MB860

Transmeta Efficeon
Mini-ITX Motherboard

USER'S MANUAL

Version 1.0

Acknowledgments

Award is a registered trademark of Award Software International, Inc.
PS/2 is a trademark of International Business Machines Corporation.
Transmeta, Crusoe, Code Morphing and LongRun are trademarks of Transmeta Corporation.
Microsoft Windows is a registered trademark of Microsoft Corporation.
Winbond is a registered trademark of Winbond Electronics Corporation.
All other product names or trademarks are properties of their respective owners.

Table of Contents

Introduction 1

Product Description 1
Checklist 2
Specifications 3
Board Dimensions 4

Installations 5

Installing the Memory 6
Setting the Jumpers 7
Connectors on MB860 11
Watchdog Timer Configuration 21
Digital I/O Sample Code 25

BIOS Setup 28

Drivers Installation 50

ALi Integrated Driver Installation 51
Transmeta TM8000 AGP Driver Installation 53
Analog Device AC'97 Audio Driver Installation 56
ATI Mobility Radeon M7/M9 VGA Driver Installation 57
Realtek LAN Drivers Installation 58

Appendix 60

A. I/O Port Address Map 60
B. Interrupt Request Lines (IRQ) 61

This page is intentionally left blank.

Introduction

Product Description

The MB860 Mini-ITX motherboard comes with a Transmeta Efficeon TM8600 processor, a power-efficient x86 solution. The I/O interfaces built into the Efficeon processor's integrated Northbridge are matched with its high performance core featuring support for DDR-333 DRAM, a 1.6 GB/s HyperTransport™ interconnect, and an AGP 4X graphics interface. With the new Code Morphing Software for the Efficeon processor, MB860 provides high performance while consuming less power.

The MB860 features an ATI M7 High Performance graphics controller with 16MB embedded memory. Supporting up to 1.2GHz, this small-footprint motherboard comes with four serial ports, and four USB ports support, watchdog timer and one PCI slot for added functionality and expandability.

About the processor features:

Enhanced LongRun Power Management
Unlike conventional x86 processors, Transmeta's Enhanced LongRun power management technology is part of the Efficeon processor's Code Morphing Software. This combination allows the Efficeon processor to seamlessly adjust its operating frequency and voltage up to hundreds of times per second — dramatically extending battery life, limiting heat dissipation yet providing rapid system responsiveness.

Operating System Solutions
Efficeon TM8600 processors are designed to run with the full suite of x86 compatible operating systems, including Microsoft® Windows NT, Windows 2000, Windows XP and Windows XP Tablet PC Edition. These processors are also designed to work optimally with Linux operating systems.

Checklist

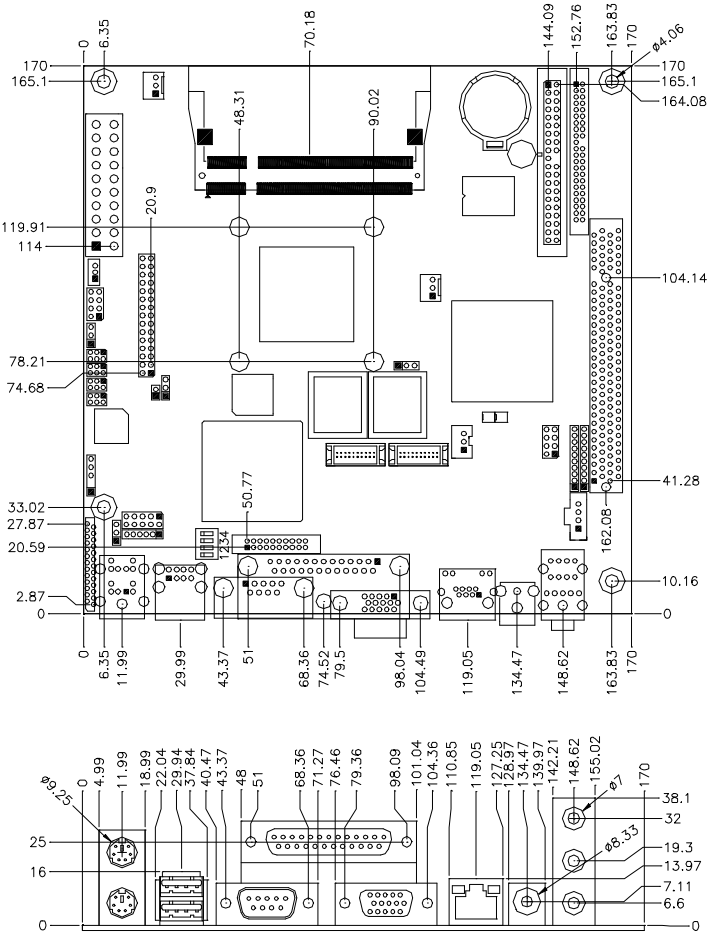
Your MB860 package should include the items listed below.

- The MB860 Mini-ITX motherboard
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- Optional cables such as:
  - 2 IDE ribbon cables (40-pin & 44-pin)
  - 3 COM port cables

Specifications

Product Name	MB860
CPU Type	TM8600 (Transmeta Efficeon)
CPU Voltage	0.8V-1.25V
System Speed	900MHz-1.2GHz
HyperTransport System Bus Speed	400MHz
Green /APM	APM1.2
Chipset	Transmeta Crusoe TM8600, 783-pin BGA South Bridge: ALI M1563M, 444-pin BGA
BIOS+CMS	Award BIOS 2MByte, LPC Flash ROM, support ACPI function, 16MB (total)
Cache	Integrated 128k Byte instruction and 64k Byte data caches and 1024k Byte L2 write-back cache
VGA	ATI M7CSP-16 3D graphics controller Embedded 16MB Display memory, CRT/ TFT/ TV-out / TMDS
LAN	RTL 8100C(L)(10/100) or RTL8110s-32 Gigabit Ethernet controllers
Audio	Built in ALI M1563M sound controller + AC97 Codec ADI AD1885 (Line-out, Line-in, Mic).
Memory type	1 x DDR 2.5V 266/333 DDR SDRAM SO-DIMM Module, Max. 1GMB
LPC I/O	Winbond W83627: IrDA, LPT, COM1/2, FDC 2. Keyboard/Mouse Controller COM1: RS232 COM2: RS232
RTC/CMOS	Built in ALI 1563M
Secondary LPC I/O	Fintek F81216 Support COM3/ COM4 (RS232)
Battery	Lithium battery
Local bus IDE	Built in ALI 1563M, IDE1, IDE2 (Ultra DMA 33/66/100/133)
On board D-sub	PS/2 keyboard/mouse, RJ-45 x1
USB	4 ports, USB 1.1 / 2.0
IrDA	Pin header
Watchdog Timer	256 segments (0, 1, 2 ... 255 sec/min)
System Voltages	+5V, +12V, -12V, 5VSB, -5V, 3.3V
Hardware Monitor	Winbond W83627
Expansion Slot	1 PCI slot
Other Features	Modem Wakeup, LAN Wakeup
Form Factor	Mini-ITX
Board Size	170 x 170 mm

