

# **MAT-880**

Socket 479 Pentium® M  
Intel® 855GME 5.25" SBC

## **USER'S MANUAL**

Version 1.0

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# Table of Contents

|  |           |
|--|-----------|
| <b>Introduction.....</b>                         | <b>1</b>  |
| Product Description .....                        | 1         |
| Checklist .....                                  | 2         |
| MAT-880 Specifications.....                      | 3         |
| Board Dimensions.....                            | 4         |
| <b>Installations.....</b>                        | <b>5</b>  |
| Installing the CPU .....                         | 6         |
| Installing the Memory .....                      | 7         |
| Setting the Jumpers.....                         | 8         |
| Connectors on MAT-880.....                       | 14        |
| Watchdog Timer Configuration.....                | 26        |
| <b>BIOS Setup .....</b>                          | <b>30</b> |
| <b>Drivers Installation .....</b>                | <b>54</b> |
| Intel Chipset Software Intallation Utility ..... | 55        |
| VGA Drivers Installation .....                   | 57        |
| AC97 Codec Audio Driver Installation.....        | 58        |
| Intel PRO LAN Drivers Installation .....         | 59        |
| <b>Appendix.....</b>                             | <b>60</b> |
| A. I/O Port Address Map.....                     | 60        |
| B. Interrupt Request Lines (IRQ) .....           | 61        |

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# Introduction

## Product Description

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MAT-880 Pentium® M 5.25" embedded board incorporates the Intel® advanced 855GME Chipset that supports processors from 900MHz to 1.6MHz in both 478 or 479-ball Micro-FCBGA package with a front size bus of 400MHz.

Graphics display functionality is provided by the integrated-chipset VGA controller that supports CRT display and LVDS interface with 24-bit panel specifications. Ethernet connectivity comes from the ICH4-integrated Ethernet 10/100 Ethernet controller and a secondary LAN using an Intel 82541GI Gigabit Ethernet.

Two DDR DIMM sockets supports up to 2GB of memory. Four COM ports are supported, with COM3 and COM4 with a Fintek F81216D I/O controller. There are two IDE connectors – IDE1 supporting UDMA33/66/100 and IDE2 with UDMA33 while supporting a CF Type II socket for its slave channel.

Other I/O features include two Serial ATA ports, 4-in 4-out digital I/O and four USB ports using pin headers. Expansion slots composed of one PCI and one Mini PCI slot. The 5.25" disk-size board uses a 20-pin ATX power.

This board represents the perfect choice for those who want superior performance for various low-power embedded applications.

## Checklist

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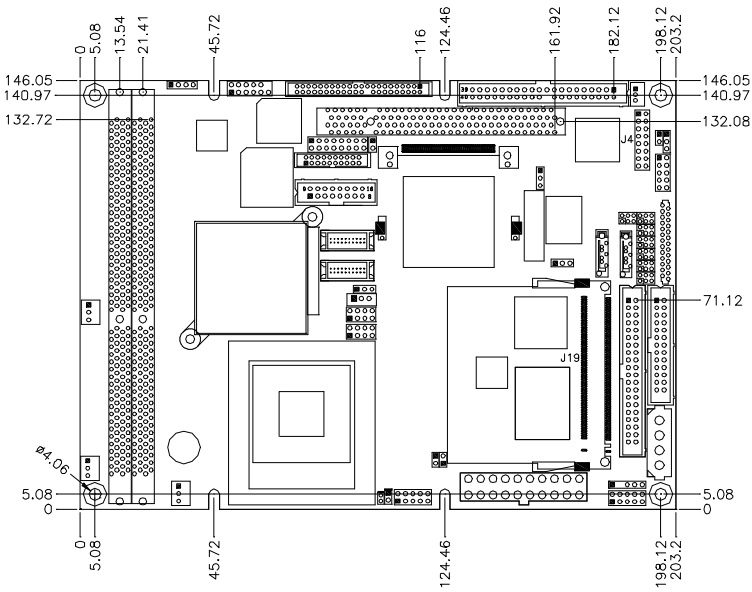
Your MAT-880 package should include the items listed below.

- The MAT-880 Pentium M embedded board
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Optional cables such as:
  - 1 slim FDD Ribbon Cable
  - 1 Audio Cable
  - 2 IDE Ribbon Cables (40-pin & 44-pin)
  - 1 COM Port Cable
  - 1 Printer Port Cable
  - 1 PS/2 Keyboard/Mouse Cable
  - 1 VGA Cable

## MAT-880 Specifications

|                        |  |
|------------------------|--|
| <b>Form Factor</b>     | 5.25-inch Disk-Size  |
| <b>CPU Type</b>        | Intel Pentium <sup>®</sup> M Processor, Ultra Low Voltage, at HFM core frequency of 900 MHz ~ 1.6GHz, 478 or 479-ball Micro-FCBGA Package  |
| <b>CPU Voltage</b>     | 0.700V~1.708V  |
| <b>System Speed</b>    | 900M~1.7GHz  |
| <b>CPU Frequency</b>   | 400MHz   |
| <b>Green /APM</b>      | APM1.2   |
| <b>Chipset</b>         | Intel <sup>®</sup> 82855GME Chipset<br>GMCH: 82855GME, 732-pin Micro-FCBGA<br>ICH4: 82801DB, 421-pin BGA, FWH  |
| <b>BIOS</b>            | Award BIOS, supports ACPI function   |
| <b>Cache</b>           | 1M Level 2 cache   |
| <b>VGA</b>             | Intel <sup>®</sup> 855GME integrated, support CRT pin header & LVDS interface (Max. 24bit) DF13 Socket x2  |
| <b>DVI Port</b>        | Chrontel CH7301, Support TMDS (DF11 Socket X1)   |
| <b>LAN</b>             | 1. ICH4 integrated LAN controller (10/100Mb) + Phy 82562ET pin header<br>2. Intel 82541GI LAN (10/100/1000Mb) pin header   |
| <b>Audio</b>           | ICH4 built-in Sound controller + AC97 Codec ALC650 6-Channel (Line-in, Line-out, MIC) pin header   |
| <b>Memory type</b>     | 2 x DDR 184-pin DIMM 2.5V (DDR200/266/333MHz), Max. capacity - 2GB, support ECC function   |
| <b>LPC I/O</b>         | Winbond 83627HF: IrDax1 Parallel x1, COM1 (RS-232), COM2 (RS-232/ RS422/RS485), FDC 1.44MB (Slim), Hardware monitor (3 thermal inputs, 6 voltage monitor inputs, VID0-5, 2 fan header) |
| <b>Secondary I/O</b>   | Fintek F81216D COM3 & COM4 (RS-232) (40pin header COM1~4)  |
| <b>RTC/CMOS</b>        | ICH4 built-in  |
| <b>Battery</b>         | Lithium Battery  |
| <b>KB Controller</b>   | Winbond 83627HF built-in keyboard controller   |
| <b>IDE</b>             | ICH4 built-in, IDE1, 40-pin box header (UDMA 33/66/100) IDE2 Master channel 44-pin 2mm (UDMA 33)   |
| <b>Compact Flash</b>   | Type II, 1 port using IDE2 Slave channel   |
| <b>Serial ATA</b>      | Sil3512 support 2 ports  |
| <b>Digital I/O</b>     | 4-in 4-out, 2x5 pin header   |
| <b>USB</b>             | 4 ports, USB 2.0, 2x4 pin header x2  |
| <b>Watchdog Timer</b>  | Yes (256 segments, 0,1,2...255. sec/min)   |
| <b>Power Connector</b> | 20-pin ATX power input   |
| <b>System Voltages</b> | +5V, +12V, -12V, 5VSB  |
| <b>Expansion Slots</b> | PCI slot x1 (Supports 2 Bus Master), Mini PCI slot   |

