MB875

Intel® 852GM Chipset
Custom Motherboard
for 1U Rackmount

USER'S MANUAL

Version 1.0

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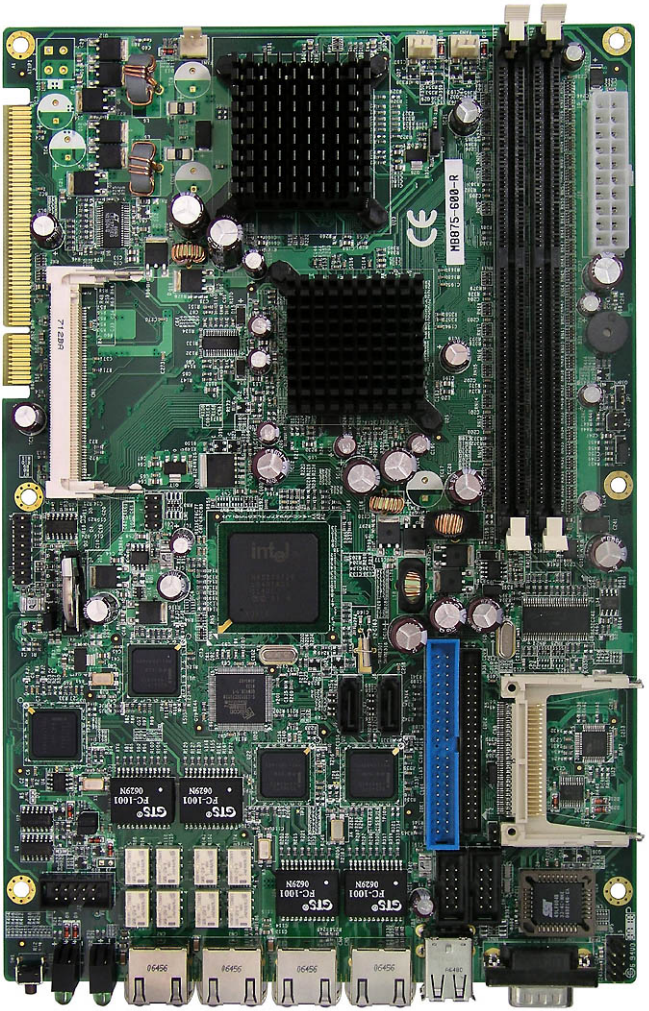


The MB875 Motherboard

The MB875 Edge Connectors

Introduction

Product Description

The MB875 is a versatile motherboard with four Gigabit Ethernets that is designed for SOHO network security applications. Optimized for network performance, this scalable platform is based on the Intel(R) 852GM chipset and supports Intel(R) Pentium(R) M / Celeron(R) M processors of up to 2.0GHz speeds with front size bus of 400MHz. System memory can support up to 2GB of DDR266 DIMM modules.

The MB875 uses the highly efficient Intel(R) 82541PI Ethernet providing robust Gigabit networking with enhanced power management and consumes less than 1.0W of power at Gigabit speeds. It supports intensive networking communication required by firewall or VPN and offers bypass function support on LAN1 and LAN2 to ensure high network availability.

To provide the best utilization and performance, the platform provides a number storage interfaces including two IDE ports, two SATA ports, four USB ports and a CompactFlash socket. One PCI 32-bit/33MHz Golden Finger and one Mini-PCI slot are available for expansion. Furthermore, it features status / alarm LED and a factory-default button that can be flexibly configured to create features for ISVs. The MB875 motherboards are now available to purchase.

MB875 FEATURES

- Supports Pentium(R) M / Celeron(R) M processors
- Up to 2.0GHz, 400MHz FSB
- DDR DIMM x 2, Max. 2GB
- Integrated VGA for CRT, shared memory
- Integrated four Gigabit Ethernet
- 4 x COM, 4 x USB 2.0 ports, 2 x SATA, CF socket
- 1 x PCI, 1 x Mini PCI slot, Watchdog timer

Checklist

Your MB875 package should include the items listed below.

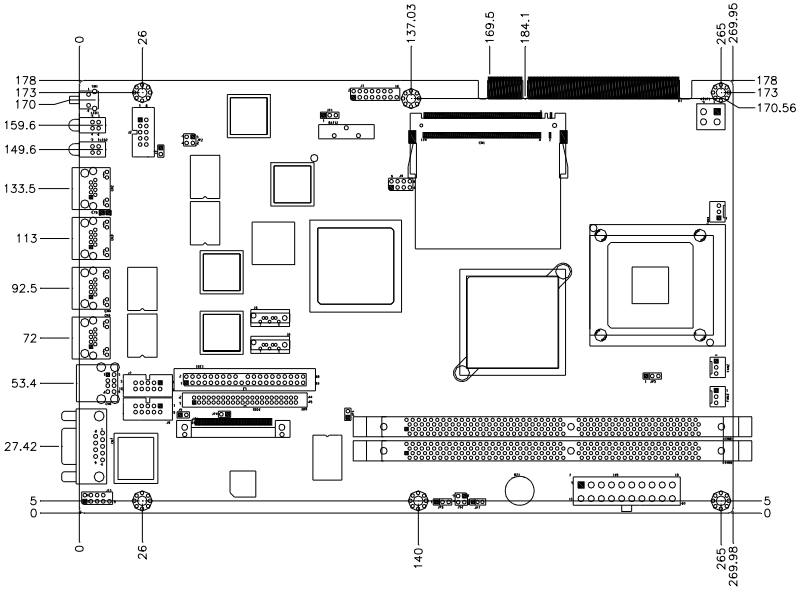
- The MB875 Pentium® M Mini-ITX motherboard
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Option Cable

