

ETX-GX-300
Low Power GX1-300 MMX with
SVGA/LCD, TV-out, Watchdog & Audio
ETX MODULE COMPUTER BOARD

User Manual Version 1.0

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Support

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1. Introduction

ETX-GX-300 is an ETX-form factor CPU module. With its small size and four IO connectors, ETX CPU module can be easily and securely mounted on to a customized baseboard or ICP ETX development board. It supports the full functions of an AT & ATX-compatible industrial computer on a single board. ETX-GX-300 is equipped with a low-power consumption and high performance GX1-300 processor on board. It also contains an SDRAM SODIMM socket that can support up to 512MB memory.

ETX-GX-300 provides an audio interface, EIDE interface, one parallel port, two serial ports RS-232, two USB ports, and a PS/2 keyboard/mouse interface. The built-in SVGA/LCD display controller supports both the CRT and LCD display simultaneously. It offers the resolutions of LCD screen up to 1024 x 768 and CRT resolutions up to 1280 x 1024 @ 16 colors. It also provides LVDS interface for long distance LCD panel signal transmission. The display type is configured by software utility. The Flash ROM contains both the system BIOS and the VGA BIOS. The modification can be done by reprogramming the Flash ROM.

1.1 Specifications

NS GX1-300 MMX 32-Bit x86 Processor: Supports Intel MMX instruction set extension for the acceleration of multi media applications.

- 16 KB unified L1 cache
- Five-stage pipelined integer unit
- Integrated Floating Point Unit (FPU)

System memory: One 144-pin SODIMM socket support up to 512 MB SDRAM

BIOS: AWARD 256 KB Flash memory

Display Controller: MediaGx processor has applied the UMA technology which provides 1-4MB display memory, to be set up by BIOS.

- Support CRT and LVDS LCD displays simultaneously
- Support 18-bit LVDS LCD panel resolution up to 1024x768 @ 18bpp
- Support non-interlaced CRT monitors resolutions up to 1280x1024 @ 256 colors or 1024x768 @ 16bpp

Audio: Compliant to AC97, support stereo

- Connector: Speaker, Mic-in, Line-in, Line-out, CD-in
- IDE interface: The IDE support to two PCI Enhanced IDE hard drives
- FDD interface: support up to two floppy disk drives, 5.25" (360KB and 1.2MB) and/or 3.5" (720KB, 1.44MB, and 2.88MB) (Multi function with Parallel port)
- Serial ports Two RS232 ports

Parallel port: One Parallel port, supports SPP/EPP/ECP mode (Multi function with Floppy interface)

PS/2 Mouse/Keyboard interface: Easy connection to a keyboard or PS/2 mouse

USB interface: Two USB ports, USB 1.0 compliant

Power management: Supports power saving modes including Normal/Doze/Sleep modes. APM1.1 compliant

Watchdog timer: Can be set by 1-255 seconds period. Reset or NMI was generated when CPU did not periodically trigger the timer.

Power supply: +5V @2A (typical)

Operating temperature: -20-60 (-4-140)

Dimension: ETX form factors, 114mm x 95mm

1.2 Package Contents

Before you begin installing the product, please check the following materials are included in the package:

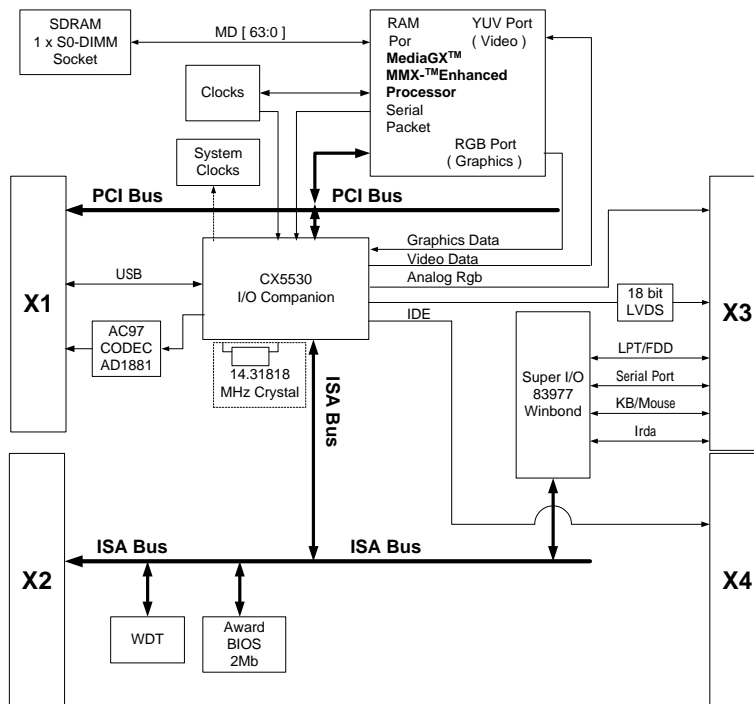
- ETX-GX-300 All-in-one single board computer x 1
- CD-ROM for utility and drivers x 1

