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## **Federal Communications Commission Statement**

This device complies with FCC Rules Part 15. Operation is subject to the following two conditions:

- ♦ This device may not cause harmful interference
- ♦ This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy. If this equipment is not installed and used in accordance with the manufacturer's instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ♦ Reorient or relocate the receiving antenna.
- ♦ Increase the separation between the equipment and receiver.
- ♦ Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- ♦ Consult the dealer or an experienced radio/TV technician for help.

The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

## **Canadian Department of Communications Statement**

This digital apparatus does not exceed the Class B limits for audio noise emissions from digital apparatuses set out in the Radio Interference Regulations of the Canadian Department of Communications.

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RECYCLED PAPER 

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## **Adaptec 7800 Family Manager Set User's Guide**

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# *Memo*

## Introduction

### 1-1 Product Specifications

#### ❑ Processor

- Supports up to 450 MHz Intel Dual **Pentium® II** processors
- Two Slot 1 CPU socket with retention mechanism
- High efficiency **Switching Power Module** (1.8v ~ 3.5v, 0.1v increments)
- Supports 66/100 MHz system clock speeds
- Innovative *SeePU* technology (software CPU installation with no jumper settings)



Supports 75/83/103/112/124/133 MHz system clock for over-clocking possibility. Refer to Section 2-3 for Overclocking details.

#### ❑ Chipset

- Intel **82440BX** two chip PCIs set

#### ❑ DRAM Memory

- Four 3.3V 168-pin DIMM sockets support up to 512 MB
- Supports 16/32/64/128MB, 64/72-bit unbuffered Synchronous DIMM modules
- Onboard Bus Switches (bank separators) provide stronger current-driving capability for DRAM.
- Provides single-bit ECC capability



PC 100 certified SDRAM DIMM modules with SPD are required for 100MHz frequency clock speed



Because 128MB unbuffered DIMM and Registered DIMM modules are not yet mainstream, their compatibility can not be 100% guaranteed. (See Section 2-5 for details.)

#### ❑ Expansion Slots

- One 32-bit AGP slot (Rev 1.0 compliant)
- Four 32-bit PCI slots (Rev 2.1 compliant)
  - Supports 3.3V, 3.3VSB and #PME capability on PCI slots
- Two 16-bit ISA slots (One PCI/ISA shared slot)
  - PCI slot 4 share the same IRQ w/the onboard SCSI chip. The add-on card on PCI slot 4 must be capable of sharing IRQ or make sure it is not occupied.

❑ **BIOS**

- Award System BIOS, supports PnP, APM, DMI & Multi-device booting features i.e. floppy, LS120, CD-ROM, HDD(IDE, SCSI), ZIP-ATAPI etc.
- Includes Trend **ChipAway Virus** protection for virus-free boot and virus free operating system
  - ⊗ The Trend ChipAway Virus is a rule-based anti-virus technology and does not require periodical updates of virus code

❑ **Two Ultra DMA-33 PCI IDE Ports**

- Supports up to PIO Mode 4, Multi-word Mode 2 and Ultra DMA-33 timings
- Bus Mastering software drivers for all well known multi-task operating systems

❑ **On-board Ultra I/O**

- WB977TF I/O chip (built-in AMI KBC software and RTC)
- One Parallel (SPP/ECP/EPP) and two Serial (16550A compliant) ports
- One floppy disk drive connector supports up to 2.88MB, Japanese 3-Mode, and 1Mbps transfer rates
- IrDA IR function supports up to 115.2Kbps

❑ **Ultra2 SCSI with RAIDport On Board**

- **Adaptec 7890** SCSI controller and AIC-3860 chip
- One 50-pin **Narrow (8-bit) SCSI** port, support up to 7 SCSI devices, and data transfer rate up to **20MBps**
- One 68-pin **UltraWide (16-bit) SCSI** port, support up to 15 SCSI devices (external or internal) and data transfer rate up to **40MBps**
- One 68-pin **Ultra2 (32-bit) SCSI** port, support up to 15 SCSI devices and data transfer rate up to **80MBps**
- One 60-pin Adaptec **RAIDport-III** to support **ARO-1130CA-C** RAIDcard for RAID system upgradeability

❑ **Two Channel USB Ports**



Now under compatibility testing with different peripherals

❑ **Board Dimensions**

- ATX form factor, 305mm x 250mm, 6 Layers
- Nine mounting holes

## □ Advanced Management Features

- Software power off control, Power-on by modem, Power on by alarm, Power-on by keyboard, Over-ride power button, Power failure recovery, Chassis intrusion detection, Blinking LED in Suspend, **Wake Up On LAN**, etc.
- **Poly-fuse** over-current protection for USB and keyboard
- Flash BIOS protect via BIOS
- Add an AIC-3860 chip to divide the SCSI bus into independent SE and LVD segments to keep the benefits on cable length and maximum data rate
- Double-height I/O connector for rapid system installation
- Supports **SB-link** header for Creative PCI audio cards
- Supports On-board Management Extension Hardware and includes system monitoring software to streamline PC management
- Meets EPA Green PC standard: power consumption under 30W in Doze, Standby, and Suspend modes
- **ACPI** features ready when ACPI-enabled O/S is available

## □ Switching Power Supply Requirement (at least 200 Watts)

Output Voltage	Max. Regulation Requirement	Min. Current Requirement (Amps)
+12V	+/- 5%	0
+5V	+/- 5%	1
+3.3V	+/- 5%	10*
-5V	+/- 10%	0
-12V	+/- 10%	0
<b>+5VSB</b>	<b>+/- 5%</b>	<b>0.75</b>

**Table 1-1**

- \* 3.3V at 10Amps is necessary to guarantee full loading operation because some AGP cards and memory modules have high current consumption.

## 1-2 Package Contents

This product comes with the following components:

- One mainboard and one User's Manual
- One twin Slot 1 retention mechanism and eight screws
- One 40-pin IDE connector ribbon cable (Figure 1-1)
- One 34-pin floppy disk drive ribbon cable (Figure 1-2a) or (Figure 1-2b)
- One 50-pin narrow SCSI cable (Figure 1-3) and one 68-pin Ultra 2 SCSI cable (Figure 1-4)
- One Terminator Card (Figure 1-5)
- One CD-ROM that includes
  - Award Flash EPROM Utility, Award DMI Utility
  - Intel Bus Master IDE drivers for Win95, WinNT, and OS/2
  - Exclamation Mark Remover Utility for Win95
  - System Health Monitoring Software
  - Trend **PC-cillin** Anti-virus v3.0(OEM version) utility in eight different languages
- One 3.5 inch Adaptec EZ-SCSI driver diskette and two 3.5 inch Adaptec 7800 Family Manager Set diskettes

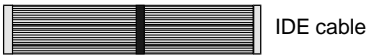


Figure 1-1

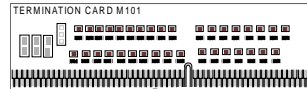


Figure 1-5



Figure 1-2a



Figure 1-2b



Figure 1-3

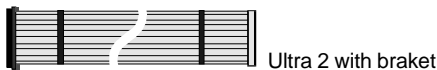
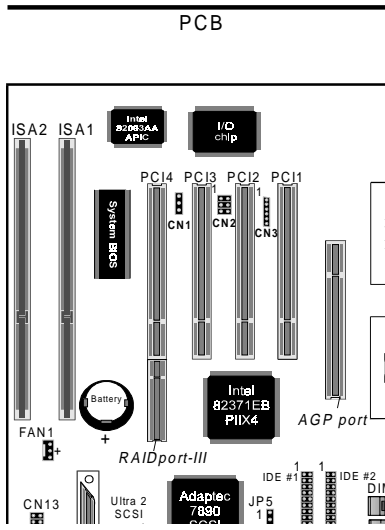


Figure 1-4



## 1-3 Mainboard Layout



## 1-4 Connector and Jumper Reference Chart

Jumper & Connector No.	Function
CN1	WOL (Wake-on-LAN)
CN2	Creative's SB-LINK connector
CN3	Infrared connector
CN13	Green switch connector
	Green LED connector
	System reset switch connector
	Turbo LED connector
	Keyboard lock & power LED connector
	Speaker connector
	IDE/SCSI activity LED connector
	Over-ride power button
PW1	ATX power supply connector

## Chapter 2

# Hardware Setup

If your mainboard has already been installed in your computer you may still need to refer to this chapter if you plan to upgrade your system's hardware.



**Be sure to disconnect the power cable from the power source before performing any work on your mainboard, i. e. installing a CPU, memory module, changing a jumper setting, etc. Not doing so may result in electrical shock!**

### 2-1 Introduction to Jumpers

Jumpers are used to select between various operating modes. A jumper consists of a row of gold colored pins that protrude from the surface of the mainboard. It is important not to confuse jumpers with connectors or headers.



**Putting jumper caps on anything that is not a jumper may result in damaging your mainboard. Please refer to Section 1-3, Mainboard Layout, for the location of jumpers on your mainboard.**

As indicated in Figure 2-1 below, a cap is used to cover the pins of a jumper, resulting in shorting those pins that it covers. If the cap is removed from the top of the pins, the jumper is left "open." The number 1 shown both in the diagram below and in all multiple pin jumper and header diagrams in this manual indicates the pin designated with the number 1. The numbering of the remaining pins follows in sequence.

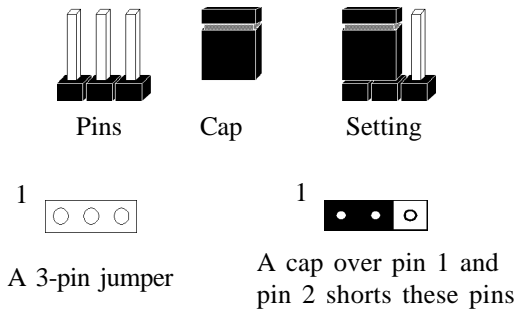


Figure 2-1

## 2-2 Installing an S.E.C. Processor in Slot 1

1. Insert the Pentium II processor into the retention mechanism. Press evenly and gently until the snaps on the upper side of the processor have been inserted into the holes at the top of the retention mechanism. Terminator card must be inserted to the secondary slot 1. (in case of single CPU config.) If the two CPUs differ in any family type, speed, FSB frequency, L2 cache size/type and L2 cachable address range. The system may still appear to run correctly, but consistent behavior can not be guaranteed.
2. Note that when removing the processor, these snaps can be clicked into a completely vertical position, leaving your hands free to stabilize the board. Pull the processor evenly and gently out of the retention mechanism.



Installing a heat sink and cooling fan is necessary for proper heat dissipation from your CPU. Failing to install these items may result in overheating and possible burn-out of your CPU.

## 2-3 Setting Your CPU's Parameters(SeePU Technology)

*SeePU* is a new user friendly technology that enables the user to setup a mainboard's CPU parameters through an easy to use BIOS setup procedure. It is no longer necessary to make many jumper settings as on conventional mainboards.

1. After installing all your hardware into your PC system, turn on your system's power. Enter the CMOS Setup Utility by pressing the Delete key when your BIOS identification screen appears.
2. Move the cursor to SeePU & Chipset Setup menu and press Enter. Find the CPU Setup commands at the right hand part of the BIOS screen (Figure 2-2) Commands for operating the cursor in BIOS are found at the lower right of the BIOS screen.

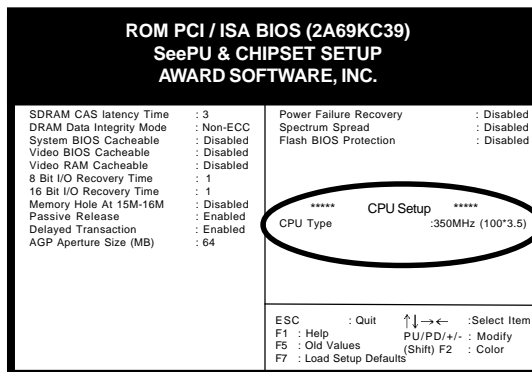



Figure 2-2

- Change the CPU Type according to the speed of your Pentium II processor. See Figure 2-3 for frequency specifications.

CPU Type	CPU Spe	
	External Clock	Frequency
Pentium II processor	66	3.5
		4
		4.5
		5
	100	3.5
		4
4.5		

Figure 2-3

- Use the User Define option to custom set your CPU's parameters. Set the frequency ratio (also known as external clock multiplier factor) and CPU bus frequency according to your processor's specifications. See Figure 2-4.

