not need PCI interrupt, you may put PCI VGA on slot4.

Integrated Peripherals → Onboard FDC Controller

Onboard FDC Controller

Enabled
Disabled

Setting this parameter to **Enabled** allows you to connect your floppy disk drives to the onboard floppy disk connector instead of a separate controller card. Change the setting to Disabled if you want to use a separate controller card.

Integrated Peripherals → Onboard Serial Port 1

Integrated Peripherals → Onboard Serial Port 2

Onboard Serial Port

1
Auto
3F8/IRQ4
2F8/IRQ3
3E8/IRQ4
2E8/IRQ3
Disabled

This item allow you to assign address and interrupt for the board serial port. Default is **Auto**.



Note: If you are using an network card, make sure that the interrupt does not conflict.

Integrated Peripherals → Onboard Parallel Port

Onboard Parallel Port

3BC/IRQ7
378/IRQ7
278/IRQ5
Disabled

This item controls the onboard parallel port address and interrupt.

AWARD BIOS



Note: If you are using an I/O card with a parallel port, make sure that the addresses and IRQ do not conflict.

Integrated Peripherals → Parallel Port Mode

Parallel Port Mode

SPP
EPP
ECP
ECP + EPP

This item lets you set the parallel port mode. The mode options are SPP (Standard and Bidirection Parallel Port), EPP (Enhanced Parallel Port) and ECP (Extended Parallel Port). SPP is the IBM AT and PS/2 compatible mode. EPP enhances the parallel port throughput by directly writing/reading data to/from parallel port without latch. ECP supports DMA and RLE (Run Length Encoded) compression and decompression.

Integrated Peripherals → Onboard IR Controller

Onboard IR Controller

Enable
Disable

To enable or disable onboard wireless Infrared controller.

Integrated Peripherals → IR Address Selection

IR Address Selection

2E0H
2E8H
2F8H
3E0H
3E8H
3F8H

This item selects the address of IR controller.

Integrated Peripherals → IR Mode

IR Mode

ASKIR
IrDA

This item selects the mode of onboard wireless Infrared controller. The IrDA standard includes both HPSIR and FIR, the driver in the Win95 will automatically change to different mode according to different chip.

AWARD BIOS

- **ASKIR** - Select this setting if you installed an Infrared module via IrDA connector (refer to section 2.3 "Connectors"). This ASKIR setting allows infrared serial communication at a maximum baud rate of 56K baud.
- **HPSIR** - Select this setting if you installed an Infrared module in your system via IrDA connector (refer to section 2.3 "Connectors"). The HPSIR setting allows infrared serial communication at a maximum baud rate of 115K baud.
- **FIR** - Select this setting if you installed an Infrared module via IrDA connector (refer to section 2.3 "Connectors"). This FIR (Fast IR) setting allows infrared serial communication at a maximum baud rate of 4M baud.

Integrated Peripherals → IR IRQ Select

<u>IR IRQ Selection</u>
IRQ3
IRQ4
IRQ10
IRQ11

This item selects the IRQ of IR port.



Note: If you are using a network card, make sure that the interrupt does not conflict.

AWARD BIOS

3.10 Password Setting

Password prevents unauthorized use of your computer. If you set a password, the system prompts for the correct password before boot or access to Setup.

To set a password:

1. At the prompt, type your password. Your password can be up to 8 alphanumeric characters. When you type the characters, they appear as asterisks on the password screen box.
2. After typing the password, press **Enter**.
3. At the next prompt, re-type your password and press **Enter** again to confirm the new password. After the password entry, the screen automatically reverts to the main screen.

To disable the password, press **Enter** when prompted to enter the password. The screen displays a message confirming that the password has been disabled.

3.11 IDE HDD Auto Detection

If your system has an IDE hard drive, you can use this function to detect its parameters and enter them into the "Standard CMOS Setup" automatically.

This routine only detects one set of parameters for your IDE hard drive. Some IDE drives can use more than one set of parameters. If your hard disk is formatted using different parameters than those detected, you have to enter the parameters manually. If the parameters listed do not match the ones used to format the disk, the information on that disk will not be accessible. If the auto-detected parameters displayed do not match those that used for your drive, ignore them. Type **N** to reject the values and enter the correct ones manually from the Standard CMOS Setup screen.

3.12 Save & Exit Setup

This function automatically saves all CMOS values before leaving Setup.

AWARD BIOS

3.13 Load EEPROM Default

Except "Load Setup Default" and "Load Turbo Default", you may also use "Save EEPROM Default " to save your own settings into EEPROM, and reload by using this item.

