IEI Technology Corp.

NOVA-6612

5.25” Intel Pentium M / Celeron M CPU with CRT, LVDS/TV-Out, Dual GbE, SATA and Audio

USER MANUAL

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RoHS Lead Free

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Glossary

AC '97	Audio Codec 97
ACPI	Advanced Configuration and Power Interface
APM	Advanced Power Management
ARMD	ATAPI Removable Media Device
ASKIR	Shift Keyed Infrared
ATA	Advanced Technology Attachments
BIOS	Basic Input/Output System
CFII	Compact Flash Type 2
CMOS	Complementary Metal Oxide Semiconductor
CPU	Central Processing Unit
Codec	Compressor/Decompressor
COM	Serial Port
DAC	Digital to Analog Converter
DDR	Double Data Rate
DIMM	Dual Inline Memory Module
DIO	Digital Input/Output
DMA	Direct Memory Access
EIDE	Enhanced IDE
EIST	Enhanced Intel SpeedStep Technology
FDD	Floppy Disk Drive
FDC	Floppy Disk Connector
FFIO	Flexible File Input/Output
FIFO	First In/First Out
FSB	Front Side Bus
IrDA	Infrared Data Association
HDD	Hard Disk Drive
IDE	Integrated Data Electronics
I/O	Input/Output
ICH4	I/O Controller Hub 4
L1 Cache	Level 1 Cache
L2 Cache	Level 2 Cache
LCD	Liquid Crystal Display
LPT	Parallel Port Connector
LVDS	Low Voltage Differential Signaling
MAC	Media Access Controller
OS	Operating System
PCI	Peripheral Connect Interface
PIO	Programmed Input Output
PnP	Plug and Play
POST	Power On Self Test
RAM	Random Access Memory
SATA	Serial ATA
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology
SPD	Serial Presence Detect
S/PDI	Sony/Philips Digital Interface
SDRAM	Synchronous Dynamic Random Access Memory
SIR	Serial Infrared
UART	Universal Asynchronous Receiver-transmitter
USB	Universal Serial Bus
VGA	Video Graphics Adapter

Chapter

1

Introduction

1.1 NOVA-6612 Overview

The 5.25” NOVA-6612 socket 479 Pentium M and Celeron M CPU platform is fully equipped with advanced multi-mode I/Os. The NOVA-6612 is designed for system manufacturers, integrators, and VARs that want performance, reliability, and quality at a reasonable price.

1.1.1 NOVA-6612 Applications

The NOVA-6612 is designed for applications in the following areas:

- Industrial PC applications
- Human Machine Interface (HMI) applications
- Marine, GPS and transportation applications
- Financial, retail and kiosk applications

1.1.2 NOVA-6612 Benefits

Some of the NOVA-6612 benefits include:

- Low power, high performance
- Providing access to multiple PCI and ISA expansion slots for easy system expansion
- Multiple storage option integration including
  - 40 Pin IFM or 3.5” HDD
  - 44 Pin IFM or 2.5” HDD
  - Dual SATA ports with RAID 0 and RAID 1 support
  - Optional CFII support
- Data security SATA RAID support

1.1.3 NOVA-6612 Features

Some of the NOVA-6612 features are listed below:

- Complies with RoHS
- Supports socket 479 Intel® Pentium M / Celeron M CPUs
- Supports a maximum front side bus (FSB) speed up to 533MHz
- Supports up to 1GB of 333MHz or 400MHz of DDR memory

- Comes with two high performance gigabit Ethernet (GbE) controller
- Supports two SATA channels with transfer rates up to 150MB/s
- Supports eight USB 2.0 devices

1.2 NOVA-6612 Board Overview

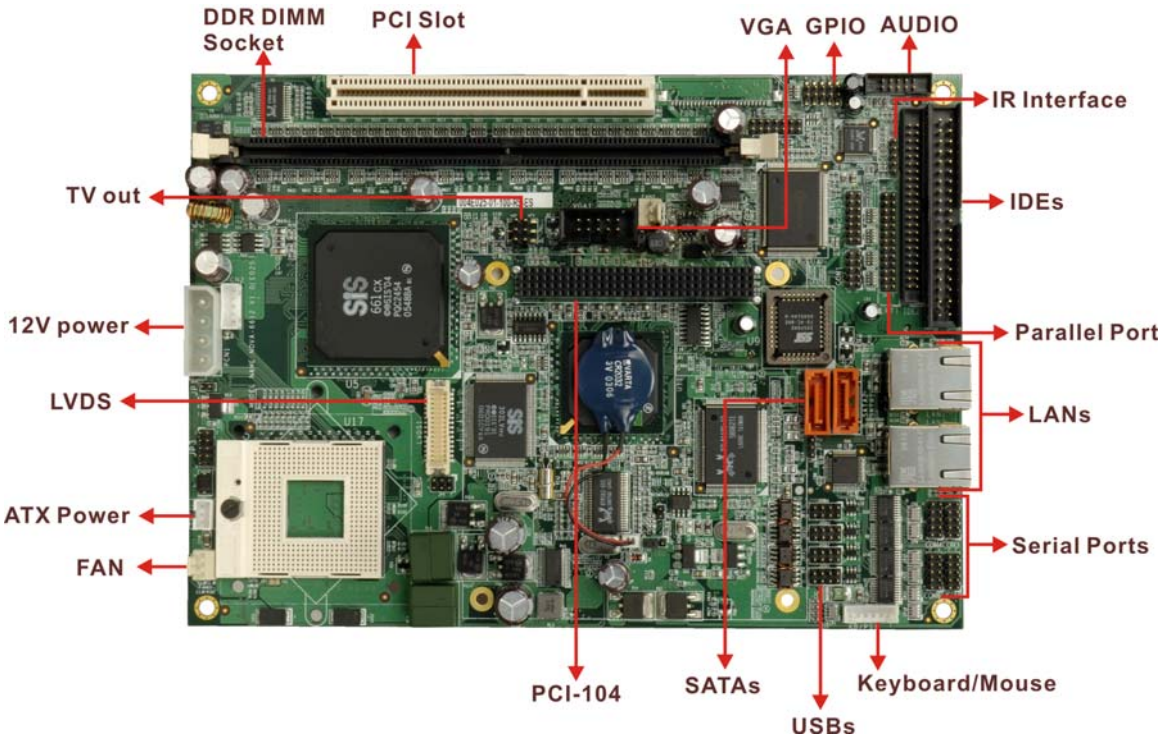

Figure 1-1: NOVA-6612 Board Overview (Top View)

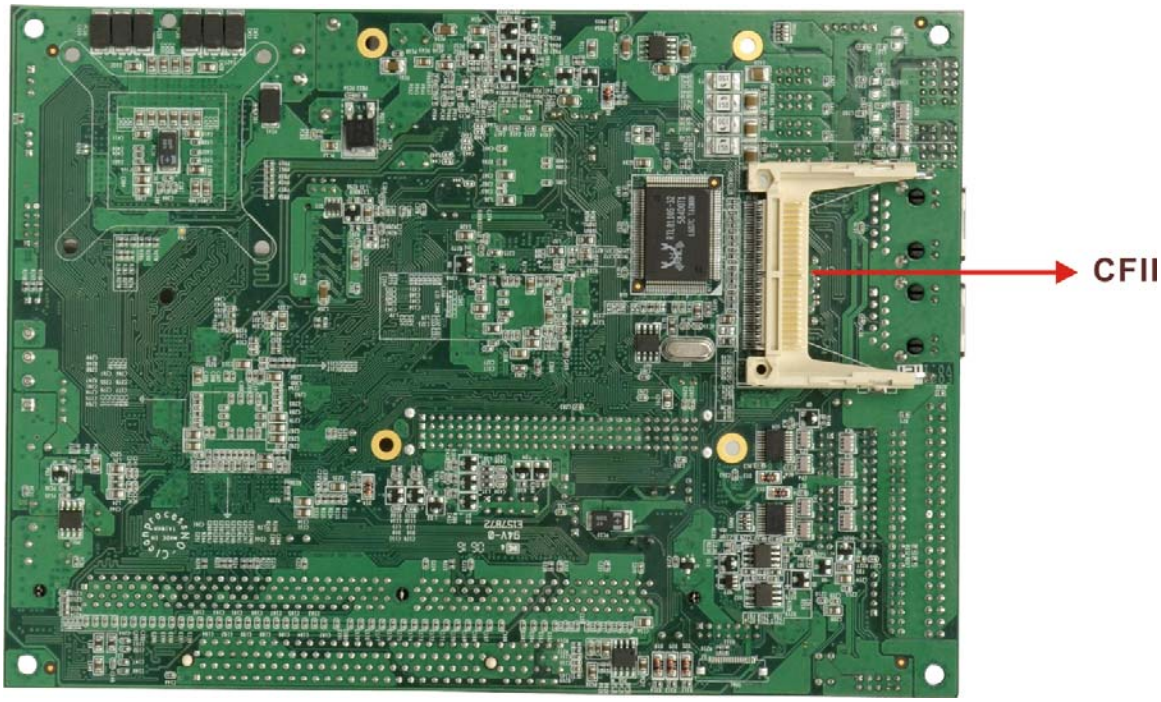

Figure 1-2: NOVA-6612 Board Overview (Bottom View)

1.2.1 NOVA-6612 Connectors

The NOVA-6612 has the following connectors onboard:

- 1 x ATX power connector
- 1 x Audio connector
- 1 x Boundary scan test connector
- 1 x Compact Flash (CF) connector (solder side)
- 1 x DDR SDRAM slot
- 2 x Fan connectors
- 1 x GPIO connector
- 2 x IDE Interface connectors (40-pin and 44-pin)
- 1 x Inverter power connector
- 1 x IR interface connector
- 1 x Keyboard/mouse connector
- 1 x LCD LVDS interface connector
- 1 x LED connector

- 1 x Parallel port connector
- 1 x PCI-104 connector
- 1 x PCI slot
- 5 x Serial port connectors
- 1 x RS-232/422/485 serial port connector
- 2 x Serial ATA connectors
- 1 x System front panel connector
- 1 x Power connector
- 1 x TV out connector
- 4 x USB connectors

The NOVA-6612 has the following connectors on the board rear panel:

- 2 x Ethernet connectors

The NOVA-6612 has the following onboard jumpers:

- Clear CMOS
- CPU FSB setting
- CF card setup
- LCD voltage setup
- COM2 setup (RS-232/422/485)
- PCI-104 voltage setup

The location of these connectors on the motherboard can be seen in **Figure 1-1**. These connectors are fully described in **Chapter 3**.

1.2.2 Technical Specifications

NOVA-6612 technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in **Chapter 2 Detailed Specifications**.

SPECIFICATION	
CPUs Supported	**Intel® Pentium® M** **Intel® Celeron® M**
Chipsets	**Northbridge: SIS 661CX**

	Southbridge: SIS 964
I/O Controller	**SIS 964**
Graphics Support	**SiS Mirage™ Graphic Engine**
Display	**CRT; LVDS; TV-out**
Memory	**One DDR memory modules (Max. 1GB)**
PCI Bus Interface	**33MHz, Revision 2.3**
Serial ATA (SATA)	**Two SATA channels with 150MB/s transfer rates**
HDD Interface	**Two IDE channels supports four Ultra ATA/100 devices**
USB Interfaces	**Eight USB 2.0 connectors supported**
Serial Ports	**Six COM ports**
Super I/O	**W83697HG**
IrDA	**By super I/O**
Digital I/O	**4 input / 4 output by super I/O**
Audio Interfaces	**One Audio Codec '97 (AC'97) version 2.3 connector**
Ethernet	**Two Gigabit Ethernet (GbE) connectors**
BIOS	**AMI flash BIOS**
Power	**+5V, +12V, AT/ATX supported**
Physical Dimensions	**280mm x 251mm (width x length)**
Operating Temperature	**Minimum: 0ºC (32°F)** **Maximum: 60°C (140°F)**

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 CPU Support

Table-2-1 lists the CPUs supported by the NOVA-6612 board.

CPU Type	Intel® Pentium® M / Intel® Celeron® M
Max. FSB	533 MHz
L2 Cache	512KB / 1MB / 2MB
Max. Clock Speed	2.26 GHz

Table-2-1: Supported CPUs

2.2 Onboard Chipsets

2.2.1 Northbridge and Southbridge Chipsets

The following chipsets are preinstalled on the board:

- **Northbridge**: SiS661CX
- **Southbridge**: SiS964

The following two sections (**Section 2.2.2** and **Section 2.2.3**) list some of the features of the SiS661CX and the SiS964 chipsets. For more information on these two chipsets please refer to the SiS website.

2.2.2 SiS661CX Northbridge Chipset

The SiS661CX northbridge chipset comes with the following features:

- Host Interface
  - 12 Outstanding Transactions support
  - Quasi-Synchronous/Asynchronous Host/DRAM Timing support
  - Supports 2M/4M/8M/16M TSEG SMRAM
  - Supports Dynamic Bus Inversion.
- DRAM Controller
  - DDR400/DDR333/DDR266 supported
  - Up to two un-buffered DIMMs DDR400 supported

- Up to 1GB per DIMM with 512Mb tech.
- Dynamic Clock Enable (CKE) control placing the Memory into Suspend to DRAM state.

- SiS MuTIOL® 1G Delivering 1GB/s Bandwidth
  - Proprietary Interconnect between Northbridge and Southbridge
  - Bi-Directional 16 bit Data Bus at 533MHz Operating Frequency

2.2.3 SiS964 Southbridge Chipset

The SiS964 southbridge chipset comes with the following features:

- SiS MuTIOL® 1G Delivering 1GB/s Bandwidth
  - Proprietary Interconnect between SiS north bridge and SiS964 southbridge
  - Bi-Directional 16 bit Data Bus at 533MHz Operating Frequency
- Integrated Serial Host Controller
  - Provides 2 independent ports for SATA, compliant with Serial ATA 1.0 specification with transfer rate 150MB/s
  - Supports RAID 0, 1 and JBOD
- USB 2.0/1.1 Host Controller
  - One EHCI USB 2.0 controller
  - Supports Total 8 USB 2.0 ports
  - Supports USB 2.0 High-Speed Device @480 Mb/s transfer rates
- Fast Ethernet Controller with MII Interface
  - Supports 10/100Mb Fast Ethernet with External PHY
- Supports six channels AC'97 Rev.2.3 Audio and V.90 Software Modem
- Advanced Power Management: ACPI 1.0b and APM 1.2 Compliant
- Dual IDE channels with ATA 133/100
- Supports up to six PCI Masters
- LPC 1.1 Interface
- Integrated Keyboard/PS2 Mouse Controller

2.3 Data Flow

Figure 2-1 shows the data flow between the two onboard chipsets and other components installed on the motherboard and described in the following sections of this chapter.

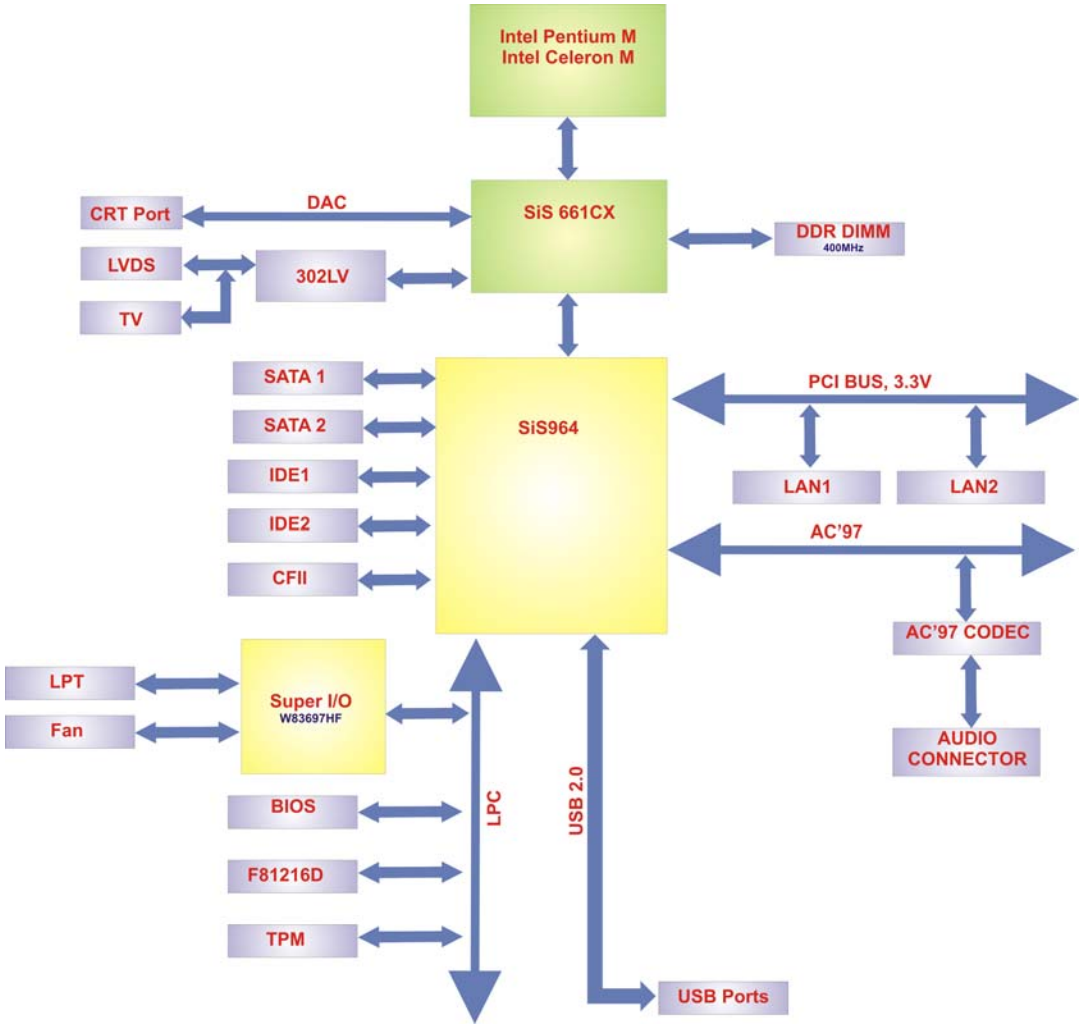

Figure 2-1: Data Flow Block Diagram

2.4 Graphics Support

The graphics features listed below are all integrated on the SiS661CX northbridge chipset.

- AGP 3.5 and AGP 2.0 Compliant
  - AGP 8X/4X mode support
  - Fast Write support
  - 1.5V interface support only
- DX9 S/W Compliant
- High performance 256Bit 3D/128Bit 2D Graphic Engine
  - 2 pixel rendering pipelines and 4 texture units per cycle (2P4T)
  - Up to 200 MHz ECLK
- SiS Ultra-AGPII™ Technology w/ up to 3.2GB/s Data Transfer Rate
  - Successor of Ultra-AGPII™ Technology and doubles the bandwidth up to 3.2GB/s with DDR400
  - AGP 8X equivalent bandwidth for 3D/2D/Video
- Advanced Hardware Acceleration for DVD playback
- Dual 12-bit DDR Digital Interface for Digital LCD/TV-OUT support
  - NTSC/PAL TV-OUT
  - LCD Monitor
  - Dual view function support for LCD-TV,LCD-CRT or CRT-TV
- Built-in high performance 333MHz RAMDAC
- Graphics support mode
  - CRT highest resolution mode: 2048x1536x32@75NI
  - LCD highest resolution mode: 1600x1200x32@ 60NI
  - TV highest resolution mode: 1024x768x32@60NI

2.5 Memory Support

The NOVA-6612 has one 184-pin dual inline memory module (DIMM) sockets and supports one 400MHz or 333MHz SDRAM DDR DIMM modules with a maximum RAM of up to 1GB.

2.6 PCI Bus Interface Support

The PCI bus on the NOVA-6612 has the following features:

- 33MHz Revision 2.3 is implemented
- Up to six external bus masters are supported
- Maximum throughput: 133MB/sec
- Master devices: Maximum of six with three implemented
- One PCI REQ/GNT pair can be given higher arbitration priority
- 44-bit addressing using the DAC protocol supported

2.7 GbE Ethernet

The onboard Realtek RTL8110S GbE controller combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, 32-bit PCI bus controller, and embedded memory. The controller has state-of-the-art DSP technology and mixed-mode signal technology and it offers high-speed transmission over CAT 5 UTP cables or CAT 3 UTP (10Mbps only) cables. The GbE controller specifications are below.

- Integrated 10/100/1000 transceiver
- Auto-Negotiation with Next Page capability
- Supports PCI rev.2.3, 32-bit, 33/66MHz
- Supports pair swap/polarity/skew correction
- Crossover Detection & Auto-Correction
- Wake-on-LAN and remote wake-up support
- Microsoft® NDIS5 Checksum Offload (IP, TCP, UDP) and largesend offload support
- Supports Full Duplex flow control (IEEE 802.3x)
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
- Supports IEEE 802.1P Layer 2 Priority Encoding
- Supports IEEE 802.1Q VLAN tagging
- Serial EEPROM
- 3.3V signaling, 5V PCI I/O tolerant
- Transmit/Receive FIFO (8K/64K) support
- Supports power down/link down power saving

2.8 Drive Interfaces

The NOVA-6612 can support the following drive interfaces.

- 2 x SATA drives
- 4 x IDE devices

2.8.1 SATA Drives

The NOVA-6612 supports two, first generation SATA drives with transfer rates of up to 150MB/s

2.8.2 IDE HDD Interfaces

The NOVA-6612 southbridge chipset IDE controller supports up to four HDDs with the following specifications:

- Supports PIO IDE transfers up to 16MB/s
- Supports Ultra ATA/100 devices with data transfer rates up to 100MB/s

2.9 Serial Ports

The NOVA-6612 has six high-speed UART serial ports, configured as COM1, COM2, COM3, COM4, COM5 and COM6. The serial ports have the following specifications.

- 16C550 UART with 16-byte FIFO buffer
- 115.2Kbps transmission rate

2.10 Real Time Clock

256-byte battery backed CMOS RAM

2.11 System Monitoring

The NOVA-6612 is capable of self-monitoring various aspects of its operating status including:

- CPU, chipset, and battery voltage, +3.3V, +5V, and +12V
- RPM of cooling fans
- CPU and board temperatures (by the corresponding embedded sensors)

2.12 Infrared Data Association (IrDA) Interface

The NOVA-6612 IrDA supports the following interfaces.

- Serial Infrared (SIR)
- Shift Keyed Infrared (ASKIR)

If an IrDA port is need, COM2 must be configured as either SIR or ASKIR mode in the BIOS under **Super IO devices**. Normal RS-232 COM2 is then disabled.

2.13 USB Interfaces

The NOVA-6612 has eight internal USB interfaces. The USB interfaces support USB 2.0.

2.14 BIOS

The NOVA-6612 uses a licensed copy of AMI BIOS. The features of the flash BIOS used are listed below:

- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (**P**re-Boot E**x**ecution **E**nvironment) support
- USB booting support

2.15 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the NOVA-6612 are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the northbridge and southbridge chipsets to ensure the operating temperature of these chips remain low.

2.16 Audio Codec

The NOVA-6612 has an integrated REALTEK ALC655 CODEC. The ALC655 CODEC is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR-based designs. Some of the features of the codec are listed below.

- Meets performance requirements for audio on PC99/2001 systems
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- 16-bit Stereo full-duplex CODEC with 48KHz sampling rate
- Compliant with AC'97 Rev 2.3 specifications
- Front-Out, Surround-Out, MIC-In and LINE-In Jack Sensing
- 14.318MHz -> 24.576MHz PLL to eliminate crystal
- 12.288MHz BITCLK input
- Integrated PCBEEP generator to save buzzer
- Interrupt capability
- Three analog line-level stereo inputs with 5-bit volume control, LINE_IN, CD, AUX
- High-quality differential CD input
- Two analog line-level mono inputs: PCBEEP, PHONE-IN
- Two software selectable MIC inputs
- Dedicated Front-MIC input for front panel applications (software selectable)
- Boost preamplifier for MIC input
- LINE input shared with surround output; MIC input shared with Center and LFE output
- Built-in 50mW/20ohm amplifier for both Front-out and Surround-Out
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Supports Power-Off CD function
- Adjustable VREFOUT control
- Supports 48KHz S/PDIF output, complying with AC'97 Rev 2.3 specifications
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analog: 3.3V/5V
- Standard 48-pin LQFP package

- EAX™ 1.0 & 2.0 compatible
- Direct Sound 3D™ compatible
- A3D™ compatible
- I3DL2 compatible
- HRTF 3D positional audio
- 10-band software equalizer
- Voice cancellation and key shifting in Karaoke mode
- AVRack® Media Player
- Configuration Panel for improved user convenience

2.17 Power Consumption

Table 2-2 shows the power consumption parameters for the NOVA-6612 when a Celeron M processor with a clock speed of 1.6GHz is running with a 1Gb DDR400 module.

Voltage	Current
+5V	4.61A
+12V	1.3A

Table 2-2: Power Consumption

2.18 Packaged Contents and Optional Accessory Items

2.18.1 Package Contents

The NOVA-6612 is shipped with the following components.

- 1 x NOVA-6612 single board computer
- 1 x IDE flat cable 40P/40P/40P
- 2 x SATA cables
- 1 x SATA power cable
- 4 x RS232 cables
- 1 x Keyboard/mouse cable
- 1 x Audio cable
- 1 x USB cable
- 1 x VGA cable
- 1 x Mini jumper pack

- 1 x Utility CD
- 1 x Quick Installation Guide

2.18.2 Optional Accessory Items

The items shown in the list below are optional accessory items are purchased separately.

- CPU cooler
- TV-out cable
- ATX power cable
- RS-232/422/485 cable

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Chapter

3

Connectors and Jumpers

3.1 Peripheral Interface Connectors

Section 3.1.1 shows peripheral interface connector locations. **Section 3.1.2** lists all the peripheral interface connectors seen in **Section 3.1.1**.

3.1.1 NOVA-6612 Layout

Figure 3-1 shows the onboard peripheral connectors, backplane peripheral connectors and onboard jumpers.

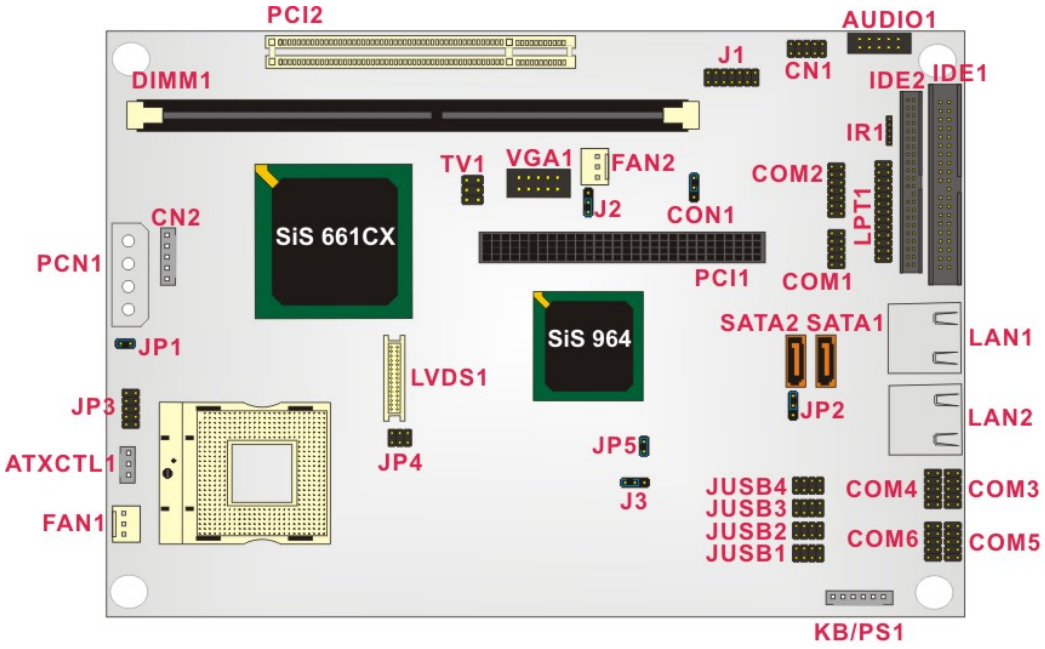

Figure 3-1: Connector and Jumper Locations

3.1.2 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the NOVA-6612. Detailed descriptions of these connectors can be found in **Section 3.2** on **page 37**.

Connector	Type	Label
ATX power connector	3-pin header	ATXCTL1
Audio connector	10-pin header	AUDIO1
Boundary scan test connector	10-pin header	JP3
Compact Flash (CF) connector	50-pin header	CF1
CRT connector	10-pin header	VGA1
DDR SDRAM slot	184-pin slot	DIMM1
Fan connector (1)	3-pin header	FAN1
Fan connector (2)	3-pin header	FAN2
GPIO connector	10-pin header	CN1
IDE Interface connector (Primary)	40-pin header	IDE1
IDE Interface connector (Secondary)	44-pin header	IDE2
Inverter Power connector	5-pin header	CN2
IR Interface connector	5-pin header	IR1
Keyboard/Mouse connector	6-pin header	KB/PS1
LCD LVDS Interface Connector	30-pin header	LVDS1
Parallel port connector	26-pin header	LPT1
PCI-104 connector	120-pin PCI slot	PCI1
PCI connector	120-pin PCI slot	PCI2
Serial port connector (1)	10-pin header	COM1
Serial port connector (2)	14-pin header	COM2

Serial port connector (3)	**10-pin header**	**COM3**
Serial port connector (4)	**10-pin header**	**COM4**
Serial port connector (5)	**10-pin header**	**COM5**
Serial port connector (6)	**10-pin header**	**COM6**
SATA drive connector (150MB/s)	**7-pin SATA connector**	**SATA1**
SATA drive connector (150MB/s)	**7-pin SATA connector**	**SATA2**
System front panel connector	**14-pin header**	**J1**
Power connect	**4-pin header**	**PCN1**
TV-out connector	**6-pin header**	**TV1**
USB connector (1)	**8-pin header**	**JUSB1**
USB connector (2)	**8-pin header**	**JUSB2**
USB connector (3)	**8-pin header**	**JUSB3**
USB connector (4)	**8-pin header**	**JUSB4**

Table 3-1: Peripheral Interface Connectors

3.1.3 Rear Panel Connectors

Table 3-2 lists the rear panel connectors on the NOVA-6612. Detailed descriptions of these connectors can be found in **Section 3.3** on **page 63**.

Connector	Type	Label
Ethernet connector (1)	**RJ-45**	**LAN1**
Ethernet connector (2)	**RJ-45**	**LAN2**

Table 3-2: Rear Panel Connectors

3.1.4 Onboard Jumpers

Table 3-3 lists the onboard jumpers. Detailed descriptions of these jumpers can be found in **Section 3.4** on **page 65**.

Description	Label	Type
Clear CMOS	J3	3-pin header
CPU power jumper	JP1	2-pin header
CPU FSB setting	JP5	2-pin header
CF card setup	JP2	3-pin header
LCD voltage setup	JP4	6-pin header
COM2 setup (RS-232/422/485)	CON1	3-pin header
PCI-104 voltage setup	J2	3-pin header

Table 3-3: Onboard Jumpers

3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the NOVA-6612.

3.2.1 ATX Power Connector

CN Label: **ATXCTL1**

CN Type: **3-pin header (1x3)**

CN Location: **See Figure 3-2**

CN Pinouts: **See Table 3-4**

The ATX Power connector (ATXCTL1) connects an ATX or AT power supply connector.

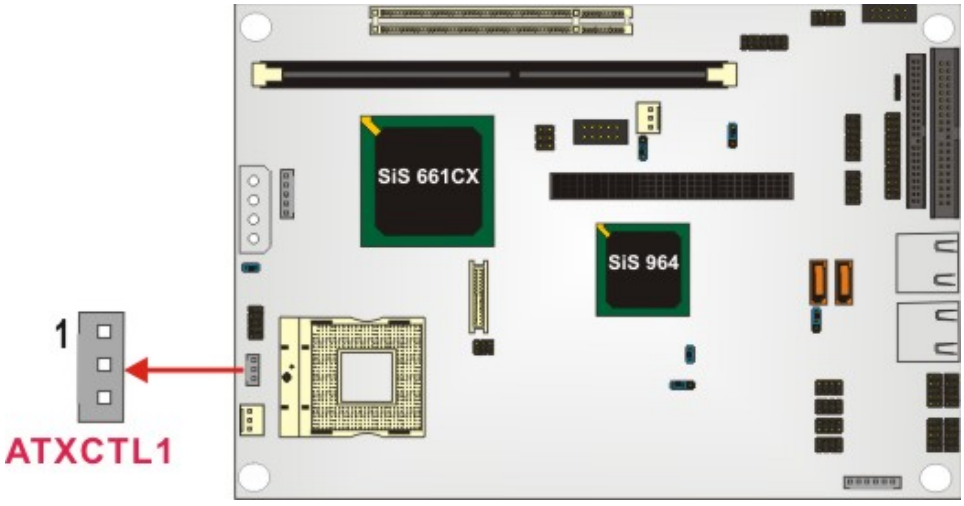

Figure 3-2: ATX Power Connector Location

PIN NO.	DESCRIPTION
1	PSON
2	GND
3	5VSB

Table 3-4: ATX Power Connector Pinouts

3.2.2 Audio Connector

CN Label: **AUDIO1**

CN Type: **10-pin headers (2x5)**

CN Location: **See Figure 3-3**

CN Pinouts: **See Table 3-5**

The NOVA-6612 has a built-in AC ’97 AUDIO CODEC connector directly connected to the mic-in, line-out and speaker-out.

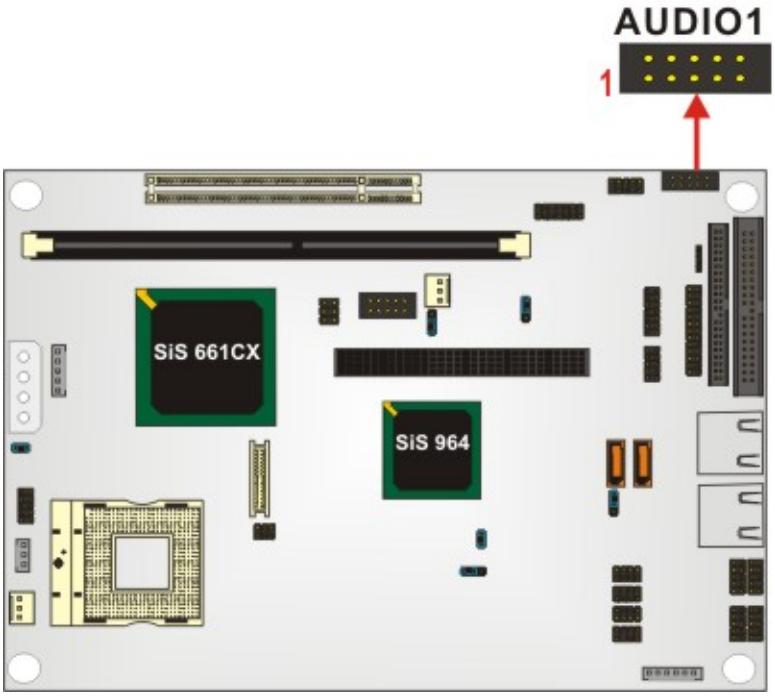

Figure 3-3: Audio Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	SPKOUT R	2	Line out R
3	GND	4	GND
5	SPKOUT L	6	Line out L
7	GND	8	GND
9	MIC in	10	NC

Table 3-5: Audio Connector Pinouts

3.2.3 Compact Flash Connector

CN Label: **CF1 (solder side of the motherboard)**

CN Type: **50-pin header (2x25)**

CN Location: **See Figure 3-4**

CN Pinouts: **See Table 3-6**

A compact flash memory module is inserted to the Compact Flash connector (CF1). Jumper 2 (JP2) configures the compact flash drive as either a slave or master device.