  VGA4K
  USB2K-4
  PK1-2K
  PK1K
  PS2D

MB875 Specifications

CPU Type	Intel ULV Celeron M CPU or Intel Pentium M CPU
CPU Voltage	0.700V ~ 1.708V
CPU Speed	600MHz
CPU FSB	400MHz
Cache	512K Level 2 (CPU integrated)
CPU Socket	BGA on board or socket 479
Chipset	Intel 852GM Chipset: GMCH: 852GM 732-pin mFCBGA ICH4: 82801DB 421-pin BGA,
Green /APM	APM1.2
BIOS	Award BIOS, supports ACPI Function
Memory	Two DDR266/333 DIMM sockets, support up to 2GB SDRAM
VGA	2x8 pins pin-header x 1 for VGA
LAN	Intel 82541PI gigabit Ethernet x 4 [LAN1 & LAN2 Bypass]
USB	Intel ICH4 built-in USB2.0 controller, supports 6 ports - 2 ports @front of unit for USB_0,1 - 1x 4 pins pin-header x 2 for USB_2,3
SATA	Silicon Image SiL3512 PCI to 2 SATA (1.5Gb/s) ports
IDE Interface	Two channels; support Ultra DMA 33/66/100
LPC I/O	Winbond W83627HF: COM1/2 (RS232), PS/2 Keyboard/Mouse controller & Hardware monitor (3 thermal inputs, 6 voltage monitor inputs, 3 Fan Headers). Fintek 81216 : COM3/4
RTC/CMOS	Intel ICH4 built-in RTC with onboard Lithium Battery
Edge Connectors / LED / Button @front side	DB9 (male) x1 for COM1 (console port) Dual USB stack connector x1 for USB 0, 1 RJ45 (w/ dual status LED) x 4 GPInput Switch x 1 Power LED x 1 (Green x 1) HDD Access LED x 1 (Red x 1) GPO LED 1/2 x 2 (Green x 1, Red x 1)
On Board Connectors / Headers	SATA connector x2 for SATA HDD 40 pins, 2.54mm, box-header x1 for IDE1 44 pins, 2.0mm, box-header x1 for IDE1 Compact flash type II socket x1 for CF on IDE2 bus 10 pins, 2.54mm, pin-header x1 for PS/2 KB/mouse 2 pins, 2.54mm, pin-header x 1 for Reset button
Expansion	PCI (33MHz/32-bit) slot x1 Mini PCI x 1
Power Connector	ATX power connector
Dimensions	180mm x 270mm

Board Dimensions



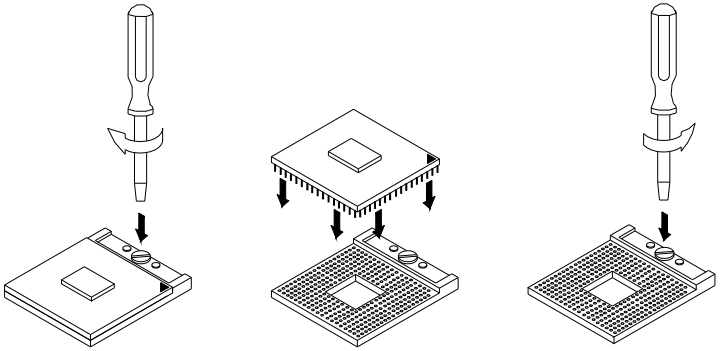
Installations

This section provides information on how to use the jumpers and connectors on the MB875 in order to set up a workable system. The topics covered are:

Installing the CPU

The MB875 board supports a Socket 479 processor socket for Intel® Pentium® M or Celeron® M processors.

The processor socket comes with a screw to secure the processor. As shown in the left picture below, loosen the screw first before inserting the processor. Place the processor into the socket by making sure the notch on the corner of the CPU corresponds with the notch on the inside of the socket. Once the processor has slide into the socket, fasten the screw. Refer to the figures below.



***NOTE**: Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.*

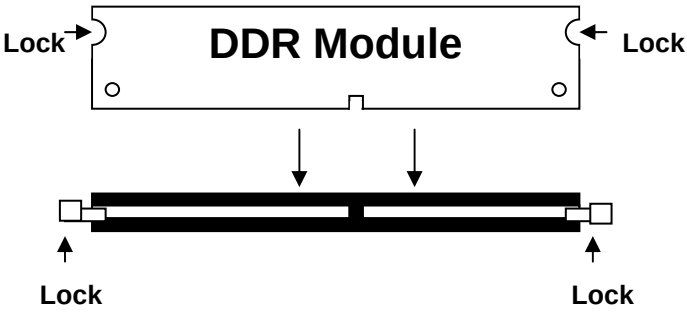
Installing the Memory

The MB875 board supports one DDR memory sockets for a maximum total memory of 1GB in DDR memory type. The memory module capacities supported are 128MB, 256MB, 512MB and 1GB. The following table lists the supported DDR DIMM configurations. Intel® 852GM supports configurations defined in the JEDEC DDR DIMM specification only. Non-JEDEC standard DIMMs such as double-sided x16 DDR SDRAM DIMMs are not supported.

Installing and Removing Memory Modules

To install the DDR modules, locate the memory slot on the board and perform the following steps:

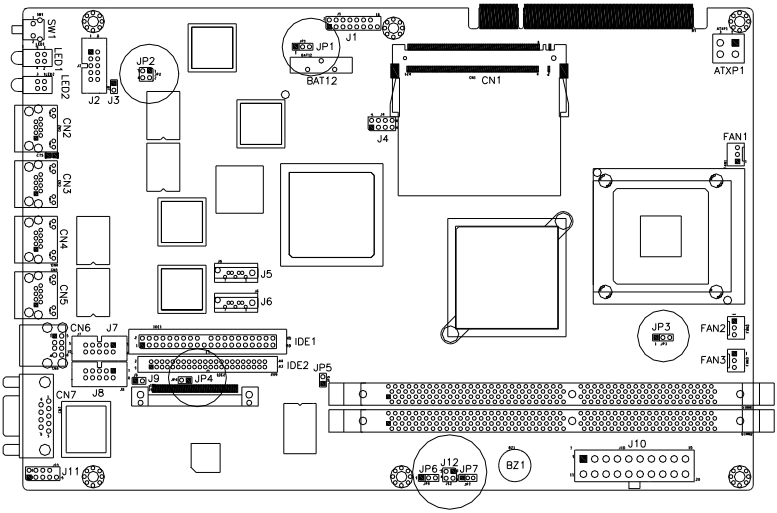
1. Hold the DDR module so that the key of the DDR module align with those on the memory slot.
2. Gently push the DDR module in an upright position until the clips of the slot close to hold the DDR module in place when the DDR module touches the bottom of the slot.
3. To remove the DDR module, press the clips with both hands.



Setting the Jumpers

Jumpers are used on MB875 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MB875 and their respective functions.