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

2. Installation

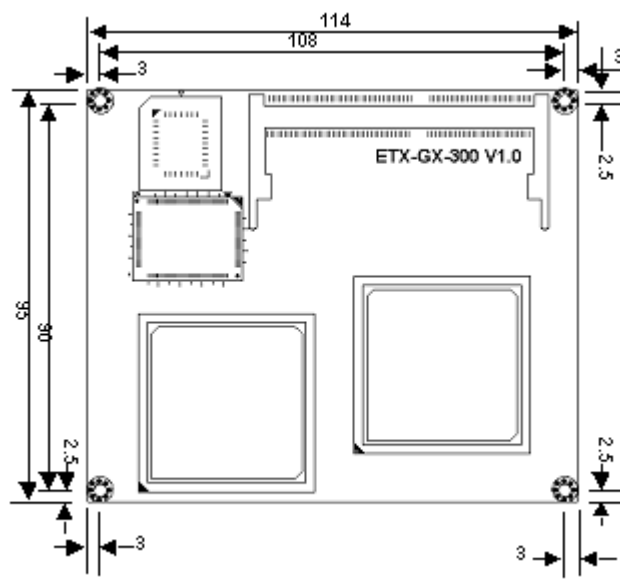
This chapter gives instructions about how to set up ETX-GX-300 hardware, including directions of connecting peripherals. Before installation, please pay attention to the unpacking precautions on the following page for safety.

2.1 ETX-GX-300 Block Diagram & Board Layout

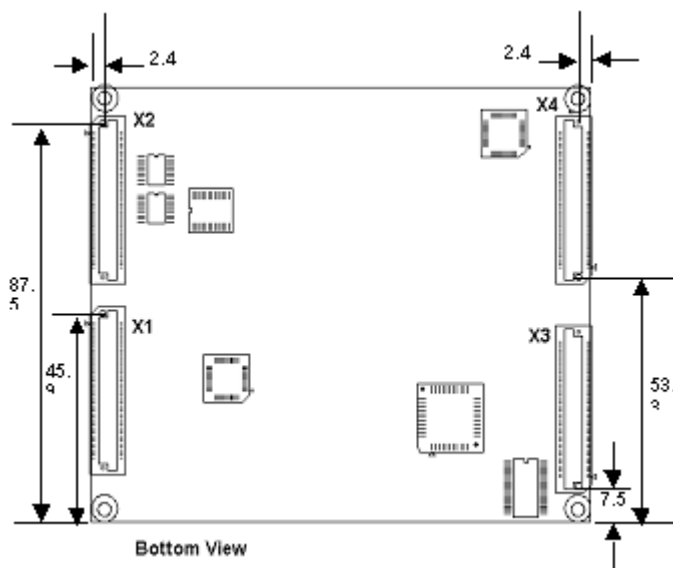


ETX-GX-300 Block diagram

ETX-GX-300 Board Layout



Top View



Bottom View

2.2 Unpacking Precautions

Some components of ETX-GX-300 SBC are very sensitive to static electric charges and can be damaged by a sudden rush of power. To protect it from unintended damage, be sure to note these precautions:

- Ground yourself to remove any static charge before touching the ETX-GX-300 SBC. You can do it by using a grounded wrist strap at all times or by frequently touching any conducting materials that is connected to the ground.
- Handle your ETX-GX-300 SBC by its edges. Do not touch IC chips, leads or circuitry.
- Do not plug any connector or jumper while the power is on.

2.3 System Memory DRAM

There is one 144-pin SO-DIMM socket to accept 3.3V non-buffered SDRAM. Up to 512 Mbytes of memory are supported.

2.4 Watchdog Timer Setting

Watchdog Timer is enabled by reading port 443H. It should be triggered before the time-out period ends, otherwise it will assume the program operation is abnormal and will issue a time-out signal which will be routed to the ETX baseboard through the X4 connector. Watchdog Timer is disabled by reading port 043/843H. For detailed information on Watchdog Timer, refer to Appendix A.

3. Connection

This chapter describes how to connect peripherals, switches and indicators to the ETX-GX-300 board.