# Board Dimensions





## Installations

This section provides information on how to use the jumpers and connectors on MAT-880 in order to set up a workable system. The topics covered are:

|                                   |    |
|-----------------------------------|----|
| Installing the CPU .....          | 6  |
| Installing the Memory .....       | 7  |
| Setting the Jumpers.....          | 8  |
| Connectors on MAT-880.....        | 14 |
| Watchdog Timer Configuration..... | 26 |

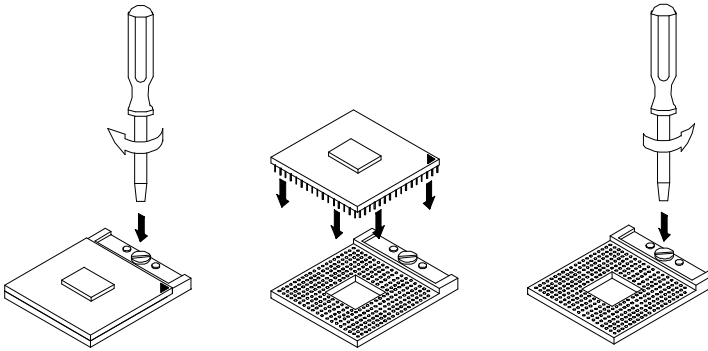
## Installing the CPU

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MAT-880 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

MAT-880 embedded board supports two DDR memory sockets for a maximum total memory of 2GB in DDR memory type. The memory module capacities supported are 64MB, 128MB, 256MB, 512MB and 1GB. The following table lists the supported DDR DIMM configurations. Intel 855GME supports configurations defined in the JEDEC DDR DIMM specification only (A,B,C). Non-JEDEC standard DIMMs such as double-sided x16 DDR SDRAM DIMMs are not supported.

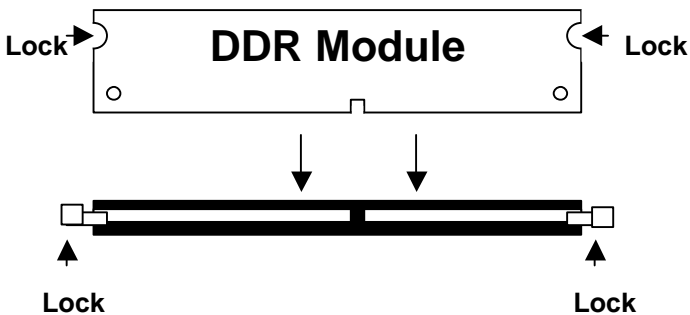
### Supported DDRM DIMM Configurations.

| Density       | 64 Mbit  |         | 128Mbit   |         | 256Mbit   |          | 512Mbit   |          |
|---------------|----------|---------|-----------|---------|-----------|----------|-----------|----------|
| Device Width  | X8       | X16     | X8        | X16     | X8        | X16      | X8        | X16      |
| Single/Double | SS/DS    | SS/DS   | SS/DS     | SS/DS   | SS/DS     | SS/DS    | SS/DS     | SS/DS    |
| 184-pin DDR   | 64/128MB | 32MB/NA | 128/256MB | 64MB/NA | 256/512MB | 128MB/NA | 512/1024M | 256MB/NA |

### Installing and Removing Memory Modules

To install the DDR modules, locate the memory slot on the embedded 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

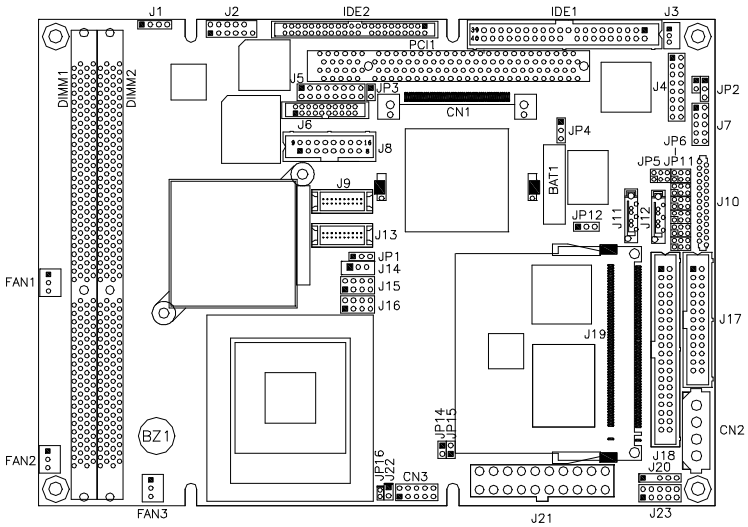
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Jumpers are used on MAT-880 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MAT-880 and their respective functions.