Jumper Locations on MB875



JP1: Clear CMOS Contents

Use JP1 to clear the CMOS contents. *Note that the ATX-power connector should be disconnected from the board before clearing CMOS.*

JP1	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear CMOS

JP2: Watchdog Timer Settings

JP2 Setting	Function
Pin 1-3 & 2-4 Short	Ethernet default: Eth0 & Eth1 None Bypass. System will **bypass** LANs upon the timeout of Watchdog timer
Pin 1/2/3/4 Open	Ethernet default: Eth0 & Eth1 Bypass mode. System will **not bypass** LANs upon the timeout of Watchdog timer
Pin 1-2 & 3-4 Short	System will **reboot** upon the timeout of Watchdog timer. (Default)

Jumper	Function
* 1-2, 3-4 Open	System will bypass LANs upon the timeout of WDT timer
1-2, 3-4 Short	System will reboot upon the timeout of WDT timer

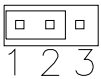
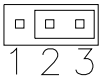
JP4: Compact Flash Slave/Master

JP4	Compact Flash
 Open	Slave
 Close	Master

JP5: Processor Operating Frequency

JP5	CPU Operating Frequency
 Open	133MHz
 Close	100MHz (default)

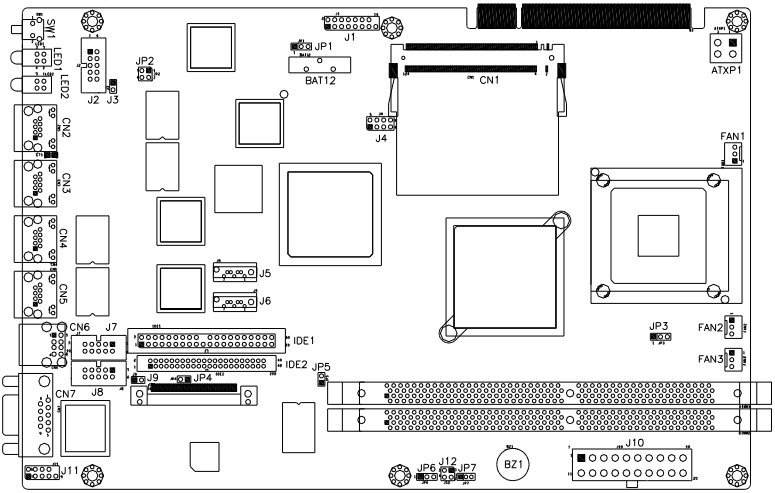
JP7: Power ON Setting

JP7	Setting	Function
	Pin 1-2 Short/Closed	Power on by system button
	Pin 2-3 Short/Closed	Power on by power supply AC on

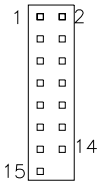
Connectors on MB875

The connectors on MB875 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on MB875 and their respective functions.

Connector Locations on MB875

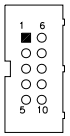


J1: VGA CRT Connector



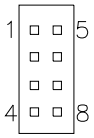
Signal Name	Pin	Pin	Signal Name
R	1	2	+5V
G	3	4	GND
B	5	6	NC
NC	7	8	SPD1
GND	9	10	Hsync
GND	11	12	Vsync
GND	13	14	SPCLK
GND	15		

J2: COM2 Serial Port



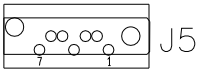
Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	Ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	No Connect.

J4: USB Connector



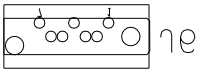
Signal Name	Pin #	Pin #	Signal Name
Vcc	1	5	Ground
USB2-	2	6	USB3+
USB2+	3	7	USB3-
Ground	4	8	Vcc

J5: SATA HDD Connector



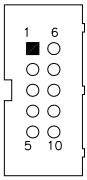
Pin #	Signal Name
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground

J6: SATA HDD Connector



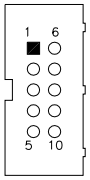
Pin #	Signal Name
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground

J7: COM3 Serial Port



Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	Ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	No Connect.

J8: COM4 Serial Port

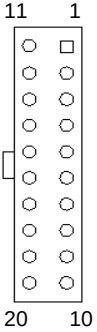


Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	Ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	No Connect.

J9: Case Open Detect Header

Pin #	Signal Name
1	Case Open Detect
2	Ground

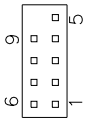
J10: ATX Power Connector



Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

J11: Keyboard / Mouse Connector

J11, a 10-pin header connector, has functions for both keyboard and mouse. The following table shows the pin assignments of this connector.



Signal Name	Pin #	Pin #	Signal Name
Protect pin	10	5	N.C.
KB clock	9	4	Mouse clock
KB data	8	3	Mouse data
Vcc	7	2	Vcc
Ground	6	1	Ground

J12: Power On & Reset Headers

Pin #	Signal Name
1	PS_ON#
2	Ground

Pin #	Signal Name
3	RESET#
4	Ground

SW1: Digital I/O Input Pin Switch

LED1: Digital IO Output LED

LED2: HDD / Power LED

Red: HDD LED
Green: Power LED

CN2, CN3, CN4, CN5: LAN Connectors

CN2: LAN1
CN3: LAN2
CN4: LAN3
CN5: LAN4

CN6: USB Connector

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BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press  <DEL>  to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Phoenix - AwardBIOS CMOS Setup Utility

Standard CMOS Features	Frequency/Voltage Control
Advanced BIOS Features	Load Fail-Safe Defaults
Advanced Chipset Features	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management Setup	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type…	

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section, which displays information on the currently highlighted item in the list.

***Note**: If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

***Warning:** It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Wed, Apr 28, 2004	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level >
IDE Primary Master	None	Change the day, month,
IDE Primary Slave	None	Year and century
IDE Secondary Master	None	
IDE Secondary Slave	None	
Drive A	1.44M, 3.5 in.	
Drive B	None	
Video	EGA/VGA	
Halt On	All Errors	
Base Memory	640K	
Extended Memory	129024K	
Total Memory	130048K	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day : **Sun to Sat**
Month : **1 to 12**
Date : **1 to 31**
Year : **1999 to 2099**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour : 00 to 23**
Minute : 00 to 59
Second : 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Primary HDDs / IDE Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select 'Manual' to define the drive information manually. You will be asked to enter the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDING ZONE :	Landing zone
SECTOR :	Number of sectors

The Access Mode selections are as follows:

CHS	(HD < 528MB)
LBA	(HD > 528MB and supports Logical Block Addressing)
Large	(for MS-DOS only)
Auto	

Remarks: The main board supports two serial ATA ports and are represented in this setting as IDE Channel 2 / 3 Master.

Drive A / Drive B

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

CPU Feature	Press Enter	ITEM HELP
Virus Warning	Disabled	Menu Level >
CPU L1 and L2 Cache	Enabled	
CPU L3 Cache	Enabled	
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	
Second Boot Device	HDD-0	
Third Boot Device	CDROM	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Disabled	
Boot Up NumLock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (Chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
APIC Mode	Enabled	
MPS Version Control for OS	1.4	
OS Select For DRAM>64MB	Non-OS2	
Report No FDD For WIN 95	Yes	
Small Logo (EPA) Show	Enabled	

CPU Feature

Press Enter to configure the settings relevant to CPU Feature.

