EP-BX7A
EP-BX7+100

A Socket 370 Processor based Mainbord

TRADEMARKS

Manual Revision 1.3
August 31 , 2000

This User's Manual specifies the board layout, components, connectors, power and environmental requirements, and the BIOS for the **EP-BX7A/BX7+100** mainboard. It describes the standard mainboard product and available manufacturing options. The manual is intended to provide detailed, technical information about the mainboard and its components to the vendors, system integrators, other engineers and technicians, and the general audience who need this information.

What This Document Contains

Chapter	Description
1	Introduction
2	Overview
3	Hardware Installation
4	Award Bios Setup
5	Appendix A-H

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's manual for furture reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - The power cord or plug is damaged
    - Liquid has penetrated into the equipment
    - The equipment has been exposed to moisture
    - The equipment has not work well or you can not get it working according to User's Manual.
    - The equipment has dropped and damaged
    - If the equipment has obvious sign of breakage

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Note: HPT370 only supports HDD, doesn't supports removeable Device. (Ex.: CD-ROM, LS-120, ZIP....)

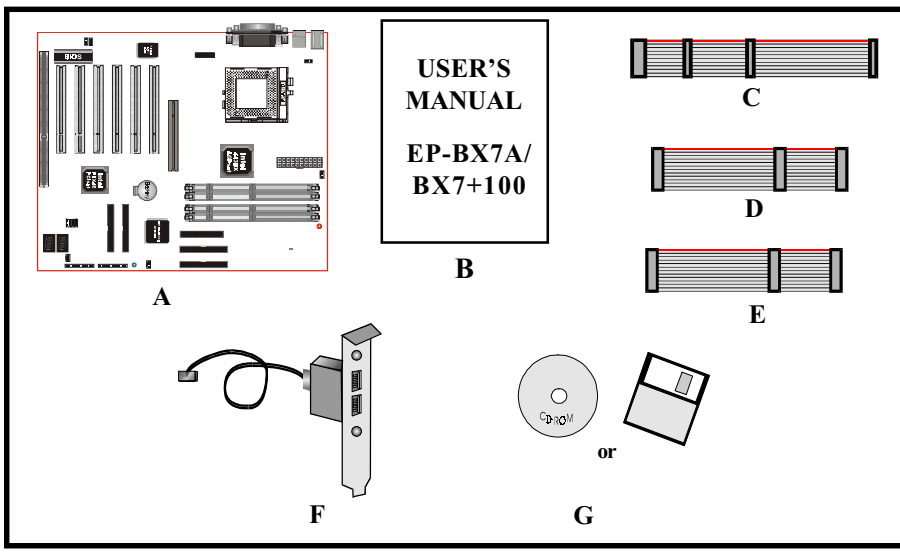
CHAPTER 1
INTRODUCTION

SUBJECTS COVERED:

a) Components Checklist

Components Checklist

- ✓ A. (1) EP-BX7A/BX7+100 mainboard
- ✓ B. (1) EP-BX7A/BX7+100 user's manual
- ✓ C. (1) Floppy ribbon cable
- ✓ D. (1) ATA-33 Hard drive ribbon cable
- E. (1) ATA-66 Hard drive ribbon cable (EP-BX7+100 Only)
- F. (1) USB Cable (Optional)
- ✓ G. (1) Driver and utility



CHAPTER 2
OVERVIEW

SUBJECTS COVERED:

a) Features

b) Intel Celeron processors (P.P.G.A.) 370

c) Intel Coppermine processors (FC-PGA) 370

d) Accelerated Graphics Port (AGP)

e) ATX Form Factor

f) Hardware Monitoring

g) Input/Output Shield

h) Power ON/OFF Remotely (KBPO & Modem Ring-in)

i) Universal Serial Bus (USB)

The **EP-BX7A/BX7+100** mainboard's features are summarized below.

Form Factor	● ATX
Processor	● 370 Processor including PPGA & FC-PGA ● Operating at 300-800MHz
Chipset	● Intel 82443BX AGPset
Memory	● 168-pin DIMM x 4 ● Supports up 1 GB of SDRAM (minimum of 8MB) on board ● EP-BX7A/BX7+100 will support Error Checking and Correcting (ECC) when using parity DRAM memory modules ● Automatically detect Synchronous DRAM (SDRAM) at 66MHz or 100MHz
I/O Control	● Provides independent high performance PCI IDE interface capable of supporting PIO Mode 3/4 and Ultra DMA 33 devices. ● Only the BX7+100 supports Ultra DMA 66/100 devices ● Support ATAPI devices on both Primary and Secondary IDE interface ● Designed with Winbond W83977TF/EF Multi I/O
Peripheral Interfaces	● 1 floppy port ● 1 parallel port ● 2 serial ports *Note：Japanese "Floppy3 mode" is also supported.*

	● 1 PS/2 mouse connector ● 1 PS/2 keyboard ● 5 USB Port Max.(2 ports on boards, 3 ports for option)
Video	● No Video On Board
Expansion	● 1*16 bit ISA ● 6*32 bit PCI Slot (All Master)
Capabilities	● 1*AGP ● Supports PCI Bus Master slots and a jumpless PCI INT# control scheme which reduces configuration confusion when plugging in PCI card(s). ● Capabilities Software power-down when using Windows®95/98 or Windows®2000.
BIOS	● Support ring-in feature(Remote Power-on through external modem, allow system to be turned remotely) . ● Resume by Alarm：Allow system to turn on at a preselected time. ● Power Loss Recovery：In the event of power outage your system will automatically turn itself back on without user intervention. ● Support CPU Hardware sleep and SIMM (System Management Mode) ● Supports Desktop Management Interface (DMI) facilitating the management of desktop computers, hardware and software components and peripherals, whether they are stand-alone systems or linked into networks. (Optional)

	● Supports Hot key, any key or password Keyboard Power On function (KBPO) ● Support USDM software to allow the status monitoring of various aspects of the system when using Windows 98/95 or Windows NT 4.0 ● Support the CPU, PWR and Chassis fan Auto stop in the sleep mode. ● Supports the System Power LED (PANEL) blinks in the sleep mode ● Build-in WOL (Wake On Lan) Connector
Power Source	● EP-BX7A/BX7+100 utilizes a Lithium battery which provides environmental protection and longer batter life ● Built-in ATX 20-pin power supply connector

Intel Celeron processors (P.P.G.A)370

The Intel Celeron processors provide power to handle the internet, educational programs, interactive 3D games, and productivity applications. The Intel Celeron processors at 533, 500, 466, 433, 400, 366, 333 and 300A MHz include integrated L2 cache 128Kbyte. The core for the 533, 500, 466, 433, 400, 366, 333 and 300A MHz processors have 19M transistors due to the addition of the integrated L2 cache 128Kbyte. All the Intel Celeron processors are available in the plastic pin grid array (P.P.G.A.) form factor. The P.P.G.A. form factor is compatible with the 370 pin socket. All the Intel Celeron processors are available in the plastic pin grid array (PPGA) package. The PPGA package is compatible with the 370 pin socket and provides more flexibility to design low cost systems by enabling lower profile and smaller systems and providing the potential for reducing costs of processor retention and cooling solutions. Like the Intel Celeron processors that utilize S.E.P.P., the Intel Celeron processors that use P.P.G.A., feature a P6-microarchitecture-based core processor on a single-sided substrate without BSRAM componentry.

The Intel Celeron processor at 533, 500, 466, 433, 400, 366, 333, and 300A MHz. Includes Intel MMX[tm] media enhancement technology. Offers Dynamic Execution technology.

Includes a 32Kbyte (16Kbyte/16Kbyte) non-blocking, level-one cache that provides fast access to heavily used data. Intel Celeron processors at 533, 500, 466, 433, 400, 366, 333 and 300A MHz include integrated L2 cache 128Kbyte. All the Intel Celeron processor utilize the Intel P6 microarchitecture's multi-transaction system bus at 66MHz. The 533, 500, 466, 433, 400, 366, 333 and 300A MHz processors utilize the Intel P6 microarchitecture's multi-transaction system bus with the addition of the L2 cache interface. The combination of the L2 cache bus and the processor-to-main-memory system bus increases bandwidth and performance over single-bus processors.Intel MMX technology includes new instructions and data types that allow applications to achieve a new level of performance. Intel's MMX technology is designed as a set of basic, general-purpose integer instructions that are easily applied to the needs of a wide diversity of multimedia and communications applications. The highlights of the technology are: * Single Instruction, Multiple Data (SIMD) technique

* 57 new instructions
* Eight 64-bit wide MMX technology registers
* Four new data types

Intel Coppermine processors (FC-PGA) 370

These Coppermine-128K and Coppermine-256K processor is the next addition to the P6 micro architecture product family. The FC-PGA package is a new addition to the Intel IA-32 processor line and hereafter will be referred to as the "Coppermine FC-PGA processor", or simply "The processor". The package utilizes the same 370-pin zero insertion force socket (PGA370) used by the Intel Celeron processor. Thermal solutions are attached directly to the back of the processor core package without the use of a thermal plate or heat spreader.

The Coppermine processor, like the Intel Celeron, Intel Pentium II and Pentium III in the P6 family processor, implement a Dynamic Execution micro architecture --- a unique combination of multiple branch prediction, data flow analysis, and speculative execution. This enable these processors to deliver higher performance than the Intel Pentium processor, while maintaining binary compatibility with all previous Intel Architecture processors. The processor also executes Intel MMX technology instructions for enhanced media and communication performance just as it's predecessor the Intel Pentium III processor. Additionally the Coppermine FC-PGA processor executes streaming SIMD (Single-Instruction Multiple Data) Extensions for enhanced floating point and 3-D application performance. The concept of processor identification, via CPUID, is extended in the processor family with the addition of a processor serial number. The processor utilizes multiple low-power states such as AutoHALT, Stop-Grant, Sleep and Deep Sleep to conserve power during idle times.

Accelerated Graphics Port (AGP)

The Accelerated Graphics Port (more commonly known as AGP) interface is a new platform bus specification that enables high performance graphics capabilities, especially 3D. This interface specification will enable 3D applications, which not only require sufficient information storage so that the monitor image may be refreshed, but also enough storage to support texture mapping, z-buffering and alpha blending.

PCI will continue to be the main general-purpose system I/O bus. The AGP interface has been designed specifically for dedicated use by graphics controllers, and is not intended to replace PCI. It is physically separated from the PCI bus and it uses a separate connector.

The benefits of AGP:

1. Direct texturing from main memory:
   -Two memory pipes are provided to graphic engines for concurrency.
   -Richer textures with no frame buffer growth.
   -Graphics & CPU get a continuous view of graphic data structures from “GART” (Graphics Address Re-mapping Table) Hardware.
2. De-multiplexed address and data.
   -Enables pipelining and concurrency.
3. 533 Mbytes /s peak bandwidth. -Delivers high performance data control.
4. Peak bandwidth can be 4 times the PCI bus bandwidth, and higher sustained rates via Sideband and pipelining.
5. Direct Memory Execute Textures.
6. Reduced Contention with the CPU and I/O devices for bus and memory access. The PCI bus serves disk controllers, LAN chips, and possibly video capture. AGP operates concurrently with and independent from most PCI operations. Furthermore, the CPU can accesses system RAM while with the AGP graphic chip reads RAM, because of out-of-order queuing hardware support in the chip set. Therefore, in spite of the heavy access from the graphic chip, there should be no audio breakup or other CPU degradation.
7. A separate port for the graphics chip to access memory, which allows for concurrent texture reads from AGP memory while read/writing from local memory. Efficient utilization of the bandwidths allows the graphic chip to obtain 1.3 GB/s peak by using both ports simultaneously, versus 0.8 GB/s from the local RAM.
8. Allowing the CPU to write directly to AGP shared system memory

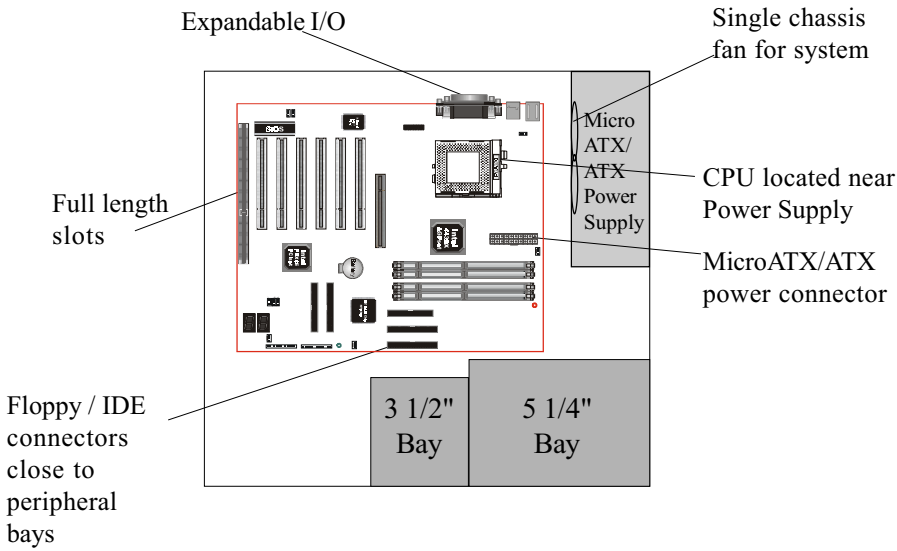
ATX Form Factor

The **EP-BX7A/BX7+100** is designed with ATX form factor - the latest industry standard of chassis. The 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, audio, etc.) to systems. This will help systems integrators differentiate their products in the marketplace, and better meet your needs.

- By integrating more I/O down onto the board and better positioning the hard drive and floppy connectors material cost of cables and add-in cards is reduced.

- By reducing the number of cables and components in the system, manufacturing time and inventory holding costs are reduced and reliability will increase.

- By using an optimized power supply, it's possible to reduce cooling costs and lower acoustical noise.



The **EP-BX7A/BX7+100** is equipped with an ATX power supply connectors, which are 20-pin input devices for ATX power supplies. When attached to an ATX supply with an 20-pin supply connector cables ensures a steady supply of current to the mainboard and devices.

To implement the built-in remote on/off function of the ATX power supply a momentary switch, which is normally open, should be connected to the PW-ON connector on the motherboard as the on/off switch.

Based on the ATX form factor the **EP-BX7A/BX7+100** has been designed to support many ACPI and soft-off functions. According to the definition of ACPI: suspend mode will be enabled while pressing the system on/off button for less than 4 seconds. Nevertheless the system can always be turned off by pressing the system on/off button for more than 4 seconds or by using the soft-off function if supported by the operating system.