 You do not need to make voltage settings because *SeePU* automatically sets your CPU voltage.

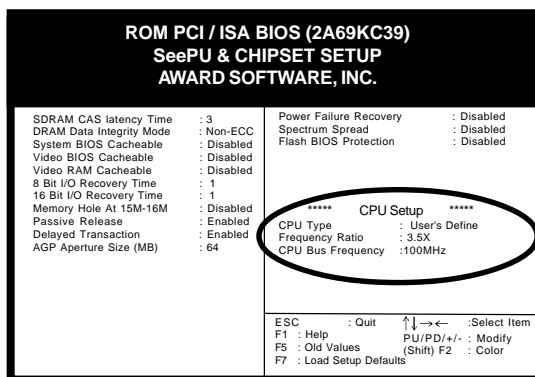
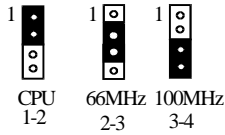
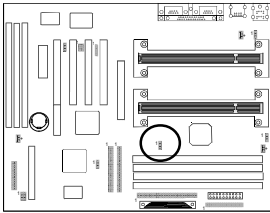


Figure 2-4

- Press Esc to return to the CMOS Setup Utility, press F10 to Save and Exit Setup and choose 'Y' to confirm. The system will automatically reboot and during startup you will see the correct CPU type indicated on the start-up screen screen.

## External Clock Frequency Jumper (JP7)



This jumper allows the external clock frequency to be determined either by the CPU or the user. If set to pins 1-2, the CPU determines the external clock speed. If set to pins 2-3, the external clock is always 66MHz and if set to pins 3-4 the external clock is always 100MHz.

### Overclocking

Operating a CPU at a higher frequency than its specification allows is called overclocking. If the CPU frequency is set at a higher frequency than its specification allows, it may or may not run at that frequency, depending on the quality of your CPU and the extent to which the frequency has been overset. The mainboard manufacturer highly discourages overclocking as it may result in data loss, CPU burn-out, system failure, etc.

Many Pentium II processors are frequency locked processors and are not able to perform overclocking. Regardless of whether the processor is a frequency locked, overclocking may cause some processors to hang when turning on the system. When the processor hangs, the screen remains blank and the system does not boot. To solve this problem, do the following.

1. Turn off the computer and then press the Home key on your keyboard
2. Turn on your computer, wait for five seconds and then release the Home key. (Pressing the Home key allows the computer to boot at a low system speed. For example, for 66MHz external clock CPUs, the CPU boot-up speed is 233MHz. For 100MHz external clock CPUs, the CPU boot-up speed is 350MHz.)



133MHz overclocking technology limited while onboard SCSI chip enabled

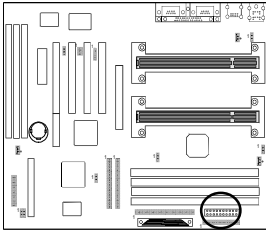
## 2-4 Connector and Jumper Settings

Connectors are used to link the system board with other parts of the system, including the power supply, the keyboard, and the various controllers on the front panel of the system case.

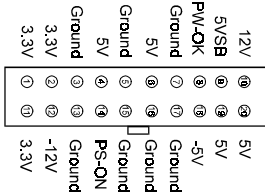


**The power supply connector is the last connection to be made while installing a mainboard. Before connecting the power supply, please make sure it is not connected to the power source.**

### ATX Power Supply Connector (PW1)



This mainboard requires a power supply of at least 200 watts. **The power cord leading from the system's power supply to the external power source must be the very last part connected when assembling a system.**



The ATX power supply provides a single 20-pin connector interface which incorporates standard +/-5V, +/-12V, optional 3.3V and Soft-power signals. The Soft-power signal, a 5V trickle supply is continuously supplied when AC power is available. When the system is in the Soft-Off mode, this trickle supply maintains the system in its minimum power state.

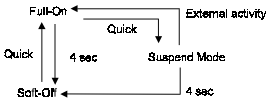
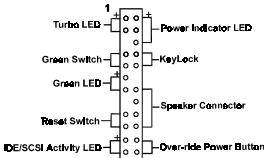
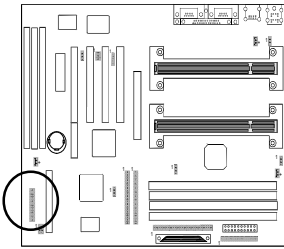
### Software Power-Off Control

This mainboard can be powered down using the Windows 95 Software Power-Off function. To power down your computer, click the START button on the Windows 95 task bar. Select "Shut Down The Computer" and the system turns off. The message "It is now safe to turn off your computer" will not be shown when using this function.

### Power-On By Modem

While in Soft-off state, if an external modem ring-up signal occurs, the system wakes up and can be remotely accessed. Enable this function in BIOS's Power Management Setup menu. (See section 4-4)

## Front Panel Connector Set (CN13) A through G



### Over-ride Power Button Operation

#### A. Over-ride Power Button Connector

The power button on the ATX chassis can be used as a normal power switch as well as a button to activate Advanced Power Management Suspend mode. This mode is used for saving electricity when the computer is not in use for long periods of time. The Soft-OFF by PWR-BTTN function in BIOS's Power Management Setup menu must be set to "Delay 4 Sec." to activate this function. (See section 4-4)

When the Soft-OFF by PWR-BTTN function is enabled, pushing the power button rapidly will switch the system to Suspend mode. Any occurrence of external activity such as pressing a key on the keyboard or moving the mouse will bring the system back to Full-On. Pushing the button while in Full-On mode for more than 4 seconds will switch the system completely off. See Over-ride Power Button Operation diagram.

#### B. Keyboard Lock & Power Indicator LED Connector

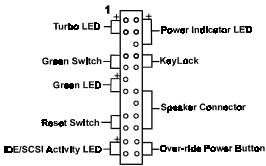
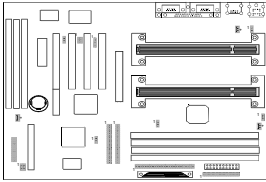
Plugging this connector into the lock on the front panel of the system case allows the lock to enable or disable the keyboard. This function provides limited security against casual intruders. The power indicator LED shows the system's power status. It is important to pay attention to the correct cable and pin orientation (i.e., not to reverse the order of these two connectors.)

	Pin	Definition
Power Good LED	1	+5V DC
	2	No Connect
	3	Ground
Keyboard Lock	4	Keylock
	5	Ground

#### Blinking LED in Suspend Mode

While in Suspend mode, the LED light on the front panel of your computer will flash. Suspend mode is entered by pressing the Override Power Button, pushing the Green button on your ATX case, or enabling the Power Management and Suspend Mode options in BIOS's Power Management menu. (See section 4-4)





### C. Green Switch/Green LED Connector

Some ATX cases provide a Green switch which is used to put the system in Suspend mode. In Suspend mode, the power supply to the system is reduced to a trickle, the CPU clock is stopped, and the CPU core is in its minimum power state. The system is woken up whenever the keyboard or mouse is touched. The system resumes in different ways as defined by Power Management Setup screen in BIOS.

### D. System Reset Switch Connector

This connector should be connected to the reset switch on the front panel of the system case. The reset switch allows you to restart the system without turning the power off.

Pin	Definition
1	System
2	GND

### E. Speaker Connector

PIN	Definition
1	Speaker Signal
2	NC
3	NC
4	+5V DC

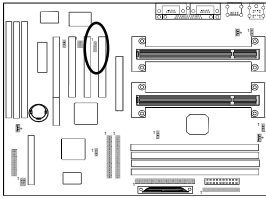
### F. IDE/SCSI Activity LED Connector

The IDE activity LED lights up whenever the system reads/writes to the IDE devices. (See section 4-7 in detail)

### G. Turbo LED Connector

This mainboard does not have a Turbo/De-turbo speed modes. Even though this function does not exist, the turbo LED will light when the LED is connected and turbo button pressed.

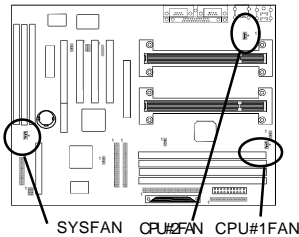
### Infrared Connector (CN3)



If you enable the COM2 Mode in BIOS's Integrated Peripherals menu the COM2 port will support IR functions. (See section 4-7)



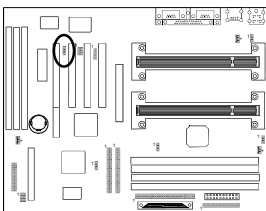
### System/CPU2&1 Cooling Fan Connectors (FAN1/FAN2&FAN3)



These added connectors allow the fan to draw their power from the mainboard instead of the disk drive connector. The board's management extension hardware is able to detect the CPU and system fan speed in rpm (revolutions per minute). These connectors supports 3-pin cooling fans with minimum of 3500 RPM. The wiring and plug may vary depending on the manufacturer. On standard fans, the red is positive (+12V), the black is ground, and the yellow wire is the rotation signal.



### WOL (Wake-on-LAN) Connector (CN1)

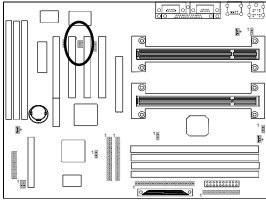


Enable the Wake Up On LAN selection in BIOS's Power Management Menu to use this function. The capability to remotely manage PCs on a network is a significant factor in reducing administrative and ownership costs. Magic Packet technology is designed to give WOL (Wake-on-LAN) capability to the LAN controller. When a PC capable of receiving wake up command goes to sleep, the Magic Packet mode in the LAN controller is enabled. When the LAN controller receives a Magic Packet frame, the LAN controller will wake up the PC. This header is used to connect an add-in NIC (Network Interface Card) which gives WOL capability to the mainboard.



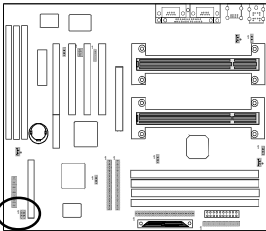
To support this function, a switching power supply with a minimum of **750mA 5VSB** is required.



## Creative's SB-LINK Sound Connector (CN2)



The SB-LINK serves as a bridge between the mainboard and Creative's PCI sound card. This connector delivers Sound Blaster 16 compatibility for real-mode DOS games.

## Clear CMOS Data Jumper (JP2)

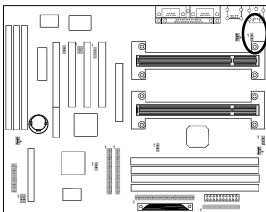




1  Normal (default)      1  Clear CMOS data

To clear the contents of the CMOS, please follow the steps below.

1. Disconnect the system power supply from the power source.
2. Set the jumper cap at location 2~3 for 5 seconds, then set it back to the default position.
3. Connect the system's power and then start the system.
4. Enter BIOS's CMOS Setup Utility and choose Load Setup Defaults. Type Y and press enter.
5. Set the system configuration in the Standard CMOS Setup menu.

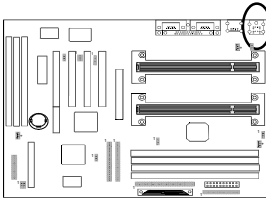
## Power-on by Keyboard Jumper (JP6)



1  Disabled (default)      1  Enabled

This mainboard is able to be turned on by the keyboard. To use this function, enable the Power On By Keyboard option in BIOS's Integrated Peripherals screen (See section 4-7). You must also set this jumper's cap to pins 2-3 to use this function. Some out-of-date keyboards may require larger current than supplied by the Suspend 5V of modern power supplies. When using older keyboards disable this function.

## PS/2 Mouse and Keyboard Ports



If a PS/2 mouse is used, BIOS will automatically detect and assign IRQ12 to the PS/2 mouse.