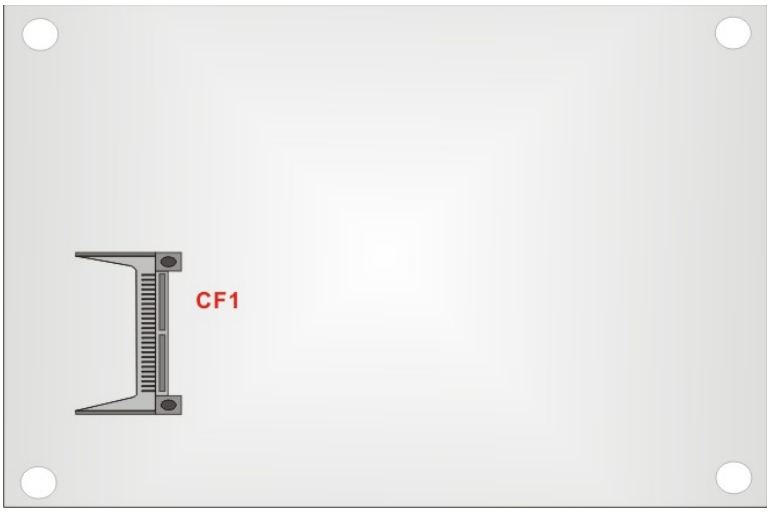

Figure 3-4: CFII Socket Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS1#	32	HDC_CS3#
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC5
12	N/C	37	IRQ15
13	VCC_COM	38	VCC5
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY

18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	N/C
21	DATA 0	46	CBLIDB
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 3-6: CFII Socket Pinouts

3.2.4 CRT Connector

CN Label: **VGA1**

CN Type: **10-pin header**

CN Location: **See Figure 3-5**

CN Pinouts: **See Table 3-7**

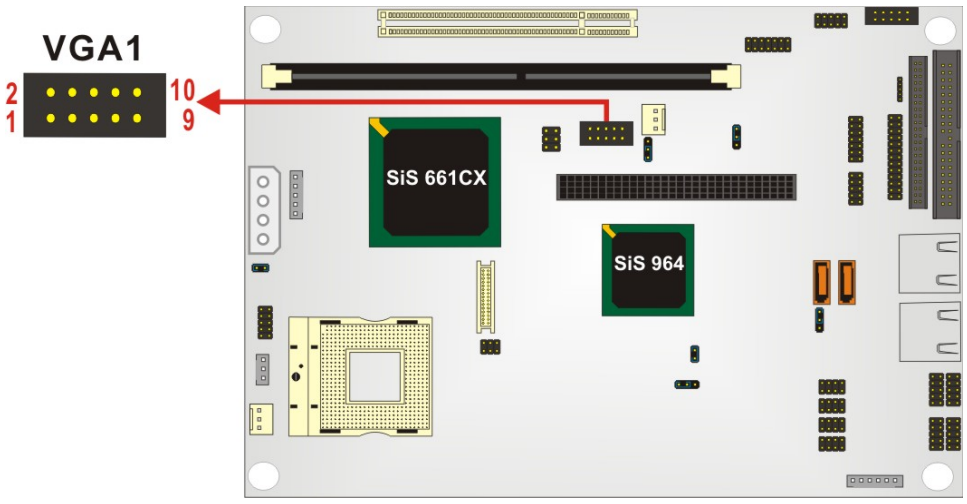

Figure 3-5: CRT Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	DDCCLK
3	GREEN	4	DDCDAT
5	BLUE	6	GROUND
7	HSYNC	8	GROUND
9	VSYNC	10	GROUND

Table 3-7: CRT Connector Pinouts

3.2.5 Fan Connector

CN Label: **FAN1 and FAN2**

CN Type: **3-pin header**

CN Location: **See Figure 3-6**

CN Pinouts: **See Table 3-8**

The cooling fan connector provides a 12V, 500mA current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

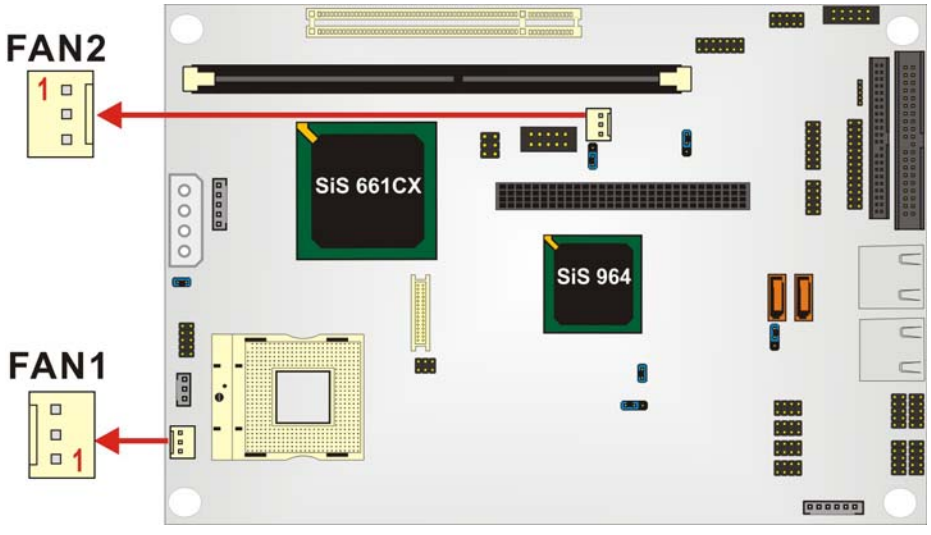

Figure 3-6: Fan Connector Locations

PIN NO.	DESCRIPTION
1	Fan Speed Detect
2	+12V
3	GND

Table 3-8: Fan Connector Pinouts

3.2.6 GPIO Connector

CN Label: **CN1**

CN Type: **10-pin header (2x5)**

CN Location: **See Figure 3-7**

CN Pinouts: **See Table 3-9**

The General Purpose Input Output (GPIO) connector can be connected to external I/O control devices including sensors, lights, alarms and switches.

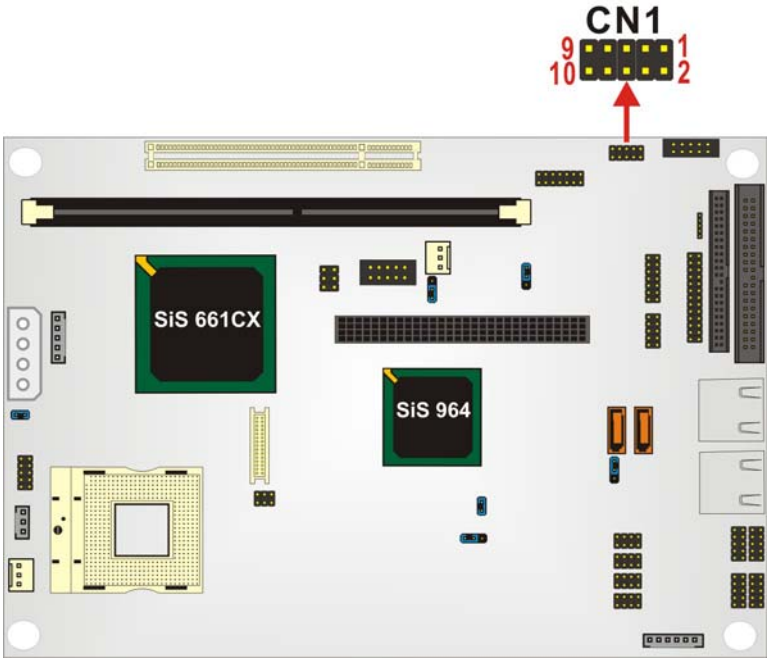

Figure 3-7: GPIO Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	GPO0	4	GPO1
5	GPO2	6	GPO3
7	GPI0	8	GPI1
9	GPI2	10	GPI3

Table 3-9: GPIO Connector Pinouts

3.2.7 IDE Connector (Primary)

CN Label: **IDE1**

CN Type: **40-pin header (2x20)**

CN Location: **See Figure 3-8**

CN Pinouts: **See Table 3-10**

One primary 40-pin primary IDE device connector on the NOVA-6612 motherboard supports connectivity to ATA/100 IDE devices with data transfer rates up to 100MB/s.

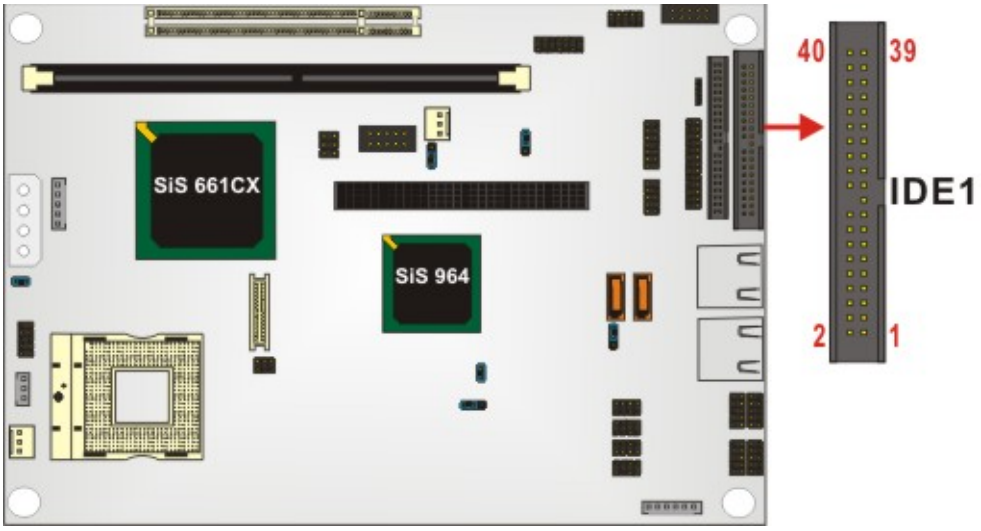

Figure 3-8: Primary IDE Device Connector Location

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	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND
31	INTERRUPT	32	N/C
33	SA1	34	66DET
35	SA0	36	SA2
37	HDC CS1#	38	HDC CS3#
39	X	40	GROUND

Table 3-10: Primary IDE Connector Pinouts

3.2.8 IDE Connector (Secondary)

CN Label: **IDE2**

CN Type: **44pin header (2x22)**

CN Location: **See Figure 3-9**

CN Pinouts: **See Table 3-11**

One primary 44-pin secondary IDE device connector on the NOVA-6612 motherboard supports connectivity to ATA/100 IDE devices with data transfer rates up to 100MB/s.

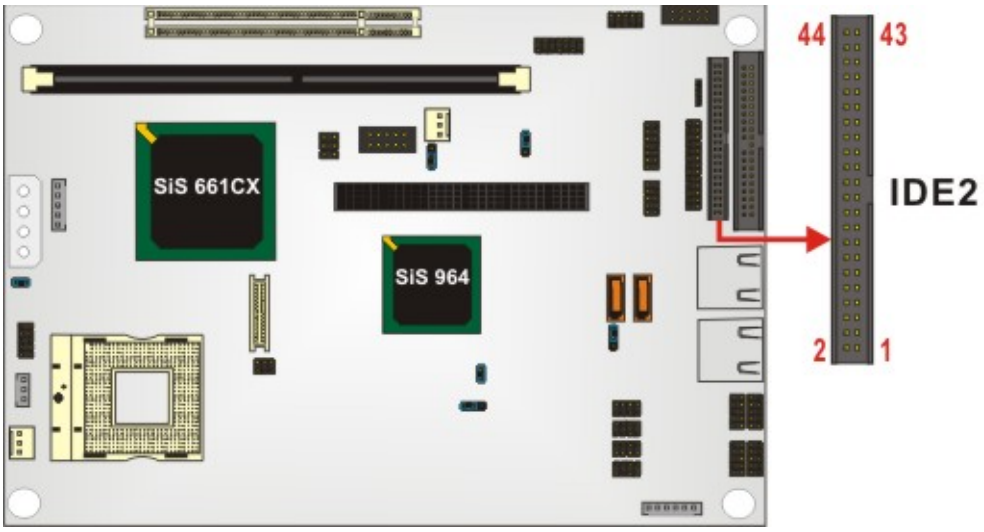

Figure 3-9: Secondary IDE Device Connector Location

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	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND
31	INTERRUPT	32	N/C
33	SA1	34	66DET
35	SA0	36	SA2
37	HDC CS1#	38	HDC CS3#
39	HDD ACTIVE#	40	GROUND

41	VCC	42	VCC
43	GROUND	44	N/C

Table 3-11: Secondary IDE Connector Pinouts

3.2.9 Inverter Power Connector

CN Label: **CN2**

CN Type: **5-pin header (1x5)**

CN Location: **See Figure 3-10**

CN Pinouts: **See Table 3-12**

The inverter connector is connected to the LCD backlight.

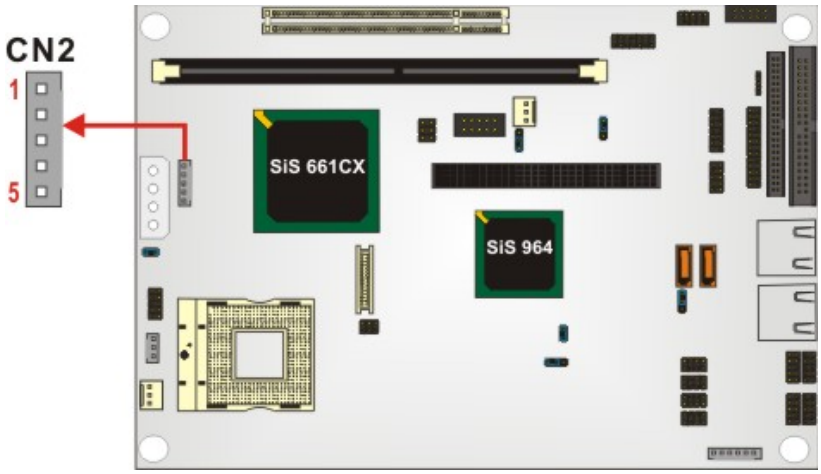

Figure 3-10: Inverter Power Connector Location

PIN NO.	DESCRIPTION
1	Briness
2	GROUND
3	INV VCC
4	GROUND
5	LCDBKTCT

Table 3-12: Inverter Power Connector Pinouts

3.2.10 IR Interface Connector

CN Label: **IR1**

CN Type: **5-pin header (1x5)**

CN Location: **See Figure 3-11**

CN Pinouts: **See Table 3-13**

The integrated infrared (IrDA) connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

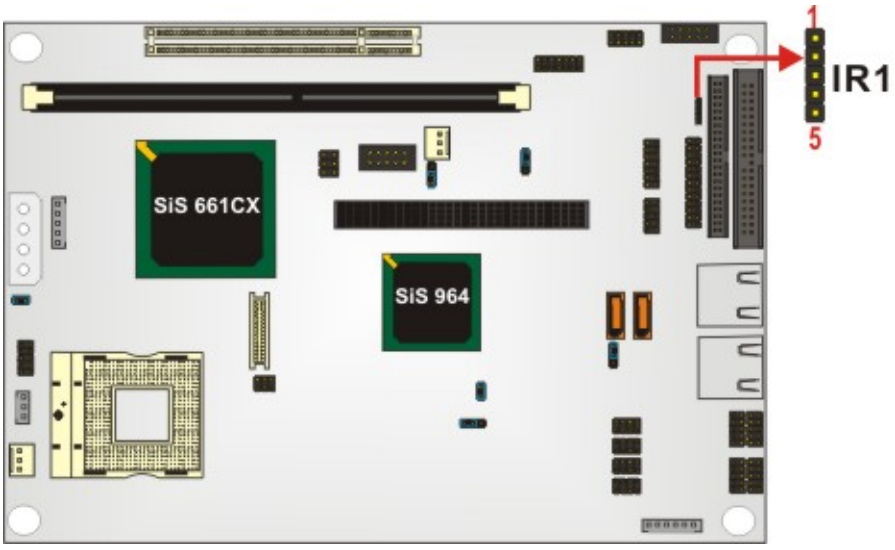

Figure 3-11: IR Connector Location

PIN NO.	DESCRIPTION
1	VCC5
2	CIRRX
3	RX
4	GND
5	TX

Table 3-13: IR Connector Pinouts

3.2.11 Keyboard/Mouse Connector

CN Label: **KB/PS1**

CN Type: **6-pin header (1x6)**

CN Location: **See Figure 3-12**

CN Pinouts: **See Table 3-14**

The Keyboard/PS2 mouse cable shipped with the NOVA-6612 board is connected to the keyoard/mouse connector.

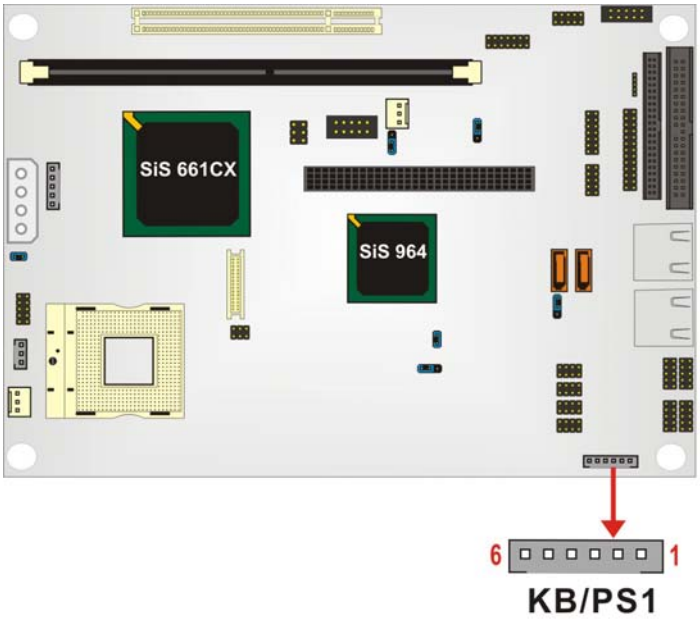

Figure 3-12: KB/PS1 Connector Locations

PIN NO.	DESCRIPTION
1	VCC5
2	MOUSE DATA
3	MOUSE CLK
4	KWYBOARD DATA
5	KEYBOARD CLK
6	GND

Table 3-14: KB/PS1 Connector Pinouts

3.2.12 LCD LVDS Connector

CN Label: **LVDS1**

CN Type: **30-pin header (2x15)**

CN Location: **See Figure 3-13**

CN Pinouts: **See Table 3-15**

The LCD LVDS connector (LVDS1) connects to a one or two channel (18-bit or 24-bit) LVDS panel.

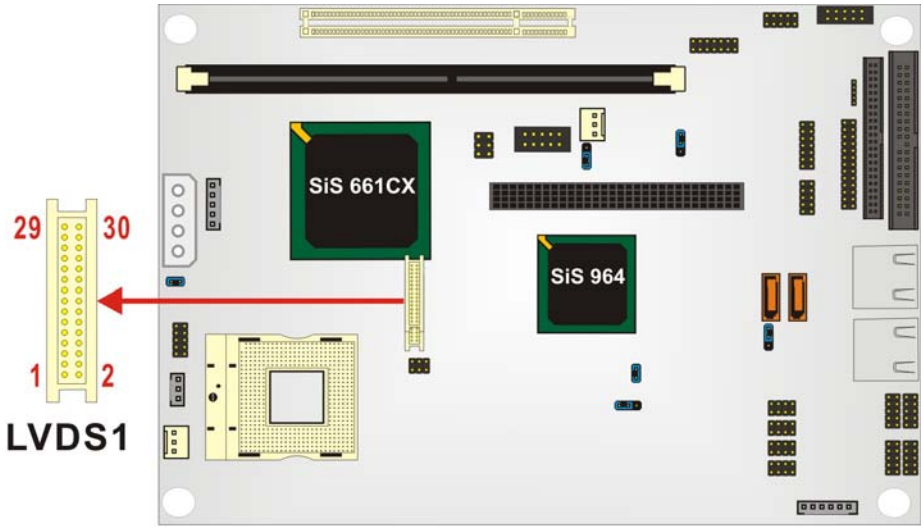

Figure 3-13: LCD LVDS Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	GND
3	LVDS0+	4	LVDS0-
5	LVDS1+	6	LVDS1-
7	LVDS2+	8	LVDS2-
9	LVDSCLK+	10	LVDSCLK-
11	LVDS3+	12	LVDS3-
13	GND	14	GND
15	LVDSB0+	16	LVDSB0-

17	LVDSB1+	18	LVDSB1-
19	LVDSB2+	20	LVDSB2-
21	LVDSBCLK+	22	LVDSBCLK-
23	LVDSB3+	24	LVDSB3-
25	GND	26	GND
27	VCCLCD	28	VCCLCD
29	VCCLCD	30	VCCLCD

Table 3-15: LCD LVDS Connector Pinouts

3.2.13 Parallel Port Connector

CN Label: **LPT1**

CN Type: **26-pin header (2x13)**

CN Location: **See Figure 3-14**

CN Pinouts: **See Table 3-16**

The parallel port connector is usually connected to a printer. A 26-pin flat-cable connector is used to connect the parallel port with a printer or other parallel communication devices.

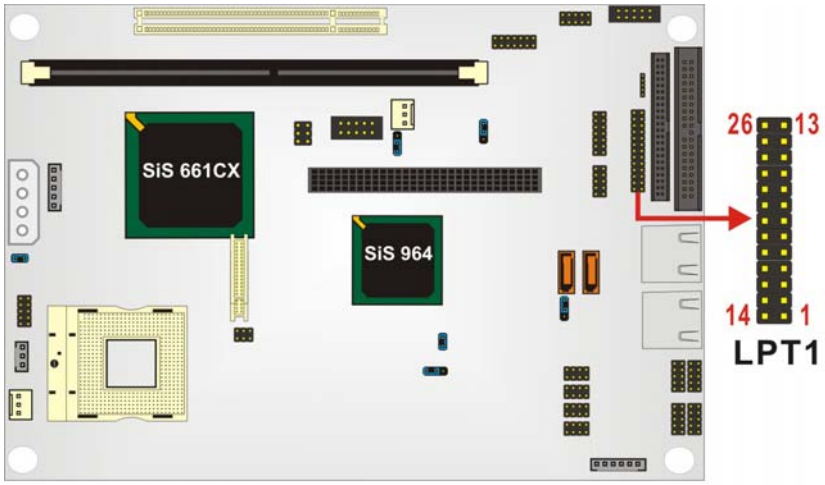

Figure 3-14: Parallel Port Connector Location

PIN	DESCRIPTION	PIN	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	25	GROUND
13	PRINTER SELECT	26	GROUND

Table 3-16: Parallel Port Connector Pinouts

3.2.14 PCI-104 Connector

CN Label: **PCI1**

CN Type: **4x30 pin PCI slot**

CN Location: **See Figure 3-15**

CN Pinouts: **See Table 3-17**

This connector supports the PCI-104 module.

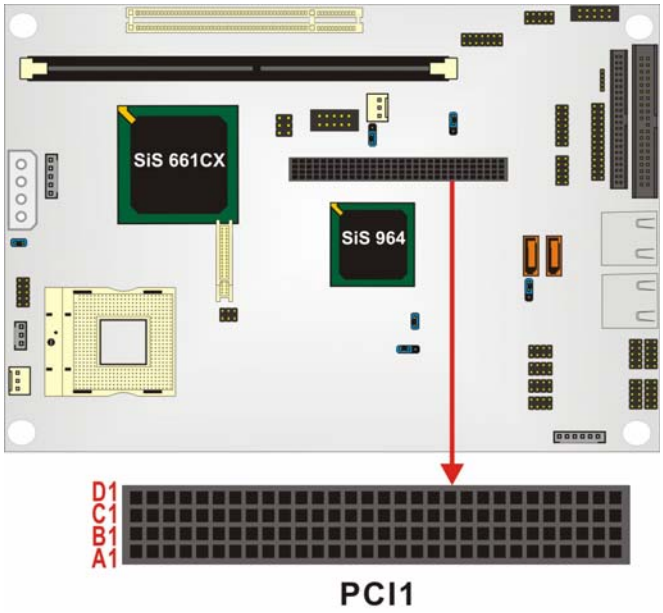

Figure 3-15: PCI-104 Connector Location

PIN	Description	PIN	Description	PIN	Description	PIN	Description
A1	GROUND	B1	TBD1	C1	+5V	D1	AD0
A2	VIO	B2	AD2	C2	AD1	D2	+5V
A3	AD5	B3	GND	C3	AD4	D3	AD3
A4	CBE0-	B4	AD7	C4	GND	D4	AD6
A5	GND	B5	AD9	C5	AD8	D5	GND
A6	AD11	B6	VIO	C6	AD10	D6	N66EV
A7	AD14	B7	AD13	C7	GND	D7	AD12
A8	+3.3V	B8	CBE1-	C8	AD15	D8	+3.3V
A9	SERR-	B9	GND	C9	SBO-	D9	PAR
A10	GND	B10	PERR-	C10	+3.3V	D10	SDONE
A11	STOP-	B11	+3.3V	C11	LOCK-	D11	GND
A12	+3.3V	B12	TRDY-	C12	GND	D12	DEVSEL-
A13	FRAME-	B13	GND	C13	IRDY-	D13	+3.3V
A14	GND	B14	AD16	C14	+3.3V	D14	CBE2-
A15	AD18	B15	+3.3V	C15	AD17	D15	GND
A16	AD21	B16	AD20	C16	GND	D16	AD19
A17	+3.3V	B17	AD23	C17	AD22	D17	+3.3V

A18	IDSEL0	B18	GND	C18	IDSEL1	D18	IDSEL2
A19	AD24	B19	CBE3-	C19	VIO	D19	IDSEL3
A20	GND	B20	AD26	C20	AD25	D20	GND
A21	AD29	B21	+5V	C21	AD28	D21	AD27
A22	+5V	B22	AD30	C22	GND	D22	AD31
A23	REQ0-	B23	GND	C23	REQ1-	D23	VIO
A24	GND	B24	REQ2-	C24	+5V	D24	GNT0-
A25	GNT1-	B25	VIO	C25	GNT2-	D25	GND
A26	+5V	B26	PCICLK0	C26	GND	D26	PCICLK1
A27	PCICLK2	B27	+5V	C27	PCICLK3	D27	GND
A28	GND	B28	INTD-	C28	+5V	D28	PCIRST-
A29	+12V	B29	INTA-	C29	INTB-	D29	INTC-
A30	-12v	B30	TBD2	C30	TBD	D30	GND/3.3V

Table 3-17: PCI-104 Connector Pinouts

3.2.15 RS-232 Serial Port Connectors

CN Label: **COM1, COM3, COM4, COM5, COM6**

CN Type: **10-pin header (2x5)**

CN Location: **See Figure 3-16**

CN Pinouts: **See Table 3-18, Table 3-19, Table 3-20, Table 3-21, Table 3-22**

The COM1, COM3, COM4, COM5 and COM6 serial ports connectors connect to RS-232 serial port device.

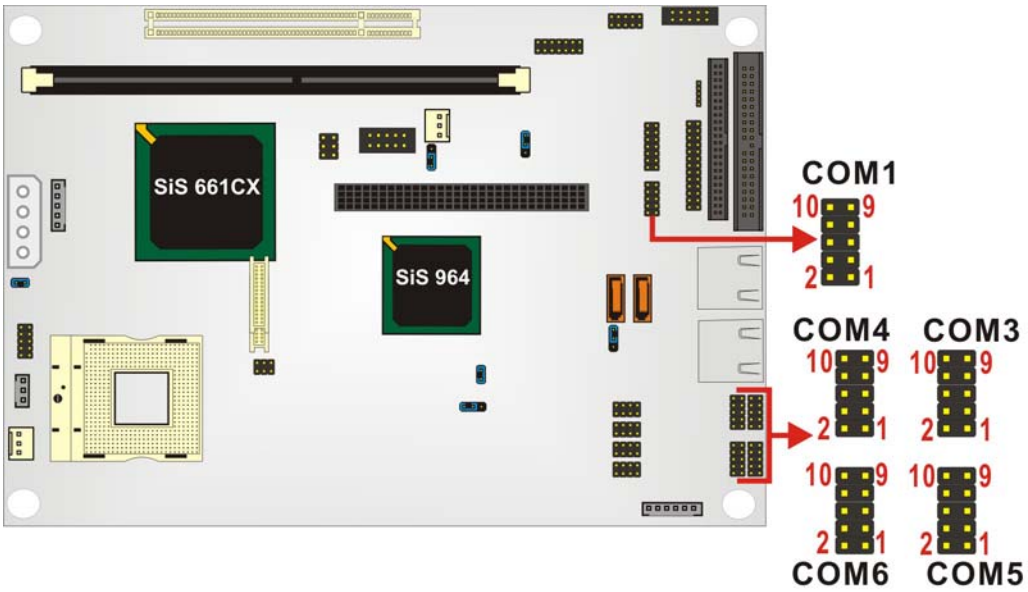

Figure 3-16: Serial Port Connectors Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD1	2	DSR1
3	RX1	4	RTS1
5	TX1	6	CTS1
7	DTR1	8	RI1
9	GND	10	NC

Table 3-18: COM1 Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD3	2	DSR3
3	RX3	4	RTS3
5	TX3	6	CTS3
7	DTR3	8	RI3
9	GND	10	NC

Table 3-19: COM3 Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD4	2	DSR4
3	RX4	4	RTS4

5	TX4	6	CTS4
7	DTR4	8	RI4
9	GND	10	NC

Table 3-20: COM4 Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD5	2	DSR5
3	RX5	4	RTS5
5	TX5	6	CTS5
7	DTR5	8	RI5
9	GND	10	NC

Table 3-21: COM5 Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD6	2	DSR6
3	RX6	4	RTS6
5	TX6	6	CTS6
7	DTR6	8	RI6
9	GND	10	NC

Table 3-22: COM6 Pinouts

3.2.16 RS-232/422/485 Serial Port Connector

CN Label: **COM2**

CN Type: **14-pin header (2x7)**

CN Location: **See Figure 3-17**

CN Pinouts: **See Table 3-23**

The COM2 serial port connector connects to an RS-232, RS-422 or RS-485 serial port devices.

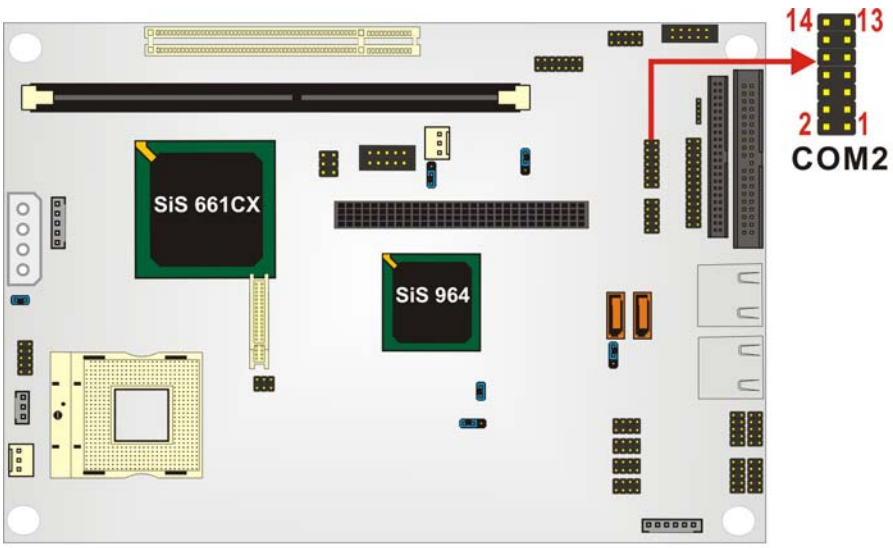

Figure 3-17: RS-232/422/485 Serial Port Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD2	2	DSR2
3	RX2	4	RTS2
5	TX2	6	CTS2
7	DTR2	8	RI2
9	GND	10	NC
11	TX+	12	TX-
13	RX+	14	RX-

Table 3-23: RS-232/422/485 Serial Port Connector Pinouts

3.2.17 SATA Drive Connectors

CN Label: **SATA1 and SATA2**

CN Type: **1x7 pin SATA drive connectors**

CN Location: **See Figure 3-18**

CN Pinouts: **See Table 3-24**

The two SATA drive connectors are connected to two first generation SATA drives. First generation SATA drives transfer data at speeds as high as 150MB/s.

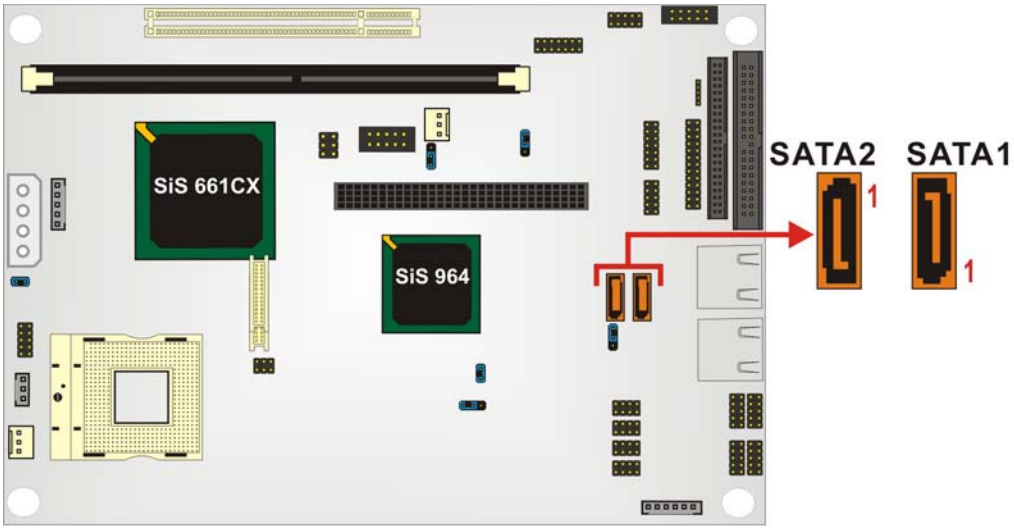

Figure 3-18: SATA Drive Connector Pinout Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-24: SATA Drive Connector Pinouts

3.2.18 System Front Panel Connector

CN Label: **J1**

CN Type: **14-pin header (2x7)**

CN Location: **See Figure 3-19**

CN Pinouts: **See Table 3-25**

The system front panel connector (J1) connects to several external switches and indicators to monitor and control the motherboard. These indicators and switches include:

- Power button

- Reset button
- Speaker
- HDD LED

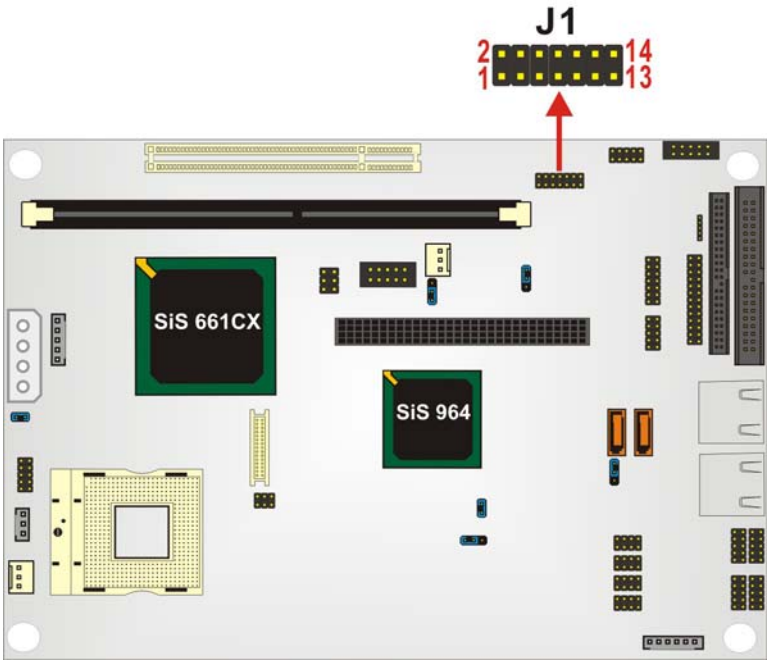

Figure 3-19: System Front Panel Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC5_LED	2	VCC5
3	VCC5_LED	4	IDE_LED#
5	GND	6	PWRBTN#
7	VCC5	8	GND
9	X	10	RESET#
11	X	12	GND
13	SPEAKER		

Table 3-25: System Front Panel Connector Pinouts

3.2.19 Power Connector

CN Label: **PCN1**

CN Type: **4-pin header**

CN Location: **See Figure 3-21**

CN Pinouts: **See Table 3-27**

This connector supports the 12V power supply.

