MB500

AMD Geode LX
Mini ITX Motherboard

USER'S MANUAL

Version 1.0

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Introduction

MB500 Product Features

The MB500 Mini ITX motherboard incorporates the AMD Geode LX processor with speeds of 433MHz (LX700) or 500MHz (LX800). As of this writing, it comes with two board versions, namely:

MB500 - AMD Geode LX700, 433MHz, Mini ITX motherboard w/ VGA, 10/100 LAN, CF
MB500F - AMD Geode LX800, 500MHz, Mini ITX motherboard w/ VGA, dual 10/100 LAN, CF

The AMD Geode™ LX 800@0.9W processor delivers the most performance per watt in the industry today, providing x86 power and versatility to applications for entertainment, business, education, and embedded markets. Its innovative architecture and high level of integration enables small form-factor designs. The AMD Geode LX700@0.8W processor delivers great performance at lower power for value, embedded applications, while delivering full x86 functionality.

MB500 FEATURES:

- Supports AMD Geode LX, 433MHz (LX700) / 500MHz (LX800)
- DDR DIMM x 1, Max. 1GB memory
- One or two Realtek RTL8100C 10/100 Ethernet
- Integrated LX800/LX700 2D VGA controller
- Supports VGA CRT and TFT/LVDS LCD display
- 4x USB 2.0, 4x COM, CompactFlash socket
- Watchdog timer, Digital I/O, 1x PCI, 1x Mini PCI

Checklist

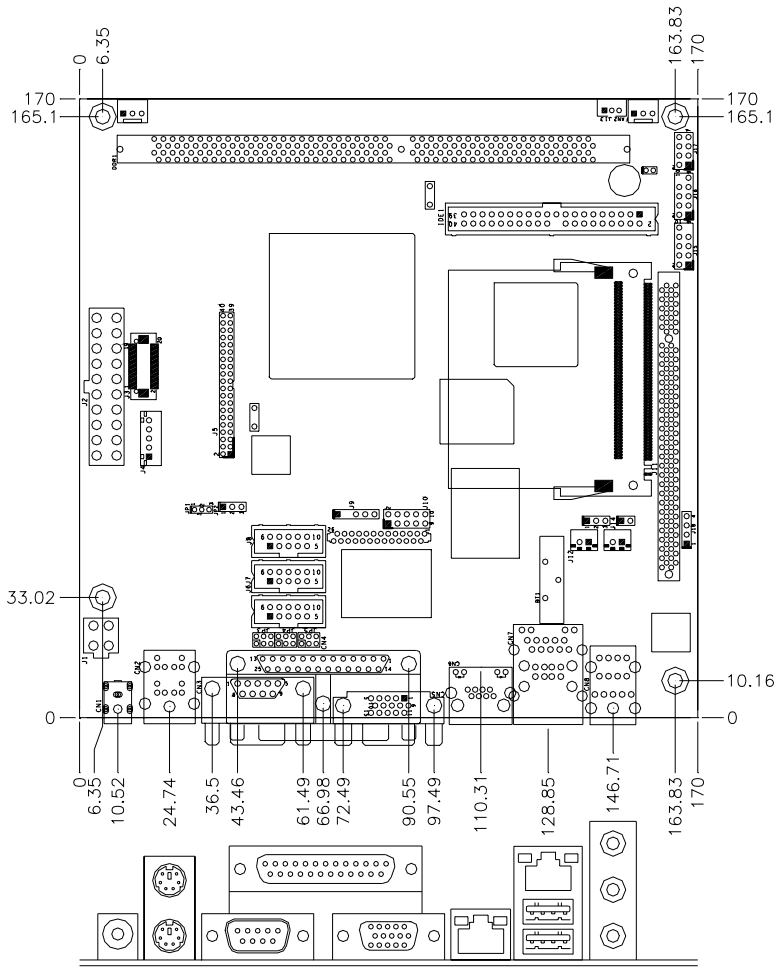
Your MB500 package should include the items listed below.

- The MB500 Mini ITX board
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- 1 x I/O Shield
- Accompanying cables (IDE, COM, LPT)

Specifications

CPU	AMD Geode LX LX800 @ 500MHz (MB500F) LX700 @ 433MHz (MB500)
Chipset	AMD CS3356 chipset
BIOS	Award BIOS, 4Mbit
System Memory	One DDR socket supports up to 1GB DDR SDRAM 266/333/400 DDR SDRAM
Integrated VGA	AMD LX800/LX700 built-in 2D graphics controller Supports CRT and TFT LCD display Supports 24-bit single channel LVDS 64MB shared memory
LAN	One or two Realtek RTL8100C 10/100 Ethernet controller RJ-45 on board
Audio	Line in, Line out, Mic connectors on board
Multi I/O	AMD CS5536 + Winbond W83627HF + Fintek F81216D Supports 1x IDE, 1x FDD, 1x KB, 1x Mouse, 4x RS232, 1x LPT
IDE Interface	One enhanced IDE channel supports 2 IDE devices; supports UDMA33/66/100
FDD Interface	Onboard slim FDD connector
Serial Ports	Four Serial ports (COM2 configurable as RS422/485)
USB (2.0)	Supports 4 USB ports (2 ports + 2 ports via pin header)
IrDA	Pin header
Keyboard and Mouse	PS/2 type connector
Watchdog Timer	Generates system reset; 256 levels
Hardware Monitoring	Built in W83627HF; monitors system/CPU temperature and voltage
Digital I/O	4 in / 4 out
Expansion Slot	1 PCI, 1 MiniPCI
CompactFlash Socket	Type II
Edge Connectors	PS/2 KB & Mouse, 4x USB, COM1, LPT, RJ45, VGA, LAN1 RJ45, LAN2 RJ-45 (MB500F only), SPDIF
Onboard Connectors/Headers	CF socket, COM2/3/4, IDE, FDD, USB, IrDA, 44-pin TFT interface
Form Factor	Mini-ITX Motherboard
Dimensions	170mm x 170mm