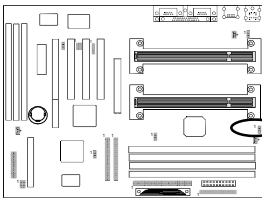


Pin	Definition
1	Data
2	No Connect
3	Ground
4	+5V (fused)
5	Clock
6	No Connect

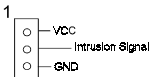
## Poly-fuse Over Current Protection

The poly-fuse protects the system from dangerous voltages the system might be exposed to via the keyboard or USB connectors. In case of such exposure, the poly-fuse will immediately be disconnected from the circuit, just like a normal fuse. After being disconnected for a certain period of time, the poly-fuse will return to its normal state, after which the keyboard or USB can function properly. Unlike conventional fuses, the poly-fuse does not have to be replaced, relieving the user wasted time and inconvenience.

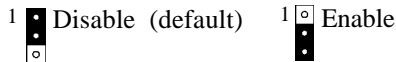
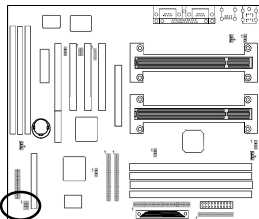
## Chassis Intrusion Monitoring Connector (JP8)



This board supports the chassis instruction monitoring feature of the management extension hardware by means of a mechanical or photo sensor switch attached to the motherboard through this 1x3-pin chassis security header. The mechanical switch is set to open for normal computer operation.

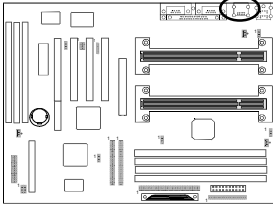


## Power Failure Recovery Jumper (JP3)



Computers using an ATX power supply usually do not turn back on after the power source to the computer unexpectedly fails (i.e. electricity outage). Setting the cap at location 2~3 will allow the computer to always turn back on after a power failure. This is especially important for computers that must be on 24 hours per day.

## USB(Universal Serial Bus) Ports



If you want to use a USB keyboard, you must enable the USB Keyboard Support function in BIOS's Integrated Peripherals menu (See Section 4-7). USB is an open industry standard, providing a simple and inexpensive way to connect up to 125 devices to a single computer port. Keyboards, mice, tablets, digitizers, scanners, bar-code readers, modems, printers and many more can all be used at the same time.

USB is a dynamically reconfigurable serial bus with an elementary data rate of 12Mbps. Based on off the shelf, low cost micro-controller technology, its modular layered software protocol supports sophisticated devices and application programs.

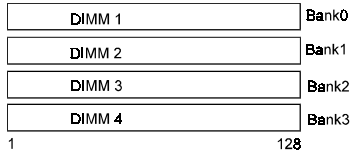
This board contains a USB Host controller and includes a root hub with two USB ports (meets USB Rev 1.0 spec.). Two USB peripherals or hub devices are able to be connected.



Compatibility with different USB peripherals is still being tested.

## 2-5 Main Memory Configuration

The DRAM memory system consists four banks and the memory size ranges from **16~512 MBytes**. If you only use one bank it does not matter which one you use and if you use two or more banks, it does not matter which bank you install first.



### DRAM Specifications


	System
4 unbuffered DIMM Modules	6€
	10
4 Registered DIMM Modules	6€
	10


DIMM type: 3.3V, unbuffered, registered, 64/72-bit Synchronous DRAM with SPD\*

Module size: Single/double-side 16/32/64/128 MBytes

Parity: Either parity or non-parity

 The compatibility of 128MB and Registered DIMM is still under testing and cannot be 100% guaranteed.

 This mainboard supports 3.3v, unbuffered, 4-clock, SDRAM DIMM only. Buffered, 5V, or 2-clock SDRAM DIMMs should not be used.

 Due to loading anomalies, using DIMM with an 'n x 4' DRAM base on this mainboard is not recommended. For example, a DIMM that uses sixteen 16Mb x 4 devices should not be used.

### 🚩 SPD (Serial Presence Detect)

This is an EPROM that contains speed and design information about the memory module. The mainboard queries the module and makes adjustments to system operation based on what it finds.

### 🚩 ECC DRAM Capability

**This mainboard can be configured to support ECC (Error Check and Correct) function when utilizing parity DIMM modules.** To utilize the chipset's ECC features, you must use a 72-bit DIMM module. These modules are automatically detected during bootup. However, the user must configure the DRAM Data Integrity Mode to "ECC" in BIOS's Chipset Features Setup menu to enable the ECC function. ECC detects double bit errors and detects and corrects single bit memory errors on the fly without user intervention. Errors may be generated by a defective memory module, conflicting memory speeds between different banks, DMA, etc.



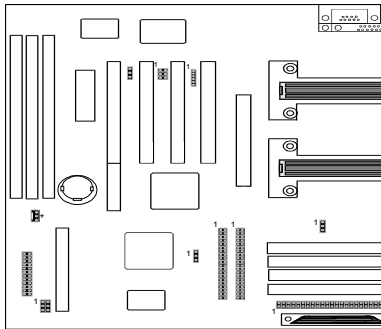
# *Memo*



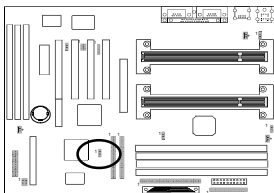
## Ultra2 SCSI Interface

The on-board SCSI interface from Adaptec supports up to **15** Ultra2 SCSI devices and provides up to a **80 MBps** SCSI data transfer rate in 32-bit mode. Wide, Ultra-Wide and Ultra2 SCSIs support double the number of devices as the industry-standard SCSI and the Ultra2 SCSI bandwidth offers eight times the transfer rate of standard SCSI adapters. Ultra2 SCSI with the **AIC 3860** feature an advanced multimode Ultra2 SCSI I/O cell for supporting single-ended and Ultra2 devices that provides a powerful multitasking interface between your computer's PCI bus and SCSI devices (disk drives, CD-ROM drives, scanners, tape backups, removable media drives, etc.).

Adaptec **EZ-SCSI** software and menu-driven **SCSIselect** optimization utility make installation and management of the SCSI I/O subsystem virtually automatic. Advanced Plug-and-Play features automatically assign IDs and control SCSI bus termination. Flash ROM enables users to easily upgrade the SCSI BIOS and system BIOS in one step and to readily take advantage of future product enhancements.



### On-board SCSI Jumper (JP5)



1  Enabled (default)      1  Disabled

Setting this jumper to pins 1-2 enable the onboard SCSI chip. Remember to enable the Onboard PCI SCSI Chip in the Integrated Peripherals Menu (Section 4-7) to enable the on-board SCSI function.

## 3-1 SCSI Configuration Guidelines

Before configuring your SCSI devices, you should understand the basic concepts described in this section. The information will help you set up your host controller and devices so that they can function properly.

### SCSI ID Number

Each device attached to the host controller, as well as the host controller itself must have a unique SCSI ID number (0 to 7 for the Narrow SCSI and 0 to 15 for the Wide SCSIs).

- ⌘ The SCSI ID serves two purposes:
  1. To uniquely define each SCSI device on the SCSI bus
  2. To determine the device's priority on the SCSI bus

For the devices connected to the Wide SCSI bus, ID 7 has the highest priority. The priority of the remaining IDs, in descending order, is 6 to 0 and then 15 to 8.

We recommend that you **leave the host controller set to its default setting of SCSI ID 7**. If you need to change the host controller SCSI ID, see *Configuring the Host Controller* (Section 3-3). To change the SCSI ID on your hard disk and other SCSI devices, refer to the devices' documentation.

The host controller supports the SCSI Configured Automatically (**SCAM**) protocol, which assigns SCSI IDs dynamically and resolves SCSI ID conflicts automatically at bootup. If your system includes SCSI disk drives or other devices that support SCAM, you do not need to manually assign SCSI IDs to these devices. To enable SCAM support, see *Configuring the Host controller* (Section 3-3).

- ⌘ Most SCSI devices currently in use do not support SCAM. The SCSI IDs on these devices must be set manually. To change the SCSI IDs on these devices, refer to the devices' documentation.

## SCSI Terminators

To ensure reliable communication, the SCSI bus must be properly terminated. The Host Adapter SCSI Termination must be set to Enabled (Default) or Disabled at the **SCSIselect Utility**. Refer to Pages 24-25 for sample in details.

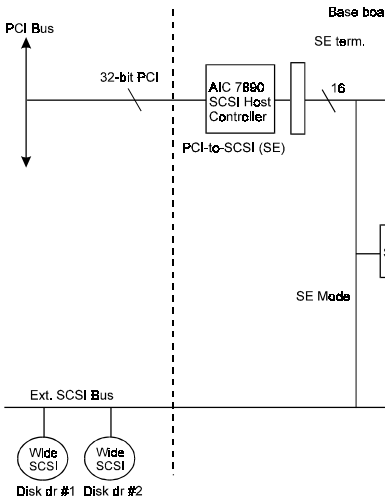
Note:

The Ultra 2 SCSI termination setting are implemented into the chipset and cables, it is not necessary to configure termination on Ultra2 SCSI bus.

## Application Notes

The application notes provided in this Appendix illustrate several ways in which the AIC-3860 may be used within a SCSI bus. The AIC-3860 allows LVD SCSI bus segments and single-ended SCSI bus segments to work as one logical SCSI bus. Each bus segments requires termination at the end of the segment.

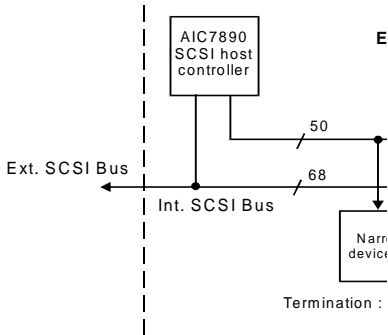
Figure 1 show how to use the AIC-3860 to extend Ultra SCSI cable length.



\* Maximum cable length: 3 m for 1 device, 1.5 m for up to 8 device

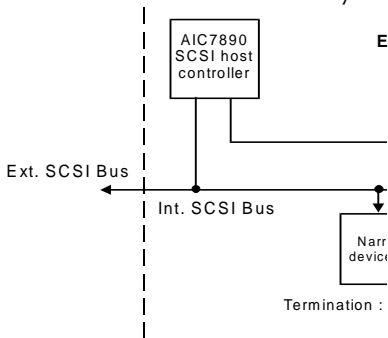
## Termination Examples:

### A. Internal Narrow SCSI Devices Only

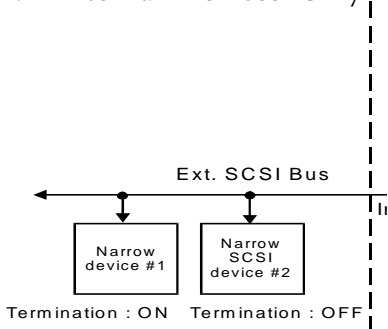


### B. Wide SCSI Devices Only

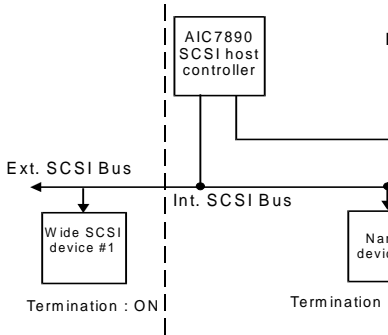
#### B.1 Internal Devices Only



#### B.2 External Devices Only

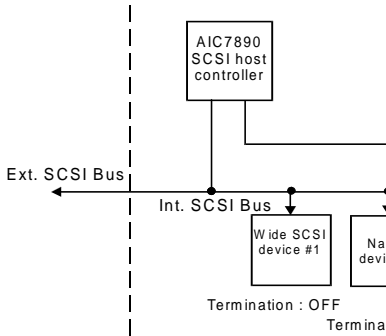


### B.3 Internal & External SCSI devices

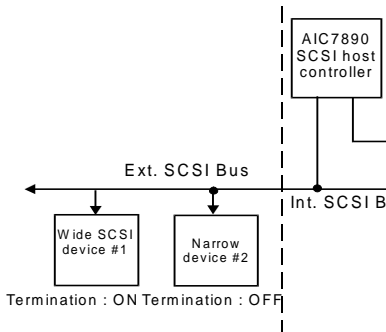


## C. Combination of Narrow & Wide SCSI Devices

### C.1 Internal SCSI Devices Only



### C.2 Internal & External SCSI devices



## 3-2 Installing SCSI Devices

You can connect up to seven internal and external Narrow SCSI devices to the Narrow SCSI port, and up to 15 devices (7 Narrow internal and 8 Wide internal or external SCSI devices, or 15 Wide internal and external SCSI devices ) to the Wide SCSI port.