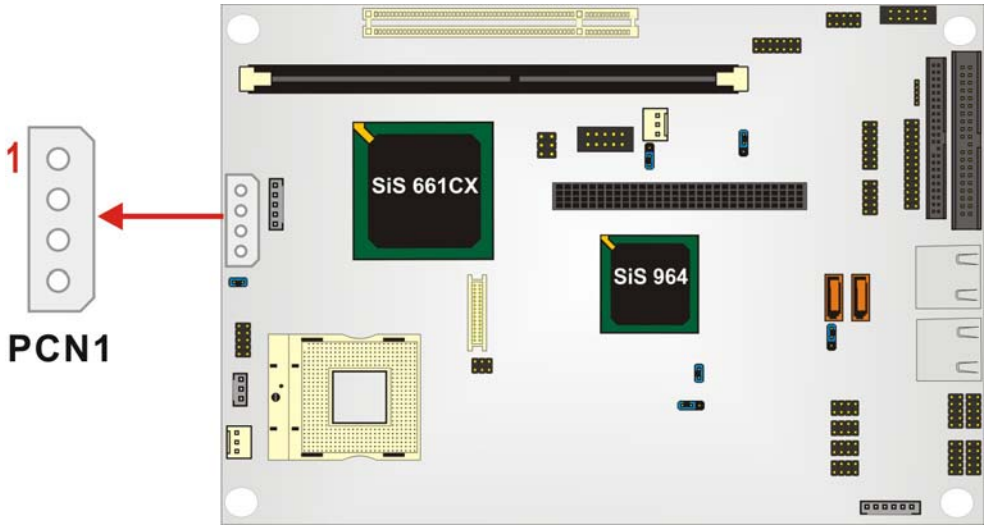

Figure 3-20: Power Connector Pinout Locations

PIN NO.	DESCRIPTION
1	VCC
2	GND1
3	GND2
4	+12V

Table 3-26: Power Connector Pinouts

3.2.20 TV Out Connector

CN Label: **TV1**

CN Type: **6-pin header (2x3)**

CN Location: **See Figure 3-21**

CN Pinouts: **See Table 3-27**

The 2x3 pin TV out connector connects to a TV.

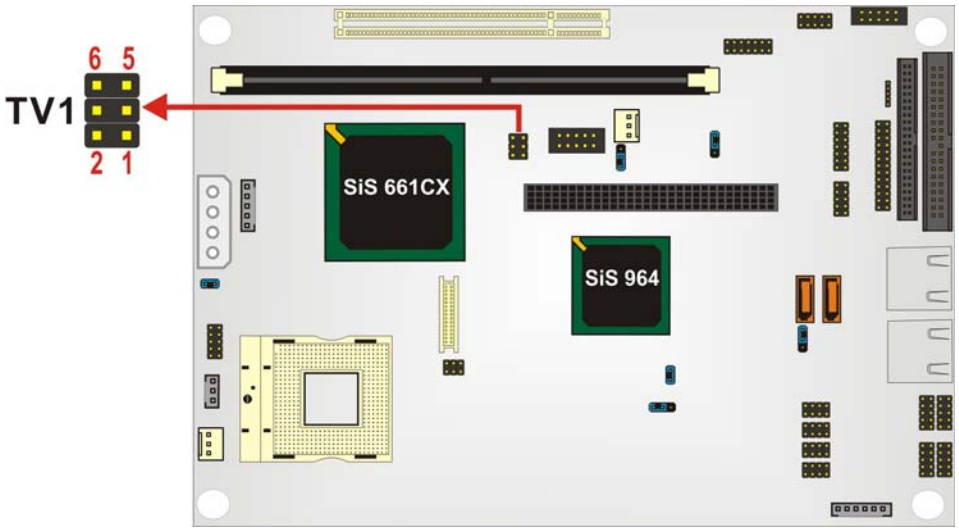

Figure 3-21: TV Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	IOY
3	GND	4	IOC
5	GND	6	ICCOMP

Table 3-27: TV Connector Pinouts

3.2.21 Internal USB Connectors

CN Label: **JUSB1, JUSB2, JUSB3, JUSB4**

CN Type: **8-pin header (2x4)**

CN Location: **See Figure 3-22**

CN Pinouts: **See Table 3-28, Table 3-29, Table 3-30, Table 3-31**

One 2x4 pin connector provides connectivity to two USB 2.0 ports. The USB ports are used for I/O bus expansion.

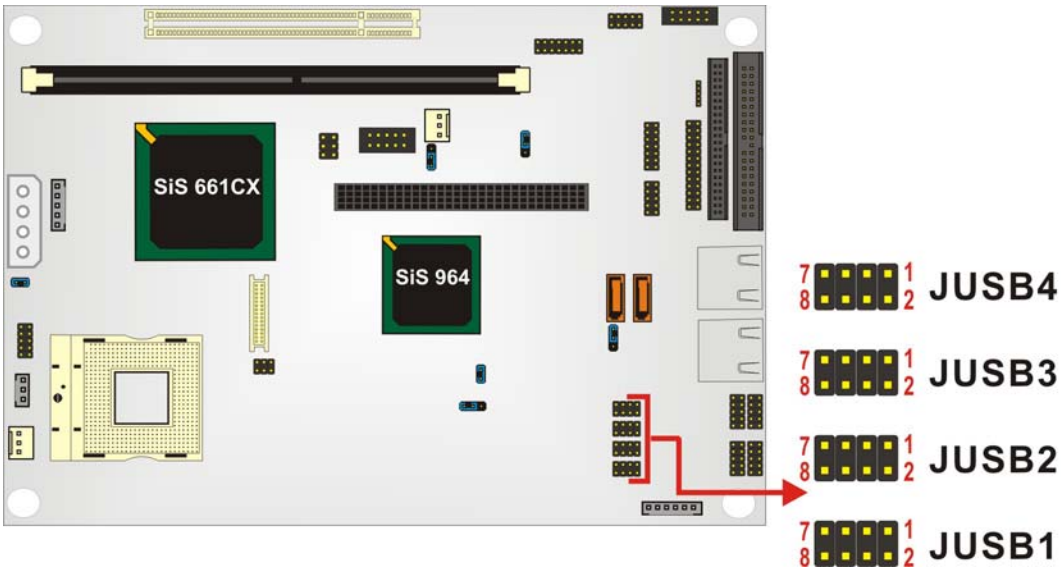

Figure 3-22: USB Connectors Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBVCC1	2	GND
3	D1F-	4	D2F+
5	D1F+	6	D2F-
7	GND	8	USBVCC1

Table 3-28: JUSB1 Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBVCC2	2	GND
3	D3F-	4	D4F+
5	D3F+	6	D4F-
7	GND	8	USBVCC2

Table 3-29: JUSB2 Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBVCC3	2	GND
3	D5F-	4	D6F+
5	D5F+	6	D6F-
7	GND	8	USBVCC3

Table 3-30: JUSB3 Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBVCC4	2	GND
3	D7F-	4	D8F+
5	D7F+	6	D8F-
7	GND	8	USBVCC4

Table 3-31: JUSB4 Pinouts

3.3 External (Rear Panel) Connectors

The peripheral connectors on the back panel are connected to devices externally when the NOVA-6612 is installed in a chassis. The peripheral connectors on the rear panel are:

- 2 x RJ-45 GbE connectors

3.3.1 LAN Connectors

CN Label: **LAN1 and LAN2**

CN Type: **RJ-45**

CN Location: **See Figure 3-23**

CN Pinouts: **See Table 3-32 and Table 3-33**

The NOVA-6612 is equipped with two built-in GbE Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

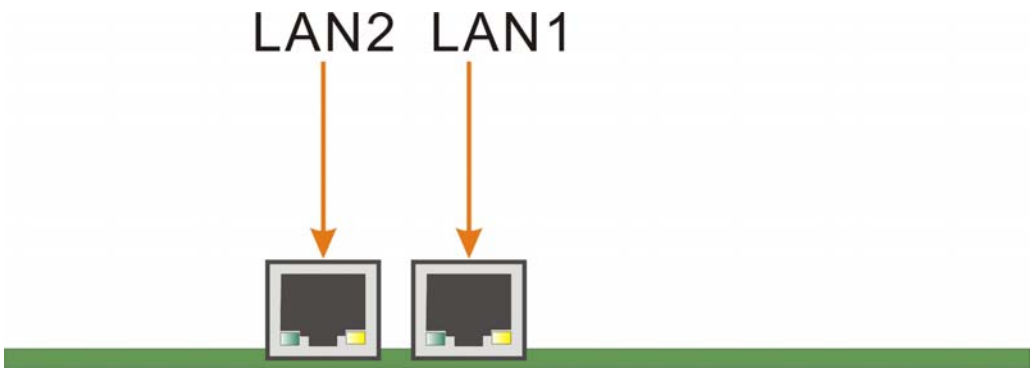

Figure 3-23: NOVA-6612 Rear Panel

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX01+	2	TX01-
3	TX11+	4	TX11-
5	V_DAC	6	V_DAC
7	TX21+	8	TX21-
9	TX31+	10	TX31-
11	LINK100-	12	LINK1000-
13	ACT-	14	ACT+

Table 3-32: LAN1 Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX02+	2	TX02-
3	TX12+	4	TX12-
5	V_DAC	6	V_DAC
7	TX22+	8	TX22-
9	TX32+	10	TX32-
11	LINK100-	12	LINK1000-
13	ACT-	14	ACT+

Table 3-33: LAN2 Pinouts

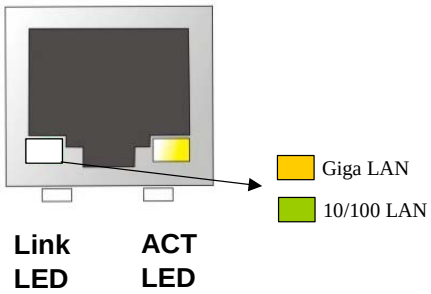

Figure 3-24: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The yellow LED indicates activity on the port and the green LED indicates the port is linked. See **Table 3-34.**

STATUS	DESCRIPTION
ORANGE	1000Mps is linked
GREEN	10/100Mps is linked
YELLOW	Activity

Table 3-34: RJ-45 Ethernet Connector LEDs

3.4 Onboard Jumpers

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

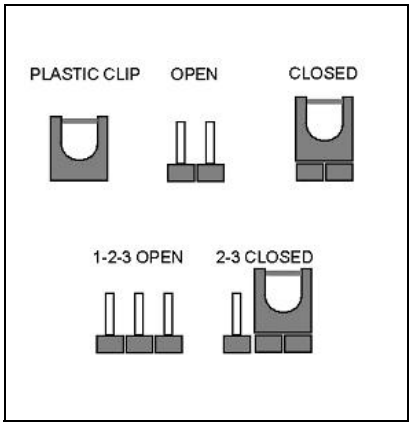

Figure 3-25 Jumper

The NOVA-6612 motherboard has six onboard jumpers. The jumpers are described in **Table 3-35**.

Description	Label	Type
Clear CMOS	J3	3-pin header
CPU power setting	JP1	2-pin header
CPU FSB setting	JP5	2-pin header
CF card setup	JP2	3-pin header
LCD voltage setup	JP4	6-pin header
COM2 setup (RS-232/422/485)	CON1	3-pin header
PCI-104 voltage setup	J2	3-pin header

Table 3-35: Onboard Jumpers

3.4.1 Clear CMOS Jumper

Jumper Label: **J3**

Jumper Type: **3 pin header**

Jumper Settings: **See Table 3-36**

Jumper Location: **See Figure 3-26**

If the NOVA-6612 fails to boot due to improper BIOS settings, use this jumper to clear the CMOS data and reset the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the “CMOS Settings Wrong” message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

Clear CMOS	DESCRIPTION
Short 2-3	Keep CMOS Setup (Default)
Short 1-2	Clear CMOS Setup

Table 3-36: Clear CMOS Jumper Settings

The clear CMOS jumper is located in **Figure 3-26**.

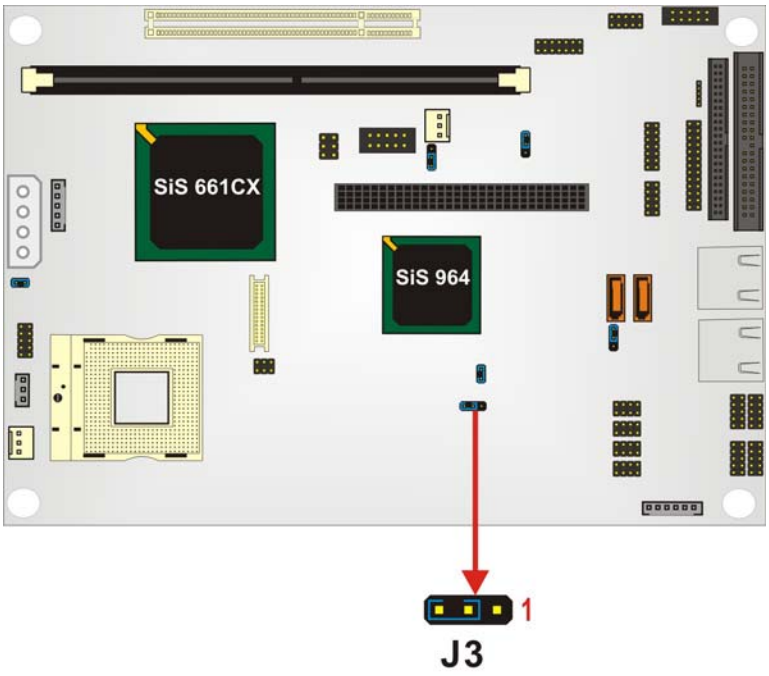

Figure 3-26: Clear CMOS Jumper Pinout Locations

3.4.2 CPU Power Jumper

Jumper Label: **JP1**

Jumper Type: **2-pin header**

Jumper Settings: **See Table 3-37**

Jumper Location: **See Figure 3-27**

The CPU Power jumper allows the user to select the CPU power.

JP1	DESCRIPTION
OPEN	100MHz
CLOSE	133MHz (Default)

Table 3-37: JP1 CPU Power Jumper Settings

The CPU Power jumper location is shown in **Figure 3-27**.

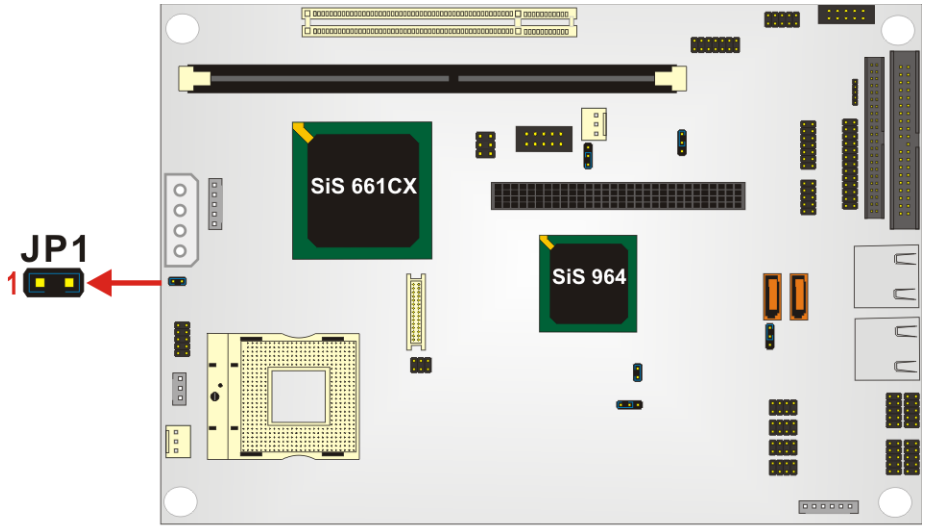

Figure 3-27: JP1 CPU Power Jumper Locations

3.4.3 CPU FSB Settings Jumpers

Jumper Label: **JP5**

Jumper Type: **2-pin header**

Jumper Settings: **See Table 3-38**

Jumper Location: **See Figure 3-28**

The CPU FSB Settings jumper allows the user to select the front side bus frequency between the CPU and the northbridge.

JP5	DESCRIPTION
OPEN	FSB 400MHz
CLOSE	FSB 533MHz (Default)

Table 3-38: JP5 FSB Selection Jumper Settings

The CPU FSB Settings jumper location is shown in **Figure 3-27**.

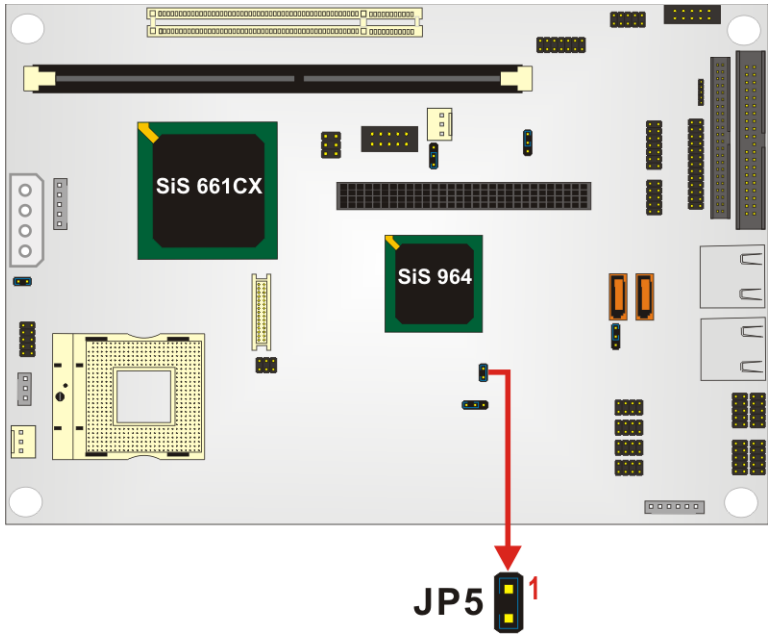

Figure 3-28: JP5 FSB Selection Jumper Locations

3.4.4 CF Card Setup

Jumper Label: **JP2**

Jumper Type: **3-pin header**

Jumper Settings: **See Table 3-39**

Jumper Location: **See Figure 3-29**

The CF Card Setup jumper sets the compact flash card as either the slave device or the master device.

JP2	DESCRIPTION
Short 1-2	Master
Short 2-3	Slave (Default)

Table 3-39: CF Card Setup Jumper Settings

The CF Card Setup jumper location is shown in **Figure 3-29**.

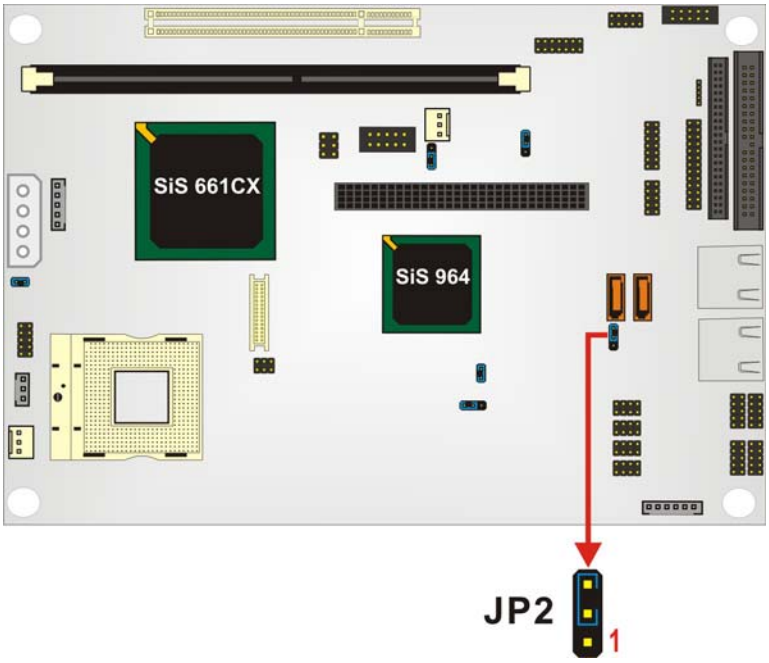

Figure 3-29: JP2 Pinout Locations

3.4.5 LCD Voltage Setup Jumper

WARNING:

Making the wrong setting on this jumper may cause irreparable damage to both the motherboard and the LCD screen connected to the onboard connector.

Jumper Label: **JP4**

Jumper Type: **6-pin header**

Jumper Settings: **See Table 3-40**

Jumper Location: **See Figure 3-30**

This jumper allows the user to set the voltage for the LCD panel. Before setting this jumper please refer to the LCD panel user guide to determine the required voltage. After the required voltage is known, make the necessary jumper setting in accordance with the settings shown in **Table 3-40**.

JP4	DESCRIPTION
Short 1-2	3.3V
Short 3-4	5V
Short 5-6	12V

Table 3-40: JP4 Jumper Settings

The LCD Voltage Setup jumper location is shown in **Figure 3-30** below.

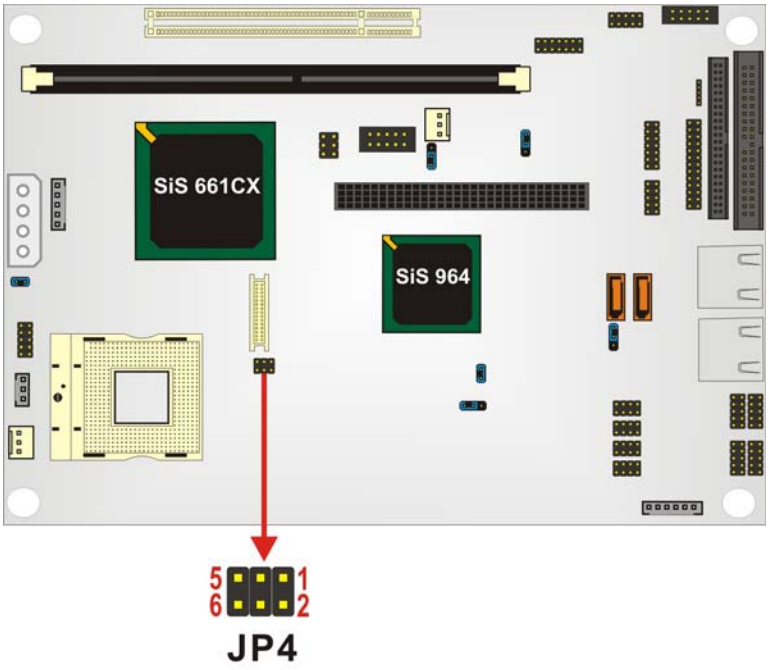

Figure 3-30: JP4 Pinout Locations

3.4.6 COM2 Setup Jumper

Jumper Label:	**CON1**
Jumper Type:	**3-pin header**
Jumper Settings:	**See Table 3-41**
Jumper Location:	**See Figure 3-31**

This jumper configures the COM2 connector as an RS-232 serial port, an RS-422 serial port or an RS-485 serial port. The selection options are shown in **Table 3-41**.

CON1	DESCRIPTION
Short 1 – 2	RS-232 (Default)
Short 2 – 3	RS-422/RS-485

Table 3-41: CON1 Jumper Settings

The COM2 Setup jumper location is shown in **Figure 3-31** below.

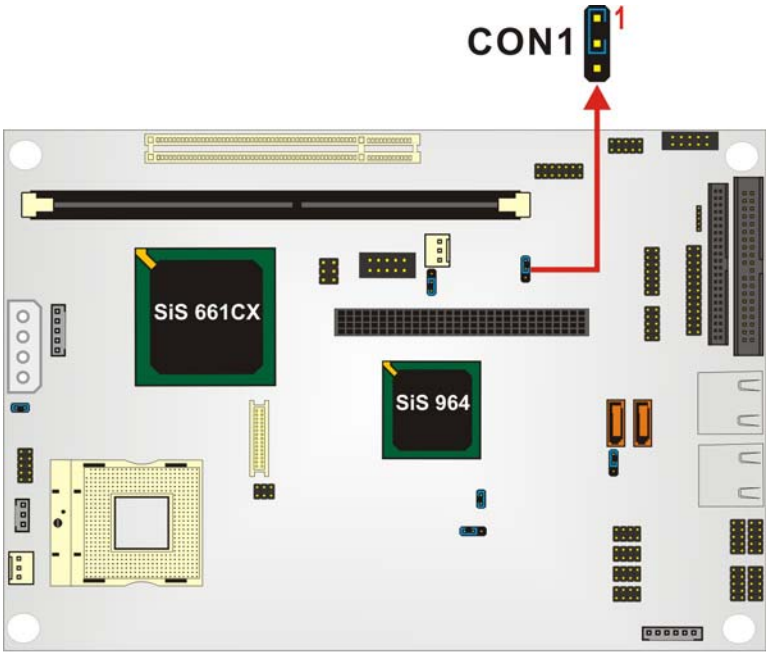

Figure 3-31: CON1 Pinout Locations

3.4.7 PCI-104 Voltage Setup Jumper

Jumper Label: **J2**

Jumper Type: **3-pin header**

Jumper Settings: **See Table 3-42**

Jumper Location: **See Figure 3-32**

This jumper allows the user to set the voltage for the PCI-104 connector (PCI1). The selection options are shown in **Table 3-42**.

J2	DESCRIPTION
Short 1 – 2	5V (Default)
Short 2 – 3	3V

Table 3-42: J2 Jumper Settings

The PCI-104 voltage setup jumper location is shown in **Figure 3-32** below.

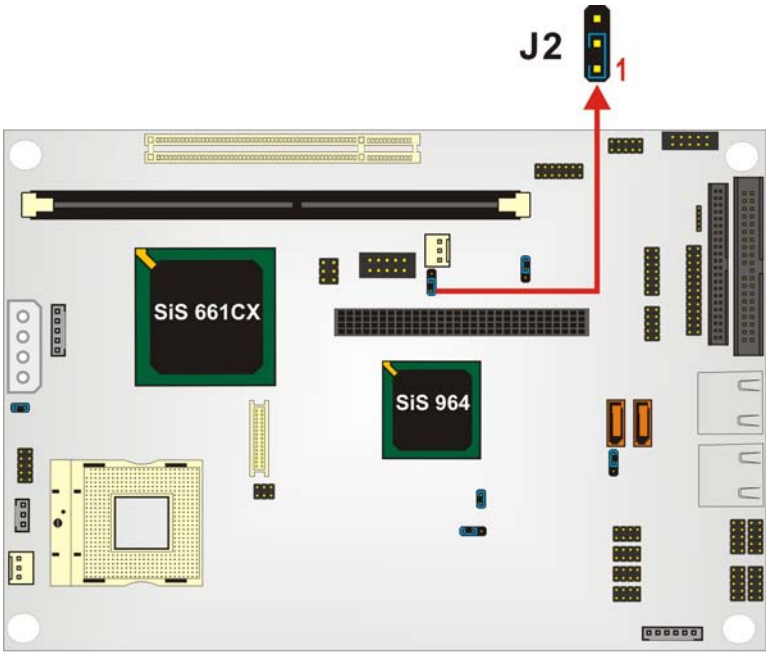

Figure 3-32: J2 Pinout Locations

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Chapter

4

Installation and Configuration

4.1 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the motherboard is installed. All installation notices pertaining to the installation of the motherboard should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the motherboard and injury to the person installing the motherboard.

4.1.1 Installation Notices

Before and during the installation of the NOVA-6612, please **do** the following:

- Read the user manual
  - The user manual provides a complete description of the NOVA-6612, installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD)
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- Place the motherboard on an antistatic pad
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn off all power to the NOVA-6612
  - When working with the motherboard, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the NOVA-6612 **DO NOT:**

- remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- use the product before verifying all the cables and power connectors are

properly connected.

- allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.2 Unpacking

NOTE:

If any of the items listed below are missing when the NOVA-6612 is unpacked, do not proceed with the installation and contact the NOVA-6612 reseller or vendor.

4.2.1 Unpacking Precautions

Before installing the NOVA-6612, unpack the motherboard. Some components on NOVA-6612 are very sensitive to static electricity and can be damaged by a sudden rush of power. To protect it from being damaged, follow these precautions:

- The user should ground them self to remove any static charge before touching the NOVA-6612. To do so wear a grounded wrist strap at all times or frequently touch any conducting materials that is connected to the ground.
- Handle the NOVA-6612 by its edges. Do not touch the IC chips, leads or circuitry if not necessary.

Do not place a PCB on top of an anti-static bag. Only the inside of the bag is safe from static discharge.

4.2.2 Checklist

When unpacking the NOVA-6612, please make sure that the package contains the following items.

- 1 x NOVA-6612 single board computer

- 1 x IDE flat cable
- 2 x SATA cables
- 1 x SATA power cable
- 4 x RS232 cables
- 1 x Keyboard/mouse cable
- 1 x Audio cable
- 1 x USB cable
- 1 x VGA cable
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x Quick Installation Guide

If one or more of these items are missing, please contact the reseller or vendor the NOVA-6612 was purchased from and do not proceed any further with the installation.

4.3 NOVA-6612 motherboard Installation

WARNING!

1. Never run the motherboard without an appropriate heat sink and cooler that can be ordered from IEI Technology or purchased separately.
2. Be sure to use the CPU 12V power connector (CN10007) for the CPU power.

WARNING!

Please note that the installation instructions described in this manual should be carefully followed in order to avoid damage to the motherboard components and injury to the user.

WARNING!

When installing electronic components onto the motherboard always take the following anti-static precautions in order to prevent ESD damage to the motherboard and other electronic components like the CPU and DIMM modules

The following components must be installed onto the motherboard or connected to the motherboard during the installation process.

- CPU
- CPU cooling kit
- DIMM modules
- Peripheral device connection

4.3.1 CPU Installation

WARNING!

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure that a heat sink and CPU cooling fan is properly installed before the motherboard is run or else both the CPU and the board may be damaged.

To install an Intel 479-pin CPU onto the motherboard, follow the steps below:

Step 1: **Is the CPU retention screw in an unlocked position?** When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to position it in an unlocked position. (See **Figure 4-1**)

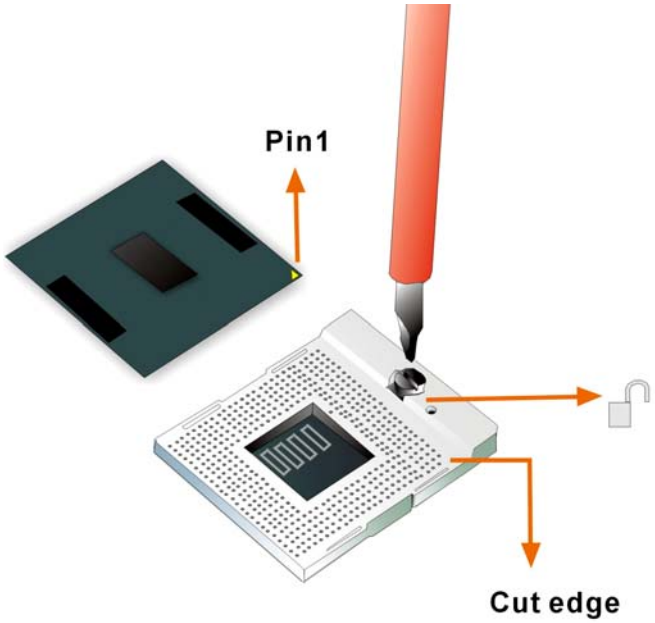


Figure 4-1: Make sure the CPU socket retention screw is unlocked

Step 2: **Inspect the CPU socket.** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 3: **Correctly position the CPU.** Make sure the pin 1 mark matches the cut edge on the CPU socket. Carefully place the CPU on top of the socket. When properly placed, the CPU should be easily inserted into the socket.

Step 4: **Insert the CPU.** To insert the CPU into the socket, hold the CPU by its edges and follow the instructions below:

a. Correctly orientate the CPU with the IHS (Integrated Heat Sink) side facing upward.

b. Locate the pin 1 mark on the CPU.

c. Gently insert the CPU into the socket.

d. Rotate the retention screw into the locked position. (See **Figure 4-2**)

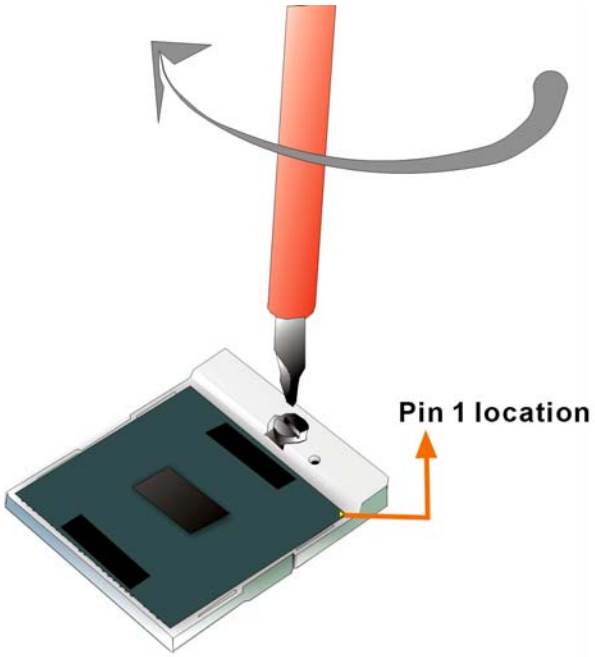


Figure 4-2: Lock the CPU Socket Retention Screw

4.3.2 Cooling Kit (CF-479B-RS) Installation

Figure 4-3: IEI CF-479B-RS Cooling Kit

IEI provides a cooling kit designed for socket 479 CPUs. (See **Figure 4-3**) The cooling kit is comprised of a CPU heat sink and a cooling fan.