Virus Warning

If this option is enabled, an alarm message will be displayed when trying to write on the boot sector or on the partition table on the disk, which is typical of the virus.

CPU L1 and L2 Cache / CPU L3 Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. By default, these items are Enabled.

Quick Power On Self Test

When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

First/Second/Third Boot Device
These fields determine the drive that the system searches first for an operating system. The options available include *Floppy*, *LS120*, *HDD-0*, *SCSI*, *CDROM*, *HDD-1*, *HDD-2*, *HDD-3*, *ZIP100*, *USB-FDD*, *USB-CDROM*, *USB-HDD* and *Disable*.

Boot Other Device
These fields allow the system to search for an OS from other devices other than the ones selected in the First/Second/Third Boot Device.

Swap Floppy Drive
This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to ***Disabled.***

Boot Up Floppy Seek
This feature controls whether the BIOS checks for a floppy drive while booting up. If it cannot detect one (either due to improper configuration or its absence), it will flash an error message.

Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system.

Gate A20 Option
This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Typematic Rate Setting
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Rate (Chars/Sec)
When the typematic rate is enabled, the system registers repeated keystrokes speeds. Settings are from 6 to 30 characters per second.

Typematic Delay (Msec)
When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option

This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System*, the system prompts for the User Password every time you boot up. When you select *Setup*, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

APIC Mode

APIC stands for Advanced Programmable Interrupt Controller. The default setting is ***Enabled***.

MPS Version Control for OS

This option is specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability. The default setting is ***1.4***.

OS Select for DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

Report No FDD For WIN 95

If you are using Windows 95/98 without a floppy disk drive, select Enabled to release IRQ6. This is required to pass Windows 95/98's SCT test. You should also disable the Onboard FDC Controller in the Integrated Peripherals screen when there's no floppy drive in the system. If you set this feature to Disabled, the BIOS will not report the missing floppy drive to Win95/98.

Small Logo (EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up. The default setting is ***Enabled***.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

		ITEM HELP
DRAM Timing Selectable	By SPD	Menu Level >
CAS Latency Time	2	
Active to Precharge Delay	6	
DRAM RAS# to CAS# Delay	3	
DRAM RAS# Precharge	3	
DRAM Data Integrity Mode	ECC	
MGM Core Frequency	Auto Max 266MHz	
System BIOS Cacheable	Enabled	
Video BIOS Cacheable	Enabled	
Memory Hole at 15M-16M	Disabled	
Delayed Transaction	Enabled	
Delay Prior to Thermal	16 Min	
AGP Aperture Size (MB)	64	
** On-Chip VGA Setting **		
On-Chip VGA	Enabled	
On-Chip Frame Buffer Size	32MB	
Boot Display	CRT+DVI	
TV Standard	Off	
Video Connector	Automatic	
TV Format	Auto	
Panel Scaling	Auto	
Panel Number	1024x768 18bit SC	

DRAM Timing Selectable

This option refers to the method by which the DRAM timing is selected. The default is ***By SPD***.

CAS Latency Time

You can configure CAS latency time in HCLKs as 2 or 2.5 or 3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

Active to Precharge Delay

The default setting for the Active to Precharge Delay is ***7***.

DRAM RAS# to CAS# Delay

This option allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Reducing the delay improves the performance of the SDRAM.

DRAM RAS# Precharge

This option sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes. The default setting for the Active to Precharge Delay is ***3***.

DRAM Data Integrity Mode

Select ECC if your memory module supports it. The memory controller will detect and correct single-bit soft memory errors. The memory controller will also be able to detect double-bit errors though it will not be able to correct them. This provides increased data integrity and system stability.

MGM Core Frequency

This field sets the frequency of the DRAM memory installed. The default setting is ***Auto Max 266MHz***.

System BIOS Cacheable

The setting of *Enabled* allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable

The Setting *Enabled* allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are *Enabled* and *Disabled*.

Delayed Transaction

The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enabled to support compliance with PCI specification version 2.1.

Delay Prior to Thermal

This field activates the CPU thermal function after the systems boots for the set number of minutes. The options are *16Min* and *64Min*.

AGP Aperture Size
The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The default setting is ***64M***.

On-Chip VGA
The default setting is ***Enabled***.

On-Chip Frame Buffer Size
The default setting is ***32MB***. The options available include *1MB, 4MB, 8MB* and *16MB.*

Boot Display
The default setting is ***CRT+DVI***. The options available include some combinations with LVDS and TV-out. The MB875 supports dual view (CRT with LVDS or TV-out).

TV Standard (on MB875F/FC version only)
The default setting is ***Off***.

Video Connector (on MB875F/FC version only)
The default setting is ***Automatic***.

TV Format (on MB875F/FC version only)
The default setting is ***Auto***.

Panel Scaling
The default setting is ***Auto***. The options available include *On* and *Off*.

Panel Number
These fields allow you to select the LCD Panel type. The defaults:

640x480	18bit SC
800x600	18bit SC
1024x768	18bit SC
1280x1024	24bit DC
1400x1050	18bit DC
1024x768	24bit SC
1600x1200	24bit DC
1280x1024	18bit DC

Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals. The first screen shows three main items for user to select. Once an item selected, a submenu appears. Details follow.

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

OnChip IDE Device	Press Enter	ITEM HELP
Onboard Device	Press Enter	Menu Level >
SuperIO Device	Press Enter	

Phoenix - AwardBIOS CMOS Setup Utility
OnChip IDE Device

On-Chip Primary PCI IDE	Enabled	ITEM HELP
IDE Primary Master PIO	Auto	Menu Level >
IDE Primary Slave PIO	Auto	
IDE Primary Master UDMA	Auto	
IDE Primary Slave UDMA	Auto	
On-Chip Secondary PCI IDE	Enabled	
IDE Secondary Master PIO	Auto	
IDE Secondary Slave PIO	Auto	
IDE Secondary Master UDMA	Auto	
IDE Secondary Slave UDMA	Auto	
IDE HDD Block Mode	Enabled	

Phoenix - AwardBIOS CMOS Setup Utility
Onboard Device

USB Controller	Enabled	ITEM HELP
USB 2.0 Controller	Enabled	Menu Level >
USB Keyboard Support	Disabled	
USB Mouse Support	Disabled	
AC97 Audio	Auto	
Init Display First	PCI Slot	
Power On After Fail	Off	

Phoenix - AwardBIOS CMOS Setup Utility
SuperIO Device

		ITEM HELP
Onboard FDC Controller	Enabled	Menu Level >
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
RxD , TxD Active	Hi, Lo	
IR Transmission Delay	Disabled	
UR2 Duplex Mode	Half	
Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
EPP Mode Select	EPP1.7	
ECP Mode Use DMA	3	

OnChip Primary/Secondary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.

