MAT-F703

Pentium 4 Full-Size CPU Card
With VGA, LAN, TV-out , DVI Interface & Audio
PCI/ISA Bus, PICMG Compliant

User's Manual

Version 1.0

Manual edition 1.0, Jan.2003

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Chapter 1. General Information

1.1 Introduction

The MAT-F703 is fully function of socket 478 Pentium® 4 CPU Card, which is PCI/ISA bus and PICMG compliant. The MAT-F703 with Intel® 845PE and ICH4 chipset supports Intel® Pentium® 4 processors with 533MHz system bus, with two 184-pin DDR DIMM sockets for DDR SDRAM to 2Gbytes. The MAT-F703 supports one Ethernet Interface, two USB 2.0 compliant ports. Furthermore, the MAT-F703 has high speed ATI Radeon 7000 AGP 4X 32M/64M onboard; it supports 32/64MB DDR memory, CRT display, TV-out and DVI interface optional.

The onboard features include one RS-232 and one RS-232/422/485 serial port, one bi-directional parallel port with SPP,ECP and EPP modes supported, also with watchdog timer and ISA high driving capability. In addition, the MAST-F703 supports sound interface by optional daughter card.

1.2 Specification

Specifications	
General Functions	
CPU	Socket 478 Pentium® 4 processor with 533MHz system bus
BIOS	Award® 4Mbit Flash BIOS
Chipset	Intel 845PE + ICH4
I/O Chipset	Winbond® 83627HF-MAT
Memory	Onboard two 184-pin DDR DIMM sockets supports DDR333 and up to 2Gbytes
Enhanced IDE	Support up to four IDE devices. Ultra DMA 33/ 66/100 mode with data transfer rate up to 100MB/sec.
FDD interface	Supports 34-pin header up to two floppy disk drives
Parallel port	One bi-directional parallel port. Supports SPP/ECP/EPP
Serial port	One RS-232 and one RS-232/422/485 serial ports
IR interface	Support one IrDA Tx/Rx header
KB/Mouse connector	6-pin Mini-DIN connector supports PS/2 keyboard & mouse

USB connectors	Supports two USB 2.0 compliant ports
Battery	Lithium battery for data retention up to 10years(in normal condition)
Watchdog Timer	Can generate a system reset, or IRQ11. Support 1-256 second selectable timeout interval
System Monitoring	Built in W83627HF-MAT; supports temperatures, Fan speed, and voltages monitoring
Bus interface	PCI/ISA bus, PICMG compliant
Power management	Supports ATX power supply; LAN wake up & modem ring-in functions
VGA Interface	
Chipset	ATI Radeon 7000 4X AGP; Supports 32/64MB DDR memory, CRT display. TV-out and DVI interface optional.
Ethernet Interface	
Chipset	One 82559ER 100/10Base-Tx or 82540EM 1000/100/10Base-Tx Fast Ethernet controller
Sound Interface (Optional daughter card)	
Chipset	AC 97 codec (ADI 1881A)
Audio interface	Mic in, Line in, Speaker out and CD audio in
ISA High Drive	ISA High Driving capability up to 64 mA
Mechanical and Environmental	
Power supply voltage	5V (4.75V to 5.25V), +12V(11.4V to 12.6V),-12V (-11.4V to -12.6V), 5VSB (4.75V to 5.25V)
Max. power requirements	10A @ 5 V, 10A @ +12 V, 60mA @ -12V (Max.), 1.5A @5VSB
Operating temperature	32 to 140°F (0 to 60°C)
Weight	13.3"(L) x 4.8"(W) (338mm x 122mm)

1.3 MAT-F703 Package

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

1. MAT-F703 Socket 478 Single Board
2. Quick Installation Guide
3. Cable: Please refer to Appendix C Optional Cables

4. CD-ROM which contains the following folders:

(1) Manual
(2) LAN Driver
(3) Tools
(4) Chipset Driver
(5) VGA Driver
(6) Sound Driver
(7) USB 2.0 Driver

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. Do not apply power to the board if it appears to have been damaged.

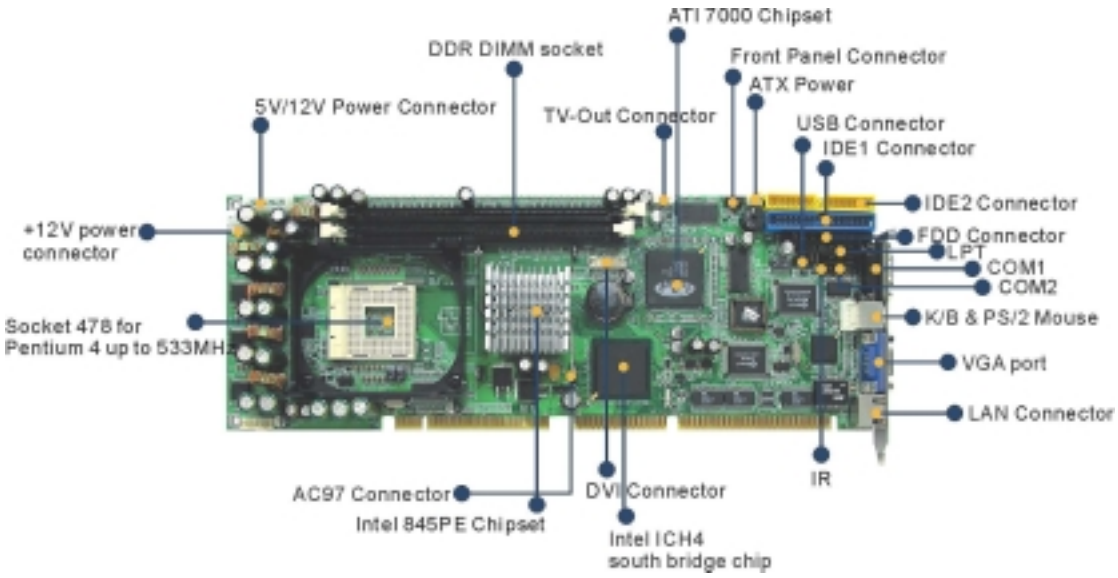
Leave the board in its original packing until you are ready to install

Precautions

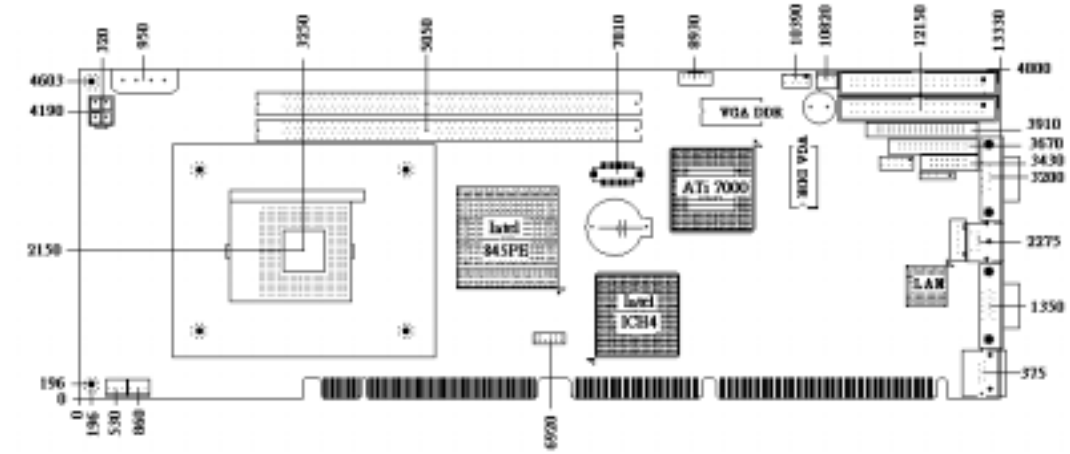
Please make sure you properly ground yourself before handling the MAT-F703 board or other system components. Electrostatic discharge can be easily damage the MAT-F703 board.

1. Do not remove the anti-static packing until you are ready to install the MAT-F703 board.
2. 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.
3. Handle the MAT-F703 board by its edges and avoid touching its component.

1.4Board Layout

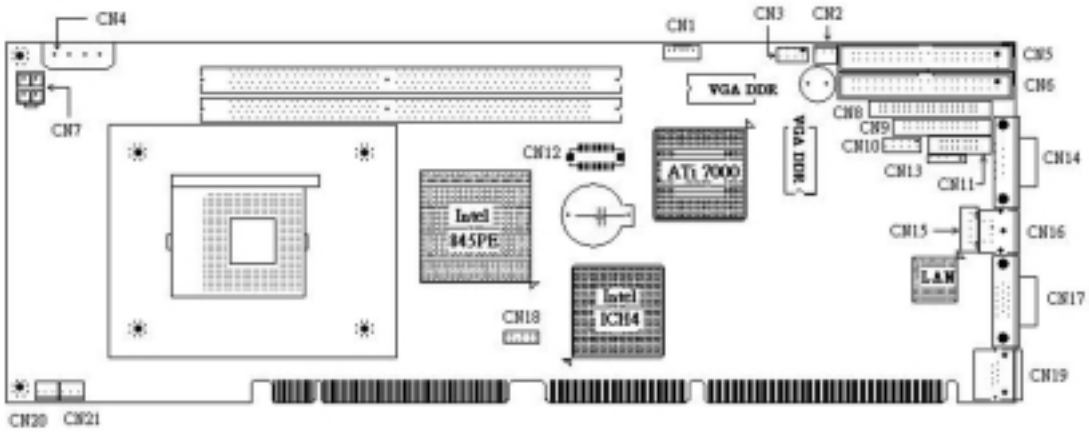


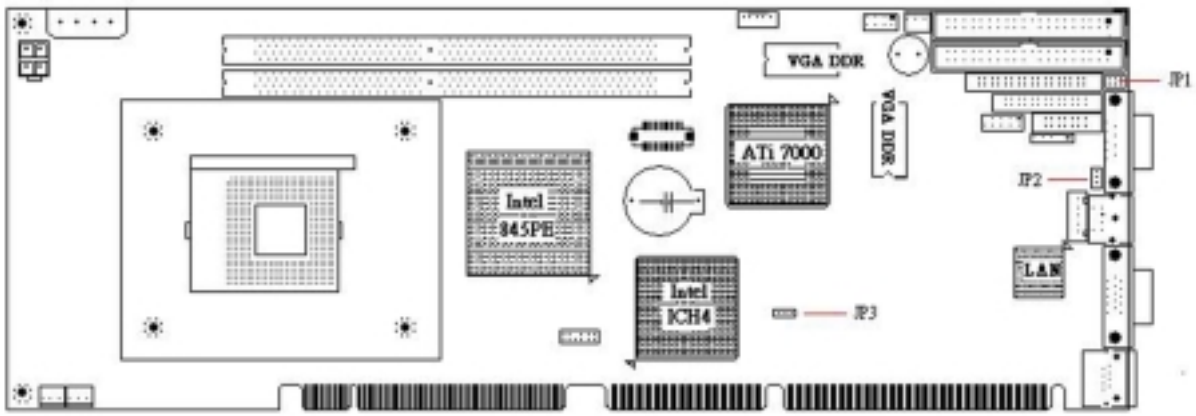
1.5Board Dimension



Chapter 2. Connectors Location and Configuration

2.1 Connectors/Jumper Location and Define



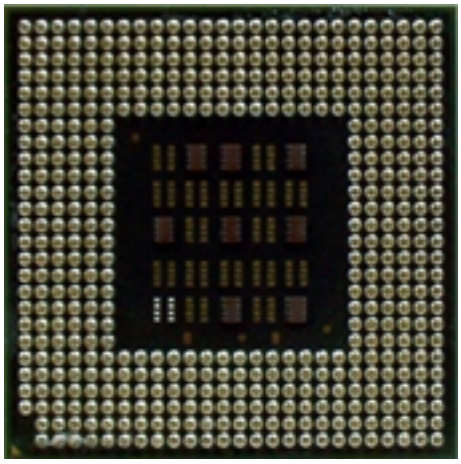


Connector	Define	Connectors	Define
CN1	TV-Out Connector	CN11	COM2 Connector
CN2	5VSB Connector	CN12	DVI Connector
CN3	Front Panel	CN13	IR Connector
CN4	Main Power Connector	CN14	COM1 D-Sub Connector
CN5	IDE2 Connector	CN15	Internal Keyboard Connector
CN6	IDE1 Connector	CN16	KB/MS Connector
CN7	P4 12V Power	CN17	VGA D-Sub Connector
CN8	Floppy Connector	CN18	AC-97 Connector
CN9	LPT Connector	CN19	LAN1 Connector
CN10	USB Connector	CN20	FAN Connector
JP1	RS232/422/485 Select	CN21	FAN Connector
JP2	Watchdog Select	JP3	CMOS Setting

2.2 Installing CPU

The MAT-F703 with 478 socket supports Intel® Pentium® 4 processors, up to 533MHz system bus.

