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1. INTRODUCTION

1.1. PREFACE

Welcome to use the **6BXS** motherboard. It is a Pentium® II Processor based PC / AT compatible system with AGP / PCI / SCSI / ISA Bus, and has been designed to be the fastest PC / AT system. There are some new features allow you to operate the system with just the performance you want.

This manual also explains how to install the motherboard for operation, and how to set up your CMOS CONFIGURATION with BIOS SETUP program.

1.2. KEY FEATURES

- ❑ Intel Pentium® II Processor based PC / AT compatible mainboard.
- ❑ Slot 1 supports Pentium® II processor running at 200-633 MHz.
- ❑ Intel 440BX chipset, Supports AGP / SDRAM / Ultra DMA/33 IDE / Wake on LAN / Keyboard and PS/2 Mouse Power On / ACPI features.
- ❑ Supports Intel LDCM® Network Manageability.
- ❑ Supports 4xDIMMs using 3.3V SDRAM DIMM module.
- ❑ Supports 8 MB - 1 GB SDRAM memory on board.
- ❑ Supports ECC or Non-ECC type DRAM module.
- ❑ 1xAGP slot, 4xPCI Bus slots, 3xISA Bus slots.
- ❑ Supports 2 channels Ultra DMA/33 IDE ports for 4 IDE Devices.
- ❑ Supports both Ultra SCSI and Ultra Wide SCSI ports.
- ❑ Supports 2xCOM (16550), 1xLPT (EPP / ECP), 1x Floppy port.
- ❑ Supports 2xUSB ports, 1xPS/2 Mouse, 1xPS/2 Keyboard.
- ❑ Licensed AWARD BIOS, 2M bit FLASH RAM.
- ❑ 31 cm x 21 cm ATX SIZE form factor, 4 layers PCB.

1.3. PERFORMANCE LIST

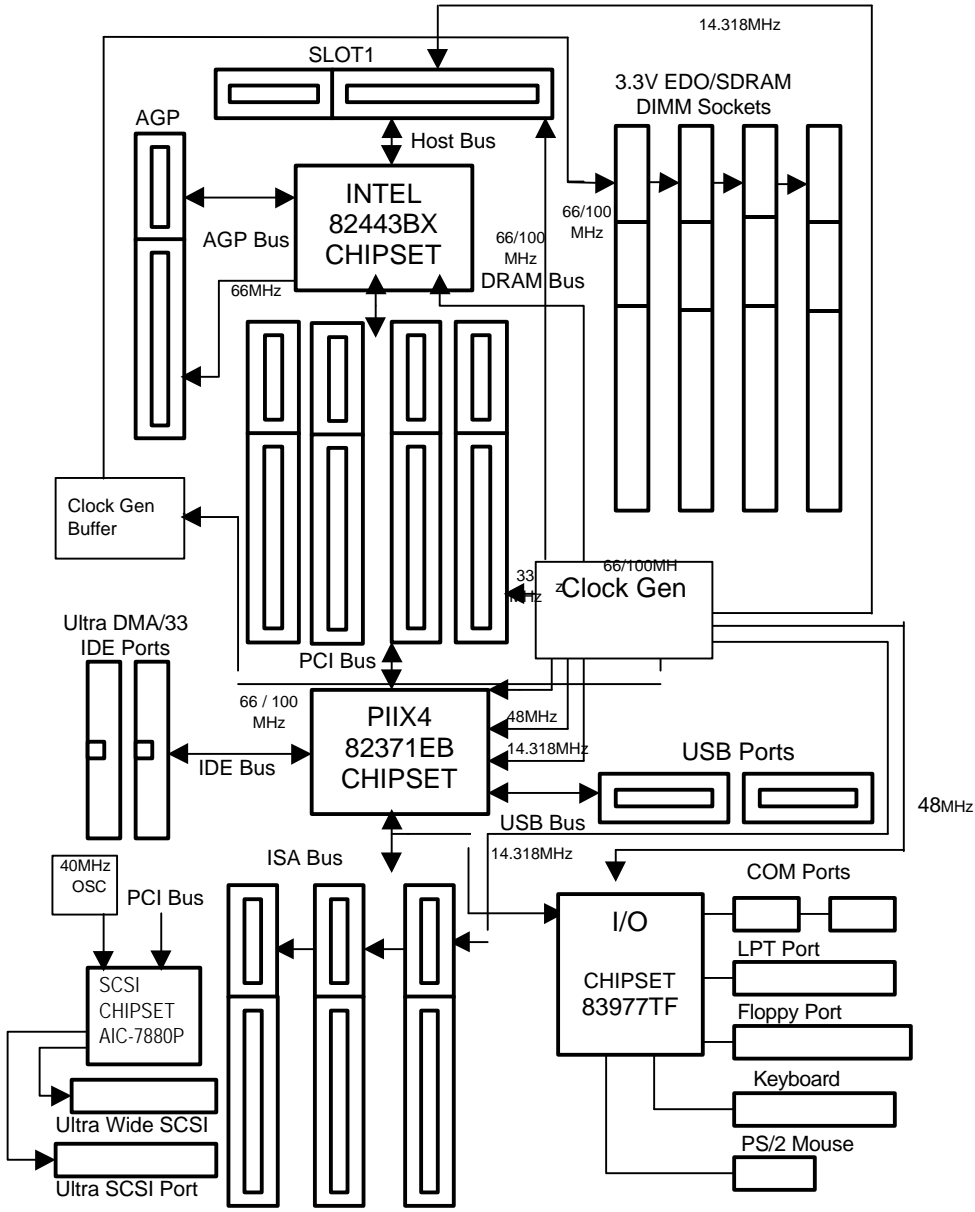
The following performance data list is the testing results of some popular benchmark testing programs.