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on the MB500 in order to set up a workable system. The topics covered are:

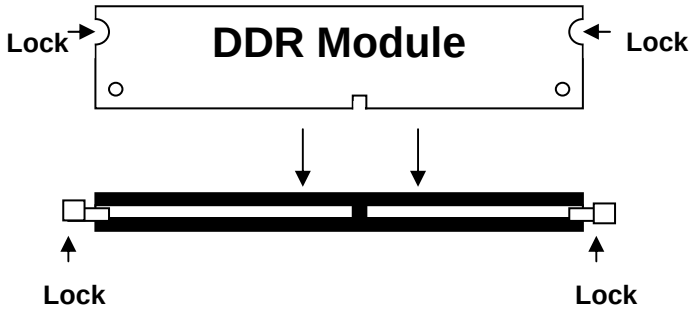
Installing the Memory

The MB500 embedded board supports one DDR memory sockets for a maximum total memory of 1GB in DDR memory type. The memory module capacities supported are 128MB, 256MB, 512MB and 1GB.

Installing and Removing Memory Modules

To install the DDR modules, locate the memory slot on the embedded board and perform the following steps:

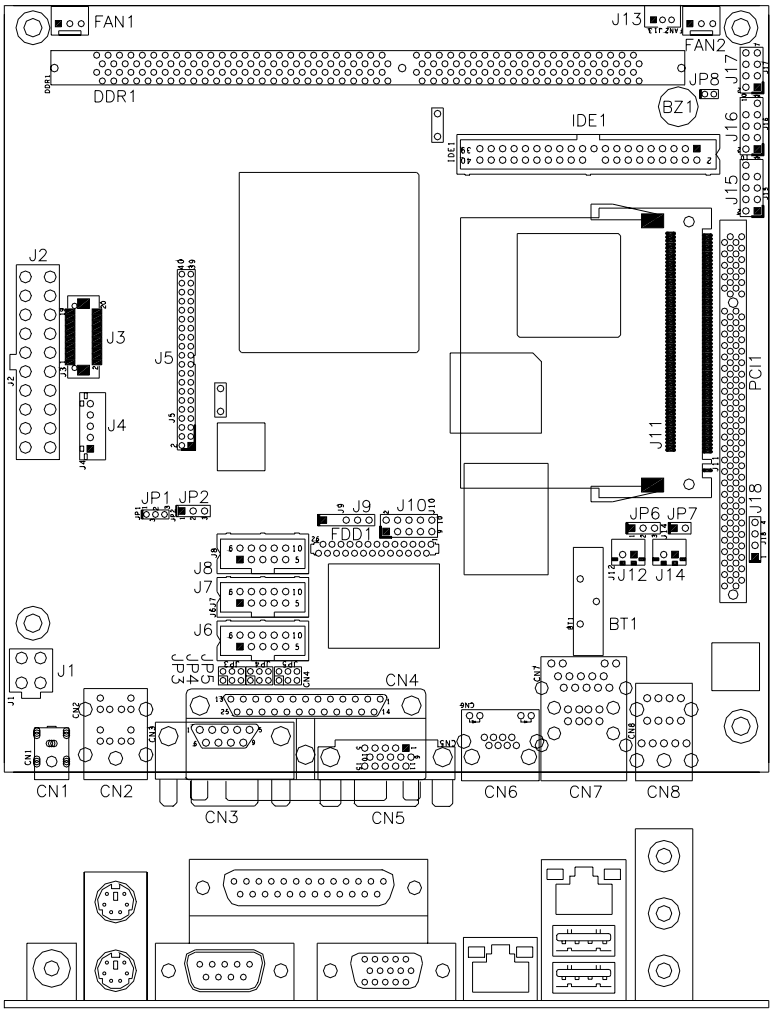
1. Hold the DDR module so that the key of the DDR module aligns with those on the memory slot.
2. Gently push the DDR module in an upright position until the clips of the slot close to hold the DDR module in place when the DDR module touches the bottom of the slot.
3. To remove the DDR module, press the clips with both hands.



Setting the Jumpers

Jumpers are used on MB500 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MB500 and their respective functions.

Jumper Locations on MB500



JP2: Voltage Setting for LVDS

Jumper	Setting	Function
	Pin 1-2 Short/Closed	5V
	Pin 2-3 Short/Closed	3.3V

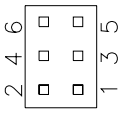
JP6: Clear CMOS Contents

Note: Disconnect the ATX-power connector from the board before clearing CMOS.

Jumper	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear CMOS

JP3, JP4, JP5: RS232/422/485 (COM2) Selection

COM1 is fixed for RS-232 use only.
COM2 is selectable for RS232, RS-422 and RS-485.
The following table describes the jumper settings for COM2 selection.



