# User's Manual

## An AMD Socket A Processor based mainboard (133/100MHz)

## Supports PC133/VC133 Memory Modules

**TRADEMARK**

All products and company names are trademarks or registered trademarks of their respective holders.

*These specifications are subject to change without notice.*

*Manual Revision 1.2*
*July 10, 2001*

## Important Notice

This jumperless mainboard does not provide any switch for FSB setting.

The default setting for this board is at 100MHz, for 133MHz or above adjustment, you should manually adjust it under BIOS setup menu.

Please refer to page 4-22 "BIOS Setup menu - Frequency/ Voltage Control" for details.

# Table of Contents

# Section 1
# INTRODUCTION

## Components Checklist

- ✓    A.    (1)    Mainboard

- ✓    B.    (1)    User's manual

- ✓    C.    (1)    Floppy ribbon cable

- ✓    D.    (1)    ATA-66/100 Hard drive ribbon cable

- ✓    E.    (1)    USB Cable

- ✓    F.    (1)    Driver and utility

- ✓    G.    (1)    ATA-33 Hard drive ribbon cable

USER'S
MANUAL

A

B

C

D

G

E

or

F

# Overview
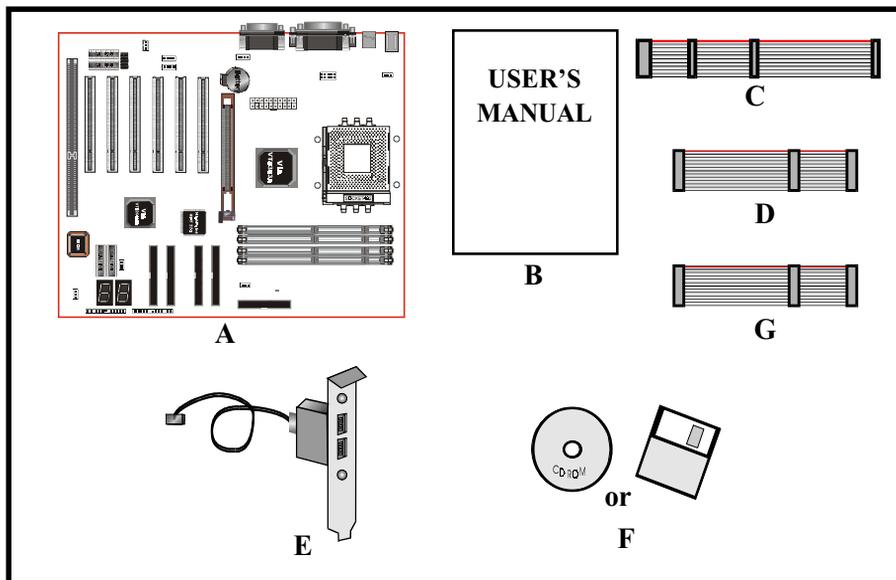
## AMD Duron™ & Athlon™ Processors

The AMD Athlon™ is a seventh-generation micro architecture with an integrated L2 cache, which is powerful enough to support the bandwidth requirements of a large range of applications, hardware, graphics, and memory technologies. These processors implement advanced design techniques such as:

- Socket A (PGA 462)
- 200/266MHz system interface based on the Alpha™ EV6 bus protocol.
- Three out-of-order, superscalar, pipelined Multimedia Units.
- Three out-of-order, superscaler, pipelined Integer Units.
- Fixed-sized internal instruction formats (MacroOPs).
- 72-entry Instruction Control Units.
- AMD enhanced 3DNow!™ technology
- L1 and L2 caches.
- Dynamic branch prediction.

Socket A is the name for AMD's new socketed interface designed to support both AMD Duron™ and AMD Athlon™ processors. This innovation is made possible by integrating the L2 cache memory on chip with the processor. Socket A will help enable smaller enclosures, and ultimately result in a wider variety of solutions in the market.

The AMD Duron™ & Athlon™ processors in the Socket A format continue to deliver the ultimate performance for cutting-edge applications. Both bring to desktop systems running industry-standard x86 software superscalar RISC performance. Being provided in the Socket A format they are the world's most powerful x86 processors. They easily deliver the highest integer, floating-point, and 3D multimedia performance for applications running on x86 platforms around.

The AMD Duron™ processor is derived from the AMD Athlon™ processor core. It features full-speed, on-chip cache memory, a 200MHz front side system bus, and enhanced 3DNow!™ technology. Although both processors are related, there are key differences. The AMD Athlon™ processor is targeted at the performance segment, and as such will have more cache memory and higher clock speeds.

## Accelerated Graphics Port (AGP or A.G.P.)

Typically, 3D graphics rendering requires a tremendous amount of memory, and demands ever increasing throughput speed as well. As 3D products for the personal computer become more and more popular, these demands will only increase. This will cause a rise in costs for both end users and manufacturers. Lowering these costs as well as improving performance is the primary motivation behind AGP. By providing a massive increase in the bandwidth available between the video card and the processor, it will assist in relieving some of these pressures for quite sometime.

## Ultra ATA/66/100

The board provides two channel Ultra ATA/66/100 Bus Master IDE controller, that support Ultra ATA/66/100 protocols, perfect for such demanding applications as real-time video, multimedia, and high performance operating system. A new IDE cable is required for Ultra ATA/66/100. This cable is an 80 conductor cable; however the connectors are, of course, backwards compatible with ATA/33.

## Hardware Monitoring

Hardware monitoring allows you to monitor various aspects of your systems operations and status. The features include CPU temperature, voltage and RPM of fan.

## Introduction

## Mainboard Form-Factor

The board is designed with ATX form factor - the new industry standard of chassis. ATX form factor is essentially a Baby-AT baseboard rotated 90 degrees within the chassis enclosure and a new mounting configuration for the power supply. With these changes the processor is relocated away from the expansion slots, allowing them all to hold full length add-in cards. ATX defines a double height aperture to the rear of the chassis which can be used to host a wide range of onboard I/O. Only the size and position of this aperture is defined, allowing PC manufacturers to add new I/O features (e.g.; TV input, TV output, joystick, modem, LAN, etc.) to systems. This will help systems integrators differentiate their products in the marketplace, and better meet your needs.

- • Smaller size promotes a smaller system size.

- • I/O shield does not need to be retooled in an ATX 2.01 or later. The mainboard should be used in an ATX 2.01 (or later) compliant case.

- • A smaller power supply can be used. High integration on mainboard reduces the system costs.
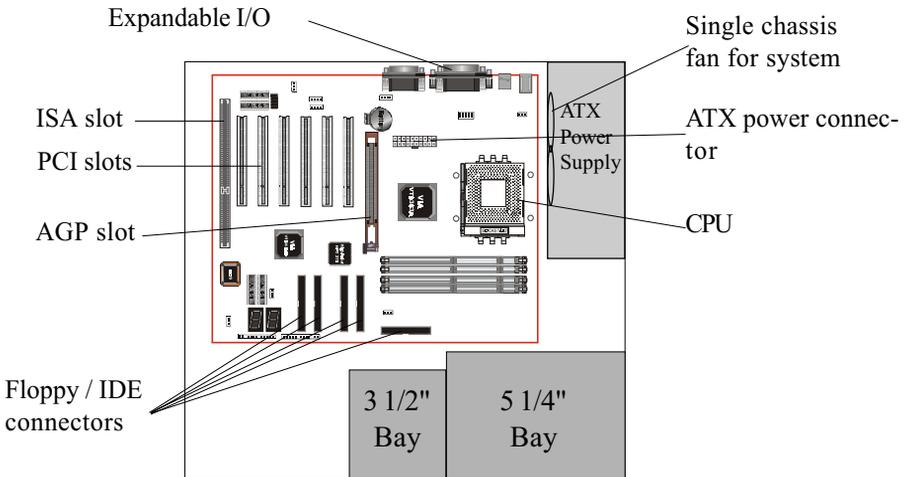


*Figure 2: Summary of ATX chassis features*

## I/O Shield Connector

The board is equipped with an I/O back panel.  Please use the appropriate I/O shield (figure 3).
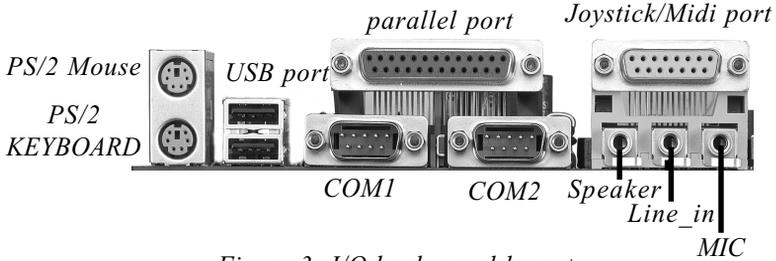


*Figure 3: I/O back panel layout*

## Power-On/Off (Remote)

The board has a single 20-pin connector for ATX power supplies. For ATX power supplies that support the **Remote On/Off** feature, this should be connected to the systems front panel for system Power On/Off button. The systems power On/Off button should be a momentary button that is normally open.

The board has been designed with "Soft Off" functions. You can turn Off the system from one of two sources: The first is the  front panel Power On/Off button, and the other is the "Soft Off" function (coming from the M/B's onboard circuit controller) that can be controlled by the operating system such asWindows® 95/98/SE/ME or Windows®2000.
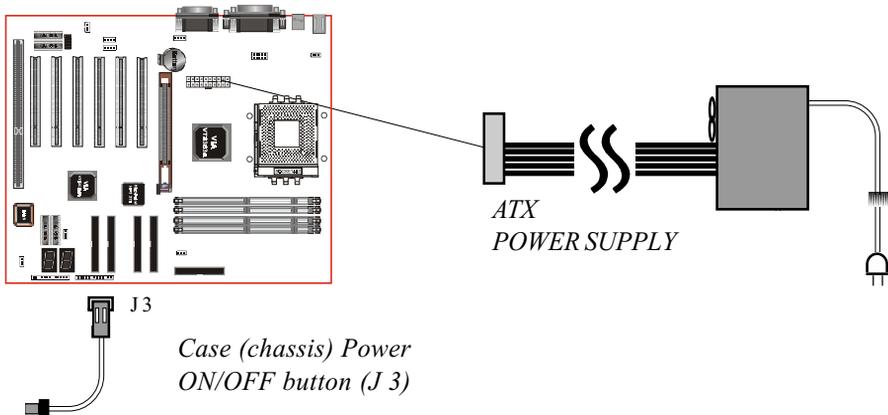


*Figure 4: Simple ATX Power ON/OFF Controller*

## System Block Diagram



AMD
Socket A
Processors

133/100MHz

4X

66MHz
AGP Bus

AGP Slot

PAC
PCI Bridge
and memory
controller
VT8363A

MA [0:13]
MD [0:63]
MPE [0:7]

133/100MHz

Optional

HPT370
ATA100
With RAID

UIDE 1
UIDE 2

Graphic
Video

AC
97

PCI Slots

VT82C686B
I/O Bridge

IDE 1
IDE 2

CD-Rom

USB 0,1   USB 2,3

HDD
(ATA-66/100)

Serial Port 1
Serial Port 2
LPT Port
PS/2 Mouse
PS/2 Keyboard

BIOS
Flash Memory

ISA Slot
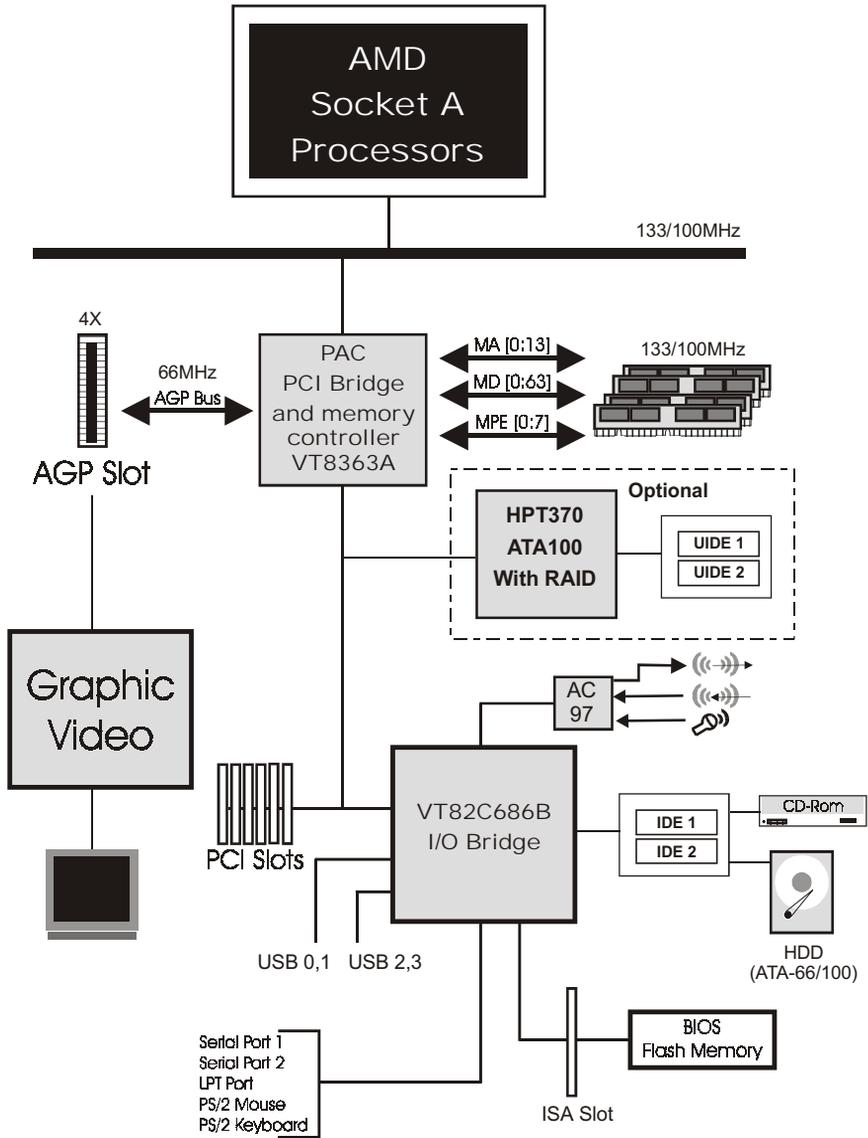
*Figure 5:  System Block Diagram*

