ET500

AMD Geode LX
ETX CPU Module

USER'S MANUAL

Version 1.0

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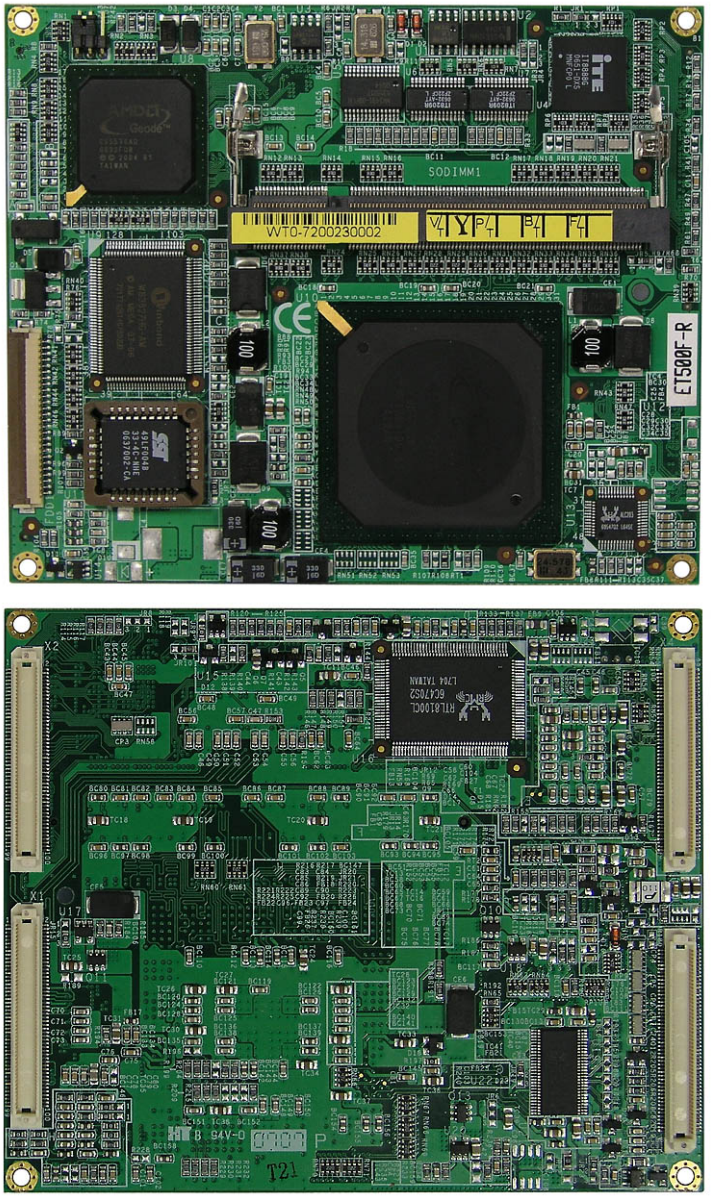


The ET500 ETX CPU Module

Introduction

Product Description

The ET500 ETX solution features the AMD Geode LX800 running 500MHz and AMD Geode LX700 at 433MHz clock speed. The AMD Geode LX 800@0.9W processor operates at a maximum power of 3.6W (TDP), while the AMD Geode LX 700@0.8W consumes a maximum power of 3.1W. The ET500 is an ultra lower-power, fanless ETX CPU module designed for applications in the field of multimedia, POS, automation and digital signage. Measuring 114mm x 95mm, this plug-on CPU module offers time-to-market advantages by allowing it to be interchangeable with existing baseboards. IBASE also offers design services for ODM baseboards to help customers considerably reduce the time-to-market as well as design risk.

The ET500 ETX CPU module comes with the AMD Geode CS5536 companion device and accommodates up to 1GB of DDR SODIMM memory. The integrated high performance graphics accelerator supports CRT VGA and 18-bit single channel LVDS interface. 10/100 Ethernet functionality is provided by the Realtek RTL8100CL single chip Ethernet controller. Other key features include support for four USB ports, two serial ports, AC-97 audio, hardware monitoring, slim FDD and a PCI to ISA bridge.