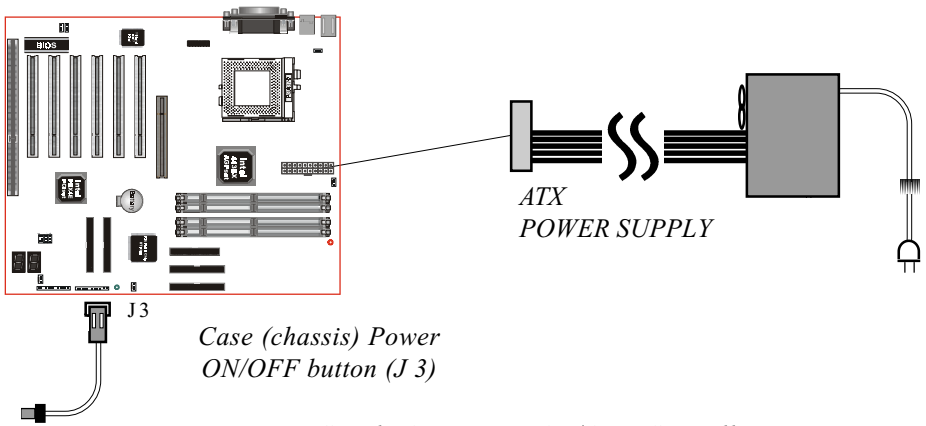


Figure 3: Simple ATX Power ON/OFF Controller

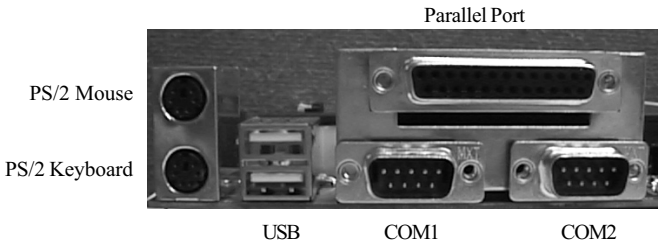
Hardware Monitoring

Hardware monitoring allows you to monitor various aspects of your systems operations and status. These include features such as CPU temperature, voltage and fan RPM's. By entering the Award BIOS CMOS utility and selecting the Chipset Features section you can monitor this information.

I/O Shield

The **EP-BX7A/BX7+100** is equipped with an I/O back panel. Please use the appropriate I/O shield.

Figure 4: I/O back panel layout



Power ON/OFF Remotely (KBPO & Modem Ring-in)

Keyboard power on (KBPO)
The Keyboard Power-On (KBPO) function allows users to turn on a PC by easily touching the keyboard instead of bending down to look for the power button under a table. To use this unique feature your motherboard have it set to enable, and use an ATX power supply rated 0.1a (100mA) or greater for the +5vsb. KBPO is only available on selected motherboard models.

Modem Ring-IN
On the basis of bounded functions in the I/O chipset, the two onboard serial ports are able to support external modem ring-in power-on. Using external modems users are now able to power on the system simply by placing a call to the system remotely.

Universal Serial Bus (USB)

USB is a peripheral bus specification developed by the PC and telecom industries — that brings plug and play of computer peripherals outside the box, eliminating the need to install cards into dedicated computer slots and reconfigure the system.

Personal computers equipped with USB allow computer peripherals to be automatically configured as soon as they are physically attached - without the need to reboot or run setup. USB also allows multiple devices to run simultaneously on a computer, with peripherals such as monitors and keyboards acting as additional plug-in sites, or hubs.

System Block Diagram

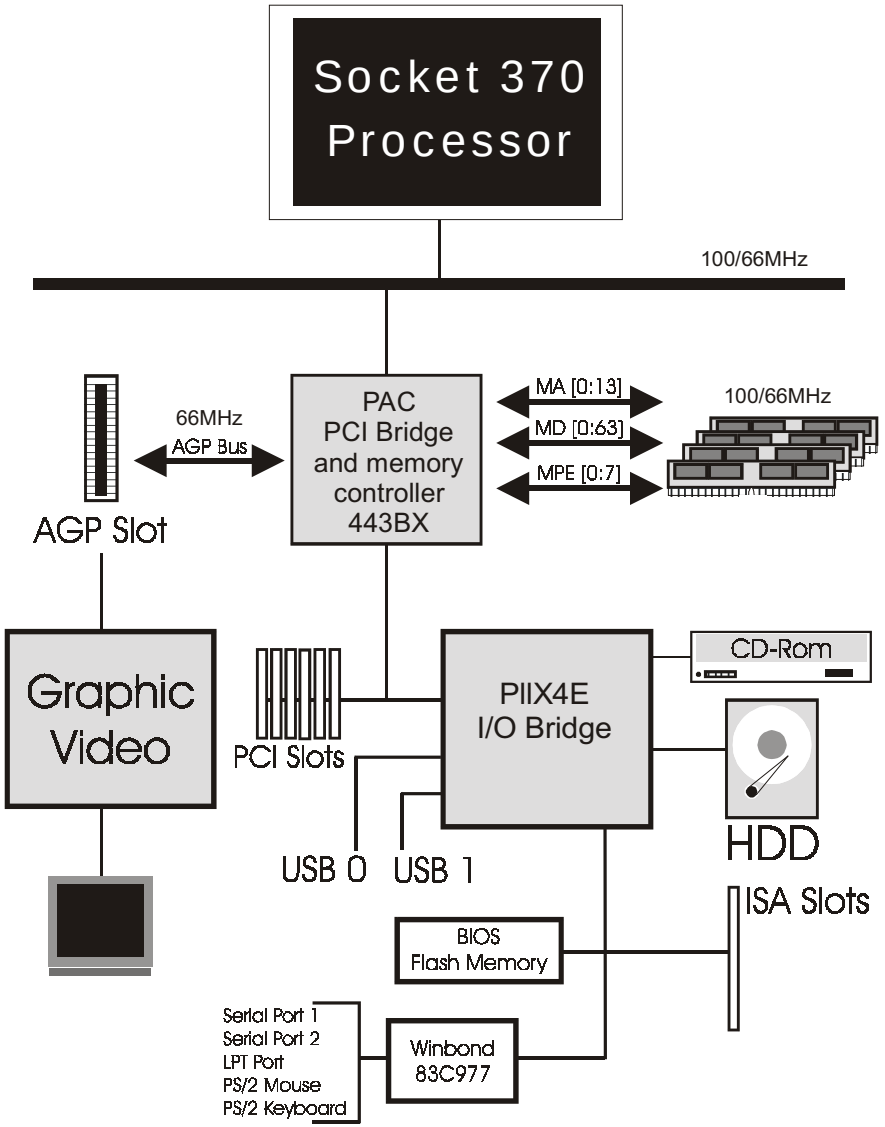


Figure 5: System Block Diagram

Chapter 3
Hardware Installation

SUBJECTS COVERED:

a) Directions & Recommended Tools

b) Installing into ATX Case

c) Installing Connectors

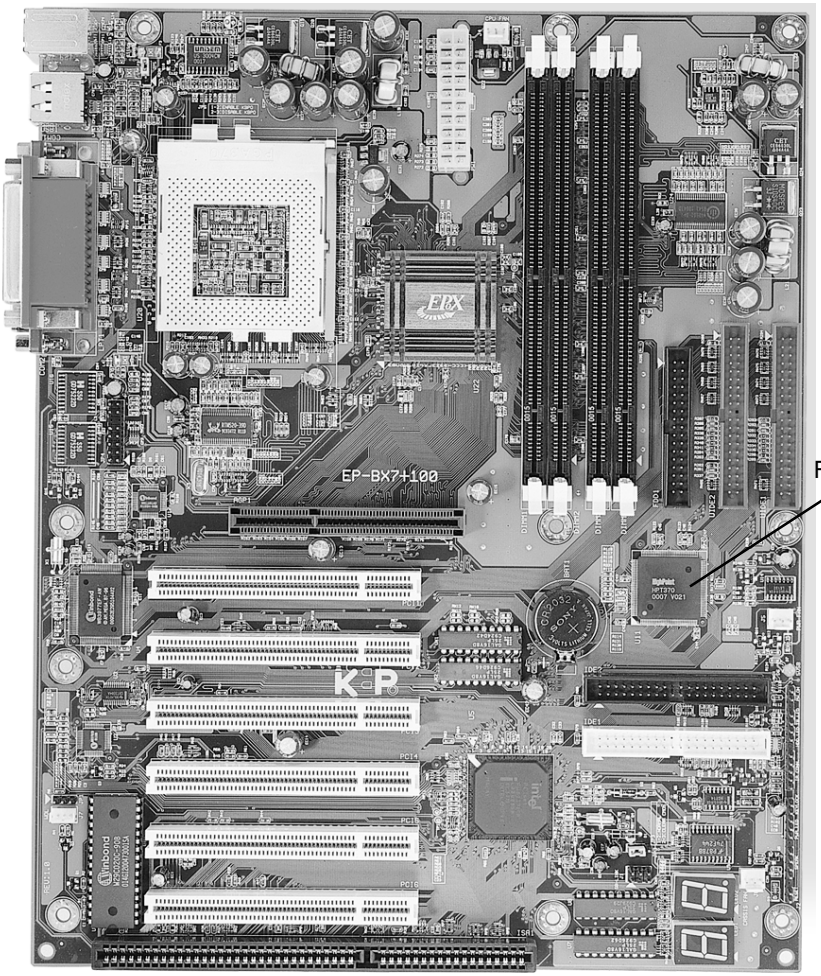
d) Installing Memory

e) Installing Processor

f) Device Connector Description

g) Configuring KBPO & Modem Ring-in

EP-BX7A/BX7+100 Detailed Layout



Directions & Recommended Tools

Thank you for using our products! This chapter will discuss some general steps needed in order to get your new mainboard installed and operational. The **EP-BX7A/BX7+100** is a high performance mainboard which allows the use of Intel Celeron / Coppermine Socket 370 processors. The mainboard uses the ATX form factor and requires a matching case. Below you will find our recommended installation procedure for fast and easy setup.

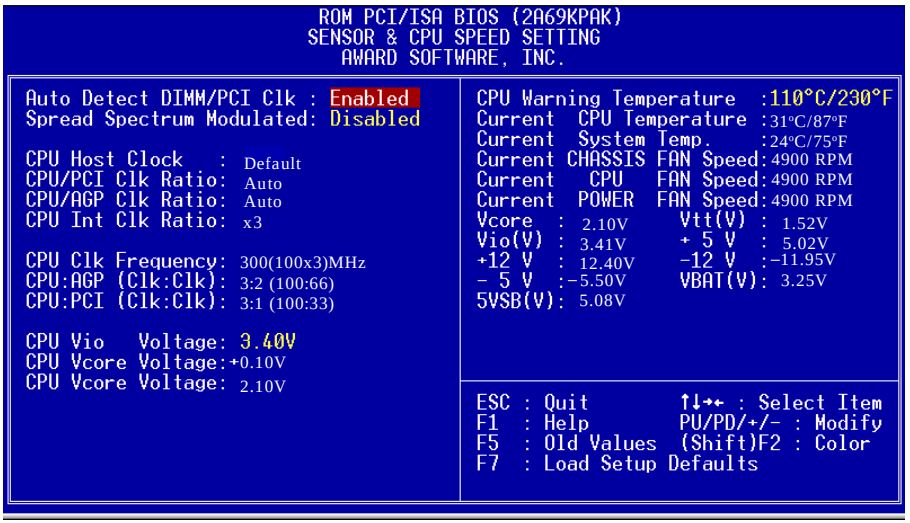
Recommended Tools (Not Included)

Needle nose pliers: the all purpose needle nose pliers is useful for many purposes such as, tightening loose standoffs when no socket is available, holding screws & jumpers, cutting plastic tie-offs, etc.

Phillips and flat-head screwdrivers: useful for the actual mouting of the mainboard itself to the case as well as hard drives, cards, CD-ROM drives, etc.

Configuration of Jumpers

There are no jumper setting for CPU Speed Setup but detected automatically through the BIOS.



JP1 

Chassis (Case) intruder dectect

JP3 

CMOS Clear
JP3 = 1-2 Normal (Default)
= 2-3 Clear CMOS

JP5 

Keyboard Power-ON Function
JP5 = 1-2 Enabled
= 2-3 Disabled (Default)

LED1 

LED2 

Debug card on board
(Please refer to Appendix B for POST codes)

Installing into ATX Case

Static electricity can severely damage your equipment. Handle the EP-BX7A/ BX7+100 and any other device in your system with extreme care and avoid unnecessary contact with system components on the mainboard. Always work on an antistatic surface to avoid possible damage to the mainboard from static discharge. Always have the power supply unplugged and powered off when inserting and removing devices within the computer chassis.

There are countless types, sizes, and shapes when it comes to cases in the computer industry. Generally the mainboard is mounted into the case using nylon and/or brass standoffs. These standoffs prevent the mainboard from actually touching the case itself (shorting) and additionally provides support to prevent bending and warping of the board during normal use.

1. Observe the safety precautions as listed above.

2. Place the I/O shield into the I/O connector area of the case. An ATX 2.1 compliant I/O shield should be provided with the system case. The shield ensures proper cooling and also minimizes EMI.

3. Position the board over the standoffs and slide the motherboard into place noting that the I/O connectors on the mainboard should protrude slightly through the I/O shield.

4. Insert matching screws through the mounting holes of the mainboard into the threaded standoffs. Repeat for all remaining standoffs, and do not over-tighten!

5. Connect any IDE or Floppy drive cables now onto the mainboard. Always observe the correct orientation of the cables. PIN1 on the cable is signified by a color stripe. Connect ATX cable(s) from power supply to mainboard (PW1).

6. Install any add-in boards; fully seating them into their respective slots.

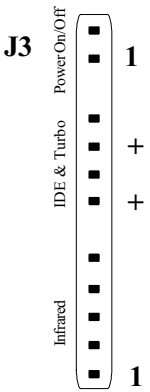
7. Move on to the next section to connect case switches and LEDs.

The mainboard is equipped with an ATX power supply connectors (PW1) which when connected to an ATX supply ensuring a ssteady current.

Installing Connectors

The computer case may supply additional wires which control the function of the power switch, hard drive LED, power LED and reset among others. This section outlines where on the mainboard these wires should be attached. PIN1 is designated as a "1" or "+" unless otherwise noted.

Power On/Off - 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 immediatly), or 4 sec delay (you need to hold the button down for 4 seconds before the system turns off).

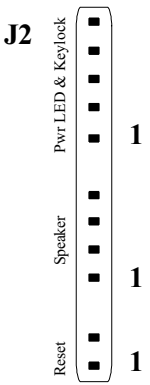


Turbo LED indicator - LED ON when higher speed is selected

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

Infrared - Infrared connector

1. Vcc	4. GND
2. IRTX	5. IRTX2
3. IRRX2	



KeyLock - Keyboard lock switch & Power LED connector

1. Power LED(+)	4. Keylock
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.

Installing Memory

The EP-BX7A/BX7+100 supports (4) 168-pin DIMMs (Dual In-line Memory Module). The DIMMs is for SDRAM (Synchronized DRAM).