|   |    |
|---|----|
| Jumper Locations on IMAT-880.....                   | 9  |
| Configuring the CPU Frequency .....                 | 10 |
| JP1: LVDS Panel Power Select .....                  | 10 |
| JP2: Gigabit LAN Enable/Disable.....                | 10 |
| JP3: Compact Flash Slave/Master .....               | 10 |
| JP4: Clear CMOS Contents.....                       | 11 |
| JP5, JP6, JP7: RS232/422/485 (COM2) Selection ..... | 11 |
| JP8: COM1 RS232 +5V / +12V Power Setting.....       | 11 |
| JP9: COM2 RS232 +5V / +12V Power Setting.....       | 12 |
| JP10: COM3 RS232 +5V / +12V Power Setting.....      | 12 |
| JP11: COM4 RS232 +5V / +12V Power Setting.....      | 12 |
| JP12: ATX / AT Power Select.....                    | 12 |
| JP16: Processor Operating Frequency.....            | 13 |

Jumper Locations on MAT-880





|   |      |
|---|------|
| Jumpers on MAT-880.....                             | Page |
| JP1: LVDS Panel Power Select.....                   | 10   |
| JP2: Gigabit LAN Enable/Disable .....               | 10   |
| JP3: Compact Flash Slave/Master.....                | 10   |
| JP4: Clear CMOS Contents .....                      | 11   |
| JP5, JP6, JP7: RS232/422/485 (COM2) Selection ..... | 11   |
| JP8: COM1 RS232 +5V / +12V Power Setting.....       | 11   |
| JP9: COM2 RS232 +5V / +12V Power Setting.....       | 12   |
| JP10: COM3 RS232 +5V / +12V Power Setting.....      | 12   |
| JP11: COM4 RS232 +5V / +12V Power Setting.....      | 12   |
| JP12: ATX / AT Power Select .....                   | 12   |
| JP16: Processor Operating Frequency.....            | 13   |

### Configuring the CPU Frequency



The MAT-880 embedded board does not provide DIP switches to configure the processor speed (CPU frequency).

#### JP1: LVDS Panel Power Select



| JP1  | LVDS Panel Power |
|--|------------------|
| <br>1 2 3 | 3.3V (default)   |
| <br>1 2 3 | 5V               |

*Note: The LVDS panel resolution can be configured in the BIOS Setup.*

#### JP2: Gigabit LAN Enable/Disable



| JP2  | Gigabit LAN |
|--|-------------|
| <br>1 2 3 | Enable      |
| <br>1 2 3 | Disable     |

#### JP3: Compact Flash Slave/Master

| JP3  | Compact Flash |
|--|---------------|
| <br>Open   | Slave         |
| <br>Close | Master        |

**JP4: Clear CMOS Contents**

Use JP4 to clear the CMOS contents. *Note that the ATX-power connector should be disconnected from the board before clearing CMOS.*

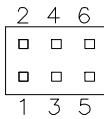
| JP4  | Setting                 | Function   |
|--|-------------------------|------------|
| <br>1 2 3 | Pin 1-2<br>Short/Closed | Normal     |
| <br>1 2 3 | Pin 2-3<br>Short/Closed | Clear CMOS |

**JP5, JP6, JP7: RS232/422/485 (COM2) Selection**

COM1, COM3, and COM4 are fixed for RS-232 use only.


COM2 is selectable for RS232, RS-422 and RS-485.

The following table describes the jumper settings for COM2 selection.



| COM2 Function                  | RS-232            | RS-422            | RS-485            |
|--------------------------------|-------------------|-------------------|-------------------|
| Jumper Setting<br>(pin closed) | JP7:<br>1-2       | JP7:<br>3-4       | JP7:<br>5-6       |
|                                | JP5:<br>3-5 & 4-6 | JP5:<br>1-3 & 2-4 | JP5:<br>1-3 & 2-4 |
|                                | JP6:<br>3-5 & 4-6 | JP6:<br>1-3 & 2-4 | JP6:<br>1-3 & 2-4 |

**JP8: COM1 RS232 +5V / +12V Power Setting**

| Pin # | Signal Name  | JP8   | Signal Name  | Pin # |
|-------|--------------|---|--------------|-------|
| 1     | RI           |  | +12V         | 2     |
| 3     | RI (default) |   | RI (default) | 4     |
| 5     | RI           |   | +5V          | 6     |

COM1 Settings: Pin 1-2 short = +12V, Pin 5-6 short = +5V,

Pin 3-4 short = standard COM port

**JP9: COM2 RS232 +5V / +12V Power Setting**

| Pin # | Signal Name  | JP9 | Signal Name  | Pin # |
|-------|--------------|-----|--------------|-------|
| 1     | RI           |     | +12V         | 2     |
| 3     | RI (default) |     | RI (default) | 4     |
| 5     | RI           |     | +5V          | 6     |

COM2 Settings: Pin 1-2 short = +12V, Pin 5-6 short = +5V,  
Pin 3-4 short = standard COM port

**JP10: COM3 RS232 +5V / +12V Power Setting**

| Pin # | Signal Name  | JP10 | Signal Name  | Pin # |
|-------|--------------|------|--------------|-------|
| 1     | RI           |      | +12V         | 2     |
| 3     | RI (default) |      | RI (default) | 4     |
| 5     | RI           |      | +5V          | 6     |

COM3 Settings: Pin 1-2 short = +12V, Pin 5-6 short = +5V,  
Pin 3-4 short = standard COM port

**JP11: COM4 RS232 +5V / +12V Power Setting**

| Pin # | Signal Name  | JP11 | Signal Name  | Pin # |
|-------|--------------|------|--------------|-------|
| 1     | RI           |      | +12V         | 2     |
| 3     | RI (default) |      | RI (default) | 4     |
| 5     | RI           |      | +5V          | 6     |



COM4 Settings: Pin 1-2 short = +12V, Pin 5-6 short = +5V,  
Pin 3-4 short = standard COM port