ET500 FEATURES

- Embedded AMD Geode LX processor, 433MHz (LX700) / 500MHz (LX800)
- DDR SO-DIMM x 1, Max. 1GB
- Realtek RTL8100CL 10/100 BaseT Ethernet
- Integrated LX800/LX700 2D VGA controller, supports CRT & LVDS interfaces
- 4 x USB 2.0, 2 x COM, slim FDD, PCI to ISA bridge
- Watchdog timer, hardware monitoring

Specifications

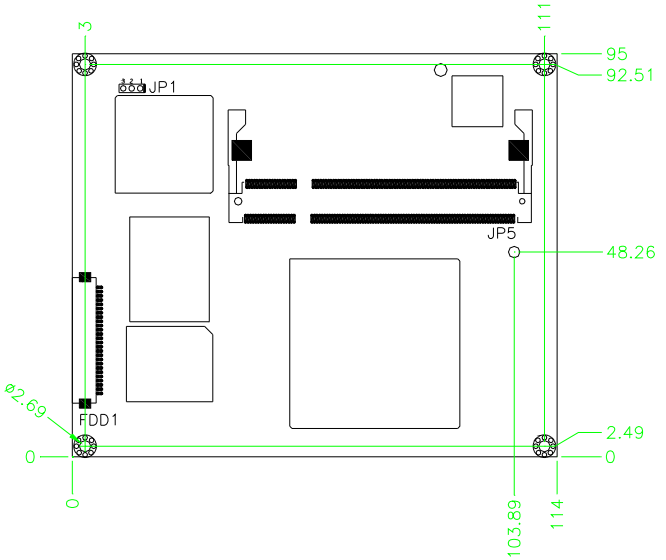
Product Name	ET500
Form Factor	ETX
CPU Type	AMD Geode LX processor
CPU Operating Frequency	LX800 @500MHz (ET500F) LX700 @433MHz (ET500)
Green / APM	ACPI / APM1.2
BIOS	Award BIOS (2MB FWH)
Chipset	AMD CS5536 I/O companion multi-function south bridge
Memory	One DDR SODIMM socket, Max. up to 1GB
Graphic	LX800/LX700 built-in high performance 2D graphic controller, supports CRT display
LVDS	TI SN75LVDS83 x1 for LVDS (default 18-bit single channel)
LAN	Realtek RTL8100CL-LF 10/100Mbps Ethernet chip x1 (LQFP package, 1.7mm height, on back side)
IDE	CS5536 built-in one channel UDMA100 IDE
Audio	Realtek ALC203 AC97 audio stereo codec (line-out, line-in & Mic)
USB	CS5536 built-in USB2.0 controller, support 4 ports
LPC I/O	Winbond W83627HG: KB/Mouse controller, Parallel, IrDA, Floppy, COM1, COM2 (RS232) & Hardware monitor (3 thermal inputs & 4 voltage monitor inputs)
RTC/CMOS	Geode CS5536 built-in (Lithium battery at carrier board)
PCI to ISA Bridge	ITE IT8888G TFBGA (w/o ISA master & PnP)
Watchdog Timer	Yes (256 segments, 0, 1, 2…255. sec/min)
ETX Interface	ETX connector x 4 for PCI-Bus, USB, Sound, VGA (CRT & LVDS), COM Ports, Parallel Port, IDE, Keyboard / Mouse, LAN & ISA-Bus
On Board header	Slim floppy connector x1
Operating Temperature	0°C ~ 60°C (32°F ~140°F)
Storage Temperature	-20°C ~ 80°C (68°F ~176°F)
Relative Humidity	10% ~ 90% (non-condensing)
RoHS Compliant	Yes
Board Size	95mm x 114mm (3.74” x 4.5”)

Checklist

Your ET500 package should include the items listed below.

- The ET500 CPU Module
- This User's Manual
- 1 CD containing the following:
  - Chipset Drivers
  - Flash Memory Utility

Dimensions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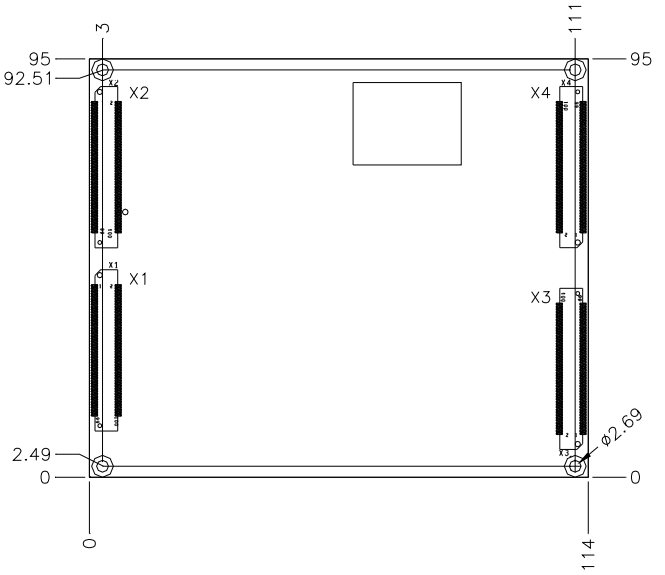
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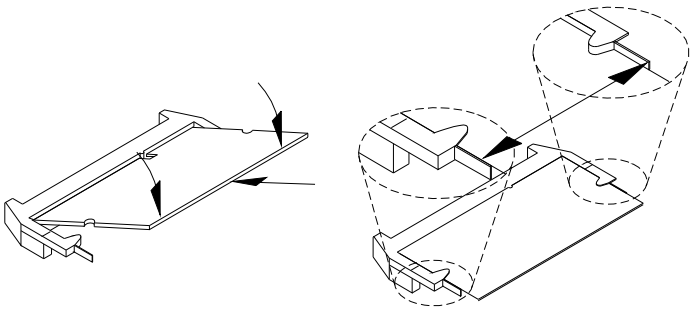
Installing the Memory