- DIMM SDRAM may be 83MHz (12ns), 100MHz (10ns) or 125MHz (8ns) 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 below and Table 1 show several possible memory configurations usage

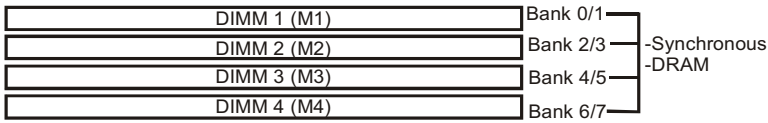


Table 1

Total Memory	DIMM 1 (Bank 0/1)	DIMM 2 (Bank 2/3)	DIMM 3 (Bank 4/5)	DIMM 4 (Bank 6/7)
= 256MB Maximum	SDRAM* 32MB, 64MB, 128MB, 256MB x 1	None	None	None
= 512MB Maximum	SDRAM* 32MB, 64MB, 128MB, 256MB x 1	SDRAM* 32MB, 64MB, 128MB, 256MB x 1	None	None
= 768MB Maximum	SDRAM* 32MB, 64MB, 128MB, 256MB x 1	SDRAM* 32MB, 64MB, 128MB, 256MB x 1	SDRAM* 32MB, 64MB, 128MB, 256MB x 1	None
= 1GB Maximum	SDRAM* 32MB, 64MB, 128MB, 256MB x 1	SDRAM* 32MB, 64MB, 128MB, 256MB x 1	SDRAM* 32MB, 64MB, 128MB, 256MB x 1	SDRAM* 32MB, 64MB, 128MB, 256MB x 1

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

* *We recommend to use PC100 Memory Module for bus speed between 66MHz and 100MHz and PC133 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 & Removal

Figure 1 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 2) until it fits tightly into the DIMM socket (figure 3).

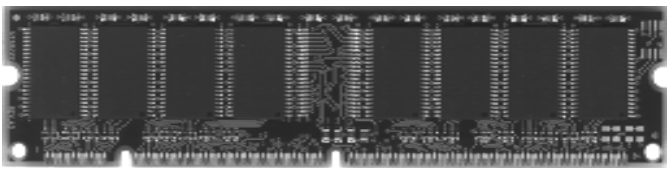


Figure 1

LEFT KEY ZONE
(UNBUFFERED)

CENTER KEY ZONE
(3.3 V DRAM)

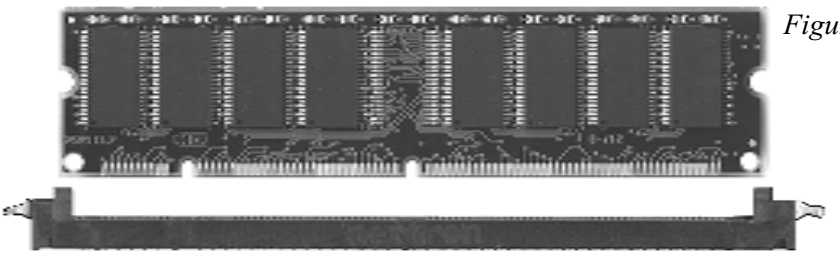


Figure 2

Open DIMM module clip before installing DIMM. When DIMM is inserted the clip will raise into closed position.

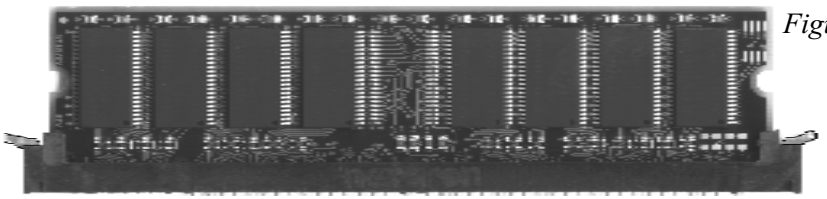
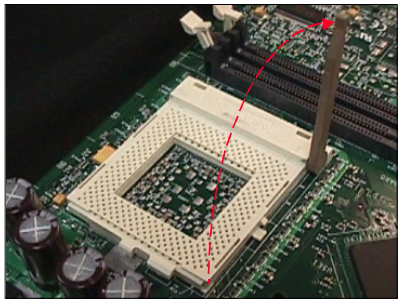


Figure 3

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.

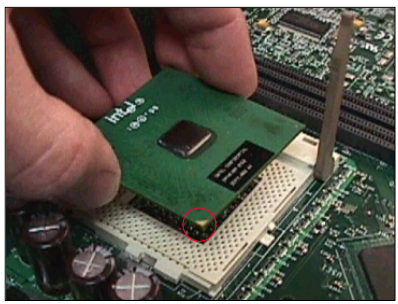
Installing Processor(s)

CPU Insertion: (use CuMine™ for reference)



Step 1

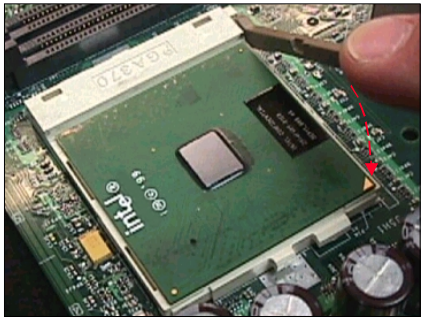
Open the socket by raising the actuation lever.



Step 2

Insert the processor.

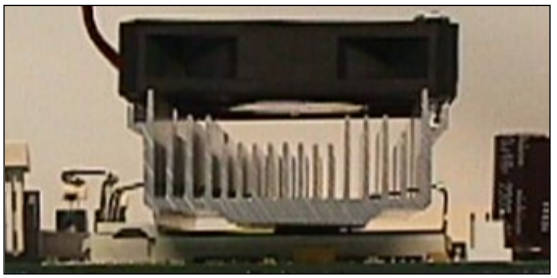
Ensure proper pin 1 orientation by aligning the FC-PGA corner marking with the socket corner closest to the actuation arm tip. The pin field is keyed to prevent mis-oriented insertion.
Don't force processor into socket. If it does not go in easily, check for mis-orientation and debris.
Make sure the processor is fully inserted into the socket on all sides.



Step 3

Close the socket by lowering and locking the actuation lever.

Note: Intel's reference design thermal solution is an active heatsink; an extruded aluminum heatsink based and a fan attached to the top on the fin array. (See Figure below)



Device Connector & Jumper Description

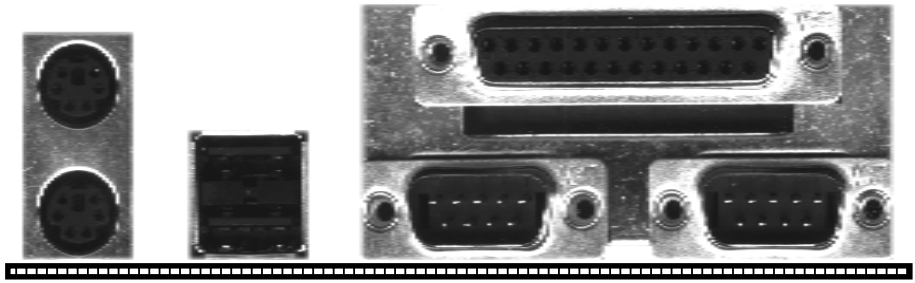


Figure 4

J1: SB-LINK Connector
- Reserved for Creative SB-LINK™ (Sound Blaster LINK™) with the Sound Blaster AWE64D PCI Sound Card to compatible.

J2,J3: Chassis Panel Connector
- Power LED, Speaker, Reset, Turbo LED, HDD LED, IR Conn., Sleep/ Power_ON

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

J5: Power Supply 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
- Reserved for NIC (Network Interface Card) to Wake the System.

IDE1: Primary IDE Connector

IDE2: Secondary IDE Connector

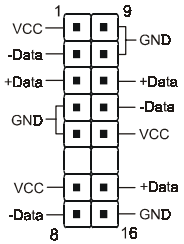
UIDE1: Ultra ATA66/100 Primary IDE Connector (EP-BX7+100 only)

UIDE2: Ultra ATA66/100 Secondary IDE Connector (EP-BX7+100 only)

FDD1: Floppy Controller Connector

PW1: ATX Power Connector
- 20-pin power connector

JP4: USB Connector
- The third ,fourth and fifth USB ports (Cable optional)



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		NC	
7	Red	Vcc	Cable Power
8	White	-Data	Data
9	Black	Ground	Cable Ground
10	Black	Ground	Case Ground
11	Green	+Data	Data
12	White	-Data	Data
13	Red	Vcc	Cable Power
14		NC	
15	Green	+Data	Data
16	Black	Ground	Case Ground

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 that JP5 is at the position 1-2 after you finished the system installation.

JP5

Keyboard Power-ON Function
JP5 = 1-2 Enabled
= 2-3 Disabled (Default)

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

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.

Notes:

1. Intel 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 > = 0.1A (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 JP4 at the position 2-3 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.

Chapter 4
Award BIOS Setup

SUBJECTS COVERED:

a) BIOS Instructions

b) Standard CMOS Setup

c) BIOS Features Setup

d) Chipset Features Setup

e) Power Management Setup

f) PNP/PCI Configurations Setup

g) Load Setup Defaults

h) Integrated Peripherals

i) Changed Supervisor or User Password

j) IDE HDD Auto Detection

k) Save and Exit Setup

l) Exit without Saving

Section 4
AWARD BIOS SETUP

BIOS Instructions

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.

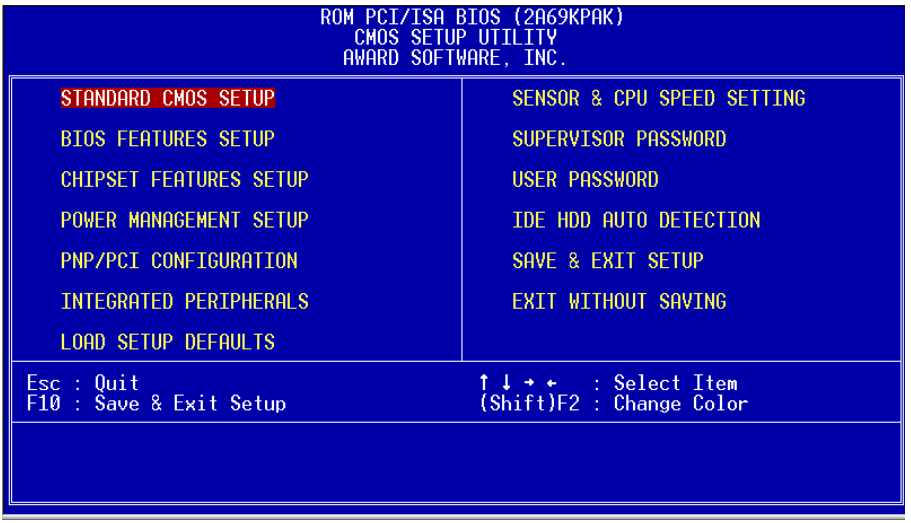


Figure 1: CMOS Setup Utility

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.

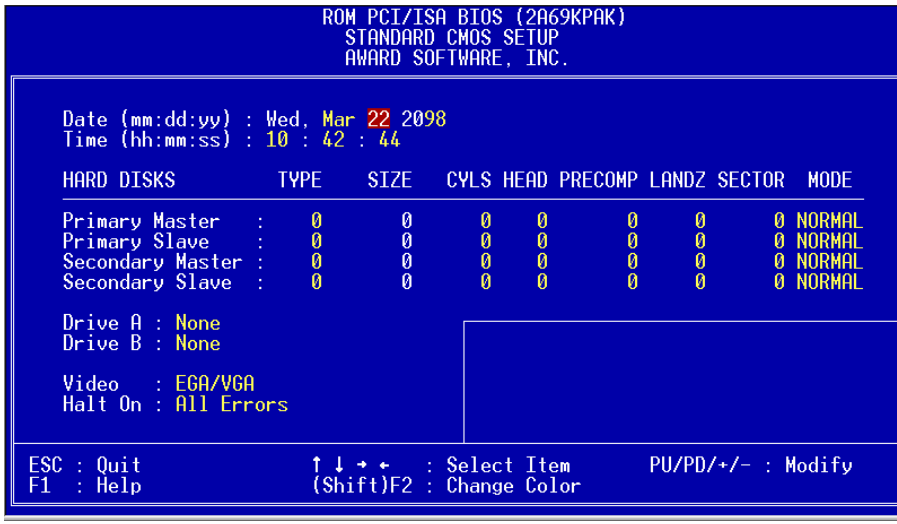


Figure 2: Standard CMOS Setup

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 BIOS Features Setup

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 EP-BX7A/BX7+100.

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

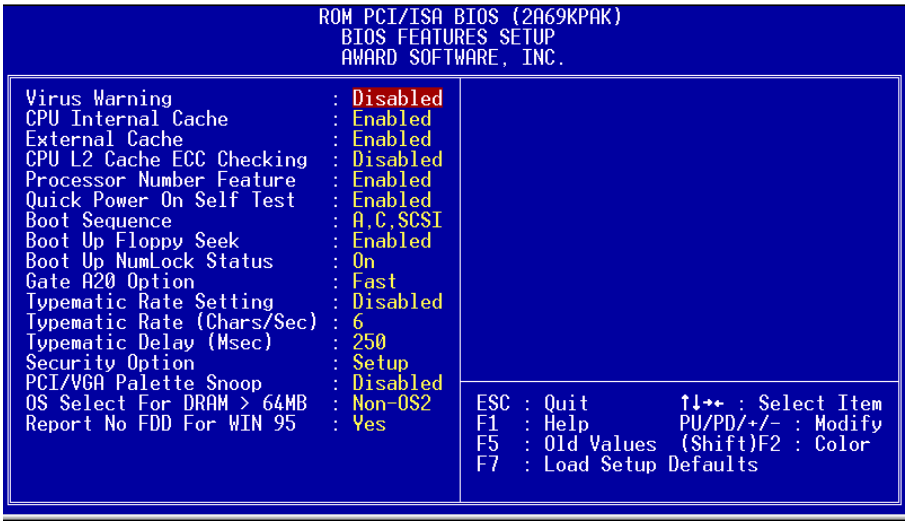


Figure 3: BIOS Features Setup

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 motherboard's L2 cache thereby increasing performance.*

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

CPU L2 Cache ECC Checking: This controls if the CPU's L2 cache will support error Checking and correcting (ECC). The default is Disabled.

Enabled: *Enabled ECC support for CPU's L2 cache. Performance will decrease 2%~4%.*

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

Processor Number Feature: Pentium III or later CPU new feature. The default is Enabled.

Enabled: *Processor serial number readable.*

Disabled: *Processor serial number disabled.*

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.*

Boot Sequence: This category determines which drive is searched first by the O/S (Operating System). The default is A,C,SCSI.