IDE Primary/Secondary Master/Slave PIO

These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA

These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

IDE HDD Block Mode

This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

USB Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Enabled***.

USB 2.0 Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Enabled***. In order to use USB 2.0, necessary OS drivers must be installed first. ***Please update your system to Windows 2000 SP4 or Windows XP SP1.***

USB Keyboard Support

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Disabled***.

USB Mouse Support

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Disabled***.

AC97 Audio

The default setting of the AC97 Audio is ***Auto***.

Init Display First

The default setting is ***PCI Card***.

Power On After Fail

The setting configures the system power on status when power is restored to the system after a power failure occurrence. The default setting is ***Off***.

Onboard FDC Controller

Select *Enabled* if your system has a floppy disk controller (FDC) installed on the motherboard and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port

These fields allow you to select the onboard serial and parallel ports and their addresses. The default values for these ports are:

Serial Port 1	3F8/IRQ4
Serial Port 2	2F8/IRQ3
Parallel Port	378H/IRQ7

UART Mode Select

This field determines the UART 2 mode in your computer. The default value is ***Normal***. Other options include *IrDA* and *ASKIR*.

Parallel Port Mode

This field allows you to determine parallel port mode function.

SPP	Standard Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively.

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

		ITEM HELP
Power-Supply Type	ATX	
ACPI Function	Enabled	
Power Management	User Define	Menu Level >
Video Off Method	V/H SYNC+Blank	
Video Off In Suspend	Yes	
Suspend Type	Stop Grant	
Modem Use IRQ	3	
Suspend Mode	Disabled	
HDD Power Down	Disabled	
Soft-Off by PWR-BTTN	Instant-Off	
CPU THRM-Throttling	50%	
Wake-Up by PCI Card	Disabled	
Power On by Ring	Disabled	
Resume by Alarm	Disabled	
Date (of Month) Alarm	0	
Time (hh:mm:ss) Alarm	0 : 0 : 0	
** Reload Global Timer Events **		
Primary IDE 0	Enabled	
Primary IDE 1	Enabled	
Secondary IDE 0	Enabled	
Secondary IDE 1	Enabled	
FDD, COM, LPT Port	Enabled	
PCI PIRQ[A-D] #	Enabled	

Power Supply Type

Use this field to select the power supply type used in the system. The default setting is ***ATX***.

ACPI Function

Enable this function to support ACPI (Advance Configuration and Power Interface).

Power Management

This field allows you to select the type of power saving management modes. There are four selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min.

Video Off Method

This field defines the Video Off features. There are three options.

V/H SYNC + Blank	Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS	Allows BIOS to control the video display.
Blank Screen	Writes blanks to the video buffer.

Video Off In Suspend

When enabled, the video is off in suspend mode. The default setting is ***Yes***.

Suspend Type

The default setting for the Suspend Type field is ***Stop Grant***.

Modem Use IRQ

This field sets the IRQ used by the Modem. By default, the setting is ***3***.

Suspend Mode

When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

HDD Power Down

When enabled, and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Soft-Off by PWRBTN

This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds.

CPU THRM-Throttling

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

Wake up by PCI Card

By default, this field is disabled.

Power On by Ring

This field enables or disables the power on of the system through the modem connected to the serial port or LAN.

Resume by Alarm

This field enables or disables the resumption of the system operation. When enabled, the user is allowed to set the *Date* and *Time*.

Reload Global Timer Events

The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events that can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

PNP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

Reset Configuration Data	Disabled	ITEM HELP
		Menu Level
Resources Controlled By	Auto (ESCD)	
IRQ Resources	Press Enter	Select Yes if you are using a Plug and Play capable operating system Select No if you need the BIOS to configure non-boot devices
PCI/VGA Palette Snoop	Disabled	

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled.***

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices automatically with the use of a use a PnP operating system such as Windows 95.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

		ITEM HELP
CPU Warning Temperature	85°C	Menu Level >
Shutdown Temperature	Disabled	
System Temp.	45°C/113°F	
CPU Temp	52°C/125°F	
FAN1 Speed	5400 RPM	
FAN2 Speed	5463 RPM	
FAN3 Speed	5388 RPM	
Vcore(V)	1.02 V	
VGMCH(V)	1.32 V	
+3.3V	3.32 V	
+5V	4.94 V	
+12V	12.03 V	
VBAT	3.21 V	
5VSB(V)	4.96 V	
Smart Fan1 Temp	Disabled	
Smart Fan2 Temp	Disabled	

CPU Warning Temperature

This field allows the user to set the temperature so that when the temperature is reached, the system sounds a warning. This function can help prevent damage to the system that is caused by overheating.

Temperatures/Voltages

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

Shutdown Temperature

This field allows the user to set the temperature by which the system automatically shuts down once the threshold temperature is reached. This function can help prevent damage to the system that is caused by overheating.

Smart Fan Temperature

This field enables or disables the smart fan feature. At a certain temperature, the fan starts turning. Once the temperature drops to a certain level, it stops turning again.

Frequency/Voltage Control

This section shows the user how to configure the processor frequency.

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

Auto Detect PCI Clk	Disabled	ITEM HELP
Spread Spectrum Modulated	Disabled	Menu Level >

Auto Detect PCI Clk

This field enables or disables the auto detection of the PCI clock.

Spread Spectrum Modulated

This field sets the value of the spread spectrum. The default setting is ***Disabled***. This field is for CE testing use only.

Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Set Supervisor Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type “Y”, you will quit the setup utility and save all changes into the CMOS memory. If you type “N”, you will return to Setup utility.

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing “Y” will quit the Setup utility without saving the modifications. Typing “N” will return you to Setup utility.