The enclosed Narrow SCSI cable allows you to connect up to 2 internal SCSI devices. If you are connecting more than 2 internal SCSI devices, you must obtain an internal SCSI cable with enough connectors to accommodate all of your devices. Contact your dealer for special cable service.

### Length Limitation of SCSI Cables

When Fast SCSI devices are connected to the bus, the total length of all cables must not exceed 3 meters (9.8 ft.) to ensure reliable operation. If no Fast SCSI devices are connected, the total length of all cables must not exceed 6 meters (19.7 ft.).

### Connecting Internal SCSI Devices

If you are connecting internal SCSI devices, make sure you have an internal SCSI cable with enough connectors to accommodate all of your devices.

1. Prepare each SCSI device for installation; configure the device SCSI ID and terminators (terminate the last internal device attached to the cable).
2. Install the SCSI device in your computer.
3. Plug the connector at one end of the internal SCSI cable into the host adapter's internal SCSI connector.



Make sure the colored stripe on the side of the cable is aligned with pin-1 of the host adapter's connector. Pin-1 of the connector is usually designated by a small triangle (▲), or a "1" at a corner of the connector.

4. Plug the remaining connectors on the cable into the connectors on the of the devices.



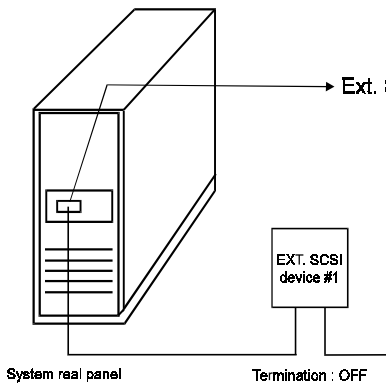
Make sure the colored stripe on the cable is aligned with pin-1 of the device's connector.

5. Connect a DC power cable (from your computer's power supply) to the power connector on the SCSI device.

## Connecting External SCSI Devices

If you are connecting external SCSI devices to your host adapter, you must obtain an external SCSI cable for each external device you install.

1. Prepare each SCSI device for installation; configure the SCSI ID and attach a terminating plug into the last external device.
2. Plug the connector at one end of the external SCSI cable into the host adapter's external SCSI connector.
3. Plug the connector at the other end of the cable to either one of the SCSI connectors on the external SCSI device.
4. To connect other external SCSI devices, daisy-chain each device to the previous device until all external SCSI devices have been connected.



Daisy-chaining the Ext.

### 3-3 Configuring the Host Controller

The on-board SCSI includes a menu-driven **SCSISelect** configuration utility which allows you to change host controller settings without opening the computer or handling the board. SCSISelect also contains SCSI disk utilities that let you do low-level format or verify the disk media of your SCSI hard disk drives. The following table shows the default settings of the SCSI configuration utility.

<b>Boot Device Settings</b>
Host Adapter SCSI ID
SCSI Parity Checking
Host Adapter SCSI Termination
<b>Boot Device Settings</b>
Boot Target ID
Boot LUN Number
<b>SCSI Device Settings</b>
Initiate Sync Negotiation
Maximum Sync Transfer
Enable Disconnection
Initiate Wide Negotiation
Send Start Unit Command
<b>Advanced Host Adapter Settings</b>
Host Adapter BIOS
Support Removable Disks Under BIOS as Fixed Disks
Extended BIOS Translation for DOS Drives >

1. Setting is valid only if Multiple LUN support is enabled.
2. Setting is valid only if host adapter BIOS is enabled.

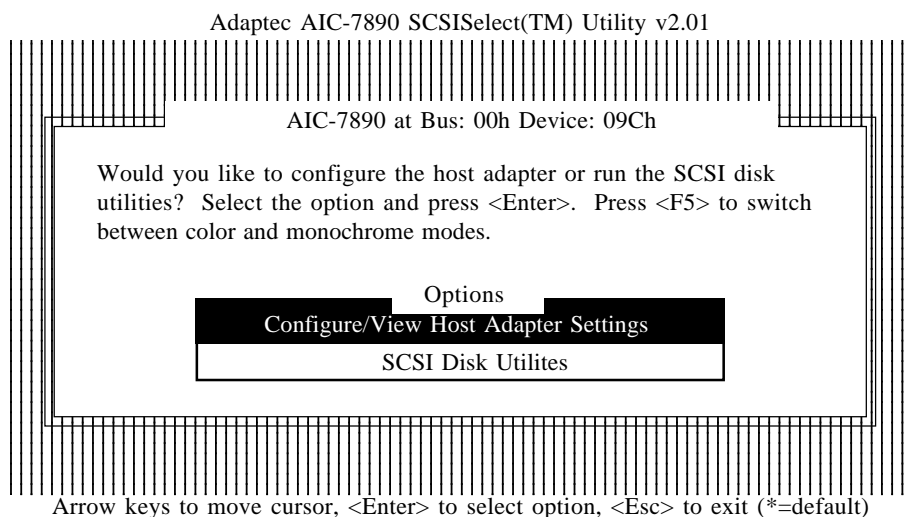


## Starting the SCSISelect Utility

You can start the SCSISelect utility by pressing **Ctrl-A** when the following prompt appears during bootup.

Press <Ctrl><A> for SCSISelect (TM) Utility !

The first menu that appears displays the options Configure/View Host Adapter Settings and SCSI Disk Utilities.



## Using SCSISelect Menus

SCSISelect uses menus to list options you can select. To select an option, use the **↑** and **↓** keys to move the cursor to the desired option and then press **Enter**.

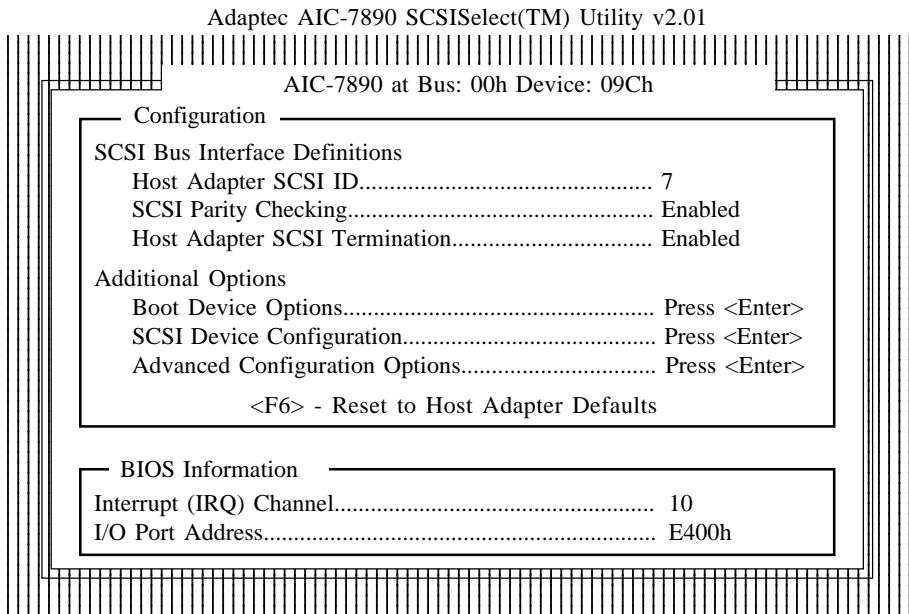
In some cases, selecting an option displays another menu. You can return to the previous menu at any time by pressing **Esc**. To restore the original SCSISelect default values, press F6. To toggle the display between color and monochrome modes, press F5 (this feature may not work on some monitors).

## Exiting SCSISelect

To exit SCSISelect, press Esc until a message prompts you to exit. At the prompt, select **YES** to exit, then press any key to reboot the computer. Any changes you made in SCSISelect take effect after the computer boots.

## Basic Host Adapter Setting

- Host adapter SCSI ID--The default setting is SCSI ID **7**, which gives the host adapter the highest priority in the SCSI bus (see SCSI ID Number in Section 3-1).
- SCSI Parity Checking--This option determines whether the host adapter verifies the accuracy of data transfer on the SCSI bus. The default setting is **Enabled**. You should disable SCSI Parity Checking if any SCSI device does not support SCSI parity. If you are not sure whether a device supports SCSI parity, consult the documentation of the device.
- Host Adapter SCSI Termination --The default setting is Enabled (Low ON/ High ON) . To determine the appropriate termination setting for your host controller, see SCSI Terminators in Section 3-1.



Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (\*=default)

## Boot Device Settings

```

Adaptec AIC-7890 SCSISelect(TM) Utility v2.01
-----
AIC-7890 at Bus: 00h Device: 09Ch
-----
Configuration
-----
SCSI Bus Interface Definitions
Host Adapter SCSI ID..... 7
SCSI Parity Checking..... Enabled
-----
Boot Device Configuration
-----
Select SCSI peripheral from which to boot.
To view peripheral by ID# select "SCSI Disk Utilities" form previous menu.
Boot SCSI ID..... 0
-----
Options Listed Below Have NO EFFECT if MULTI LUN Support is Disabled
-----
Boot LUN Number..... 0
-----
-----
BIOS Information
-----
Interrupt (IRQ) Channel..... 10
I/O Port Address..... E400h
-----

```

Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (\*=default)


- Boot Target ID**--This option specifies the SCSI ID of the device you wish to boot from. The default setting is SCSI ID 0. The SCSI ID selected here must correspond to the ID configured on the boot device.
- Boot LUN Number**--If your boot device has multiple LUNs (Logical Unit Numbers) and Multiple LUN Support is enabled, you can specify which LUN to boot from on your boot device. The default setting is LUN 0.

## SCSI Devices Settings

Adaptec AIC-7890 SCSISelect(TM) Utility v2.01

SCSI Device Configuration								
SCSI Device ID	#0	#1	#2	#3	#4	#5	#6	#7
Initiate Sync Negotiation...	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maximum Sync Transfer Rate...	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
Enable Disconnection.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Initiate Wide Negotiation....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Options Listed Below Have NO EFFECT if the BIOS is Disabled								
Send Start Unit Command...	No	No	No	No	No	No	No	No
BIOS Multiple LUN Support	No	No	No	No	No	No	No	No
Include in BIOS Scan....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SCSI Device ID	#8	#9	#10	#11	#12	#13	#14	#15
Initiate Sync Negotiation...	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maximum Sync Transfer Rate...	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
Enable Disconnection.....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Initiate Wide Negotiation....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Options Listed Below Have NO EFFECT if the BIOS is Disabled								
Send Start Unit Command...	No	No	No	No	No	No	No	No
BIOS Multiple LUN Support	No	No	No	No	No	No	No	No
Include in BIOS Scan....	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (\*=default)

- Initiate Sync Negotiation**--This option determines whether synchronous data transfer negotiation between the device and host adapter is initiated by the host adapter.
  - Normally, you should leave the Initiate Sync Negotiation setting enabled because most SCSI devices support synchronous negotiation and because it allows for faster data transfer.
  -  Some older SCSI-1 devices do not support Sync Negotiation. This may cause your computer to operate erratically or hang if Initiate Sync Negotiation is set to yes. Set Initiate Sync Negotiation to No for these devices.
- Maximum Sync Transfer Rate**--This option sets the Maximum synchronous data transfer rate that the host adapter supports.



Some older SCSI-1 devices do not support Ultra SCSI data transfer rates. This may cause your computer to operate erratically or hang if the transfer rate is set too high. Select a maximum rate of 5.0 for these devices.

- Enable Disconnection--This option determines whether the host adapter allows the SCSI device to disconnect from the SCSI bus. Enabling disconnection allows the host adapter to perform other operations on the SCSI bus while the SCSI device is temporarily disconnected. The default setting is *Yes*.