**JP12: ATX / AT Power Select**

| JP12 | ATX / AT |
|------|----------|
|      | ATX      |
|      | AT       |



**JP16: Processor Operating Frequency**

| JP16   | CPU FSB |
|--|---------|
| <br>Open  | 133MHz  |
| <br>Close | 100MHz  |

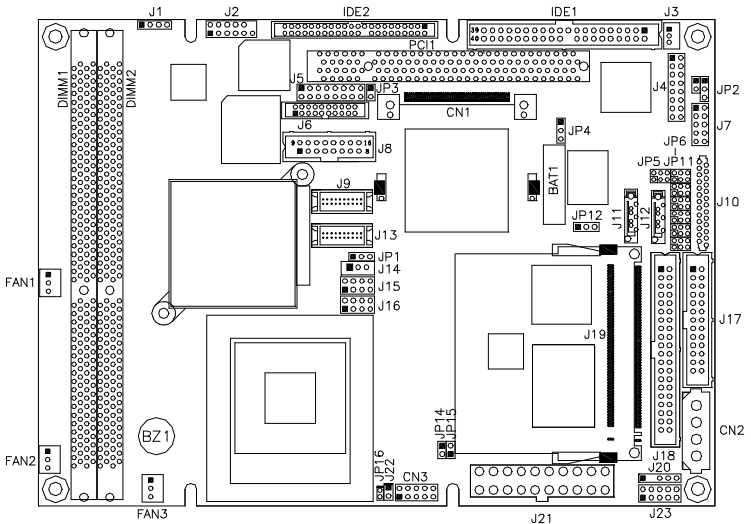
## Connectors on MAT-880

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Connectors on MAT-880 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists connectors on MAT-880 and their respective functions.

|  |    |
|--|----|
| Connector Locations on MAT-880.....                      | 15 |
| FAN1, FAN2: System Fan Power Connector.....              | 16 |
| FAN3: CPU Fan Power Connector.....                       | 16 |
| IDE1, IDE2: EIDE Connectors.....                         | 16 |
| J1: CD-In Audio Connector.....                           | 17 |
| CN2: AT H2/+5V Power Connector.....                      | 17 |
| J2: External Audio Connector.....                        | 18 |
| CN3: Digital 4-in 4-out I/O Connector.....               | 18 |
| J3: Wake On LAN Connector.....                           | 18 |
| J4: Gigabit LAN Connector (used with ID240).....         | 18 |
| J5: System Function Connector.....                       | 19 |
| J6: TMDS Connector.....                                  | 20 |
| J7: 10/100Mbit Ethernet Connector.....                   | 21 |
| J8: VGA CRT Connector.....                               | 21 |
| J10: Floppy Drive Connector.....                         | 21 |
| J13, J9: LVDS Connectors (1st channel, 2nd channel)..... | 22 |
| J14: Panel Inverter Power Connector.....                 | 22 |
| J15, J16: USB Connectors.....                            | 22 |
| J17: Parallel Port Connector.....                        | 23 |
| J18: Serial Ports.....                                   | 23 |
| J20: IrDA Connector.....                                 | 24 |
| J21: ATX Power Supply Connector.....                     | 24 |
| J23: PS/2 Keyboard/Mouse Connector.....                  | 25 |

Connector Locations on MAT-880



Connectors on MAT-880.....Page

FAN1, FAN2: System Fan Power Connector ..... 16

FAN3: CPU Fan Power Connector ..... 16

IDE1, IDE2: EIDE Connectors ..... 16

J1: CD-In Audio Connector ..... 17

CN2: AT H2/+5V Power Connector ..... 17

J2: External Audio Connector ..... 18

CN3: Digital 4-in 4-out I/O Connector..... 18

J3: Wake On LAN Connector ..... 18

J4: Gigabit LAN Connector (used with ID240)..... 18

J5: System Function Connector ..... 19

J6: TMDS Connector ..... 20

J7: 10/100Mbit Ethernet Connector..... 21

J8: VGA CRT Connector ..... 21

J10: Floppy Drive Connector..... 21

J13, J9: LVDS Connectors (1st channel, 2nd channel)..... 22

J14: Panel Inverter Power Connector ..... 22

J15, J16: USB Connectors..... 22

J17: Parallel Port Connector..... 23

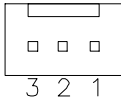
J18: Serial Ports..... 23

J20: IrDA Connector ..... 24

J21: ATX Power Supply Connector ..... 24

**FAN1, FAN2: System Fan Power Connector**

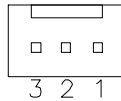
FAN1, FAN2 is a 3-pin header for system fans. The fan must be a 12V (500mA) fan.



| Pin # | Signal Name        |
|-------|--------------------|
| 1     | Ground             |
| 2     | +12V               |
| 3     | Rotation detection |

**FAN3: CPU Fan Power Connector**

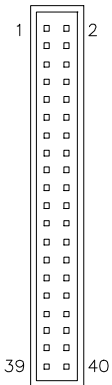
FAN3 is a 3-pin header for the CPU fan. The fan must be a 12V fan.



| Pin # | Signal Name        |
|-------|--------------------|
| 1     | Ground             |
| 2     | +12V               |
| 3     | Rotation detection |

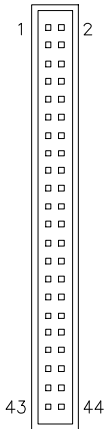
**IDE1, IDE2: EIDE Connectors**

**IDE1: Primary IDE Connector**



| Signal Name   | Pin # | Pin # | Signal Name   |
|---------------|-------|-------|---------------|
| Reset IDE     | 1     | 2     | Ground        |
| Host data 7   | 3     | 4     | Host data 8   |
| Host data 6   | 5     | 6     | Host data 9   |
| Host data 5   | 7     | 8     | Host data 10  |
| Host data 4   | 9     | 10    | Host data 11  |
| Host data 3   | 11    | 12    | Host data 12  |
| Host data 2   | 13    | 14    | Host data 13  |
| Host data 1   | 15    | 16    | Host data 14  |
| Host data 0   | 17    | 18    | Host data 15  |
| Ground        | 19    | 20    | Protect pin   |
| DRQ0          | 21    | 22    | Ground        |
| Host IOW      | 23    | 24    | Ground        |
| Host IOR      | 25    | 26    | Ground        |
| IOCHRDY       | 27    | 28    | Host ALE      |
| DACK0         | 29    | 30    | Ground        |
| IRQ14         | 31    | 32    | No connect    |
| Address 1     | 33    | 34    | No connect    |
| Address 0     | 35    | 36    | Address 2     |
| Chip select 0 | 37    | 38    | Chip select 1 |
| Activity      | 39    | 40    | Ground        |