NOTE:

The CF-479B-RS heat sink comes with a sprayed layer of thermal paste. Make sure the paste is not accidentally wiped during the unpacking or installation of the heat sink. Thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the CF-479B-RS cooling kit, please follow the steps below.

Step 1: **Place the cooling kit onto the CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

Step 2: **Properly align the cooling kit**. Make sure its four threaded screw fasteners can pass through the pre-drilled holes on the PCB.

Step 3: **Secure the cooling kit**. From the solder side of the PCB, align the provided nut caps to the heat sink screw threads that protrude through the PCB holes. Without over tightening the nut caps, insert them onto the protruding screw threads to secure the cooling kit to the PCB board. (See **Figure 4-4**)

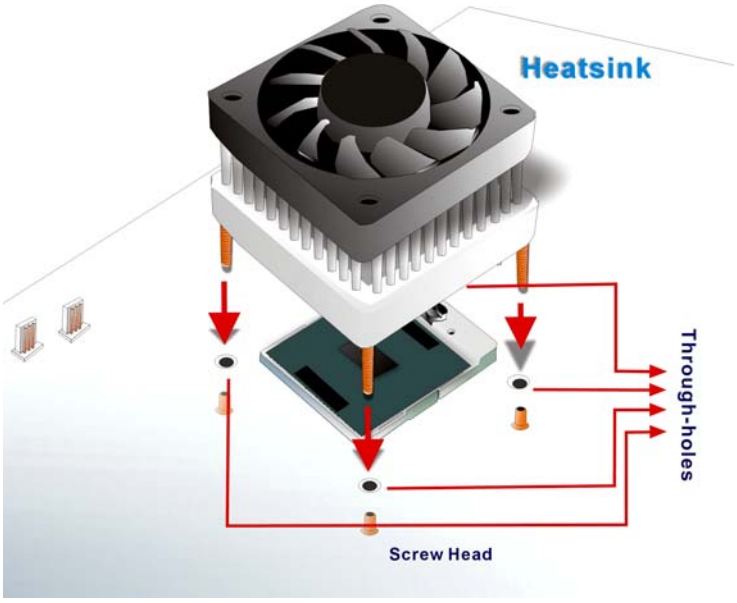


Figure 4-4: Securing the Cooling Kit

Step 4: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector

on the motherboard. Carefully route the cable and avoid heat generating chips and fan blades. (See **Figure 4-5**)

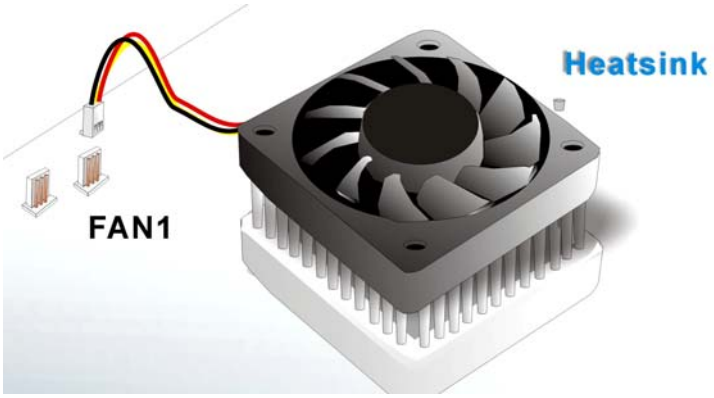


Figure 4-5: Connect the cooling fan cable

4.3.3 Mounting the NOVA-6612 Embedded Module

The NOVA-6612 embedded module has a standard PCI-104 connector on the front side. Baseboards can be designed by the end user, customized by IEI, or purchased from IEI. For more information visit the IEI webstie (www.ieiworld.com) or contact an IEI sales representative.

To install the module, follow the instructions below.

Step 1: Align the PCI-104 connector with the corresponding connector on a compatible module.

Step 2: Gently push the embedded module down to ensure the connectors are properly connected.

4.3.4 DIMM Module Installation

4.3.4.1 Purchasing the Memory Module

WARNING!

When purchasing the SODIMM modules, make sure the modules are compatible with the SODIMM slot specified in **Section 2.5 Memory**

Support.

WARNING!

The DDR2 architecture is not compatible with DDR1 modules. If the system is installed with DDR1 modules, damage might occur and may become inaccessible

4.3.4.2 DIMM Module Installation

The NOVA-6612 has one DDR SDRAM DIMM socket. Follow the steps below to install the DIMM module.

Step 3: Make sure the two handles of the DIMM socket are in the "open" position, leaning outward (**Figure 4-6**).

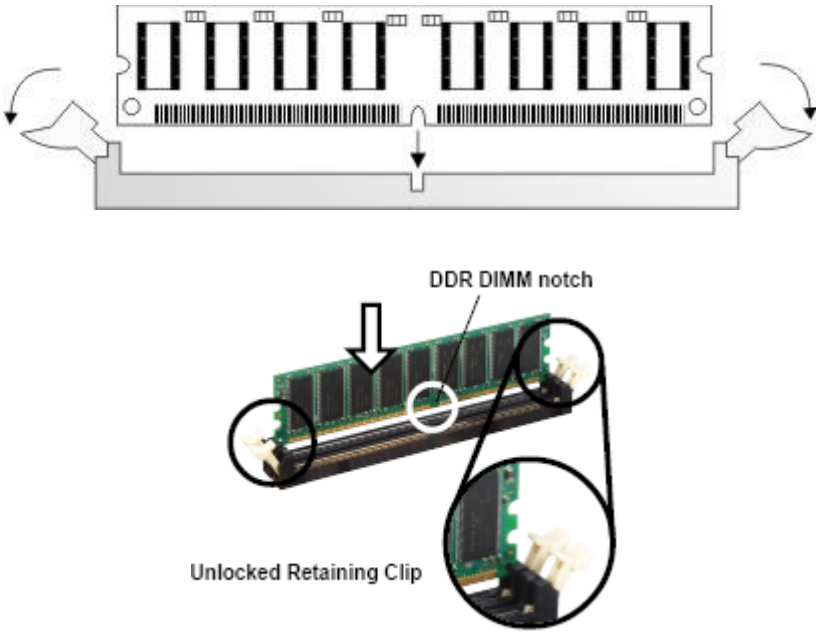


Figure 4-6: Installing the DIMM Module

Step 4: Slowly slide the DIMM module along the plastic guides on both ends of the socket. Press the DIMM module down into the socket until it clicks into position

and the two handles have automatically locked the memory module into place (**Figure 4-7**).

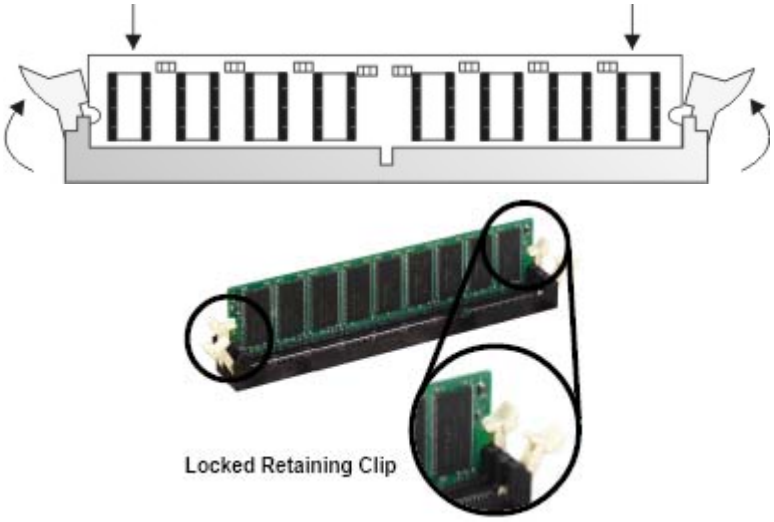


Figure 4-7: Locking the DIMM Module

Step 5: To remove the memory module, push both handles outward, and the memory module is ejected by the mechanism in the socket.

4.3.5 Peripheral Device Connection

Cables provided by IEI that connect peripheral devices to the motherboard are listed in **Table 4-1**. Cables not included in the kit must be separately purchased.

Quantity	Type
1	IDE flat cable 40P/40P/40P
1	Audio Cable
1	Keybaord/mouse cable
2	SATA cables
1	SATA power cable
4	RS-232 cables
1	USB cable
1	VGA cable

Table 4-1: IEI Provided Cables

4.3.5.1 IDE Disk Drive Connector (IDE1)

The cable used to connect the motherboard to the IDE HDD is a standard 40-pin ATA/100 flat cable. To connect an IDE HDD to the motherboard, follow the instructions below.

Step 1: Find the IDE flat cable in the kit that came with the motherboard.

Step 2: Connect one end of the cable to the IDE connector on the motherboard. A keyed pin on the IDE connector prevents it from being connected incorrectly.

Step 3: Locate the red wire on the other side of the cable that corresponds to the pin 1 connector.

Step 4: Connect the other side of the cable to the HDD making sure that the pin 1 cable corresponds to pin 1 on the connector.

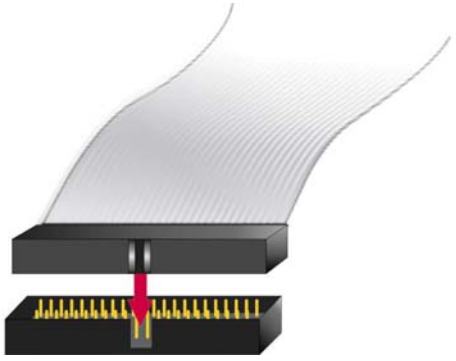


Figure 4-8: Connection of IDE Connector

NOTE:

When two IDE disk drives are connected together, back-end jumpers on the drives must be used to configure one drive as a master and the other as a slave.

4.3.5.2 Compact Flash Disk

When appropriately formatted, a compact Flash disk can serve as a bootable hard drive in applications where installation space is limited. The Compact Flash card occupies a secondary IDE channel. Configuration options can be found through the BIOS configuration utility.

4.3.5.3 Parallel Port Connector (LPT1)

The onboard parallel port connector (LPT1) connects to a printer. The NOVA-6612 comes with a multi-mode (ECP/EPP/SPP) parallel port. The parallel port interface features a 26-pin flat-cable connector that requires an adapter cable if a traditional DB-25 connector is used. The parallel port interface can be re-assigned to LPT2 or LPT3 through the BIOS configuration utility. The default interrupt channel is IRQ7. Select ECP or EPP DMA mode using the BIOS configuration utility.

4.3.5.4 Audio Interface

AC'97 Audio signals are interfaced through a 10-pin flat-cable connector. The signals include microphone line-in, line-in stereo, line-out stereo and speaker out stereo. An audio 10-pin-to-phone-jack adapter kit is required.

4.3.5.5 COM Port Connectors [COM1, COM2, COM3 and COM4]

The NOVA-6612 provides six serial ports (COM1, COM3, COM4, COM5, COM6: RS-232; COM2: RS-232/422/485) interfaced through three 10-pin male headers (COM1, COM3, COM4, COM5, COM6) and one 14-pin male header (COM2). The serial ports facilitate the connection to serial devices or a communications network, e.g., terminal console.

4.4 Chassis Installation

After the CPU, the cooling kit, and the DIMM modules have been installed and after the internal peripheral connectors have been connected to the peripheral devices and the jumpers have been configure, the motherboard can be mounted into chassis.

To mount the motherboard into a chassis please refer to the chassis user guide that came with the product.

4.5 Rear Panel Connectors

4.5.1 Ethernet Connection

The rear panel RJ-45 connectors can be connected to an external LAN and communicate with data transfer rates up to 1Gb/s.

Chapter

5

AMI BIOS Setup

5.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before, restart the computer and try again.

5.1.2 Using Setup

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. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
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
"+" key	Increase the numeric value or make changes
"-" 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

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **Chapter 3**, **Section 3.4.1**.

5.1.5 BIOS Menu Bar

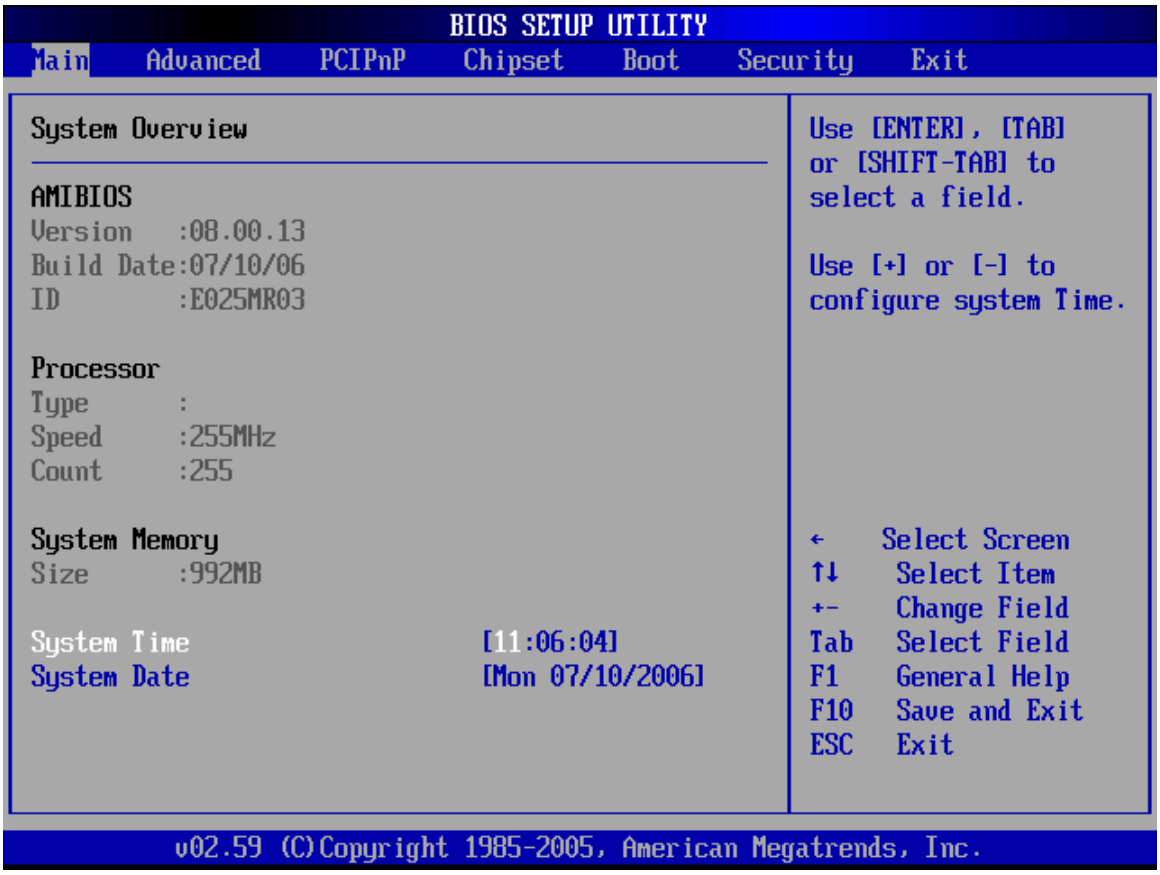
The **menu bar** on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

When the **BIOS Setup** program is entered, the **Main** menu (**BIOS Menu 1**) appears. The **Main** menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ **System Overview**

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications

- **Type**: Names the currently installed processor
- **Speed**: Lists the processor speed
- **Count**: The number of CPUs on the motherboard

- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The **System Overview** field also has two user configurable fields:

- **System Time [xx:xx:xx]**: The system time is set here.
- **System Date [Day xx/xx/xxxx]:** The system date is set here.

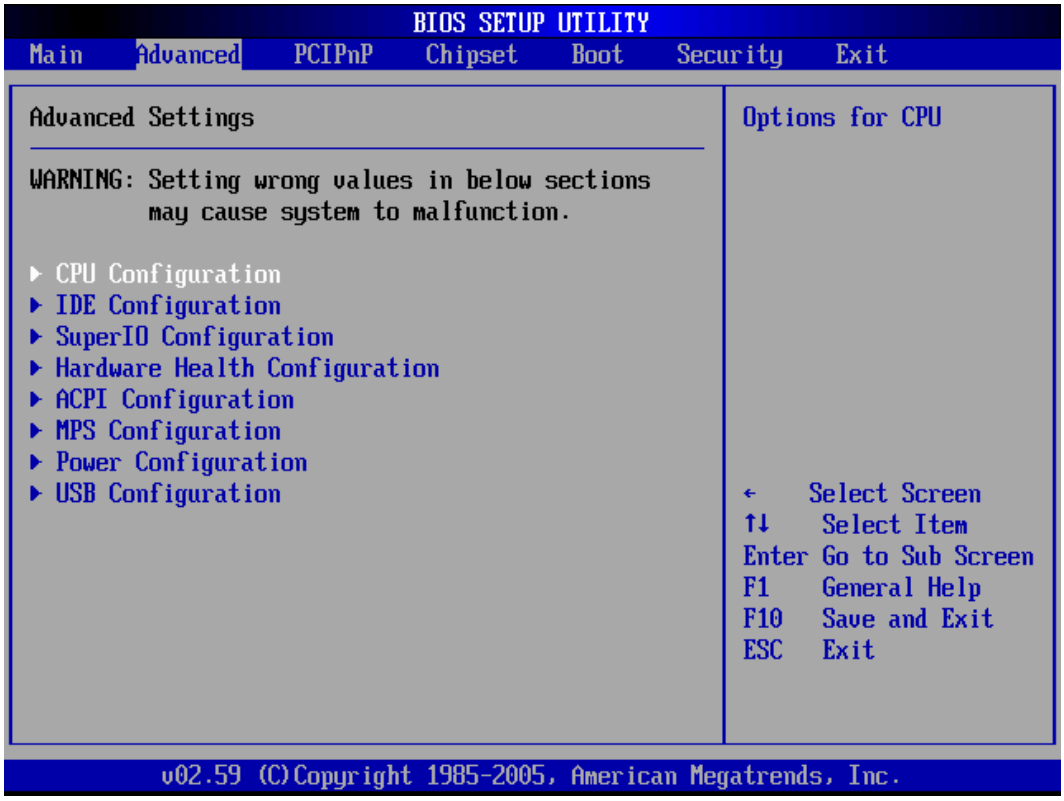
5.3 Advanced

The **Advanced** menu (**BIOS Menu 2**) allows access to the CPU and peripheral device configuration options through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

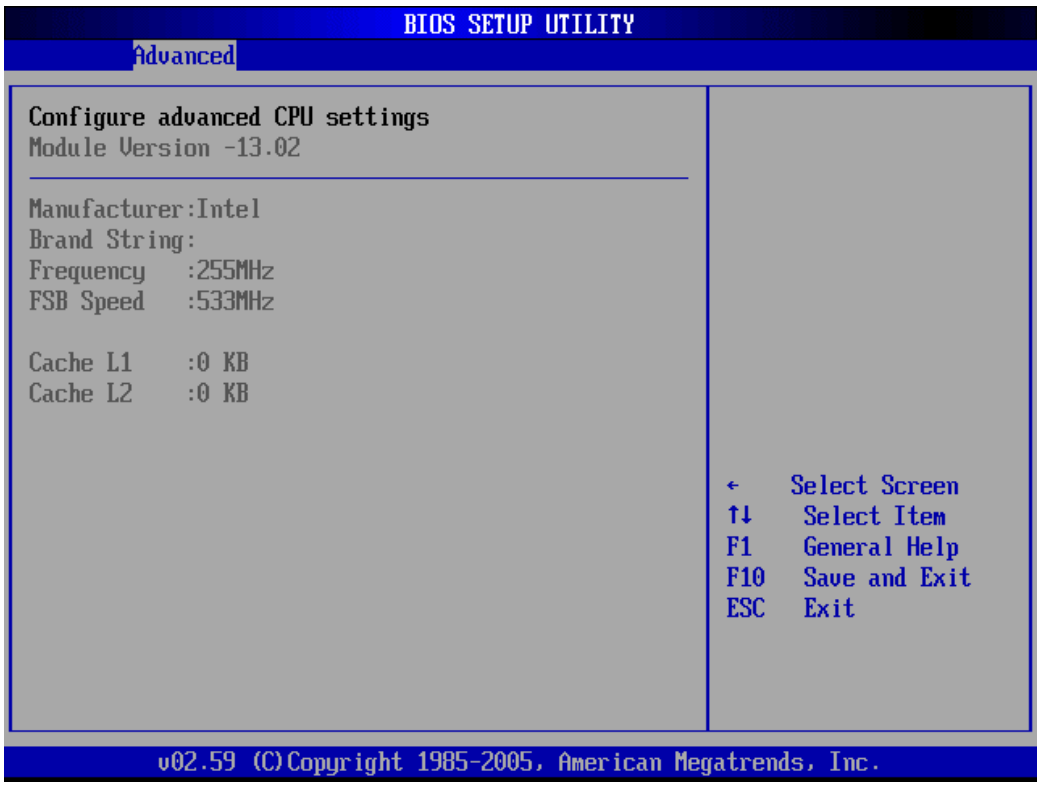
- CPU Configuration (see Section 5.3.1)
- IDE Configuration (see Section 5.3.2)
- SuperIO Configuration (see Section 5.3.3)
- Hardware Health Configuration (see Section 0)
- ACPI Configuration (see Section 5.3.5)
- MPS Configuration (see Section 5.3.6)
- Power Configuration (see Section 5.3.7)
- USB Configuration (see Section 5.3.8)



BIOS Menu 2: Advanced

5.3.1 CPU Configuration

The **CPU Configuration** menu (**BIOS Menu 3**) shows detailed CPU specifications and CPU configuration options.



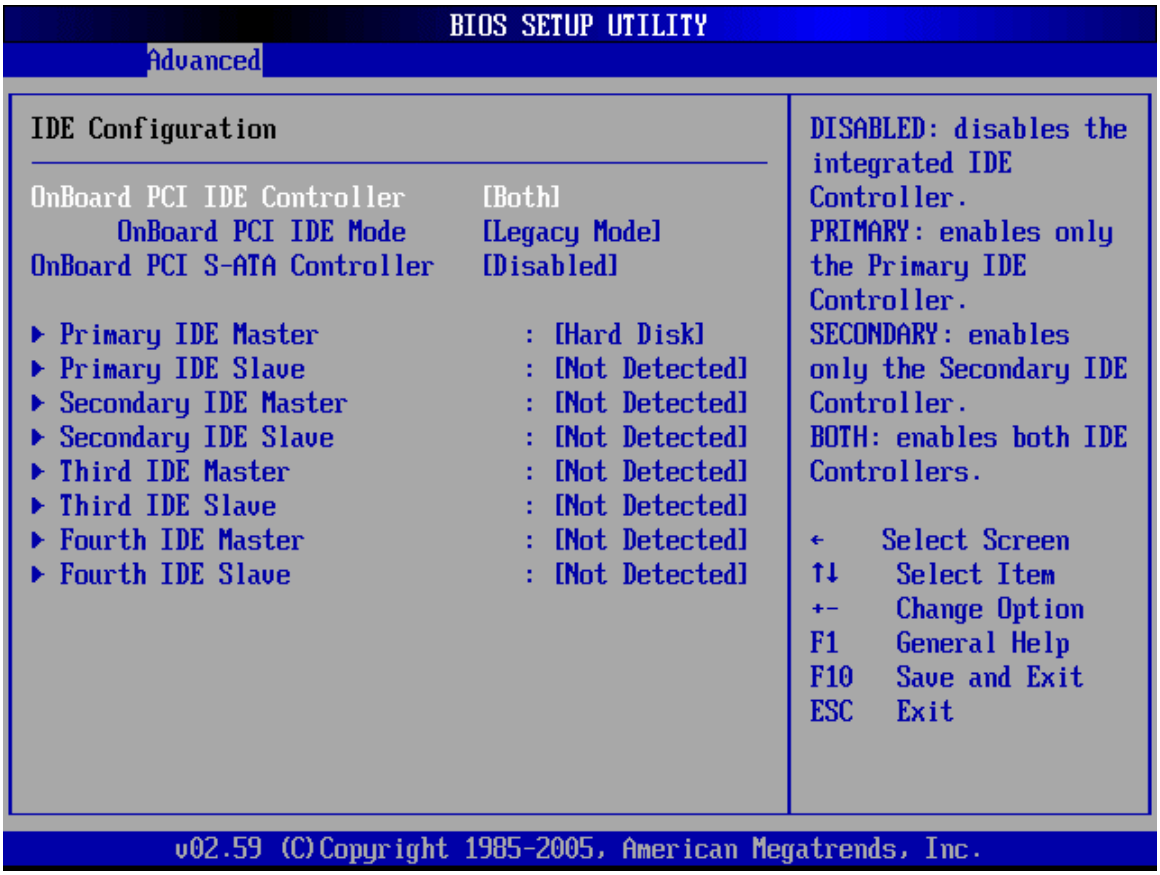
BIOS Menu 3: CPU Configuration

The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- **Manufacturer**: Lists the name of the CPU manufacturer
- **Brand String**: Lists the brand name of the CPU being used
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size

5.3.2 IDE Configuration

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system.



BIOS Menu 4: IDE Configuration

➔ **OnBoard PCI IDE Controller [Both]**

The **OnBoard PCI IDE Controller** BIOS option specifies the IDE channels used by the onboard PCI IDE controller. The following configuration options are available.

➔ **Disabled** Prevents the system from using the onboard IDE controller

➔ **Primary** Only allows the system to detect the Primary IDE channel, including both the Primary Master and Primary Slave)

➔ **Secondary** Only allows the system to detect the Secondary IDE

channel, including both the Secondary Master and Secondary Slave)

➔ **Both** (Default) Allows the system to detect both the Primary and Secondary IDE channels including the Primary Master, Primary Slave, Secondary Master and Secondary Slave.

➔ **Onboard PCI IDE Mode [Legacy Mode]**

The **Onboard PCI IDE Mode** BIOS option sets the running mode for the PCI IDE.

➔ **Legacy Mode** (Default) The PCI IDE mode is the same as the IDE mode

➔ **Native Mode** The PCI IDE mode is the native mode

➔ **Onboard PCI S-ATA Controller [Disabled]**

The **Onboard PCI S-ATA Controller** option sets the onboard SATA controller. If the RAID function is going to be used (see **Appendix E**) this option must be set in the **RAID** mode.

➔ **Disabled** (Default) The onboard PCI SATA controller is disabled

➔ **Native Mode** The SATA controller is set as an IDE device with ID at 0181h

➔ **Raid Mode** The SATA controller is set as a RAID device with ID at 0181h

➔ **IDE Master and IDE Slave**

When entering setup, BIOS auto detects the presence of IDE devices. This displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

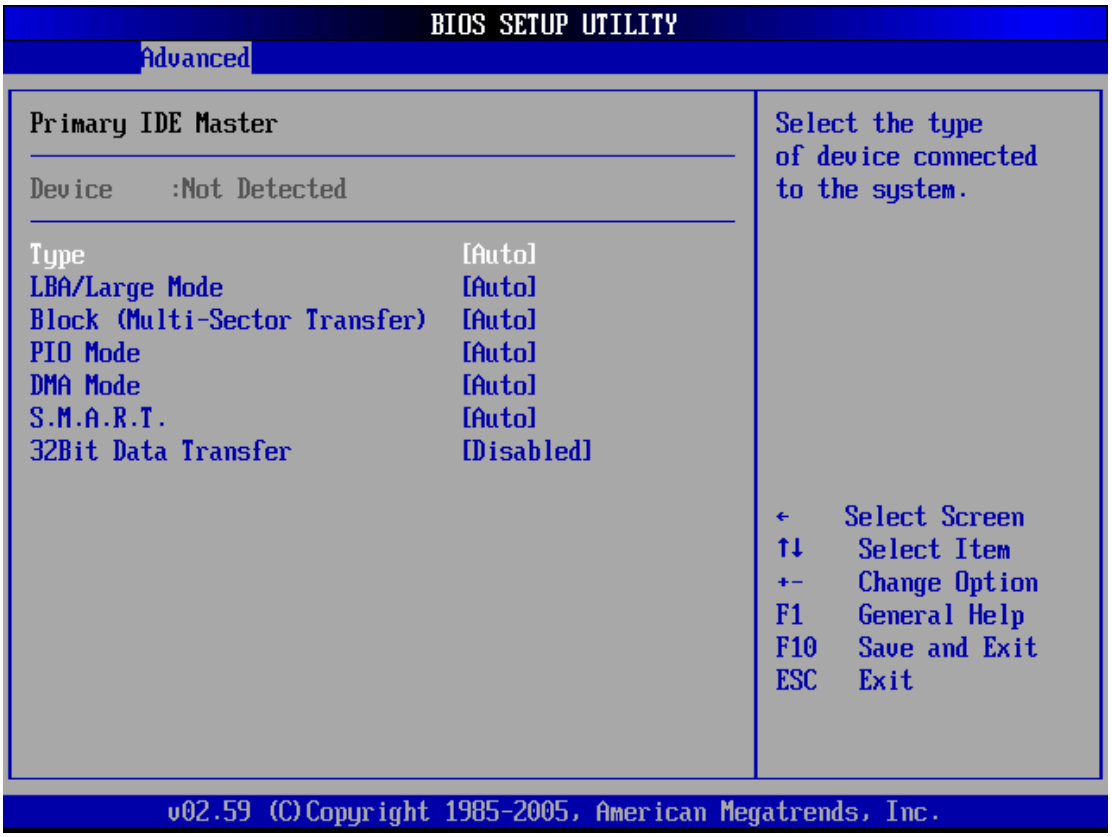
- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

- Third IDE Master
- Third IDE Slave
- Fourth IDE Master
- Fourth IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

5.3.2.1 IDE Master, IDE Slave

IDE Master and IDE Slave configuration options for both primary and secondary IDE devices are shown in the BIOS menu below.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The “grayed-out” items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Vendor**: Lists the device manufacturer
- **Size**: The size of the device.
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.
- **Async DMA**: Indicates the highest Asynchronous DMA Mode that is supported.
- **Ultra DMA**: Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.

➔ **Type [Auto]**

The **Type** BIOS option determines the type of device that the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) has completed.

➔ **Not Installed**		Selecting this value prevents the BIOS from searching for an IDE disk drive on the specified channel.
➔ **Auto**	(Default)	This selection enables the BIOS to auto detect the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM

drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

➔ **ARMD** This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

- ➔ **ZIP**
- ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

The **LBA/Large Mode** BIOS option disables or auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

- ➔ **Disabled** This selection prevents the BIOS from using the LBA mode control on the specified channel.
- ➔ **Auto** (Default) This option allows the BIOS to auto detect the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

- ➔ **Disabled** Selecting this option prevents the BIOS from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
- ➔ **Auto** (Default) Selecting this value to allows the BIOS to auto detect the device support for Multi-Sector Transfers on the specified channel. If supported. Select this value to allow the BIOS to auto detect the number of sectors per block for transfer from the hard disk drive to the memory. The data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

The **PIO Mode** option selects the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto**	(Default)	This setting allows the BIOS to auto detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.
➔ **0**		PIO mode 0 selected with a maximum transfer rate of 3.3MBps
➔ **1**		PIO mode 1 selected with a maximum transfer rate of 5.2MBps
➔ **2**		PIO mode 2 selected with a maximum transfer rate of 8.3MBps
➔ **3**		PIO mode 3 selected with a maximum transfer rate of 11.1MBps
➔ **4**		PIO mode 4 selected with a maximum transfer rate of 16.6MBps (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

The **DMA Mode** BIOS selection adjusts the DMA mode options.

➔ **Auto**	(Default)	The BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.

➔ **S.M.A.R.T [Auto]**

Self-Monitoring Analysis and Reporting Technology (SMART) feature can help predict impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto**	(Default)	BIOS to auto detects if the hard disk drive supports S.M.A.R.T. Use this setting if the IDE disk drive support cannot be determined.

➔ **Disabled** Select this value to prevent the BIOS from using the SMART feature.

➔ **Enabled** Select this value to allow the BIOS to use the SMART feature on support hard disk drives.

➔ **32Bit Data Transfer [Disabled]**

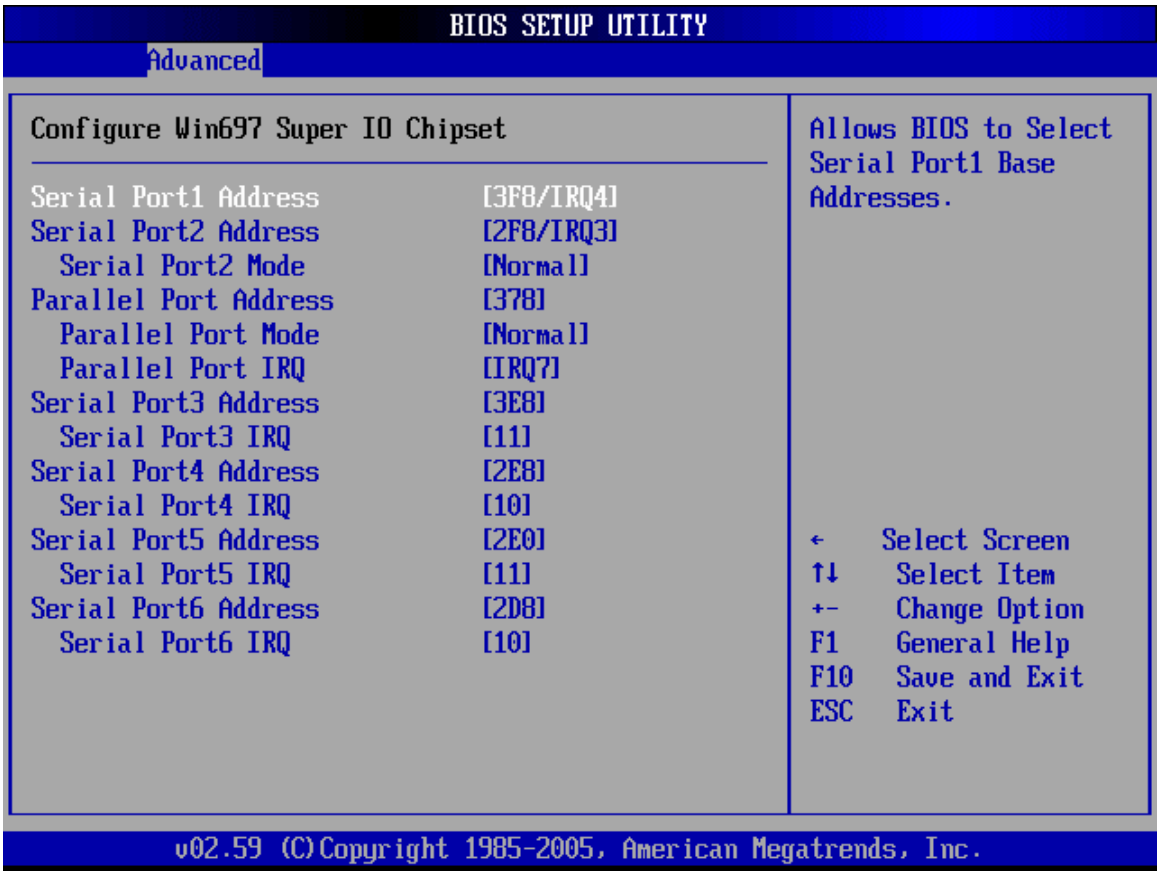
The **32Bit Data Transfer** BIOS option enables or disables 32-bit data transfers.

