MAT-B651

Low Power Geode CPU Onboard
With VGA/LCD, Audio, LAN & SSD

User's Manual

Version 2.0

Manual edition 1.0, Jan. 2002

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Chapter 1. General Information

1-1. Introduction

The MAT-B651 is a full function of 3.5" Embedded format SBC board use NS CX5330A chipset supports processors from 200MHz up to 300MHz. The MAT-B651 supports CRT and 18-bit TFT panels, Dual Intel® 82559ER or Realtek RLT8139C Ethernet chipset with RJ45 jack for 10/100Mbps and AC-97 Audio Interface.

The onboard features include three RS-232 and one RS-232/422/485 serial ports, one bi-directional parallel port, two USB ports, also with watchdog timer and PC/104 connector for flexible expansion capabilities. In addition, the onboard SSD interface supports 50-pin CompfactFlash socket for TypeI/II CompactFlash Cards.

1-2. Specification

Specifications	
General Functions	
CPU	NS GX1-300MHz low power processor
BIOS	Award® 256KB Flash BIOS
Chipset	NS CX5530A
I/O Chipset	Dual Winbond 83977
Memory	One 144-pin SO-DIMM socket support up to 128 Mbytes SDRAM
Enhanced IDE	Support up to two IDE devices (Ultra DMA 33).
FDD interface	Support up to two floppy disk drives
Parallel port	Support SPP/ECP/EPP
Serial port	Three RS-232 and one RS-232/422/485 serial ports.
IR interface	Support one IrDA Tx/Rx header
KB/Mouse connector	Support PC/AT keyboard and PS/2 mouse
USB connectors	Support dual USB ports
Battery	Lithium battery for data retention up to 10 years(in normal condition)
Watchdog Timer	Software programmable.
PC/104 Connector	One PC/104 connector
Power management	APM 1.1 compliant
Flat Panel/CRT Interface	
Chipset	NS CX5530A
Display memory	Share system memory 1~4MB
Display type	Simultaneous supports CRT and 18-bit TFT LCD
Resolution	Flat panel displays support up to 1024 x 768 @ 18bpp TFT

	panel and CRT monitors up to 1024 x 768 @ 16bpp or 1280 x1024 @ 8bpp
Ethernet Interface	
Chipset	Dual Intel 82559ER or Realtek RTL8139C (option)
Ethernet interface	PCI 100/10 Mbps Ethernet controller
SSD Interface	One 50-pin CompactFlash™ socket
Sound Interface (option)	
Chipset	Option AC 97 codec
Audio controller	SoundBlaster Pro Hardware andDirect Sound Ready AC97 Digital Audio
Audio interface	Mic in, Line in, Speaker out and CD audio in
Software Driver	Supports for Windows 95, Windows 98 and windows NT
Mechanical and Environmental	
Power supply voltage	VCC (4.75V to 5.25V), +12V (12.6V to 11.4V)
Max. power requirements	2A @ 5 V, 300mA @ +12V
Operating temperature	32 to 140°F (0 to 60°C)
Board size	5.7"(L) x 4"(W) (145mm x 102mm)
Weight	0.6 lb. (0.3 Kg) (bare

1-3. MAT-B651Package

Please make sure that the following items have been included in the package before installation.

- MAT-B651 3.5” Embedded SBC board
- Quick Installation Guide
- Cables (Please refer Appendix D)
- CD-ROM which contains the following folders:
- Manual (in PDF format)
- LAN Driver
- VGA Driver
- Audio Driver
- BIOS Utility

If any of these items are missing or damaged, please contact your dealer from whom you purchased the board at once. Save the shipping materials and carton in the event that you want to ship or store the board in the future. After you unpack the board, inspect it to assure an intact shipment. Press down all the integrated circuits to make sure they are properly seated in their sockets. Do not apply power to the board if it appears to have been damaged.

Leave the board in its original packing until you are ready to install

Precautions

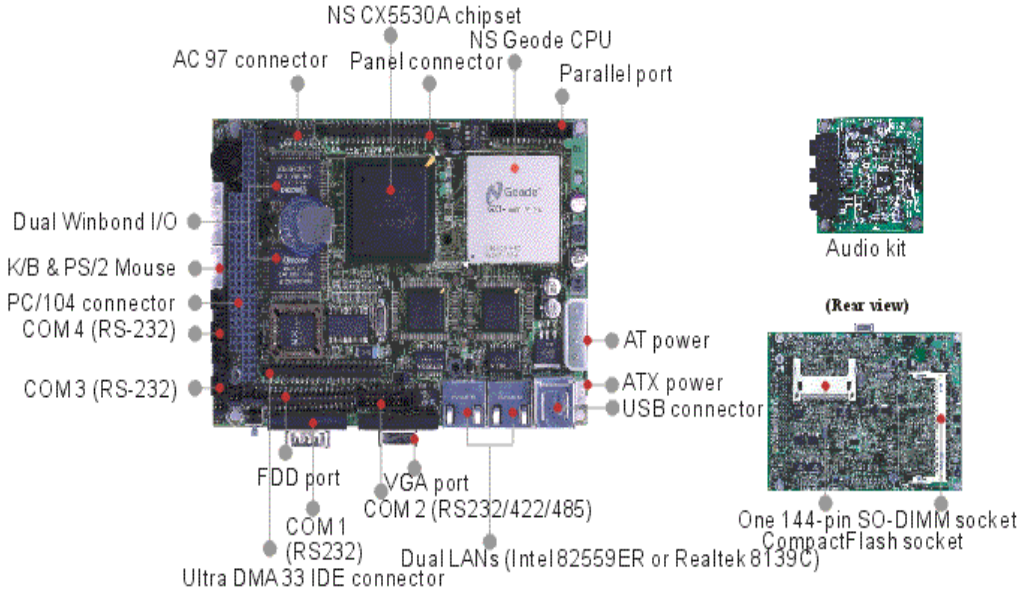
Please make sure you properly ground yourself before handling the MAT-B651 board or other system components. Electrostatic discharge can be easily damage the MAT-B651 board.

Do not remove the anti-static packing until you are ready to install the MAT-B651 board.

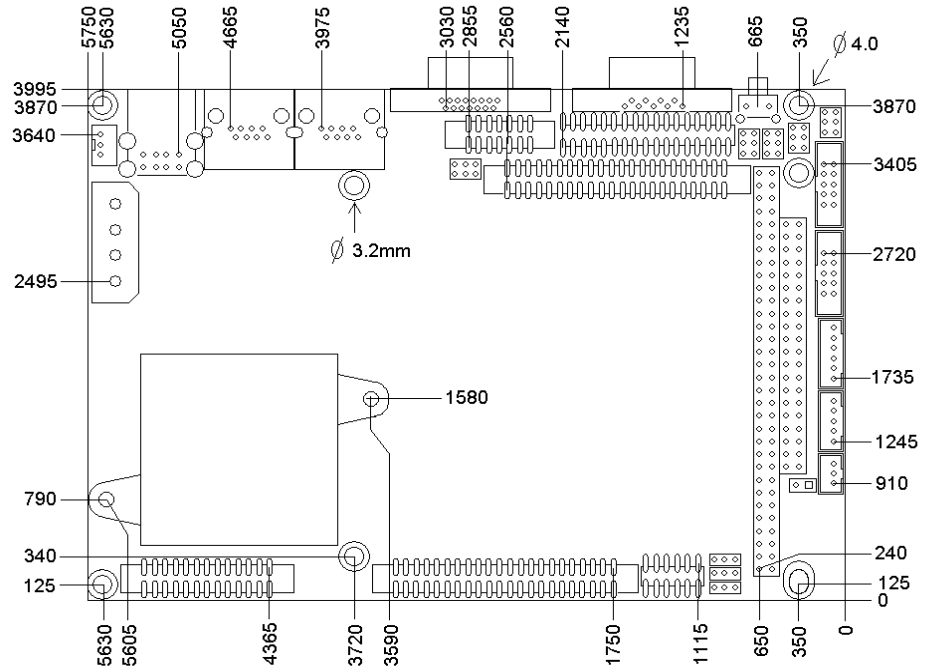
Ground yourself before removing any system component from it protective anti-static packaging. To ground yourself, grasp the expansion slot covers or other unpainted parts of the computer chassis.

Handle the MAT-B651 board by its edges and avoid touching its component.

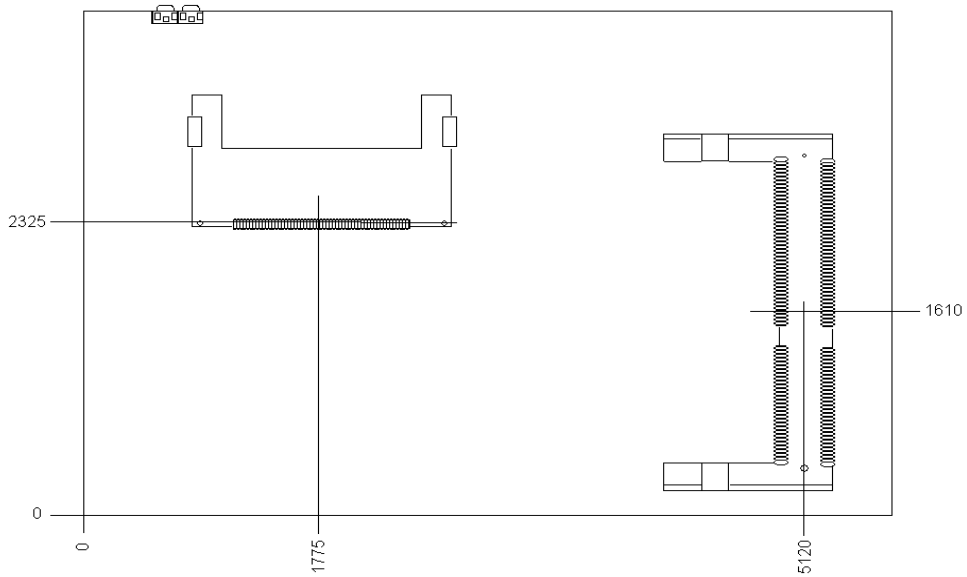
1-4. Board Layout



1-5. Board Dimension



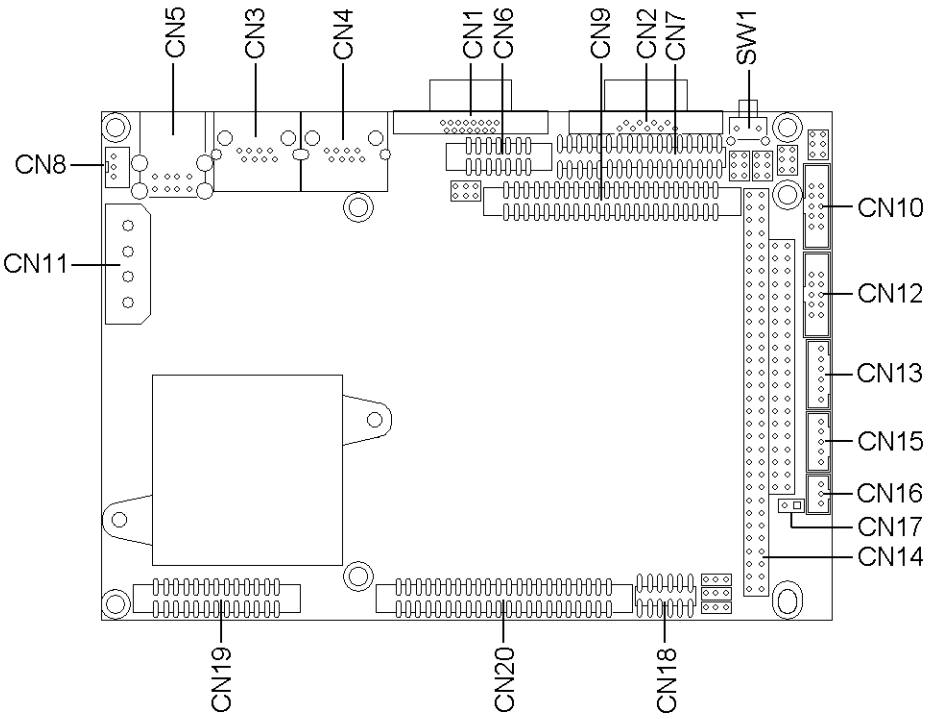
Board Dimension (mil) (Component Side)



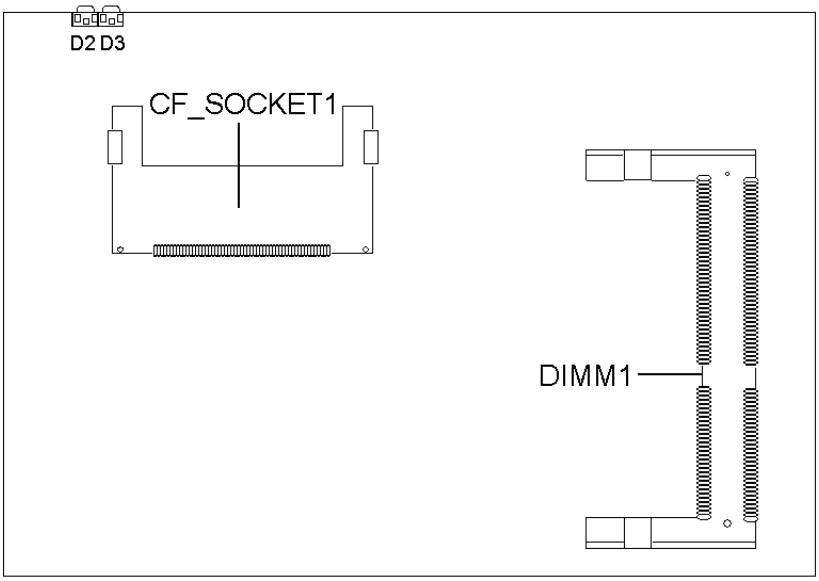
Board Dimension (mil) (Solder Side)

Chapter 2. Installation

2-1. Location of Connectors



(Component Side)

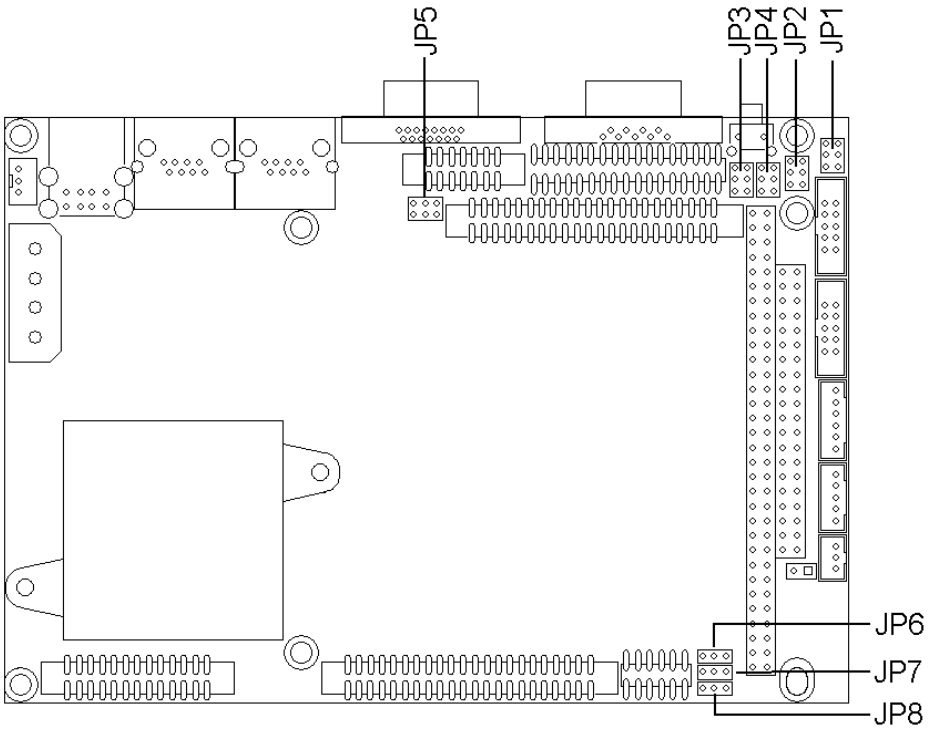


(Solder Side)

2-2. List of Connectors

Connectors	Description	Connectors	Description
CN1	VGA Connector (D-Sub)	CN11	Main Power Connector
CN2	COM1 Connector (D-Sub)	CN12	COM4 Connector (Pin Header)
CN3	LAN1 Connector (RJ45)	CN13	KB/Mouse Connector
CN4	LAN2 Connector (RJ45)	CN14	PC/104 Connector
CN5	USB Connector	CN15	IR Connector
CN6	COM2 Connector (Pin Header)	CN16	Auxiliary Power Connector
CN7	Floppy Connector	CN17	ATX Power Control Connector
CN8	ATX Power Connector	CN18	AC 97 Audio Connector
CN9	IDE Connector 44pin	CN19	Parallel Connector
CN10	COM3 Connector (Pin Header)	CN20	Flat Panel Connector
D2	Power LED	D3	HDD LED
SW1	Reset Switch		

2-3. Location of Jumpers



2-4. List of Jumpers

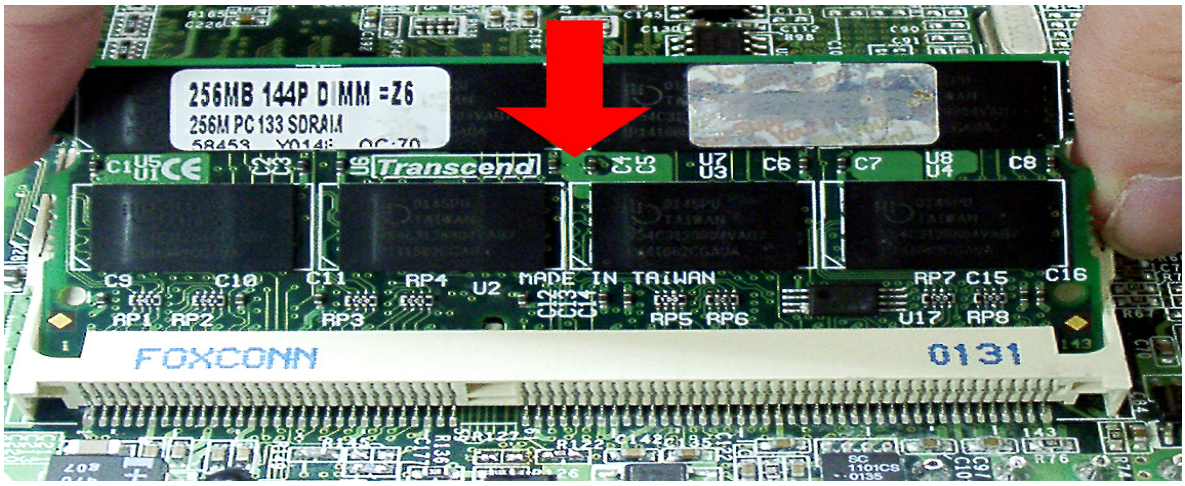
Pin	Define	Pin	Define
JP1	COM1 RI/Voltage Select	JP5	COM2 RS-232/422/485 Select
JP2	COM3 RI/Voltage Select	JP6	Clear CMOS
JP3	COM2 RI/Voltage Select	JP7	Reset Select
JP4	COM4 RI/Voltage Select	JP8	LCD Panel Voltage Select

2-5. Installing System Memory

To insert a SO-DIMM Memory:

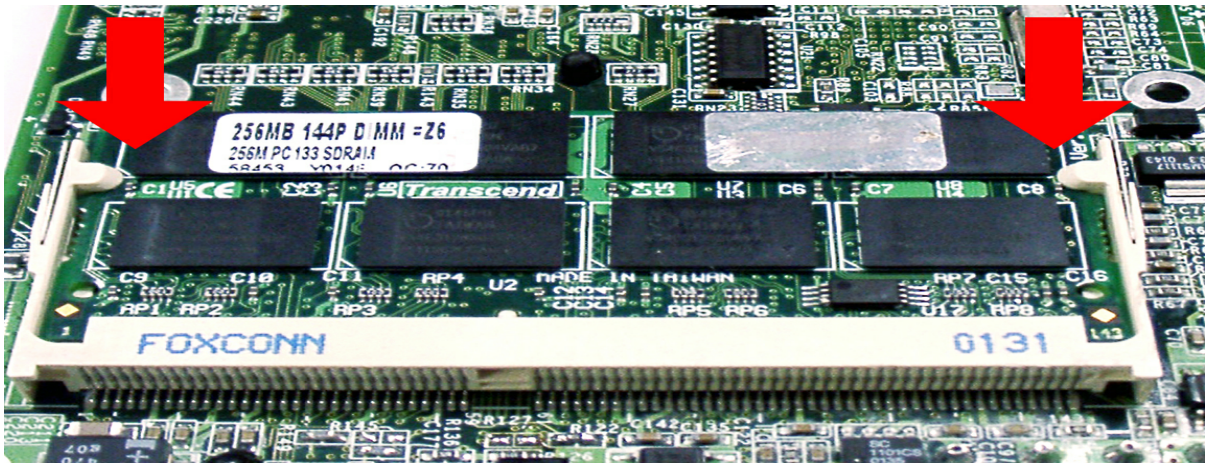
The MAT-B651 supports one 144-pin SO-DIMM sockets, memory up to 128Mbyte.