These data are just referred by users, and there is no responsibility for different testing data values gotten by users. (The different Hardware & Software configuration will result in different benchmark testing results.)

- CPU Pentium® II processor
- DRAM (32x4)MB SDRAM (SEC KM48S2020CT-G8)
- CACHE SIZE 512 KB included in CPU
- DISPLAY GA-601 AGP Display Card (4MB SGRAM)
- STORAGE Onboard Ultra Wide SCSI (Seagate ST34501W)
- O.S. Windows NT™ 4.0
- DRIVER Display Driver at 1024 x 768 x 64k colors x 75Hz.
Adaptec AIC-7880 SCSI Driver

Processor	Intel Pentium® II	
	300MHz(100x3)	350MHz(100x3.5)
Winbench98		
CPU mark32	809	944
FPU Winmark	1550	1800
Business Disk	2560	2610
Hi-End Disk	5790	6000
Business Graphics	176	199
Hi-End Graphics	185	213
Winstone98		
Business	32.8	35.4
Hi-End	36.4	40.1

1.4. BLOCK DIAGRAM



1.5. INTRODUCE THE Pentium® II Processor & AGP



Figure 1:Retention Mechanism & attach Mount



Figure 2:OEM Pentium® II Processor

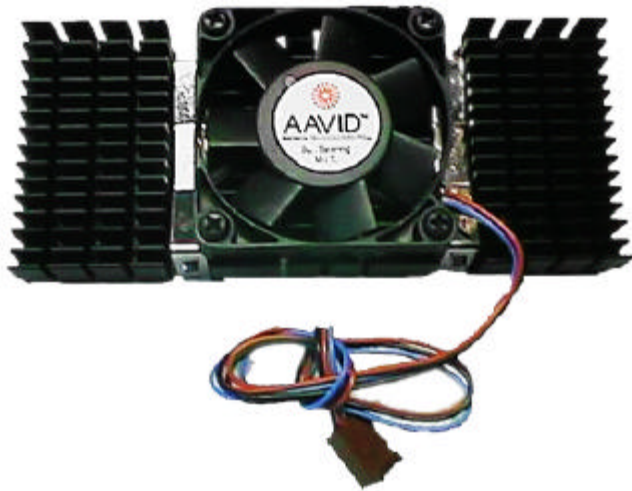


Figure 3:Heatsink / FAN & Heat sink support for OEM Pentium® II Processor

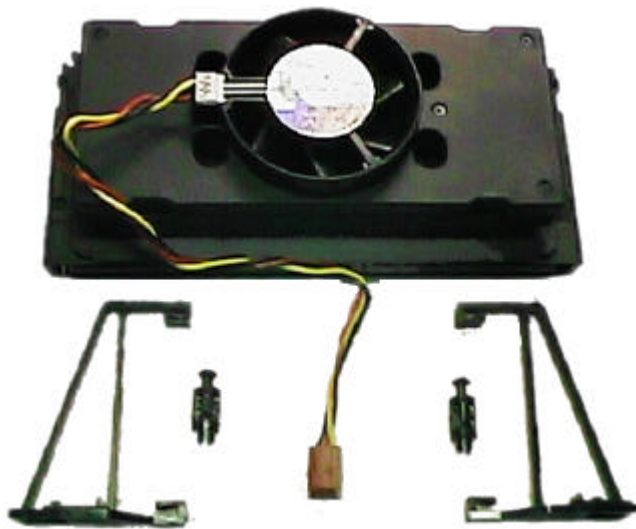


Figure 4:Boxed Pentium® II Processor & Heat sink support

1.6 What is AGP?

The Accelerated Graphics Port (AGP) is a new port on the Host-To-PCI bridge device that supports an AGP port. The main purpose of the AGP port is to provide fast access to system memory.