The following is your list of options:
[A, C, SCSI] - [C, A, SCSI] - [C, CD-ROM, A] - [CD-ROM, C, A]
[D, A,CD-ROM],[E, A, CD-ROM] - [F, A, CD-ROM] - [SCSI, A, C]
[SCSI C, A] - [C Only]

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 Fast.

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.*

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.*

PCI/VGA Palette Snoop: This field controls the ability of a primary PCI VGA controller to share a common palette (When a snoop write cycles) with an ISA video card. The default is Disabled.

Enabled: *If an ISA card is connected to a PCI VGA card via the VESA connector, and that ISA card connects to a VGA monitor, then that ISA card uses the RAMDAC of the PCI card.*

Disabled: *Disables the VGA card Palette Snoop function.*

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.*

Report No FDD For WIN95: This option allows BIOS to indicate whether WIN95 is with FDD or not. The Default value is Yes.

NO: *Report No FDD for WIN95.*

YES: *Report FDD for WIN95*

4-3 Chipset Features Setup

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

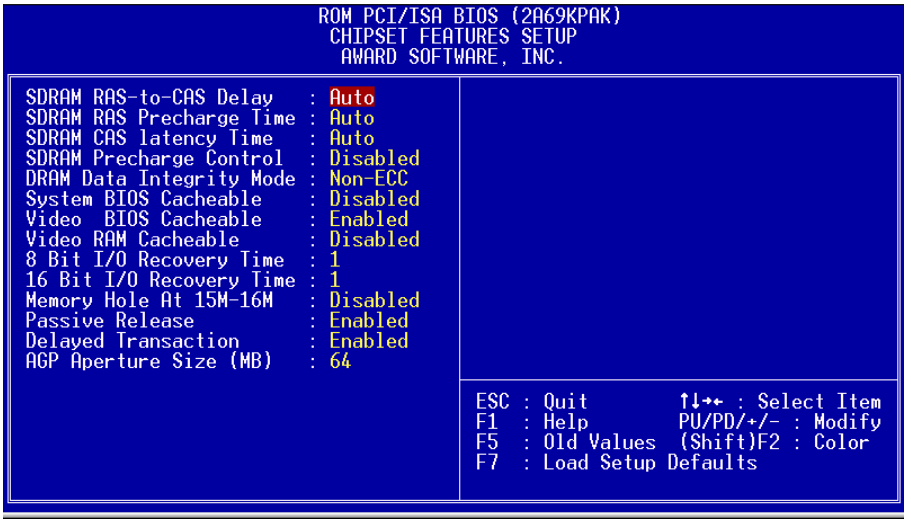


Figure 4: Chipset Features Setup

SDRAM RAS-to-CAS Delay: This allows the option to insert a timing delay between the CAS and RAS strobe signals (used when SDRAM is written to , read from or refreshed). The default is 3.

***2**: Provides faster memory performance.*

***3**: Provides slower memory performance.*

SDRAM RAS Precharge Time: The precharge time is the number of cycles it takes for the RAS to accumulate its charge before SDRAM refresh. If insufficient time is allowed, refresh may be incomplete and the SDRAM may fail to retain data. The default is 3.

***2**: Provides faster memory performance.*

***3**: Provides better memory compatibility.*

SDRAM CAS Latency Time: This setting defines the CAS timing parameter of the SDRAM in terms of clocks. The default is Auto.

***2**: Provides faster memory performance.*

***3**: Provides better memory compatibility.*

Auto: *CAS Latency Time programming depend on information read from DRAM SPD.*

SDRAM Precharge Control: The default is Disabled.

Enabled: *Enabled the option.*

Disabled: *Disabled the option.*

DRAM Data integrity Mode: Use this option to configure the type of DRAM in your system. The default is Non-ECC.

Non-ECC: *If your memory is Non-ECC, choose this option.*

ECC: *If your memory is ECC memory, choose this option.*

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 BIOS Cacheable: This option copies the video ROM BIOS to fast RAM (C0000h to C7FFFh). The default is Enabled.

Enabled: *Enables the Video BIOS Cacheable to speed up the VGA Performance.*

Disabled: *Will not use the Video BIOS Cacheable function.*

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.*

8 Bit I/O Recovery Time: This function allows you to set the wait state that is added to an 8 bit ISA instruction originated by the PCI bus. The default is 1.

NA: *No wait state*
8: *8 wait states*
1: *1 wait states*
2: *2 wait states*
3: *3 wait states*
4: *4 wait states*
5: *5 wait states*
6: *6 wait states*
7: *7 wait states*

16 Bit I/O Recovery Time: This function allows you to set the wait state that is added to an 16 bit ISA instruction originated by the PCI bus. The default is 1.

NA: *No wait state* ***4***: *4 wait states*
3: *3 wait states* ***2***: *2 wait states*
1: *1 wait states*

Memory Hole at 15M-16M: 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.

Passive Release: This option allows access from the CPU to PCI bus to be active during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM. The default is Enabled.

Enabled: *Enabled.*
Disabled: *Disabled.*

Delayed Transaction: This option allows the chipset to use its embedded 32-bit posted write buffer to support delay transactions cycles. The default is Disabled.

Enabled: *Select enabled to support PCI 2.1 specification.*
Disabled: *Disabled.*

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 accessable by the AGP card.*
8: *8MB of systems memory accessable by the AGP card.*
16: *16MB of systems memory accessable by the AGP card.*
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.*

4-4 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.

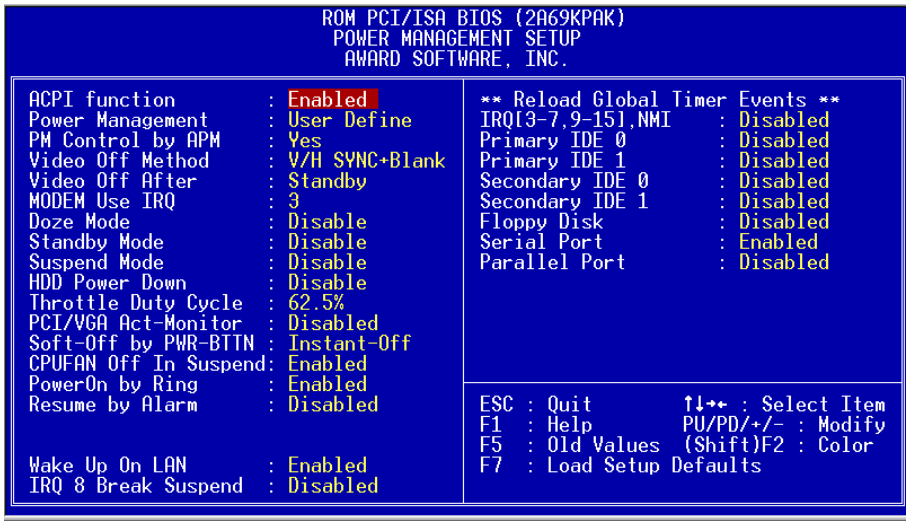


Figure 5: Power Management Setup

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

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.*

Power Management: Use this to select your Power Management selection.
The default is User define.

Disabled: *The system operates in NORMAL conditions (Non-GREEN), and the Power Management function is disabled.*

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.*

PM controlled 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 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.*

Video Off After: 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.*

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 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*

This Mainboard supports HDD Power Down, Doze and Standby power saving functions when using the Intel Pentium II Processor. The default is Disabled

Doze Mode: The “Doze” mode timer starts to count when no “PM events” have occurred.

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.

Suspend Mode: This function works only when the Pentium II Processor is installed. The timer starts to count when “System Standby” mode timer is timed out and no “PM Events” are occurring. Valid range is from 1 minute up to 1 hour.

HDD Power Down: HDD Standby timer can be set from 1 to 15 minute(s).

Throttle Duty Cycle: Sets how much performance will be lost during a power management mode. Default is 62.5%.

PCI/VGA Act-Monitor: Use this option if your monitor has advanced power saving features. The default is Disabled

Enabled: *Your monitor's power features will be included in power management.*

Disabled: *Your monitor's power features will not be included in power management.*

Soft-Off by PWR-BTTN: Use this to select your soft-off function.
The default is Instant Off.

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 take system out of Suspend Mode.*

CPUFAN Off In Suspend: This option is used to set if the CPU fans will turn off furing suspend mode. The default is Enabled

Enabled: *The system will turn off the CPU fans furing suspend mode.*

Disabled: *The system will not turn off the CPU fans furing suspend mode.*

PowerOn by Ring: This option is used to set the remote ring in feature. This option is only available when Power Loss Recovery is Enabled.
The default is Enabled.

Enabled: *The system can use remote ring-in to wake the system up.*

Disabled: *The system cannot use remote ring in to wake the system up.*

Resume by Alarm: This option allows you to have the system turn on at a preset time each day or on a certain day. This option is only available when Power Loss Recovery is Enabled. The default is Enabled.

Enabled: *The system will turn on at the preset time.*

Disabled: *The system can not have this function.*

**Reload Global Timer Events **

These options allow the user to reset the global power features timer if any of the enabled events occur.

IRQ [3-7, 9-15], NMI: The default is Disable.
Primary IDE 0: The default is Disable.
Primary IDE 1: The default is Disable.
Secondary IDE 0: The default is Disable.
Secondary IDE 1: The default is Disable.
Floppy Disk: The default is Disable.
Serial Port: The default is Enable.
Parallel Port: The default is Disable.

4-5 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 IRQs may cause the system to not find certain devices.

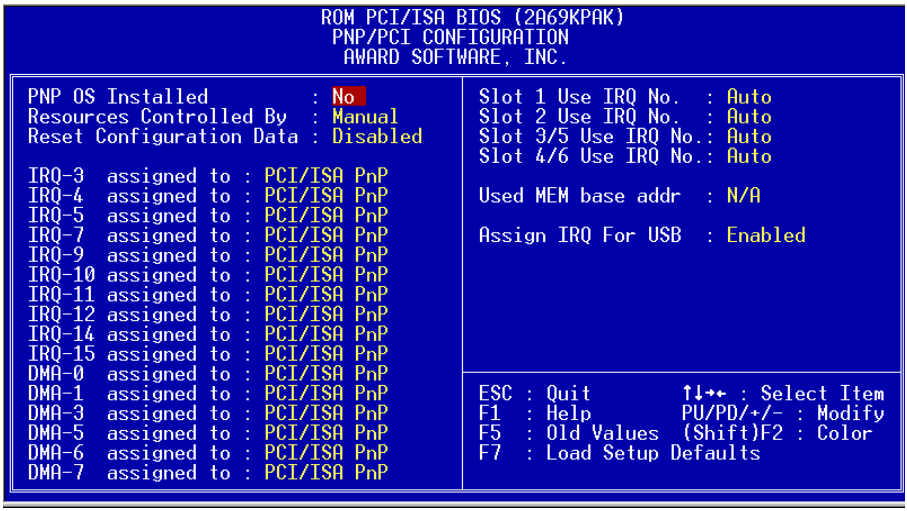


Figure 6: PCI Configuration Setup

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 Manual.

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.*

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.*

IRQ-3 to IRQ-15 assigned to: These settings allow IRQ's to be reserved for Legacy ISA device use exclusively or be available for use with PNP devices. These options are only displayed if "Resources Controlled By" is set to manual.

DMA-0 to DMA-7 assigned to: These settings allow DMA's to be reserved for Legacy ISA device use exclusively or be available for use with PNP devices. These options are only displayed if "Resources Controlled By" is set to manual.

Slot 1 to Slot 7 Use IRQ No.: This settings allows the user to specify what IRQ will ne assigned to PCI devices in the chosen slot. Options available: Auto, 3, 4, 5, 7, 9, 10,11,12, 14 & 15. The default are auto.

Used MEM base addr: The Used MEM base addr (CB00, CC00, D000, D400, D800, DC00) and Used MEM Length (8K, 16K, 32K, 64K) are used to support some specific ISA Legacy cards with requested memory space below 1M address. Now with these two functions, users can define where the used memory address is located and its length of the legacy area that is used by the legacy device to avoid the memory space conflict. For example, if you select "D000" for Used MEM base addr" and "16K" for "Used MEM Length", that means the address region D000H-D3FFFH is occupied by ISA legacy cards, and thus BIOS will not assign this region for PnP/ISA and PCI cards. The default is N/A.

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

***Enabled**: Provides IRQ for USB device.*

***Disabled**: Release IRQ for other device.*

4-6 Load Setup Defaults

The “LOAD SETUP DEFAULTS” function loads the system default data directly from ROM and initializes the associated hardware properly. This function will be necessary only when the system CMOS data is corrupted.

4-7 Integrated Peripherals

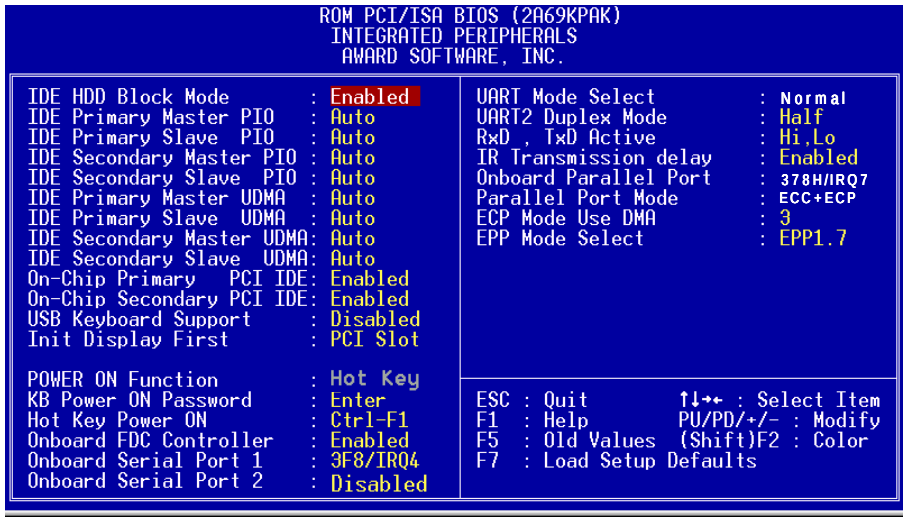


Figure 7: Integrated Peripherals

Note: *If you do not use the onboard IDE connectors, then you will need to set Onboard Primary PCI IDE: Disabled and Onboard secondary PCI IDE : Disabled. The onboard PCI IDE cable should be equal to or less than 18 inches (45cm).*

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: *Disabled IDE HDD Block Mode.*

IDE 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.*

IDE 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.*

IDE 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.*

IDE Secondary Slave PIO: The default is Auto.

***Auto**: BIOS will automatically detect the Onboard Secondary Slave PCI IDE HDD Accessing mode.*

IDE 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.*

IDE 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.*

IDE 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.*

IDE 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.*

On-Chip Primary PCI IDE: This option turns on/off the onboard primary IDE. The default is Enabled.

***Enabled**: This activates the primary PCI IDE.*

***Disabled**: This disable sthe primary PCI IDE and frees up the resource.*

On-Chip Secondary PCI IDE: This option turns on/off the onboard secondary IDE. The default is Enabled.