To Insert a SO-DIMM Memory*:* Please align the module with the socket key and press down until the levers at each end of the socket snap close up.



There is only one direction for installing a module in the socket. Do not attempt to force the module into the socket incorrectly.

To Remove a SO-DIMM Memory: To remove a SO-DIMM, press down on the levers at both end of the module until the module pops out

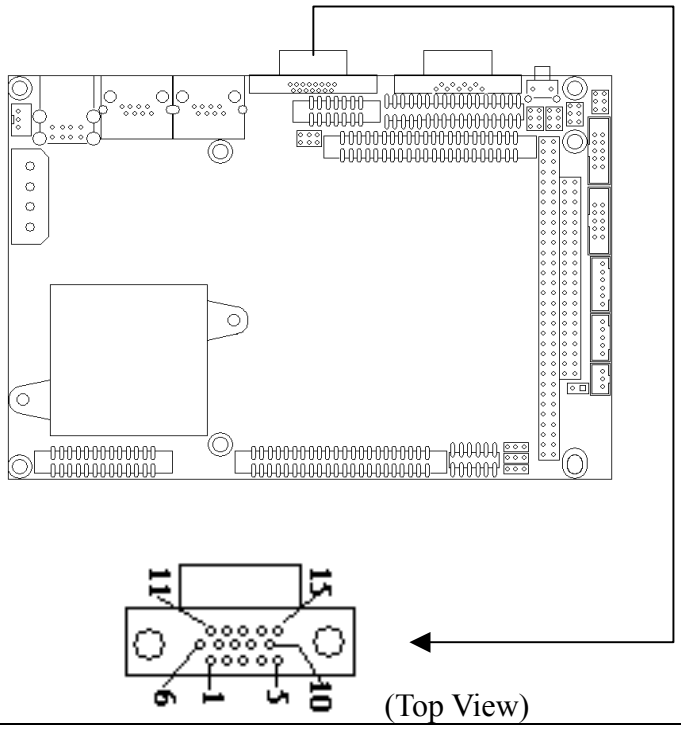


There is only one direction for installing a module in the socket. Do not attempt to force the module into the socket incorrectly.

2-6. Connector, Jumper and Switch Settings

CN1: VGA Connector

The MAT-B651 supports a standard D-SUB VGA connector for CRT display.



(Top View)

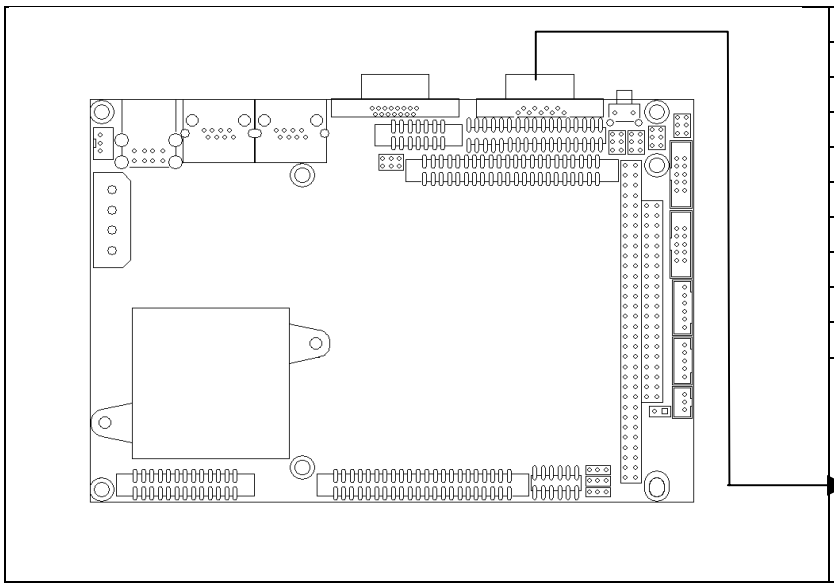
Pin	Signal
1	RED
2	GREEN
3	BLUE
4	NC
5	Ground
6	Ground
7	Ground
8	Ground
9	NC
10	Ground
11	NC
12	DDC Data
13	H-SYNC
14	V-SYNC
15	DDC Clock

CN2, CN6, CN10, CN12: Serial Ports

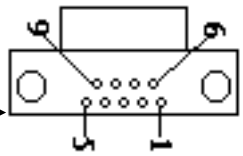
The MAT-B651 supports four serial ports: three RS-232 (COM1/COM3/COM4) and one RS-232/422/485 (COM2). The COM1(CN2) is D-Sub connector and COM2/COM3/COM4 are pin header type. These ports allow you to connect serial devices such as mouse, printer and more. You need an adapter cable if you use a traditional DB-9 connector for COM2/COM3/COM4. The COM2 cable has 14-pin and COM3/COM4 has 10-pin.

The COM2 designed as RS232 and can be changed to RS-422/485 in the JP5.

CN2: COM1 D-Sub Connector

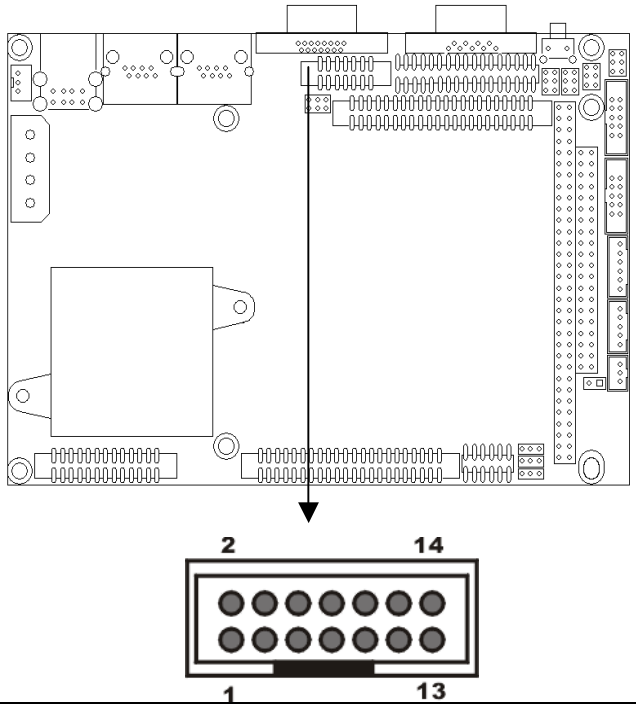


Pin	Assignment
1	DCD
2	RXD
3	TXD
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	RI



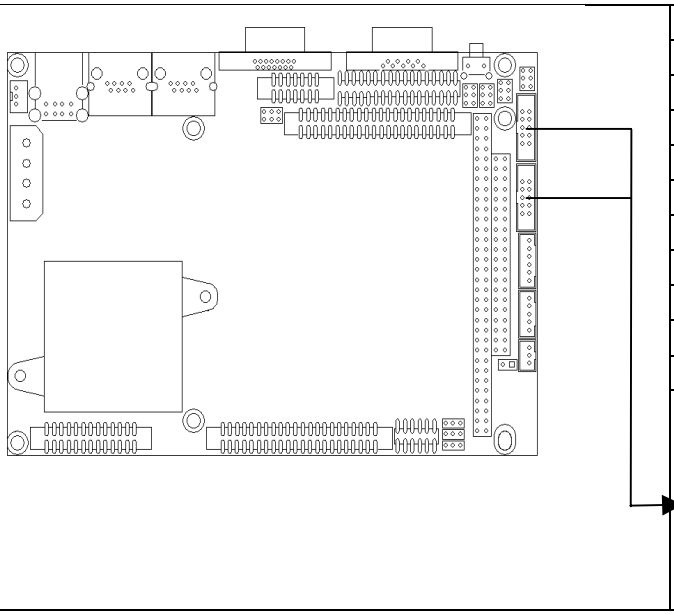
(Top View)

CN6: COM2 RS-232/422/485 PIN-Header



Pin	Assignment
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	Ground
10	NC
11	422/485TX+
12	422/485TX-
13	422RXD+
14	422RXD-

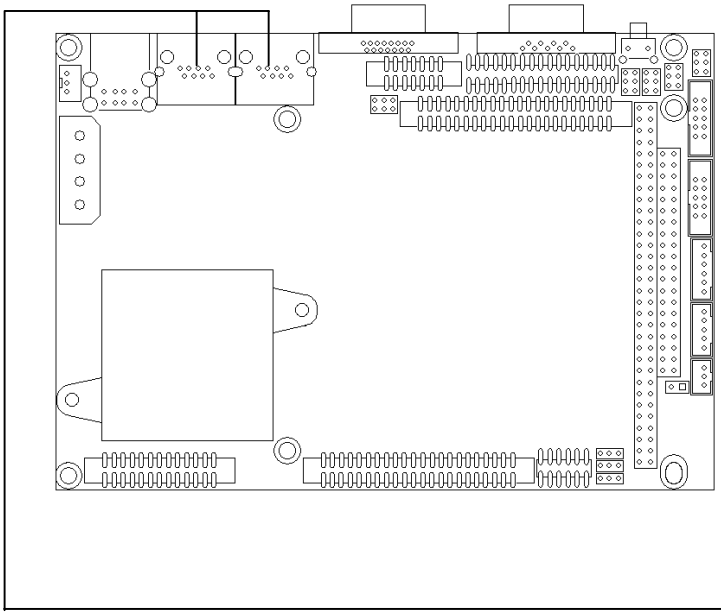
CN10, CN12: COM3, COM4 Pin-Header Connector



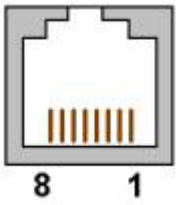
Pin	Assignment
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	Ground
10	NC

CN3, CN4: LAN1/LAN2 10/100BaseT RJ-45 Connector

The MAT-B651onboard with dual Ethernet RJ-45 connectors, the onboard Intel® 82559ER or Realtek RTL8139C fast Ethernet controller supports 10Mbps and 100Mbps N-Way auto-negotiation operations.

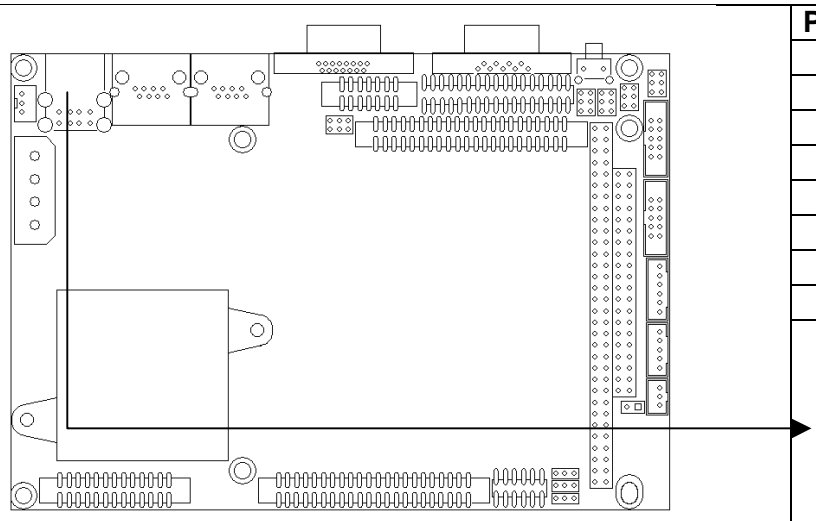


Pin	Assignment
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC
LAN LED	
9	Vcc
10	Speed
11	Active
12	Link

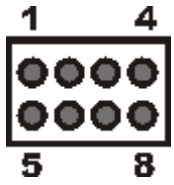


CN5: USB Connector

The MAT-B651 supports two USB (Universal Serial Bus) ports, which give complete plug and play, hot attach/detach for up to 127 external devices. The USB interface complies with USB specification Rev.1.0 and can be disabled in the system BIOS setup.

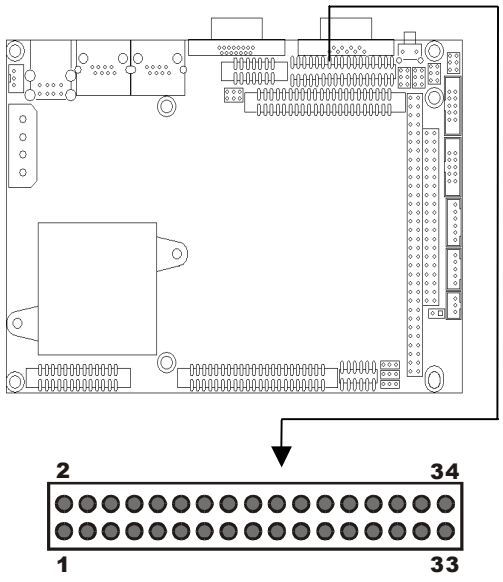


Pin	Assignment
1	+5V
2	Data0-
3	Data0+
4	Ground
5	+5V
6	Data1-
7	Data1+
8	Ground



CN7: Standard Floppy Connector

Connect the single end of floppy disk drive cable to this 32-pin connector block. Connect the other end of the cable to one or more floppy disk drives. The connector with twisted wires always connects to drive A; the connector without twisted wires connects to drive B.



Pin	Assignment	Pin	Assignment
1	Ground	2	Drvden0
3	Ground	4	NC
5	Ground	6	NC
7	Ground	8	Index
9	Ground	10	Motor enable 0
11	Ground	12	Drive select 1
13	Ground	14	Drive select 0
15	Ground	16	Motor enable 1
17	Ground	18	Direction
19	Ground	20	Step
21	Ground	22	Write data
23	Ground	24	Write gate
25	Ground	26	Track 00
27	Ground	28	Write protect
29	Ground	30	Read data
31	Ground	32	Side 1 select
33	Ground	34	Diskette change

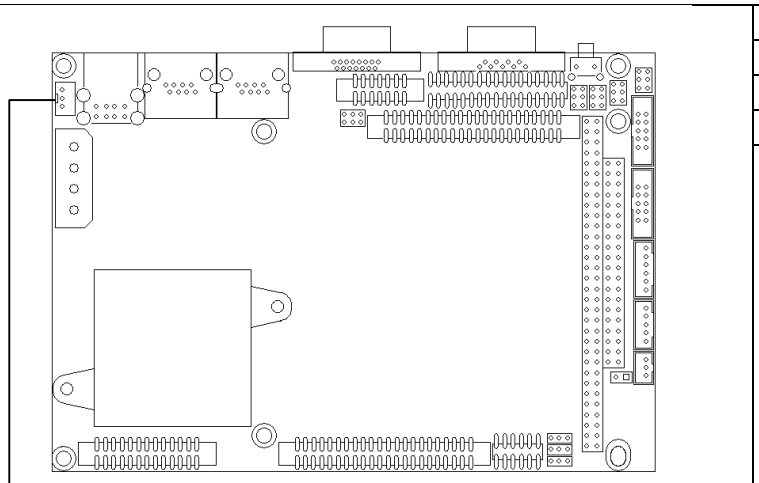
CN8: ATX Power Connector

The MAT-B651 supports a soft power switch function if an ATX power supply is used.

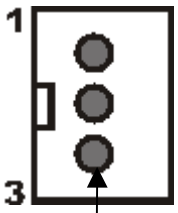
Note: Enable the soft power switch as follow:

Connect the ATX-to-PS/2 power cable to CN8 and the ATX DC power connector

Connect the 2-pin power on/off cable to CN17

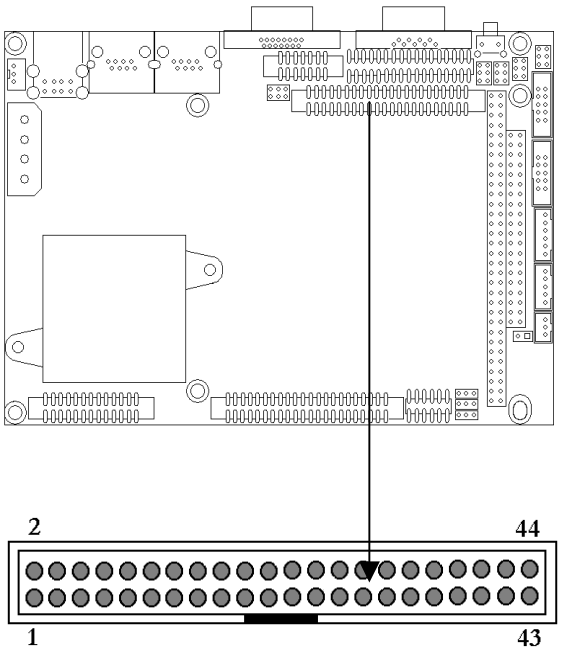


Pin	Assignment
1	5V Standby
2	NC
3	PS_On



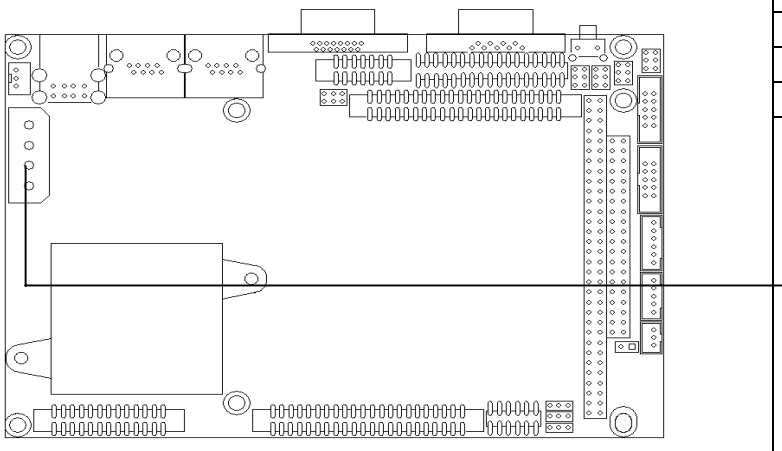
CN9: IDE Connector

You are able to configure two hard disks to Master mode by using one ribbon cable on the primary IDE connector and another on the secondary IDE connector.