The m478PGA form factor is a chip packaging designed for the Intel® Pentium 4 processors up to 533MHz System Bus. On the m478PGA package, the processor's silicon core faced up, and is expose. This allows the core to have direct contact with a heatsink/fan.



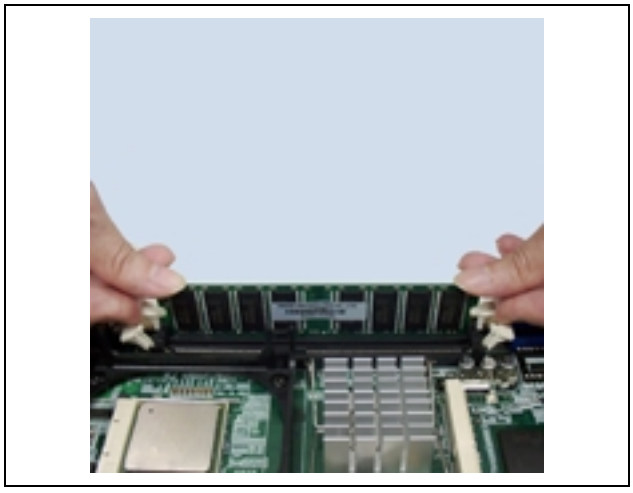
Locating Pin 1 on your CPU and ZIP Socket

All Pentium 4 CPUs use a small golden triangle to indicate the location of pin 1.
One the corner to the right of pin 1 is an orange dot.

2.3 Installing System Memory

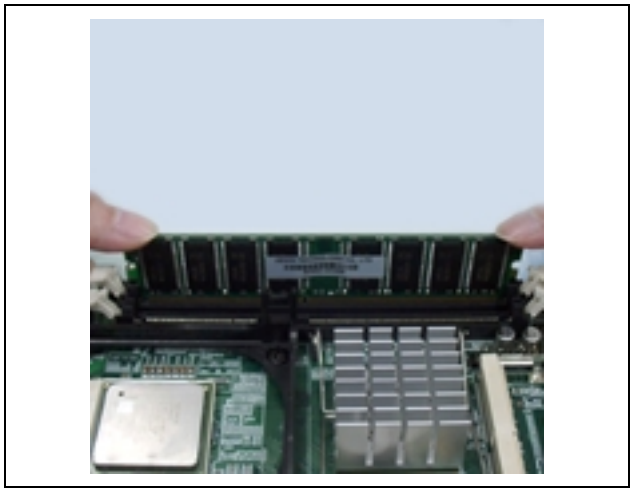
The MAT-F703 supports two 184-pin DDR DIMM sockets, memory up to 2Gbytes.

To insert a DDR 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.



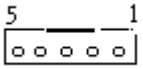
Note: There is only one direction for installing a module in the socket. Do not attempt to force the module into the socket incorrectly.

To remove a DDR DIMM Memory: Press down on the levers at both end of module until the module pops out.



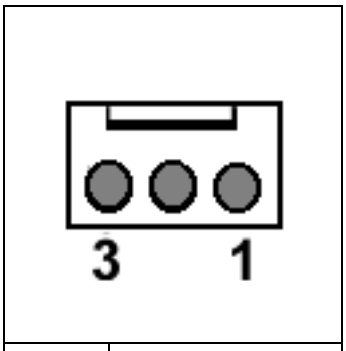
2.4 Connector and Jumper Settings

CN1: TV-Out Connector



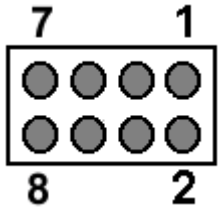
Pin	Define
1	LUMINANCE OUT
2	CROMIANCE OUT
3	Ground
4	Ground
5	COMPOSITE OUT

CN2: 5VSB Connector



Pin	Define
1	+5V
2	PS-ON*
3	Ground

CN3: Front Panel Connector



Pin	Define	Pin	Define
1	Power LED+ (+5V)	2	Power LED – (GND)
3	IDE_LED+ (+5V)	4	IDE_LED- (ACTIVE)
5	POWER ON SWITCH+	6	POWER ON SWITCH- (GND)
7	RESET SWITCH+	8	RESET SWITCH- (GND)

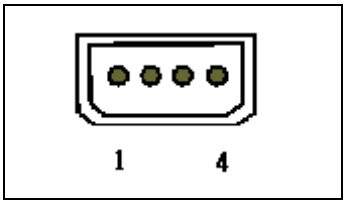
Pin 1-2: this 2-pin connector connects to the case-mounted power LED

Pin 3-4: this 2-pin connector connects to the case-mounted HDD LED & indicates hard disk drive activity

Pin 5-6: this 2-pin connector connects to case-mounted ATX power button

Pin 7-8: this 2-pin connector connects to case-mounted Reset Switch, you can use it to reboot the system

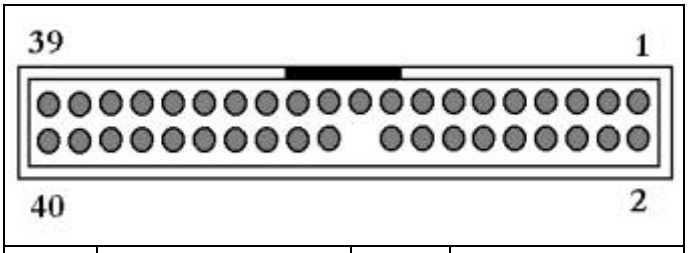
CN4: Main Power Connector



Pin	Define
1	+12V
2	Ground

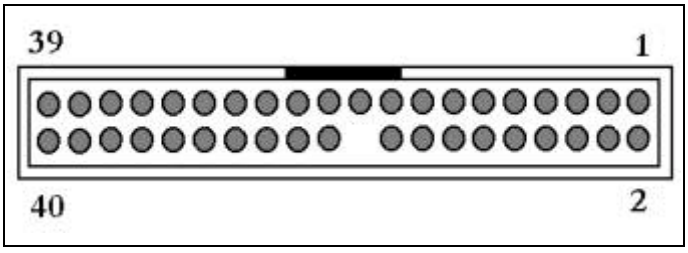
3	Ground
4	+5V

CN5: IDE2 Connector



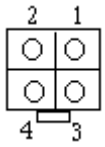
Pin	Define	Pin	Define
1	PCIRST#0	2	Ground
3	SDD7	4	SDD8
5	SDD6	6	SDD9
7	SDD5	8	SDD10
9	SDD4	10	SDD11
11	SDD3	12	SDD12
13	SDD2	14	SDD13
15	SDD1	16	SDD14
17	SDD0	18	SDD15
19	Ground	20	
21	SDREQ	22	Ground
23	SDIOW#	24	Ground
25	SDIOR#	26	Ground
27	SIORDY	28	DECECT
29	SDDACK#	30	Ground
31	IRQ15	32	NC
33	SDA1	34	DECECT
35	SDA0	36	SDA2
37	SDCS#1	38	SDCS#3
39	IDEACTS#	40	Ground

CN6: IDE1 Connector



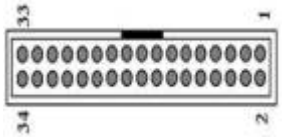
Pin	Define	Pin	Define
1	RESET*	2	Ground
3	DATA7	4	DATA8
5	DATA6	6	DATA9
7	DATA5	8	DATA10
9	DATA4	10	DATA11
11	DATA3	12	DATA12
13	DATA2	14	DATA13
15	DATA1	16	DATA14
17	DATA0	18	DATA15
19	Ground	20	KEY PIN
21	DREQ	22	Ground
23	DIOW*	24	Ground
25	DIOR*	26	Ground
27	IOCHRDY	28	CSEL
29	DACK*	30	Ground
31	IRQ14	32	N/C
33	A1	34	DETECT
35	A0	36	A2
37	HD SELECT 0*	38	HD SELECT 1*
39	ACTIVE*	40	Ground

CN7: ATX Power 12V



Pin	Define	Pin	Define
4	+12V	2	Ground
3	+12V	1	Ground

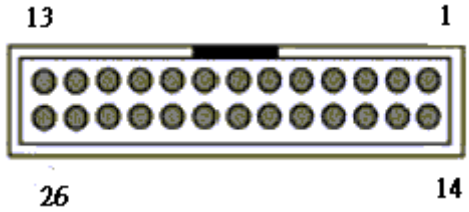
CN8: Floppy Connector



Pin	Define	Pin	Define
1	Ground	2	DENSITY SELECT0*

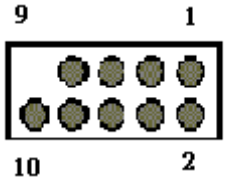
3	Ground	4	NC
5	Ground	6	DENSITY SELECT1*
7	Ground	8	INDEX*
9	Ground	10	MOTOR ENABLE 0*
11	Ground	12	DRIVE SELECT 1*
13	Ground	14	DRIVE SELECT 0*
15	Ground	16	MOTOR ENABLE 1*
17	Ground	18	DIRECTION*
19	Ground	20	STEP*
21	Ground	22	WRITE DATA*
23	Ground	24	WRITE GATE*
25	Ground	26	TRAK00*
27	Ground	28	WRITE PROTECT*
29	Ground	30	READ DATA*
31	Ground	32	SIDE 1 SELECT*
33	Ground	34	DISK CHANGG*

CN9: Printer Connector



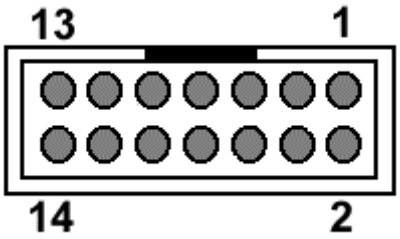
Pin	Define	Pin	Define
1	STROBE	14	AFD#
2	PD0	15	ERR#
3	PD1	16	INIT#
4	PD2	17	SLIN#
5	PD3	18	Ground
6	PD4	19	Ground
7	PD5	20	Ground
8	PD6	21	Ground
9	PD7	22	Ground
10	ACK#	23	Ground
11	BUSY	24	Ground
12	PE	25	Ground
13	SLCT	26	NC

CN10:USB Connector



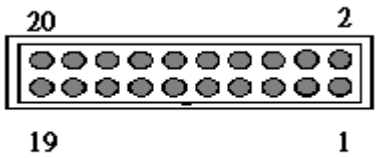
Pin	Define	Pin	Define
1	VCC	2	VCC
3	D0-	4	D1-
5	D0+	6	D1+
7	Ground	8	Ground
9	NC	10	Ground

CN11: COM2 Connector



Pin	Define	Pin	Define
1	DCD1	2	DSR1
3	RXDD1	4	RTS1
5	TXDD1	6	CTS1
7	DTR1	8	RI
9	Ground	10	NC
11	422/485TX+	12	422/485TX-
13	422RXD+	14	422RXD-

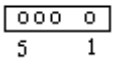
CN12: DVI Connector



Pin	Define	Pin	Define
1	GND	2	GND

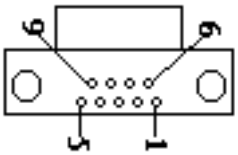
3	TX2N	4	TX0N
5	TX2P	6	TX0P
7	GND	8	GND
9	CLK	10	TXCN
11	DATA	12	TXCP
13	GND	14	GND
15	TX1N	16	CHARGE
17	TX1P	18	+5V
19	GND	20	+5V

CN13: IR Connector



Pin	Define
1	5V
2	NC
3	IRRX
4	Ground
5	IRTX

CN14: COM1 D-Sub Connector

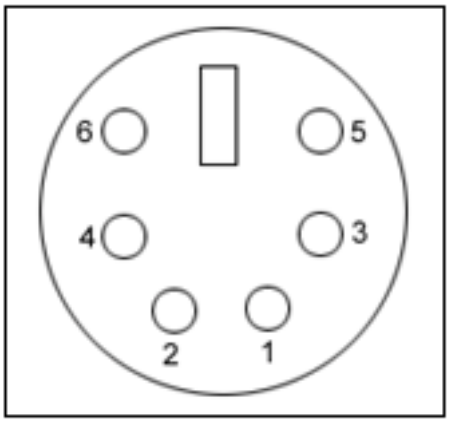


Pin	Define
1	DCD
2	RXD
3	TXD
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	R1

CN15: Internal Keyboard Connector

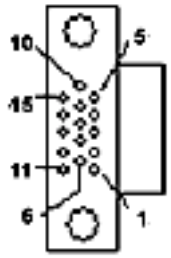
Pin	Define
1	KB-CLK
2	KB-DATA
3	NC
4	Ground
5	+5V

CN16: Keyboard/Mouse Connector



Pin	Define
1	KB-DATA
2	MS-DATA
3	Ground
4	+5V
5	KB-CLK
6	MS-CLK

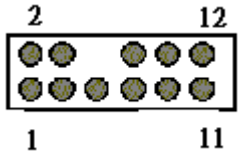
CN17: VGA D-Sub Connector



Pin	Define
1	RED

2	GREEN
3	BLUE
4	MONID0
5	Ground
6	Ground
7	Ground
8	Ground
9	+5V
10	Ground
11	MONID1
12	DDC DATA
13	HSYNC
14	VSYNC
15	DDC CLOCK

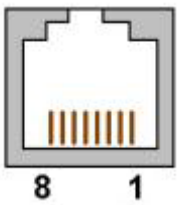
CN18: AC-97 Connector



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

NOTE: Some AC97 connector with housing that connector pin 6 is N/C.

