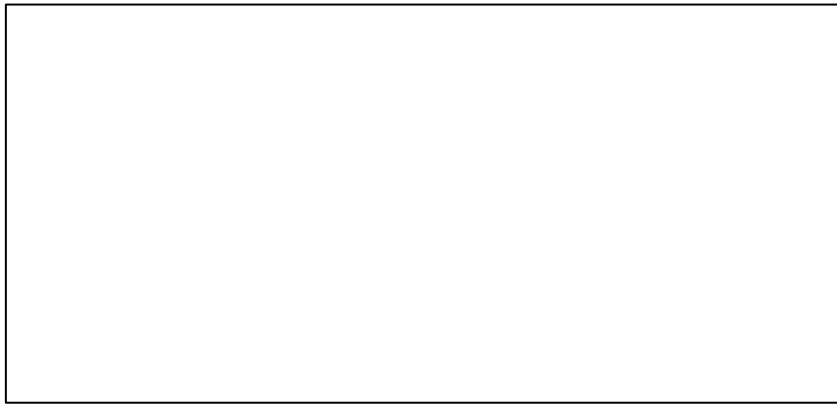

Jan 30, 2005

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1. Introduction

Thanks for choosing JUKI-6770 PENTIUM-M Single Board Computer. The JUKI-6770 board is a PCISA form factor board equipped with high performance processor and multi-mode I/O. It is designed for system manufacturers, integrators, or VARs that want to provide all the performance, reliability, and quality at a reasonable price.

In addition, the JUKI-6770 has a build-in AGP4X VGA(Intel 852GM)with 3D graphics capabilities to provide up to 2048x1536x16 color resolution. The onboard VGA shares 8MB system DDR-SDRAM .

An advanced high performance super AT I/O chip – Winbond W83627HF is used in the JUKI-6770 board. Both on-chip UARTs are compatible with the NS16C550. The parallel port and IDE interface are compatible with IBM PC/AT architecture.

The JUKI-6770 has a built-in(ICH4) 10/100 Fast Ethernet LAN port. It is fully integrated 10BASE-T/100BASE-TX LAN solution with high performance networking functions and low power features.

The JUKI-6770 uses the advanced Intel 852GM chipset which is 100% software compatible chipset with PCI 2.1 standard.

Please be noticed that JUKI-6770 can't support the 4th PCI slot.

1.1 Specifications

CPU	• Intel Pentium-M/Celeron-M Processor • Supports 400/533(optional) MHz FSB
Bus interface	PCI/ISA
Bus speed	ISA: 8MHZ, PCI: 33MHz,
DMA channels	7
Interrupt levels	15
Chipset	INTEL 852GM (GMCH)/855GME(optional)
Real-time clock	INTEL 82801DB(ICH4)
System memory	• One 184-pin DIMM socket • Support DDR 200/266/333(855GME) SDRAM • Maximum memory is up to 1GB
ATA/100 IDE interface	• Up to four PCI enhanced IDE hard drives • Can handle data transfer up to 100MB/s • Compatible with existing ATA IDE specifications • There is no need to do any changes for users' current accessories
Floppy disk drive interface	Supports up to two floppy disk drives, 5.25"(360KB and 1.2MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB)
Serial ports	• COM1(RS-232) & COM2(RS-232/RS422/RS485) with 16C550 UART (or compatible) with 16-byte FIFO buffer • Support up to 115.2Kbps • Ports can be individually configured to COM1, COM2 or disabled
Bi-directional Parallel port	Configurable to LPT or disabled. Supports EPP/ECP/SPP
Hardware monitor	Built-in to monitor power supply voltage and fan speed status

IrDA port	Supports Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface
USB port	Supports 5 USB2.0/1.1 ports for future expansion
Watch-dog timer	● Software programmable reset generated when CPU does not periodically trigger the timer ● The BIOS INT15 can be used to control the watchdog and generate the system reset
VGA controller	● i852GM integrated graphic engine ● Share system DDR SDRAM 8M ● Screen Resolution: up to 2048x1536x16
Ethernet	● ICH4 Fast Ethernet controllers with IEEE 802.3u Auto-Negotiation support for 10BASE-T/100BASE-TX standard ● One RJ45 connector is located on the mounting bracket for easy connection ● (The other RJ45 connector is optional)
Keyboard and PS/2 mouse connector	● A 6-pin mini-DIN connector is located on the mounting bracket for easy connection to a keyboard or PS/2 mouse ● For alternative application, a keyboard use pin header connector are also available on board
Digital input/output	● Provides 4-bit digital input and 4-bit digital output (+5V level)
Audio	AC'97 Audio CODEC
Compact flash	Can be used with a passive adapter (True IDE Mode) in a Type I/II Socket.
Power consumption	(PENTIUM-M : 1.7GHz, 1GB DDR-266 SDRAM) +5V @ 3.3 A ,+12V @ 1.7 A . Recommended : 250-watt power supply or higher

Operating temperature	0° ~ 60° C (*CPU needs cooler & silicone heat sink paste*)

WARNING ! 1. Never run the processor without the heat sink (cooler)properly and firmly attached.

1.2 Package Contents

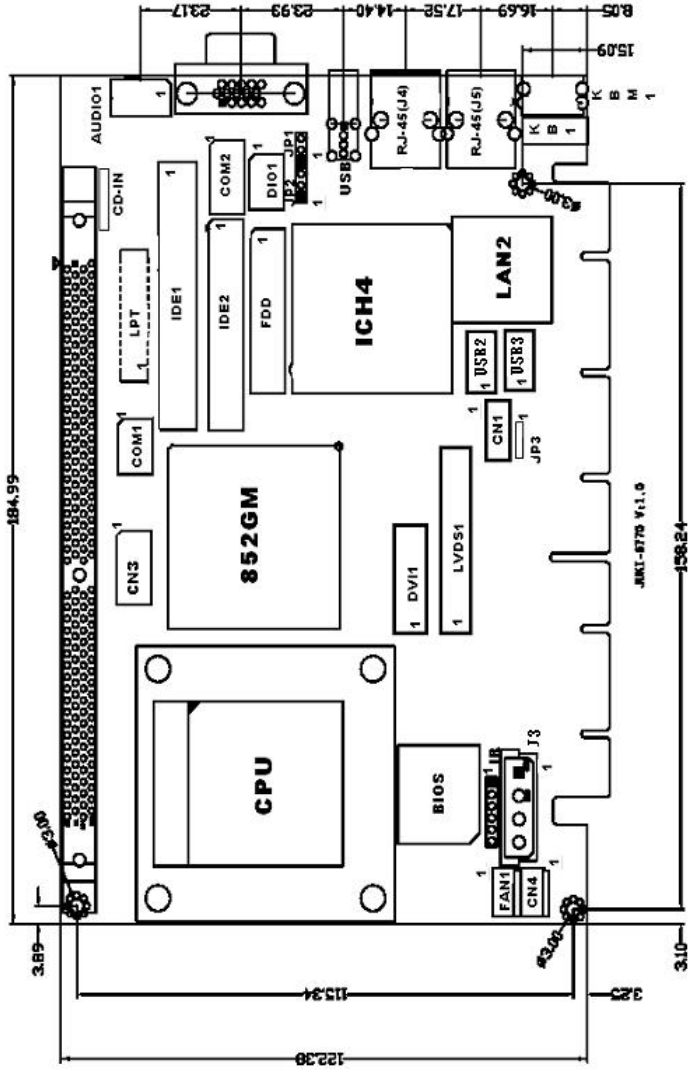
- One JUKI-6770 Single Board Computer
- One ATA/100 IDE cable & One 44P IDE cable
- One RS-232 and Printer Cable & One RS232/422/485 Cable with bracket
- One USB cable
- One FDD cable
- One LPT cable
- One Audio cable
- One PS/2 Y splitter cables for keyboard and mouse connection
- One user's manual
- One driver CD-ROM

If any of these items is missing or damaged, contact the dealer from whom you purchased this product. Save the shipping materials and carton in case you want to ship or store the product in the future.

2. Installation

This chapter describes how to install the JUKI-6770. At first, the layout of JUKI-6770 is shown, and the unpacking information that you should be careful is described. The jumpers and switches setting for the JUKI-6770's configuration are also included.

2.1 Layout



PS. Those components about LAN2 and DVI are optional.

2.2 Unpacking Precautions

Some components on JUKI-6770 SBC are very sensitive to static electric charges and can be damaged by a sudden rush of power. To protect it from unintended damage, be sure to follow these precautions:

- ✓ Ground yourself to remove any static charge before touching JUKI-6770 SBC. You can do it by using a grounded wrist strap at all times or by frequently touching any conducting materials that is connected to the ground.
- ✓ Handle the JUKI-6770 SBC by its edges. Don't touch IC chips, leads or circuitry if not necessary.
- ✓ Do not plug any connector or jumper while the power is on.