The AGP port can be used either as fast PCI port (32-bits at 66MHz vs. 32-bits at 33MHz) or as an AGP port which supports 2x data-rate, a read queue, and side band addressing. When the 2x-data rate is used the port can transmit data at 533MB/sec ($66.6 \times 2 \times 4$). The read-queue can be used to pipeline reads – removing the effects of the reads-latency. Side band addressing can be used to transmit the data address on a separate line in order to speed up the transaction.

2. SPECIFICATION

2.1. HARDWARE

- CPU
 - Pentium® II processor 200 – 633 MHz.
 - 242 pins 66/100MHz slot1 on board.
- PROTECTION
 - Speaker Alarm when detect "CPU FAN Failure" or "CPU Overheat".
 - Automatically slow down CPU speed when "CPU Overheat".
 - Intel LDCM® supported.
 - H/W monitor power status ($\pm 5V$, $\pm 12V$, CPU voltage & CMOS battery voltage).(Optional)
- SPEED
 - 66/100 MHz system speed.
 - 66 MHz AGP bus speed. (133MHz 2*mode)
 - 33 MHz PCI-Bus speed.
 - 8 MHz AT bus speed.
- DRAM MEMORY
 - 4 banks 168 pins DIMM module sockets on board.
 - Use 8 / 16 / 32 / 64 / 128 / 256 MB DIMM module DRAM.
 - 8 ~ 1 GB SDRAM.
 - Supports 3.3V SDRAM.
 - Supports ECC or Non-ECC type DRAM.
- CACHE MEMORY
 - 32 KB 1st cache memory included in CPU.
 - 256KB/512 KB 2nd cache in CPU.
 - Supports DIB speed mode for L2 Cache.
- I/O BUS SLOTS
 - 4 33MHz Master / Slave PCI-BUS.
 - 3 8MHz 16 bits ISA BUS.
 - 1 66MHz / 133MHz AGP bus.
- IDE PORTS
 - 2 Ultra DMA/33 Bus Master IDE channels on board.(Using IRQ14,15)
 - Support Mode 3,4 IDE & ATAPI CD – ROM.