COM2 Function	RS-232	RS-422	RS-485
Jumper Setting (pin closed)	JP3: 3-5 & 4-6 JP4: 3-5 & 4-6 JP5: 1-2	JP3: 1-3 & 2-4 JP4: 1-3 & 2-4 JP5: 3-4	JP3: 1-3 & 2-4 JP4: 1-3 & 2-4 JP5: 5-6

JP7: Case Open Setting

Jumper	Setting	Function
	Short/Closed	Case closed
	Open	Case open

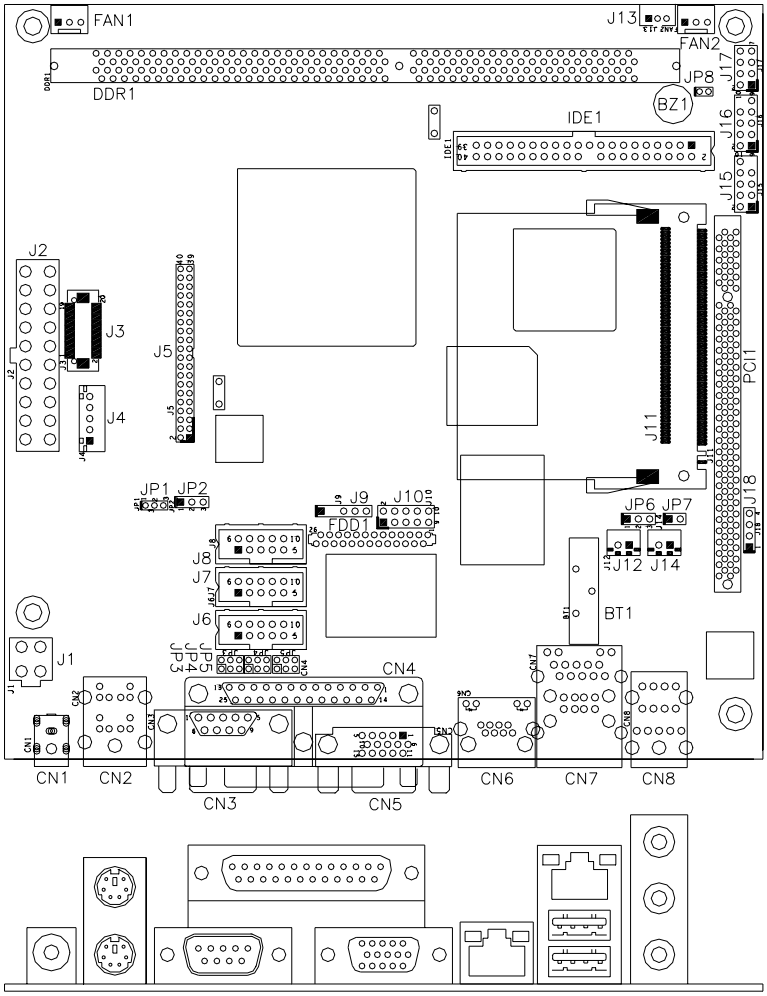
JP8: CompactFlash Master/Slave Selection

Jumper	Setting	Function
	Short/Closed	Slave
	Open	Master

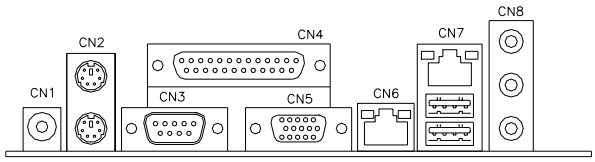
Connectors on MB500

The connectors on MB500 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on MB500 and their respective functions.

Connector Locations on MB500

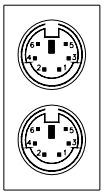


Connectors on MB500



CN1: DC Jack (DC in, 12V only)

CN2: PS/2 Keyboard and Mouse Connectors



PS/2 Mouse

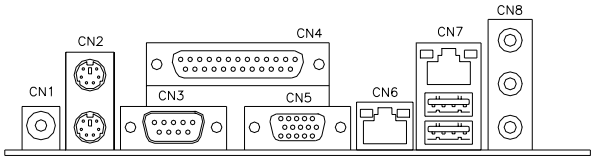
PS/2 Keyboard

Signal Name	Keyboard	Mouse	Signal Name
Keyboard data	1	1	Mouse data
N.C.	2	2	N.C.
GND	3	3	GND
5V	4	4	5V
Keyboard clock	5	5	Mouse clock
N.C.	6	6	N.C.

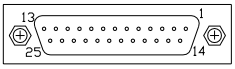
CN3: COM1 Serial Port

CN3 (COM1) is a DB-9 connector serial port.

Signal Name	Pin #	Pin #	Signal Name
DCD, Data carrier detect	1	6	DSR, Data set ready
RXD, Receive data	2	7	RTS, Request to send
TXD, Transmit data	3	8	CTS, Clear to send
DTR, Data terminal ready	4	9	RI, Ring indicator
GND, ground	5	10	Not Used

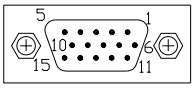


CN4: Parallel Port Connector

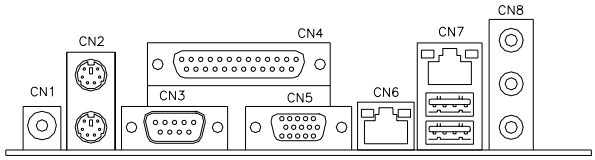


Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground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

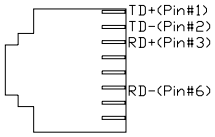
CN5: VGA CRT connector



Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	N.C.
HSYNC	13	14	VSYNC
NC	15		



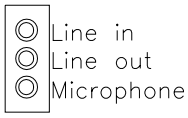
CN6: 10/100 RJ45 Connector (for MB500F only)



CN7: 10/100 RJ45 and USB Connectors

CN7 is a stacked connector with RJ45 on top and 2 USB ports at the bottom.