Table of Jumpers

LABEL	FUNCTION
JP1	CMOS state setting
JP2	CompactFlash Master(1-2)/Slave(2-3) setting
JP3	LVDS LCD power source 3.3V(1-2)/5v(2-3) setting

2.3 Clear CMOS Setup

If the user wants to clear the CMOS setup , the user should close the JP1 (2-3) about 3 seconds, then open it again. Set back to normal operation mode, open JP1.

- **JP1 : Clear CMOS Setup**

JP1	DESCRIPTION
1-2	**Normal Operation**
2-3	Clear CMOS Setup

WARNING !
When you change power between ATX to AT, be sure to clear CMOS(Power ON) first .Otherwise, the CPU Board may fail to Boot up.

2.4 CompactFlash Master/Slave Mode Setting

JP2 : Master/Salve Mode Setting

JP2	DESCRIPTION
1-2	**Master**
2-3	Slave

2.5 LVDS Voltage Mode Setting

JP3 : 3.3V/5V Mode Setting

JP3	DESCRIPTION
1-2	**3.3V**
2-3	5V

3. Connection

This chapter describes how to connect peripherals, switches and indicators to the JUKI-6770 board.

Table of Connectors

Label	Function
IDE1	Ultra ATA100 Primary (40 Pin)
IDE2	Secondary IDE connectors (44 PIN)
FDD1	Floppy connector
LPT1	Parallel port connector
DIO1	Digital I/O
COM1	Serial port connector(10 Pin)
COM2	RS-232/422/485 connector(14 PIN)
J1	Compact Flash Storage Card Type II connector
IR1	IRDA infrared interface port
USB1	USB port connector
USB2	USB dual port connector
USB3	USB dual port connector
J4	LAN1 RJ45 (10/100) connectors
J5	LAN2 RJ45(10/100/1000(optional)) connectors
KBM1	6-pin Mini-Din Keyboard & Mouse connector
KB1	External 5-pin Header Keyboard Connector
FAN1	FAN connector
CN3	External switches and indicators
CD-IN	Audio CD IN connector
CN4	Backplane to CPU board ATX power control Connector
DVI	DVI DISPLAY(Optional)
LVDS1	LVDS1 CONNECTOR
CN1	Backlight Inverter Connector

3.1 Floppy Disk Drive Connector

The JUKI-6770 board is equipped with a 34-pin daisy-chain drive connector cable.

• FDD1 : FDC Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	N/C	6	N/C
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE GATE#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	N/C	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT#
33	N/C	34	DISK CHANGE#

3.2 PCI E-IDE Disk Drive Connector

You can attach four IDE(Integrated Device Electronics) hard disk drives on two channels. These connectors support Ultra-DMA100 IDE devices. Non-DMA100 devices are suggested to be connecting to the secondary IDE connector.

IDE 1 : Primary IDE Connector
IDE 2 : Secondary IDE Connector

• IDE1 Interface Connector(2.54mm Pitch)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11

11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE – DEFAULT
29	N/C	30	GROUND – DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

- **IDE2 Interface Connector (2.0mm Pitch)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	N/C	28	BALE – DEFAULT
29	N/C	30	GROUND – DEFAULT
31	INTERRUPT	32	IOCS16#-DEFAULT
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	VCC	42	VCC
43	GROUND	44	N/C

3.3 Parallel Port

This port is usually connected to a printer. The JUKI-6770 includes an on-board parallel port accessed through

a 26-pin flat-cable connector.

- **LPT1 : Parallel Port Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE#	14	AUTO FORM FEED #
2	DATA 0	15	ERROR#
3	DATA 1	16	INITIALIZE
4	DATA 2	17	PRINTER SELECT LN#
5	DATA 3	18	GROUND
6	DATA 4	19	GROUND
7	DATA 5	20	GROUND
8	DATA 6	21	GROUND
9	DATA 7	22	GROUND
10	ACKNOWLEDGE	23	GROUND
11	BUSY	24	GROUND
12	PAPER EMPTY	26	GROUND
13	PRINTER SELECT	26	GROUND

3.4 Serial Ports

The JUKI-6770 offers two high-speed NS16C550 compatible UART.

COM1 : 10-pin header onboard
COM2 : 14-pin header onboard

Connector	Ports	Address	Interrupt
COM1	COM1	3F8	IRQ4
COM2	COM2	2F8	IRQ3

- **Serial Port 10(14)-pin Connector**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD)	2	DATA SET READY (DSR)
3	RECEIVE DATA (RXD)	4	REQUEST TO SEND (RTS)
5	TRANSMIT DATA (TXD)	6	CLEAR TO SEND (CTS)
7	DATA TERMINAL READY (DTR)	8	RING INDICATOR (RI)
9	GROUND	10	NC
(11)	RS-422 TX+ RS-485 Data+	(12)	RS-422 TX- RS-485 Data-

(13)	RS-422 RX+	(14)	RS-422 RX-

3.5 Keyboard & PS/2 Mouse Connector

A 6-pin mini DIN connector is located on the mounting bracket for easy connection to a keyboard or a PS/2 mouse. The card comes with a PS/2 Y splitter cables for keyboard and mouse connection.

• KBM1 : 6-pin Mini-DIN Keyboard Connector

PIN NO.	DESCRIPTION
1	KEYBOARD DATA
2	MOUSE DATA
3	GROUND
4	+5V
5	KEYBOARD CLOCK
6	MOUSE CLOCK

For alternative application, a keyboard and a PS/2 mouse pin header connectors are also available on board.

• KB1 : 5-pin Header Keyboard Connector

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	+5V

3.6 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling the CPU board. All the functions are in the CN3 connector.

CN3 : External Switches and Indicators

	PIN	DESCRIPTION	PIN	DESCRIPTION	
Power LED	1	+5V	2	Speaker +	Speaker
	3	GND	4	N/C	
ATX POWER BUTTON	5	BUTTON PIN1	6	N/C	
	7	BUTTON PIN2	8	Speaker -	

HDD LED	9	HDD LED +	10	Reset PIN1	Reset Button
	11	HDD LED -	12	Reset PIN2	

3.7 PS-ON Connector

- **CN4 : Backplane to CPU board Connector**

PIN NO.	DESCRIPTION
1	GND
2	ATX-ON
3	5VSB

Power source from Backplane with ATX Connector (Through Power Button & +5VSB)

3.8 USB Port Connector

The JUKI-6770 provides 2 built-in USB2.0 ports for the future I/O bus expansion.

USB2&USB3			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	VCC	2	GROUND
3	DATA0-	4	DATA1+
5	DATA0+	6	DATA1-
7	GROUND	8	VCC

3.9 IrDA Infrared Interface Port

The JUKI-6770 has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. If you want to use the IrDA port, you have to configure SIR or ASKIR model in the BIOS under Peripheral Setup COM2. Then the normal RS-232 COM 2 will be disabled.

- **IR1: IrDA connector**

PIN NO.	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	Ground
5	IR-TX
6	NC

3.10 Fan Connectors (FAN1)

The JUKI-6770 provides two CPU cooling fan connectors, These connectors can supply 12V/500mA to the cooling fan. All connectors have the same pin assignments and provide a "rotation" pin to get rotation signals from fans and notice the system. So the system BIOS can recognize the fan speed. Please note that only specified fan can issue the rotation signals.

- **Fan Connector**

PIN NO.	DESCRIPTION
1	GROUND
2	+12V
3	Rotation Signal

3.11 AUDIO Connector

The JUKI-6770 has a built-in AC'97 AUDIO CODEC connector directly connects to the pin-header (AUDIO1).

AUDIO1			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPEAK(L)	2	SPEEAK(R)
3	GND	4	GND
5	LINE_OUT(L)	6	LINE_OUT(R)
7	LINEIN(L)	8	LINEIN(R)
9	GND	10	GND
11	MIC	12	GND

CDIN1 : CD-IN

PIN NO.	DESCRIPTION
1	CD LEFT SIGNAL
2	GROUND
3	GROUND
4	CD RIGHT SIGNAL

3.12 External Power Connector (J3)

The JUKI-6770 has an onboard external power connector J3. You

can apply power directly to the CPU board.

- **J3:External Power Connector**

PIN NO.	DESCRIPTION
1	+5V
2	GROUND
3	GROUND
4	+12V

3.13 Digital I/O Connector

One characteristic of digital circuit is its fast response to high or low signal. This kind of response is highly needed for harsh and critical industrial operating environment. That' s why we design 4-bit digital inputs and 4-bit digital outputs on the JUKI-6770 Digital Input and Output, generally, are control signals. You can use these signals to control external devices that needs On/Off circuit or TTL devices.