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Drivers Installation

This section describes the installation procedures for software and drivers under the Windows 98SE, Windows ME, Windows 2000 and Windows XP. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

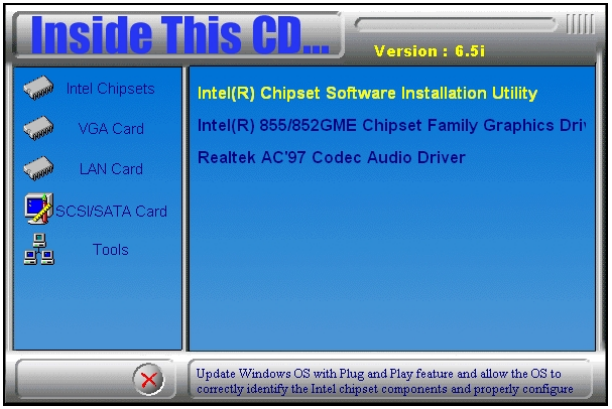
IMPORTANT NOTE:
After installing your Windows operating system (Windows 98SE/ME/2000/XP), you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

Intel Chipset Software Intallation Utility

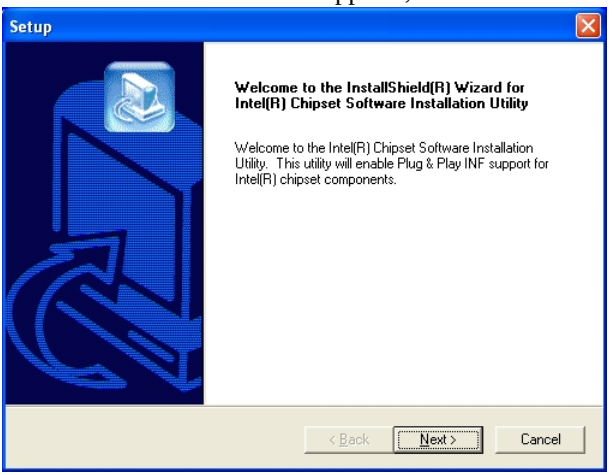
The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation under Windows 98SE/ME/2000/XP.

1. Insert the CD that comes with the board. Click ***Intel Chipsets*** and then ***Intel(R) 855/852GME Chipset Family Drivers***.

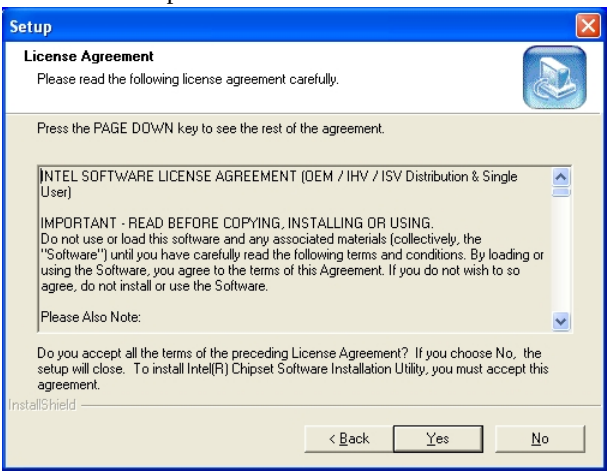
2. Click ***Intel(R) Chipset Software Installation Utility.***



3. When the Welcome screen appears, click ***Next*** to continue.



4. Click ***Yes*** to accept the software license agreement and proceed with the installation process.



5. On Readme Information screen, click ***Next*** to continue the installation.

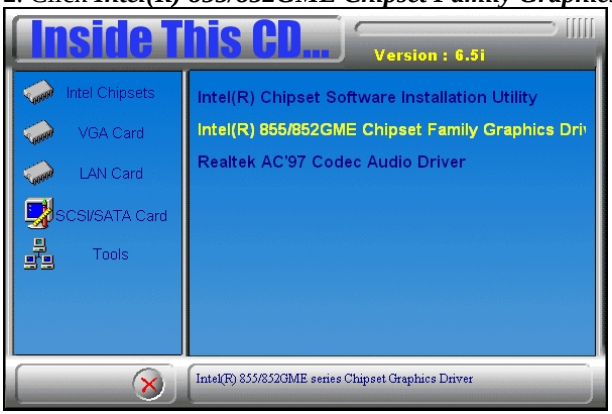
6. The Setup process is now complete. Click ***Finish*** to restart the computer and for changes to take effect. When the computer has restarted, the system will be able to find some devices. Restart your computer when prompted.

VGA Drivers Installation

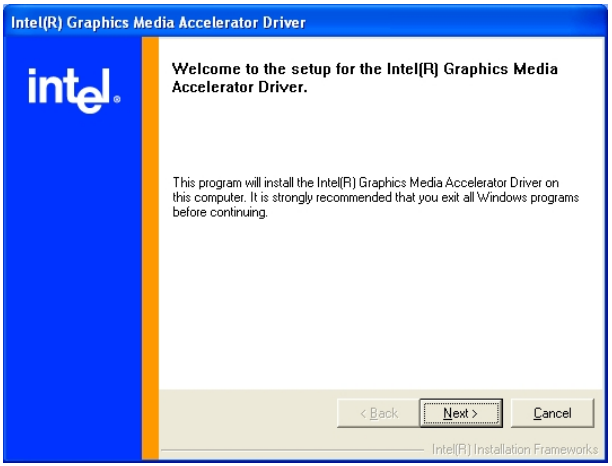
To install the VGA drivers, follow the steps below to proceed with the installation.

1. Insert the CD that comes with the motherboard. Click ***Intel Chipsets*** and then ***Intel(R) 855/852GME Chipset Family Drivers***.

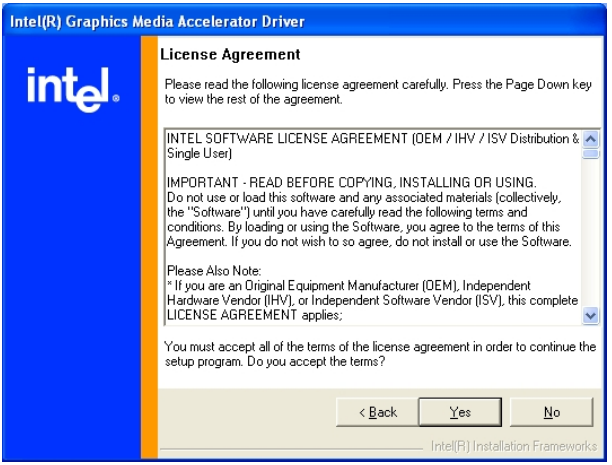
2. Click ***Intel(R) 855/852GME Chipset Family Graphics Driver.***



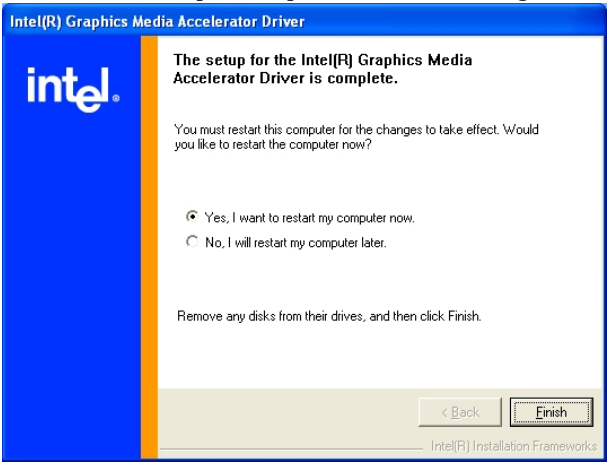
3. When the Welcome screen appears, click ***Next*** to continue.