The ET500 supports one SODIMM DDR memory socket for a maximum total memory. 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 board and perform the following steps:

1. Hold the DDR module so that the keys of the DDR module align with those on the memory slot. Insert the module into the socket at a slight angle (approximately 30 degrees). Note that the socket and module are both keyed, which means that the module can be installed only in one direction.
2. To seat the memory module into the socket, apply firm and even pressure to each end of the module until you feel it slip down into the socket.
3. With the module properly seated in the socket, rotate the module downward. Continue pressing downward until the clips at each end lock into position.
4. To remove the DDR module, press the clips with both hands.



Connectors on ET500

1. X1 (PCI-Bus, USB, Audio)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	VCC	52	VCC
3	PCICLK3	4	PCICLK4	53	PAR	54	SERRJ
5	GND	6	GND	55	GPERRJ	56	N C
7	PCICLK1	8	PCICLK2	57	PMEJ	58	USB20
9	REQJ3	10	GNTJ3	59	LOCKJ	60	DEVSELJ
11	GNTJ2	12	3V	61	TRDYJ	62	USB30
13	REQJ2	14	GNTJ1	63	IRDYJ	64	STOPJ
15	REQJ 1	16	3V	65	FRAMEJ	66	USB21
17	GNTJ0	18	N.C.	67	GND	68	GND
19	VCC	20	VCC	69	AD16	70	CBEJ2
21	SERIRQ	22	REQJ0	71	AD17	72	USB31
23	AD0	24	3V	73	AD19	74	AD18
25	AD1	26	AD2	75	AD20	76	USB00
27	AD4	28	AD3	77	AD22	78	AD21
29	AD6	30	AD5	79	AD23	80	USB10
31	CBEJ0	32	AD7	81	AD24	82	CBEJ3
33	AD8	34	AD9	83	VCC	84	VCC
35	GND	36	GND	85	AD25	86	AD26
37	AD10	38	AUXAL	87	AD28	88	USB01
39	AD11	40	MIC	89	AD27	90	AD29
41	AD12	42	AUXAR	91	AD30	92	USB11
43	AD13	44	ASVCC	93	PCIRSTJ	94	AD31
45	AD14	46	SNDL	95	IRQY	96	IRQZ
47	AD15	48	ASGND	97	IRQW	98	IRQX
49	CBEJ1	50	SNDR	99	GND	100	GND

2. X2 (ISA-Bus)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	VCC	52	VCC
3	SD14	4	SD15	53	SA6	54	IRQ5
5	SD13	6	MASTERJ	55	SA7	56	IRQ6
7	SD12	8	DREQ7	57	SA8	58	IRQ7
9	SD11	10	DACKJ7	59	SA9	60	SYSCLK
11	SD10	12	DREQ6	61	SA10	62	REFSHJ
13	SD9	14	DACKJ6	63	SA11	64	DREQ1
15	SD8	16	DREQ5	65	SA12	66	DACKJ 1
17	MEMWJ	18	DACKJ5	67	GND	68	GND
19	MEMRJ	20	DREQ0	69	SA13	70	DREQ3
21	LA17	22	DACKJ0	71	SA14	72	DACKJ3
23	LA18	24	IRQ14	73	SA15	74	IORJ
25	LA19	26	IR015	75	SA16	76	IOWJ
27	LA20	28	IRQ12	77	SA18	78	SA17
29	LA21	30	IRQ11	79	SA19	80	SMEMRJ
31	LA22	32	IRQ10	81	IOCHRDY	82	AEN
33	LA23	34	IO16J	83	VCC	84	VCC
35	GND	36	GND	85	SD0	86	SMEMWJ
37	SBHEJ	38	M16J	87	SD2	88	SD1
39	SA0	40	OSC	89	SD3	90	NOWSJ
41	SA1	42	BALE	91	DREQ2	92	SD4
43	SA2	44	TC	93	SD5	94	IRQ9
45	SA3	46	DACKJ2	95	SD6	96	SD7
47	SA4	48	IRQ3	97	IOCHKJ	98	RSTDRV
49	SA5	50	IRQ4	99	GND	100	GND

