



integration with integrity

User's Manual

Full-size PICMG 1.3 SBC 3307770

Version 1.0

---

---

## **Copyrights**

This manual is copyrighted and all rights are reserved. It does not allow any non authorization in copied, photocopied, translated or reproduced to any electronic or machine readable form in whole or in part without prior written consent from the manufacturer.

In general, the manufacturer will not be liable for any direct, indirect, special, incidental or consequential damages arising from the use of inability to use the product or documentation, even if advised of the possibility of such damages. The manufacturer keeps the rights in the subject to change the contents of this manual without prior notices in order to improve the function design, performance, quality and reliability. The author assumes no responsibility for any errors or omissions, which may appear in this manual, nor does it make a commitment to update the information contained herein.

## **Trademarks**

Intel is a registered trademark of Intel Corporation.

Award is a registered trademark of Award Software, Inc.

All other trademarks, products and or product's name mentioned herein are mentioned for identification purposes only, and may be trademarks and/or registered trademarks of their respective companies or owners.

---

# Table of Contents

## How to Use This Manual

<b>Chapter 1 System Overview .....</b>	<b>1-1</b>
1.1 Introduction.....	1-1
1.2 Check List .....	1-2
1.3 Product Specification .....	1-2
1.3.1 Mechanical Drawing.....	1-4
1.4 System Architecture .....	1-5
<b>Chapter 2 Hardware Configuration .....</b>	<b>2-1</b>
2.1 Jumper Setting .....	2-1
2.2 Connectors.....	2-2
<b>Chapter 3 System Installation.....</b>	<b>3-1</b>
3.1 Dual Core Intel® Xeon Processor LV.....	3-1
3.2 Main Memory .....	3-2
3.3 Installing Single Board Computer.....	3-3
3.3.1 Chipset Component Driver.....	3-4
3.3.2 ATI Radeon 7000 graphics processor .....	3-4
3.3.3 On-board 10/100/1000 Gigabit Ethernet Controller.....	3-4
3.4 Clear CMOS Operation.....	3-5
3.5 WDT Function.....	3-5
<b>Chapter 4 Troubleshooting .....</b>	<b>4-1</b>
4.1 Hardware Quick Installation .....	4-1
4.2 Frequency Asking Questions (FAQ).....	4-2
4.3 BIOS Setting.....	4-3
<b>Appendix A</b>	
<b>Appendix B</b>	

## How to Use This Manual

The manual describes how to configure your 3307770 system to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of Single Board Computer.

**Chapter 1 : System Overview.** Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this series model of single board computer.

**Chapter 2 : Hardware Configuration.** Shows the definitions and locations of Jumpers and Connectors that you can easily configure your system.

**Chapter 3 : System Installation.** Describes how to properly mount the CPU, main memory and Compact Flash to get a safe installation and provides a programming guide of Watch Dog Timer function.

**Chapter 4 : Troubleshooting.** Provides various useful tips to quickly get 3307770 running with success. As basic hardware installation has been addressed in Chapter 3, this chapter will basically focus on system integration issues, in terms of backplane setup, BIOS setting, and OS diagnostics.

The content of this manual and EC declaration document is subject to change without prior notice. These changes will be incorporated in new editions of the document. **Global American, Inc.** may make supplement or change in the products described in this document at any time.

Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site : <http://www.globalamericaninc.com/>

# Chapter 1

## System Overview

### 1.1 Introduction

Introduction of PICMG 1.3 (SHB Express) did help industries to have much higher I/O bandwidth along with rapidly speed up processor. However, the performance segmentation requirements are not satisfied yet since the extreme computing power and I/O throughput are not applicable. Same evolving path of Pentium 4 processor, the thermal design power of server grade processor almost hits the critical point that leads noise and vibration issues as well. Fortunately, Intel announced a new category Xeon processor that only generates 31W (2.0GHz), so the TDP of dual processor on-board down to 62W that similar to dual PIII processor. More than that, the Xeon processor LV also supports dual-core technology.

3307770, the PICMG 1.3 SHB supports dual Dual-Core Xeon processor LV (four cores) adopts Intel E7520 and 6300ESB chipset. The board equipped four DDR2 DIMM sockets allows up to 8GB, ECC registered memory for those applications that could benefit from it such as media streaming, data storage, machine image, telecommunication and broadcasting. I/O interfaces are improved at the same time like PCI Express x4 based dual Gigabit Ethernet controller; dual PCI Express x8 and one PCI x4 links.

Though PCI Express x4 or x8 add-in cards are not popular now, they can be very flexible to feature legacy I/O interconnection such as Hub Link on 3307770, a dual Xeon ePCI-X SHB that supports up to four PCI-X buses. Dual PCI Express-to-PCI-X bridge can be utilized to create same PCI-X buses and gather all PCI-X slots together for those add-in cards that have their own communication channel.

Graphics display is another advantage of this superior SHB because many industries need more than a display of most servers because those applications are image related. 3307770 equipped ATI Radeon 7000 graphics processor running on separated PCI bus. Default configuration with 32MB DDR video memory delivers enhanced 3D and 2D performance. Optional supports 64MB DDR video memory and dual VGA output.

## 1.2 Check List

The 3307770 package should cover the following basic items:

- ✓ One 3307770 Single Host Board
- ✓ Dual high-efficiency processor coolers
- ✓ One Serial port & Printer port cable kit (2.0mm pitch)
- ✓ One FDC cable (2.0mm pitch)
- ✓ One IDE cable
- ✓ One 7-pin SATA signal cable
- ✓ One Installation Resources CD-Title
- ✓ One booklet of 3307770 manual

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

## 1.3 Product Specification

- **Main processor**
  - Single or Dual Intel® Xeon processor LV
  - FSB: 667MHz
- **BIOS**

Phoenix (Award) system BIOS with 4Mb Flash ROM with easy upgrade function  
ACPI, DMI, Green function and Plug and Play Compatible
- **Main Memory**
  - Support dual-channel & signal channel DDR memory interface
  - ECC, registered only
  - Four DIMM sockets support DDR2 400 SDRAM up to 8GB System Memory
- **L2 Cache Memory**

Built-in Processor
- **Chipset**

Intel E7520 MCH and 6300 chipset
- **Bus Interface**

Follow PICMG 1.3 RC1.0 standard
- **PCI IDE Interface**

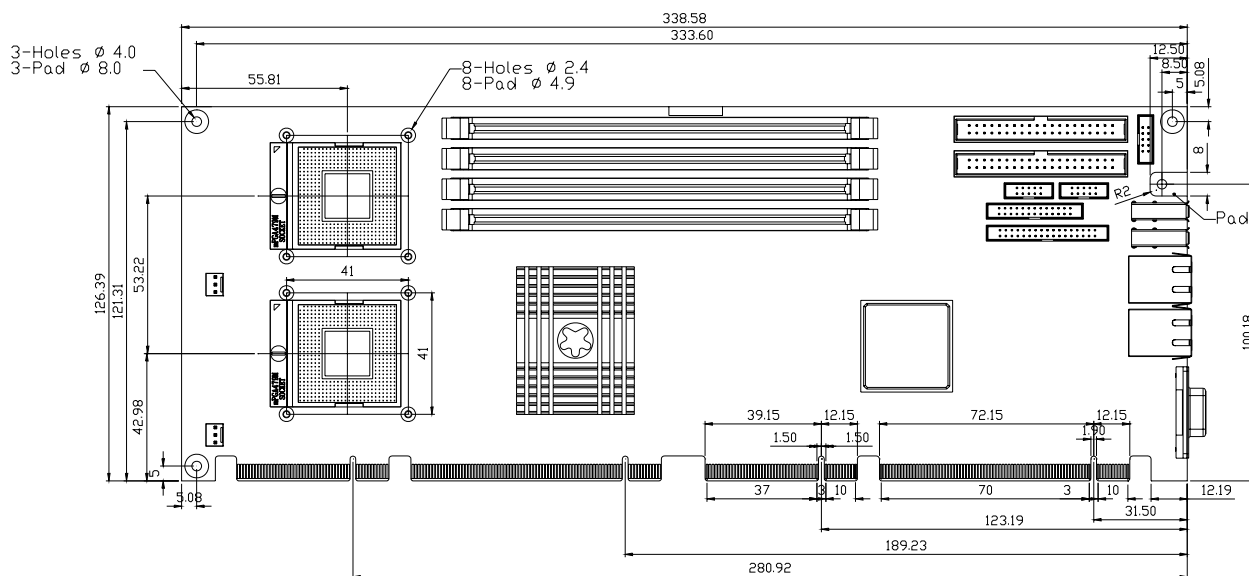
Support two enhanced IDE ports up to four HDD devices with PIO mode 4 and  
Ultra DMA/33/66/100 mode transfer and Bus Master feature
- **Floppy Drive Interface**

Support one FDD port up to two floppy drives and 5-1/4"(360K, 1.2MB), 3-1/2"  
(720K, 1.2MB, 1.44MB, 2.88MB) diskette format and 3-mode FDD

- **Serial Ports**  
Support two high-speed 16C550 compatible UARTs with 16-byte T/R FIFOs
- **Parallel Port**  
Support one parallel port with SPP, EPP and ECP modes
- **USB Interface**  
Support four USB (Universal Serial Bus) ports for high-speed I/O peripheral devices (Dual USB ports on bracket dedicated to Keyboard and Mouse)
- **PS/2 Mouse and Keyboard Interface**  
Support one 2x5-pin connector for PS/2 keyboard/mouse connection
- **Auxiliary I/O Interfaces**  
System reset switch, external speaker, Keyboard lock and HDD active LED, etc
- **Real Time Clock/Calendar (RTC)**  
Support Y2K Real Time Clock/Calendar with battery backup for 7-year data retention
- **CompactFlash**
  - True IDE mode, compatibles with the ATA/ATAPI-4 specification
  - One Type II CF socket on secondary IDE channel for supporting up to 1GB memory
- **On-board VGA**
  - ATI Radeon™ 7000 graphics processor with 32MB up to 64MB DDR memory features HYPER Z™ technology to increase effective memory bandwidth and PIXEL TAPESTRY® for fast image rendering, built-in DVD playback capability
  - Optional support TMDS interface for DVI display and second VGA display
- **On-board Ethernet LAN**
  - PCI Express x4 interface based Intel 82571 Ethernet controller to support dual Gigabit Ethernet MAC & PHY
  - Lower CPU utilization due to off-loading capabilities of transmit and receive IP, TCP and UDP checksum
- **Expansion Interface**  
Support three PCI Express x4, one PCI Express x8 links and four PCI devices
- **Cooling Fans**  
Support three 3-pin headers for CPU, and System fans
- **System Monitoring Feature**  
Monitor CPU temperature, system temperature and major power sources, etc
- **Bracket**  
Support dual Ethernet port with 2 indicators, dual USB ports, and one CRT port
- **Outline Dimension (L X W):**  
338.58mm (13.33") X 126.39mm (4.98")

- **Power Requirements:**
  - +12V (CPU) @2.8A; +12V (System) @0.6A;- +5V @3.6A
  - Test configuration:
    - CPU: Dual Dual-core Intel Xeon processor LV - 2GHz/667MHz FSB/2MB L2 Cache
    - Memory: DDR2 SDRAM 1GBx4
    - Primary Master IDE HDD: Seagate ST320413A
    - OS: Microsoft Windows XP + SP1
    - Test Programs: 3D Mark 2001 PRO for loading VGA and Burning Test V4.0 for loading CPU
    - Connected Fans: Only CPU fan connected
    - Run Time: 30 minutes
- **Operating Temperature:**
  - 5°C ~ 60°C (23°F ~ 140°F)
- **Storage Temperature:**
  - 20°C ~ 80°C
- **Relative Humidity:**
  - 0% ~ 95%, non-condensing

### 1.3.1 Mechanical Drawing



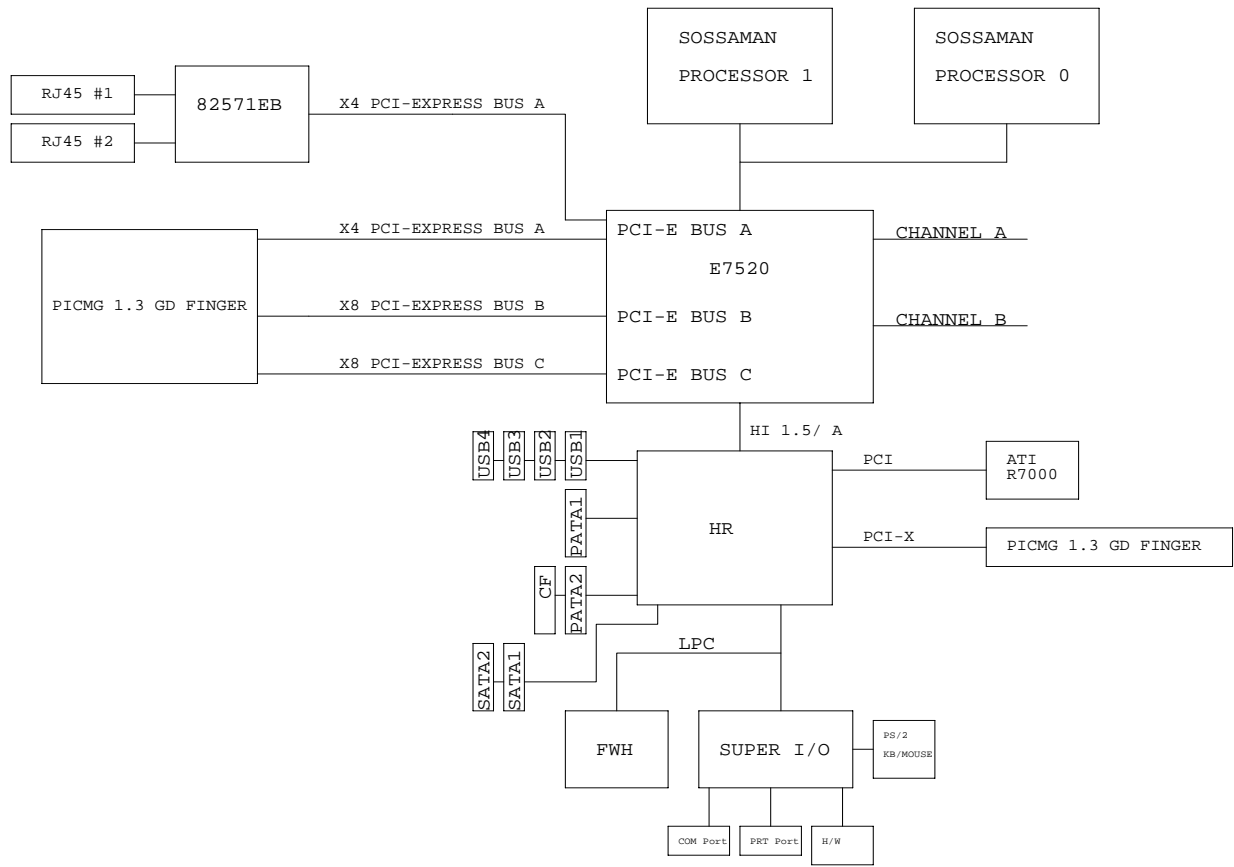


## 1.4 System Architecture

3307770 adopts Intel dual-processor server chipset, MCH (Memory Controller Hub) - E7520, and ICH (I/O Controller Hub) - 6300ESB. E7520 supports Intel Xeon processor LV, ECC & registered DDR2 400 system memory up to 8GB on four DIMM sockets, and three configurable PCI Express x8 links. The PCI Express link was configured as four PCI Express x4 and one PCI Express x8 thru BIOS. One PCI Express x4 was used to equipped Intel 82571 Dual Gigabit Ethernet Controller which takes advantage of short route to processor and memory to increase its performance. The other three PCI Express x4 and PCI Express x8 links are routed to gold finger for external expansion.

6300ESB is special chipset of Intel IPD which supports dual PCI buses, one bus was design to support external PCI devices and the other PCI bus was solely for on-board display controller - ATI Radeon 7000. ATI Radeon 7000 default equipped with 32MB DDR memory on-board and scalable to expand to 64MB for higher memory resolution and frequency support. Default configuration of display interface is one VGA connector on bracket, and it can be extended to have 2<sup>nd</sup> VGA or DVI-D extension. The ICH also features SATA, IDE, USB and LPC (Low Pin Count) interface for storage devices and Super I/O connections.

Super I/O - SMSC SCH5017 on LPC provides I/O interfaces such as PS/2 keyboard/mouse, dual serial ports, one parallel port, one FDD channel and functions like WatchDog timer and Hardware Monitoring.



**3307770 System Block Diagram**

## Chapter 2 Hardware Configuration

This chapter gives the definitions and shows the positions of jumpers, headers and connectors. All of the configuration jumpers on 3307770 are in the proper position. The default settings shipped from factory are marked with an asterisk (★).

### 2.1 Jumper Setting

In general, jumpers on the single board computer are used to select options for certain features. Some of the jumpers are designed to be user-configurable, allowing for system enhancement. The others are for testing purpose only and should not be altered. To select any option, cover the jumper cap over (SHORT) or remove (NC) it from the jumper pins according to the following instructions. Here NC stands for “Not Connect”.

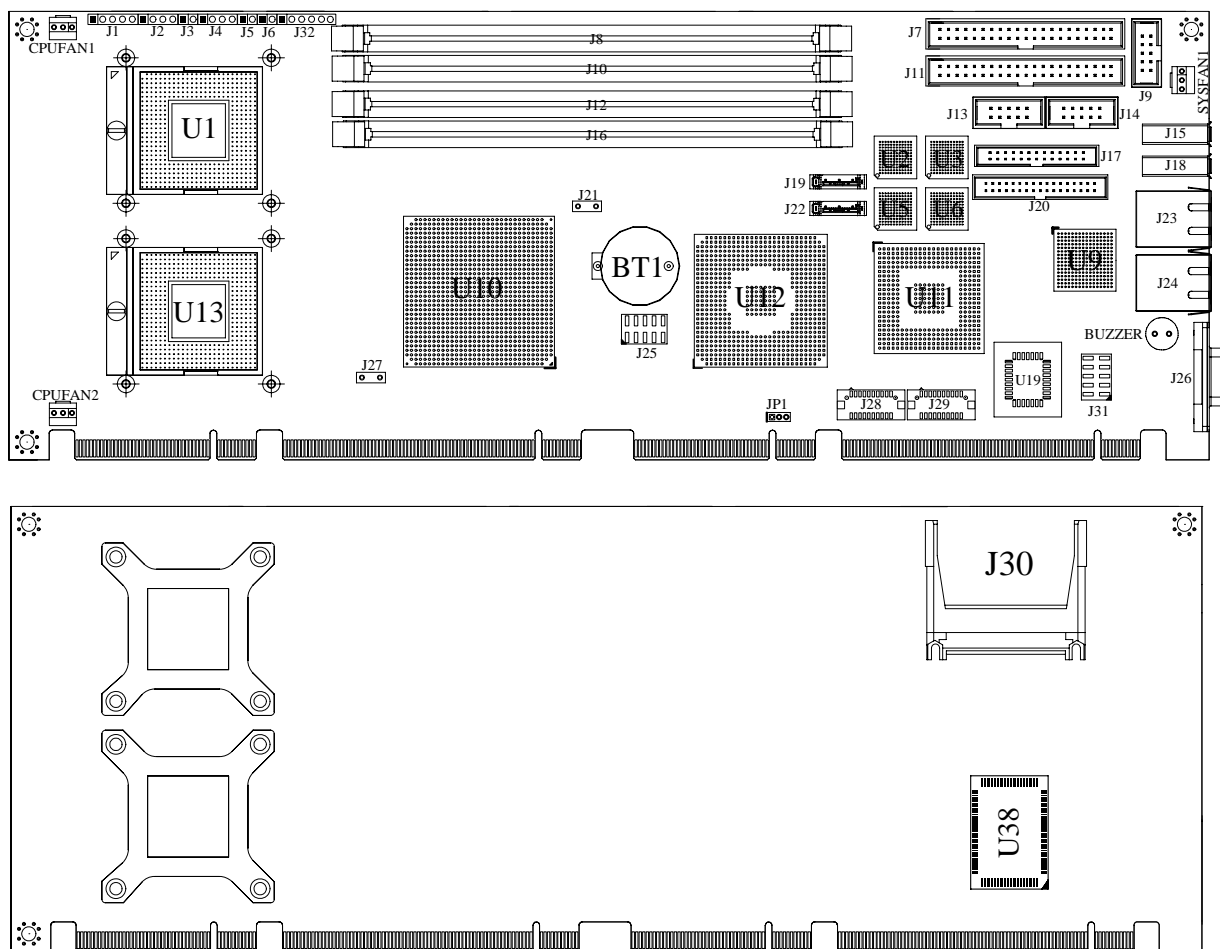


Figure 2-1 3307770 Jumper/Connector Location

**JP1 : RTC CMOS Clear Jumper Setting**

JP1	Function
1-2	Normal Operation ★
2-3	Clear CMOS Contents

**J6 : AT/ATX MODE SELECT**

J6	Function
Short	AT MODE
N/C	ATX MODE ★

**J32 : On Board VGA Setting**

J32	Function
1-2 N/C Short	VGA Controller Enabled ★ VGA Controller Disabled
3-4 N/C Short	VGA ID Enabled ★ VGA ID Disabled
5-6 N/C Short	VGA Interrupt Enabled ★ VGA Interrupt Disabled

**2.2 Connectors**

I/O peripheral devices and Flash disk will be connected to these interface connectors

Connector	Function	Remark
J1	PowerLED & Key-lock Header	5x1 pin header
J2	External Speaker Header	4x1 pin header
J3	HDD Active LED ( PATA/SATA/CF ) header	2x1 pin header
J4	Gigabit Ethernet Indication (ACT/LINK) Header	4x1 pin header
J5	Intruder Indication Header	2x1 pin header
J6	Power On/Off Header (AT MODE)	2x1 pin header
J7	Second IDE Connector	
J8	DDRII A-Channel	
J9	PS/2 Keyboard/Mouse Connector	
J10	DDRII B-Channel	
J11	Primary IDE Connector	
J12	DDRII A-Channel	
J13	COM1 Serial Port (RS-232)	
J14	COM2 Serial Port (RS-232)	

J15	USB Port 1 Connector	
J16	DDRII B-Channel	
J17	LPT Connector	
J18	USB Port 2 Connector	
J19	SATA HDD Port 1	
J20	Floppy Connector	
J22	SATA HDD Port 2	
J23	Gigabit Ethernet Port A	
J24	Gigabit Ethernet Port B	
J25	USB Port 3/4 Connector	
J26	D-SUB15 VGA Connector	
J28	Secondary VGA Display Connector	
J29	DVI-D Display Connector	
J30	CompactFlash	
J32	Port 80 Header	5x2 pin header
CPUFAN1	CPU0 Fan Power Connector	
CPUFAN2	CPU1 Fan Power Connector	
SYSFAN1	Chassis Fan Power Connector	

### Pin Assignments of Connectors

#### J1 : Power LED & Key-lock Header

PIN No.	Signal Description
1	Power LED Positive
2	N/C
3	Power LED Negative
4	Key-lock Signal
5	Ground

#### J2 : External Speaker Header

PIN No.	Signal Description
1	Speaker Signal
2	N/C
3	Ground
4	+5V

**J3 : HDD Active LED (PATA/SATA/CF) Header**

PIN No.	Signal Description
1	LED Positive
2	LED Negative

**J4 : Gigabit Ethernet LAN Indication (ACT/LINK) Header**

PIN No.	Signal Description
1	A Port ACT
2	A Port LINK
3	B Port ACT
4	B Port LINK

**J5 : Intruder Indication Header**

PIN No.	Signal Description
1	Intruder Signal
2	Ground

**J6 : Power On/Off Header (AT MODE)**

PIN No.	Signal Description
1	Power Button
2	Ground

**J7 : Secondary IDE Connector**

PIN No.	Signal Description	PIN No.	Signal Description
1	RESET#	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	N/C
21	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	Pull-down

29	DMA ACK#	30	Ground
31	INT REQ	32	N/C
33	SA1	34	ATA_SEL
35	SA0	36	SA2
37	CS0#	38	CS1#
39	HDD Active#	40	Ground

**J9 : PS/2 Keyboard / Mouse Connector**

PIN No.	Signal Description	PIN No.	Signal Description
1	MDAT	2	N/C
3	Ground	4	+5V
5	MCLK	6	KCLK
7	+5V	8	Ground
9	N/C	10	KDAT

**J11 : Primary IDE Connector**

PIN No.	Signal Description	PIN No.	Signal Description
1	RESET#	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	N/C
21	DMA REQ	22	Ground
23	IOW#	24	Ground
25	IOR#	26	Ground
27	IOCHRDY	28	Pull-down
29	DMA ACK#	30	Ground
31	INT REQ	32	N/C
33	SA1	34	ATA_SEL
35	SA0	36	SA2
37	CS0#	38	CS1#
39	HDD Active#	40	Ground

**J13 : COM1 Serial Port**

PIN No.	Signal Description
1	RTS
2	DTR
3	TXD
4	Ground
5	Ground
6	RXD
7	DSR
8	CTS
9	Ground
10	Ground

**J14 : COM2 Serial Port**

PIN No.	Signal Description
1	RTS
2	DTR
3	TXD
4	Ground
5	Ground
6	RXD
7	DSR
8	CTS
9	Ground
10	Ground

**J15 : USB Port 1 Connector**

PIN No.	Signal Description
1	+5V
2	USBN
3	USBP
4	Ground
5	Ground



**J17 : LPT Connector**

PIN No.	Signal Description	PIN No.	Signal Description
1	Strobe#	14	Auto Form Feed#
2	Data0	15	Error#
3	Data1	16	Initialization#
4	Data2	17	Printer Select IN#
5	Data3	18	Ground
6	Data4	19	Ground
7	Data5	20	Ground
8	Data6	21	Ground
9	Data7	22	Ground
10	Acknowledge#	23	Ground
11	Busy	24	Ground
12	Paper Empty	25	Ground
13	Printer Select	26	NC

**J18 : USB Port 2 Connector**

PIN No.	Signal Description
1	+5V
2	USBN
3	USBP
4	Ground
5	Ground

**J19 : SATA Port 1 Connector**

PIN No.	Signal Description
1	Ground
2	TxP
3	TxN
4	Ground
5	RxN
6	RxP
7	Ground

**J20 : Floppy Connector**

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	Density Select
3	Ground	4	N/C
5	Ground	6	N/C
7	Ground	8	Index#
9	Ground	10	Motor ENA#
11	Ground	12	Drive Select B#
13	Ground	14	Drive Select A#
15	Ground	16	Motor ENB#
17	Ground	18	Direction#
19	Ground	20	Step#
21	Ground	22	Write Data#
23	Ground	24	Write Gate#
25	Ground	26	Track 0#
27	Ground	28	Write Protect#
29	Ground	30	Read Data#
31	Ground	32	Head Select#
33	Ground	34	Disk Change#

**J22 : SATA Port 1 Connector**

PIN No.	Signal Description
1	Ground
2	TxP
3	TxN
4	Ground
5	RxN
6	RxP
7	Ground

**J23 : Gigabit Ethernet Port A**

PIN No.	Signal Description
1	MD2+
2	MD0+
3	MD0-
4	Termination To Ground
5	MD2-
6	MD3+
7	Termination To Ground
8	MD1+

9	MD1-
10	MD3-
11	ACT
12	LINK
13	SPEED 100
14	SPEED 1000
15	Termination To Ground
16	Termination To Ground

**J24 : Gigabit Ethernet Port B**

PIN No.	Signal Description
1	MD2+
2	MD0+
3	MD0-
4	Termination To Ground
5	MD2-
6	MD3+
7	Termination To Ground
8	MD1+
9	MD1-
10	MD3-
11	ACT
12	LINK
13	SPEED 100
14	SPEED 1000
15	Termination To Ground
16	Termination To Ground

**J25 : USB Port 3 & 4 Connector**

PIN No.	Signal Description	PIN No.	Signal Description
1	+5V	2	Ground
3	Port3 USBN	4	Ground
5	Port3 USBP	6	Port4 USBP
7	Ground	8	Port4 USBN
9	Ground	10	+5V

**J26 : D-SUB15 VGA Connector**

PIN No.	Signal Description
1	Red
2	Green
3	Blue
4	MONID0
5	Ground
6	Ground
7	Ground
8	Ground
9	+5V
10	Ground
11	MONID1
12	SDA
13	Hsync
14	Vsync
15	SCL
16	Case Ground
17	Case Ground

**J28 : Secondary VGA Connector**

PIN No.	Signal Description
1	Ground
2	+5V
3	Red
4	+5V
5	Ground
6	N/C
7	Green
8	Ground
9	Ground
10	SDA
11	Blue
12	SCL
13	Ground
14	Ground
15	Hsync
16	N/C
17	Ground
18	Ground
19	Vsync
20	N/C

**J29 : DVI-D Display Connector**

PIN No.	Signal Description
1	Data0-
2	Data0+
3	Ground
4	Ground
5	Data1-
6	Data1+
7	Ground
8	Ground
9	Data2-
10	Data2+
11	Ground
12	Ground
13	CLK-
14	CLK+
15	+5V
16	+5V
17	DVIDDCLK
18	DVIDDATA
19	HPD
20	N/C

**J30 : CompactFlash**

PIN No.	Signal Description	PIN No.	Signal Description
1	Ground	2	D3
3	D4	4	D5
5	D6	6	D7
7	CS#0	8	A10
9	ATA_SEL	10	A9
11	A8	12	A7
13	VCC	14	A6
15	A5	16	A4
17	A3	18	A2
19	A1	20	A0
21	D0	22	D1
23	D2	24	IOCS16
25	CD2	26	CD1
27	D11	28	D12
29	D13	30	D14
31	D15	32	CS1
33	VS1	34	IOR

35	IOW	36	WE#
37	INTRQ	38	VCC
39	CSEL	40	VS2
41	RESET	42	IOCHRDY
43	INPACK	44	REQ
45	DASP	46	PDIAG
47	D8	48	D9
49	D10	50	Ground

**J32 : PORT 80 Header**

PIN No.	Signal Description	PIN No.	Signal Description
1	LAD0	6	+3.3V
2	LAD1	7	Reset
3	LAD2	8	LF_FWH
4	LAD3	9	CLK
5	N/C	10	Ground

**CPUFAN1 : CPU 1 Fan Power Connector**

PIN No.	Signal Description
1	Ground
2	+12V
3	Sensor Signal

**CPUFAN2 : CPU 2 Fan Power Connector**

PIN No.	Signal Description
1	Ground
2	+12V
3	Sensor Signal

**SYSFAN1 : Chassis Fan Power Connector**

PIN No.	Signal Description
1	Ground
2	+12V
3	Pull-up 4.7K ohm

## Chapter 3

### System Installation

This chapter provides instruction to set up the system. The additional information is able to help you install onboard PCI Express device and handle WDT operation in software programming.

#### 3.1 Dual Core Intel® Xeon Processor LV

##### Installing mPGA Socket 479

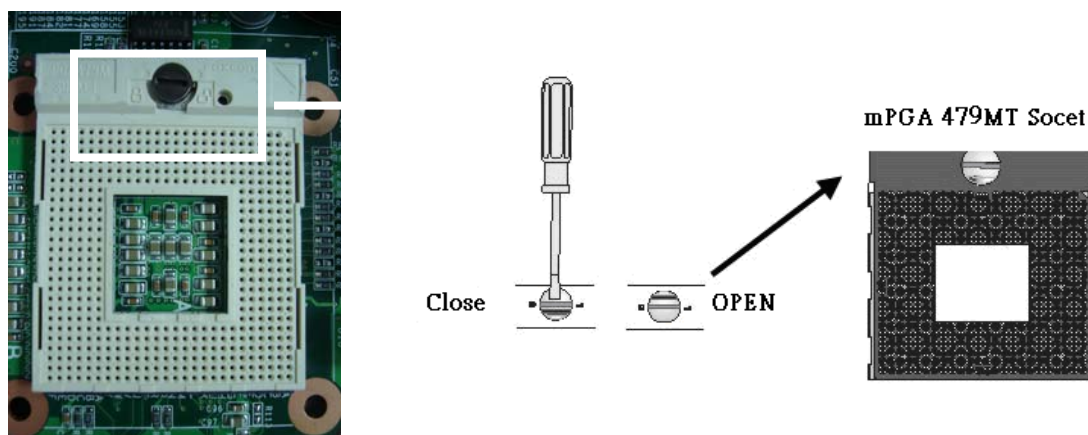


Figure 1. CPU socket demonstration

- 1) Disengaging the Socket Actuator, use a screwdriver to disengage (open) the socket actuator.
- 2) Align the processor pins with pin holes on the socket. Make sure that the notch corner or dot mark (pin 1) of the CPU corresponds to the socket's bevel end. Then press the CPU gently until it fits into place. If this operation is not easy or smooth, don't do it forcibly. You need to check and rebuild the CPU pin uniformly.



Figure 2. CPU's pin 1 mark

- 3) While gently holding the processor down with your finger, secure the processor in the socket by closing the socket actuator with a screwdriver.
- 4) Follow the installation guide of cooling fan or heat sink to mount it on CPU surface and lock it on the socket 479M.

To un-install the current processor, use a screwdriver to disengage (open) the socket actuator, as shown in Figure 1. The socket actuator should open after only a half turn or so, and you should then be able to remove the processor with your fingers.

### **CPU Application**

- Single or Dual Intel® Xeon processor LV
- FSB: 667MHz

Caution ! If user needs to employ single processor on 3307770, please kindly adopt processor on U1 actuator; don't configure at U13, which will be not available operation.

### **CPUFAN1&2: 12V CPU Cooler Power connector**

PIN No.	Signal Description
1	Ground
2	+12V
3	Sensor signal

## **3.2 Main Memory**

3307770 supports 4 x 240-pin DIMM sockets support 1.8V of dual-channel DDR2 400 with ECC & registered function, the maximum memory size can be up to 8GB. Auto detecting memory clock is according to BIOS CMOS settings.

For system compatibility and stability, don't use memory module without brand. You can also use single-sided or double-sided DIMM in both slots.

Precaution for the contact and lock integrity of memory module with socket, it will impact on the system reliability. Follow normal procedures to install your DRAM module into memory socket. Before locking, make sure that all modules have been fully inserted into the card slots.



### **Dual Channel DDR2 DIMMs**

Dual Channel DDR2 memory technology doubles the bandwidth of memory bus. Adequate or higher bandwidth of memory than processor would increase system performance. To enable Dual Channel DDR2 memory technology, you have to install dual identical memory modules in both memory sockets. Following tables show bandwidth information of different processor and memory configurations.

<b>Memory Frequency</b>	<b>Dual Channel DDR2 Bandwidth</b>	<b>Single Channel DDR2 Bandwidth</b>
400 MHz	12.8 GB/s	6.4 GB/s
533 MHz	17.2 GB/s	8.6 GB/s

#### **Note:**

To maintain system stability, don't change any of DRAM parameters in BIOS setup to upgrade your system performance without acquiring technical information.

### **CPU FSB / Memory Frequency synchronization**

Support different memory frequencies depending on the CPU front side bus and the type of DDR2 DIMM.

<b>CPU FSB</b>	<b>Memory Frequency</b>
667MHz	400/533 MHz

## **3.3 Installing Single Board Computer**

To fabricate 3307770 into standard chassis or proprietary environment, you need to perform the following:

- Step 1: Check all jumpers setting on proper position.
- Step 2: Install and configure CPU and memory module on right position.
- Step 3: Place 3307770 into the dedicated position in your system.
- Step 4: Attach cables to existing peripheral devices and secure it.

Please follow instruction 3.3.1~3.3.3 to install hardware drive before all kind of hardware, cable kits and power source already been ready.

### 3.3.1 Chipset Component Driver

3307770 is based on Intel® Xeon processor LV, Intel® E7520 and 6300ESB chipsets. Some elderly operation systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 2000 /XP / Server 2003, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in 3307770 CD-title.

### 3.3.2 ATI Radeon 7000 graphics processor

3307770 equipped with ATI Radeon 7000 graphics processor to running on separated PCI bus. Default configuration with 32MB up to 64MB DDR video memory delivers enhanced 3D and 2D performance. Optional supports 64MB DDR video memory and dual VGA output.

#### Drivers Support

Please find chipset driver from 3307770 CD-title. Drivers support Windows 2000 / XP System 32-bit & Windows XP System 64-bit.

Windows 2000/XP (32bit): Please execute Installation for Windows 2000/Server 2003/XP System 32-bit file to start graphics driver installation.

Windows XP (64-bit): Please execute Installation for Windows XP System 64-bit file to start graphics driver installation.

### 3.3.3 On-board 10/100/1000 Gigabit Ethernet Controller

One PCI Express x4 interface Intel® 82571EB Dual Port Gigabit Ethernet Controller attaches to E7520 which takes advantage of short route to processor and memory to increase it performance.

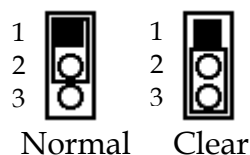
#### LED Indicator (for LAN status)

3307770 provides two LED indicators to report Intel® 82571EB Gigabit Ethernet operation status. Please refer to the table below as a quick reference guide.

82571EB	Color	Name of LED	Operation of Ethernet Port		
			Linked		Active
Status LED	Yellow	LAN Linked & Active LED	On		twinkling
Speed LED	Orange	LAN speed LED	Giga Mbps	100 Mbps	10 Mbps
	Green		Orange	Green	Off

### 3.4 Clear CMOS Operation

The following table indicates how to enable/disable CMOS Clear Function hardware circuit by putting jumpers at proper position.



JP1	Function
1-2 Short	Normal Operation ★
2-3 Short	Clear CMOS contents

### 3.5 WDT Function

The working algorithm of the WDT function can be simply described as a counting process. The Time-Out Interval can be set through software programming. The availability of the time-out interval settings by software or hardware varies from boards to boards.

3307770 allows users control WDT through dynamic software programming. The watchdog timer (WDT) is integrated into E6300ESB I/O Controller Hub ( ICH ) and provides a resolution that ranges from 1 msecond to 10 minutes. The WDT provides a two-stage timer implementation : the first stage can be used to generate an IRQ,SMI or SCI interrupt after the programmed time interval has expired ; the second stage can be used to generate a hard system reset.

The WDT uses a 35-bit down-counter, which is loaded with the value from the first preload register. The timer is then enabled and starts its down counting, which is the first stage. When the host fails to reload the WDT before the 35-bit down-counter reaches zero, the WDT generates an internal interrupt. After the interrupt is generated, the WDT loads the value from the second preload register into 35-bit down-counter and starts counting down. The WDT is now in the second stage. If the host fails to reload the WDT before the second stage times out, a system RESET is generated.

E6300ESB pin M24 ( WDTOUT) is active low, the watchdog timer is a hardware timer which resets the SHB if the timer is not refreshed by software periodically. The timer is typically used to restart a system in which an application becomes hung on an external event. When the application is hung, it no longer refreshes the timer. The watchdog timer then times out and resets the SHB. For more information about WDT, please refer to Intel E6300ESB data sheet. <http://www.intel.com>

## Chapter 4

# Troubleshooting

This chapter provides a few useful tips to quickly get 3307770 running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

### 4.1 Hardware Quick Installation

#### CPU Installation

Due to the design of 3307770, it is based on Intel® dual-processor server chipset. Before installing CPU, please ensure the processor chosen is the right one. Regarding to CPU information, please refer to Intel® website; <http://www.intel.com>

#### CPU power source connector

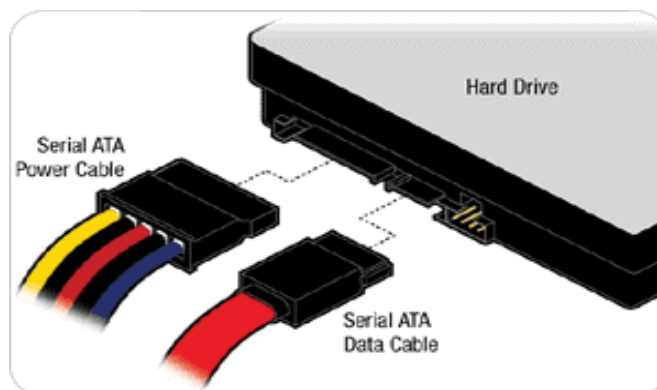
3307770 doesn't equip +12V power connector for CPU processor, but when user adopts 3307770 to configure on backplane, please kindly connect +12V power to backplane, which is necessary for operation; exactly, even if user doesn't adopt CPU power, the SBC is still operating, but it would be not stable at full loading circumstance.

#### ATX Power Setting

3307770 is able to support ATX power source; besides, user can simulate by jump setting (J6) for AT type. Please refer description of chapter 2 jumper setting.

#### Serial ATA Hardware Installation

Unlike IDE bus, each Serial ATA channel can only connect to single SATA hard disk at simultaneously; there are two SATA connectors on motherboard, **J19**, **J22**. The installation of Serial ATA is simpler and easier than IDE, because SATA hard disk doesn't require setting up Master and Slave, which can reduce mistake of hardware installation. All you need to do is to plug in two cables on SATA HDD (power and data-cable).



## 4.2 Frequency Asking Questions (FAQ)

**Q: I have one IDE hard disk and one SATA hard disk. How can I assign SATA Hard disk as First boot device?**

**A:** User just only adjusts the jump of IDE HDD to set at master device. SATA HDD will be automatically detected. Eventually, please refer 4.5 “Advanced BIOS Features”, and then enter “Hard Disk Boot Priority” to set HDD device boot priority.

**Q: If I wanna adopt CF card on 3307770, and equip one IDE HDD and one CD-ROM devices at simultaneously, why the BIOS diagnostic is not regular?**

**A:** Don't adopt CF card and employ IDE HDD and CD-ROM at J7 (channel 1) simultaneously, because those devices use the same channel form J7; user can adopt CF card and only one IDE device by J7 connector; otherwise, it will occur conflict situation. (Caution! Master channel is form CF storage, so user must set slave for IDE HDD at simultaneously at J7)

**Q: Since 3307770 has two Gigabit Ethernet onboard, could 3307770 support Intel® fault tolerance function, or what people called teaming function?**

**A:** Yes, 3307770 fully supports teaming function without any required change. What has to be done is to install Intel® PRO drivers we provided in Global American Driver CD, and then go to device manager to enable teaming function.

**Q:I am using an ATA-66 (or 100) hard drive, how can I know that ATA-66 function is enabled?**

**A:** You need to use the 80-pin ATA-66 IDE flat cable to have this function. During the POST phase, you can see ATA-66 (or 100) message while hard drive is being detected. Besides, after installing Microsoft® series OS successfully, you also need to Install ATA-66/100 driver to active ATA-66/100 function.

### **4.3 BIOS Setting**

It is assumed that users have correctly adopted modules and connected all the devices cables required before turning on ATX power. CPU, CPU Fan, 240-pin DDR2 SDRAM, keyboard, mouse, floppy drive, IDE CD-ROM, SATA hard disk, printer, VGA connector, device cables are good examples that deserve attention. With no assurance of properly and correctly accommodating these modules and devices, it is very possible to encounter system failures that result in malfunction of any device.

To make sure that you have a successful start with 3307770, it is strongly recommended, when going with the boot-up sequence, to hit “DEL” key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

#### **Loading the default optimal setting**

When prompted with the main setup menu, please scroll down to “**Load Optimal Defaults**”, press “Enter” and “Y” to load in default optimal BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Global American has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

#### **Auto Detect Hard Disks**

In the BIOS => Standard CMOS setup menu, pick up any one from Primary/Secondary Master/Slave IDE ports, and press “Enter”. Setup the selected IDE port and its access mode to “Auto”. This will force system to automatically pick up the IDE devices that are being connected each time system boots up.

### **Improper disable operation**

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the floppy drive, COM1/COM2 ports, Parallel port, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

- Disable COM1 serial port to release IRQ #4
- Disable COM2 serial port to release IRQ #3
- Disable Parallel port to release IRQ #7
- Disable PS/2 mouse to release IRQ #12,
- Etc...

A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Timer
IRQ #1	Keyboard Event
IRQ #2	Usable IRQ
IRQ #3	COM 2
IRQ #4	COM 1
IRQ # 5	Usable IRQ
IRQ #6	Diskette Event
IRQ #7	Usable IRQ
IRQ #8	Real-Time Clock
IRQ #9	Usable IRQ
IRQ #10	Usable IRQ
IRQ #11	Usable IRQ
IRQ #12	IBM Mouse Event
IRQ #13	Coprocessor Error
IRQ #14	Hard Disk Event
IRQ #15	Usable IRQ

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

### **System Memory Address Map**

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used.

<b>Memory Area</b>	<b>Size</b>	<b>Device Description</b>
0000 - 003F	1K	Interrupt Area
0040 - 004F	0.3K	BIOS Data Area
0050 - 006F	0.5K	System Data
0070 - 0BE3	45K	DOS
0BE4 - 0E1B	8.9K	Program Area
0E1C - 9D66	573K	[Available]
9D67 -9EFF	6.4K	Program Area
= Conventional memory ends at 636K =		
9F00 - 9FBF	3K	VGA Graphics
9FC0 - 9FFF	1K	Unused
A000 - AFFF	64K	VGA Text
B000 - B7FF	32K	Video ROM
B800 - BFFF	32K	Unused
C000 - CAFF	44K	High RAM
CB00 - EFFF	148K	Unused
F000 - FFFF	64K	ROM



**Interrupt Request Lines (IRQ)**

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

<b>IRQ#</b>	<b>Current Use</b>	<b>Default Use</b>
IRQ 0	System ROM	System Timer
IRQ 1	System ROM	Keyboard Event
IRQ 2	[Unassigned]	Usable IRQ
IRQ 3	System ROM	COM 2
IRQ 4	System ROM	COM 1
IRQ 5	[Unassigned]	Usable IRQ
IRQ 6	System ROM	Diskette Event
IRQ 7	[Unassigned]	Usable IRQ
IRQ 8	System ROM	Real-Time Clock
IRQ 9	[Unassigned]	Usable IRQ
IRQ 10	[Unassigned]	Usable IRQ
IRQ 11	[Unassigned]	Usable IRQ
IRQ 12	DRMOUSE	IBM Mouse Event
IRQ 13	System ROM	Coprocessor Error
IRQ 14	System ROM	Hard Disk Event
IRQ 15	[Unassigned]	Usable IRQ

---

Any advice or comments about our products and service, or anything we can help you with please don't hesitate to contact with us. We will do our best to support your products, projects and business.



Address: Global American, Inc.  
17 Hampshire Drive  
Hudson, NH 03051

Telephone: Toll Free (U.S. Only) 800-833-8999  
(603)886-3900

FAX: (603)886-4545

Website: <http://www.globalamericaninc.com>  
Support: Technical Support at Global American