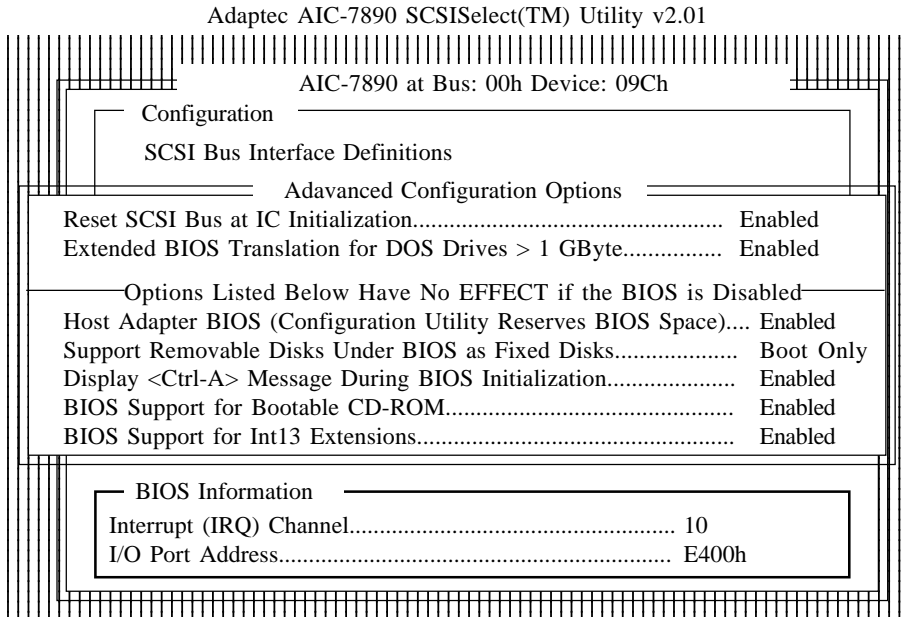
You should leave Enable Disconnection set to yes if two or more SCSI devices are connected to the host adapter. This optimizes SCSI bus performance. If only one SCSI device is connected to the host adapter, set Enable Disconnection to No to achieve slightly better performance.

- Initiate Wide Negotiation--This option determines whether the host adapter attempts 16-bit data transfer instead of 8-bit data transfer. The default setting is *Yes*.

When set to No, the BIOS uses 8-bit data transfer unless the SCSI device itself requests Wide negotiation. The 16-bit data transfer doubles the transfer rate comparing to the 8-bit data transfer.

Some 8-bit SCSI devices may have trouble in handling Wide negotiation. For these devices, set Initiate Wide Negotiation to No.

## Advanced Host Adapter Settings



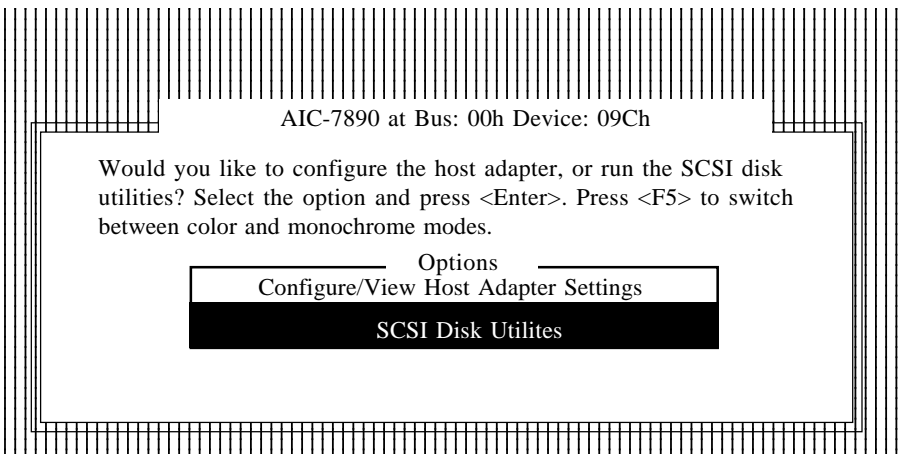
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (\*=default)

- Host Adapter BIOS--If you boot from a SCSI disk drive connected to the host controller, the BIOS must be enabled. You should disable the host adapter BIOS if the peripherals on the SCSI bus (for example, CD-ROM drives) are all controlled by device drivers and do not need the BIOS.
- Support Removable Disks Under BIOS as Fixed Disk---This option controls which removable-media drives are supported by the host adapter BIOS. The default setting is *Boot Only*. The following choices are available:
  - Boot Only--Only the removable-media drive designated as the boot device is treated as a hard disk drive.
  - All Disks--All removable-media drives supported by the BIOS are treated as hard disk drives.
  - Disabled--No removable-media drives are treated as hard disk drives.
- Extended BIOS Translation for DOS Drives > 1 GByte--This option determines whether extended translation is available for SCSI hard disks with capacity greater than 1 GByte. This scheme supports disk drives as large as 8 GBytes under MS-DOS with a maximum partition size of 2 GBytes.

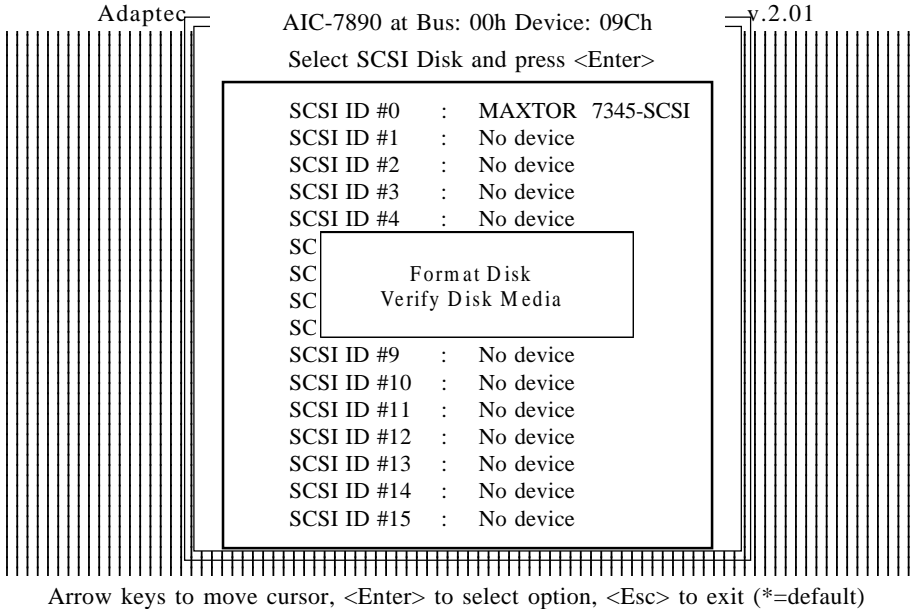
- ⌘ Extended BIOS Translation is used only with MS-DOS 5.0 or above. You do not need to enable this option if you are using another operating system such as NetWare, OS/2, Windows NT, or UNIX.
- ⌘ When you partition a disk larger than 1 GByte, use the MS-DOS *fdisk* utility as you normally would. Because the cylinder size increases to 8 MBytes under extended translation, the partition size you choose must be a multiple of 8 MBytes. If you request a size that is not a multiple of 8 MBytes, *fdisk* rounds up to the nearest whole multiple of 8 MBytes.
- Display <Ctrl-A> Message During BIOS Initialization--This option determines whether the **Press <Ctrl><A> for SCSISelect (TM) Utility !** message appears on your screen during system bootup.
- Multiple LUN Support--This option determines whether booting from a SCSI device that has multiple LUNs is supported.
- BIOS Support for Bootable CD-ROM--This option determines whether the host adapter BIOS provides support for booting from a CD-ROM drive. The default setting is *Enabled*.

## Using the SCSI Disk Utilities

Adaptec AIC-7890 SCSISelect(TM) Utility v2.01



Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (\*=default)



- BIOS Support for Int 13 Extensions--This option determines whether the host adapter BIOS supports disks with more than 1024 cylinders. The default setting is **Enabled**.

To access the SCSI disk utilities, select the **SCSI Disk Utilities** option from the menu that appears after starting SCISSelect. Once the option is selected, SCISSelect immediately scans the SCSI bus and display a list of all SCSI IDs and the devices assigned to each ID.

When you select a specific ID and device, a small menu appears, displaying the options Format Disk and Verify Disk Media.

- Format Disk--This utility allows you to perform a low-level format on a hard disk drive. Most SCSI disk devices are preformatted at the factory and do not need to be formatted again. The Adapter Format Disk utility is compatible with the vast majority of SCSI disk drives.
- Verify Disk Media--This utility allows you to scan the media of a hard disk driver for defects. If the utility finds bad blocks on the media, it prompts you to reassign them; if you select yes, those blocks are no longer used. You can press Esc at any time to abort the utility.







**Type (Auto/User/None):** Use the fields under the Type column to determine the method you will use to configure the IDE devices. If you choose Auto, BIOS will automatically detect and make optimal settings for most IDE hard drives.



The mainboard manufacturer recommends that you choose Auto for all drives.

Choose User to define your own drive type manually. You must enter values indicated in the table below into each drive parameter field. This information should be included in the documentation from your hard disk vendor or system manufacturer:

TYPE	Setting method
CYLS	Number of cylinders
HEAD	Number of heads
PRECOMP	Write precompensation cylinc
LANDZ	Landing zone
SECTOR	Number of sectors
MODE	Mode type

**Table 4-1 Hard Disk Drive Parameters**

**Cyls/Head/Sector:** The number of Cylinders, Heads, and Sectors can usually be found written on the top of the hard disk. If you have a relatively new hard drive, entering this information alone is usually sufficient for normal hard disk operation. The hard disk will not work properly if you enter improper information for these categories.

**Precomp:** Older hard drives (i.e., MFM or RLL drives) have the same number of sectors per track at the innermost tracks as at the outermost tracks. Thus, the data density at the innermost tracks is higher and the bits are lying closer together. Even though the physical size of a sector gets progressively smaller as the track diameter diminishes, each sector must still hold 512 bytes. Write precompensation circuitry compensates for the difference in sector size by boosting the write current for inner track sectors.

**Landz:** This defines the address of the landing zone and is only used for older hard drives which do not have an auto-parking feature.

**Mode:** If the Type value is not None for any device, you must set the Mode value for that device. There are four different Mode values: Auto, Normal, Large, and LBA.

**Auto** - BIOS detects and enters the IDE drive type during bootup.

**Normal** - for IDE drives that meet the old IDE specification which support a maximum capacity of 528MB (1024 cylinders, 16 heads, and 63 sectors).

**Large** - for IDE drives that do not support LBA and have more than 1024 cylinders. Try this setting if your hard disk does not operate properly with the LBA setting. Large mode is not supported by all operating systems, i.e., only certain versions of DOS support large mode.

**LBA** - (Large/Logical Block Addressing) With LBA, the IDE controller transforms the data address described by sector, head, and cylinder number into a physical block address, significantly improving data transfer rates. This mode is for drives with greater than 1024 cylinders and between 528MB and 8.4GB in size. This protocol is the current common standard.

Choose None for Type if there are no IDE HDD devices in your system.

- ☞ You can use the IDE HDD Auto Detection function to auto detect your hard drive parameters. Using this function will automatically insert the parameters discussed under Hard Disk Setup and will indicate User for the Field value. Please see the IDE HDD Auto Detection Section in this chapter for more information.

### **Floppy Disk Drives**

Choose the memory capacity and disk size that corresponds with that of your floppy disk drive(s). Enable the Floppy 3 Mode Support setting for Japanese 3-mode floppy drives.

### **Video**

Select the type of video adapter present in your system. You can ignore this setting if you are using a VGA monitor since VGA BIOS automatically configures this setting.

### **Halt**

When the system is powered on, BIOS performs a series of diagnostic tests called POST (Power On Self Test). This function stops the computer if BIOS detects a hardware error. You can tell BIOS to halt on all errors, no errors, or not to halt on specific errors.

## 4-2 BIOS Features Setup

By choosing the BIOS Features Setup option from the CMOS Setup Utility menu (Figure 4-1), the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.