- DIO1: Digital I/O

DIO1			
PIN NO.	**DESCRIPTION**	**PIN NO.**	**DESCRIPTION**
1	GND	2	+5V
3	OUT0	4	OUT1
5	OUT2	6	OUT3
7	IN0	8	IN1
9	IN2	10	IN3

3.14 DVI (Optional)

The JUKI-6770 provides DVI interface for your DVI display.

- **DVI1 : DVI Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DATA2-	14	Vcc
2	DATA2+	15	GND
3	GND	16	HP_DET
4	NC	17	DATA0-
5	NC	18	DATA0+
6	DDCCLK	19	GND
7	DDCDATA	20	NC

8	NC	21	NC
9	DATA1-	22	GND-
10	DATA1+	23	CLK+
11	GND	24	CLK-
12	NC	25	GND
13	NC		

3.15 LVDS1 CONNECTOR

- LVDS1 **: LVDS Connector**

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	16	LVDSB Y3-
2	GND	17	LVDSB CLK+
3	LVDS Y3+	18	LVDSB CLK-
4	LVDS Y3-	19	LVDSB Y2+
5	LVDS CLK+	20	LVDSB Y2-
6	LVDS CLK-	21	LVDSB Y1+
7	LVDS Y2+	22	LVDSB Y1-
8	LVDS Y2-	23	LVDSB Y0+
9	LVDS Y1+	24	LVDSB Y0-
10	LVDS Y1-	25	GND
11	LVDS Y0+	26	GND
12	LVDS Y0-	27	VCC LCD
13	GND	28	VCC LCD
14	GND	29	VCC LCD
15	LVDSB Y3+	30	VCC LCD

3.16 Compact Flash Storage Card Socket (J1)

The JUKI-6770 configures Compact Flash Storage Card in IDE Mode. This type II Socket is compatible with IBM Micro Drive.

- **J1 : Compact Flash Storage Card Socket pin assignment**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	PULL DOWN
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15

7	CS1#	32	CS3#
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC
12	N/C	37	IRQ15
13	VCC	38	VCC
14	N/C	39	MASTER/SLAVE
15	N/C	40	N/C
16	N/C	41	RESET#
17	N/C	42	IORDY
18	A2	43	N/C
19	A1	44	VCC
20	A0	45	ACTIVE#
21	D0	46	PDIAG#
22	D1	47	D8
23	D2	48	D9
24	N/C	49	D10
25	PULL DOWN	50	GROUND

3.17 Backlight inverter Connector

CN1: backlight inverter connector

PIN NO.	DESCRIPTION
1	NC
2	GROUND
3	BKL POWER
4	GROUND
5	VCC

4. AMI BIOS SETUP

4.1 Introduction

This manual discusses AMI's Setup program built into the ROM BIOS. The Setup program allows users to modify the basic system configuration. This special information is then stored in battery-backed RAM so that it retains the Setup information when the power is turned off.

4.2 Starting Setup

The AMI BIOS is immediately activated when you first power on the computer.The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Del> immediately after switching the system on, or
2. by pressing the <Del>key when the following message appears briefly at the bottom of the screen during the POST. **Press DEL to enter SETUP.**

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to...

4.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item in the left hand
Right arrow	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

4.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the **F1** key again.

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AMI BIOS supports an override to the CMOS settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid

making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

4.5 BIOS MENU BAR

The **menu bar** on top of the screen has the following main items:

Main For changing the basic system configuration.

Advanced For changing the advanced system settings.

PCI PnP This entry appears if your system supports PnP / PCI.

Boot For changing the system boot configuration.

Security Use this menu to set User and Supervisor Passwords.

Chipset For changing the chipset setting.

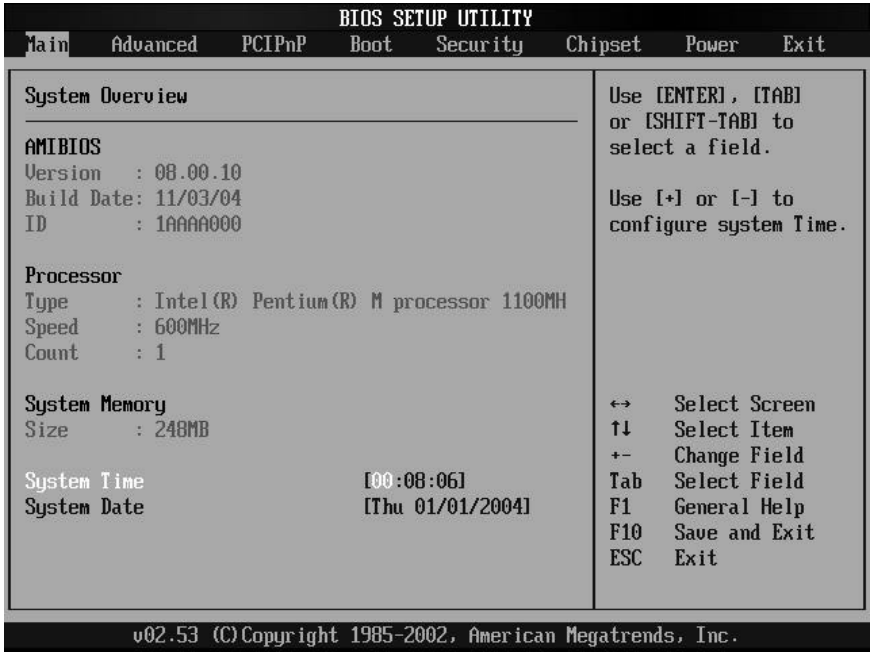
Power For changing the advanced power management configuration.

Exit For selecting the exit options and loading default settings.

4.6 Main

When you enter the BIOS Setup program, the Main menu screen

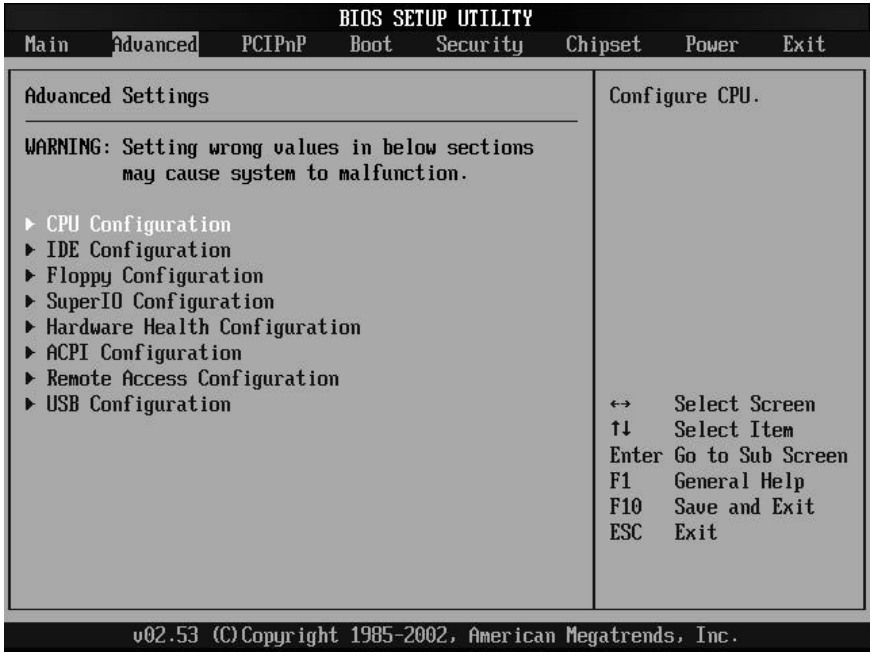
appears giving you an overview of the basic system information.



AMI BIOS This item displays the auto-detected BIOS information.
Processor This item displays the auto-detected CPU specification.
System Memory This item displays the auto-detected system memory.
System Time [xx:xx:xx] This item allows you to set the system time.
System Date [Day xx/xx/xxxx] This item allows you to set the system date.