➔ **Disabled** (Default) Prevents the BIOS from using 32-bit data transfers.

➔ **Enabled** Allows BIOS to use 32-bit data transfers on support hard disk drives.

5.3.3 Super IO Configuration

The **Super IO Configuration** menu (**BIOS Menu 6**) sets or changes the configurations for the FDD controllers, parallel ports and serial ports.



BIOS Menu 6: Super IO Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

The **Serial Port1 Address** option allows BIOS to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8/IRQ4**	(Default)	Serial Port 1 I/O port address is 3F8 and the interrupt address is IRQ4
➔ **3E8/IRQ4**		Serial Port 1 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 1 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

The **Serial Port2 Address** option allows BIOS to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8/IRQ3**	(Default)	Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3
➔ **3E8/IRQ4**		Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Allows BIOS to select the mode for Serial Port 2

➔ **Normal**	(Default)	Serial Port 1 mode is normal
➔ **IrDA**		Serial Port 1 mode is IrDA
➔ **ASK IR**		Serial Port 1 mode is ASK IR

➔ **Parallel Port Address [378]**

This option allows BIOS to select the base addresses for the Parallel Port

➔ **Disabled**		No base address is assigned to the Parallel Port
➔ **378**	(Default)	Parallel Port I/O port address is 378
➔ **278**		Parallel Port I/O port address is 278
➔ **3BC**		Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

The Parallel Port Mode selection selects the mode the parallel port operates in.

➔ **Normal**	(Default)	The normal parallel port mode is the standard mode for parallel port operation.
➔ **Bi-Directional**		Bi-Directional parallel port is able to receive 8 lines of data into the computer.
➔ **EPP**		The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
➔ **ECP+EPP**		The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode The parallel port becomes compatible with EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

The **Parallel Port Address** BIOS option assigns the parallel port interrupt address. The following address options are available.

➔ **IRQ5**		Parallel port interrupt address is IRQ5
➔ **IRQ7**	(Default)	Parallel port interrupt address is IRQ7

➔ **Serial Port3 Address [3E8]**

This option allows BIOS to select the base addresses for serial port 3

- ➔ **Disabled** No base address is assigned to serial port 3
- ➔ **3E8** (Default) Serial port 3 I/O port address is 3E8
- ➔ **2E8** Serial port 3 I/O port address is 2E8
- ➔ **2E0** Serial port 3 I/O port address is 2E0

➔ **Serial Port3 IRQ [11]**

The **Serial Port3 IRQ** selection sets the interrupt address for serial port 3.

- ➔ **10** Serial port 3 IRQ address is 10
- ➔ **11** (Default) Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

This option allows BIOS to select the base addresses for serial port 4.

- ➔ **Disabled** No base address is assigned to serial port 4
- ➔ **3E8** Serial port 4 I/O port address is 3E8
- ➔ **2E8** (Default) Serial port 4 I/O port address is 2E8
- ➔ **2E0** Serial port 4 I/O port address is 2E0

➔ **Serial Port4 IRQ [10]**

The **Serial Port4 IRQ** selection sets the interrupt address for serial port 4.

- ➔ **10** (DEFAULT) Serial port 4 IRQ address is 10
- ➔ **11** Serial port 4 IRQ address is 11

➔ **Serial Port5 Address [2E0]**

This option allows BIOS to select the base addresses for serial port 5.

- ➔ **Disabled** No base address is assigned to serial port 5
- ➔ **3E8** Serial port 5 I/O port address is 3E8
- ➔ **2E8** Serial port 5 I/O port address is 2E8
- ➔ **2E0** (Default) Serial port 5 I/O port address is 2E0
- ➔ **2D8** Serial port 5 I/O port address is 2D8

➔ **Serial Port5 IRQ [11]**

The **Serial Port5 IRQ** selection sets the interrupt address for serial port 5.

- ➔ **10** Serial port 5 IRQ address is 10
- ➔ **11** (Default) Serial port 5 IRQ address is 11

➔ **Serial Port6 Address [2D8]**

This option allows BIOS to select the base addresses for serial port 6.

- ➔ **Disabled** No base address is assigned to serial port 6
- ➔ **3E8** Serial port 6 I/O port address is 3E8
- ➔ **2E8** Serial port 6 I/O port address is 2E8
- ➔ **2E0** Serial port 6 I/O port address is 2E0
- ➔ **2D8** (Default) Serial port 6 I/O port address is 2D8

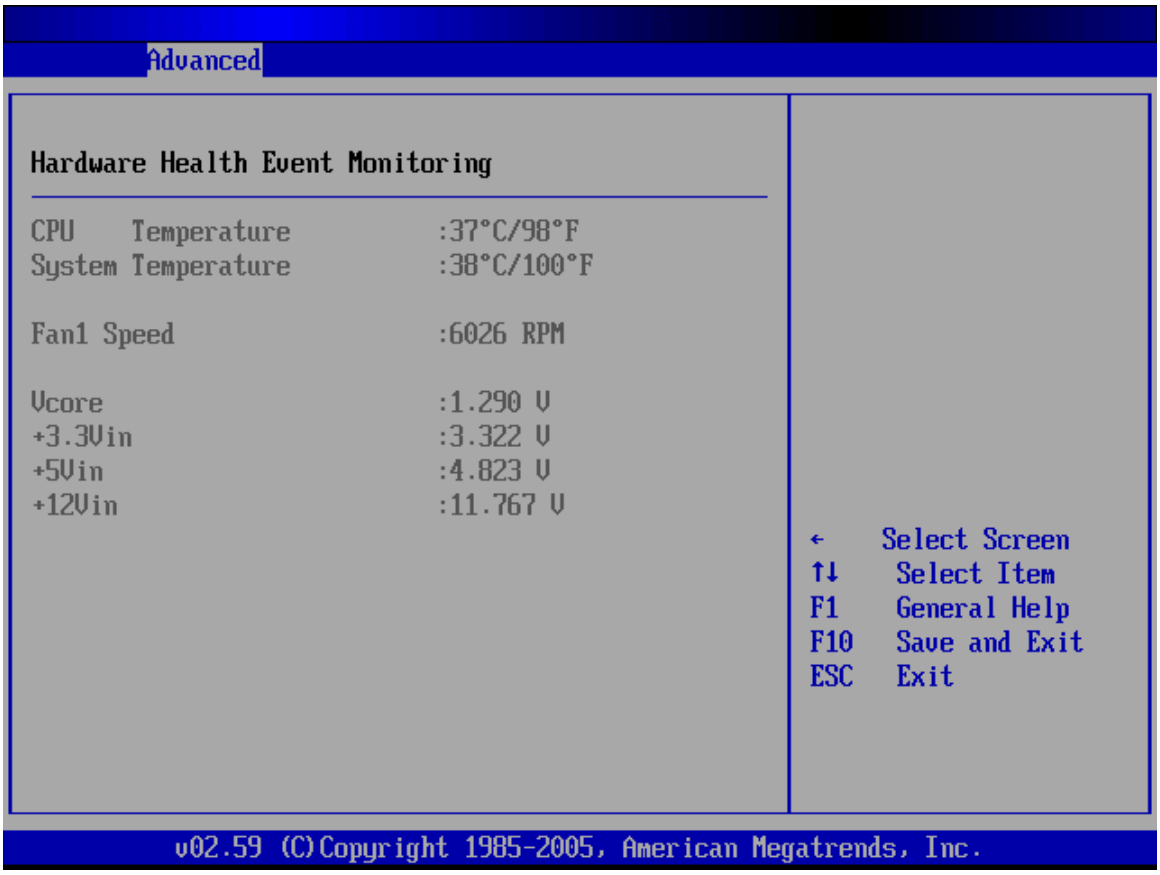
➔ **Serial Port6 IRQ [10]**

The **Serial Port6 IRQ** selection sets the interrupt address for serial port 6.

- ➔ **10** (Default) Serial port 6 IRQ address is 10
- ➔ **11** Serial port 6 IRQ address is 11

5.3.4 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 7: Hardware Health Configuration

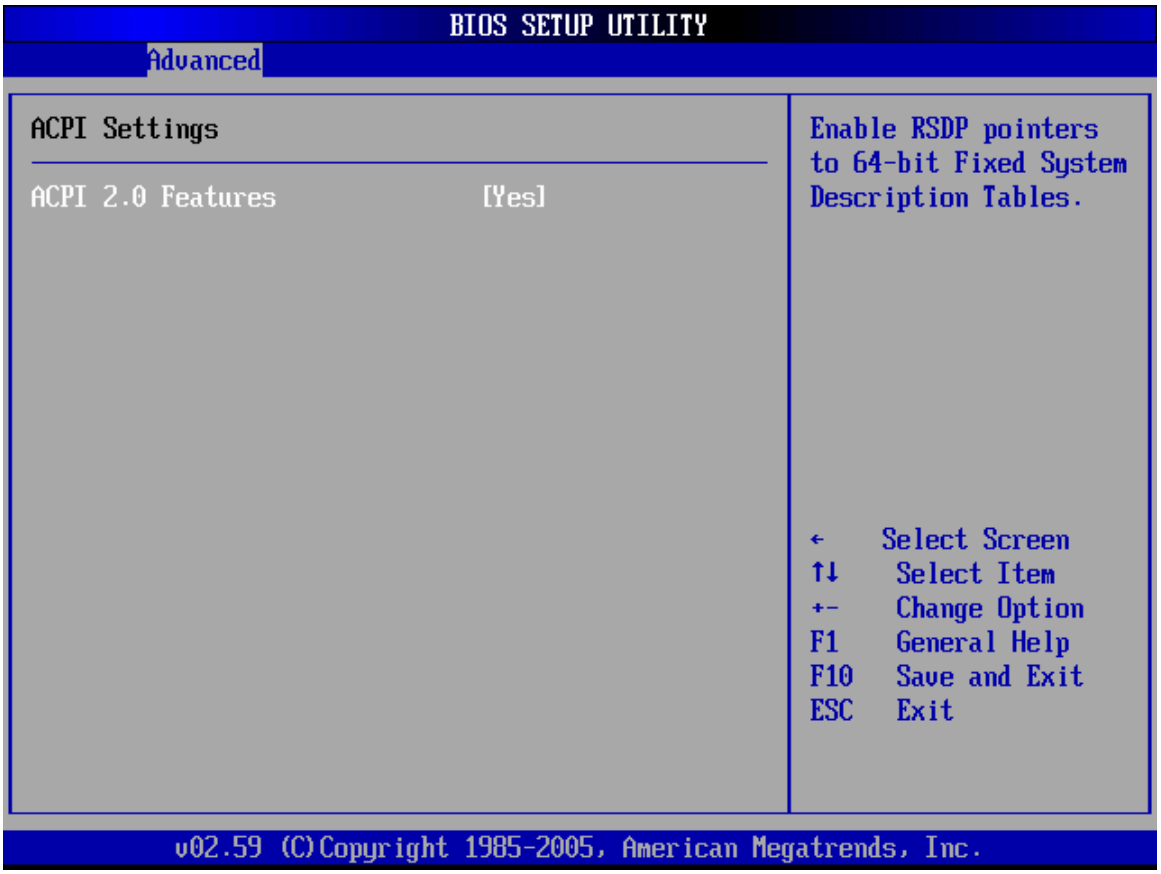
The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - CPU Temperature
  - System Temperature
- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - Fan1 Speed
- **Voltages**: The following system voltages are monitored

- Vcore
- +3.30Vin
- +5.00Vin
- +12Vin

5.3.5 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 8**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



BIOS Menu 8: ACPI Configuration

➔ **ACPI 2.0 Features [Yes]**

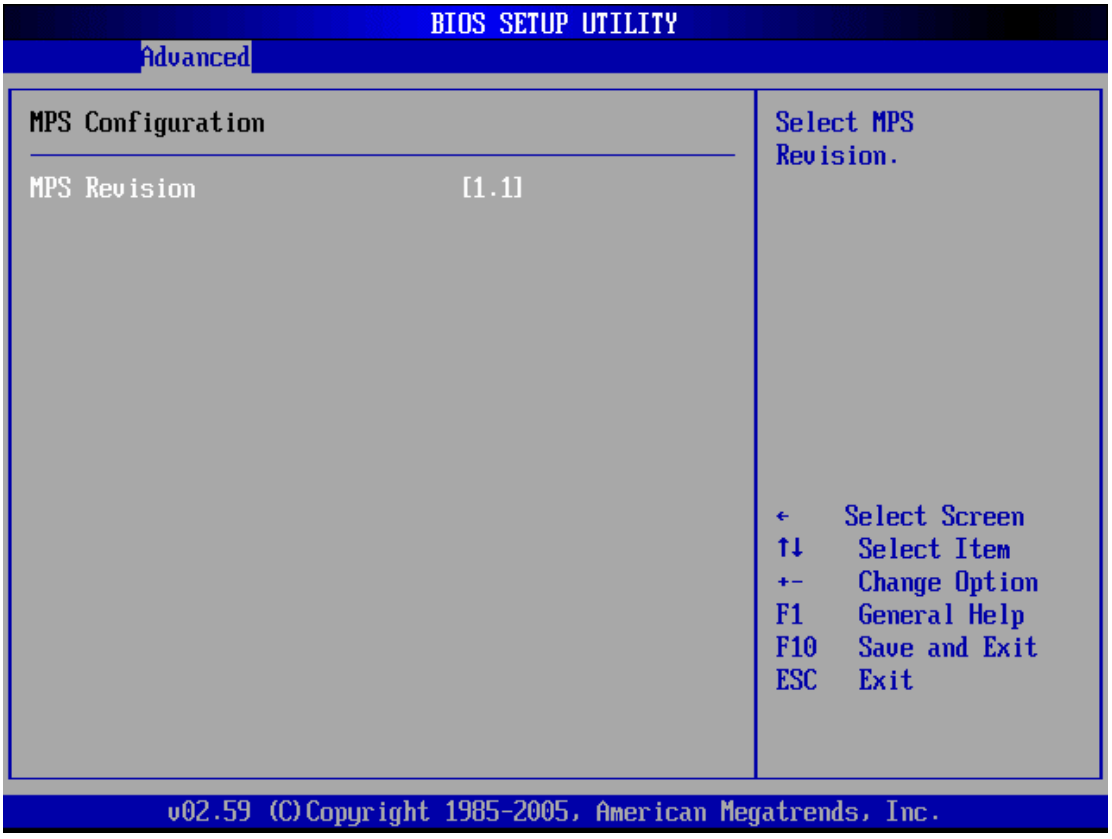
The **ACPI 2.0 Features** BIOS enables the ACPI (Advanced Configuration and Power Interface) features. If enabled the system RSDP (Root System Description Pointer) can obtain physical addresses for other 64-bit fixed system description tables.

➔ **No** RSDP pointers to 64-bit fixed systems will not be provided to the system

➔ **Yes** (Default) RSDP pointers to 64-bit fixed systems will be provided to the system

5.3.6 MPS Configuration

The **MPS Configuration** menu (**BIOS Menu 9**) configures the multi-processor table.



BIOS Menu 9: MPS Configuration

➔ **MPS Revision [1.1]**

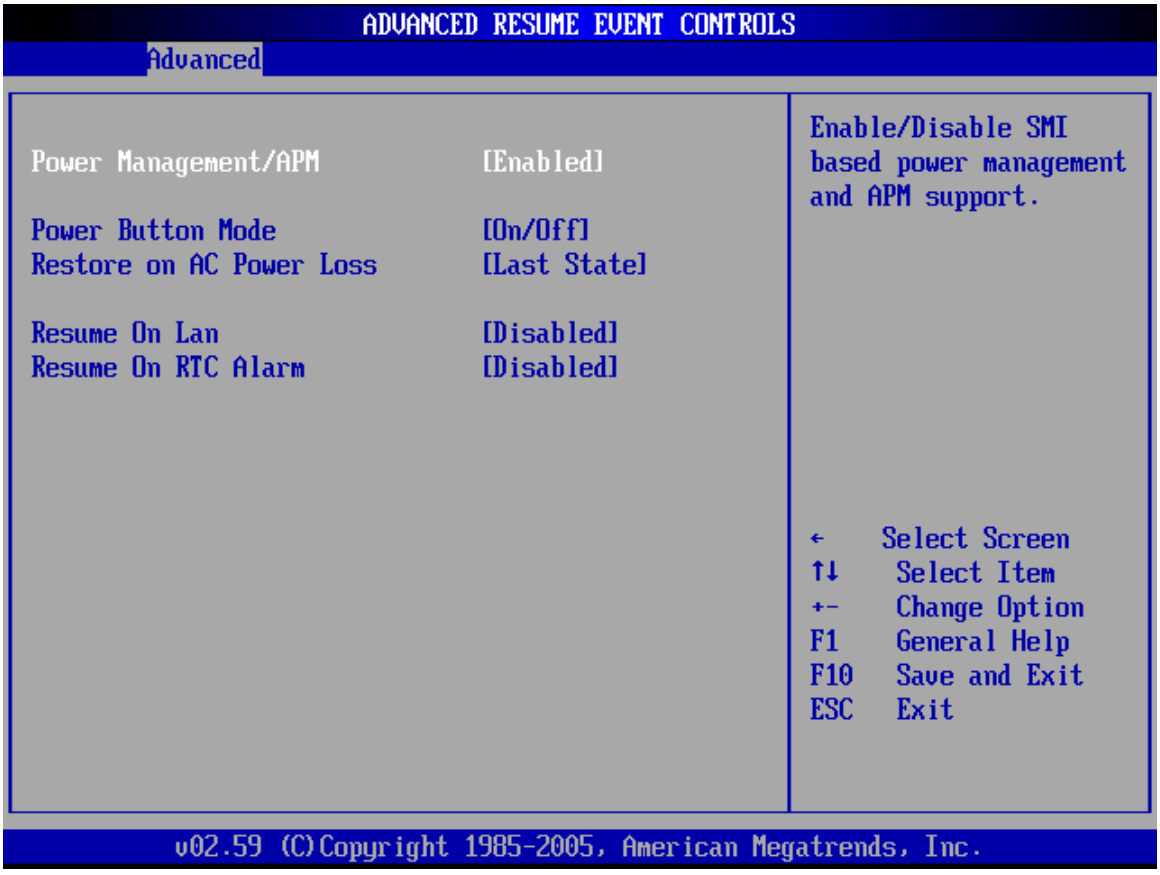
The **Multiprocessor Specification (MPS) for OS** specifies the MPS version to be used.

➔ **1.1** (Default) MPS version 1.1 is used

➔ **1.4** MPS version 1.4 is used

5.3.7 Power Configuration

The **Power Configuration** menu (**BIOS Menu 10**) gives power configuration information and configures some power features.



BIOS Menu 10: Power Configuration

➔ **Power Management/APM [Enabled]**

The **Power Management/APM** BIOS option accesses the advanced power management features.

➔ **Disabled**		Disables the Advanced Power Management (APM) feature
➔ **Enabled**	(Default)	Enables the APM feature

➔ **Power Button Mode [On/Off]**

The **Power Button Mode** BIOS specifies how the power button functions.

➔ **On/Off**	(Default)	When the power button is pressed the system is either turned on or off
➔ **Standby**		When the power button is pressed the system goes into standby mode
➔ **Suspend**		When the power button is pressed the system goes into suspend mode

➔ **Restore on AC Power Loss [Last State]**

The Restore on AC Power Loss BIOS option specifies what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off**		The system remains turned off
➔ **Power On**		The system turns on
➔ **Last State**	(Default)	The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Resume on Lan [Disabled]**

The **Resume on Lan** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the LAN.

➔ **Disabled** (Default) Wake event not generated by LAN activity

➔ **Enabled** Wake event generated by LAN activity

➔ **Resume On RTC Alarm [Disabled]**

The **Resume On RTC Alarm** determines when the computer will be roused from a suspended state.

➔ **Disabled** (Default) The real time clock (RTC) cannot generate a wake event

➔ **Enabled** If selected, the following will appear with values that can be selected:

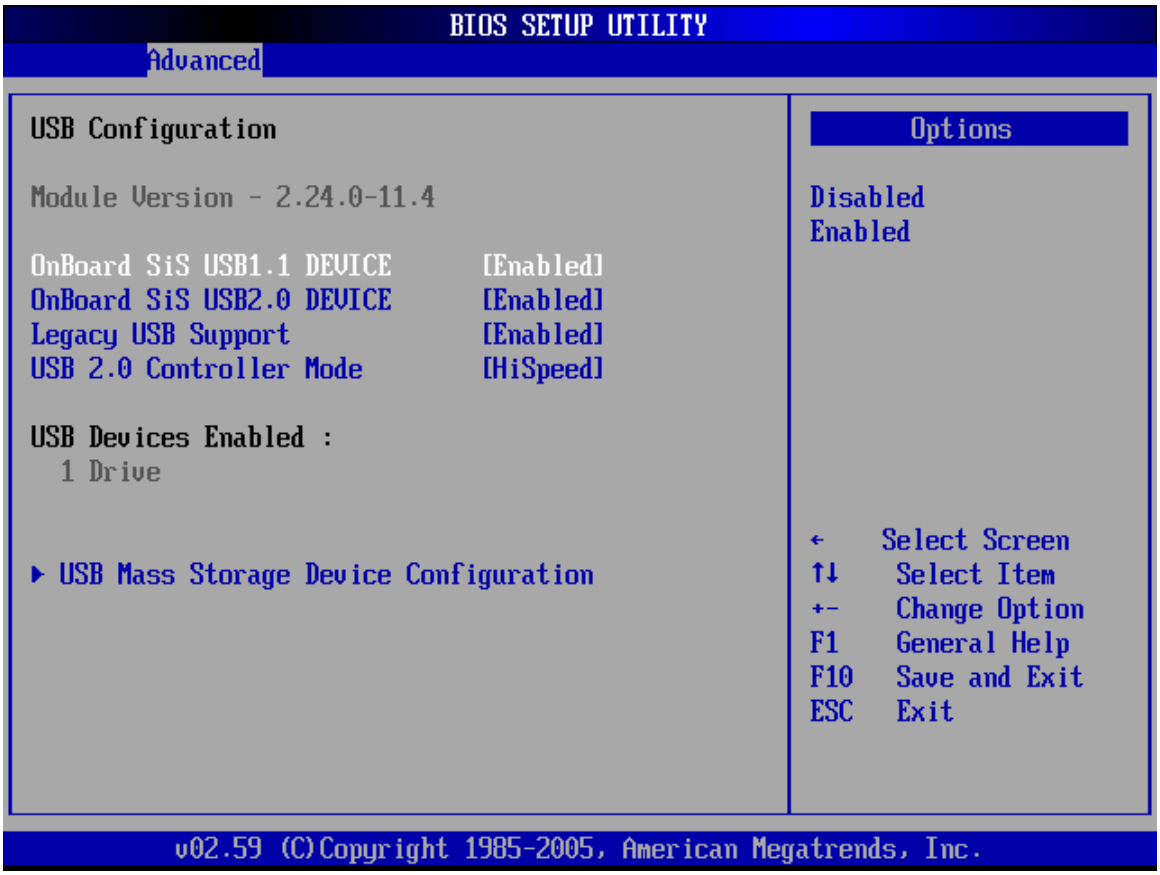
➔ **RTC Alarm Date (Days)**

➔ **System Time**

After setting the alarm, the computer will turn itself on from a suspend state when the alarm goes off.

5.3.8 USB Configuration

The **USB Configuration** menu (**BIOS Menu 11**) gives USB configuration information and configures some USB features.



BIOS Menu 11: USB Configuration

➔ **Onboard SiS USB1.1 DEVICE [Enabled]**

The Onboard **SiS USB1.1 DEVICE** BIOS option enables or disables the onboard SiS USB1.1 controller. If disabled, USB1.1 devices cannot be used.

➔ **Disabled** USB 1.1 interface is disabled and cannot be used.

➔ **Enabled** (Default) USB 1.1 interface is enabled and can be used.

➔ **Onboard SiS USB2.0 DEVICE [Enabled]**

The Onboard **SiS USB2.0 DEVICE** BIOS option enables or disables the onboard SiS USB2.0 controller. If disabled, USB2.0 devices cannot be used.

➔ **Disabled** USB 2.0 interface is disabled and cannot be used.

➔ **Enabled** (Default) USB 2.0 interface is enabled and can be used.

➔ **Legacy USB Support [Enabled]**

The **Legacy USB Support** BIOS option refers to USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded on the system.

➔ **Disabled** Legacy USB support disabled

➔ **Enabled** (Default) Legacy USB support enabled

➔ **USB2.0 Controller Mode [HiSpeed]**

The **USB2.0 Controller Mode** BIOS option sets the speed of the USB2.0 controller.

➔ **FullSpeed** The controller is capable of operating at full speed (12Mbits/second)

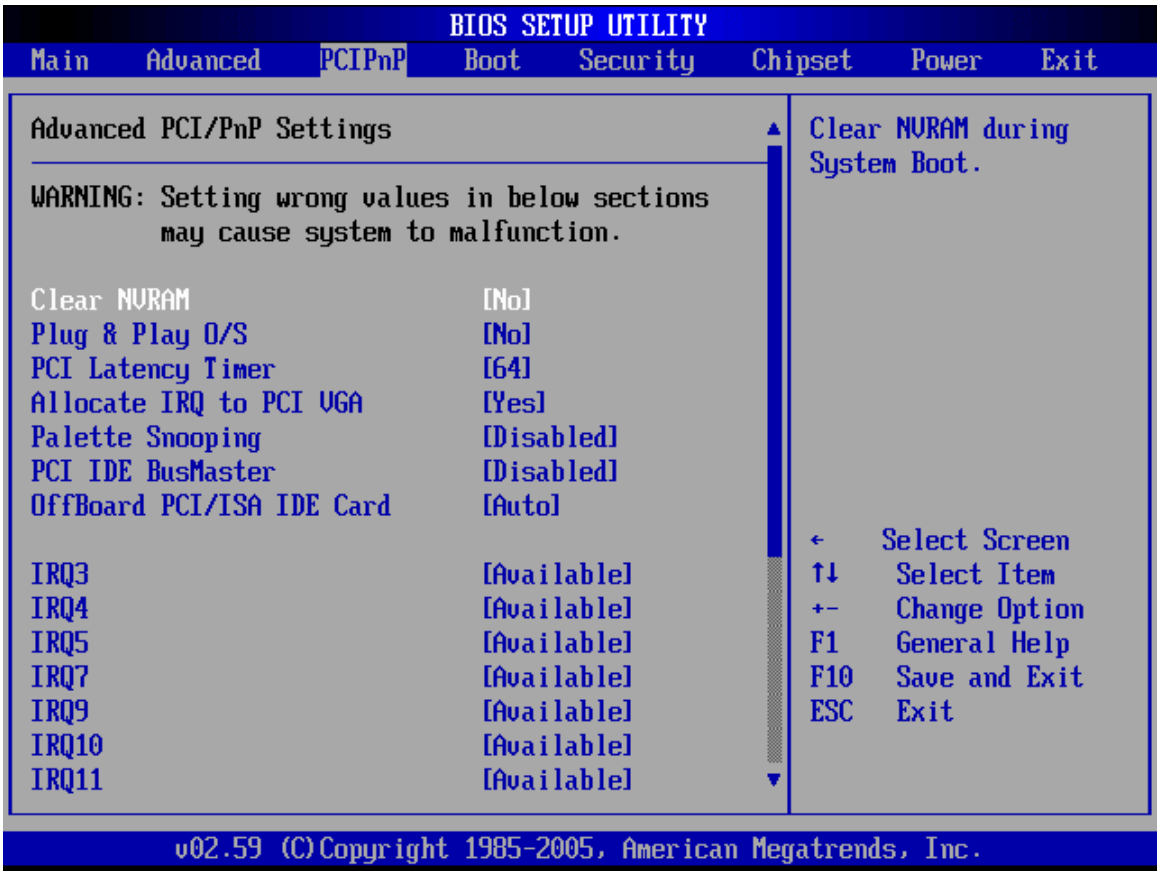
➔ **HiSpeed** (Default) The controller is capable of operating at high speed (480Mbits/second)

5.4 PCI/PnP

The **PCI/PnP** menu (**BIOS Menu 12**) configures advanced PCI and PnP settings.

WARNING!

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.



BIOS Menu 12: PCI/PnP Configuration

➔ **Clear NVRAM [No]**

The **Clear NVRAM** option specifies whether the contents of the NVRAM (Non-Volatile RAM) when the power is turned off.

➔	**No**	(Default)	System does not clear NVRAM during system boot
➔	**Yes**		System clears NVRAM during system boot

➔ **Plug & Play O/S [No]**

The **Plug & Play O/S** BIOS option determines whether the Plug and Play devices connected to the system is configured by the operating system or the BIOS.

➔ **No** (Default) If the operating system does not meet the Plug and Play specifications, this option allows the BIOS to configure all the devices in the system.

➔ **Yes** This setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system is running Plug and Play aware operating systems.

➔ **PCI Latency Timer [64]**

The values stipulated in the PCI Latency Timer are in units of PCI clock cycles for the PCI device latency timer register. Configuration options are:

- 32
- 64 (Default)
- 96
- 128
- 160
- 192
- 224
- 248

➔ **Allocate IRQ to PCI VGA [Yes]**

The **Allocate IRQ to PCI VGA** option restricts the system from giving the VGA adapter card an interrupt address.

➔ **Yes** (Default) Assigns an IRQ to a PCI VGA card if card requests IRQ

➔ **No** Does not assign IRQ to a PCI VGA card even if the card requests an IRQ

➔ **Palette Snooping [Disabled]**

The **Palette Snooping** BIOS option enables or disables the palette snooping function.

➔ **Disabled** (Default) Unless the VGA card manufacturer requires palette snooping to be enabled, this option should be disabled.

➔ **Enabled** PCI devices are informed that an ISA based Graphics device is installed in the system so the ISA based Graphics card functions correctly. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with the adapter card manual first, before modifying the default settings in the BIOS.

➔ **PCI IDE BusMaster [Disabled]**

The **PCI IDE BusMaster** BIOS option enables or prevents the use of PCI IDE busmastering. The Optimal and

➔ **Disabled** (Default) Busmastering is prevented

➔ **Enabled** IDE controller on the PCI local bus has mastering capabilities

➔ **OffBoard PCI/ISA IDE Card [Auto]**

The **OffBoard PCI/ISA IDE Card** BIOS option selects the OffBoard PCI/ISA IDE Card.

➔ **Auto** (Default) The location of the Off Board PCI IDE adapter card is automatically detected by the AMIBIOS.

➔ **PCI Slot 1** PCI Slot 1 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 1.

➔ **PCI Slot 2** PCI Slot 2 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 2.

➔ **PCI Slot 3** PCI Slot 3 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 3.

➔ **PCI Slot 4** PCI Slot 4 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 4.

➔ **PCI Slot 5** PCI Slot 5 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 5.

➔ **PCI Slot 6** PCI Slot 6 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 6.

➔ **IRQ# [Available]**

➔ **Available** (Default) The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

➔ **Available** (Default) The specified DMA is available to be used by PCI/PnP devices

➔ **Reserved** The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

➔ **Reserved Memory Size [Disabled]**

The **Reserved Memory Size** BIOS option specifies the amount of memory that should be reserved for legacy ISA devices.

➔ **Disabled** (Default) No memory block reserved for legacy ISA devices

➔ **16K** 16KB reserved for legacy ISA devices

➔ **32K** 32KB reserved for legacy ISA devices

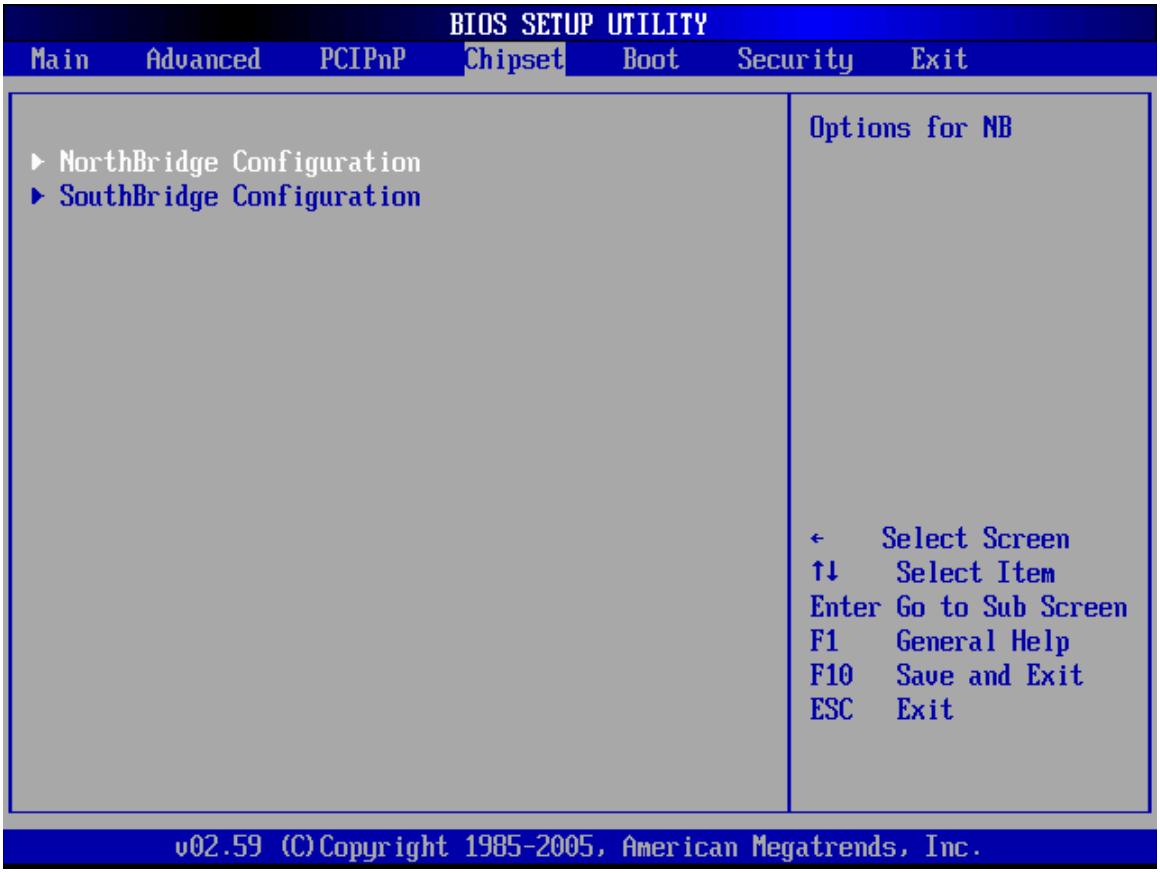
➔ **64K** 54KB reserved for legacy ISA devices

5.5 Chipset

The Chipset menu (**BIOS Menu 13**) has two sub-menus, NorthBridge Configuration and SouthBridge Configuration. The NorthBridge Configuration menu configures the northbridge chipset and the SouthBridge Configuration menu configures the southbridge chipset.

WARNING!