Board Dimensions



Installations

This section provides information on how to use the jumpers and connectors on the MB860 in order to set up a workable system. The topics covered are:

Installing the Memory..... 6
Setting the Jumpers..... 7
Connectors on MB860 11
Watchdog Timer Configuration 21
Digital I/O Sample Code..... 25

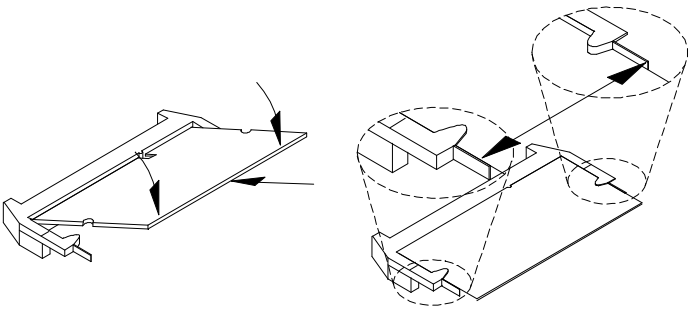
Installing the Memory

The MB860 board supports one DDR SO-DIMM sockets for a maximum total memory of 1GB in DDR memory type. The memory module capacities supported are 128MB, 256MB, 512MB and 1GB. The following table lists the supported DDR DIMM configurations. MB860 supports configurations defined in the JEDEC DDR DIMM specification only.

Installing and Removing Memory Modules

To install the DDR modules, locate the memory slot on the board and perform the following steps:

1. Hold the DDR module so that the key of the DDR module align with those on the memory slot.
2. Gently push the DDR module in an upright position until the clips of the slot close to hold the DDR module in place when the DDR module touches the bottom of the slot.
3. To remove the DDR module, press the clips with both hands.

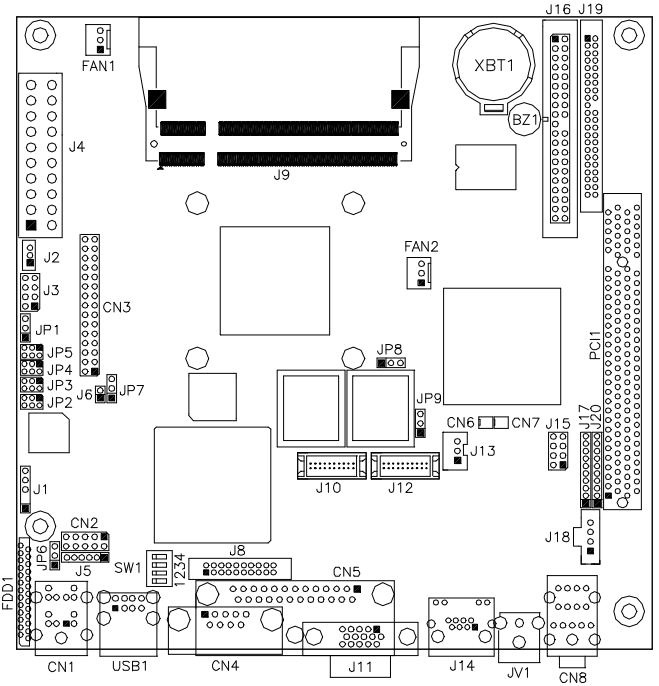


Setting the Jumpers

Jumpers are used on MB860 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MB860 and their respective functions.

Jumper Locations on MB860 8
SW1: Panel Resolution Setting 9
JP9: LCD Panel VDD Selection 9
W1: Clear CMOS Contents 9
JP2: COM1 RS232 +5V / +12V Power Setting 9
JP3: COM2 RS232 +5V / +12V Power Setting 10
JP4: COM3 RS232 +5V / +12V Power Setting 10
JP5: COM4 RS232 +5V / +12V Power Setting 10
JP6: USB Voltage Selection 10

Jumper Locations on MB860



Jumpers on MB860 ..... Page
SW1: Panel Resolution Setting 9
JP9: LCD Panel VDD Selection 9
W1: Clear CMOS Contents 9
JP2: COM1 RS232 +5V / +12V Power Setting 9
JP3: COM2 RS232 +5V / +12V Power Setting 10
JP4: COM3 RS232 +5V / +12V Power Setting 10
JP5: COM4 RS232 +5V / +12V Power Setting 10
JP6: USB Voltage Selection 10

SW1: Panel Resolution Setting

SW1	1	2	3	4
800x600, 18-bit	OFF	ON	ON	xx
1024x768, 18-bit	ON	OFF	ON	xx
1024x768, 24-bit	OFF	OFF	ON	xx
1280x1024, 18-bit, 2CH	ON	ON	OFF	xx

JP9: LCD Panel VDD Selection

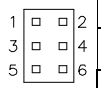
JP9	VDD
	3.3V (default)
	5V

W1: Clear CMOS Contents

Use this jumper to clear the CMOS contents. *Note that the ATX-power connector should be disconnected from the board before clearing CMOS.*

W1	Setting	Function
	Pin 1-2 Short/Closed	Normal
	Pin 2-3 Short/Closed	Clear CMOS

JP2: COM1 RS232 +5V / +12V Power Setting

Pin #	Signal Name	JP2	Signal Name	Pin #
1	RI		+12V	2
3	RI (Default)		RI (Default)	4
5	RI		+5V	6

COM1 Settings: Pin 1-2 short = +12V, Pin 5-6 short = +5V, Pin 3-4 Standard COM Port

JP3: COM2 RS232 +5V / +12V Power Setting

Pin #	Signal Name	JP3	Signal Name	Pin #
1	RI		+12V	2
3	RI (Default)		RI (Default)	4
5	RI		+5V	6

COM2 Settings: Pin 1-2 short = +12V, Pin 5-6 short = +5V, Pin 3-4 Standard COM Port

JP4: COM3 RS232 +5V / +12V Power Setting

Pin #	Signal Name	JP4	Signal Name	Pin #
1	RI		+12V	2
3	RI (Default)		RI (Default)	4
5	RI		+5V	6

COM3 Settings: Pin 1-2 short = +12V, Pin 5-6 short = +5V, Pin 3-4 Standard COM Port

JP5: COM4 RS232 +5V / +12V Power Setting

Pin #	Signal Name	JP5	Signal Name	Pin #
1	RI		+12V	2
3	RI (Default)		RI (Default)	4
5	RI		+5V	6

COM4 Settings: Pin 1-2 short = +12V, Pin 6-5 short = +5V, Pin 3-4 Standard COM Port