- SCSI PORTS
 - Supports 1 Ultra Wide SCSI port.
 - Supports 1 Ultra SCSI port.
- I/O PORTS
 - Supports 2 16550 COM ports.
 - Supports 1 EPP/ECP LPT port.
 - Supports 1 Floppy port.
 - Supports 2 USB ports.
 - Supports PS/2 Mouse & Keyboard.
- GREEN FUNCTION
 - Suspend mode support.
 - Green switch & ACPI LED support.
 - IDE & Display power down support.
 - Monitor all IRQ / DMA / Display / I/O events.
- BIOS
 - 2M bits FLASH RAM.
 - Supports Plug & Play, DMI Function.
- DIMENSION
 - ATX Form Factor, 4 layers PCB.

2.2. SOFTWARE

- DRIVER
 - Intel LDCM® optional.
 - Health monitor Utility.
 - Bus Master IDE Driver.
- BIOS
 - Licensed AWARD BIOS.
 - AT CMOS Setup, BIOS / Chipset Setup, Green Setup, Hard Disk Utility included.
 - Monitor Health status.
- O.S.
 - Operation with MS-DOS®, Windows®95, WINDOWS™ NT, OS/2, NOVELL and SCO UNIX.

2.3. ENVIRONMENT

- Ambient Temp.
 - 0°C to +50°C (Operating).
- Relative Hum.
 - 0 to +85% (Operating).
- Altitude
 - 0 to 10,000 feet (Operating).
- Vibration
 - 0 to 1,000 Hz.
- Electricity
 - 4.9 V to 5.2 V. (Max. 20A current at 5V.)

3. HARDWARE INSTALLATION

3.1. UNPACKING

The mainboard package should contain the following:

- The **6BXS** mainboard.
- The Retention Mechanism & Attach Mount
- USER'S MANUALS for mainboard & . SCSI device.
- Cable set for IDE, Floppy, SCSI & I/O devices.
- Diskettes and CD for Mainboard Utility.
- External SCSI port adapter.

The mainboard contains sensitive electric components, which can be easily damaged by static electricity, so the mainboard should be left in its original packing until it is installed.

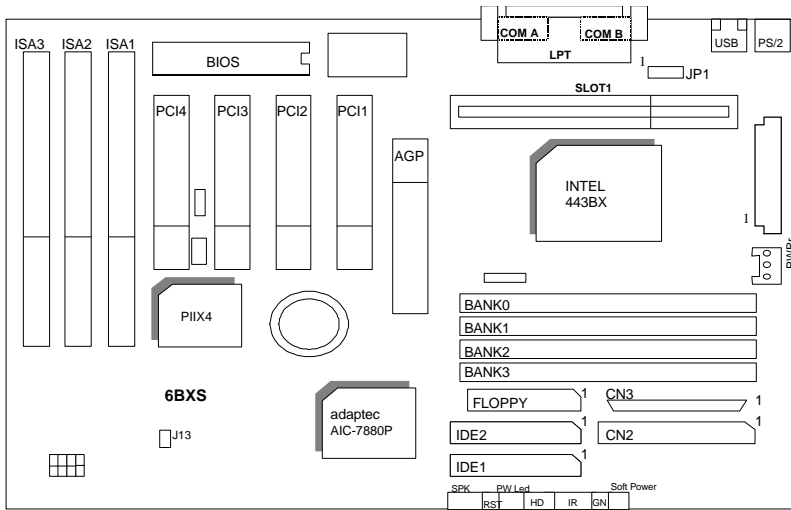
Unpacking and installation should be done on a grounded anti-static mat. The operator should be wearing an anti static wristband, grounded at the same point as the anti-static mat.

Inspect the mainboard carton for obvious damage. Shipping and handling may cause damage to your board. Be sure there are no shipping and handling damages on the board before proceeding.