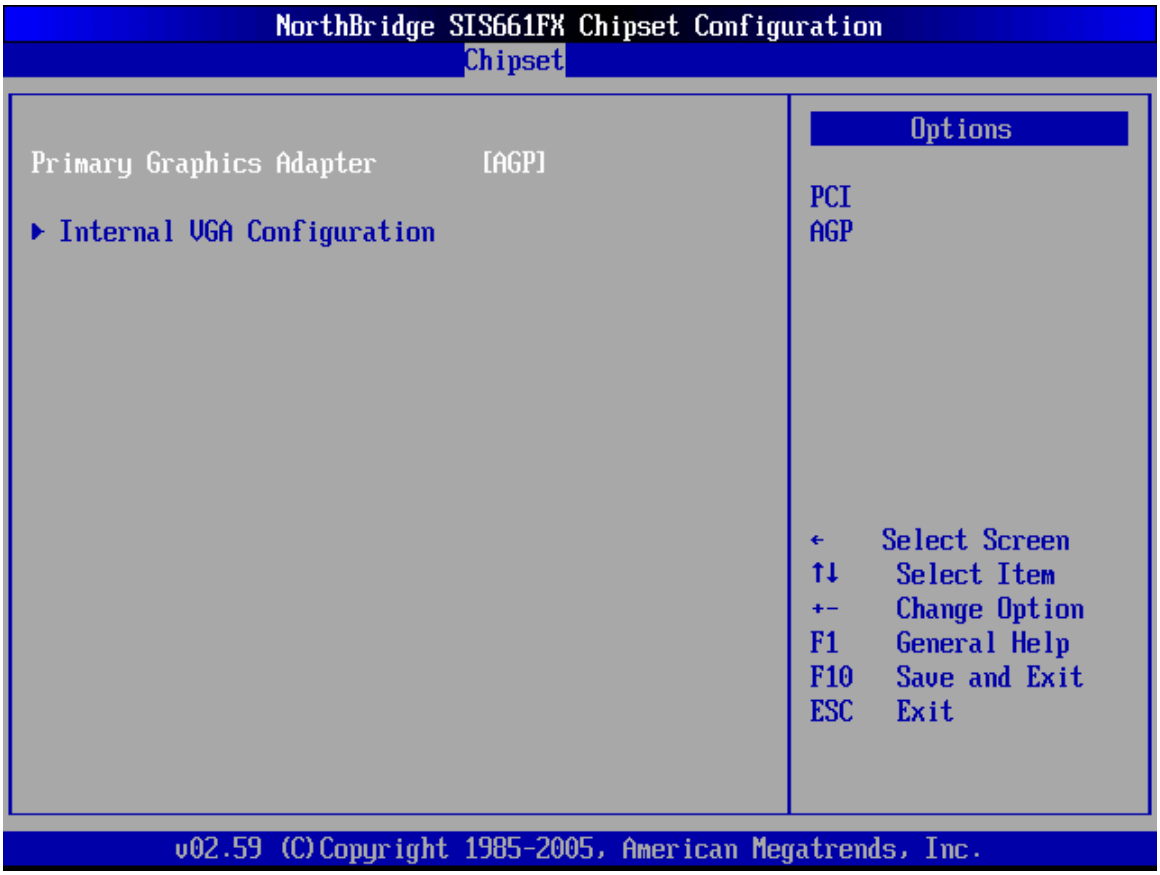
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 13: Chipset

5.5.1 NorthBridge Configuration

The **NorthBridge Configuration** menu (**BIOS Menu 14**) allows the northbridge chipset to be configured.



BIOS Menu 14: NorthBridge Chipset Configuration

➔ **Primary Graphics Adapter [AGP]**

The **Primary Graphics Adapter** option selects the graphics adapter the system uses.

➔ **PCI** PCI graphics adapter is used

➔ **AGP** (Default) AGP graphics adapter is used

5.5.1.1 Internal VGA Settings

➔ **Share Memory Size [32MB]**

The **Share Memory Size** BIOS feature allocates the maximum amount of system memory to the integrated graphics processor. The options are:

- 16MB
- 32MB (Default)
- 64MB
- 128MB
- Disabled

➔ **Display Device Select [CRT only]**

The **Display Device Select** BIOS feature determines what displays are used. Dual display functionality is enabled here. Dual display configuration options are listed below:

- CRT only (Default)
- CRT + LCD
- CRT + TV

➔ **LCD Display Type [Full Screen]**

The **LCD Display Type** BIOS determines the screen display type. Configuration options are listed below:

- Full Screen (Default)
- Center Screen

➔ **LCD Panel Resolution Type [1024 X 768]**

The **LCD Panel Resolution Type** determines the LCD panel resolution. Configuration options are listed below:

- 1024 x 768 (Default)
- 1280 x 1024
- 1400 x 1050
- 1280 x 768 (HT x VT = 1688 x 806)
- 1600 x 1200
- 1280 x 768 (HT x VT = 1408 x 806)

➔ **TV Display Device [Composite]**

The **LCD Display Device** determines the TV display device connected to the system. Configuration options are listed below:

- Composite (Default)
- S-Video
- SCART
- Hi-Vision
- YPbPr
- Composite and +SVideo

➔ **TV NTSC/PAL Display [NTSC]**

The **TV NTSC/PAL Display** specifies what TV format is used:

- NTSC (Default)
- PAL

➔ **Different PAL TV [PAL]**

The **Different PAL TV** specifies the PAL format of the TV graphics card use. Configuration options are listed below.

- PAL (Default)
- PAL-M
- PAL-N

➔ **TV UnderScan/OverScan [UNDERSCAN]**

The **TV UnderScan/OverScan** specifies whether overscan or underscan functionalities are enabled on the system. Configuration options are listed below.

- UNDERSCAN (Default)
- OVERSCAN

➔ **Different YpbPrTV [525i]**

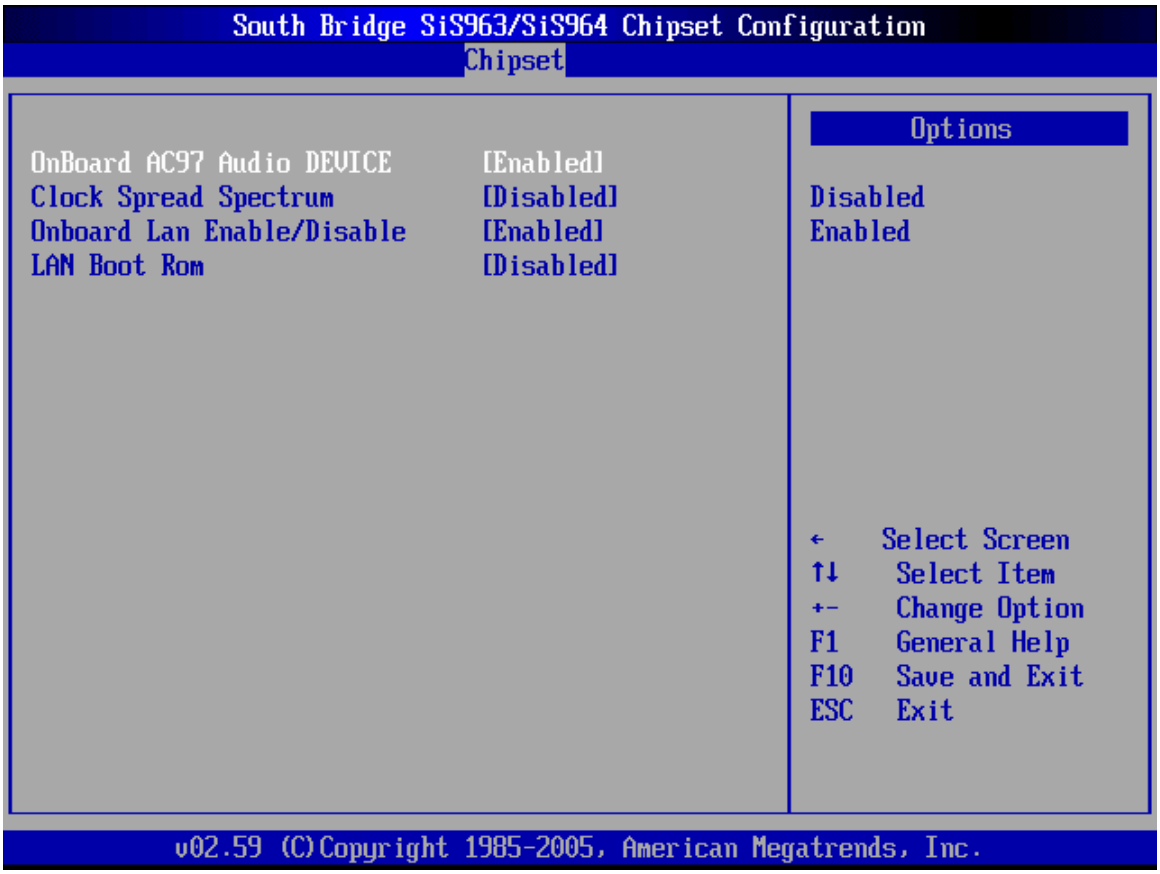
The **Different YPbPrTV** specifies YPbPr TV settings. Configuration options are listed below.

- 515i (Default)
- 525p
- 750p

- 1080i

5.5.2 SouthBridge Configuration

The **SouthBridge Configuration** menu (**BIOS Menu 15**) the southbridge chipset to be configured.



BIOS Menu 15: SouthBridge Chipset Configuration

➔ **OnBoard AC97 Audio DEVICE [Enabled]**

The **OnBoard AC97 Audio DEVICE** option enables or disables the AC'97 CODEC.

➔ **Disabled** The onboard AC'97 is disabled

➔ **Enabled** (Default) The onboard AC'97 is enabled

➔ **Clock Spread Spectrum [Disabled]**

The **Clock Spread Spectrum** BIOS option can help to improve CPU EMI issues.

➔ **Disabled**	(Default)	The clock spread spectrum is disabled
➔ **Enabled**		The clock spread spectrum is enabled

➔ **OnBoard LAN Enable/Disable [Enabled]**

The **OnBoard LAN Enable/Disable** option enables or disables the onboard LAN1.

➔ **Disabled**		Onboard LAN1 device manually disabled
➔ **Enabled**	(Default)	The onboard LAN1 device automatically detected and enabled

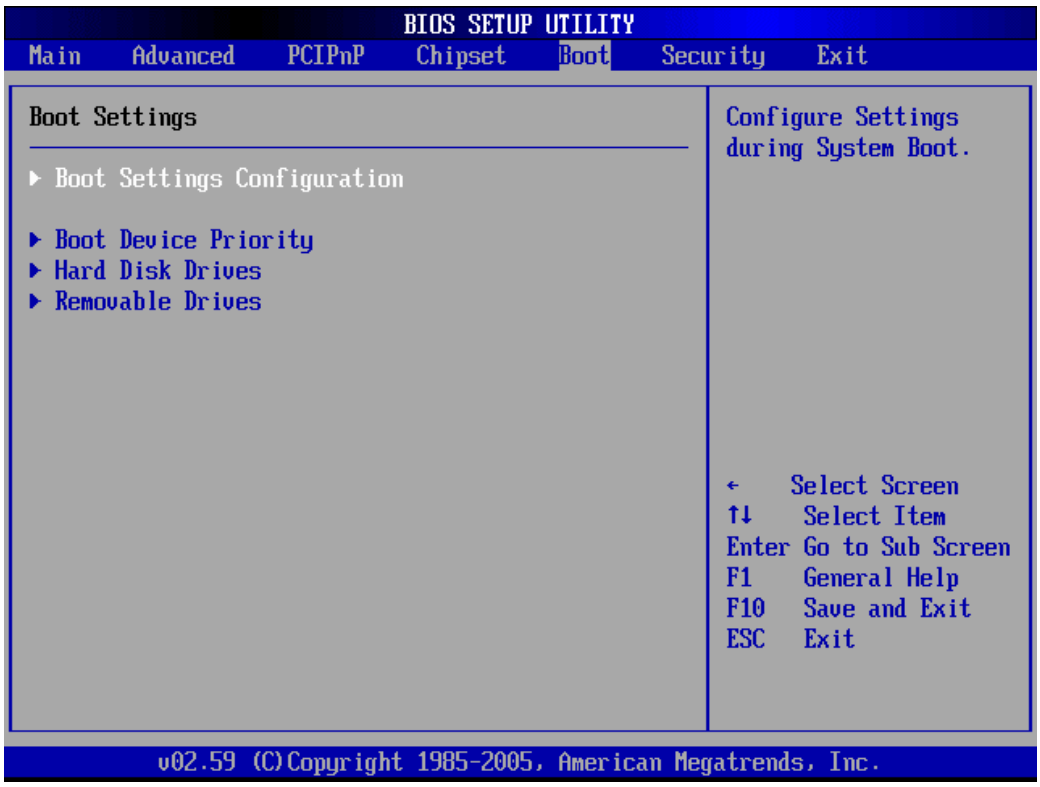
➔ **LAN Boot Rom [Disabled]**

The **LAN Boot Rom** option enables the system to be booted from a remote system.

➔ **Disabled**	(Default)	Cannot be booted from a remote system through the LAN
➔ **Enabled**		Can be booted from a remote system through the LAN

5.6 Boot

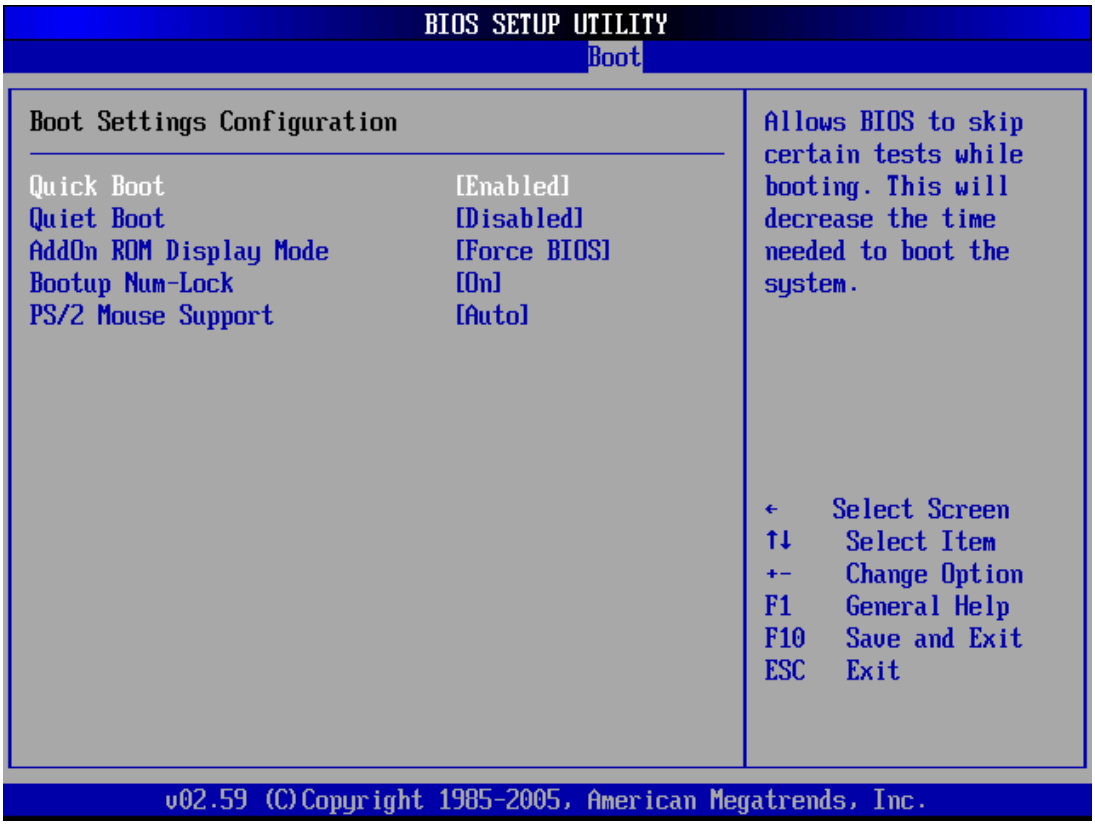
The Boot menu (**BIOS Menu 16**) configures system boot options.



BIOS Menu 16: Boot

5.6.1 Boot Settings Configuration

The **Boot Settings Configuration** menu (**BIOS Menu 17**) configures advanced system boot options.



BIOS Menu 17: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

The **Quick Boot** BIOS option makes the computer speed up the boot process.

➔ **Disabled**		System does not skip any POST procedures
➔ **Enabled**	(Default)	Allows system to skip some POST procedures to decrease the system boot time

➔ **Quiet Boot [Disabled]**

The **Quiet Boot** BIOS option allows the boot up screen options to be modified between POST messages or an OEM logo.

➔ **Disabled**	(Default)	Displays normal POST messages
➔ **Enabled**		Displays OEM Logo instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

The **AddOn ROM Display Mode** option allows add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**	(Default)	Allows the computer system to force a third party BIOS to display during system boot.
➔ **Keep Current**		Allows the computer system to display the information during system boot.

➔ **Bootup Num-Lock [On]**

The **Bootup Num-Lock** BIOS option allows the Number Lock setting to be modified during boot up.

➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.
➔ **On**	(Default)	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **PS/2 Mouse Support [Auto]**

The **PS/2 Mouse Support** BIOS option allows the PS/2 mouse support to be adjusted.

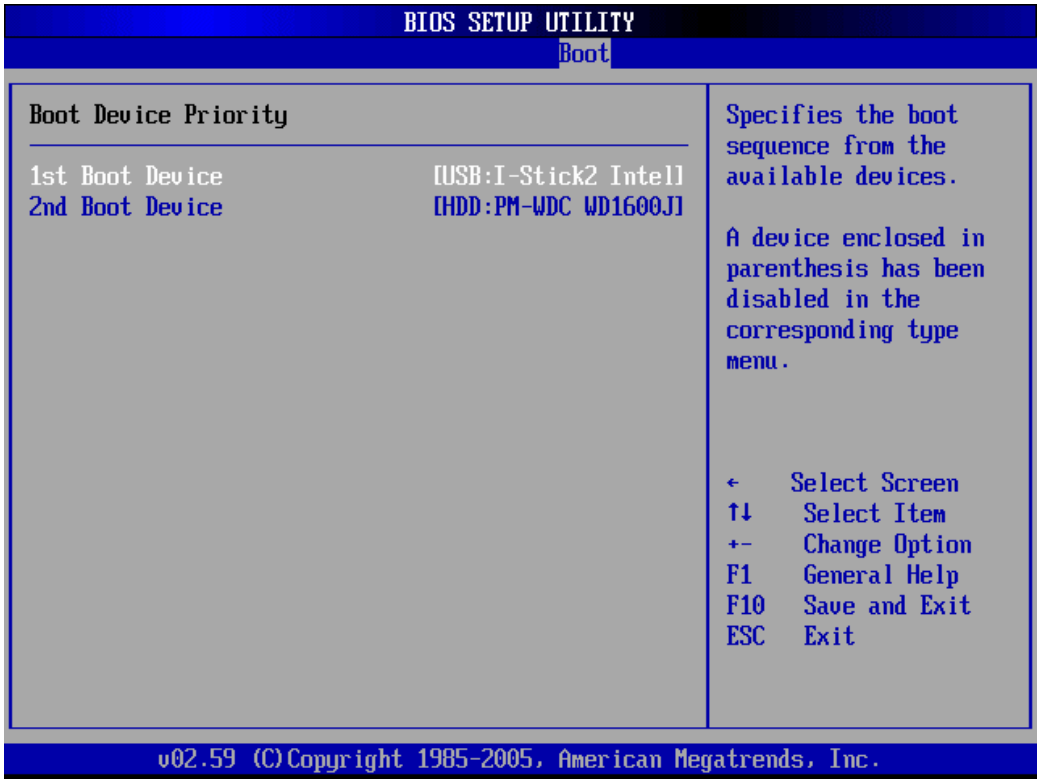
➔ **Disabled**	Disables PS/2 mouse support and prevents the PS/2 mouse port from using system resources.
➔ **Enabled**	Allows the system to use a PS/2 mouse.

➔ **Auto** (Default) Allows the system to automatically detect if a PS/2 mouse is being used.

5.6.2 Boot Device Priority

The **Boot Device Priority** menu (**BIOS Menu 18**) specifies the boot sequence from the available devices. Possible boot devices may include:

- HDD
- CD/DVD



BIOS Menu 18: Boot Device Priority Settings

5.6.3 Hard Disk Drives

The **Hard Disk Drives** menu is similar to the **Removable Drives BIOS Menu 19** and it specifies the boot sequence of the available HDDs. When the menu is opened, the HDDs connected to the system are listed as shown below:

- 1st Drive [HDD: PM-(part number)]

 **NOTE:**

Only the drives connected to the system are shown.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available HDDs is shown. Select the first HDD system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.

5.6.4 Removable Drives

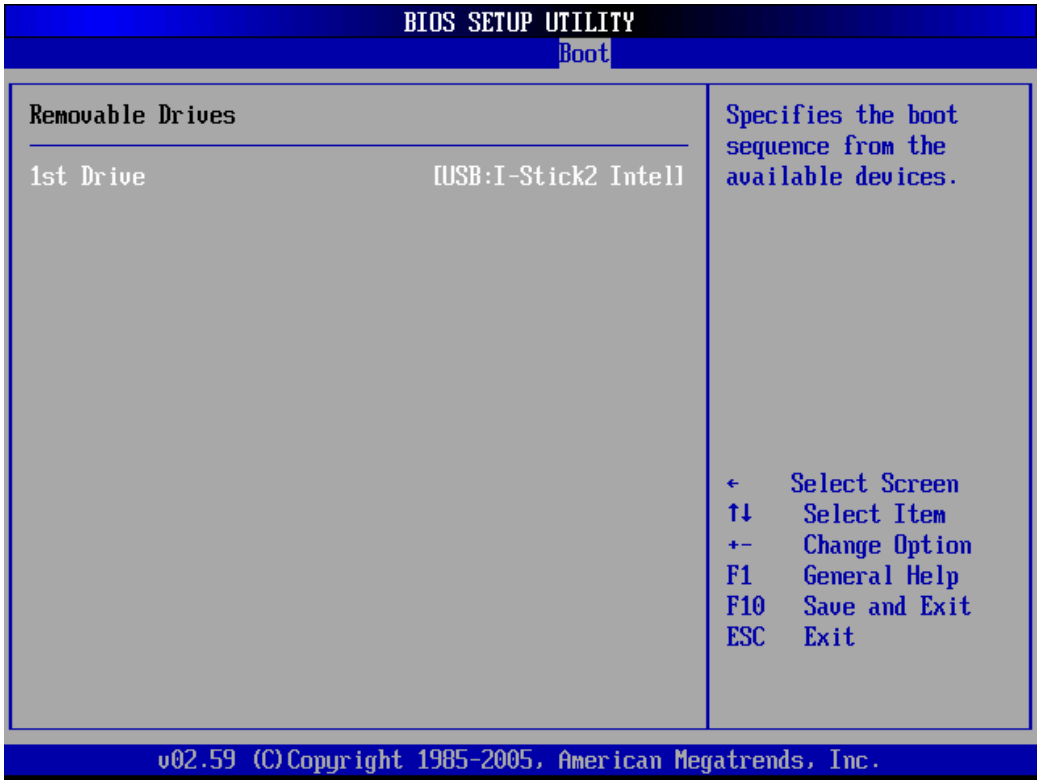
The **Removable Drives** menu (**BIOS Menu 19**) specifies the boot sequence of the available USB drive. When the menu is opened, the USB drive connected to the system are listed as shown below:

- 1st Drive [1st USB DRIVE]

 **NOTE:**

Only the drives connected to the system are shown. For example, if only one USB is connected only "**1st Drive**" is listed.

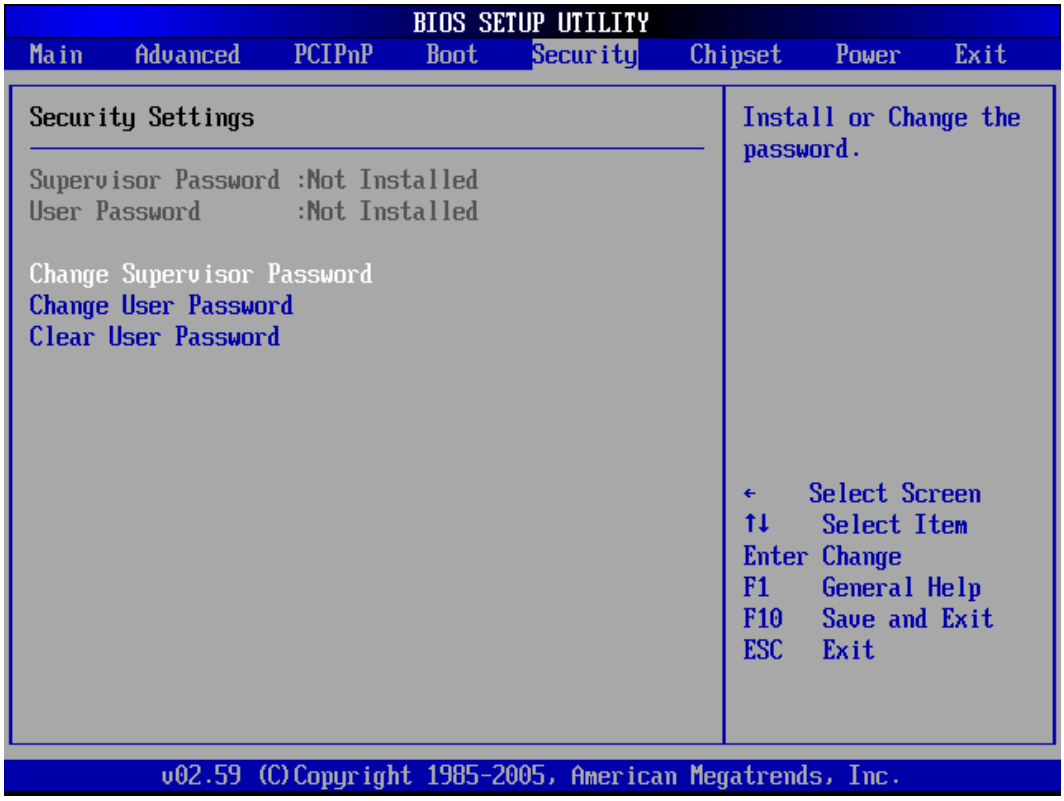
The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available USBs is shown. Select the first USB system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.



BIOS Menu 19: Removable Drives

5.7 Security

The **Security** menu (**BIOS Menu 20**) allows system security settings including passwords to be configured.



BIOS Menu 20: Security

➔ **Change Supervisor Password**

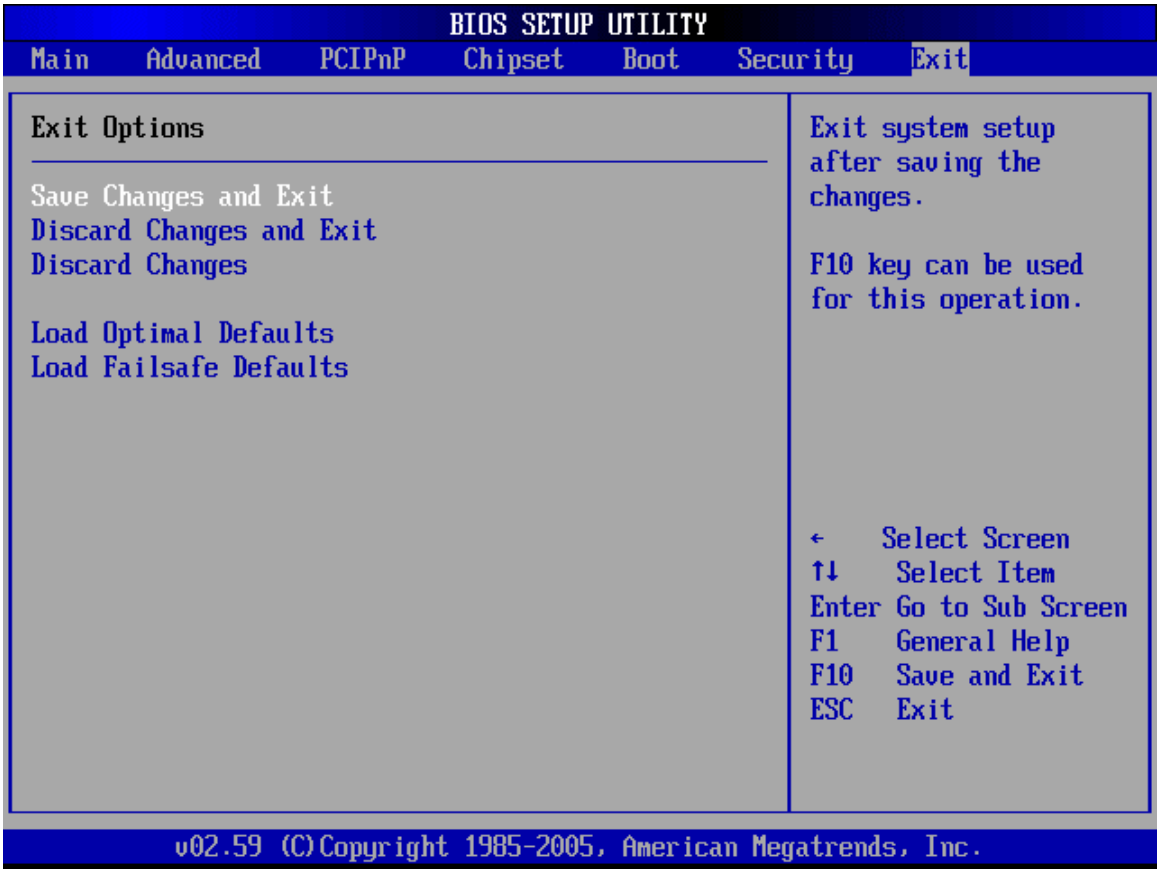
The default setting for the **Change Supervisor Password** is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

The default setting for the **Change User Password** is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

5.8 Exit

The **Exit** menu (**BIOS Menu 21**) loads default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 21: Exit

➔ **Save Changes and Exit**

If configuration changes are complete, select this option to save them and exit the BIOS menus.

➔ **Discard Changes and Exit**

If configuration changes are complete but do need to be saved, select this option to exit the BIOS menus.

➔ **Discard Changes**

If configuration changes are complete but do need to be saved but BIOS still needs to be run , select this option.

➔ **Load Optimal Defaults**

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

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Chapter

6

Software Drivers

6.1 Available Software Drivers

NOTE:

The content of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The NOVA-6612 motherboard has the following software drivers:

- RealTek Audio Driver (ALC655) Installation
- Realtek LAN Driver (for GbE LAN) Installation
- SiS AGP Driver Installation
- SiS IDE Driver Installation
- SiS VGA Utilities Driver
- SiS RAID Driver Installation

All drivers can be found on the CD that came with the motherboard. To install the drivers please follow the instructions in the sections below. (The RAID Driver Installation is fully described in Appendix E.)

6.2 RealTek Audio Driver (ALC655) Installation

To install the Realtek Audio driver, please follow the steps below.

Step 1: Insert the Utility CD that came with the motherboard into the system CD drive. Open the **X:\4-Audio** directory (where **X:** is the system CD drive) and double-click the **WDM_A384.exe** installation file to begin extracting files (**Figure 6-1**).

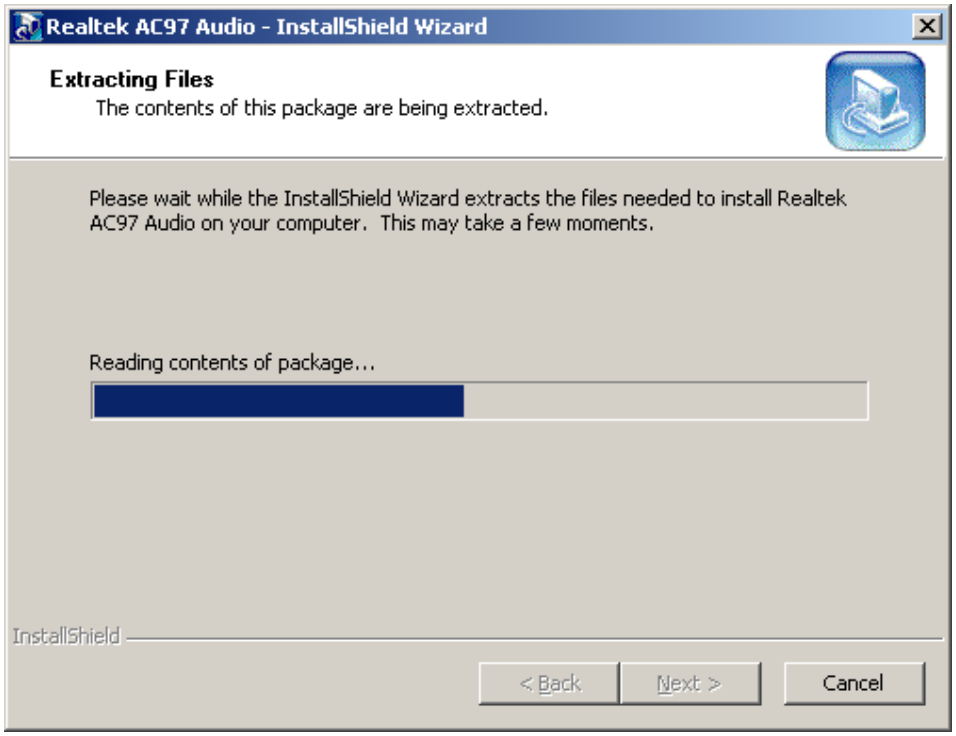

Figure 6-1: InstallShield Wizard Extracting Files

Step 2: The **Realtek AC'97 Audio Setup** prepares the **InstallShield Wizard** (**Figure 6-2**).

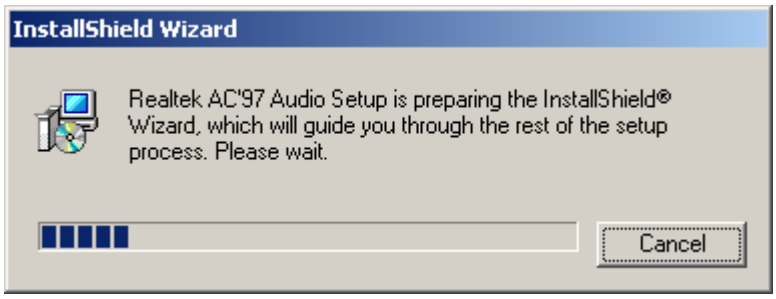

Figure 6-2: Audio Driver Install Shield Wizard Starting

Step 3: The **Setup Status** screen appears as the driver is installed (**Figure 6-3**).