CN19: LAN1 Connectors

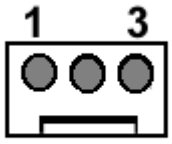


Pin	Define
1	MDI0+
2	MDI0-
3	MDI1+
4	MDI2+
5	MDI2-
6	MDI1-
7	MDI3+
8	MDI3-
9	LINK100_N
10	LINK1000_N
11	LINK_UP_N
12	ACTIVITY_N

LED:

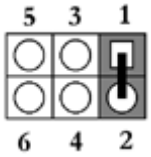
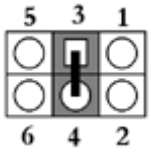
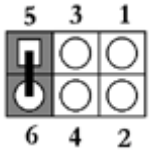
Bi-Color Speed LED	
10 Mbps	Off
100 Mbps	Green
1000 Mbps	Yellow
Link/Activity LED	
Link	Green
Activity	Blink

CN20, CN21: FAN Connector

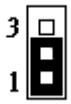
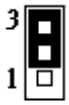


Pin	Define
1	Ground
2	+12V
3	Speed Detect

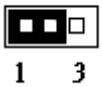
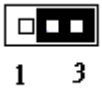
JP1: RS232/422/485 Select

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

JP2: Reset Select

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

JP3: CMOS Setting

Setting		Define
	1-2	Normal
	2-3	Clear CMOS

Chapter 3. BIOS Setup

The ROM chip of your MAT-F703 board is configured with a customized Basic Input/Output System (BIOS) from Phoenix-Award BIOS. The BIOS is a set of permanently recorded program routines that give the system its fundamental operational characteristics. It also tests the computer and determines how the computer reacts to instructions that are part of programs.

The BIOS is made up of code and programs that provide the device-level control for the major I/O devices in the system. It contains a set of routines (called POST, for Power-On Self Test) that check out the system when you turn it on. The BIOS also includes CMOS Setup program, so no disk-based setup program is required CMOS RAM stores information for:

1.Date and time
2.Memory capacity of the main board
3.Type of display adapter installed
4.Number and type of disk drives

The CMOS memory is maintained by battery installed on the MAT-F703 board. By using the battery, all memory in CMOS can be retained when the system power switch is turned off. The system BIOS also supports easy way to reload the CMOS data when you replace the battery of the battery power lose.

3.1 Quick Setup

In most cases, you can quickly configure the system by choosing the following main menu options:

1. Choose "Load Optimized Defaults" from the main menu. This loads the setup default values from the BIOS Features Setup and Chipset Features Setup screens.
2. Choose "Standard COS Features" from the main menu. This option lets you configure the date and time, hard disk type, floppy disk drive type, primary display and more.
3. In the main menu, press F10 ("Save & Exit Setup") to save your changes and reboot the system.

3.2 Entering the CMOS Setup Program

Use the CMOS Setup program to modify the system parameters to reflect the options

installed in your system and to customized your system. For example, you should run the Setup program after you:

1.Received an error code at startup
2.Install another disk drive
3.Use your system after not having used it for a long time
4.Find the original setup missing
5.Replace the battery
6.Change to a different type of CPU
7.Run the Phoenix-Award Flash program to update the system BIOS

Run the CMOS Setup program after you turn on the system. On-screen instructions explain how to use the program.

⇩ **Enter the CMOS Setup program's main menu as follows:**

1. Turn on or reboot the system. After the BIOS performs a series of diagnostic checks, the following message appears:
   "Press DEL to enter SETUP"
2. Press the <DEL> key to enter CMOS Setup program. The main menu appears:

Phoenix - AwardBIOS CMOS Setup Utility

▸ Standard CMOS Features	Frequency/Voltage Control
▸ Advanced BIOS Features	Load Fail-Safe Defaults
▸ Advanced Chipset Features	Load Optimized Defaults
▸ Integrated Peripherals	Set Supervisor Password
▸ Power Management Setup	Save User Password
▸ PnP/PCI Configuration	Save & Exit Setup
▸ PC Health Status	Exit Without Saving
↑↓→←: Select Item F10: Save & Exit Setup	
Time, Date, Hard Disk Type....	

3. Choose a setup option with the arrow keys and press <Enter>. See the following sections for a brief description of each setup option.

In the main menu, press F10 ("Save & Exit Setup) to save your changes and reboot the system. Choosing "EXIT WITHOUT SAVING" ignores your changes and exits the program. Pressing <ESC> anywhere in the program returns you to the main menu.

3.3 Menu Options

The main menu options of the CMOS Setup program are described in the following and the following sections of this chapter.

STANDARD CMOS FEATURES:
Configure the date & time, hard disk drive type, floppy disk drive type, primary display type and more

ADVANCED BIOS FEATURES:
Configure advanced system options such as enabling/disabling cache memory and shadow RAM

ADVANCED CHIPSET FEATURES:
Configure advanced chipset register options such DRAM timing

INTEGRATED PERIPHERALS:
Configure onboard I/O functions

POWER MANAGEMENT SETUP:
Configure power management features such as timer selects

PNP/PCI CONFIGURATION:
Configure Plug & Play IRQ assignments and PCI slots

PC HEALTH STATUS:
Configure the CPU speed and, if the optional Winbond W83627HF system monitor IC is installed, view system information

FREQUENCY/VOLTAGE CONTROL

Change CPU Clock

LOAD FAIL-SAFE DEFAULT:
Loads BIOS default values. Use this option as diagnostic aid if your system behaves erratically

LOAD OPTIMIZED DEFAULTS:
Loads optimized BIOS settings

SET SUPERVISORS & USER PASSWORD:
Configure the system so that a password is required when the system boots or you attempt to enter the CMOS setup program. When you log in with this password, you will be able to enter the COS Setup main menu, but you can not enter other menus in the CMOS Setup program.

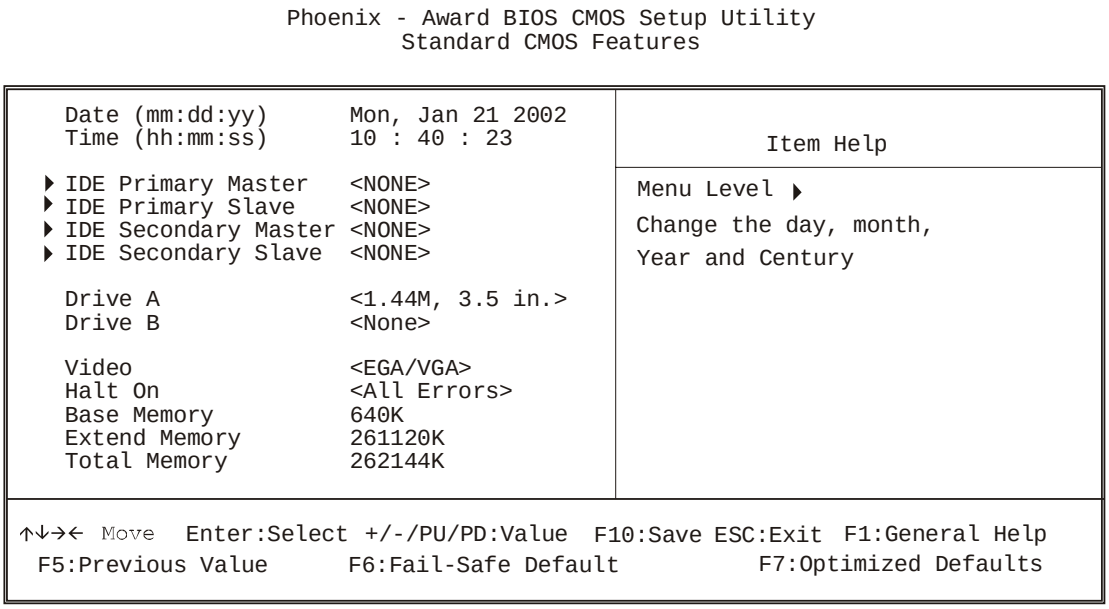
SAVE & EXIT SETUP:
Save changes of values to CMOS and exit the CMOS setup program

EXIT WITHOUT SAVING:
Abandon all CMOS changes and exit the CMOS setup program

Standard CMOS Features Setup

⇩ **Use the Standard CMOS Setup option as follows:**

1. Choose "Standard CMOS Features" from the main menu. The following screen appears:



2. 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.

Date (mm:dd:yy):

Type the current date

Time (hour:min:sec):

Type the current time (24-hour clock)

Hard Disks:

Choose from "Auto", "User", or "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: None

360K, 5.25"

1.2M, 5.25"

720K, 3.5"

1.44M, 3.5"

2.88M, 3.5"

Video:

Choose: EGA/VGA
CGA 40
CGA 80
Mono

Halt On:

Controls whether the system stops in case of an error detected during power up.

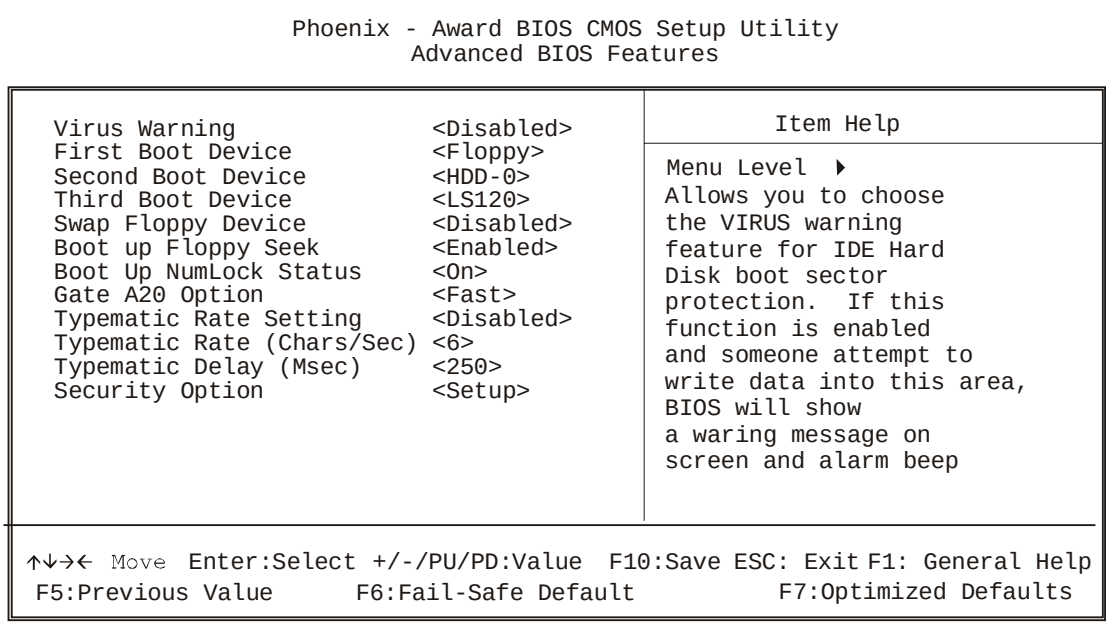
Choose: All Errors (Default)
No Errors
All, But Keyboard
All, But Diskette
All, But Disk/Key

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

Advanced BIOS Features Setup

⇩ **Use the Advanced BIOS Features Setup option as follows:**

1. Choose "Advanced BIOS Features Setup" from the main menu. The following screen appears:



2. Use the arrow keys to move between items and to select values. Modify the selected fields using the PgUP/PgDN keys. Press the <F1> "Help" key for information on the available options:

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, you can use an anti-virus utility on a virus-free, bootable floppy disk to reboot and clean your system. The default setting is **Disabled**.