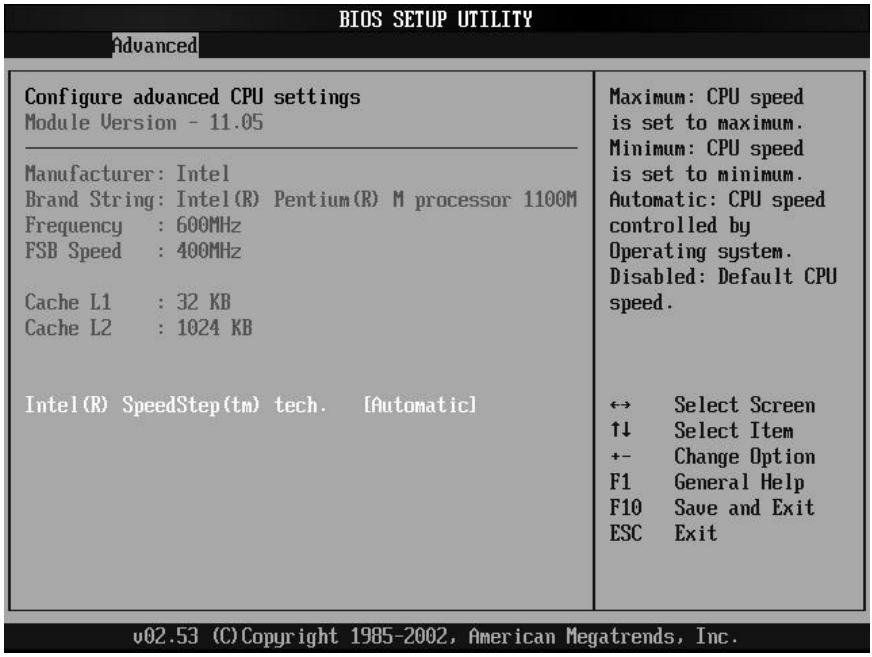
4.7 Advanced

The Advanced menu items allow you to change the settings for the CPU and other system devices



4.7.1 CPU Configuration

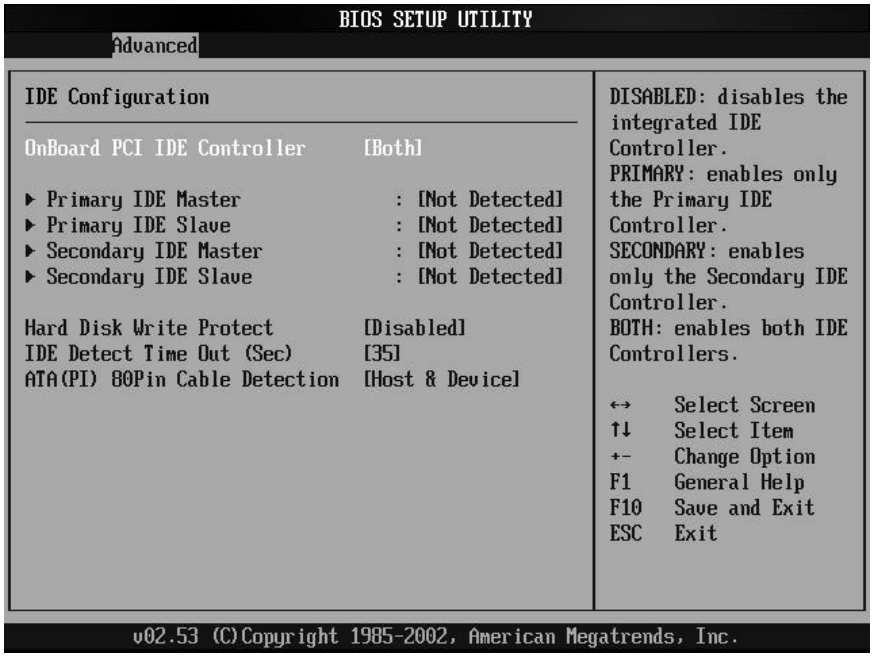
The items in this menu show the CPU-related information auto-detected by BIOS.



Intel® SpeedStep™ tech. [Automatic]
This item allows you to Select disable the processor Hyper-Threading Technology.
Configuration options: [Maximum Speed] [Minimum Speed] [Automatic] [Disabled]

4.7.2 IDE Configuration

The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press Enter if you wish to configure the item



Onboard PCI IDE Controller：[Both]

Configuration options: [Disable] [Primary] [Secondary] [Both]

Primary and Secondary IDE Master/Slave

The values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring) are auto-detected by BIOS and are not user-configurable. These items show N/A if no IDE device is installed in the system.

Type [Auto]

Selects the type of IDE drive. Setting to Auto allows automatic selection of the appropriate IDE device type. Select CDROM if you are specifically configuring a CD-ROM drive. Select ARMD (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.

Configuration options: [Not Installed] [Auto] [CDROM] [ARMD].

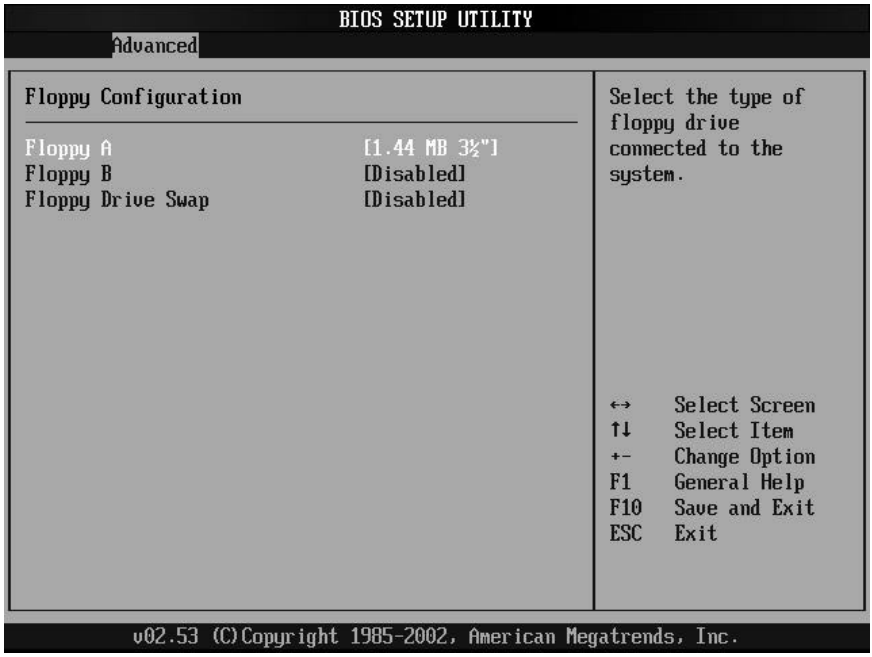
LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to Auto enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled.

Configuration options: [Disabled] [Auto]

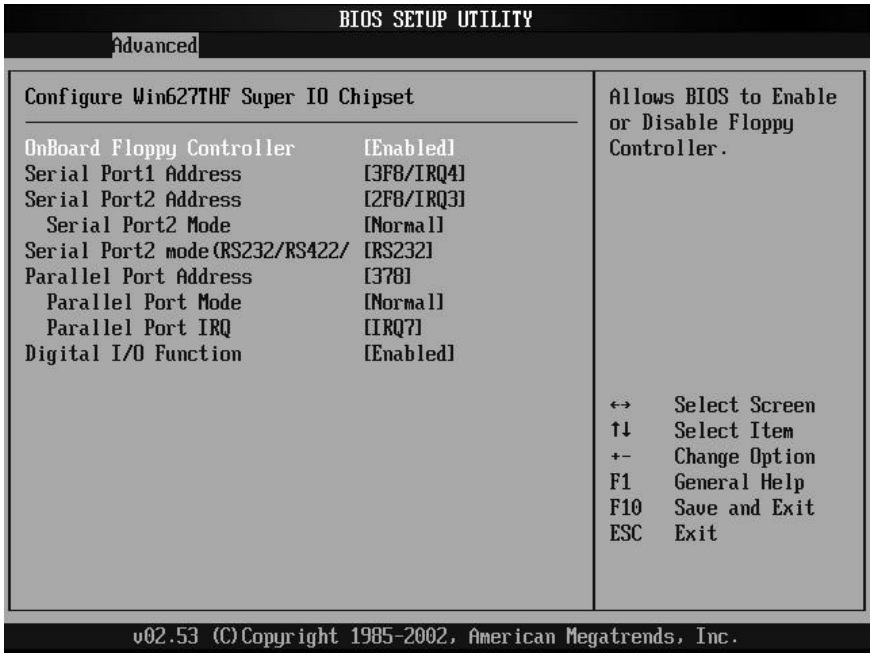
Block (Multi-sector Transfer) [Auto]
Enables or disables data multi-sectors transfers. When set to Auto, the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to Disabled, the data transfer from and to the device occurs one sector at a time.
Configuration options: [Disabled] [Auto]
PIO Mode [Auto]
Selects the PIO mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]
SMART Monitoring [Auto]
Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]
32Bit Data Transfer [Disabled]
Enables or disables 32-bit data transfer.
Configuration options:[Disabled] [Enabled]
Hard Disk Write Protect：[Disabled]
Configuration options: [Disable] [Enabled]
IDE Detect Time Out (Sec)：[35]
Configuration options: [0] [5][10][15][20][25][30][35]
ATA(PI) 80Pin Cable Detection：[Host & Device]
Configuration options: [Host & Device][Host][Device]