3.14 Save EEPROM Default

You may use this item to save your own settings into EEPROM. Then, if the data in CMOS is lost or you forget the previous settings, you may use "Load EEPROM Default " to reload.

3.15 Exit without Saving

Use this function to exit Setup without saving the CMOS value changes. Do not use this option if you want to save the new configuration.

3.16 NCR SCSI BIOS and Drivers

The NCR 53C810 SCSI BIOS resides in the same flash memory chip as the system BIOS. The onboard NCR SCSI BIOS is used to support NCR 53C810 SCSI control card without BIOS code.

The NCR SCSI BIOS directly supports DOS, Windows 3.1 and OS/2. For better system performance, you may use the drivers that come with the NCR SCSI card or with your operating system. For details, refer to the installation manual of your NCR 53C810 SCSI card.

AWARD BIOS

3.17 BIOS Flash Utility

The BIOS Flash utility allows you to upgrade the system BIOS. To get the Flash utility and the upgrade BIOS file, contact your local distributor or visit our homepage. Please make sure that you have the correct BIOS ready, the BIOS filename is normally like AP5TR110.BIN, which means model AP5T BIOS revision 1.10.

There are two useful programs, Checksum utility CHECKSUM.EXE and Flash utility AOFLASH.EXE. Follow the procedures below to upgrade your BIOS.

[CHECKSUM.EXE]

This utility will help you to determine if the BIOS has been downloaded correctly or not.

1. Execute
C:> CHECKSUM Biosfile.bin
Biosfile.bin is the filename of the BIOS code.
2. The utility will show "Checksum is ssss".
3. Compare the "ssss" with original checksum posted on Web or BBS. If they are different, please do not proceed any further and try to download the BIOS again.

[AOFLASH.EXE]

This utility will try to check the mainboard model, BIOS version and Super/Ultra IO chip model. To ensure the correct BIOS file for the correct mainboard and IO chip. This utility will permanently replace your original BIOS content after flashing.

1. Bootup the system from floppy without loading any memory handler (HIMEM, EMM386, QEMM386, ...) or device driver.
2. Execute
A:> AOFLASH Biosfile.bin
Biosfile.bin is the filename of the BIOS code.

AWARD BIOS

3. After loading the new BIOS code, the utility will prompt you to save original BIOS code into your HDD or floppy. Please press "Y" to store it as "BIOS.OLD".
4. After the old BIOS has been successfully saved, press "Y" to replace BIOS.
5. DO NOT turn off the power during "FLASHING".
6. Reboot the system by turn off the power after "FLASHING".
7. Press "DEL" key to enter BIOS setup during POST.
8. Reload the "BIOS SETUP DEFAULT" and reconfigure other items as previous set.
9. Save & Exit. Done!



Warning: DO NOT turn off the power during "FLASHING". If the BIOS programming is not successfully finished, the system will not be boot again, and you may need to physically replace the BIOS chip.

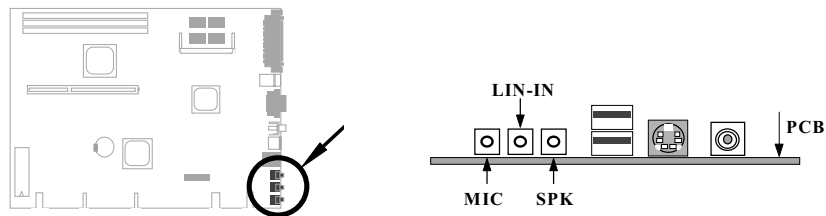


Tip: You may load back original BIOS "BIOS.OLD" by the same procedure.

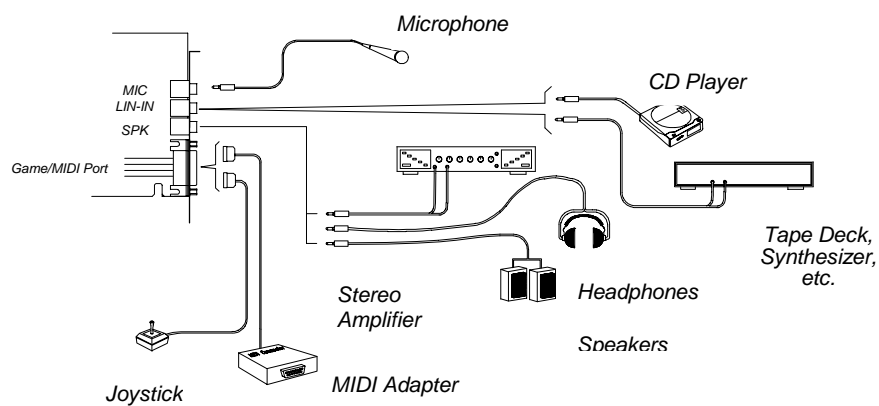
Chapter 4

Audio Chip

NX6B comes with a 16-bit sound processor onboard. On the system board, you may find there are these connectors: **SPK**, **LIN-IN** and **MIC**.