CN8: Line Out, Line In, Mic Connector

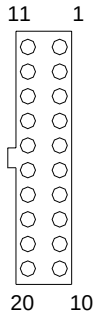


CN9: Compact Flash Socket

PCI1: PCI Slot

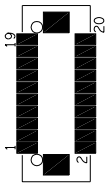
DDR1: 184-pin DDR DIMM Socket

J2: ATX Power Supply Connector



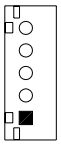
Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

J3: LVDS Connector



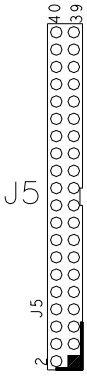
Signal Name	Pin #	Pin #	Signal Name
TX0-	2	1	TX0+
Ground	4	3	Ground
TX1-	6	5	TX1+
5V/3.3V	8	7	Ground
TX3-	10	9	TX3+
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+
5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

J4: LCD Inverter Connector



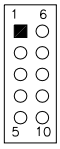
Pin #	Signal Name
1	+12V
2	Ground
3	Backlight Enable
4	NC
5	Vcc

J5: LCD (TTL) Connector



Signal Name	Pin #	Pin #	Signal Name
VDD	1	2	VDD
VDD	3	4	SHFCLK
VSYNC	5	6	HSYNC
Ground	7	8	Ground
B0	9	10	B1
B2	11	12	B3
B4	13	14	B5
B6	15	16	B7
Ground	17	18	Ground
G0	19	20	G1
G2	21	22	G3
G4	23	24	G5
G6	25	26	G7
Ground	27	28	Ground
R0	29	30	R1
R2	31	32	R3
R4	33	34	R5
R6	35	36	R7
LDEMOD	37	38	Ground
FP VDD EN	39	40	BKL EN

J6, J7, J8: COM2, COM3, COM4 Serial Ports

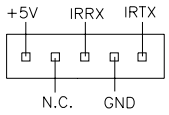


Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	Ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	No Connect.

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

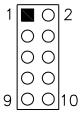
Pin #	Signal Name		
	RS-232	R2-422	RS-485
1	DCD	TX-	DATA-
2	RX	TX+	DATA+
3	TX	RX+	NC
4	DTR	RX-	NC
5	Ground	Ground	Ground
6	DSR	RTS-	NC
7	RTS	RTS+	NC
8	CTS	CTS+	NC
9	RI	CTS-	NC
10	NC	NC	NC

J9: IrDA Connector



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

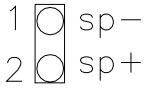
J10: Digital 4-in 4-out I/O Connector



Signal Name	Pin	Pin	Signal Name
Ground	1	2	Vcc
Out3	3	4	Out1
Out2	5	6	Out0
IN3	7	8	IN1
IN2	9	10	IN0

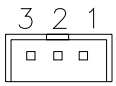
J11: Mini PCI Socket

J12: For Right Speaker



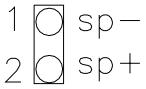
J13: Wake On LAN Connector

J13 is a 3-pin header for the Wake On LAN function. Wake On LAN will function properly only with an ATX power supply with 5VSB that has 200mA.

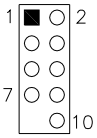


Pin #	Signal Name
1	+5VSB
2	Ground
3	Wakeup

J14: For Left Speaker

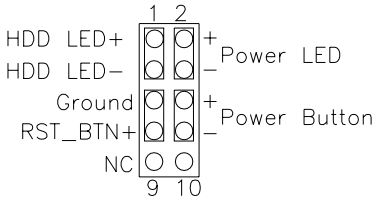


J15: USB Connector (USB2/USB3)

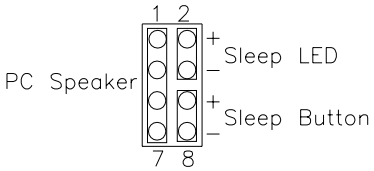


Signal Name	Pin	Pin	Signal Name
Vcc	1	2	Vcc
D2-	3	4	D3-
D2+	5	6	D3+
Ground	7	8	Ground
	9	10	NC

J16: Front I/O Connector



J17: Function Connector



J18: CD-In Audio Connector

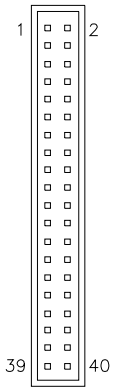
Pin #	Signal Name
1	CD Audio R
2	Ground
3	Ground
4	CD Audio L

FDD1: Floppy Drive Connector

FDD1is a slim 26-pin connector and will support up to 2.88MB FDD.

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

IDE1: Primary IDE Connector

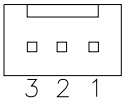


IDE2: 1st IDE

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

FAN1, FAN2: Fan Power Connectors

This is a 3-pin header for fans. The fan must be a 12V (500mA) fan.