**IDE2: Secondary IDE Connector**



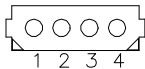
| Signal Name   | Pin # | Pin # | Signal Name   |
|---------------|-------|-------|---------------|
| Reset IDE     | 1     | 2     | Ground        |
| Host data 7   | 3     | 4     | Host data 8   |
| Host data 6   | 5     | 6     | Host data 9   |
| Host data 5   | 7     | 8     | Host data 10  |
| Host data 4   | 9     | 10    | Host data 11  |
| Host data 3   | 11    | 12    | Host data 12  |
| Host data 2   | 13    | 14    | Host data 13  |
| Host data 1   | 15    | 16    | Host data 14  |
| Host data 0   | 17    | 18    | Host data 15  |
| Ground        | 19    | 20    | Key           |
| DRQ0          | 21    | 22    | Ground        |
| Host IOW      | 23    | 24    | Ground        |
| Host IOR      | 25    | 26    | Ground        |
| IOCHRDY       | 27    | 28    | Host ALE      |
| DACK0         | 29    | 30    | Ground        |
| IRQ14         | 31    | 32    | No connect    |
| Address 1     | 33    | 34    | No connect    |
| Address 0     | 35    | 36    | Address 2     |
| Chip select 0 | 37    | 38    | Chip select 1 |
| Activity      | 39    | 40    | Ground        |
| Vcc           | 41    | 42    | Vcc           |
| Ground        | 43    | 44    | N.C.          |

**J1: CD-In Audio Connector**



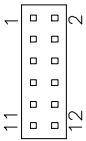
| Pin # | Signal Name |
|-------|-------------|
| 1     | CD Audio R  |
| 2     | Ground      |
| 3     | Ground      |
| 4     | CD Audio L  |

**CN2: AT H2/+5V Power Connector**



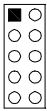
| Pin # | Signal Name |
|-------|-------------|
| 1     | +12V        |
| 2     | Ground      |
| 3     | Ground      |
| 4     | +5V         |

**J2: External Audio Connector**



| Signal Name | Pin # | Pin # | Signal Name |
|-------------|-------|-------|-------------|
| LINEOUT_R   | 1     | 2     | LINEOUT_L   |
| Ground      | 3     | 4     | Ground      |
| LINEIN_R    | 5     | 6     | LINEIN_L    |
| Ground      | 7     | 8     | Ground      |
| Mic-In      | 9     | 10    | VREFOUT     |
| Ground      | 11    | 12    | Protect pin |

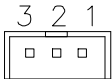
**CN3: Digital 4-in 4-out I/O Connector**



| Signal Name | Pin | Pin | Signal Name |
|-------------|-----|-----|-------------|
| Ground      | 1   | 2   | Vcc         |
| Out3        | 3   | 4   | Out1        |
| Out2        | 5   | 6   | Out0        |
| Int3        | 7   | 8   | Int1        |
| Int2        | 9   | 10  | Int0        |

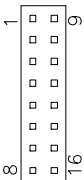
**J3: Wake On LAN Connector**

J3 is a 3-pin header for the Wake On LAN function on the board. The following table shows the pin out assignments of this connector. Wake On LAN will function properly only with an ATX power supply with 5VSB that has 200mA.



| Pin # | Signal Name |
|-------|-------------|
| 1     | +5VSB       |
| 2     | Ground      |
| 3     | -PME        |

**J4: Gigabit LAN Connector (used with ID240)**



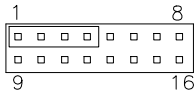
| Signal Name  | Pin | Pin | Signal Name |
|--------------|-----|-----|-------------|
| MDI0+        | 1   | 9   | MDI0-       |
| 2.5V         | 2   | 10  | GND         |
| MDI1+        | 3   | 11  | MDI1-       |
| MDI2+        | 4   | 12  | MDI2-       |
| 2.5V         | 5   | 13  | 2.5V        |
| MDI3+        | 6   | 14  | MDI3-       |
| ACT_LED      | 7   | 15  | LINK_UP     |
| Link1000_LED | 8   | 16  | Link100_LED |

### J5: System Function Connector

J5 provides connectors for system indicators that provide light indication of the computer activities and switches to change the computer status. J5 is a 16-pin header that provides interfaces for the following functions.

#### Speaker: Pins 1 - 4

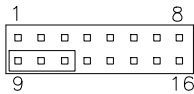
This connector provides an interface to a speaker for audio tone generation. An 8-ohm speaker is recommended.



| Pin # | Signal Name |
|-------|-------------|
| 1     | Speaker out |
| 2     | No connect  |
| 3     | Ground      |
| 4     | +5V         |

#### Power LED: Pins 9-11

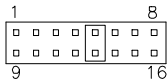
The power LED indicates the status of the main power switch.



| Pin # | Signal Name |
|-------|-------------|
| 9     | Power LED   |
| 10    | NC          |
| 11    | Ground      |

#### ATX Power ON Switch: Pins 5 and 13

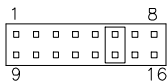
This 2-pin connector is an "ATX Power Supply On/Off Switch" on the system that connects to the power switch on the case. When pressed, the power switch will force the system to power on. When pressed again, it will force the system to power off.



| Pin # | Signal Name |
|-------|-------------|
| 5     | PS_ON       |
| 13    | Ground      |

#### SMI/Hardware Switch: Pins 6 and 14

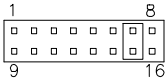
This connector supports the "Green Switch" on the control panel, which, when pressed, will force the system into the power-saving mode immediately.



| Pin # | Signal Name |
|-------|-------------|
| 6     | SMI         |
| 14    | Ground      |