3.1 ETX Connector X1

X1: PCI-Bus, USB, and Audio

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	GND
3	PCICLK3	4	PCICLK4
5	GND	6	GND
7	PCICLK1	8	PCICLK2
9	REQ3#	10	GNT3#
11	GNT2#	12	3.3V
13	REQ2#	14	GNT1#
15	REQ1#	16	3.3V
17	GNT0#	18	RESERVED
19	5V	20	5V
21	SERIRQ	22	REQ0#
23	AD0	24	3.3V
25	AD1	26	AD2
27	AD4	28	AD3
29	AD6	30	AD5
31	CBE0#	32	AD7
33	AD8	34	AD9
35	GND	36	GND
37	AD10	38	LINE-IN-L
39	AD11	40	MIC
41	AD12	42	LINE-IN-R
43	AD13	44	ASVCC
45	AD14	46	LINE-OUT-L
47	AD15	48	ASGND
49	CBE1#	50	LINE-OUT-R

PIN	SIGNAL	PIN	SIGNAL
51	5V	52	5V
53	PAR	54	SERR#
55	PERR#	56	RESERVED
57	PME#	58	N.C.
59	LOCK#	60	DEVSEL#
61	TRDY#	62	N.C.
63	IRDY#	64	STOP#
65	FRAME#	66	N.C.
67	GND	68	GND
69	AD16	70	CBE2#
71	AD17	72	N.C.
73	AD19	74	AD18
75	AD20	76	USB0#
77	AD22	78	AD21
79	AD23	80	USB1#
81	AD24	82	CBE3#
83	5V	84	5V
85	AD25	86	AD26
87	AD28	88	USB0
89	AD27	90	AD29
91	AD30	92	USB1
93	PCIRST#	94	AD31
95	INTC#	96	INTD#
97	INTA#	98	INTB#
99	GND	100	GND

3.2 ETX Connector X2

X2: ISA Bus

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	GND
3	SD14	4	SD15
5	SD13	6	N.C.
7	SD12	8	DRQ7
9	SD11	10	DACK7#
11	SD10	12	DRQ6
13	SD9	14	DACK6#
15	SD8	16	DRQ5
17	MEMW#	18	DACK5#
19	MEMR#	20	DRQ0
21	SA17	22	DACK0#
23	SA18	24	IRQ14
25	SA19	26	IIRQ15
27	SA20	28	IRQ12
29	SA21	30	IRQ11
31	SA22	32	IRQ10
33	SA23	34	IOCS16#
35	GND	36	GND
37	SBHE#	38	MEMCS16#
39	SA0	40	OSC
41	SA1	42	BALE
43	SA1	44	TC
45	SA3	46	DACK2#
47	SA4	48	IRQ3
49	SA5	50	IRQ4

PIN	SIGNAL	PIN	SIGNAL
51	5V	52	5V
53	SA6	54	IRQ5
55	SA7	56	IRQ6
57	SA8	58	IRQ7
59	SA9	60	SYSCLK
61	SA10	62	N.C.
63	SA11	64	REQ1
65	SA12	66	DACK1#
67	GND	68	GND
69	SA13	70	DRQ3
71	SA14	72	DACK3#
73	SA15	74	IOR#
75	SA16	76	IOW#
77	SA18	78	SA17
79	SA19	80	SMEMR#
81	IOCHRDY	82	AEN
83	5V	84	5V
85	SD0	86	SMEMW#
87	SD2	88	SD1
89	SD3	90	ZOWS#
91	DRQ2	92	SD4
93	SD5	94	IRQ9
95	SD6	96	SD7
97	N.C.	98	RSTDRV
99	GND	100	GND

3.3 ETX Connector X3

X3: VGA, LCD, Video, COM1, COM2, LPT/Floppy, Irda, Mouse, and Keyboard

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	GND
3	R	4	B
5	CRTHSYNC	6	G
7	CRTVSYNC	8	DDCSCL
9	N.C.	10	DDCSDA
11	N.C.	12	N.C.
13	N.C.	14	N.C.
15	GND	16	GND
17	N.C.	18	N.C.
19	N.C.	20	N.C.
21	GND	22	GND
23	N.C.	24	N.C.
25	N.C.	26	N.C.
27	GND	28	GND
29	TXOUT2-	30	TXCLKOUT+
31	TXOUT2+	32	TXCLKOUT-
33	GND	34	GND
35	TXOUT0+	36	TXOUT1+
37	TXOUT0-	38	TXOUT1-
39	5V	40	5V
41	N.C.	42	N.C.
43	N.C.	44	FPENABKL
45	N.C.	46	FPENAVDD
47	TV-CVBS	48	TV-Y
49	TV-SYNC	50	TV-C

PIN	SIGNAL	PIN	SIGNAL
51	LPT/FLPY#	52	RESERVED
53	5V	54	GND
55	STB#	56	AFD#
57	RESERVED	58	PD7
59	IRRX	60	ERR#
61	IRTX	62	PD6
63	RXD2	64	INIT#
65	GND	66	GND
67	RTS2#	68	PD5
69	DTR2#	70	SLIN#
71	DCD2#	72	PD4
73	DSR2#	74	PD3
75	CTS2#	76	PD2
77	TXD2	78	PD1
79	RI2#	80	PD0
81	5V	82	5V
83	RXD1	84	ACK#
85	RTS1#	86	BUSY#
87	DTR1#	88	PE
89	DCD1#	90	SLCT
91	DSR1#	92	MSCLK
93	CTS1#	94	MSDATA
95	TXD1	96	KBCLK
97	RI1#	98	KBDATA
99	GND	100	GND