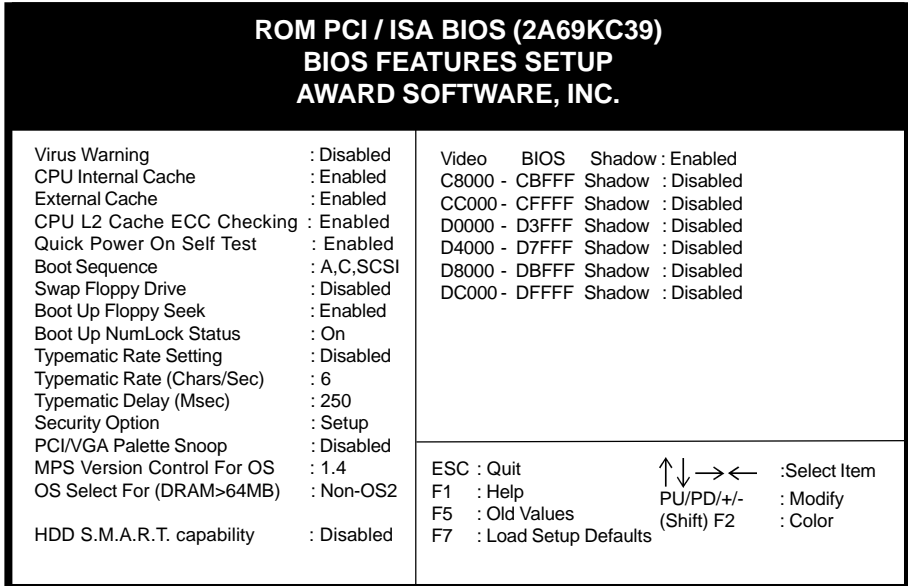


Figure 4-3 BIOS Feature Setup Screen

### A. VIRUS PROTECTION

#### Virus Warning

This is an anti-virus code incorporated in the mainboard's BIOS firmware. During the boot-up sequence, BIOS loads before loading of the partition table or boot sector. The anti-virus code loads with BIOS and is able to detect boot-up viruses before they have a chance to infect the hard drive. This function employs rule-based logic that doesn't look for specific viruses but rather detects patterns found in every virus, eliminating the need to perform periodical version updates after new viruses have been found.

### B. CACHE CONTROL

#### CPU Internal Cache/External Cache

Cache memory is much faster than conventional DRAM system memory. These fields allow you to enable or disable the CPUs Level 1 built-in cache and Level

2 external cache. Both settings are left enabled to significantly increase the performance of your computer.

### **CPU L2 Cache ECC Checking**

Enable this function to perform ECC (Error Check and Correct) on the CPU's L2 SRAM. ECC detects and corrects single-bit errors while it only detects double bit errors. Certain SDRAM modules also have ECC capability. For more information on SDRAM, see Section 2-5 in this manual. If you are using a 333MHz or higher CPU, this function must be enabled.

## **C. BOOT UP FEATURES**

After turning on the system, BIOS will perform a series of device initializations and diagnostic tests discussed below.

### **Quick Power On Self Test (POST)**

Enable this function to reduce the amount of time required to run the POST (Power On Self Test). BIOS saves time by skipping some items during POST.

### **Boot Sequence**

This option sets the sequence of drives BIOS attempts to boot from after POST completes. BIOS will search these drives for an operating system.

### **Swap Floppy Drive**

Enabling this function will swap the floppy drive assignment so that drive A will function as drive B, and drive B will function as drive A. Note that the boot sequence assignment mentioned directly above does not include booting from floppy drive B. This function is useful if floppy drives B and A are of a different format and you want to boot from floppy drive B.

### **Boot up Floppy Seek**

During POST, BIOS will determine if the installed floppy disk drive has 40 or 80 tracks. A 360K drive has 40 tracks and 720K, 1.2M and 1.44M drives have 80 tracks. All modern floppy disk drives have 80 tracks.

### **Boot Up NumLock Status**

This function defines the keyboard's numberpad as number keys or arrow keys.

## **D. KEYBOARD INTERFACE**

### **Typematic Rate Setting**

When enabled, you can set the following two typematic control items. When disabled, keystrokes are determined arbitrarily by the keyboard controller in your system.

### **Typematic Rate (Chars/Sec)**

The typematic rate sets the rate at which characters on the screen repeat when a key is pressed and held down.

### **Typematic Delay (Msec)**

The typematic delay sets how long after you press a key that a character begins repeating.

## **E. Security Option**

The Supervisor and/or User Password functions shown in Figure 4-1 must be set to take advantage of this function. See Section 4-8 for password setting information. When the Security Option is set to System, a password must be entered to boot the system or enter the BIOS setup program. When the Security Option is set to Setup, a password is required to enter the BIOS setup program.

## **F. PCI/VGA Palette Snoop**

Some non-standard VGA cards or MPEG video cards may not show colors properly. Setting this function to Enabled can correct this problem.

## **G. MPS Version Control for OS**

MPS *Multi Processor Support* let you select between 1.1 and 1.4 version controller for OS.

## **H. OS Select (For DRAM > 64MB)**

If your system's DRAM is larger than 64MB and you are running OS/2, select OS/2 as the item value. Otherwise, set the item value to Non-OS/2 for all other operating systems.

## **I. HDD S.M.A.R.T. Capability**

S.M.A.R.T. or Self-Monitoring, Analysis, and Reporting Technology enables a drive's internal status to be monitored through diagnostic commands. Both your hard drive must support this capability and this function must be enabled in order to take advantage of this function. See your hard drive literature for more information.

## **K. Shadow Memory**

Software such as system BIOS, video BIOS, SCSI BIOS, etc that resides in ROM (Read Only Memory) chips is called firmware. Shadowing of firmware occurs when BIOS is copied to RAM address C0000h through DFFFFh. Video BIOS loads into the C0000-C7FFF memory area when video shadowing is enabled. If an expansion peripheral in your system contains ROM-based firmware, you need to know the address range the ROM occupies to shadow it into the correct area of RAM.

Shadowing improves the firmware's performance because the firmware can be read by the CPU through the 16- or 32-bit DRAM bus as opposed to the 8-bit XT bus. However, shadowing also results in reducing the amount of high memory (640 KB to 1 MB) for loading device drivers. Shadowing is used mostly for ROM chips on ISA cards and not for PCI cards. Shadowing and playing games at the same time may result in system instability as some games access the RAM memory area being shadowed.



### 4-3 SeePU & Chipset Setup

By choosing the *SeePU* & Chipset Setup option from the CMOS SETUP UTILITY menu (Figure 4-1), the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.

ROM PCI / ISA BIOS (2A69KC39)			
SeePU & CHIPSET SETUP			
AWARD SOFTWARE, INC.			
SDRAM RAS-to-CAS Delay	: Auto	Spectrum Spread	: Disabled
SDRAM Precharge Control	: Disabled	Flash BIOS Protection	: Disabled
DRAM Data Integrity Mode	: Non-ECC	Hardware Reset Protect	: Disabled
System BIOS Cacheable	: Disabled	**** CPU Setup ****	
Video BIOS Cacheable	: Disabled	CPU Type	: 350MHz (100*3.5)
Video RAM Cacheable	: Disabled		
8 Bit I/O Recovery Time	: 1		
16 Bit I/O Recovery Time	: 1		
Memory Hole At 15M-16M	: Disabled		
Passive Release	: Enabled		
Delayed Transaction	: Disabled		
AGP Aperture Size (MB)	: 64		
		ESC : Quit	↑↓→← : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		F7 : Load Setup Defaults	

Figure 4-4 Chipset Features Setup Screen



With the exception of the CPU Setup, all of the above settings have been determined by the mainboard manufacturer and should not be changed unless you are absolutely sure of what you are doing. Explanation of the DRAM timing and chipset features setup is lengthy, highly technical and beyond the scope of this manual. Below are abbreviated descriptions of the functions in this setup menu. You can look on the world wide web for helpful chipset and RAM configuration information including AWARD's web site at <http://www.award.com>.

#### A. DRAM Data Integrity Mode

BIOS automatically detects the presence of ECC DIMMs (72-bit modules). However, to take advantage of ECC you must set this function at "ECC." If any non-parity DIMMs are installed, the memory operates in non-parity mode only and this function must be set at "Non-ECC."

## **B. System BIOS Cacheable**

Enabling this function allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Caching the system BIOS results in better performance than shadowing the system BIOS as discussed earlier in this chapter.

## **C. Video BIOS Cacheable**

Enabling this function allows caching of the video BIOS ROM at C0000h-C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result. Caching the video BIOS results in better performance than shadowing the video BIOS as discussed earlier in this chapter.

## **D. 8-bit I/O Recovery Time & 16-bit I/O Recovery Time**

Back-to-back CPU or PCI master originated 8-bit and 16-bit cycles have an arbitrary delay of at least 3.5 system clock cycles. This category is used to add additional recovery delay between 8-bit and between 16-bit cycles. This delay takes place because the PCI bus is much faster than the ISA bus. The options are 1 to 8 and N/A.

## **E. Memory Hole at 15M-16M**

Enabling this function will reserve the memory address space between 15MB and 16MB for ISA expansion cards. However, enabling this function will result in not allowing the system to have access to memory above 16MB. Please note that some expansion cards require this setting to be enabled.

## **F. AGP Aperture Size (MB)**

This function determines the amount of system memory that is given to the AGP card. Options range from 4MB to 256MB. This is a dynamic memory allotment in that the AGP card will only use the amount of memory that it needs. The remaining memory not in use will be available for the system to use. For example, if 16MB are allotted to the AGP card and the card only needs 8MB, the remaining 8MB will be available for system use.

## **G. Spectrum Spread**

When Enabled this function will cause lower EMI by spreading the system frequency spectrum. While this function decreases EMI, system stability may be slightly compromised. Choosing Smart Clock will turn off the AGP, PCI, and SDRAM clocks when not in use. Smart Clock does not perform a spectrum spreading function.

## H. Flash BIOS Protection

The mainboard manufacturer developed BIOS protection technology that protects the System BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS data cannot be changed when attempting to update BIOS with the the FLASH utility. When disabled, the BIOS data can be updated by using the FLASH utility.



To Pass the Windows 95 SCT testing, this item should be disabled.



Please note that when disabling this setting, the system BIOS is vulnerable by intrusion of computer viruses. It is recommended to disable this setting only temporarily while updating your system's BIOS.

## I. Hardware Reset Protect

When this function is enabled, your PC's hardware reset button will not function. This function is especially useful to prevent accidental resets for file servers and routers, etc., which should be available 24 hrs/day. When disabled, your PC's hardware reset button will function normally.

## J. CPU Setup

The mainboard manufacturer developed *SeePU* technology that allows you to easily change your CPU's **clock multiplier factor** and **CPU Bus frequency** in BIOS. Refer to Section 2-3 for details.

## 4-4 Power Management Setup

This section provides information on the Green PC power management functions. By choosing the Power Management Setup option from the CMOS Setup Utility menu (Figure 4-1), the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.

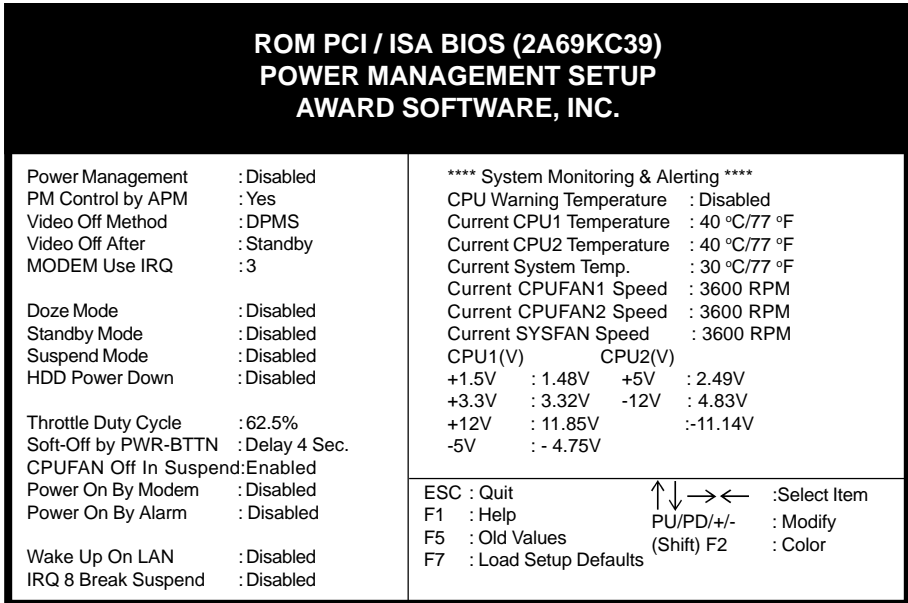


Figure 4-5 Power Management Setup Screen

### A. Power Management

Power management allows the computer to save electricity when it is not in use by entering increasingly deep power saving modes as shown by the diagram below.