JP6: USB Voltage Selection

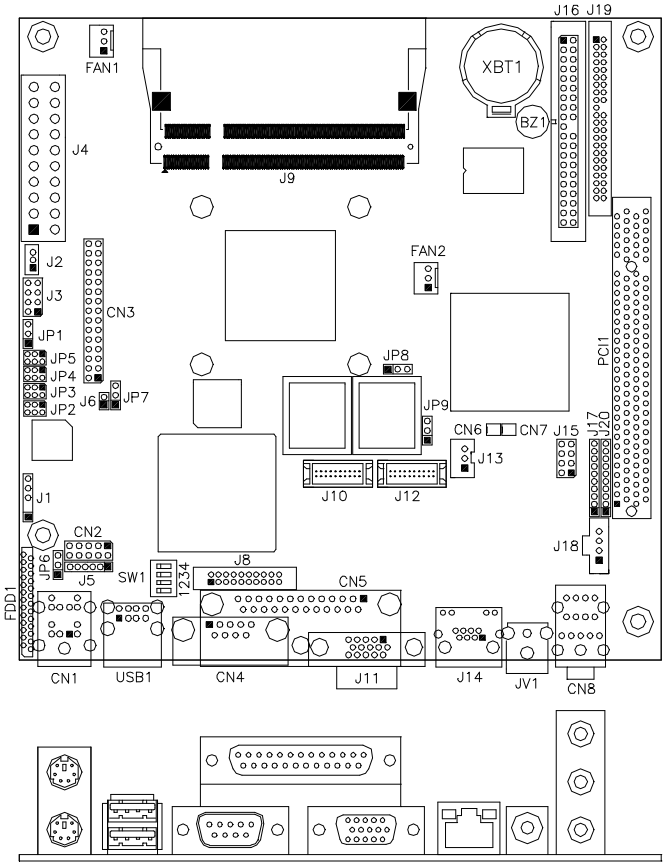
JP6	Setting	USB Voltage
	Pin 1-2 Short/Closed	Vcc (default)
	Pin 2-3 Short/Closed	5VSTBY

Connectors on MB860

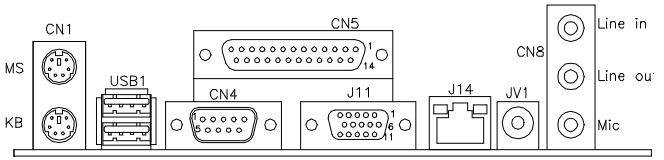
The connectors on MB860 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on MB860 and their respective functions.

Connector Locations on MB860 12
CN1: PS/2 Keyboard and Mouse (top) Connectors..... 13
USB1: USB Connector 13
CN4: COM1 DB-9 Serial Port..... 13
CN5: Parallel Port DB-25 Connector..... 14
J11: VGA CRT DB-15 connector 14
J14: RJ45 Connector 14
JV1: TV out Connector 15
CN8: Line Out, Line In, Mic Connector 15
FDD1: Floppy Drive Connector..... 15
J1: IrDA Connector..... 15
CN2: Digital 4-in 4-out I/O Connector 16
J2: Wake On LAN Connector..... 16
J3: System Function Connector 16
J4: ATX Power Supply Connector..... 16
J5: External PS/2 Keyboard Connector..... 17
J8: TMDS Panel Connector..... 17
JP8: TV-Out Connector..... 17
J9: DDR SODIMM Socket 17
J10, J12: LVDS Connectors (1st channel, 2nd channel)..... 18
J13: Panel Inverter Power Connector..... 18
J15: USB Connectors 18
J16, J19: EIDE Connectors..... 19
J18: CD-In Audio Connector..... 20
CN3: Serial Ports Connector 20

Connector Locations on MB860



Connector Locations on MB860 ..... Page
CN1: PS/2 Keyboard and Mouse (top) Connectors 13
USB1: USB Connector 13
CN4: COM1 DB-9 Serial Port 13
CN5: Parallel Port DB-25 Connector 14
J11: VGA CRT DB-15 connector 14
J14: RJ45 Connector 14
JV1: TV out Connector 15
CN8: Line Out, Line In, Mic Connector 15
FDD1: Floppy Drive Connector 15
J1: IrDA Connector 15
CN2: Digital 4-in 4-out I/O Connector 16
J2: Wake On LAN Connector 16
J3: System Function Connector 16
J4: ATX Power Supply Connector 16
J5: External PS/2 Keyboard Connector 17
J8: TMDS Panel Connector 17
JP8: TV-Out Connector 17
J9: DDR SODIMM Socket 17
J10, J12: LVDS Connectors (1st channel, 2nd channel) 18
J13: Panel Inverter Power Connector 18
J15: USB Connectors 18
J16, J19: EIDE Connectors 19
J18: CD-In Audio Connector 20



The above external onboard connectors are described below.

CN1: PS/2 Keyboard and Mouse (top) Connectors

Signal Name	Keyboard	Mouse	Signal Name
Keyboard data	1	1	Mouse data
N.C.	2	2	N.C.
GND	3	3	GND
5V	4	4	5V
Keyboard clock	5	5	Mouse clock
N.C.	6	6	N.C.

USB1: USB Connector

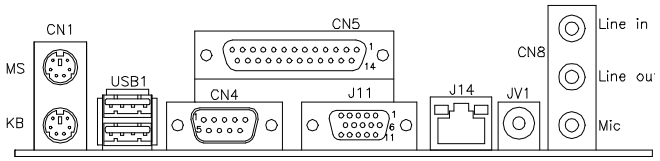
USB1 consists of a two stacked USB ports. Refer to the section below for the respective pin assignments.



Pin #	Signal Name
1	Vcc
2	USB-
3	USB+
4	Ground

CN4: COM1 DB-9 Serial Port

Signal Name	Pin #	Pin #	Signal Name
DCD, Data carrier detect	1	6	DSR, Data set ready
RXD, Receive data	2	7	RTS, Request to send
TXD, Transmit data	3	8	CTS, Clear to send
DTR, Data terminal ready	4	9	RI, Ring indicator
GND, ground	5	10	Not Used



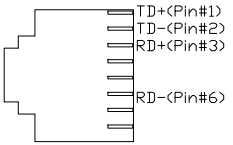
CN5: Parallel Port DB-25 Connector

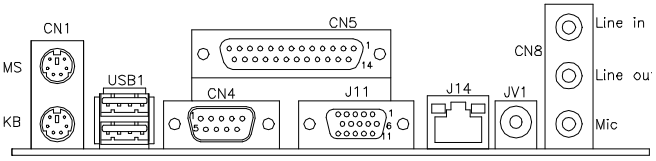
Signal Name	Pin #	Pin #	Signal Name
Line printer strobe	1	14	AutoFeed
PD0, parallel data 0	2	15	Error
PD1, parallel data 1	3	16	Initialize
PD2, parallel data 2	4	17	Select
PD3, parallel data 3	5	18	Ground
PD4, parallel data 4	6	19	Ground
PD5, parallel data 5	7	20	Ground
PD6, parallel data 6	8	21	Ground
PD7, parallel data 7	9	22	Ground
ACK, acknowledge	10	23	Ground
Busy	11	24	Ground
Paper empty	12	25	Ground
Select	13	N/A	N/A

J11: VGA CRT DB-15 connector

Signal Name	Pin #	Pin #	Signal Name
Red	1	2	Green
Blue	3	4	N.C.
GND	5	6	GND
GND	7	8	GND
N.C.	9	10	GND
N.C.	11	12	N.C.
HSYNC	13	14	VSYNC
NC	15		

J14: RJ45 Connector





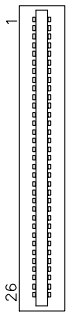
JV1: TV out Connector

This is an RCA jack for TV out function.

CN8: Line Out, Line In, Mic Connector

FDD1: Floppy Drive Connector

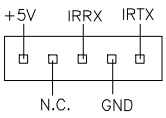
FDD1is a slim 26-pin connector and will support up to 2.88MB FDD.



Signal Name	Pin #	Pin #	Signal Name
VCC	1	2	INDEX
VCC	3	4	DRV_SEL
VCC	5	6	DSK_CH
NC	7	8	NC
NC	9	10	MOTOR
DINST	11	12	DIR
NC	13	14	STEP
GND	15	16	WDATA
GND	17	18	WGATE
GND	19	20	TRACK
NC	21	22	WPROT
GND	23	24	RDATA
GND	25	26	SIDE

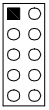
J1: IrDA Connector

J1 is used for an optional IrDA connector for wireless communication.



Pin #	Signal Name
1	+5V
2	No connect
3	Ir RX
4	Ground
5	Ir TX

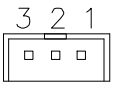
CN2: Digital 4-in 4-out I/O Connector



Signal Name	Pin	Pin	Signal Name
Ground	1	2	Vcc
Out3	3	4	Out1
Out2	5	6	Out0
In3	7	8	In1
In2	9	10	In0

J2: Wake On LAN Connector

Wake On LAN will function properly only with an ATX power supply with 5VSB that has 200mA.



Pin #	Signal Name
1	+5VSB
2	Ground
3	-PME

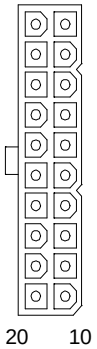
J3: System Function Connector



Signal Name	Pin	Pin	Signal Name
Ground	1	2	PS_ON
Power LED	3	4	Ground
5V	5	6	HDD Active
Ground	7	8	Reset

ATX power on switch: Pins 1-2
Power LED: Pins 3-4; HDD LED: Pins 5-6
Reset switch: Pins 7-8

J4: ATX Power Supply Connector



Signal Name	Pin #	Pin #	Signal Name
3.3V	11	1	3.3V
-12V	12	2	3.3V
Ground	13	3	Ground
PS-ON	14	4	+5V
Ground	15	5	Ground
Ground	16	6	+5V
Ground	17	7	Ground
-5V	18	8	Power good
+5V	19	9	5VSB
+5V	20	10	+12V

J5: External PS/2 Keyboard Connector

J5, a 6-pin header connector, has functions for external keyboard.

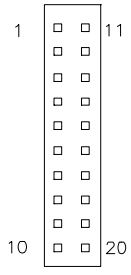


Pin #	Signal Name
1	Vcc
2	Internal KB CLK
3	External KB CLK
4	Internal KB data
5	External KB data
6	Ground

Default: 2-3 short, 4-5 short for internal CN1 keyboard
For external keyboard, use 1, 3, 5, 6 pin

J8: TMDS Panel Connector

TMDS stands Transition Minimized Differential Signaling.



J8

Signal Name	Pin #	Pin #	Signal Name
TX1P	1	11	TX2P
TXIN	2	12	TX2N
GND	3	13	GND
GND	4	14	GND
TXCP	5	15	TX0P
TXCN	6	16	TX0N
GND	7	17	NC
+5v	8	18	NC
HTPG	9	19	DDCDATA
NC	10	20	DDCCLK

JP8: TV-Out Connector

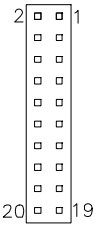


Pin #	Signal Name
1	Y/G
2	Ground
3	C/R

J9: DDR SODIMM Socket

J10, J12: LVDS Connectors (1st channel, 2nd channel)

The LVDS connectors, available on MB860 are composed of the first channel (J10) and second channel (J12) to support 18-bit, 36-bit, 24-bit or 48-bit panels.



Signal Name	Pin #	Pin #	**Signal Name**
TX0-	2	1	TX0+
Ground	4	3	Ground
TX1-	6	5	TX1+
5V/3.3V	8	7	Ground
TX3-	10	9	TX3+
TX2-	12	11	TX2+
Ground	14	13	Ground
TXC-	16	15	TXC+
5V/3.3V	18	17	ENABKL
+12V	20	19	+12V

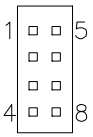
J13: Panel Inverter Power Connector



Pin #	**Signal Name**
1	ELON
2	Ground
3	+12V

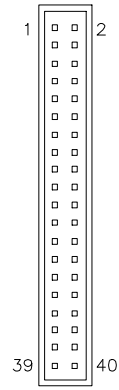
J15: USB Connectors

The following table shows the pin outs of the USB pin headers connectors. Overall, the one pin header support four USB ports (USB 2.0 compliant).



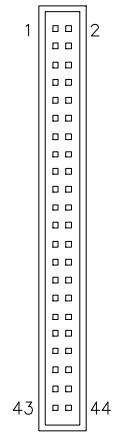
Signal Name	**Pin**	**Pin**	**Signal Name**
Vcc	1	5	Ground
USB0-	2	6	USB1+
USB0+	3	7	USB1-
Ground	4	8	Vcc

J16, J19: EIDE Connectors



J16: IDE1

Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Protect pin
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground



J19: IDE2

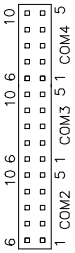
Signal Name	Pin #	Pin #	Signal Name
Reset IDE	1	2	Ground
Host data 7	3	4	Host data 8
Host data 6	5	6	Host data 9
Host data 5	7	8	Host data 10
Host data 4	9	10	Host data 11
Host data 3	11	12	Host data 12
Host data 2	13	14	Host data 13
Host data 1	15	16	Host data 14
Host data 0	17	18	Host data 15
Ground	19	20	Key
DRQ0	21	22	Ground
Host IOW	23	24	Ground
Host IOR	25	26	Ground
IOCHRDY	27	28	Host ALE
DACK0	29	30	Ground
IRQ14	31	32	No connect
Address 1	33	34	No connect
Address 0	35	36	Address 2
Chip select 0	37	38	Chip select 1
Activity	39	40	Ground
Vcc	41	42	Vcc
Ground	43	44	N.C.

J18: CD-In Audio Connector



Pin #	Signal Name
1	CD Audio R
2	Ground
3	Ground
4	CD Audio L

CN3: Serial Ports



Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	Ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	No Connect.

Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sort of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:
This code and information is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability and/or fitness for a particular purpose.

```
;[]============================================
; Name    : Enable_And_Set_Watchdog
; IN  : AL - 1sec ~ 255sec
; OUT     : None
;[]============================================
Enable_And_Set_Watchdog  Proc Near
            push ax                 ;save time interval
            call  Unlock_Chip
            mov  cl, 2Bh
            call  Read_Reg
            and  al, NOT 10h
            call  Write_Reg             ;set GP24 as WDTO
            mov  cl, 07h
            mov  al, 08h
            call  Write_Reg             ;switch to LD8
            mov cl, 0F5h
            call  Read_Reg
            and  al, NOT 08h
            call  Write_Reg             ;set count mode as second
            pop  ax
            mov  cl, 0F6h
            call  Write_Reg             ;set watchdog timer
            mov  al, 01h
            mov  cl, 30h
            call  Write_Reg             ;watchdog enabled
            call  Lock_Chip
            ret
Enable_And_Set_Watchdog  Endp
```

;[]==========

```
; Name    : Disable_Watchdog
; IN : None
; OUT     : None
;[]=============================================
Disable_Watchdog Proc Near
            call  Unlock_Chip

            mov  cl, 07h
            mov  al, 08h
            call  Write_Reg          ;switch to LD8

            xor   al, al
            mov  cl, 0F6h
            call  Write_Reg          ;clear watchdog timer

            xor   al, al
            mov  cl, 30h
            call  Write_Reg          ;watchdog disabled

            call  Lock_Chip
            ret
Disable_Watchdog Endp
;[]=============================================
; Name    : Unlock_Chip
; IN : None
; OUT     : None
;[]=============================================
Unlock_Chip  Proc Near
            Mov dx, 4Eh
            mov  al, 87h
            out   dx, al
            out   dx, al
            ret
Unlock_Chip  Endp
;[]=============================================
; Name    : Lock_Chip
; IN : None
; OUT     : None
;[]=============================================
Unlock_Chip  Proc Near
            mov  dx, 4Eh
            mov  al, 0AAh
            out   dx, al
            ret
Unlock_Chip  Endp
;[]=============================================
```

```
; Name    : Write_Reg
; IN  : CL - register index
;       AL - Value to write
; OUT     : None
;[]=============================================
Write_Reg      Proc Near
               push ax
               mov  dx, 4Eh
               mov  al,cl
               out  dx,al
               pop  ax
               inc  dx
               out  dx,al
               ret
Write_Reg      Endp
;[]=============================================
; Name    : Read_Reg
; IN  : CL - register index
; OUT     : AL - Value to read
;[]=================================================
Read_Reg       Proc Near
               Mov al, cl
               mov  dx, 4Eh
               out  dx, al
               inc  dx
               in   al, dx
               ret
Read_Reg       Endp
;[]=============================================
```

Digital I/O Sample Code

Filename: W627hf.h

```
//=============================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//=============================================================================
#ifndef __W627HF_H
#define __W627HF_H                      1
//=============================================================================
#define W627_IOBASE                     0x4E
//=============================================================================
#define     W627HF_INDEX_PORT       (W627_IOBASE+0)
#define     W627HF_DATA_PORT        (W627_IOBASE+1)
//=============================================================================
#define     W627HF_REG_LD           0x07
//=============================================================================
#define W627HF_UNLOCK               0x87
#define     W627HF_LOCK             0xAA
//=============================================================================
void Set_W627HF_LD( unsigned char);
void Set_W627HF_Reg( unsigned char, unsigned char);
unsigned char Get_W627HF_Reg( unsigned char);
//=============================================================================
#endif      //__W627HF_H
```

Filename: W627hf.cpp

```
//=====================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//=====================================================================
#include "W627HF.H"
#include <dos.h>
//=====================================================================
void Unlock_W627HF (void);
void Lock_W627HF (void);
//=====================================================================
void Unlock_W627HF (void)
{
        outportb(W627HF_INDEX_PORT, W627HF_UNLOCK);
        outportb(W627HF_INDEX_PORT, W627HF_UNLOCK);
}
//=====================================================================
void Lock_W627HF (void)
{
        outportb(W627HF_INDEX_PORT, W627HF_LOCK);
}
//=====================================================================
void Set_W627HF_LD( unsigned char LD)
{
        Unlock_W627HF();
        outportb(W627HF_INDEX_PORT, W627HF_REG_LD);
        outportb(W627HF_DATA_PORT, LD);
        Lock_W627HF();
}
//=====================================================================
void Set_W627HF_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_W627HF();
        outportb(W627HF_INDEX_PORT, REG);
        outportb(W627HF_DATA_PORT, DATA);
        Lock_W627HF();
}
//=====================================================================
unsigned char Get_W627HF_Reg( unsigned char REG)
{
        unsigned char Result;
        Unlock_W627HF();
        outportb(W627HF_INDEX_PORT, REG);
        Result = inportb(W627HF_DATA_PORT);
        Lock_W627HF();
        return Result;
}
//=====================================================================
```

File of the Main.cpp

```
//=========================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//=========================================================================
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "W627HF.H"
//=========================================================================
void ClrKbBuf(void);
int main (int argc, char *argv[]);
//=========================================================================
int main (int argc, char *argv[])
{
	unsigned char ucDO = 0;					//data for digital output
	unsigned char ucDI;					//data for digital input
	unsigned char ucBuf;

	Set_W627HF_LD( 0x07);					//switch to logic device 7

	Set_W627HF_Reg(0xF1, 0x00);				//clear
	ucDI = Get_W627HF_Reg(0xF1) & 0x0F;

	ClrKbBuf();
	while(1)
	{
		ucDO++;
		Set_W627HF_Reg(0xF1, ((ucDO & 0x0F) << 4));
		ucBuf = Get_W627HF_Reg(0xF1) & 0x0F;
		if (ucBuf != ucDI)
		{
			ucDI = ucBuf;
			printf("Digital I/O Input Changed. Current Data is 0x%X\n",ucDI);
		}

		if (kbhit())
		{
			getch();
			break;
		}
		delay(500);
	}
	return 0;
}
//=========================================================================
void ClrKbBuf(void)
{
	while(kbhit())
	{	getch();	}
}
//-------------------------------------------------------------------------
```

BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the motherboard. The topics covered in this chapter are as follows:

BIOS Introduction 29
BIOS Setup.....29
Standard CMOS Setup.....31
Advanced BIOS Features.....34
Advanced Chipset Features.....37
Integrated Peripherals.....39
Power Management Setup.....42
PNP/PCI Configurations.....45
PC Health Status.....46
Frequency/Voltage Control.....47
Load Fail-Safe Defaults.....48
Load Setup Defaults.....48
Set Supervisor/User Password.....48
Save & Exit Setup.....48
Exit Without Saving.....48

BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system's ROM supports x86 processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press  <DEL>  to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

CMOS Setup Utility – Copyright © 1984-2001 Award Software

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	Set User Password
PnP/PCI Configurations	Save & Exit Setup
PC Health Status	Exit Without Saving
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	
Time, Date, Hard Disk Type…	

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section, which displays information on the currently highlighted item in the list.

***Note**: If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

***Warning:** It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

Date (mm:dd:yy)	Thu, Jun 10 2004	Item Help
Time (hh:mm:ss)	00 : 00 : 00	Menu Level
IDE Primary Master	None	Change the day, month,
IDE Primary Slave	None	Year and century
IDE Secondary Master	None	
IDE Secondary Slave	None	
Drive A	None	
Drive B	None	
Video	EGA/VGA	
Halt On	All Errors	
Base Memory	640K	
Extended Memory	129024K	
Total Memory	130048K	

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

Date

The date format is:

Day : **Sun to Sat**
Month : **1 to 12**
Date : **1 to 31**
Year : **1994 to 2079**

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

Time

The time format is: **Hour : 00 to 23**
Minute : 00 to 59
Second : 00 to 59

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

IDE Primary HDDs / IDE Secondary HDDs

The onboard PCI IDE connectors provide Primary and Secondary channels for connecting up to four IDE hard disks or other IDE devices. Each channel can support up to two hard disks; the first is the "Master" and the second is the "Slave".