3.4 ETX Connector X4

X4: IDE1, IDE2, and miscellaneous

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	GND
3	5VSB	4	PWGIN
5	PS_ON	6	SPEAKER
7	PWRBTN#	8	VBAT
9	KBINH	10	N.C.
11	WDTACT#	12	N.C.
13	ROMKBCS#	14	N.C.
15	ROMCS#	16	I2CCLK
17	5V	18	5V
19	OVRCUR	20	DIOCS#
21	EXTSMI#	22	I2CDATA
23	N.C.	24	N.C.
25	SIDE_CS3#	26	N.C.
27	SIDE_CS1#	28	DASP_S
29	SIDE_A2	30	PIDE_CS3#
31	SIDE_A0	32	PIDE_CS1#
33	GND	34	GND
35	PDIAG_S	36	PIDE_A2
37	SIDE_A1	38	PIDE_A0
39	SIDE_IRQ#	40	PIDE_A1
41	N.C.	42	N.C.
43	SIDE_DACK#	44	PIDE_IRQ#
45	SIDE_IORDY	46	PIDE_DACK#
47	SIDE_IOR#	48	PIDE_IORDY
49	5V	50	5V

PIN	SIGNAL	PIN	SIGNAL
51	SIED_IOW#	52	PIDE_IOR#
53	SIDE_DRQ	54	PIDE_IOW#
55	SIDE_D15	56	PIDE_DRQ
57	SIDE_D0	58	PIDE_D15
59	SIDE_D14	60	PIDE_D0
61	SIDE_D1	62	PIDE_D14
63	SIDE_D13	64	PIDE_D1
65	GND	66	GND
67	SIDE_D2	68	PIDE_D13
69	SIDE_D12	70	PIDE_D2
71	SIDE_D3	72	PIDE_D12
73	SIDE_D11	74	PIDE_D3
75	SIDE_D4	76	PIDE_D11
77	SIDE_D10	78	PIDE_D4
79	SIDE_D5	80	PIDE_D10
81	5V	82	5V
83	SIDE_D9	84	PIDE_D5
85	SIDE_D6	86	PIDE_D9
87	SIDE_D8	88	PIDE_D6
89	RING#	90	N.C.
91	N.C.	92	PIDE_D8
93	N.C.	94	SIDE_D7
95	N.C.	96	PIDE_D7
97	N.C.	98	IDERST#
99	GND	100	GND

4. AWARD BIOS Setup

ETX-GX-300 uses the AWARD PCI/ISA BIOS for system configuration. The AWARD BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options which may be selected to meet end-user requirements. This chapter is written to assist you in the proper usage of these features.

4.1 Getting Started

When you turn on the power button, the BIOS will enter the Power-On-Self-Test routines. These routines will be executed for system test and initialization and system configuration verification. After the POST routines are completed, the following message appears:

" Hit DEL if you want to run SETUP"

To access AWARD BIOS SETUP UTILITY, press . The following screen will be displayed at this time:

ROM PCI/ISA BIOS (2A434I9H) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION	SAVE & EXIT SETUP
LOAD BIOS DEFAULTS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	
Esc : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift)F2 : Change Color

4.2 Standard CMOS Setup

Standard CMOS Setup is used for basic hardware system configuration. The main function is for Date/Time setting and Floppy/Hard Disk Drive setting.

To set the Date, for example, press either the arrow or <Enter> on your keyboard to select one of the fields (Month, Date or Year), then press either <PgUp> or <PgDn> to increase or decrease the value of that field. Repeat the same steps for Time setting.

```
ROM PCI/ISA BIOS (2A43419H)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.
```

Date (mm:dd:yy) : Thu, Nov 14 2002								
Time (hh:mm:ss) : 14 : 18 : 54								
HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	:	0	0	0	0	0	0	AUTO
Primary Slave	:	0	0	0	0	0	0	AUTO
Secondary Master	:	47	0	0	0	0	0	AUTO
Secondary Slave	:	47	0	0	0	0	0	AUTO
Drive A : 1.44M, 3.5 in.								
Drive B : None								
Video : EGA/UGA								
Halt On : No Errors								
ESC : Quit		↑ ↓ + = : Select Item		PU/PD/*/- : Modify				
F1 : Help		(Shift)F2 : Change Color						

For IDE hard disk drive setup, follow the setup procedure below:

1. Use the Auto setting for detection during boot-up.
2. Use the IDE HDD AUTO DETECTION in the main menu; the computer will automatically detect the HDD specifications.
3. Manually enter the specifications by yourself from the "User" option.