***Enabled**: This activates the secondary PCI IDE.*

***Disabled**: This disable sthe secondary PCI IDE and frees up the resource.*

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.*

Init Display First: If multiple video cards are used this specifies which bus will be the primary display adapter. The default is PCI Slot.

***PCI Slot**: PCI Video card will be primary adapter.*

***AGP**: AGP Video card will be primary adapter.*

Power On Function: There are "**Button Only**", "**Hot Key**" and "**Any key**" can be chosen by this field that allows users to select one of these various functions as Power On Method for their requirement.
The default value in this selection is " Hot Key". (Ctrl-F1)

***Hot Key**: User can press "**Control Key**" (Ctrl) and "**Function Key**" (from F1 to F12) individually to power on the system.*
The interval between "Ctrl" key and function Key (F1-F12)must be short.

***Anykey**: Press anykey to power on the system.*

***Button Only**: This power on method is controlled by J3 (pw-on.) Use Power On Button to power on the system.*

***Password:** User can Power On the System by password, the password can be entered from 1 to 5 characters. The maximum of password is 5 characters.*

If user forget / lost the password, please go into BIOS setting to change the Power On Method, or keyin another words as password instead of original one.

Hot Key Power On: Use this option with the above "Power On Function" to set a combination of keys that can be used to power the system on. The default is Ctrl-F1.

Options: *Ctrl-F1, Ctrl-F2, Ctrl-F3, Ctrl-F4, Ctrl-F5, Ctrl-F6, Ctrl-F7, Ctrl-F8, Ctrl-F9, Ctrl-F10, Ctrl-F11, and Ctrl-F12.*

Onboard FDC Controller: This controls the state of the onboard floppy controller. The default value is Enabled.

Enabled: *Enable the Onboard Winbond Chips's floppy drive interface controller.*

Disabled: *Disable the Onboard Winbond Chip's floppy drive interface controller.*

Onboard Serial Port 1: This field allows the user to configure the 1st serial port. The default is 3F8/IRQ4.

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 SMC CHIP's Serial port 1.*

Onboard Serial Port 2: This field allows the user to configure the 2nd serial port. The default is Disabled.

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 SMC CHIP's Serial port 2.*

UART Mode Select: The mode of the IR Controller. The default is Normal.

RxD, TxD Active: This field configures the receive and transmit signals generated from the IR port. The default is Hi Lo (when UART Mode Select is not set to Normal).

Options: *Hi Hi, Hi Lo, Lo Hi, and Lo Lo.*

IR Transmission delay: This default is Enabled (when UART Mode Select is not set to Normal).

Options: *Enabled and Disabled*

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 Winbond Chip's LPT port.*

Parallel Port Mode: This field allows the user to select the parallel port mode. The default is ECP+EPP.

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.*

ECP Mode Select: This field sets what EPP mode variation to use.

EPP1.9*: Sets EPP1.9*
EPP1.7*: Sets EPP1.7*

4-8 Sensor & CPU Speed Setting

Choose the "SENSOR & CPU SPEED SETTING" in the CMOS SETUP UTILITY to display the following screen. This menu allows to choose the correct CPU speed to match your CPU installed.

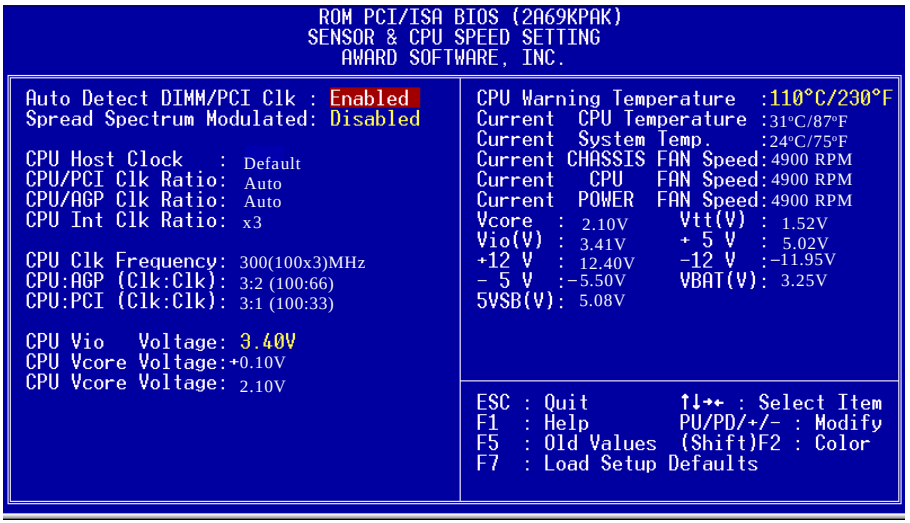


Figure 8: Sensor and CPU Speed Setting

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. The default is Enabled.

***Enabled**: Enables this option.*

***Disabled**: Disables this option.*

Spread Spectrum Modulated: The default is Disabled.

***Enabled**: Enables this option.*

***Disabled**: Disables this option.*

CPU Host/PCI Clk: The default is Default.

Default: *To select CPU host bus clock frequency depend on what CPU user is plug-in.*

Else: *User select desired CPU working frequency.*

Warning: Any overclock setting will cause the damage of CPU itself.

CPU/AGP Clk Ratio: The default is Default.

Default: *If the CPU host bus selects above 83.3Mhz, AGP will run clock at 2/3 CPU's*

If the CPU host bus selects less or equal to 83.3MHz, AGP will run clock same as CPU's.

3:2 : *AGP will run clock at 2/3 CPU's.*

1:1 : *AGP will run same as CPU's.*

CPU Int Clk Ratio:

*CPU internal clock frequency = Ratio * Host bus clock*

Clock Frequency: 300 (100x3) MHz

Next time system boot CPU clock frequency information.(No option/Display only)

CPU:AGP (Clk:Clk) :

Next time system boot AGP clock frequency information.

(No option/Display only)

CPU Vcore Voltage: The default is +0.00V

Options : *0.00V, 0.05V, 0.10V, 0.20V, 0.30V, 0.40V and 0.50V minor increase to CPU working voltage.*

CPU Vcore Voltage: The default is 2.00V

Next time system boot Vcore Voltage information (No option/Display only).

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

Current System Temp: This is the Current temperature of the system.

Current POWER FAN Speed: The current POWER fan speed in RPMs.

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/Vio/Vtt), **+5V, -5V, +12V, -12V**: The voltage level of the switch power supply.

4-9 Change Supervisor or User Password

To change the password, choose the “SUPERVISOR PASSWORD or USER PASSWORD” option from the CMOS SETUP UTILITY menu and press [Enter].

NOTE: Either “Setup” or “System” must be selected in the “Security Option” of the BIOS FEATURES SETUP menu.

1. If CMOS is corrupted or the option was not used, a default password stored in the ROM will be used. The screen will display the following message:

   Enter Password:

   Press the [Enter] key to continue after the proper password is given.

2. If the CMOS is corrupted or the option was used earlier and the user wishes to change the default password, the SETUP UTILITY will display a message and ask for a confirmation.

   Confirm Password:

3. After pressing the [Enter] key (ROM password if the option was not used) or current password (user-defined password), the user can change the password and store new one in CMOS RAM. A maximum of 8 characters can be entered.

4-10 IDE HDD Auto Detection

The “IDE HDD auto detection” utility is a very useful tool, especially when you do not know which kind of hard disk type you are using. You can use this utility to detect the correct disk type installed in the system automatically. But now you can set HARD DISK TYPE to Auto in the STANDARD CMOS SETUP. You don’t need the “IIDE HDD AUTO DETECTION” utility. The BIOS will Auto-detect the hard disk size and model on display during POST.

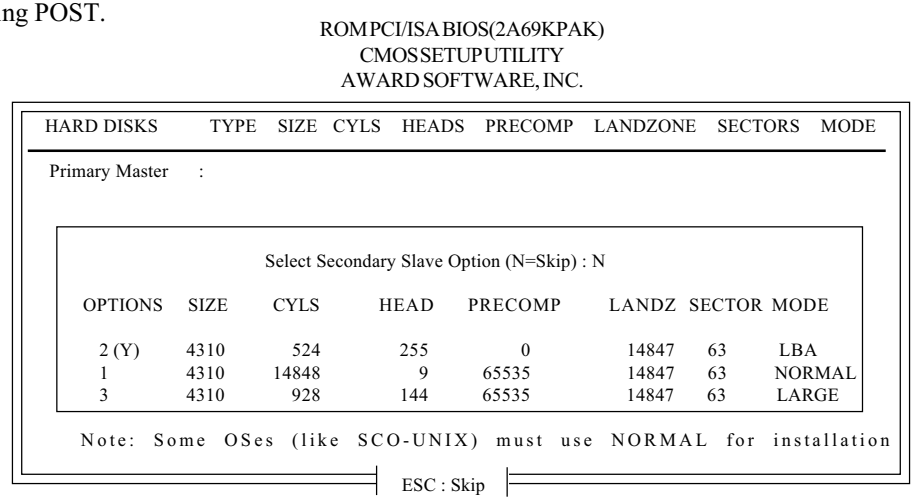


Figure 9: IDE HDD Auto Detection

NOTE: HDD Modes

The Award BIOS supports 3 HDD modes : NORMAL, LBA & LARGE NORMAL mode Generic access mode in which neither the BIOS nor the IDE controller will make any transformations during accessing.
The maximum number of cylinders, head & sectors for NORMAL mode are.

1024, 16 & 63	
no. Cylinder	(1024)
x no. Head	(16)
x no. Sector	(63)
x no. per sector	(512)
	528 Megabytes

LBA (Logical Block Addressing) mode: A new HDD accessing method to overcome the 528 Megabyte bottleneck. The number of cylinders, heads & sectors shown in setup may not be the number physically contained in the HDD. During HDD accessing, the IDE controller will transform the logical address described by sector, head & cylinder into its own physical address inside the HDD. The maximum HDD size supported by LBA mode is 8.4 GigaBytes which is obtained by the following formula:

no. Cylinder	(1024)
x no. Head	(255)
x no. Sector	(63)
x bytes per sector	(512)
	8.4 GigaBytes

LARGE mode: Extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinder without LBA support (in some cases, user do not want LBA). The Award BIOS provides another alternative to support these kinds of LARGE mode.

CYLS	HEADS	SECTOR	MODE
1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS (or other OS) that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside

INT 12h in order to access the right HDD address!

Maximum HDD size:

no. Cylinder	(1024)
x no. Head	(32)
x no. Sector	(63)
x bytes per sector	(512)
	1 GigaByte

Note: To support LBA or LARGE mode of HDDs, there must be some software involved. All the software is located in the Award HDD Service Routine (INT 13h). It may fail to access a HDD with LBA (LARGE) mode selected if you are running under an Operating System which replaces the whole INT 13h.

UNIX operating systems do not support either LBA or LARGE and must utilize the Standard mode. UNIX can support drives larger than 528MB.

4-11 Save & Exit Setup

The “SAVE & EXIT SETUP” option will bring you back to the boot up procedure with all the changes you just recorded in the CMOS RAM.

4-12 Exit Without Saving

The “EXIT WITHOUT SAVING” option will bring you back to normal boot up procedure without saving any data into CMOS RAM.

All old data in the CMOS will not be destroyed.

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Chapter 5
Appendix

SUBJECTS COVERED:

a) Appendix A: Technical Information

b) Appendix B: BIOS Post Codes

c) Appendix C: LOAD SETUP DEFAULTS

d) Appendix D: BIOS Beep Codes

e) Appendix E: Frequently Asked Questions (FAQ)

f) Appendix F: Ghost 5.1 Quick User's Guide

g) Appendix G: Software Installation

h) Appendix H: HP370 UltraDMA-100 & RAID Setup Guide

Technical Information

A-1 MEMORY MAP

Address Range	Size	Description
[00000-7FFFF]	512K	Conventional memory
[80000-9FBFF]	127K	Extended Conventional memory
[9FC00-9FFFF]	1K	Extended BIOS data area if PS/2 mouse is installed
[A0000-C7FFF]	160K	Available for Hi DOS memory
[C8000-DFFFF]	96K	Available for Hi DOS memory and adapter ROMs
[E0000-EEFFF]	60K	Available for UMB
[EF000-EFFFF]	4K	Video service routine for Monochrome & CGA adaptor
[F0000-F7FFF]	32K	BIOS CMOS setup utility
[F8000-FCFFF]	20K	BIOS runtime service routine (2)
[FD000-FDFFF]	4K	Plug and Play ESCD data area
[FE000-FFFFF]	8K	BIOS runtime service routine (1)

A-2 I/O MAP

[000-01F]	DMA controller.(Master)
[020-021]	INTERRUPT CONTROLLER.(Master)
[022-023]	CHIPSET control registers. I/O ports.
[040-05F]	TIMER control registers.
[060-06F]	KEYBOARD interface controller.(8042)
[070-07F]	RTC ports & CMOS I/O ports.
[080-09F]	DMA register.
[0A0-0BF]	INTERRUPT controller.(Slave)
[0C0-0DF]	DMA controller.(Slave)
[0F0-0FF]	MATH COPROCESSOR.
[1F0-1F8]	HARD DISK controller.
[278-27F]	PARALLEL port 2.
[2B0-2DF]	GRAPHICS adapter controller.
[2F8-2FF]	SERIAL port 2.
[360-36F]	NETWORK ports.
[378-37F]	PARALLEL port 1.
[3B0-3BF]	MONOCHROME & PARALLEL port adapter.
[3C0-3CF]	EGA adapter.

[3D0-3DF]	CGA adapter.
[3F0-3F7]	FLOPPY DISK controller.
[3F8-3FF]	SERIAL port 1.

A-3 TIMER & DMA CHANNELS MAP

TIMER MAP:

TIMER Channel 0	System timer interrupt.
TIMER Channel 1	DRAM REFRESH request.
TIMER Channel 2	SPEAKER tone generator.

DMA CHANNELS:

DMA Channel 0	Available.
DMA Channel 1	Onboard ECP (Option).
DMA Channel 2	FLOPPY DISK (SMC CHIP).
DMA Channel 3	Onboard ECP (default).
DMA Channel 4	Cascade for DMA controller 1.
DMA Channel 5	Available.
DMA Channel 6	Available.
DMA Channel 7	Available

A-4 INTERRUPT MAP

NMI :

Parity check error.

IRQ (H/W):

0	System TIMER interrupt from TIMER 0.
1	KEYBOARD output buffer full.
2	Cascade for IRQ 8-15.
3	SERIAL port 2.
4	SERIAL port 1.
5	PARALLEL port 2.
6	FLOPPY DISK (SMC CHIP).
7	PARALLEL port 1.
8	RTC clock.
9	Available.
10	Available.
11	Available.
12	PS/2 Mouse.
13	MATH coprocessor.