3. X3 (VGA, LCD, Video, COM1, COM2, LPT, IrDA, Mouse, Keyboard)

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	N C	52	N C
3	R	4	B	53	VCC	54	GND
5	HSY	6	G	55	/STB	5 6	/AFD
7	VSY	8	DDCK	57	ic.	58	PD7
9	NC	10	DDDA	59	IRRX	60	/ERR
11	NC	12	NC	61	IRTX	62	PD6
13	NC	14	NC	63	RXD2	64	/INIT
15	GND	16	GND	65	GND	66	GND
17	NC	18	NC	67	RTS2J	68	PD5
19	NC	20	NC	69	DTR2J	70	/SLIN
21	GND	22	GND	71	DCD2J	72	PD4
23	TX3#	24	NC	73	DSR2J	74	PD3
25	TX3	26	NC	75	CTS2J	76	PD2
27	GND	28	GND	77	TXD2J	78	PD1
29	TX2#	30	TXCLK	79	RI2J	80	PD0
31	TX2	32	TXCLK#	81	VCC	82	VCC
33	GND	34	GND	83	RXD1	84	/ACK
35	TX0	36	TX1	85	RTS1J	86	/BUSY
37	TX0#	38	TX1#	87	DTR1J	88	PE
39	VCC	40	VCC	89	DCD1J	90	/SLCT
41	NC	42	NC	91	DSR1J	92	MSCLK
43	NC	44	BLON#	98	CTS1J	94	MSDAT
45	NC	46	DIGON	95	TXD1	96	KBCLK
47	NC	48	NC	97	RI1J	98	KBDAT
49	NC	50	NC	99	GND	100	GND

4. X4 (IDE 1, Misc)

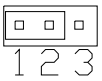
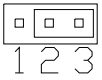
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	51	NC	52	PIDE_IORJ
3	5V SB	4	PWGIN	53	NC	54	PIDE IOWJ
5	PS ON	6	SPEAKER	55	NC	56	PIDE DRQ
7	PWRBTNJ	8	BATT	57	NC	58	PIDE D15
9	NC	10	LILED	59	NC	60	PIDE D0
11	WDTRIG	12	ACTLED	61	NC	62	PIDE D14
13	NC	14	NC	63	NC	64	PIDE D1
15	NC	16	NC	65	GND	66	GND
17	VCC	18	VCC	67	NC	68	PIDE D13
19	OVCRJ	20	NC	69	NC	70	PIDE D2
21	NC	22	NC	71	NC	72	PIDE D12
23	SMBCLK	24	SMBDATA	73	NC	74	PIDE D3
25	NC	26	N.C.	75	NC	76	PIDE D11
27	NC	28	NC	77	NC	78	PIDE D4
29	NC	30	PIDE_CS3J	79	NC	80	PIDE D10
31	NC	32	PIDE CS1J	81	VCC	82	VCC
33	GND	34	GND	83	NC	84	PIDE D5
35	NC	36	PIDE_A2	85	NC	86	PIDE D9
37	NC	38	PIDE_A0	87	NC	88	PIDE D6
39	NC	40	PIDE A1	89	-RING	90	N.C.
41	N.C.	42	N.C.	91	RXD-	92	PIDE D8
43	NC	44	PIDE INTRO	93	RXD+	94	NC
45	NC	46	PIDE_AKJ	95	TXD-	96	PIDE D7
47	NC	48	PIDE RDY	97	TXD+	98	HDRSTJ
49	VCC	50	VCC	99	GND	100	GND

5. FDD1: FDD Connector

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

6. JP1: Power Supply Type Select

Use JP1, a 3-pin header, to select between AT and ATX power supply.

JP1	Setting	Power Supply Type
	Pin 1-2 Short/Closed	ATX
	Pin 2-3 Short/Closed	AT

BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the board. 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	None	
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	Disabled	
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	Auto	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	
Memory Hole at 15M-16M	Disabled	

CPU Frequency

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

Memory Frequency

This default setting for this field is ***Auto***. Other options are ***100MHz***, ***133MHz***, ***166MHz***, and ***200MHz***.

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.

Memory Hole At 15M-16M

In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are *Enabled* and *Disabled*.

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
Master Drive PIO Mode	Auto	Menu Level >
Slave Drive PIO Mode	Auto	
IDE Primary Master UDMA	Disabled	
IDE Primary Slave UDMA	Disabled	
IDE DMA transfer access	Enabled	
IT888 ISA Decode IO	[Press Enter]	
IT888 ISA Decode Memory	[Press Enter]	
IT888 DMA	[Press Enter]	
IDE HDD Block Mode	Enabled	
Onboard LAN Boot ROM	Disabled	
Onboard FDC Controller	Disabled	
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	

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

		ITEM HELP
Power Management	Disabled	
** PM Timers **		Menu Level >
Standby Mode	Disabled	
Suspend Mode	Disabled	
Power-On by Alarm	Disabled	
PME Event Function	Disabled	
Soft-off by PWR-BTTN	Instant-off	
Time (hh:mm:ss) Alarm	0	
IRQ Wakeup Events	Press Enter	

Power Management

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

Suspend Mode

When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

Soft-Off by PWRBTN

This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds.