First/Second/Third Boot Device:

The BIOS attempts to load the operating system from the devices in the sequence selected in these items.

Choose: Floppy, LS-120, HDH-0, 1, 2, 3, SCSI, CDROM, ZIP100, USB-FDD, USB-ZIP, USB-CDROM, USB-HDD, LAN, 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 boo-up

Gate A20 Option:

Choose Enabled or Disabled. Enable this option to allow RAM accesses faster than normal, and is useful in networking operating systems.

Typematic Rate Setting:

Choose Enabled or Disabled. Enable his option to adjust the keystroke repeat rate. Adjust the rate via Typematic Rate Delay and Typematic Rate

Typematic Rate (Chars/Sec):

Choose the rate at which character keeps 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 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.

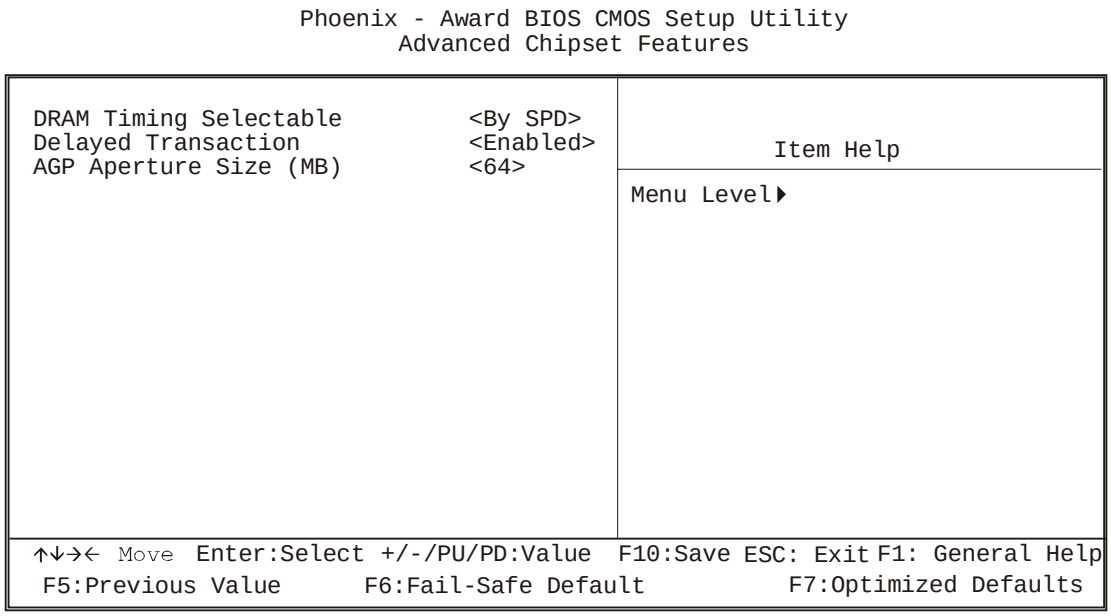
"System" – The password prompt appears each time the system is booted.

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.

Advanced Chipset Features Setup

⇩ **Use the Advanced Chipset Features Setup option as follows:**

1. Choose "Advanced Chipset Features Setup" from the main menu. The following screen appears:



2. Move between items and select values by using the arrow keys. Modify the selected fields using the PnUP/PgDN keys. For information on the various options, press <F1> key.

DRAM Timing Selectable:

This item lets you to select the values this field, depending on whether the board has paged DRAMs or EDO.

Choose: SPD, Manual

Delayed Transaction:

Choose Enabled/Disabled if you have an ISA card compatibility problem, when enabled, this option lets you control the Delay Transaction function of the chipset. This function is used to meet the latency of the PCI cycles to or from the ISA bus.

AGP Aperture Size (MB):

Select the size of AGP aperture. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycle that hit the aperture range are forwarded to the AGP without any translation. 64MB

Integrated Peripherals

⇩ **Use the Integrated Peripherals Setup option as follows:**

1. Choose "Integrated Peripherals Setup" from the main menu. The following screen appears:

```
                Phoenix - Award BIOS CMOS Setup Utility
                        Integrated Peripherals

  On-Chip Primary PCI IDE     <Enabled>          |
  IDE Primary Master PIO      <Auto>             |        Item Help
  IDE Primary Slave PIO       <Auto>             |
  IDE Primary Master UDMA     <Auto>             |   Menu Level ▸
  IDE Primary Slave UDMA      <Auto>             |
  On-Chip Secondary PCI IDE   <Enabled>          |
  IDE Secondary Master PIO    <Auto>             |
  IDE Secondary Slave PIO     <Auto>             |
  IDE Secondary Master UDMA   <Auto>             |
  USB Controller              <Enabled>          |
  USB Keyboard Support        <Disabled>         |
  AC97 Audio                  <Auto>             |
  Init Display First          <PCI Slot>         |
  BIOS Lock Control           <Enabled>          |
  IDE HDD Block Mode          <Enabled>          |
  Onboard FDC Controller      <Enabled>          |
  Onboard Serial Port 1       <3F8/IRQ4>         |
  Onboard Serial Port 2       <2F8/IRQ3>         |
  UART Mode Select            <Normal>           |
  Onboard Parallel Port       <378/IRQ7>         |
  Parallel Port Mode          <SPP>              |
  PWRON After PWR-Fail        <Off>              |
  Game Port Address           <201>              |
  Midi Port Address           <300>              |
  Midi Port IRQ               <10>               |
  Watch Dog Timer Select      <Disabled>         |

↑↓→← Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC: Exit  F1: General Help
 F5:Previous Value      F6:Fail-Safe Default          F7:Optimized Defaults
```

2. Move between items and select values by using the arrow keys. Modify the selected fields using the PgUP/PgDN keys. Please press the <F1> key for information on the various options.

On-Chip Primary/Secondary PCI IDE:

Enables/Disables. Select Enabled to activate the primary IDE interface. Select

Disabled to deactivate this interface

IDE Primary/Secondary Master/Slave PIO:
Auto/Mode0/Mode1/Mode2/Mode3/Mode4
The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

IDE Primary/Secondary Master/Slave UDMA:
Auto, Mode0, Mode1, Mode2, Mode3, Mode4
UltraDMA33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver. If your hard drive and your system software both support UltraDMA33/66/100, select Auto to enable BIOS support

USB Controller:
Enabled/Disable. This option should be enabled if your system has a USB installed on the system board and you want to use it.

USB Keyboard Support:
Enabled/Disabled USB keyboard support

Init Display First:
Default: PCI Slot
This option lets you choose the priority of AGP & PCI VGA card

AC-97 Audio:
Choose Auto/Disabled

BIOS Lock Control:
Choose Lock/Unlock

IDE HDD Block Mode:
Enabled/Disabled the IDE HDD Block Mode function.
Note: Not all drives support this function

Onboard FDC Controller:

Enabled/Disabled. Select enabled if your system has a floppy disk controller installed on the system board and you wish to use it. If the system has no floppy drive, select Disabled in this field.

Onboard Serial Port1/2:
Choose: 3F8/IRQ4, 2F8/IRQ3
Select an address and corresponding interrupt for the first and second serial ports.

UART Mode Select:
Default Setting: Normal
This option lets you to select which mode for the onboard Serial Port 2

Onboard Parallel Port:
Choose: 378/IRQ7
This option lets you to determine onboard parallel port controller I/O address setting.

Parallel Port Mode:
Default Setting: SPP
Select an operating mode for the onboard parallel port.

PWRON After PWR-Fail:
This setting specifies whether your system will reboot after a power failure occurs.
The available settings:
OFF: Leaves the computer in the power off state and need to push the power button to turn on the power supply.
ON: Reboots the computer
Former-STS: Restores the system to the status before power failure occurs.

Game Port Address:
Choose: 201
This option lets you to determine onboard game port address setting

Midi Port Address/IRQ:
Choose: 300/IRQ10
This option lets you to determine onboard Midi port address and IRQ setting

Watchdog Timer Select:
To select Watchdog Timer wait state time: 10/20/30/40 sec./1/2/4 min./Disabled

Power Management Setup

The Power Management Setup controls the board's "green" features. To save energy these features shut down the video display and hard disk drive.

⇩ **Use the Power Management Setup option as follows:**

1. Choose "Power Management Setup" from the main menu. The following screen appears.

```
                Phoenix - Award BIOS CMOS Setup Utility
                        Power Management Setup

  ACPI Function                 <Enabled>
  ACPI Suspend Type             <S1 (POS)>          Item Help
  Power Management              <User Define>
  Video Off Method              <DPMS>              Menu Level ▸
  Video Off In Suspend          <Yes>
  Suspend Type                  <Stop Grant>
  MODEM Use IRQ                 <NA>
  Suspend Mode                  <Disabled>
  HDD Power Down                <Disabled>
  Soft-Off by PWR-BTW           <Instant-Off>
  CPU Thermal-Throttling        <50.0%>
  Power On By Ring              <Enabled>
  Wake Up On LAN                <Enabled>
  Resume by Alarm               <Disabled>
**Reload Global Timer Events **
  Primary IDE 0                 <Disabled>
  Primary IDE 1                 <Disabled>
  Secondary IDE 0               <Disabled>
  Secondary IDE 1               <Disabled>
  FDD, COM, LPT Port            <Disabled>
  PCI PIRQ (A-D) #              <Disabled>

↑↓→← Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC: Exit  F1: General Help
 F5:Previous Value      F6:Fail-Safe Default          F7:Optimized Defaults
```

2. Move between items and select values by using the arrow keys. Modify the selected field the PgUP/PgDN keys. For information on the various options, press <F1> key.

ACPI Function:

Enables/Disables the ACPI function

ACPI Suspend Type:

Choose SI (POS) / S3 (STR) / S1 & S3

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" - Predefine timer value of 4-12 min.
"Max Saving" – Predefine timer value of 1 minute

Video Off Method:
Choose V/H SYNC+Blank, DPMS, Blank Screen
When power management blanks the screen and turns off vertical and horizontal scanning.
The DPMS (Display Power Management System) setting allows the BIOS to control the video card if it has the DPMS features. If you don't have a Green monitor, use the Blank Screen option

Video Off In Suspend:
Choose the video off condition: NA/Suspend/Doze

Suspend Type:
Choose stop Grand / PwrOn Suspend

MODEM Use IRQ:
Choose the IRQ used by the modem.
Default: Disabled

Suspend Mode:
Sets the time for Suspend mode or disables it

HDD Power Down:
Sets the time for the HDD power down mode or disables it

Soft-Off by PWR-BTW:
Default: Instant-Off
Press the power button for more than 4 seconds forces the system to enter the Soft-Off state when the system has "hung"

CPU Thermal-Throttling:
Choose 12.5%, 25%, 37.5%, 50%, 62.5%, 75%, 87.5%

Power On by Ring:
Enabled/Disabled. When enabled, the system will power up automatically when modem ring.