4. Click ***Yes*** to to agree with the license agreement and continue the installation.



5. Restart the computer as promted and for changes to take effect.



AC97 Codec Audio Driver Installation

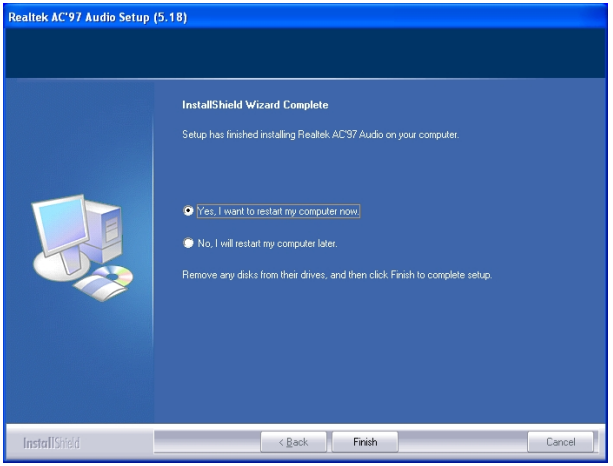
Follow the steps below to install the Realtek AC97 Codec Audio Drivers.

1. Insert the CD that comes with the motherboard. Click ***Intel Chipsets*** and then ***Intel(R) 855/852GME Chipset Family Drivers***.

2. Click ***Realtek AC'97 Codec Audio Driver.***

3. When the Welcome screen appears, click ***Next*** to continue.

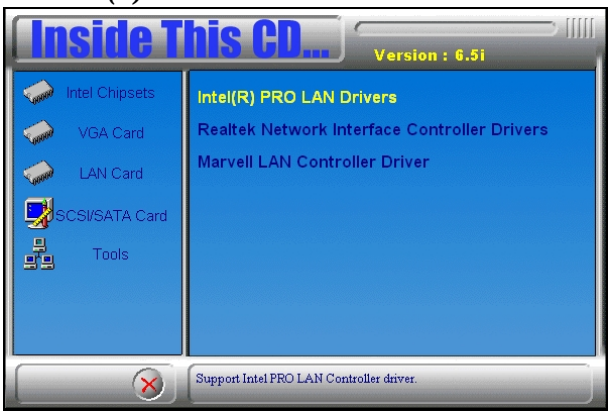
4. Set up has finished installing Realtek AC'97 Audio on your computer. ***Finish*** to restart the computer and for changes to take effect.



Intel PRO LAN Drivers Installation

Follow the steps below to complete the installation of the Intel PRO LAN drivers.

1. Insert the CD that comes with the motherboard. Click ***LAN Card*** and then ***Intel(R) PRO LAN Drivers***.



2. Click ***Install Base Software*** to continue.

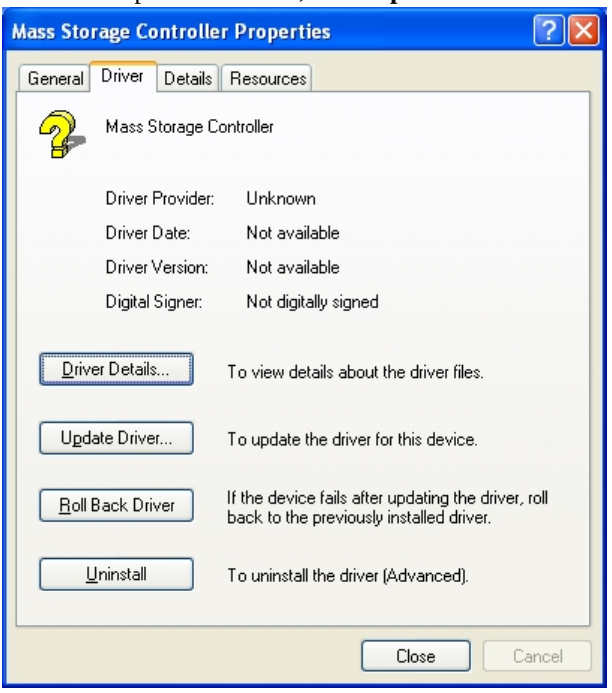
3. When prompted, please to restart the computer for new settings to take effect.

SATA Drivers Installation

To install the SATA drivers, follow the steps below to proceed with the installation.

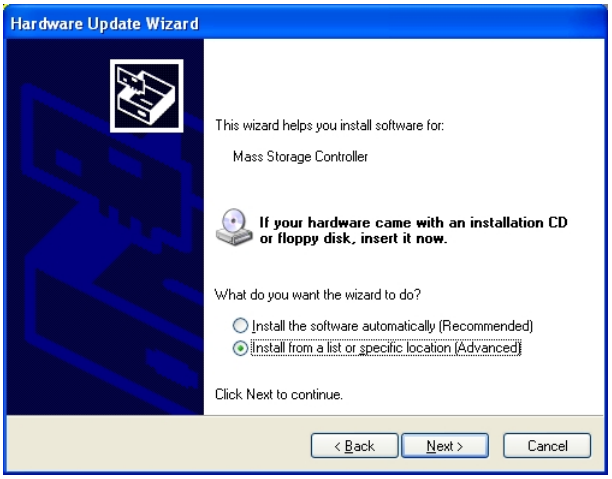
1. Insert the Windows operating system, go to the Device Manager. Click the **Mass Storage Controller**.

2. In the Properties window, click **Update Driver**.

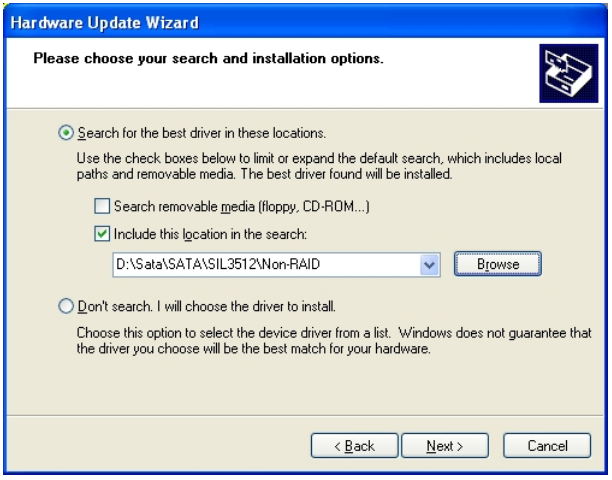


3. Once in the Welcome screen of the Hardware Update Wizard, select "***No, not this time***" and click ***Next***.

4. Select "**Install from a list or specific location (Advanced)**" and click ***Next***.



5. Click **Browse** to find the location of the drivers. Assuming D: is the drive where the CD drivers is located, the path would be: D:\Sata\SATA\SIL3512\Non-RAID. Click ***Next*** to continue