**Reset Switch: Pins 7 and 15**

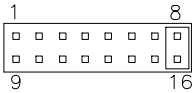
The reset switch allows the user to reset the system without turning the main power switch off and then on again. Orientation is not required when making a connection to this header.



| Pin # | Signal Name |
|-------|-------------|
| 7     | Reset#      |
| 15    | Ground      |

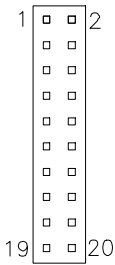
**Hard Disk Drive LED Connector: Pins 8 and 16**

This connector connects to the hard drive activity LED on control panel. This LED will flash when the HDD is being accessed.



| Pin # | Signal Name |
|-------|-------------|
| 8     | HDD Active  |
| 16    | 5V          |

**J6: TMDS Connector**



| Signal Name | Pin # | Pin # | Signal Name |
|-------------|-------|-------|-------------|
| TX1P        | 1     | 11    | TX2P        |
| TX1N        | 2     | 12    | TX2N        |
| GND         | 3     | 13    | GND         |
| GND         | 4     | 14    | GND         |
| TXCP        | 5     | 15    | TXOP        |
| TXCN        | 6     | 16    | TXON        |
| GND         | 7     | 17    | NC          |
| VCC+5V      | 8     | 18    | NC          |
| HPDET       | 9     | 19    | DDCDATA     |
| NC          | 10    | 20    | DDCCLK      |

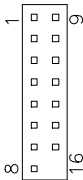


**J7: 10/100Mbit Ethernet Connector**



| Signal Name | Pin | Pin | Signal Name |
|-------------|-----|-----|-------------|
| 5VSB        | 1   | 6   | SPEED LED   |
| RX+         | 2   | 7   | RX-         |
| LILED       | 3   | 8   | PULL LOW    |
| ACTLED      | 4   | 9   | PULL LOW    |
| TX+         | 5   | 10  | TX-         |

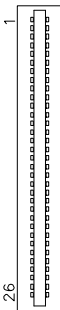
**J8: VGA CRT Connector**



| Signal Name | Pin | Pin | Signal Name |
|-------------|-----|-----|-------------|
| R           | 1   | 9   | +5V         |
| G           | 2   | 10  | GND         |
| B           | 3   | 11  | NC          |
| NC          | 4   | 12  | DDCDAT      |
| GND         | 5   | 13  | HSYNC       |
| GND         | 6   | 14  | VSYNC       |
| GND         | 7   | 15  | DDCCLK      |
| GND         | 8   | 16  | Protect pin |

**J10: Floppy Drive Connector**

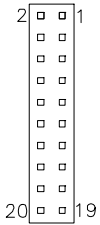
J10 is a slim 26-pin connector and will support up to 2.88MB FDD.



| Signal Name | Pin # | Pin # | Signal Name |
|-------------|-------|-------|-------------|
| VCC         | 1     | 2     | INDEX       |
| VCC         | 3     | 4     | DRV_SEL     |
| VCC         | 5     | 6     | DSK_CH      |
| NC          | 7     | 8     | NC          |
| NC          | 9     | 10    | MOTOR       |
| DINST       | 11    | 12    | DIR         |
| NC          | 13    | 14    | STEP        |
| GND         | 15    | 16    | WDATA       |
| GND         | 17    | 18    | WGATE       |
| GND         | 19    | 20    | TRACK       |
| NC          | 21    | 22    | WPROT       |
| GND         | 23    | 24    | RDATA       |
| GND         | 25    | 26    | SIDE        |

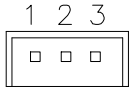
**J13, J9: LVDS Connectors (1st channel, 2nd channel)**

The LVDS connectors are composed of the first channel (J13) and second channel (J9) to support 24-bit or 48-bit.



| Signal Name | Pin # | Pin # | Signal Name |
|-------------|-------|-------|-------------|
| TX0-        | 2     | 1     | TX0+        |
| Ground      | 4     | 3     | Ground      |
| TX1-        | 6     | 5     | TX1+        |
| 5V/3.3V     | 8     | 7     | Ground      |
| TX3-        | 10    | 9     | TX3+        |
| TX2-        | 12    | 11    | TX2+        |
| Ground      | 14    | 13    | Ground      |
| TXC-        | 16    | 15    | TXC+        |
| 5V/3.3V     | 18    | 17    | ENABKL      |
| +12V        | 20    | 19    | +12V        |

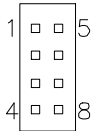
**J14: Panel Inverter Power Connector**



| Pin # | Signal Name |
|-------|-------------|
| 1     | +12V        |
| 2     | ENABKL      |
| 3     | Ground      |

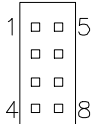
**J15, J16: USB Connectors**

The following table shows the pin outs of the USB pin headers connectors. Overall, the two pin headers support four USB ports (USB 2.0 compliant).



J15

| Signal Name | Pin | Pin | Signal Name |
|-------------|-----|-----|-------------|
| Vcc         | 1   | 5   | Ground      |
| USB0-       | 2   | 6   | USB1+       |
| USB0+       | 3   | 7   | USB1-       |
| Ground      | 4   | 8   | Vcc         |

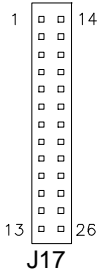
  


J16

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

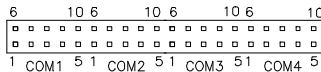
### J17: Parallel Port Connector

The following table describes the pin out assignments of this connector.



| Signal Name          | Pin # | Pin # | Signal Name |
|----------------------|-------|-------|-------------|
| Line printer strobe  | 1     | 14    | AutoFeed    |
| PD0, parallel data 0 | 2     | 15    | Error       |
| PD1, parallel data 1 | 3     | 16    | Initialize  |
| PD2, parallel data 2 | 4     | 17    | Select      |
| PD3, parallel data 3 | 5     | 18    | Ground      |
| PD4, parallel data 4 | 6     | 19    | Ground      |
| PD5, parallel data 5 | 7     | 20    | Ground      |
| PD6, parallel data 6 | 8     | 21    | Ground      |
| PD7, parallel data 7 | 9     | 22    | Ground      |
| ACK, acknowledge     | 10    | 23    | Ground      |
| Busy                 | 11    | 24    | Ground      |
| Paper empty          | 12    | 25    | Ground      |
| Select               | 13    | N/A   | N/A         |