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select 'Manual' to define the drive information manually. You will be asked to enter the following items.

CYLS :	Number of cylinders
HEAD :	Number of read/write heads
PRECOMP :	Write precompensation
LANDZ :	Landing zone
SECTOR :	Number of sectors

The Access Mode selections are as follows:

Auto	
Normal	(HD < 528MB)
Large	(for MS-DOS only)
LBA	(HD > 528MB and supports Logical Block Addressing)

Drive A / Drive B

These fields identify the types of floppy disk drive A or drive B that has been installed in the computer. The available specifications are:

360KB	1.2MB	720KB	1.44MB	2.88MB
5.25 in.	5.25 in.	3.5 in.	3.5 in.	3.5 in.

Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

EGA/VGA	For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default)
CGA 40	Power up in 40 column mode.
CGA 80	Power up in 80 column mode.
MONO	For Hercules or MDA adapters.

Halt On

This field determines whether or not the system will halt if an error is detected during power up.

No errors	The system boot will not be halted for any error that may be detected.
All errors	Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted.
All, But Keyboard	The system boot will not be halted for a keyboard error; it will stop for all other errors
All, But Diskette	The system boot will not be halted for a disk error; it will stop for all other errors.
All, But Disk/Key	The system boot will not be halted for a keyboard or disk error; it will stop for all others.

Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

Virus Warning	Disabled	ITEM HELP
CPU Internal Cache	Enabled	Menu Level
Quick Power On Self Test	Enabled	
First Boot Device	Floppy	Allows you choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area, BIOS will show a warning message on screen and alarm beep
Second Boot Device	HDD-0	
Third Boot Device	CDROM	
Boot Other Device	Enabled	
Swap Floppy Drive	Disabled	
Boot Up Floppy Seek	Disabled	
Boot Up Numlock Status	On	
Gate A20 Option	Fast	
Typematic Rate Setting	Disabled	
Typematic Rate (chars/Sec)	6	
Typematic Delay (Msec)	250	
Security Option	Setup	
OS Select For DRAM>64MB	Non-OS2	
Report No FDD For WIN 95	Yes	
Video BIOS Shadow	Enabled	
C8000-CBFFF Shadow	Disabled	
CC000-CFFFF Shadow	Disabled	
D0000-D3FFF Shadow	Disabled	
D4000-D7FFF Shadow	Disabled	
D8000-DBFFF Shadow	Disabled	
DC000-DFFFF Shadow	Disabled	
Small Logo (EPA) Show	Enabled	

Virus Warning

This item protects the boot sector and partition table of your hard disk against accidental modifications. If an attempt is made, the BIOS will halt the system and display a warning message. If this occurs, you can either allow the operation to continue or run an anti-virus program to locate and remove the problem.

CPU Internal Cache

When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are ***Enabled***.

Quick Power On Self Test

When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

First/Second/Third Boot Device

These fields determine the drive that the system searches first for an operating system. The options available include *Floppy*, *LS120*,*HDD-0*, *SCSI*, *CDROM*, *HDD-1*, *HDD-2*, *HDD-3*, *ZIP100*, *USB-FDD*, *USB-CDROM*, *USB-HDD*, and *Disable*.

Boot Other Device

These fields allow the system to search for an operating system from other devices other than the ones selected in the First/Second/Third Boot Device.

Swap Floppy Drive

This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to ***Disabled.***

Boot Up Floppy Seek

This feature controls whether the BIOS checks for a floppy drive while booting up. If it cannot detect one (either due to improper configuration or its absence), it will flash an error message.

Boot Up NumLock Status

This allows you to activate the NumLock function after you power up the system.

Gate A20 Option

This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

Typematic Rate Setting

When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

Typematic Rate (Chars/Sec)

When the typematic rate is enabled, the system registers repeated keystrokes speeds. Settings are from 6 to 30 characters per second.

Typematic Delay (Msec)

When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

Security Option

This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System*, the system prompts for the User Password every time you boot up. When you select *Setup*, the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

OS Select for DRAM > 64MB

This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

Report No FDD For WIN 95

If you are using Windows 95/98 without a floppy disk drive, select Enabled to release IRQ6. This is required to pass Windows 95/98's SCT test. You should also disable the Onboard FDC Controller in the Integrated Peripherals screen when there's no floppy drive in the system. If you set this feature to Disabled, the BIOS will not report the missing floppy drive to Win95/98.

Video BIOS Shadow

This item allows you to change the Video BIOS location from ROM to RAM. Video Shadow will increase the video speed.

C8000 - CBFFF Shadow/DC000 - DFFFF Shadow

Shadowing a ROM reduces the memory available between 640KB to 1024KB. These fields determine whether or not optional ROM will be copied to RAM.

Small Logo (EPA) Show

The EPA logo appears at the right side of the monitor screen when the system is boot up. The default setting is ***Enabled***.

Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

M1563 Configuration	Press Enter	ITEM HELP
AGP Configuration	Press Enter	Menu Level
HyperTransport Config	Press Enter	M1563 Power Saving, Clock Gated and Prefetch
ALI OnChip Audio	Enabled	

Phoenix - AwardBIOS CMOS Setup Utility
M1563 Configuration

M1563 Gated Clock	Disabled	ITEM HELP
EHCI PHY Power Saving	Enabled	Menu Level
EHCI Read Pre-Fetch	Enabled	
IDE Read Pre-Fetch	Enabled	
OHCI Read Pre-Fetch	Enabled	
AC97 Read Pre-Fetch	Enabled	
PCI Slots Read Pre-Fetch	Enabled	
PCI/14M/USB CLK PowerDown	Disabled	

Phoenix - AwardBIOS CMOS Setup Utility
AGP Configuration

AGP Aperture Size (MB)	128	ITEM HELP
AGP 4X override	Disabled	Menu Level

Phoenix - AwardBIOS CMOS Setup Utility
HyperTransport Configuration

TM8000 to M1563 HTT Freq.	400MHz-400MHz	ITEM HELP
TM8000 to M1563 HTT Width	8 Bits	Menu Level
TM8000/M1563 HTT TriState	Enabled	

ALI OnChip Audio

The default setting of the AC97 Audio is ***Enabled***.

M1563 Gated Clock

The default setting is ***Disabled***.

EHCI PHY Power Saving

The default setting is ***Enabled***.

EHCI Read Pre-Fetch

The default setting is ***Enabled***.

IDE Read Pre-Fetch

The default setting is ***Enabled***.

OHCI Read Pre-Fetch

The default setting is ***Enabled***.

AC97 Read Pre-Fetch
The default setting is ***Enabled***.

PCI Slots Read Pre-Fetch
The default setting is ***Enabled***.

PCI/14M/USB CLK PowerDown
The default setting is ***Disabled***.

AGP Aperture Size (MB)
The field sets aperture size of the graphics. The aperture is a portion of the PCI memory address range dedicated for graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The default setting is ***128M***.

AGP 4X override
The default setting is ***Disabled***.

TM8000 to M1563 HTT Freq.
The default setting is ***400MHz-400MHz***.