Note:

If you need more information on any particular field, just highlight it then press <F1>. A pop-up window will come out to give you more information on that field.

4.3 BIOS Features Setup

BIOS Features Setup is designed for the 'fine tuning' of your system in order to improve its performance. As for normal operation, you don't have to change any default setting. The default setting is pre-set for most reliable operation.

ROM PCI/ISA BIOS (2A434I9H)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000-CBFFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	CC000-CFFFF Shadow	: Disabled
Boot From LAN First	: Disabled	D0000-D3FFF Shadow	: Disabled
Boot Sequence	: A,C,SCSI	D4000-D7FFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	D8000-DBFFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled	DC000-DFFFF Shadow	: Disabled
Boot Up NumLock Status	: On	Cyrix 6x86/MII CPUID:	Enabled
Boot Up System Speed	: High		
Gate A20 Option	: Fast		
Memory Parity Check	: Enabled		
Typeomatic Rate Setting	: Disabled		
Typeomatic Rate (Chars/Sec)	: 6		
Typeomatic Delay (Msec)	: 250		
Security Option	: Setup	ESC : Quit	↑↓→← : Select Item
PCI/UGA Palette Snoop	: Disabled	F1 : Help	PU/PD/+/- : Modify
OS Select For DRAM > 64MB	: Non-OS2	F5 : Old Values	<Shift>F2 : Color
Report No FDD For WIN 95	: Yes	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

4.4 Chipset Features Setup

This setup function works mostly on board's chipset. This option is used to change the chipset's configuration. Please, carefully change any default setting, otherwise the system will run unstable.

ROM PCI/ISA BIOS <2A434I9H>
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

SDRAM CAS latency Time : AUTO	Flat Panel Resolution : 800x600
SDRAM Clock Ratio Div By : 3	TU Output Mode : NTSC
16-bit I/O Recovery <CLK>: 5	TU Out Scan Mode : Overscan
8-bit I/O Recovery <CLK>: 5	
USB Controller : Enabled	
USB Legacy Support : Disabled	
Build in CPU Audio : Enabled	
Audio I/O Base Address : 220H	
MPU-401 I/O Base Address : 330H	
Audio IRQ Select : IRQ 5	
Audio Low DMA Select : DMA 1	
Audio High DMA Select : DMA 5	
Joystick Status : Enabled	
Multiple Monitor Support : PCI First	ESC : Quit ↑↓← : Select Item
Video Memory Size : 4.0 M	F1 : Help PU/PD/+/- : Modify
Display status : Both	F5 : Old Values <Shift>F2 : Color
	F6 : Load BIOS Defaults
	F7 : Load Setup Defaults

The flat panels will then be applied with two modes: 640x480, 800x600 or 1024x768, for which it needs to set up from BIOS for proper flat panel resolution.

- **Build in CPU Audio — Enabled, Disabled**
To disable or enable the audio function
- **Audio I/O Base Address — 220H, 240H, 260H, 280H**
To select the I/O address for audio function
- **MPU-401 I/O Base Address — 300H, 330H, Disabled**
To select the I/O address for MPU-401 (midi interface)
- **Audio IRQ Select — 5, 7, 10, Disabled**
To select the interrupt for audio function
- **Audio Low DMA Select — DMA0, DMA1, DMA3, Disabled**
To select the high DMA channel
- **Audio High DMA Select — DMA5, DMA6, DMA7, Disabled**
To select the high DMA channel
- **Video Memory Size — None, 1.5M, 2.5M, 4.0M**
To select the size of video memory. It makes use of system memory

for display.

- **Multiple Monitor Support — PCI first, M/B first**
To select the primary VGA for multiple monitor support in WINDOWS
- **TV-OUT Mode — NTSC, PAL**
To select the TV-OUT mode

4.5 Power Management Setup

Power Management Setup helps user to handle ETX-GX-300 board's "green" function. This feature can shut down the video display and hard disk to save energy. The power management setup screen is as following:

```
ROM PCI/ISA BIOS (2A43419H)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.
```

Power Management	: Disabled	IRQ1 <KeyBoard>	: ON
** PM Timers **		IRQ3 <COM 2>	: OFF
Doze Mode	: Disabled	IRQ4 <COM 1>	: OFF
Standby Mode	: Disabled	IRQ5 <LPT 2>	: OFF
HDD Power Down	: Disabled	IRQ6 <Floppy Disk>	: OFF
MODEM Use IRQ	: NA	IRQ7 <LPT 1>	: OFF
Throttle Duty Cycle	: 33.3 %	IRQ9 <IRQ2 Redir>	: OFF
		IRQ10 <Reserved>	: OFF
		IRQ11 <Reserved>	: OFF
		IRQ12 <PS/2 Mouse>	: OFF
		IRQ13 <Coprocessor>	: OFF
		IRQ14 <Hard Disk>	: OFF
		IRQ15 <Reserved>	: OFF
		ESC : Quit	↑↓←→ : Select Item
		F1 : Help	PU/PD/+/- : Modify
		F5 : Old Values	<Shift>F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

4.6 PNP / PCI Configuration

This menu is used to assign certain IRQ to your PNP/PCI devices manually.

```
ROM PCI/ISA BIOS (2A43419H)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.
```

PNP OS Installed : No Resources Controlled By : Auto Reset Configuration Data : Disabled	PCI IRQ Activated By : Level
	ESC : Quit ↑↓+* : Select Item F1 : Help PU/PD/+/- : Modify F5 : Old Values <Shift>F2 : Color F6 : Load BIOS Defaults F7 : Load Setup Defaults

PNP OS Installed: If you install Plug and Play operating system (OS), the OS will reassign the interrupt if you select Yes in this field. If you install a non-Plug and Play OS or if you want to prevent reassigning of interrupt settings, select No in this field.

Resources Controlled By: Select Auto if you want the computer to assign the IRQs automatically and vice versa.

Reset Configuration Data: Enabling this field enables you to reset the configuration data.

IRQ-xx assigned to: This option shows whether certain IRQ is used by a PCI/ISA card.

4.7 Load BIOS Defaults

```
ROM PCI/ISA BIOS (2A43419H)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP          INTEGRATED PERIPHERALS
BIOS FEATURES SETUP          SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP       USER PASSWORD
POWER MANAGEMENT SETUP       IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION        Load BIOS Defaults <Y/N>? N SETUP
LOAD BIOS DEFAULT             SAVING
LOAD SETUP DEFAULTS

Esc : Quit                    ↑ ↓ → ← : Select Item
F10 : Save & Exit Setup      <Shift>F2 : Change Color
```

If you select 'Y' to this field, the BIOS Defaults will be loaded except Standard CMOS SETUP. The default settings are not optimal and turning all high performance into disabled condition. Select 'N' to abort.

Suggestion: For beginners, we suggest using LOAD SETUP DEFAULTS because it is the safest mode for your system.

4.8 Load Setup Defaults

```
ROM PCI/ISA BIOS (2A43419H)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP          INTEGRATED PERIPHERALS
BIOS FEATURES SETUP          SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP       USER PASSWORD
POWER MANAGEMENT SETUP       IDE HDD AUTO DETECTION
PNP/PCI CONFIGURATION        Load SETUP Defaults <Y/N>? N SETUP
LOAD BIOS DEFAULT             SAVING
LOAD SETUP DEFAULTS

Esc : Quit                    ↑ ↓ → ← : Select Item
F10 : Save & Exit Setup      <Shift>F2 : Change Color
```

If you select 'Y' to this field, the Setup Defaults will be loaded except Standard CMOS SETUP. The default settings are optimal configuration settings for your system.

4.9 Integrated Peripherals

ROM PCI/ISA BIOS (2A43419H)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

IDE HDD Block Mode	: Enabled	IR Transmission delay	: Enabled
Primary IDE Channel	: Enabled	Onboard Parallel Port	: 378/IRQ7
Master Drive PIO Mode	: Auto	Parallel Port Mode	: SPP
Slave Drive PIO Mode	: Auto	ECP Mode Use DMA	: 3
Secondary IDE Channel	: Enabled	EPP Mode Select	: EPP1.7
Master Drive PIO Mode	: Auto	Digital I/O	: 280h
Slave Drive PIO Mode	: Auto		
IDE Primary Master UDMA	: Auto	Onboard Serial Port 3	: 3E8H
IDE Primary Slave UDMA	: Auto	Serial Port 3 Use IRQ	: IRQ11
IDE Secondary Master UDMA	: Auto	Onboard Serial Port 4	: 2E8H
IDE Secondary Slave UDMA	: Auto	Serial Port 4 Use IRQ	: IRQ10
		Onboard Parallel Port 2	: 278H
		Parallel Port 2 Use IRQ	: IRQ9
KBC input clock	: 8 MHz		
Onboard FDC Controller	: Enabled	ESC : Quit	↑↓→← : Select Item
Onboard Serial Port 1	: 3F8/IRQ4	F1 : Help	PU/PD/+/- : Modify
Onboard Serial Port 2	: 2F8/IRQ3	F5 : Old Values (Shift)F2 : Color	
UART Mode Select	: Normal	F6 : Load BIOS Defaults	
UART2 Duplex Mode	: Half	F7 : Load Setup Defaults	
RxD , TxD Active	: Hi,Lo		

This option is used to assign Onboard I/O, IRQ, and DMA etc. If you don't know how to configure them, just press <F7> to load Setup Defaults.

Digital I/O Base Address — 240H, 260H, 280H, Disabled

To select the I/O address for digital I/O function.

4.10 Supervisor Password and User Password

Supervisor Password sets a password that is used to protect your system and Setup Utility. Supervisor Password has higher priority than User Password. Once you setup the password, the system will always ask you to key-in password every time you enter the BIOS SETUP. If you enter the BIOS SETUP with Supervisor Password, you can choose every setup/option on the main menu but with User Password, you can only choose three setup/options (USER PASSWORD, SAVE & EXIT SETUP and EXIT WITHOUT SAVING). To disable these passwords, enter the BIOS SETUP room with Supervisor Password and then just press the <Enter> key instead of entering a new password when the 'Enter Password' prompt pops up.

Note: If you forget the password, do the Clear/Reset CMOS procedure (refer to Section 2.5 Clear CMOS Setup).

4.11 IDE HDD Auto Detection

This option detects the parameters of an IDE hard disk drive (HDD sector, cylinder, head, etc) automatically and will put the parameters into the Standard CMOS Setup screen. Up to 2 IDE drives can be detected and the parameters will be listed in the box. Press <Y> if you accept these parameters. Press <N> to skip the next IDE drives.

Note: If your IDE HDD was formatted in previous older system, incorrect parameters may be detected. In this case, you need to enter the correct parameters manually or low-level format the disk.

4.12 Save and Exit Setup

```
ROM PCI/ISA BIOS <2A43419H>
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.
```

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP/PCI CONFIGURA	ETUP
LOAD BIOS DEFAULT	SAVING
LOAD SETUP DEFAULTS	

SAVE to CMOS and EXIT <Y/N>? y

Esc : Quit
F10 : Save & Exit Setup

↑ ↓ → ← : Select Item
<Shift>F2 : Change Color

Select this option when you finish setting all the parameters and want to save them into the CMOS. Just simply press <Enter> key and all the configuration changes will be saved.

5. SVGA Setup

5.1 Introduction

ETX-GX-300 is equipped with on-board LCD/VGA interface. The description below is its specifications and features:

Chipset

The ETX-GX-300 uses a Cyrix CX5530 chipset as its SVGA controller. It is compatible with many common 18-bit LCD displays and traditional analog CRT monitors. The VGA BIOS supports LCD. Besides, it also accepts interlaced and non-interlaced analog monitors (color and monochrome VGA) with high-resolution quality while maintaining complete IBM VGA compatibility. But digital monitors (i.e. MDA, CGA, and EGA) can be NOT supported. Multiple frequency (multisync) monitors are operated as if they were analog monitors.

Display memory

Having 1.5 ~ 4 MB UMA memory, the VGA controller can make CRT displays or color panel displays perform with resolutions up to 1024 x 768 at 64 K colors. The display memory can be modified up to 4 MB in BIOS for true-color resolution of 1024 x 768.

Display drivers

1. Win95, 98 drivers (VGA & Audio) in
 \ VGA\MediaGX\National Geode Win9x Drivers 1.2
2. WinNT4.0 drivers in
 \ VGA\MediaGX\Nt40\
3. Windows 2000 drivers in
 \ VGA\MediaGX\ Win2k\
4. Windows ME drivers (VGA & Audio) in
 \ VGA\ MediaGX\ WinME\
5. WindowsXP drivers in
 \ VGA\MediaGX\ WinXP\

5.2 Further Information

For more detailed information about the PCI/SVGA installation in your ETX-GX-300, including driver updates, troubleshooting instructions, please refer to the following webs which provide some resources you may need.

If not find the information you need, please contact with your local contributor or ICP support team:

ICP web site: www.iei.com.tw

6. Audio

6.1 Introduction

With on-board audio interface, the ETX-GX-300 can perform high-quality stereo sound and FM music synthesis (ESFM) by using the CX5530 audio controller. The audio interface has functions of recording, compressing, and playing back voice, sound, and music with a built-in mixer control. In addition, the on board audio interface supports the Plug and Play (PnP) standard and provides PnP configuration for audio, FM, and MPU-104 logical devices. It is compatible with AC97 version 2.0, voice, and music functions. The ESFM synthesizer is registered compatible with the OPL3 and has extended capabilities.

Audio drivers

1. Installing software driver in Windows NT

The driver was provided from the CD utility.

WinNT4.0 Audio drivers in

\Audio\MediaGX\NT40

2. Installing software driver in Win95/98/ME

The audio drivers will be installed automatically while you install the display driver.

3. Installing software driver in Windows 2000

The driver was provided from the CD utility.

Win2000 Audio drivers in

\Audio\MediaGX\Win2k

Appendix A: Watchdog Timer

The Watchdog Timer is a device to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working normally, hardware on the board will issue a time-out signal.

Three I/O ports control the Watchdog Timer.

443	Write	Set Watchdog Time period
443 (hex)	Read	Enable the refresh the Watch-Dog Timer.
043/843 (hex)	Read	Disable the Watchdog Timer.

Prior to enable the Watch-Dog Timer, user has to define Timer first. The output data is a value of time interval and the range of the value is from 01(hex) to FF (hex) and time interval 1 sec to 255 sec.

Data	Time Interval
01	1 sec
02	2 sec
03	3 sec
04	4 sec
.	.
.	.
.	.
FF	255 sec

This will enable and activate the countdown timer which will eventually time out and send a time-out signal. To ensure that this condition does not occur, the Watch-Dog Timer must be periodically refreshed by reading the same I/O port 043/843H and 443H. This must be done within the time out period that is selected by software, please refer to the example program.

A tolerance of at least 5% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time consuming.

Therefore if the time out period has been set to 10 seconds, the I/O port 443H must be read within 7 seconds.

Note: When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system will reset.

Example assembly program:

```
TIMER_PORT = 443H  
TIMER_START = 443H
```

```

TIMER_STOP    = 843H

;; INITIAL TIME PERIOD COUNTER
MOV DX, TIME_PORT
MOV AL, 8:    ;; 8 SECONDS
OUT DX,AL
;; ADD YOUR APPLICATION HERE
MOV DX, TIMER_START
IN AL, DX.   ;; START COUNTER

;; ADD YOUR APPLICATION HERE
W_LOOP:
MOV DX, TIMER_STOP
IN AL, DX
MOV DX, TIMER_START
IN AL, DX.   ;; RESTART COUNTER

;; ADD YOUR APPLICATION HERE
CMP EXIT_AP, 0
JNE W_LOOP
MOV DX, TIMER_STOP
IN AL, DX
;; EXIT AP

```

Appendix B: I/O Address Map

System I/O Address Map

I/O Address Map	Description
000-01F	DMA Controller #1
020-021	Interrupt Controller # 1, Master
022-023	Chipset address
040-05F	System Timer
060-06F	Standard 101/102 keyboard Controller
070-07F	Real time Clock, NMI Controller
080-0BF	DMA Page Register
0A0-0BF	Interrupt Controller # 2
0C0-0DF	DMA Controller # 2
0F0-0F0	Clear Math Coprocessor Busy
0F1-0F1	Reset Math Coprocessor
0F8-0FF	Math Coprocessor
1F0-1F8	VIR BUS Master PCI IDE Controller
200-207	Game I/O
278-27F	Reserved
2F8-2FF	Serial Port 2
378-37F	Parallel Printer Port 1
3B0-3DF	Cyrix Graphic Adapter
3F0-3F7	Floppy Disk Controller
3F8-3FF	Serial Port 1
443	Watch dog timer enable
043/843	Watch dog timer disable

PNP audio I/O map range from 220~250H (16 bytes)

MPU-401 select from 300~330H (2 bytes)

DMA channel assignments

Channel	Function
0	Available
1	Audio*
2	Floppy disk (8-bit transfer)
3	Parallel**
4	Cascade for DMA controller 1
5	Audio*
6	Available
7	Available

* Audio DMA defaults setting: DMA 1.5
Audio High DMA select: DMA 1.3
Audio Low DMA select: DMA 5.6.7

** Parallel port DMA default setting: DMA 3
Parallel port DMA select: DMA 1.3

Interrupt assignments

Interrupt #	Interrupt source
NMI	Parity error detected
IRQ 0	System timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 8	Real-time clock
IRQ 9	Available
IRQ 10	Available
IRQ 11	Available
IRQ 12	PS/2 mouse
IRQ 13	Numeric data processor
IRQ 14	Fixed disk controller
IRQ 15	USB controller
IRQ 3	Serial communication port 2
IRQ 4	Serial communication port 1
IRQ 5	Audio*
IRQ 6	Diskette controller (FDC)
IRQ 7	Parallel port 1 (print port)

* Audio default setting: IRQ5

Ethernet IRQ is automatic set by the system

1st MB memory map

Address	Description
F000h-FFFFh	System ROM
D800h-EFFFh	Unused
C800h-D7FFh	Ethernet ROM*
C000h-C7FFh	Expansion ROM*
B800h-BFFFh	CGA/EGA/VGA text
B000h-B7FFh	Unused
A000h-AFFFh	EGA/VGA graphics
0000h-9FFFh	Base memory
D000-D400H	Available

* Default setting

** If Ethernet boot ROM is enabled.