### J18: Serial Ports



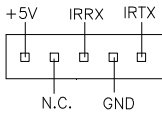
| Pin # | Signal Name (RS-232)     |
|-------|--------------------------|
| 1     | DCD, Data carrier detect |
| 2     | RXD, Receive data        |
| 3     | TXD, Transmit data       |
| 4     | DTR, Data terminal ready |
| 5     | Ground                   |
| 6     | DSR, Data set ready      |
| 7 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

COM2 is jumper selectable for RS-232, RS-422 and RS-485.

| Pin # | Signal Name |        |        |
|-------|-------------|--------|--------|
|       | RS-232      | R2-422 | RS-485 |
| 1     | DCD         | TX-    | DATA-  |
| 2     | RX          | TX+    | DATA+  |
| 3     | TX          | RX+    | NC     |
| 4     | DTR         | RX-    | NC     |
| 5     | Ground      | Ground | Ground |
| 6     | DSR         | RTS-   | NC     |
| 7     | RTS         | RTS+   | NC     |
| 8     | CTS         | CTS+   | NC     |
| 9     | RI          | CTS-   | NC     |
| 10    | NC          | NC     | NC     |

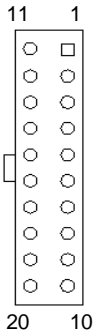
### J20: IrDA Connector

J20 is used for an optional IrDA connector for wireless communication.



| Pin # | Signal Name |
|-------|-------------|
| 1     | +5V         |
| 2     | No connect  |
| 3     | Ir RX       |
| 4     | Ground      |
| 5     | Ir TX       |

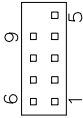
### J21: ATX Power Supply Connector



| 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        |

**J23: PS/2 Keyboard/Mouse Connector**

J23, 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      |

## 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
    pushax                ;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
    pushax
    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
```