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

		ITEM HELP
PNP OS Installed	No	Menu Level
Init Display First	PCI Slot	
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

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

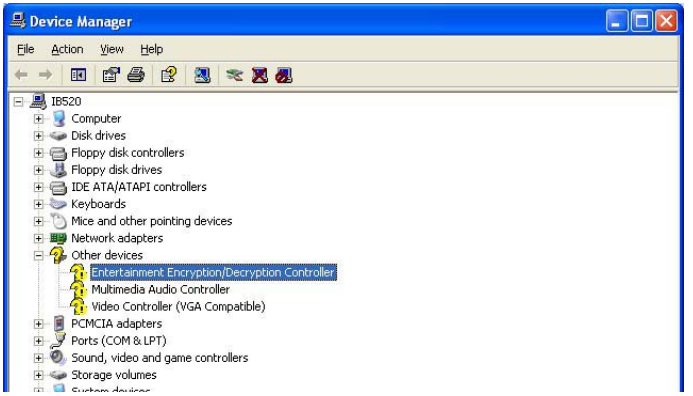
Select this option to exit the Setup utility without saving the changes you have made in this session. Typing “Y” will quit the Setup utility without saving the modifications. Typing “N” will return you to Setup utility.

Drivers Installation

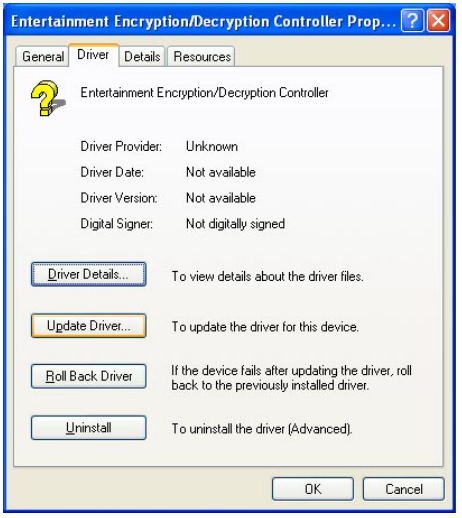
This section describes the installation procedures for software and drivers under the Windows 2000 and Windows XP. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the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

Entertainment Encryption/Decryption Controller Driver

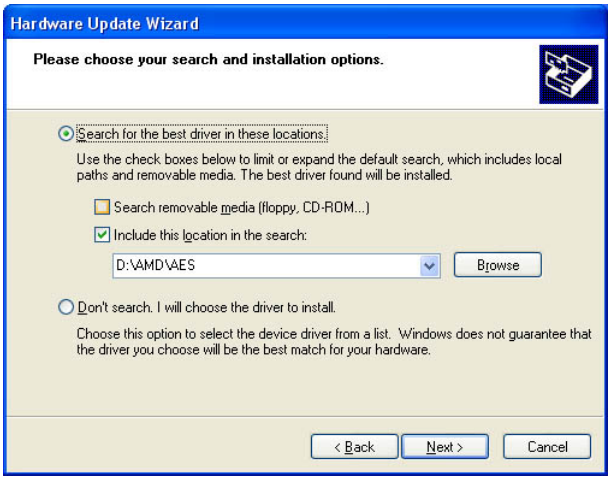
1. In the Windows operating system, go to the Device Manager.
2. As shown below, click the **Entertainment Encryption/Decryption Controller** under **Other devices**.



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

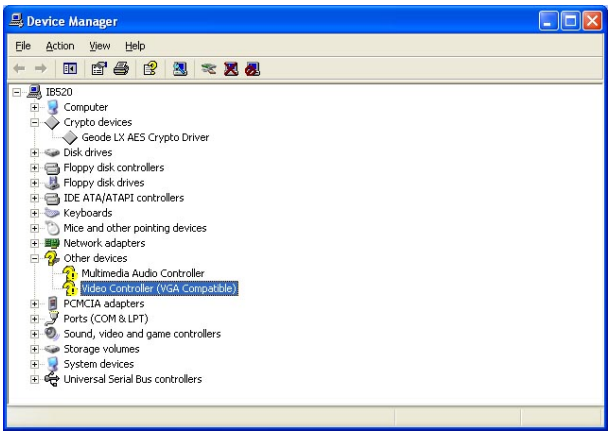


4. In the Hardware Update Wizard, select **No, not this time** and click **Next** to continue. Then select **Install from a list of specific location (Advanced)**. Click **Browse** to find the driver's path in the CD provided - **\AMD\AES**. Then, click **Next** to start the drivers installtion. Then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

