MSI

MICRO-STAR INTERNATIONAL

IM-GME965

MS-9821 (V1.X) Mainboard

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Revision History

Revision	Revision History	Date
V1.0	First release	June 2008

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

> Visit the MSI website at ***http://global.msi.com.tw/index.php?func=service*** for FAQ, technical guide, BIOS updates, driver updates, and other information.
> Contact our technical staff at ***http://ocss.msi.com.tw***.

Safety Instructions

1. Always read the safety instructions carefully.

2. Keep this User's Manual for future reference.

3. Keep this equipment away from humidity.

4. Lay this equipment on a reliable flat surface before setting it up.

5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.

6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.

7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.

8. Always Unplug the Power Cord before inserting any add-on card or module.

9. All cautions and warnings on the equipment should be noted.

10. Never pour any liquid into the opening that could damage or cause electrical shock.

11. If any of the following situations arises, get the equipment checked by service personnel:

    ► The power cord or plug is damaged.
    ► Liquid has penetrated into the equipment.
    ► The equipment has been exposed to moisture.
    ► The equipment does not work well or you can not get it work according to User's Manual.
    ► The equipment has dropped and damaged.
    ► The equipment has obvious sign of breakage.

12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60°C (140°F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

警告使用者：
此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此情況下，使用者會被要求採取某些適當的對策

廢電池請回收

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

FCC-B Radio Frequency Interference Statement

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

▶ Reorient or relocate the receiving antenna.

▶ Increase the separation between the equipment and receiver.

▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

▶ Consult the dealer or an experienced radio/television technician for help.

Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

Micro-Star International
MS-9821

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

iv

WEEE (Waste Electrical and Electronic Equipment) Statement

ENGLISH

To protect the global environment and as an environmentalist, MSI must remind you that...

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life. MSI will comply with the product take back requirements at the end of life of MSI-branded products that are sold into the EU. You can return these products to local collection points.

DEUTSCH

Hinweis von MSI zur Erhaltung und Schutz unserer Umwelt

Gemäß der Richtlinie 2002/96/EG über Elektro- und Elektronik-Altgeräte dürfen Elektro- und Elektronik-Altgeräte nicht mehr als kommunale Abfälle entsorgt werden. MSI hat europaweit verschiedene Sammel- und Recyclingunternehmen beauftragt, die in die Europäische Union in Verkehr gebrachten Produkte, am Ende seines Lebenszyklus zurückzunehmen. Bitte entsorgen Sie dieses Produkt zum gegebenen Zeitpunkt ausschliesslich an einer lokalen Altgerätesammelstelle in Ihrer Nähe.

FRANÇAIS

En tant qu'écologiste et afin de protéger l'environnement, MSI tient à rappeler ceci...

Au sujet de la directive européenne (EU) relative aux déchets des équipement électriques et électroniques, directive 2002/96/EC, prenant effet le 13 août 2005, que les produits électriques et électroniques ne peuvent être déposés dans les décharges ou tout simplement mis à la poubelle. Les fabricants de ces équipements seront obligés de récupérer certains produits en fin de vie. MSI prendra en compte cette exigence relative au retour des produits en fin de vie au sein de la communauté européenne. Par conséquent vous pouvez retourner localement ces matériels dans les points de collecte.

РУССКИЙ

Компания MSI предпринимает активные действия по защите окружающей среды, поэтому напоминаем вам, что....

В соответствии с директивой Европейского Союза (ЕС) по предотвращению загрязнения окружающей среды использованным электрическим и электронным оборудованием (директива WEEE 2002/96/EC), вступающей в силу 13 августа 2005 года, изделия, относящиеся к электрическому и электронному оборудованию, не могут рассматриваться как бытовой мусор, поэтому производители вышеперечисленного электронного оборудования обязаны принимать его для переработки по окончании срока службы. MSI обязуется соблюдать требования по приему продукции, проданной под маркой MSI на территории ЕС, в переработку по окончании срока службы. Вы можете вернуть эти изделия в специализированные пункты приема.

v

ESPAÑOL

MSI como empresa comprometida con la protección del medio ambiente, recomienda:

Bajo la directiva 2002/96/EC de la Unión Europea en materia de desechos y/o equipos electrónicos, con fecha de rigor desde el 13 de agosto de 2005, los productos clasificados como "eléctricos y equipos electrónicos" no pueden ser depositados en los contenedores habituales de su municipio, los fabricantes de equipos electrónicos, están obligados a hacerse cargo de dichos productos al termino de su periodo de vida. MSI estará comprometido con los términos de recogida de sus productos vendidos en la Unión Europea al final de su periodo de vida. Usted debe depositar estos productos en el punto limpio establecido por el ayuntamiento de su localidad o entregar a una empresa autorizada para la recogida de estos residuos.

NEDERLANDS

Om het milieu te beschermen, wil MSI u eraan herinneren dat....

De richtlijn van de Europese Unie (EU) met betrekking tot Vervuiling van Electrische en Electronische producten (2002/96/EC), die op 13 Augustus 2005 in zal gaan kunnen niet meer beschouwd worden als vervuiling.

Fabrikanten van dit soort producten worden verplicht om producten retour te nemen aan het eind van hun levenscyclus. MSI zal overeenkomstig de richtlijn handelen voor de producten die de merknaam MSI dragen en verkocht zijn in de EU. Deze goederen kunnen geretourneerd worden op lokale inzamelingspunten.

SRPSKI

Da bi zaštitili prirodnu sredinu, i kao preduzeće koje vodi računa o okolini i prirodnoj sredini, MSI mora da vas podesti da...

Po Direktivi Evropske unije ("EU") o odbačenoj elektronskoj i električnoj opremi, Direktiva 2002/96/EC, koja stupa na snagu od 13. Avgusta 2005, proizvodi koji spadaju pod "elektronsku i električnu opremu" ne mogu više biti odbačeni kao običan otpad i proizvođači ove opreme biće prinudeni da uzmu natrag ove proizvode na kraju njihovog uobičajenog veka trajanja. MSI će poštovati zahtev o preuzimanju ovakvih proizvoda kojima je istekao vek trajanja, koji imaju MSI oznaku i koji su prodati u EU. Ove proizvode možete vratiti na lokalnim mestima za prikupljanje.

POLSKI

Aby chronić nasze środowisko naturalne oraz jako firma dbająca o ekologię, MSI przypomina, że...

Zgodnie z Dyrektywą Unii Europejskiej ("UE") dotyczącą odpadów produktów elektrycznych i elektronicznych (Dyrektywa 2002/96/EC), która wchodzi w życie 13 sierpnia 2005. tzw. "produkty oraz wyposażenie elektryczne i elektroniczne " nie mogą być traktowane jako śmieci komunalne, tak więc producenci tych produktów będą zobowiązani do odbierania ich w momencie gdy produkt jest wycofywany z użycia. MSI wypełni wymagania UE, przyjmując produkty (sprzedawane na terenie Unii Europejskiej) wycofywane z użycia. Produkty MSI będzie można zwracać w wyznaczonych punktach zbiorczych.

TÜRKÇE

Çevreci özelliğiyle bilinen MSI dünyada çevreyi korumak için hatırlatır:

Avrupa Birliği (AB) Kararnamesi Elektrik ve Elektronik Malzeme Atığı, 2002/96/EC Kararnamesi altında 13 Ağustos 2005 tarihinden itibaren geçerli olmak üzere, elektrikli ve elektronik malzemeler diğer atıklar gibi çöpe atılamayacak ve bu elektronik cihazların üreticileri, cihazların kullanım süreleri bittikten sonra ürünleri geri toplamakla yükümlü olacaktır. Avrupa Birliği'ne satılan MSI markalı ürünlerin kullanım süreleri bittiğinde MSI ürünlerin geri alınması isteği ile işbirliği içerisinde olacaktır. Ürünlerinizi yerel toplama noktalarına bırakabilirsiniz.

ČESKY

Záleží nám na ochraně životního prostředí - společnost MSI upozorňuje...

Podle směrnice Evropské unie ("EU") o likvidaci elektrických a elektronických výrobků 2002/96/EC platné od 13. srpna 2005 je zakázáno likvidovat "elektrické a elektronické výrobky" v běžném komunálním odpadu a výrobci elektronických výrobků, na které se tato směrnice vztahuje, budou povinni odebírat takové výrobky zpět po skončení jejich životnosti. Společnost MSI splní požadavky na odebírání výrobků značky MSI, prodávaných v zemích EU, po skončení jejich životnosti. Tyto výrobky můžete odevzdat v místních sběrnách.

MAGYAR

Annak érdekében, hogy környezetünket megvédjük, illetve környezetvédőként fellépve az MSI emlékezteti Önt, hogy ...

Az Európai Unió ("EU") 2005. augusztus 13-án hatályba lépő, az elektromos és elektronikus berendezések hulladékairól szóló 2002/96/EK irányelve szerint az elektromos és elektronikus berendezések többé nem kezelhetőek lakossági hulladékként, és az ilyen elektronikus berendezések gyártói kötelessé válnak az ilyen termékek visszavételére azok hasznos élettartama végén. Az MSI betartja a termékvisszavétellel kapcsolatos követelményeket az MSI márkanév alatt az EU-n belül értékesített termékek esetében, azok élettartamának végén. Az ilyen termékeket a legközelebbi gyűjtőhelyre viheti.