6. The installation process is now complete. Click ***Finish*** to close the Hardware Update Wizard.

Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE

C. Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sort of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:
This code and information is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability and/or fitness for a particular purpose.

```
;[]=============================================
; Name  : Enable_And_Set_Watchdog
; IN    : AL - 1sec ~ 255sec
; OUT   : None
;[]=============================================
Enable_And_Set_Watchdog   Proc    Near
        push    ax              ;save time interval
        call Unlock_Chip

        mov cl, 2Bh
        call Read_Reg
        and al, NOT 10h
        call Write_Reg          ;set GP24 as WDTO

        mov cl, 07h
        mov al, 08h
        call Write_Reg          ;switch to LD8
```

```
        mov cl, 0F5h
        call Read_Reg
        and al, NOT 08h
        call Write_Reg      ;set count mode as second

        pop ax
        mov cl, 0F6h
        call Write_Reg      ;set watchdog timer

        mov al, 01h
        mov cl, 30h
        call Write_Reg      ;watchdog enabled

        call Lock_Chip
        ret
Enable_And_Set_Watchdog  Endp
;[]=============================================
; Name  : Disable_Watchdog
; IN    : None
; OUT   : None
;[]=============================================
Disable_Watchdog  Proc  Near
        call Unlock_Chip

        mov cl, 07h
        mov al, 08h
        call Write_Reg      ;switch to LD8

        xor al, al
        mov cl, 0F6h
        call Write_Reg      ;clear watchdog timer

        xor al, al
        mov cl, 30h
        call Write_Reg      ;watchdog disabled

        call Lock_Chip
        ret
Disable_Watchdog  Endp
;[]=============================================
```

```
; Name  : Unlock_Chip
; IN : None
; OUT   : None
;[]=============================================
Unlock_Chip     Proc     Near
          Mov dx, 4Eh
          mov al, 87h
          out  dx, al
          out  dx, al
          ret
Unlock_Chip     Endp
;[]=============================================
; Name  : Lock_Chip
; IN : None
; OUT   : None
;[]=============================================
Unlock_Chip     Proc     Near
          mov dx, 4Eh
          mov al, 0AAh
          out  dx, al
          ret
Unlock_Chip     Endp
;[]=============================================
; Name  : Write_Reg
; IN : CL - register index
;      AL - Value to write
; OUT   : None
;[]=============================================
Write_Reg   Proc     Near
          push     ax
          mov dx, 4Eh
          mov al,cl
          out  dx,al
          pop ax
          inc  dx
          out  dx,al
          ret
Write_Reg   Endp
;[]=============================================
```

```
; Name  : Read_Reg
; IN : CL - register index
; OUT   : AL - Value to read
;[]================================================
==
Read_Reg    Proc      Near
            Mov al, cl
            mov dx, 4Eh
            out  dx, al
            inc  dx
            in   al, dx
            ret
Read_Reg    Endp
;[]================================================
```

D. Digital I/O Sample Code

Filename: W627hf.h

```
//=============================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//=============================================================================
#ifndef __W627HF_H
#define __W627HF_H                      1
//=============================================================================
#define W627_IOBASE                     0x4E
//=============================================================================
#define     W627HF_INDEX_PORT       (W627_IOBASE+0)
#define     W627HF_DATA_PORT        (W627_IOBASE+1)
//=============================================================================
#define     W627HF_REG_LD           0x07
//=============================================================================
#define W627HF_UNLOCK               0x87
#define     W627HF_LOCK             0xAA
//=============================================================================
void Set_W627HF_LD( unsigned char);
void Set_W627HF_Reg( unsigned char, unsigned char);
unsigned char Get_W627HF_Reg( unsigned char);
//=============================================================================
#endif      //__W627HF_H
```

Filename: W627hf.cpp

```
//=====================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//=====================================================================
#include "W627HF.H"
#include <dos.h>
//=====================================================================
void Unlock_W627HF (void);
void Lock_W627HF (void);
//=====================================================================
void Unlock_W627HF (void)
{
        outportb(W627HF_INDEX_PORT, W627HF_UNLOCK);
        outportb(W627HF_INDEX_PORT, W627HF_UNLOCK);
}
//=====================================================================
void Lock_W627HF (void)
{
        outportb(W627HF_INDEX_PORT, W627HF_LOCK);
}
//=====================================================================
void Set_W627HF_LD( unsigned char LD)
{
        Unlock_W627HF();
        outportb(W627HF_INDEX_PORT, W627HF_REG_LD);
        outportb(W627HF_DATA_PORT, LD);
        Lock_W627HF();
}
//=====================================================================
void Set_W627HF_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_W627HF();
        outportb(W627HF_INDEX_PORT, REG);
        outportb(W627HF_DATA_PORT, DATA);
        Lock_W627HF();
}
//=====================================================================
unsigned char Get_W627HF_Reg( unsigned char REG)
{
        unsigned char Result;
        Unlock_W627HF();
        outportb(W627HF_INDEX_PORT, REG);
        Result = inportb(W627HF_DATA_PORT);
        Lock_W627HF();
        return Result;
}
//=====================================================================
```

File of the Main.cpp

```
//===========================================================================
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//===========================================================================
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "W627HF.H"
//===========================================================================
void ClrKbBuf(void);
int main (int argc, char *argv[]);
//===========================================================================
int main (int argc, char *argv[])
{
	unsigned char ucDO = 0;				//data for digital output
	unsigned char ucDI;				//data for digital input
	unsigned char ucBuf;

	Set_W627HF_LD( 0x07);				//switch to logic device 7

	Set_W627HF_Reg(0xF1, 0x00);			//clear
	ucDI = Get_W627HF_Reg(0xF1) & 0x0F;

	ClrKbBuf();
	while(1)
	{
		ucDO++;
		Set_W627HF_Reg(0xF1, ((ucDO & 0x0F) << 4));
		ucBuf = Get_W627HF_Reg(0xF1) & 0x0F;
		if (ucBuf != ucDI)
		{
			ucDI = ucBuf;
			printf("Digital I/O Input Changed. Current Data is 0x%X\n",ucDI);
		}

		if (kbhit())
		{
			getch();
			break;
		}
		delay(500);
	}
	return 0;
}
//===========================================================================
void ClrKbBuf(void)
{
	while(kbhit())
	{	getch();	}
}
//---------------------------------------------------------------------------
```

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