



EP-GXB-M (SMP)

**A Dual Pentium® II Xeon Slot 2
Processor based AGP mainboard.**

TRADEMARKS

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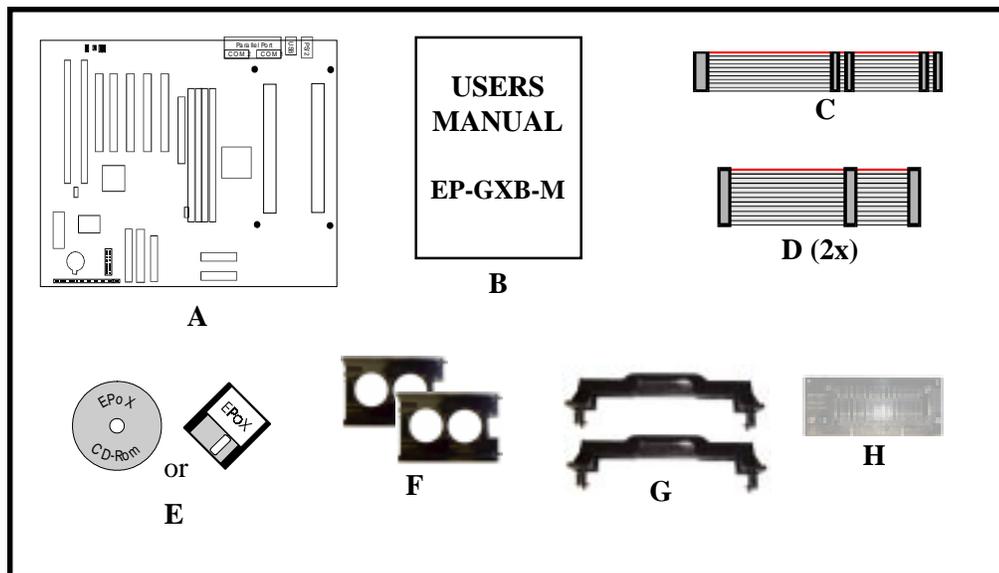
EP-GXB-M

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Components Checklist

- A (1) EP-GXB-M mainboard
- B (1) EP-GXB-M user's manual
- C (1) Floppy drive cable
- D (2) Hard drive cables
- E (1) Software drivers set (disks or CD-ROM)
Bus master drivers
Windows 95/98 PCI Bridge support
USDM hardware monitoring utility (option)
- F (2) Retension mechanism base with screws
- G (2) Retension mechanism cap
- H (1) Termination module



User Notice

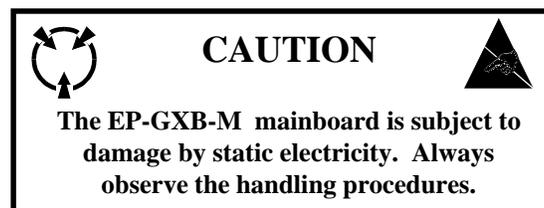
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Handling Procedures

Static electricity can severely damage your equipment. Handle the EP-GXB-M 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. EPoX assumes no responsibility for any damage to the EP-GXB-M mainboard that results from failure to follow instruction or failure to observe safety precautions.



EP-GXB-M

Technical Support Services

If you need additional information, help during installation or normal use of this product, please contact your retailer. Your retailer will have the most current information about your configuration. If your retailer cannot help, you may visit our online technical support website and/or contact our support technicians at the locations listed below.

Record your serial number before installing your EP-GXB-M mainboard. (The serial number is located near the ISA slots at the edge of the board.)

EP-GXB-M serial number: _____

Contacting Technical Support

EPoX technical support is working hard to answer all of your questions online. From our website you can find answers to many common questions, drivers, BIOS updates, tech notes, and important technical bulletins. If you are still unable to locate the solution you are seeking, you always have the option to contact our support technicians directly.

North American website (English language)

<http://www.epox.com>

sales@epox.com

support@epox.com

European website (Multi-language)

<http://www.epox.nl>

sales@epox.nl

support@epox.nl

Taiwan website (Chinese language)

<http://www.epox.com.tw>

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Table of Contents

Chapter 1: Introduction

Overview of EP-GXB-M features	11
Pentium® II Xeon Processor	13
Accelerated Graphics Port (AGP)	14
ATX Form Factor	15
Hardware Monitoring	16
I/O Shield	17
Power ON/OFF Remotely (KBPO & Modem Ring-in)	17
Universal Serial Bus (USB)	17
Symmetrical Multi-Processing (SMP)	18
System Block Diagram	19

Chapter 2: Hardware Installation

Directions & Recommended Tools	21
Detailed Board Layout	22
Configuration of Jumpers	23
Installing into ATX case	24
Installing Connectors	25
Installing Memory	26
Installing Processor(s)	28
Device Connector Description	30
Configuring KBPO and Modem Ring-in	31

Chapter 3: Software Installation

Included Software & Drivers	33
Microsoft Windows® 95 Setup	34
Microsoft Windows® 98 Setup	36
Microsoft Windows® NT 4 Setup	38

Chapter 4: Award BIOS Setup

BIOS Instructions	41
Standard CMOS Setup	42
BIOS Features Setup	43
Chipset Features Setup	48
Power Management Setup	52
PNP/PCI Configuration Setup	56
Load Setup Defaults	57
Integrated Peripherals	58
Change Supervisor or User Password	62
IDE HDD Auto Detection	63
Save & Exit Setup	64
Exit Without Saving	64

Appendix A: Technical Information

Memory Map	67
I/O Map	67
Timer & DMA Channel Map	68
Interrupt Map	68
RTC & CMOS RAM Map	69

Appendix B: BIOS Post Codes

Post Codes	73
Unexpected Errors	76

Appendix C: Load Setup Defaults

.....	79
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Appendix D: Frequently Asked Questions

Tips to install motherboards	81
BIOS beep codes	82
BIOS flash instructions	82
BIOS function S.M.A.R.T.	83
BIOS recovery if flash fails	84
KBPO does not work	84
Memory conflict with AGP in Windows® 95	84
“MSDOS Compatibility mode” in Windows® 95/98	85
New hard drive cannot be accessed	86
No video when power applied	86
“PCI Bridge” and Device Manager of Windows® 95/98	87
“PCI Serial Controller” and Device Manager of Windows® 95/98 ..	88
SB-Link connector	88
WOL connector	89

Additional Sources of Information

EPoX

<http://www.epox.com>

<http://www.epox.com.tw>

<http://www.epox.nl>

Intel Corporation

<http://www.intel.com>

<http://developer.intel.com>

Microsoft Corporation

<http://www.microsoft.com>

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Chapter 1

Introduction & Features

Overview of EP-GXB-M features

- EP-GXB-M is based on the Dual Pentium® II Xeon Processor operating at 400-550 MHz (100MHz) on Slot 2. The board is configured by an Easy-Setting-Single-Jumper (E.S.S.J.) to match your CPU clock speed.
- Designed with Intel's 82443GX AGPset.
- Supports up to 2 Gigabyte of SDRAM (minimum of 16 MB) on board. You can use 168-pin SDRAM DIMM x 4 (please see page 26).
- EP-GXB-M will support Error Checking and Correcting (ECC) when using parity SDRAM memory modules. This will detect multiple bit errors and correct 1-bit memory errors.
- Supports (2) 16 bit ISA slots, (5) 32 bit PCI slots, (1) AGP slot and provides (2) independent high performance PCI IDE interfaces capable of supporting PIO Mode 3/4 and Ultra DMA 33 devices. The EP-GXB-M supports (5) PCI Bus Master slots and a jumperless PCI INT# control scheme which reduces configuration confusion when plugging in PCI card(s).
- Supports ATAPI (e.g. CD-ROM) devices on both Primary and Secondary IDE interfaces.
- Designed with Winbond W83977 Multi I/O: (1) floppy port, (1) parallel port (EPP, ECP), and (2) serial ports (16550 Fast UART), (1) IrDA.
Note: Japanese "Floppy 3 mode" is also supported
- Includes a PS/2 mouse connector.
- Allows use of a PS/2 or AT keyboard (with optional adapter).
- Features Award Plug & Play BIOS easy flash upgradability.