ITALIANO

Per proteggere l'ambiente, MSI, da sempre amica della natura, ti ricorda che....

In base alla Direttiva dell'Unione Europea (EU) sullo Smaltimento dei Materiali Elettrici ed Elettronici, Direttiva 2002/96/EC in vigore dal 13 Agosto 2005, prodotti appartenenti alla categoria dei Materiali Elettrici ed Elettronici non possono più essere eliminati come rifiuti municipali: i produttori di detti materiali saranno obbligati a ritirare ogni prodotto alla fine del suo ciclo di vita. MSI si adeguerà a tale Direttiva ritirando tutti i prodotti marchiati MSI che sono stati venduti all'interno dell'Unione Europea alla fine del loro ciclo di vita. È possibile portare i prodotti nel più vicino punto di raccolta.

CONTENTS

Chapter 1
Product Overview

Thank you for choosing the IM-GME965 (MS-9821 v1. X) Mini ITX mainboard from MSI.

Based on the innovative **Intel® GME965** & **ICH8M** controllers for optimal system efficiency, the IM-GME965 accommodates the latest **Intel® Penryn/Core 2 Duo/ Core Duo/Celeron M** processors in Socket P and supports two DDR2 533/667MHz SO-DIMM slots to provide the maximum of 4GB memory capacity.

In the entry-level and mid-range market segment, the IM-GME965 can provide a high-performance solution for today's front-end and general purpose workstation, as well as in the future.

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Mainboard Specifications

Processor
- Intel Penryn/Core 2 Duo/Core Duo/Celeron M CPU in Socket P
- Supports 3-pin CPU fan pin-header with Fan Speed Control
- Supports Intel Dual Core Technology to 533/667/800MHz and up

Supported FSB
- 533/667/800MHz

Chipset
- North Bridge: Intel GME965 chipset
- South Bridge: Intel ICH8M chipset

Memory
- Unbuffer Non-ECC DDR2 533/667 SDRAM (4GB Max)
- 2 DDR2 SO-DIMM slots (200pin / 1.8V)

LAN
- Supports Gagabit Ethernet by Intel 82566DC

Audio
- HDA Codec by Realtek ALC888 7.1 channel
- Compliant with Azalia 1.0 specs
- 6 watt amplifier

IDE
- 1 IDE port by ICH8M
- Supports Ultra DMA 66/100 mode
- Supports PIO, Bus Master operation mode

SATA
- SATA II ports by ICH8M
- Supports two SATA II devices
- Supports storage and data transfers at up to 3Gb/s

Connectors

● **Back Panel**
- 1 RJ-45 LAN jack
- 4 USB 2.0 ports
- 1 D-Sub VGA connector
- 1 serial port

- 1 PS/2 keyboard port
- 1 PS/2 mouse port
- 6 audio jacks

● **Onboard Connectors**
- 2 USB 2.0 connectors (4 ports)
- 1 parallel port connector
- 1 SPI Flash ROM connector (for debugging)
- 1 LVDS connector
- 1 TV-out connector
- 3 serial port connectors
- 1 chassis intrusion switch connector
- 1 amplifier connector

Slots

- 1 PCI Express x16 slot
- 1 Mini PCI-E slot
- 1 32-bit/33MHz PCI slot
- 1 CF socket (optional)

Form Factor

- Mini ITX: 170mm x 170mm
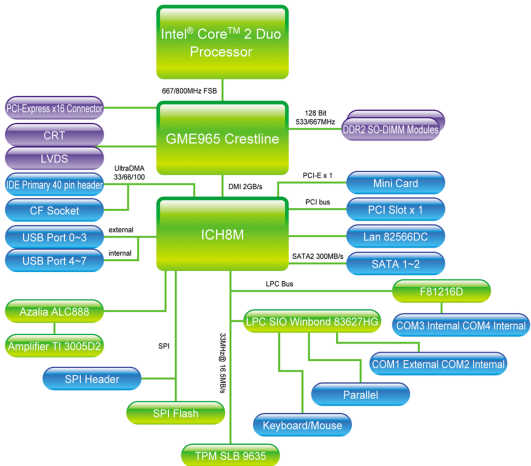
Mounting
- 4 mounting holes

Environmental

● **Storage Temperature**
- Temperature: -20°C ~ 80°C
- Humidity: 0% RH ~ 95% RH

● **Operation Temperature**
- Temperature: 0°C ~ 55°C
- Humidity: 0% RH ~ 85% RH

Block Diagram

Mainboard Layout

IM-GME965 (MS-9821 v1.X) Mini ITX Mainboard

Board Dimension

limit height 5mm

1-6
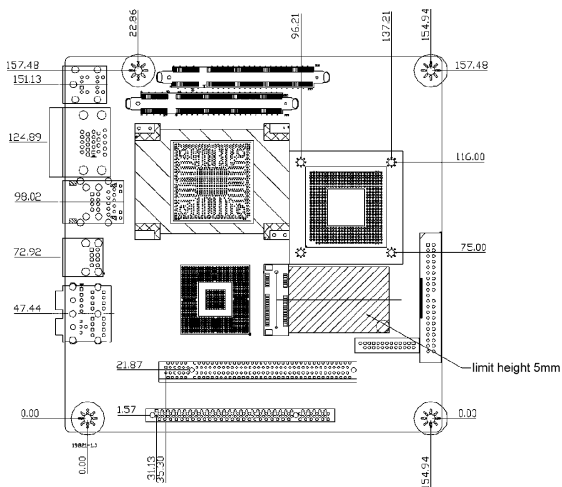
Back Panel & I/O Shield Drawing

1-7
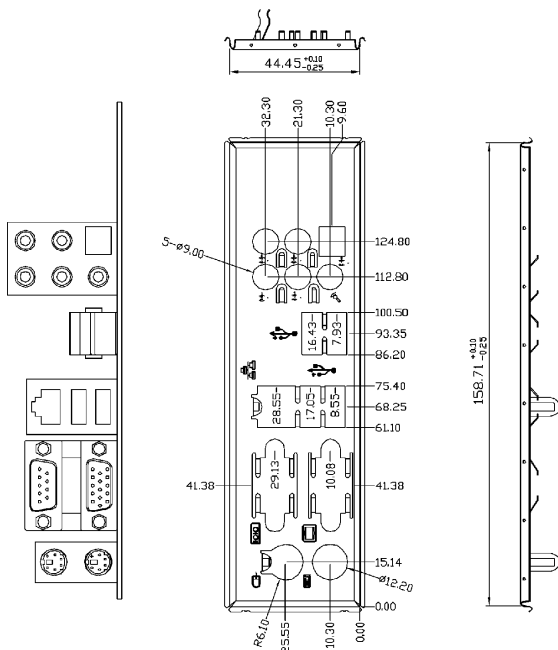
Power Consumption

Component	Description
CPU	Intel Core 2 Duo T7500 processor
Memory	Transcend 1G DDR2-667 x1
Add-On VGA	NA
Hard Disk	Maxtor 40G IDE 7200rpm HDD x1
Operating System	Microsoft® Windows XP® Professional SP2

MS-9821	12V input	19V input
	Current(A) & Voltage	Current(A) & Voltage
Enter DOS(Stable)	3.07/11.861	2.03A/19.069
Enter BIOS(Stable)	2.67/11.899	1.81/19.092
Idle	2.09/11.940	1.39/19.131
CPU Stress 100%	5.09/11.692	3.30/19.043
Windows stress(3dMARK2006)	4.35/11.74	2.63/19.04
Windows Desktop Standby S1 without two LANs connected (stable)	1.30/12.01	0.76/19.178
Windows Desktop Standby S3 without two LANs connected (stable)	0.110/12.144	0.052/19.249
Windows Desktop Hibernate S4 without two LANs connected (stable)	0.085/12.149	0.038/19.251
Windows Desktop Soft Off S5 without two LANs connected (stable)	0.075/12.150	0.045/19.251

Safety Compliance & MTBF

Certification		Standard number	Title of standard
CE	RFI	EN 55022:1998+A1:2000+A2:2003 Class B	Product family standard
		EN 6100-3-2:2000 Class D	Limits for harmonic current emission
		EN 6100-3-3:1995+A1:2001	Limitation of voltage fluctuation and flicker in low-voltage supply system
	Immunity	EN 55024:1998+A1:2001+A2:2003	Product family standard
BSMI	CNS 13438 乙類(1997年版)		
C-Tick	AS/NZS CISPR 22:2004		
FCC	FCC CFR Title 47 Part 15 Subpart B: 2005 Class B		
	CISPR 22: 2005		
VCCI	VCCI V-3:2004, Class B		
	VCCI V-4:2004, Class B		

MTBF - Reliability Prediction

Calculation Model	Operation Temperature (°C)	Operating Environment	Duty Cycle (FITs.)	MTBF(hr.)
Telcordia Issue 1	25	GB, GC - Ground Benign, Controlled	4,564.28	219,093

Chapter 2
Hardware Setup

This chapter provides you with the information about hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

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Quick Components Guide

JTV1, *p.2-13*

Back Panel
I/O, *p.2-7*

JLVDS1, *p.2-14*

DIMM Slots, *p.2-3*

CPU, *p.2-4*

JPW1, *p.2-6*

SYSFAN1, *p.2-12*

CPUFAN1, *p.2-12*

JCF_SEL1, *p.2-19*

IDE1, *p.2-9*

Mini PCI-E
Slot, *p.2-18*

SATA1~2, *p.2-10*

J2, *p.2-17*

JLPT1, *p.2-16*

JSPI1, *p.2-11*

JBAT1, *p.2-17*

PCI-E Slot, *p.2-18*

JSPD1, *p.2-11*

PCI Slot, *p.2-18*

JFP1, *p.2-12*

J5, *p.2-17*

COM1~2, *p.2-16*

COM3, *p.2-16*

JCASE1, *p.2-9*

F_USB1~2, *p.2-15*

JSPWR1, *p.2-6*

JCOMP1~2, *p.2-17*

JAMP1, *p.2-11*

2-2
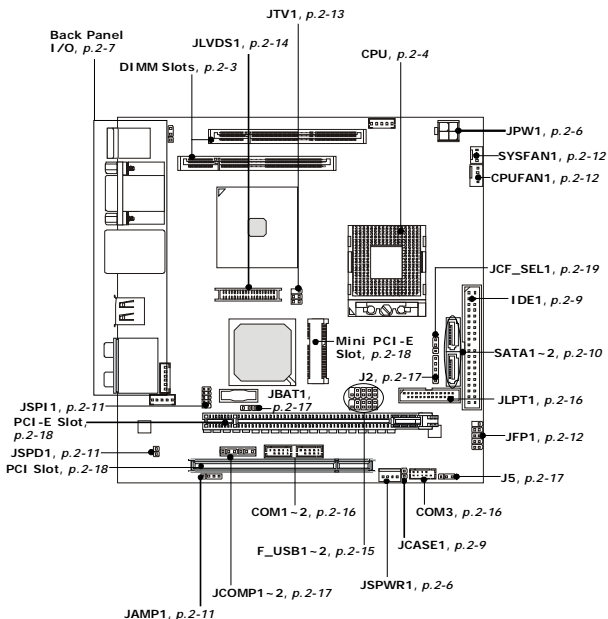
Memory

The DIMM slots are intended for system memory modules.

DDR2 SO-DIMM Slot
200-pin, 1.8V

Installing Memory Modules

1. Locate the SO-DIMM slots on the mainboard.
2. Align the notch on the DIMM with the key on the slot. Insert the DIMM vertically into the SO-DIMM slot. Then push it in until the golden finger on the DIMM is deeply inserted in the SO-DIMM slot.
3. Manually check if the DIMM has been locked in place by the retaining clips at the sides.

Important

1. Make sure that you **install the memory modules first** before installing the CPU and cooler set.
2. Always insert the memory module into **the DIMM1 first**.

2-3

CPU (Central Processing Unit)

The mainboard supports **Intel® Penryn/Core 2 Duo/Core Duo/Celeron M** processors in Socket P. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not have the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

> **Important**
>
> *1. Overheating will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating.*
> *2. Make sure that you apply an even layer of heat sink paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.*
> *3. While replacing the CPU, always turn off the power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.*

2-4

Socket P CPU Installation

1. Locate the CPU socket on the mainboard.
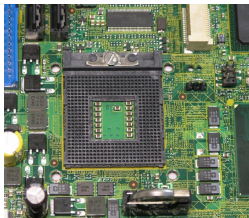
2. Place the CPU on top of the socket. Make sure that you align the gold arrow on the CPU with the arrow key on the socket.
3. Push the CPU down until its pins securely fit into the socket.
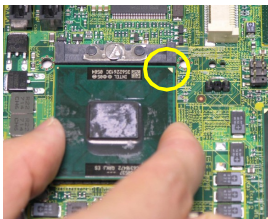
4. On the front end of the CPU socket is a locking mechanism designed into the form of a screw head. Make sure that you actuate or deactuate this mechanism with a screwdriver before and after installing the CPU.
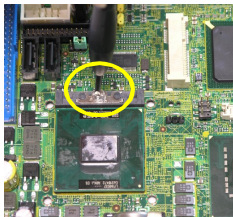
Important

Mainboard photos shown in this section are for demonstration only and may differ from the actual look of your mainboard.

2-5

Power Supply

System/CPU Power Connector: JPW1
This connector provides power to the system and CPU.

JPW1

JPW1 Pin Definition	
PIN	SIGNAL
1	GND
2	GND
3	12V or 14~24V
4	12V or 14~24V

HDD Power Connector: JSPWR1
The connector provides power to the hard disk drives.

VCC5 GND GND +12V

JSPWR1

Important

*Power supply of **120watts** (and above) is highly recommended for system stability.*

2-6

Back Panel

Mouse	Serial Port	LAN		
Keyboard	VGA Port	USB Ports	USB Ports	MIC / Optical SPDIF-Out

Line-In / RS-Out / Line-Out / CS-Out
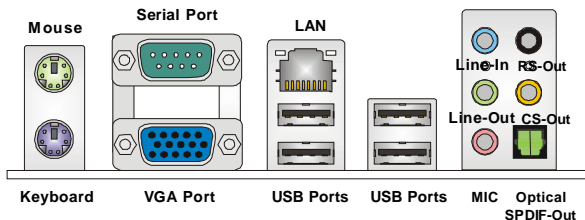
▶ **Mouse/Keyboard**
The standard PS/2® mouse/keyboard DIN connector is for a PS/2® mouse/keyboard.

▶ **Serial Port**
The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

▶ **VGA Port**
The DB15-pin female connector is provided for monitor.

▶ **USB Port**
The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

▶ **LAN**
The standard RJ-45 LAN jack is for connection to the Local Area Network (LAN). You can connect a network cable to it.

Activity Indicator ⎯⎯⎯ ⎯⎯⎯ Link Indicator

LED	Color	LED State	Condition
Left	Green	Off	LAN link is not established.
		On (steady state)	LAN link is established.
		On (brighter & pulsing)	The computer is communicating with another computer on the LAN.
Right	Green	Off	10 Mbit/sec data rate is selected.
		On	100 Mbit/sec data rate is selected.
	Orange	On	1000 Mbit/sec data rate is selected.

2-7

▶ **Audio Ports**

These audio connectors are used for audio devices. You can differentiate the color of the audio jacks for different audio sound effects.

■ **Line-In (Blue)** - Line In / Side-Surround Out in 7.1 channel mode, is used for external CD player, tapeplayer or other audio devices.

■ **Line-Out (Green)** - Line Out, is a connector for speakers or headphones.

■ **Mic (Pink)** - Mic, is a connector for microphones.

■ **RS-Out (Black)** - Rear-Surround Out in 4/ 5.1/ 7.1 channel mode.

■ **CS-Out (Orange)** - Center/ Subwoofer Out in 5.1/ 7.1 channel mode.

▶ **Optical S/PDIF-Out**

This SPDIF (Sony & Philips Digital Interconnect Format) connector is provided for digital audio transmission to external speakers through an optical fiber cable.

Connector

Chassis Intrusion Connector: JCASE1

This connector connects to the chassis intrusion switch cable. If the chassis is opened, the chassis intrusion mechanism will be activated. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.

CINTRU □ 1
GND □ 2

JCASE1

IDE Connector: IDE1

This connector supports IDE hard disk drives, optical disk drives and other IDE devices.

IDE1
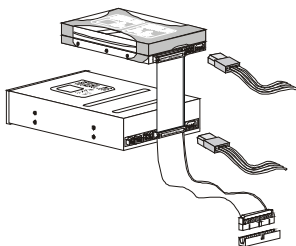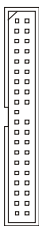
Important

If you install two IDE devices on the same cable, you must configure the drives separately to master / slave mode by setting jumpers. Refer to IDE device's documentation supplied by the vendors for jumper setting instructions.

2-9

Serial ATA II Connector: SATA1, SATA2

This connector is a high-speed Serial ATA II interface port. Each connector can connect to one Serial ATA II device.

SATA1

SATA2
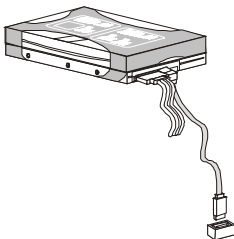
Important

Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, data loss may occur during transmission.

2-10

Audio Amplifier Connector: JAMP1

The JAMP1 is used to connect audio amplifiers to enhance audio performance.

JAMP1

1 ▢▢▢▢

Pin Definition

PIN	SIGNAL
1	AMP_L-
2	AMP_L+
3	AMP_R-
4	AMP_R+

S/PDIF-Out Connector: JSPD1 (Optional, for HDMI graphics card only)

This connector is used to connect S/PDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission **to the HDMI graphics card**.

SPDIF-Out ——— GND

JSPD1

SPI Flash ROM Connector: JSPI1

This connector is used to flash SPI flash ROM.

JSPI1

1 ▢▢ 2
9 ▢▢ 10

Pin Definition

Pin	Description	Pin	Description
1	VCC3_SB	2	VCC3_SB
3	SPI_MISO_F	4	SPI_MOSI_F
5	SPI_CS0_F#	6	SPI_CLK_F
7	GND	8	GND
9	SPI_HOLD#	10	NC

2-11

Fan Power Connectors: CPUFAN1, SYSFAN1

The fan power connectors support system cooling fan with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset onboard, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.

```
┌─┐ GND
│□│ +12V
│□│ SENSOR        ┌─┐ GND
│□│ CONTROL       │□│ +12V
                  │□│ SENSOR
CPUFAN1           SYSFAN1
```

Important

Please refer to the recommended CPU fans at Intel® official website or consult the vendors for proper CPU cooling fan.

Front Panel Connector: JFP1

The mainboard provides one front panel connector for electrical connection to the front panel switches and LEDs. The JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

```
              JFP1
          10 ┌─────┐ 9
Power  - ┤□ □├ + Reset
Switch + ┤□ □├ - Switch
Power    ┤□ □├   HDD
LED   ─┤□ □├ + LED
           2        1
```
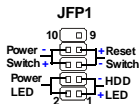
JFP1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED+	Hard disk LED pull-up
2	FPPWR/SLP	MSG LED pull-up
3	HD_LED -	Hard disk active LED
4	FPPWR/SLP	MSG LED pull-up
5	RST_SW-	Reset Switch low reference pull-down to GND
6	PWR_SW+	Power Switch high reference pull-up
7	RST_SW+	Reset Switch high reference pull-up
8	PWR_SW -	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

2-12

TV-Out Connector: JTV1 (Optional)

This connector is for you to attach an optional TV-Out bracket that offers two types of TV-Out connectors: S-Video and RCA Composite connectors. Select the appropriate one to connect the standard television or the HDTV (High-Definition TeleVision).

Display Matrix

	CRT	LVDS	TV-OUT	SDVO	PCI-E x16 port
CRT		V	V	V	X
LVDS	V		V	V	X
TV-OUT	V	V		V	X
SDVO	V	V	V		X
PCI-E x16 port	X	X	X	X	

V : Support   X : No Support

JTV1

Pin Definition

Pin	Description	Pin	Description
1	GND	4	GND
2	LCVBS	5	LC
3	LY	6	NC

TV-Out Bracket (Optional)

Connect to JTV1

HDTV-Out Connector *(RCA Composite)*   Standard TV-Out Connector *(S-Video)*
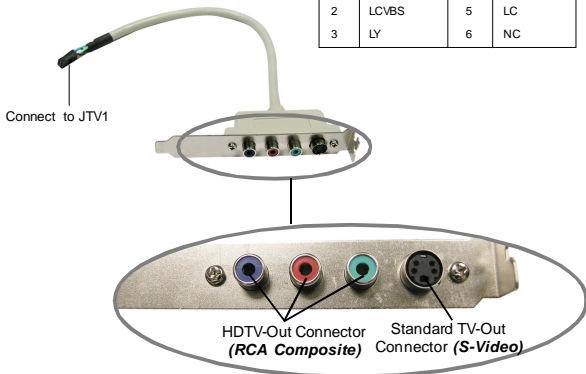
Important

Please note that the TV-Out bracket can connect to one TV only. Users have to choose either the RCA Composite or the S-Video to connect. Simultaneously connecting two TVs to this bracket is prohibited and may lead to the malfunction of the TVs.

2-13

LVDS Flat Panel Connector: JLVDS1

The LVDS (Low Voltage Differential Signal) connector provides a digital interface typically used with flat panels. After connecting an LVDS interfaced flat panel to the JLVDS1, be sure to check the panel datasheet and set the **J7 LVDS Power Selection Jumper** (p. 2-18) to a proper voltage.

JLVDS1

1   39

2   40

Display Matrix

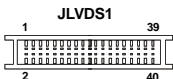|	CRT	LVDS	TV-OUT	SDVO	PCI-E x16 port
CRT		V	V	V	X
LVDS	V		V	V	X
TV-OUT	V	V		V	X
SDVO	V	V	V		X
PCI-E x16 port	X	X	X	X	

V : Support   X : No Support

SIGNAL	PIN		SIGNAL
+12V	2	1	+12V
+12V	4	3	+12V
GND	6	5	+12V
GND	8	7	VCC3/VCC5
LCD_VDD	10	9	LCD_VDD
LDDC_DATA	12	11	LDDC_CLK
LVDS_VDDEN	14	13	L_BKLTCTL
GND	16	15	L_BKLTEN
LA_DATA0	18	17	LA_DATA0#
LA_DATA1	20	19	LA_DATA1#
LA_DATA2	22	21	LA_DATA2#
LA_CLK	24	23	LA_CLK#
LA_DATA3	26	25	LA_DATA3#
GND	28	27	GND
LB_DATA0	30	29	LB_DATA0#
LB_DATA1	32	31	LB_DATA1#
LB_DATA2	34	33	LB_DATA2#
LB_CLK	36	35	LB_CLK#
LB_DATA3	38	37	LB_DATA3#
GND	40	39	GND

Front USB Connector: F_USB1, F_USB2

This connector, compliant with Intel® I/O Connectivity Design Guide, is ideal for connecting high-speed USB interface peripherals such as **USB HDD**, **digital cameras**, **MP3 players**, **printers**, **modems and the like**.

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key (no pin)	10	NC

F_USB1/2

```
9  □ □ □ □ □  1
10 □ □ □ □ □  2
```

USB 2.0 Bracket
(Optional)
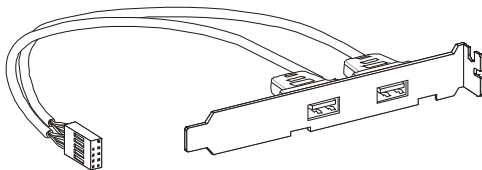
Important

Note that the pins of VCC and GND must be connected correctly to avoid possible damage.

2-15

Serial Port Connector: COM1, COM2, COM3

This connector is a 16550A high speed communications port that sends/receives 16 bytes FIFOs. You can attach a serial device to it through the optional serial port bracket.

Pin Definition

```
9  [....] 1
10 [....] 2
```
COM1/2

```
2  [....] 10
1  [....] 9
```
COM3

| PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	VCC_COM3	Power Source

**Parallel Port Connector: JLPT1**

The mainboard provides a 26-pin header for connection to an optional parallel port bracket. The parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.

JLPT1

```
25 [............] 1
26 [............] 2
```
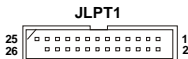
| Pin	Signal Name	Pin	Signal Name
1	RSTB#	2	AFD#
3	PRND0	4	ERR#
5	PRND1	6	PINIT#
7	PRND2	8	LPT_SLIN#
9	PRND3	10	GND
11	PRND4	12	GND
13	PRND5	14	GND
15	PRND6	16	GND
17	PRND7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	GND
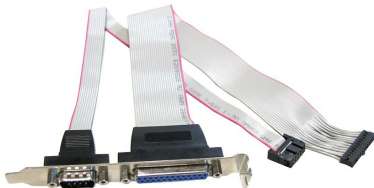
Parallel/Serial Port Bracket (Optional)

2-16

Jumper

LVDS Power Selection Jumper: J2

Use this jumper to specify the operation voltage of the LVDS interfaced flat panel.
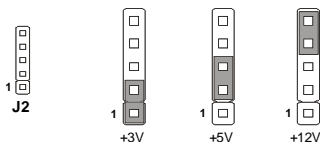
COM Port Power Jumpers: J5, JCOMP1, JCOMP2

These jumpers specify the operation voltage of the onboard serial ports.
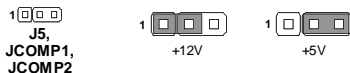
Clear CMOS Jumper: JBAT1

There is a CMOS RAM onboard that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, set this jumper to clear data.

Keep Data   Clear Data

Important

You can clear CMOS by shorting 1-2 pin while the system is off. Then return to 2-3 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

2-17

Slot

PCI (Peripheral Component Interconnect) Express Slot

The PCI Express slot supports PCI Express interface expansion cards.
The PCI Express x 16 slot supports up to 4.0 GB/s transfer rate.
The CON1 is Mini PCI-E connector for wireless LAN, TV tuner, and Robson NAND Flash.

PCI Express x16 Slot

Mini PCI-E Slot

PCI (Peripheral Component Interconnect) Slot

The PCI slot supports LAN card, SCSI card, USB card, and other add-on cards that comply with PCI specifications.

32-bit PCI Slot

PCI Interrupt Request Routing

The IRQ, acronym of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus pins as follows:

| DEVICE	INT Pin	IDSEL	CLOCK	REQ# / GNT#
32-bit PCI Slot	PIRQA	AD17	PCICLK 0	REQ#0 / GNT#0
32-bit PCI Riser	PIRQC	AD18	PCICLK 1	REQ#1 / GNT#1
32-bit PCI Riser	PIRQD	AD19	PCICLK 2	REQ#2 / GNT#2

Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

2-18

CompactFlash Card Slot: CF1 (Optional)

This CompactFlash slot shares one channel of the IDE controller. You can install one CompactFlash typeI / type II device.

CF1
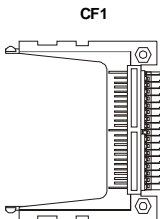
CF Mode Selecting Jumper:
JCF_SEL1 (Optional)

This jumper is used to select Master/ Slave mode of the CF device.

JCF_SEL1

Master   Slave
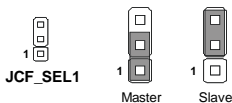
Important

*   * *The CF1 slot and the IDE1 connector shares and uses the same channel. CF1 and IDE1 can support up to 2 IDE devices without CF device or 1 IDE device with 1 CF device.*
*   * *If you install two IDE devices, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.*
*   * *If you install one IDE device with ATA133 IDE cable and one CF device, you must configure the CF drive to Master mode by setting jumper JCF_SEL1. CF only supports Master mode by using ATA133 IDE cable. CF only supports Slave mode by using ATA33 IDE cable.*

2-19

Chapter 3
BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.
You may need to run the Setup program when:

► An error message appears on the screen during the system booting up, and requests you to run SETUP.

► You want to change the default settings for customized features.

MSI

MICRO-STAR INTERNATIONAL

3-1

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key to enter Setup.

```
Press Del to enter SETUP
```

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

1. The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

2. Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:

   A9821IMS V1.0 031508 where:

   1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX.
   2nd - 5th digit refers to the model number.
   6th digit refers to the chipset as I = Intel, N = nVidia, and V = VIA.
   7th - 8th digit refers to the customer as MS = all standard customers.
   V1.0 refers to the BIOS version.
   031508 refers to the date this BIOS was released.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F6>	Load Optimized Defaults
<F7>	Load Fail-Safe Defaults
<F10>	Save all the CMOS changes and exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press ▶ Primary IDE Master ▶ Primary IDE Slave
<Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

The Menu Bar
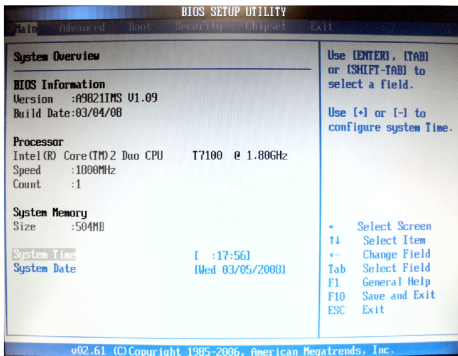
▶ **Main**
Use this menu for basic system configurations, such as time, date etc.

▶ **Advanced**
Use this menu to set up the items of special enhanced features.

▶ **Boot**
Use this menu to specify the priority of boot devices.

▶ **Security**
Use this menu to set supervisor and user passwords.

▶ **Chipset**
This menu controls the advanced features of the onboard Northbridge and Southbridge.

▶ **Exit**
This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.

3-4

Main
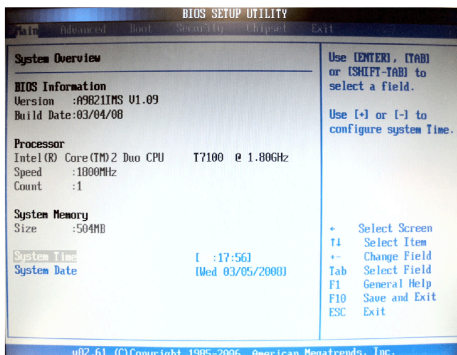
▶ **BIOS Information, Processor, System Memory**
These items show the firmware and hardware specifications of your system. Read only.

▶ **System Time**
The time format is <Hour> <Minute> <Second>.

▶ **System Date**
The date format is <Day>, <Month> <Date> <Year>.

Advanced

▶ **CPU Configuration**

▶ Hardware Prefetcher
The processor has a hardware prefetcher that automatically analyzes its requirements and prefetches data and instructions from the memory into the Level 2 cache that are likely to be required in the near future. This reduces the latency associated with memory reads. When enabled, the processor's hardware prefetcher will be enabled and allowed to automatically prefetch data and code for the processor. When disabled, the processor's hardware prefetcher will be disabled.
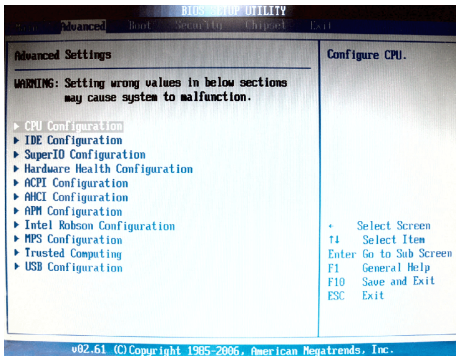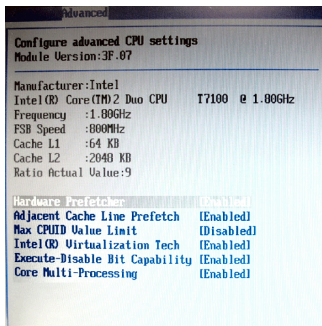
▶ Adjacent Cache Line Prefetch
The processor has a hardware adjacent cache line prefetch mechanism that automatically fetches an extra 64-byte cache line whenever the processor requests for a 64-byte cache line. This reduces cache latency by making the next cache line immediately available if the processor requires it as well. When enabled, the processor will retrieve the currently requested cache line, as well as the subsequent cache line. When disabled, the processor will only retrieve the currently requested cache line.

▶ Max CPUID Value Limit
The Max CPUID Value Limit BIOS feature allows you to circumvent problems with older operating systems that do not support the Intel Pentium 4 processor with Hyper-Threading Technology. When enabled, the processor will limit the maximum CPUID input value to 03h when queried, even if the processor supports a higher CPUID input value. When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

▶ Intel(R) Virtualization Tech
Virtualization enhanced by Intel Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple "virtual" systems.

▶ Execute Disable Bit Capability
Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation.

▶ Core Multi-Processing
CMP (Core Multi Processing) is the ability to have many independent processing cores on a single die, each with their own L1 Code & Data caches, Local APICs & thermal controls, while having a shared L2 cache, power management & bus interface. Intel multi-core architecture has a single Intel processor package that contains two or more processor "execution cores," or computational engines to enable enhanced performance and more-efficient simultaneous processing of multiple tasks.

3-7
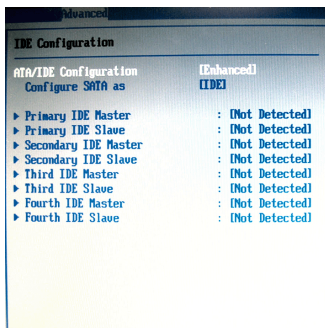
▶ **IDE Configuration**

▶ **ATA/IDE Configuration**
This setting specifies the modes of the PATA & SATA ports.

   ▶ **Configure SATA as**
   This setting specifies the function of the on-chip SATA controller.

▶ **Primary/Secondary/Third/Fourth IDE Master/Slave**

[Type]	Press PgUp/<+> or PgDn/<-> to select [Manual], [None] or [Auto] type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use [Manual] to define your own drive type manually.
[LBA/Large Mode]	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors
[Block(Multi-Sector Transfer)]	Any selection except Disabled determines the number of sectors transferred per block
[PIO Mode]	Indicates the type of PIO (Programmed Input/Output)
[DMA Mode]	Indicates the type of Ultra DMA
[S.M.A.R.T.]	This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.
[32 Bit Data Transfer]	Enables 32-bit communication between CPU and IDE controller

3-9

▶ **Super IO Configuration**
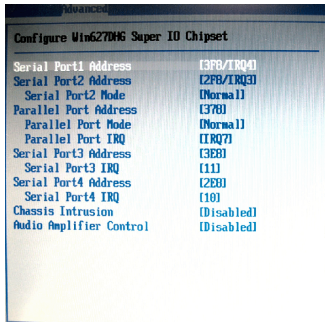
▶ **Serial Port 1 / 2 Address**
Select an address and a corresponding interrupt for the serial port 1/2.

▶ **Serial Port2 Mode**
This setting allows you to specify the operation mode for the serial port 2.

▶ **Parallel Port Address**
This setting specifies the I/O port address and IRQ of the onboard parallel port.

▶ **Parallel Port Mode**
This setting allows you to specify the operation mode for the parallel port.

▶ **Parallel Port IRQ**
Select a corresponding interrupt for the parallel port.

▶ **Serial Port 3 / 4 Address**
Select an address for the serial port 3/4.

▶ **Serial Port 3 / 4 IRQ**
Select a corresponding interrupt for the serial port 3/4.

▶ **Chassis Intrusion**
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to [Enabled] later.

▶ **Audio Amplifier Control**
This setting enables/disables the onboard audio amplifier.

▶ **Hardware Health Configuration**
These items display the current status of the monitored hardware devices/components such as voltages and temperatures.
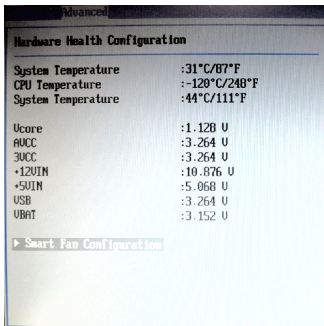
▶ **Smart Fan Configuration**
This setting controls the Smart Fan feature. Smart Fan is an excellent feature which will adjust the CPU/system fan speed automatically depending on the current CPU/system temperature.
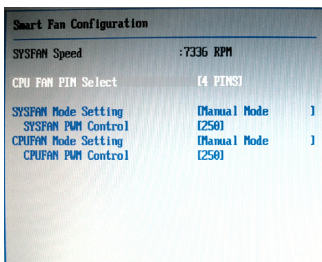
▶ **CPU FAN Pin Select**
This setting selects the pin numbers of the CPU fan power connector.

▶ **SYSFAN Mode Setting, CPUFAN Mode Setting**
These settings specify the operation mode of the CPU & system fans.

▶ **SYSFAN PWM Control, CPUFAN PWM Control**
These settings control the PWM duty cycle of the CPU & system fans.

▶ **ACPI Configuration**
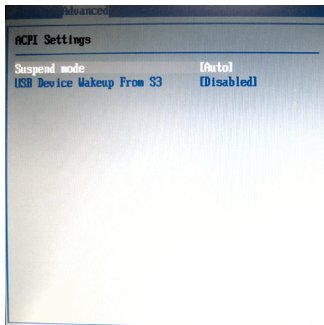
▶ **Suspend Mode**
This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, you can choose to enter the Standby mode in S1 (POS) or S3 (STR) fashion through the setting of this field.

▶ **USB Device Wakeup From S3**
This setting allows the activity of the USB device to wake up the system from the S3 sleep state.

▶ **AHCI Configuration**
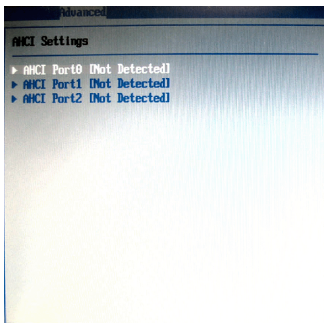
▶ **AHCI Port 0, AHCI Port 1, AHCI Port 2**
These settings specify the operation modes of the onboard SATA ports.
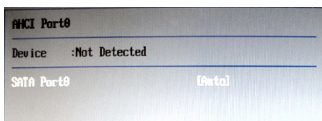
▶ **APM Configuration**
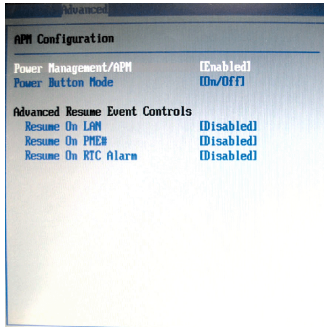
▶ **Power Management/APM**
Setting to [Enabled] will activate an Advanced Power Management (APM) de-
vice to enhance Max Saving mode and stop CPU internal clock.

▶ **Power Button Mode**
This setting controls the operation of the power button.

▶ **Resume On LAN**
This field specifies whether the system will be awakened from power saving
modes when activity or input signal of onboard LAN is detected.

▶ **Resume On PME#**
When setting to [Enabled], this setting allows your system to be awakened from
the power saving modes through any event on PME (Power Management Event).

▶ **Resume On RTC Alarm**
When [Enabled], your can set the date and time at which the RTC (real-time
clock) alarm awakens the system from suspend mode.

► **Intel Robson Configuration**
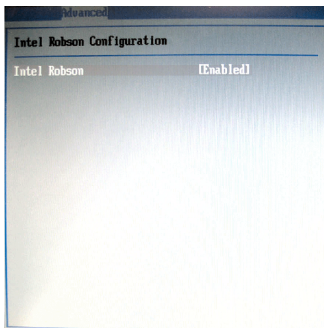
► **Intel Robson**
Robson is the code name for a new Intel platform technology that uses non-volatile memory (Flash memory) to increase system responsiveness, make multi-tasking faster, and extend battery life. Intel Robson technology is poised to eliminate many of the bottlenecks associated with HDD latency. By enabling the majority of application workload to be written and read from a system cache instead of the HDD, Robson will offer users of mobile computers built on the Santa Rosa platform significantly increased performance -- particularly in application load and run time, the speed in which systems resume operation after hibernation or boot, and in system-level power usage.

▶ **MPS Configuration**
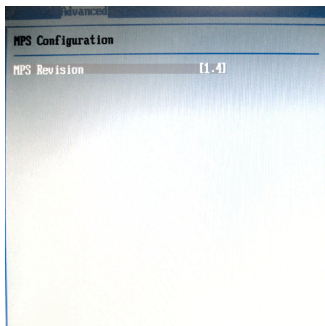
▶ **MPS Revision**

This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system.

▶ **Trusted Computing**
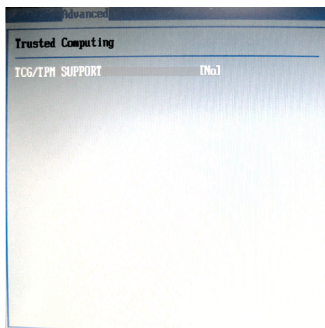
▶ **TCG/TPM Support**
This setting controls the Trusted Platform Module (TPM) designed by the Trusted Computing Group (TCG). TPMs are special-purpose integrated circuits (ICs) built into a variety of platforms to enable strong user authentication and machine attestation—essential to prevent inappropriate access to confidential and sensitive information and to protect against *compromised networks.*

▶**USB Configuration**
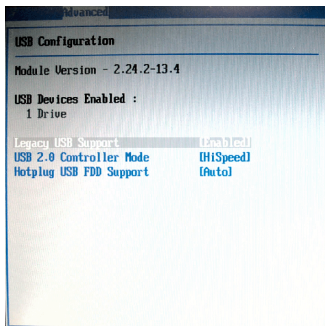
▶**Legacy USB Support**
Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.

▶**USB 2.0 Controller Mode**
This setting specifies the operation mode of the onboard USB 2.0 controller.

▶**Hotplug USB FDD Support**
Set to [Enabled] if your need to use a hotplug USB-interfaced FDD in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix.

Boot
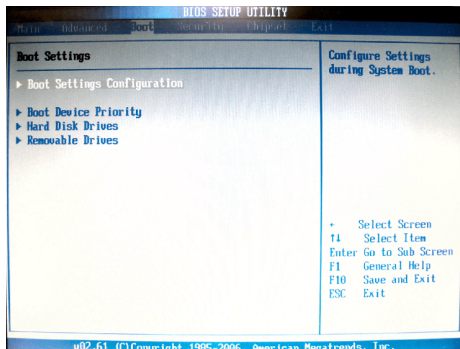
▶ **Boot Settings Configuration**
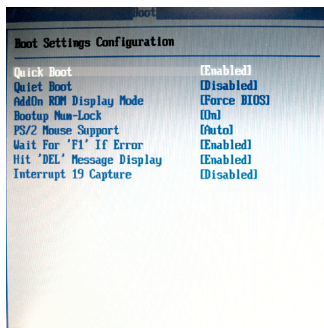
▶ **Quick Boot**
Enabling this setting will cause the BIOS power-on self test routine to skip some of its tests during bootup for faster system boot.

▶ **Quiet Boot**
This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo.
When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.
When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.
Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disable this BIOS feature for a faster boot-up time.

▶ **AddOn ROM Display Mode**
This item is used to determine the display mode when an optional ROM is initialized during POST. When set to [Force BIOS], the display mode used by AMI BIOS is used. Select [Keep Current] if you want to use the display mode of optional ROM.

▶ **Bootup Num-Lock**
This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

▶ **PS/2 Mouse Support**
Select [Enabled] if you need to use a PS/2-interfaced mouse in the operating system.

▶ **Wait For 'F1' If Error**
When this setting is set to [Enabled] and the boot sequence encounters an error, it asks you to press F1. If disabled, the system continues to boot without waiting for you to press any keys.

▶ **Hit 'DEL' Message Display**
Set this option to [Disabled] to prevent the message as follows:
                    Hit Del if you want to run setup
It will prevent the message from appearing on the first BIOS screen when the computer boots. Set it to [Enabled] when you want to run the BIOS Setup Utility.

▶ **Interrupt 19 Capture**
Interrupt 19 is the software interrupt that handles the boot disk function. When enabled, this BIOS feature allows the ROM BIOS of these host adaptors to "capture" Interrupt 19 during the boot process so that drives attached to these adaptors can function as bootable disks. In addition, it allows you to gain ac-

cess to the host adaptor's ROM setup utility, if one is available.

When disabled, the ROM BIOS of these host adaptors will not be able to "capture" Interrupt 19. Therefore, you will not be able to boot operating systems from any bootable disks attached to these host adaptors. Nor will you be able to gain access to their ROM setup utilities.

▶ **Boot Device Priority**
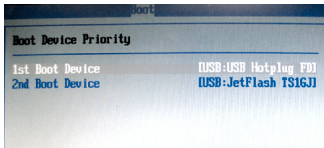
▶ **1st Boot Device, 2nd Boot Device**
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

▶ **Hard Disk Drives, Removable Drives**
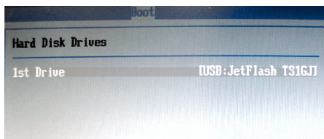
▶ **1st Drive**
This setting allows users to set the priority of the available hardware devices. First press <Enter> to enter the sub-menu. Then you may use the arrow keys (↑↓) to select the desired device, then press <+>, <-> or <PageUp>, <PageDown> key to move it up/down in the priority list.

3-21

Security


```
                    BIOS SETUP UTILITY
Main  Advanced  Boot  Security  Chipset  Exit

Security Settings                          Install or Change the
                                           password.
Supervisor Password :Not Installed
User Password       :Not Installed

Change Supervisor Password
Change User Password



                                           →    Select Screen
                                           ↑↓   Select Item
                                           Enter Change
                                           F1   General Help
                                           F10  Save and Exit
                                           ESC  Exit

        v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.
```
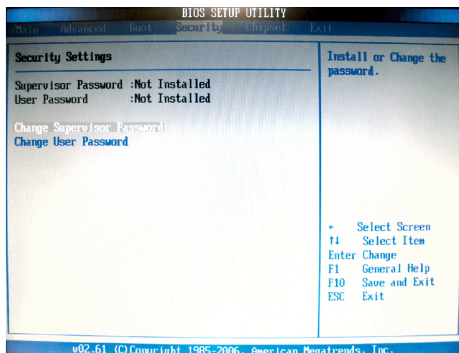
▶ **Supervisor Password / Change Supervisor Password**
Supervisor Password controls access to the BIOS Setup utility. These settings allow
you to set or change the supervisor password.