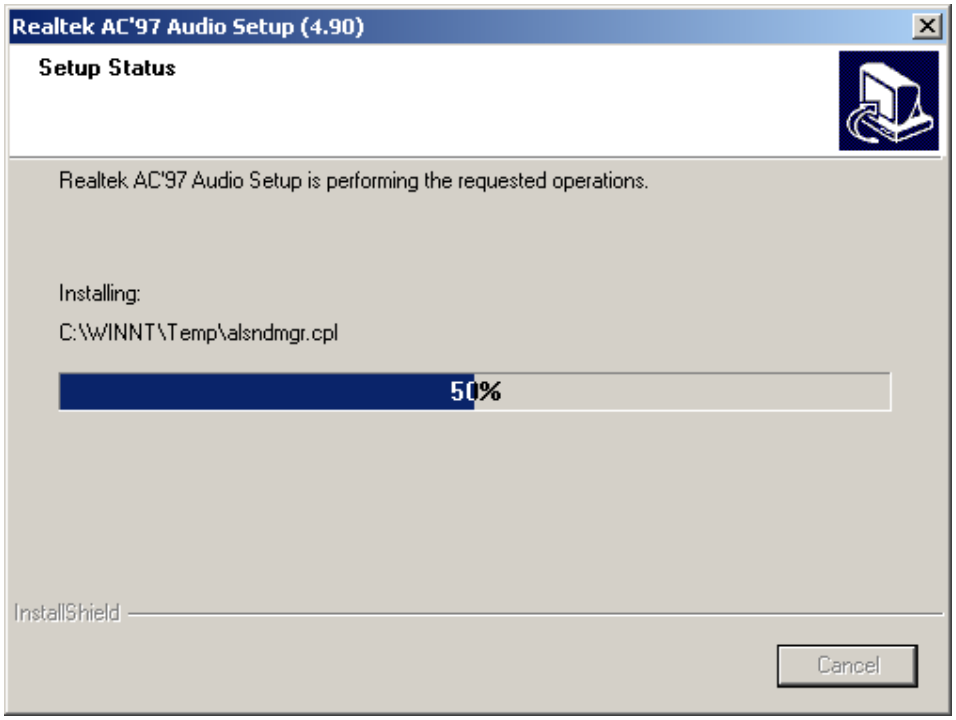

Figure 6-3: Audio Driver Setup Preparation

Step 4: At this stage the **Digital Signal Not Found** screen appears (**Figure 6-4**). Click **YES** to continue.

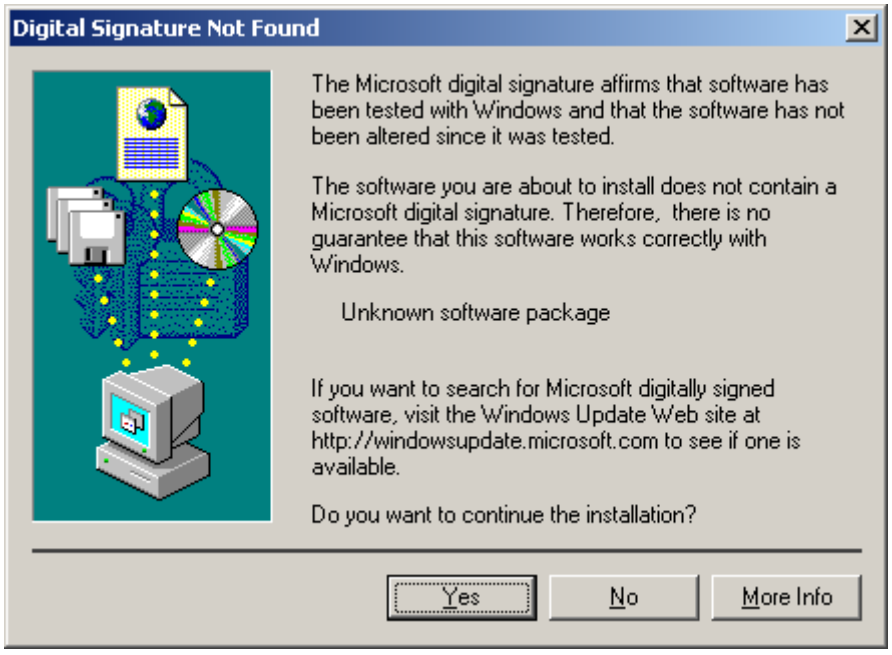

Figure 6-4: Audio Driver Digital Signal

Step 5: The audio driver installation continues (**Figure 6-5**).

Figure 6-5: Audio Driver Installation Continues

Step 6: After the driver installation process is complete, a confirmation screen appears (**Figure 6-6**).

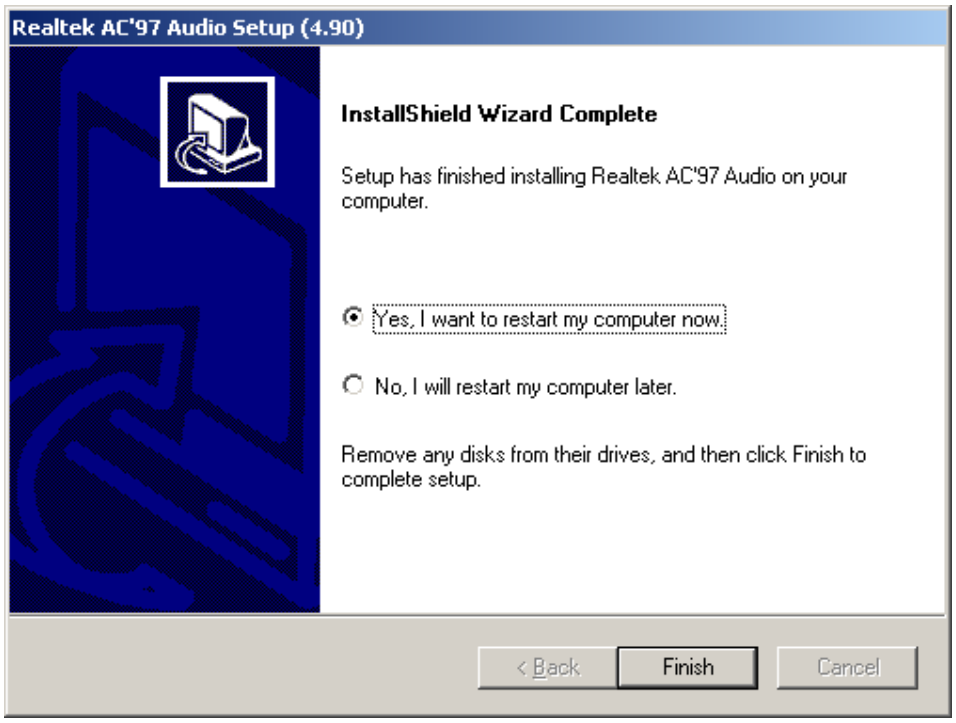

Figure 6-6: Audio Driver Installation Complete

Step 7: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

6.3 Realtek LAN Driver (for GbE LAN) Installation

To install the Realtek LAN driver, please follow the steps below.

Step 1: Insert the Utility CD that came with the motherboard into the system CD drive. Open the **X:\3-LAN\Realtek** directory (where **X:** is the system CD drive) and double-click the **setup.exe** installation file to initiate the **InstallShield Wizard** (**Figure 6-7**).

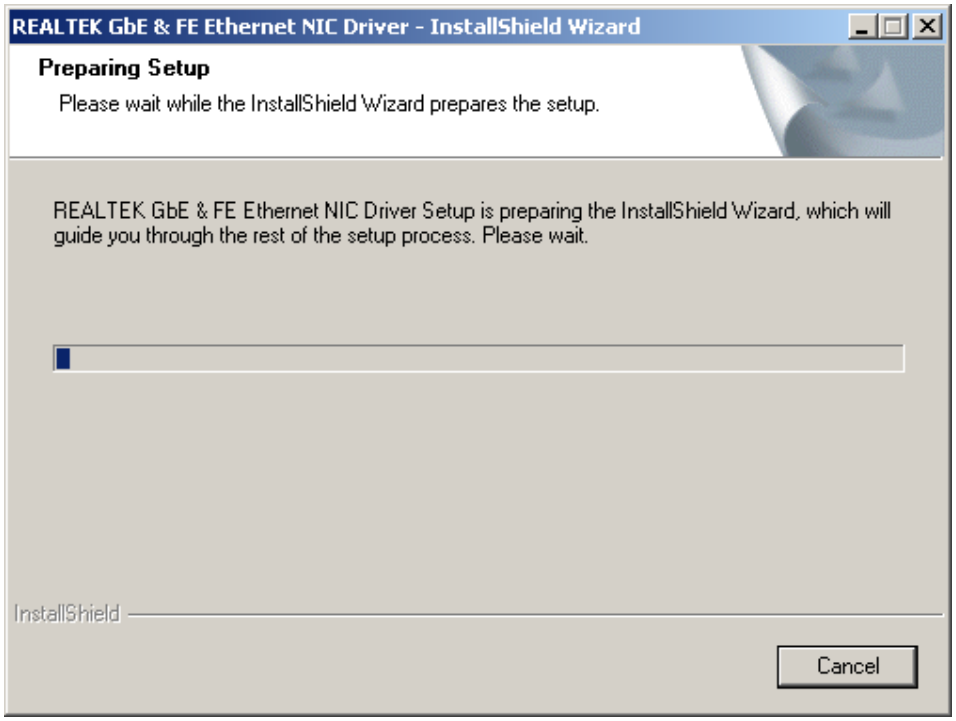

Figure 6-7: Realtek LAN Driver InstallShield Wizard

Step 2: The **InstallShield Wizard Welcome** screen appears (**Figure 6-8**).

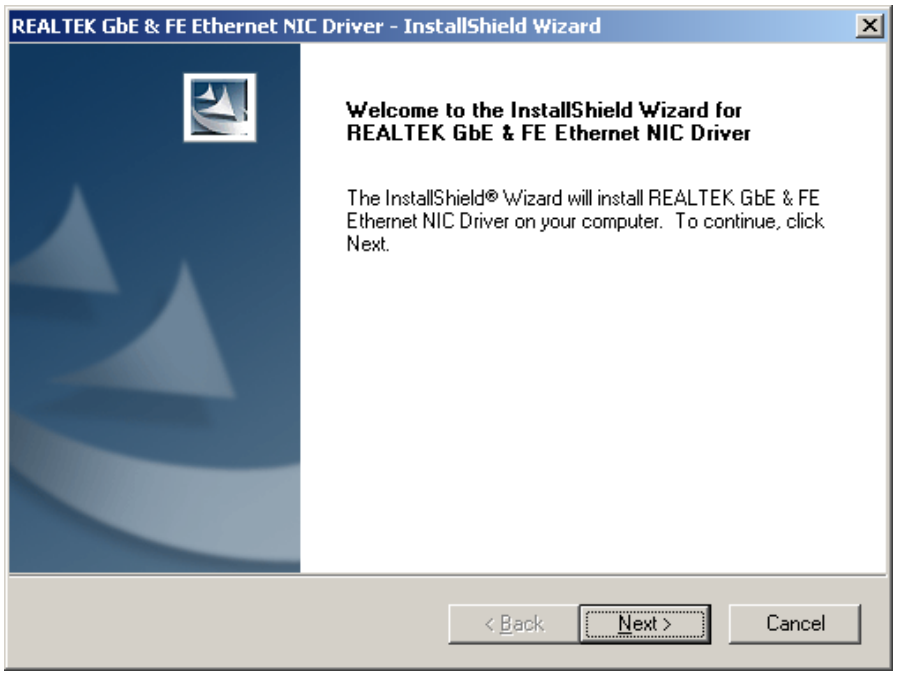

Figure 6-8: Realtek LAN Driver Welcome

Step 3: Click **NEXT** and the **Ready to Install** screen appears (**Figure 6-9**).

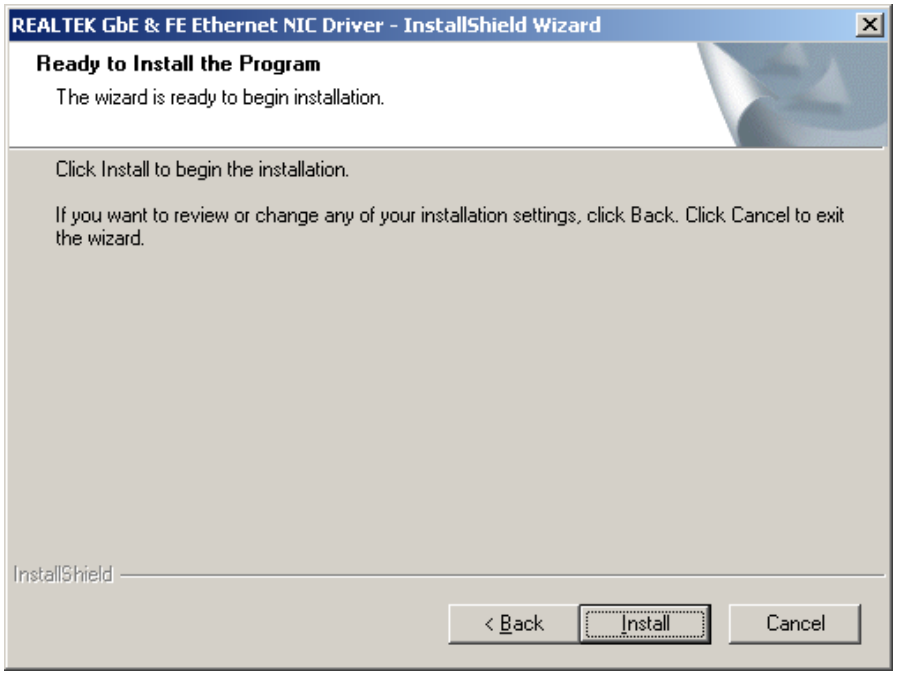

Figure 6-9: Realtek LAN Driver Ready to Install

Step 4: Click **INSTALL** and the **Setup Status** screen appears as the driver is installed (**Figure 6-10**).

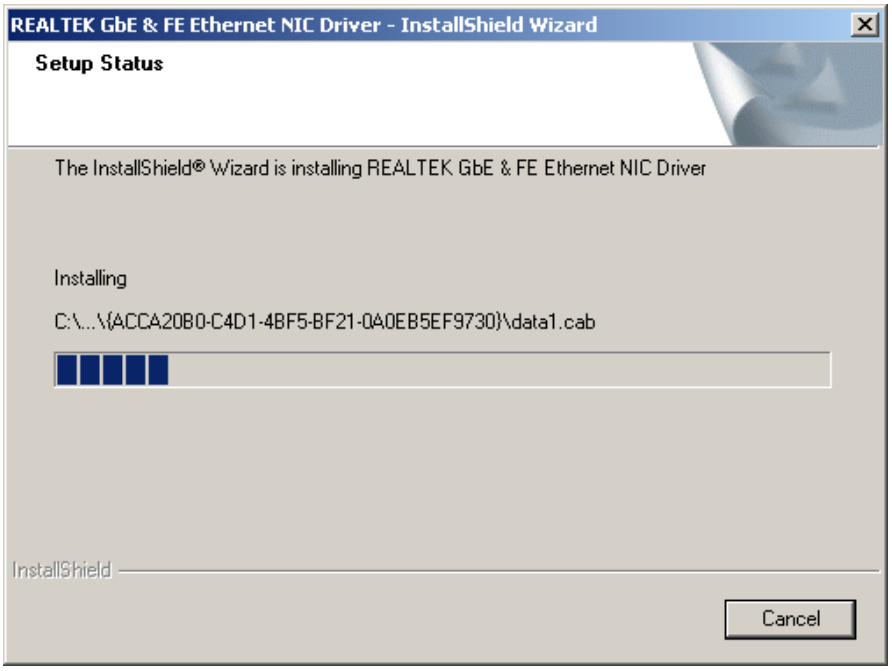

Figure 6-10: Realtek LAN Driver Setup Status

Step 5: After the driver installation process is complete, a confirmation screen appears (**Figure 6-11**).

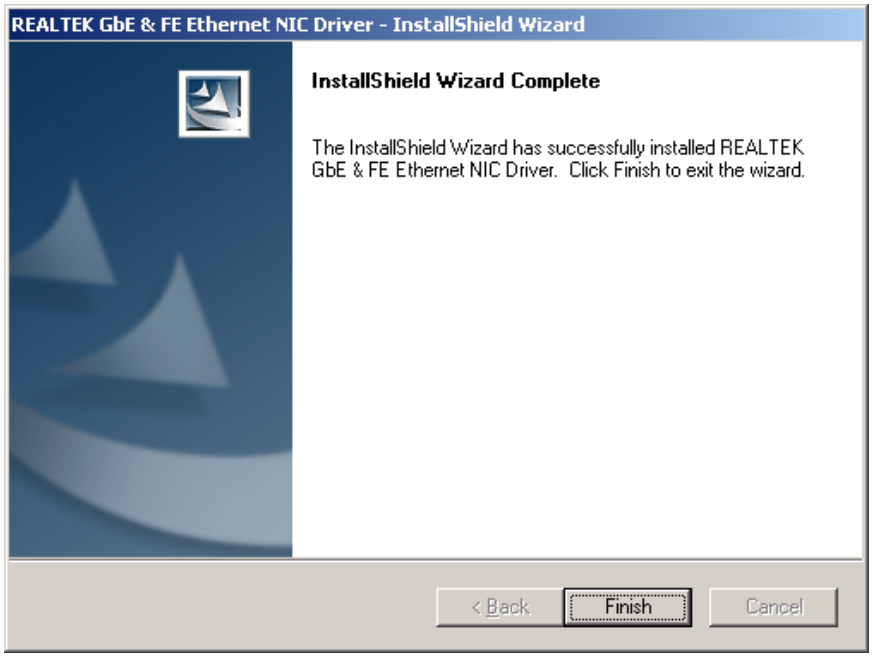

Figure 6-11: Realtek LAN Driver Installation Complete

Step 6: Click **FINISH** to exit the **InstallShield** wizard.

6.4 SiS AGP Driver Installation

To install the SiS AGP driver, please follow the steps below:

Step 1: Insert the Utility CD that came with the motherboard into the system CD drive.

Step 2: Open the **AGP 121** directory and double-click the **Setup.exe** installation file.

Step 3: The **Starting Install Shield Wizard** appears (**Figure 6-12**).

Figure 6-12: Starting Install Shield Wizard Screen

Step 4: The **Preparing Setup** window appears next (**Figure 6-13**).

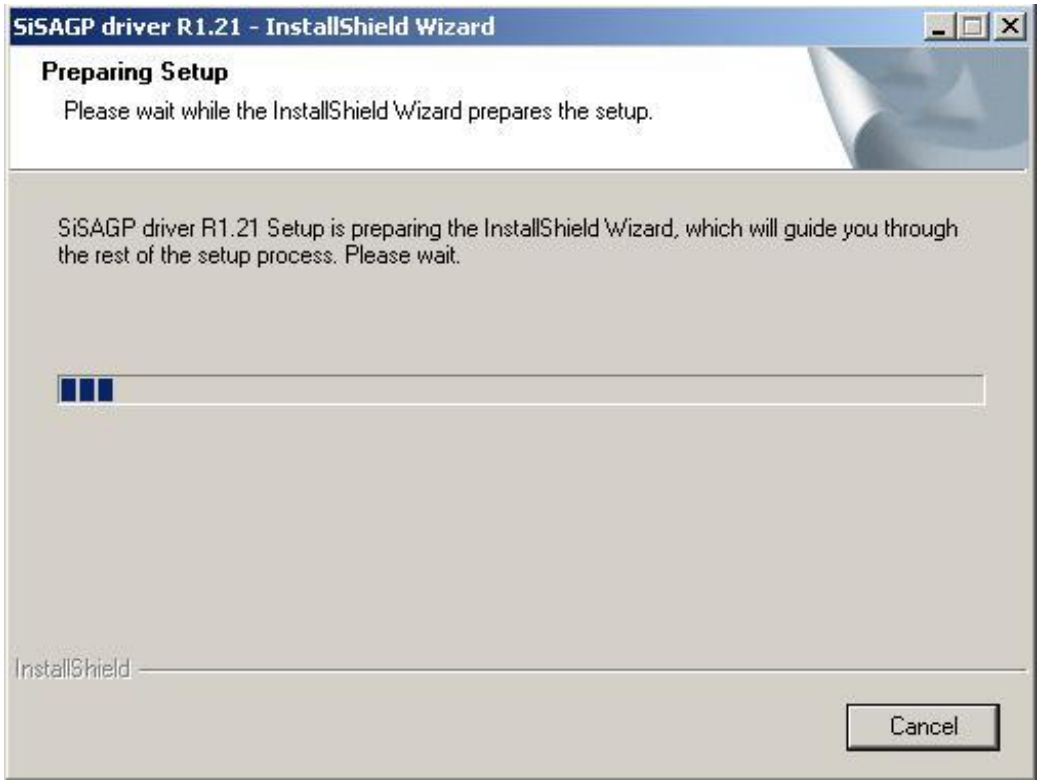

Figure 6-13: Preparing Setup Screen

Step 5: The **InstallShield** window appears next (**Figure 6-14**). Click **NEXT** to continue the installation.

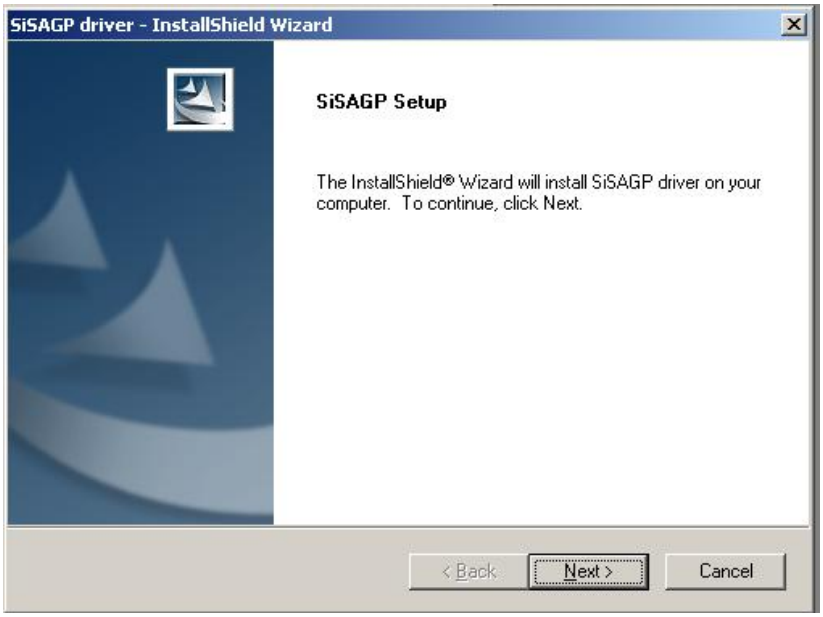

Figure 6-14: Install Shield Screen

Step 6: The installation shield starts to extract and install files (**Figure 6-15**).

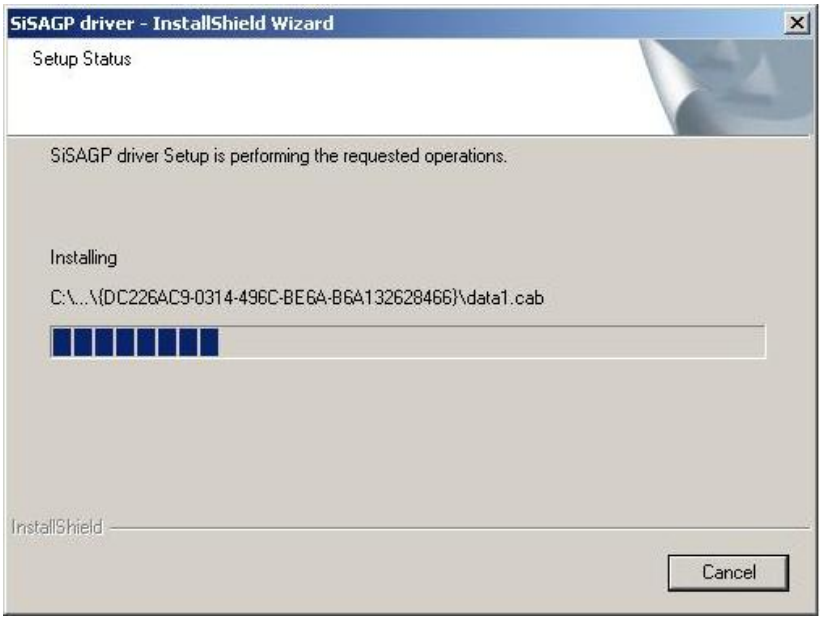

Figure 6-15: Installing Screen

Step 7: The confirmation screen offers the option of restarting the computer now or later (**Figure 6-16**). For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

Figure 6-16: Restart the Computer

6.5 SiS IDE Driver Installation

To install the **SiS IDE** driver, please follow the steps below.

Step 1: Insert the Utility CD that came with the motherboard into the system CD drive. Navigate to the **IDE R204a** directory and double-click the **setup.exe** installation file to initiate the installation.

Step 2: The **Choose Setup Language** screen appears (**Figure 6-17**). Select the preferred setup language and click **OK** to continue the installation.

Figure 6-17: Select a Language

Step 3: The driver **Welcome** screen appears (**Figure 6-18**). Click **NEXT** to continue the installation.

Figure 6-18: Welcome Screen

Step 4: The **Select Components** screen appears (**Figure 6-19**). Select the appropriate component and click **NEXT** to continue the installation.

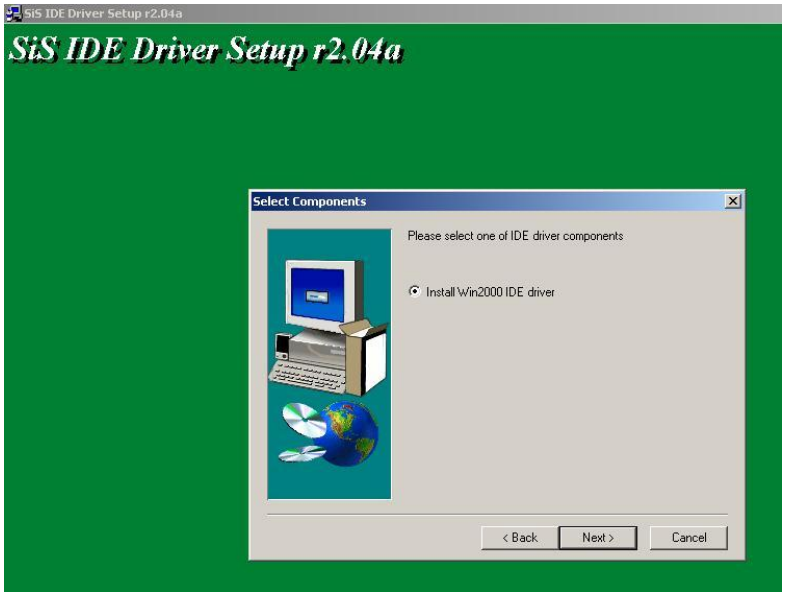

Figure 6-19: Chipset Driver Readme File Information

Step 5: The driver installation begins (**Figure 6-20)**

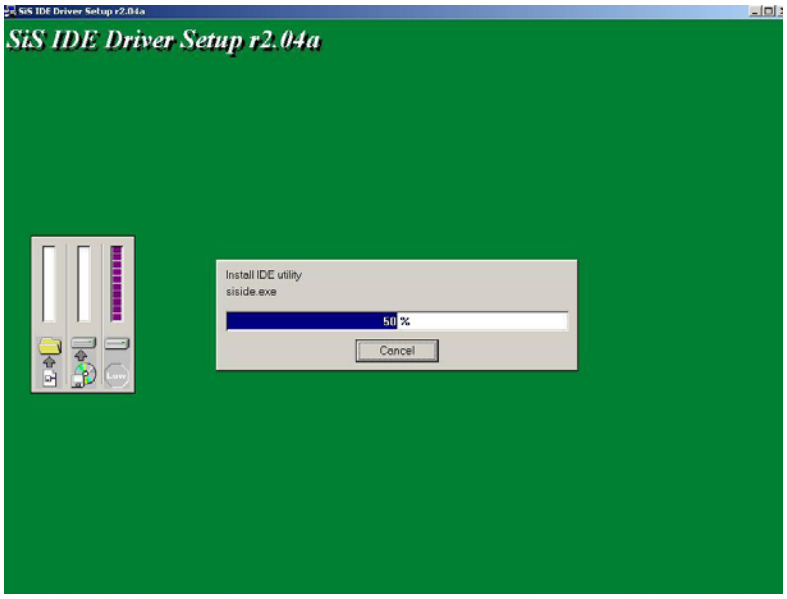

Figure 6-20: Chipset Driver Installation Complete

Step 6: The confirmation screen appears and offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

6.6 SiS VGA Utilities Driver

To install the **SiS VGA Utilities** driver, please follow the steps below.

Step 1: Insert the Utility CD that came with the motherboard into the system CD drive. Navigate to the **Chipset_VGA 3.72logo** directory and double-click the **setup.exe** installation file to initiate the **InstallShield Wizard** (**Figure 6-21**).

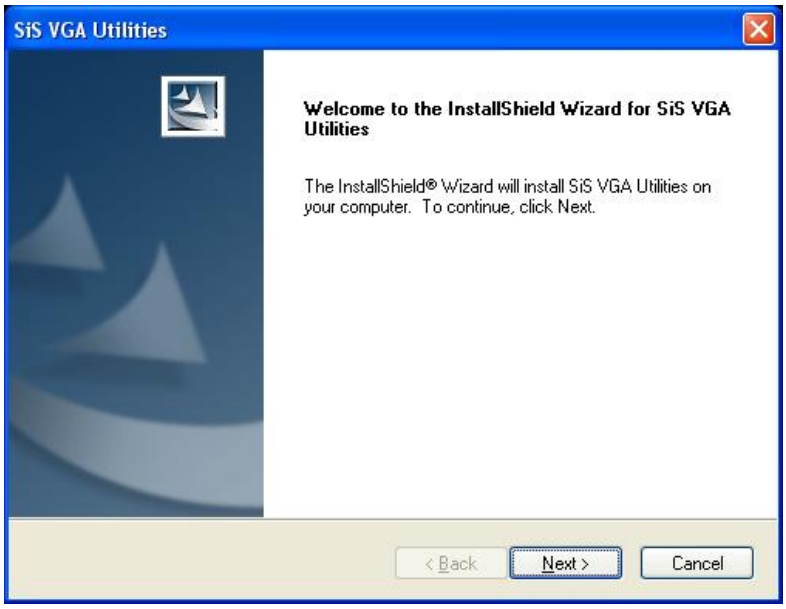

Figure 6-21: VGA Utilities Welcome Screen

Step 2: The **Setup Type** screen appears (**Figure 6-22**). Select the preferred setup type and click **NEXT** to continue the installation.

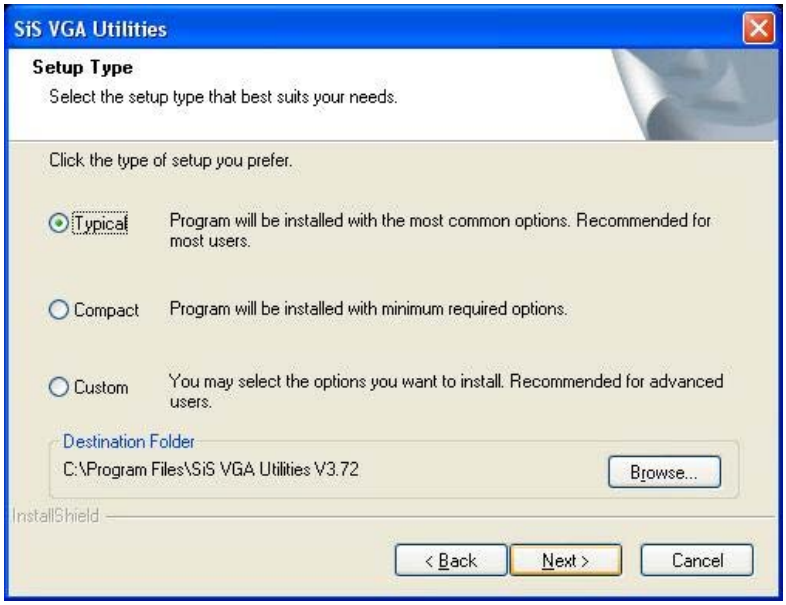

Figure 6-22: Select Setup Installation Type

Step 3: The **Select Program Folder** screen appears (**Figure 6-23**). Select a destination folder for the program and click **NEXT** to continue the installation.

Figure 6-23: Select Folders to Copy Files

Step 4: The **Start Copying Files** screen appears (**Figure 6-24**). Review the selected settings and click **NEXT** to continue the installation.

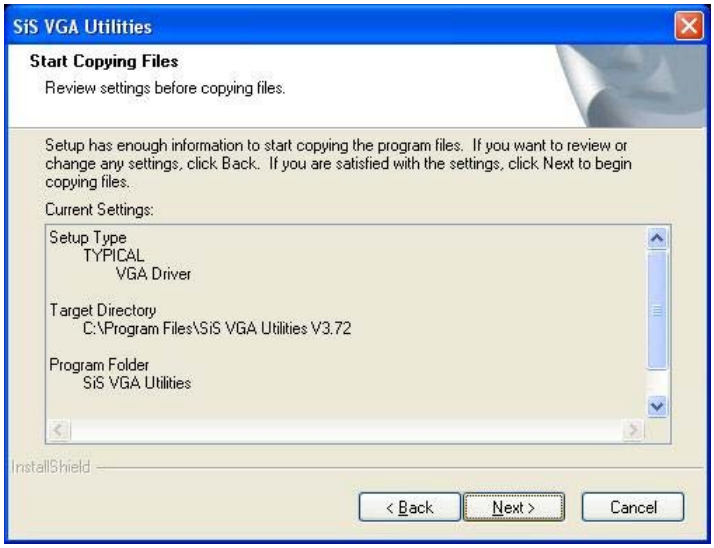

Figure 6-24: Review Settings

Step 5: The driver installation begins. Once the installation is complete, the **Setup Type** screen appears (**Figure 6-25**). Click **NEXT** to read the ReadMe file.

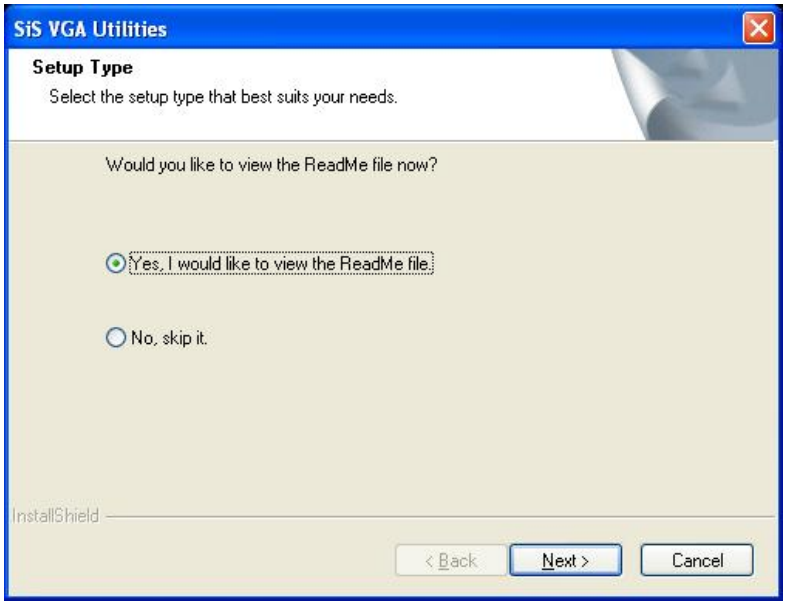

Figure 6-25: Read ReadMe File

Step 6: After reading the ReadMe file, the confirmation screen appears and offers the option of restarting the computer now or later (**Figure 6-26**). For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

Figure 6-26: Restart the Computer

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Appendix

A

BIOS Configuration Options

A.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in **Chapter 5**.