- EP-GXB-M utilizes a Lithium battery which provides environmental protection and longer battery life.
- Supports the Universal Serial Bus (USB) connector. The onboard PIIX4 chip provides the means for connecting PC peripherals such as keyboards, joysticks, telephones, and modems.
- 2 Built-in ATX 20-pin power supply connectors.
- Software power-down when using Windows® 95/98.
- Supports ring-in feature -allows system to be turned on remotely using external modem.
- Power on by Alarm - Allows your system to turn on at a preselected time.
- Power Loss Recovery - In the event of a power outage your system will automatically turn itself back on without user intervention.
- Supports CPU Hardware sleep and SMM (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. (option)
- Supports Hot Key, Any Key, or password Keyboard power ON function (KBPO).
- Supports USDM software which allows Windows® 95/98, or Windows® NT 4.0 to monitor various aspects of the system hardware.
- Supports stopping the CPU, AUX, and Chassis FANs during sleep mode.
- Supports blinking of the System Power LED (PANEL) during sleep mode.
- Built-in WOL (Wake On Lan) Connector.
- Built-in SB-LINK Header for Creative Labs Sound Blaster® AWE64D PCI sound card.

Pentium II Xeon Processor

The Pentium® II Xeon Processor is the follow-on to the Pentium® II Processor. The Pentium® II Xeon Processor, like the Pentium® Pro processor, implements a Dynamic Execution micro-architecture -- a unique combination of multiple branch prediction, data flow analysis, and speculative execution. This enables the Pentium® II Processor to deliver higher performance than the Pentium® processor, while maintaining binary compatibility with all previous Intel architecture processors.

A significant feature of the Pentium® II Xeon Processor, from a system perspective, is the built-in direct multiprocessing support. In order to achieve multiprocessing, and maintain the memory and I/O bandwidth to support it, new system designs are needed. For systems with dual processors, it is important to consider the additional power burdens and signal integrity issues of supporting multiple loads on a high speed bus. The Pentium® II Xeon Processor supports scalable multiprocessing support for up to eight processors (on compatible motherboards), support for clustering technologies such as NUMA and VI architecture and 36-bit memory support.

The Pentium® II Xeon Processor in a variety of versions from 512KB built-in cache to 1MB and 2MB versions. Data is shared with the rest of the system via a high-speed high-bandwidth 100MHz front side bus. Up to 64GB of memory can be addressed and cached by the processor which allows for increased performance in many applications.

The S.E.C. cartridge has the following features: a thermal plate, a cover and a PCB with an edge finger connection. The thermal plate allows standardized heatsink attachment or customized thermal solutions. The thermal plate enables a reusable heatsink to minimize fit issues for serviceability, upgradeability and replacement. The full enclosure also protects the surface mount components. The edge finger connection maintains socketability for system configuration. The edge finger connector is denoted as 'Slot 2 connector' in this and other documentation.

The entire enclosed product is called the Pentium® II Xeon Processor. The packaging technology and each of the physical elements of the product are referred to using accurate technical descriptions. This allows clear reference to the products as just a processor. This is the model used in past packaging technologies like PGA, TCP, PQFP, DIP, etc

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 access 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 EPoX EP-GXB-M 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-GXB-M is equipped with two ATX power supply connectors, which are 20-

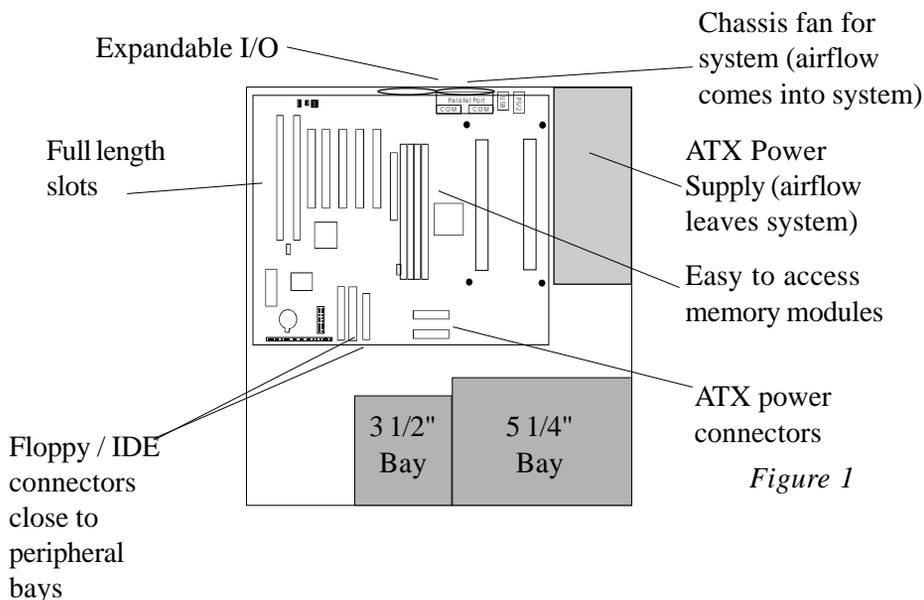
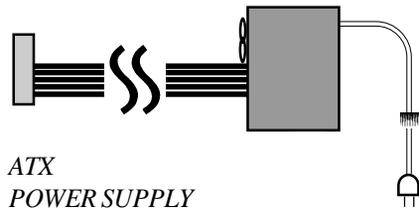
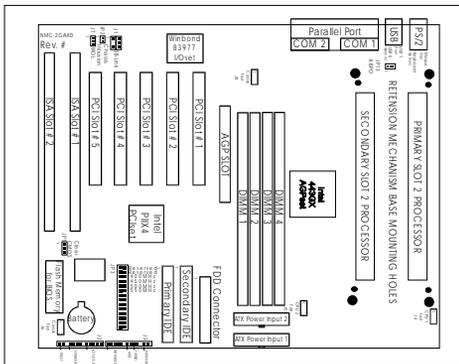


Figure 1

pin input devices for ATX power supplies. When attached to an ATX supply with two 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-GXB-M 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.



EP-GXB-M

*Figure 2: Case (chassis)
Power ON/OFF button
(J3: PW-ON)*

J3-PWON

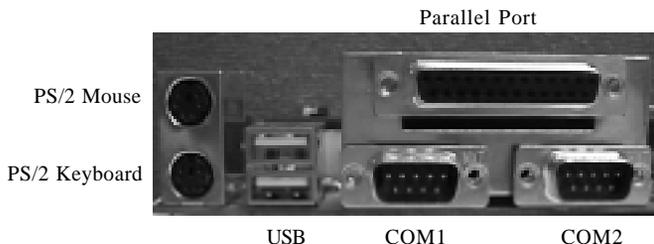
Hardware Monitoring

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-GXB-M is equipped with an I/O back panel. Please use the appropriate I/O shield.

*Figure 3:
EP-GXB-M
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 EPoX 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.

Symmetrical Multi-Processing (SMP)

At last an Enterprise-Class solution for your Bandwidth Critical applications server at PC prices. This mainboard features the latest Intel Pentium® II Processor horse-power in a Symmetrical Multi-Processing (SMP) configuration previously only available on RISC and Mainframe systems.

In SMP Operating Systems such as Unix® and Windows® NT the two main tasks of I/O and Application thread can be most efficiently done if split evenly over two CPU's. The core benefit to you is not only the reduced outlay in infrastructure, but also the PC-architecture that you need for security of investment and future compatibility.

This mainboard is also an excellent single-user Workstation solutions for Mission-Critical 32-bit applications such as Adobe® Photoshop for Windows® NT, where double floating-point power can really smooth out your work-load. Also provided are the latest PC Workstation technologies including A.G.P., USB, and PC2.1 Expansion Slots.