▶ **User Password / Change User Password**
User Password controls access to the system at boot. These settings allow you to
set or change the user password.

Chipset

▶ **North Bridge Configuration**

North Bridge Chipset Configuration

Boots Graphic Adapter Priority [PEG/PCI]
Internal Graphics Mode Select [Enabled, 8MB]

PEG Port Configuration
  PEG Port   [Auto]
  PEG Force x1   [Disabled]
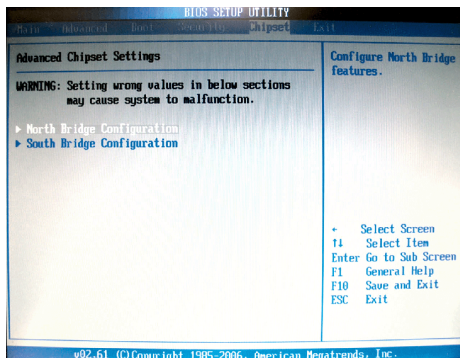
▶ Video Function Configuration
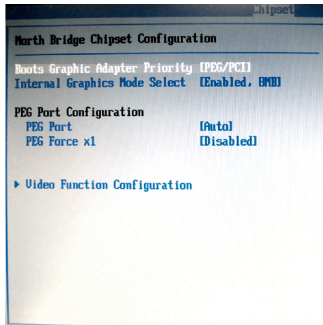
▶ **Boot Graphics Adapter Priority**
This item specifies which VGA card is your primary graphics adapter.

▶ **Internal Graphics Mode Select**
The field specifies the size of system memory allocated for video memory.

▶ **PEG Port**
This setting allows you to select whether to use the onchip graphics processor or the PCI Express card. When set to [Auto], the BIOS checks to see if a PCI Express graphics card is installed. If it detects that a PCI Express graphics card is present, the motherboard boots up using that card. Otherwise, it defaults to the onboard graphics processor.

▶ **PEG Force X1**
This BIOS feature allows you to convert a PCI Express X16 slot into a PCI Express X1 slot. When [Enabled], the PCI Express X16 slot will be forced to run in the PCI Express X1 mode. When [Disabled], the PCI Express X16 slot will be allowed to run in its normal PCI Express X16 mode.
If you have a PCI Express X16 graphics card installed in your system, you should disable this BIOS feature. This allows for optimal performance of the card by ensuring maximum transfer rates between the graphics card and the motherboard.
But if you need to install a PCI Express X1 card into the PCI Express X16 slot, you should enable this BIOS feature to ensure maximum compatibility.

3-24

▶ **Video Function Configuration**


```
Video Function Configuration

DVMT Mode Select              [DVMT Mode]
  DVMT/FIXED Memory           [256MB]

Boot Display Device           [CRT + LVDS]
Flat Panel Type               [1024X 768 18bit]
```
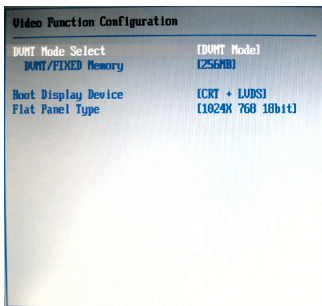
▶ **DVMT Mode Select**
Intel's Dynamic Video Memory Technology (DVMT) allows the system to dy-
namically allocate memory resources according to the demands of the sys-
tem at any point in time. The key idea in DVMT is to improve the efficiency of
the memory allocated to either system or graphics processor.
It is recommended that you set this BIOS feature to DVMT Mode for maximum
performance. Setting it to DVMT Mode ensures that system memory is dy-
namically allocated for optimal balance between graphics and system
performance.

  ▶ **DVMT/FIXED Memory**
  When set to DVMT/FIXED Mode, the graphics driver will allocate a fixed
  amount of memory as dedicated graphics memory, as well as allow more
  system memory to be dynamically allocated between the graphics pro-
  cessor and the operating system.

▶ **Boot Display Device**
Use the field to select the type of device you want to use as the display(s)
of the system.

▶ **Flat Panel Type**
This setting allows you to set your preferences for the boot display device.

3-25

▶ **South Bridge Configuration**


```
                                              Chipset
   South Bridge Chipset Configuration

   USB Functions                    [10 USB Ports]
   USB 2.0 Controller               [Enabled]
   GbE Controller                   [Enabled]
    GbE LAN Boot                    [Disabled]
    GbE Wake Up From S5             [Disabled]
   HDA Controller                   [Enabled]

   Restore on AC Power Loss         [Last State]
```
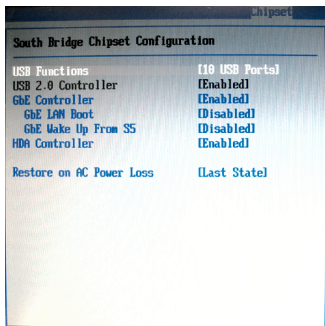
▶ **USB Functions**
This setting specifies the function of the onboard USB controller.

▶ **USB 2.0 Controller**
Set to [Enabled] if you need to use any USB 2.0 device in the operating system that does not support or have any USB 2.0 driver installed, such as DOS and SCO Unix.

▶ **GbE Controller**
This setting disables/enables the onboard Gigabit Ethernet controller.

 ▶ **GbE LAN Boot**
 When [Enabled], the BIOS attempts to boot from a LAN boot image before it attempts to boot from a local storage device.

 ▶ **GbE Wake Up From S5**
 This field specifies whether the system will be awakened from the S5 power saving mode when activity or input signal of onboard LAN is detected.

▶ **HDA Controller**
This setting controls the High Definition Audio interface integrated in the Southbridge.

▶ **Restore on AC Power Loss**
This setting specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:
  [Off]   Leaves the computer in the power off state.
  [On]   Leaves the computer in the power on state.
  [Last State]   Restores the system to the previous status before power
                 failure or interrupt occurred.

3-26
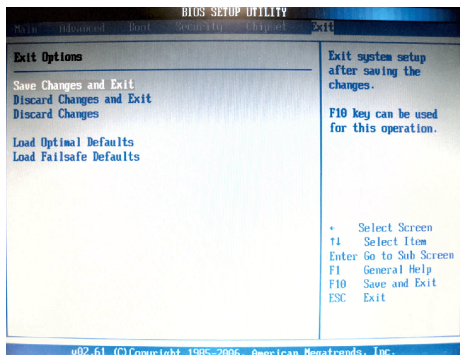
Exit

▶ **Save Changes and Exit**
Save changes to CMOS and exit the Setup Utility.

▶ **Discard Changes and Exit**
Abandon all changes and exit the Setup Utility.

▶ **Discard Changes**
Abandon all changes and continue with the Setup Utility.

▶ **Load Optimal Defaults**
Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

▶ **Load Failsafe Defaults**
Use this menu to load the default values set by the BIOS vendor for stable system performance.

Chapter 4
System Resources

This chapter provides information on the following system resources:

1. Watch Dog Timer Setting (p.4-2);

2. AMI POST Code (p.4-3);

3. Resource List (p.4-7).

MSI

MICRO-STAR INTERNATIONAL

Watch Dog Timer Setting

Software code
SIO_IDX equ 2EH
SIO_DTA equ 2FH
Timer equ 10; reset after 10 seconds

1. Enter configuration mode
   ```
   mov dx,SIO_IDX
   mov al,87h
   out dx,al
   out dx,al
   ```

2. Set to LDN 08
   ```
   mov dx,SIO_IDX
   mov al,07h
   out dx,al
   mov dx,SIO_DTA
   mov al,08h
   out dx,al
   ```

3. Set WatchDog Timer
   ```
   mov dx,SIO_IDX
   mov al,0f6h
   out dx,al
   mov dx,SIO_DTA
   mov al,Timer
   out dx,al
   ```

4. Exit configuration mode
   ```
   mov dx,SIO_IDX
   mov al,0AAh
   out dx,al
   ```

AMI POST Code

Bootblock Initialization Code Checkpoints

The Bootblock initialization code sets up the chipset, memory and other components before system memory is available. The following table describes the type of checkpoints that may occur during the bootblock initialization portion of the BIOS:

Checkpoint	Description
Before D1	Early chipset initialization is done. Early super I/O initialization is done including RTC and keyboard controller. NMI is disabled.
D1	Perform keyboard controller BAT test. Check if waking up from power management suspend state. Save power-on CPUID value in scratch CMOS.
D0	Go to flat mode with 4GB limit and GA20 enabled. Verify the bootblock checksum.
D2	Disable CACHE before memory detection. Execute full memory sizing module. Verify that flat mode is enabled.
D3	If memory sizing module not executed, start memory refresh and do memory sizing in Bootblock code. Do additional chipset initialization. Re-enable CACHE. Verify that flat mode is enabled.
D4	Test base 512KB memory. Adjust policies and cache first 8MB. Set stack.
D5	Bootblock code is copied from ROM to lower system memory and control is given to it. BIOS now executes out of RAM.
D6	Both key sequence and OEM specific method is checked to determine if BIOS recovery is forced. Main BIOS checksum is tested. If BIOS recovery is necessary, control flows to checkpoint E0.
D7	Restore CPUID value back into register. The Bootblock-Runtime interface module is moved to system memory and control is given to it. Determine whether to execute serial flash.
D8	The Runtime module is uncompressed into memory. CPUID information is stored in memory.
D9	Store the Uncompressed pointer for future use in PMM. Copying Main BIOS into memory. Leaves all RAM below 1MB Read-Write including E000 and F000 shadow areas but closing SMRAM.
DA	Restore CPUID value back into register. Give control to BIOS POST (ExecutePOSTKernel). See *POST Code Checkpoints* section of document for more information.