14 Onboard HARD DISK (IDE1) channel.
15 Onboard HARD DISK (IDE1) channel.

A-5 RTC & CMOS RAM MAP

RTC & CMOS:

00	Seconds.
01	Second alarm.
02	Minutes.
03	Minutes alarm.
04	Hours.
05	Hours alarm.
06	Day of week.
07	Day of month.
08	Month.
09	Year.
0A	Status register A.
0B	Status register B.
0C	Status register C.
0D	Status register D.
0E	Diagnostic status byte.
0F	Shutdown byte.
10	FLOPPY DISK drive type byte.
11	Reserve.
12	HARD DISK type byte.
13	Reserve.
14	Equipment type.
15	Base memory low byte.
16	Base memory high byte.
17	Extension memory low byte.
18	Extension memory high byte.
19-2d	
2E-2F	
30	Reserved for extension memory low byte.
31	Reserved for extension memory high byte.
32	DATE CENTURY byte.
33	INFORMATION FLAG.
34-3F	Reserve.
40-7F	Reserved for CHIPSET SETTING DATA.

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BIOS 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.

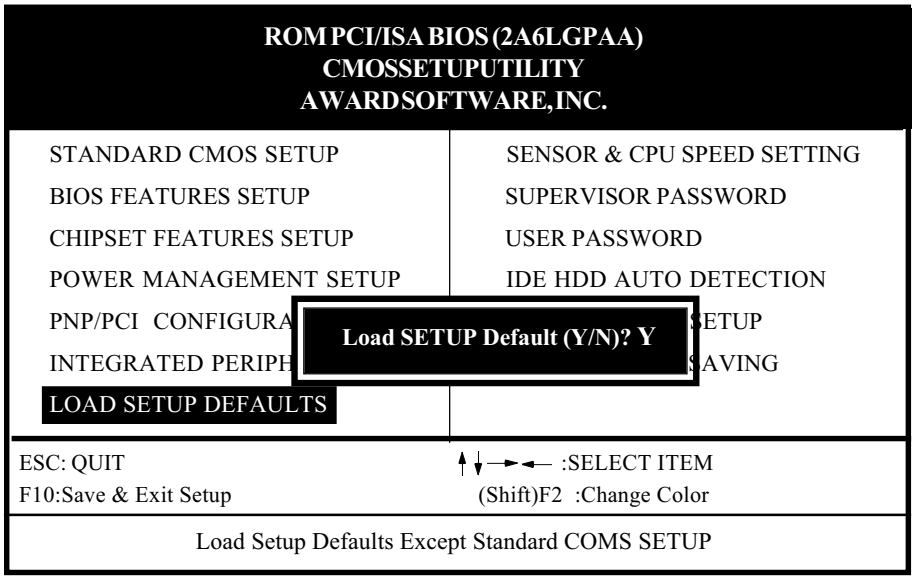
3E	Try to turn on Level 2 cache. **Note:** Some chipset may need to turn on the L2 cache in this stage. But usually, the cache is turn on later in POST 61h.
3F-40	Reserved.
BF	1. Program the rest of the Chipset's value according to Setup. (Later Setup Value Program)
41	2. If auto-configuration is enabled, 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.

B-2 Unexpected Errors:

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

NOTE:
The "**LOAD SETUP 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.



LOADSETUPDEFAULT

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BIOS Beep Codes

Question: What do beep codes mean?

Answer: Beeps codes are the audio beeps that the motherboard will output when your system has a problem. Generally they can be used to identify some problem (usually associated with a non booting system). Below are some basic beep codes and their possible meanings:

- one long and 3 very short beeps - video related
- continuous beeps - memory related
- no screen and no beep - CPU related

BEEPS	PORT 80H CODE	EXPLANATION
1-2-2-3	16h	BIOS ROM checksum
1-3-1-1	20h	Test DRAM refresh
1-3-1-3	22h	Test keyboard controller
1-3-3-1	28h	Autosize DRAM
1-3-3-2	29h	Initialize POST memory manager
1-3-3-3	2Ah	Clear 512 KB base RAM
1-3-4-1	2Ch	RAM failure on address line xxxx
1-3-4-3	2Eh	RAM failure on data bits xxxx of low byte of memory bus
1-4-1-1	30h	RAM failure on data bits xxxx of high byte of memory bus
2-1-2-2	45h	POST device initialization
2-1-2-3	46h	Check ROM copyright notice
2-2-3-1	58h	Test for unexpected interrupts
2-2-4-1	5Ch	Test RAM between 512 and 640 KB
1-2	98h	Search for option ROMs. One long, two short beeps on checksum failure

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Frequently Asked Questions

Technical Support

Welcome to the EPoX technical support pages. We are working hard to answer all of your questions. In this section you will find commonly asked questions our support department is asked by users.

Tips to install motherboards

- Always refer to your motherboard manual to check jumper settings for the correct Processor speed, voltage, cable directions, etc.
- Take time to ground yourself before handling your new motherboard. Static electricity causes intermittent/non fatal damage which may be hard to diagnose.
- If upgrading to new a motherboard, make sure any metal nuts that are not required are removed to keep them from touching the motherboard and "shorting" it.
- Make sure the motherboard cables are installed in the correct direction (PIN 1 = colored stripe).
- Use the correct fans for your processor. Excessive heat can damage your CPU and motherboard.
- Before installing any additional software, make sure the operating system is completely setup and correctly identifies all motherboard devices. Install any chipset support software required before installing other software. Operating system installation procedures available in chapter 3.
- Windows 95 OSR 2.x and Windows 98 do not need to install additional bus master drivers. To enable DMA mode enter the Control Panel, System, Device Manager and view the properties of your hard drives and/or CD-ROM. Place a check in the DMA box.

BIOS Flash Instructions

Question: How do I flash my BIOS?

Answer: Flashing your computer BIOS can be a very intimidating chore. Many users are unfamiliar with this type of activity and are apprehensive about doing things that could potentially damage or render their system inoperable. Because of these risks, we advise users to flash their BIOS only if the newer BIOS will fix a specific problem that they are having. With computer BIOS upgrades, newer is not always better.

Despite this, updating your computer's BIOS is a fairly simple task. First, you need to download the ***.EXE** file from our web site that is appropriate to your motherboard.. This can be found under the BIOS upgrade section of the technical support area at http://www.epox.com. Next, you will need a formatted bootable floppy disk inserted to the floppy drive. Then you will need to run the ***.EXE** file and direct the self-extraction to the floppy drive. Finally, you will reboot the system with the bootable floppy disk with the BIOS information and onced the system is in the **A**: prompt run the **UPDATE.BAT** file.

DETAILED BIOS FLASH INSTRUCTIONS

BIOS Download Instructions

Download the xxxxxxxx.EXE file corresponding to your model from the EPoX website to an empty directory on your hard disk or floppy. Run the downloaded xxxxxxxx.EXE file and it will self extract into the above listed files.

Copy these extracted files to a bootable DOS floppy disk. Note: the DOS floppy disk should contain NO device drivers or other programs that load during the boot other than the operating system itself.

BIOS Update Instructions

Boot using your DOS floppy disk to the 'A:\>' command prompt. At the DOS command prompt type: UPDATE

When the Flash program completes restart the computer, remove the DOS floppy disk, and enter your CMOS setup by pressing the <DEL> key

immediately. Using the arrow keys select 'LOAD SETUP DEFAULTS' and when prompt to confirm press 'Y' and 'ENTER'. Press 'F10' to Save & Exit the BIOS. When prompted to confirm again press 'Y' and 'ENTER'. The system flash is now completed.

Note: During the use of UPDATE a backup of your original BIOS date/code will be saved in the same directory as the UPDATE file. It will be called 'OLD.BIN' and can be used with the restore instructions below in case you need to revert back to the original BIOS date/code.

BIOS Restore Instructions

Use of the restore procedure requires the OLD.BIN file created in the update procedure above! Boot using your DOS floppy disk to the 'A:\>' command prompt. At the DOS command prompt type: RESTORE. When the Flash program completes restart the computer, remove the DOS floppy disk, and enter your CMOS setup by pressing the <DEL> key immediately. Using the arrow keys select 'LOAD SETUP DEFAULTS' and when prompt to confirm press 'Y' and 'ENTER'. Press 'F10' to Save & Exit the BIOS. When prompted to confirm again press 'Y' and 'ENTER'. The system flash is now completed and should now be reverted back to the original BIOS date/code.

BIOS flash failed

If you have access to an old un-accelerated ISA video card, you might be able to recover your BIOS. Remove all cards and drives from your system, except for the ISA video card and the floppy drive. Then try to boot from a system disk (a bootable floppy with only the flash programs and corresponding BIOS binary). If you are able to boot to the floppy, flash your BIOS according to the directions above.

I get out of memory errors when I flash my BIOS!

On some system configurations, even with a clean boot disk, you will get an out of memory error (insufficient memory) when you try to flash your BIOS. The solution is simple: Try bypassing the startup files by pressing the following keys during startup using you bootable floppy disk. Attempt the FLASH again.

DOS 6.2x boot disks - press F5 to bypass.
WINDOWS 95/98 boot disks - press F8 and select "Safe command prompt."
Lastly try using a MS-DOS 6.x boot disk.

Manual use of the AWDFLASH Utility

Most users will find that our UPDATE and RESTORE batch files can accomplish the BIOS flash with the majority of configurations. But if you wish to manually use the AWDFLASH utility, below are the most common command line usages and parameters.

Awdflash 7.33 (C)Award Software 1999 All Rights Reserved

```
 Usage:  AWDFLASH [FileName1] [FileName2] [/<sw>[/<sw>...]]
     FileName1 : New BIOS Name For Flash Programming
     FileName2 : BIOS File For Backing-up the Original BIOS
  <Swtches>
    ?: Show Help Messages
   py: Program Flash Memory              pn: No Flash Programming
   sy: Backup Original BIOS To Disk File  sn: No Original BIOS Backup
   Sb: Skip BootBlock programming         sd: Save DMI data to file
   cp: Clear PnP(ESCD) Data After Programming
   cd: Clear DMI Data After Programming
   cc: Clear CMOS Data After Programming
    R: RESET System After Programming
  cks: Show update Binfile checksum
 Tiny: Occupy lesser memory
    E: Return to DOS When Programming is done
    F: Use Flash Routines in Original BIOS For Flash Programming
   LD: Destroy CMOS Checksum And No System Halt For First Reboot
       After Programming
 cksXXXX: Compare Binfile CheckSum with XXXX

 Example: AWDFLASH 2a59i000.bin /py/sn/cd/cp/cks2635
```

BIOS function S.M.A.R.T.

Question: What is the BIOS feature named S.M.A.R.T.?

Answer: Selected EPoX models now incorporate Award BIOS dates with S.M.A.R.T (Self-Monitoring, Analysis and Reporting Technology). S.M.A.R.T. helps manage the reliability of the hard drive by alerting the system when problems and a high degree of errors are detected. The system can then alert users on taking actions to avoid a system failure. S.M.A.R.T. enables a drive's status to be monitored through diagnostics designed into the hard drive's circuitry. These diagnostics can be used for logging and data protection.

This feature is used in conjunction with compatible hard drives and diagnostic software utilities that support the technology. Please contact your hard drive and/or software utility manufacturers for more details.

BIOS recovery if flash fails

Question: How do I recover my BIOS from a bad flash?

Answer: If you have access to an old un-accelerated ISA video card, you might be able to recover your BIOS. Remove all cards and drives from your system, except for the ISA video card and the floppy drive. Then try to boot from a system disk (a bootable floppy with only the flash program and corresponding BIOS image). If you are able to boot to the floppy, flash your BIOS according to the flash directions.

KBPO does not work

Question: Why doesn't the KBPO (keyboard power-on) function work?

Answer: The Keyboard Power-On (KBPO) function allows users to turn on a PC by easily touching the keyboard instead of bending down to look for the power button under a table. To use this unique feature your EPoX motherboard must first support KBPO, have it set to enable, and use an ATX power supply rated 0.1a (100mA) or greater for the +5vsb. KBPO is only available on selected motherboard models.

0.1a (100mA) is the bare minimum required for KBPO; in actuality 0.72a (720mA) or greater is preferred as some devices and keyboards may have a negative effect on lower current power supplies causing KBPO not to function correctly.

Memory conflict with AGP in Windows 95

Question: I'm getting a "memory conflict with AGP controller" error when I install an AGP VGA card under Win95 OSR2, what's the problem?

Answer: This problem is caused by a driver provided by Microsoft in Win95 OSR2. Under Windows 95 (OSR2 versions), there is a VgartD.VxD virtual device driver which is handling the traffic between local VGA RAM and system memory through the AGP bus, and it's producing some these "side-effects". Although the conflicts are listed they should not be reassigned manually. Microsoft has addressed the issue in the driver for Windows 98.

"MSDOS Compatibility mode" in Windows 95/98

Question: I get "MSDOS compatibility mode" and yellow exclamation points listed in Windows 95/98's Device Manager after I've installed a new motherboard. What is happening and how can I fix it?

Answer: Windows 95/98 has built-in 16-bit generic drivers that it uses by default if it can't find a 32-bit driver or can't properly initialize the one it loads. It puts up exclamation marks to indicate that it had a problem initializing the 32-bit driver. This is not a driver or hardware problem but a problem with Windows 95/98 itself. There are known limitations of Windows 95/98 that may cause problems. These are not problems with your IDE controllers and can happen with any system.

No problems will occur that we are aware of if Windows 95/98 is loaded onto a newly formatted hard disk. However, if Windows 95/98 is loaded and then the user changes motherboards and attempts to use the same hard disk with the new board (and, therefore, a new IDE controller), Windows 95/98 is not always able completely figure out the new configuration. This can happen any time the motherboard is changed to a different type.

Putting the old motherboard back probably won't do any good as the previous system registry has been destroyed by Windows 95/98's attempts to configure itself for the new board. The standard procedure in this case it to re-install Windows 95/98. Please note that if you re-install Windows 95/98 you may need to re-install many of your applications.

This may seem drastic but there are other procedures. Microsoft is aware of this

problem and has an article on their web page that discusses solutions that don't require you to re-install Windows 95/98. This article is located at:

http://support.microsoft.com/support/kb/articles/Q151/9/11.asp

The procedure provided is fairly straightforward but requires the use of the Registry Editor (REGEDIT.EXE). The Registry Editor is very powerful and should only be used by technically trained users! What you do is select "run" on the start menu and enter "C:\WINDOWS\REGEDIT.EXE", then find the following registry key.

HKEY_LOCAL_MACHINE\SYSTEM\CURRENTCONTROLSET\SERVICES\VXD\IOS

If there is an entry there called "**NOIDE**", select it and click on the "remove" button. After you remove this entry, restart the system and Windows 95/98 will attempt to initialize the protected mode driver for the controller. If no further problems are encountered, everything should then work fine in 32-bit mode.

Note: Check for the existence of a virus infecting the master boot record of your hard drive as this may force the controllers to use "MSDOS Compatibility mode."

New hard drive cannot be accessed

Answer: I just installed a new hard drive, and I can't use it. Why?

Question: Before a new hard drive can be accessed it must be properly recognized by the BIOS. Use the CMOS utility and perform an IDE HDD AUTODETECT or you can optionally enter the parameters for the drive yourself. For hard drives over 512MB be sure the BIOS uses LBA mode so the operating system can have access to the total available space.

New hard drives generally do not come partitioned or formatted. You must run FDISK.EXE (in DOS or Windows 95/98), and create a DOS partition. When complete, re-boot and then format the hard drive. Type "**format x:**" without the quotes and replace x with the drive letter of the new drive. Windows 95 OSR2's FDISK.exe program may ask if you want to use FAT32. This is for larger drives (over 2.1 gig). The maximum size that a single partition may be is about 2.1 gig using DOS and FAT16.

Windows 98 and NT 4 OEM users setting up the system for the first time may use n

the bootable CD-ROM feature of the Windows install CD to begin setup. The Microsoft software can setup the new drive automatically for you in most cases. To use a bootable CD-ROM you must use compatible Atapi EIDE CD-ROM drives and set the Boot Sequence to CD-ROM first in the CMOS BIOS Features Setup. See page 44.

No video when power applied

Question: My computer gets no video. What's wrong?

Answer: Reasons that a board will not "boot" could be memory, CPU, power supply, and/or video card related. In order you should check video card, memory, power supply and lastly CPU. CPUs rarely ever go bad. But as a rule reseat all your devices. Make sure the memory has CLEAN contacts. Over time dirt particles can build up on the contacts. It may be possible that the CPU is not fully plugged in. It may have popped out a little during movement. Confirm all jumpers are correctly set.

Check your power supply. Does it power on? If not you may have a short. Is the power supply correctly set to the right VOLTAGE INPUT? This is usually found on the back of the power supply. It can be set by a small switch. Users with ATX power supplies and ATX motherboards have an additional wire to hook up. The wire from the front power switch must be connected to the motherboard in the correct location, or your computer will not power up. This connector is labeled something similar to Power On/Off (PW-ON).

Are all the cables correctly connected (PIN1 to PIN1)? PIN1 on cables usually are marked as a colored stripe. Check the monitor's power and video connection. Try reseating the video card or putting it in a new slot (if available). Swap out the video card and/or the monitor.

AGP video cards are easy to miss as the possible problem, because they must be fully inserted into the slot as the slightest amount of misalignment can prevent the AGP video card from working correctly or at all! If any of the AGP's gold/brass contacts are visible (where they connect to the motherboard) then you must reseat the card. The case may also be preventing the card from fully being seated. Try remounting the motherboard if possible and raise its height.

"PCI Bridge" and Device Manager of Windows 95/98

Question: There are "Unknown PCI Bridge" or "Unknown PCI Card" devices appearing in the Device Manager of Microsoft Win95/98. Why?

Answer: The newer Intel 440GX chipset that is used on EP-GXB-M series motherboards has an integrated PCI IDE controller among other advanced features. The characteristics of these devices are not be defined by Windows 95/98. This causes these messages to appear. You need to use the driver disk (or CD-ROM) that came with your motherboard to install Windows 95/98 "PCI Bridge" support. Most drivers can also be found in our website's technical support section. See chapter 3.

"PCI Serial Controller" and Device Manager of Windows 95/98

Question: Why does Windows 95/98 list a device name "PCI Serial Controller" that needs a driver? Why does my PCI modem not work?

Answer: The device named "PCI Serial Controller" that may be listed in the Device Manager of the Control Panel/System is the result of Windows 95/98 not having the proper driver available during initial setup for your internal PCI modem. As a result of not having the proper driver installed your PCI internal modem may not be functioning properly. Please obtain proper Windows 95/98 drivers (INF files) from your modem manufacturer. Once obtained you can delete the "PCI Serial Controller" device, reboot, and Windows 95/98 will again attempt to locate a driver (INF files). Instruct it to examine the modem drivers (INF files) so a proper driver may be installed.

As an additional note the "PCI Serial Controller" should not be confused with the "PCI Universal Serial Bus" which is commonly known as USB. The USB ports are in most cases on the motherboard (integrated) and you will require a compatible operating system to use them.

WOL connector

Question: What is WOL (Wake On-LAN)?

Answer: Selected EPoX models now incorporate WOL. This new technology allows a client system of a local area network to be remotely power on via a network connector. Compatible NIC (network interface cards) and client/server software (not included) is required for this function.

Please consult NIC and client/server product documentation for WOL compatibility.

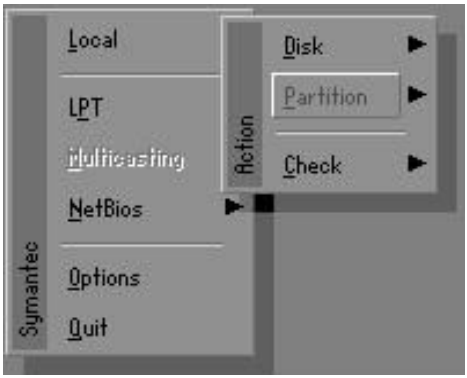
Appendix F

F-1 GHOST 5.1 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.

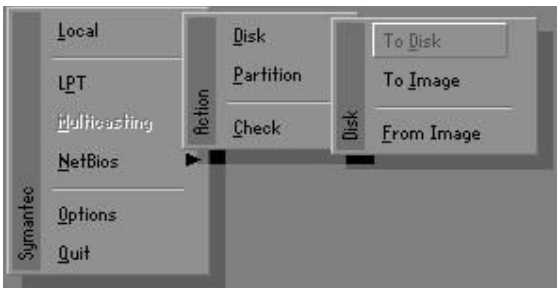
Description of Menus

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:

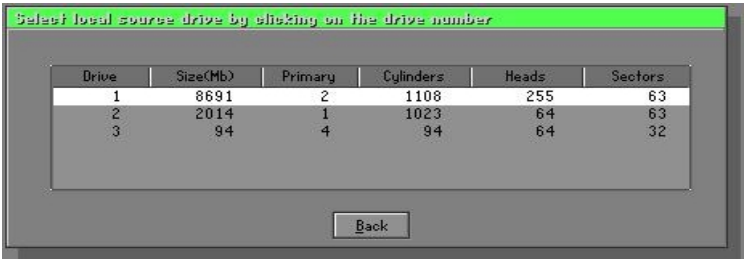
1. Disk To Disk (disk cloning)
2. Disk To Image (disk backup)
3. Disk From Image (restore backup)

Important!

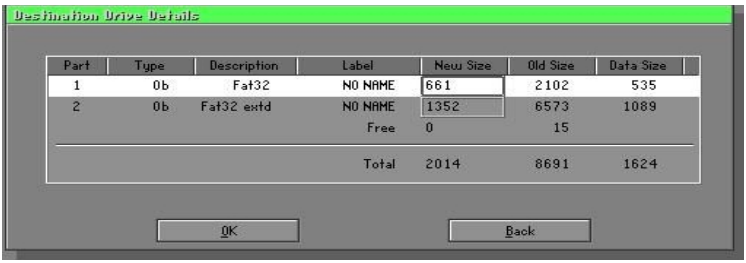
1. To use this function, the system must have at least 2 disks. Press the **Tab** key to move the cursor.
2. When restoring to a destination disk, all data in that disk will be completely destroyed**.**

Disk To Disk (Disk Cloning)

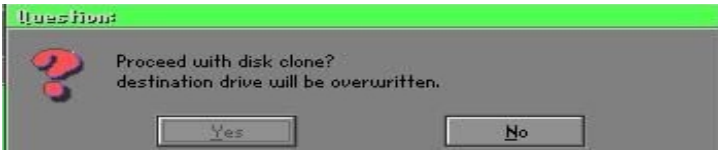
1. Select the location of the **Source drive**.
2. Select the location of the **Destination drive**.



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

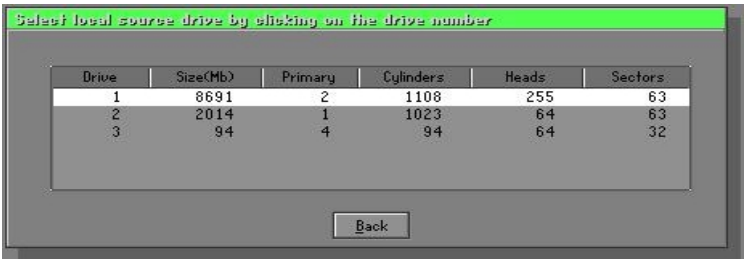


4. Click OK to display the following confirmation screen. Select **Yes** to start.

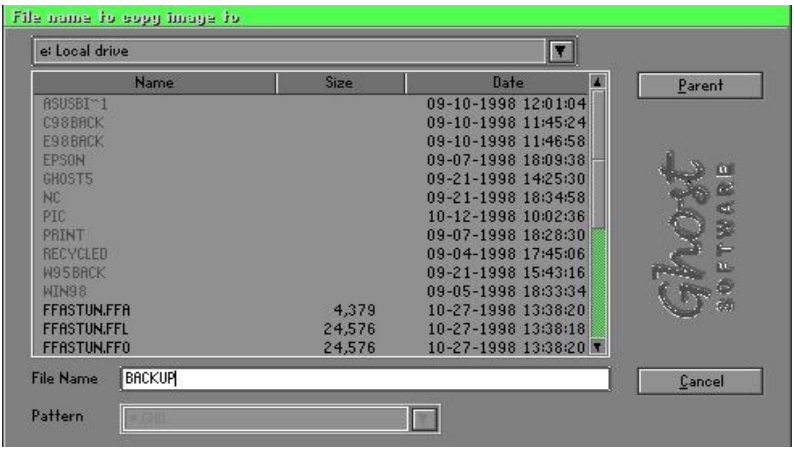


Disk To Image (Disk Backup)

1. Select the location of the Source drive.



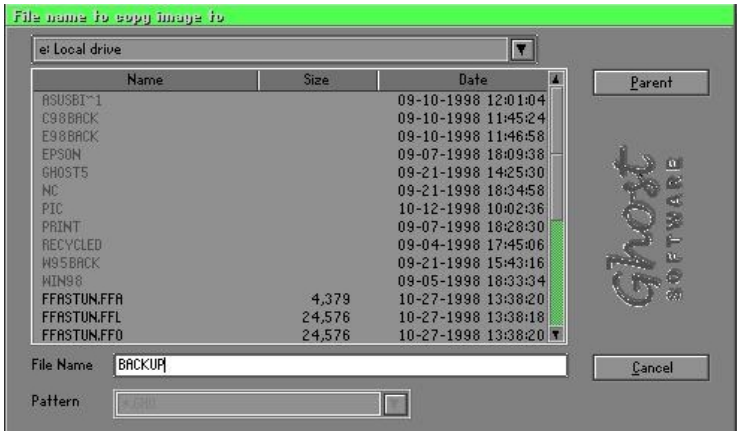
2. Select the location for storing the backup file.



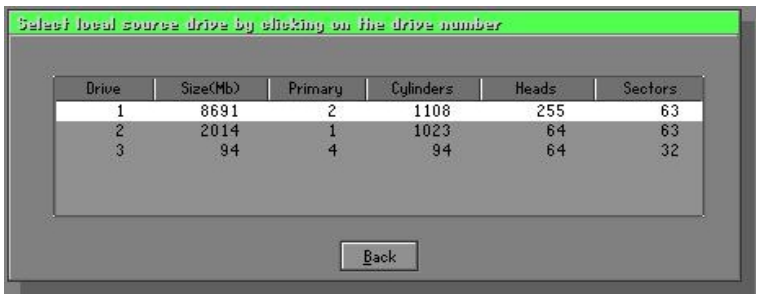
3. Click **OK** to display the following confirmation screen. Select **Yes** to start.

Disk From Image (Restore Backup)

1. Select the Restore file.

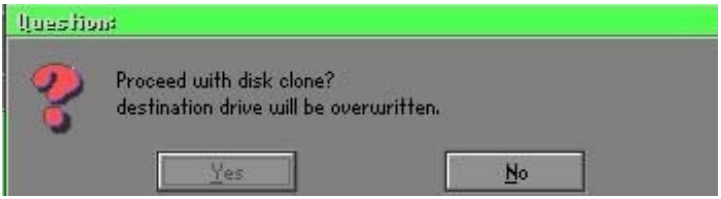


2. Select the **Destination drive** of the disk to be restored.

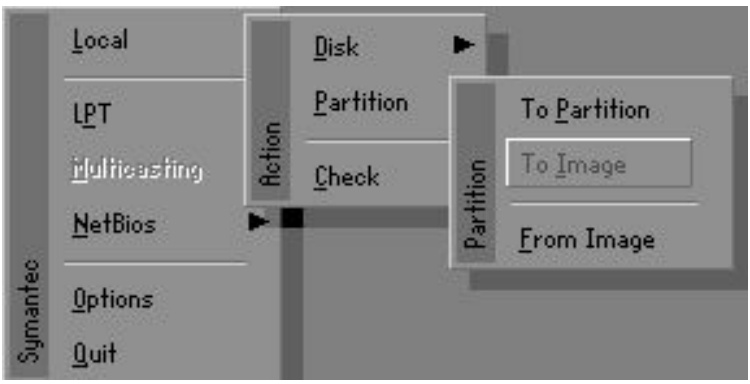


3. When restoring disk backup, set the required partition size as shown in the following figure.

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



Partition



There are 3 partition functions:

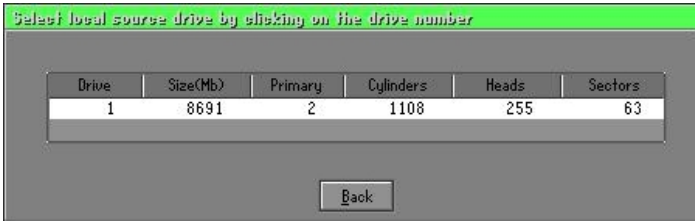
1. **Partition To Partition** (partition cloning)
2. **Partition To Image** (partition backup)
3. **Partition From Image** (restore partition)

Partition To Partition (Partition Cloning)

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

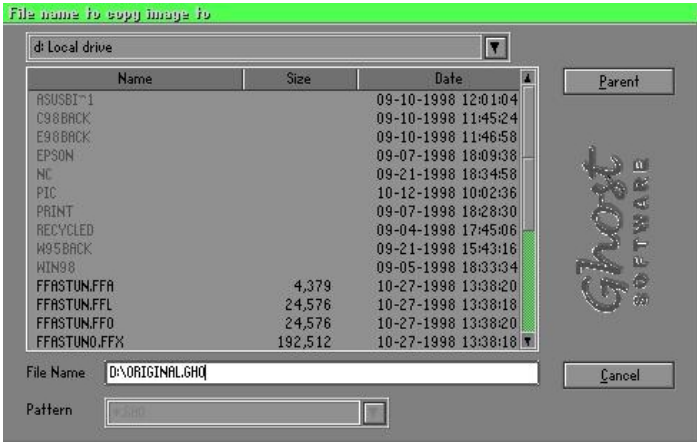
Partition To Image (Partition Backup)

1. Select the disk to be backed up.



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.