TM8000 to M1563 HTT Width
The default setting is ***8 Bits***.

TM8000/M1563 HTT TriState
The default setting is ***Enabled***.

Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals.

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

On-Chip Primary PCI IDE	Enabled	ITEM HELP
Master PIO	Auto	Menu Level
Slave PIO	Auto	
Master Ultra DMA	Auto	
Slave Ultra DMA	Auto	
On-Chip Secondary PCI IDE	Enabled	
Master PIO	Auto	
Slave PIO	Auto	
Master Ultra DMA	Auto	
Slave Ultra DMA	Auto	
On-Chip USB1.1 Controller	Enabled	
USB Keyboard Support	Disabled	
On-Chip USB2.0 Controller	Disabled	
Init Display First	PCI Slot	
IDE HDD Block Mode	Enabled	
Onboard Serial Port 3	3E8H	
Serial Port 3 Use IRQ	IRQ11	
Onboard Serial Port 4	2E8H	
Serial Port 4 Use IRQ	IRQ10	
POWER ON Function	BUTTON Only	
Hot Key Power ON	Ctrl-F1	
Onboard FDC Controller	Enabled	
Onboard Serial Port 1	3F8/IRQ4	
Onboard Serial Port 2	2F8/IRQ3	
UART Mode Select	Normal	
RxD , TxD Active	Hi,Lo	
IR Transmission Delay	Enabled	
UR2 Duplex Mode	Half	
Use IR Pins	IR-Rx2Tx2	
Onboard Parallel Port	378/IRQ7	
Parallel Port Mode	SPP	
EPP Mode Select	EPP1.7	
ECP Mode Use DMA	3	
PWRON After PWR-Fail	Off	

OnChip Primary/Secondary PCI IDE

The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.

IDE Primary/Secondary Master/Slave PIO

These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

IDE Primary/Secondary Master/Slave UDMA

These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

On-Chip USB1.1 Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Enabled***.

USB Keyboard Support

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Disabled***.

On-Chip USB2.0 Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Disabled***. In order to use USB 2.0, necessary OS drivers must be installed first.

Init Display First

This field allows the system to initialize first the VGA card on chip or the display on the PCI Slot. By default, the *PCI Slot* VGA is initialized first.

IDE HDD Block Mode

This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

Power On Function

This field sets how the system can be powered on from a system off state. The options available include *Hot KEY*, *Mouse Left*, *Mouse Right*, *Any KEY*, *BUTTON ONLY* and *Keyboard 98*. The default setting is ***Button Only***.

Onboard FDC Controller

Select *Enabled* if your system has a floppy disk controller (FDC) installed on the motherboard and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field. This option allows you to select the onboard FDD port.

Onboard Serial/Parallel Port

These fields allow you to select the onboard serial and parallel ports and their addresses. The default values for these ports are:

Serial Port 1	3F8H/IRQ4
Serial Port 2	2F8H/IRQ3
Serial Port 3	3E8H/IRQ11
Serial Port 4	2E8H/IRQ10
Parallel Port	378H/IRQ7

UART Mode Select

This field determines the UART 2 mode in your computer. The default value is ***Normal***. Other options include *IrDA* and *ASKIR*.

Parallel Port Mode

This field allows you to determine parallel port mode function.

SPP	Standard Printer Port
EPP	Enhanced Parallel Port
ECP	Extended Capabilities Port

PWRON After PWR-Fail

This field sets the system power status whether on or off when power returns from a power failure situation.

Power Management Setup

The Power Management Setup allows you to save energy of your system effectively.

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

		ITEM HELP
ACPI Function	Enabled	Menu Level
Power Management	User Define	
PM Control by APM	No	
Modem Use IRQ	3	
Video Off In Suspend	Yes	
Video Off Method	V/H SYNC+Blank	
PM Timers		
HDD Power Down	Disabled	
Suspend Mode	Disabled	
*** PowerOn\WakeUp Function ***		
Soft-Off by PWR-BTTN	Instant-Off	
WakeUp\PowerOn by PCI Card	Disabled	
WakeUp\PowerOn by Ring	Disabled	
CPU THRM-Throttling	87.5%	
Resume by Alarm	Disabled	
Date(of Month) Alarm	0	
Time(hh:mm:ss) Alarm	0 : 0 : 0	
*** Suspend Break Events ***		
IRQ[1] (KeyBoard)	Enabled	
IRQ[3]	Disabled	
IRQ[4]	Disabled	
IRQ[5]	Disabled	
IRQ[6] (Floppy Disk)	Enabled	
IRQ[7]	Disabled	
IRQ[8] (RTC)	Disabled	
IRQ[9]	Disabled	
IRQ[10]	Disabled	
IRQ[11]	Disabled	
IRQ[12](PS2 Mouse)	Enabled	
IRQ[14](Primary IDE)	Enabled	
IRQ[15](Secondary IDE)	Disabled	

ACPI Function

Enable this function to support ACPI (Advance Configuration and Power Interface).

Power Management

This field allows you to select the type of power saving management modes. There are four selections for Power Management.

Min. Power Saving	Minimum power management
Max. Power Saving	Maximum power management.
User Define	Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min.

PM Control by APM

The default setting is ***No***.

Modem Use IRQ

This field sets the IRQ used by the Modem. By default, the setting is ***3***.

Video Off In Suspend

When enabled, the video is off in suspend mode. The default is ***Yes***.

Video Off Method

This field defines the Video Off features. There are three options.

V/H SYNC + Blank	Default setting, blank the screen and turn off vertical and horizontal scanning.
DPMS	Allows BIOS to control the video display.
Blank Screen	Writes blanks to the video buffer.

HDD Power Down

When enabled, and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

Suspend Mode

When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

Soft-Off by PWRBTN

This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds.

WakeUp\PowerOn by PCI Card
The default setting is ***Disabled***.

WakeUp\PowerOn by Ring
The default setting is ***Disabled***.

CPU THRM-Throttling
When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

Resume by Alarm
This field enables or disables the resumption of the system operation. When enabled, the user is allowed to set the *Date* and *Time*.

Suspend Break Events
The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events which can prevent the system from entering a power saving mode or can awaken the system from such a mode. 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.

PNP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

PNP OS Installed	No	ITEM HELP
Reset Configuration Data	Disabled	Menu Level
Resources Controlled By	Auto (ESCD)	Select Yes if you are using a Plug and Play capable operating system Select No if you need the BIOS to configure non-boot devices
IRQ Resources	Press Enter	
DMA Resources	Press Enter	
PCI/VGA Palette Snoop	Disabled	

PNP OS Installed

The default setting is ***No***.

Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled.***

Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices automatically with the use of a use a PnP operating system such as Windows 95.

PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

		ITEM HELP
CPU Warning Temperature	90°C/194°F	
System Temp.	43℃/105℉	
CPU Temp.	43℃/105℉	
Chassis Temp.	43℃/105℉	
FAN1 Speed	0 RPM	
FAN2 Speed	0 RPM	
Vcore(V)	1.15 V	
+3.3V	3.31 V	
+ 5 V	5.16 V	
+12 V	11.97 V	
-12 V	-11.29 V	
VBAT(V)	3.26 V	
5VSB(V)	4.82 V	
Shutdown Temperature	Disabled	
FAN1 Failure Warning	Disabled	
FAN2 Failure Warning	Disabled	

CPU Warning Temperature

This field allows the user to set the temperature so that when the temperature is reached, the systems sounds a warning. This function can help prevent damage to the system that is caused by overheating.