POST Code Checkpoints

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer. Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.

POST Code Checkpoints

Checkpoint	Description
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.
38	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, ... etc.) successfully installed in the system and update the BDA, EBDA...etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh.

	Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

4-6

Resource List

Generic I/O Ports

(I) ICH8M GPIO

Pin	GPIO	Typ	Multi	Power	Connection.
AG12	0	I/O	BMBUSY#	3.3v	PM_BMBUSY#
AG22	11	I/O	SMBALERT#	3.3v	SMB_ALERT#
AE20	15	I/OD	STP_PCI#	3.3v	PM_STP_PCI#
AG18	3	I/OD	STP_CPU#	5v	PM_STP_CPU#
AH11	32	I/OD	CLKRUN#	3.3v	P_CLKRUN#
AJ8	1	I/OD	TACH1	3.3v	NC
AJ9	6	I/O	TACH2	3.3v	NC
AH9	7	I/O	TACH3	3.3v	NC
AE16	8	I/O	GPIO8	3.3v	SIO_PME#
AC19	12	I/O	GPIO12	3.3v	SPI_HOLD_GPO#
AG8	17	I/O	TACH0	3.3v	SPI_WP#
AH12	18	I/O	GPIO18	3.3v	SLPBTIN#
AE11	20	I/O	GPIO20	3.3v	ATADET0
AG10	22	I/O	SCLOCK	3.3v	NC
AH25	27	I/O	QRT_STATE0	3.3v	EL_STATE0
AD16	28	I/O	QRT_STATE1	3.3v	EL_STATE1
AG13	35	I/O	SATACLKREQ#	3.3v	CLK_SATA_OE#
AF9	38	I/O	SLOAD	3.3v	NC
AJ11	39	I/O	SDATAOUT0	3.3v	NC
AD10	48	I/O	SDATAOUT1	3.3v	NC
AJ12	21	I/O	SATA0GP	3.3v	RESISTOR
AJ10	19	I/O	SATA1GP	3.3v	RESISTOR
AF11	36	I/O	SATA2GP	3.3v	RESISTOR
AG11	37	I/O	SATA3GP	3.3v	RESISTOR
AH27	26	I/O	S4_STATE#	3.3v	NC
AJ27	24	I/O	NCMEM_LED	3.3v	LAN_EN
AJ24	10	I/O	ME_EC_ALERT	3.3v	PHY_DIS#
AF22	14	I/O	EC_ME_ALERT	3.3v	NC
AG19	9	I/O	WOL_EN	3.3v	NC
AG16	40	I/O	OC1#	3.3v	OC0#
AG15	41	I/O	OC2#	3.3v	OC0#
AE15	42	I/O	OC3#	3.3v	OC0#
AF15	43	I/O	OC4#	3.3v	OC1#
AG17	29	I/O	OC5#	3.3v	OC1#
AD12	30	I/O	OC6#	3.3v	OC1#
AJ18	31	I/O	OC7#	3.3v	OC1#

(Ⅱ) SIO GPIO

Pin	GPIO	Typ	Multi	Power	Connection.
121	17	I/O	VID7	VCC5	NC
122	16	I/O	VID6	VCC5	NC
123	15	I/O	VID5	VCC5	NC
124	14	I/O	VID4	VCC5	NC
125	13	I/O	VID3	VCC5	NC
126	12	I/O	VID2	VCC5	NC
127	11	I/O	VID1	VCC5	NC
128	10	I/O	VID0	VCC5	NC
120	20	O	CPUFANOUT1/GP20	VCC	CFAN_PWM
119	21	I/O	CPUFANN1/GP21	VCC	CPU_FAN
89	33	I/O	RSTOUT3#/GP33/SDA	VSB	NC
90	32	I/O	RSTOUT2#/GP32/SCL	VSB	NC
91	31	I/O	GP31	VSB	NC
92	30	I/O	GP30	VSB	NC
67	57	O	GP57/PSOUT#	VSB	PWRBTN#
68	56	I	GP56/PSIN#	VSB	IO_PWRBTN#
64	37	I/O	GP37	VSB	NC
72	53	I/O	GP53/PSON#	VSB	PS_ON#
73	52	I	GP52/SUSB#	VSB	SLP_S3#
77	50	I/O	WDTO#GP50	VSB	GP50
2	23	I/O	SCK/GP23	VCC	NC
88	34	O	RSTOUT4#GP34	VSB	NC
69	36	I/O	GP36	VSB	NC
87	35	I/O	GP35	VSB	NC
75	51	O	RSMRST#	VSB	VCC3
56	61	I	DCDA#	VCC	DCDA#
50	66	I	DDSRA#	VCC	DDSRA#
53	63	I	SINA	VCC	SINA
51	65	I/O	RTSA#	VCC	RTSA#
54	62	O	SOUTA	VCC	SOUTA
49	67	I	CTSA#	VCC	CTSA#
52	64	O	DTRA#	VCC	DTRA#
57	60	I	RIA#	VSB	RIA#
84	41	I	DCDB#	VSB	DCDB#

79	46	I	DSRB#	VSB	DSRB#
82	43	I	SINB	VSB	SINB
80	45	O	RTSB#	VSB	RTSB#
83	42	O	SOUTB	VSB	SOUTB
78	47	I	CTSB#	VSB	CTSB#
81	44	O	DTRB#	VSB	DTRB#
85	40	I	RIB#	VSB	RIB#
63	26	I/O	KBDAT#	VSB	KBDAT#
62	27	I/O	KBCLK#	VSB	KBCLK#
66	24	I/O	MSDAT#	VSB	MSDAT#
65	25	I/O	MSCLK#	VSB	MSCLK#
70	55	I/O	SUSLED	VSB	GND
71	54	I/O	PWROK	VSB	NC

I/O Map

I/O Port	Description
0000-000F	DMA Controller 1
0020-0021	Interrupt Controller 1
002E-002F	SIO Port
0040-0043	System Timer
004E-004F	TPM Port
0060, 0064	Keyboard Controller
0070-0073	RTC and CMOS
0080-0090	DMA Controller Page Registers
0092	Port 92h
00A0-00A1	Interrupt Controller 2
00B2-00B3	APM Register
00C0-00DF	DMA Controller 2
00F0-00FF	Numeric Data Processor
01F0-01F7	Primary IDE Controller
02F8-02FF	COM2
0376	Secondary IDE Controller
0378-037F	LPT1
03F6	Primary IDE Controller
03F8-03FF	COM1
0400-045F	ACPI I/O Space
0500-050F	SMBus I/O Space
0CF8-0CFF	PCI Configuration Port

PCI Devices

PCI Device					
Device	Ven. ID	Dev. ID	Bus#	Dev#	Func#
Host Bridge	8086	2A00	00	00	00
VGA-compatible Controller	8086	2A02	00	02	00
Other Display Controller	8086	2A03	00	02	01
Ethernet Controller	8086	104B	00	19	00
UHCI USB Controller	8086	2834	00	1A	00
UHCI USB Controller	8086	2835	00	1A	01
Unknown Device	8086	283A	00	1A	07
Unknown Device	8086	284B	00	1B	00
PCI-to-PCI Bridge	8086	283F	00	1C	00
UHCI USB Controller	8086	2830	00	1D	00
UHCI USB Controller	8086	2831	00	1D	01
UHCI USB Controller	8086	2832	00	1D	02
Unknown Device	8086	2836	00	1D	07
Subtractive Decode P2P Bridge	8086	2448	00	1E	00
ISA Bridge	8086	2815	00	1F	00
IDE Controller	8086	2850	00	1F	01
IDE Controller	8086	2828	00	1F	02
Smbus	8086	283E	00	1F	03

SMBus Resource Allocation

SMBus Resource Allocation		
Device	Address	Description
MS-7	0101 111X	MSI ACPI Controller
DIMM Slot	1010 0000	SPD

ISA Interrupt Allocation

ISA Interrupt Allocation	
IRQ	Description
IRQ0	System Timer
IRQ1	Keyboard Controller
IRQ2	Cascade Interrupt
IRQ3	COM2
IRQ4	COM1
IRQ5	PCI Device
IRQ6	PCI Device
IRQ7	LPT1
IRQ8	RTC
IRQ9	ACPI Controller Interrupt
IRQ10	PCI Device
IRQ11	PCI Device
IRQ12	PS/2 Mouse
IRQ13	Numeric Data Processor
IRQ14	Primary IDE Controller
IRQ15	Secondary IDE Controller

ISA DMA Channel Allocation

DMA Channel	Description
Channel 0	Unassigned 8-bit channel
Channel 1	Unassigned 8-bit channel
Channel 2	Unassigned 8-bit channel
Channel 3	Unassigned 8-bit channel
Channel 4	Cascade channel
Channel 5	Unassigned 16-bit channel
Channel 6	Unassigned 16-bit channel
Channel 7	Unassigned 16-bit channel

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