Figure 4-6 Power Saving Mode Flow Chart

The computer runs in Normal operation mode until the Doze timer expires, at which point the computer enters Doze mode. If no external activity occurs, the computer will go into Standby and Suspend modes when their respective timers expire. If external activity occurs, the computer will wake up from Power Management and return to Normal mode. To activate the function, set Power

Management to Maximum Saving, User Define, or Minimum Saving described below. For a description of the power saving modes (Doze, Standby, and Suspend) see their descriptions below.

**Disabled** - Turns off the Power Management functions.

**Max. Saving** - All timers are set at the minimum value of one minute to maximize power saving.

**Min. Saving** - All timers are set at the maximum value of one hour for minimal power saving.

**User Define** - User can configure the timer to a desired time according to the values available.

- ☞ Note that enabling the Power Management function will result in enabling the HDD Power Down function (Max Saving = 15 min, Min Saving = 1 min). The HDD Power Down function is not part of the Power Management scheme as indicated in Figure 4-6. Refer to the Standby Mode, Suspend Mode, and HDD Power Down descriptions below for more information on hard drive power management.

## ***B. PM Control by APM***

This function allows software other than BIOS to control Power Management features. Enable this function in BIOS and make sure APM (Advanced Power Management) is present. For example, run the Power utility program located in the DOS directory, C:\DOS\POWER.EXE to use Power Management features under DOS. For Windows 3.1x and Windows 95, you need to install Windows with the APM feature.

## ***C. Video Off Method***

This function serves as both a screen saver and power saver for monitors. See the next function, Video Off After, for setting the video timer.

**Blank** - BIOS will only blank the monitor's screen. The electricity saved in this mode is negligible and this function is only used as a screen saver to prevent screen damage while the screen is on but not in use.

**V/H SYNC+Blank** - The system turns off the vertical and horizontal synchronization ports, writes blanks to the VGA buffer and the monitor's electron gun turns off. This function requires a monitor with Green features in order to take advantage of the power saving function. If you enable this function and do not have a Green monitor, the result will be the same as if you had selected Blank. This function serves as both a screen saver and an electricity saver.

**DPMS Supported** - Select this option if your video card supports the Display Power Management Signaling (DPMS) standard (i.e., you have a monitor that supports Green features). Use software supplied by your video subsystem to set video power management options.

#### **D. Video Off After**

This setting determines when the monitor enters power saving mode. As the function name indicates, the monitor enters the power saving mode after the chosen event expires. The Power Management function must be enabled to use this function.

#### **E. Modem Use IRQ**

If your computer has a modem, use this function to tell BIOS which IRQ is being occupied by the modem card. When the system is in Green mode, the modem requires an IRQ assignment to wake up the system and perform tasks. This assignment is compliant with the APM 1.2 specification and is to be used in coordination with APM 1.2 compliant operating systems.

#### **F. Doze Mode**

The Power Management function must not be set to disabled to enable this function. If no interrupts have occurred and the Doze timer expires, system will enter Doze mode. In Doze mode, the CPU clock runs at a lower speed while all other devices operate normally.

- ✎ Power saving modes achieved in lower power saving states will either be maintained or enter higher power saving modes when switching to higher power saving states. For example, the CPU clock will not switch back to normal in Standby mode. It will maintain a decreased rate in Standby Mode and turn off in Suspend Mode.

#### **G. Standby Mode**

The Power Management function must not be set to disabled to enable this function. If the system runs in Doze mode and the Standby timer expires, the system will enter Standby mode. In Standby mode, the hard disk drive and the monitor shut off while all other devices still operate at full speed. Note that the Video Off and HDD Power Down functions in Figure 4-5 provide the same power saving options found in Standby mode. The priority for determining which function controls power saving for the monitor and hard drive is determined by which timer expires first.

## **H. Suspend Mode**

The Power Management function must not be set to disabled to enable this function. If the system runs in Standby mode and the Suspend timer expires, all devices regulated by power management will shut off and the CPU speed will be 0 MHz.

## **I. HDD Power Down**

The Power Management function must not be set to disabled to enable this function. When the HDD idle time has elapsed, BIOS sends a command to the hard disk to turn off the motor. Set a time between 1 and 15 to indicate time required to wait before the hard drive enters a power saving mode. Some old hard drives may not support this function.

## **J. Throttle Duty Cycle**

When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

## **K. Soft-Off by PWR-BTTN**

When set to Delay 4 Sec., this function allows the power button to put the system in Suspend, a power saving mode. See Section 2-4 for operation instructions of the over-ride power button operation which puts the system in Suspend mode. When set to Instant-Off the Soft-Off by PWR-BTTN function is disabled and the computer turns completely off when the power button is pressed.

## **L. CPUFAN Off In Suspend**

When enabled, this function turns off the CPU fan when the computer is in suspend mode.

## **M. Power On By Modem**

When enabled, a modem that receives a call will wake up the system from soft off and green mode. You should connect the modem to the COM port and turn on the resume event in green mode.

## **N. Power On By Alarm**

When enabled, this setting allows the system to turn back on at a designated time of the month. User must designate date of month and time of day. This function is only available when using an ATX power supply and the Software Power-Off function to turn off the computer. See the Software Power-Off feature in Section 2-4 of this manual for instructions.

### **O. Wake Up On LAN**

Enable this selection to use the Wake Up On LAN function discussed in Section 2-4 of this manual.

### **P. IRQ8 Break Suspend**

Enabling this setting turns the monitoring of IRQ8 (the Real Time Clock) On so it does not awaken the system from Suspend mode.

### **Q. SMART (System Monitoring and Alerting) Technology**

The management extension hardware incorporates features that are compliant with Desktop Management Interface (DMI) as well as LANDesk® Client Manager software. The hardware implementation comes with the following features:

- ◆ Seven on-board voltage monitors
  - Power supply voltage monitoring +/-12V, +/-5V
  - CPU voltage monitoring +1.5V, +2.5V, +3.3V
- ◆ Two fan speed sensing and On/Off control
- ◆ System overheat monitoring and alerting
- ◆ Security switch for detecting physical intrusion, such as when the chassis lid has been removed, even when power is off.



## 4-5 PNP/PCI Configuration

This section provides IRQ and DMA setting information. By choosing the PNP/PCI Configuration option from the CMOS Setup Utility menu (Figure 4-1), the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.

ROM PCI / ISA BIOS (2A69KC39)			
PNP/PCI CONFIGURATION			
AWARD SOFTWARE, INC.			
PNP OS Installed	: No	Assign IRQ For VGA	: Enabled
Resources Controlled By	: Manual	FDD IRQ Can Be Free	: No
Reset Configuration Data	: Disabled	Assign IRQ For USB	: Enabled
IRQ-3 assigned to	: PCI/ISA PnP	Slot 1 Use IRQ No.	: Auto
IRQ-4 assigned to	: PCI/ISA PnP	Slot 2 Use IRQ No.	: Auto
IRQ-5 assigned to	: PCI/ISA PnP	Slot 3 Use IRQ No.	: Auto
IRQ-7 assigned to	: PCI/ISA PnP	Slot 4 Use IRQ No.	: Auto
IRQ-9 assigned to	: PCI/ISA PnP	Used MEM base addr	: N/A
IRQ-10 assigned to	: PCI/ISA PnP		
IRQ-11 assigned to	: PCI/ISA PnP		
IRQ-12 assigned to	: PCI/ISA PnP		
IRQ-14 assigned to	: PCI/ISA PnP		
IRQ-15 assigned to	: PCI/ISA PnP		
DMA-0 assigned to	: PCI/ISA PnP	ESC : Quit	↑ ↓ → ← : Select Item
DMA-1 assigned to	: PCI/ISA PnP	F1 : Help	PU/PD/+/- : Modify
DMA-3 assigned to	: PCI/ISA PnP	F5 : Old Values	(Shift) F2 : Color
DMA-5 assigned to	: PCI/ISA PnP	F7 : Load Setup Defaults	
DMA-6 assigned to	: PCI/ISA PnP		
DMA-7 assigned to	: PCI/ISA PnP		

Figure 4-7 PCI & ONBOARD I/O Setup Screen

### A. PNP OS Installed

If you want to install a PNP compatible OS (such as Windows 95) set to Yes.

### B. Resources Controlled By

When set to Manual the system BIOS will not refer to the ESCD for IRQ & DMA information. Instead, it will refer to the items in the setup menu for assigning IRQ & DMA. When set to Auto the system BIOS will refer to the ESCD for all legacy information.



ESCD(Extended System Configuration Data) provides a detailed format of the configuration data structures stored in flash memory. Each data structure defines the resources used by a device or a card in the system. This includes legacy and PCI/ISA PnP devices.

### **C. Reset Configuration Data**

When enabled the system BIOS will clear/reset the ESCD during POST. After clearing the ESCD, the BIOS will then change this item's value to Disabled. Otherwise, the ESCD data will become useless.

### **D. IRQ#/DMA# assign to**

When resources are controlled manually, you can assign each system interrupt & DMA channel for "Legacy ISA" or "PCI/ISA PnP" card used.

While using **Legacy ISA Card**(non-PnP ISA card), please set it's necessary corresponding resources (INT#, DMA#) from "PCI/ISA PnP" to "Legacy ISA."

- ✎ All ISA non-PnP devices are legacy devices that select resources (I/O Addr., INT# or DMA#) by using hardware jumpers.
- ✎ IRQ-3/4/7/12/14/15 have been set as default for on board devices (COM2, COM1, Printer port, PS/2 mouse, IDE1 and IDE2).

### **E. Assign IRQ For VGA**

This function allows BIOS to make an IRQ available to VGA cards. Most current VGA card models do not require this function to be enabled.

### **F. FDD IRQ Can Be Free**

This function allows user to choose if the FDD IRQ is able to be freed up. The default setting is NO and this does not allow the IRQ to be free.

### **G. Assign IRQ For USB**

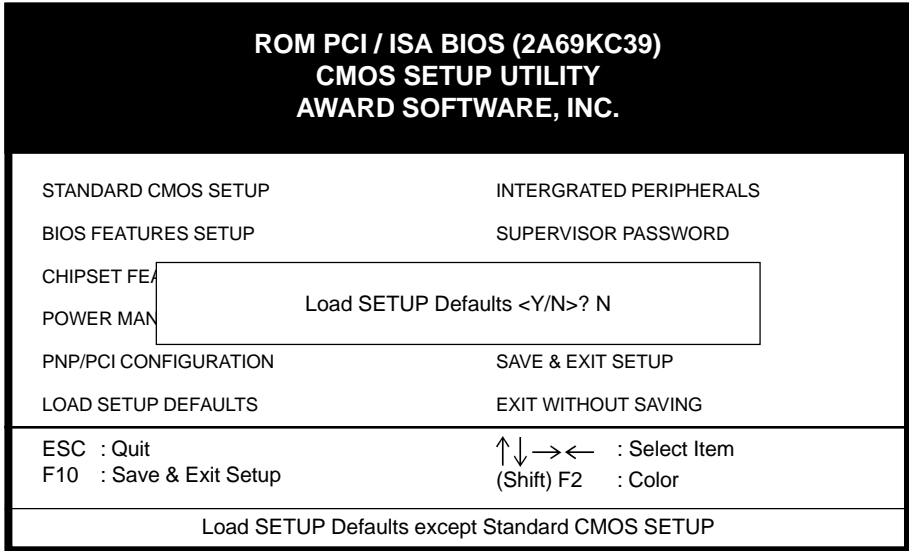
If USB is employed this function must be Enabled. Otherwise, disable this function to optimize Windows 95 IRQ resources for other IRQ usage.

### **H. Used MEM base addr**

This function devotes a space of memory (8K, 16K, 32K, 64K) for any peripheral that has a high memory requirement. This is also used to designate memory space for legacy ISA cards. The settings C800~DC00 are used to designate point at which the memory will start being used. The default setting is N/A (disabled.)

## 4-6 Load Setup Defaults

Load Setup Defaults loads the default system values directly from the CMOS Setup Utility menu (Figure4-1). If the stored record created by the setup program becomes corrupted and therefore unusable, these defaults will be loaded automatically when you turn on the computer.