4.7.3 Floppy Configuration



Sets the type of floppy drive installed.
Configuration options: [Disabled][360K, 5.25 in.][1.2M , 5.25 in.][720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M,3.5in.]
Floppy Device Swap：[Disabled]
Configuration options: [Disabled][Enabled]

4.7.4 SuperIO Configuration



On Board Floppy Controller [Enabled]
Allows you to enable or disable the floppy disk controller.
Configuration options: [Disabled] [Enabled]
S**erial Port1 Address [3F8 / IRQ4]**
Allows you to select the Serial Port1 base address.
Configuration options: [Disabled] [3F8/IRQ4] [3E8/IRQ4] [2E8/IRQ3]
Serial Port2 Address [2F8 / IRQ3]
Allows you to select the Serial Port2 base address.
Configuration options: [Disabled] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]
Serial Port2 Mode [Normal]
Configuration options: [Normal] [IrDA] [ASK IR]
Serial Port2 Mode(RS232 / 422 / 485) [RS232]
Configuration options: [RS232] [RS422] [RS485]
Parallel Port Address [378]
Allows you to select the Parallel Port base addresses.
Configuration options: [Disabled] [378] [278] [3BC]
Parallel Port Mode [Normal]
Allows you to select the Parallel Port mode.

Configuration options: [Normal] [Bi-directional] [EPP] [ECP]

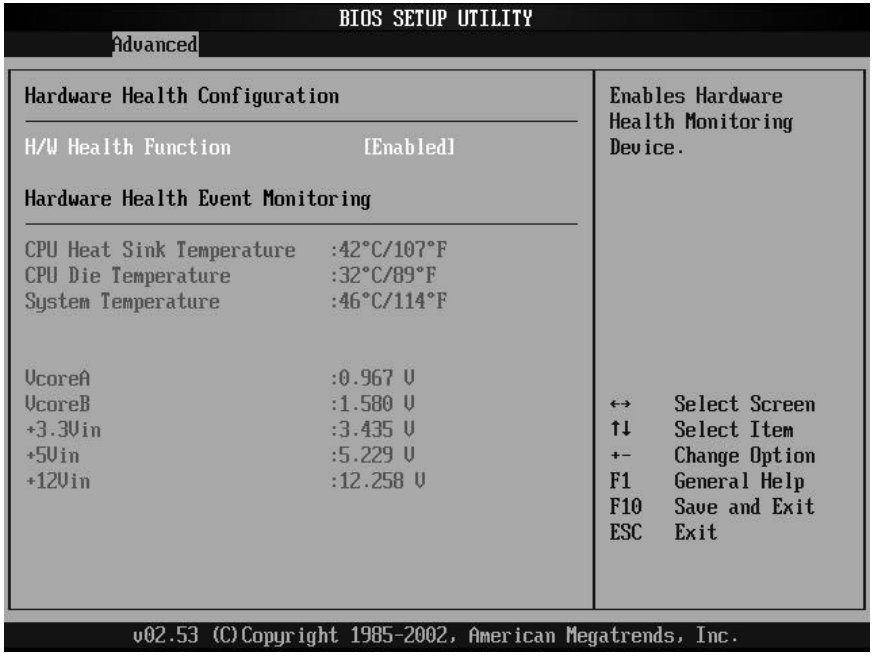
Parallel Port IRQ [IRQ7]

Configuration options: [IRQ5] [IRQ7]

Digital I/O Function [Enabled]

Configuration options: [Disabled] [Enabled]

4.7.5 Hardware Health Configuration



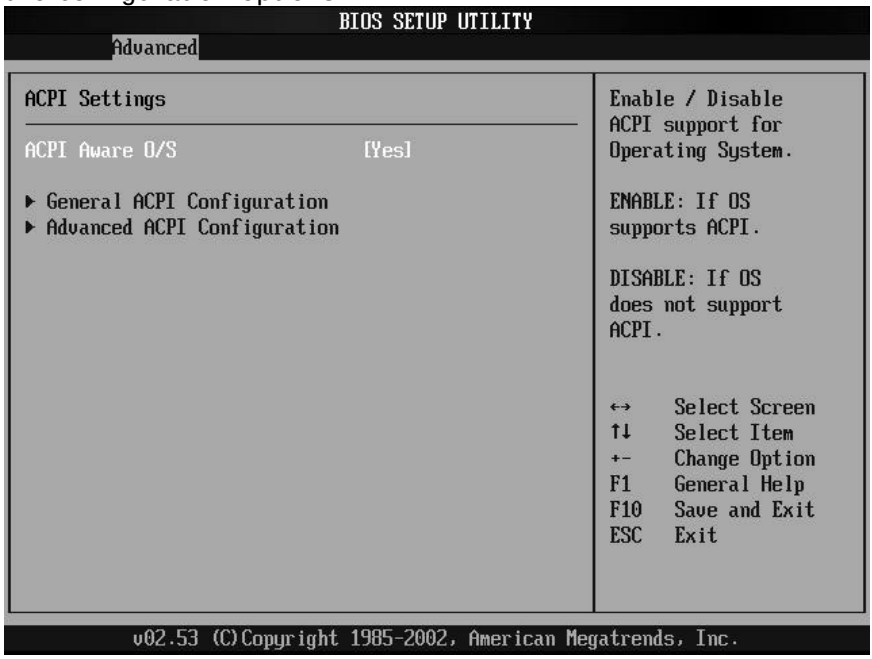
H/W Health Function [Enabled]

Configuration options: [Disabled] [Enabled]

4.7.6 ACPI Configuration

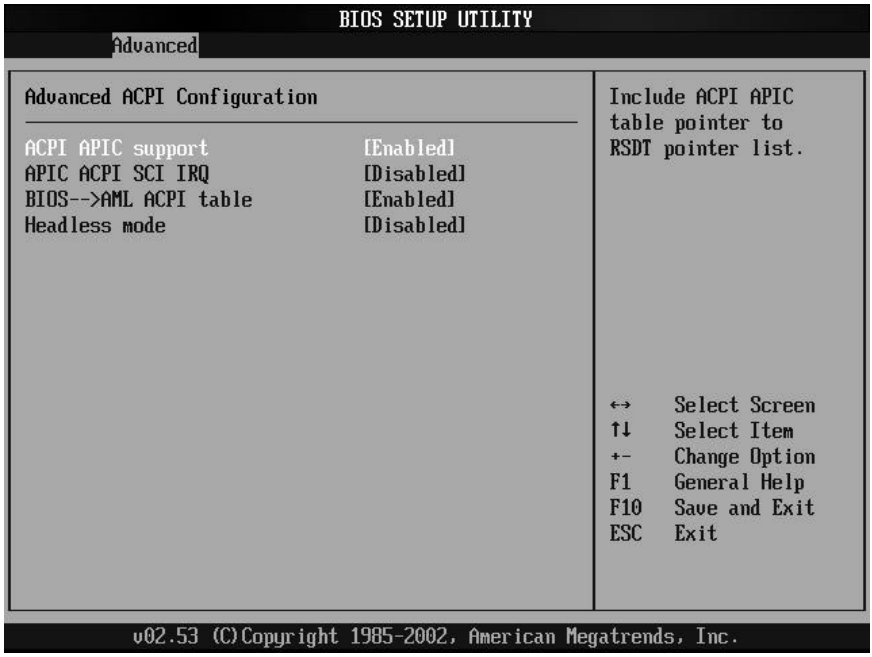
Allows you to change the settings for the Advanced Power

Management (APM). Select an item then press Enter to display the configuration options.