```
;[]=====
```

# 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 .....            | 31 |
| BIOS Setup.....                    | 31 |
| Standard CMOS Setup.....           | 33 |
| Advanced BIOS Features .....       | 36 |
| Advanced Chipset Features .....    | 39 |
| Integrated Peripherals .....       | 42 |
| Power Management Setup.....        | 46 |
| PNP/PCI Configurations .....       | 49 |
| PC Health Status.....              | 50 |
| Frequency/Voltage Control .....    | 51 |
| Load Fail-Safe Defaults.....       | 52 |
| Load Optimized Defaults .....      | 52 |
| Set Supervisor/User Password ..... | 52 |
| Save & Exit Setup.....             | 52 |
| Exit Without Saving .....          | 52 |

## BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel Pentium 4 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

|                      |                   | Item Help   |
|----------------------|-------------------|---|
| Date (mm:dd:yy)      | Wed, Apr 28, 2004 | Menu Level ><br><br>Change the day, month, Year and century |
| Time (hh:mm:ss)      | 00 : 00 : 00      |   |
| IDE Primary Master   | None              |   |
| IDE Primary Slave    | None              |   |
| 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 board supports two serial ATA ports that 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

|                            | Press Enter | ITEM HELP    |
|----------------------------|-------------|--------------|
| CPU Feature                |             | Menu Level > |
| Virus Warning              | Disabled    |              |
| CPU L1 and L2 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

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. These items allow you to enable (speed up memory access) or disable the cache function. 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 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+LVDS          |              |
| 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-FFFFh, 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+LVDS*. The options available include *CRT* and *LVDS*.

### 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 default values for these ports are:

|           |          |
|-----------|----------|
| 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 |              |
| SecondIO 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   |              |
| Onboard SATA chip mode    | SATA mode |              |

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 |              |
| Integrated LAN       | Enabled  |              |

Phoenix - AwardBIOS CMOS Setup Utility  
SuperIO Device

|                        |           |              |
|------------------------|-----------|--------------|
| Onboard FDC Controller | Enabled   | ITEM HELP    |
| Onboard Serial Port 1  | 3F8/IRQ4  | Menu Level > |
| 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         |              |
| PWRON After PWR-Fail   | Off       |              |

Phoenix - AwardBIOS CMOS Setup Utility  
SecondIO Device

|                       |       |              |
|-----------------------|-------|--------------|
| Onboard Serial Port 3 | 3E8   | ITEM HELP    |
| Serial Port 3 Use IRQ | IRQ10 | Menu Level > |
| Onboard Serial Port 4 | 2E8   |              |
| Serial Port 4 Use IRQ | IRQ11 |              |

**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.

**Onboard SATA chip Mode**

This field, by default, is set to SATA.

### 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*. This determines which VGA controller is initialized when the system boots.

### Integrated LAN

The default setting of the LAN controller is *Enabled*.

### 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  |
| Serial Port 3 | 3E8/IRQ10 |
| Serial Port 4 | 2E8/IRQ11 |
| 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 |

**PWRON After PWR-Fail**

This field sets the system power status whether on or off when power returns from a power failure situation.

## Power Management Setup

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

Phoenix - AwardBIOS CMOS Setup Utility  
Power Management Setup

|                                  |                |              |
|----------------------------------|----------------|--------------|
| Power-Supply Type                | ATX            | ITEM HELP    |
| 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   |
| Resources Controlled By<br>IRQ Resources | Auto (ESCD)<br>Press Enter | Menu Level  |
| PCI/VGA Palette Snoop                    | Disabled                   | 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 |

### 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  | 75°C/167°F | Menu Level > |
| System Temp.             | 45°C/113°F |              |
| CPU Temp                 | 52°C/125°F |              |
| CPU FAN Speed (FAN3)     | 5400 RPM   |              |
| System FAN Speed (FAN1)  | 5463 RPM   |              |
| System FAN Speed (FAN2)  | 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     |              |
| Shutdown Temperature     | Disabled   |              |
| CPU Fan Failure Warning  | Disabled   |              |
| Sys. Fan Failure Warning | Disabled   |              |
| Aux. Fan Failure Warning | 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.

### CPU/System/Chassis Fan Failure Warning

When enabled, this field lets the system sounds an audible warning to the user that the CPU fan or chassis fan has malfunctioned.

## 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:

|  |    |
|--|----|
| Intel Chipset Software Intallation Utility ..... | 55 |
| VGA Drivers Installation.....                    | 57 |
| AC97 Codec Audio Driver Installation .....       | 58 |
| Intel PRO LAN Drivers Installation.....          | 59 |

### **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.

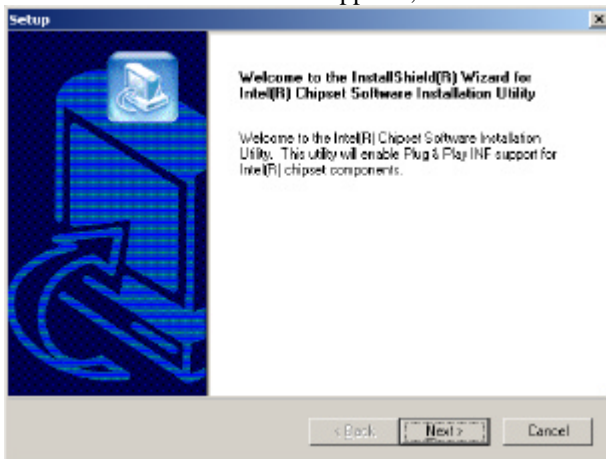
## Intel Chipset Software Intallation Utility

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.

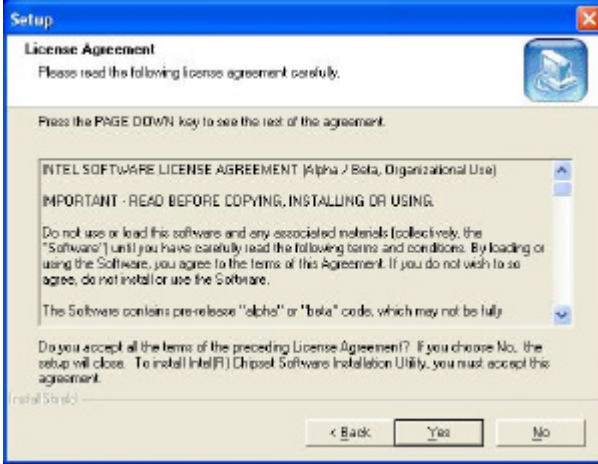
1. Insert the CD that comes with the board. Click *Intel Chipsets* and then *Intel(R) 855GME Chipset Drivers*.
2. Click *Intel(R) Chipset Software Installation Utility*.



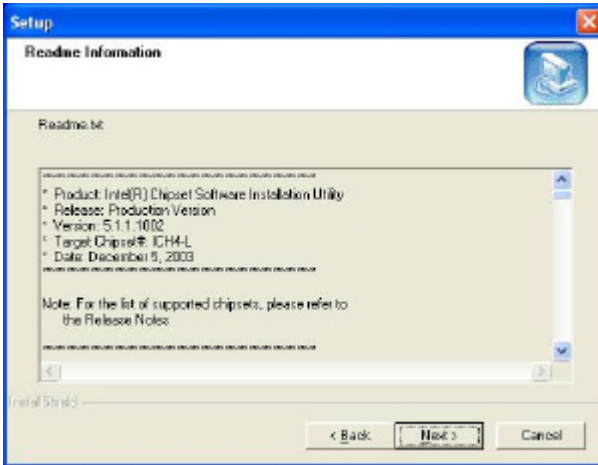
3. When the Welcome screen appears, click *Next* to continue.



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



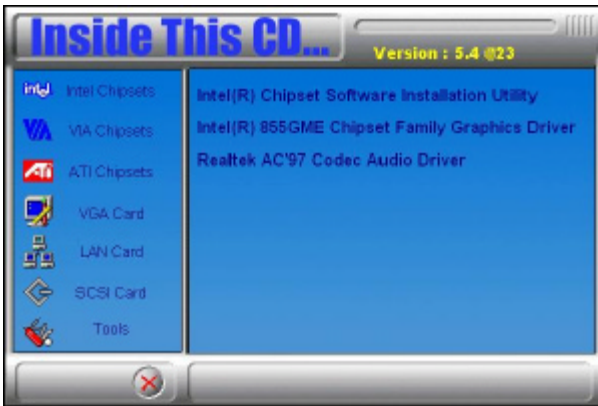
3. When the Welcome screen appears, click **Next** to continue.
4. Click **Yes** to agree with the license agreement and continue the installation.
5. Restart the computer as prompted and for changes to take effect.

## AC97 Codec Audio Driver Installation

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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) 855GME Chipset Drivers**.
2. Click **Realtek AC'97 Codec Audio Driver**.

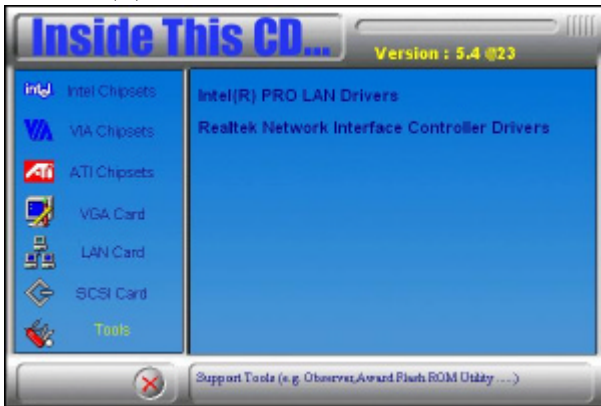


3. Click **Finish** to restart the computer and for changes to take effect. .

## 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.

# 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                      |
| 278h - 27Fh | Parallel Port #2(LPT2)             |
| 2F8h - 2FFh | Serial Port #2(COM2)               |
| 2B0h - 2DFh | Graphics adapter Controller        |
| 378h - 3FFh | Parallel Port #1(LPT1)             |
| 360h - 36Fh | Network Ports                      |
| 3B0h - 3BFh | Monochrome & Printer adapter       |
| 3C0h - 3CFh | EGA adapter                        |
| 3D0h - 3DFh | 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          |

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