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

Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sort of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:
This code and information is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability and/or fitness for a particular purpose.

```
;[]============================================
; Name      : Enable_And_Set_Watchdog
; IN   : AL - 1sec ~ 255sec
; OUT       : None
;[]============================================
Enable_And_Set_Watchdog     Proc  Near
            push ax             ;save time interval
            call   Unlock_Chip

            mov  cl, 2Bh
            call   Read_Reg
            and   al, NOT 10h
            call   Write_Reg    ;set GP24 as WDTO

            mov  cl, 07h
            mov  al, 08h
            call   Write_Reg    ;switch to LD8
            mov  cl, 0F5h
            call   Read_Reg
            and   al, NOT 08h
            call   Write_Reg    ;set count mode as second

            pop   ax
            mov  cl, 0F6h
            call   Write_Reg    ;set watchdog timer

            mov  al, 01h
            mov  cl, 30h
            call   Write_Reg    ;watchdog enabled
```

```
                call   Lock_Chip
                ret
Enable_And_Set_Watchdog         Endp

;[]=============================================
; Name      : Disable_Watchdog
; IN   : None
; OUT       : None
;[]=============================================
Disable_Watchdog     Proc  Near
                call   Unlock_Chip

                mov  cl, 07h
                mov  al, 08h
                call   Write_Reg        ;switch to LD8

                xor   al, al
                mov  cl, 0F6h
                call   Write_Reg        ;clear watchdog timer

                xor   al, al
                mov  cl, 30h
                call   Write_Reg        ;watchdog disabled

                call   Lock_Chip
                ret
Disable_Watchdog     Endp
;[]=============================================
; Name      : Unlock_Chip
; IN   : None
; OUT       : None
;[]=============================================
Unlock_Chip     Proc  Near
                mov  dx, 4Eh
                mov  al, 87h
                out   dx, al
                out   dx, al
                ret
Unlock_Chip     Endp
;[]=============================================
; Name      : Lock_Chip
; IN   : None
; OUT       : None
```

```
;[]=============================================
Unlock_Chip     Proc  Near
                mov  dx, 4Eh
                mov  al, 0Aah

                out   dx, al
                ret
Unlock_Chip     Endp
;[]=============================================
; Name      : Write_Reg
; IN   : CL - register index
;         AL - Value to write
; OUT       : None
;[]=============================================
Write_Reg Proc  Near
                push ax
                mov  dx, 4Eh
                mov  al,cl
                out   dx,al
                pop   ax
                inc   dx
                out   dx,al
                ret
Write_Reg Endp
;[]=============================================
; Name      : Read_Reg
; IN   : CL - register index
; OUT       : AL - Value to read
;[]=============================================
Read_Reg Proc  Near
                mov  al, cl
                mov  dx, 4Eh
                out   dx, al
                inc   dx
                in     al, dx
                ret
Read_Reg Endp
;[]=============================================
```

BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the motherboard. The topics covered in this chapter are as follows:

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports various processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press  <DEL>  to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Phoenix - AwardBIOS CMOS Setup Utility

Standard CMOS Features Advanced BIOS Features Advanced Chipset Features Integrated Peripherals Power Management Setup PnP/PCI Configurations PC Health Status	Load Fail-Safe Defaults Load Optimized Defaults Set Supervisor Set User Password Save & Exit Setup Exit Without Saving
ESC : Quit F10 : Save & Exit Setup	↑ ↓ → ← : Select Item
Time, Date, Hard Disk Type…	

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section, which displays information on the currently highlighted item in the list.

***Note**: If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

***Warning:** It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Fri, Jun 30, 2006	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level >
IDE Primary Master	None	Change the day, month,
IDE Primary Slave	None	Year and century
Drive A	1.44M, 3.5 in.	
Drive B	None	
Video	EGA/VGA	
Halt On	All, But keyboard	
Base Memory	640K	
Extended Memory	514816K	
Total Memory	515584K	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day : **Sun to Sat**
Month : **1 to 12**
Date : **1 to 31**
Year : **1999 to 2099**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour : 00 to 23**
Minute : 00 to 59
Second : 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Primary HDDs / IDE Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select 'Manual' to define the drive information manually. You will be asked to enter the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDING ZONE :	Landing zone
SECTOR :	Number of sectors

The Access Mode selections are as follows:

CHS	(HD < 528MB)
LBA	(HD > 528MB and supports Logical Block Addressing)
Large	(for MS-DOS only)
Auto	

Remarks: The main board supports two serial ATA ports and are represented in this setting as IDE Channel 2 / 3 Master.

Drive A / Drive B

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

Virus Warning	Disabled	ITEM HELP
CPU Internal Cache	Enabled	Menu Level >
First Boot Device	Floppy	
Second Boot Device	HDD-0	
Third Boot Device	CDROM	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Enabled	
Boot Up NumLock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (Chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
OS Select For DRAM>64MB	Non-OS2	
Small Logo (EPA) Show	Disabled	

Virus Warning

If this option is enabled, an alarm message will be displayed when trying to write on the boot sector or on the partition table on the disk, which is typical of the virus.

CPU Internal Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU.

First/Second/Third Boot Device

These fields determine the drive that the system searches first for an operating system. The options available include *Floppy*, *LS120*, *HDD-0*, *SCSI*, *CDROM*, *HDD-1*, *HDD-2*, *HDD-3*, *ZIP100*, *USB-FDD*, *LAN*, *USB-CDROM*, *USB-HDD* and *Disable*.

Boot Other Device

These fields allow the system to search for an OS from other devices other than the ones selected in the First/Second/Third Boot Device.