Operating Systems that support Dual Processing

Operating System Name	Revision	S82093AA APIC
Windows NT Server/Workstation	3.51 or above	Yes
Netware SMP	4.xx	No, will be supported in a future revision
SCO Unix MPX	3.0	No, not planned to be supported
SCO Unix Openserver	5.0	Yes
Solaris	2.4/2.5	No, will be supported in a future revision
Unixware	2.0x/2.1	No / Yes
OX/2 SMP	2.11	No, will be supported in a future revision

Table 1: SMP O/S support

System Block Diagram

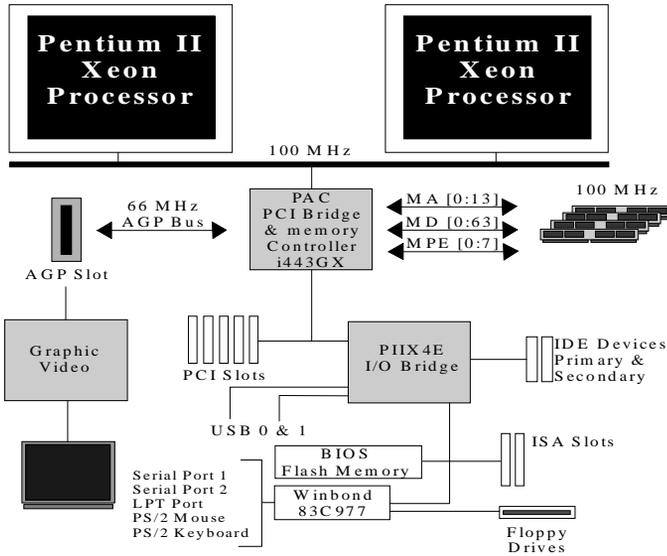


Figure 4: System block diagram

Chapter 2

Hardware Installation

Directions & Recommended Tools

Thank you for using EPoX products! This chapter will discuss some general steps needed in order to get your new mainboard installed and operational. The EP-GXB-M is a high performance mainboard which allows the use of Dual Intel Pentium II Xeon processors. Due to the size and characteristic of the Xeon brand processor the mainboard uses the extended ATX form factor and requires a matching case. Below you will find our recommended installation procedure for fast and easy setup.

Step 1 - Configuration of Jumpers	23
Step 2 - Installing into ATX case	24
Step 3 - Installing Connectors	25
Step 4 - Installing Memory	26
Step 5 - Installing Processor(s)	28
Step 6 - Configuring KBPO & Modem Ring-in	31

When the system is completely assembled and ready for use move on to chapter 3 for software installation and recommended drivers.

Recommended Tools (Not Included)

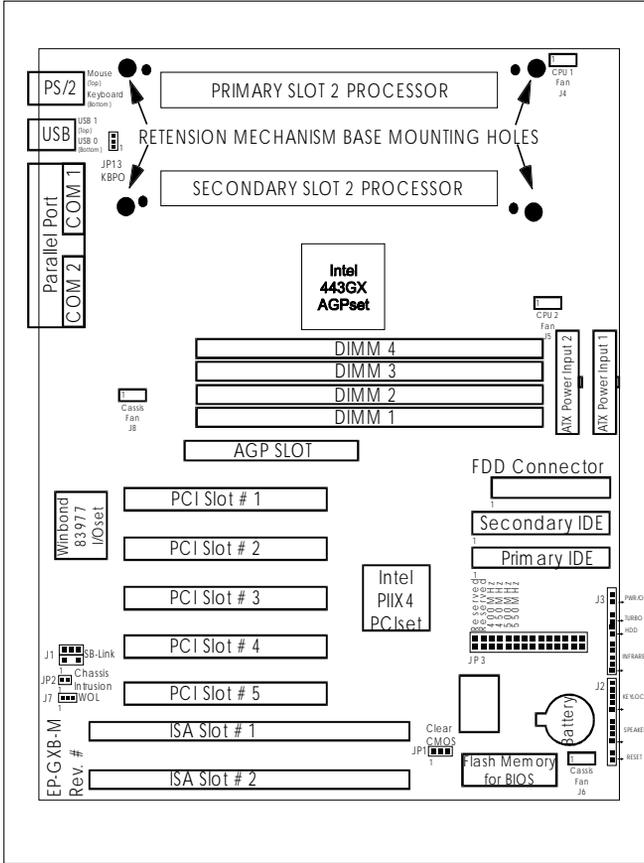
Needle nose pliers: the all purpose needle nose pliers is useful for many purposes such as, tightening loose standoffs when no socket is available, holding screws & jumpers, cutting plastic tie-offs, etc.



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.



Detailed Board Layout



Configuration of Jumpers

Jumpers are small plastic-encased conductors that are used to slip over a pair of jumper pins. EPoX designs all mainboards with the fewest jumpers and pins to make your setup fast and easy. It is recommended that the jumpers be set before the mainboard is installed into the case because access to the jumpers will be easier. The following will describe all of the jumpers that are required to be set before moving on.

Note: The jumpers as shown below are in their correct physical orientation.

JP1: CMOS Clear



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

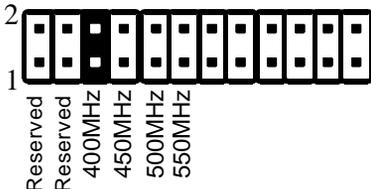
JP13: Keyboard Power-ON function (see page 31)



JP13: = 1-2 - Enable
 = 2-3 - Disable (Default)

ESSJ 2 CPU Speed Selection

JP3:



JP13: = See diagram at left.

Based on the implementation of the Intel 440GX AGPset the EP-GXB-M provides 100MHz for Slot 2 processors and memory operations. The primary and secondary processor slots both operate synchronously at 100MHz FSB, therefore if two processors are used both will need to be of the same type and speed. When using the 100MHz FSB all memory must be PC100 compliant SDRAM.

Memory is an important component of any 100MHz motherboard. When selecting memory for use on your EPoX brand motherboard we recommend using only the finest quality modules. EPoX would like to stress that using non-compliant PC100 SDRAM modules with a 100MHz FSB severely compromises the integrity of the system.

Installing into ATX case

Static electricity can severely damage your equipment. Handle the EP-GXB-M 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 except for the 4 surrounding the slot2 connectors (see locations on page 22). 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/PW2).
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 two ATX power supply connectors (PW1 & PW2) which when connected to an ATX supply with dual cables ensures a steady 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.

J3	Power On/Off	■	1	<p>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). When the system is in 4 sec delay mode, EPoX has added a special feature to make the system go into suspend mode when the button is pressed momentarily. See page 54.</p> <p>Turbo LED indicator - LED ON when higher speed is selected</p> <p>IDE LED indicator - LED ON when Onboard PCI IDE Hard disks is activate</p> <p>Infrared - Infrared connector</p> <table border="0" style="margin-left: 40px;"> <tr> <td>1. Vcc</td> <td>4. GND</td> </tr> <tr> <td>2. IRTX</td> <td>5. IRTX2</td> </tr> <tr> <td>3. IRRX2</td> <td></td> </tr> </table>	1. Vcc	4. GND	2. IRTX	5. IRTX2	3. IRRX2					
	1. Vcc	4. GND												
	2. IRTX	5. IRTX2												
	3. IRRX2													
IDE & Turbo	■	+												
■	+													
■														
Infrared	■		1											
■														
■														
■														
J2	Pwr LED & Keylock	■	1	<p>KeyLock - Keyboard lock switch & Power LED connector</p> <table border="0" style="margin-left: 40px;"> <tr> <td>1. Power LED(+)</td> <td>4. Keylock</td> </tr> <tr> <td>2. N/C</td> <td>5. GND</td> </tr> <tr> <td>3. GND</td> <td></td> </tr> </table> <p>Speaker - Connect to the system's speaker for beeping</p> <table border="0" style="margin-left: 40px;"> <tr> <td>1. Speaker</td> <td>3. GND</td> </tr> <tr> <td>2. N/C</td> <td>4. GND</td> </tr> </table> <p>Reset - Closed to restart system.</p>	1. Power LED(+)	4. Keylock	2. N/C	5. GND	3. GND		1. Speaker	3. GND	2. N/C	4. GND
	1. Power LED(+)	4. Keylock												
	2. N/C	5. GND												
	3. GND													
1. Speaker	3. GND													
2. N/C	4. GND													
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■														
Speaker	■		1											
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■														
Reset	■		1											
■														
■														
■														

Installing Memory

The EP-GXB-M supports (4) 168-pin PC100 SDRAM DIMMs (Dual In-line Memory Module). Do not use EDO DIMM in the system.

- SDRAM DIMM may be 100 MHz (10ns) or 125 MHz (8ns) bus speed.
- SDRAM DIMM may be 16MB, 32MB, 64MB, 128MB, 256MB or 512MB.
- Table 1 shows several possible memory configurations.
- Table 2 shows compatible SDRAM components types according to Intel 440GX datasheets. (Internet: <http://developer.intel.com>)
- 4Mx4, 16Mx4, 32Mx4 and 64Mx4 SDRAM memory components are supported in the form of Registered DIMM only.
- Registered and non-Registered DIMM may not be mixed in the system.
- Registered DIMM must be installed in order starting from BANK 0 then 1, 2, and finally 3 when using additional pieces.