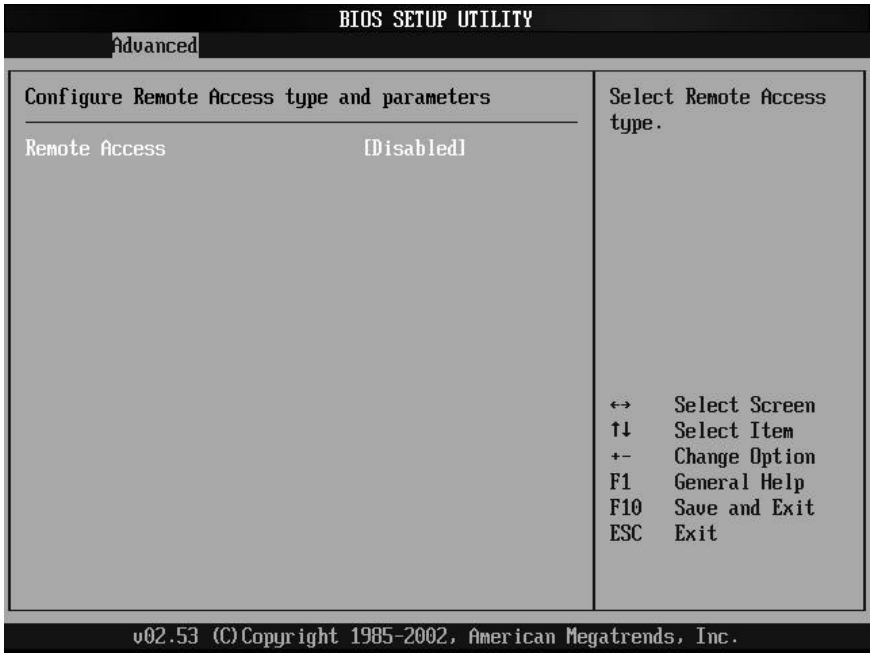
ACPI Aware O/S [Yes]
Configuration options: [No] [Yes]
General ACPI Configuration
Allows you to select the ACPI state to be used for system suspend.
Configuration options: [S1 (POS) Only]

4.7.7 Advanced ACPI Configuration



ACPI APIC support [Enabled]
Configuration options: [Disabled] [Enabled]
Apic ACPI SCI IRQ [Disabled]
Configuration options: [Disabled] [Enabled]
BIOS －－＞AML ACPI table [Enabled]
Configuration options: [Disabled] [Enabled]
Headless mode [Disabled]
Configuration options: [Disabled] [Enabled]

4.7.8 Remote Access Configuration



Configure Remote Access.

Remote Access [Disabled]

Configuration options: [Disabled] [Enabled]

Serial port number [COM1]

Configuration options: [COM1] [COM2]

Serial port Mode [115200 8,n,1]

Configuration options: [115200 8,n,1] [57600 8,n,1] [38400 8,n,1] [19200 8,n,1] [09600 8,n,1]

Flow Control [None]

Configuration options: [None] [Hardware] [Software]

Redirection After BIOS POST [Always]

Configuration options: [Disabled] [Boot Loader] [Always]

Terminal Type [ANSI]

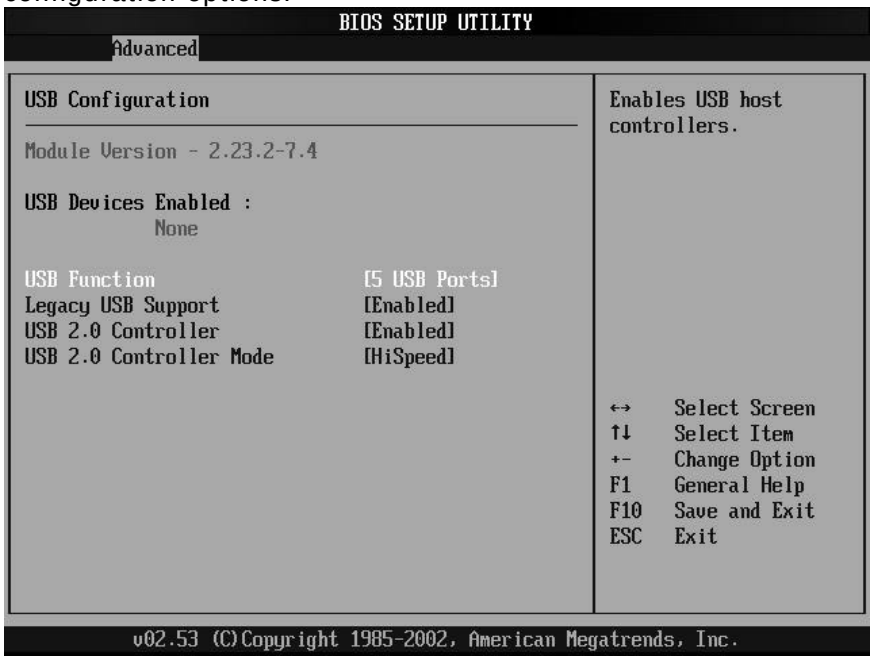
Configuration options: [ANSI] [VT100] [VT-UTF8]

VT-UTF8 Combo Key Support [Disabled]

Configuration options: [Disabled] [Enabled]

4.7.9 USB Configuration

The items in this menu allows you to change the USB-related features. Select an item then press Enter to display the configuration options.



USB Function [5 USB Ports]
Allows you to set the number of USB ports to activate.
Configuration options: [Disabled] [2 USB Ports] [4 USB Ports] [5 USB Ports]

Legacy USB Support [Enable]
Enable support for legacy USB.
Configuration options: [Disabled] [Enabled] [Auto]

USB 2.0 Controller [Enabled]
Allows you to enable or disable the USB 2.0 controller.
Configuration options: [Disabled] [Enabled]

USB 2.0 Controller Mode [HiSpeed]
Allows you to configure the USB 2.0 controller in HiSpeed (480 Mbps) or Full Speed (12 Mbps).
Configuration options: [HiSpeed] [Full Speed]

4.8 PCIPnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting IRQ and DMA channel memory size block for legacy ISA devices.

Plug & Play O/S [NO]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you installed a Plug & Play operating system, the operating system configures the Plug & Play devices not required for boot.

Configuration options: [No] [Yes]

PCI Latency Timer [32]

Allows you to select the value in units of PCI clocks for the PCI device latency timer register.

Configuration options: [32] [64] [96] [128] [160] [192] [224] [248].

Allocate IRQ to PCI VGA [Yes]

When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested.

Configuration options: [No] [Yes]

Palette Snooping [Disabled]

When set to [Enabled], the palette snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Setting to [Disabled] deactivates this feature.

Configuration options: [Disabled] [Enabled]

PCI IDE Bus Master [Disabled]

Allows BIOS to use PCI bus mastering when reading/writing to IDE devices.

Configuration options: [Disabled] [Enabled]

Off Board PCI / ISA IDE Card [Auto]

Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card.

IRQ xx [Available]

When set to [Available], the specific IRQ is free for use of PCI/PnP devices. When set to [Reserved], the IRQ is reserved for legacy ISA devices.

Configuration options: [Available] [Reserved]

DMA 0~7 Channel [Available]

Configuration options: [Available] [Reserved]

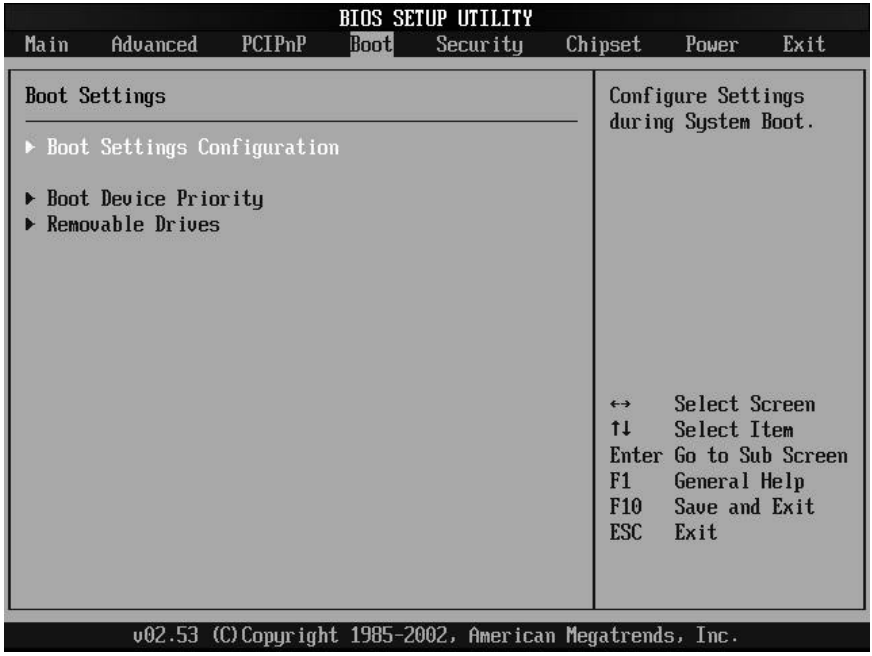
Reserved Memory Size [Disabled]

Configuration options: [Disabled] [16K] [32k] [64k]

4.9 Boot

The Boot menu items allow you to change the system boot options. Select an item then press Enter to display the sub-

menu.



4.9.1 Boot Settings Configuration

Quiet Boot [Disabled]

This allows you to enable or disable the full screen logo display feature.