To fully utilize the audio functions, you may connect various peripheral devices that the audio chip supports. The following figure shows the different devices that you can connect.



Audio Chip

4.1 Installation and Uninstallation

Please insert Motherboard Installation CD to your CD drive, and choose "Audio driver" and "Audio applications" item from the autorun window. Then follow the screen messages to setup applications for the onboard Sound Blaster 16.

You may also excute Audio\Driver\Upddrv95.exe and \Audio\Setup.exe to setup the driver and application softwares.

The full installation option requires about 6MB of hard disk space for the program files and an additional 2MB for working space. You might need more if your drive is in compressed form.

Before uninstalling the software package, ensure that all Sound Blaster 16 applications are closed. Any Sound Blaster 16 application that is running while uninstallation is in progress will not be deleted. Also, files that are added to the Sound Blaster 16 directory after the initial software installation will not be deleted by the uninstallation process. You will have to manually delete these files after the uninstallation process is completed.

Some of the files in the Windows directory can be shared by other applications. The uninstallation will prompt you when it tries to delete these files. You should choose not to delete the files unless you are very sure that the files are no longer used by Windows.

4.2 DOS Audio Driver Support Under Windows 95 DOS Box

Some of the DOS applications are developed with Creative's Sound Blaster Developer Kit. These applications require the low-level DOS audio device drivers to be loaded. To load the DOS audio drivers, you need to add the following lines to the CONFIG.SYS file:

```
DEVICE=<C:\dir>\DRV\CTSB16.SYS /UNIT=0 /BLASTER=A:220 I:5 D:1 H:5  
/WIN95
```

```
DEVICE=<C:\dir>\DRV\CTMMSYS.SYS
```



Note:

a. <C:\dir> is the sound directory where the audio software is located.

b. The /BLASTER parameter specifies the Sound Blaster base I/O port address (A), interrupt request line (I), low 8-bit DMA channel (D) and high 16-bit DMA channel (H).

c. The settings in the /BLASTER parameter must tally with the actual settings allocated by Windows 95. To find out the actual settings, go into Windows 95 DOS box, and type SET and press <Enter> at the DOS prompt. You will see one of the lines displayed is:

BLASTER=A220 I5 D1 H5 P330 T6

The values after the A, I, D and H are the actual settings to be used for the /BLASTER parameter.

To help you set up the DOS audio drivers, we have prepared a text file CONFIG.TXT in the sound directory. This text file contains the above lines to specify the DOS audio drivers. The sound directory in the text file had been updated by the installation program. You just need to update the /BLASTER parameter and copy the lines into the CONFIG.SYS file.

Audio Chip

4.3 DOS Environment Settings

Some of the existing DOS programs require the presence of MIDI and SOUND environments in order for them to work. The Setup program will add the SET MIDI and SET SOUND environment lines at the beginning of the AUTOEXEC.BAT file.

4.4. Full-Duplex Constraints

Your audio card supports full-duplex recording and playback. However, to make full use of this feature, please make sure you observe the following constraints:

- a. Start only one session of simultaneous playback and recording.
- b. Use the same sampling rate for both operations.
- c. Preferably play back and record audio files which are in uncompressed (that is, Pulse Code Modulation or PCM) wave format.
- d. Reduce the sampling rate for both operations if your audio playback and recording session is too slow.



Note: *The Full-Duplex and DirectSound capabilities are mutually exclusive. If you activate the full-duplex feature, the DirectSound capability cannot be enabled. And vice versa.*

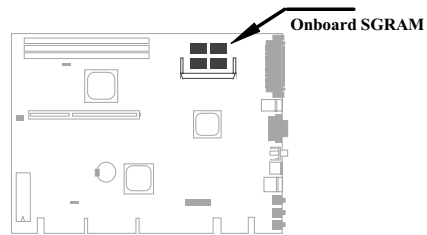
4.5 Online Documentation

NX6B system board comes with the Win95 application softwares for the onboard Creative CT2510 chip, such as Creative CD, Creative MIDI, Creative Mixer, etc. To help you get information on the applications in this package easily, we have compiled a set of online documentation which can be accessed from your audio card's program group. Just click the START button on your Windows 95 taskbar. Select "Programs", followed by "Sound Blaster 16" and then "User's Guide".

Chapter 5

VGA

The NX6B comes with a high performance onboard graphics accelerator (ATI 3D Rage Pro 2x AGP). The board comes with 2-8MB video display memory (default 4MB SGRAM) onboard. You can upgrade this to maximum 16 MB by installing a SGRAM SODIMM. The added memory allows you to use more colors and display graphics at higher resolutions.



VGA

5.1 Installing ATI enhanced driver for Win95

1. When Windows 95 prompts you to insert a disk from the hardware manufacturer, insert the "ATI Installation CDROM" into your CDROM drive.
2. Click OK.
3. Type the following:
D:\WIN95
(If **D** is not your CDROM drive, substitute **D** with the correct drive letter.)
4. Click OK.
5. Click Yes to restart your computer.
6. After your computer restarts, install the other software components. If Win95 does not run the ATI Installation CDROM automatically, please execute D:\Atisetup.exe.
7. Click on Display Drivers.
8. Follow the online screen instructions to complete the installation.

5.2 Installing ATI enhanced driver for Windows NT 3.5 and Windows 3.51

1. Boot Windows NT.
2. Double-click the Main icon.
3. Double-click the Control Panel icon.
4. Double-click the Display icon.
5. Click Change Display Type.
6. Click Change.
7. Click Others.
8. Insert the "ATI Installation CDROM" into your CDROM drive
For Windows NT 3.5, type the following:
D:\NT35 (D being the letter of your CDROM drive)
For Windows NT 3.51, type the following:
D:\NT351 (D being the letter of your CDROM drive)
9. Click OK.
10. Select ATI Graphics Accelerators.
11. Click Install
12. Click Yes to change your system configuration
13. Click Continue to confirm the full path name.
14. After the files have been copied to your computer, click OK.
15. Reboot Windows NT.
After reboot, the Invalid Display Settings window appears.
16. Click OK.
The Display Settings dialog box appears.
17. Select a desired display mode. For more detailed information about changing your display mode, click Help.

VGA

5.3 Installing ATI enhanced driver for Windows NT 4.0

1. Boot Windows NT.
2. Right-click on the desktop and select Properties.
3. Click the Settings tab.
4. Click Display Type.
5. Click Change.
6. Click Have Disk.
7. Insert the ATI Installation CDROM into your CDROM drive.
D:\NT40 (D being the letter of your CDROM drive)
8. Click OK.
9. Select your graphics card from the list, then click OK.
10. When the Third-party Drives window appears, click Yes.
11. After the files have been copied to your system, click OK.
12. Click Close.
13. Click Close, then click Yes to restart Windows.
After reboot, the Invalid Display Settings window appears.
14. Click OK.
The Display Properties dialog appears.
15. Select a desired display mode. For more detailed information about changing your display mode, click Help.

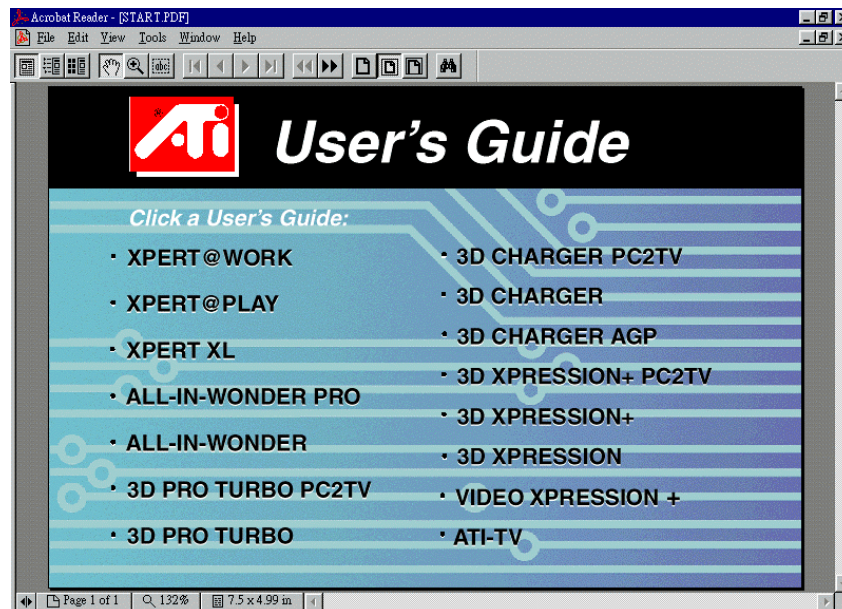


Caution: You need to setup Windows NT 4.0 Service Pack 3 for installing an AGP card.

5.4 On-Line Documentation

A comprehensive on-line manual could be found in the "ATI Installation CDROM". Please follow the steps as below:

1. Insert the ATI Installation CDROM into your CDROM drive
D:\INT40 (**D** being the letter of your CDROM drive)
2. If your CDROM drive does not support autoplay function, please run **D:\Atisetup.exe**.
3. Click "On-Line Manual".



4. Choose the first item - "XPERT@PLAY".



Note: To read this on-line manual, you must install a PDF reader first, such as Acrobat Reader or DocuCom Reader, which are included in the "Motherboard Installation CDROM".

Appendix A

Frequently Asked Question

Q: What is MMX?

A: MMX is the new single-line multiple-instruction technology of the new Intel Pentium PP/MT (P55C) and Pentium II (Klamath) CPU. The AMD K6 and Cyrix M2 will support MMX, too. The MMX instructions are specifically useful for multimedia applications (such as 3D video, 3D sound, video conference). The performance can be improved if applications use these instructions.

Q: What is the performance improvement of Pentium II (Klamath)?

A: Following is the comparison table of the new generation CPU.

DRAM : 64MB EDO or SDRAM

HDD : Quantum Fireball 1280AT

VGA : Matrox Millennium VGA, 4MB, 1024x768 24bit, 85Hz.

OS : Windows 95 4.00.950

CPU	MB	Chipset	Winstone97 Business	Winstone97 High-End
PP/MT-200	AP5T/AX5T	Intel 430TX	48.3	21.9
PP/MT-233	AP5T/AX5T	Intel 430TX	50.5	23.6
Pentium II 200	AX6F	Intel 440FX	45.3	24.1
Pentium II 233	AX6F	Intel 440FX	48.4	26.5
Pentium II 266	AX6F	Intel 440FX	50.8	28.2
Pentium II 266	AX6L	Intel 440LX	54.5	30.8

You can see that Klamath-233 is no better than PP/MT-233 on Business Winstone97, but it has large improvement on High-End Winstone97. It is probably because Klamath has very good floating point performance and is suitable for graphic operation.

Q: What is USB (Universal Serial Bus)?

Frequently Asked Questions

A: USB is a new 4-pin serial peripheral bus that is capable of cascading low/medium speed peripherals (less than 10Mbit/s) such as keyboard, mouse, joystick, scanner, printer and modem/ISDN. With USB, the traditional complex cables from back panel of your PC can be eliminated.

You need the USB driver to support USB device(s). This motherboard is USB ready, you may get latest BIOS from our web site or your distributor. Our latest BIOS includes the keyboard driver (called Legacy mode), that simulates USB keyboard to act as AT or PS/2 keyboard and makes it possible to use USB keyboard if you don't have driver in your OS. For other USB devices, you may get the drivers from your device vendor or from OS (such as Win95). Be sure to turn off "USB Legacy Support" in BIOS "Chipset Setup" if you have another driver in your OS.

Q: What is Bus Master IDE (DMA mode)?

A: The traditional PIO (Programmable I/O) IDE requires the CPU to involve in all the activities of the IDE access including waiting for the mechanical events. To reduce the workload of the CPU, the bus master IDE device transfers data from/to memory without interrupting CPU, and releases CPU to operate concurrently while data is transferring between memory and IDE device. You need the bus master IDE driver and the bus master IDE HDD to support bus master IDE mode. Note that it is different with master/slave mode of the IDE device connection. For more details, refer to section 2.3 "Connectors".

Q: What is the Ultra DMA/33?

A: This is the new specification to improve IDE HDD data transfer rate. Unlike traditional PIO mode, which only uses the rising edge of IDE command signal to transfer data, the DMA/33 uses both rising edge and falling edge. Hence, the data transfer rate is double of the PIO mode 4 or DMA mode 2. (16.6MB/s x2 = 33MB/s).

The following table lists the transfer rate of IDE PIO and DMA modes. The IDE bus is 16-bit, which means every transfer is two bytes.