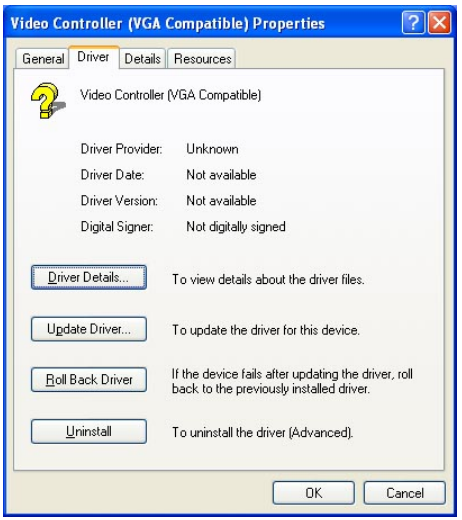


VGA Drivers Installation

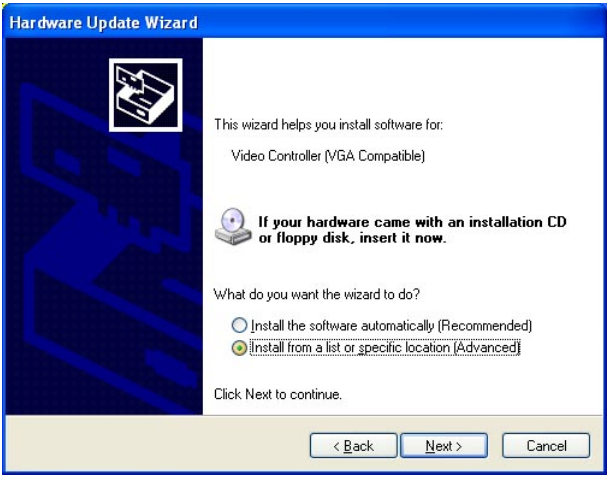
1. In the Windows operating system, go to the Device Manager.
2. As shown below, click the **Video Controller (VGA Compatible** under **Other devices**.



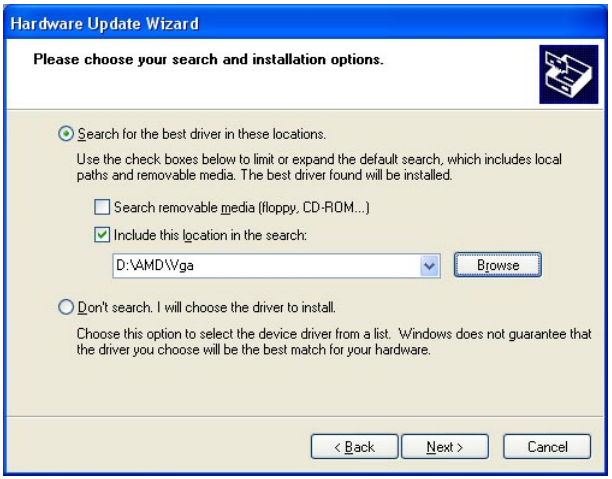
3. In the following window, click the **Driver** tab and click **OK** to continue.

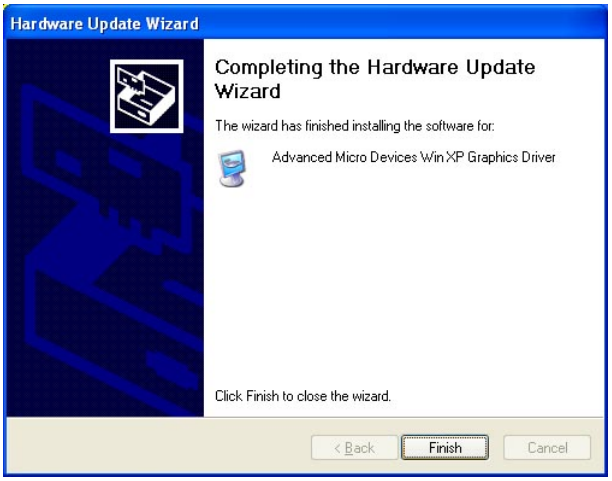


4. In the Hardware Update Wizard, select **No, not this time** and click **Next** to continue. Then select **Install from a list of specific location (Advanced)**.