Configuration options: [Disabled] [Enabled]

Boot From LAN Support [Disabled]

Configuration options: [Disabled] [Enabled]

Add On ROM Display Mode [Force BIOS]

Sets the display mode for option ROM.

Configuration options: [Force BIOS] [Keep Current]

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.

Configuration options: [Off] [On]

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.

Configuration options: [Disabled] [Enabled] [Auto]

Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for F1 key to be pressed

when error occurs.
Configuration options: [Disabled] [Enabled]

Hit 'DEL' Message Display [Enabled]

When set to Enabled, the system displays the message 'Press DEL to run Setup' during POST.
Configuration options: [Disabled] [Enabled]

Interrupt 19 Capture [Disabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19.
Configuration options: [Disabled] [Enabled]

4.9.2 Boot Device Prority

Specifies the boot device priority sequence.

1st ~ xxth Boot Device

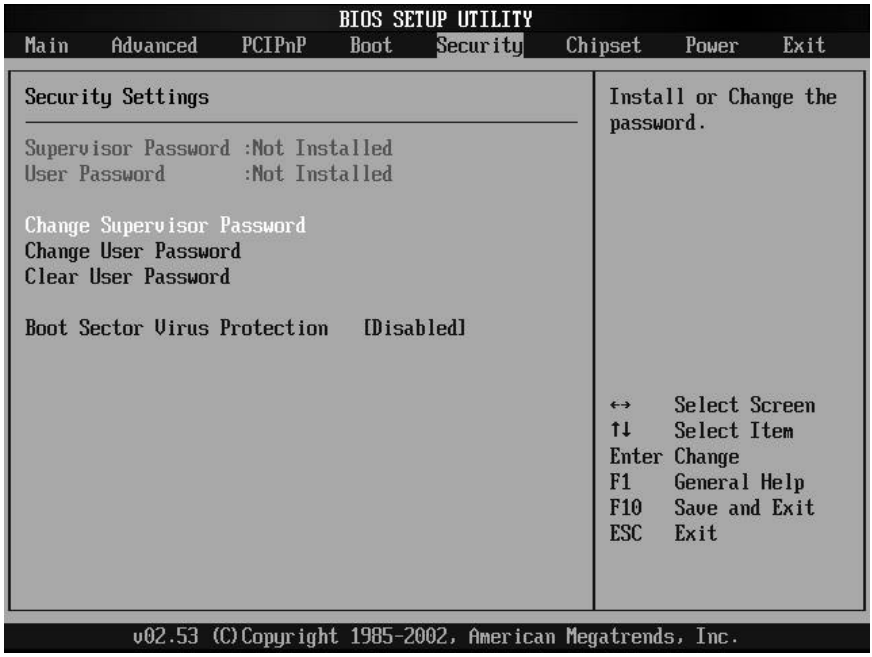
These items specify the boot device priority sequence from the available hard disk drives. The number of items that appear on the screen depends on the number of hard disk drives installed in the system.
Configuration options: [xxxxx Drive] [Disabled]

4.9.3 Removable Drives

Specifies the boot device priority sequence from available removable drives

4.10 Security

The Security menu items allow you to change the system security settings. Select an item then press Enter to display the configuration options.



Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen shows the default Not Installed. After you have set a password, this item shows Installed.

Change User Password

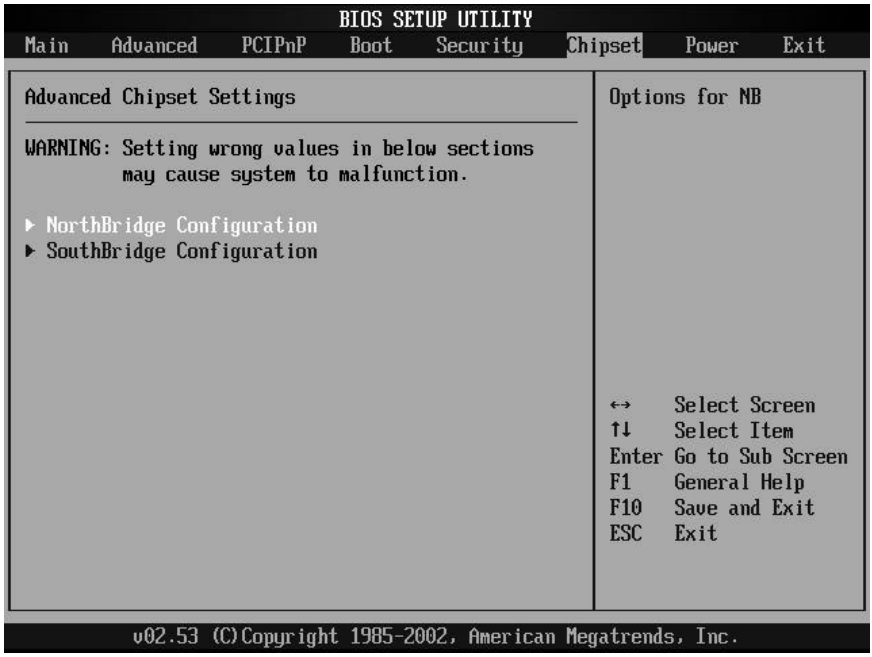
Select this item to set or change the user password. The User Password item on top of the screen shows the default Not Installed. After you have set a password, this item shows Installed.

Boot Sector Virus Protection [Disabled]

Allows you to enable or disable the boot sector virus protection. Configuration options: [Disabled] [Enabled]

4.11 Chipset

The Chipset menu items allow you to change the advanced chipset settings. Select an item then press Enter to display the sub-menu.



4.11.1 NorthBridge Configuration

Configure DRAM Timing by SPD [Enabled]

When this item is enabled, the DRAM timing parameters are set according to the DRAM SPD (Serial Presence Detect). When disabled, you can manually set the DRAM timing parameters through the DRAM sub-items.

Configuration options: [Disabled] [Enabled]

Memory Hole [Disabled]

Configuration options: [Disabled] [15MB-16MB]

Init. Graphic Adapter Priority [Internal VGA]

Allows selection of the graphics controller to use as primary boot device.

Configuration options: [Internal VGA] [AGP/Int-VGA] [AGP/PCI] [PCI/AGP] [PCI/Int-VGA]

Internal Graphics Mode Select [Enable, 8MB]

Select the amount of system memory used by the internal graphics device.

Configuration options: [Enable, 1MB] [Enable, 4MB] [Enable, 8MB] [Enable, 16MB] [Enable, 32MB]

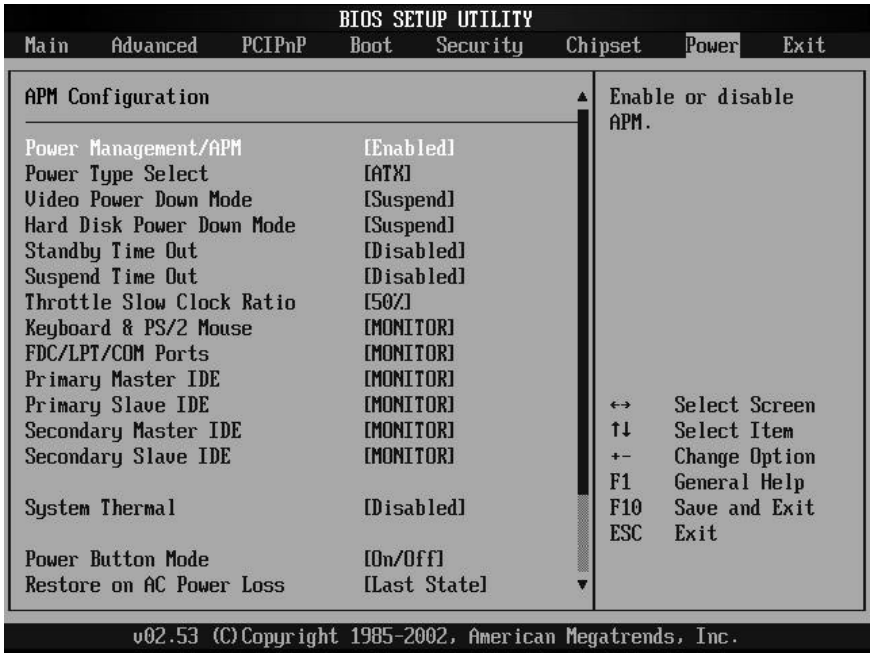
Graphics Aperture Size [64MB]
Allows you to select the size of mapped memory for AGP graphic data.
Configuration options: [64MB] [128MB] [256MB]
Boot Display Device [CRT+LFP]
Allows you to display CRT, LFP, EFP mode device.
Configuration options: [CRT] [EFP] [LFP] [CRT+EFP] [CRT+LFP]
Flat Panel Type [800x600 LVDS]
Allows you to secect panel type mode device.
Configuration options: [640X480 LVDS] [800X600 LVDS] [1024X768 LVDS 24bits] [1280X1024 LVDS] [1400X1050 LVDS] [1024X768 LVDS 18bits] [1600x1200 48bits] [1280X1024 48bits] [800X600 24bits] [800X600 18bits] [1024X768 36bits]

4.11.2 SouthBrifge Configuration

On Board AC'97 Audio [Auto]
Allows you to enable or disable the AC'97 Audio.
Configuration options: [Auto] [Disabled]

Restore on AC Power Loss [Last State]
When set to Power Off, the system goes into off state after an AC power loss. When set to Power On, the system goes on after an AC power loss. When set to Last State, the system goes into either off or on state . Whatever was the system state before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

4.12 Power



Power Management/APM [Enabled]
Allows you to enable or disable the Advanced Power Management (APM) feature.
Configuration options: [Disabled] [Enabled]

Power Type Select [ATX]
Allows you to select the power type mode.
Configuration options: [ATX] [AT]

Video Power Down Mode [Suspend]
Allows you to select the video power down mode.
Configuration options: [Disabled] [Standby] [Suspend]

Hard Disk Power Down Mode [Suspend]
Allows you to select the hard disk power down mode.
Configuration options: [Disabled] [Standby] [Suspend]

Standby Time Out [Disabled]
Allows you to select the specified time at which the system goes on standby.
Configuration options:[Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [10 Min] [20 Min] [30 Min] [40 Min] [50 Min] [60 Min]

Suspend Time Out [Disabled]
Allows you to select the specified time at which the system

goes on suspend.
Configuration options:[Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [10 Min] [20 Min] [30 Min] [40 Min] [50 Min] [60 Min]

Throttle Slow Clock Ratio [50%]

Allows you to select the duty cycle in throttle mode.
Configuration options: [87.5%] [75.0%] [62.5%] [50%] [37.5%] [25%] [12.5%]

Keyboard & PS/2 Mouse [MONITOR]

Configuration options: [IGNORE] [MONITOR]

FDC/LPT/COM Ports [MONITOR]

Configuration options: [IGNORE] [MONITOR]

Primary Master IDE [MONITOR]

Configuration options: [IGNORE] [MONITOR]

Primary Slave IDE [MONITOR]

Configuration options: [IGNORE] [MONITOR]

Secondary Master IDE [MONITOR]

Configuration options: [IGNORE] [MONITOR]

Secondary Slave IDE [MONITOR]

Configuration options: [IGNORE] [MONITOR]

System Thermal [Disabled]

power management event.
Configuration options: [Disabled] [Enabled]

Power Button Mode [On/Off]

Allows the system to go into On/Off mode or suspend mode when the power button is pressed.
Configuration options: [On/Off] [Suspend]

Power on AC Power Loss [Last State]

Configuration options: [Power On] [Power Off] [Last State]

Resume On Ring [Disabled]

Allows you to enable or disable RI to generate a wake event.
Configuration options: [Disabled] [Enabled]

Resume On PME# [Disabled]

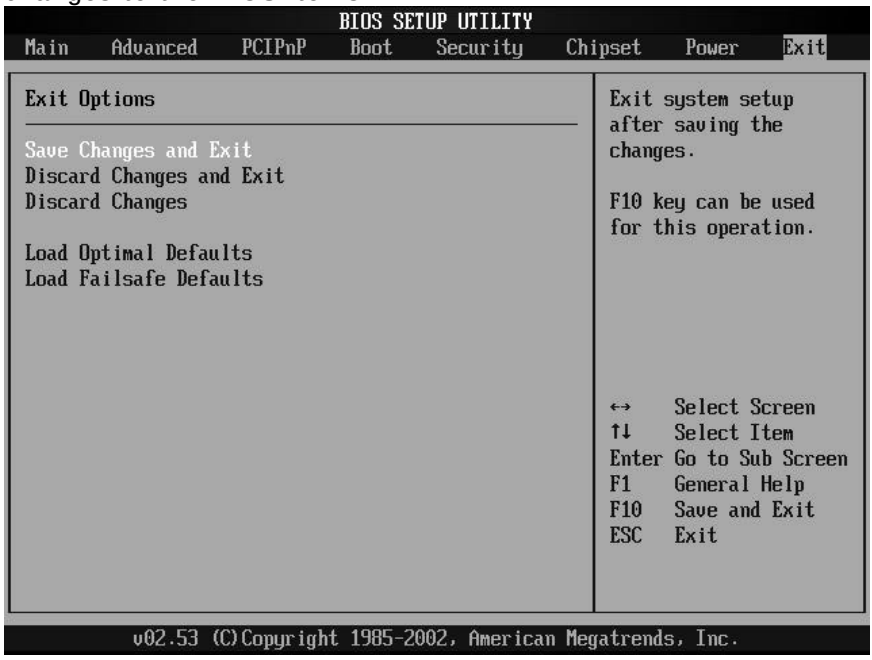
Allows you to enable or disable PCI PME# to generate a wake event.
Configuration options: [Disabled] [Enabled]

Resume On RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to Enabled, the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values.
Configuration options: [Disabled] [Enabled]

4.13 Exit

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



Save Changes and Exit

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.

Discard Changes and Exit

Select this option only if you do not want to save the changes that you made to the Setup program. If you made changes to fields other than system date, system time, and password, the BIOS asks for a confirmation before exiting.

Discard Changes

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option,

a confirmation appears. Select [Yes] to discard any changes and load the previously saved values.

Load Optimal Defaults

This option allows you to load optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

Load Failsafe Defaults

This option allows you to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Appendix A. WatchDog Timer

The WatchDog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, hardware on the board will either perform a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the WatchDog Timer:

INT 15H:

AH – 6FH
Sub-function: **AL – 2** : Set the Watchdog Timer's period **BL** : Time-out value(Its unit--second or minute, is dependent on the item "WatchDog Timer unit select" in CMOS setup).

You have to call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer will start counting down. While the timer value reaches zero, the system will reset. To ensure that this reset condition does not occur, the WatchDog Timer must be periodically refreshed by calling sub-function 2. However the Watchdog timer will be disabled if you set the time-out value to be zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

Note: when exiting a program it is necessary to disable the WatchDog Timer, otherwise the system will reset.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

      MOV     AX, 6F02H          ;setting the time-out value
      MOV     BL, 30              ;time-out value is 48 seconds
      INT     15H
 ;
; ADD YOUR APPLICATION PROGRAM HERE
;
      CMP     EXIT_AP, 1         ;is your application over?
      JNE     W_LOOP             ;No, restart your application

       MOV    AX, 6F02H          ;disable Watchdog Timer
       MOV    BL, 0               ;
       INT    15H
;
; EXIT
;
```

Appendix B: Digital I/O

One characteristic of digital circuit is its fast response to high or low signal. This kind of response is highly needed for harsh and critical industrial operating environment. That's why we design 4-bit digital inputs and 4-bit digital outputs on the JUKI-6770. Digital Input and Output, generally, are control signals. You can use these signals to control external devices that needs On/Off circuit or TTL devices. You can read or write data to the selected address to enable the function of digital IO.

A BIOS function call (INT 15H) is used to control Digital I/O:

INT 15H:

AH – 6FH
Sub-function: **AL – 8**: Set the Digital port is INPUT **AL** : Digital I/O input value

Example program:

```
MOV   AX, 6F08H          ;setting the Digital port is input
INT   15H                ;
```

AL low byte = value

AH – 6FH
Sub-function: **AL – 9**: Set the Digital port is OUTPUT **BL** : Digital I/O output value

Example program:

```
MOV   AX, 6F09H          ;setting the Digital port is output
MOV   BL, 09H            ;Digital value is 09H
INT   15H                ;
```

Digital Output is 1001b

Appendix C. Resources Map

1 st MB Memory Address Map

Memory address	Description
00000-9FFFF	SYSTEM MEMORY
A0000-BFFFF	VGA BUFFER
C0000-CFFFF	VGA BIOS
E0000-FFFFF	SYSTEM BIOS
100000	EXTEND MEMORY

IRQ Mapping Chart

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	SCI IRQ user by ACPI bus
IRQ2	IRQ Controller	IRQ10	INTEL Network connection
IRQ3	COM2	IRQ11	ICH4 USB2.0 / AC97 audio
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	ACPI for PCI IRQ	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

DMA Channel Assignment

Channel	Function
0	Available
1	Available
2	Floppy disk
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available