- **System Overview** 92
- **OnBoard PCI IDE Controller [Both]** 96
- **Onboard PCI IDE Mode [Legacy Mode]** 97
- **Onboard PCI S-ATA Controller [Disabled]** 97
- **IDE Master and IDE Slave** 97
- **Auto-Detected Drive Parameters** 99
- **Type [Auto]** 99
- **ZIP** 100
- **LS-120** 100
- **LBA/Large Mode [Auto]** 100
- **Block (Multi Sector Transfer) [Auto]** 100
- **PIO Mode [Auto]** 101
- **DMA Mode [Auto]** 101
- **S.M.A.R.T [Auto]** 101
- **32Bit Data Transfer [Disabled]** 102
- **Serial Port1 Address [3F8/IRQ4]** 103
- **Serial Port2 Address [2F8/IRQ3]** 104
- **Serial Port2 Mode [Normal]** 104
- **Parallel Port Address [378]** 104
- **Parallel Port Mode [Normal]** 104
- **Parallel Port IRQ [IRQ7]** 105
- **Serial Port3 Address [3E8]** 105
- **Serial Port3 IRQ [11]** 106
- **Serial Port4 Address [2E8]** 106
- **Serial Port4 IRQ [10]** 106
- **Serial Port5 Address [2E0]** 106
- **Serial Port5 IRQ [11]** 107
- **Serial Port6 Address [2D8]** 107
- **Serial Port6 IRQ [10]** 107

➔ ACPI 2.0 Features [Yes] 110
➔ MPS Revision [1.1] 111
➔ Power Management/APM [Enabled] 112
➔ Power Button Mode [On/Off] 112
➔ Restore on AC Power Loss [Last State] 112
➔ Resume on Lan [Disabled] 112
➔ Resume On RTC Alarm [Disabled] 113
➔ RTC Alarm Date (Days) 113
➔ System Time 113
➔ Onboard SiS USB1.1 DEVICE [Enabled] 114
➔ Onboard SiS USB2.0 DEVICE [Enabled] 114
➔ Legacy USB Support [Enabled] 115
➔ USB2.0 Controller Mode [HiSpeed] 115
➔ Clear NVRAM [No] 116
➔ Plug & Play O/S [No] 116
➔ PCI Latency Timer [64] 117
➔ Allocate IRQ to PCI VGA [Yes] 117
➔ Palette Snooping [Disabled] 117
➔ PCI IDE BusMaster [Disabled] 118
➔ OffBoard PCI/ISA IDE Card [Auto] 118
➔ IRQ# [Available] 119
➔ DMA Channel# [Available] 120
➔ Reserved Memory Size [Disabled] 120
➔ Primary Graphics Adapter [AGP] 122
➔ Share Memory Size [32MB] 122
➔ Display Device Select [CRT only] 123
➔ LCD Display Type [Full Screen] 123
➔ LCD Panel Resolution Type [1024 X 768] 123
➔ TV Display Device [Composite] 123
➔ TV NTSC/PAL Display [NTSC] 124
➔ Different PAL TV [PAL] 124
➔ TV UnderScan/OverScan [UNDERSCAN] 124

➔ Different YpbPrTV [525i] 124
➔ OnBoard AC97 Audio DEVICE [Enabled] 125
➔ Clock Spread Spectrum [Disabled] 126
➔ OnBoard LAN Enable/Disable [Enabled] 126
➔ LAN Boot Rom [Disabled] 126
➔ Quick Boot [Enabled] 128
➔ Quiet Boot [Disabled] 128
➔ AddOn ROM Display Mode [Force BIOS] 129
➔ Bootup Num-Lock [On] 129
➔ PS/2 Mouse Support [Auto] 129
➔ Change Supervisor Password 133
➔ Change User Password 133
➔ Save Changes and Exit 134
➔ Discard Changes and Exit 134
➔ Discard Changes 135
➔ Load Optimal Defaults 135
➔ Load Failsafe Defaults 135

Appendix

B

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

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, Watchdog Timer either performs 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:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table B-1: AH-6FH Sub-function

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 starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to 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 resets.

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 THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
         Digital IO
         DOS Debug.exe

         Input      I   A21 00H     ;Input signal off

         Output     O   A21 FFH     ;Output signal on
```

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Appendix

C

Address Mapping

C.1 IO Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2D8-2DF	Serial Port 6 (COM6)
2E0-2E7	Serial Port 5 (COM5)
2E8-2EF	Serial Port 4 (COM4)
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	SiS661CX Graphics Controller
3C0-3DF	SiS661CX Graphics Controller
3E8-3EF	Serial Port 3 (COM3)
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table C-1: IO Address Map

C.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table C-2: 1st MB Memory Address Map

C.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	COM 4 / COM 6
IRQ3	COM2	IRQ11	COM 3 / COM 5
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table C-3: IRQ Mapping Table

C.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table C-4: DMA Channel Assignments

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Appendix

D

External AC'97 Audio CODEC

D.1 Introduction

The motherboard comes with an onboard Realtek ALC655 CODEC. Realtek ALC655 is a 16-bit, full duplex AC'97 Rev. 2.3 compatible audio CODECwith a sampling rate of 48KHz.

D.1.1 Accessing the AC'97 CODEC

The CODEC is accessed through three phone jacks on the rear panel of the motherboard. The phone jacks include:

1. A LINE input shared with surround output
2. A MIC input shared with Center and LFE output
3. A LINE output
4. A MIC input line.

D.1.2 Driver Installation

The driver installation has been described in **Chapter 6**, **Section** Error! Reference source not found..

After rebooting the sound effect configuration utility appears in the Windows Control Panel (see **Figure 6-27**). If the peripheral speakers are properly connected, sound effects should be heard.

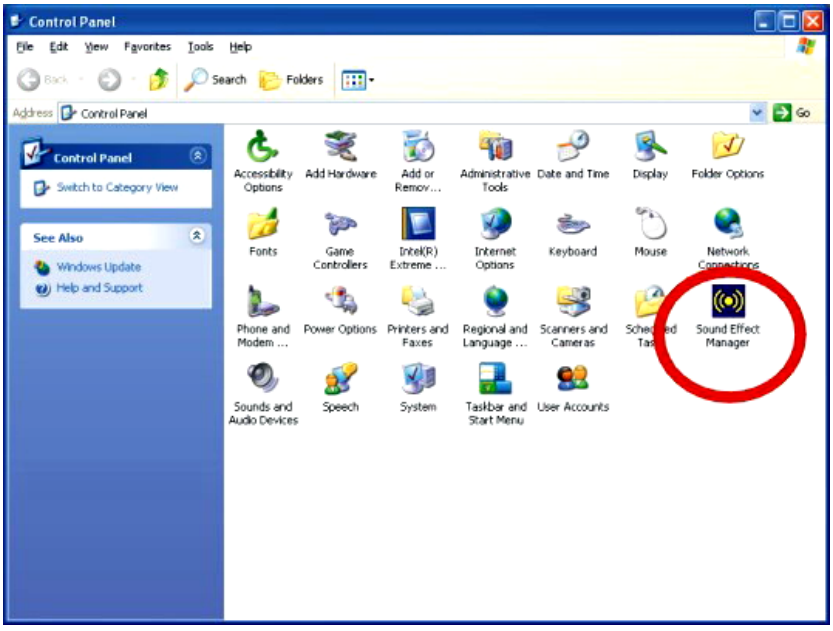

Figure 6-27: Sound Effect Manager con

D.2 Sound Effect Configuration

D.2.1 Accessing the Sound Effects Manager

To access the **Sound Effects Manager**, please do the following:

Step 1: Install the audio CODEC driver.

Step 2: Click either:

- The Sound Effect Manager icon in the Notification Area of the system task bar (see Figure 6-28), or
- The Sound Effect Manager icon in the Control Panel (Figure 6-29).

Figure 6-28: Sound Effect Manager Icon [Task Bar]

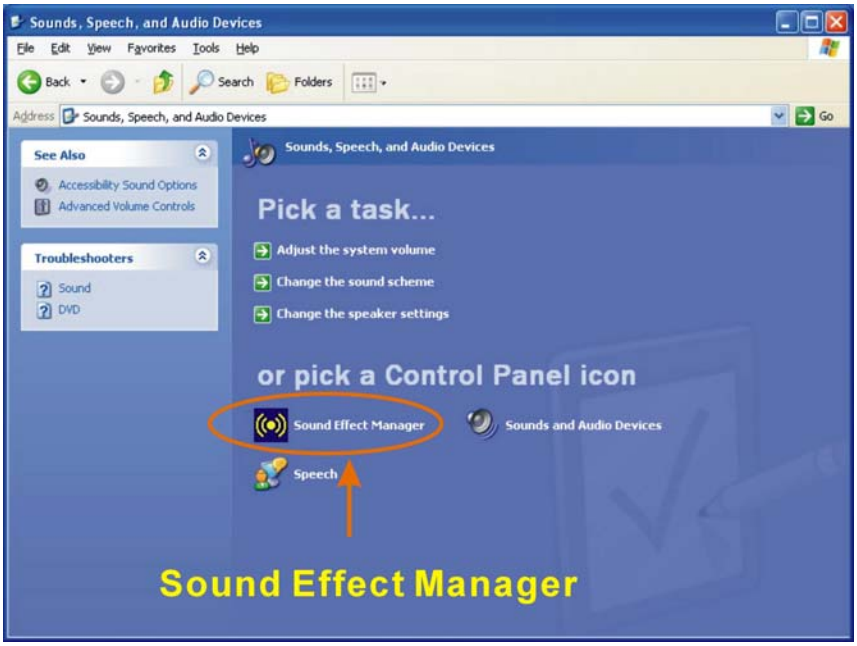

Figure 6-29: Sound Effect Manager Icon [Control Panel]

Step 3: The sound effect manager appears. (See **Figure 6-30**)

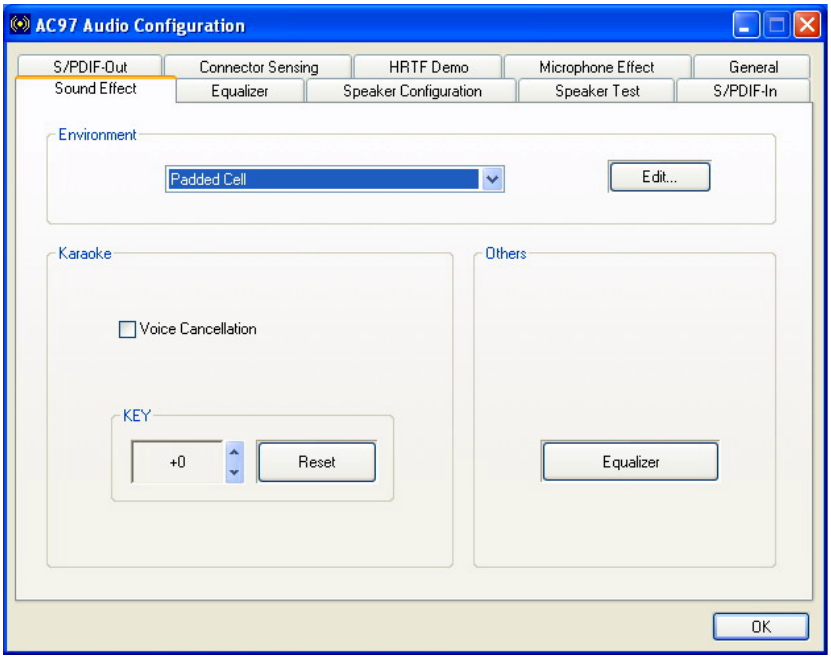

Figure 6-30: Sound Effects Manager (ALC655)

NOTE:

The Sound Effect Manager shown in **Figure 6-30** is for the RealTek ALC655 audio CODEC. Different CODECs may have different sound manager appearances.

The following section describes the different configuration options in the Sound Effect Manager.

D.2.2 Sound Effect Manager Configuration Options

The **Sound Effects Manager** enables configuration of the items listed below. To configure these items click the corresponding menu tab in the **Sound Effects Manager** in **Figure 6-30**.

NOTE:

The **Karaoke Mode** is configured in the **Sound Effect** menu. To access Karaoke configuration settings, click on the **Sound Effect** menu tab.

- Sound Effect
- Karaoke Mode
- Equalizer
- Speaker Configuration
- Speaker Test
- S/PDIF-In
- S/PDIF-Out
- Connector Sensing
- HRTF Demo
- Microphone Effect
- General

NOTE:

Not all RealTek **Sound Effect Managers** have all the above listed options. The Sound Effect Manager loaded onto the system may only have some of the options listed above.

Below is a brief description of the available configuration options in the **Sound Effects Manager**.

- ***Sound Effect***:- Select a sound effect from the 23 listed options in the drop down menu. Selected sound effect properties can be edited. To edit the sound effect click "**EDIT**."
- ***Karaoke Mode***:- The **Karaoke Mode** is accessed in the Sound Effect window. The **Voice Cancellation** disables the vocal part of the music being played. The **Key adjustment** up or down arrow icons enables

users to define a key that fits a certain vocal range.

- ***Equalizer Selection***:- Preset equalizer settings enable easy audio range settings. Ten frequency bands can be configured.

- ***Speaker Configuration***:- Multi-channel speaker settings are configured in this menu. Configurable options include:
  - Headphone
  - Channel mode for stereo speaker output
  - Channel mode for 4 speaker output
  - Channel mode for 5.1 speaker output
  - Synchronize the phonejack switch with speakers settings

- ***Speaker Test*:-** Each speaker connected to the system is tested individually to see if the 4-channel or 6-channel audio operates properly.

- ***S/PDIF-In & S/PDIF-Out***:- These functions are currently not supported.

- ***Connector Sensing***:- Realtek ALC655 detects if an audio device is plugged into the wrong connector. If an incorrect device is plugged in a warning message appears.

- ***HRTF Demo***:- Adjust HRTF (Head Related Transfer Functions) 3D positional audio here before running 3D applications.

- ***Microphone Effect***:- Microphone noise suppression is enabled in this menu.

- ***General***:- General information about the installed AC'97 audio configuration utility is listed here.

Appendix

E

RAID Setup

E.1 Introduction

E.1.1 RAID Support

The SiS964 southbridge chipset integrated controller supports the following three SATA RAID levels:

- JBOD
- RAID0
- RAID1

E.1.2 What is RAID

RAID, or redundant array of inexpensive disks, is a method of saving data on multiple disks so that if one of the disks is damaged or destroyed, the data on the disks is not lost. Only the three RAID levels listed above can be implemented on the system

- JBOD stands for Just a Bunch Of Disks. This is not a RAID level. If any thing happens to one hard drive, all the information on that drive is lost.
- RAID0 refers to disk striping. Data is distributed (striped) over multiple disks. This increases the overall disk performance but the data is not redundantly stored and therefore any damage to the system disks results in a loss of information.
- RAID1 refers to disk mirroring. The information on one disk is completely mirrored onto a second disk. The effective storage capacity of the hard disks is halved but the data on the disks is safe. If one of the disks is destroyed or damaged in any way the information on that disk is retrievable from the second disk.

E.2 RAID Setup

E.2.1 Introduction

To setup the RAID, the following procedures must be completed.

Step 4: Two SATA drives must be installed onto the system.

Step 5: The RAID BIOS must be configured.

Step 6: RAID drivers must be copied onto a floppy disk.

E.2.2 Copy the RAID Driver

Before configuring the RAID on the system, copy the RAID driver from the driver CD that came with the system onto a floppy disk. To do this, follow the steps below.

Step 1: Insert the CD into a computer.

Step 2: Open the "**ROCKY Driver**" CD directory.

Step 3: Open the **RAID 304c** directory (see **Figure E-1**).

Figure E-1: RAID 304C Subdirectory

Step 4: Select the **964_180** subdirectory (see **Figure E-2**).

Figure E-2: RAID 304C Subdirectory

Step 5: The following subdirectories appear (see **Figure E-3**)

- Srv2003
- Win2000
- Winxp
- WS03XP64

Figure E-3: Select OS Directory Corresponding to the OS

Step 6: These directories all contain drivers compatible with different OSes. Select the directory for the OS used on the system and copy all the files onto a separate floppy disk drive.

E.2.3 Install SATA Drives

To implement the on-chip RAID function, two SATA drives must be connected to the system. Use the SATA drive cables that came with the system to connect the SATA drives.

E.2.4 Configure the SATA Controller in BIOS

To configure the RAID BIOS, follow the steps below:

Step 1: Turn on the motherboard and enter the BIOS setup utility. Do this by clicking **DELETE** when the system boots up.

Step 2: Select the **Advanced** settings menus.

Step 3: Select the **IDE Configuration** sub-menu.

Step 4: In the **IDE Configuration** sub-menu select the "**Onboard PCI S-ATA Controller**" option.

Step 5: Set the "**Onboard PCI S-ATA Controller**" option to the "**Raid Mode**" and hit **ENTER**.

Step 6: Save the changes and exit the BIOS setup utility. To do this, hit the escape key and select the **Exit** menu from the top menu bar in the BIOS utility setup.

Step 7: When the **Exit** menu appears, select the "**Save Changes and Exit**" menu option.

E.2.5 Configure the RAID BIOS

The next step is to configure the BIOS RAID. To do this, follow the steps below.

Step 1: Restart the system. Wait for the POST to be complete.

Step 2: The system prompts the user to press <**CTRL**> and <**S**> to enter the BIOS RAID Setup Utility (see **Figure E-4**).

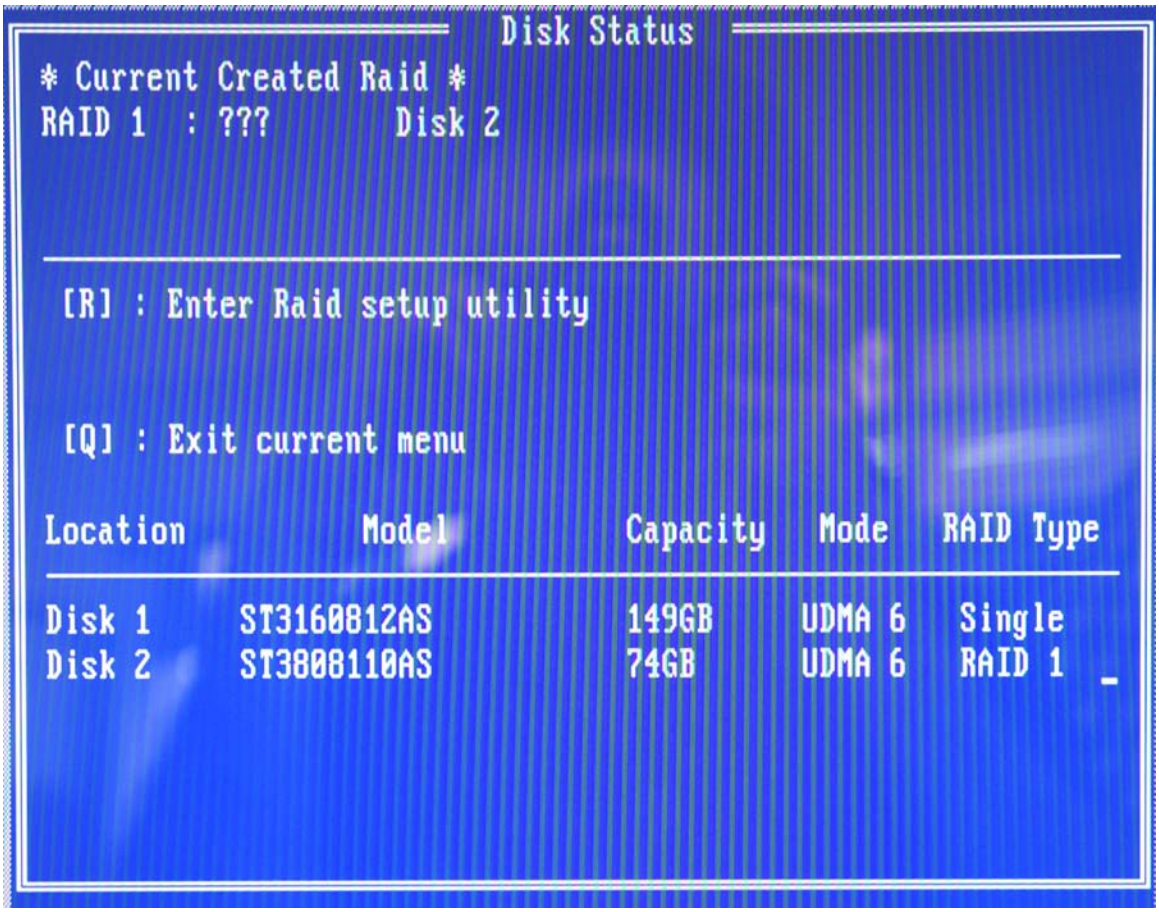

Figure E-4: BIOS RAID Utility

Step 3: To setup the RAID, press "**R**." The RAID setup screen appears (see **Figure E-5**).

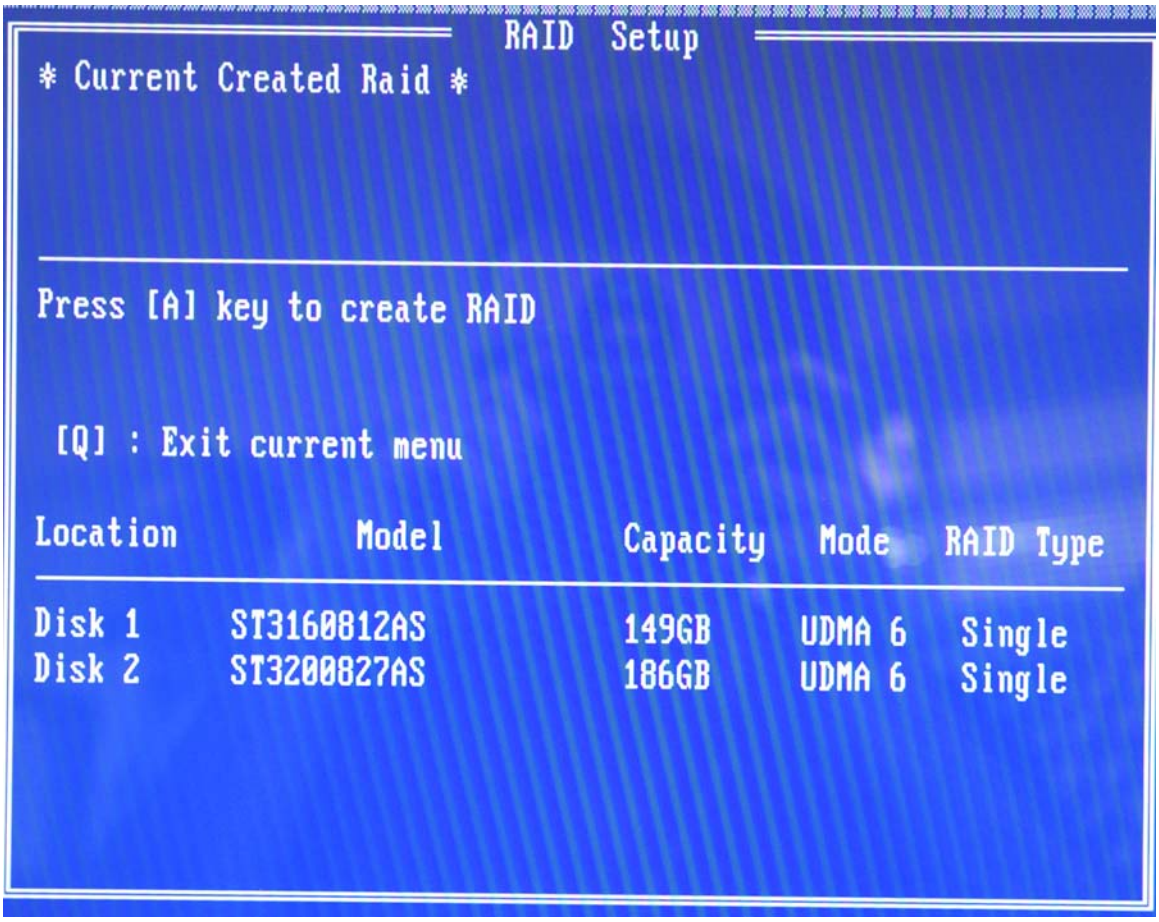

Figure E-5: Create RAID

Step 4: Click "**A**" to setup the RAID(see **Figure E-5**).

Step 5: The system then prompts the user to select the RAID configuration type. JBOD, RAID0 or RAID1. Select the desired RAID configuration (see **Figure E-6**).

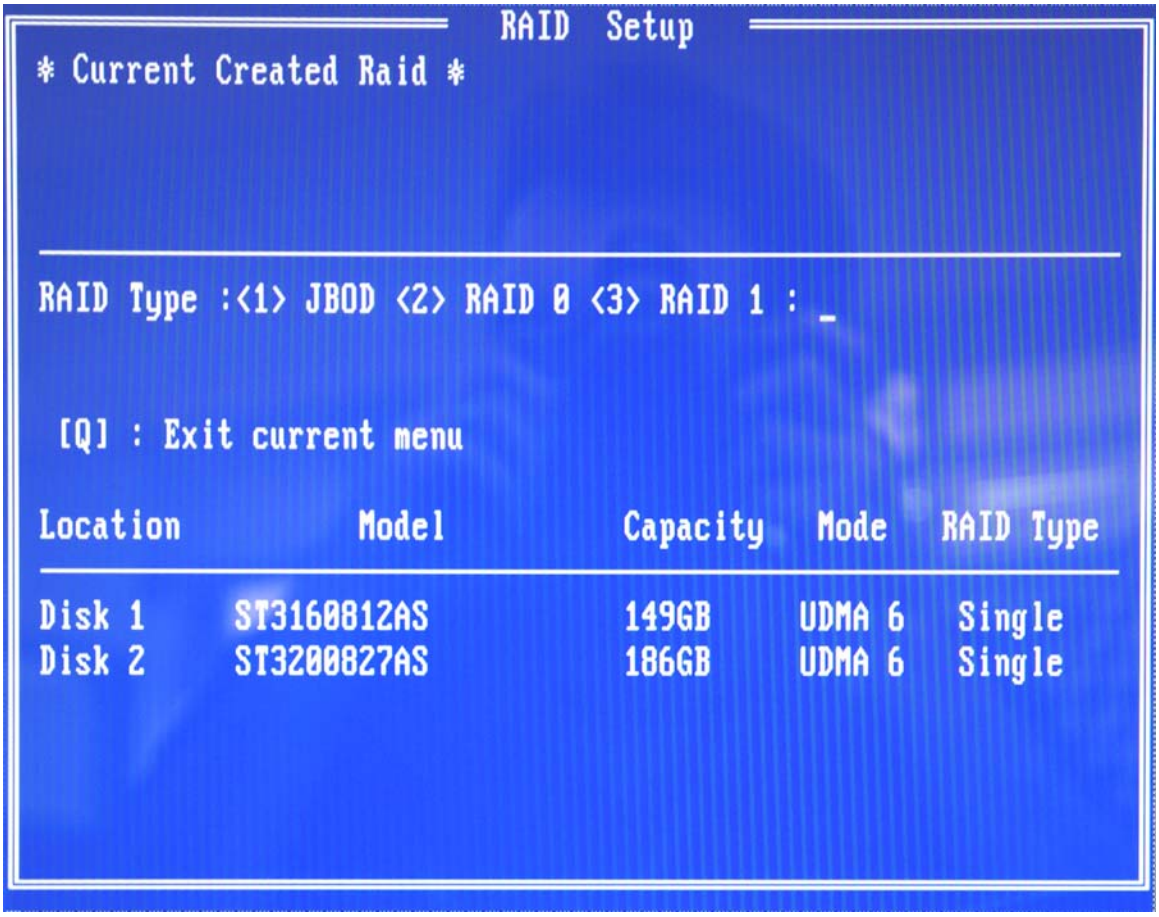

Figure E-6: Create RAID

Step 6: The system then prompts the user to "**Auto Create**" or "**Manual Create**" (see **Figure E-7**).

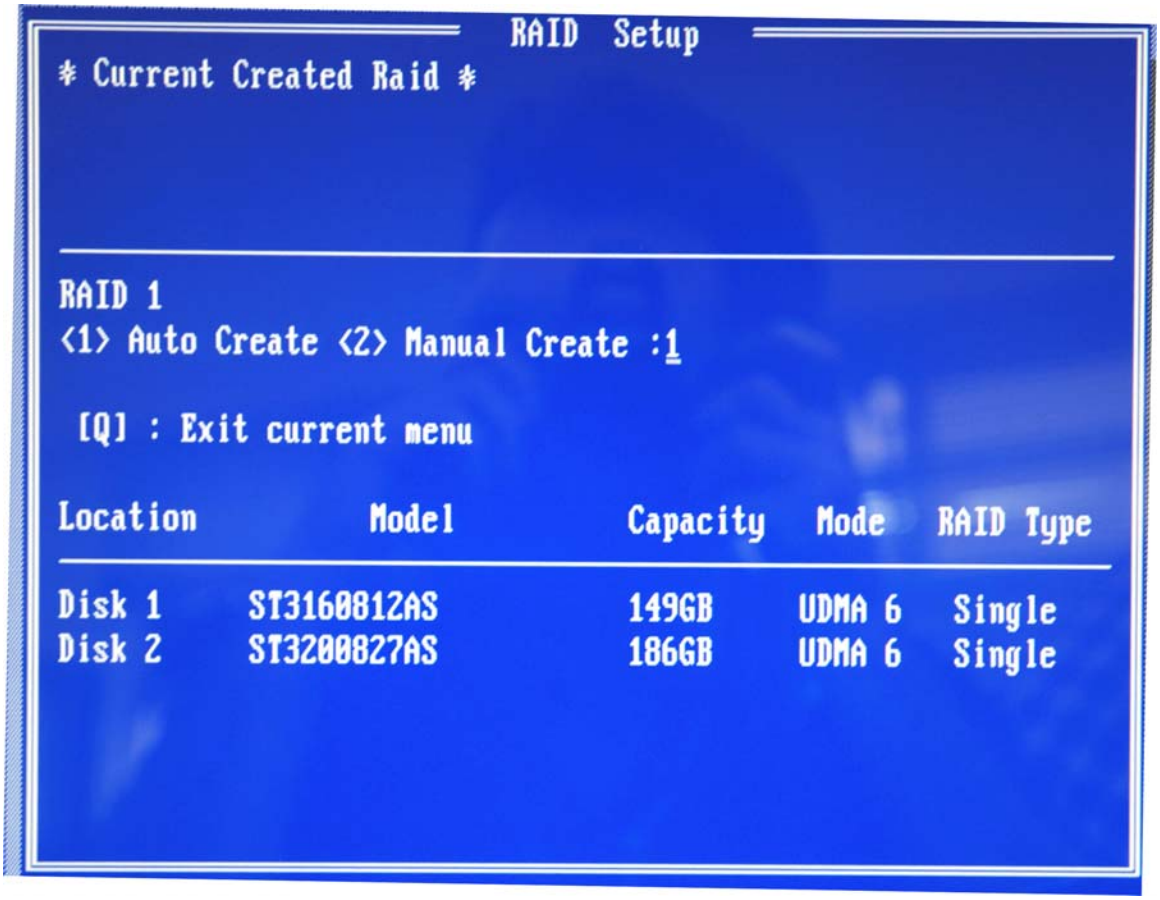

Figure E-7: Select "Auto"

Step 7: The user is prompted to **Auto Create** or **Manual Create**. Select **Auto Create** (see **Figure E-8**).

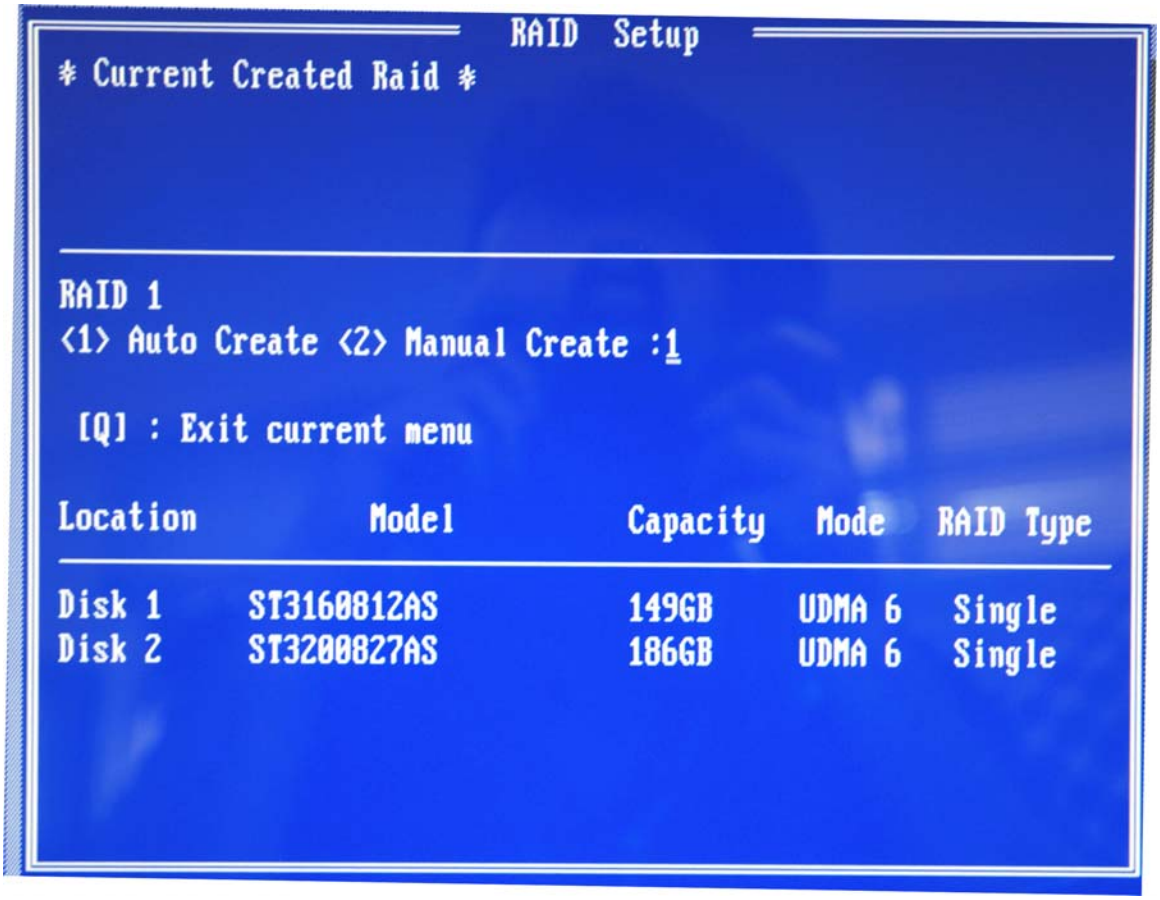

Figure E-8: Select "Auto"

Step 8: After the RAID configuration is complete, save the changes and exit the RAID configuration utility.

E.2.6 Install the OS

Now install the OS onto the SATA drives. To do this, follow the steps below.

Step 1: Insert the OS installation CD into the CD drive attached to the IDE device.

Step 2: Restart the system.

Step 3: When prompted, press "**F6**" to install the RAID controller device. Next, press "**F2**" to continue the installation.

Step 4: A message informs the user the OS is unable to determine the mass storage device installed on the system. At this point, insert the FDD with the copied RAID

driver files into the FDD drive. The OS accesses the SATA drives through this disk.

Step 5: Next, select the driver for the OS being installed into the system. Once selected, press Enter.

Step 6: The OS and the RAID drivers are then installed into the system. The SATA drives are configured as RAID drives as stipulated in the above selection.

Step 7: The OS continues to be installed and the RAID on the SATA drives configured.

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