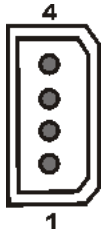


Pin	Signal	Pin	Signal
1	Reset	23	IOW#
2	Ground	24	Ground
3	Data7	25	IOR#
4	Data8	26	Ground
5	Data6	27	IRDY
6	Data9	28	Ground
7	Data5	29	DACK#
8	Data10	30	Ground
9	Data4	31	IRQ14
10	Data11	32	NC
11	Data3	33	Address 1
12	Data12	34	Detect
13	Data2	35	Address 0
14	Data13	36	Address 2
15	Data1	37	Select 0
16	Data14	38	Select 1
17	Data0	39	Active
18	Data15	40	Ground
19	Ground	41	+5V
20	NC	42	+5V
21	DREQ	43	Ground
22	Ground	44	NC

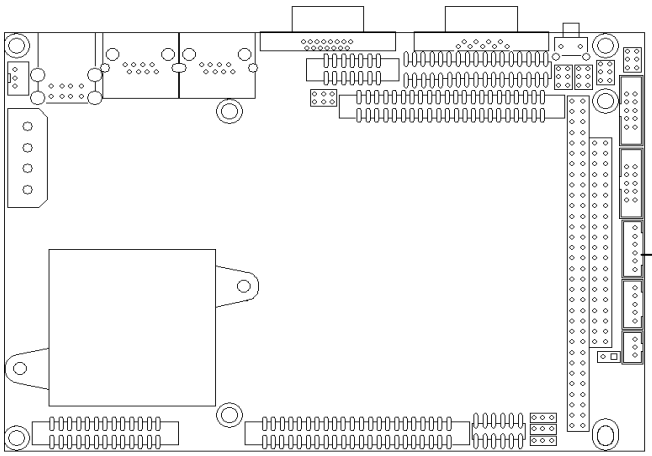
CN11: Main Power Connector



Pin	Assignment
1	+12V
2	Ground
3	Ground
4	+5V



CN13: Keyboard/Mouse Connector

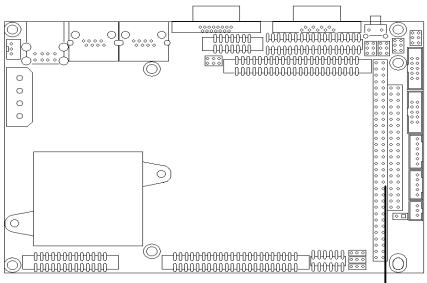


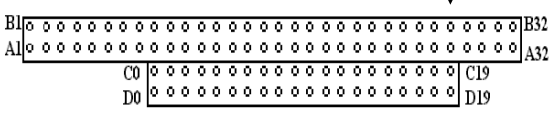
Pin	Assignment
1	KBCLK#
2	KBDATA#
3	MSCLK#
4	Ground
5	+5V
6	MSDATA#

CN14: PC/104 Connector

CNN14 is a standard PC/104 bus connector, and it is fully occupied with the signals of the "ISA" (PC/AT) bus. It offers full architecture, hardware and software compatibility with the ISA bus and can accept ultra-compact (3.6" x 3.8") stackable modules.

Signal	Pin	Signal	Pin	Signal	Pin	Signal	Pin
Ground	C0	Ground	D0	IOCHCHK	A1	Ground	B1
SBHE*	C1	MEMCS16*	D1	SD7	A2	RESET	B2
LA23	C2	IOSC16*	D2	SD6	A3	+5V	B3
LA22	C3	IRQ10	D3	SD5	A4	IRQ9	B4
LA21	C4	IRQ11	D4	SD4	A5	NC	B5
LA20	C5	IRQ12	D5	SD3	A6	NC	B6
LA19	C6	IRQ15	D6	SD2	A7	NC	B7
LA18	C7	IRQ14	D7	SD1	A8	0 wait state	B8
LA17	C8	DACL0*	D8	SD0	A9	+12V	B9
MEMR*	C9	DRQ0*	D9	IOCHRDY	A10	Ground	B10
MEMW*	C10	DACK5*	D10	AEN	A11	SMEMW#	B11
SD8	C11	DRQ5	D11	SA19	A12	SMEMR*	B12
SD9	C12	DACK6*	D12	SA18	A13	IOW*	B13
SD10	C13	DRQ6	D13	SA17	A14	IOR*	B14
SD11	C14	DACK7*	D14	SA16	A15	DACK3*	B15
SD12	C15	DRQ7	D15	SA15	A16	DRQ3	B16
SD13	C16	+5V	D16	SA14	A17	DACK1*	B17
SD14	C17	MASTER*	D17	SA13	A18	DRQ1	B18
SD15	C18	Ground	D18	SA12	A19	REFRESH*	B19
Ground	C19	Ground	D19	SA11	A20	SYSCLK	B20
				SA10	A21	IRQ7	B21
				SA9	A22	IRQ6	B22
				SA8	A23	IRQ5	B23
				SA7	A24	IRQ4	B24
				SA6	A25	IRQ3	B25
				SA5	A26	NC	B26
				SA4	A27	TC	B27
				SA3	A28	BALE	B28
				SA2	A29	+5V	B29
				SA1	A30	OSC	B30
				SA0	A31	Ground	B31
				Ground	A32	Ground	B32

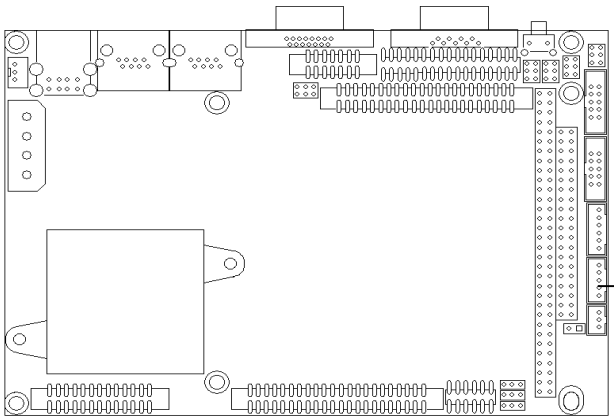




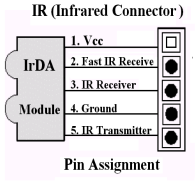
Please see how to install the PC/104 module in Appendix C.

CN15: IR Connector

The IrDA connector (CN15) can be configured to support a wireless infrared module. With this module and application software such as Laplink or a WIN95/98 direct cable connection, you can transfer files to or from Loptops, Notebooks, PDAs, and printers. This connector supports HPSIR (115.2kbps, 2 meters) and ASK-IR (56Kbps). Connect an infrared module to the IrDA connector and enable the infrared function in the BIOS setup.

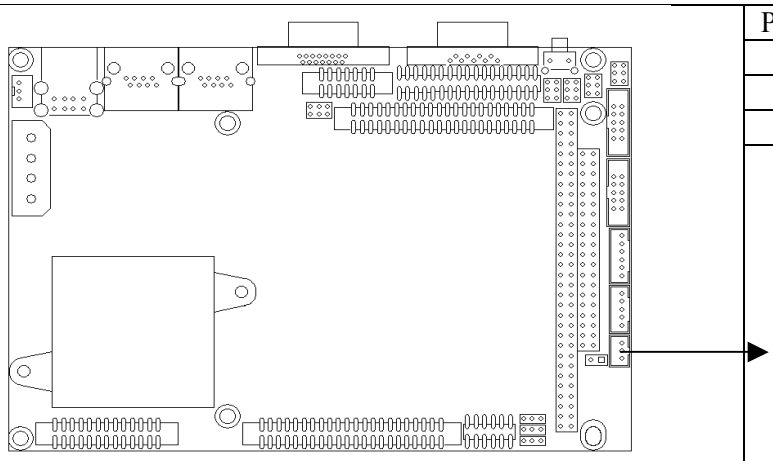


Pin	Assignment
1	Vcc
2	Fast IR Receive
3	IR Receiver
4	Ground
5	IR Transmitter

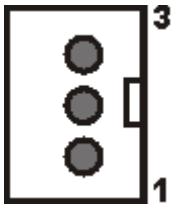


CN16: Auxiliary Power Connector

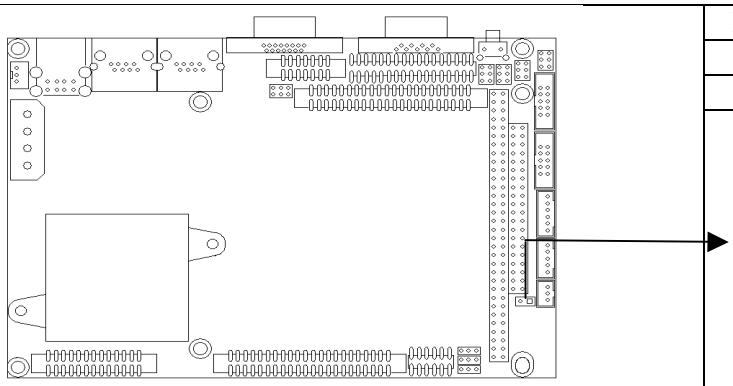
The MAT-B651 supports an auxiliary power connector that includes –5V and –12V voltages. It supports some PCI add-on cards or PC/104 modules that needs these voltages. Please connect the auxiliary power cable to CN16 and the power supply DC connector.



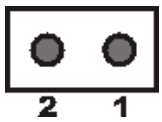
Pin	Assignment
1	-5V
2	Ground
3	-12V



CN17: ATX Power Control Connector

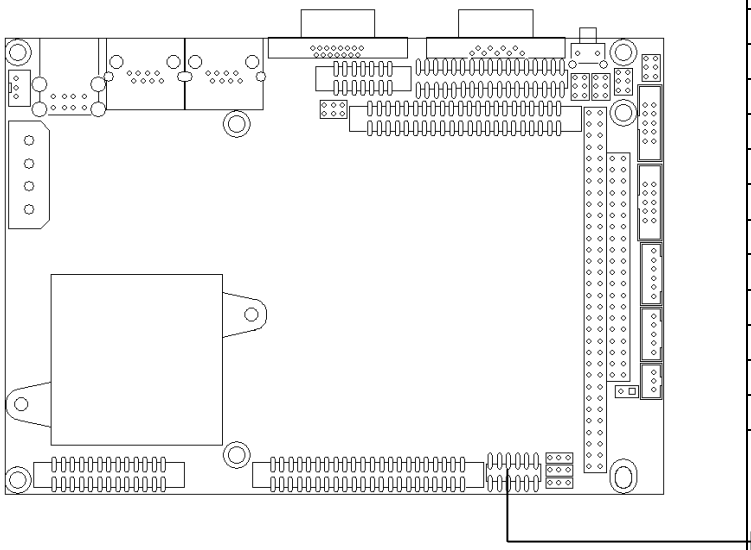


Pin	Assignment
1	PANSW
2	Ground

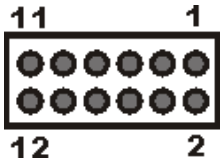


CN18: Audio Connector

This connector is used to connect a CD Audio cable, depending on the type of installed CD-ROM drive, connect the CD-ROM drive cable to one of these 12-pin connectors.

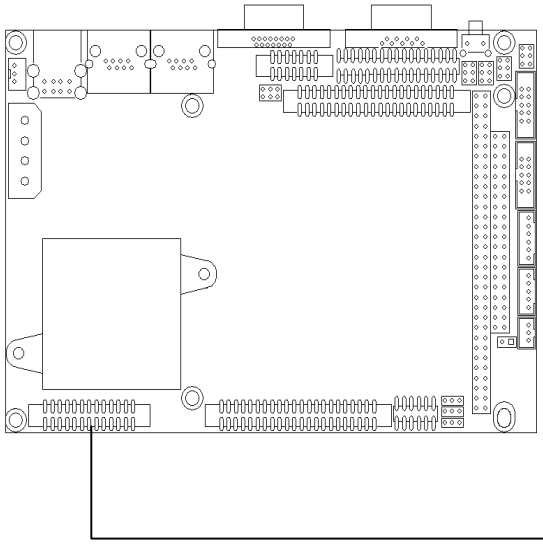


Pin	Assignment
1	+12V
2	Ground
3	Ground
4	CLKBIT
5	+3V
6	NC
7	SDTAIN
8	SYNC
9	Ground
10	PRST#
11	SDATAOUT
12	PCBEEP

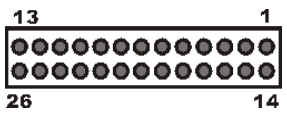


CN19: Parallel Port Connector

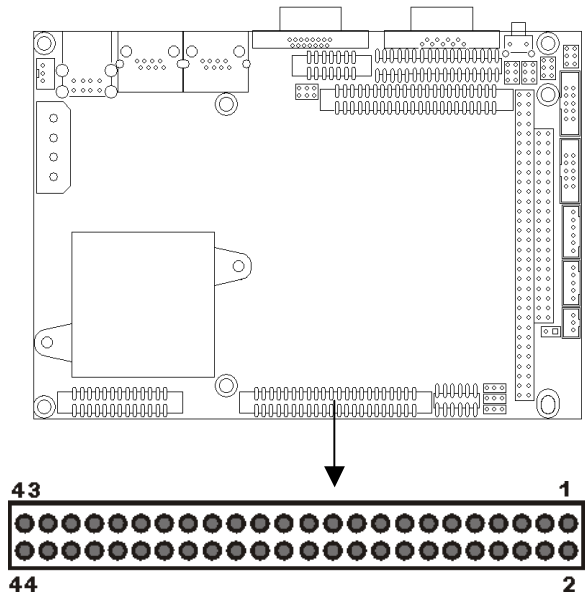
The MAT-B651 supports one parallel port, accessed through CN19. You need an adapter cable if you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other. The port is designed as LPT1 and can be disabled or changed to LPT2 or LPT3 in the BIOS Integrated Peripherals setup. You also can select the ECP/EPP mode in the BIOS Integrated Peripherals setup.



Pin	Assignment	Pin	Assignment
1	STRPBE	2	PD0
3	PI1	4	PD2
5	PD3	6	PD4
7	PD5	8	PD6
9	PD7	10	ACK#
11	BUSY	12	PE
13	SLCT	14	AUTOFD
15	ERR	16	INIT
17	SLCTIN	18	Ground
19	Ground	20	Ground
21	Ground	22	Ground
23	Ground	24	Ground
25	Ground	26	NC

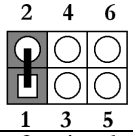
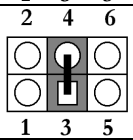
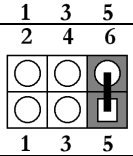


CN20: Flat Panel Connector

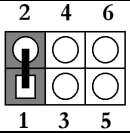
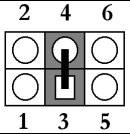
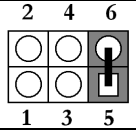


Pin	Signal	Pin	Signal
1	12V	2	12V
3	Ground	4	Ground
5	Vcc LCD	6	Vcc LCD
7	NC	8	Ground
9	NC	10	NC
11	LCD_FD0	12	LCD_FD1
13	LCD_FD2	14	LCD_FD3
15	LCD_FD4	16	LCD_FD5
17	NC	18	NC
19	LCD_FD6	20	LCD_FD7
21	LCD_FD8	22	LCD_FD9
23	LCD_FD10	24	LCD_FD11
25	NC	26	NC
27	LCD_FD12	28	LCD_FD13
29	LCD_FD14	30	LCD_FD15
31	LCD_FD16	32	LCD_FD17
33	Ground	34	Ground
35	SHFCLK	36	FPVSYNC
37	DE	38	FPHSYNC
39	Ground	40	FPBKLEN
41	NC	42	NC
43	NC	44	Vcc LCD

JP1, JP2, JP3, JP4: COM1 – COM4 RI/Voltage Select

Setting		COM Port	RI/Voltage
	1-2	COM1/COM2/COM3/COM4	Ring
	3-4	COM1/COM2/COM3/COM4	5V
	5-6	COM1/COM2/COM3/COM4	12V

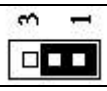
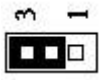
JP5: COM2 RS-232/422/485 Selector (Default: RS-232)

Setting		COM Ports
	1-2 (Default)	RS-232
	3-4	RS-422
	5-6	RS-485

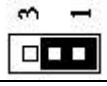
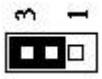
JP6: CMOS Clear

Setting		Define
	1-2	Normal Status (Default)
	2-3	Clear CMOS

JP7: Watchdog Time Mode Select

Setting		Define
	1-2	IRQ11
	2-3	Reset Switch (Default)

JP8: LCD Panel Voltage Select

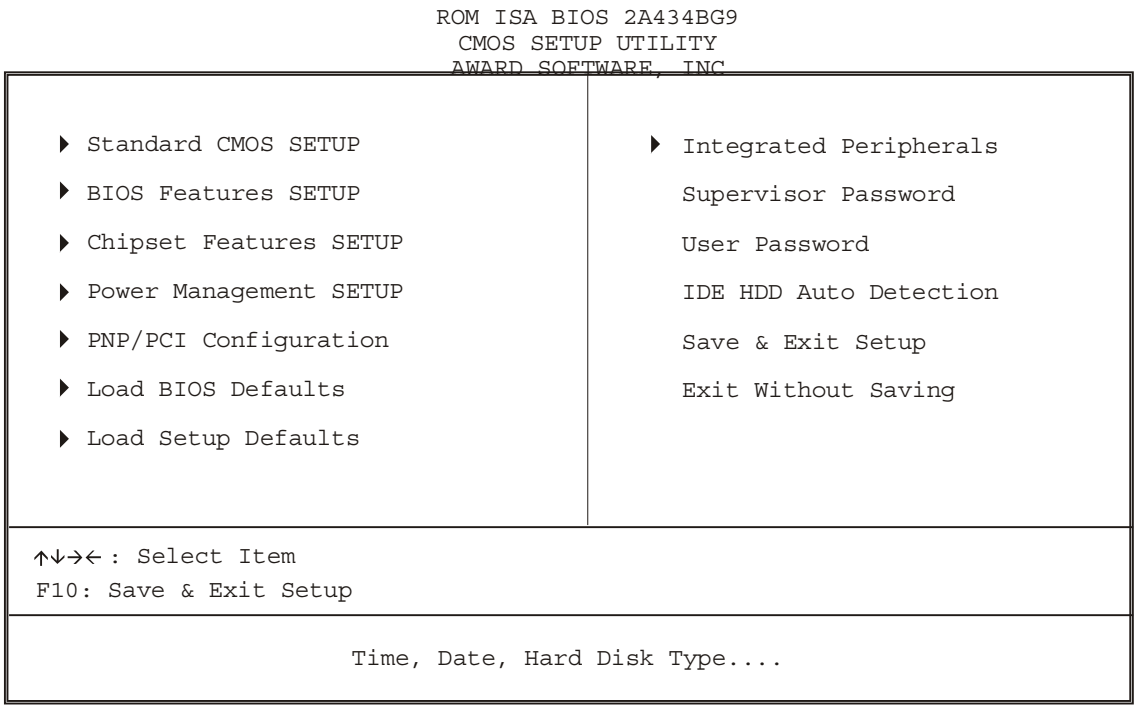
Setting		Define
	1-2	+5V
	2-3	+3.3V (Default)

Chapter 3. BIOS Setup

Award's BIOS ROM has a built-in Setup program that allows user to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

3-1. Entering CMOS Setup

Power on the computer and press <Del> immediately. This will allow you to enter Setup.