Total Memory	DIMM 1	DIMM 2	DIMM 3	DIMM 4
= 2GB Maximum	SDRAM 16MB, 32MB 64MB, 128MB, 256MB, 512MB X 1			
= 1.5GB Maximum	SDRAM 16MB, 32MB 64MB, 128MB, 256MB, 512MB X 1	SDRAM 16MB, 32MB 64MB, 128MB, 256MB, 512MB X 1	SDRAM 16MB, 32MB 64MB, 128MB, 256MB, 512MB X 1	None
= 1GB Maximum	SDRAM 16MB, 32MB 64MB, 128MB, 256MB, 512MB X 1	SDRAM 16MB, 32MB 64MB, 128MB, 256MB, 512MB X 1	None	None
= 512MB Maximum	SDRAM 16MB, 32MB 64MB, 128MB, 256MB, 512MB X 1	None	None	None

SDRAM Option	SDRAM Component Type
16MB	2Mx8
32MB	4Mx16 or 4Mx4*
64MB	8Mx8
128MB	16Mx16 or 16Mx4*
256MB	32Mx4*, 32Mx8
512MB	64Mx4*

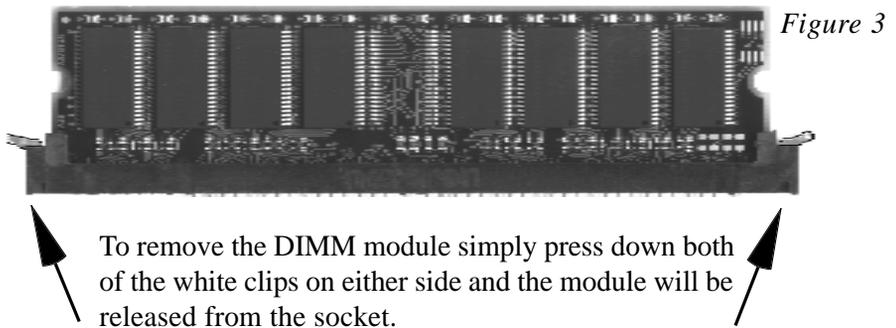
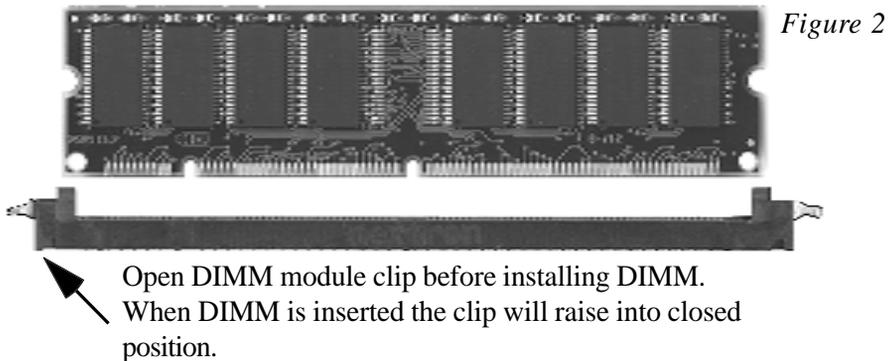
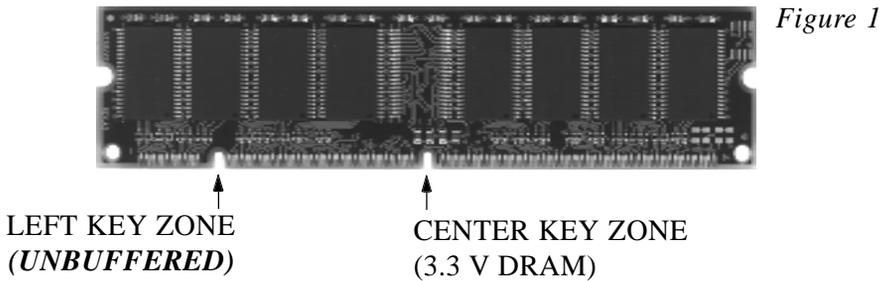
*Table 1
A few possible configurations.*

*Table 2
Compatible component types.
* - Registered DIMM only.*

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).



Installing Processor(s)

The EP-GXB-M supports two Intel Pentium II Xeon processors. This section outlines the procedure to install one or two processors into the mainboard. The chassis (case) must supply additional screw holes and support standoffs so the retention mechanism may properly support the Xeon. There is also a possible need for rubber bumpers between the mainboard and case surface to prevent shock and vibration.

1. Observe the safety precautions as listed on page 24 for handling static sensitive devices.
2. Place the two plastic bases of the retention mechanism on both ends of the Slot 2 connectors and secure in place using screws supplied (see figure 4). The bases contain small plastic pegs that will insert in to small holes to prevent incorrect usage.

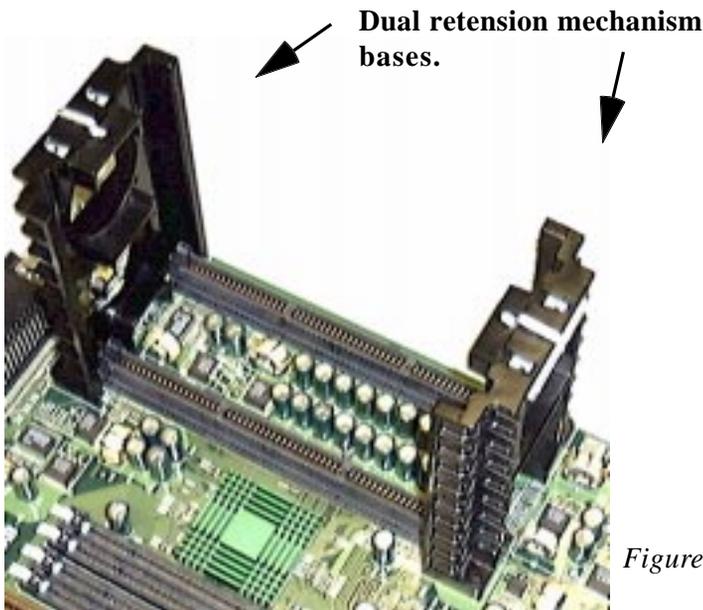


Figure 4

3. Included with the mainboard kit are two caps that attach to the Xeon processors as shown in figure 5 (one shown). Attached this cap to the top of the processor (see figure 6). This will act as a handle allowing the user to insert the processor into the complete retention mechanism.



Figure 5



Figure 6

4. Insert the processor into the retention mechanism as shown in figure 7. The caps and bases are designed so that they will not connect unless they are attached in the correct direction. So, if the cap will not attach to the base simply remove the cap from the processor and reverse it.
5. If 3-pin fan power cables are present they may be attached to either J4 or J5.
6. Repeat steps to insert second processor if present. If only one processor will be used in the system insert termination module (included) into the secondary slot2 (see figure 7).

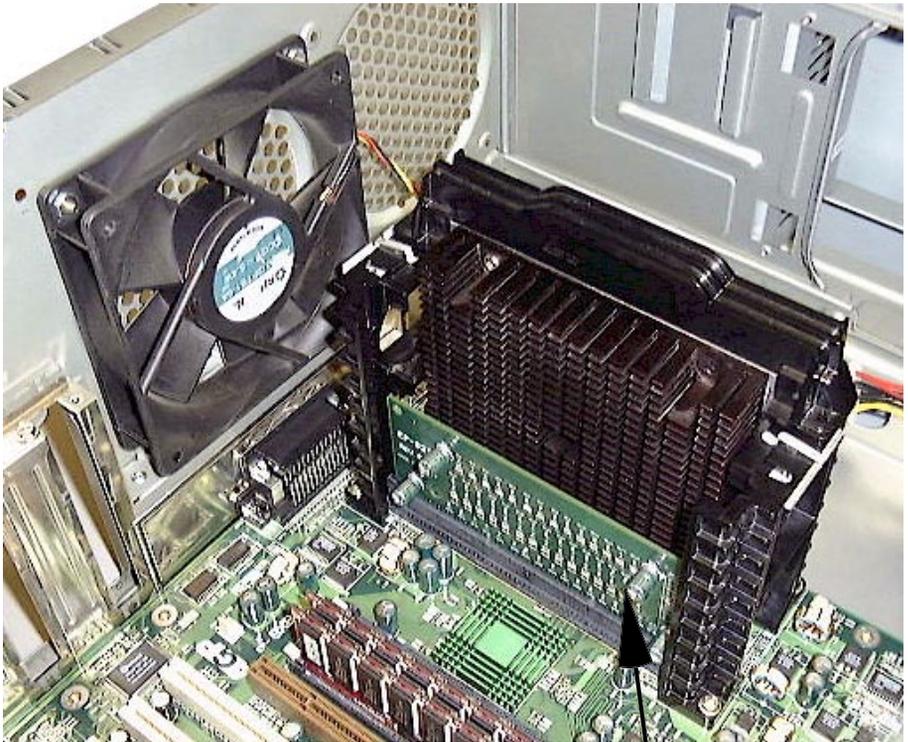
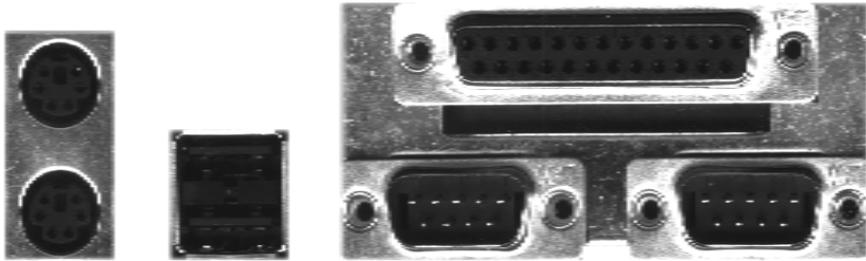