**Figure 4-8 Load Setup Defaults Screen**

## 4-7 Integrated Peripherals

This section provides information on setting peripheral devices. By choosing the Integrated Peripherals option from the CMOS Setup Utility menu (Figure 4-1), the screen below is displayed. This sample screen contains the manufacturer's default values for the mainboard.

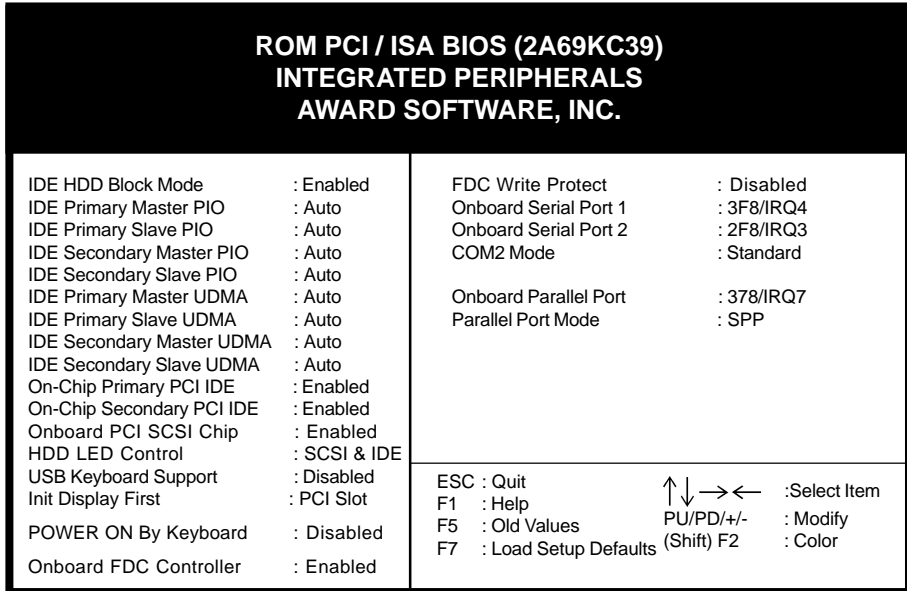


Figure 4-9 Integrated Peripherals Setup Screen

### A. On Board IDE Control

#### IDE HDD Block Mode

Specify the maximum number of sectors that can be transferred at a time.

#### IDE Primary/Secondary Master/Slave PIO

The four IDE PIO (programmed Input/Output) fields let you set a PIO mode (0-4) for each IDE device that the internal PCI IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

#### On-chip Primary/Secondary PCI IDE

You can set this to disable the On-chip IDE controller if you are going to add a higher performance IDE board.

## **B. Power On By Keyboard**

Set to Disabled to control your computer's power by the button on your system case. Set this function to Any Key to turn on the computer by touching any key on the keyboard. If you set this function to Hot Key or Password you must designate the keystrokes that will turn on the computer. Note that the power button is always able to turn on the computer regardless of how this function is set. Be sure to set Jumper 1 as discussed in Section 2-4 of this manual to enable this function.

If you have forgotten your password, you must remove the power cable from the ATX power supply connector and clear the CMOS data as discussed in Section 2-4 to clear the password.

## **C. HDD LED Control**

Set this function to SCSI & IDE to make the hard disk drive light on the chassis flash when both SCSI and IDE devices are in use. If the system has no SCSI device set this item to HDD only to specify that the HDD LED is used by IDE device. Be sure to connect the IDE/SCSI activity wire from the chassis to the front panel connector set on the mainboard to enable this function.

## **D. COM2 Mode**

When this function is Enabled, then the COM port will be redirected to support IR function.

## **E. USB Keyboard Support**

If your current operating system doesn't support USB drivers (i.e., DOS) this function must be enabled for USB keyboard operation in these operating systems.

☞ When using a USB keyboard this function is automatically Enabled during bootup regardless of its setting in BIOS.

## **G. Init Display First**

This function allows user to choose between AGP slot or VGA slot to initialise Display first .

## 4-8 Supervisor Password & User Password Setting

There are four different variables that control password settings. The first two are located under the Security Option function in BIOS Features Setup Menu (Figure 4-3). When the Security Option function is set to Setup, a password is required to enter BIOS and change BIOS settings. When the Security Option function is set to System, a password is required to enter both BIOS and the the computer's operating system (for example Windows 95) found on the boot drive. This is shown in Figures 4-10 and 4-11.

The third and fourth variables are user password and supervisor password selected in BIOS (Figure 4-1). The main purpose of separating user and supervisor is to allow only the supervisor to have control over the settings in BIOS. The user, on the other hand, is only allowed to access the computer's operating system and change the user password in BIOS (See Figure 4-11 below). Note that when there is no supervisor password set, the user password controls access to all BIOS settings (See Figure 4-10 below).

### A. Set Either Supervisor Password or User Password

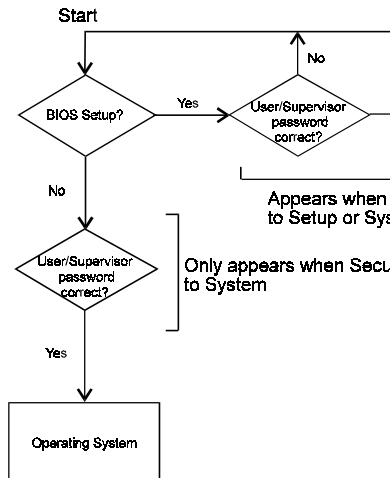


Figure 4-10 Set Either Supervisor or User Password

## B. Set Both Supervisor Password and User Password

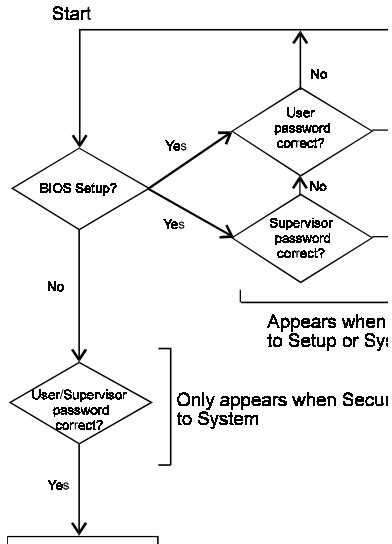


Figure 4-11 Set Both Supervisor and User Password

## 4-9 IDE HDD Auto Detection

This utility can automatically detect IDE hard disk type and parameters. The detection process take about 5 seconds for each physical drive. After the utility detects the disk drive, type Y and press [Enter] to automatically load the parameters in the Hard Disk section of the Standard CMOS Setup menu. Otherwise, leave the option set at N and press [Enter] or the [Esc] key to skip the detected drive. After detecting your hard drive(s), return to the Standard CMOS menu to check your settings.

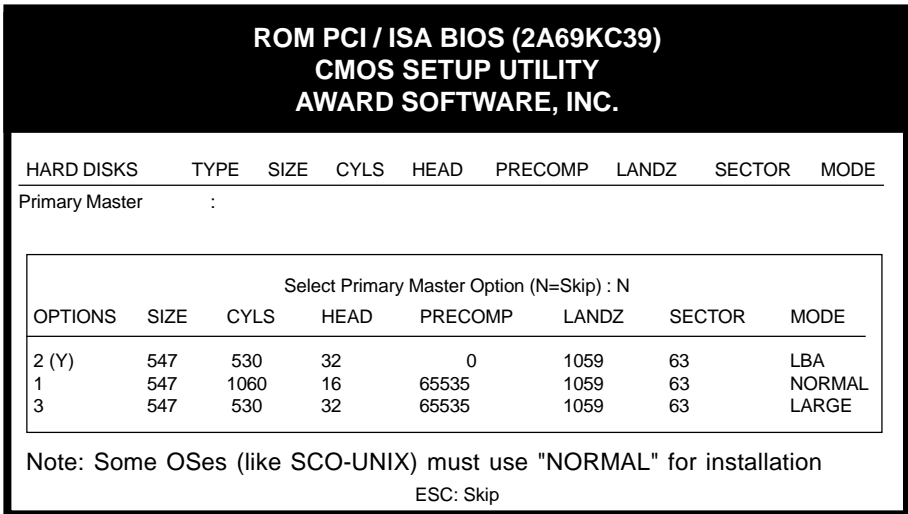


Figure 4-12 IDE HDD Auto Detection Screen

## 4-10 Save and Exit Setup

If you select this and type Y (for yes) followed by the [Enter] key, the values entered in the setup utilities will be recorded in the CMOS memory of the BIOS chip.

## 4-11 Exit Without Saving

Selecting this option and pressing Y followed by the [Enter] key lets you exit the Setup program without recording any new values or changing old values.



## Chapter 5

### Brief Software Driver Guide

The Mainboard Software Guide is found on the CD-ROM that is enclosed with your mainboard and is a PDF file which must be viewed with Adobe's freeware called Acrobat® Reader. The Acrobat Reader software is also included on the same CD-ROM. See the Readme.txt file in the CD-ROM's root directory for installation instructions of the Acrobat Reader. The Mainboard software guide discusses the following items:

The following items are discussed in the PDF files:

- Bus Master/PIO IDE Driver Installation
- USB Driver Installation
- Removing the Exclamation and/or Question Marks From the Windows 95 Device Manager Menu
- Updating Your System BIOS
- Installing and Using a Desktop Management Interface (DMI) Utility



# *Memo*

# Appendix I

## On Board I/O Addresses & IRQ Maps

System Resource	IRQ	I/O Address
1. Timer	IRQ0	040, 043
2. Keyboard	IRQ1	060, 064
3. Programmable INT	IRQ2	0020, 0021, 00A0, 00A1
4. COM2(B)	IRQ3	2F8, 2FF
5. COM1(A)	IRQ4	3F8, 3FF
6. Floppy	IRQ6	3F0, 3F7
7. LPT1	IRQ7	378, 37F
8. Real Time Clock	IRQ8	070, 071
9. PS/2 Mouse	IRQ12	060, 064
10.Math coprocessor	IRQ13	0F0, 0FF
11.IDE 1	IRQ14	1F0, 1F7
12.IDE 2	IRQ15	170, 177

⚠ IRQ 5, 9, 10 and 11 are available for interface cards.



# *Memo*

# Appendix II

## Quick Connector and Jumper Reference

**CN1:** WOL (Wake-on-LAN) connector

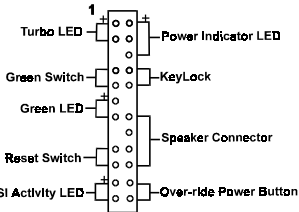


**CN2:** Creative's SB-Link connector links AWE64D with PCI Bus Mastering

**CN3:** Infrared connector



**CN13:** Front panel connector set



**FAN1/FAN2/FAN3:** System/CPU#2 /CPU#1 cooling fan connector



**JP2:** Clear CMOS data jumper

- 1~2 : Normal (default)
- 2~3 : Clear CMOS data

**JP3:** Power failure recovery jumper

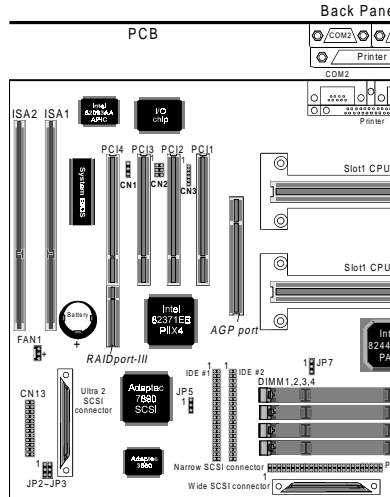
- 1~2 : Disabled (default)
- 2~3 : Enabled

**JP5:** On-board SCSI jumper

- 1~2 : Enabled (default)
- 2~3 : Disabled

**JP6:** Power on by keyboard

- 1~2 : Disabled
- 2~3 : Enabled



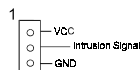
**SeePU** (Jumper free CPU installation) setting table

CPU Type	CPU Spec	
	External Clock	Frequency Ratio
Pentium II processor	66	3.5
		4
		4.5
		5
	100	3.5
		4.5

**JP7:** External clock frequency jumper

- 1~2 : External clock determined by CPU (default)
- 2~3 : External clock is always 66MHz
- open : External clock is always 100MHz

**JP8:** Chassis intrusion monitoring connector





# *Memo*