3-2. Standard CMOS Setup

When you choose the Standard CMOS Setup option from the Initial Setup Screen menu, the screen shown below is displayed. This standard Setup Menu allows users to configure system components such as date, time, hard disk drive, floppy drive and display. Once a field is highlighted, on-line help information is displayed in the left button of the Menu screen.

Standard CMOS Setup

⇩ Use the Standard CMOS Setup option as follows:

Choose "STANDARD CMOS SETUP" from the main menu. The following screen appears:

```
                    ROM PCI/ISA BIOS (2A434BG9)
                        Standard CMOS SETUP
                        AWARD SOFTWARE, INC

  Date (mm:dd:yy)       Mon, Jan 21 2002
  Time (hh:mm:ss)       10 : 40 : 23

  HARD DISK          TYPE    SIZE    CYLS   HEAD   PRECOMP LANDZ SECTOR  MODE
  Primary Master   : Auto      0       0      0      0       0     0      Auto
  Primary Slave    : Auto      0       0      0      0       0     0      Auto
  Secondary Master : Auto      0       0      0      0       0     0      Auto

  Drive A : 1.44MB, 3.5in
  Drive B : None

  Video   : EGA/VGA
  Halt On : All Errors

ESC : Quit          ↑↓→← Move                  +/-/PU/PD:Modify
F1  : Help          (Shift)F2 : Change Color
```

Use the arrow keys to move between fields. Modify the selected field using the PgUP/PgDn/+/- keys. Some fields let you enter numeric values directly.

Option	Description
Date (mn/date/year)	Type the current date
Time (hour:min:sec)	Type the current time (24-hour clock)
Hard Disks	Choose from “Auto,” “User,” “None.” If your drive is not one of the predefined types, choose “User” and enter the following drive specifications: cylinders, heads, Wpcom, L-Zone, sectors, and mode. Consult the documentation received with the drive for the values that will give you optimum performance.
Drive A Drive B	Choose: 360K, 5.25in 1.2M, 5.25in 720K, 3.5in 1.44M, 3.5in 2.88M, 3.5in or None
Video	Choose: Mono CGA40 CGA80, or EGA/VGA

Halt On	Controls whether the system stops in case of an error detected during power up. Choose: All Errors (the default) No Errors All, But Keyboard All, But Diskette All, But Disk/Key

After you have finished with the Standard CMOS Setup program, press the <ESC> key to return to the main menu.

3-3. BIOS Features Setup

By choosing the BIOS Features Setup option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the MAT-B651.

Use the BIOS Features Setup from the main menu. The following screen appears:

```
                    ROM PCI/ISA BIOS (2A434BG9)
                        BIOS FEATURES SETUP
                        AWARD SOFTWARE, INC

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

Use the arrow keys to move between fields. Modify the selected field using the PgUP/PgDn/+/- keys. Some fields let you enter numeric values directly.

Option	Description
Virus Warning	When enabled, any attempt to write to the boot sector and partition table will halt the system and cause a warning message to appear. If this happens,
CPU Internal Cache	Enables the CPU internal cache. The default setting is Enabled
Quick Power On Self Test	Speeds up POST after turning on the computer. When enabled, this setting will shorten or skip some check items during POST
Boot From LAN First	Disabled/Enabled. Enabled, the system will boot from LAN first when enabled with LAN has BOOT ROM function.
Boot Sequence	By default, the BIOS attempts to first boot from drive C: and then, if unsuccessful, from drive A:. You can change this sequence from A, C, D~F, CD ROM, SCSI, LS120, or USB
Swap Floppy Drive	Swaps the drive designation for A: and B: floppy disk drives
Boot Up Floppy Seek	When enabled, the BIOS will check whether there is a floppy disk drive installed. The default setting is Disabled.
Boot Up NumLock Status	Choose On or Off. On puts the numeric keypad in Num Lock mode at boot-up. Off puts the numeric keypad in arrow key mode at boot-up
Boot Up System Speed	It selects the default system speed – the system will run at immediately after power up. High – Set the speed at high Low – Set the speed at low
Gate A20 Option	Choose Enabled or Disabled. Enable this option to allow RAM accesses above 1MB using the fast gate A20 line. This option makes accesses faster than normal, and is useful in networking operating system
Memory Parity Check	Enabled: Normal memory parity check, system DRAM is no parity bit then the system will display “RAM Parity Error” Disabled: Ignore memory parity check even DRAM has no parity bit, the system will not display “RAM Parity Error”
Typematic Rate Setting	Choose Enabled or Disabled. Enable this option to adjust the keystroke repeat rate. Adjust the rate via Typematic Rate Delay and Typematic Rate
Typematic Rate	Choose the rate at which a character keeps

(Chars/Sec)	repeating
Typematic Delay (Msec)	Choose the delay between holding down a key and when the character begins repeating.
Security Option	Choose Setup or System. This option lets you specify whether a password is required every time the system boots or only when an attempt is made to enter the CMOS Setup program. "Setup" – The password prompt only appears if you attempt to enter the CMOS Setup program. "System" – The password prompt appears each time the system is booted. ***Note: The password function is disabled by default. For a description of enabling the password function, refer to the section "Supervisor Password & User Password" later in this chapter.***
PCI/VGA Palette Snoop	Enabling this item informs the PCI/VGA card to keep silent when palette register is updated.
OS Select For DRAM > 64M	Set to OS/2 if your system is using OS/2 and has memory size of more than 64MB
Report No FDD For Win 95	The setting is Enabled when run with Windows 95 without connecting FDD
Video BIOS Shadow	When enabled, the ROM BIOS on the video display card is copied into system DRAM to enhance performance.

After you have finished with the BIOS Features Setup program, press the <ESC> key to return to the main menu.

3-4. Chipset Features Setup

By choosing the Chipset Features Setup option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the MAT-B651.

Use the Chipset Features Setup from the main menu. The following screen appears:

```
                    ROM PCI/ISA BIOS (2A434BG9)
                      CHIPSET FEATURES SETUP
                       AWARD SOFTWARE, INC

SDRAM CAS Latency Time      :3T          Multiple Monitor Support: M/B First
SDRAM Clock Ratio Div By    :4           Video Memory Size       : 2.5M
                                         Flat Panel Support      : Disabled
16-bit I/O Recovery (CLK)   :5
8-bit I/O Recovery (CLK)    :5

USB Controller              :Enalbed
USB Legacy Support          :Disabled

Build in CPU Audio          :Disabled

                                         ESC  : Quit          ↑↓→←    :Select Item
                                         F1   : Help          PU/PD/+/-: Modify
                                         F5   : Old Values    (Shift)F2: Color
                                         F6   : Load BIOS Defaults
                                         F7   : Load Setup Defaults
```

Use the arrow keys to move between fields. Modify the selected field using the PgUP/PgDn/+/- keys. Some fields let you enter numeric values directly.

Option	Description
SDRAM CAS Latency Time	The value in this field were set according to the specification of the installed SDRAM type. If your SDRAM has the SPD IC installed, the BIOS will read the data and instruct you to set the latency to w for better performance when your SDRAM meets this timing specification.
SDRAM Clock Ratio Div By	This item allows you to set the SDRAM Clock Ratio Setting at 4: SDRAM clock is 75MHz Setting at 3: SDRAM clock is 100MHz
16-Bit I/O Recovery	Choose NA or 1 to 5 CPU clocks. This option lets you determine the recovery time of 16-bit I/O. The I/O recovery mechanism adds bus cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is much faster than the ISA bus.
8-Bit I/O Recovery	Choose NA or 1 to 8 CPU clocks. This option lets you determine the recovery time of 8-bit I/O. The

	I/O recovery mechanism adds bus cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is much faster than the ISA bus
USB Controller	To disable/enable the USB interface
USB Legacy Support	The setting is Enabled when using USB keyboard and Mouse
Built in CPU Audio	To disable/enable the audio function
Multiple Monitor Status	To select the primary VGA for multiple monitor support in WINDOWS
Video Memory Size	To select the size of video memory. It makes use of system memory for display. **Note: If your system run with Windows 2000 then the VGA shared memory should be 4.0M**
Flat Panel Status	To disable/enable the Flat Panel display function

After you have finished with the Chipset Features Setup program, press the <ESC> key to return to the main menu.

3-5. Power Management Setup

By choosing the Power Management Setup option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the MAT-B651.

```
                    ROM PCI/ISA BIOS (2A434BG9)
                      POWER MANAGEMENT SETUP
                       AWARD SOFTWARE, INC

Power Management           :Disabled      IRQ1  (Keyboard)         :ON
                                          IRQ3  (COM 2)            :OFF
       ** PM Timers **                    IRQ4  (COM 1)            :OFF
Doze Mode                  :Disabled      IRQ5  (LPT 2)            :OFF
Standby Mode               :Disabled      IRQ6  (Floppy Disk)      :OFF
HDD Power Down             :Disabled      IRQ7  (LPT 1)            :OFF
MODEM Use IRQ              :NA            IRQ9  (IRQ2 Redir)       :OFF
                                          IRQ10 (Reserved)         :OFF
Throttle Duty Cycle        :33%           IRQ11 (Reserved)         :OFF
                                          IRQ12 (PS/2 Mouse)       :OFF
                                          IRQ13 (Coprocessor)      :OFF
                                          IRQ14 (Hard Disk)        :OFF
                                          IRQ15 (Reserved)         :OFF
                                         ------------------------------
                                          ESC  : Quit         ↑↓→←    :Select Item
                                          F1   : Help         PU/PD/+/-: Modify
                                          F5   : Old Values   (Shift)F2: Color
                                          F6   : Load BIOS Defaults
                                          F7   : Load Setup Defaults
```

1. Use the Power Management Setup from the main menu. The following screen appears:

Use the arrow keys to move between fields. Modify the selected field using the

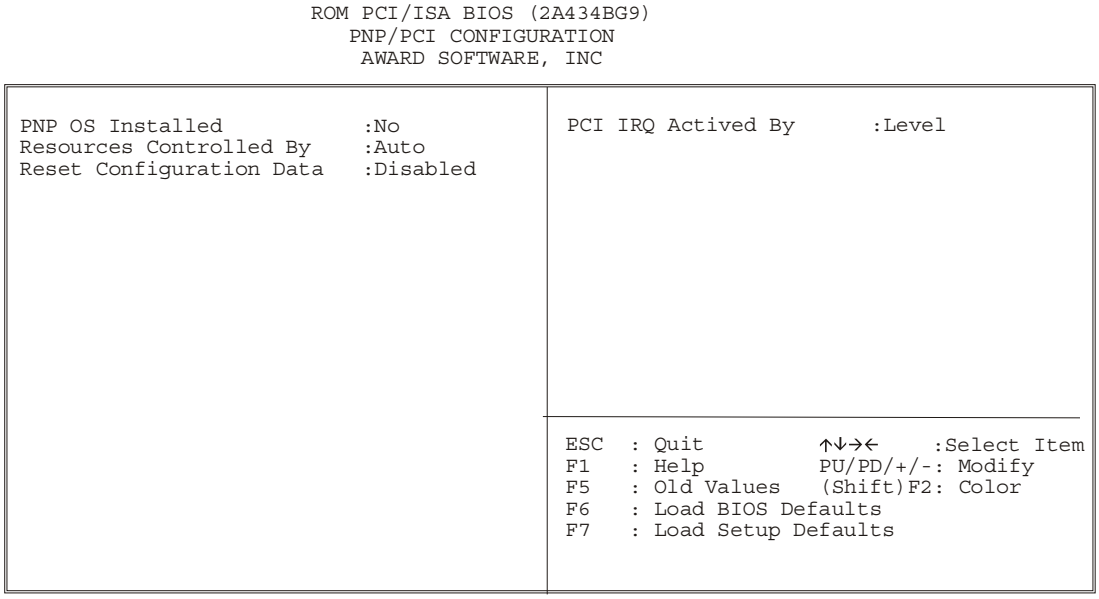
PgUP/PgDn/+/- keys. Some fields let you enter numeric values directly.

Item	Description
Power Management	Choose Disable, User Define, Min Saving, or Max. Saving. "User Define" – Lets you specify when the HDD and system will shut down. "Min Saving" – Predefined timer value of 4-12 minutes. "Max Saving" – Predefined timer value of 1 minute.
Doze Mode	Sets the timer for Doze mode or disables it.
Standby Mode	Sets the time for Standby mode or disables it
HDD Power Down	Sets the time for the HDD power down mode or disables it
MODEM Use IRQ	Choose the IRQ used by the modem.
Throttle Duty Cycle	This item allows you to specify the CPU speed (at percentage) to which it will slow down when the CPU reaches the predetermined overheat temperature. The setting range from 12.5% to 87.5% at 12.5% increment.
Primary INTR	Sets the detection of IRQ1, IRQ3-7, IRQ9-15 interrupt events on/off; any events occurring will awaken a system that has been powered down.

After you have finished with the Power Management Setup program, press the <ESC> key to return to the main menu.

3-6. PnP/PCI Configuration

By choosing the PnP/PCI Configuration option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the MAT-B651.



Use the Power Management Setup from the main menu. The following screen appears:

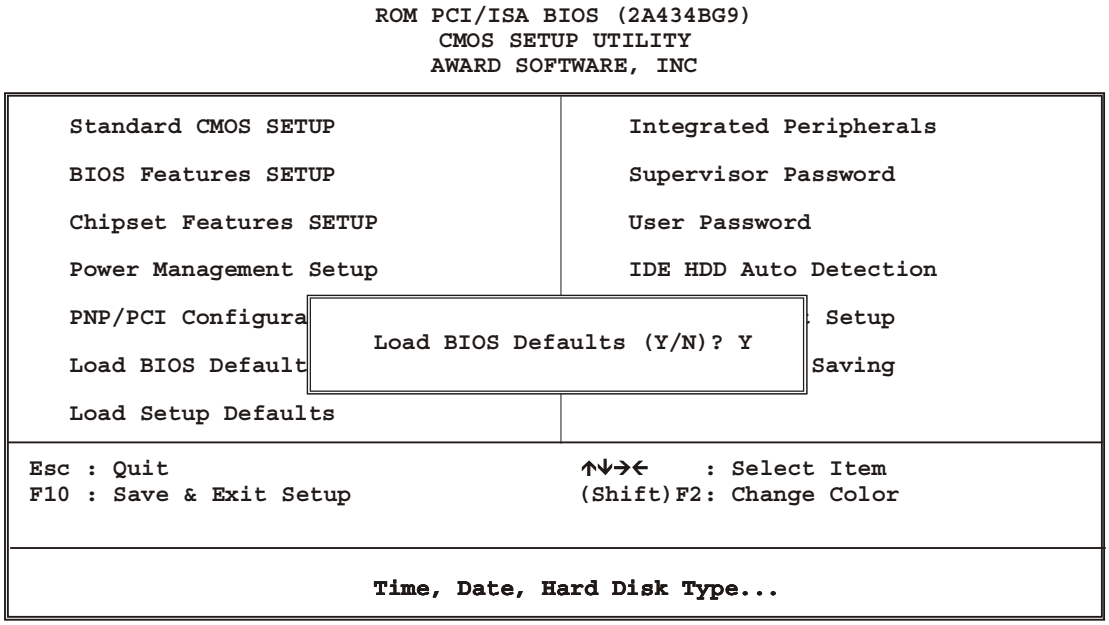
Use the arrow keys to move between fields. Modify the selected field using the PgUP/PgDn/+/- keys. Some fields let you enter numeric values directly.

Item	Description
PNP OS Installed	Choose Yes or No. When Yes is selected, an IRQ will be assigned by the OS
Resources Controlled By	Choose Auto or Manual. This option specifies whether resources are controlled by automatic or manual configuration
Reset Configuration Date	Choose Enable or Disable "Enable" – PNP configuration data is reset in BIOS "Disable" – PNP configuration date is retained in BIOS
PCI IRQ Actived By	This item allows you to set the PCI IRQ signal active define by Level (high/low) or Trigger (rising/falling).

After you have finished with the Power Management Setup program, press the <ESC> key to return to the main menu.

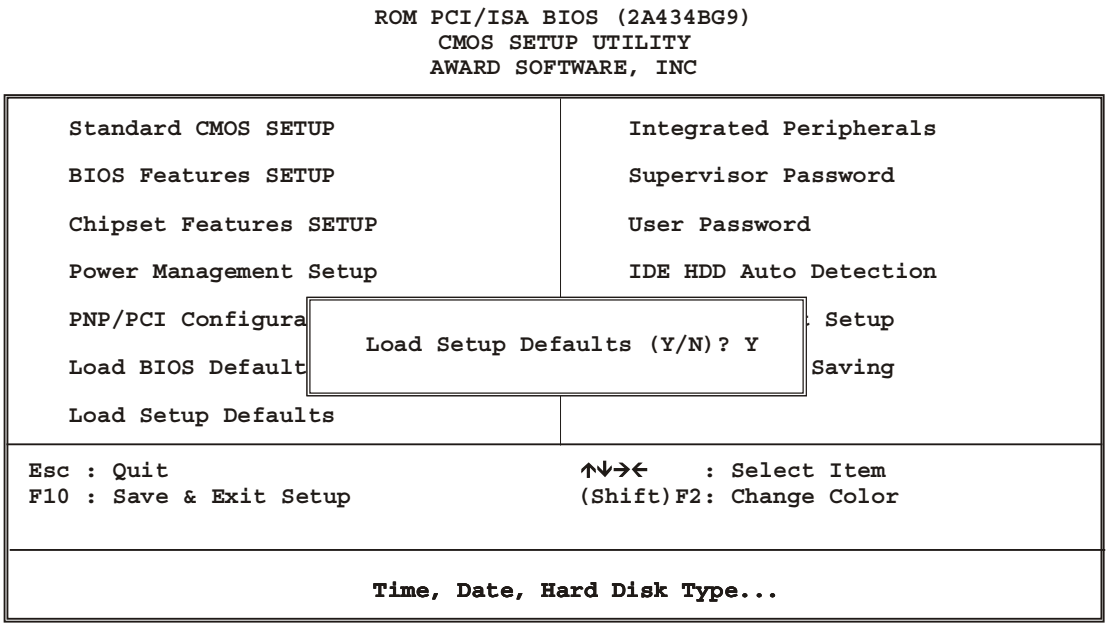
3-7. Load BIOS Defaults

Load BIOS Default loads the default system values directly from ROM. If the stored record created by the Setup program becomes corrupted (and therefore unusable), these defaults will load automatically when you turn the MAT-B651 on.



3-8. Load Setup Defaults

This option loads optimized settings stored in the BIOS ROM. The auto-configured settings do not affect the Standard CMOS Setup screen.



To Use this feature, highlight it on the main screen and press <Enter>. A line will appear on

the screen asking if you want to load the SETUP default values. Press the <Y> key and then press <Enter> if you want to load the SETUP default

3-9. Integrated Peripherals

By choosing the Integrated Peripherals option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the MAT-B651. The Panel Type by default supports a 18-bit 640 x 480 TFT LCD panel display.