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Mode	Clock per 33MHz PCI	Clock count	Cycle time	Data Transfer rate
PIO mode 0	30ns	20	600ns	$(1/600\text{ns}) \times 2\text{byte} = 3.3\text{MB/s}$
PIO mode 1	30ns	13	383ns	$(1/383\text{ns}) \times 2\text{byte} = 5.2\text{MB/s}$
PIO mode 2	30ns	8	240ns	$(1/240\text{ns}) \times 2\text{byte} = 8.3\text{MB/s}$
PIO mode 3	30ns	6	180ns	$(1/180\text{ns}) \times 2\text{byte} = 11.1\text{MB/s}$
PIO mode 4	30ns	4	120ns	$(1/120\text{ns}) \times 2\text{byte} = 16.6\text{MB/s}$
DMA mode 0	30ns	16	480ns	$(1/480\text{ns}) \times 2\text{byte} = 4.16\text{MB/s}$
DMA mode 1	30ns	5	150ns	$(1/150\text{ns}) \times 2\text{byte} = 13.3\text{MB/s}$
DMA mode 2	30ns	4	120ns	$(1/120\text{ns}) \times 2\text{byte} = 16.6\text{MB/s}$
DMA/33	30ns	4	120ns	$(1/120\text{ns}) \times 2\text{byte} \times 2 = 33\text{MB/s}$

Q: What is ACPI (Advanced Configuration & Power Interface) and OnNow?

A: The ACPI is new power management specification of 1997 (PC97). It intends to save more power by taking full control of power management to operating system and not through BIOS. Because of this, the chipset or super I/O chip needs to provide standard register interface to OS (such as Win97) and provides the ability for OS to shutdown and resume power of different part of chip. The idea is a bit similar to the PnP register interface.

ACPI defines momentary soft power switch to control the power state transition. Most likely, it uses the ATX form factor with momentary soft power switch. The most attractive part of ACPI for desktop user is probably the "OnNow" feature, an idea from notebook. This feature allows you to immediately resume to your original work without the long time waiting from bootup, entering Win95 and running Winword. Intel 430TX PCIsset, 440LX AGPset and 440BX AGPset can support ACPI.

Q: What is ATX Soft Power On/Off and Momentary Switch?

A: The Soft Power On of the ATX specification means to provide a standby current for special circuit to wait for wakeup event when main power is off. For example, Infrared wakeup, modem wakeup, or voice wakeup. Currently, the most simple usage is to provide standby current for power switch circuit so that power switch can turn on/off the main power through soft power control pin. The ATX power specification does not mention anything about the power switch type. You can use toggle or momentary switch, note that ACPI specification requires momentary switch for power state control.

Soft Power Off means to turn off system through software, Windows 95 Shutdown function can be used to verify if your mainboard supports soft power off.

Frequently Asked Questions

Q: What is RTC Wake Up Timer (Alarm)?

A: RTC (Real Time Clock) is a device like electronic watch, and keep the date/time of the computer system running. The Wake Up Timer is more like an alarm, which wakes up and powers on your system at a pre-defined time for specific application. It can be set to wake up everyday or on specific date within a month. The date/time accurate is second. To set the date/time, go into BIOS setup, Power Management RTC Wake Up Timer, select Enable.

Q: What is the AGP (Accelerated Graphic Port)?

A: AGP is a PCI-like bus interface targeted for high-performance 3D graphic. AGP supports only memory read/write operation and single-master single-slave one-to-one only. The AGP uses both rising and falling edge of the 66MHz clock and produces 66MHz x 4byte x 2 = 528MB/s data transfer rate.

Q: What is the AGP bus clock on Intel 440BX chipset?

A: AGP used to perform as the same bus clock as the Intel 440LX chipset were. If we provide 75Mhz of bus clock to 440LX chipset, AGP will also perform with 75Mhz of clock. The Intel 440BX chipset which supports 100Mhz of bus clock behaves to meet the specification so that AGP bus clock is always kept by 66Mhz of clock no matter how 440BX chipset bus clock may be set. In this manner, it will ensure the compatibility & stability of the AGP within defined specification.

Q: Why is there a resource conflict between my AGP VGA card & PCI-to-PCI bridge (or AGP bridge) within Device Manger under Windows '95?

A: It is normal for AGP cards to conflict with the PCI standard PCI-to-PCI bridge (or AGP bridge). Since Windows'95 does not inherently support AGP technology, it reports this conflict incorrectly. This conflict will not adversely affect the performance of your system. Attempting to resolve it will result in improper operation of the PC. This issue is expected to be fixed by Microsoft when Windows 98 released.

Q: Does Pentium, Pentium Pro or Pentium II support Deturbo mode?