Swap Floppy Drive
This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to ***Disabled.***

Boot Up Floppy Seek
This feature controls whether the BIOS checks for a floppy drive while booting up. If it cannot detect one (either due to improper configuration or its absence), it will flash an error message.

Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system.

Gate A20 Option
This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Typematic Rate Setting
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Rate (Chars/Sec)
When the typematic rate is enabled, the system registers repeated keystrokes speeds. Settings are from 6 to 30 characters per second.

Typematic Delay (Msec)
When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option
This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System*, the system prompts for the User Password every time you boot up. When you select *Setup*, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

OS Select for DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

Small Logo (EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

CPU Frequency	Auto	ITEM HELP
Memory Frequency	133 MHz	Menu Level >
CAS Latency	Auto	
Video Memory Size	8M	
Output Display	Panel & CRT	
Flat Panel Configuration	Press Enter	
Onboard Audio	Enabled	
Overcurrent Reporting	Disabled	
Port 4 Assignment	Host	

CPU Frequency

This options for this field are ***Auto***, ***433MHz*** and ***500MHz***.

Memory Frequency

This default setting for this field is ***133MHz***.

CAS Latency Time

You can configure CAS latency time in HCLKs as ***1.5, 2, 2.5, 3*** or ***3.5***. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

Video Memory Size

The default setting for this field is ***8M***. The options are from ***8M*** to ***254M***.

Flat Panel Configuration

This options for this field are ***Flat Panel***, ***CRT*** and ***Panel & CRT***. For flat panel, configuration settings include Flat Panel Type, Resolution (320x240 up to 1600x1200), Data Bus Type, Refresh Rate (60~100Hz), HSYNC Polarity, VSYNC Polarity, SHFCLK Active Period and LP Active Period.

Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals. The first screen shows three main items for user to select. Once an item selected, a submenu appears. Details follow.

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

		ITEM HELP
OnChip IDE Channel 1	Enabled	Menu Level >
Master Drive PIO Mode	Auto	
Slave Drive PIO Mode	Auto	
IDE Primary Master UDMA	Disabled	
IDE Primary Slave UDMA	Disabled	
IDE DMA transfer access	Enabled	
IDE HDD Block Mode	Enabled	
Onboard LAN Boot ROM	Disabled	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
Onboard Parallel Port	387/IRQ7	
Parallel Port Mode	SPP	

OnChip IDE Channel 1

The integrated peripheral controller contains an IDE interface with support for IDE channels. Select *Enabled* to activate the channel.

IDE Primary/Secondary Master/Slave PIO

These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA

These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

IDE HDD Block Mode

This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

Onboard LAN Boot ROM

This feature allows users to enable or disable the onboard LAN boot ROM. The default setting is *Disabled*

Onboard FDC Controller

Select *Enabled* if your system has a floppy disk controller (FDC) installed on the motherboard and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port

These fields allow you to select the onboard serial and parallel ports and their addresses. The default values for these ports are:

Serial Port 1	3F8/IRQ4
Serial Port 2	2F8/IRQ3
Parallel Port	378H/IRQ7

UART Mode Select

This field determines the UART 2 mode in your computer. The default value is ***Normal***. Other options include *IrDA* and *ASKIR*.

Parallel Port Mode

This field allows you to determine parallel port mode function.

SPP	Standard Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port

Power Management Setup

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

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

Power Management	Disabled	ITEM HELP
** PM Timers **		Menu Level >
Standby Mode	Disabled	
Suspend Mode	Disabled	
Power-On by Alarm	Disabled	
Time (hh:mm:ss) Alarm	0	
IRQ Wakeup Events	Press Enter	

Power Management

The options for the power management setting are ***Disabled***, ***Legacy*** and ***APM***.

PM Timers and IRQ Wakeup Events

The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events that can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

PNP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

PNP OS Installed	No	ITEM HELP
Init Display First	PCI Slot	Menu Level
Reset Configuration Data	Disabled	Default is Disabled. Select Enabled to reset Extended System Configuration Data ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot.
Resources Controlled By	Auto (ESCD)	
IRQ Resources	Press Enter	
Memory Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	

PNP OS Installed

If your OS supports Plug & Play (PnP), select **Yes** so that it can take over the management of device resources. If you are using a non-PnP-aware OS or not all of the operating systems you are using support PnP, select **No** to let the BIOS handle it instead.

Init Display First

This field refers to the primary video or primary video adapter. The default setting is ***PCI Slot***.

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled.***

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices automatically with the use of a use a PnP OS system such as Windows 95.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

		ITEM HELP
CPU Warning Temperature	Disabled	Menu Level >
Current System Temp.	45°C/113°F	
Current CPU Temp	30°C/86°F	
Vcore(V)	1.18 V	
Vmem	2.57V	
Vcc3(V)	3.39V	
+5V	5.13 V	
+12V	11.12 V	
-12V	-12.19 V	
VBAT	3.21 V	

CPU Warning Temperature

This field allows the user to set the temperature so that when the temperature is reached, the system sounds a warning. This function can help prevent damage to the system that is caused by overheating.

Temperatures/Voltages

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Set Supervisor/User Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type “Y”, you will quit the setup utility and save all changes into the CMOS memory. If you type “N”, you will return to Setup utility.