After opening the mainboard carton, extract the system board and place it only on a grounded anti-static surface component side up. Again inspect the board for damage. Press down on all of the socket IC's to make sure that they are properly seated. Do this only on with the board placed on a firm flat surface.

● **DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.**

3.2. MAINBOARD LAYOUT



<Figure 3.1>

3.3. QUICK REFERENCE FOR JUMPERS & CONNECTORS

◆ I/O Ports Connector	
USB	USB port.
CN2	Ultra SCSI port
CN3	Ultra Wide SCSI port
IDE1	For Primary IDE port.
IDE2	For Secondary IDE port.
PS/2	For PS/2 Keyboard port.
PS/2	For PS/2 Mouse port.
Floppy	For Floppy port
COM B	For Serial port2 (COM B).
COM A	For Serial port1 (COM A).
LPT	For LPT port.

◆ SPK : SPEAKER Connector	
Pin No.	Function
1	VCC
2	NC.
3	NC.
4	Output

◆ RST : RESET Switch	
Pin No.	Function
1	RESET Input
2	GND

◆ PWR : POWER ON LED (PW-LED)	
Pin No.	Function
1	LED POWER (+)
2	NC
3	GND

◆ HD : Hard Disk active LED (HD-LED)	
Pin No.	Function
1	LED POWER (+)
2	LED POWER (-)

◆ IR : INFRARED Connector (IR) -- Function Option	
Pin No.	Function
1	IR Data Output
2	GND
3	IR Data Input
4	Signal
5	POWER (+)

◆ GN : GN-SW	
Pin No.	Function
1	CTRL-Signal
2	GND

◆ Soft PWR : Soft Power Switch	
Pin No.	Function
1	CTRL-Signal
2	GND

◆ FAN PWR: CPU cooling FAN Power Connector	
Pin No.	Function
1	GND.
2	+12V
3	SENSE

◆ J13 : System After Ac Back	
Pin No.	Function
1	Signal
2	GND

◆ JP1 : Keyboard Power On Selection	
Pin No.	Function
1-2	Enabled Keyboard power on.
2-3	Disabled Keyboard power on.

◆ SB-LINK : For PCI Audio / Sound Card use only	
Pin No.	Function
1	Signal
2	GND
3	NC
4	Signal
5	GND
6	Signal

◆ JP7 : Wake on LAN	
Pin No.	Function
1	+5V SB
2	GND
3	Signal

◆ Slot 1	
For Pentium® II processor installed	

3.4. DRAM INSTALLATION

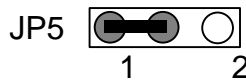
The mainboard can be installed with 8 / 16 / 32 / 64 / 128 / 256 MB 168 pins DIMM module DRAM, and the DRAM speed must be 50 or 60 ns for EDO & 67~100 MHz for SDRAM. The DRAM memory system on mainboard consists of bank 0, 1, 2 & bank 3.

Since 168 pins DIMM module is 64 bits width, using 1 PCS which can match a 64 bits system. The total memory size is 8 MB ~ 1 GB EDO or SDRAM. The DRAM installation position refer to Figure 3.1, and notice the Pin 1 of DIMM module must match with the Pin 1 of DIMM socket. Insert the DRAM DIMM module into the DIMM socket at Vertical angle. If there is a wrong direction of Pin 1, the DRAM DIMM module couldn't be inserted into socket completely.

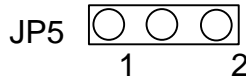
3.5. CPU SPEED SETUP

The system bus speed can be set to 66.6MHz or 100MHz form the jumper (JP5). The user can change the DIP SWITCH (SW) selection to set up the CPU speed for different processors. The CPU speed must match with the frequency RATIO and Front Side Bus (FSB) speed. It will cause system hanging up if the frequency RATIO and FSB Speed do not match with the CPU.

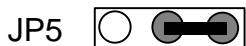
Set system speed to 66MHz: JP5 pin 1-2 short will cause system always run at 66 MHz FSB (Front Side Bus).



