User's Manual

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

Supports PC1600/2100 Memory Modules

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- ✓ E. (1) USB Cable

- ✓ F. (1) Driver and utility

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Overview
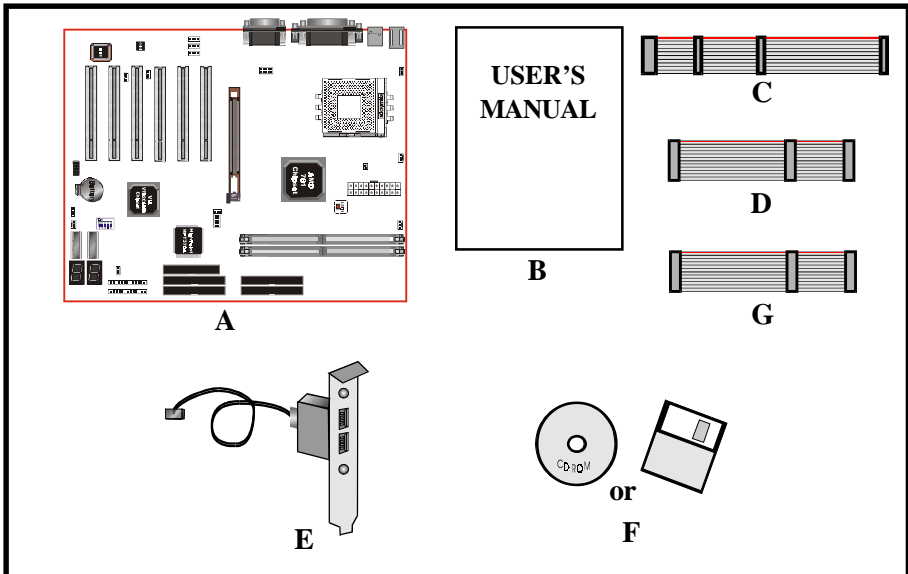
Terminology

- **Accelerated Graphics Port (AGP)**

  The AGP interface that is in the AMD 761™, it supports a subset of 3.3V, 66MHz components, 3.3V 66/133 MHz AGP 2.0 compliant components, and the new 1.5V 66/266 MHz components.

- **Socket A (Socket 462)**

  The Socket connector that is similar Intel PGA 370 socket. Socket A has 462 pin sites to support AMD Duron™/Althon™ processor in PGA package.

- **3DNow!™**

  3DNow! technology enabled fast frame rates on high-resolution 3D rendered scenes, amazing physical modeling of real-world environments, sharp and detailed 3D imaging, smooth video playback, and theater-quality audio. The new enhanced 3DNow! technology implemented in the AMD Athlon processor adds streaming and digital signal processing (DSP) technologies, which allows faster, more accurate speech recognition, DVD-quality audio and video, and streaming audio and video for a rich Internet experience.

- **DDR SDRAM**

  The DDR (Double Data Rate) Synchronous SRAM employs high-speed, low-power CMOS designs. The DDR SRAM enables high performance operation through high clock frequencies (achieved through pipelining) and double data rate mode of operation in the system. Double data rate of SDRAM in which data is sent on both the rising and falling edges of clock cycle in a data burst.

- **STR (Suspend-To-RAM)**

  A lower power state than active. In the STR state, the system state is stored in main memory and all unnecessary system logic is turned off. Only main memory and logic required to wake the system remain powered.

◆ **RAID, RAID 0+1, RAID 0, RAID 1**

RAID   Redundant Array of Independent Disks (RAID) refers to a method of organizing data on one or more physical disks to provide increased I/O performance and data protection. The different methods for organizing the data are referred to as RAID Levels. The RAID levels offered by HPT370A are 0,1 and 0+1.

RAID 0+1   A combination of RAID 1 and RAID 0. Provides high performance and high availability.

RAID 0   Striping of data across multiple drives in an array. Very fast performance, however there is no data protection.

RAID 1   Also known as mirroring. Mirroring refers to the 100% duplication of data from one disk to another. Due to the 100% duplication, this is a costly solution.

System Overview

The board was developed by AMD-761 system controller (Northbridge) and VIA's VT82C686B (Sourthbridge) for the high-performance Socket A AMD Duron™/ Althon™ processor-based.

The board is a four-layer, ATX form factor board. That supports a 200/266MHz (double clocked) front-side bus, 100/133MHz (or 200/266MHz clcok rate) DDR SDRAM interface and supports AGP 2X and 4X, six PCI 32bit/33MHz slots, Suspend-to-RAM, and paired with VIA VT82C686B Sourthbridge to supports two bus mastering ATA 33/66/ 100 EIDE ports. Additionally an extra IDE port by HPT370A/Ultra DMA 66/100 & IDE RAID x 2 (Up to 4 Device) was supports too (HPT370A is optional). The IDE-RAID HPT370A supports RAID 0,1 and 0+1. This is idea for small businesses that need to mirror their servers to used IDE hard disk for a much cheaper solution than SCSI RAID. The board designs do not contain ISA slots. It supports a "POSTMAN" (optional) function and "80 Port" to deliver a easy way for the Power On Self Test (POST) code sending out a error messages via HuMANlike voice by the speaker and POST error code by the 7-segment LED on board.

Figure 5 Show a block digram for an AMD Duron™/Althon™ processor with DDR SDRAM-base system.

Introduction

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 or 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 (one channel is optional) 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.
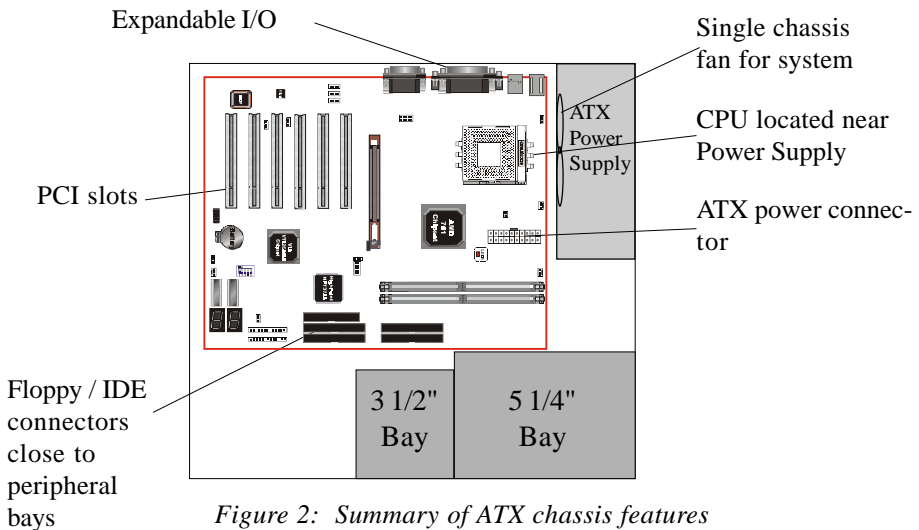
Figure 2: Summary of ATX chassis features

I/O Shield Connector

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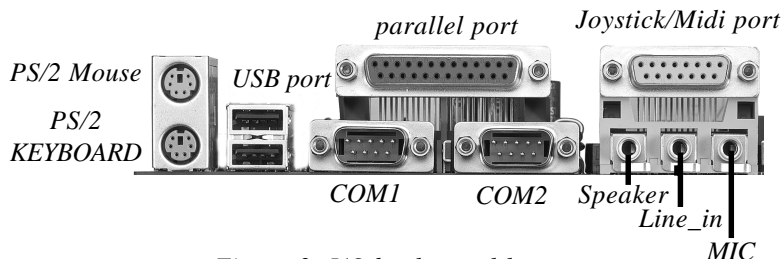
Figure 3: I/O back panel layout

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 as Windows® 95/98/SE/ME or Windows®2000.
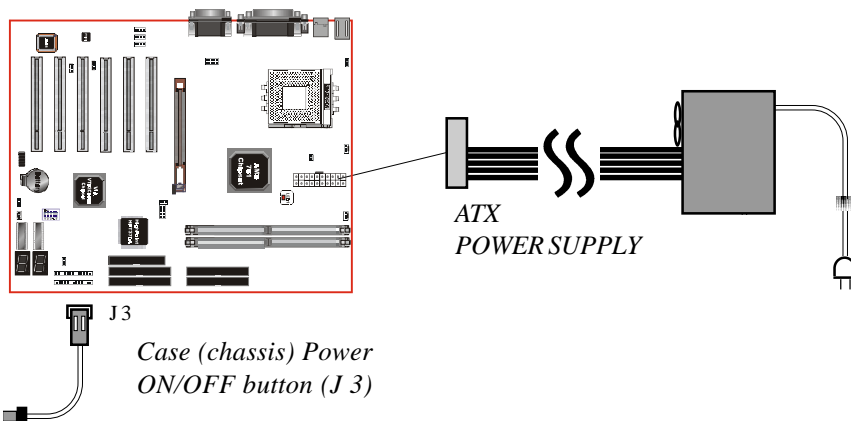
Figure 4: Simple ATX Power ON/OFF Controller

System Block Diagram
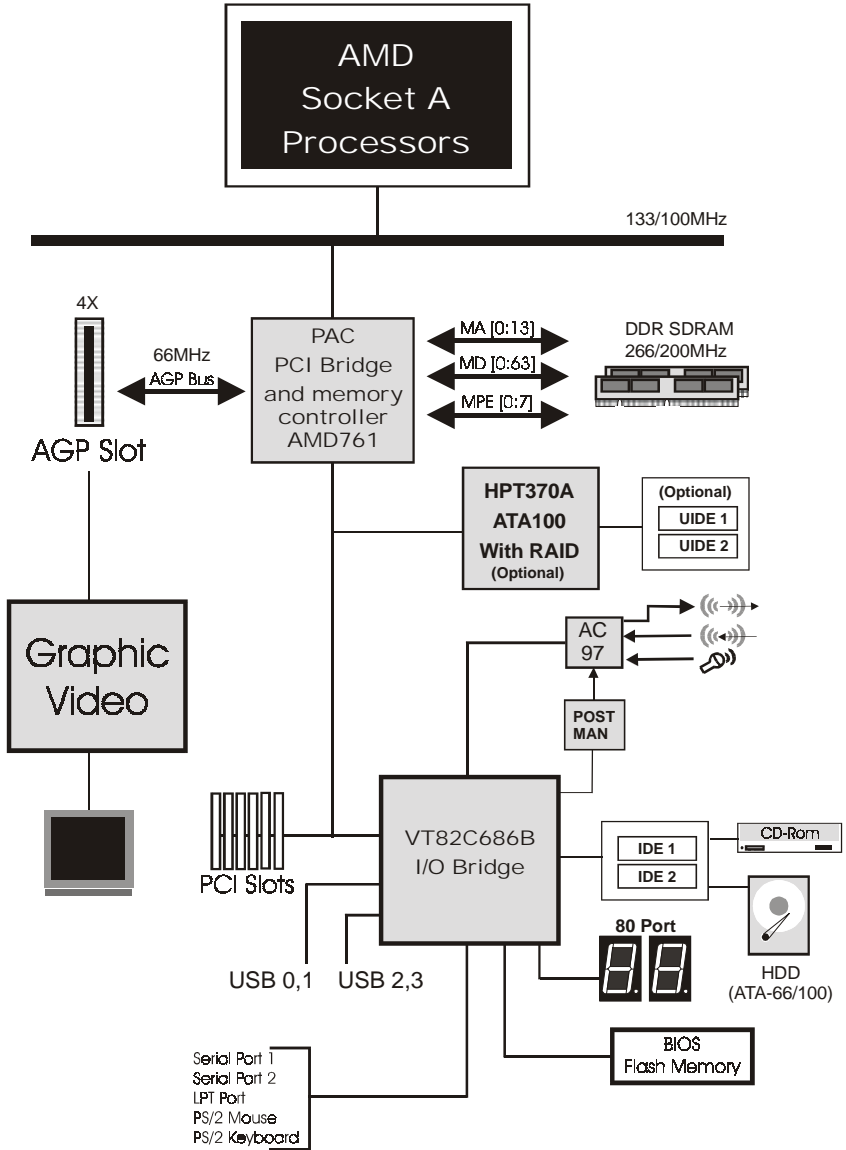
Figure 5: System Block Diagram

Section 2
FEATURES

Mainboard Features:

◆ **PROCESSOR**

- AMD Athlon™, Duron™ Processors with a 200/266 MHz Host bus (100/133MHz x 2), Socket A, operating at 600MHz ~ 1.2GHz

◆ **CHIPSET**

- AMD-760™ Chipset (AMD-761™ + VIA VT82C686B)

◆ **DDR SDRAM DIMM MODULE**

- 184pin DDR DIMM x 2 for PC1600/2100 Memory
- DRAM Size: 64MB to 512MB

◆ **EXPANSION SLOT**

- PCI x 6 (six PCI bus master), 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 (2 for Opt.)

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 Wake-On-Modem Function
  - Supports STR (Suspend To Ram) function
  - Supports CPU Vcore & DDR Voltage settings via Jumper
  - Supports CPU Clock & Multiplier settings via BIOS & Jumper
  - 80 Port Debug(POST) Card onboard design with 7-segment LED display
  - Supports POSTMAN(Power On Self Test with Human-like voice alarm) (Optional)

- ◆ **FORM FACTOR**
  - 305mm x 245mm ATX Size

Section 3
INSTALLATION

Mainboard Detailed Layout
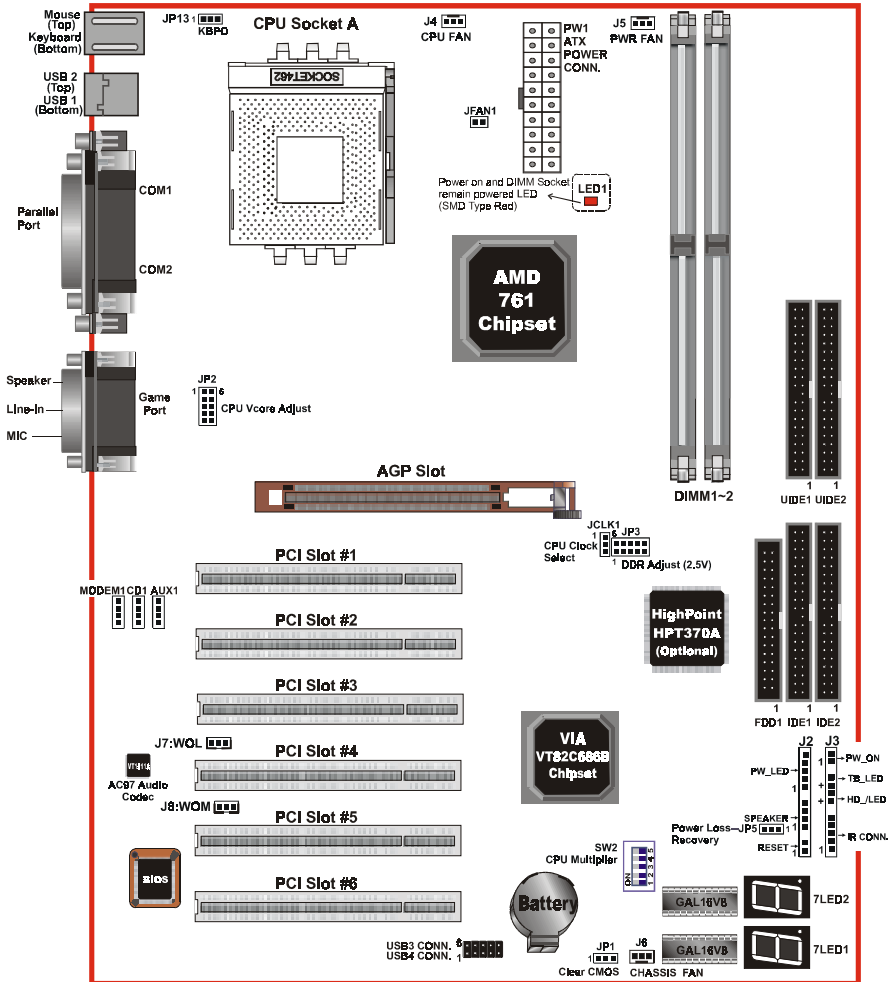
Figure 1

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**
- **3-7.** **POSTMAN Function**

Section 3-1
CPU Insertion

CPU Insertion: (use AMD Athlon™ as reference)
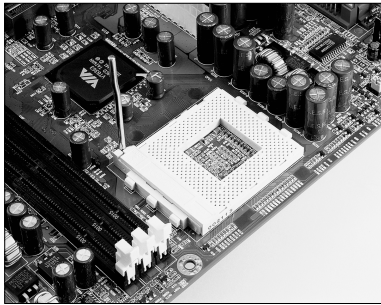
Figure 2

Step 1

Open the socket by raising the actuation lever.
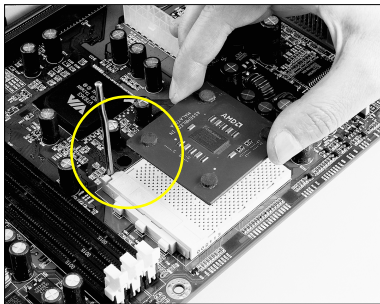
Figure 3

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 inserted into the socket on all sides.
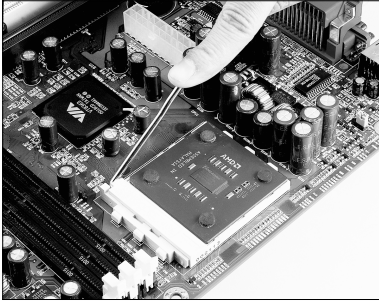
Figure 4

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 overheated and burned.
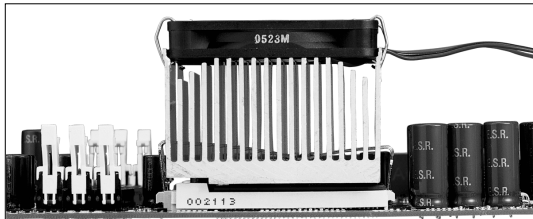
Figure 5

Installation

Section 3-2
Jumper Settings
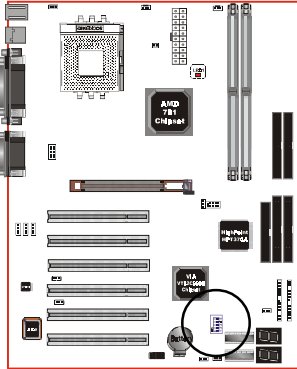
SW2: CPU Ratio Selection

SW2					CPU Ratio
1	2	3	4	5	
X	X	X	X	OFF	AUTO (Default)
ON	ON	ON	ON	ON	x 11
OFF	ON	ON	ON	ON	x 11.5
ON	OFF	ON	ON	ON	x 12
OFF	OFF	ON	ON	ON	x 12.5
ON	ON	OFF	ON	ON	x 5
OFF	ON	OFF	ON	ON	x 5.5
ON	OFF	OFF	ON	ON	x 6
OFF	OFF	OFF	ON	ON	x 6.5
ON	ON	ON	OFF	ON	x 7
OFF	ON	ON	OFF	ON	x 7.5
ON	OFF	ON	OFF	ON	x 8
OFF	OFF	ON	OFF	ON	x 8.5
ON	ON	OFF	OFF	ON	x 9
OFF	ON	OFF	OFF	ON	x 9.5
ON	OFF	OFF	OFF	ON	x 10
OFF	OFF	OFF	OFF	ON	x 10.5

X: don't care
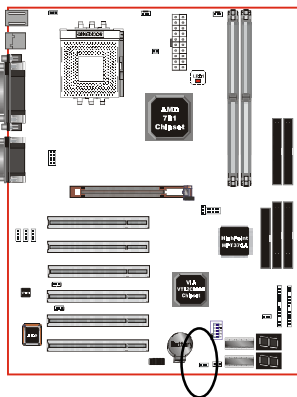
JP1

CMOS Clear

1-2 Normal (Default)

2-3 Clear CMOS
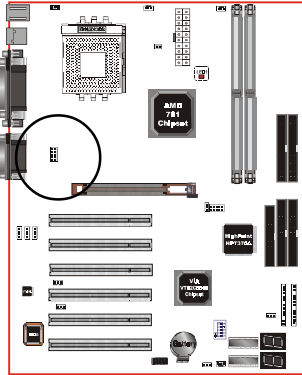
JP2

CPU Vcore Adjust

JP2	CPU Vcore Adjust
1-6	+0.V (Default)
2-7	+0.1V
3-8	+0.2V
4-9	+0.3V
5-10	+0.4V
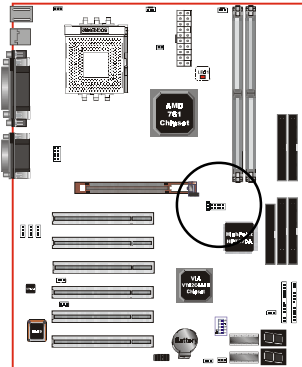
JP3

DDR Adjust (2.5V)

JP3	DDR Adjust (2.5V)
1-6	+0.0V
2-7	+0.1V (Default)
3-8	+0.2V
4-9	+0.3V
5-10	+0.4V
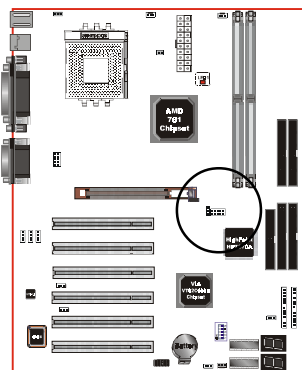
JCLK1

CPU Clock Select

JCLK1	CPU	DDR	AGP	PCI
1-2 (Default)	100MHz	200MHz	66.6	33.3
2-3	133MHz	266MHz	66.6	33.3

Installation
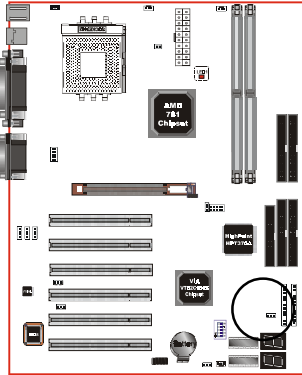
JP5

Power Loss Recovery
1-2 Disabled (Default)
2-3 Enabled
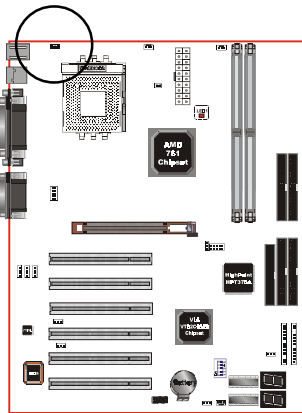
JP13

Keyboard Power On Function
1-2 Disabled (Default)
2-3 Enabled

Section 3-3
System Memory Configuration

Memory Layout

The board supports (2) PC1600/2100 184-pin DIMMs (Dual In-line Memory Module). The DIMMs is for DDR SDRAM (Double-Data-Rate Synchronous DRAM) only.

- DDR SDRAM support 200MHz at AMD Athlon™/Duron™ 100MHz front-side bus or 266MHz at AMD Athlon™/Duron™ 133MHz front-side bus.

- Supports Memory Error Correcting Code (ECC).

- Supports 64Mbit, 128Mbit, 256Mbit and 512Mbit technology.

- 64-bit data width, plus & 8 bit ECC paths.

- Supports up to two unbuffered DDR DIMMs or two registered DIMMs.

- Supports up to 1Gbytes of memory.

Figure 6 and Table 1 show several possible memory configurations.

```
┌─────────────────────────────────────┐
│          DDR DIMM 1                  │ Bank 0/1 ─┐ DDR
├─────────────────────────────────────┤           ├ Synchronous
│          DDR DIMM 2                  │ Bank 2/3 ─┘ DRAM
└─────────────────────────────────────┘
```
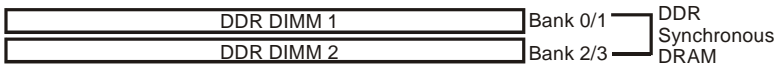
Figure 6

Total Memory	DDR DIMM 1 (Bank 0/1)	DDR DIMM 2 (Bank 2/3)
= 512MB Maximum	DDR SDRAM* 64MB, 128MB, 256MB, 512MB X 1	None
= 1GB Maximum	DDR SDRAM* 64MB, 128MB, 256MB, 512MB X 1	DDR SDRAM* 64MB, 128MB, 256MB, 512MB X 1

Table 1

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

* *We recommend use PC1600 Memory Module only for front-side bus 100MHz.*

* *Can not mixing the unbuffered and registered DDR SDRAM on DIMM1 and DIMM2 socket.*

* *Supports PC1600 modules with 2-2-2 timing.*

* *Supports PC2100 modules with 2-2-2 timing.*

DIMM Module Installation

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

DIMMs have 168-pins and one notche that will match with the onboard DDR 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).

CENTER KEY ZONE
(2.5 V DRAM)

Figure 7

Figure 8
DIMM Module clip before installation

Figure 9
DIMM Module clip after installation
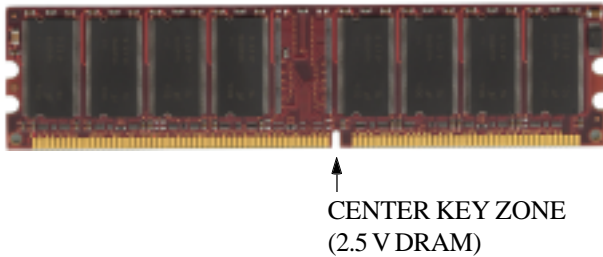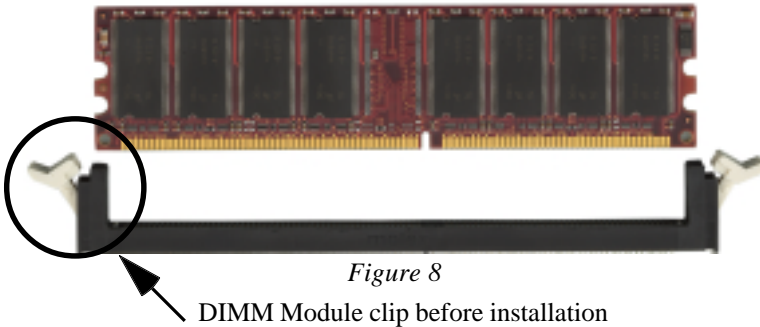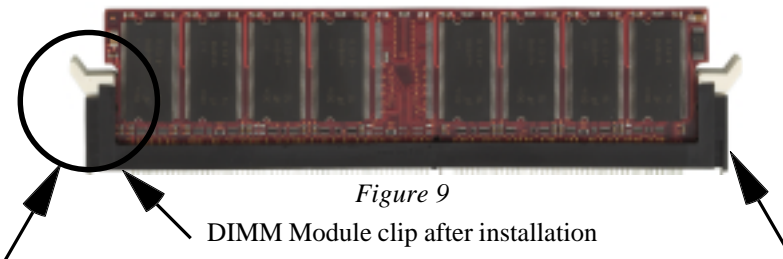
To remove the DIMM module simply press down both of the white clips on either side and the module will be released from the socket.

Section 3-4
Device Connectors
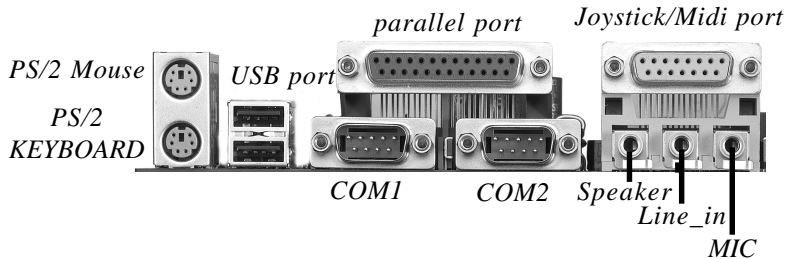
Figure 10

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

J8: WOM (Wake On Modem) Connector

IDE1: Ultra ATA-66/100 Primary IDE Connector (supported by 686B chipset) (Blue Color)

IDE2: Ultra ATA-66/100 Secondary IDE Connector (supported by 686B chipset) (Blue Color)

UIDE1: Ultra ATA-66/100&RAID Primary IDE Connector (supported by HPT370A chipset) (Blue Color)(Optional)

UIDE2: Ultra ATA-66/100&RAID Secondary IDE Connector (supported by HPT370A chipset) (Blue Color)(Optional)

Installation

FDD1: Floppy Controller Connector (Black Color)

PW1: ATX Power Connector
  • 20-pin power connector

CD1: CD Audio_IN Connector
  • Pin1(CD_IN_Left), Pin2/Pin3(CD_Reference), Pin4(CD_IN_Right)

AUX1: 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.
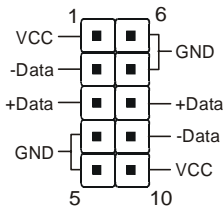
USB port header pin descriptions.

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**

1
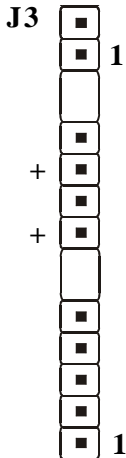
Turbo LED indicator - LED ON when higher speed is selected

+

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	

1
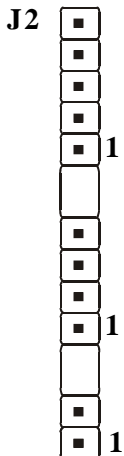
J2   **Power LED** - Power LED and S3 LED connector
1. Power LED(+)	4. NC
2. N/C	5. GND
3. GND	

1

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

1

Reset - Closed to restart system.

1

Section 3-5
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 JP13 at the position 2-3 after you finished the system installation.

JP13　　　■■ ■　　Keyboard Power On Function
　　　　　1　　　　　　1-2　Disabled (Default)
　　　　　　　　　　　2-3　Enabled

Step 2: Push the momentary switch (J3 PW-ON) to turn on your system and then push again to hold for more than 4 seconds to turn it off affter counting memory as soon as you turn it on.

Step 3: You can enjoy the Keyboard Power ON function (KBPO) by *pressing any 1 key, Hot key (Ctrl-F1, F2.....F12), Password (A maximum of 5 charac ters can be entered.) and BUTTON only to turn on your system. Please refer to the BIOS Integrated peripherals setup for detail. The BIOS Default is keyboard Hot key <Ctrl> - <F1> to turn on the 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.

Notes:

1. Intel ATX version 2.0 specification has recommended you use the power supply with >=1.0A in 5.0VSB. With our mainboard, *the 5.0VSB standby power only has to be > = 0.1A (100mA)* then you can enjoy this unique benefit. However, the ATX power supply which is < 0.1 (100mA) is still applicable to your system by placed JP13 at the position 1-2 to disable this feature.

2. We recommended you use the power supply with 1.0A in 5.0VSB. Because this supported PCI 2.1 specification for remote power-on and wake-up function.

3-6 STR (Suspend To RAM) Function

The board supports the STR power management state by maintaining the appropriate states on the DDR SDRAM interface signals. The power source must be kept alive to the DDR 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 DDR 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)
LED1 (Red LED)	OFF	ON	ON	ON	OFF
J2 PW_LED	OFF	ON	Blinking	Blinking	OFF

3-7 "**POSTMAN**" Function Introduction (Optional)

With the board also make our initial premier of the new "**POSTMAN**" debug function. This new feature designed to enhance the Power On Self Test (POST) introduces a huMANlike voice with helpful debugging/error messages. So in the event the system experiences boot up difficulties "POSTMAN" will deliver the message in an easier to understand method than traditional POSTcodes. Such as, "SDRAM Detect Fail" for memory missing, memory install improperly or memory broken and "VGA Fail" for AGP card missing, AGP card install improperly or AGP card broken.

The voice could be pronounced through either an internal speaker or external speakers plugged into Line Out connector for a clear sound.

The messages recorded for this function are listed below for your reference while having problems with system boot up.

0. SDRAM Detect Fail

1. BIOS ROM Checksum Fail

2. Keyboard or PS/2 Mouse Fail

3. VGA Fail

4. Clock Generator or Overclock Fail

5. NO CPU Fan

6. Over Voltage Fail

7. SMBUS Fail

8. System boot OK

9. CPU, BIOS or Power Cable plug in abnormal

Section 4
BIOS SETUP

Main Menu

Once you enter the AwardBIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and two exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

```
        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...                       │
   └─────────────────────────────────────────────────────────────────────┘
```

Note that a brief description of each highlighted selection appears at the bottom of the screen.

Setup Items

The main menu includes the following main setup categories. Recall that some systems may not include all entries.

Standard CMOS Features

Use this menu for basic system configuration.

BIOS

Advanced BIOS Features

Use this menu to set the Advanced Features available on your system.

Advanced Chipset Features

Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals

Use this menu to specify your settings for integrated peripherals.

Power Management Setup

Use this menu to specify your settings for power management.

PnP / PCI Configuration

This entry appears if your system supports PnP / PCI.

PC Health Status

This item is only show the system health status (include Voltage, Fan speed, CPU temperature...)

Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control.

Load Fail-Safe Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate.

Load Optimized Defaults

Use this menu to load the BIOS default values that are factory settings for optimal performance system operations. While Award has designed the custom BIOS to maximize performance, the factory has the right to change these defaults to meet their needs.

Supervisor / User Password

Use this menu to set User and Supervisor Passwords.

Save & Exit Setup

Save CMOS value changes to CMOS and exit setup.

Exit Without Save

Abandon all CMOS value changes and exit setup.

4-1 Standard CMOS Setup

The items in Standard CMOS Setup Menu are divided into 10 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.

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

    Date (mm:dd:yy)          Thu, Dec 21 2000           Item Help
    Time (hh:mm:ss)          10 : 27 : 17
                                                    Menu Level    ▶
  ▶ IDE Primary Master
  ▶ IDE Primary Slave                              Press [Enter] to enter
  ▶ IDE Secondary Master                           next page for detail
  ▶ IDE Secondary Slave                            hard drive settings

    Drive A                  [1.44M, 3.5 in.]
    Drive B                  [None]

    Video                    [EGA/VGA]
    Halt On                  [All , But Keyboard]

    Base Memory                      640K
    Extended Memory                65472K
    Total Memory                    1024K


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

Figure 1: The Main Menu

Main Menu Selections

This table shows the selections that you can make on the Main Menu

Item	Options	Description
Date	Month DD YYYY	Set the system date. Note that the 'Day' automatically hanges when you set the date
Time	HH : MM : SS	Set the system time
IDE Primary Master	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Primary Slave	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Master	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
IDE Secondary Slave	Options are in its sub menu (described in Table 3)	Press <Enter> to enter the sub menu of detailed options
Drive A Drive B	None 360K, 5.25 in 1.2M, 5.25 in 720K, 3.5 in 1.44M, 3.5 in 2.88M, 3.5 in	Select the type of floppy disk drive installed in your system
Video	EGA/VGA CGA 40 CGA 80 MONO	Select the default video device
Halt On	All Errors No Errors All, but Keyboard All, but Diskette All, but Disk/Key	Select the situation in which you want the BIOS to stop the POST process and notify you
Base Memory	N/A	Displays the amount of conventional memory detected during boot up
Extended Memory	N/A	Displays the amount of extended memory detected during boot up
Total Memory	N/A	Displays the total memory available in the system

Table 2 Main Menu Selections

IDE Adapters

The IDE adapters control the hard disk drive. Use a separate sub menu to configure each hard disk drive.

Figure 2 shows the IDE primary master sub menu.

```
      CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                           IDE Primary Master
   IDE HDD Auto-Detection    [Press Enter]              Item Help

   IDE Primary Master        [Auto]          Menu Level    ▶▶
   Access Mode               [Auto]
                                             To auto-detect the
   Capacity                     6449 MB      HDD's size, head... on
                                             this channel
   Cylinder                     13328
   Head                            15
   Precomp                      65535
   Landing Zone                 13327
   Sector                          63




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

Figure 2 IDE Primary Master sub menu

BIOS

Use the legend keys to navigate through this menu and exit to the main menu. Use Table 3 to configure the hard disk.

Item	Options	Description
IIDE HDD Auto-detection	Press Enter	Press Enter to auto-detect the HDD on this channel. If detection is successful, it fills the remaining fields on this menu.
IDE Primary Master	None Auto Manual	Selecting 'manual' lets you set the remaining fields on this screen. Selects the type of fixed disk. "User Type" will let you select the number of cylinders, heads, etc. Note: PRECOMP=65535 means NONE !
Capacity	Auto Display your disk drive size	Disk drive capacity (Approximated). Note that this size is usually slightly greater than the size of a formatted disk given by a disk checking program.
Access Mode	Normal LBA Large Auto	Choose the access mode for this hard disk
The following options are selectable only if the 'IDE Primary Master' item is set to 'Manual'		
Cylinder	Min = 0 Max = 65535	Set the number of cylinders for this hard disk.
Head	Min = 0 Max = 255	Set the number of read/write heads
Precomp	Min = 0 Max = 65535	**** **Warning**: Setting a value of 65535 means no hard disk
Landing zone	Min = 0 Max = 65535	****
Sector	Min = 0 Max = 255	Number of sectors per track

Table 3 Hard disk selections

4-2 Advanced BIOS Features

This section allows you to configure your system for basic operation. You have the opportunity to select the system's default speed, boot-up sequence, keyboard operation, shadowing and security.

```
        CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                          Advanced BIOS Features
    Virus Warning              [Disabled]            Item Help
    CPU Internal Cache         [Enabled]
    External Cache             [Enabled]         Menu Level   ▶
    Quick Power On Self Test   [Enabled]
    HPT-370 or SCSI Card Boot  [HPT-370]         Allows you to choose
    First Boot Device          [Floppy]          the VIRUS warning
    Second Boot Device         [HDD-0]           feature for IDE Hard
    Third Boot Device          [LS120]           Disk boot sector
    Boot Other Device          [Enabled]         protection. If this
    Swap Floppy Drive          [Disabled]        function is enabled
    Boot Up Floppy Seek        [Enabled]         and someone attempt to
    Boot Up NumLock Status     [On]              write data into this
    Typematic Rate Setting     [Disabled]        area , BIOS will show
  x Typematic Rate (Chars/Sec) 6                 a warning message on
  x Typematic Delay (Msec)     250               screen and alarm beep
    Security Option            [Setup]
    OS Select For DRAM > 64MB  [Non-OS2]
    Video BIOS Shadow          [Enabled]

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

Virus Warning

Allows you to choose the VIRUS Warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep.

Enabled: Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.

Disabled: No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

CPU Internal Cache/External Cache

These two categories speed up memory access. However, it depends on CPU/chipset design.

Enabled: Enable cache
Disabled: Disable cache

BIOS

Quick Power On Self Test

This category speeds up Power On Self Test (POST) after you power up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.

    Enabled: Enable quick 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

If the system has two floppy drives, you can swap the logical drive name assignments. The choice: Enabled/Disabled.

Boot Up Floppy Seek

Seeks disk drives during boot up. Disabling speeds boot up.

The choice: Enabled/Disabled.

Boot Up NumLock Status

Select power on state for NumLock.

The choice: On/Off.

Typematic Rate Setting

Key strokes repeat at a rate determined by the keyboard controller. When enabled, the typematic rate and typematic delay can be selected.

The choice: Enabled/Disabled.

Typematic Rate (Chars/Sec)

Sets the number of times a second to repeat a key stroke when you hold the key down.

The choice: 6, 8, 10, 12, 15, 20, 24, 30.

Typematic Delay (Msec)

Sets the delay time after the key is held down before it begins to repeat the keystroke.

The choice: 250, 500, 750, 1000.

Security Option

Select whether the password is required every time the system boots or only when you enter setup.

System   The system will not boot and access to Setup will be denied if the correct password is not entered at the prompt.

Setup   The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

OS Select For DRAM > 64MB

Select the operating system that is running with greater than 64MB of RAM on the system. The choice: Non-OS2, OS2.

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.
The choice: Enabled/Disabled.

4-3 Advanced Chipset Features

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

        System BIOS Cacheable     [Disabled]              Item Help
        Video RAM Cacheable       [Disabled]
        Memory Hole At 15M-16M     [Disabled]        Menu Level    ▶
        AGP Aperture Size (MB)     [128]
        AGP ISA Aliasing           [Enabled]
        AGP Secondary Lat Timer    [20h]
        AGP Fast Write             [Enabled]
        AGP Data Transfer Mode     [4x]
        AGP Always Compensate      [Enabled]
        SDRAM ECC Setting          [Disabled]
        Super Bypass Mode          [Enabled]
        SDRAM Timing setting by     [Auto]
      x SDRAM PH Limit             8  Cycle
      x SDRAM Idle Limit           8  Cycle
      x SDRAM Trc Timing Value     8  Cycle
      x SDRAM Trp Timing Value     3  Cycle
      x SDRAM Tras Timing Value    7  Cycle
      x SDRAM CAS Latency          2  Cycle
      x SDRAM Trcd Timing Value    3  Cycle

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

This section allows you to configure the system based on the specific features of the installed chipset. This chipset manages bus speeds and access to system memory resources, such as DRAM and the external cache. It also coordinates communications between the conventional ISA bus and the PCI bus. It must be stated that these items should never need to be altered. The default settings have been chosen because they provide the best operating conditions for your system. The only time you might consider making any changes would be if you discovered that data was being lost while using your system.

DRAM Settings (This field is no function)

The first chipset settings deal with CPU access to dynamic random access memory (DRAM). The default timings have been carefully chosen and should only be altered if data is being lost. Such a scenario might well occur if your system had mixed speed DRAM chips installed so that greater delays may be required to preserve the integrity of the data held in the slower memory chips.

System BIOS Cacheable

Selecting *Enabled* allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

The choice: Enabled, Disabled.

Video RAM Cacheable

This option allows the CPU to cache read/writes of the video RAM. The default is Disabled

Enabled: This option allows for faster video access.

Disabled: Reduced video performance.

Memory Hole At 15M-16M

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

The Choice: Enabled, Disabled.

AGP Graphics Aperture Size (MB)

The amount of system memory that the AGP card is allowed to share. The default is 128.

    32:    32MB of systems memory accessable by the AGP card.
    64:    64MB of systems memory accessable by the AGP card.
    128: 128MB of systems memory accessable by the AGP card.
    256: 256MB of systems memory accessable by the AGP card.

AGP ISA Aliasing

You can reserve this item for more compatibility with ISA VGA.

The Choice: Enabled, Disabled.

AGP Secondary Lat Timer

The Choice: 00h, 20h, 40h, 60h, 80h, C0h, FFh.

AGP Fast Write

Select Enabled allows to use Fast Write Protocol for 4X AGP.

The Choice: Enabled, Disabled.

AGP Data transfer Mode

Chipset AGP Mode support

The Choice: 1x/2x, 4x

AGP Always Compensate

The Choice: Enabled, Disabled.

SDRAM ECC Setting

Use this option to configurate the type of DRAM in your system.
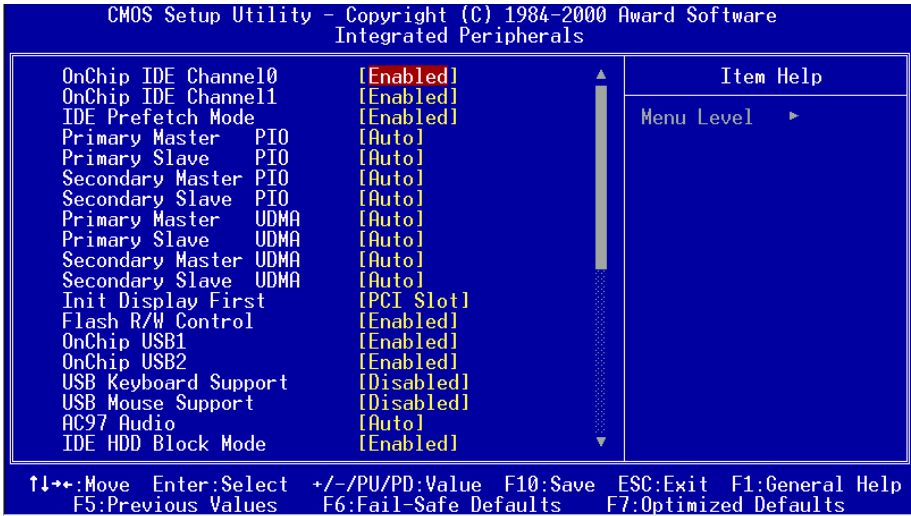The Choice: Disabled, Check Only, Correct Errors, Correct+Scrub.

Super Bypass Mode

The Choice: Enabled, Disabled.

SDRAM Timing Setting By

The Choice: Auto, Manual.

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]
    Flash R/W Control         [Enabled]
    OnChip USB1               [Enabled]
    OnChip USB2               [Enabled]
    USB Keyboard Support      [Disabled]
    USB Mouse Support         [Disabled]
    AC97 Audio                [Auto]
    IDE HDD Block Mode        [Enabled]      ▼

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

OnChip Primary/Secondary PCI IDE

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

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/Secondary Master/Slave PIO

The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.
The choice: Auto, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4.

BIOS

Primary/Secondary Master/Slave UDMA

Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support.
The Choice: Auto, Disabled.

Init Display First

This item allows you to decide to active whether PCI Slot or on-chip VGA first
The choice: PCI Slot, Onboard .

Flash R/W Control

The Choice: Enabled, Disabled.

OnChip USB1/2

This should be enabled if your system has a USB installed on the system board and you want to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature.
The choice: Enabled, Disabled.

USB Keyboard/Mouse Support

Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have a USB Legacy Device (Keyboard, Mouse).
The choice: Enabled, Disabled.

AC97 Audio

This item allows you to decide to Auto/disable the chipset family to support AC97 Audio.
The function setting AC97 Audio Codec states. The system default is Auto.

IDE HDD Block Mode

Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.
The choice: Enabled, Disabled

Onboard FDD Controller

Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install and-in FDC or the system has no floppy drive, select Disabled in this field.

The choice: Enabled, Disabled.

Onboard Serial Port 1/Port 2

Select an address and corresponding interrupt for the first and second serial ports.

The choice: 3F8/IRQ4, 2E8/IRQ3, 3E8/IRQ4, 2F8/IRQ3, Disabled.

UART 2 Mode

This filed allows the users to configure what IR mode the 2nd serial port should use. The default is Stardand.

Optional: Stardand, HPSIR and ASKIR.

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 LPT port.

Parallel Port Mode

This field allows the user to select the parallel port mode.

The default is EPP+ECP.

   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.

BIOS

Parallel Port EPP Type

This item allows you to determine the IR transfer mode of onboard I/O chip.
options: 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
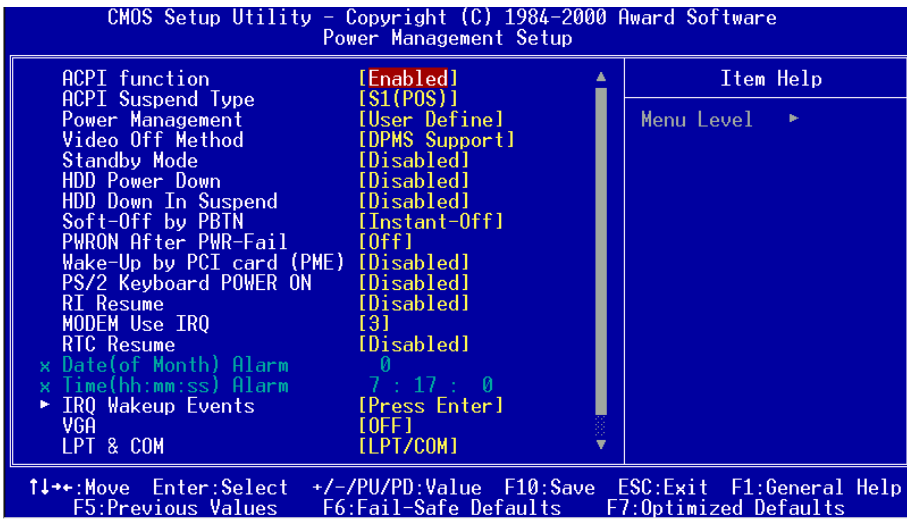
Built-in MPU-401 compatible MIDI I/O port selection:
The Choice: 300-303H, 310-313H, 320-323H, 330-333H (default)

Game Port (200-207H)

Built-in joystick port support disabled/enabled(default).

4-5 Power Management Setup

The Power Management Setup allows you to configure you system to most effectively save energy while operating in a manner consistent with your own style of computer use.

```
      CMOS Setup Utility - Copyright (C) 1984-2000 Award Software
                        Power Management Setup
   ACPI function             [Enabled]        ▲        Item Help
   ACPI Suspend Type         [S1(POS)]
   Power Management          [User Define]          Menu Level    ▶
   Video Off Method          [DPMS Support]
   Standby Mode              [Disabled]
   HDD Power Down            [Disabled]
   HDD Down In Suspend       [Disabled]
   Soft-Off by PBTN          [Instant-Off]
   PWRON After PWR-Fail      [Off]
   Wake-Up by PCI card (PME) [Disabled]
   PS/2 Keyboard POWER ON    [Disabled]
   RI Resume                 [Disabled]
   MODEM Use IRQ             [3]
   RTC Resume                [Disabled]
 x Date(of Month) Alarm        0
 x Time(hh:mm:ss) Alarm        7 : 17 :  0
 ▶ IRQ Wakeup Events         [Press Enter]
   VGA                       [OFF]
   LPT & COM                 [LPT/COM]         ▼
  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
       F5:Previous Values     F6:Fail-Safe Defaults    F7:Optimized Defaults
```

ACPI Function

This item allows you to enable/disable the Advanced Configuration and Power Management (ACPI).
The choice: Enabled, Disabled.

ACPI Suspend Type

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

Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

1. HDD Power Down
2. Doze Mode
3. Suspend Mode

BIOS

There are four selections for Power Management, three of which have fixed mode settings.

Disable (default)	No power management. Disables all four modes
Min. Power Saving	Minimum power management. Doze Mode = 1 hr. Standby Mode = 1 hr., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max. Power Saving	Maximum power management -- **ONLY AVAILABLE FOR SL CPU's**. Doze Mode = 1 min., Standby Mode = 1 min., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

Video Off Method

This determines the manner in which the monitor is blanked.

V/H SYNC+Blank	This selection will cause the system to turn off the vertical and horizontal synchronization ports and write blanks to the video buffer.
Blank Screen	This option only writes blanks to the video buffer.
DPMS	Initial display power management signaling.

Standby Mode

When the standby mode timer times-out, it will enter the standby mode and retain CPU at a slow working speed. The screen will be blanked out.
The choice: Disabled, 30sec, 1min, 4min, 20min, 30min, 1 hour.

HDD Power Down

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

HDD Down In Suspend

The choice: Enabled, Disabled.

Soft-Off by PWR-BTTN

Pressing the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung." The default is Instant-off.
The choice: Delay 4 Sec, Instant-Off.

PWRON After PW-Fail

The system will stay of or power on after a power interrupte.
The default is OFF.

    Fomer-Status: Stay off or power on depend on system safe shut-down or
                     power fail.

    ON: System always power on after a power interrupte.

    OFF: System always stay off after a power interrupte.

Wake-UP by PCI Card (PME)

An input signal from PME on the PCI card awakens the system from a soft off state.
The choice: Enabled, Disabled.

PS/2 Keyboard POWER ON

This item allows you to select wake-up the system by PS2 Keyboard when you save
the computer power at S1-S5 mode.
The choice: Enabled, Disabled.

RI Resume

The choice: Enabled, Disabled.

MODEM Use IRQ

The determine the IRQ in which the MODEM can use.
The choice: 3, 4, 5, 7, 9, 10, 11, NA.

RTC Resume

This option allows you to have the system turn on at a present time each day or on a
certain day.
The choice: Disabled, Enabled.

IRQ Wakeup Events

Allows users to set system to monitor IRQs 3-15 for activity to awaken system form a
power management mode.

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
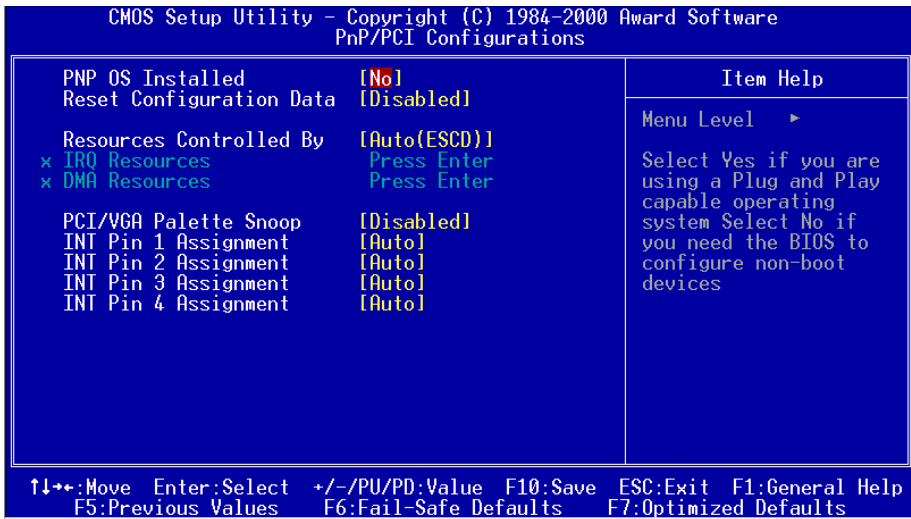awaken a system which has been powered down.

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 master

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

4-6 PnP/PCI Configuration Setup

This section describes configuring the PCI bus system. PCI, or **P**ersonal **C**omputer **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its own special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.

```
         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
     INT Pin 1 Assignment        [Auto]             you need the BIOS to
     INT Pin 2 Assignment        [Auto]             configure non-boot
     INT Pin 3 Assignment        [Auto]             devices
     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
```

PNP OS Installed

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

Reset Configuration Data

Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the operating system can not boot.

The choice: Enabled, Disabled .

Resource controlled by

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means

absolutely nothing unless you are using a Plug and Play operating system such as Windows95. If you set this field to "manual" choose specific resources by going into each of the sub menu that follows this field (a sub menu is preceded by a "Ø").

The choice: Auto(ESCD), Manual.

PCI/VGA Palette Snoop

Leave this field at *Disabled*.

Choices are Enabled, Disabled.

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

    Shutdown Temperature        [Disabled]          |      Item Help
    Current CPU Temp.           [33ºC/91ºF]          |
    Current System Temp.        [59ºC/138ºF]         |   Menu Level    ►
    Current CPU FAN Speed       [0 RPM]              |
    Current Chassis FAN Speed   [0 RPM]              |
    Vcore                       [1.53V]              |
    Vagp                        [2.09V]              |
     3.3V                       [3.42V]              |
      5V                        [4.97V]              |
      12V                       [12.16V]             |



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

Shutdown Temperature

This is the temperature that the computer will turn off the power to combat the effects of an overheating system. (requires ACPI to be enabled in Power Management BIOS and ACPI compliant operating system.) The default is Disabled.

Options available are 60ºC/140ºF to 100ºC/212ºF in increments of 5ºC.

Current CPU / System Temperature

This is the current temperature of the CPU/System.

Current CPU Fan / Chassis Fan Speed

The current CPU fan speed in RPMs.

Vcore

The voltage level of the Vcore.

Vagp

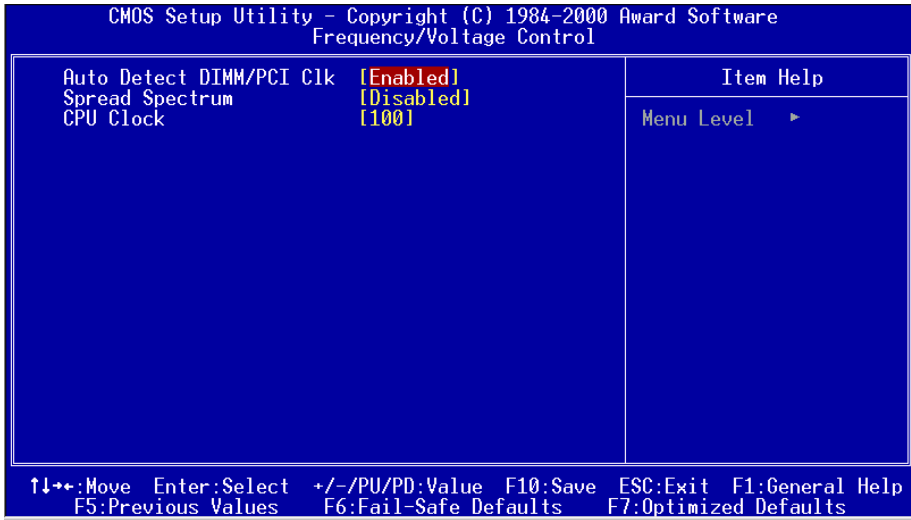The voltage level of Power supplied to AGP card.

        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                  [100]              │  Menu Level    ►     │
│                                               │                      │
│                                               │                      │
│                                               │                      │
│                                               │                      │
│                                               │                      │
│                                               │                      │
│                                               │                      │
│                                               │                      │
│                                               │                      │
│                                               │                      │
│                                               │                      │
│                                               │                      │
└──────────────────────────────────────────────┴──────────────────────┘
↑↓→←: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

This item allows you to enable/disable auto detect DIMM/PCI Clock.

The choice: Enabled, Disabled.

Spread Spectrum Modulate

This item allows you to enable/disable the spread spectrum modulate.

The choice: Enabled, Disabled.

CPU Clock

The mainboard is designed to set the CPU clock via BIOS. This item allows you to select the CPU Host clock speed by "Enter" key. The default speed depends on what CPU was installed.

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.

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Section 5
Driver Installation

Easy Driver Installation
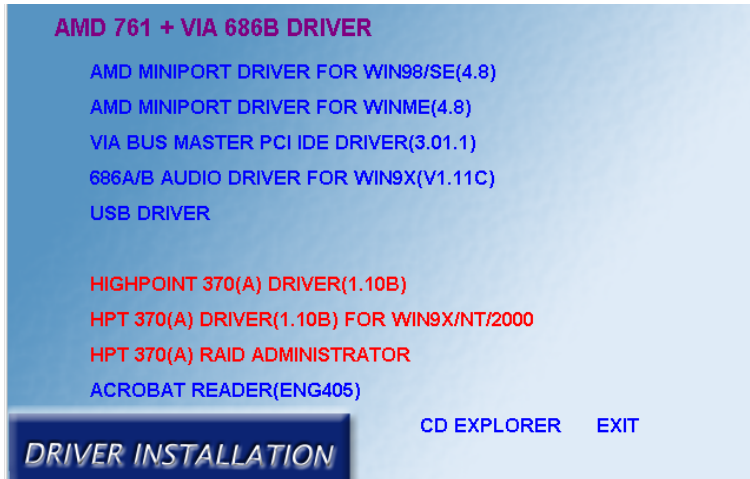
Insert the bundled autorun driver in CD-disk.

Step 1 : Click **AMD MINIPORT DRIVER** to install MiniPort.

Step 2 : Click **VIA BUS MASTER PCI IDE DRIVER** to install Bus Master PCI IDE.

Step 3 : Click **686A/B AUDIO DRIVER** to install the Audio Sound Driver.

Step 4 : Click **USB Driver** to install USB.

Step 5 : Click **HPT370(A) DRIVER** to install HPT370(A).

Step 6 : Click **HPT370(A) RAID ADMINISTRATOR** to install HPT370(A) RAID Administrator.

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Appendix A

NOTE:

The "**LOAD Optimized DEFAULTS**" function loads the system default data directly from ROM and initializes the associated hardware properly. This function will be necessary when you accept this mainboard, or the system CMOS data is corrupted.

CMOS Setup Utility - Copyright (C)   1984-1998

Standard CMOS Feature	Frequency/Voltage Control
Advanced BIOS Feature	Load Fail-Safe Defaults
Advanced Chipset Feature	Load Optimized Defaults
Integrated Peripherals	Set Supervisor Password
Power Management S|	Load Optimized Defaults (Y/N)? Y	
PnP/PCI Configuratio|	
PC Health Status	Exit Without Saving
Esc : Quit ↑ ↓ ← → : Select Item	
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type….	

LOAD Optimized DEFAULTS

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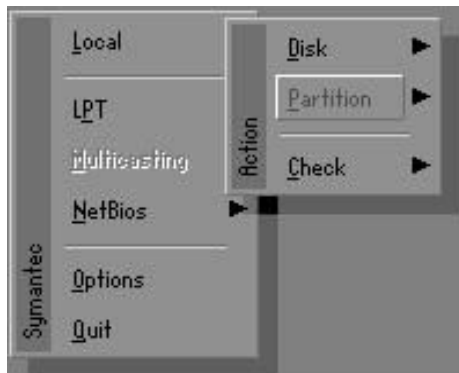
In which **Disk** indicates hard disk options
Partition indicates partition options
Check indicates check options

Disk
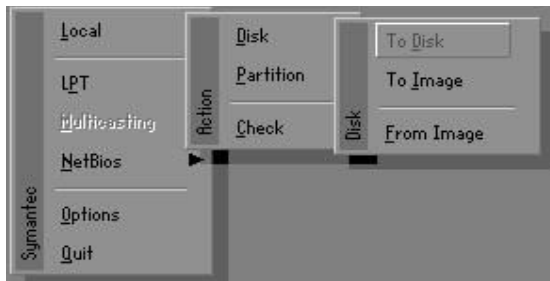
Appendix

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**.
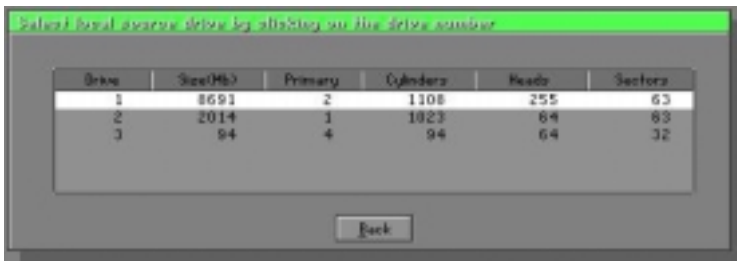
3. When cloning a disk or restoring the backup, set the required partition
    size as shown in the following figure.
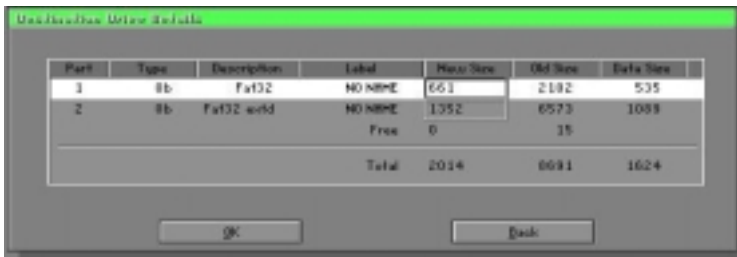
4. Click OK to display the following confirmation screen. Select **Yes** to start.
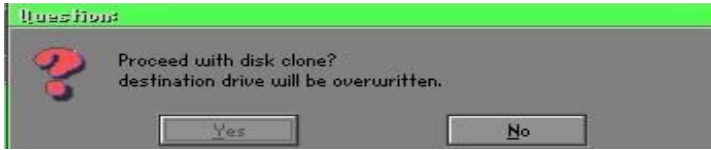
Disk To Image (Disk Backup)

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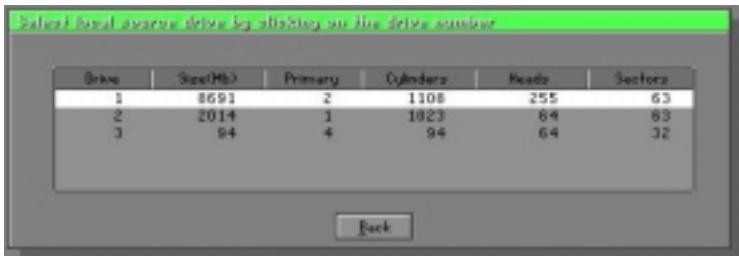
2. Select the location for storing the backup file.
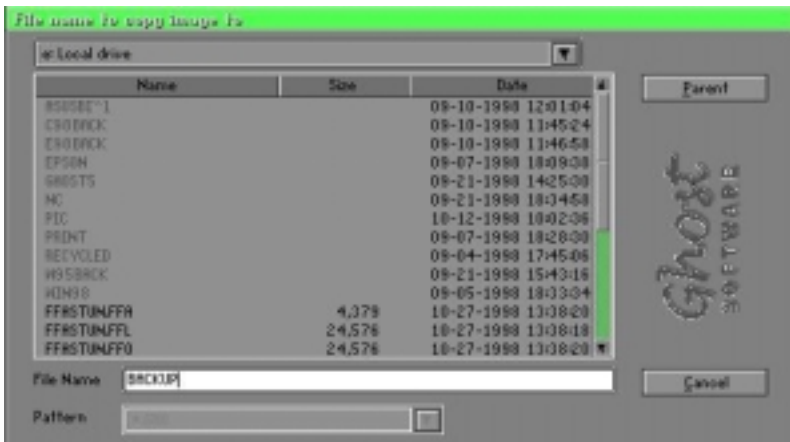
3. Click **OK** to display the following confirmation screen. Select **Yes** to start.
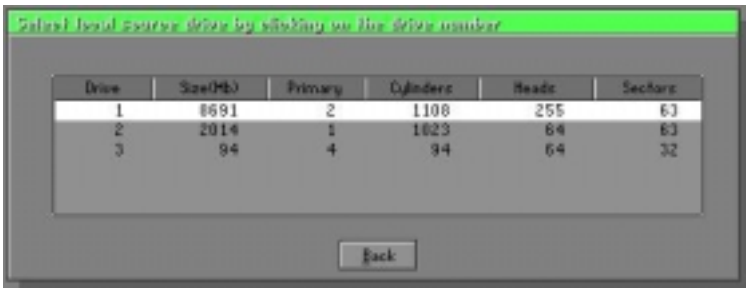

Disk From Image (Restore Backup)

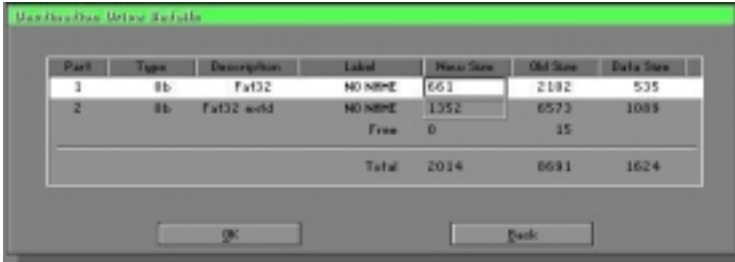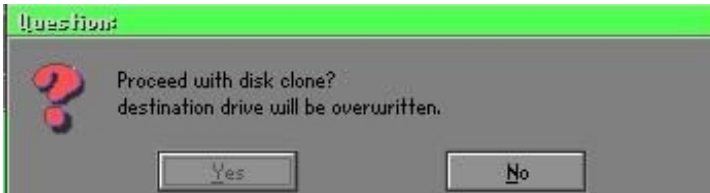1. Select the Restore file.
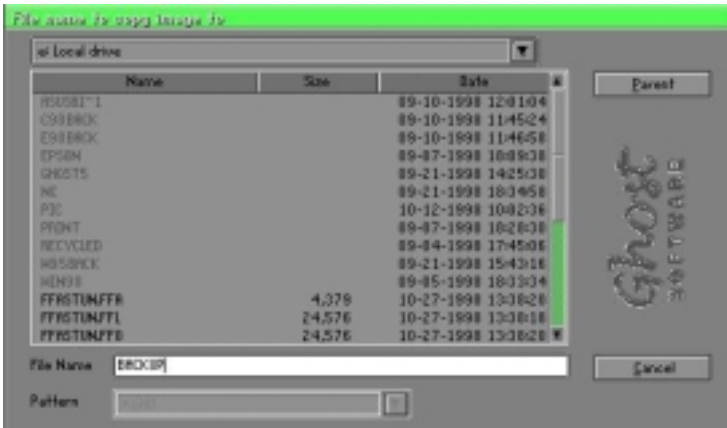
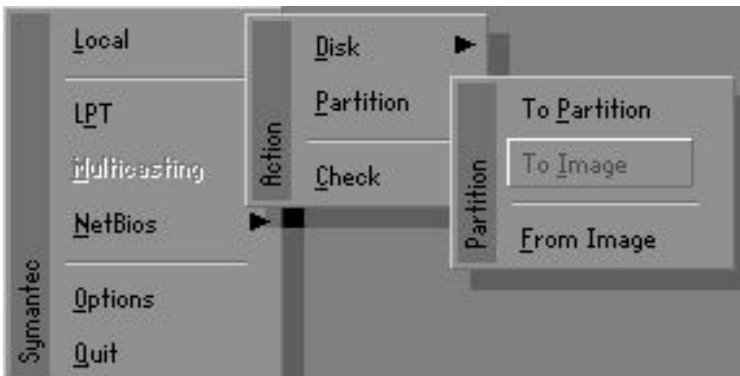2. Select the **Destination drive** of the disk to be restored.

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.
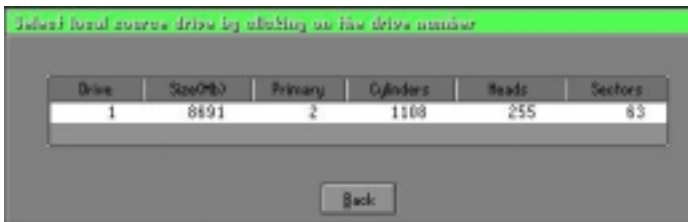

Partition

There are 3 partition functions:

1. Partition To Partition (partition cloning)

2. Partition To Image (partition backup)

3. Partition From Image (restore partition)
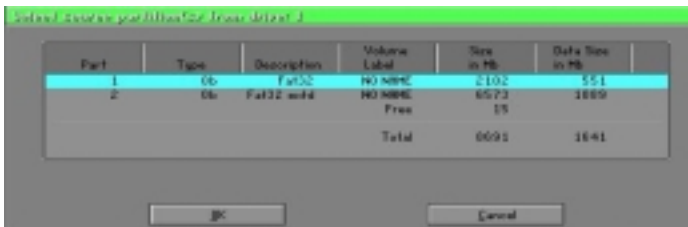
Partition To Partition (Partition Cloning)

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

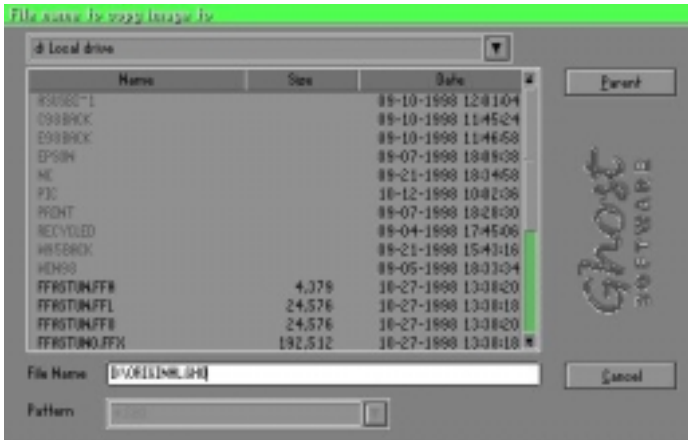### Partition To Image (Partition Backup)

1. Select the disk to be backed up.

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

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

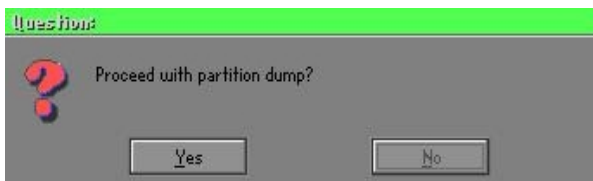4. Is the file compressed? There are 3 options:

    (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.
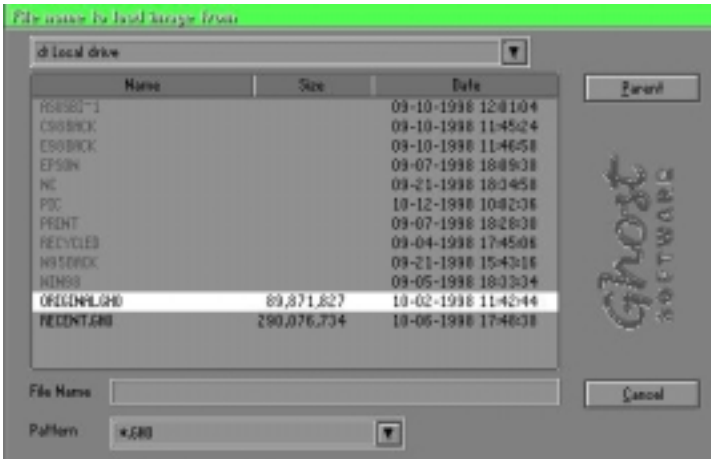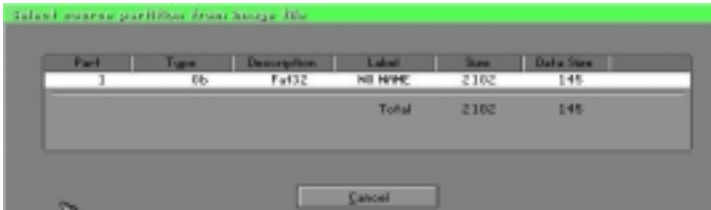
Partition From Image (Restore Partition)
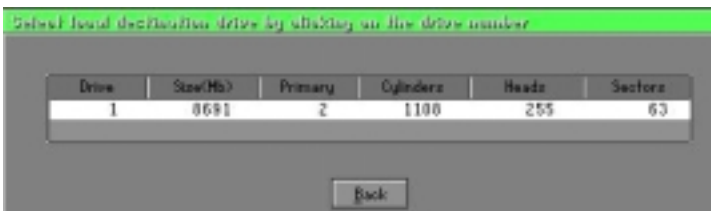
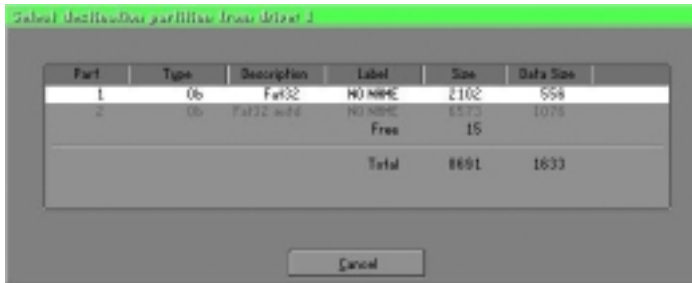1.   Select the backup file to be restored.
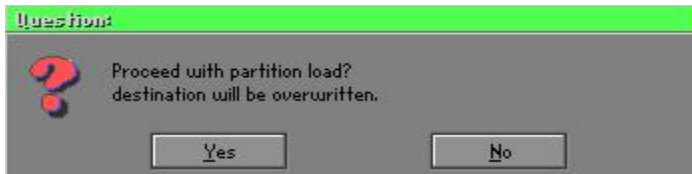

2. Select the source partition.

3. Select the disk to be restored.

4. Select the partition to be restored.

5. Select Yes to start restoring.

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

ISA POST codes are typically output to I/O port address 80h.

POST (hex)	DESCRIPTION
01-02	Reserved.
C0	Turn off OEM specific cache, shadow.
03	1. Initialize EISA registers (EISA BIOS only).
	2. Initialize all the standard devices with default values
	Standard devices includes.
	- DMA controller (8237).
	- Programmable Interrupt Controller (8259).
	- Programmable Interval Timer (8254).
	- RTC chip.
04	Reserved
05	1. Keyboard Controller Self-Test.
06	2. Enable Keyboard Interface.
07	Reserved.
08	Verifies CMOS's basic R/W functionality.
C1	Auto-detection of onboard DRAM & Cache.
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster.
08	Test the first 256K DRAM.
09	OEM specific cache initialization. (if needed)
0A	1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers. Initialize INT numbers from 33-120 with Dummy (Spurious) Interrupt Handler.
	2. Issue CPUID instruction to identify CPU type.
	3. Early Power Management initialization. (OEM specific)
0B	1. Verify the RTC time is valid or not.
	2. Detect bad battery.
	3. Read CMOS data into BIOS stack area.
	4. PnP initializations including. (PnP BIOS only)
	- Assign CSN to PnP ISA card.

	- Create resource map from ESCD.
	5. Assign IO & Memory for PCI devices. (PCI BIOS only)
0C	Initialization of the BIOS Data Area. (40:ON - 40:FF)
0D	1. Program some of the Chipset's value according to Setup. (Early Setup Value Program)
	2. Measure CPU speed for display & decide the system clock speed.
	3. Video initialization including Monochrome, CGA, EGA/VGA. If no display device found, the speaker will beep.
0E	1. Test video RAM. (If Monochrome display device found)
	2. Show messages including.
	- Award Logo, Copyright string, BIOS Data code & Part No.
	- OEM specific sign on messages.
	- Energy Star Logo. (Green BIOS ONLY)
	- CPU brand, type & speed.
	- Test system BIOS checksum. (Non-Compress Version only)
0F	DMA channel 0 test.
10	DMA channel 1 test.
11	DMA page registers test.
12-13	Reserved.
14	Test 8254 Timer 0 Counter 2.
15	Test 8259 interrupt mask bits for channel 1.
16	Test 8259 interrupt mask bits for channel 2.
17	Reserved.
19	Test 8259 functionality.
1A-1D	Reserved.
1E	If EISA NVM checksum is good, execute EISA initialization. (EISA BIOS only)
1F-29	Reserved.
30	Detect Base Memory & Extended Memory Size.
31	1. Test Base Memory from 256K to 640K.
	2. Test Extended Memory from 1M to the top of memory.
32	1. Display the Award Plug & Play BIOS Extension message. (PnP BIOS only)
	2. Program all onboard super I/O chips (if any) including

	COM ports, LPT ports, FDD port ... according to setup value.
33-3B	Reserved.
3C	Set flag to allow users to enter CMOS Setup Utility.
3D	1. Initialize Keyboard.
	2. Install PS2 mouse.
3E	Try to turn on Level 2 cache.
	Note: Some chipset may need to turn on the L2 cache in this stage. But usually, the cache is turn on later in POST 61h.
3F-40	Reserved.
BF	1. Program the rest of the Chipset's value according to Setup. (Later Setup Value Program)
41	2. If auto-configuration is enabled, program the chipset with pre-defined Values.
42	Initialize floppy disk drive controller.
43	Initialize Hard drive controller.
45	If it is a PnP BIOS, initialize serial & parallel ports.
44	Reserved.
45	Initialize math coprocessor.
46-4D	Reserved.
4E	If there is any error detected (such as video, kb...), show all error messages on the screen & wait for user to press <F1> key.
4F	1. If password is needed, ask for password.
	2. Clear the Energy Star Logo. (Green BIOS only)
50	Write all CMOS values currently in the BIOS stack area back into the CMOS.
51	Reserved.
52	1. Initialize all ISA ROMs.
	2. Later PCI initializations. (PCI BIOS only)
	- assign IRQ to PCI devices.
	- initialize all PCI ROMs.
	3. PnP Initialzations. (PnP BIOS only)
	- assign IO, Memory, IRQ & DMA to PnP ISA devices.
	- initialize all PnP ISA ROMs.
	4. Program shadows RAM according to Setup settings.
	5. Program parity according to Setup setting.

|	
	6. Power Management Initialization.
	- Enable/Disable global PM.
	- APM interface initialization.
53	1. If it is NOT a PnP BIOS, initialize serial & parallel ports.
	2. Initialize time value in BIOS data area by translate the RTC time value into a timer tick value.
60	Setup Virus Protection. (Boot Sector Protection) functionality according to Setup setting.
61	1. Try to turn on Level 2 cache.
	Note: If L2 cache is already turned on in POST 3D, this part will be skipped.
	2. Set the boot up speed according to Setup setting.
	3. Last chance for Chipset initialization.
	4. Last chance for Power Management initialization. (Green BIOS only)
	5. Show the system configuration table.
62	1. Setup daylight saving according to Setup value.
	2. Program the NUM Lock, typematic rate & typematic speed according to Setup setting.
63	1. If there is any changes in the hardware configuration, update the ESCD information. (PnP BIOS only)
	2. Clear memory that have been used.
	3. Boot system via INT 19H.
FF	System Booting. This means that the BIOS already pass the control right to the operating system.

C-2 Unexpected Errors:

POST (hex)	DESCRIPTION
B0	If interrupt occurs in protected mode.
B1	Unclaimed NMI occurs.0

Appendix D

D-1 EEPROM BIOS Remover

Do not remove the BIOS chip, unless instructed by a technician and only with a
PLCC IC extractor tool.
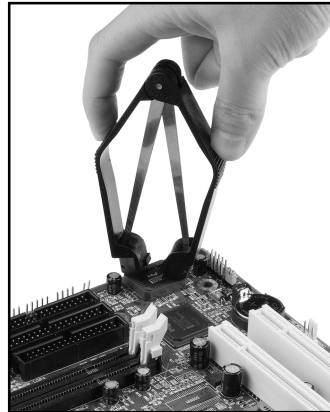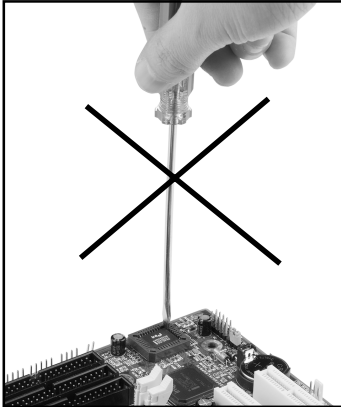
Any intention or improper way to replace the BIOS are prohibited.
Otherwise , BIOS socket may be damaged and as a result, system
will fail to boot up.

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