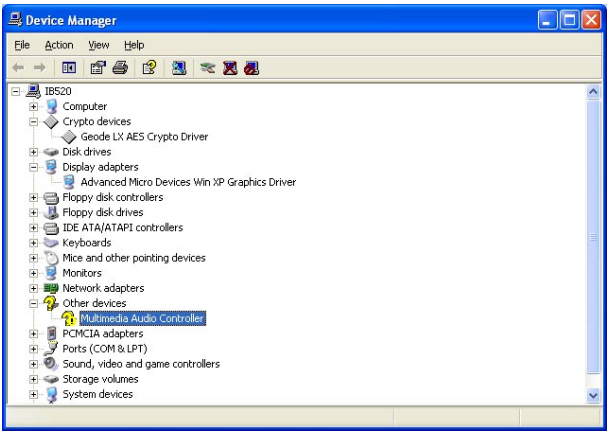
5. In the next screen, click **Search for the best driver in these** locations. Check **Include this location in the** search. Click **Browse** to find the driver's path in the CD provided or enter the path directly - **\AMD\Vga**. Then, click **Next** to start the drivers installtion. Then click **Finish**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



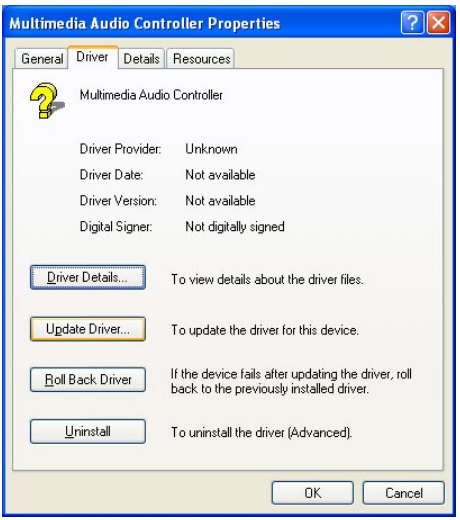


Audio Driver Installation

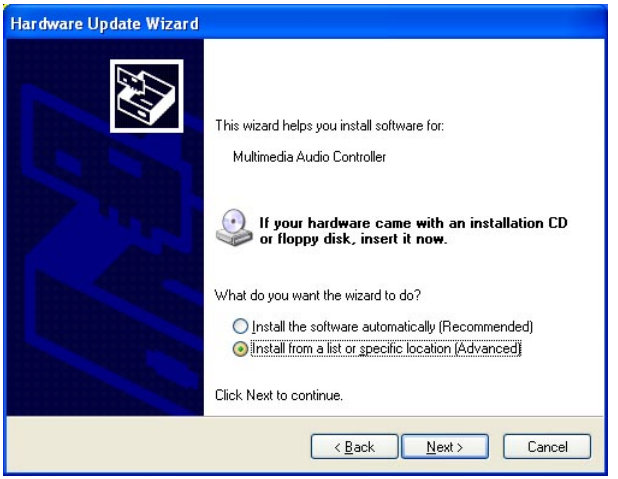
1. In the Windows operating system, go to the Device Manager.
2. As shown below, click the **Multimedia Audio Controller** under **Other devices**.



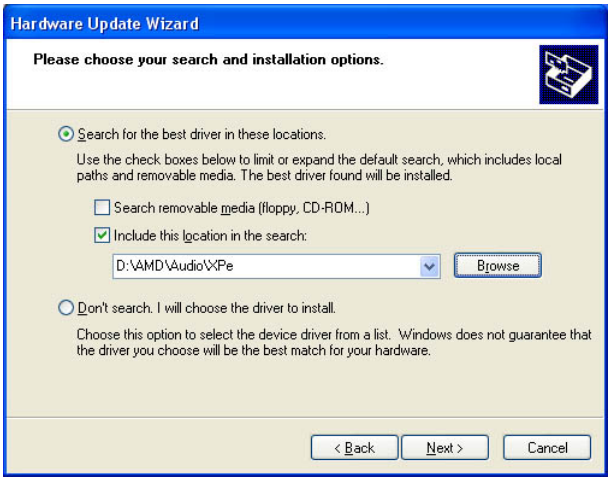
3. In the following window, click the **Driver** tab and click **OK** to continue.

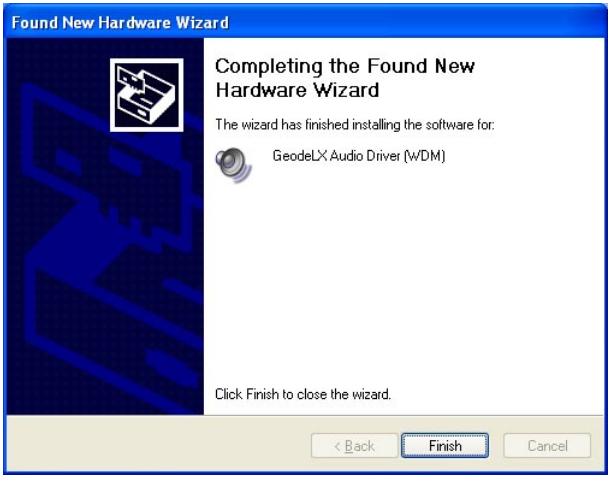


4. In the Hardware Update Wizard, select **No, not this time** and click **Next** to continue. Then select **Install from a list of specific location (Advanced)**.