Figure 7. Completed assembly with 1 processor and terminator module.

Termination module.

Device Connector Description

<i>PS/2 Mouse</i> (Top)	<i>USB 1</i> (Top)	<i>Parallel Port</i> (Top)	
<i>PS/2 Keyboard</i> (Bottom)	<i>USB 0</i> (Bottom)	<i>Com1</i> (Bottom Left)	<i>Com2</i> (Bottom Right)

Figure 8

- AGP1:** AGP slot
- FDD1:** Floppy controller
- IDE1:** Primary IDE
- IDE2:** Secondary IDE
- ISA1 ~ 2:** ISA slots
- J1:** SB-Link [see page 88]
- J2 ~ 3:** Chassis panel connector HDD LED)
- J4:** CPU 1 fan power (allows RPM monitoring) [see page 16]
- J5:** CPU 2 fan power (allows RPM monitoring) [see page 16]
- J6:** Chassis fan power (allows RPM monitored) [see page 16]
- J7:** Wake On-Lan (WOL) [see page 89]
- J8:** Chassis fan power (not monitored)
- JP1:** CMOS clear
- JP2:** Chassis (case) intruder detect
- JP3:** CPU speed select
- JP13:** Keyboard power-on (KBPO)
- PCI1 ~ 5:** PCI slots
- PW1 ~ 2:** ATX power supply connectors

Configuring 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 EPoX motherboard have it set to enable, and use an ATX power supply rated 0.1a (100mA) or greater for the +5vsb.

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.

To enable KBPO:

1. Press the power on/off switch to turn on the system and then push again and hold for more than 4 seconds to turn power back off.
2. Move the KBPO jumper (JP13) to the enable position to activate the function. You now can enjoy the Keyboard Power-ON function by pressing any 1 or 2 keys at the same time for 1-2 seconds on the keyboard. After releasing the keys the system will then power on.

Notes:

1. If the ATX power supply cable is removed from the motherboard at any time then the above procedure will need to be repeated. Disable the KBPO jumper than follow steps above.
2. The number of keys needed to turn on the system may vary depending upon internal keyboard designs. This is due to the different current loading characteristic of different keyboard designs. Additionally the keystrokes used may be modified in the BIOS. See page 60.

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. Simply enable "Power On by Ring" and set "Modem Use IRQ" in the Award BIOS CMOS utility under the Power Management section. See pages 53-55.

Chapter 3

Software Installation

Included Software & Drivers

All drivers required for installation of the mainboard under Windows 95/98 and NT 4 are located on the included floppy disks (or CD-ROM). Additionally drivers and manuals are also available on our website at <http://www.epox.com/support>.

If you wish to take advantage of Accelerated Graphics Port (AGP) video cards your system will require at least Windows 95 OSR2.1 or Windows 98. OSR2.0 versions of Windows 95 can be updated to OSR2.1 by installing the USB supplement patch available from your computer vendor or Microsoft. If you use Windows 95 OSR2.0 or older without updating then you cannot use AGP or USB functions.

Bus mastering and UltraDMA (ATA-33) drive support can be enabled within Windows 95 and Windows NT by installing the included Intel Bus Mastering drivers. Windows 98 users need not install the driver as these functions are already supported by default.

Copyright notice

The software on EPoX disks and/or CD is owned and copyrighted by EPoX or its third party suppliers. You may not disassemble or decompile the software unless EPoX's prior written consent is obtained.

Microsoft Windows 95 Setup

Installation of Windows 95 is a fairly simple task but for proper system operation a few key drivers should be installed. This section highlights what drivers are necessary and in what order they should be installed during the setup process.

Also note if you wish to take advantage of Accelerated Graphics Port (AGP) video cards your system will require at least Windows 95 OSR2.1 or Windows 98. OSR2.0 versions of Windows 95 can be updated to OSR2.1 by installing the USB supplement patch available from your computer vendor or Microsoft. If you use Windows 95 OSR2.0 or older without updating then you cannot use AGP or USB functions. Windows 95 does not support dual processing (second processor will be ignored).

- 1: ***Install Windows 95.***
- 2: ***Install Windows 95 INF update utility for Intel 440GX AGPset.*** This utility updates Microsoft operating systems so that they may properly identify and configure the latest Intel® 440GX AGPset.

Use the utility program **SETUP.EXE** from the EPoX Win95 floppy disk.

- 3: ***Install PCI Bridge patch.*** This utility will replace the devices listed as “PCI-bridge” and/or “PCI-card” with the Intel PCI Bus Master IDE Controller and Universal Serial Bus Controller.

Use the utility program **WINP2X4** from the EPoX Win98 floppy disk or CD-ROM. After starting this utility a display similar to this will appear:

```
WinP2X4.EXE v1.82  
Copyright(c) Award Software, Inc. 1997 All Rights Reserved  
  
==== Microsoft Windows 95/98 implement for Intel PIIX4====  
The Windows 95/98 directory is C:\WINDOWS (Y/N)?
```

Respond Y if Windows 95 directory is correct. If the Windows 95 default directory is not correct please respond N, and follow the on-screen prompt to enter the correct path. After the utility completes shutdown Window and restart. Windows upon next boot will detect new devices and install support for them.

-
- 4: ***Install USB Support if not automatically installed.*** (AGP/USB users only. All other may skip to step 4.)
- 5: ***Install Video Card's driver.***
- 6: ***Install DirectX.*** This is available from Microsoft at <http://www.microsoft.com>.
- 7: ***Congratulations basic installation complete!*** You now may continue to install any additional drivers for other devices. At this time you may wish to check for any devices listed with question marks (?) in the Device Manager [Control Panel / System icon] that had no drivers built-in during Windows installation.

Additional information

Memory conflict with AGP in Windows® 95	84
“MSDOS Compatibility mode” in Windows® 95/98	85
New hard drive cannot be accessed	86
“PCI Bridge” and Device Manager of Windows® 95/98	87
“PCI Serial Controller” and Device Manager of Windows® 95/98	88

Microsoft Windows 98 Setup

Installation of Windows 98 is a fairly simple task (even easier than Windows 95 do to the bootable CD-ROM feature) but for proper system operation a few key drivers should be installed. This section highlights what drivers are necessary and in what order they should be installed during the setup process. Windows 98 does not support dual processing (second processor will be ignored).

- 1: **Install Windows 98.** If you are installing from CD-ROM you can now boot directly from the Windows 98 CD and begin installation right away. No more bootable floppy disks or DOS real mode CD drivers needed! (Atapi EIDE CD drives only.) See page 44 for enabling this feature (boot sequence).
- 3: **Install Windows 98 INF update utility for Intel 440GX AGPset.** This utility updates Microsoft operating systems so that they may properly identify and configure the latest Intel® 440GX AGPset.

Use the utility program **SETUP.EXE** from the EPoX Win98 floppy disk.

- 4: **Install PCI Bridge patch.** This utility will replace the devices listed as “PCI-bridge” and/or “PCI-card” with the Intel PCI Bus Master IDE Controller and Universal Serial Bus Controller.