Wake Up On LAN:
Enabled/Disabled. Wake Up On LAN function

Resume by Alarm:
Enables/Disables. When Enabled, you can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.
The following is a list of IRQ's, interrupt ReQuests, which can be exempted much as the COM ports and LPT ports above can. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

Reload Global Timer Events:
Choose Enable or Disable

Primary IDE 0	<Disabled>
Primary IDE 1	<Disabled>
Secondary IDE 0	<Disabled>
Secondary IDE 1	<Disabled>
FDD, COM, LPT Port	<Disabled>
PCI PIRQ <A-D>	<Disabled>

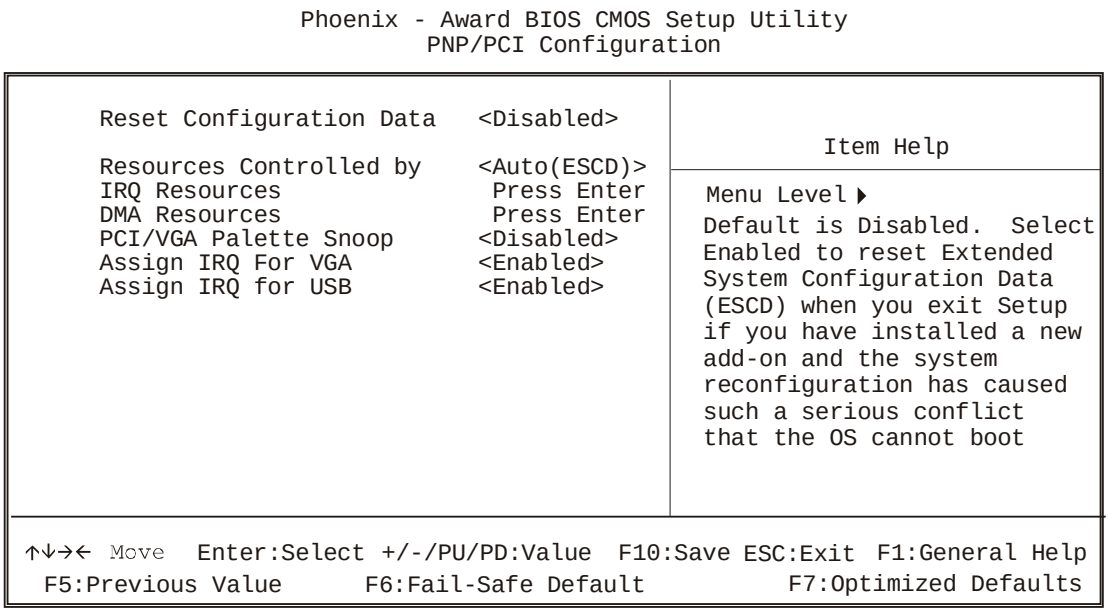
3. After you have finished with the Power Management Setup, press the <ESC> key to return to the main menu.

PNP/PCI Configuration

This option is used to configure Plug and Play assignments and route PCI interrupts to designated ISA interrupts.

⇩ **Use the PNP/PCI Configuration Setup option as follows:**

1. Choose "PNP/PCI Configuration Setup" from the main menu, the following screen appears.



2. Move between items and select values by using the arrow keys. Modify the selected fields using the PgUP/PgDN keys. For information on the various options, please press <F1> key.

Reset Configuration Data:

Choose Enable or Disable

"Enable" – PNP configuration data is reset in BIOS

"Disable" – PNP configuration date is retained in BIOS

Resources Controlled By:

Choose Auto or Manual. This option specifies whether resources are controlled by automatic or manual configuration

IRQ Resources:

IRQ-3 Assigned to <PCI Device>
IRQ-4 Assigned to <PCI Device>
IRQ-5 Assigned to <PCI Device>
IRQ-7 Assigned to <PCI Device>
IRQ-9 Assigned to <PCI Device>
IRQ-10 Assigned to <PCI Device>
IRQ-11 Assigned to <PCI Device>
IRQ-12 Assigned to <PCI Device>
IRQ-14 Assigned to <PCI Device>
IRQ-15 Assigned to <PCI Device>

PCI/VGA Palette Snoop:
Enabling this item informs the PCI/VGA card to keep silent when palette register is updated

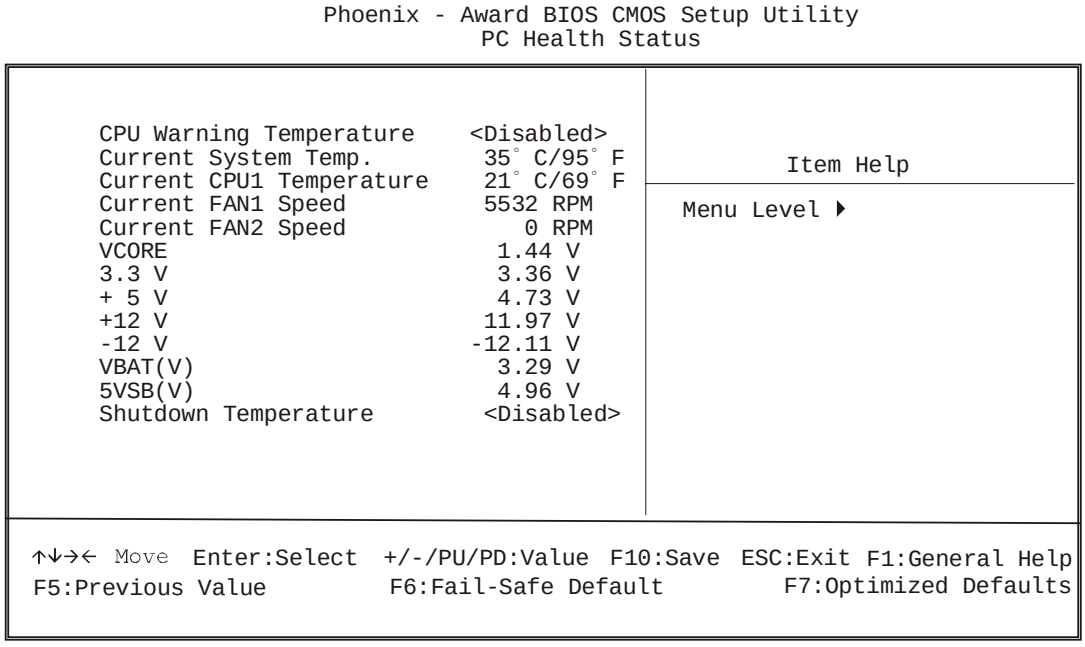
Assign IRQ for VGA:
Choose Enabled/Disabled to specify whether the VGA uses on IRQ or not.

Assign IRQ for USB:
Choose Enabled/Disabled to specify whether the USB uses an IRQ or not.

3. Please press the <ESC> key to return the main menu after finishing with the PNP/PCI Configuration Setup.

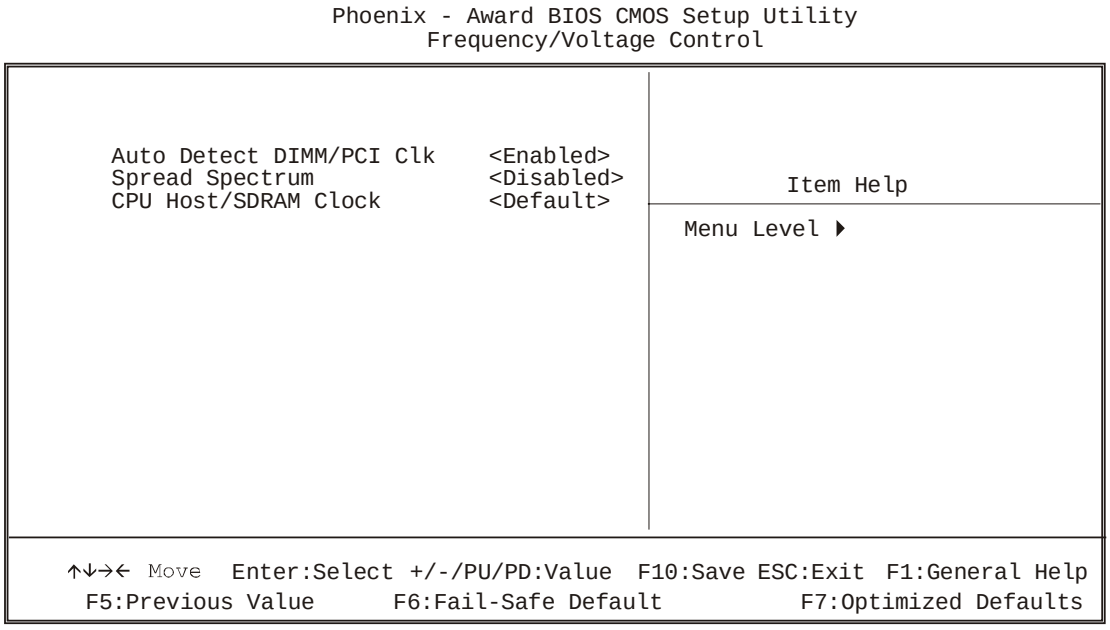
PC Health Status Configuration Setup

Choose "PC Health Status Configuration Setup" from the main menu, the following screen appears:



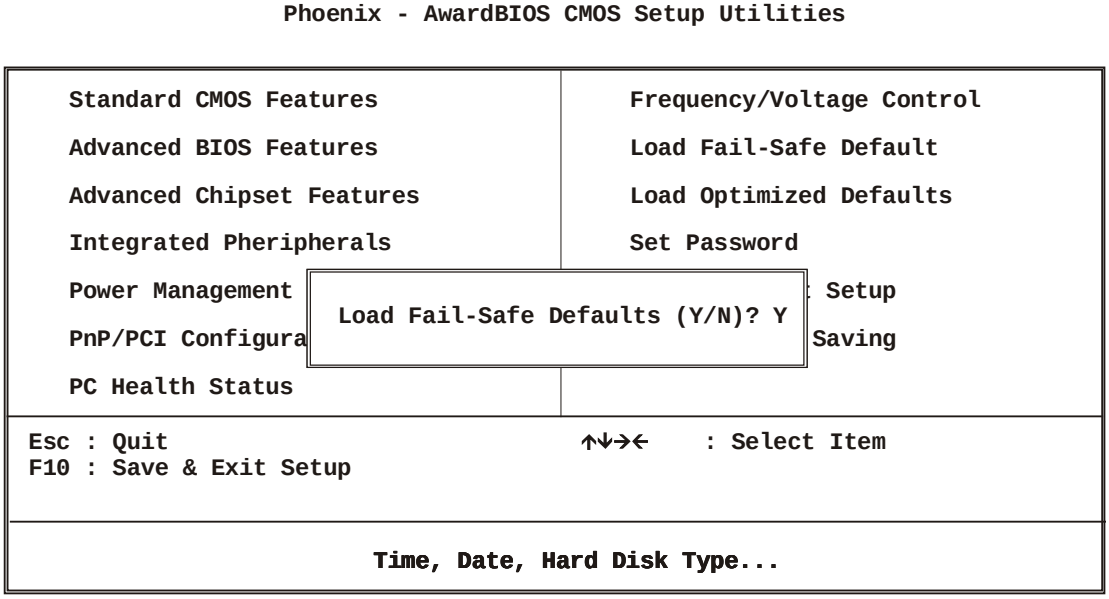
Frequency/Voltage Control Option

Choose the "Frequency/Voltage Control" from main menu, the following screen appears:



Load Fail-Safe Defaults

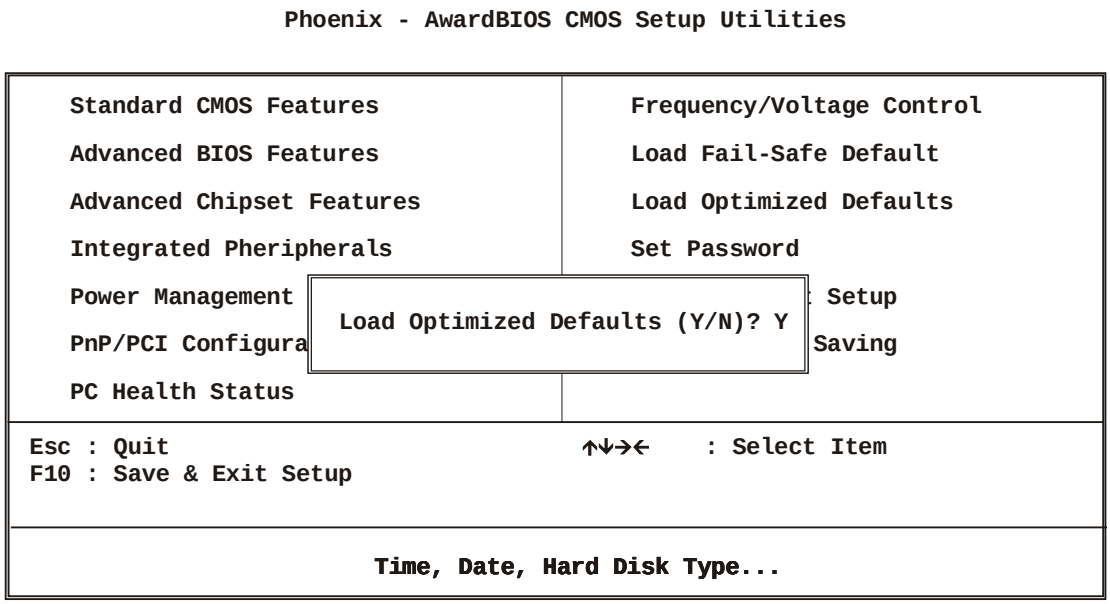
This option loads the troubleshooting default values permanently stored in the BIOS ROM. This is useful if you are having problems with the main board and need to debug or troubleshoot the system. The loaded default settings do not affect the Standard CMOS Setup screen.