A: The Deturbo mode was originally designed to slow down CPU speed for old applications (especially old games). It uses programming loop to wait or delay special event. This programming method is considered very bad since the delay of loop highly depends on the CPU speed and the application fails at high-speed CPU. Almost all new applications (including games) use RTC or interrupt to wait event. There is no need for Deturbo mode now. The Turbo switch is now used as Suspend switch. However, some MBs still support Turbo/Deturbo function via keyboard. You can set the system to Deturbo by pressing <Ctrl> <Alt> <->. To back to Turbo mode, press <Ctrl>

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<Alt> <+>. Note that the Deturbo mode has been removed in new MBs since these require more code space in Flash ROM.

Q: Power Management Icon does not appear in the Windows 95 Control Panel even though the APM under BIOS Setup is enabled.

A: This problem occurs if you did not enable the APM function before you install Windows 95. If you have already installed Windows 95, re-install it after the BIOS APM function is enabled.

Q: Why does the system fail to go into suspend mode under Win95?

A: This problem may be caused by your CDROM settings. The CDROM Auto Insert Notification of Win95 is default enabled, the system will continue to monitor your CDROM, auto-execute application when a CD diskette is loaded, and prevents the system from entering into suspend mode. To resolve this, go into Control Panel → System → Device Manager → CDROM → Setting, and disable the "Auto Insert Notification" function.

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Q: Which version of the Windows '95 that I am using?

A: You may determine the version of Windows '95 by following steps.

1. Double click "System" in "Control Panel".
2. Click "General".
3. Look for "System" heading & refer to following,

4.00.950	Windows 95
4.00.950A	Windows 95 + Service Pack or OEM Service Release 1
4.00.950B	OEM Service Release 2 or OEM Service Release 2.1
4.00.950C	OEM Service Release 2.5

If you are running OSR 2.1, you may tell it from by checking "USB Supplement to OSR2" in the list of installed program of Add/Remove program tool under Control Panel, and checking for version 4.03.1212 of the Ntkern.vxd file in the Windows\System\Vmm32 folder.

Q: How can I eliminate the "?" marks presented under Device Manager after installing Win'95 on TX or LX or BX based system?

A: Even though your system will work fine with this "?" marks, we received many requests about how to eliminate it. Our software team spends few weeks to develop an utility AOchip.exe for the convenience of Win95 users. It is very user friendly and can be used on any TX, LX or BX chipset based motherboard, not limited to this board. You are welcome to distribute it, if you like it, simply say thanks to our software team. Note that you need USB driver for USB devices to work properly which is expected to be implemented on Windows'98.

Q: What is LDCM (LAN Desktop Client Manager)?

A: This is a software of Intel. The major goal is to provide an easy way for corporate network administrator to monitor the status of all the clients (workstation). You need at least DMI BIOS for LDCM. Our BIOS is also DMI ready but unfortunately, Intel LDCM needs Intel network card and ATI VGA to work properly. It is obviously not suitable for home user to pay LDCM extra cost.

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Q: How to install Windows 95 USB driver?

A: If you are Win'95 OSR 2.0 user (.950B, shows "PCI Universal Serial Devices"), you may obtain USBSUPP.EXE from Microsoft or your OEM system provider for installing Microsoft USB supplement which will create "USB Supplement to OSR2" in the list of Add/Remove program tool under Control Panel. After above installation, please run Aochip.exe from the Motherboard Installation CDROM.

If you are Win'95 OSR 2.1 or 2.5 user, only AOchip.exe installation is necessary.

If you are Win'95 retail user (.950 or .950A), there is no direct upgrade path available from Microsoft at this moment. It is expected to be implemented under Windows'98.

Q: What is jumper-less mainboard?

A: Pentium II VID signal and SMBus clock generator provide CPU voltage auto-detection and allows user to set CPU frequency through CMOS setup, no jumper or switch is needed. The correct CPU information is saved into EEPROM, with these technologies, the disadvantages of Pentium base jumper-less design are eliminated. There will be no worry of wrong CPU voltage detection and no need to re-open the housing if CMOS battery loss. The only jumper left is to clear CMOS, which is a safety hook if you forget the password.

Q: What is battery-less mainboard?

A: AX6L/AX6LC/AX6B implements EEPROM and special circuit (patent applied) that allows you to save your current CPU and CMOS Setup configurations without the need of battery. The RTC (real time clock) can also keep running as long as power cord is plugged. If you lose your CMOS data by accident, you can just reload the CMOS configurations from EEPROM and the system will recover as usual.

Q: What is Hardware Monitoring?

A: There are four high-valued "Hardware Monitoring" features being implemented on this mainboard.