Use the utility program **WINP2X4** from the EPoX Win98 floppy disk or CD-ROM. After starting this utility a display similar to this will appear:

WinP2X4.EXE v1.82

Copyright(c) Award Software, Inc. 1997 All Rights Reserved

=== Microsoft Windows 95/98 implement for Intel PIIx4===

The Windows 95/98 directory is C:\WINDOWS (Y/N)?

Respond Y if Windows 98 directory is correct. If the Windows 98 default directory is not correct please respond N, and follow the on-screen prompt to enter the correct path. After the utility completes shutdown Window and restart. Windows upon next boot will detect new devices and install support for them.

- 5: **Install Video Card's driver.**

- 6: *Congratulations basic installation complete!* You now may continue to install any additional drivers for other devices. At this time you may wish to check for any devices listed with question marks (?) in the Device Manager [Control Panel / System icon] that had no drivers built-in during Windows installation.

Additional information

Memory conflict with AGP in Windows® 95	84
“MSDOS Compatibility mode” in Windows 95/98	85
New hard drive cannot be accessed	86
“PCI Bridge” and Device Manager of Windows 95/98	87
“PCI Serial Controller” and Device Manager of Windows 95/98 ...	88

Hardware Requirements for Multiple Display Support in Win98 (Q182708)
<http://support.microsoft.com/support/kb/articles/Q182/7/08.asp>

How to Enable Multiple Display Support Using Windows 98 (Q179602)
<http://support.microsoft.com/support/kb/articles/Q179/6/02.asp>

Windows NT 4 Setup

Unlike Windows 95 & 98, Windows NT 4 supports a Dual Processing environment. Therefore if you wish to obtain extra performance from your system using a second processor Windows NT 4 is a better platform. Besides the installation procedure of Windows NT 4 itself, drivers required for use of the EP-GXB-M are almost not required.

Please note that currently Microsoft will only support AGP & USB functions when the operating system is Windows 95 OSR2.1 (or newer), Windows 98, or Windows NT 5.0 (a.k.a. Windows 2000). These operating systems are programmed to support AGP functions using separate independent VxD miniport drivers from VGA drivers, through API. However, under Windows NT 4.0 the AGP functions are not defined in the API. Therefore if an AGP card is used in the system it will function equivalent to PCI performance.

- 1: ***Install Windows NT 4.*** Follow Microsoft directions for installation. If you are installing from CD-ROM you can now boot directly from the Windows NT 4 CD and begin installation right away. No more bootable floppy disks or DOS real mode CD drivers needed! (Atapi EIDE CD drives only.) See page 44 for enabling this feature (boot sequence). Additionally Service Pack 3 or higher is recommended to be installed.

During Windows NT 4 installation the setup program will detect the computer type. For both single and dual processing configurations the EP-GXB-M should use “**MPS Multiprocessor PC.**”

- 2: ***Congratulations basic installation complete!*** You now may continue to install any additional drivers for other devices.

Additional information

Boot Partition Created During Setup Limited to 4 Gigabytes (Q119497)
<http://support.microsoft.com/support/kb/articles/q119/4/97.asp>

Chapter 4

Award BIOS Setup

BIOS Instructions

Award's ROM BIOS provides a built-in setup program which allows the user to modify 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 CMOS setup utility power on the computer and press the key immediately, this will bring you into the BIOS 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.



Figure 1: CMOS Setup Utility

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.

```

ROM PCI/ISA BIOS (2A69KPAE)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

```

Date (mm:dd:yy) : Tue, Feb 2 1999								
Time (hh:mm:ss) : 13 : 3 : 11								
HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	: Auto	0	0	0	0	0	0	AUTO
Primary Slave	: Auto	0	0	0	0	0	0	AUTO
Secondary Master	: Auto	0	0	0	0	0	0	AUTO
Secondary Slave	: Auto	0	0	0	0	0	0	AUTO
Drive A : 1.44M, 3.5 in.								
Drive B : None								
Video : EGA/VGA								
Halt On : All,But Keyboard								
				Base Memory: 640K				
				Extended Memory: 130048K				
				Other Memory: 384K				
				Total Memory: 131072K				
ESC : Quit		↑ ↓ → : Select Item		PU/PD/+/- : Modify				
F1 : Help		(Shift)F2 : Change Color						

Figure 2: Standard CMOS Setup

Notes

- 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.
- The “Halt On:” field is used to determine when to halt the system by the BIOS if an error occurs.
- 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.

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

```

ROM PCI/ISA BIOS (2A69KPAE)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.
  
```

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
External Cache	: Enabled	CC000-CFFFF Shadow	: Disabled
CPU L2 Cache ECC Checking	: Disabled	D0000-D3FFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D4000-D7FFF Shadow	: Disabled
Boot Sequence	: A, C, SCBI	D8000-DBFFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	DC000-DFFFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled		
Boot Up NumLock Status	: On		
Gate A20 Option	: Fast		
Typeomatic Rate Setting	: Disabled		
Typeomatic Rate (Chars/Sec)	: 6		
Typeomatic Delay (Msec)	: 250		
Security Option	: Setup		
PCI/VGA Palette Snoop	: Disabled		
Assign IRQ For VGA	: Enabled	ESC : Quit	↑↓ : Select Item
NPS Version Control For OS	: 1.4	F1 : Help	FU/PD/+/- : Modify
OS Select For DRAM > 64MB	: Non-OS2	F5 : Old Values (Shift)F2 : Color	
HDD S.M.A.R.T. capability	: Disabled	F7 : Load Setup Defaults	
Report No FDD For WIN 95	: Yes		

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. The default is Enabled.

- Enabled: This activates the processor's internal cache thereby increasing performance.
- Disabled: This deactivates the processor's internal cache thereby lowering performance.

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

- Enabled: This activates the CPU's L2 cache thereby increasing performance.
- Disabled: This deactivates the CPU's L2 cache thereby lowering performance.

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

- Enabled: Enables ECC support for the CPU's L2 cache. Performance will decrease 2% ~ 4%.
- Disabled: Disables ECC support for the CPU's L2 cache.

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

- Enabled: This setting will shorten or skip of the items checked during POST.
- Disabled: Normal POST.

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]

Swap Floppy Drive: This will swap your physical drive letters A & B if you are using two floppy disks. The default is Disabled.

- Enabled: Floppy A & B will be swapped under the O/S.
- Disabled: Floppy A & B will be not swapped.

Boot Up Floppy Seek: During Power-On-Self-Test (POST), BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. Only 360K type is 40 tracks while 760K, 1.2MB and 1.44MB are all 80 tracks. The default is Enabled.

- Enabled: The BIOS will search the floppy disk drive to determine if it is 40 or 80

tracks.

- Disabled: The BIOS will not search for the type of floppy disk drive by track number.

NOTE: BIOS cannot 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.

Assign IRQ For VGA: This will controls whether or not the video card will be assigned an IRQ by the BIOS. The default is Enabled.

- Enabled: BIOS will assign an IRQ to VGA card.
- Disable: BIOS will not assign an IRQ to VGA card.

MPS Version Control For OS: This will control what version of Multi-Processor support (MPS) that your systems uses. The default is 1.4

- 1.1: Version 1.1
- 1.4: Version 1.4

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.

HDD S.M.A.R.T. capability: Enable SMART hard drive functions for compatible hardware. The default is Disabled.

- Enabled: S.M.A.R.T features are available.
- Disabled: S.M.A.R.T. features will not be available.

Report No FDD For WIN 95: This option allows the BIOS to indicate whether WIN95 will operate with a floppy disk drive or not. The default is NO.

- NO: Report FDD to WIN95.
- YES: Report no FDD to WIN95.

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

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

C8000 - CBFFF Shadow:

CC000 - CFFFF Shadow:

D0000 - D3FFF Shadow:

D4000 - D7FFF Shadow:

D8000 - DBFFF Shadow:

DC000 - DFFFF Shadow:

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

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

Chipset Features Setup

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

```

ROM PCI/ISA BIOS (2A69KPAE)
CHIPSET FEATURES SETUP
AMARD SOFTWARE, INC.