```
                    ROM PCI/ISA BIOS (2A434BG9)
                      INTEGRATED PERIPHERALS
                       AWARD SOFTWARE, INC

IDE HDD Block Mode          :Enabled        Onboard Parallel Port    :378/IRQ7
Primary IDE Channel         :Enabled        Parallel Port Mode       :SSP
 Master Drive PIO Mode      :Auto
 Slave Drive PIO Mode       :Auto           PHONERING Wake Up        :Disabled
Secondary IDE Channel       :Enabled        Onboad Serial Port 3     :3E8
 Master Drive PIO Mode      :Auto           Serial Port 3 Use IRQ    :IRQ9
                                            Onboard Serial Port 4    :2E8
IDE Primary Master UDMA     :Auto           Serial Port 4 Use IRQ    :IRQ10
IDE Primary Slave UDMA      :Auto
IDE Secondary Master UDMA   :Auto

KBC Input Clock             :8MHz
Onboard FDC Controller      :Enabled
Onboard Serial Port 1       :3F8/IRQ4
Onboard Serial Port 2       :2F8/IRQ3       ESC  : Quit          ↑↓→←    :Select Item
Onboard IR Controller       :Disabled       F1   : Help          PU/PD/+/-: Modify
                                            F5   : Old Values    (Shift)F2: Color
                                            F6   : Load BIOS Defaults
                                            F7   : Load Setup Defaults
```

Use the Power Management Setup from the main menu. The following screen appears:

Use the arrow keys to move between fields. Modify the selected field using the PgUP/PgDn/+/- keys. Some fields let you enter numeric values directly.

Option	Description
IDE HDD Block Mode	**Enables/Disables the IDE HDD Block Mode function** **Note: Not all drives support this function**
IDE Primary Master/Slave PIO	**Enables/Disables the first/second onboard PCI IDE**
IDE Secondary Master PIO	**Lets you select a PIO mode for the onboard PCI IDE**
IDE Primary Master/Slave UDMA	**Enables/disables support for Ultra DMA/33 IDE devices**
IDE Secondary Master UDMA	**Enables/disables support for Ultra DMA/33 IDE devices**
KBC Input Clock	**Have 6MHz, 8MHz (Default), 12MHz, 16MHz select KBC input clock**
Onboard FDC Controller	**Enables/Disables the onboard FDD controller**
Onboard Serial Port 1 and 2	**Enables/Disables the onboard serial port 1 and 2 respectively**
Onboard IR Controller	**Enables/Disabled the onboard IR**
Onboard Parallel Port	**Enables/Disables the onboard parallel port**

Parallel Port Mode	**Lets you select the parallel port mode**
PHONERING Wake Up	**Enabled/Disabled. When enabled, the system will power up automatically when modem ring.**
Watch Dog Timer Select	**Enabled/Disabled the watch dog timer**
Onboard Serial Port 3 and 4	**Enables/Disables the onboard serial port 3 and 4 respectively**
Serial Port 3 and 4 IRQ	**Let you select COM3/COM4 interrupt IRQ3-7, 9-11**

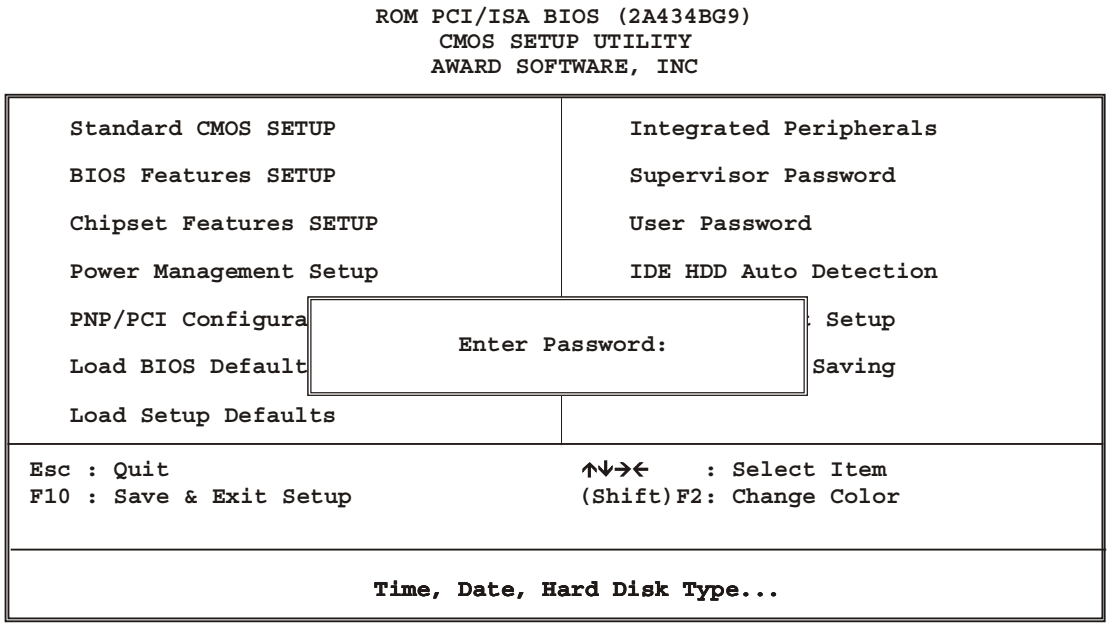
After you have finished with the Power Management Setup program, press the <ESC> key to return to the main menu.

3-10. Password Setting

The password options let you prevent unauthorized system boot-up or unauthorized use of CMOS setup. The Supervisor Password allows both system and CMOS Setup program access; the User Password allows access to the system and the CMOS Setup Utility main menu.

The password functions are disabled by default. You can use these options to enable a password function or, if a password function is already enabled, change the password.

To change a password, first choose a password option from the main menu and enter the current password. Then type your new password at the prompt. The password is case sensitive and you can use up to 8 alphanumeric characters. Press <Enter> after entering the password. At the Next Prompt, confirm the new password by typing it and pressing <Enter> again.



After you use this option to enable a password function, use the “Security Option” in “BIOS Feature Setup” to specify whether a password is required every time the system boots or only when an attempt is made to enter the CMOS Setup program.

3-11. IDE HDD Auto Detection

The onboard IDE controller supports Enhanced IDE and has two connectors that support a total of four IDE devices. If you use another IDE controller that does not have Enhanced IDE supported for four devices, you can only install two IDE hard disk drives. Your IDE controller must support Enhanced IDE features in order to use drive E: and F:

Important: This utility will only detect one set of parameters for an IDE drive. Some IDE drives can use more than one set. This is not a problem if the drive is new and there is nothing on it. If the hard disk drive is already formatted when you install it and different parameters were used rather than those detected here, you will have to enter them manually.

If the parameters listed don't match the ones used when the drive was formatted, the drive won't be readable. If the auto-detect parameters displayed do not match the ones that should be used in your drive, do not accept them. Press the <N> key to reject the values and enter the correct ones manually from the standard CMOS Setup screen.

Choose "IDE HDD AUTO DETECTION" in the main menu and press <Enter>. The following screen appears:

```
                ROM PCI/ISA BIOS (2A434BG9)
                    CMOS SETUP UTILITY
                  AWARD SOFTWARE, INC.

HARD DISKS          TYPE   SIZE    CYLS HEAD PRECOMP LANDZ SECTOR  MODE
Primary Master    :

  Select Primary Master Option (N=Skip) : N

    OPTIONS     SIZE   CYLS HEAD PRECOMP LANDZ SECTOR  MODE
       2(Y)     4310    524  255       0   8911     63 LBA
       1        4312   8912   15   65535   8911     63 Normal
       3        4312    557  240   65535   8911     63 Large