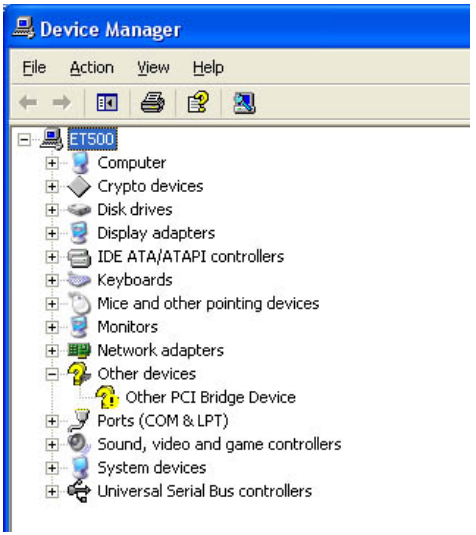
5. In the next screen, click **Search for the best driver in these** locations. Check **Include this location in the** search. Click **Browse** to find the driver's path in the CD provided or enter the path directly - **\AMD\Audio\XPe**. Then, click **Next** to start the drivers installtion. Then click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



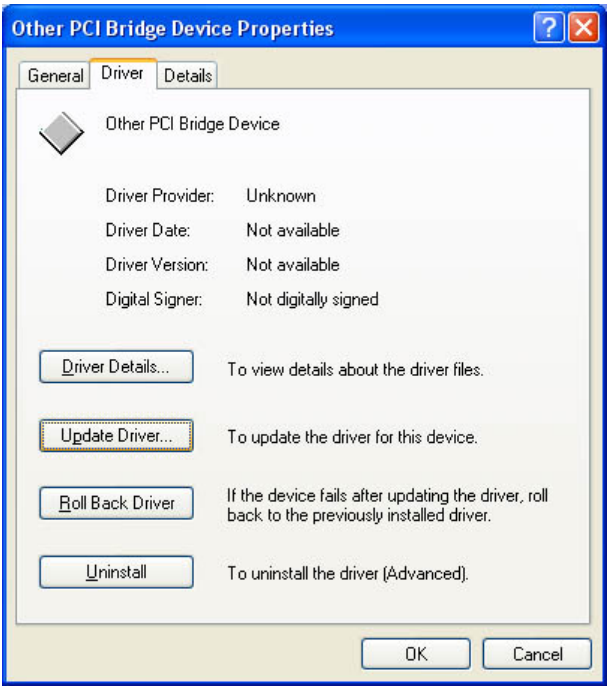


PCI Bridge Driver Installation

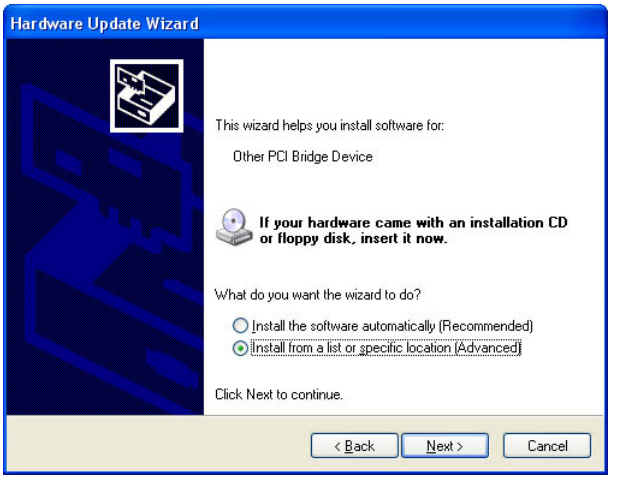
1. In the Windows operating system, go to the Device Manager.
2. As shown below, click **Other devices,** then **Other PCI Bridge Device**.



3. In the following window, click the **Driver** tab and click **Update Driver** 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, 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\ITE8888**. Then, click **Next** to start the drivers installation.

Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which 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	Keyboard Controller (1)
0601h	Control Port
064h	Real Time Clock
070h - 07Fh	Keyboard Controller (2)
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h – 00FFh	Coprocessor
01F0h – 01F7h 03F6h	IDE (Primary)
02F8h - 02FFh	Serial Port #2(COM2)
0378h – 037Ah	Parallel Port #1(LPT1)
03C0h – 03DFh	Reserved for VGA
03F0h – 03F5h 03F7h	FDD Controller
03F8h - 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	PIC2 (IRQ8-15)
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	For PCI
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	For PCI
IRQ10	For PCI
IRQ11	For PCI
IRQ12	PS/2 Mouse
IRQ13	Coprocessor
IRQ14	Primary IDE

C. 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
;[]=============================================
```

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