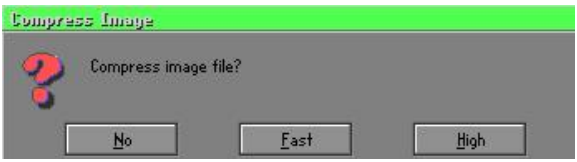


4. Is the file compressed? There are 3 options:

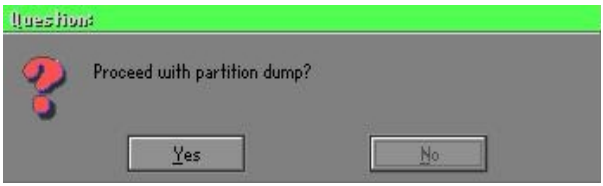
   (1) No: do not compress data during backup

   (2) Fast: Small volume compression

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

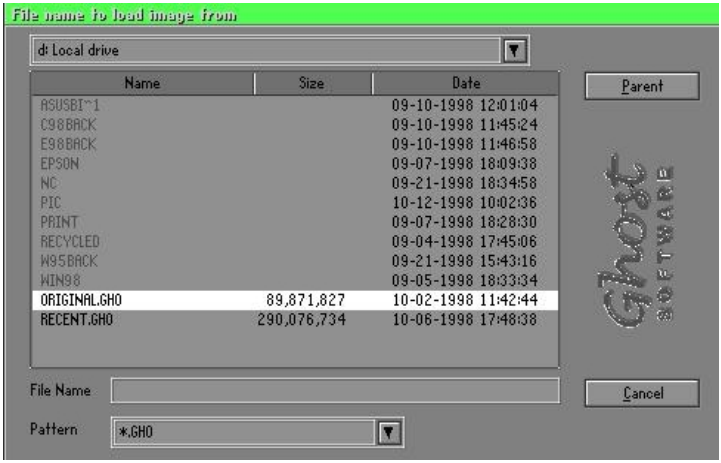


5. During confirmation, select Yes to start performing backup.

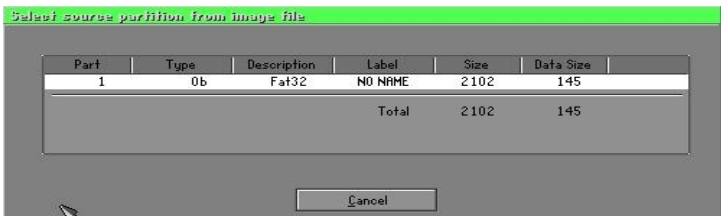


Partition From Image (Restore Partition)

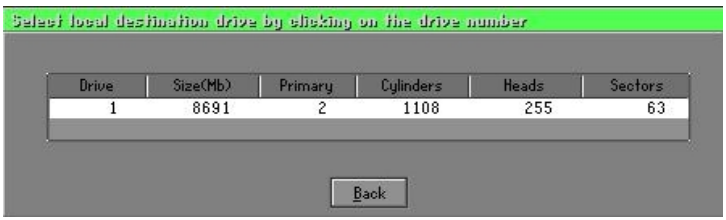
1. Select the backup file to be restored.



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 G

G-1 Software Installation

Windows 95/98 Driver Installation

Systems Windows 95/98 Already Installed

1. Windows 95/98 must be installed on the system prior to installing the driver.
2. Close any running applications.
3. Open "My Computer".
4. Double click on the "Control Panel" icon.
5. Double click on the "System" applet.
6. Double click on the “PCI Mass Storage Controller” device.
7. Click on the “Drivers” tab.
8. Click on “Update Driver...” or “Change Driver...” button.
9. Click on the "Next" button.
10. There is a window that ask you "Do you want Windows to do?", choose "Display a list of all the driver in a specific location, so you can select the driver you want" then click on the "Next" button.
11. There is a Window listing hardware types, select the "SCSI controllers" then click on the "Next" button.
12. Put the install diskette into the drive A: and then click on the "Have Disk..." button.
13. Key in Path “A:\Win” than click on the “OK” button.
14. Click on the "OK" button.
15. Click on the "Next" button.
16. If there is a window showing the settings (resources) to be used by the driver, then click on the "Next" again. At this point, the system will install the driver.
17. Click on the "Finish" button.
18. Then the system will ask you to restart the system. If the settings reported in step 15 are not what set on the host adapter, you must adjust the settings

by using the device manager in the System control panel before restarting your computer.

Checking Windows95/98 Installation

1. From Windows 95/98, open the “Control Panel” from “My Computer” followed by system icon.
2. Choose the “Device Manager” tab and click the “+” in front of the “SCSI Controllers” hardware type.
3. The driver “HPT RCM DEVICE” and “HPT370 UDMA/ATA100 RAID Controller” should be installed.

Uninstalling the Driver

You can use the device manager in the System control panel to remove the driver.

Windows NT 4.0 Driver Installation

Systems Without Windows NT 4.0 Already Installed

1. Put the Windows NT4.0 CD-Title into the CD-ROM and Boot from the CD-ROM.
2. Press <F6> when the message "Setup is inspecting your computer hardware configuration....".
3. When the "Windows NT Setup" windows is generated, press "S" to add a specify additional device.
4. Insert the install diskette into Driver A: and then press "Enter".
5. Select "HPT370 UDMA/ATA100 RAID Controller for WinNT4.0" then press <Enter>.

   Note: for CD installations, if using an ATAPI CD-ROM, you must be using the IDE Controller.
6. Follow the normal setup installation procedure.

Checking the Installation

If you want to check if the HPT370 UDMA/ATA100 RAID Controller and its device driver are correctly installed, you can:

1. Open My Computer.
2. Open Control Panel.
3. Double click icon SCSI Adapters.
4. Click "Drives" tab then You should see the item HPT370 UDMA/ATA100 RAID Controller (started) listed.

Removing a Host Adapter

Removing a host adapter can be as simple as physically removing it from the slot when your computer is shut down. Windows NT boots and functions properly in this configuration, but a warning message is generated every time you boot Windows NT. To eliminate the warning message, you must update the Windows NT software configuration, as described in the following steps:

1. Open My Computer.
2. Open Control Panel.
3. Double click SCSI Adapters.
4. Click Drivers.
5. Select HPT370 UDMA/ATA100 RAID Controller, then click Remove.

Windows 2000 Driver Installation

Systems Without Windows 2000 Already Installed

1. Put the Windows 2000 CD-Title into the CD-ROM and Boot from the CD-ROM.
2. When the "Windows 2000 Setup" windows is generated, then press <F6> if you need to install a third party SCSI or RAID driver....
3 Press "S" to add a specify additional device.
4. Please insert the install diskette into Driver A: and then press "Enter".
5. Select "HPT370 UDMA/ATA100 RAID Controller for Win2000" then press <Enter>.

   Note: for CD installations, if using an ATAPI CD-ROM, you must be using the IDE Controller.

6. Follow the normal setup installation procedure.

Checking the Installation

If you want to check if the HPT370 UDMA/ATA100 RAID Controller and its device driver are correctly installed, you can:

1. From Windows 2000, open Control Panel form My Computer followed by the system icon.
2. Choose "Hardware" tab and click Device Manager, then click "+" in front of the "SCSI and RAID Controller".
3. The driver "Highpoint RCM Device" and "HPT370 UDMA/ATA100 RAID Controller" should be installed.

Uninstalling the Driver

You can use the device manager in the System control panel to remove the driver.

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Appendix H

H-1 HPT370 UltraDMA-100 & RAID Setup Guide

RAID Introduction

The HPT370 ROM BIOS provides a built-in setup program which allows the user to modify, create, or delete arrays. RAID stands for Redundant Array of Inexpensive Disks. It is a method of combining several hard drives into one unit called an array. RAID offers fault tolerance and higher performance than a single hard drive or group of independent hard drives. There are different levels of RAID representing different types of functions. The HPT370 integrated into the mainboard supports the following:

Level	Description	Min. Drives Required	Best For
RAID 0	Data Striping	2	Performance
RAID 1	Disk Mirror	2	Data protection
RAID 0+1	Striping & Mirror	4	Performance & Protection

To enter the setup utility power on the computer and wait until after the memory test finishes. When the following is displayed on the screen press the <Ctrl><H> keys immediately. At least one hard drive must be attached to the HTP370 controllers on motherboard connectors IDE3 or IDE4, otherwise entry into the HPT370 BIOS will be denied.

> HighPoint Technologies, Inc. HPT370 UDMA/ATA100 RAID Controller BIOS
> (c) 1999-2000. HighPoint Technologies, Inc. All rights reserved.
>
> Press <Ctrl><H> to run BIOS Setting Utility
> Scan Devices. Please Wait...

The menu displays all the major selection items. Select the item you need to configure. 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 right corner 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.

Channel Status

From the BIOS setting utility the user will be presented with many options. Under the menu will be displayed the Channel Status window. This displays all the currently attached drives on IDE3 and IDE4 of the motherboard. Drives attached to motherboard connectors IDE1 and IDE2 are controlled by the UltraDMA-66 controller and thus are not supported for RAID functionality. The port, drive name, mode, size, and its status will be displayed for reference.

Array Status

By pressing the <F1> function key the Channel Status window will be replaced with the Array Status. This windows shows all currently created RAID arrays in the system. Their names, block size and size will be displayed.

1. Create RAID

Select item 1. Create RAID to create a RAID array in your system. From picking this menu item you will be presented with the following choices:

1. Array Mode
2. Select Disk Drives
3. Block Size
4. Start Creation Process

Array Mode

The first step in creating an array is to set the desired mode. Three possible RAID array modes are presented. Select the mode in which the drives should function.

Striping (MODE 0) for Performance takes two or more drives and combines their storage capabilities into one. Example: If you stripe a 4GB HDD and a 2GB HDD drive you will make an array of 6GB total. Software and operating systems will not see the two drives - only the 6GB array.

Mirror (RAID 1) for Security takes two drives and mirrors all data on one drive to the other. Although you physically have two drives your software and operating system for all practical purposes will only see one. Any data stored on your drive will automatically be mirrored onto the other. Both drives should be identical size, model, and type.

Stripping + Mirror (RAID 0+1). This option combines the both RAID 0 and RAID 1 above. It allows the user to mirror striped drives onto another set of striped drives for extra protection.

Select Disk Drives

After making a decision of what type of array to create next you need to choose what drives you wish to participate with it. After choosing this menu item parenthesis will appear next to the drives in the Channel Status window. Use the arrow keys to move the cursor to the desired drives. Press the <Enter> key to select them. After choosing the drives press the <Esc> once.

Block Size

This option sets the block sizes that the array will create to organize the data. It is recommended to keep the default of 64K selected.

Start Creation Process

This is the final step in the RAID array creation. After you have confirmed your mode and drives use this option to create the array. Warning this will destroy all previous data on the drives selected. The creation will only take a moment and will bring the user back to the main menu. At this point the array is created and should now be partitioned and format for operating system use.

Once created the array will be given a name by the utility. If this is the first array in the system it will be named Array #0. A second array in the system will be named Array #1 and so forth.

2. Delete RAID

Select item 2. Delete RAID from the main menu to erase a RAID array currently in the system. Upon closing this option the Channel Status window will be displayed along with a set of parenthesis next to any arrayed drives. Only the first drive of the array will have the parenthesis. Use the arrow keys to move the cursor to the desired drive. Press the <Enter> key to select it. You now will be prompted by a warning message. If you are sure you want the array removed press <Y>. The array is now removed and the drives have all been separated into individuals. Drives that were originally stripped may now have their data corrupted.

3. Duplicate Mirror Disk

Select item 3. Duplicate Mirror Disk from the main menu to create an exact copy of one drive to another. Both drives should be identical size, model, and type. Upon selecting this option you will be shown the following three choices.

1. Select Source Disk
2. Select Target Disk
3. Start Duplication Process

Select Source Disk

Before you can duplicate (copy) any drive you must first select what drive it is you want to copy. Upon choosing this option the Channel Status window will be displayed along with a set of parenthesis next to all the drives. Use the arrow keys to move the cursor to the desired drive. Press the <Enter> key to select it.

Select Target

Use this option to pick the destination drive. Upon choosing this option the Channel Status window will be displayed along with a set of parenthesis next to all the drives. Use the arrow keys to move the cursor to the desired drive. Press the <Enter> key to select it. Any data previously on this drive will be erased using the next step - start duplication process.

Start Duplication Process

This option will start the copy process. Depending upon the size of the drives the copying may take up to 30 minutes or more. Upon completion the drives should now exact copies of each other (mirror).

This option is useful for making a RAID 1 array out of an existing drive with data. First copy the drive onto a similar drive then make the array out of both of them.

4. Create Spare Disk

Select item 4. Create Spare Disk from the main menu to include an extra drive into an existing RAID 1 mirror array. So in case one of the drives in the array malfunctions the spare will take over.

1. Select Mirror Array
2. Select Spare Drive

Select Mirror Array

Select the array currently in the system you would like to add the spare drive into.

Select Spare Drive

Select the extra drive you would like to include into the mirror. Any existing data on the drive may be lost as the mirror takes over.

5. Remove Spare Disk

Select item 5. Remove Spare Disk from the main menu to remove any spare drives that were added into an existing RAID 1 mirror array. Select the mirror array you wish to remove a spare from then the actual spare drive.

6. Set Drive Mode

Select item 6. Set Drive Mode from the main menu to adjust the data transfer mode for any drive attached to the HPT370 controller. Upon choosing this option the Channel Status window will be displayed along with a set of parenthesis next to all the drives. Use the arrow keys to move the cursor to the desired drive. Press the <Enter> key to select it.

When selecting a drive a pop-up window will be displayed showing the following available modes. Only select modes for which your drive actually supports. Refer to your hard drives documentation for more information.

PIO 0
PIO 1
PIO 2
PIO 3
PIO 4
MW DMA 0
MW DMA 1
MW DMA 2
UDMA 0
UDMA 1
UDMA 2
UDMA 3
UDMA 4

7. Select Boot Disk

Select item 7. Select Boot Disk from the main menu to choose what hard drive attached to the HPT370 should be allowed to boot the system. This drive must also contain a bootable working operating system. Note: The Boot Device (Boot sequence) option in the Award BIOS must also be set to give priority to the HPT370 over the onboard VIA UltraDMA-66 IDE controller. Select SCSI in the Award BIOS and the HPT370 will be allowed to boot the system with its attached drives.

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