 Note: Some OSes (like SCO-UNIX before V5.0) must use "Normal" for installation

                              ESC : Skip
```

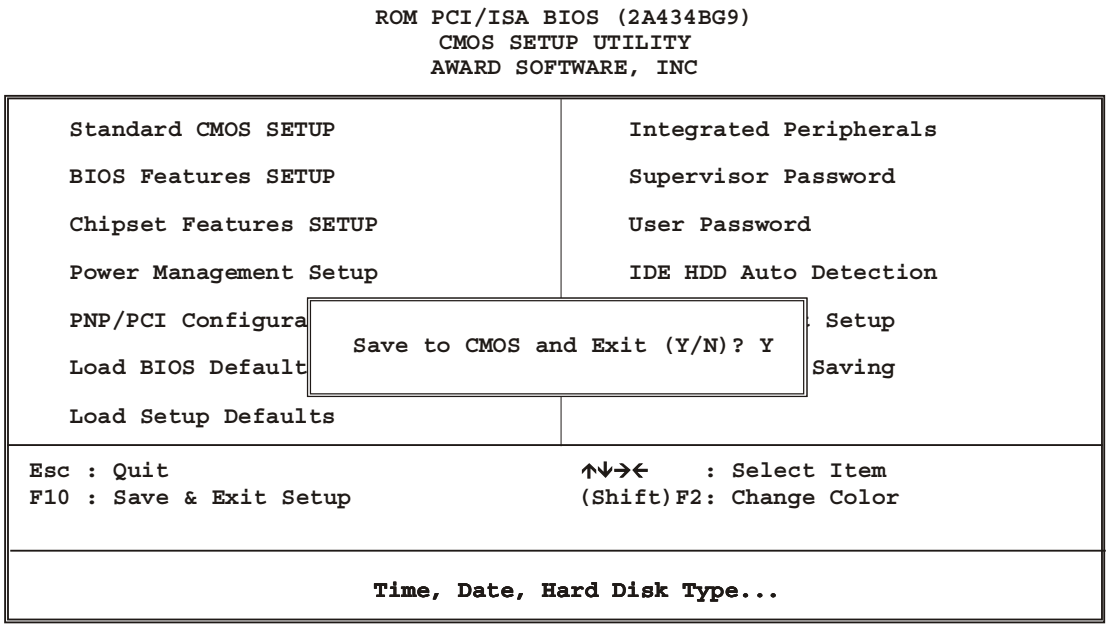
Press <ESC> to exit to the main menu.

If you are setting up a hard disk drive that supports LBA mode, three lines will appear in the parameter box. Choose the line that lists LBA or an LBA drive. Do not choose Large or

Normal.

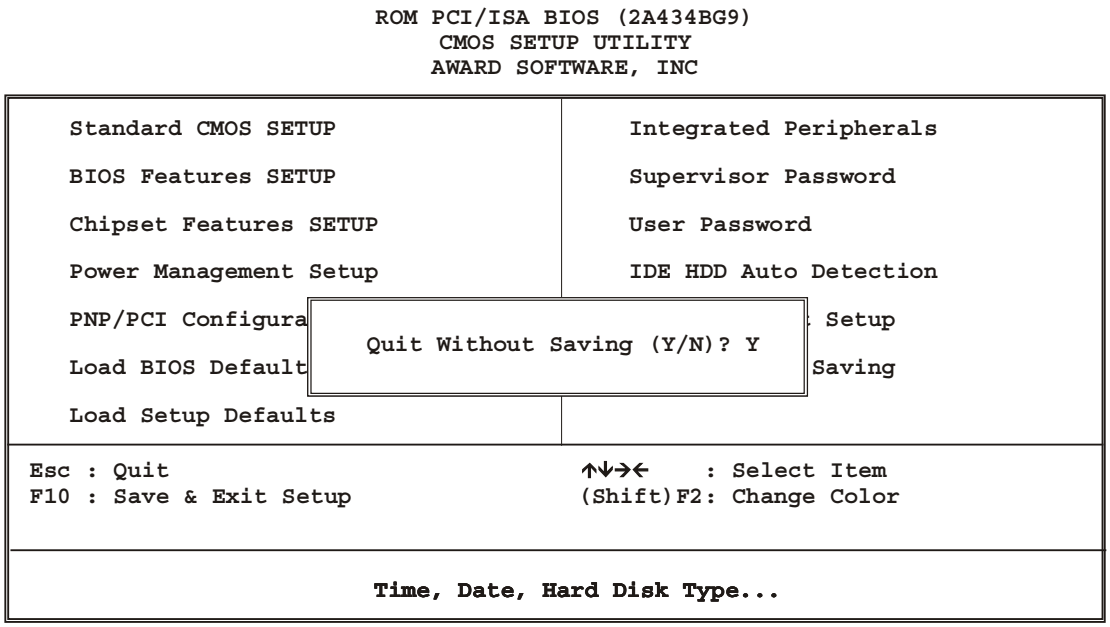
3-12. Save and Exit Setup

This function automatically saves all CMOS values before exiting Setup.



3-13. Exit Without Saving

Use this function to exit Setup without saving the CMOS value.

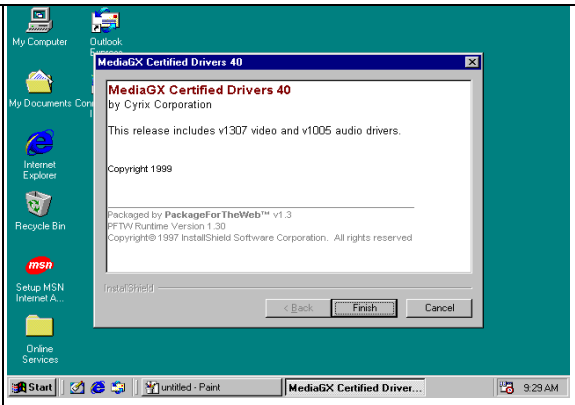
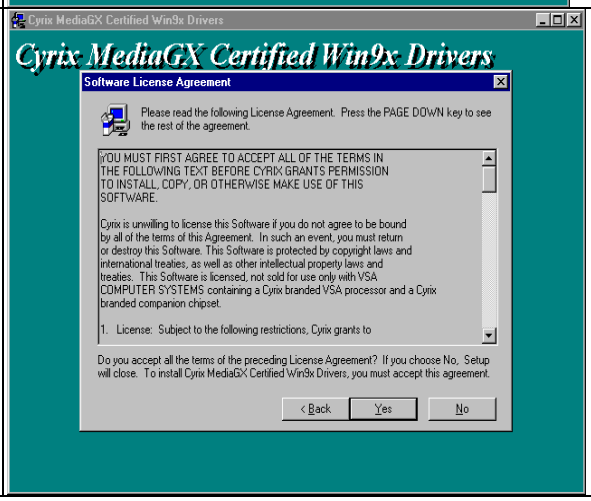

ROM PCI/ISA BIOS (2A434BG9)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC
Standard CMOS SETUP
BIOS Features SETUP
Chipset Features SETUP
Power Management Setup
PNP/PCI Configura
Load BIOS Default
Load Setup Defaults
Integrated Peripherals
Supervisor Password
User Password
IDE HDD Auto Detection
Setup
Saving
Quit Without Saving (Y/N)? Y
Esc : Quit
F10 : Save & Exit Setup
↑↓→← : Select Item
(Shift)F2: Change Color
Time, Date, Hard Disk Type...

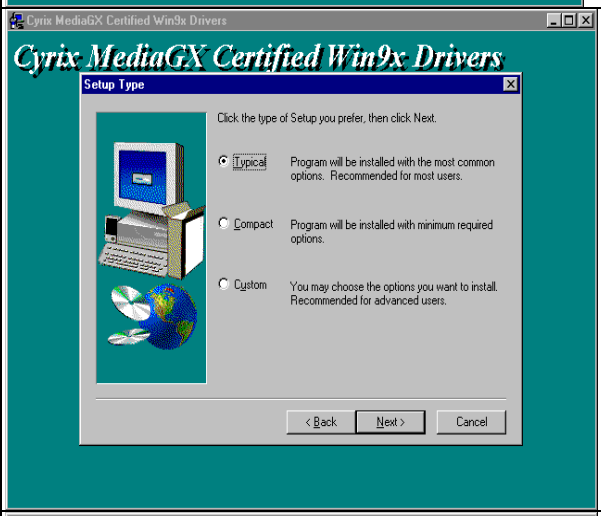
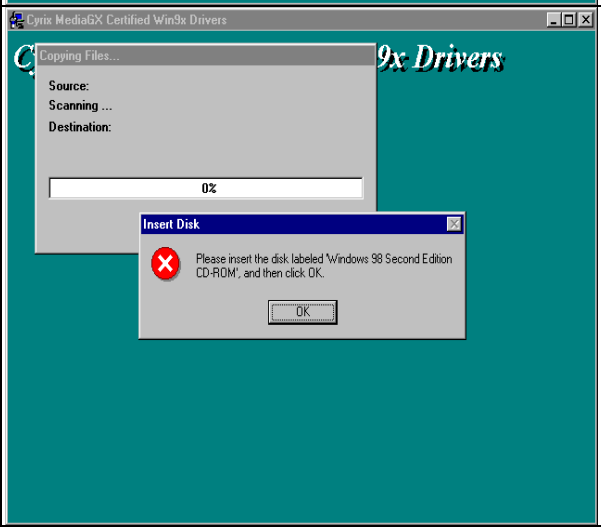
Chapter 4. Drivers and Utilities Installation

4-1. Install VGA/Audio Driver for Windows 98

⇩ Install the VGA drive for Windows98 as follows:

Warning: This program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.

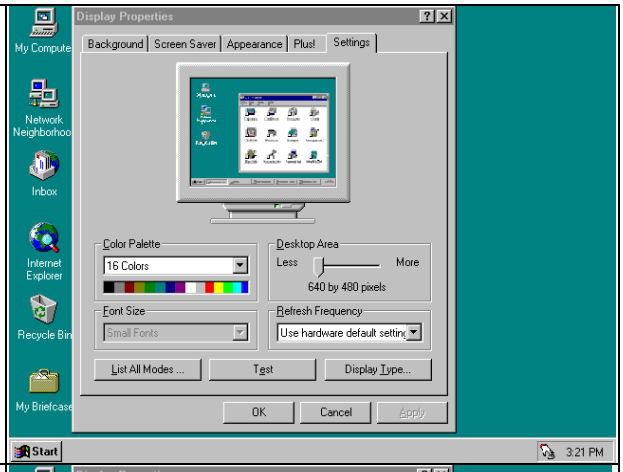
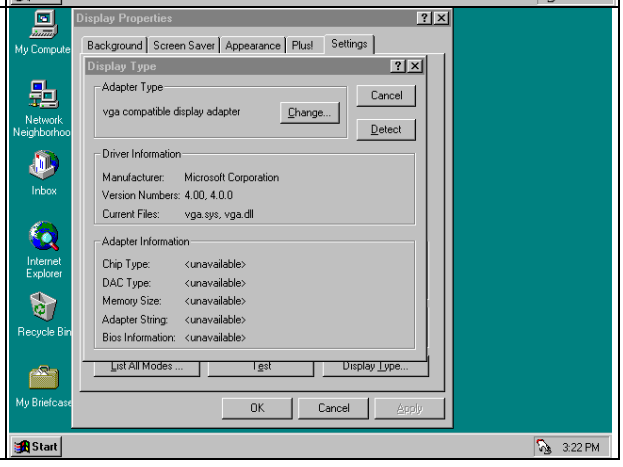
Please note: when you setup VGA for WIN 98, it installs Audio at the same time. Please type in the correct path, for example: **D:\VGA\Win9xC-40\Cyrix MediaGX Certified Win 9x Drivers 4.0.** Please click "Finish"	
Please click Next> to the next step of installation.	
Please click "Yes" after you reading and accepting the license agreement.	

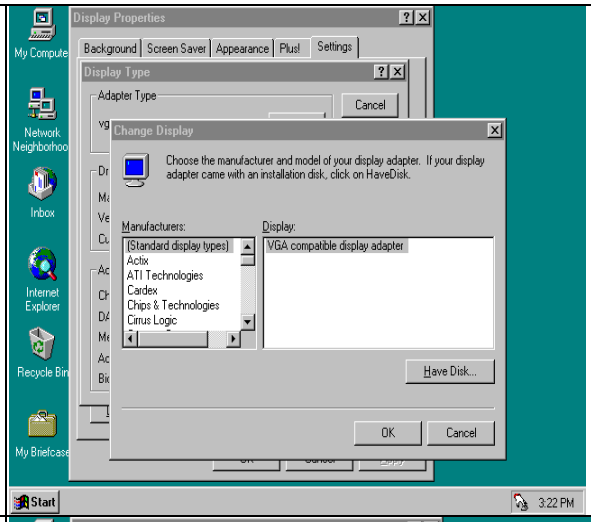
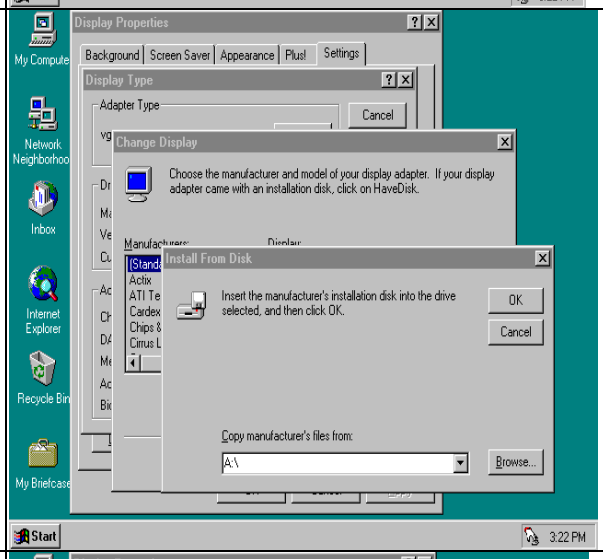
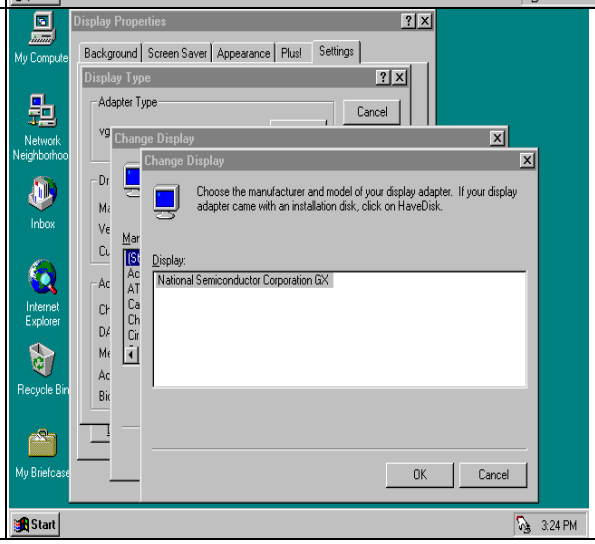
Please click “Next> after choosing the proper location.	
Please select “Typical” and click “Next> to the next step of installation.	
Please insert the Windows 98 CD-ROM, and then click “OK”	

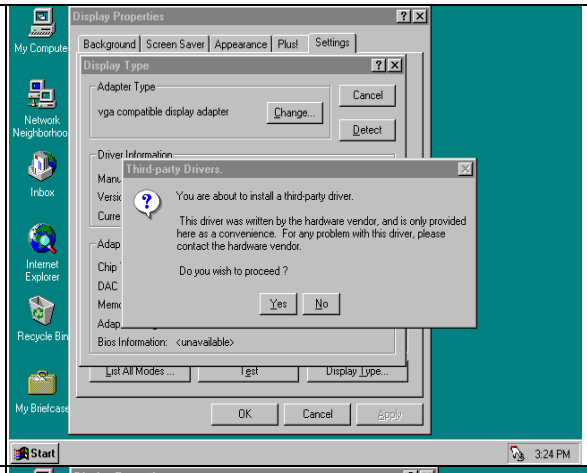
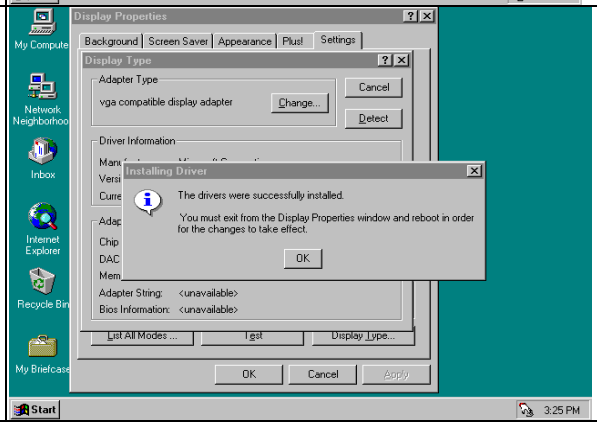
Please choose "Yes", and click "Finish" to restart the computer.	

4-2. Install the VGA Driver for Windows NT

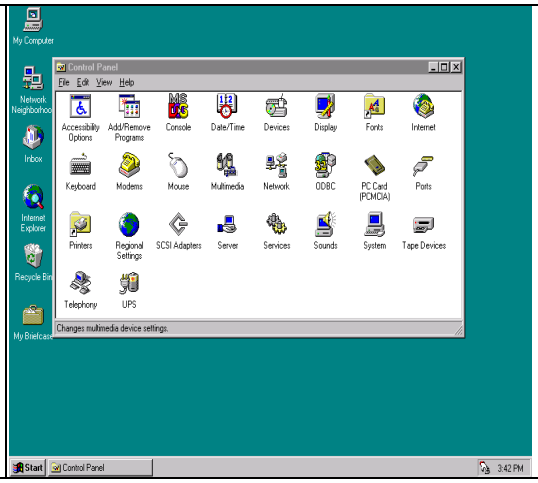
Install the onboard CX5330A VGA Driver for Windows NT

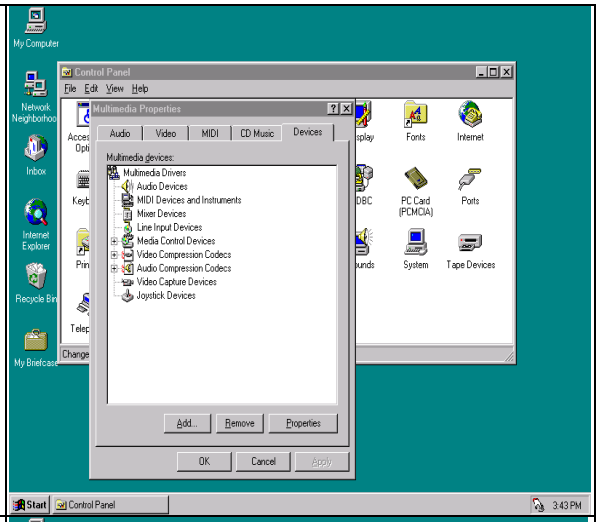
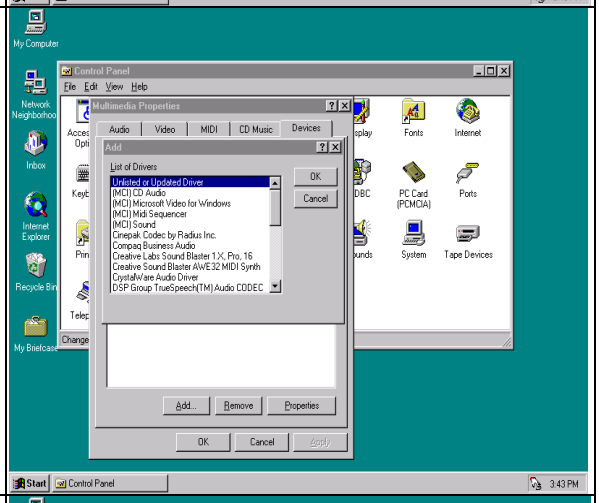
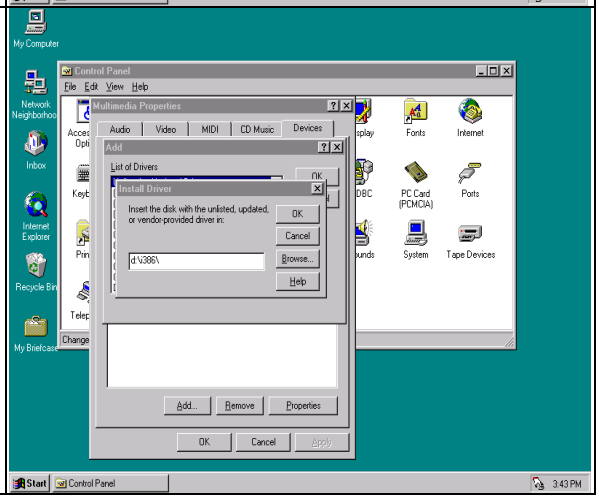
Please Click "Start", go to "Setting" and click "Control Panel". Choose the "Display" icon and double-click the icon, the next configuration screen will appear	
Please press "Change" to the next step of installation.	

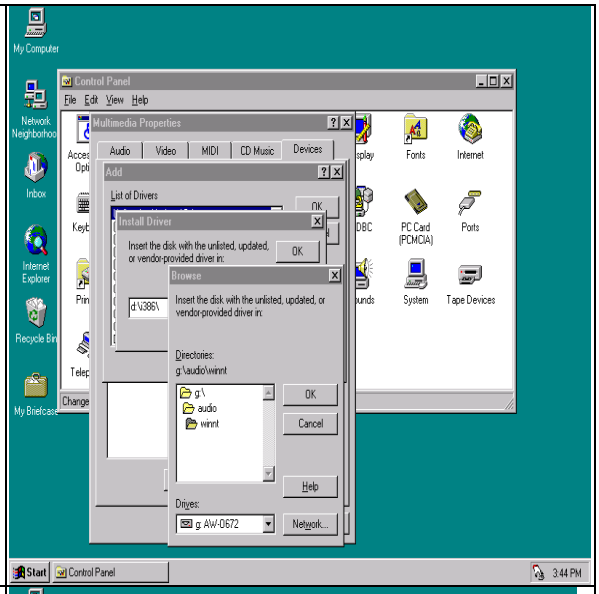
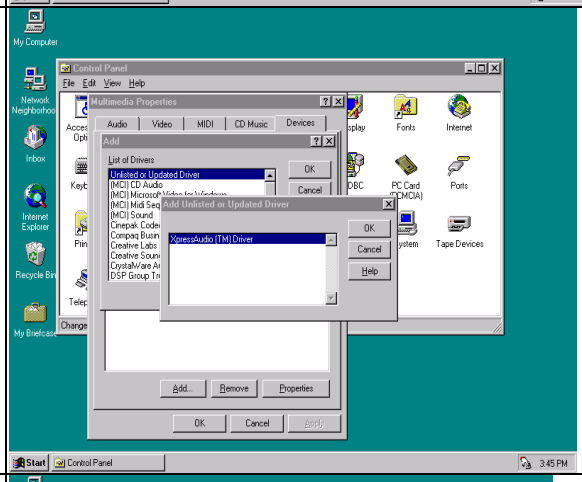
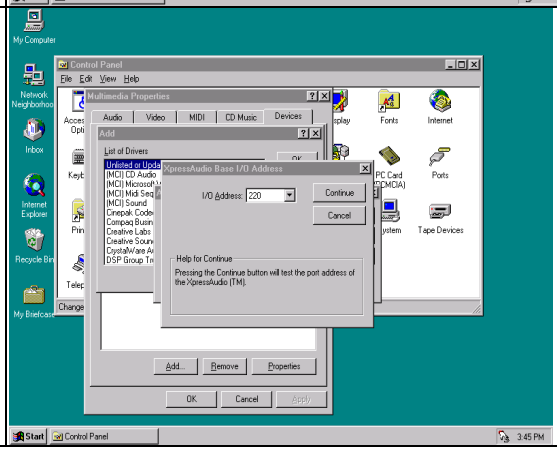
Please click “Have Disk..” to the next step of installation.	
Please insert the utility disc in to the CD-ROM drive. Please type **D:\VGA\winnt** Press “OK” to the next step of installation	
Please select the highlighted item and press “OK” to the next step	

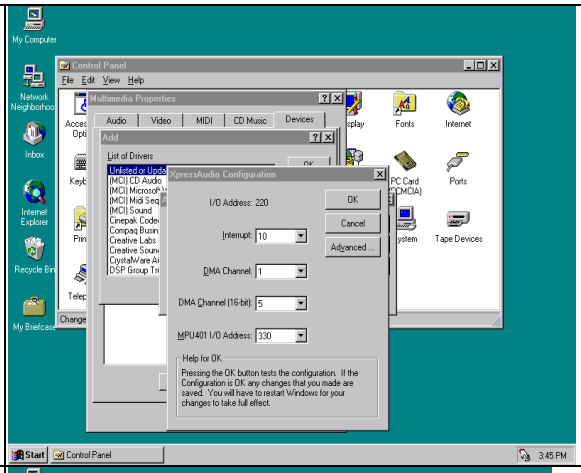
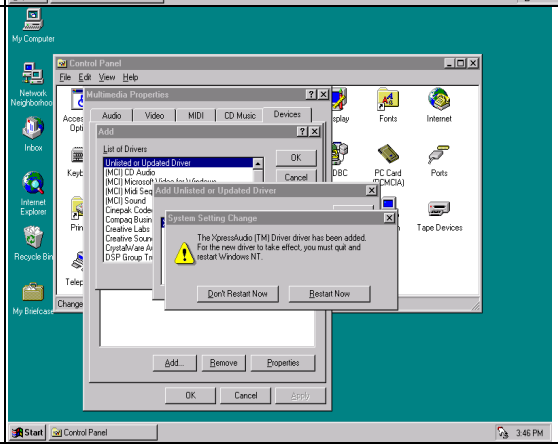
Please click "Yes" to the next setp	
Please press "OK" to reboot	

4-3. Install the Audio Driver for Windows NT

Please Click "Start", go to "Setting" and click "Control Panel". Choose the "Multimedia" icon and double-click the icon, the next configuration screen will appear	

Select the “Device” item and click “Add” to next step of installation.	
Please select the “Unlisted or Updated Driver” and click “OK”	
Please insert the utility disc in to the CD-ROM drive. Please type: **D:\Audio\winnt** Press “OK” to the next step	

Please click "OK" to the next step	
Please select the highlighted item and click "OK" to the next step of installation	
Set the I/O Address and click "Continue" to the next step	

Set the XpressAudio Configuration and click “OK” to the next step.	
Click “Restart Now”	

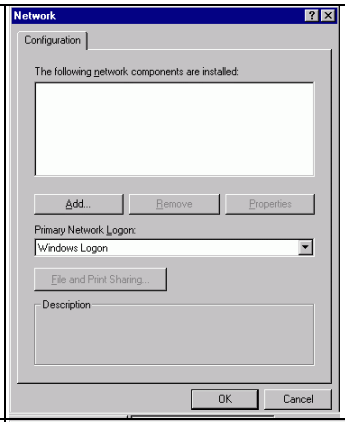
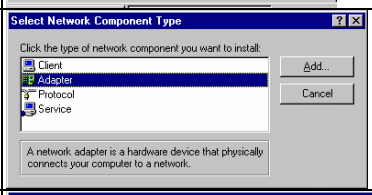
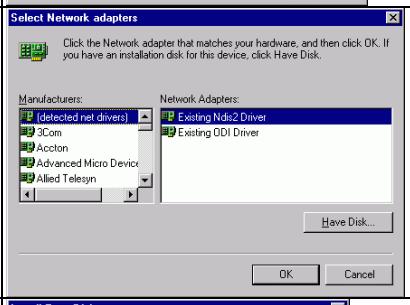
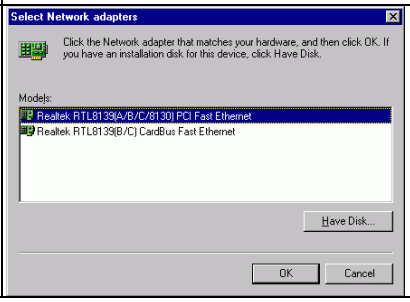
4-4. Install the Ethernet Driver

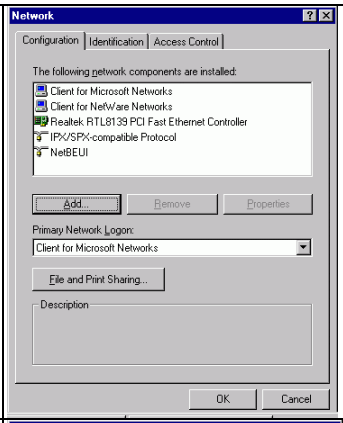
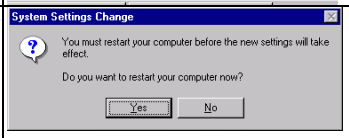
Installing the Ethernet Drivers

The MAT-B651 has a high-performance Ethernet chipset Intel 82559ER and Realtek RTL8139C that provide 32-bit performance, PCI Bus master capability, fully compliance with the IEEE 802.3u 100Base-T specification, and IEEE 802.3x Full Duplex Flow Control. It supports the Advanced Configuration Power Management Interface (ACPI), PCI power management for modern operating systems that is capable of Operating System Directed Power Management (OSPM) to achieve the most efficient power management. It also supports remote wake-up in both ACPI and APM environments.

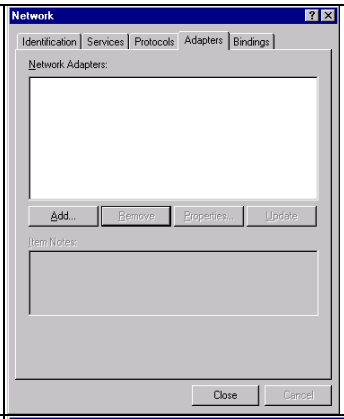
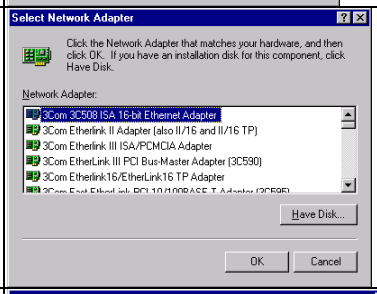
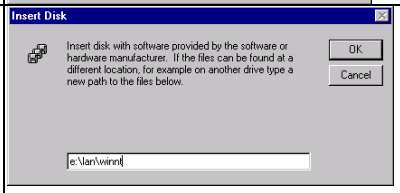
4-4-1. Realtek 8139C Drivers Installation

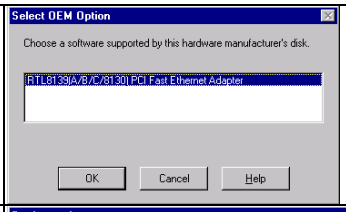
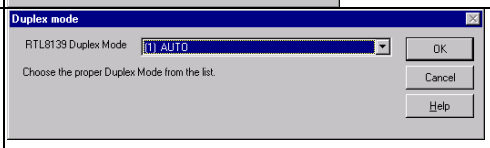
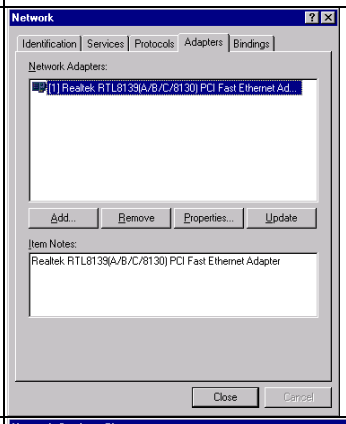
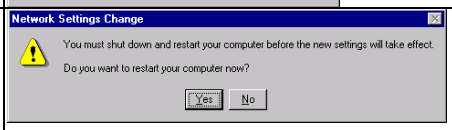
Install Driver for Windows 95/98 (Realtek RTL8139C)

Click **"Start"**, go to **"Settings"** and click **"Control Panel"**. Choose the **"Network"** icon and double-click the icon. The Configuration screen will appear. Click **"OK"** to continue.	
Select **"Adapter"** and click **"Add"**.	
Click **"Have Disk"** to continue.	
Insert the Drivers and Utilities CD into the CD-ROM drive (example E:). Click **Browse** to find the INF file. The file is located at **E:\LAN/8139C\Driver\Win98**	
Select **"Realtek RTL8139C (A/B/C/8130) PCI Fast Ethernet"** and click **"OK"**.	