Exit Without Saving

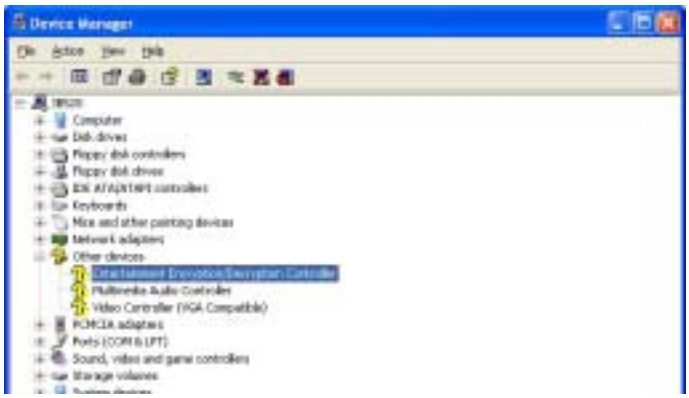
Select this option to exit the Setup utility without saving the changes you have made in this session. Typing “Y” will quit the Setup utility without saving the modifications. Typing “N” will return you to Setup utility.

Drivers Installation

This section describes the installation procedures for software and drivers under the Windows 2000 and Windows XP. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

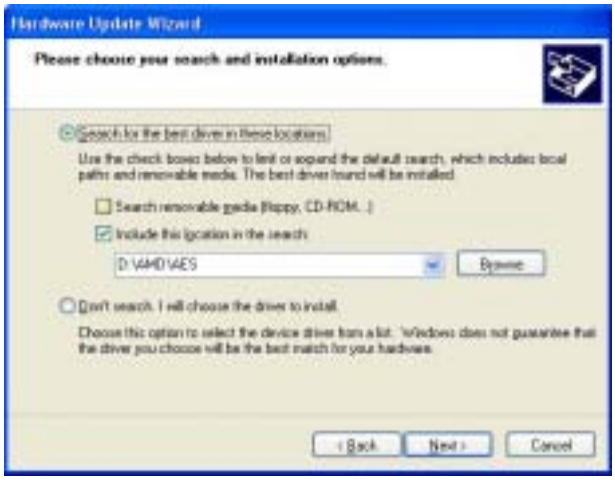
Entertainment Encryption/Decryption Controller Driver

1. In the Windows operating system, go to the Device Manager.
2. As shown below, click the **Entertainment Encryption/Decryption Controller** under **Other devices**.



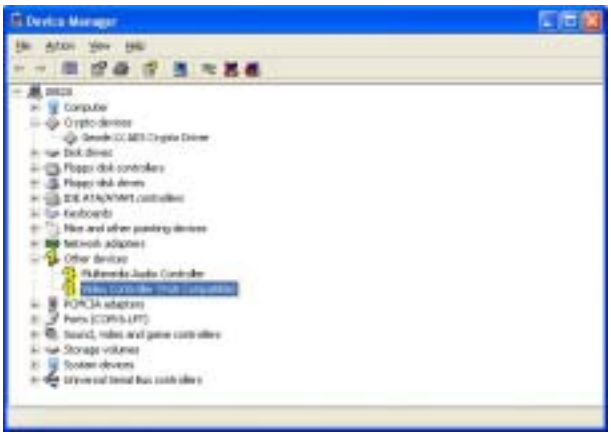
3. In the following window, click the **Driver** tab and click **OK** to continue.

4. In the Hardware Update Wizard, select **No, not this time** and click **Next** to continue. Then select **Install from a list of specific location (Advanced)**. Click **Browse** to find the driver's path in the CD provided - **\AMD\AES**. Then, click **Next** to start the drivers installtion. Then click **Finish** after the wizard has finished installing the software for ***Geode LX AES Crypto Driver***.



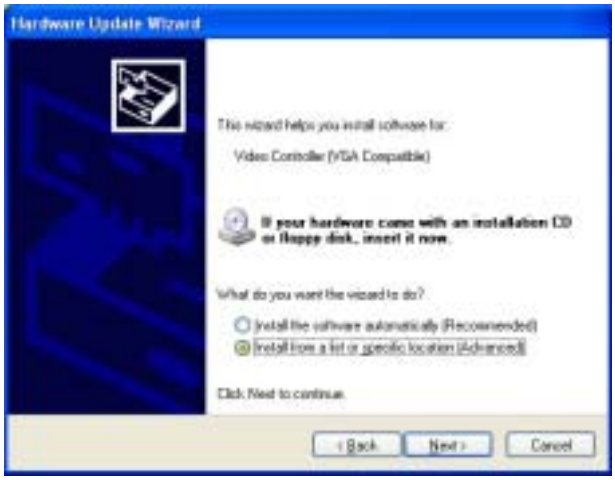
VGA Drivers Installation

1. In the Windows operating system, go to the Device Manager.
2. As shown below, click the **Video Controller (VGA Compatible** under **Other devices**.

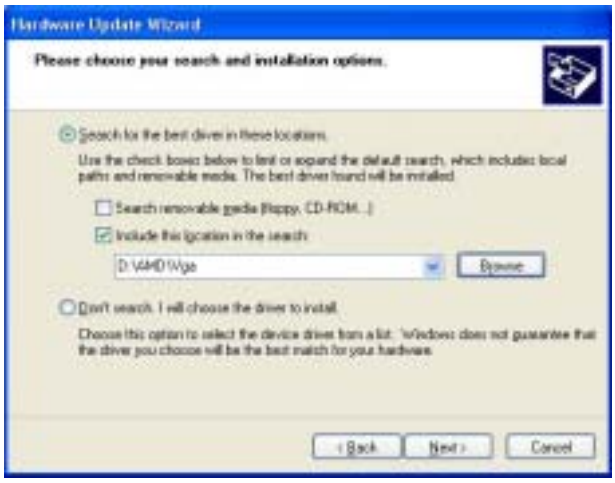


3. In the following window, click the **Driver** tab and click **OK** to continue.

4. In the Hardware Update Wizard, select **No, not this time** and click **Next** to continue. Then select **Install from a list of specific location (Advanced)**.