```

SDRAM RAS-to-CAS Delay : 2	Auto Detect DIMM/PCI Clk : Enabled
SDRAM RAS Precharge Time : 2	Spread Spectrum Modulated: Enabled
SDRAM CAS latency Time : Auto	Current CPU1 Temperature : 46°C/114°F
SDRAM Precharge Control : Enabled	Current CPU2 Temperature : 40°C/104°F
DRAM Data Integrity Mode : Non-ECC	Shutdown Temperature : 70°C/158°F
System BIOS Cacheable : Disabled	Current System Temp. : 27°C/ 80°F
Video BIOS Cacheable : Enabled	Current CPU2 Fan Speed : 0 RPM
Video RAM Cacheable : Disabled	Current CPU1 Fan Speed : 4017 RPM
8 Bit I/O Recovery Time : 3	Current Chassis Speed : 0 RPM
16 Bit I/O Recovery Time : 2	Vcore : 2.04 V Vtt : 1.52 V
Memory Hole At 15M-16M : Disabled	Vio : 3.34 V +5(V) : 5.08 V
Passive Release : Enabled	+12(V) : 12.22 V -12(V) :-11.71 V
Delayed Transaction : Disabled	-5(V) :- 5.09 V
AGP Aperture Size (MB) : 64	
ESC : Quit *+* : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values (Shift)F2 : Color F7 : Load Setup Defaults	

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 CALT timing parameter of the SDRAM in terms of clocks. The default is Auto.

- Auto: Best settings are read from SPD E²PROM.
- 2: Provides faster memory performance.
- 3: Provides better memory compatibility.

SDRAM Precharge Control: The default is Enabled.

- Enabled: Enables the option.
- Disabled: Disables 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 memory, 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 Enabled.

- 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 Disabled.

- 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 are added to an 8 bit ISA instruction originated by the PCI bus. The default is 3.

- 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 states that are added to an 16 bit ISA instruction originated by the PCI bus. The default is 2.

- 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 accessible by the AGP card.
- 8: 8MB of systems memory accessible by the AGP card.
- 16: 16MB of systems memory accessible by the AGP card.
- 32: 32MB of systems memory accessible by the AGP card.
- 64: 64MB of systems memory accessible by the AGP card.
- 128: 128MB of systems memory accessible by the AGP card.
- 256: 256MB of systems memory accessible by the AGP card.

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.

Current CPU1 Temperature: This is the current temperature of the 1st CPU.

Current CPU2 Temperature: This is the current temperature of the 2nd CPU.

Shutdown Temperature: This is the temperature that the computer will turn off the power to combat the effects of an overheating system. (Requires ACPI to be enabled in Power Management BIOS and ACPI compliant operating system.) The default is 60°C/140°F.

- Options available are 60°C/140°F to 75°C/167°F in increments of 5°C.

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

Current CPU 1 FAN Speed: The current CPU #1 fan speed in RPMs.

Current CPU 2 FAN Speed: The current CPU #2 fan speed in RPMs.

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

Vcore: Core voltage level of the CPU.

Vio: I/O voltage level of the CPU.

Vtt: GTL+ voltage level of the CPU.

±5V, ±12V: Voltage level of the power supply.

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.

```

ROM PCI/ISA BIOS (2A69KPAE)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

```

ACPI function	: Enabled	** Reload Global Timer Events **	
Power Management	: User Define	IRQ[3-7,9-15],NMI	: Disabled
PM Control by APM	: Yes	Primary IDE 0	: Disabled
Video Off Method	: V/H SYNC+Blank	Primary IDE 1	: Disabled
Video Off After	: Standby	Secondary IDE 0	: Disabled
MODEM Use IRQ	: 3	Secondary IDE 1	: Disabled
Doze Mode	: Disable	Floppy Disk	: Disabled
Standby Mode	: Disable	Serial Port	: Enabled
Suspend Mode	: Disable	Parallel Port	: Disabled
HDD Power Down	: Disable		
Throttle Duty Cycle	: 62.5%		
PCI/VGA Act-Monitor	: Disabled		
Soft-Off by PWR-BTTN	: Delay 4 Sec.		
CPUFAN Off In Suspend	: Disabled		
Power Loss Recovery	: Disabled		
PowerOn by Ring	: Enabled		
Resume by Alarm	: Disabled		
IRQ 8 Break Suspend	: Disabled		
		ESC : Quit	+<-> : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	(Shift)F2 : Color
		F7 : Load Setup Defaults	

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: Use this to enable or disable ACPI power management functions. The default is Enabled.

- Enabled: Enable ACPI power management functions.
- Disabled: Disable ACPI power management functions.

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 whether or not you want the Power Management to be controlled by 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 IRQ 3.

- N/A: No IRQ is used. 3: IRQ 3
- 4: IRQ 4 5: IRQ 5
- 7: IRQ 7 9: IRQ 9
- 10: IRQ 10 11: IRQ 11

The EP-GXB-M 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 how the power switch will function. The default is Instant Off.

- **Instant Off:** Turns off the power instantly when the power switch is pressed.
- **4 Second Delay:** Turns off after a 4 second delay. If the power switch is pressed and held for less than 4 seconds the system will go into Suspend Mode. Press 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 during suspend mode. The default is Enabled.

- **Enabled:** The system will turn off the CPU fans during suspend mode.
- **Disabled:** The system will not turn off the CPU fan during suspend mode.

Power Loss Recovery: If the power to the system is cut off the system will turn itself back on with no user intervention if this option is enabled. The default is Disabled.

- **Enabled:** The system will power back on after a power interruption.
- **Disabled:** The system will stay off after a power interruption.

Power On by Ring: This option is used to set the remote ring in and Wake on LAN (WOL) features. The default is Enabled.

- Enabled: The system can use remote ring-in & WOL to wake the system up.
- Disabled: The system cannot use remote ring in & WOL to wake system up.

Power On 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 will not turn on until you turn it on.

Date (of month) Alarm: This is how you set the date that the system will turn on. The default is 0.

- 0: System will turn on everyday on preset time.
- 1-31: Represents the day of the month that you need the system to turn on.

Time (hh:mm:ss) Alarm: This sets the time that you need the system to turn on. The default is 08:00:00.

****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 Disabled.
- Primary IDE 0: The default is Disabled.
- Primary IDE 1: The default is Disabled.
- Secondary IDE 0: The default is Disabled.
- Secondary IDE 1: The default is Disabled.
- Floppy Disk: The default is Disabled.
- Serial Port: The default is Enabled.
- Parallel Port: The default is Disabled.

PNP/PCI Configuration Setup

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

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

```

ROM PCI/ISA BIOS (2A69KPAE)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

```

PNP OS Installed : No	Used MEM base addr : N/A
Resources Controlled By : Manual	Assign IRQ For USB : Enabled
Reset Configuration Data : Disabled	
IRQ-3 assigned to : PCI/ISA PnP	
IRQ-4 assigned to : PCI/ISA PnP	
IRQ-5 assigned to : PCI/ISA PnP	
IRQ-7 assigned to : PCI/ISA PnP	
IRQ-9 assigned to : PCI/ISA PnP	
IRQ-10 assigned to : PCI/ISA PnP	
IRQ-11 assigned to : PCI/ISA PnP	
IRQ-12 assigned to : PCI/ISA PnP	
IRQ-14 assigned to : PCI/ISA PnP	
IRQ-15 assigned to : PCI/ISA PnP	
DMA-0 assigned to : PCI/ISA PnP	
DMA-1 assigned to : PCI/ISA PnP	
DMA-3 assigned to : PCI/ISA PnP	
DMA-5 assigned to : PCI/ISA PnP	
DMA-6 assigned to : PCI/ISA PnP	
DMA-7 assigned to : PCI/ISA PnP	
	ESC : Quit +←→ : Select Item
	F1 : Help PU/PD/+/- : Modify
	F5 : Old Values (Shift)F2 : Color
	F7 : Load Setup Defaults

Figure 6: PCI Configuration Setup

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

Resources Controlled By: Allows manual setting of resources or automatic by the PNP BIOS. 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.

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 the BIOS to assign an IRQ to the USB controller. If no USB devices are used in the system this can be set to "disabled" to free an IRQ for other uses. The default is Enabled

- Disabled: Release IRQ for other device.
- Enabled: Provides IRQ for USB device.

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.

Integrated Peripherals

Choose the “INTEGRATED PERIPHERALS” in the CMOS SETUP UTILITY to display the following screen. This menu allows the user to modify the various integrated controllers, ports, and devices onboard the mainboard.

```

ROM PCI/ISA BIOS (2A69KPAB)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

```

IDE HDD Block Mode : Enabled	Onboard Serial Port 2 : 2F8/IRQ3
IDE Primary Master PIO : Auto	UART Mode Select : Normal
IDE Primary Slave PIO : Auto	
IDE Secondary Master PIO : Auto	Onboard Parallel Port : 378/IRQ7
IDE Secondary Slave PIO : Auto	Parallel Port Mode : ECP+EPP
IDE Primary Master UDMA : Auto	ECP Mode Use DMA : 3
IDE Primary Slave UDMA : Auto	EPP Mode Select : EPP1.9
IDE Secondary Master UDMA : Auto	
IDE Secondary Slave UDMA : Auto	
Onboard Primary PCI IDE : Enabled	
Onboard Secondary PCI IDE : Enabled	
USB Keyboard Support : Disabled	
Init Display First : PCI Slot	
POWER ON Function : Hot KEY	
Hot Key Power ON : Ctrl-F1	ESC : Quit ++ : Select Item
KBC input clock : 12 MHz	F1 : Help PU/PD/+/- : Modify
Onboard FDC Controller : Enabled	F5 : Old Values (Shift)F2 : Color
Onboard Serial Port 1 : 3F8/IRQ4	F7 : Load Setup Defaults

Figure 8: 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 (45 cm.).

IDE HDD Block Mode: IDE Block Mode allows the controller to access blocks of sectors rather than a single sector at a time. The default is Enabled.

- Enabled: Enabled IDE HDD Block Mode. Provides higher HDD transfer rates.
- Disabled: Disable IDE HDD Block Mode.

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.
- Mode 0~4: Manually set the IDE Programmed interrupt 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.

Onboard Primary PCI IDE: This option turns on and off the onboard primary IDE. The default is enabled.

- Enabled: This activates the primary PCI IDE.
- Disabled: This disables the primary PCI IDE and frees up the resource.

Onboard 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 disables the secondary PCI IDE and frees up its resources.

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 Slots: PCI video card will be primary adapter.
- AGP: AGP video card will be primary adapter.

Power On Method: This option allows user to select one of the various methods to power on the system. (See section 3-5 for additional information about KBPO). The default is Hot Key.

- Hot Key: User can press a combination of the “Control Key” (Ctrl) and a “Function Key” to power on the system. (See “Hot Key Power On” option below).
- Anykey: Press any key to power on the system.
- Button only: This power on method is controlled by J2 (PW-ON). Use the power switch to power on the system.
- Password: User can power on the system by a 1 ~ 5 character password. If the password is forgot go back to this option in the BIOS and enter a new password.

Hot Key Power On: Use this option with the above “Power On Method” 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.

KBC input clock: This sets the keyboard clock value. The default is 12 MHz.

- Options: 6, 8, 12, 16 are the available choices.

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

- Enabled: Enable the onboard floppy drive interface controller.
- Disabled: Disable the onboard floppy drive interface controller.

Onboard Serial Port 1: This field allows the user to configure the 1st serial port. The default is Auto.

- AUTO: Enable onboard serial port 1 and address is auto adjusted
- COM1: Enable onboard serial port 1 and address is 3F8H/IRQ4.
- COM2: Enable onboard serial port 1 and address is 2F8H/IRQ3.
- COM3: Enable onboard serial port 1 and address is 3E8H/IRQ4.
- COM4: Enable onboard serial port 1 and address is 2E8H/IRQ3.
- Disabled: Disable onboard serial port 1.

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

- AUTO: Enable onboard serial port 2 and address is auto adjusted
- COM1: Enable onboard serial port 2 and address is 3F8H/IRQ4.
- COM2: Enable onboard serial port 2 and address is 2F8H/IRQ3.
- COM3: Enable onboard serial port 2 and address is 3E8H/IRQ4.
- COM4: Enable onboard serial port 2 and address is 2E8H/IRQ3.
- Disabled: Disable onboard serial port 2.

UART Mode Select: This field allows the user to configure what IR mode the 2nd serial port should use. The default is Normal.

- Options: Normal, IrDA, and ASKIR.

RxD, RxD 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 Transmitting delay: The 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 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.

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

- EPP1.9: Sets EPP 1.9
- EPP1.7: Sets EPP 1.7

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 if the option was not used before, then the screen will display the following message prompting for a new password: (max 8 characters)

Enter Password:

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

2. To verify the password the BIOS will ask you to confirm the entry. A prompt similar to the one below will be shown. Press the [Enter] key when finished.

Confirm Password:

3. After setting the password(s) “SAVE & EXIT SETUP” to save.

NOTE: System security depends upon what “Security Option” was selected in the BIOS FEATURE SETUP menu. If both SUPERVISOR and USER passwords are set and “System” is set in the “Security Option” then the BIOS will prompt for a pass-

word each time the system is booted. Either password may be entered but only the SUPERVISOR has the ability to change the majority of CMOS options. USER can only boot and change the USER password in CMOS.

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. You can also set HARD DISK TYPE to Auto in the STANDARD CMOS SETUP so the BIOS will automatically detect the drives at boot.

NOTE: 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)
<u>x no. per sector</u>	<u>(512)</u>
528 Megabytes	

If user set his HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that!

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)
<u>x bytes per sector</u>	<u>(512)</u>
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.

<u>CYLS</u>	<u>HEADS</u>	<u>SECTOR</u>	<u>MODE</u>
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)
<u>x bytes per sector</u>	<u>(512)</u>
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 a 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.

Save & Exit Setup

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

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.

Appendix A

Technical Information

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 High DOS memory
[C8000-DFFFF]	96K	Available for High 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)

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.

Timer & DMA Channel 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.
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

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.

7	PARALLEL port 1.
8	RTC clock.
9	ACPI.
10	Available.
11	Available.
12	PS/2 Mouse.
13	MATH coprocessor.
14	Onboard HARD DISK (IDE1) channel.
15	Onboard HARD DISK (IDE1) channel.

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.

Appendix B

BIOS Post Codes

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. <ul style="list-style-type: none"> - 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-FFFFFF 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 CUID 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. (40:00 - 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	<ol style="list-style-type: none"> 1. Try to turn on Level 2 cache. <p>Note: If L2 cache is already turned on in POST 3D, this part will be skipped.</p> <ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Setup daylight saving according to Setup value. 2. Program the NUM Lock, typematic rate & typematic speed according to Setup setting.
63	<ol style="list-style-type: none"> 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.

Unexpected Errors

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

Appendix D

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 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

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 **AWDFLASH.EXE** file from our web site. This can be found under the bios upgrade section of the technical support area at <http://www.epox.com>. Next, you need to download the ***.BIN** file that is appropriate to your motherboard. Note: Some browsers may try and default this file to an ***.EXE** extension. Make sure that it is saved as a ***.BIN** file, as using any other file may cause your flash operation to fail.

Detailed BIOS Flash instructions

1. Prepare a clean bootable floppy disk. Using the command prompt (DOS prompt) insert a blank floppy disk in your A: drive and type: **FORMAT A: /S**
2. Copy the flash utility (AWDFLASH.EXE) to the boot disk created in step 1.
3. Copy the appropriate BIOS BIN file to the boot disk created in step 1.
4. Restart your machine keeping the bootable floppy disk in the A: drive. At the

command prompt (DOS prompt) type the following:

AWDFLASH XXXXXXXXX.BIN

Replace XXXXXXXXX.BIN with the actual BIOS BIN file name copied during step 3.

5. The flash utility will then execute and load the BIOS BIN file. At this point the BIOS utility will display a prompt and ask you for a file name to save. This is the name of a file the flash utility will create, to save the current BIOS which is in your system (backup).

File Name to Save: (Supply a file name the utility will create to backup the original BIOS). Example OLDBIOS.BIN

File Name to Program: (New BIOS you are about to flash)

6. After the flash utility saves the original BIOS you will be prompted to continue the operation. If you wish to continue and now flash (program) the new BIOS code into your system answer “**Y**” (yes) to the question. You will now see a status bar as the BIOS code is written. When the program finishes you will be prompted to restart the system.
7. Restart the system and enter the CMOS setup by pressing the **DELETE** key during the memory test. Select **LOAD SETUP DEFAULTS** from the bios setup menu. Select **SAVE AND EXIT**. Answer “**Y**” (yes) when it asks if you are sure.

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 is 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 users setting up the system for the first time may use 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 xx.

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 reseal 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.

SB-Link connector

Question: What is SB-LINK?

Answer: Selected EPoX models now incorporate SB-Link. This new technology which is found in newer core logic chip sets provides the DMA and IRQ signals present in ISA Bus today, but not available on the PCI Bus. SB-Link serves as a bridge between the motherboard and PCI sound card to deliver full backwards compatibility with Sound Blaster 16 for real-mode DOS games and software.

Please consult sound card product documentation for SB-LINK compatibility.

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.