Set system speed to 100MHz: JP5 all pins open will cause system always run at 100MHz FSB.



Set system speed to Auto: JP5 pin 2-3 short will detect system speed 66/100MHz FSB automatically.



DIP SWITCH (SW)				FREQ. RATIO	EXT.CLK. MHz	INT.CLK. MHz	CPU Type
1	2	3	4				
OFF	OFF	ON	ON	3.5	66	233	Pentium® II 233 MHz
ON	ON	OFF	ON	4	66	266	Pentium® II 266 MHz
OFF	ON	OFF	ON	4.5	66	300	Pentium® II 300 MHz
ON	OFF	OFF	ON	5	66	333	Pentium® II 333 MHz
OFF	OFF	OFF	ON	5.5	66	366	Pentium® II 366 MHz
ON	OFF	ON	ON	3	100	300	Pentium® II 300 MHz
OFF	OFF	ON	ON	3.5	100	350	Pentium® II 350 MHz
ON	ON	OFF	ON	4	100	400	Pentium® II 400 MHz
OFF	ON	OFF	ON	4.5	100	450	Pentium® II 450 MHz

- ⚡ **The CPU is a sensitive electric component and it can be easily damaged by static electricity, so users must keep it away from metal surface when the CPU is installed onto main board.**

3.6. CMOS RTC & ISA CFG CMOS SRAM

There're RTC & CMOS SRAM on board; they have a power supply from external battery to keep the DATA inviolate & effective. The RTC is a REAL-TIME CLOCK device, which provides the DATE & TIME to system. The CMOS SRAM is used for keeping the information of system configuration, so the system can automatically boot OS every time. Since the lifetime of internal battery is 5 years, the user can change a new Battery to replace old one after it cannot work.

3.7. SPEAKER CONNECTOR INSTALLATION

There is a speaker in AT system for sound purpose. The 4 - Pins connector SPK is used to connect speaker.

3.8. HARDWARE RESET SWITCH CONNECTOR INSTALLATION

The RESET switch on panel provides users with HARDWARE RESET function. The system will do a cold start after the RESET switch is pushed and released by user. The RESET switch is a 2 PIN connector and should be installed to **RST** on mainboard.

3.9. POWER LED CONNECTOR INSTALLATION

System has power LED lamp on the panel of case. The power LED will light on off or flash to indicate which step on the system. The connector should be connected to PWR of mainboard in correct direction.

3.10. IDE & ATAPI DEVICE INSTALLATION

There are two-Enhanced PCI IDE ports (**IDE1**, **IDE2**) on board, which following ATAPI standard SPEC. Any one IDE port can connected to two ATAPI devices (IDE Hard Disk, CD-ROM & Tape Driver), so total four ATAPI devices can exist in a system. The **HD** is the active LED port for ATAPI devices.

3.11. SCSI DEVICE INSTALLATION

There are two SCSI ports on board, One is 8bit SCSI port for SCSI-2 or ULTRA SCSI device, and total 15 SCSI devices can exist in a system.

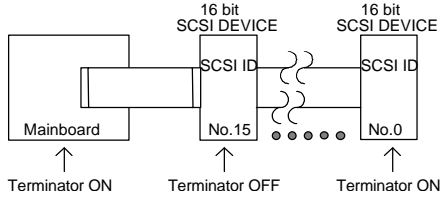
The other is 16bit SCSI port for wide or ULTRA Wide SCSI device, and total 15 SCSI devices (include 8bit SCSI device) can exist in a system.

The low byte terminator (used for 8bit SCSI port) and high byte terminator (used for Wide SCSI port) turning "ON" or "OFF" are controlled by BIOS SETUP (in the INTEGRATED PERIPHERALS SETUP PAGE).