Set the configuration of the related items and click **"OK"**.	
Click **"Yes"** to restart the system for the new settings to take effect.	

Installation for Windows NT (Realtek 8139C)

Click **"Start"**, go to **"Settings"** and click **"Control Panel"**. Choose the **"Network"** icon and double-click the icon. The Configuration screen will appear. Click **"Add"** to continue.	
Click **"Have Disk"** to continue.	
Insert the Drivers and Utilities CD into the CD-ROM drive (example E:). Click **Browse** to find the INF file. The file is located at **E:\LAN\8139C\Driver\Winnt4**	

Select **"Realtek RTL8139 (A/B/C/8130) PCI Fast Ethernet"** and click **"OK"**.	
Select **"(1) Auto"** for the Duplex Mode and click **"OK".**	
Setting the configuration of the related items and click **"OK"**.	
Click **"Yes"** to restart the system for the new settings to take effect.	

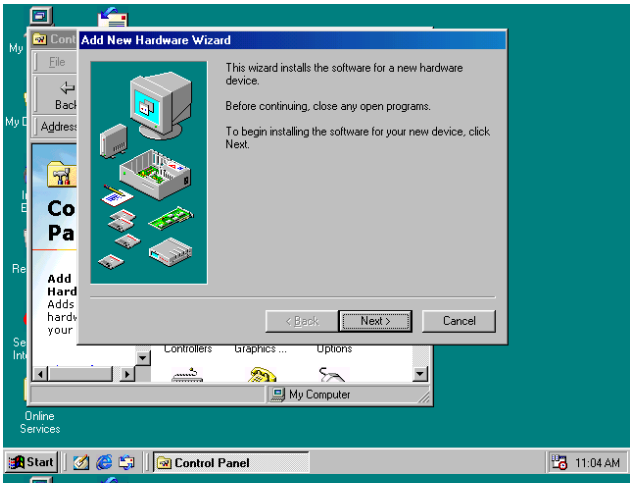
4-4-2. Intel 82559ER or 82559 Driver Installation

Install Windows 95/98 (Intel 82559ER or 82559)

Please install Ethernet drivers as follows:

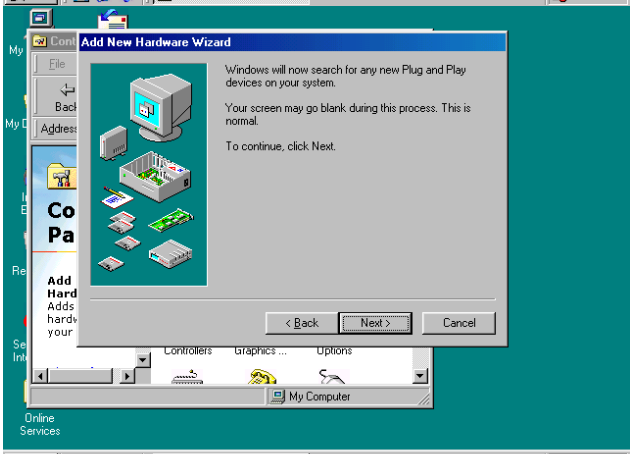
Click **"Start"**, go to **"Setting"** and click **"Control Panel"**. Choose the **"Add New Hardware"** icon and double-click the icon, the next configuration screen will appear.

“Add New Hardware Wizard” shown this wizard installs the software for a new hardware device. Before continuing, close any open programs. To begin installing the software for your new device, click “Next>”, go to the next step of installation.

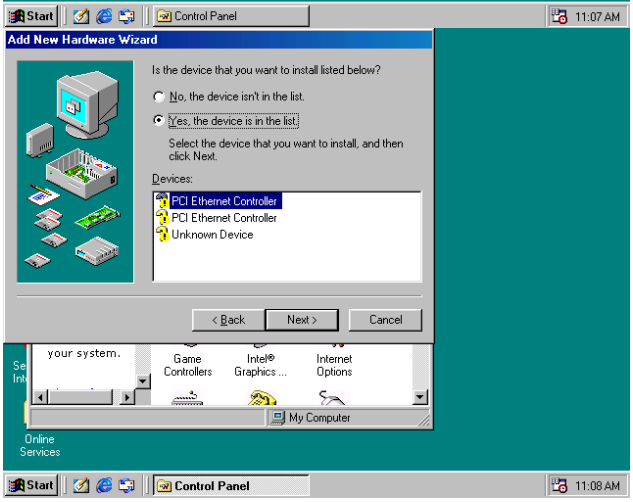


“Add New Hardware Wizard” shown Windows will no search for any new Plug and Play devices on your system. Your screen may go black during this process. This is normal.

To continue, click “Next>” to the next step of installation.

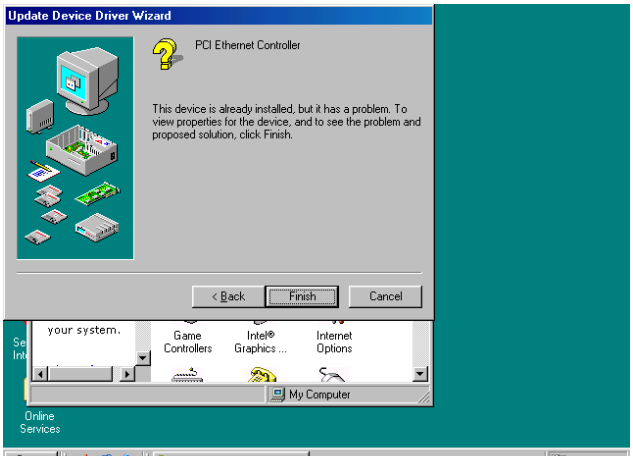


Please select the device that you want to install, and then click “Next>” to the next step of installation.



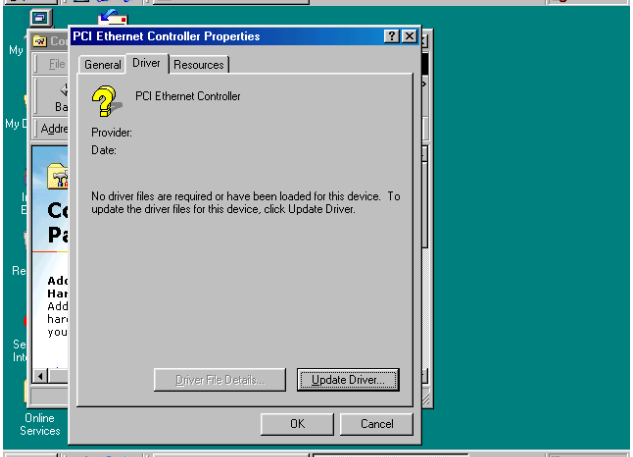
This is Update Device Driver Wizard.

This device is already installed, but it has a problem. To view properties for the device, and to see the problem and proposed solution, please click "Finish" to the next step of installation



This is PCI Ethernet Controller Properties screen.

No driver files are required or have been loaded for this device. To update the driver files for this device, please click "Update Driver" to the next step of installation

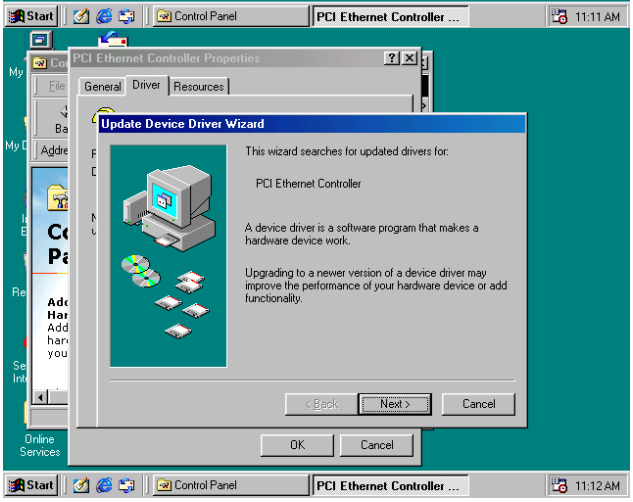


This Wizard searches for update drivers for:

PCI Ethernet Controller

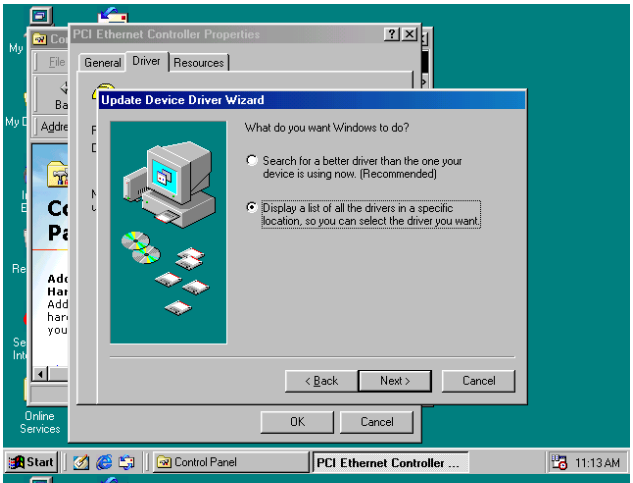
A device driver is a software program that makes a hardware device work.

Updating to a newer version of a device driver may improve the performance of your hardware device or add functionality, please click "Next>" to the next step of installation

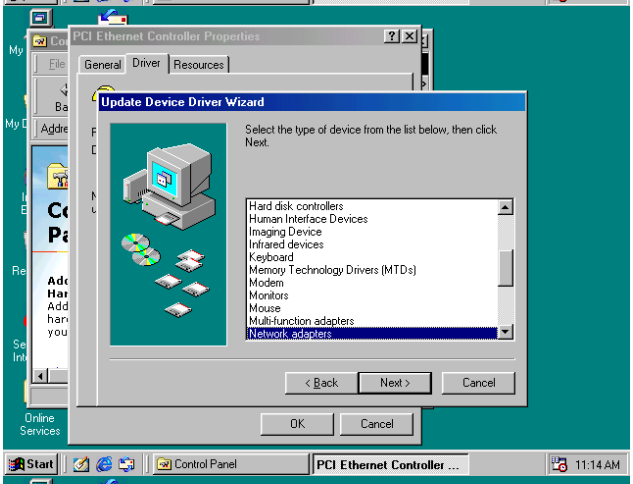


This is Update Device Driver Wizard. What do you want Windows to do? Please choose “Display a list of all the drivers in a specific location, so you can select the driver you want.

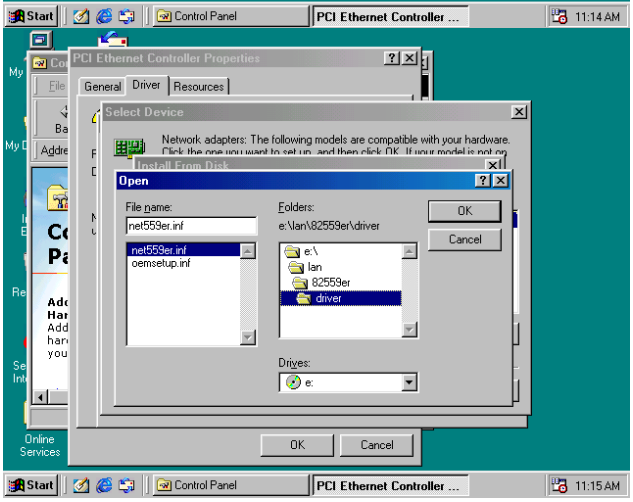
Please click “Next>” to the next step of installation



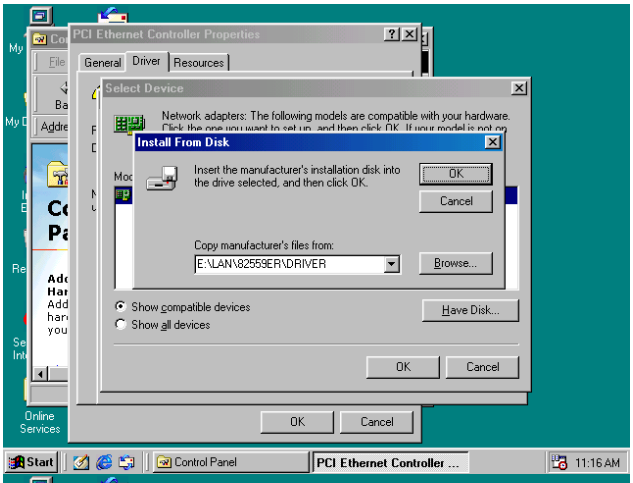
This s screen for selecting the type of device from the list, then click “Next>” to next step of installation



This is to show the “Folders”, please click “OK” to the next step of installation.

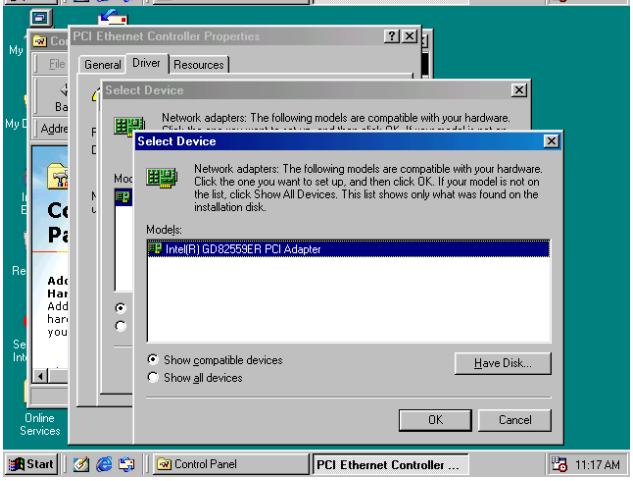


This is Install from Disk. Please insert the manufacturer's installation disk into the drive selected, and then please click "OK" to next step of installation.



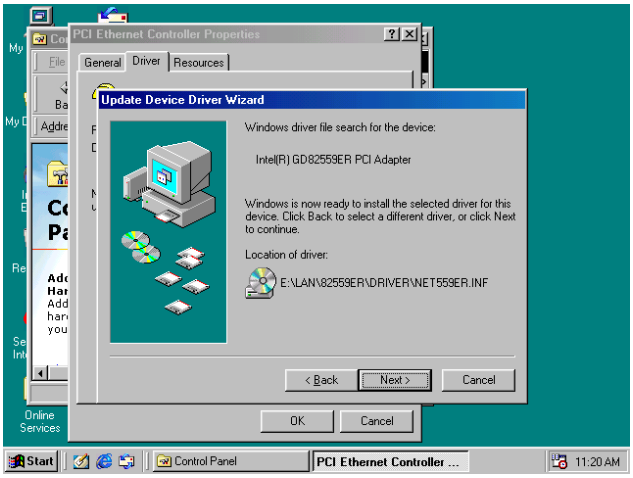
This is Select Device screen.

Network adapters: The following models are compatible with your hardware. Click the one you want to set up, and then click "OK". If your model is not on the list, please click Show All Devices. This list shows only what was found on the installation disk

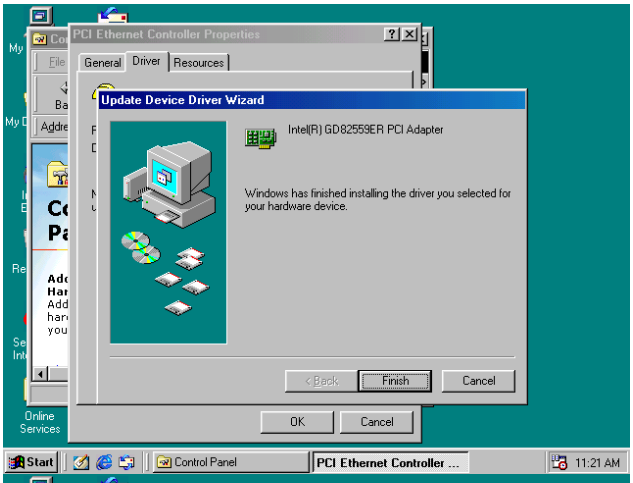


This is Update Driver Wizard.

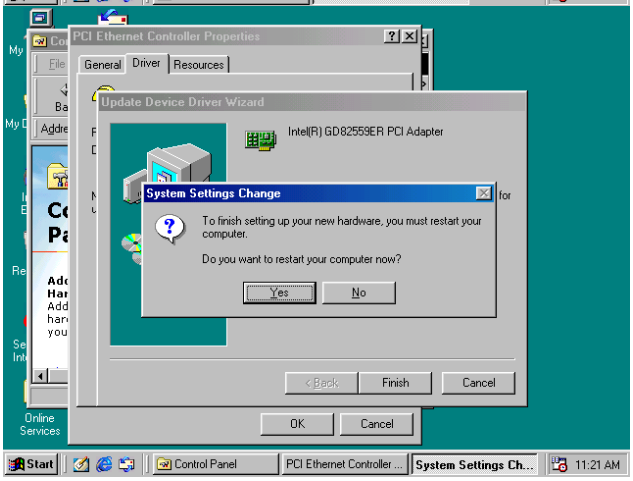
Windows is now ready to install the selected driver for this device. Please click Back to select a different driver, or click Next to continue.



This screen shown Windows has finished installing the driver you selected for your hardware device. Please click “Finish” to the next step of installation



This screens the System Settings Change. To finish setting up your new hardware, you must restart your computer. Please click “YES” to restart your computer.



Appendix A. Programming the Watchdog Timer

The MAT-B651 provides a watchdog timer that resets the CPU or generates an interrupt if processing comes to a stop. This function ensures greater system reliability in industrial stand-alone and unmanned environments.

In order to enable the watchdog timer, you have to output the value of the watchdog timer interval to the controller. The value range is from 01H to FFH, and the related time watchdog timer interval is 1 sec to 255 sec.

Data	Timer interval
00	Disabled
01	1 sec
02	2 sec
*	*
*	*
FF	255 sec

If you want to disable the watchdog timer, just set the timer interval value to 00H.

After setting the timer interval value, the watchdog timer begins to count down. You have to refresh the watchdog timer, so that the watchdog timer will return to its initial value; otherwise, your system will reset after a time-out. The following program shows how to set the watchdog timer:

Program 1: Initializing the watchdog controller

ASSEMBLY LANGUAGE	DOS DEBUG
MOV DX,370	O 370 87
MOV AL,87H	O 370 87
OUT DX,AL	
OUT DX,AL	
MOV AL,07H	O 370 07
OUT DX,AL	O 371 08
MOV DX,371	
MOV AL,08H	
OUT DX,AL	

Program 2: Writing a watchdog timer interval value

MOV DX,370 ; Set timer interval value to 16 seconds	O 370 F2
MOV AL,F2H	O 371 XX
OUT DX,AL	O 370 AA