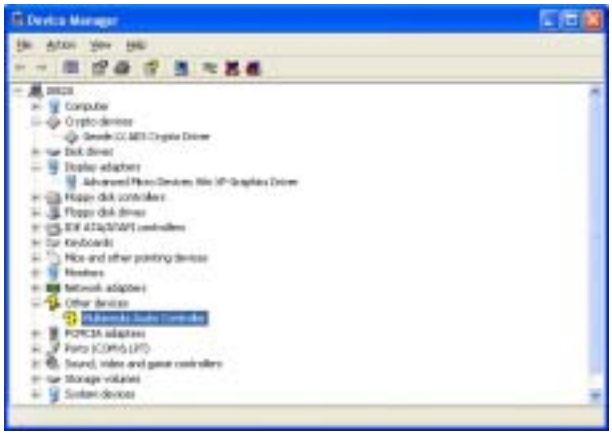


5. In the next screen, click **Search for the best driver in these** locations. Check **Include this location in the** search. Click **Browse** to find the driver's path in the CD provided or enter the path directly - **\AMD\Vga**. Then, click **Next** to start the drivers installtion. Then click **Finish** after the wizard has finished installing the software for ***Advanced Micro Devices Win XP Graphics Driver***.



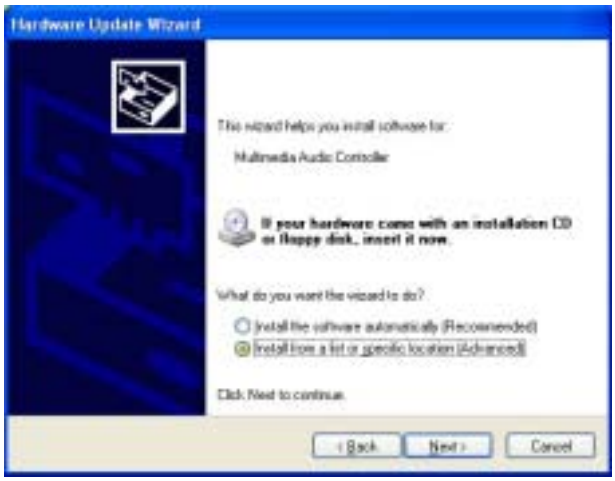
Audio Driver Installation

1. In the Windows operating system, go to the Device Manager.
2. As shown below, click the **Multimedia Audio Controller** under **Other devices**.

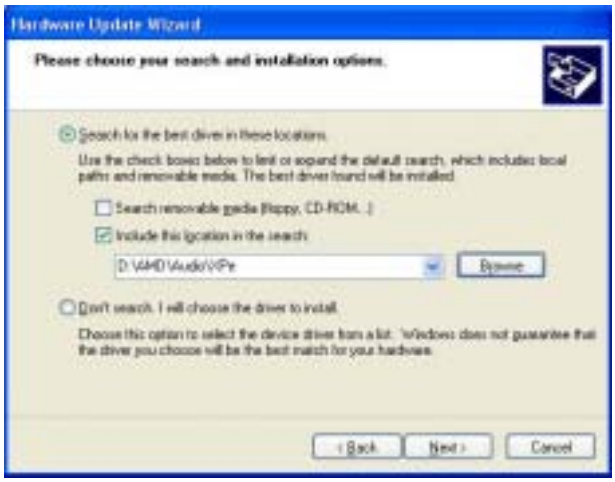


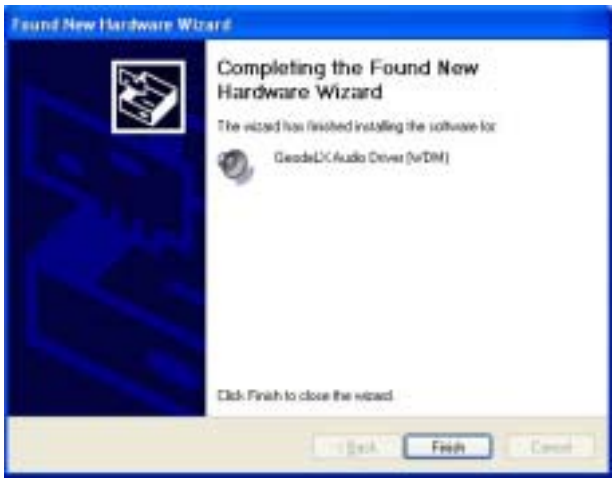
3. In the following window, click the **Driver** tab and click **OK** to continue.

4. In the Hardware Update Wizard, select **No, not this time** and click **Next** to continue. Then select **Install from a list of specific location (Advanced)**.



5. In the next screen, click **Search for the best driver in these** locations. Check **Include this location in the** search. Click **Browse** to find the driver's path in the CD provided or enter the path directly - **\AMD\Audio\XPe**. Then, click **Next** to start the drivers installtion. Then click **Finish** after the wizard has finished installing the software for ***GeodeLX Audio Driver (WDM)***.





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Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses that also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE