WINGTOP

SH-5960 M/B

ENDAT-3601M/T

User's Manual

Rev. 1A

For 3601M PCB ver. 1F Only
For 3601T PCB ver. 1F Only

08/25/2003

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Installation Notice

The manufacturer recommends using a grounded plug to ensure proper motherboard operation. Care should be used in proper conjunction with a grounded power receptacle to avoid possible electrical shock. All integrated circuits on this motherboard are sensitive to static electricity. To avoid damaging components from electrostatic discharge, please do not remove the board from the anti-static packing before discharging any static electricity to your body, by wearing a wrist-grounding strap. The manufacturer is not responsible for any damage to the motherboard due to improper operation.

Specification:

This manual covers two different layout models, and the respective board layouts are shown in chapter 1-4. Please refer to the following description to make sure which model on hand before using.

	ENDAT-3601M	ENDAT-3601T
System Chipset	VIA VT8601A + VIA VT82C686B (APOLLO PLE-133)	
Micro Processor	Embedded Low Power Consumption VIA Eden 533 MHz , C3-800 MHz or 1 GHz CPU	Support Socket 370 PIII Tualatin CPU
Memory	2 DIMM Socket up to 1GB SDRAM (max)	
LAN / Dual LAN	1 or 2 Realtek 8139x or Intel 82559ER 10/100 BaseT LAN onboard	
LCD / VGA	Support 24 Bits TFT LCD Panel with 2D / 3D Graphic Controller, SMA up to 8MB	
IDE Connector	2 x Enhance IDE Connectors Support UDMA 33/66/100	
FDD Connector	1 x FDD Connector	
Expansion Slot	1x 188Pin EISA Connector for PCI/ISA expansion.	
Flash Memory	Reserved Socket for DOC 2000 support	
I/O PORTS	4 COMs with +5V, +12V power selector; 2LPTs; 1IrDA; 4 USBs	
TFT LCD Connector	44 Pin Box Header	
LVDS output	Optional LVDS for LCD output via 16 Pin Header.	
Watch Dog Timer	Optional programmable Watch Dog Timer support 1-255s.	
RS-422/485	Optional via COM2	
Power Supply	AT or ATX Power support.	
Form Factor	LPX / 220mm x 235mm (8.6" x 9.2")	

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Chapter 1. Introduction

In order to cope with the challenges of the heating issues and demand of much more diminutive embedded system in diverse application, ENDAT-3601M system board provides the ultimate solution by integrating with VIA's technology low power consumption VIA C3 series CPU and VIA EDEN fanless ESP series CPU. Along with the Intel 0.13u announced socket 370 type CPU, ENDAT-3601T offers the function for supporting Tualatin type CPU. ENDAT-3601M/T series provides the assorted functions for various applications such as high-end POS systems, kiosks, networking systems, controlling terminals and other embedded systems.

ENDAT-3601M/T is a LPX format system board uses VIA chipsets built-in VGA and Audio feature onboard, support TFT TTL LCD feature with LVDS interface as feature option; integrated Super-I/O support 4 Serial with power selector and 2 parallel ports, built-in 1 or 2 Realtek 8139x LAN chipset with RJ45 Jack for 10BaseT/ 100BaseT. The option of Intel 82559/ER chip is also provided for the 1 x LAN or dual LAN support. This system board offers the highest performance PC specification in the industry with embedded low power consumption VIA EDEN Fanless ESP series CPU ESP5000, and with the option of the higher performed VIA C3 800MHz CPU or VIA C3 1GHz CPU.

ENDAT-3601M/T provides the option of integrating Watch Dog Timer for ideal unattended terminals. To offer better flexibility, it also provides the options of riser card for PCI or ISA expansion through a 188-pin slot. This CPU board is fully compatible with industry standards, adding many technical enhancements and are fully compatible with thousand of software application such as WIN 95, 98, WIN NT 3.x / 4.x, WIN 2000, WIN ME, WIN CE (.NET), Linux, UNIX, Novell…etc. The control logic provides high-speed performance for the most advanced multi-user, multitasking application available today. "Tomorrow's PC technology is here today".

1-1. Features

Basic Feature:

- ENDAT-3601M, embedded VIA C3 ™, Eden ™, Ezra ™ Low Power EBGA processors.
- ENDAT-3601T, support socket 370 Intel Pentium III / Celeron FCPGA / FCPGA2 / Intel Tualatin / VIA C3 CPUs
- 133 / 100 MHz CPU Front Side Bus (FSB)
- DRAM interface synchronous or pseudo synchronous with CPU FSB speed of 133 / 100 / 66 MHz Mixed 1M / 2M / 4M / 8M / 16M / 32MxN DRAMs
- 2 DIMM 168 Pin socket supported up to 1GB
- 3.3V DRAM interface with 5V tolerant inputs
- Support two channel up to four UltraDMA-100 / 66 / 33 enhance IDE
- AC-97 link.
- On-board built-in 4 USB ports with 1.1 compliant
- Integrated Super-I/O support 4 Serial with power selector and 2 parallel ports.
- System Hardware monitoring
- RTC / CMOS
- PCI-2.0 compliant, 32 bit with 5V tolerant inputs.
- 188pin expansion slot for both PCI and ISA Bus signals.
- On-board support Realtek or Intel 82559/ER 10/100 LAN adapter with RJ-45 port.
- Integrated AGP Bus 2D / 3D graphic accelerator.
- Windows 95 OSR-2 VXD, and integrated Windows 98 / ME / 2000 / NT 4.0 miniport driver support
- Supports 2, 4 and 8 Mbytes of Frame Buffer with share memory.
- Advanced support Power Management
- CRT Power Management (VESA™ DPMS)

Optional for Flat Panel Interface (TTL or LVDS)

The board is designed to support industry standard TFT panel via 44pin connector or LVDS transmitters. The interface supports both 18-bit and 24-bit display modes. Optionally, an 18+18 panel can be supported utilizing external latches.

Optional Features

- Supports second LAN adapter with Realtek or Intel chip
- Supports RS422/RS485 interface with COM2
- Support LVDS LCD panel
- Supports Audio function (via AV Card Kit)
- Supports TV-Out feature (via TV-Out adapter Kit)
- Support Watch Dog Timer (1-255sec programmable)
- Support BOOT ROM

Ordering information:

ENDAT-3601M

1. ENDAT-3601M-1R-8: Support 1 Realtek LAN, C3 800MHz
2. ENDAT-3601M-1i-8: Support 1 Intel LAN, C3 800MHz

3. ENDAT-3601M-2R-8: Support 2 Realtek LAN, C3 800MHz
4. ENDAT-3601M-2i-8: Support 2 Intel LAN, C3 800MHz

5. ENDAT-3601M-1RL-8: Support 1 Realtek LAN + LVDS, C3 800MHz
6. ENDA-3601M-1iL-8: Support 1 Intel LAN + LVDS, C3 800MHz

7. ENDAT-3601M-2RL-8: Support 2 Realtek LAN + LVDS, C3 800MHz

8. ENDAT-3601M-2iL-8: Support 2 Intel LAN + LVDS, C3 800MHz

Note: The standard version of ENDAT-3601M is embedded with VIA C3 800MHz, other optional CPUs will be provided upon request.

ENDAT-3601T

9. ENDAT-3601T-1R: Support 1 Realtek LAN
10. ENDAT-3601T-1i: Support 1 Intel LAN

11. ENDAT-3601T-2R: Support 2 Realtek LAN
12. ENDAT-3601T-2i: Support 2 Intel LAN

13. ENDAT-3601T-1RL: Support 1 Realtek LAN + LVDS
14. ENDA-3601T-1iL: Support 1 Intel LAN + LVDS

15. ENDAT-3601T-2RL: Support 2 Realtek LAN + LVDS
16. ENDAT-3601T-2iL: Support 2 Intel LAN + LVDS

1-2. Unpacking

The motherboard comes securely packaged in a sturdy cardboard shipping carton. In addition to the User's Manual, the motherboard package includes the following items:

- ENDAT-3601M/T System Board
- HDD/FDD Cables
- TV-Out adapter / cable **(Optional)**
- Audio Kit **(Optional)**
- LCD cable **(Optional)**
- IDE Driver includes: Drivers for Windows NT 3.x/4.x, Windows 95, 98, 2000, Win Me, Novell Netware and AMI FLASH ROM utilities.
- Driver utilities for on-board VGA drivers, LAN adapter and DOC 2000

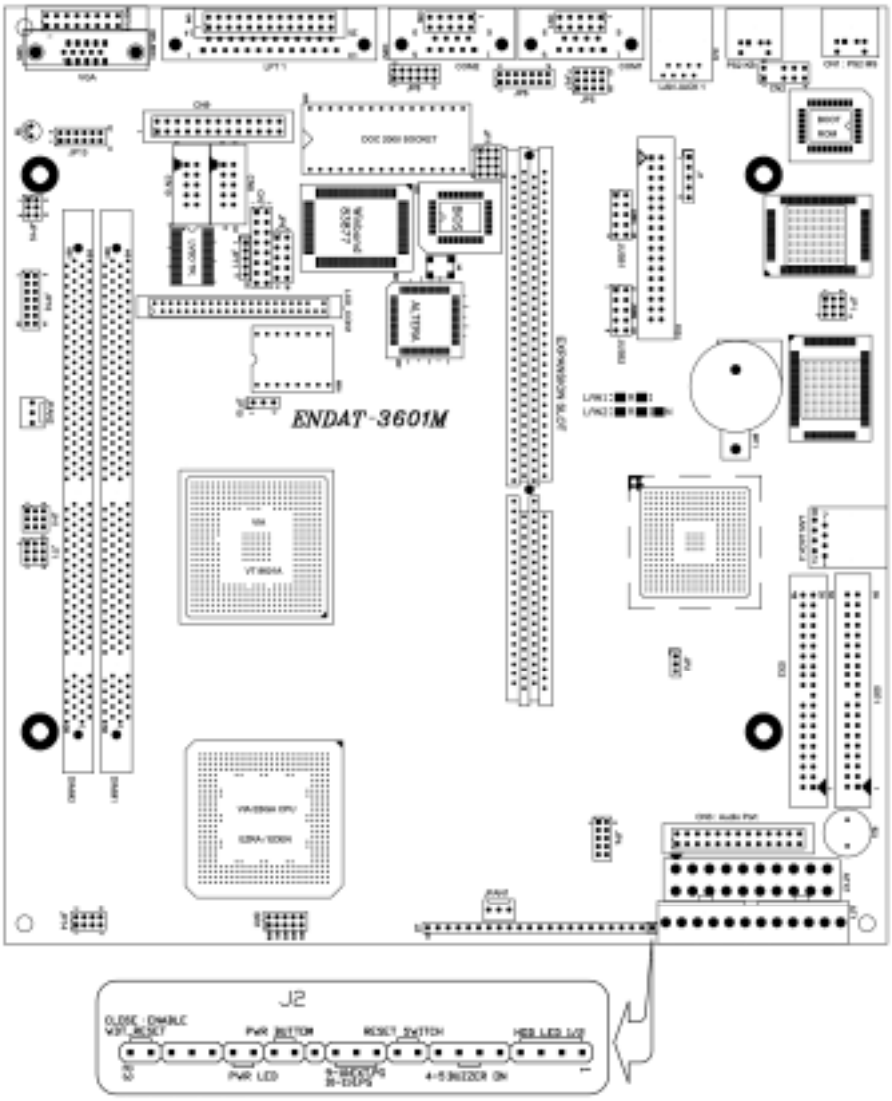
If any of these items are missing or damage, please contact the dealer from whom you purchase the motherboard. Save the shipping material and carton in the event that you want to ship or store the board in the future.

Note: Leave the motherboard in its original package until you are ready to install it!

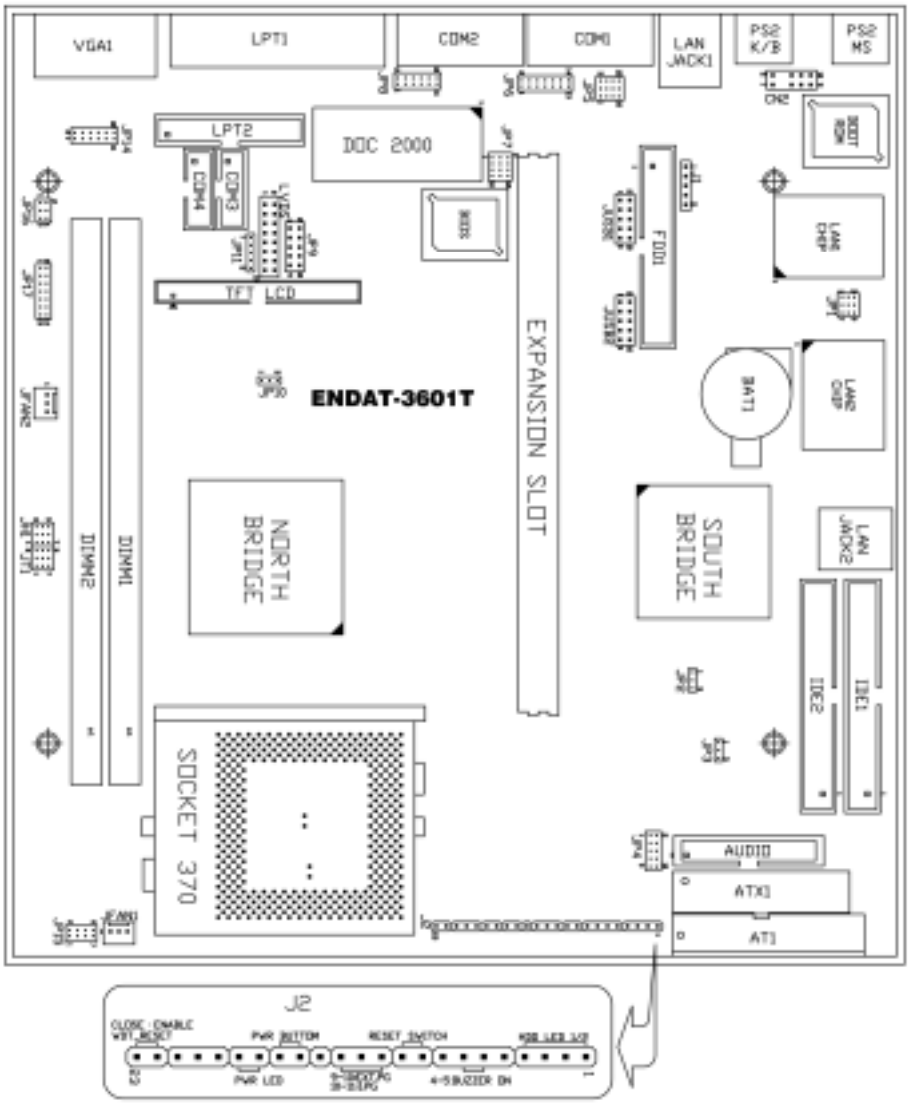
1-3. Electrostatic Discharge Precautions

Make sure you properly ground yourself before handling the motherboard, or other system components. Electrostatic discharge can easily damage the components. Note: You must take special precaution when handling the motherboard in dry or air-conditioned environments.

1-4. ENDAT-3601M



1-5. ENDAT-3601T



Chapter 2. Setting up the CPU Motherboard

2-1. Jumpers and Connectors (ENDAT-3601M)

Jumpers/Connectors Overview:

Function	Jumpers/Connectors
Cooling Fan Connector	JFAN1, JFAN2
Power Supply: Power Good	**J2:** Pin 11~13
ATX Power On/Off Switch	**J2:** Pin 15~16
Audio Port Connector	CN3
2nd Printer Port	CN9
LAN Adapter Disable/Enable	JP1
COM3 Port	CN8
COM4 Port	CN10
COM Ports Power Selector (COM1, 2, 3, 4)	JP8, JP13
RS232/RS422/RS485 Selector (COM2)	JP5, JP6
DiskOnChip Memory Address	JP4
LCD: TFT LCD Panel Connector	LCD_CON1
LVDS LCD Output Port	CN7
TFT LCD Voltage Selector	JP15
Clear CMOS	JP2
Factory Setting	JP7, JP16, JP9, JP17, JT1, JH1, JP18, JFSB0, JP11, JFSB1, JP3, J2: PIN19~21.
PS/2 Mouse/KB Pin Header	CN2
IR	J1
USB Port	JUSB1, JUSB2
FDD Connector	FDD1
IDE 1, IDE2	IDE1, IDE2
Header for Case Panel	**J2**
IDE 1 LED	**J2:** Pin 1, Pin 2
IDE 2 LED	**J2:** Pin 3, Pin 4
External Speaker	**J2:** Pin 5, Pin 8
Buzzer On/Off	**J2:** Pin 6, Pin 7
Hardware Reset Switch	**J2:** Pin 9, Pin 10
External Power Good	**J2:** Pin 11, Pin 12
Internal Power Good	**J2:** Pin 12, Pin 13
ATX Power Supply On/Off Switch	**J2:** Pin 15, Pin 16
Power LED	**J2:** Pin 17, Pin 18
WDT Function Enable/Disable	**J2:** Pin 22, Pin 23

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JP1: On-board LAN Disable/Enable

Pin No.	LAN1	LAN2
Enable	Close Pin 1-2	Close Pin 4-5
Disable	Close Pin 2-3	Close Pin 5-6

JP1: 7-8 default

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JP2: CMOS Data Clear:

Pin 1-2 *	Normal
Pin 2-3	Clear CMOS Data

JP4: DiskOnChip Memory Address Selector

JP4		Memory Address
1-2	**7-8**	0C800H-0C9FFH
1-2	**9-10**	0CC00H-0CDFFH
3-4	**7-8**	0D000H-0D1FFH
3-4	**9-10**	0D400H-0D5FFH
5-6	**7-8**	0D800H-0D9FFH**(Default)**

JP5, JP6: RS232 / 422 / 485 Selector for COM2

TYPE	JP5	JP6
RS-232	1-2, 4-5, 7-8, 10-11	1-2
RS-422/485 Full Duplex	2-3, 5-6, 8-9, 11-12	3-4, 7-8

**** Make sure the port mode is set up correctly before installing any peripherals.***
***** Please also refer to the Appendix B for the pin assignments***

JP8 (COM1, 2) / JP13 (COM3, 4) Voltage Selector:

Voltage	COM1(JP8)	COM2(JP8)	COM3(JP13)	COM4(JP13)
+12V(DC)	1-2	7-8	1-2	7-8
R.I.	3-4	9-10	3-4	9-10
+5V(DC)	5-6	11-12	5-6	11-12

J2's Pin 11~13: On-board Power Good Selector

Pin 11-12*	Using External Power Good
Pin 12-13	Using On Board Power Good

JFAN1, JFAN2: CPU / 2nd Cooling Fan Connector

Pin No.	
Pin 1	Sensor Pin.
Pin 2	+12V
Pin 3	GND

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J2: Case Panel Connection:

Pin No.	Description
1,2	HDD_LED –/+
3,4	HDD_LED –/+
5,8	External Speaker
6,7	Onboard Buzzer
9-10	Hardware RESET
11-12	External Power Good.
12-13	Internal Power Good.
15-16	ATX Power On/Off
17-18	Power LED (14:LED+, 15:LED–)
22-23	Close: Enable WDT function

J1: IR Pin Header.

Pin No.	Function
1	+5V(DC)
2	N.C.
3	IRRX
4	GND.
5	IRTX

CN3: Audio Output Port connector via AV Card Kit (Optional)

Please close pin13-14 to disable onboard Audio features if the AV Card Kit is not inserted onto the **CN3** connector. If AV card kit is inserted, please make sure the **BIOS** is enabled with the audio function, since **LPT2** and **audio** function can not be used in the same time.

CN3: Audio Port.

Pin No.			
1	BITCLK	2	GND
3	SDIN	4	N.C.
5	SDIN2	6	N.C.
7	SDOUT	8	N.C.
9	SYNC	10	GND
11	–ACRST	12	GND
13	SPEAK	14	Strapping Low
15	+5V(DC)	16	+12V(DC)
17	JBCY	18	JAB2
19	JBCX	20	JAB1
21	JACY	22	JBB2
23	JACX	24	JBB1
25	MSO	26	MSI

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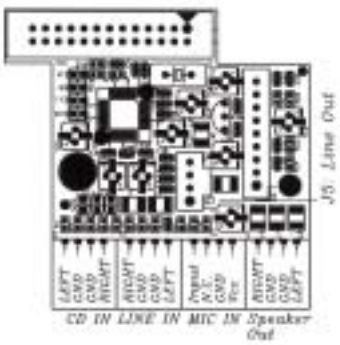

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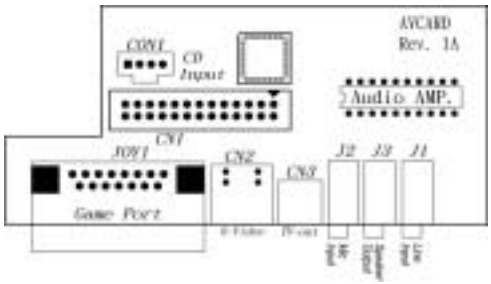

AV Card

CN2: Pin Header for PS2 KB / MS

Pin No.			
1	KB Data	2	MS Data
3	KEY	4	KEY
5	GND	6	GND
7	+5V(DC)	8	+5V(DC)
9	KB_CLK	10	MS_CLK

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Printer (LPT1/LPT2) Port

Pin No.	Description	Pin No.	Description
1	STB#	10	ACK#
2	PD0	11	BUSY
3	PD1	12	PE

4	PD2	13	SLCT
5	PD3	14	AFD#
6	PD4	15	ERR#
7	PD5	16	INIT#
8	PD6	17	SLIN#
9	PD7	18-25	GND

JP15 Voltage Selector for LCD panel.

Pin No.	Signal
2-4	VDDLCD is 5V
4-6*	VDDLCD is 3.3V
1, 3, 5	Factory default

Caution: Improper setting will damage LCD panel.

CN7: LCD - LVDS Output.

Pin No.	Signal	Pin No.	Signal
1	Y0–	2	Y2–
3	Y0+	4	Y2+
5	Y1–	6	RESERVED
7	GND	8	Y3–
9	Y1+	10	Y3+
11	CK–	12	LVDS PANEL VDD
13	CK+	14	DISP_OFF
15	VBL	16	GND

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LCD_CON1: TFT LCD Panel Port

Pin No.	Signal	Pin No.	Signal
1	VBL	2	VBL
3	GND	4	GND
5	VDDLCD	6	VDDLCD
7	ENPVEE	8	GND
9	FPD 23	10	FPD 22
11	FPD 17	12	FPD 16
13	FPD 11	14	FPD 10
15	FPD 9	16	FPD 8
17	FPD 21	18	FPD 20
19	FPD 15	20	FPD 14
21	FPD 7	22	FPD 6
23	FPD 5	24	FPD 4
25	FPD 19	26	FPD 18
27	FPD 13	28	FPD 12
29	FPD 3	30	FPD 2
31	FPD 1	32	FPD 0
33	GND	34	GND
35	P_CLK	36	FLM
37	DE	38	LP
39	GND	40	VDDLCD
41	VDDLCD	42	**KEY**
43	VDDLCD	44	VDDLCD

Please double-check the insertion and orientation of the LCD cable before applying power. Improper installation will result in permanent damage LCD panel.

JUSB1/JUSB2: USB Port

Pin No.			
1	USB_VCC	2	USB_VCC
3	USBD 0/2-	4	USBD 1/3-
5	USBD 0/2+	6	USBD 1/3+
7	USB_GND	8	USB_GND
9	USB_GND	10	USB_GND

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COM1, 2 Ports

Pin No.	Description	Pin No.	Description

1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

2-2. Jumpers and Connectors (ENDAT-3601T)

Jumpers/Connectors Overview:

Function	Jumpers/Connectors
Cooling Fan Connector	JFAN1, JFAN2
Power Supply: Power Good	**J2:** Pin 11~13
ATX Power On/Off Switch	**J2:** Pin 15~16
Audio Port Connector	CN3
2nd Printer Port	CN9
LAN Adapter Disable/Enable	JP1
COM3 Port	CN8
COM4 Port	CN10
COM Ports Power Selector (COM1, 2, 3, 4)	JP8, JP14
RS232/RS422/RS485 Selector (COM2)	JP5, JP6
DiskOnChip Memory Address	JP4
LCD: TFT LCD Panel Connector	LCD_CON1
LVDS LCD Output Port	CN7
TFT LCD Voltage Selector	JP16
Clear CMOS	JP2
Factory Setting	JP7, JP9, JP17, JT1, JH1, JP15, JP18, JFSB0, JP11, JFSB1, JP3, J2: PIN19~21
PS/2 Mouse/KB Pin Header	CN2
IR	J1
USB Port	JUSB1, JUSB2
FDD Connector	FDD1
IDE 1, IDE2	IDE1, IDE2
Header for Case Panel	**J2**
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External Speaker	**J2:** Pin 5, Pin 8
Buzzer On/Off	**J2:** Pin 6, Pin 7
Hardware Reset Switch	**J2:** Pin 9, Pin 10
External Power Good	**J2:** Pin 11, Pin 12
Internal Power Good	**J2:** Pin 12, Pin 13
ATX Power Supply On/Off Switch	**J2:** Pin 15, Pin 16
Power LED	**J2:** Pin 17, Pin 18
WDT Function Enable/Disable	**J2:** Pin 22, Pin 23

JFSB0 / JFSB1 = CPU Clock Frequency

JFSB0	JFSB1	CPU BUS CLOCK	PCI CLOCK
2-3	2-3	66MHz	33.3MHz
2-3	1-2	100MHz	33.3MHz
1-2	1-2	133MHz	33.3MHz
OPEN	OPEN	AUTO	AUTO

JP1: On-board LAN Disable/Enable

Pin No.	LAN1	LAN2
Enable	Close Pin 1-2	Close Pin 4-5
Disable	Close Pin 2-3	Close Pin 5-6

JP1 :7-8 default

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JP2: CMOS Data Clear:

Pin 1-2 *	Normal
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JP4: DiskOnChip Memory Address Selector

JP4		Memory Address
1-2	**7-8**	0C800H-0C9FFH
1-2	**9-10**	0CC00H-0CDFFH
3-4	**7-8**	0D000H-0D1FFH
3-4	**9-10**	0D400H-0D5FFH
5-6	**7-8**	0D800H-0D9FFH**(Default)**

JP5, JP6: RS232 / 422 / 485 Selector for COM2

TYPE	JP5	JP6
RS-232	1-2, 4-5, 7-8, 10-11	1-2
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R.I.	3-4	9-10	3-4	9-10
+5V(DC)	5-6	11-12	5-6	11-12

J2's Pin 11~13: On-board Power Good Selector

Pin 11-12*	Using External Power Good
Pin 12-13	Using On Board Power Good

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JFAN1, JFAN2: CPU / 2nd Cooling Fan Connector

Pin No.	Function
Pin 1	Sensor Pin.
Pin 2	+12V
Pin 3	GND

J2: Case Panel Connection:

Pin No.	Description
1,2	HDD_LED –/+
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5,8	External Speaker
6,7	Onboard Buzzer
9-10	Hardware RESET
11-12	External Power Good.
12-13	Internal Power Good.
15-16	ATX Power On/Off
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22-23	Close: Enable WDT function

J1: IR Pin Header.

Pin No.	Function
1	+5V(DC)
2	N.C.
3	IRRX
4	GND.
5	IRTX

CN3: Audio Output Port connector via AV Card Kit (Optional)

Please close pin13-14 to disable onboard Audio features if the AV Card Kit is not inserted onto the **CN3** connector. If AV card kit is inserted, please make sure the **BIOS** is enabled with the audio function, since **LPT2** and **audio** function can not be used in the same time.

CN3: Audio Port.

Pin No.			
1	BITCLK	2	GND
3	SDIN1	4	N.C.
5	SDIN2	6	N.C.
7	SDOUT	8	N.C.
9	SYNC	10	GND

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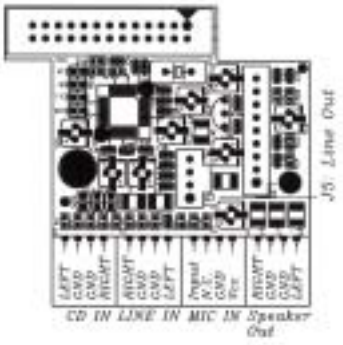
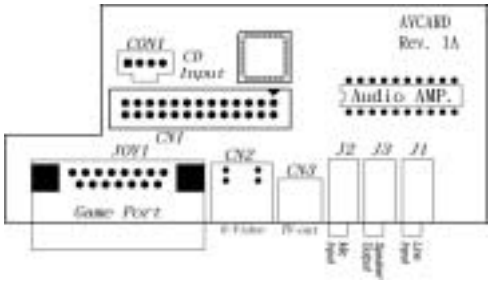
11	–ACRST	12	GND
13	SPEAK	14	Strapping Low
15	+5V(DC)	16	+12V(DC)
17	JBCY	18	JAB2
19	JBCX	20	JAB1
21	JACY	22	JBB2
23	JACX	24	JBB1
25	MSO	26	MSI



UC-A001



AV Card

CN2: Pin Header for PS2 KB / MS

Pin No.			
1	KB Data	2	MS Data
3	KEY	4	KEY
5	GND	6	GND
7	+5V(DC)	8	+5V(DC)
9	KB_CLK	10	MS_CLK

ENDAT-3601T

Printer (LPT1/LPT2) Port

Pin No.	Description	Pin No.	Description
1	STB#	10	ACK#
2	PD0	11	BUSY
3	PD1	12	PE
4	PD2	13	SLCT
5	PD3	14	AFD#
6	PD4	15	ERR#
7	PD5	16	INIT#
8	PD6	17	SLIN#
9	PD7	18-25	GND

JP16 Voltage Selector for LCD panel.

Pin No.	Signal
2-4	VDDLCD is 5V
4-6*	VDDLCD is 3.3V
1, 3, 5	Factory default

Caution: Improper setting will damage LCD panel.

CN7: LCD - LVDS Output.

Pin No.	Signal	Pin No.	Signal
1	Y0–	2	Y2–
3	Y0+	4	Y2+
5	Y1–	6	RESERVED
7	GND	8	Y3–
9	Y1+	10	Y3+
11	CK–	12	LVDS PANEL VDD
13	CK+	14	DISP_OFF
15	VBL	16	GND

ENDAT-3601T

LCD_CON1: TFT LCD Panel Port

Pin No.	Signal	Pin No.	Signal
1	VBL	2	VBL
3	GND	4	GND
5	VDDLCD	6	VDDLCD
7	ENPVEE	8	GND
9	FPD 23	10	FPD 22
11	FPD 17	12	FPD 16
13	FPD 11	14	FPD 10
15	FPD 9	16	FPD 8
17	FPD 21	18	FPD 20
19	FPD 15	20	FPD 14
21	FPD 7	22	FPD 6
23	FPD 5	24	FPD 4
25	FPD 19	26	FPD 18
27	FPD 13	28	FPD 12
29	FPD 3	30	FPD 2
31	FPD 1	32	FPD 0
33	GND	34	GND
35	P_CLK	36	FLM
37	DE	38	LP
39	GND	40	VDDLCD
41	VDDLCD	42	**KEY**
43	VDDLCD	44	VDDLCD

Please double-check the insertion and orientation of the LCD cable before applying power. Improper installation will result in permanent damage LCD panel.

ENDAT-3601T

JUSB1/JUSB2: USB Port

Pin No.			
1	USB_VCC	2	USB_VCC
3	USBD 0/2–	4	USBD 1/3–
5	USBD 0/2+	6	USBD 1/3+
7	USB_GND	8	USB_GND
9	USB_GND	10	USB_GND

COM1, 2 Ports

Pin No.	Description	Pin No.	Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

2-3. Installing Memory

The ENDAT-3601M/T CPU board offers two 168pin DIMM sockets supporting up to 1GB of memory. The DIMM memory can be 100MHz (PC-100) or 133 MHz (PC-133).

2-4. Shared VGA Memory

The ENDAT-3601M/T is using built-in AGP VGA controller with share memory architecture (SMA) - **AGP mode with 2MB to 8MB** of system memory. The amount of video memory on motherboard determines the number of colors and the video graphic resolution.

2-5. Installing Riser Card

Installing Riser Card (Max. 3 PCI Slot on Riser Card)

PCI Slot	INT	ADSEL
PCI 1	A,B,C,D	AD24(Onboard LAN)
PCI 2	B,C,D,A	AD23
PCI 3	C,D,A,B	AD22
PCI 4	D,A,B,C	AD21

There are two different riser cards that can be fitted to ENDAT-3601M/T CPU board. The first one is a 98pin ISA only Bus riser card (traditional ISA Bus riser card), the second one is a 188pins PCI/ISA riser card.

Please note: PCI/ISA riser cards jumper settings have to be matched with the motherboard INT/AD-select jumper.

The default INT/AD-select for ENDAT-3601M/T All-In-One motherboard is listed in the above table. However, it could be revised by changing **JP14 setting** for different INT/AD-select. The following table shows the variable configurations:

INT/AD Configurations:

Expansion for PCI Slot	* Close 1-2	Close 2-3
Expansion PCI 1	INT =A,B,C,D	INT = B,C,D,A
Expansion PCI 2	INT = B,C,D,A	INT = C,D,A,B
Expansion PCI 3	INT = C,D,A,B	INT = D,A,B,C
Expansion PCI 4	INT = D,A,B,C	INT = A,B,C,D

Note: Even change the setting for different configuration the AD-select should be match to each INT. Please using the default setting as above if you are not familiar with the configuration of raiser card and add-on card.

Caution: Do not insert PCI Bus Add-On cards directly into the on-board expansion slot!

2-6. Assigning IRQs for Expansion Cards

Some expansion cards require an IRQ (Interrupt request vector) to operate. Generally, each IRQ must be exclusively assigned to specific use. In a standard design, there are 16 IRQ available with 11 of them already in used by other part of the system.

Both ISA and PCI expansion cards may need to use IRQ. Cards installed in the ISA Expansion Bus have the first priority to use the available system IRQs. Any remaining IRQ then, may be assigned to this PCI Bus. Microsoft's Diagnostic (MSD.EXE) utility included in the Windows directory can be used to see their map. Make sure that there are no two devices using the same IRQ in the system. Otherwise this will cause the system to hang up or give unexpected results. To simplify the process, this motherboard complies with the Plug and Play (PnP) specifications, which was developed to allow automatic system configuration. Whenever a PnP-compliant card is added to the system, PnP cards and IRQs are automatically assigned if available. If the system has both Legacy and PnP ISA cards installed. IRQs are assigned to PnP cards from those not used by Legacy cards. The PCI and PnP configuration in the BIOS setup utility can be used to indicate which IRQs have being used by Legacy cards. For older Legacy cards that do not work with the BIOS, you can contact your vendor for an ISA configuration utility.

An IRQ number is automatically assigned to PCI expansion cards after those used by Legacy and PnP ISA cards. In the PCI

Bus design, the BIOS is automatically assigned an IRQ to a PCI slot that has a card in it which requires an IRQ. To install a PCI card, you need to set the correct "ADSEL" and "INT" (interrupt) assignment. Please refer to "Chapter 2-5" Installing a Riser Card for detail assignments.

IRQ	Status	Assignment
0	Used	Timer
1	Used	Keyboard
2	Used	Second 8259
3	Used	COM2
4	Used	COM1
5	Used	COM3
6	Used	Floppy Disk
7	Used	LPT1
8	Used	RTC
9	Used	LPT2 or Audio
10	Used	COM4
11	Used	LAN Adapter (on board)
12	Used	PS/2 Mouse
13	Used	Coprocessor
14	Used	Hard Disk (IDE 1)
15	Used	Reserved (IDE 2)

2-7. Assigning DMA Channels for ISA Cards

Since ISA cards, both Legacy and PnP may also need to use a DMA (direct memory access) channel, DMA assignments for this motherboard are handled the same way as the IRQ assignment process described above. You can select a DMA channel in the PCI and PnP configuration section of the BIOS setup utility. In the BIOS setup, you should choose "Yes" for those IRQ's and DMA's you wish to reserve for Legacy cards.

Chapter 3. AMI BIOS SETUP

AMI BIOS Setup Main Menu

Standard CMOS Setup
Advanced CMOS Setup
Advanced Chipset Setup
Power Management Setup
PCI / Plug and Play Setup
Peripheral Setup
Hardware Monitor Setup
Auto-Detect Hard Disks
Change User Password
Change Supervisor Password
Auto Configuration with Optimal Settings
Save Settings and Exit
Exit Without Saving

Use the CMOS setup program to modify the system parameters to reflect the environment installed in your system and to customize the system as desired. Press the <DEL> key to enter into the CMOS setup program when you turn on the power. Settings can be accessed via arrow keys. Press <Enter> to choose an option to configure the system properly.

In the main menu, press F10 or "Save Settings and Exit" to save your changes and reboot the system. Choose "Exit Without Saving" to ignore the changes and exit the setup procedure. Pressing <ESC> at anywhere during the setup will return to the main menu.

"Advanced CMOS Setup", "Advanced Chipset Features" and "PCI / Plug and Play Setup" requires board knowledge on PC/AT system architecture and VIA chipset specification. They intend to be used by well-trained technicians and experienced users. Incorrect setup could cause system malfunctions.

3-1. Quick Setup

In most cases, you can quickly configure the system by using the following procedure. The manufacturer highly recommends that you use "Quick Setup" for setting CMOS to avoid any unpredictable results.

1. Choose "Standard CMOS Setup" from the main menu, to configure the date and time, hard disk type, floppy disk drive type etc.
2. Choose "Auto Configuration with Optimal Setting" from the menu for loading the defaults parameters that is set by the manufacturer for the most stable normal configuration.
3. Press F10 or "Save Setting and Exit" to save the changes and reboot the system.

3-2. Description of the BIOS Setup Option

Please make clear the means of those optional parameters. Improper settings will cause the system to hang up or perform poorly. Most items are clearly understood from the screen prompt or "Help" by function key "F1". The manufacturer highly recommends that "Default" settings have been used to avoid any unpredictable results.

3-3. Advanced CMOS Setup

Advanced CMOS Setup

Quick Boot	Enabled
1st Boot Device	Floppy
2st Boot Device	IDE-0
3st Boot Device	CD/DVD-0
4st Boot Device	Disabled
Try Other Boot Devices	Yes
Floppy Access Control	Read-Write
Hard Disk Access Control	Read-Write
S.M.A.R.T. for Hard Disks	Disabled
BootUp CPU Speed	High
BootUp Num-Lock	On
Floppy Drive Swap	Disabled
Floppy Drive Seek	Disabled
PS/2 Mouse Support	Enabled
Primary Display	VGA/EGA
Password Check	Setup
Boot To OS/2	No
System BIOS Cacheable	Enabled
C000,32k Shadow	Cached
C800,16k Shadow	Disabled
CC00,16k Shadow	Disabled
D000,16k Shadow	Disabled
D400,16k Shadow	Disabled
D800,16k Shadow	Disabled
DC00,16k Shadow	Disabled

S.M.A.R.T. For Hard Disks

Set this option to "*Enabled*" to permit AMIBIOS to use the SMART (Self-Monitoring, Analysis, and Reporting Technologies) protocol for reporting system information. The settings are "*Enabled*" or "*Disabled*".

Password Check

This option enables password checking every time the system boots or when you run AMIBIOS Setup. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if AMIBIOS is executed. See the Advanced Setup chapter for instructions on changing a password.

Boot To OS/2

Set this option to "*Enabled*" if running OS/2 operating system and using more than 64 MB of system memory on the motherboard. The settings are "*Enabled*" or "*Disabled*".

System BIOS Cacheable

When set to "*Enabled*", the contents of the F0000h system memory segment can be read from or written to cache memory. The contents of this memory segment are always copied from the BIOS ROM to system RAM for faster execution. The settings are "*Enabled*" or "*Disabled*".

3-4. Details of the Advanced Chipset Setup

Advanced Chipset Setup

******** DRAM Timing ********	
Configure SDRAM Timing by SPD	Enabled
DRAM Frequency	133MHz
SDRAM CAS# Latency	3
DRAM Bank Interleave	Disabled
DRAM Page Mode	Disabled
Memory Hole	Disabled
AGP Read Synchronization	Enabled
AGP Fast Write	Enabled
AGP Aperture Size	128MB
AGP Master 1 W/S Write	Disabled
AGP Master 1 W/S Read	Disabled
PCI Delay Transaction	Enabled
USB Controller	ALL USB Port
USB Device Legacy Support	All Device
Port 64/60 Emulation	Disabled

Configure SDRAM Timing by SPD

SPD (Serial Presences Detect) is a device in memory module for storing the module information such as DRAM timing and chip parameters. If this option is enabled, BIOS will access SPD automatically to configure module timing. If disabled, DRAM timing can be configured manually.

- **SDRAM Frequency**
  Allows you to set the SDRAM frequency with user set by SPD Disable. <Choices: 66MHz / 100MHz / 133MHz>
  Caution: Improper setting will cause unpredicted result
- **SDRAM CAS# Latency** With SDRAM Timing by SPD disabled, you can select
  The SDRAM CAS# (Column Address Strode) latency manually. Choices: 2 Clocks; 3 Clocks

SDRAM Bank Interleave
This function is to enable / disable SDRAM Bank Interleave function. Choices: Disabled / Enabled

Memory Hole
To enabled / disabled (default) the support of Memory Hole which is reserved for ISA card.

AGP Read Synchronization
To enabled / disabled the AGP Read Synchronization function.

AGP Fast Write
This function allows enabling / disabling the AGP Fast Write function

AGP Aperture Size
This function allows adjusting AGP Aperture Size from 2MB to 256MB to increased VGA performance.

AGP Master 1 W/S Write
Allows you to enable / disable the AGP Master Write with 1 wait state

AGP Master 1 W/S Read
To enable / disable the AGP Master Read with 1 wait state

PCI Delay Transaction
To enable / disable the AGP Fast Write function

USB Controller
To enable / disable the on board USB Port function
Choices: USB Port 0&1 / USB Port 2&3 / All USB Device

USB Device Legacy Support
To enable / disable the on board USB support device with
Choices: Disabled / No Mice / All Device

Port 64/60 Emulation
To enable / disable the on board USB to support Mouse under NT4.0.
The default setting is "Disabled", Choices: Enabled / Disabled

3-5. Power Management Setup

Power Management Setup

Power Management/APM	Enabled
Video Power Down Mode	Stand By
Hard Disk Power Down Mode	Suspend
Standby Time Out (Minute)	Disabled
Suspend Time Out (Minute)	Disabled
Display Activity	Ignore
IRQ3	Monitor
IRQ4	Monitor
IRQ5	Ignore
IRQ6	Ignore
IRQ7	Monitor
IRQ8	Ignore
IRQ9	Ignore
IRQ10	Ignore
IRQ11	Ignore
IRQ12	Ignore
IRQ13	Ignore
IRQ14	Monitor
IRQ15	Ignore
IRQ6	Ignore
IRQ7	Monitor
IRQ8	Ignore
IRQ9	Ignore
IRQ10	Ignore
IRQ11	Ignore
IRQ12	Ignore
IRQ13	Ignore
IRQ14	Monitor
IRQ15	Ignore
Power Button Function	On/Off
Restore on AC/Power Loss	Power On

Power Management/APM
Set this option to *Enabled* to enable the chipset power management and APM (Advanced Power Management) features. The settings are *Enabled* or *Disabled.*

Video Power Down Mode
This option specifies the power state that the video subsystem enters when AMIBIOS places it in a power saving state after the specified period of display inactivity has expired. The settings are *Standby, Suspend* or *Disabled.*

Hard Disk Power Down Mode
This option specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired. The settings are *Disabled, Standby,* or *Suspend.*

Standby/Suspend Timer Unit
This option specifies the unit of time used for the Standby and Suspend timeout periods. The settings are *4 msec, 4 sec, 32 sec,* or *4 min.*

Display Activity
When set to *Monitor,* this option enables event monitoring on the video display. If set to *Monitor* and the computer is in a power saving state, AMIBIOS watches for display activity. The computer enters the Full On state if any activity occurs. AMIBIOS reloads the Standby and Suspend timeout timers if display activity occurs. The settings are *Monitor* or *Ignore.*

Power Button Function

This option specifies how the power button mounted externally on the computer chassis is used. The default setting is *On/Off*.

Restore on AC/Power Loss

Power "Off" Set Restore on AC/Power Loss is Power off.
Power "On" Set Restore on AC/Power Loss is Power on. **(Default Value)**

3-6. PCI / Plug and Play Setup

This section describes the configuration of the PCI bus system. PCI is a system that allows I/O device to operate at speeds nearing the speed of the CPU itself, when communicating with its own special components. This section covers some very technical items. It is strongly recommended that only experienced users make any changes to the default settings.

PCI / Plug and Play Setup

Plug and Play Aware O/S	No
Clear NVRAM	No
OnChip VGA Frame Buffer Size	8MB
PCI Latency Timer (PCI Clocks)	32
Primary Graphics Adapter	OnChip AGP
PCI VGA Palette Snoop	Disabled
Display Device	CRT Only
LCD Resolution	640 X 480
Allocate IRQ to PCI VGA	No
DMA Channel 0	PnP
DMA Channel 1	PnP
DMA Channel 3	PnP
DMA Channel 5	PnP
DMA Channel 7	PnP
IRQ3	ISA/EISA
IRQ5	ISA/EISA
IRQ7	PCI/PnP
IRQ9	ISA/EISA
IRQ10	PCI/PnP
IRQ11	PCI/PnP
IRQ14	PCI/PnP
IRQ15	PCI/PnP

Plug and Play Aware O/S

Set this option to *Yes* to inform AMIBIOS that the operating system can handle plug and Play (PnP) devices. The settings are *No* or *Yes.* The Optimal and Fail-Safe default settings are *No.*

Display Device

Select the display device for system. The available options are **CRT Only, CRT + LCD.**

*** Please note that the text form in the CRT+LCD mode will be shown as the format of LCD mode, not CRT mode; therefore, it will be reading differently on the CRT display.*

LCD Resolution

Select the display resolution for LCD panel. The available options are **640x480, 800x600, 1024x768.**

PCI Latency Timer (PCI Clocks)

This option specifies the latency timings (in PCI clocks) for PCI devices installed in the PCI expansion slots. The settings are *32, 64, 96, 128, 160, 192, 224,* or *248.*

IRQ3/4/5/7/9/10/11/14/15 Assigned to

These options specify the bus that the specified IRQ line is used on. These options allow you to reserve IRQs for legacy ISA adapter cards. These options determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use these options to reserve the IRQ by assigning an *ISA/EISA* setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as *PCI/PnP*. **IRQ12** only appears if the **Mouse Support** option in Advanced Setup is set to *Disabled.* IRQ14 and 15 will not be available if the onboard PCI IDE is enabled. If all IRQs are set to ISA/EISA and IRQ14 and 15 are allocated to the onboard PCI IDE, IRQ9 will still be available for PCI and PnP devices, because at least one IRQ must be available for PCI and PnP devices. The settings are *ISA/EISA* or *PCI/PnP.* The Optimal and Fail-Safe default settings are *PCI/PnP*.

DMA0/1/3/5/6/7 Assigned to

These options allow you to specify the bus type used by each DMA channel. The settings are *PnP* or *ISA/EISA* .

3-7. Peripheral Setup

Peripheral Setup

OnBoard FDC	Enable
OnBoard Serial Port1	3F8/COM1
OnBoard Serial Port2	2F8/COM2
OnBoard Parallel Port	378
Parallel Port Mode	ECP
EPP Version	N/A
Parallel Port DMA Channel	1
Parallel Port IRQ	7
OnBoard Serial Port3	3E8/COM3
Serial Port3 IRQ	9
OnBoard Serial Port4	2E8/COM4
Serial Port4 IRQ	10
OnBoard Parallel Port2	278
Parallel Port2 Mode	Normal
EPP Version	N/A
Parallel Port2 IRQ	5
Parallel Port2 DMA	N/A
OnBoard IDE	Both
OnBoard AC'97 Audio	Disabled
OnBoard Legacy Audio	Disabled
Sound Blaster	Disabled
SB I/O Base Address	220h-22Fh
SB IRQ Select	5
SB DMA Select	1
MPU-401	Disabled
MPU-401 I/O Address	300h-303h
Game Port (200h-207h)	Disabled

Onboard FDC
Set this option to “Enabled” to enable the floppy drive controller on the motherboard. The settings are Auto (AMIBIOS automatically determines if the floppy controller should be Enabled, or Disabled).

Onboard Serial Port 1/2/3/4
This option specifies the base I/O port address of serial port. The settings are Auto (AMIBIOS automatically determines the correct base I/O port address), Disabled, 3F8h, 2F8h, 3E8h, or 2E8h.

Onboard Parallel Port
This option specifies the base I/O port address of the parallel port on the motherboard. The settings are Disabled, 378h, 278h, or 3BCh. The Optimal default setting is 378h

Parallel Port Mode
This option specifies the parallel port mode. The Optimal default setting is Normal. The settings are:

Setting	Description
Normal	The normal parallel port mode is used.
Bi-Dir	Use this setting to support bidirectional transfers on the parallel port.
EPP	The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bidirectional data transfer driven by the host device.
ECP	The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve data transfer rates up to

Setting	Description
	2.5 Megabits per second. ECP provides symmetric bidirectional communication.

EPP Version
This option specifies the Enhanced Parallel Port specification version number that is used in the system. This option only appears if the **Parallel Port Mode** option is set to *EPP*. The settings are *1.7* or *1.9.*

Parallel Port IRQ
This option specifies the IRQ used by the parallel port. The settings are A*uto, (IRQ) 5,* or (*IRQ) 7.*

Parallel Port DMA Channel
This option is only available if the setting for the **Parallel Port Mode** option is *ECP.* This option sets the DMA channel used by the parallel port. The settings are *DMA Channel 0, 1,* or *3.*

Serial Port IRQ
This option specifies the IRQ used by the serial port.
The default settings are *(IRQ)3, (IRQ)4, (IRQ)9* and (*IRQ)10.*

Onboard AC' 97 Audio
This function is to disable or enable AC'97 Audio. Choices: Auto; Disabled

Onboard Legacy Audio
This function allows configuring the Audio Codec to support legacy Sound Blaster mode. Choices: Auto; Disabled

Sound Blaster
This option is to Enable / Disable the onboard Audio support Sound Blaster decoding.

SB I/O Base Address
To configure the Sound Blaster decoding I/O range.
Choice: 220h, 240h, 260h, 280h

SB IRQ Select
To configure Sound Blaster IRQ channel.
Choice: 5,7 and 10

SB DMA Select
To configure Sound Blaster DMA channel.
Choice: 0,1,2 and 3

MPU-401
This option is to Enable / Disable onboard MIDI port decoding.

MIPU-401 I/O Address
If the onboard MPU-401 port is "Enabled", it allows to set at 300h/310h/320h or 330h.

Game Port (200h-207h)
This option allows configuring onboard Game port address. The choices: Disabled; 200h; 207h

3-8. Hardware Monitor Setup

-=?System Hardware Monitor ? -
CPU Thermal Temperature
System Thermal Temperature
Chassis Fan Speed
CPU Fan Speed
Vcore
+ 2.500V
+ 3.300V
+ 5.000V
+12.000V

Provide some information such as CPU temperature, speed of cooling fan and usage voltage of CPU for user.

Chapter 4. VGA, LCD, DOC Feature

4-1. AGP-BUS VGA Feature

The ENDAT-3601M/T built-in Graphics Controller is a fully integrated 64-bit 2D/3D Accelerator. The high performance graphics engine offers high speed 3D image processing in full compliance and compatibility with IBM® VGA and VESA™ extended VGA.

The on-board Graphics Controller supports a full AGP implementation internally to remain compatible with existing software and programming models. However, since the engine is integrated it enjoys a higher bandwidth and lower latency than is possible with discrete solutions. The Controller also supports two simultaneous displays: CRT, Flat Panel Monitor.

The on-board Graphics Controller's main system features include:

- High Performance single cycle GUI
- Highly Integrated RAMDAC™ and Triple Clock Synthesizer
- Full Feature High Performance 3D Graphics Engine
- High speed internal AGP Bus Mastering data bus supporting DVD video playback & 3D
- Hardware implementation of motion compensation
- Dual Video Windows for Videoconferencing
- Versatile Motion Video Capture/Overlay/Playback Support
- Flexible Frame Buffer Memory Interface
- Advanced Mobile Power Management and CRT Power Management (VESA™ DPMS)
- PC99 Hardware Support

4-2. LCD Flat Panel Feature

Flat Panel Monitor Interface

The on-board graphic controller also support industry standard TFT LCD panel, the interface supports both 18-bit and 24-bit display modes. Optionally, an 18+18 or 24+24 can be supported utilizing external kit (UC-T1848). LVDS interface to provide a low voltage, high speed, low EMI serial DC-balanced differential data via on board LVDS transmitters to support TFT LCD Panel with 18 bit LVDS built-in. And 24, 18+18 or 24+24 can be supported utilizing external kit: UC-LT1815 (24), UC-L1836 (18+18) and UC-2448 (24+24).

The flat panel interface provides or supports the following functions for various panels:

- Generates flat panel interface signals like FLM, LP, SCLK, and DE
- Generates different video data formats to directly drive different types of panels
- Vertical and horizontal expansion of video displays to LCD panel resolution
- Vertical and horizontal centering
- Panel power sequence

Please note that the default setting is with "CRT only". If the LCD display feature is required, the setting will need to be revised in the system BIOS setting: "Display Device" under "PCI / Plug and Play Setup"; unless it is specified at the time of order.

4-3. PCI Bus Audio Adapter Features

The Chipset built-in SoundBlaster Pro Hardware and Direct Sound Ready AC97' Digital Audio Controller

- Dual full-duplex direct sound channels between system memory and AC97' link
- PCI Master interface with scatter / gather and bursting capability
- 32byte FIFO of each direct sound channel
- Host based sample rate converter and mixer
- Standard v1.0 or v2.0 AC98' Codec interface for single or cascaded AC97' Codec's from multiple vendors
- Loop back capability for re-directing mixed audio streams into USB and 1394 speakers
- Hardware SoundBlaster Pro for Windows DOS box and real-mode DOS legacy compatibility
- Plug and Play with 4 IRQ, 4 DMA and 4 I/O space options for SoundBlaster Pro and MIDI hardware
- Hardware assisted FM synthesis for legacy compatibility
- Complete software driver support for Windows-95, Windows-98 and Windows-NT

4-4. DiskOnChip Feature

On board reserved is a 32-pin Socket for DiskOnChip 2000, it is a unique data storage solution to offer a better, faster and more cost effective Flash Disk for applications.

The DiskOnChip 2000 provides a Flash Disk (as BIOS expansion) that does not require any additional bus, slot or connector. Simply insert the DiskOnChip 2000 into a 32-pin socket on your motherboard. With minimal installation costs, you have a bootable Flash Disk. DiskOnChip 2000 has built-in True FFS (True Flash File System) technology, which provides full Read/Write disk emulation.

True FFS provides hard disk compatibility at both the sector and file level. It works in a variety of operating system environments, such as DOS, Win95, WinCE, WinNT, Psos+ and QNX.

The correct memory address must be set correctly for DiskOnChip at the jumper **JP4**. The driver utilities are placed onto CD-ROM

JP4		**Memory Address**										
1-2	7-8	0	C	8	0	0	H - 0	C	9	F	F	H
1-2	9-10	0	C	C	0	0	H - 0	C	D	F	F	H
3-4	7-8	0	D	0	0	0	H - 0	D	1	F	F	H
3-4	9-10	0	D	4	0	0	H - 0	D	5	F	F	H
5-6	7-8	0	D	8	0	0	H - 0	D	9	F	F	H

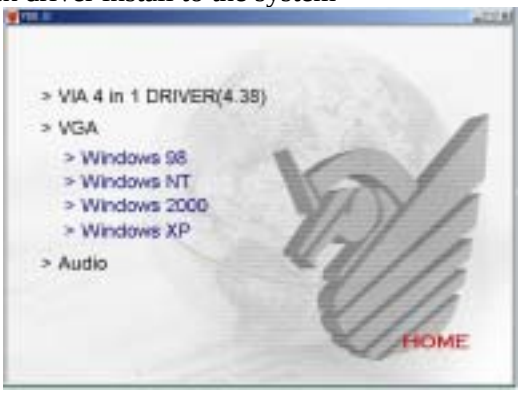
4-5. Driver Utility Installation Guide

1. When finishing the installation of Windows platform (95/98/2000/NT), please install the relative VIA driver (**4in1)** utilities for compliance compatibility of hardware environment.

2. Insert the support CD that supplied with motherboard into CD-ROM driver which enable the access with auto-run mode; or double –click the CD driver icon in "My Computer" to bring up the screen.

3. Select correct motherboard to install driver / utility for the system

4. Select VIA 4in1 service pack driver install to the system



5. The Screen will appear VIA 4in1 driver setup screen, please press "NEXT" to continue. Please follow the steps instructed by each screen for the installation of the VIA 4in1 driver. Restart the system after the completion of the installation.

6. After installing the VIA 4in1 driver, please select VGA driver for install. The system will request for "restart" after the completion of the driver installation.

7. The Screen can be adjusted at Display properties after the installation of VGA driver.

We strongly recommend using the 4in1 driver to install the system since the 4in1 driver will automatically detect / update the necessary drivers.

This driver will automatically detect and install the latest utilities as following:

IDE Bus master , VIA AGP Driver, IRQ Routing Driver, VIA INF Driver

LAN Driver: Install the LAN driver for on-board LAN adapter. Please refer to Chapter 5, The Realtek 8139 LAN Driver Installation Procedure.

VGA Driver: Install the VGA driver for on-board AGP VGA adapter

Please download or check from VIA Web-site: www.via.com.tw if you prefer to install the drivers individually or you need more information.

Chapter 5. LAN Adapter

The on-board LAN adapter integrated of Single Chip Fast Ethernet Controller with options of one or dual LAN solution, and also the LAN chip option of Realtek 8139x solution Intel 82559ER solution. It is highly integrated and requires no "glue" logic external memory on board. It runs in the bus master mode and directly sending/receiving Ethernet packet to/from memory. The On-board LAN adapter can directly fetch the system CPU. Also, it can transfer data Directly between I/O devices and system memory in the 32-bit bus master mode that provides low CPU utilization.

It complies with the IEEE 802.3x standard, IEEE802.3 standard and PCI Local Bus version 2.1 and transmits data on the network at 100 Mbps or 10 Mbps. It also operates in full-duplex mode that **doubles the network speed up to 20/200 Mbps when working with Fast Switching Hub.** Built-in one RJ-45 port for connection of 100Base-TX Fast Ethernet or 10Base-T Ethernet network, and automatically senses the connection type.

5-1. Features

- Full compliancy with PCI Rev. 2.1
- Complies with the Ethernet/IEEE 802.3u 100Base-TX and 10 Base-T industry standard
- Supports full-duplex operations, thus doubling the network speed up to 20Mbps on 10 Base-T Ethernet or 200Mbps on 100 Base-TX Fast Ethernet when setting in full duplex mode
- Two LED indicators to report network status
- One RJ-45 connector with Auto-sense cable type of 10 or 100Mbps network operation
- Supports PCI clock speed up to 33MHz, capable of zero wait states
- Supports optional Remote Boot ROM socket
- Provides a comprehensive setup program for displaying the adapter configuration and includes diagnostic on board or network tests.
- Complete drivers for Novell, ODI, SCO UNIX, LAN Manager, Windows NT and Windows 95/98 Packet driver etc

5-2. UTP Cable / RJ-45 Jack Definition

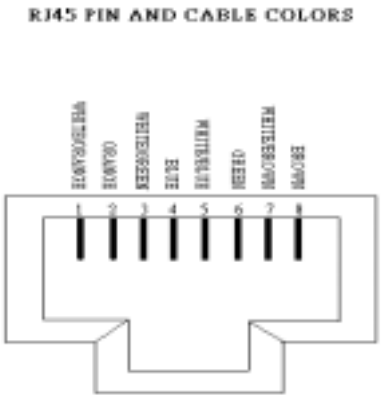
Straight through twisted pair cable is typically used to connect a hub to a server or workstation. In a straight through connection, Pin 1 at the server, Pin 2 at the hub connects to Pin 2 at the server, and so on. Figure A-1 shows the locations of pins on a standard RJ-45 plug on a twisted-pair cable.

Table A-1 shows the wiring in a straight-through twisted-pair cable (Pins 4,5,7 and 8 are not used).

Twisted Pair Number	Pin Number	Signal Description	To	Pin Number	Signal Description
1	1 2	TD+ TD–	→	1 2	TD+ TD–
2	3 6	RD+ RD–	→	3 6	RD+ RD–

RJ-45 Connector Pin Assignments

Figure A-1 shows the RJ-45 Connector pin assignments



5-3. Connecting 100Base-TX Fast Ethernet Network

The system board provides an RJ-45 port for connection to 100Base-TX Fast Ethernet or 10Base-T Ethernet Network with a single connection over unshielded twisted-pair (UTP). The adapter automatically operates at 10Mbps or 100Mbps when the appropriate 10/100Base hub be connected.

To connect the adapter to 100Base-TX Fast Ethernet Network, you need a twisted-pair Category 5 cable with RJ-45 modular jacks at both ends. This cable can have a maximum length of 300 feet (100 meters).

5-4. Connecting 10Base-T Ethernet Network

To connect the adapter to a 10Base-T Ethernet Network, you need a twisted-pair Category 3, 4 or 5 cables with RJ-45 modular jacks at both ends. This cable can have a maximum length of 300 feet (100 meters).

5-5. 10MBase/100MBase Installation Notice

- 100Mbps network must be shielded twisted-pair (STP) or Category 5 unshielded twisted-pair cable. Do not use a Category 3 or 4 cable for 100Mbps-network operation, it could cause data loss. Category 3 or 4 cable is good for 10Mbps network only.
- Category 5 cable is also good for 10Mbps operation. Use UTP Category 5 cable for the versatility to operate the network at either 100Mbps or 10Mbps speed without changing cable.
- Two pairs of wiring are required.
- Depending on building codes, different insulation materials may be required. Plenum-rated or TEFLON-coated wiring maybe required in some areas where fire proofing is required.
- The wire gauge should be between 18 and 26 AWG (Most telephone installations use 24-gauge wiring).
- UTP cable should meet the following requirements:
  1. Solid copper
  2. Nominal capacitance: less than 16pF/ft
  3. Nominal impedance: 100 ohms
  4. Nominal attenuation: less than 11.5db

Automatic Selection of the Media Type

While the driver installs, it automatically detects the media type based on the type of cable connected. Once you change the cable type, you must reinstall the driver to execute auto-detect again.

If the driver cannot detect which cable is connected or whether a cable is connected, look at cabling network driver (Ex. Modify net.cfg file parameters—force line speed=10 or 100).

10/100 Auto – Negotiation (N-Way)

Depending on the hub or connected device, the LAN adapter can automatically run at the appropriate speed, by using N-way, a feature that complies with the IEEE802.3 standard. It also works with any of the other IEEE-compliant products.

5-6. Remote BOOT ROM function

This function is available with the BIOS programming for indicated operation system. The remote boot function allows the computer to boot up over the network, instead of using the local operating system device. This enables the system to be a diskless workstation environment.

5-7. LED Indicators

The system board comes with two LED indicators on the edge of the motherboard that indicates the network system status. If you experience any problems with the adapter, first make sure the appropriate driver is loaded, the proper cable is connected to the RJ-45 port and the hub complies with the adapter specification, such as 10Mbps 10Base-T or 100Mbps 100Bast-TX. Finally, recheck the LEDs.

FUDUP (Full Duplex) Indicator

When indicator is ON, it indicates Full-duplex mode: otherwise, it is OFF. The adapter supports full duplex at 10 or 100Mbps. If the switch-hub supports the N-way feature and full duplex, the system automatically runs in full duplex mode.

Tx/Rx (Transmit/Receiver) Indicator

This indicator flashes to display that there is network activity – indicating transmission or reception data from the network.

5-8. The Setup Program

The package includes a diskette containing the setup program. This program allows you to verify the configuration and isolation of faults.

The adapter's I/O port address and interrupt request levels (IRQ) are set by the BIOS. Other default settings can be changed for situations as shown below.

Problem (RESET8139.exe) provides the following function:

- Displays the current configuration of the adapter
- Performs network diagnostic tests to verify the operation of the adapters basic functions, and the adapters ability to communicate over the network with another adapter.
- Provides set up for new configuration to make a change specify settings: Remote BOOT ROM, Flow Control and Full-Duplex mode Enable/or Disable

Full duplex operation is set automatically if the Full-duplex option is set to Disable. Please follow the prompt instructions to set-up or change the system configuration.

Note: Before running the setup program, make sure the adapter's driver is not loaded, otherwise unpredictable results may arise!

The setup program can be set the on board configuration to provide diagnostic testing. It is for testing the basic function verification, EEPROM data Access, loop back operation, and the ability to communicate over the network with another adapter.

To access this program, insert the Driver Diskette into the floppy disk drive and then type the following at the DOS prompt:

- A:\REST8139.EXE <ENTER>

1. View Current Configuration

This allows you to find the PCI Fast Ethernet adapter current configuration in your system.

2. Set Up New Configuration

Select New Set Up Configuration option from the main menu

The option settings can be changed, the table shown as below:

Option	Default Setting	Other Available Settings
Full-duplex	Disabled → Auto Selection	Enable – Forces to full duplex operation
Flow Control	TX Enable, RX Enable	TX Disable, RX Disable

Note: Before setting the adapter for full duplex, make sure the hub switch is also set to full duplex. Before you activate the switching hub to server connection, make sure the hub switch and adapter are configured for full duplex.

3. Run Diagnostics

Running diagnostic tests perform basic function verification for on board LAN adapters. The basic Diagnostic tests include:

- **EEPROM Test**: EEPROM data read/write test
- **Diagnostics On Board**: Performs on board basic function verification
- **Diagnostics On Network**: To run this test on the network, you will need another computer set up as a Responder to receive packets from the adapter being tested and echo them back to the adapter. This checks the adapter's ability for communication over the network with another adapter to receive and transmit network packets.

4. Software Installation

Installing Network Drivers

You must install a network driver to allow the adapter to work with your network operating system.

The system board provides various network drivers on the driver diskette. The following provides the installation procedures for different network drivers.

Note: Please install the "VIA 4in1 Driver" first if you want to link your LAN with Windows 98

For detailed information of each OS installation, please refer to the README (.TXT) file on the driver diskette.

Software Installation Examples

Before installing the driver programs, please refer to each directory that contains a README file, which provides detailed installation instructions, or to execute the HELP8139.EXE help file viewer in DOS. The utility will then present with a screen showing the information about how to install the network driver. Driver needed for the adapter to work with the operating system.

Appendix A: FLASH Memory Utility

Using this utility to update the system BIOS from a disk file to the on board Flash memory. Be aware the improper change of the system BIOS will cause the system to malfunction.

Using utility as follows:

1. Insert the FLASH memory BIOS utility distribution floppy diskette in drive A:
2. At the DOS prompt, type A:\> F82725 xxxx.ROM <Enter>

---- Screen Message ----
DOS/4G Protected Mode Run-time Version 2.01a
Copyright © Tenberry Software, Inc. 1996
Please wait for loading BIOS ROM ….

AMI Flash Utility V8.27.25 Flash ROM Programming report			
Chipset Vendor	: VIA	Flash ROM Vendor	: IC Brand
Chipset Code	: VIA686A/B	Flash ROM Code	: IC P/N
ROM Filename	: xxxx.ROM	ROM File Size	: 512kb
Boot Block Programming	: Yes		

>>>>>>>>>>>>>>>>>>>>>>……
Verify ROM data Now….
Flash ROM update Completed - Pass
Please restart your system.
A:\>

Please restart your system and load setup default /

Appendix B: Connector Pin Assignment

PS/2 Keyboard / Mouse Pin Header Connector (CN7)

Pin No.	Signal (KB)	Pin No.	Signal(MS)
1	KB Data	2	MS Data
3	KEY	4	KEY
5	GND	6	GND
7	+5V(DC)	8	+5V(DC)
9	KB_CLK	10	MS_CLK

D-SUB Type Connector for COM port (RS232);

Pin No.	Description	Pin No.	Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		

Box Header Type Connector for COM port (RS232);

Pin No.	Description	Pin No.	Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND	10	N.C

D-SUB Type Connector for COM2 port (RS-422/485)

Pin No.	Description	Pin No.	Description
1	–TXD	6	NA
2	+RXD	7	NA
3	+TXD	8	NA
4	NA	9	–RXD
5	NA		

Printer (LPT1/LPT2) Port

Pin No.	Description	Pin No.	Description
1	STB#	10	ACK#
2	PD0	11	BUSY
3	PD1	12	PE
4	PD2	13	SLCT
5	PD3	14	AFD#
6	PD4	15	ERR#
7	PD5	16	INIT#
8	PD6	17	SLIN#
9	PD7	18-25	GND

VGA Connector

Pin No.	Description	Pin No.	Description
1	RED	9	N.C / +5V
2	GREEN	10	GND
3	BLUE	11	N.C
4	N.C	12	DDC DAT
5	GND	13	H.Sync

Pin No.	Description	Pin No.	Description
6	GND	14	V.Sync
7	GND	15	DDC CLK
8	GND		

FDD Connector

Pin No.	Description	Pin No.	Description
1,3,5,7	GND	14	DSA#
9,11,13	GND	16	MOB#
15,17,19	GND	18	DIR
21,23,25	GND	20	STEP#
27,29,31	GND	22	WD#
33	GND	24	WE#
2	RWC#	26	TRAK0
4,6	N.C	28	WP#
8	INDEX#	30	RDATA#
10	MOA#	32	HEAD#
12	DSB#	34	DSKCHG#

LCD - LVDS Output Connector (CN7)

Pin No.	Signal	Pin No.	Signal
1	Y0–	2	Y2–
3	Y0+	4	Y2+
5	Y1–	6	RESERVED
7	GND	8	Y3–
9	Y1+	10	Y3+
11	CK–	12	LVDS PANEL VDD
13	CK+	14	DISP_OFF
15	VBL	16	GND

TFT LCD Panel Port Connector (LCD-CON1)

Pin No.	Signal	Pin No.	Signal
1	VBL	2	VBL
3	GND	4	GND
5	VDDLCD	6	VDDLCD
7	ENPVEE	8	GND
9	FPD 23	10	FPD 22
11	FPD 17	12	FPD 16
13	FPD 11	14	FPD 10
15	FPD 9	16	FPD 8
17	FPD 21	18	FPD 20
19	FPD 15	20	FPD 14
21	FPD 7	22	FPD 6
23	FPD 5	24	FPD 4
25	FPD 19	26	FPD 18
27	FPD 13	28	FPD 12
29	FPD 3	30	FPD 2
31	FPD 1	32	FPD 0
33	GND	34	GND
35	P_CLK	36	FLM
37	DE	38	LP
39	GND	40	VDDLCD
41	VDDLCD	42	**KEY**
43	VDDLCD	44	VDDLCD

Audio Output Port Connector (CN1)

Pin No.	Function	Pin No.	Function
1	BITCLK	2	GND
3	SDIN	4	N.C.
5	SDIN2	6	N.C.
7	SDOUT	8	N.C.
9	SYNC	10	GND
11	–ACRST	12	GND
13	SPEAK	14	Strapping Low
15	+5V(DC)	16	+12V(DC)
17	JBCY	18	JAB2
19	JBCX	20	JAB1
21	JACY	22	JBB2
23	JACX	24	JBB1
25	MSO	26	MSI

IR Connector (J1)

Pin 1	VCC	**Pin 4**	GND
Pin 2	N.C	**Pin 5**	IRTX
Pin 3	IRRX		

IDE1, IDE2 Connector

Pin No.	Description	Pin No.	Description
2,19,22	GND	13	IDE data2
24.26.30	GND	14	IDE data13
40	GND	15	IDE data1
20,21,28	N.C	16	IDE data14
29,32,34	N.C	17	IDE data0
1	IDE reset	18	IDE data15
3	IDE data7	23	IDE Write
4	IDE data8	25	IDE Read
5	IDE data6	27	IDE Ready
6	IDE data9	31	IDE IRQ
7	IDE data5	33	IDE A1
8	IDE data10	35	IDE A0
9	IDE data4	36	IDE A2
10	IDE data11	37	IDECS1#
11	IDE data3	38	IDESC3#
12	IDE data12	39	HDLED0#

Expansion Slot to PCI/ISA Pin Assignment

Pin No.	Description A	Description B	Description E	Description F
1	–IOCHK	GND	GND	GND
2	SD7	RSTDRV	GND	GND
3	SD6	VCC	–PCINT2	–PCINT4
4	SD5	IRQ9	–PCINT3	–PCINT1
5	SD4	–5V	VCC	VCC
6	SD3	DRQ2	KEY	KEY
7	SD2	–12V	VCC	VCC
8	SD1	0WS	–PCIRST	PCLKF
9	SD0	+12V	–GNT3	GND
10	IOCHRDY	GND	–REQ3	GNT1
11	AEN	–SMEMW	GND	GND
12	SA19	–SMEMR	PCLKE	–REQ1
13	SA18	–IOW	GND	AD31
14	SA17	–IOR	AD30	AD29
15	SA16	–DACK3	PCLKG	N.C
16	SA15	DRQ3	KEY	KEY
17	SA14	–DACK1	–GNT2	–REQ2
18	SA13	DRQ1	AD28	AD27
19	SA12	REFRESH	AD26	AD25
20	SA11	SYSCLK	AD24	–CBE3
21	SA10	IRQ7	AD22	AD23
22	SA9	IRQ6	AD20	AD21
23	SA8	IRQ5	AD18	AD19
24	SA7	IRQ4	N.C.	N.C
25	SA6	IRQ3	KEY	KEY
26	SA5	–DACK2	N.C	N.C
27	SA4	TC	AD16	AD17
28	SA3	BALE	–FRAME	–IRDY
29	SA2	VCC	–CBE2	–DEVSEL
30	SA1	OSC	–TRDY	–PLOCK
31	SA0	GND	–STOP	–PERR

Pin No.	Description C	Description D	Description G	Description H
1	–SBHE	–MEMCS16	N.C	–SERR
2	LA23	–IOSC16	N.C	AD15
3	LA22	IRQ10	–CBE1	AD14
4	LA21	IRQ11	PAR	AD12
5	LA20	IRQ12	GND	GND
6	LA19	IRQ13	KEY	KEY
7	LA18	IRQ14	GND	GND
8	LA17	–DACK0	AD13	AD10
9	–MEMR	DRQ0	AD11	AD8
10	–MEMW	–DACK5	AD9	AD7
11	SD8	DRQ5	–CBE0	AD5
12	SD9	–DACK6	AD6	AD3
13	SD10	DRQ6	AD4	AD1
14	SD11	–DACK7	AD2	AD0
15	SD12	DRQ7	KEY	KEY
16	SD13	VCC	VCC	VCC
17	SD14	MASTER	VCC	VCC
18	SD15	GND	GND	GND
19			GND	GND

Power connector

ATX

3.3V	**11**	**1**	3.3V
–12V	**12**	**2**	3.3V
GND	**13**	**3**	GND
PS ON	**14**	**4**	+5V
GND	**15**	**5**	GND
GND	**16**	**6**	+5V
GND	**17**	**7**	GND
–5V	**18**	**8**	POWER OK
+5V	**19**	**9**	5V SB
+5V	**20**	**10**	+12V

AT

POWER GOOD	**1**	
+5V	**2**	
+12V	**3**	
–12V	**4**	
GND	**5**	
GND	**6**	
GND	**7**	
GND	**8**	
–5V	**9**	
+5V	**10**	
+5V	**11**	
+5V	**12**	

Appendix C: LIMITED WARRANTY

Standard one year limited warranty on all our ENDAT series all-in-one motherboards and embedded board. Products that become defective during the warranty period shall be repaired, or subject to manufacturer's option, replaced. The limited warranty applies to normal proper usage of the hardware and does not cover products that have been modified or subjected to unusual electrical or physical stress. Unicorn Computer Corp is not liable to repair or replace defective goods caused by improper using or use of unauthorized parts. The following situations will be charged:

1. The products during the warranty but defective caused by improper using or artificial external pressure and result in the components damages. According to the damage situation, the manufacturer has the rights to decide to repair or not. The manufacturer will charge the parts/repair cost and the returning shipping charge.
2. The products out of warranty will charge the parts/repair cost and the returning shipping charge as per the repair status.
3. The manufacturer has the rights to decide to repair or not based on the stock of parts for the products which are phased out of the production.
4. Please e-mail or fax the RMA Service Request Form when have the defective products.

RMA SERVICE REQUEST FORM

When requesting RMA service, please fill out this "RMA Service Request Form". This form needs to be shipped with your returns. Service cannot begin until we have this information.

RMA NO.:

Company:	Person to Contact:
Phone No:	Purchase Date :
Fax No. :	Applied Date :
Return Shipping Address:	

Model No.	Serial No.	Problem Code	Remark

- **Issue Code of defect.**

01	Second Times R.M.A.	11	Memory Socket Bad
02	No Screen (No Boot)	12	Hang Up Hardware
03	VGA (Display) Fail	13	Hang Up Software
04	CMOS Data Lost	14	PCB Problem
05	FDC Fail	15	CPU Socket Bad
06	HDC Fail	16	LAN Fail
07	Bad Slot	17	Audio Fail
08	BIOS Problem	18	Serial Port Fail
09	Keyboard Controller Fail	19	Parallel Port Fail
10	Cache RAM Problem	20	Others

Please specify the following when returning the RMA boards:
(1) Hardware Configuration (2) OS or Software (3) Testing Program

_____
Authorized Signature