```
MOV DX,371
MOV AL,XXH      ; Timer interval *** see note ***
OUT DX,AL
MOV DX,370
MOV AL,AAH
OUT DX,AL
```

Note: This XX value range is from 01H to FFH, and the related watchdog timer interval is 1 sec. to 255 sec. (as in the previous description).

Appendix B. Installing PC/104 Modules

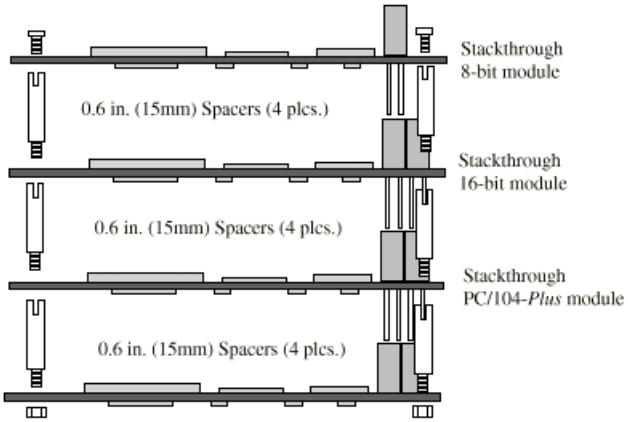
The MAT-B651 provides the standard PC/104 connector to give you the flexibility to attach PC/104 module.

⇩ Please follow these steps to install the PC/104 modules to the MAT-B651:

Set all jumpers or switches for the MAT-B651. Once the PC/104 module is installed you may have difficulty setting these.

Seat the PC/104 module male connector into the MAT-B651 CN18

Use the spacers and screws to secure the PC/104 module onto the MAT-B651

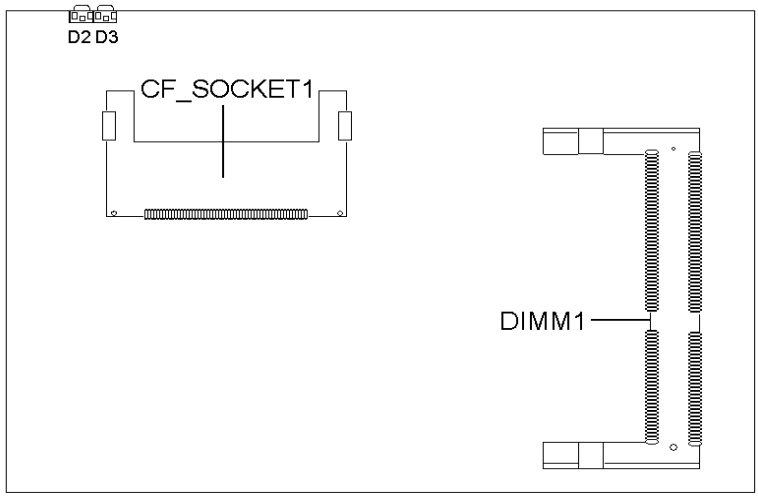


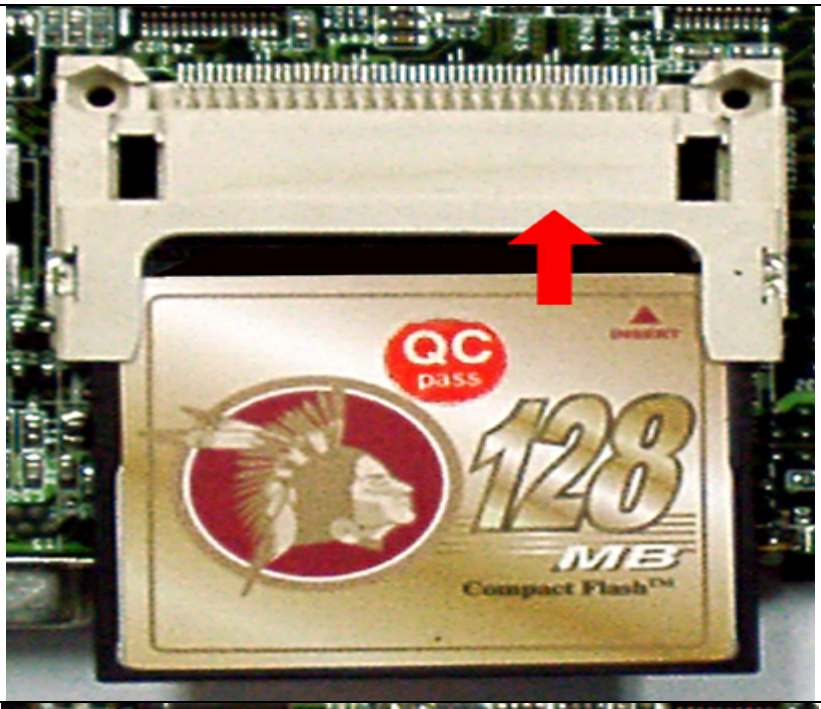
Appendix C. Installing CompactFlash Memory

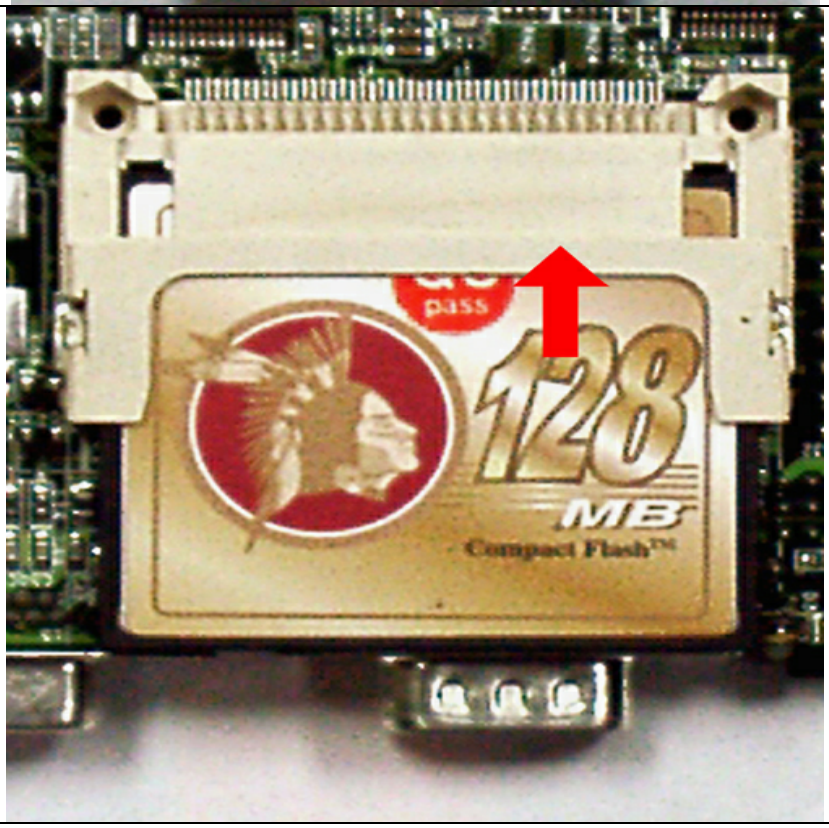
The MAT-B651 reserved a CompactFlash Socket at solder side, CompactFlash™ is a very small removable mass storage device, it provides complete PCMCIA-ATA functionality and compatibility pluse TrueIDE functionality compatible with ATA/ATAPI-4.

CompactFlash storage products are solid state, meaning they contain no moving parts, and provide users with much greater protection of their data than conventional magnetic disk device.

Pin	Assignment	Pin	Assignment	Pin	Assignment	Pin	Assignment	Pin	Assignment
1	Ground	11	Ground	21	D00	31	D15	41	RESET
2	D03	12	Ground	22	D01	32	CS	42	ORDY
3	D04	13	VCC	23	D02	33	NC	43	NC
4	D05	14	Ground	24	WP	34	IOR	44	REG
5	D06	15	Ground	25	NC	35	IOW	45	LED
6	D07	16	Ground	26	NC	36	WE	46	BVD
7	CS	17	Ground	27	D11	37	RDY/BSY	47	D08
8	Ground	18	A02	28	D12	38	VCC	48	D09
9	Ground	19	A01	29	D13	39	SCSE;	49	D10
10	Ground	20	A00	30	D14	40	NC	50	Ground

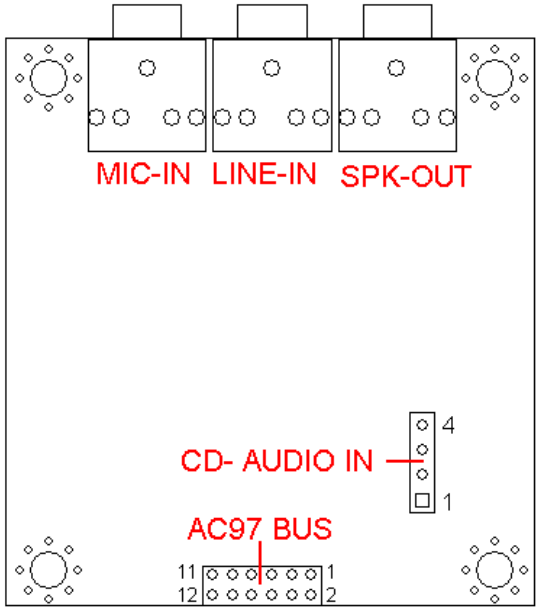



QC
pass
128
MB
Compact Flash™


pass
128
MB
Compact Flash™

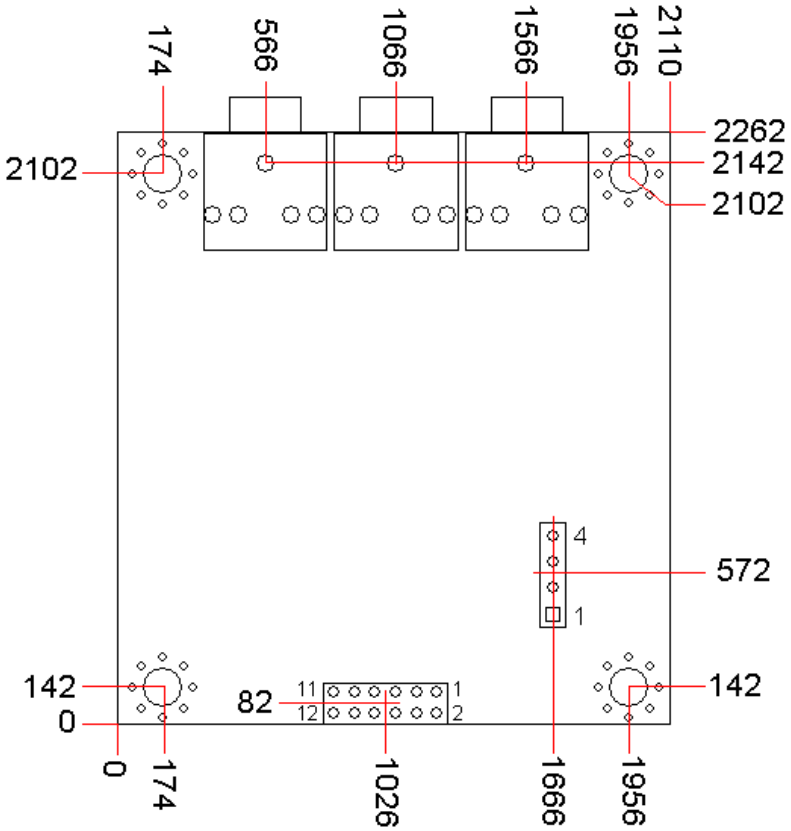
Appendix D. Audio Kit Optional

1. Board Layout

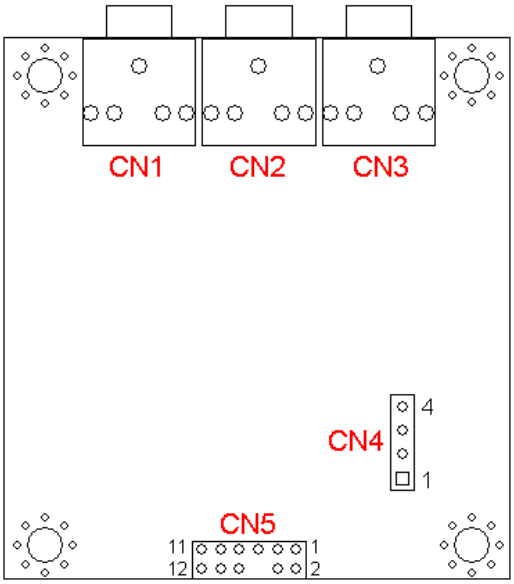


2. Board Dimension

Board Dimension (mil)



3. Location of Connectors



4. List of Connectors

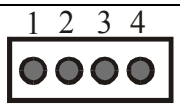
Connectors	Description
CN1	Micro-Phone Input
CN2	Line-In
CN3	Speaker-Out
CN4	CD Audio Input
CN5	AC97 Audio Input

CN1: This MIC-In jack connects to a microphone

CN2: This Line-In jack connects to a tape player or other audio sources.

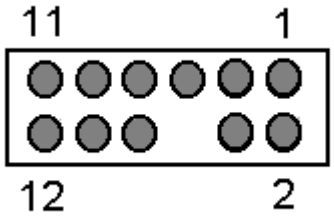
CN3: This Speaker-Out jack connects to a headphone or a speaker.

CN4: CD Audio Input Connector



Pin	*Signal*
1	***CD AIDIO-L***
2	***GND***
3	***GND***
4	***CD AUDIO-R***

CN5: AC-97 Audio Input Connector



Pin	**Signal**	**Pin**	**Signal**
1	+12V	2	GND
3	GND	4	AC97-BTCLK
5	+3.3V	6	KEY PIN
7	AC97-SDIN0	8	AC97-SYNC
9	GND	10	AC97-RESET
11	AC97-SDOUT	12	PC-BEEP

Appendix E. System Resources

Interrupt Controller
The MAT-B651 is a fully PC compatible control board, it consists of 16 ISA interrupt request lines and most of them already in used by other part of the board. Both of ISA and PCI expansion cards may need to use IRQs, please make sure that the IRQs do not conflict if you would like to use extra add-on cards.

System IRQs are available to cards installed in the ISA expansion Bus first. Any remaining IRQs then may be assigned to this PCI Bus. You are able to use Microsoft's Diagnostic (MSD.EXE) utility included in the Windows directory to see their map.

IRQ	Assignment
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt rerouting from IRQ8 through IRQ15
IRQ3	Serial Port 2
IRQ4	Serial Port 1
IRQ5	AC97
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port
IRQ8	Real Time Clock
IRQ9	Serial Port 3
IRQ10	Serial Port 4
IRQ11	Available
IRQ12	PS/2 Mouse
IRQ13	Math Coprocessor
IRQ14	Primary IDE Controller
IRQ15	Secondary IDE Controller

Appendix F. Optional Cables

Part Number	Cable Description	MAT-B651 Connector	Terminating Connector
46-I-00IDE-00	2.5" & 1.8" IDE Cable	CN9	2mm, 44-pin Dual IDE, 45cm
46-ICOM01-00	COM Cable	CN10, CN12	COM3/4 RS-232 Cable, 2mm, 13cm
46-ICOM02-00	COM Ports Cable	CN6	COM2 RS232/RS422 Cable, 2mm, 22cm
46-IFDC01-00	Floppy Cable	CN7	2.54mm to 2mm, 50cm
46-ILPT01-00	Printer Cable	CN19	2mm, 25-pin Female D-Sub, 26cm
46-IKPPS2-01	KB + PS/2 Mouse Cable	CN13	1x6 KB + PS2 Cable, 2mm, 20cm