# Section 2
# FEATURES

## Mainboard Features:

◆ **PROCESSOR**
   - AMD Athlon$^{TM}$, Duron$^{TM}$ Processors, Socket A, operating at 600MHz ~ 1.3GHz

◆ **CHIPSET**
   - VIA KT133A AGPset (KT133A + VT82C686B)

◆ **DRAM MODULE**
   - 168pin DIMM x 4 for PC133/VC133 Memory (6 Bank)
   - DRAM Size: 32MB to 1.5GB

◆ **EXPANSION SLOT**
   - PCI x 6, ISA x 1, and 4$X$ AGP x 1

◆ **ONBOARD I/O**
   - On-Chip I/O integrated with K/B, Mouse, FDD, Parallel and Serial, Fast IR and Power-ON controllers

◆ **ONBOARD PCI / IDE**
   - PCI Bus IDE Port with PIO / Ultra DMA-66/100 x 2 (Up to 4 Devices) Extra IDE Port by **HPT370A** with Ultra DMA 66/100 & IDE RAID x 2 (Up to 4 Devices)(Optional)

◆ **I/O CONNECTOR**
   - PS/2 Mouse and PS/2 style Keyboard

◆ **USB**
   - USB connector x 4

# Features

◆ **BIOS**

   - Award Plug & Play BIOS

◆ **Built-in AC97 Digital Audio(by VT82C686B)**

   - Dual full-duplex Direct Sound channels

   - H/W Sound Blaster Pro for DOS legacy compatibility

   - FM synthesis for legacy compatibility

   - Supports game and MIDI port

◆ **EXTENDED FUNCTION**

   - Supports exclusive USDM(Unified System Diagnostic Manager) and Hardware Monitoring Function by VT82C686B

   - Supports exclusive KBPO (KeyBoard Power On)

   - Supports Wake-On-LAN Function

   - Supports STR (Suspend To Ram) function

   - Supports CPU Vcore & VIO settings via BIOS

   - Supports CPU Clock & Multiplier settings via BIOS

   - Supports AGP power (voltage) setting via BIOS

   - P80P Debug (POST) Card onboard design with 7-Segment display

◆ **FORM FACTOR**

   - 305mm x 245mm ATX Size

# Section 3
# INSTALLATION

## Mainboard Detailed Layout
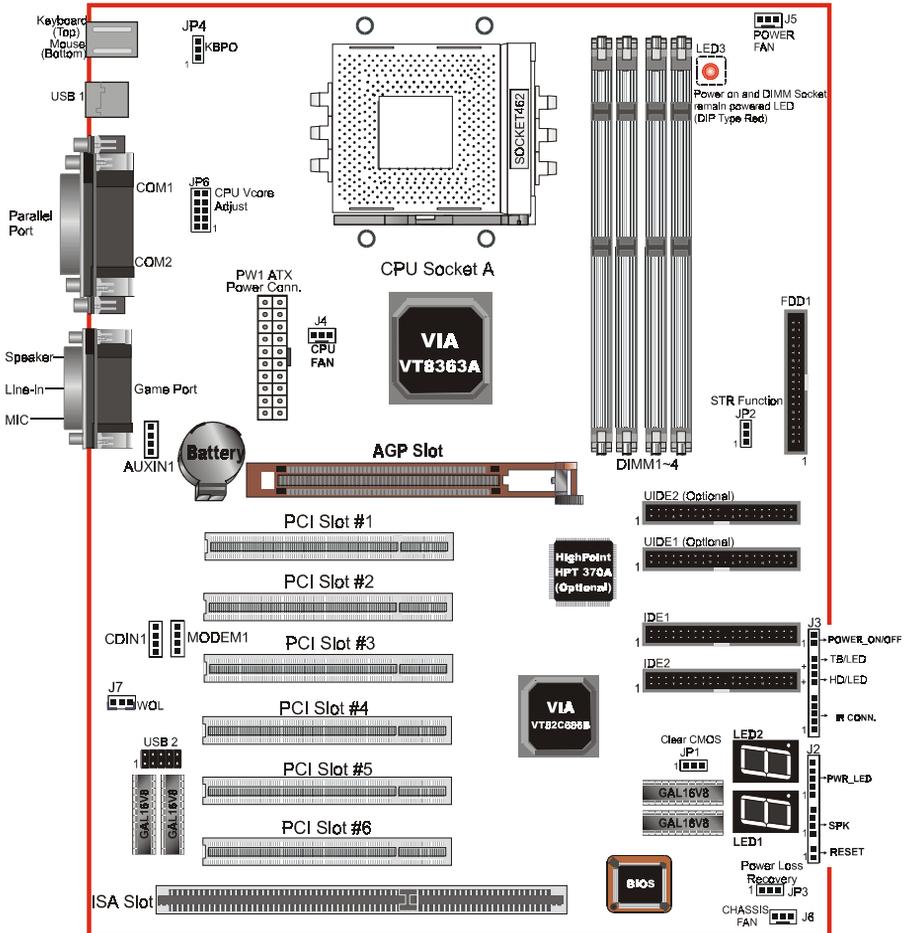


*Figure 1*

## Easy Installation Procedure

The following must be completed before powering on your new system:

    **3-1.    CPU Insertion**
    **3-2.    Jumper Settings**
    **3-3.    System memory Configuration**
    **3-4.    Device Connectors**
    **3-5     External Modem Ring-in Power ON and Keyboard Power ON Functions (KBPO)**
    **3-6.    STR Function**

## Section 3-1
## CPU Insertion

CPU Insertion: (use AMD Athlon™ as reference)
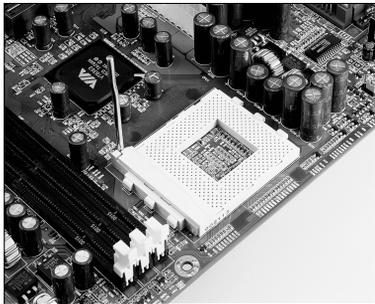


*Figure 2*

**Step 1**

Open the socket by raising the actuation lever.
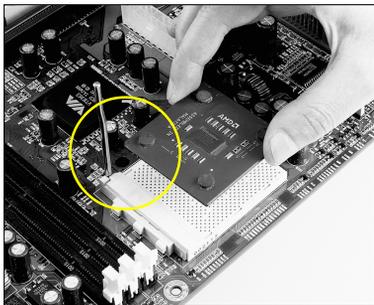


*Figure 3*

**Step 2**

Insert the processor.

Ensure proper pin 1 orientation by aligning the FC-PGA corner marking with the socket corner closest to the actuation arm tip. The pin field is keyed to prevent mis-oriented insertion.

Don't force processor into socket. If it does not go in easily, check for mis-orientation and debris. Make sure the processor is fully in-serted into the socket on all sides.
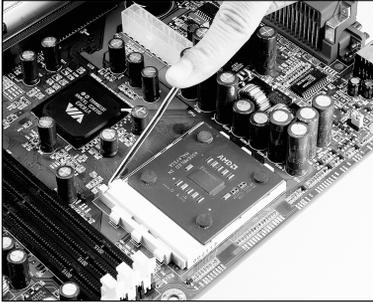
*Figure 4*

**Step 3**

Close the socket by lowering and locking the actuation lever.

**Step 4**

Thermal compound and qualified heatsink recommended by AMD are a must to avoid CPU overheat damage. For more information about installing your CPU, please refer to the AMD website article "Socket A AMD processor and Heatsink Installation Guide" http://www.amd.com/products/cpg/athlon/pdf/23986.pdf.
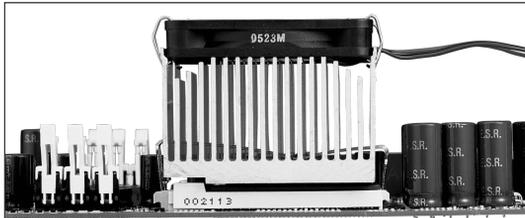


*Figure 5*

# Installation

## Section 3-2
## Jumper Settings

The mainboard was designed with very few jumpers to make your installation faster and easier.
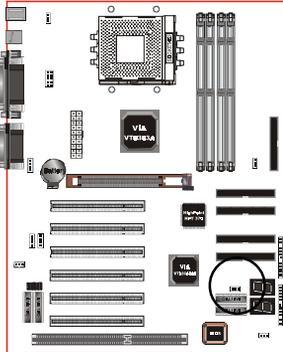


JP1     CMOS Clear
JP1  =  1-2  Normal (Default)
        =  2-3  Clear CMOS
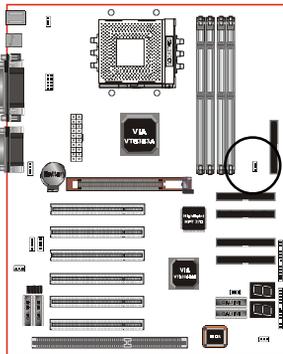


JP2     STR Function
JP2  =  1-2  Disabled (Default)
        =  2-3  Enabled
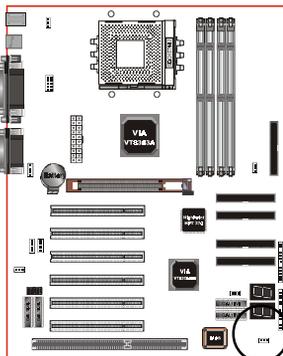


JP3     Power Loss Recovery
JP3  =  1-2  Disabled (Default)
        =  2-3  Enabled
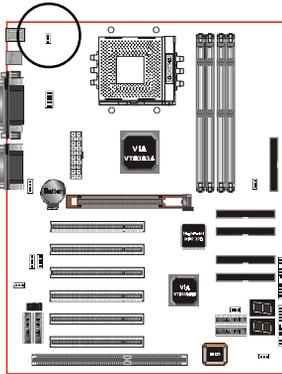
JP4    Keyboard Power-ON Function
JP4 = 1-2 Disabled (Default)
    = 2-3 Enabled
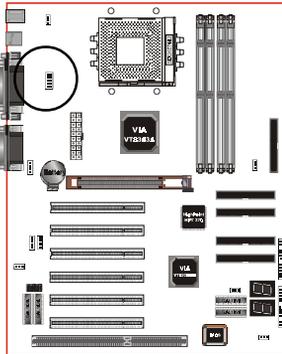
JP6    CPU Vcore Adjustable

| JP6 | CPU Vcore Adjust |
|------|------------------|
| 1-2 | +0.V (Default) |
| 3-4 | +0.1V |
| 5-6 | +0.2V |
| 7-8 | +0.3V |
| 9-10 | +0.4V |

*Note:*

1. JP6 is designed for extra voltage increment
2. Real Vcore Voltage =JP6 setting + Vcore Voltage displayed in the BIOS.
3. This table is nothing to do if the CPU Vcore Voltage Setting does not adjust to the highest in BIOS "Voltage Control" Setting.
4. Any over-spec setting may cause CPU damaged or burned. Please be cautious.
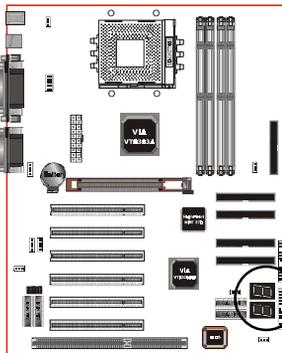
LED2    Debug card on board
(Please refer to Appendix C for
LED1    POST codes)

# Installation

## Section 3-4
## System Memory Configuration

## Memory Layout

The board supports (4) PC133/VC133 168-pin DIMMs (Dual In-line Memory Module). The DIMMs is for SDRAM (Synchronous DRAM).

- SDRAM may be 83MHz (12ns), 100MHz (10ns), 125MHz (8ns) or 133MHz (7.5ns) bus speed.
- If you use both 50ns and 60ns memory you must configure your BIOS to read 60ns.
- When using Synchronous DRAM we recommend using the 4 clock variety over the 2 clock.

Figure 6 and Table 1 show several possible memory configurations.

| DIMM 1: | Single-Sided<br>Double-Sided | Bank 0/1 |
|---------|------------------------------|----------|
| DIMM 2: | Single-Sided<br>Double-Sided | Bank 2/3 |
| DIMM 3: | Single-Sided: DIMM4 must be single-sided & same spec.<br>Double-Sided: DIMM4 must be empty | Bank 4/5 |
| DIMM 4: | Single-Sided: DIMM3 must be single-sided & same spec.<br>Double-Sided: DIMM3 must be empty | Bank 4/5 |

Synchronous DRAM
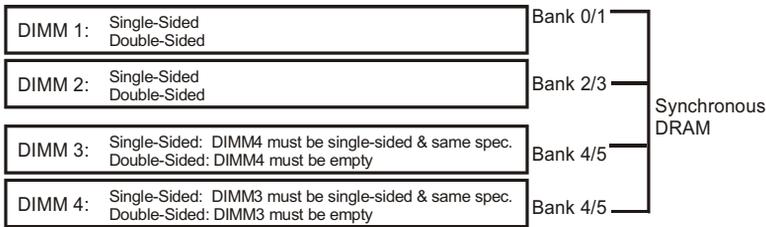
\* DIMM 3 & 4 are shared.          *Figure 6*

| Total Memory | DIMM 1<br>(Bank 0/1) | DIMM 2<br>(Bank 2/3) | DIMM 3<br>(Bank 4/5) | DIMM 4<br>(Bank 4/5) |
|---|---|---|---|---|
| = 512MB<br>Maximum | 32MB, 64MB, 128MB,<br>256MB, 512MB X 1 | None | None | None |
| = 1GB<br>Maximum | 32MB, 64MB, 128MB,<br>256MB, 512MB X 1 | 32MB, 64MB, 128MB,<br>256MB, 512MB X 1 | None | None |
| = 1.5GB<br>Maximum | 32MB, 64MB, 128MB,<br>256MB, 512MB X 1 | 32MB, 64MB, 128MB,<br>256MB, 512MB X 1 | 32MB, 64MB, 128MB,<br>256MB, 512MB X 1 | None |
| = 1.5GB<br>Maximum | 32MB, 64MB, 128MB,<br>256MB, 512MB X 1 | 32MB, 64MB, 128MB,<br>256MB, 512MB X 1 | None | 32MB, 64MB, 128MB,<br>256MB, 512MB X 1 |

*Table 1*

*\* SDRAM supports 32, 64, 128, 256MB, 512MB DIMM modules.*

*\* We recommend to use PC100/VC100 Memory Module for bus speed 100MHz and PC133/VC133 Memory for bus speed over 100MHz.*

*\* Using non-compliant memory with higher bus speed (over clocking) may severely compromise the integrity of the system.*

## DIMM Module Installation

Figure 7 displays the notch marks and what they should look like on your DIMM memory module.

DIMMs have 168-pins and two notches that will match with the onboard DIMM socket. DIMM modules are installed by placing the chip firmly into the socket at a 90 degree angle and pressing straight down (figure 8) until it fits tightly into the DIMM socket (figure 9).



LEFT KEY ZONE
*(UNBUFFERED)*

CENTER KEY ZONE
(3.3 V DRAM)
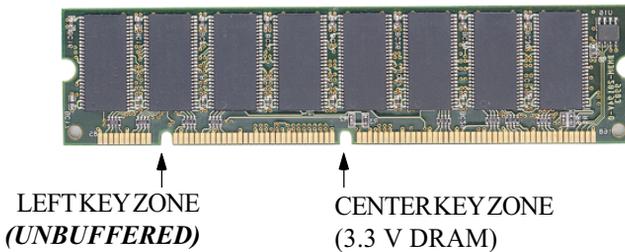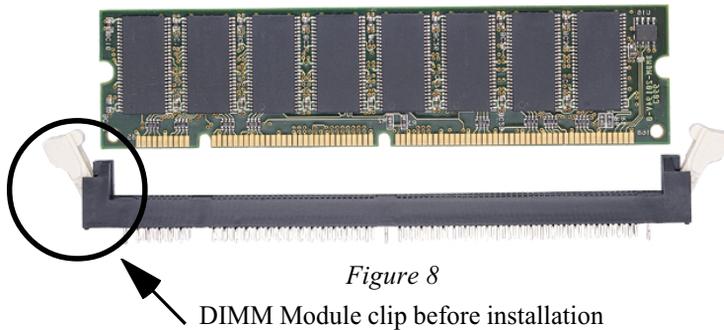
*Figure 7*



*Figure 8*
DIMM Module clip before installation
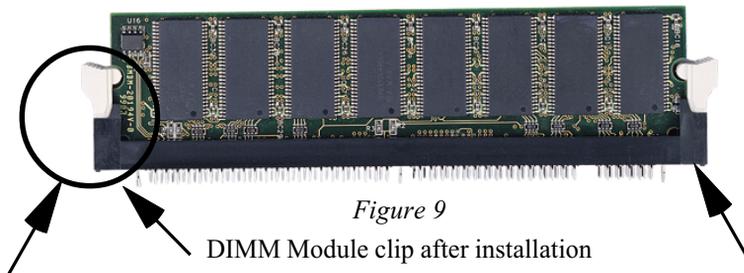


*Figure 9*
DIMM Module clip after installation

To remove the DIMM module simply press down both of the white clips on either side and the module will be released from the socket.

## Section 3-5
## Device Connectors
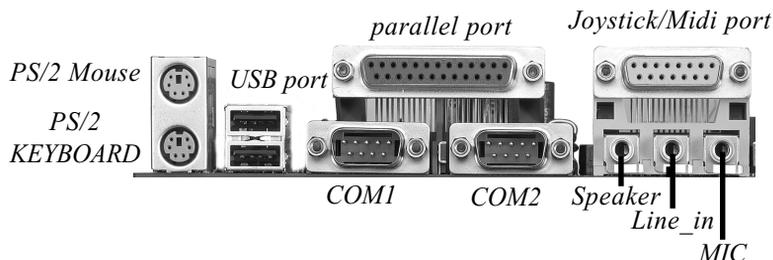


*Figure 10*

**J2,J3**: Chassis Panel Connector
  • Power_LED, Speaker, Reset, Power ON/Off, Turbo LED, HDD LED,
    IR Conn.,

**J4:** CPU Fan Power
  • A plug-in for the CPU Fan Power

**J5:** Power  Fan Power
  • A plug-in for the Power Supply Fan Power

**J6:** Chassis Fan Power
  • A plug-in for the chassis Fan Power

**J7:** WOL (Wake On Lan) Connector

**IDE1:** Ultra DMA66/100 Primary IDE Connector (supported by 686B chipset)
    (Blue Color)

**IDE2:** Ultra DMA66/100 Secondary IDE Connector (supported by 686B chipset)
    (Blue Color)

**UIDE1:** Ultra DMA66/100&RAID Primary IDE Connector (supported by HPT370A
    chipset) (Yellow Color)(Optional)

**UIDE2:** Ultra DMA66/100&RAID Secondary IDE Connector (supported by HPT370A
    chipset) (Yellow Color)(Optional)

**FDD1:** Floppy Controller Connector (Black Color)

**PW1:** ATX Power Connector
   • 20-pin power connector

**CDIN1**: CD Audio_IN Connector
   • Pin1(CD_IN_Left), Pin2/Pin3(CD_Reference), Pin4(CD_IN_Right)

**AUXIN1**: Auxiliary Line_IN Connector
   • Pin1(Left Line_IN), Pin2/Pin3(GND), Pin4(Right Line-IN)

**MODEM1**:   Telephony Connector for Modem audio output.
   • Pin1(Audio_in), Pin2/Pin3(GND), Pin4(Mic-out to Modem)

**USB2:** USB port header pins for adding two additional USB ports.
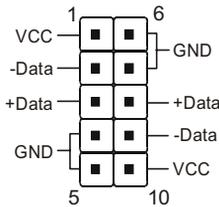


USB port header pin descriptions.

| PIN# | Wire color | Signal Name | Comment |
|------|-----------|-------------|-------------|
| 1 | Red | Vcc | Cable Power |
| 2 | White | -Data | Data |
| 3 | Green | +Data | Data |
| 4 | Black | Ground | Cable Ground |
| 5 | Black | Ground | Case Ground |
| 6 | Black | Ground | Case Ground |
| 7 | Black | Ground | Cable Ground |
| 8 | Green | +Data | Data |
| 9 | White | -Data | Data |
| 10 | Red | Vcc | Cable Power |

## Device Connectors (continued)

(This is connected to the power button on the case. Using the Soft-Off by Pwr-BTTN feature, you can choose either Instant Off (turns system off immediately), or 4 sec delay (you need to push the button down for 4 seconds before the system turns off). When the system is in 4 sec delay mode, suspend mode is enabled by pushing the button momentarily.)
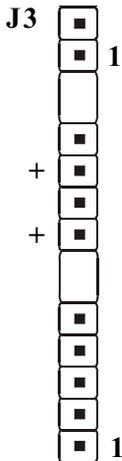
**J3**  **Power On/Off**

**Turbo LED indicator** - LED ON when higher speed is selected

**IDE LED indicator** - LED ON when Onboard PCI IDE Hard disks is activate

**IR Connector**
| | |
|---|---|
| 1. VCC | 4. GND |
| 2. NC | 5. IRTX |
| 3. IRRX | |
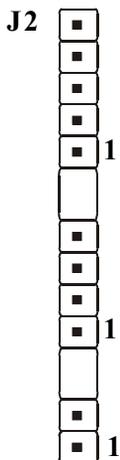
**J2**  **Power LED** - Power LED connector
| | |
|---|---|
| 1. Power  LED(+) | 4. NC |
| 2. N/C | 5. GND |
| 3. GND | |

**Speaker** - Connect to the system's speaker for beeping
| | |
|---|---|
| 1. Speaker | 3. GND |
| 2. N/C | 4. GND |

**Reset** - Closed to restart system.

## Section 3-6
## External Modem Ring-in Power
## ON and Keyboard Power ON
## Functions (KBPO)

On the basis of bounded functions in I/O chipset, the two serial ports are able to support the External Modem Ring-in Power ON function. Once users connect the external modem to COM1 or COM2, the mainboard allows users to turn on their system through the remote and host's dial-up control.

**Exclusive Keyboard Power ON Function**

To innovate a unique feature to benefit users, we devoted the easiest and most convenient way to turn on your system based on the the ATX power supply.

How to work with it

**Step 1:** Please check JP4 at the position 2-3 after you finished the system installation.

JP4         Keyboard Power-ON Function
                        JP4 = 1-2 Disabled (Default)
                             = 2-3 Enabled

**Step 2:** You can enjoy the Keyboard Power ON function (KBPO) by *pressing any key and BUTTON only to turn on your system.* Your system will be turned on automatically, after releasing the keys. To power off you system, you can use the Soft-OFF function under Windows® 95/98 or Windows®2000.

    *Notes:* ATX version 2.0 specification has recommended you use the power supply with 0.72A(720mA) in 5.0VSB. With our mainboard, *the 5.0VSB standby power only has to be > = 0.72A (720mA)* then you can enjoy this unique benefit. However, the ATX power supply which is < 0.72A (720mA) is still applicable to your system by placed JP4 at the position 1-2 to disable this feature.

## 3-7 STR (Suspend To RAM) Function

The board supports the STR power management state by maintaining the appropriate states on the SDRAM interface signals. The power source must be kept alive to the SDRAM during STR (ACPI S3). Advanced Configuration Power Interface (ACPI) provides more Energy Saving Features for operating systems that supporting Instant ON and QuickStart™ function.

1. To enable the ACPI function and use the STR functionally to save your system energy, you are recommended to confirm the following requirements:

   a. Please do install all ACPI qualified add-on cards such as AGP, LAN, Modem cards.

   b. In BIOS, please select " ACPI function: Enable" and "ACPI Suspend Type: S3(STR)" in the Power Management Setup menu.

   c. Then, please install the Windows® 98SE/ME or Windows® 2000.

   d. Restart your system.

   e. Getting in to the "Advanced" of the Power Management icon of Control Panel, and selecting the "Stand By" in the Power Buttons.

2. Getting start with STR function, please click the START button and choose Shut Down. Then, select the Stand By option in the Shut Down Windows box to get into STR mode.

   Here are the differences between STR power saving mode and Green (or Suspend) mode:

   a. It is the most advanced Power Management mode

   b. It cuts all the power supplied to peripherals except to Memory - max. power saving

   c. It saves and keeps all on-screen data including any executed applications to SDRAM.

d. You must push the Power button connected with onboard J3 pin to wake up you system (not to click to mouse or press keyboard to wake up the system).

Just pushing Power button, your system will quickly back to the last screen for you.

The "LED Indicator for ACPI Status" table shown below will guide you and give you a reference for ACPI status on this mainboard.

| ACPI Onboard's LED Status Indicator Table | | | | | |
|---|---|---|---|---|---|
| Onboard's LED Location | Status | | | | |
| | Plug in the ATX Power Core | Power ON J3(PW-ON) | Green Mode (S1) | STR (S3) | Shutdown (Soft-OFF) (S5) |
| LED3 (Red LED) | OFF | ON | ON | ON | OFF |
| J2 PW_LED | OFF | ON | Blinking | Blinking | OFF |

# Section 4
# AWARD BIOS SETUP

## Main Menu

Award's ROM BIOS provides a built-in Setup program which allows user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will stay unchanged unless there is a configuration change in the system, such as hard drive replacement or a device is added.

It is possible for the CMOS battery to fail, this will cause data loss in the CMOS only. If this does happen you will need to reconfigure your BIOS settings.

**To enter the Setup Program :**

Power on the computer and press the <Del> key immediately, this will bring you into the BIOS CMOS SETUP UTILITY.

```
          CMOS Setup Utility - Copyright (C) 1984-2000 Award Software

     ▶ 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        F9 : Menu in BIOS      ↑ ↓ → ←   : Select Item
     F10 : Save & Exit Setup

                      Time, Date, Hard Disk Type...
```

*Figure 1:  CMOS Setup Utility*

**BIOS**

The menu displays all the major selection items. Select the item you need to reconfigure.  The selection is made by moving the cursor (press any direction key ) to the item and pressing the 'Enter' key. An on-line help message is displayed at the bottom of the screen as the cursor is moved to various items which provides a better understanding of each function. When a selection is made, the menu of the selected item will appear so that the user can modify associated configuration parameters.

## 4-1 Standard CMOS Setup

Choose "Standard CMOS Setup" in the CMOS SETUP UTILITY Menu (Figure 2). The  Standard CMOS Setup allows the user to configure system settings such as the current date and time, type of hard disk drive installed, floppy drive type, and display type. Memory size is auto-detected by the BIOS and displayed for your reference. When a field is highlighted (use direction keys to move the cursor and the <Enter> key to select), the entries in the field can be changed by pressing the <PgDn> or the <PgUp> key.
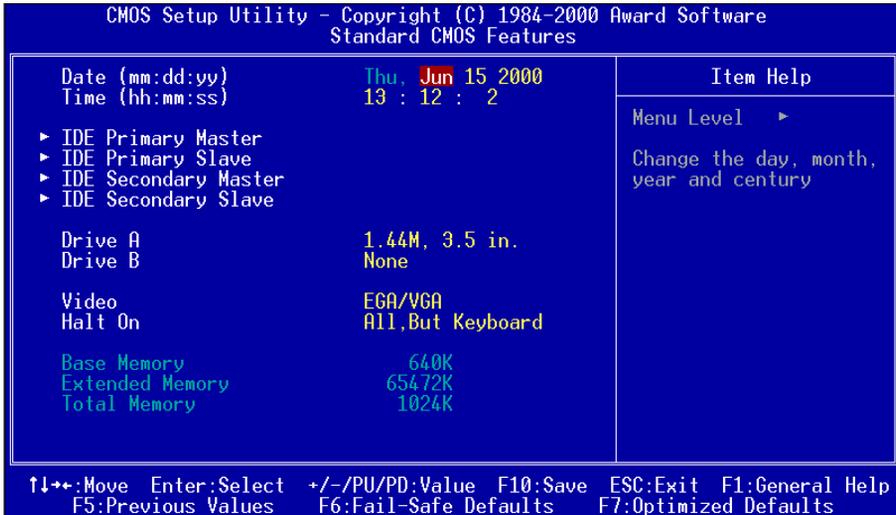


*Figure 2:  Standard CMOS Setup*

> *NOTE: If the hard disk Primary Master/Slave and Secondary Master/ Slave are set to Auto, then the hard disk size and model will be auto-detected.*

> *NOTE: The "Halt On:" field is used to determine when to halt the system by the BIOS if an error occurs.*

> *NOTE: Floppy 3 Mode support is a mode used to support a special 3.5" drive used in Japan.  This is a 3.5" disk that stores only 1.2 MB, the default setting for this is disabled.*

## 4-2 Advanced BIOS Features

Selecting the "BIOS FEATURES SETUP" option in the CMOS SETUP UTILITY menu allows users to change system related parameters in the displayed menu. This menu shows all  of the manufacturer's default values for the board.

Pressing the [F1] key will display a help message for the selected item.
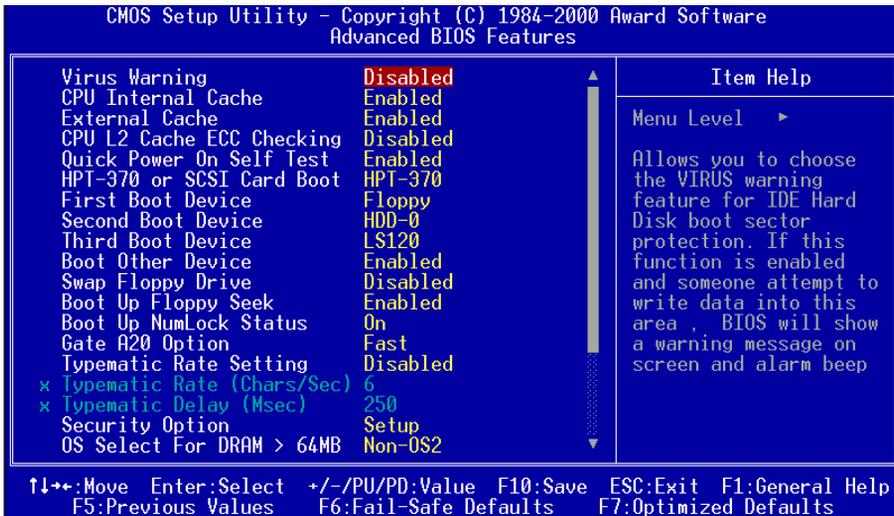


*Figure 3:  BIOS Features Setup*

# BIOS

**Virus Warning**: During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and an error message will appear.

You should then run an anti-virus program to locate the virus. Keep in mind that this feature protects only the boot sector, not the entire hard drive.
The default value is Disabled.

**Enabled**: Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector.

**Disabled**: No warning message will appear when anything attempts to access the boot sector.

*Note: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning.*

**CPU Internal Cache**: This controls the status of the processor's internal cache area. The default is Enabled.

**Enabled**: This activates the processor's internal cache thereby increasing performance.

**Disabled**: This deactivates the processor's internal cache thereby lowering performance.

**External (L2) Cache**: This controls the status of the external (L2) cache area. The default is Enabled.

**Enabled**: This activates the CPU's L2 cache thereby increasing performance.

**Disabled**: This deactivates the CPU's L2 cache thereby lowering performance.

**CPU L2 Cache ECC Checking**: This control if the CPU's L2 Cache will support Error Checking and Correcting (ECC). The default is Disabled.

**Enabled**: Enables ECC support for the CPU's L2 cache. Performance will decrease $2\% \sim 4\%$.

**Disabled**: Disables ECC support for the CPU's L2 cache.

**Quick Power On Self Test**: This category speeds up the Power On Self Test (POST). The default is Enabled.

**Enabled**: This setting will shorten or skip of the items checked during POST.

**Disabled**: Normal POST.

**HPT-370 or SCSI Card Boot:** Setup the boot up priority either from onboard HPT-370 connector or SCSI Card, if you select SCSI as the first boot device at the option below.

**First /Second/Third/Other Boot Device**: The BIOS attempts to load the operating system from the devices in the sequence selected in these items.
The choice: Floppy, LS120, HDD, SCSI, CDROM, Disabled.

**Swap Floppy Drive**: This will swap your physical drive letters A & B if you are using two floppy disks. The default is Disabled.
**Enabled**:    Floppy A & B will be swapped under the O/S.
**Disabled**:    Floppy A & B will be not swapped.

**Boot Up Floppy Seek**: During Power-On-Self-Test (POST), BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. Only 360K type is 40 tracks while 760K, 1.2MB and 1.44MB are all 80 tracks. The default is Enabled.
**Enabled**:    The BIOS will search the floppy disk drive to determine if it is 40 or 80 tracks.
**Disabled**:    The BIOS will not search for the type of floppy disk drive by track number.
   *Note:    BIOS can not tell the difference between 720K, 1.2MB and 1.44MB drive types as they are all 80 tracks.*

**Boot Up NumLock Status**: This controls the state of the NumLock key when the system boots. The default is On.
**On**: The keypad acts as a 10-key pad.
**Off**: The keypad acts like the cursor keys.

**Gate A20 Option**: This refers to the way the system addresses memory above 1MB (extended memory). The default is Normal.
**Normal**:    The A20 signal is controlled by the keyboard controller or chipset hardware.
**Fast**:    The A20 signal is controlled by Port 92 or chipset specific method.

# BIOS

**Typematic Rate Setting**:  This determines the keystrokes repeat rate.
The default is Disabled.
**Enabled**:   Allows typematic rate and typematic delay programming.
**Disabled**:  The typematic rate and typematic delay will be controlled by the
              keyboard controller in your system.

**Typematic Rate (Chars/Sec)**:  This is the number of characters that will be repeated
by a keyboard press. The default is 6.

|  |  |
|---|---|
| **6**:  6 characters per second. | **8**:  8 characters per second. |
| **10**:  10 characters per second. | **12**:  12 characters per second. |
| **15**:  15 characters per second. | **20**:  20 characters per second. |
| **24**:  24 characters per second. | **30**:  30 characters per second. |

**Typematic Delay (msec)**:  This setting controls the time between the first and
the second character displayed by typematic auto-repeat. The default is 250.
  **250**:  250 msec.
  **500**:  500 msec.
  **750**:  750 msec.
  **1000**:  1000 msec.

**Security Option**:  This category allows you to limit access to the System and
Setup, or just to Setup. The default is Setup.
**System**:   The system will not boot and the access to Setup will be denied if the
             correct password is not entered at the prompt.
**Setup**:    The system will boot; but the access to Setup will be denied if the
             incorrect password is not entered at the prompt.

**OS Select For DRAM > 64MB**:  Some operating systems require special
handling.  Use this option only if your system has greater than 64MB of memory.
The default is Non-OS2.
**OS2**:      Select this if you are running the OS/2 operating system with greater
             than 64MB of RAM.
**Non-OS2**: Select this for all other operating systems and configurations.

**Video BIOS Shadow**:  This option allows video BIOS to be copied into RAM.
Video Shadowing will increase the video performance of your system.
The default is Enabled.

**Enabled**:     Video shadow is enabled.
**Disabled**: Video shadow is disabled.

**C8000 - CBFFF Shadow**:
**CC000 - CFFFF Shadow**:
**D0000 - D3FFF Shadow**:
**D4000 - D7FFF Shadow**:

**D8000 - DBFFF Shadow**:

**DC000 - DFFFF Shadow**:

These categories determine whether ROMs from option cards will be copied into RAM.  This will be in 16K byte or 32K byte units, and the size will depend on chipset of the option card.

**Enabled**:  Optional shadow is enabled.
**Disabled**: Optional shadow is disabled.

## 4-3 Advanced Chipset Features

Choose the "CHIPSET FEATURES SETUP" in the CMOS SETUP UTILITY menu to display following menu.

```
          CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                          Advanced Chipset Features
     DRAM Timing By SPD          Enabled        ▲         Item Help
   x DRAM Clock                  100MHz
   x SDRAM Cycle Length          3                     Menu Level    ►
   x Bank Interleave             Disabled
     DRAM Page-Mode              Enabled
     Memory Hole                 Disabled
     PCI Master Pipeline Req     Enabled
     P2C/C2P Concurrency         Enabled
     Fast R-W Turn Around        Disabled
     System BIOS Cacheable       Disabled
     Video RAM Cacheable         Disabled
     AGP Aperture Size           64M
     AGP-4X Mode                 Enabled
     AGP Driving Control         Auto
   x AGP Driving Value           DA
     AGP Fast Write              Disabled
     OnChip USB                  Enabled
     OnChip USB 2                Disabled
     USB Keyboard Support        Disabled      ▼
   ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
       F5:Previous Values      F6:Fail-Safe Defaults   F7:Optimized Defaults
```

*Figure 4: Chipset Features Setup*

**DRAM Timing By SPD**: Select Enabled for setting SDRAM timing by SPD.
The Choice: Enabled, Disabled.

**DRAM Clock :** The item will synchronize/asynchronize DRAM operation clock.
Default is by SPD.
**100MHz**: DRAM is running at 100MHz frequency.
**133MHz**: DRAM is running at 133MHz frequency.

**SDRAM Cycle length**: This setting defines the CAS timing parameter of the
SDRAM in terms of clocks. Default is by SPD.
**2**: Provides faster memory performance.
**3**: Provides better memory compatibility.

**Bank Interleave:** The item allows you to set how many banks of SDRAM support
in your mainboard. Default is by SPD.
The Choice: 2 Bank, 4 Bank, Disabled.

**DRAM Page-Mode:** The item will active or inactive chipset page registers.
**Enabled**: Page-Mode Enabled.
**Disabled**: No page registers update and non Page-Mode operation.

**Memory Hole** : You can reserve this memory area for the use of ISA adaptor
ROMs. The default is Disabled.
**Enabled**: This field enables the main memory (15~16MB) to remap to ISA BUS.
**Disabled**: Normal Setting.
> Note: **If this feature is enabled you will not be able to cache this memory
> segment.**

**P2C/C2P Concurrency**: This item allows you to enable/disable the PCI to CPU,
CPU to PCI concurrency.

**Fast R-W Turn Around**: This item controls the DRAM timing. It allows you to
enable/disable the fast read/write turn around.

**System BIOS Cacheable**: This allows you to copy your BIOS code from slow
ROM to fast RAM. The default is Disabled.
**Enabled**: The option will improve system performance. However, if any program
writes to this memory area, a system error may result.
**Disabled**: System BIOS non-cacheable.

**Video RAM Cacheable**: This option allows the CPU to cache read/writes of the
video RAM. The default is Enabled.
**Enabled**: This option allows for faster video access.
**Disabled**: Reduced video performance.

**AGP Aperture Size**: The amount of system memory that the AGP card is
allowed to share. The default is 64.
>    **4**:    4MB of systems memory accessible by the AGP card.
>    **8**:    8MB of systems memory accessible by the AGP card.
>    **16**:   16MB of systems memory accessible by the AGP card.
>    **32**:   32MB of systems memory accessible by the AGP card.
>    **64**:   64MB of systems memory accessible by the AGP card.

   **128**:  128MB of systems memory accessible by the AGP card.
   **256**:  256MB of systems memory accessible by the AGP card.

**AGP-4X Mode**: Chipset AGP Mode support.
The choice: Enabled, Disabled.

**AGP Driving Control**: This item allows you to adjust the AGP driving force.
Choose Manual to key in a AGP Driving Value in the next selection.  This field is
recommended to set in Auto for avoiding any error in your system.

**AGP Fast Write**: Selecting Enabled allows to use Fast Write Protocol for 4X
AGP.

**OnChip USB/USB2**:  USB Connector (Port 0-1)/(Port 2-3).
The choice: Enabled, Disabled.

**USB Keyboard Support**:  This controls the activation status of an optional USB
keyboard that may be attached.  The default is disabled.
*Enabled*: Enable USB keyboard support.
*Disabled*: Disable USB keyboard support.

**OnChip Sound:**  Turn on/off onchip sound device.

**CPU to PCI Write Buffer**:  When enabled, up to four D words of data can be
written to the PCI bus without interruting the CPU.  When disabled, a write buffer
is not used and the CPU read cycle will not be completed until the PCI bus signals
that it is ready to receive the data.
The Choice: Enabled, Disabled.

**PCI Dynamic Bursting**:  When Enabled, data transfers on the PCI bus, where
possible, make use of the high-performance PCI bust protocol, in which graeater
amounts of data are transferred at a single command.
The Choice: Enabled, Disabled.

**PCI Master 0 WS Write**:  When Enabled, writes to the PCI bus are command
with zero wait states.
The Choice: Enabled, Disabled.

**PCI Delay 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.
The Choice: Enabled, Disabled.

**PCI #2 Access #1 Retry**:  This item allows you enabled/disable the PCI #2 Access #1 Retry.
The Choice: Enabled, Disabled.

**AGP Master 1 WS Write**:  When Enabled, writes to the AGP (Accelerated Graphics Port) are executed with one wait states.
The Choice: Enabled, Disabled.

**AGP Master 1 WS Read**:  When Enabled, read to the AGP (Accelerated Graphics Port) are executed with one wait states.
The Choice: Enabled, Disabled.

## 4-4 Integrated Peripherals

```
         CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                           Integrated Peripherals
    OnChip IDE Channel0          Enabled      ▲          Item Help
    OnChip IDE Channel1          Enabled
    IDE Prefetch Mode            Enabled            Menu Level    ▸
    Primary Master   PIO         Auto
    Primary Slave    PIO         Auto
    Secondary Master PIO         Auto
    Secondary Slave  PIO         Auto
    Primary Master   UDMA        Auto
    Primary Slave    UDMA        Auto
    Secondary Master UDMA        Auto
    Secondary Slave  UDMA        Auto
    Init Display First           PCI Slot
    IDE HDD Block Mode           Enabled
    Onboard FDD Controller       Enabled
    Onboard Serial Port 1        Auto
    Onboard Serial Port 2        Auto
    UART 2 Mode                  Standard
  × IR Function Duplex           Half
  × TX,RX inverting enable       No, Yes     ▼
 ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5:Previous Values      F6:Fail-Safe Defaults    F7:Optimized Defaults
```

*Figure 5: Integrated Peripherals*

Note:    **If you do not use the Onboard IDE connector, then you will need to set Onboard Primary PCI IDE: Disabled and Onboard Secondary PCI IDE: Disabled**

Note:    **The Onboard PCI IDE cable should be equal to or less than 18 inches (45 cm.).**

**OnChip IDE Channel0**: The default value is Enabled.
**Enabled**:  Enables Onboard IDE primary port.
**Disabled**: Disables Onboard IDE primary port.

**OnChip IDE Channel1**: The default is Enabled.
**Enabled**:  Enables Onboard IDE secondary port.
**Disabled**: Disables Onboard IDE secondary port.

**IDE Prefetch Mode**:  Enable prefetching for IDE drive interfaces that support its faster drive accesses.  If you are getting disk drive errors, change the setting to omit the drive interface where the errors occur. Depending on the configuration of your IDE subsystem, this field may not appear, and it does not appear when the Internal PCI/IDE field, above, is Disabled.
The Choice: Enabled, Disabled.

**Primary Master PIO:** The default is Auto.
**Auto**: BIOS will automatically detect the Onboard Primary Master PCI IDE HDD Accessing mode.
**Mode 0~4**: Manually set the IDE Programmed interrupt mode.

**Primary Slave PIO:** The default is Auto.
**Auto**: BIOS will automatically detect the Onboard Primary Slave PCI IDE HDD Accessing mode.
**Mode 0~4**: Manually set the IDE Programmed interrupt mode.

**Secondary Master PIO**: The default is Auto.
**Auto**: BIOS will automatically detect the Onboard Secondary Master PCI IDE HDD Accessing mode.
**Mode 0~4**: Manually set the IDE Programmed interrupt mode.

**Secondary Slave PIO**: The default is Auto.
**Auto**: BIOS will automatically detect the Onboard Secondary Slave PCI IDE HDD Accessing mode.
**Mode 0~4**: Manually set the IDE Programmed interrupt mode.

**Primary Master UDMA**: This allows you to select the mode of operation for the hard drive. The default is Auto.
**Auto**: The computer will select the optimal setting.
**Disabled**: The hard drive will run in normal mode.

**Primary Slave UDMA**: This allows you to select the mode of operation for the hard drive. The default is Auto.
**Auto**: The computer will select the optimal setting.
**Disabled**: The hard drive will run in normal mode.

**Secondary Master UDMA**: This allows you to select the mode of operation for the hard drive. The default is Auto.
**Auto**: The computer will select the optimal setting.
**Disabled**: The hard drive will run in normal mode.

**Secondary Slave UDMA**: This allows you to select the mode of operation for the hard drive. The default is Auto.
**Auto**: The computer will select the optimal setting.
**Disabled**: The hard drive will run in normal mode.

# BIOS

**Init Display First:** If two video cards are used (1 AGP and 1 PCI) this specifies which one will be the primary display adapter. The default is PCI Slot.
**PCI Slots**: PCI video card will be primary adapter.
**AGP:**       AGP video card will be primary adapter.

**IDE HDD Block Mode**: IDE Block Mode allows the controller to access blocks of sectors rather than a single sector at a time. The default is Enabled.
**Enabled**: Enabled IDE HDD Block Mode. Provides higher HDD transfer rates.
**Disabled**: Disable IDE HDD Block Mode.

**Onboard FDD Controller**: This controls the state of the onboard floppy controller. The default value is Enabled.
**Enabled**: Enable the Onboard VIA686B's floppy drive interface controller.
**Disabled**: Disable the Onboard VIA686B's floppy drive interface controller.

**Onboard Serial Port 1**: This field allows the user to configure the 1st serial port. The default is Auto.
**AUTO**:     Enable Onboard Serial port 1 and address is Auto adjusted.
**COM1**:     Enable Onboard Serial port 1 and address is 3F8H/IRQ4.
**COM2**:     Enable Onboard Serial port 1 and address is 2F8H/IRQ3.
**COM3**:     Enable Onboard Serial port 1 and address is 3E8H/IRQ4.
**COM4**:     Enable Onboard Serial port 1 and address is 2E8H/IRQ3.
**Disabled**: Disable Onboard VIA686B's Serial port 1.

**Onboard Serial Port 2**: This field allows the user to configure the 2nd serial port. The default is Auto.
**AUTO**:     Enable Onboard Serial port 2 and address is Auto adjusted.
**COM1**:     Enable Onboard Serial port 2 and address is 3F8H/IRQ4.
**COM2**:     Enable Onboard Serial port 2 and address is 2F8H/IRQ3.
**COM3**:     Enable Onboard Serial port 2 and address is 3E8H/IRQ4.
**COM4**:     Enable Onboard Serial port 2 and address is 2E8H/IRQ3.
**Disabled**: Disable Onboard VIA686B's Serial port 2.

**UART 2 Mode**: This item allows you to determine which Infra Red (IR) function of onboard I/O chip.
The Choice: Standard, ASKIR, HPSIR.

**Onboard Parallel port**: This field allows the user to configure the LPT port. The default is 378H / IRQ7.

**378H**:     Enable Onboard LPT port and address is 378H and IRQ7.
**278H**:     Enable Onboard LPT port and address is 278H and IRQ5.
**3BCH**:     Enable Onboard LPT port and address is 3BCH and IRQ7.
**Disabled**: Disable Onboard VIA686B's LPT port.

**Onboard Parallel Port Mode**: This field allows the user to select the parallel port mode.
The default is Normal.
**Normal**: Standard mode. IBM PC/AT Compatible bidirectional parallel port.
**EPP**: Enhanced Parallel Port mode.
**ECP**: Extended Capabilities Port mode.
**EPP+ECP**: ECP Mode & EPP Mode.

**ECP Mode USE DMA**: This field allows the user to select DMA1 or DMA3 for the ECP mode. The default is DMA3.
**DMA1**: This field selects the routing of DMA1 for the ECP mode.
**DMA3**: This field selects the routing of DMA3 for the ECP mode.

**Parallel Port EPP Type**: This item allows you to determine the IR transfer mode of onboard I/O chip.
The Choice: EPP1.9, EPP1.7.

**Onboard Legacy Audio:**  Legacy Audio enabled/disabled.

**Sound Blaster:**  Sound Blaster compatible device enabled/disabled.

**SB I/O Base Address:**  Sound Blaster I/O resource selection.

**SB IRQ Select:** Legacy audio device IRQ selection.

**SB DMA Select:**  Sound Blaster DMA channel selection.

**MPU-401:**  MPU-401 function enabled/disabled.

**MPU-401 I/O Address:**  Built-in MPU-401 compatible MIDI I/O port selection:
  *300-303H*
  *310-313H*
  *320-323H*
  *330-333H (default)*

**Game Port (200-207H):**  Built-in joystick port support disabled/enabled(default).

## 4-5 Power Management Setup

Choose the "POWER MANAGEMENT SETUP" in the CMOS SETUP UTILITY to display the following screen. This menu allows the user to modify the power management parameters and IRQ signals. In general, these parameters should not be changed unless it's absolutely necessary.



```
        CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                         Power Management Setup

     ACPI function            Enabled              Item Help
  ▶  Power Management         Press Enter
     ACPI Suspend Type        S1(POS)          Menu Level    ▶
     PM Control by APM        Yes
     Video Off Option         Suspend -> Off
     Video Off Method         V/H SYNC+Blank
     MODEM Use IRQ            3
     Soft-Off by PWRBTN       Instant-Off
     State After Power Failure Off
  ▶  Wake Up Events           Press Enter


  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
        F5:Previous Values    F6:Fail-Safe Defaults    F7:Optimized Defaults
```

*Figure 6:  Power Management Setup*

**ACPI Function**: This option allows you to select ACPI Function.
The default is Enabled.
**Enabled**:  Support ACPI function for new O.S
**Disabled**: No Support ACPI function.

You can only change the content of Doze Mode, Standby Mode, and Suspend Mode when the Power Management is set to 'User Define'.

**Power Management**: Use this to select your Power Management selection.
The default is User define.
**Max. saving**:    Maximum power savings. Inactivity period is 1 minute in each mode.
**Min. saving**:   Minimum power savings. Inactivity period is 1 hour in each mode.
**User define**:    Allows user to define PM Timers parameters to control power
                saving mode.

**ACPI Suspend Type**: This item allows you to select S1(POS) or S3(STR) function. The choice: S1(POS), S3(STR).

**PM controlled by APM**: This option shows weather or not you want the Power Management to be controlled the Advanced Power Management (APM). The default is Yes.

**Yes**: APM controls your PM

**No**: APM does not control your PM

**Video Off Option**: Tells you what time frame that the video will be disabled under current power management settings. The default is Standby.

**Standby**: Video powers off after time shown in standby mode setting.

**Doze**: Video powers off after time shown in doze mode setting.

**Suspend**: Video powers off after time shown in suspend mode setting.

**N/A**: Video power off not controlled by power management.

**Video Off Method**: This option allows you to select how the video will be disabled by the power management. The default is V/H Sync + Blank

**V/H Sync + Blank**: System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.

**DPMS**: Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.

**Blank Screen**: System only writes blanks to the video buffer.

**MODEM Use IRQ**: Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system. Default is IRQ 3.

**N/A**: No IRQ is used.      **3**: IRQ 3

**4**: IRQ 4          **5**: IRQ 5

**7**: IRQ 7          **9**: IRQ 9

**10**: IRQ 10          **11**: IRQ 11

**Soft-Off by PWRBTN**:  Use this to select your soft-off function.
The default is Delay 4 sec.
**Instant Off**:  Turns off the system instantly.
**Delay 4 Second** :  Turns off the system after a 4 second delay.  If momentary
                    press of button, the system will go into Suspend Mode.  Press
                    the power botton again to make system back to work.

**State After Power Failure**:  This field lets you determine the state that your PC
returns to after a power failure.  If set to Off, the PC will not boot after a power
failure, if set to On, the PC will restart after a power failure.

**VGA:**  When set to On (default), any event occurring at a VGA port will awaken a
system which has been powered down.

**LPT & COM:**  When set to *On* (default), any event occurring at a COM(serial)/
LPT (printer) port will awaken a system which has been powered down.

**HDD & FDD**:  When set to *On* (default), any event occurring at a hard or floppy
drive port will awaken a system which has been powered down.

**PCI Card**:  When set to *On* (default), any event occurring to the DMA controller
will awaken a system which has been powered down.

**Modem Ring Resume**:  When set to *Enabled*, any event occurring to the Modem
Ring will awaken a system which has been powered down.

**RTC Alarm Resume**:  When set to *Enable rtc alarm resume,* you could set the
date (of month) and timer (hh:mm:ss), any event occurring at will awaken a
system which has been powered down.

**Primary INTR**:  When set to *On* (default), any event occurring at will awaken a system which has been powered down.

## 4-6 PNP/PCI Configuration

The PNP/PCI configuration program is for the user to modify the PCI/ISA IRQ signals when various PCI/ISA cards are inserted in the PCI or ISA slots.

*WARNING: Conflicting IRQ's may cause the system to not find certain devices.*

```
         CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                            PnP/PCI Configurations

     PNP OS Installed             No                      Item Help
     Reset Configuration Data     Disabled
                                                  Menu Level   ►
     Resources Controlled By      Auto(ESCD)
   x IRQ Resources                Press Enter    Select Yes if you are
   x DMA Resources                Press Enter    using a Plug and Play
                                                 capable operating
     PCI/VGA Palette Snoop        Disabled       system Select No if
     Assign IRQ For VGA           Enabled        you need the BIOS to
     Assign IRQ For USB           Enabled        configure non-boot
     PCI Latency Timer(CLK)        32            devices
     INT Pin 1 Assignment         Auto
     INT Pin 2 Assignment         Auto
     INT Pin 3 Assignment         Auto
     INT Pin 4 Assignment         Auto




   ↑↓←→:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
        F5:Previous Values     F6:Fail-Safe Defaults    F7:Optimized Defaults
```

*Figure 7:  PCI Configuration Setup*

**PNP OS Installed**: Do you have a PNP OS installed on  your system. The default is No.

**Yes**:  Select if you are using a PNP OS.
**No**:    Select if your OS does not support PNP.

**Resources Controlled By**:  Who controlled the system PNP/PCI resources. The default is Auto.

**Manual**:   PNP Card's resources will be controlled manually. You can set which IRQ-X and DMA-X are assigned to PCI/ISA PNP or Legacy ISA Cards.

# BIOS

**Auto**:     If your ISA card and PCI card are all PNP cards, BIOS will assign the interrupt resource automatically.

**Reset Configuration Data**: This setting allows you to clear ESCD data.
The default is Disabled
**Disabled**:   Normal Setting.
**Enabled**:   If you have plugged in some Legacy cards to the system and they were recorded into ESCD (Extended System Configuration Data), you can set this field to Enabled in order to clear ESCD.

**PCI/VGA Palette Snoop:** Leave this field at Disabled.
The choice: Enabled, Disabled.

**Assign IRQ For VGA/USB**: This item allows BIOS to assign whether IRQ is with VGA/USB or not.  If you have not connect the VGA/USB device.  Can release the IRQ for other device.  The default is Enabled.
**Enabled**:   Provides IRQ for VGA/USB device.
**Disabled**: Release IRQ for other device.

**PCI Latency Timer (CLK)**:  The latency timer defines the minimum amount of time, in PCI clock cycles, that the bus master can retain the ownership of the bus. The Choice: 0-255.

**INT Pin1 to Pin4 Assignment:**  These settings allow the user to specify what IRQ will be assigned to PCI devices in the chosen slot. Options available: Auto,3, 4,5,7,9,10,11,12,14 & 15. The defaults are Auto.

## 4-7 PC Health Status

```
         CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                            PC Health Status

   Current CPU Temp.          31ºC/87ºF           ┌──────────────────┐
   Current System Temp.       0ºC/32ºF            │    Item Help     │
   Current  CPU  Fan  Speed   6135 RPM            ├──────────────────┤
   Current Chassis Fan  Speed 0 RPM               │ Menu Level    ►  │
   Vcore                      1.62V               │                  │
   AGP Vcore                  1.52V               │                  │
    3.3V                      3.22V               │                  │
     5V                       5.01V               │                  │
     12V                      12.12V              │                  │
                                                  │                  │
                                                  │                  │
                                                  │                  │
                                                  │                  │
                                                  │                  │
                                                  │                  │
                                                  └──────────────────┘
  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
     F5:Previous Values     F6:Fail-Safe Defaults   F7:Optimized Defaults
```

**Current CPU Temperature**:   This is the current temperature of the CPU.

**Current System Temperature:**  This is the Current temperature of the system.

**Current CPU FAN Speed**:  The current CPU fan speed in RPMs.

**Current Chassis FAN Speed**:  The current chassis fan speed in RPMs.

**CPU(V)**:   The voltage level of the CPU(Vcore).

**AGP Vcore**:   The voltage level of Power supplied to AGP card.
             1.52V: for 4X AGP card.
             3.3V  : for 2X AGP card.

**3.3V, 5V, 12V**:  The voltage level of the switch power supply.

## 4-8 Frequency/Voltage Control

```
       CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                         Frequency/Voltage Control
    Auto Detect DIMM/PCI Clk    Enabled              Item Help
    Spread Spectrum             Disabled
    CPU Clock                   100MHz         Menu Level    ▶
    CPU Ratio                   Default
    CPU default Ratio           x 10

    Vcore Voltage               Default
    Vcore Voltage               1.75V
    Vagp Voltage                Default
    Vagp Voltage                1.52V
    Vio Voltage                 Default
    Vio Voltage                 3.4V




    ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
       F5:Previous Values    F6:Fail-Safe Defaults   F7:Optimized Defaults
```

**Auto Detect DIMM/PCI Clk**:  When enabled the motherboard will automatically disable the clock source for a DIMM socket which does not have a module in it. Same applies for PCI slots.  This setting will reduce the EMI.  The default is Enabled.

**Spread Spectrum:**  The item allows you to enable/disable the spectrum module.

**CPU Clock :**  The mainboard is designed to set the CPU clock at jumperfree. This item allows you to select the CPU clock speed by 1MHz.  The default CPU speed is  auto detect.
*Note:  Overclocking failure will cause system No display problem.  Please press "Insert " key to back to the initial or default setting to boot up your system.*

**CPU default Ratio :** This item allows you to select the CPU ratio. If the CPU ratio is fixed.  This item was no function.  Configuration options: Default, [5.x].... [12.x].

**Vcore Voltage:** This item allows you to increase the CPU Vcore Voltage. The Options:  Default, ±0.025V increment.
**Note:** *The Vcore Voltage displayed here is nothing to do with the value(s) increased by JP6 setting.*
*Any over-spec setting may casue CPU damaged or burned.*

**Vagp Voltage:** This item allows you to increase the Vagp Voltage. (Applicable when you plug in AGP card.)
The Options: Default, +0.1V increment.

**Vio Voltage:** This item allows you to increase the CPU Vio Voltage.
The Options: Default, +0.05V increment.

## 4-9 Defaults Menu

Selecting "Defaults" from the main menu shows you two options which are described below

**Load Fail-Safe Defaults**

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Fail-Safe Defaults (Y/N) ?  N

Pressing 'Y' loads the BIOS default values for the most stable, minimal-performance system operations.

**Load Optimized Defaults**

When you press <Enter> on this item you get a confirmation dialog box with a message similar to:

Load Optimized Defaults (Y/N) ?  N

Pressing 'Y' loads the default values that are factory settings for optimal performance system operations.

## 4-10 Supervisor/User Password Setting

You can set either supervisor or user password, or both of then.  The differences between are:

**supervisor password :** can enter and change the options of the setup menus.

**user password**      : just can only enter but do not have the right to change   the options of the setup menus. When you select this function, the following message will appear at the center of the screen to assist you in creating a password.

<div align="center">

ENTER PASSWORD:

</div>

Type the password, up to eight characters in length, and press <Enter>.  The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password.  Type the password again and press <Enter>.  You may also press <Esc> to abort the selection and not enter a password. To disable a password, just press <Enter> when you are prompted to enter the password.  A message will confirm the password will be disabled.  Once the password is disabled, the system will boot and you can enter Setup freely.

<div align="center">

PASSWORD DISABLED.

</div>

When a password has been enabled, you will be prompted to enter it every time you try to enter Setup.  This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted.  This would prevent unauthorized use of your computer.

You determine when the password is required within the BIOS Features Setup Menu and its Security option (see Section 3).  If the Security option is set to "System", the password will be required both at boot and at entry to Setup.  If set to "Setup", prompting only occurs when trying to enter Setup.

## 4-11 Exit Selecting

### Save  & Exit Setup

Pressing <Enter> on this item asks for confirmation:

### Save to CMOS and EXIT (Y/N)?  Y

Pressing "Y" stores the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off.  The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

### Exit Without Saving

Pressing <Enter> on this item asks for confirmation:

### Quit without saving (Y/N)?  Y

This allows you to exit Setup without storing in CMOS any change.  The previous selections remain in effect.  This exits the Setup utility and restarts your computer.

Page Left Blank

# Section 5
# Driver Installation

## Easy Driver Installation



**Insert the bundled autorun driver in CD-disk.**

**Step 1 :** Click **SERVICE PACK 4IN1 DRIVER**. Install all components recommended.

**Step 2 :** Click **686A/B AUDIO DRIVER** to install the Audio Sound Driver.

**Step 3 :** Click **USB Driver** to install USB.

**Step 4 :** Click **HPT370(A) DRIVER** to install HPT370(A).

**Step 5 :** Click **HPT370(A) RAID ADMINISTRATOR** to install HPT370(A) RAID Administrator.

**Step 6 :** To Click the **NORTON ANTIVIRUS 2001** and follow the setup to finish the installation.  Please Do make sure to update the virus definition code regularly to protect your system form virus damage.

# Drivers Installation

## 🖳 To install VIA Service Pack 4in1

**Welcome**

Welcome to the VIA Service Pack Setup program. This program will install VIA Service Pack on your computer.

It is strongly recommended that you exit all Windows programs before running this Setup program.

Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.

WARNING: This program is protected by copyright law and international treaties.

Unauthorized repr... this program, or any portion of it, may i... (1)Click here ...minal penalties, and will be prosecuted... ...ssible under law.

*(1)Click here*

Next >    Cancel

---

**VIA Service Pack 1 README**

VIA Service Pack 1 README. Press PAGE DOWN key to see the rest of document.

```
*******************************
     VIA Service Pack
      ( VIA 4 In 1 )
       README.TXT
*******************************
VIA Service Pack (VIA 4 In 1) is Copyright(C) 1999 VIA Technologies, Inc.

Table of Contents:
    About VIA 4 In 1
    Setting Up
    Update
    Technical Support
    Special Note (WinFast AGP VGA users o...
```

Clicking Yes means you have read and agreed with the lic...se agreement and README. Click No to decline and Exit

*(2)Click here*

< Back    Yes    No

---

**Select Components**

This setup program will install the following drivers. If you don't want to install them, you can uncheck the associated check box.

☑ VIA ATAPI Vendor Support Driver
☑ AGP VxD Driver
☑ IRQ Routing Miniport Driver
☑ VIA INF Driver 1.02

*(3)Click here*

< Back    Next >    Cancel

---

**ATAPI Vendor Support Driver 2.1.50**

Install/Uninstall ATAPI Vendor Support Driver.

◉ Install VIA ATAPI Vendor Support Driver
○ Uninstall VIA ATAPI Vendor Support Driver

*(4)Click here*

< Back    Next >    Cancel

---

**ATAPI Vendor Support Driver 2.1.50**

Default IDE DMA Mode Control

☐ Click to enable DMA Mode

*(5)Click here*

< Back    Next >    Cancel

---

**VIA_GART AGP Driver 4.04**

Setup program will install/uninstall AGP driver for you.

○ Install VIA AGP VxD in Standard mode
◉ Install VIA AGP VxD in Turbo mode
○ Uninstall VIA AGP VxD

*(6)Click here*

< Back    Next >    Cancel

---

**IRQ Routing Driver 1.30**

Install/Uninstall IRQ Routing Miniport Driver.

◉ Install VIA IRQ Routing Miniport Driver
○ Uninstall VIA IRQ Routing Miniport Driver

*(7)Click here*

< Back    Next >    Cancel

---

**Setup Complete**

Setup has finished copying files to your computer.

Before you can use the program, you must restart Windows or your computer.

◉ Yes, I want to restart my computer now.
○ No, I will restart my computer later.

Remove any disk... ...n click Finish to complete setup.

*(8)Click here*

< Back    Finish

---

## 🖳 To install 686A/B Audio Driver



(1)Click here

(2)Click here

(3)Click here

## 🖳 To install USB Driver



(1)Click here

(2)Click here

(3)Click here

Page Left Blank

# Appendix A

## A-1  EEPROM BIOS Remover

Do not remove the BIOS chip, unless instructed by a technician and only with a PLCC IC extractor tool.



The BIOS socket may be damaged if using an improper method to replace the BIOS chip.

Page Left Blank

# Appendix B

## B-1  GHOST 5.1/6.03 Quick User's Guide

Installation is very easy.  You only need to copy the **Ghost5** folder or **Ghost.exe** to your hard disk.
The current market version is for single **Client**, so the LPT and NetBios portions will not be explained further.

### Description of Menus

**Ghost** clones and backs up **Disk** and **Partition.**
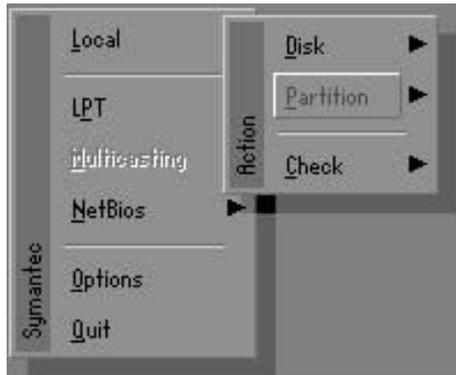


In which  **Disk** indicates hard disk options
**Partition** indicates partition options
**Check** indicates check options

### Disk
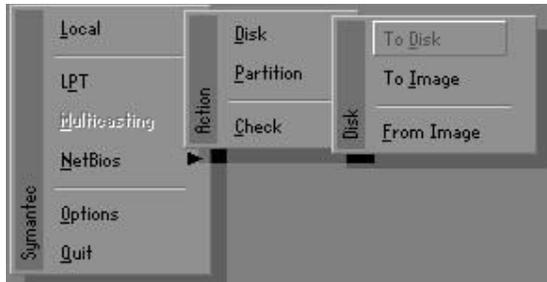
**There are 3 hard disk functions:**
   1. Disk To Disk (disk cloning)
   2. Disk To Image (disk backup)
   3. Disk From Image (restore backup)

**Important!**

1. To use this function, the system must have at least 2 disks.  Press the **Tab** key to move the cursor.

2. When restoring to a destination disk, all data in that disk will be completely destroyed**.**


**Disk To Disk (Disk Cloning)**

1. Select the location of the **Source drive**.
2. Select the location of the **Destination drive**.
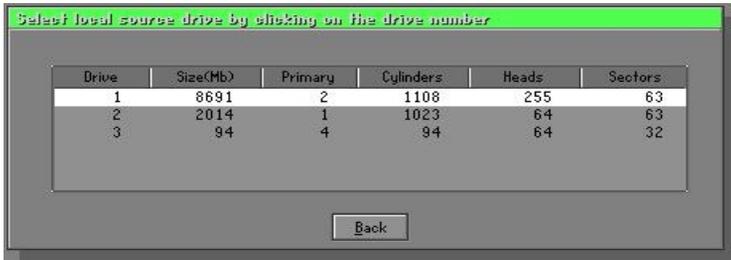


3. When cloning a disk or restoring the backup, set the required partition size as shown in the following figure.

4. Click OK to display the following confirmation screen. Select **Yes** to start.
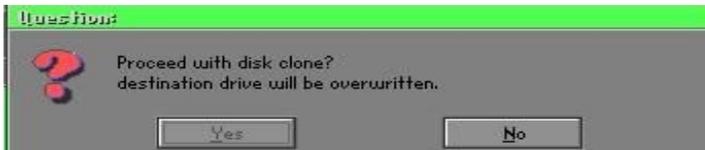


## Disk To Image (Disk Backup)

1. Select the location of the Source drive.
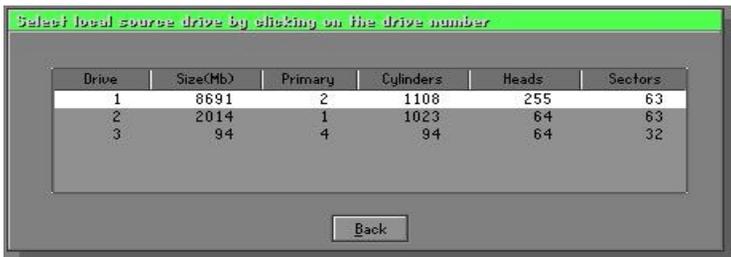


2. Select the location for storing the backup file.
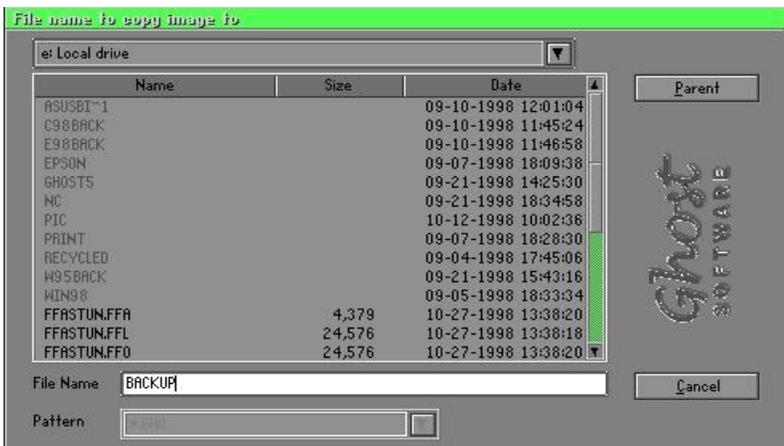
3. Click **OK** to display the following confirmation screen. Select **Yes** to start.



## Disk From Image (Restore Backup)

1. Select the Restore file.
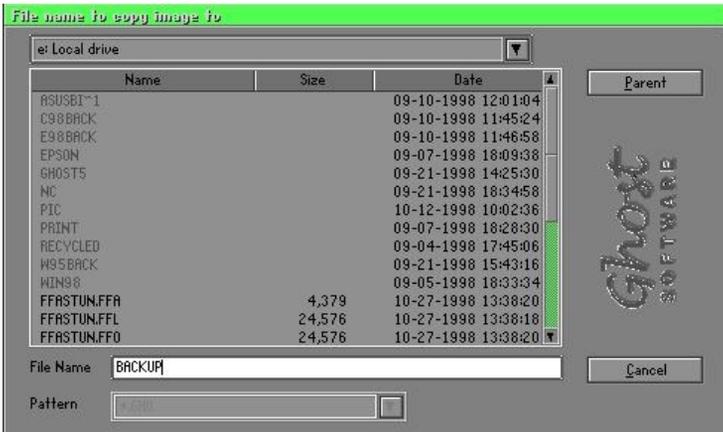


2. Select the **Destination drive** of the disk to be restored.
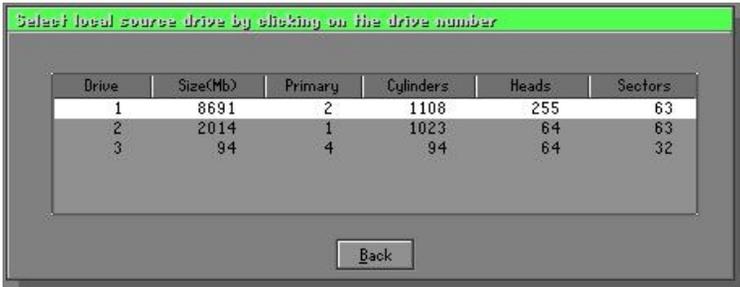
3. When restoring disk backup, set the required partition size as shown in the following figure.
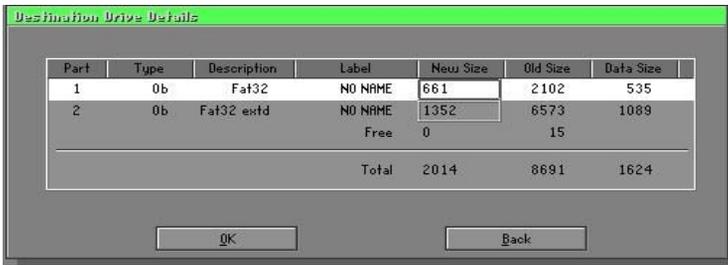


4. Click **OK** to display the following confirmation screen. Select **Yes** to start.
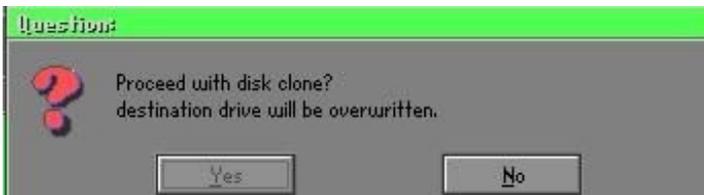


**Partition**
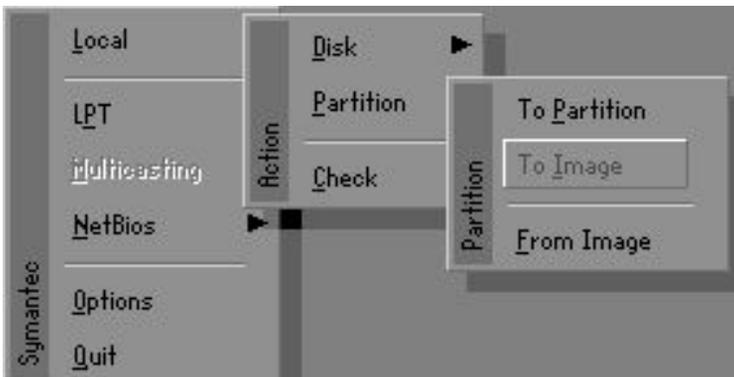
There are 3 partition functions:

**1. Partition To Partition** (partition cloning)

**2. Partition To Image** (partition backup)

**3. Partition From Image** (restore partition)

### Partition To Partition (Partition Cloning)

The basic unit for partition cloning is a partition. Refer to disk cloning for the operation method.

### Partition To Image (Partition Backup)

1. Select the disk to be backed up.

| Drive | Size(Mb) | Primary | Cylinders | Heads | Sectors |
|-------|----------|---------|-----------|-------|---------|
| 1 | 8691 | 2 | 1108 | 255 | 63 |

Select local source drive by clicking on the drive number

Back

2. Select the first partition to be backed up. This is usually where the operating system and programs are stored.

Select source partition(s) from drive 1

| Part | Type | Description | Volume Label | Size in Mb | Data Size in Mb |
|------|------|-------------|--------------|------------|-----------------|
| 1 | 0b | Fat32 | NO NAME | 2102 | 551 |
| 2 | 0b | Fat32 extd | NO NAME | 6573 | 1089 |
| | | | Free | 15 | |
| | | | Total | 8691 | 1641 |

OK          Cancel

3. Select the path and file name for storing the backup file.
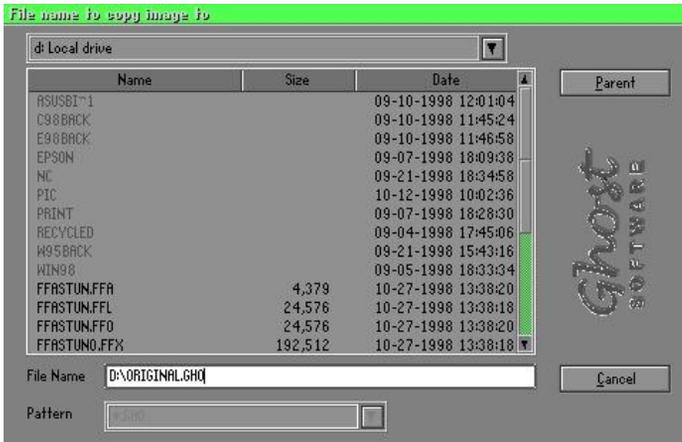


4. Is the file compressed? There are 3 options:

   (1) No: do not compress data during backup

   (2) Fast: Small volume compression

   (3) High: high ratio compression. File can be compressed to its minimum, but this requires longer execution time.
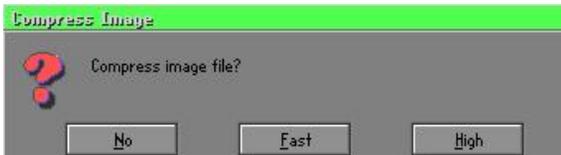


5. During confirmation, select Yes to start performing backup.

## Partition From Image (Restore Partition)

1.  Select the backup file to be restored.
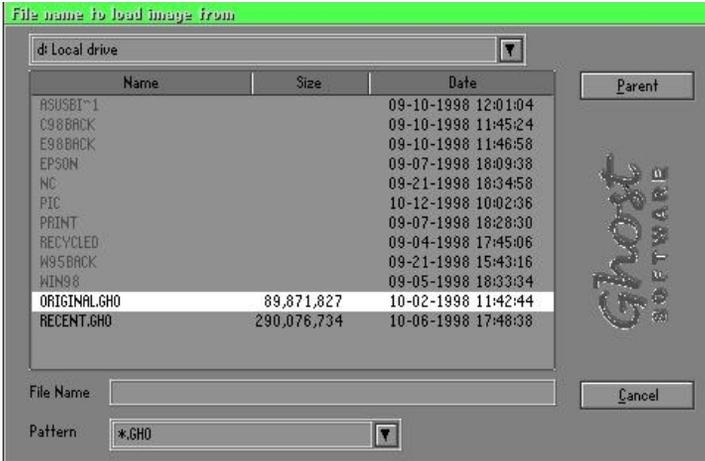


2.  Select the source partition.



3. Select the disk to be restored.

4. Select the partition to be restored.

| Part | Type | Description | Label | Size | Data Size |
|------|------|-------------|-------|------|-----------|
| 1 | 0b | Fat32 | NO NAME | 2102 | 556 |
| 2 | 0b | Fat32 extd | NO NAME | 6573 | 1076 |
| | | | Free | 15 | |
| | | | Total | 8691 | 1633 |

*Select destination partition from drive: 1*

Cancel

5. Select Yes to start restoring.

*Question*

Proceed with partition load?
destination will be overwritten.

Yes          No

### Check

This function checks the hard disk or backup file for backup or restoration error due to FAT or track error.

# How to Reinstall Windows in 2 Minutes

**This chapter teaches you how to set your computer properly and, if necessary, reinstall Windows** in 2 minutes.  **Ghost** can use different methods to complete this task.  The following two sections explain the creation of the emergency **Recover Floppy** and **Recover CD**:

## Emergency Recover Floppy

Divide a hard disk into two partitions. The first partition is for storing the operating system and application programs. The second partition is for backing up the operating system and data.  The size of the partition can be set according to the backup requirements.  For example, the **Windows** operating system needs 200MB of hard disk space, while the complete **Office** installation requires 360MB. The remaining space can be used to store other data.

After installing **Windows,** use **Ghost** to create a backup of the source system and store the file (Image file) in drive D. The file is named as **Original.gho**. Then, create a recover floppy disk containing:

- ✦ Bootable files (Command.com, Io.sys, and MSDOS.SYS )

- ✦ Config.sys (configuration setup file)

- ✦ Autoexec.bat (auto-execution batch file)

- ✦ Ghost.exe (Ghost execution file)

There are two ways to set the content of the recover  floppy for restoration:

(1) To load **Windows** automatically after booting, set the **Autoexec.bat** command as:

Ghost.exe clone, mode=pload, src=d:\original.gho:2,dst=1:1 -fx -sure -rb

Description:  Runs the restore function automatically using the Image File.  After execution, it exits Ghost and boots the system automatically.

Refer to the [Introducing Ghosts Functions].

(2) After booting, the screen displays the Menu.  Select Backup or Restore: Since the user may install other applications in the future, he/she may design **Autoexec.bat** as a Menu to back up or restore the user-defined Image file as follows:

☞ **Backup**
   Back up Windows and application programs as a file (Recent. gho). Command is:

   Ghost –clone,mode=pdump,src=1:1,dst=d:\Recent.gho -fx -sure -rb

☞ **Restore**
   Restore types include **[General Windows]** and **[Windows and Application Programs].**  If you select **[General Windows],** the system is restored to the general **Windows** operation condition.  The command is:

   Ghost.exe -clone,mode=pload,src=d:\Original.gho,dst=1:1  -fx -sure -rb

   If you select **[Windows and Application Programs],** the latest backup file (Recent.gho) is restored, skipping the installation and setup of application programs.

For description of relevant parameters, refer to **[Introducing Ghosts Functions]**.

For more information about menu design, refer to Config.sys and Autoexec.bat under /Menu in the CD.  You can also create a backup CD containing Ghost.exe and these two files.

## Recover CD

In recent years, well-known computer manufacturers (such as IBM, Acer, Compaq, etc.) bundle Recover CDs with their computers to reduce the cost resulting from servicing, while at the same time increasing their market competitiveness.

The following is a simple guide to how to create a recover CD:

1.  For extremely easy creation of the recover floppy disk, use the copy program for example "Easy CD Creator " (Note 2). First, create a recover floppy disk containing:

    Bootable files (Command.com and Io.sys and MSDOS.SYS)

    Config.sys (Configuration setup file)

    Autoexec.bat (Auto-execution batch file)

    Mscdex.exe (CD-Rom execution file)

    Ghost.exe (Ghost execution file)

    Oakcdrom.sys (ATAPI CD-ROM compatible driver)

    The content of Config.sys is:
    DEVICE=Oakcdrom.sys /d:idecd001

    The content of Autoexec.bat includes:
    MSCDEX.EXE /D:IDECD001 /L:Z
    Ghost.exe clone,mode=load,src=z:\original.gho,dst=1 -sure -rb

2.  Write the backup image file (original.gho) of the entire hard disk or partition into the recover CD. Use the Recover CD to boot up the system and restore the backup files automatically.

For description of relevant parameters, refer to **[Introducing Ghosts Functions]**.

Note: For more details regarding the creation program and method for creating the recover CD, please refer to the legal software and relevant operation manual.

## Ghost Command Line Switches Reference

Ghost may be run in interactive or in batch mode. Batch mode is useful for automating installations for backups using Ghost. Most of the Ghost switches are used to assist with batch mode operation. To list switches from Ghost, type ghost.exe -h.

**-clone**

The full syntax for this switch is:

**clone,MODE={copy|load|dump|pcopy|pload|pdump},SRC=**
{drive|file|drive**:**partition}**,DST={**drive|file|drive**:**partition}**,SZE{F|L|n=**
{nnnn**M|**nn**P|F|V}}**

Clone using arguments. This is the most useful of the batch switches and has a series of arguments that define:

**a) MODE**    This defines the type of clone command to be used:

    **COPY**    disk to disk copy

    **LOAD**    file to disk load

    **DUMP**    disk to file dump

    **PCOPY**    partition to partition copy

    **PLOAD**    file to partition load

    **PDUMP**    partition to file dump

**b) SRC**    This defines the source location for the operation:

    **Mode**    **Meaning:**

    **COPY/**

    **DUMP**    Source drive (e.g, 1 for drive one)

    **LOAD**    Disk image filename or device (e.g, g:\Images\system2.img)

    **PCOPY/**

    **PDUMP**    Source partition e.g, 1:2 indicates the second partition on drive one.

    **PLOAD**    Partition image filename or device and partition number. Example: g:\images\disk1.img:2 indicates the second partition in the Image file.

**c) DST**  This defines the destination location for the operation:

| Mode | Meaning |
|------|---------|
| COPY/ | |
| **LOAD** | Destination drive (e.g, 2 for drive two) |
| **DUMP** | Disk image filename or device,(e.g, g:\images\system2.img) |
| **PCOPY/** | |
| **PLOAD** | Destination partition,(e.g, 2:2 indicates the second partition on drive two). |
| **PDUMP** | Partition image filename (e.g, g:\images\part1.img). |

**c) SZEy**  Used to set the size of the destination partitions for either a disk load or disk copy operation.

Available y Options:

| F | Resizes the first partition to maximum size allowed based on file system t type. |
|---|---|
| L | Resizes the last partition to maximum size allowed based on file system type. |
| n=xxxxM | - indicates that the n?h destination partition is to have a size of xxxx Mb. (e.g, SZE2=800M indicates partition two is to have 800 mb.)   n=mmP - indicates that the n?h destination partition is to have a size of mm percent of the target disk. |
| n=F | - indicates that the n?h destination partition is to remain fixed in size. |
| n=V | - Indicates that the partition will be resized according to the following rules: |

**Rule 1** - If the destination disk is larger than the original source disk, then the partition(s) will be expanded to have the maximum amount of space subject to the free space available and the partition type (e.g, FAT16 partitions will have a maximum size of 2048Mb.)

**Rule 2** - If the destination disk is smaller than the original source disk, (but still large enough to accommodate the data from the source disk), the free space left over after the

|        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | data space has been satisfied will be distributed between the destination partitions in proportion to the data usage in the source partitions Someexamples follow that will help illustrate:                                                                                                                                                                                                                                                                                                                                                                           |
| -fx    | flag Exit. Normally when Ghost has finished copying a new system to a disk, it prompts the user to reboot with a press Ctrl-Alt-Del to reboot window. However, if Ghost is being run as part of a batch file it is sometimes useful to have it just exist back to the DOS prompt after completion so that further batch commands may be processed. -fx  enables this. See -rb for another option on completing a clone.                                                                                                                                                    |
| -ia    | Image All. The Image All switch forces Ghost to do a sector by sector copy of all partitions. When copying a partition from a disk to an image file or to another disk, Ghost examines the source partition and decides whether to copy just the files and directory structure, or to do an image (sector by sector) copy. If it understands the internal format of the partition it defaults to copying the files and directory structure. Generally this is the best option, but occasionally if a disk has been set up with special hidden security files that are in specific positions on the partition , the only way to reproduce them accurately on the target partition is via an image or sector-by-sector copy. |
| -span  | enables spanning across volumes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| -split=x | splits image file into 'x' Mb? Mb spans. Use this to create a 'forced' size volume set. For example, if you would like to force smaller image files from a 1024 Megabyte drive, you could specify 200 megabyte segments.For example, ghost. exe -split=200 will divide the image into 200 Megabyte segments.                                                                                                                                                                                                                                                             |
| -sure  | use the -sure switch in conjunction with -clone to avoid being prompted with the final 'Proceed with disk clone destination drive will be overwritten?' question. This command is useful in batch mode.                                                                                                                                                                                                                                                                                                                                                                |

**Example 1:**
To copy drive one to drive two on a PC, without final prompt if OK to proceed.
ghost.exe -clone,mode=copy,src=1,dst=2 –sure

**Example 2:**
To connect via NetBIOS to another PC running Ghost in slave mode, and dump a disk image of local drive two to the remote file c:\drive2.gho
ghost.exe -clone,mode=dump,src=2,dst=C:\drive2.gho -nbm
Note: The slave Ghost can be started with ghost –nbs

**Example 3:**
To copy drive one, second partition on a PC to drive two, first parti-tion the same PC, without final prompt
ghost.exe -clone,mode=pcopy,src=1:2,dst=2:1 –sure

**Example 4:**
To dump the second partition of drive one to an image file on a mapped drive g:
ghost.exe -clone,mode=pdump,src=1:2,dst=g:\part2.gho

**Example 5:**
To load partition 2 from a two-partition image file on a mapped drive g: onto the second partition of the local disk
ghost -clone,mode=pload,src=g:\part2.gho:2,dst=1:2

**Example 6:**
To load drive 2 from an image file and resize the destination partitions into a 20:40 allocation
ghost.exe -clone,mode=load,src=g:\2prtdisk.gho,dst=2,sze1=60P, sze2=40P

# Appendix C

## C-1  POST CODES

| POST (hex) | DESCRIPTION |
|---|---|
| CFh | Test CMOS R/W functionality. |
| C0h | Early chipset initialization: |
| | - Disable shadow RAM |
| | - Disable L2 cache (socket 7 or below) |
| | - Program basic chipset registers |
| C1h | Detect memory |
| | - Auto-detection of DRAM size, type and ECC. |
| | - Auto-detection of L2 cache (socket 7 or below) |
| C3h | Expand compressed BIOS code to DRAM |
| C5h | Call chipset hook to copy BIOS back to E000 & F000 shadow RAM. |
| 0h1 | Expand the Xgroup codes locating in physical address 1000:0 |
| 02h | Reserved |
| 03h | Initial Superio_Early_Init switch. |
| 04h | Reserved |
| 05h | 1.  Blank out screen |
| | 2.  Clear CMOS error flag |
| 06h | Reserved |
| 07h | 1.  Clear 8042 interface |
| | 2.  Initialize 8042 self-test |
| 08h | 1.  Test special keyboard controller for Winbond 977 series Super I/O chips. |
| | 2.  Enable keyboard interface. |
| 09h | Reserved |
| 0Ah | 1.  Disable PS/2 mouse interface (optional). |
| | 2.  Auto detect ports for keyboard & mouse followed by a port & interface swap (optional). |
| | 3.  Reset keyboard for Winbond 977 series Super I/O chips. |
| 0B-0Dh | Reserved |

| | |
|---|---|
| 0Eh | Test F000h segment shadow to see whether it is R/W-able or not. If test fails, keep beeping the speaker. |
| 0Fh | Reserved |
| 10h | Auto detect flash type to load appropriate flash R/W codes into the run time area in F000 for ESCD & DMI support. |
| 11h | Reserved |
| 12h | Use walking 1's algorithm to check out interface in CMOS circuitry. Also set real-time clock power status, and then check for override. |
| 13h | Reserved |
| 14h | Program chipset default values into chipset. Chipset default values are MODBINable by OEM customers. |
| 15h | Reserved |
| 16h | Initial Early_Init_Onboard_Generator switch. |
| 17h | Reserved |
| 18h | Detect CPU information including brand, SMI type (Cyrix or Intel) and CPU level (586 or 686). |
| 19-1Ah | Reserved |
| 1Bh | Initial interrupts vector table. If no special specified, all H/W interrupts are directed to SPURIOUS_INT_HDLR & S/W interrupts to SPURIOUS_soft_HDLR. |
| 1Ch | Reserved |
| 1Dh | Initial EARLY_PM_INIT switch. |
| 1Eh | Reserved |
| 1Fh | Load keyboard matrix (notebook platform) |
| 20h | Reserved |
| 21h | HPM initialization (notebook platform) |
| 22h | Reserved |
| 23h | 1. Check validity of RTC value: e.g. a value of 5Ah is an invalid value for RTC minute. 2. Load CMOS settings into BIOS stack. If CMOS checksum fails, use default value instead. 3. Prepare BIOS resource map for PCI & PnP use. If ESCD is valid, take into consideration of the ESCD's legacy information. |

|        |                                                              |
|--------|--------------------------------------------------------------|
|        | 4.  Onboard clock generator initialization.  Disable respective clock resource to empty PCI & DIMM slots. |
|        | 5.  Early PCI initialization:<br>-Enumerate PCI bus number<br>-Assign memory & I/O resource<br>-Search for a valid VGA device & VGA BIOS, and put it into C000:0. |
| 24-26h | Reserved                                                     |
| 27h    | Initialize INT 09 buffer                                     |
| 28h    | Reserved                                                     |
| 29h    | 1.  Program CPU internal MTRR (P6 & PII) for 0-640K memory address. |
|        | 2.  Initialize the APIC for Pentium class CPU.               |
|        | 3.  Program early chipset according to CMOS setup. Example: onboard IDE controller. |
|        | 4.  Measure CPU speed.                                       |
|        | 5.  Invoke video BIOS.                                       |
| 2A-2Ch | Reserved                                                     |
| 2Dh    | 1.  Initialize multi-language                                |
|        | 2.  Put information on screen display, including Award title, CPU type, CPU speed …. |
| 2E-32h | Reserved                                                     |
| 33h    | Reset keyboard except Winbond 977 series Super I/O chips.    |
| 34-3Bh | Reserved                                                     |
| 3Ch    | Test 8254                                                    |
| 3Dh    | Reserved                                                     |
| 3Eh    | Test 8259 interrupt mask bits for channel 1.                 |
| 3Fh    | Reserved                                                     |
| 40h    | Test 8259 interrupt mask bits for channel 2.                 |
| 41h    | Reserved                                                     |
| 42h    | Reserved                                                     |
| 43h    | Test 8259 functionality.                                     |
| 44h    | Reserved                                                     |
| 45-46h | Reserved                                                     |
| 47h    | Initialize EISA slot                                         |

| | |
|---|---|
| 48h | Reserved |
| 49h | 1. Calculate total memory by testing the last double word of each 64K page. |
| | 2. Program writes allocation for AMD K5 CPU. |
| 4A-4Dh | Reserved |
| 4Eh | 1. Program MTRR of M1 CPU |
| | 2. Initialize L2 cache for P6 class CPU & program CPU with proper cacheable range. |
| | 3. Initialize the APIC for P6 class CPU. |
| | 4. On MP platform, adjust the cacheable range to smaller one in case the cacheable ranges between each CPU are not identical. |
| 4Fh | Reserved |
| 50h | Initialize USB |
| 51h | Reserved |
| 52h | Test all memory (clear all extended memory to 0) |
| 53-54h | Reserved |
| 55h | Display number of processors (multi-processor platform) |
| 56h | Reserved |
| 57h | 1. Display PnP logo |
| | 2. Early ISA PnP initialization |
| | -Assign CSN to every ISA PnP device. |
| 58h | Reserved |
| 59h | Initialize the combined Trend Anti-Virus code. |
| 5Ah | Reserved |
| 5Bh | (Optional Feature) Show message for entering AWDFLASH. EXE from FDD (optional) |
| 5Ch | Reserved |
| 5Dh | 1. Initialize Init_Onboard_Super_IO switch. |
| | 2. Initialize Init_Onbaord_AUDIO switch. |
| 5E-5Fh | Reserved |
| 60h | Okay to enter Setup utility; i.e. not until this POST stage can users enter the CMOS setup utility. |
| 61-64h | Reserved |
| 65h | Initialize PS/2 Mouse |

| | |
|---|---|
| 66h | Reserved |
| 67h | Prepare memory size information for function call: INT 15h ax=E820h |
| 68h | Reserved |
| 69h | Turn on L2 cache |
| 6Ah | Reserved |
| 6Bh | Program chipset registers according to items described in Setup & Auto-configuration table. |
| 6Ch | Reserved |
| 6Dh | 1. Assign resources to all ISA PnP devices. 2. Auto assign ports to onboard COM ports if the corresponding item in Setup is set to "AUTO". |
| 6Eh | Reserved |
| 6Fh | 1. Initialize floppy controller 2. Set up floppy related fields in 40:hardware. |
| 70-72h | Reserved |
| 73h | (Optional Feature) Enter AWDFLASH.EXE if : -AWDFLASH is found in floppy drive. -ALT+F2 is pressed |
| 74h | Reserved |
| 75h | Detect & install all IDE devices: HDD, LS120, ZIP, CDROM….. |
| 76h | Reserved |
| 77h | Detect serial ports & parallel ports. |
| 78h | Reserved |
| 79h | Reserved |
| 7Ah | Detect & install co-processor |
| 7B-7Eh | Reserved |
| 7Fh | 1. Switch back to text mode if full screen logo is supported. -If errors occur, report errors & wait for keys -If no errors occur or F1 key is pressed to continue: ◆ Clear EPA or customization logo. |
| 80h | Reserved |
| 81h | Reserved |
| 82h | 1. Call chipset power management hook. 2. Recover the text fond used by EPA logo (not for full |

|        |                                                          |
|--------|----------------------------------------------------------|
|        | screen logo)                                             |
|        | 3.  If password is set, ask for password.                |
| 83h    | Save all data in stack back to CMOS                      |
| 84h    | Initialize ISA PnP boot devices                          |
| 85h    | 1.  USB final Initialization                             |
|        | 2.  NET PC: Build SYSID structure                        |
|        | 3.  Switch screen back to text mode                      |
|        | 4.  Set up ACPI table at top of memory.                  |
|        | 5.  Invoke ISA adapter ROMs                              |
|        | 6.  Assign IRQs to PCI devices                           |
|        | 7.  Initialize APM                                       |
|        | 8.  Clear noise of IRQs.                                 |
| 86-92h | Reserved                                                 |
| 93h    | Read HDD boot sector information for Trend Anti-Virus code |
| 94h    | 1.  Enable L2 cache                                      |
|        | 2.  Program boot up speed                                |
|        | 3.  Chipset final initialization.                        |
|        | 4.  Power management final initialization                |
|        | 5.  Clear screen & display summary table                 |
|        | 6.  Program K6 write allocation                          |
|        | 7.  Program P6 class write combining                     |
| 95h    | 1.  Program daylight saving                              |
|        | 2.  Update keyboard LED & typematic rate                 |
| 96h    | 1.  Build MP table                                       |
|        | 2.  Build & update ESCD                                  |
|        | 3.  Set CMOS century to 20h or 19h                       |
|        | 4.  Load CMOS time into DOS timer tick                   |
|        | 5.  Build MSIRQ routing table.                           |
| FFh    | Boot attempt (INT 19h)                                   |

# Appendix D

## D-1  Update Your System BIOS

Download the xxxxx.EXE file corresponding to your model form the our website to an empty directory on your hard disk or floppy.  Run the downloaded xxxxx.EXE file  and it will self extract.  Copy these extracted files to a bootable DOS floppy disk.

Note: The DOS floppy disk should contain NO device drivers or other programs.

1. Type "A:\AWDFLASH and press <Enter> Key.

2. You will see the following  setup on screen.

3. Please key in the xxxxx.bin BIOS file name.

```
           FLASH  MEMORY  WRITER V7.88
   (C)Award Software 2000 All Rights Reserved
For xxxx-W83627-6A69LPA9C-0   DATE: 05/11/2000
Flash Type -

File Name to Program : ▮




Error Message:
```

4. If you want to save the previous BIOS data to the diskette, please key in [Y], otherwise please key in [N].

```
           FLASH  MEMORY  WRITER V7.88
   (C)Award Software 2000 All Rights Reserved
For xxxx-W83627-6A69LPA9C-0   DATE: 05/11/2000
Flash Type - xxxxx  E82802AB /3.3V

File Name to Program : xxxxx.bin




Error Message:  Do You Want To Save Bios (Y/N)
```

5. Key in File Name to save previous BIOS to file.

```
         FLASH  MEMORY  WRITER V7.88
    (C)Award Software 2000 All Rights Reserved
  For  XXXX-W83627-6A69LPA9C-0   DATE: 05/11/2000
  Flash Type - XXXXX E82802AB /3.3V

  File Name to Program :  xxxxx.bin

  File Name to Save    :  xxxxx.bin




  Error Message:
```

6. Are you sure to program (y/n), please key in [Y] to start the programming.

```
         FLASH  MEMORY  WRITER V7.88
    (C)Award Software 2000 All Rights Reserved
  For  XXXX-W83627-6A69LPA9C-0   DATE: 05/11/2000
  Flash Type - XXXXX E82802AB /3.3V

  File Name to Program :  xxxxx.bin
             Checksum :  938EH
  File Name to Save    :  xxxxx.bin




  Error Message:  Are you sure to program (y/n)
```

7. The programming is finished.

```
         FLASH  MEMORY  WRITER V7.88
    (C)Award Software 2000 All Rights Reserved
  For  XXXX-W83627-6A69LPA9C-0   DATE: 05/11/2000
  Flash Type - XXXXX E82802AB /3.3V

  File Name to Program :  xxxxx.bin
             Checksum :  4B04H
   Verifying Flash Memory - 7FE00 OK




   ▓ Write OK    ■ No Update    ■ Write Fail
  F1 : Reset          F10 : Exit
```