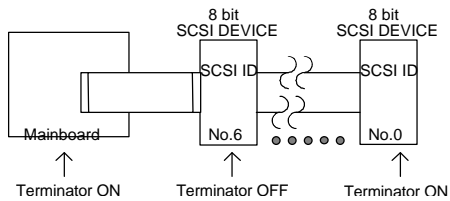
Terminator ON/OFF rules

CASE 1: BIOS SETUP (Signal Ended Termination: Both)

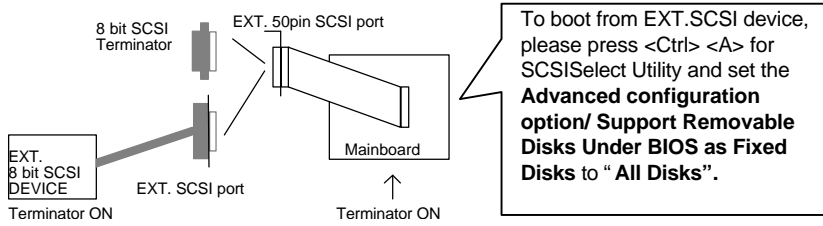
① System has 16 bit SCSI



② System has only 8 bit SCSI device

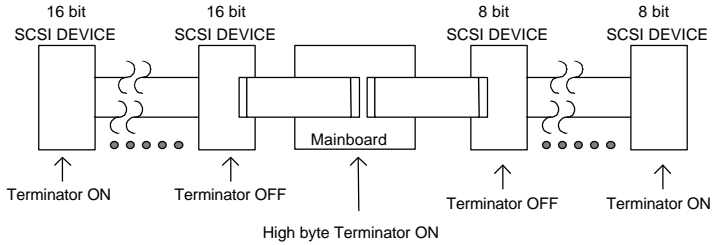


③ System has EXT. SCSI port but has not INT. SCSI device

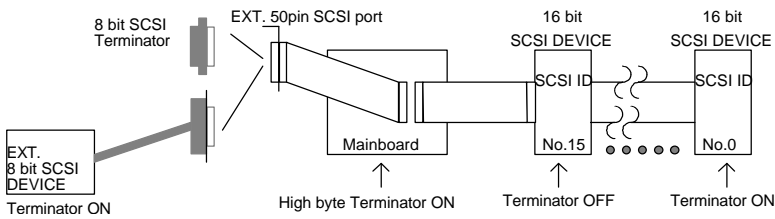


CASE 2: BIOS SETUP (Signal Ended Termination: High Byte)

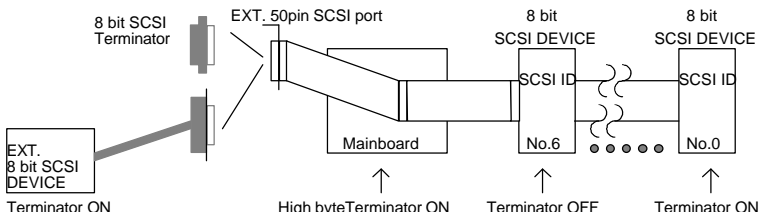
① System has 16 bit & 8 bit SCSI device



② System has 8 bit EXT. SCSI port & 16 bit INT. SCSI device



③ System has 8 bit EXT. SCSI port & 8 bit INT. SCSI device



3.12. PERIPHERAL DEVICE INSTALLATION

After the I/O device installation and jumpers setup, the mainboard can be mounted into the case and fixed by screw. To complete the mainboard installation, the peripheral device could be installed now. The basic system needs a display interface card. If the PCI - Bus device is to be installed in the system, any one of four PCI - Bus slots can be used.

3.13. KEYBOARD & PS/2 MOUSE INSTALLATION

The main board supports PS/2 Mouse (**J1**). The BIOS will auto detect whether the PS/2 Mouse is installed or not & assign IRQ12 for PS/2 Mouse port if it is installed. After installing the peripheral device, the user should check everything again, and prepare to power-on the system.