1. **Over Current Protection:** Providing over current protection for CPU Vcore. In conjunction with the over current protection provided by ATX power supply on 3.3V/5V/12V, it gives the full line over current protection.
2. **System Voltage Monitoring:** As you turn your system on, this smart design will continue to monitor your system working voltage. If any of

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the system voltage is over the component's standard, there will be warning alarm from PC speaker when AOHW100 or ADM installed.

- 3. Thermal Protection:** The higher speed of CPU, the more heat dissipation ability is needed to be taken into consideration. If user does not use a correct fan for the CPU cooling, it is highly possible the CPU will be overheating and cause system unstable.
- 4. Fan Monitoring:** There are two three-pin fan connectors, one is for CPU and the other one can be connected to the housing fan. The system will report the rotational speed of the fan and alarm fan malfunction though utility software such as Aohw120 or ADM.

Q: What is Aohw120 (Hardware Monitoring Utility)?

A: This is the Hardware Monitoring Utility software (Aohw120.exe) which monitors the status of system voltage, thermal, & fan. Instead of using ADM or LDCM which supports network administration, Aohw120 is especially designed for personal user.

Q: What is PC 100 SDRAM?

A: Although 440BX chipset supports 100MHz bus clock, however, it's apparent that traditional FPM and EDO DRAMs won't be able to work properly under this system clock frequency. In order to fully support 100MHz or even above bus clock system, Intel provided PC SDRAM Specifications to facilitate the development of SDRAM products. This is also known as PC 100 SDRAM specification. For getting the best performance and stability under 100MHz or above external clock, we strongly recommend you use the Synchronous DRAMs which meet the PC 100 requirement. The PC 100 SDRAM that our QA Team had tested are listed below.

Size	Vendor	Model	Single/Double	Chip Count
16M	Micron	MT48LC2M8A1-08	x1	8
16M	TI	TMX626812BDGE-10A	x1	8
16M	Hyundai	HY57V168010CTC-10	x1	8
32M	Micron	MT48LC2M8A1-08	x2	16
32M	Hyundai	HY57V168010CTC-10	x1	16
32M	NEC	D4516821AG5-A10-7JF	x1	16
32M	SEC	KM48S2020CT-GH	x1	16
128M	Simens	HYS72V16220GU	x2	18

Appendix B

Jumper Table Summary

Selecting the CPU Frequency

With the help of Pentium II VID signal and SMBus, this motherboard is jumperless design.

The CPU frequency selection is set by going into:

BOIS Setup → Chipset Features Setup → CPU Clock Frequency

(The possible setting is 66, 68.5, 75, 83.3, 100, 103, 112 and 133.3 MHz)

BOIS Setup → Chipset Features Setup → CPU Clock Ratio

(The possible setting is 1.5x, 2x, 2.5x, 3x, 3.5x, 4x, 4.5x, 5x, 5.5x, 6x, 6.5x, 7x, 7.5x, and 8x)

INTEL Pentium II	CPU Core Frequency	Ratio	External Bus Clock
Pentium II - 233	233MHz =	3.5x	66MHz
Pentium II - 266	266MHz =	4x	66MHz
Pentium II - 300	300MHz =	4.5x	66MHz
Pentium II - 333	333MHz =	5x	66MHz
Pentium II - 350	350MHz =	3.5x	100MHz
Pentium II - 400	400MHz =	4x	100MHz
Pentium II - 450	450MHz =	4.5x	100MHz



Warning: INTEL 440BX chipset supports maximum 100MHz external CPU bus clock, the 103, 112 and 133.3MHz are for internal test only. **These settings exceed the specification of BX chipset, which may cause serious system damage.**

Jumper Table Summary

Selecting the CPU Voltage

This motherboard supports Pentium II (Klamath) VID function, the CPU core voltage is automatically detected, the range is from 1.3V to 3.5V.

Clear CMOS

<u>JP14</u>	<u>Clear CMOS</u>
1-2	Normal operation (default)
2-3	Clear CMOS



Tip: If your system hangs or fails to boot because of over-clocking, please clear CMOS and the the system will go back to default setting. Except using JP14, you can also press <Home> key to clear CMOS while system booting.

AGP Turbo

<u>JP23</u>	<u>AGP Turbo</u>
1-2	Disabled (default)
2-3	Enabled

Disable Onboard AGP

<u>JP10</u>	<u>Disable Onboard AGP</u>
1-2	Disabled
2-3	Enabled (default)

Disable Onboard Sound Card

<u>JS1</u>	<u>Disable Onboard Sound Card</u>
1-2	Enabled (default)
2-3	Disabled