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 BIOS default values. Pres the <Y> key and then press <Enter> if you want to load the BIOS default.

Load Optimized Defaults

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



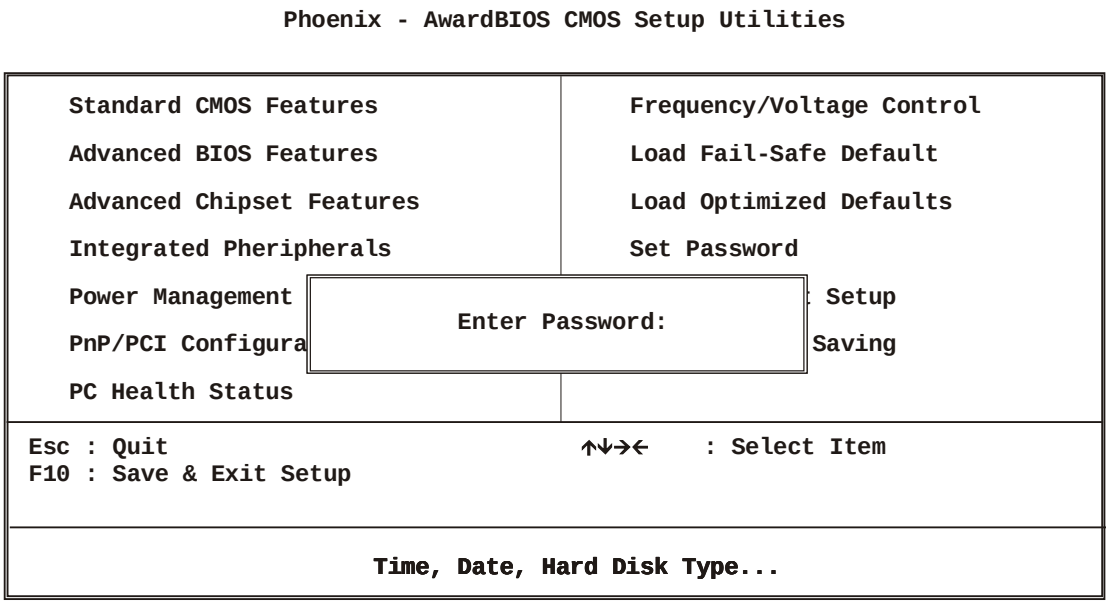
To use this feature, highlight it on the main screen and press <Enter>. A line will appear on the screen asking if you want to load the Optimized Default Values. Press the <Y> key and then press <Enter> if you want to load the SETUP default.

Supervisor/User Password

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.

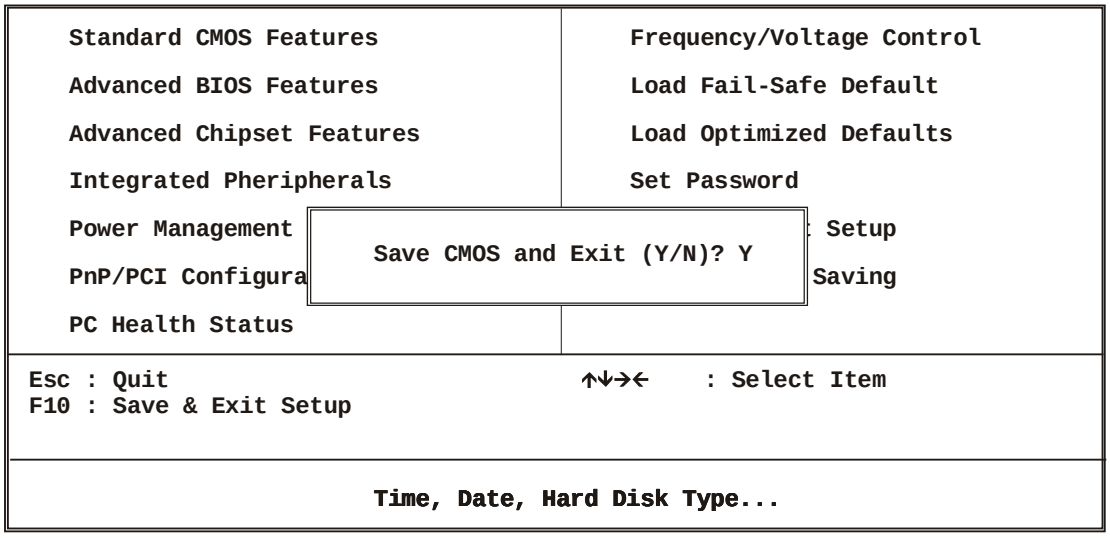
To change a password, first choose a password option from the main menu and enter the current password. Then type your new password at the prompt. The password is case sensitive and you can use up to 8 alphanumeric characters. Press <Enter> after entering the password. At the Next Prompt, confirm the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

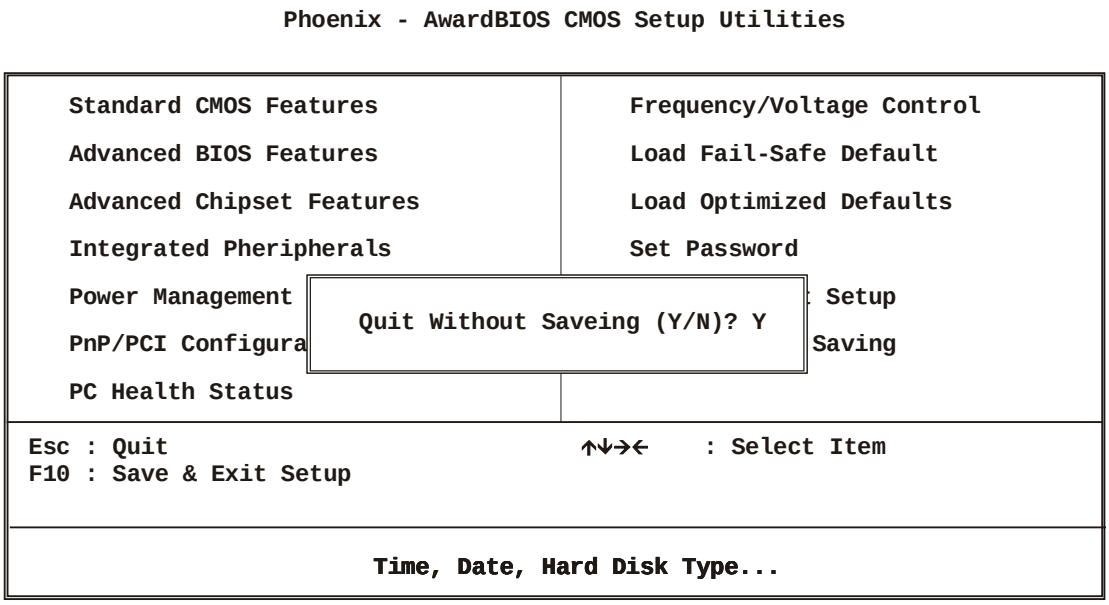
Save and Exit Setup

This function automatically saves all CMOS values before exiting Setup.



Exit Without Saving

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


Phoenix - AwardBIOS CMOS Setup Utilities
Standard CMOS Features
Advanced BIOS Features
Advanced Chipset Features
Integrated Pheripherals
Power Management
PnP/PCI Configura
PC Health Status
Frequency/Voltage Control
Load Fail-Safe Default
Load Optimized Defaults
Set Password
Setup
Saving
Quit Without Saveing (Y/N)? Y
Esc : Quit
F10 : Save & Exit Setup
↑↓→← : Select Item
Time, Date, Hard Disk Type...

Chapter 4. Driver Utility

The MAT-F703 drivers and utilities CD-ROM contains the following folders.

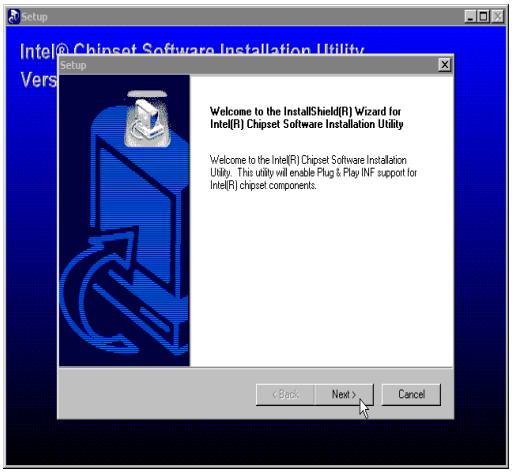
1.VGA: VGA drivers
2.LAN: Ethernet drivers
3.Sound:AC-97 drivers
4.845PE :845PE drivers
5.Manual

The Intel® Chipset Software Installation Utility installs to the target system the Windows* INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

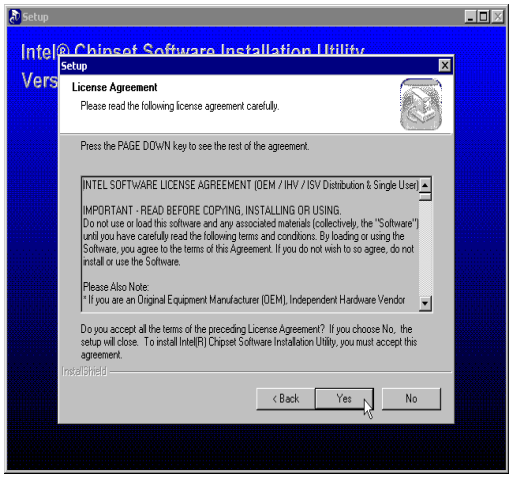
- Core PCI and ISAPNP Services
- IDE/ATA33/ATA66 Storage Support
- USB Support
- Identification of Intel® Chipset Components in the Device Manager

Installing the Intel INF Driver for Windows98SE/ME/2000/XP

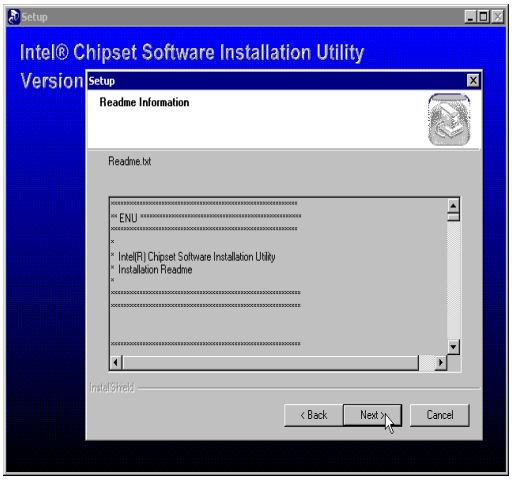
1. Insert the Drivers and Utilities CD into the CD ROM drive (example E:)
2. Double click the "845PE\Chipset Software Installation Utility" folder in drive E: to open it and run "Setup" program by double click it.



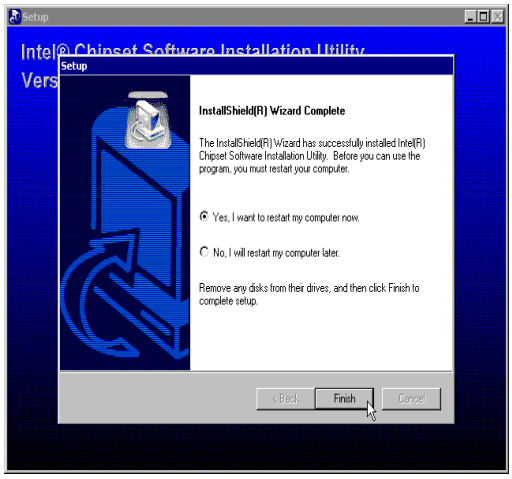
(1)Click "Next"



(2)Click "yes"



(3)Click "Next"

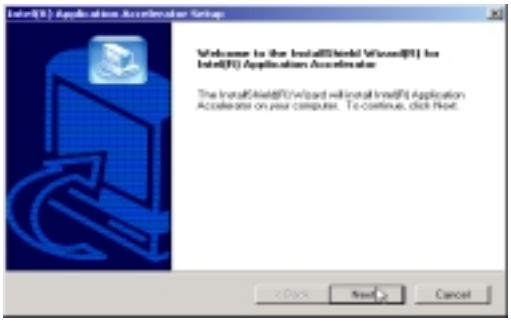


(4)Click "Finish" to restart your system

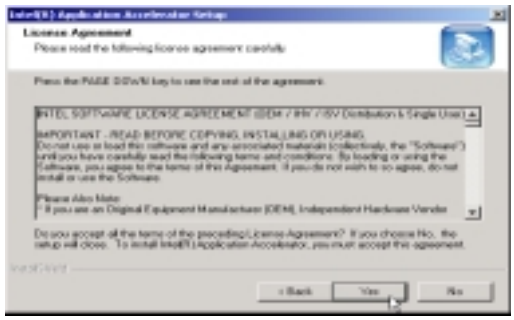
Intel Applipcation Accelerator

The Intel(R) Application Accelerator is designed to improve performance of the storage sub-system and overall system performance. This software delivers improved performance through several ingredient technologies (components). Certain components will be available only on Pentium(R) 4 processor-based systems running Microsoft Windows 2000 and Windows XP. Software installation is flexible and fully automated for Microsoft Windows 98, Windows 98 Second Edition(SE), Windows Millennium Edition(Me), Windows NT 4.0, Windows 2000, and Windows XP operating systems.

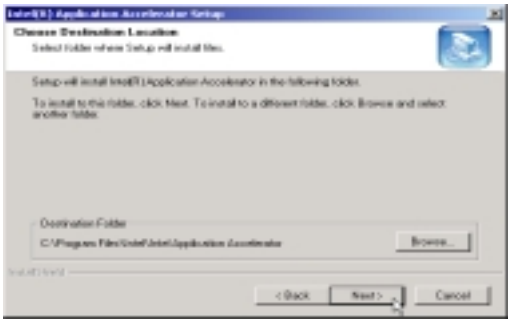
1. Insert the Drivers and Utilities CD into the CD ROM drive (example E:)
2. Double click the "845PE\Iaa" folder in drive E: to open it run "iaa**.exe"



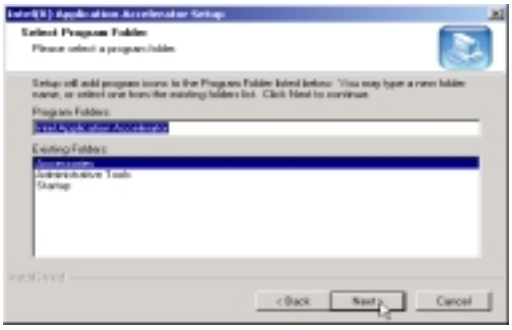
(1) Click "Next"



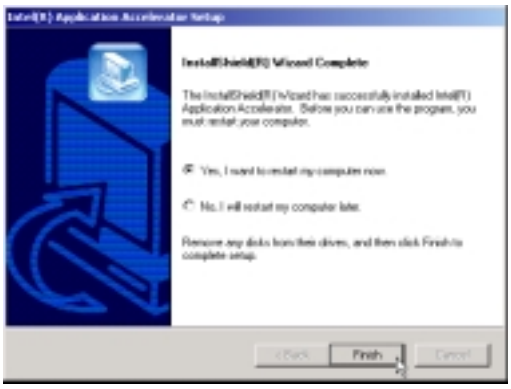
(2) Click "Yes"



(3) Click "Next"



(4) Click "Next"



(5)Click "Finish" to restart your system

VGA Driver

The MAT-F703 is a powerful, compact and full function single board computer that can be used in multitude of embedded applications. The board is designed with ATI Radeon 7000 4X AGP , it supports 32/64MB DDR memory , CRT display and TV-out interface , also supports DVI interface.

Install the drivers for VGA as follows:

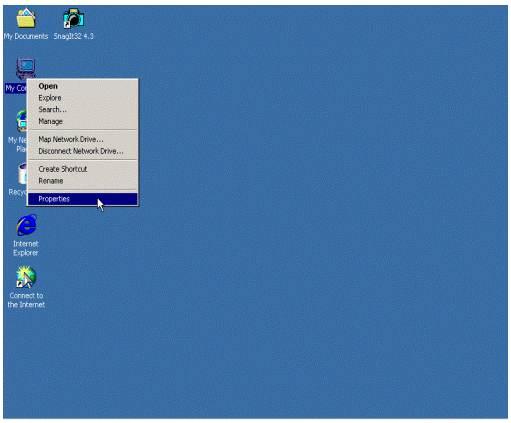
It is strongly recommended that you exit all Windows programs before running this Setup program.

Warning: This program is protected by copyright law and international treaties. Unthorized 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.

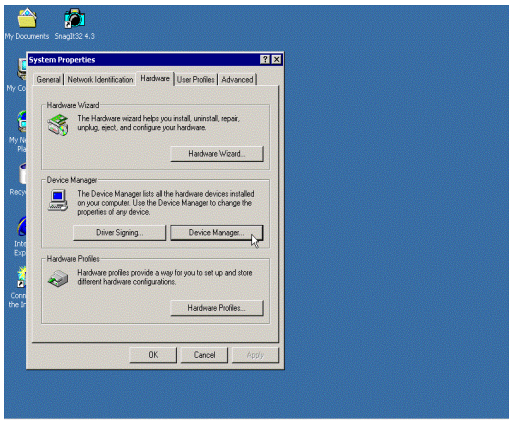
ATI Radeon 7000 VGA Graphics Driver

1. Insert the Drivers and Utilities CD into the CD ROM drive (example E:).
2. The installation is same as Windows 2000
3. Double click the "Setup" program by double click it.

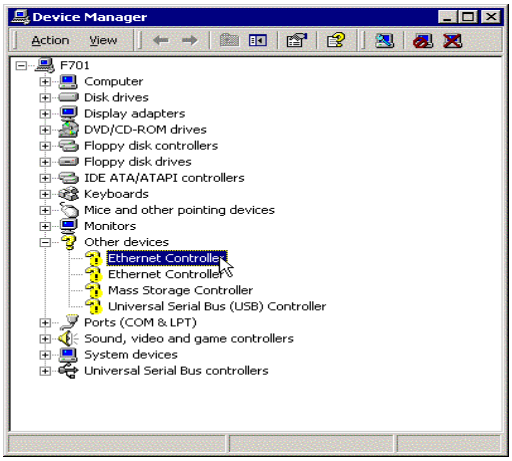
Intel Network Driver



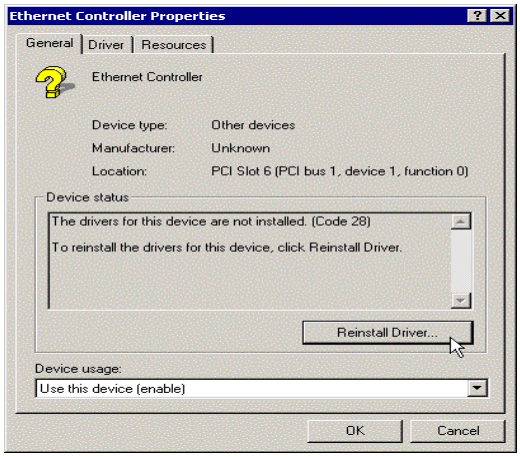
(1)Click "My Computer"→ Properties



(2)Click "Hardware"→ "Device Manager"

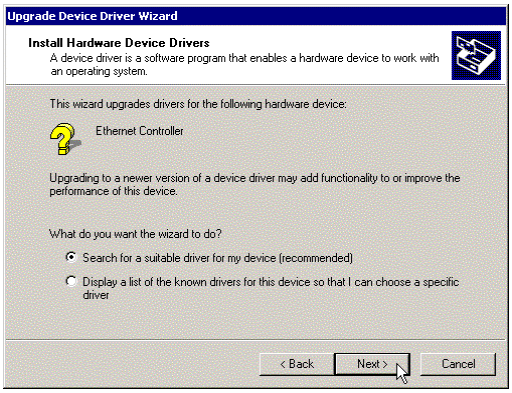


(3)Click "Other devices" →"Ethemet Controller"

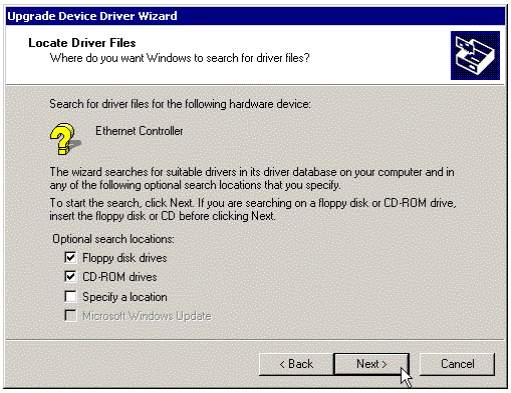


(4)Click "Reinstall Driver"

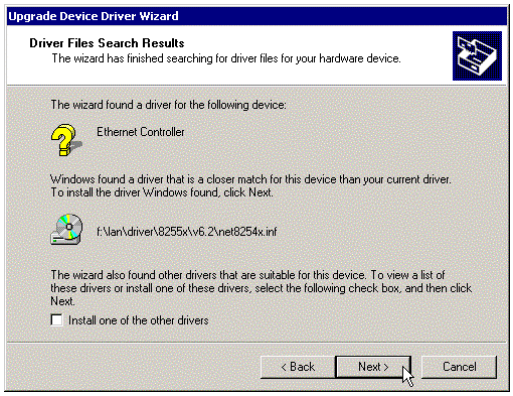
(5) Click "Next"



(6) Click "Next"



(7) Click "Next"

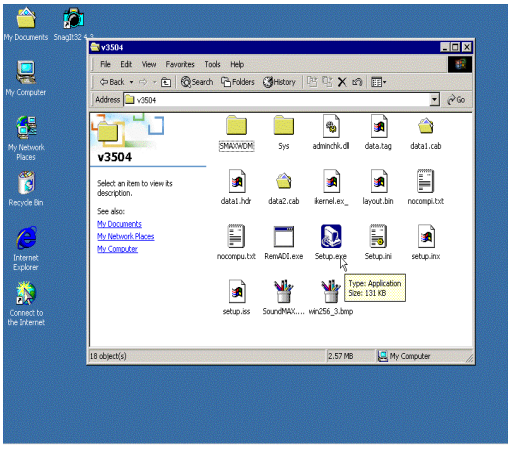


(8) Click "Next"

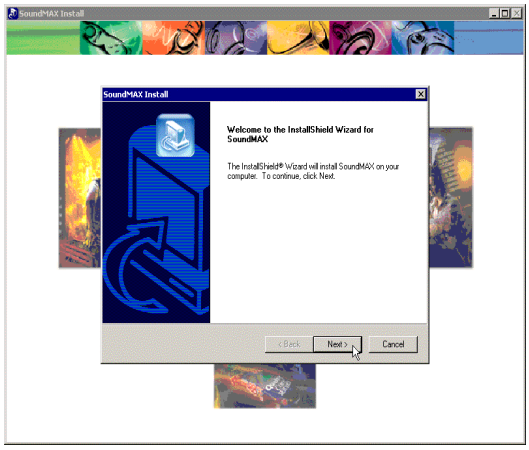
(9) Click "Finish" to restart computer

ADI AC'97 Audio Driver

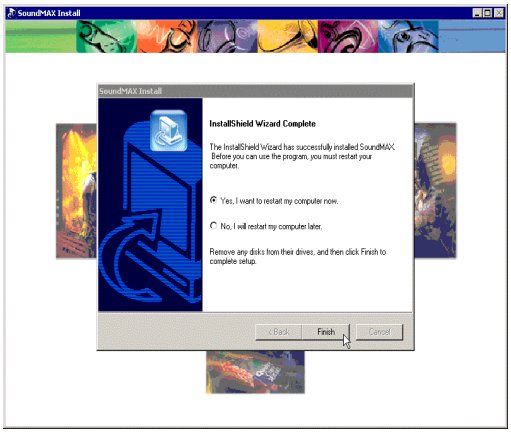
1. Insert the Drivers and Utilities CD into the CD ROM drive (example E:)
2. Double click the "Sound" folder in drive E: to open it and run "Setup" program by double click it.



(1) Double click "setup.exe"



(2) Click "Next"



(3)Click "Finish" to resrart your system

Appendix A: Programming the Watchdog Timer

The MAT-F703 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:

ASSEMBLY LANGUAGE	DOS DEBUG

Program 1: Initializing the watchdog controller

MOV DX,2EH	O 2E 87
MOV AL,87H	O 2E 87
OUT DX,AL	
OUT DX,AL	
MOV AL,07H	O 2E 07
OUT DX,AL	O 2F 08
MOV DX,2FH	
MOV AL,08H	
OUT DX,AL	

Program 2: Writing a watchdog timer interval value

```
MOV DX,2EH                                  O 2E F6
MOV AL,F6H                                  O 2F XX
OUT DX,AL                                   O 2E AA
MOV DX,2FH
MOV AL,XXH      ; Timer interval *** see note ***
OUT DX,AL
MOV DX,2EH
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).

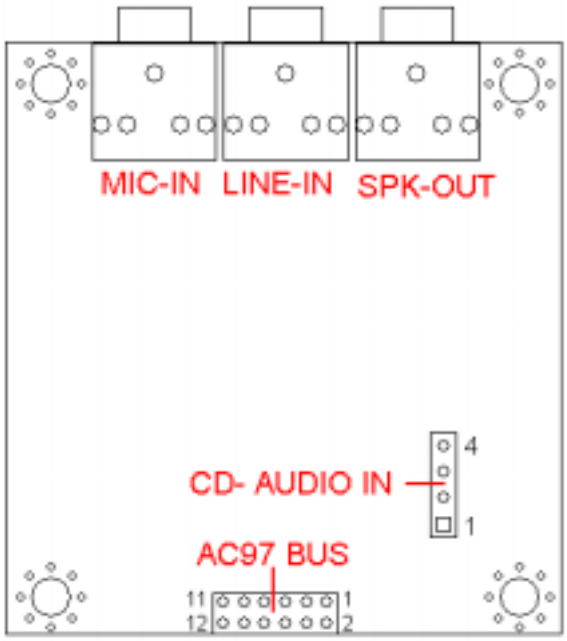
Using the Demo Program

Update the System BIOS as follows:

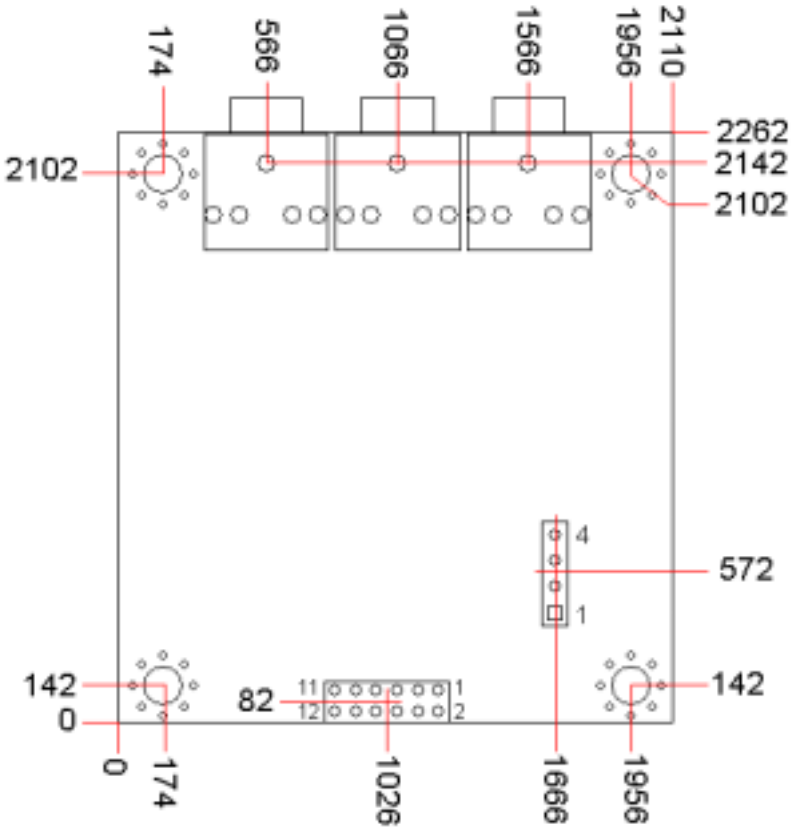
1. Run Program 1
2. Run Program 2 (load the timer interval of 1EH, 30 seconds)
3. Run your Application Program #1 (**Be sure your Application Program will finish within 30 seconds)**
4. Run Program 1
5. Run Program 2 (change the timer interval value to 3CH, 60 seconds)
6. Run your Application Program#2 (**Be sure your Application Program will be finished within 60 seconds)**
7. Run Program 1
8. Run Program 2 (reload the timer interval value of 3CH, 60 seconds)
9. Run Program 1
10. Run Program 3 (Load the timer interval of 00H, and disable the watchdog timer function)

Appendix B: AC-97 Audio Kit

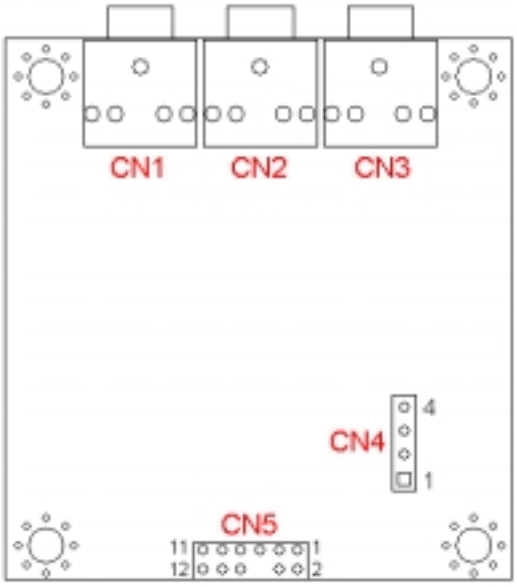
AC97 Board Layout



AC97 Board Dimension



AC97 Location of Connector



AC97 List of Connector

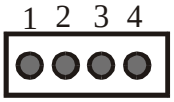
Connectors	Description
CN1	Micro-Phone Input
CN2	Line-In
CN3	Speaker-Out
CN4	CD Audio Input
CN5	AC97 Audio Input

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.

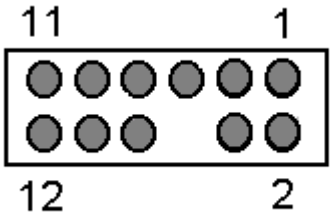
CN4: CD Audio Input Connector



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 C: System Resources

Interrupt Controller

The MAT-F703 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 the AMI Diagnostic utility 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	USB Controller

IRQ6	Floppy Disk Controller
IRQ7	Parallel Port
IRQ8	Real Time Clock
IRQ9	Free
IRQ10	Free
IRQ11	USB Controller
IRQ12	Mouse
IRQ13	Math Coprocessor
IRQ14	Primary IDE Controller
IRQ15	Secondary IDE Controller

DMA Channel Assignment

Channel 4 is by default used to cascade the two controllers

Channel	Assignment
DMA0	**Free**
DMA1	**Free**
DMA2	**Floppy Disk Controller**
DMA3	**Free**
DMA4	**Cascade**
DMA5	**Free**
DMA6	**Free**
DMA7	**Free**

Memory Map

The following table indicates memory of MAT-F703. The address ranges specify the runtime code length.

Memory below 1MB (1Mb ~ 640KB)

Address Range	Type	Owner
A0000~AFFFF	**ISA**	**VGA Adapter**
B0000~BFFFF	**ISA**	**VGA Adapter**
C0000~CBFFF	**ISA**	**Adapter ROM**
F0000~FFFFF	**ISA**	**System BIOS**

Memory above 1MB (1MB ~ 1046464KB)

Address Range	Type	Owner
D0000000~D7FFFFFF	**PCI**	**PCI-PCI Bridge**
D8000000~DBFFFFF7	**PCI**	**Host Bridge**
DC000000~DDFFFFFF	**PCI**	**PCI-PCI Bridge**
DE000000~DFFFFFFF	**PCI**	**PCI-PCI Bridge**

System Memory Map

Start High	**Start Low**	**Size High**	**Size Low**	**Type**
00000000	00000000	00000000	0009FC00	Available
00000000	000F0000	00000000	00010000	Available
00000000	FEC00000	00000000	01400000	Reserved
00000000	0009FC00	00000000	00000400	Reserved
00000000	00100000	00000000	3FEF0000	Available
00000000	3FFF3000	00000000	0000D000	ACPI Space

I/O Map

The addresses shown in the table are typical locations.

I/O Port	Assignment
0 ~ F	**AT DMA Controller**
20 ~ 21	**AT Interrupt Controller**
40 ~ 43	**82C54 Compatible Programmable Timer**
60	**8042 Compatible keyboard Controller**
61	**AT Style Speaker**
64	**8042 Compatible keyboard Controller**
70 ~ 71	**AT Real Time Clock**
81 ~ 83	**AT DMA Controller**
87	**AT DMA Controller**
89 ~ 8B	**AT DMA Controller**
8F ~ 91	**AT DMA Controller**
A0 ~ A1	**AT Interrupt Controller**
C0 ~ DF	**AT DMA Controller**
F0 ~ FF	**Math Coprocessor**
170 ~ 177	**IDE Controller**
1F0 ~ 1F7	**IDE Controller**
220 ~ 22E	**Sound Card**
294 ~297	**PCI Bus**
2F8 ~ 2FF	**Communication Port (COM2)**

376	**IDE Controller**
378 ~ 37A	**LPT1**
3B0 ~ 3BB	**VGA Adapter**
3C0 ~ 3DF	**VGA Adapter**
3F0 ~ 3F5	**FDD Controller**
3F6	**IDE Controller**
3F7	**FDD Controller**
3F8 ~ 3FF	**Communication Port (COM1)**
400 ~ 4BF	**PCI Bus**
4D0 ~ 4D1	**PCI Bus**
778 ~ 77B	**Standard parallel**
CF8 ~ CFF	**PCI Bus**
9000 ~ 9FFF	**PCI-PCI Bridge**
A000 ~ AFFF	**PCI-PCI Bridge**
B000 ~ B01E	**USB Controller**
B400 ~ B41E	**USB Controller**
B800 ~ B81E	**USB Controller**
F000 ~ F00E	**IDE Controller**

Appendix D: Order Information

MAT-F703

P4 CPU Card w/o CPU, with VGA –32MB DDR MemoryDVI,10/100 LAN

AC97-1881

Audio kit for MAT-F703

Appendix E: Optional Cables List

Part Number	Cable Description	MAT-F703 Connector	Terminating Connector
46-ATA660-00	ATA-66 IDE Cable	CN5, CN6	ATA66 IDE Cable, 46cm
46-IFDC01-00	Floppy Cable	CN8	Floppy Cable 2.54 to 2.0mm, 50cm
46-I606KP-00	KB + PS/2 Mouse Cable	CN16	KB + PS/2 Mouse Cable, 15cm
46-ILPT01-00	LPT Cable	CN9	LPT Cable w/o Bracket, 2mm, 26cm
46-ICOM2B-00	COM2 Cable	CN11	I/O Cable w/Bracket, 2mm, 20.50cm
46-IUSB1B-00	USB Cable	CN10	2-channels USB Cable w/Bracket, 2.54mm, 50cm
46-I701X3-00	3-pin Power Cable	CN2	3-pin Power Cable for Backplane Card
46-IPW4X4-00	12V Power Cable	CN7	4-pin to 4-pin 12V Power Cable