Temperatures/Fan Speeds/Voltages

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

Shutdown Temperature

This field allows the user to set the temperature by which the system automatically shuts down once the threshold temperature is reached. This function can help prevent damage to the system that is caused by overheating.

Fan Failure Warning

This field allows the user to set the Fan warning so that when the FAN1/FAN2 stops running, the system sounds a warning.

Frequency/Voltage Control

This section shows the user how to configure the processor frequency.

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

Spread Spectrum	Disabled	ITEM HELP
		Menu Level

Spread Spectrum

This field sets the value of the spread spectrum. The default setting is ***Disabled***. This field is for CE testing use only.

Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

Load Setup Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Set Supervisor/User Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type "Y", you will quit the setup utility and save all changes into the CMOS memory. If you type "N", you will return to Setup utility.

Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.

This page is intentionally left blank.

Drivers Installation

This section describes the installation procedures for software and drivers under the Windows 98SE, Windows Me, Windows 2000 and Windows XP. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

ALi Integrated Driver Installation 51
Transmeta TM8000 AGP Driver Installation 53
Analog Device AC'97 Audio Driver Installation 55
ATI Mobility Radeon M7/M9 VGA Driver Installation.... 57
Realtek LAN Drivers Installation..... 58

IMPORTANT NOTE:
After installing your Windows operating system (Windows 98SE/ME/2000/XP), you must install first the ALi Integrated Driver Installation Utility before proceeding with the drivers installation.

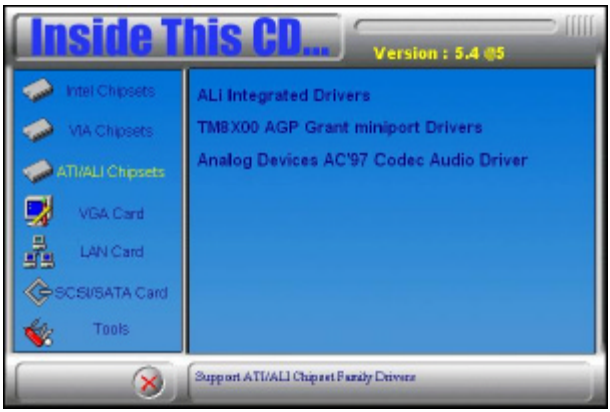
ALi Integrated Driver Installation

The ALi Integrated Driver, to be installed first before the software drivers, will enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation under Windows 98SE/ME/2000/XP.

1. Insert the CD that comes with the motherboard and the screen below would appear. Click **ATI/ALI Chipsets** and then **TM8000+ALi1563M**.



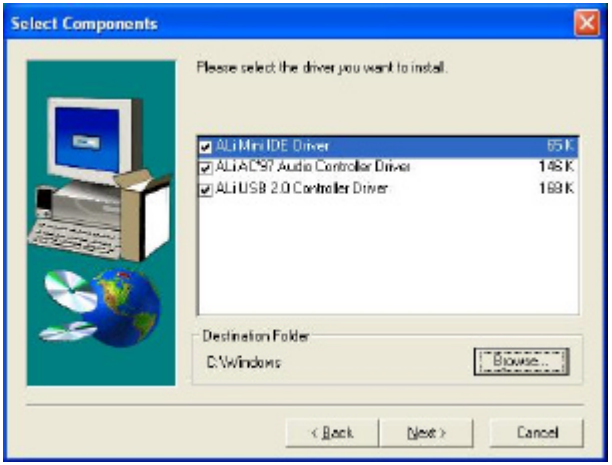
2. Click **ALi Integrated Drivers**.



3. When the Welcome screen appears, click **Next** to continue.



4. Click **Next** to continue.



5. The Setup process is now complete. Click **OK** to restart the computer.

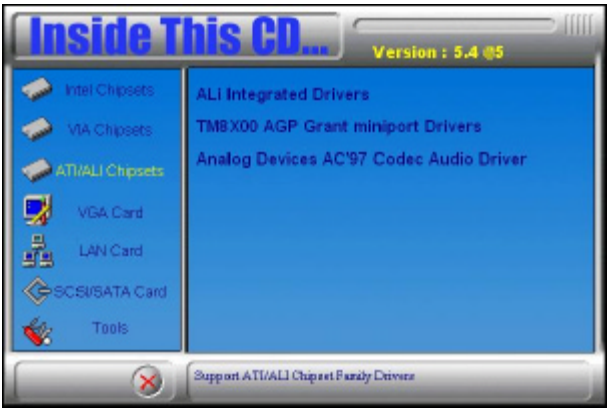
Transmeta TM8000 AGP Driver Installation

Follow the steps below to install the Transmeta TM8000 AGP driver under Windows 2000/XP.

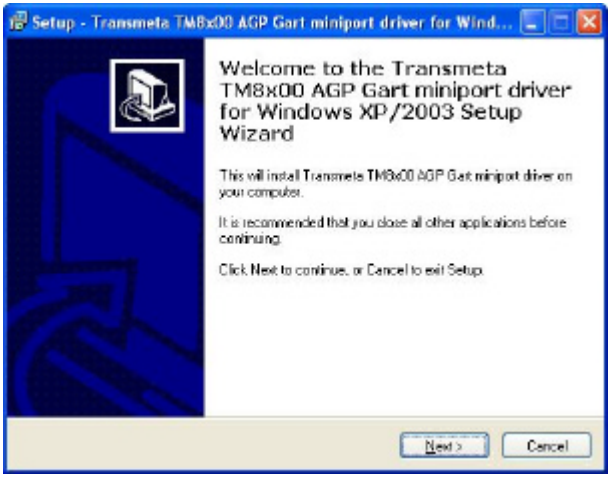
1. Insert the CD that comes with the motherboard and the screen below would appear. Click **ATI/ALI Chipsets** and then **TM8000+ALi1563M**.



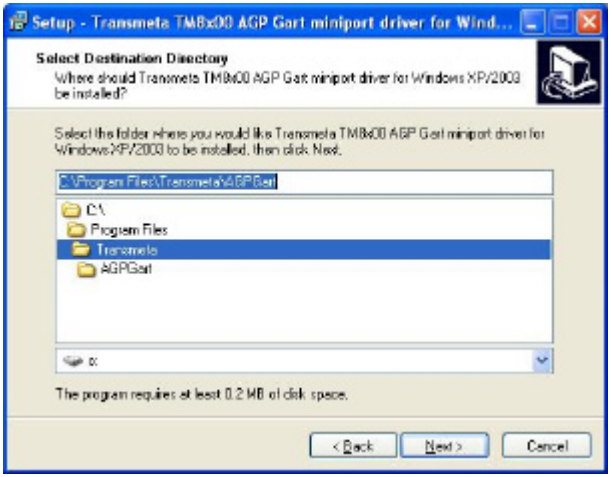
2. Click **TM8X00 AGP Grant miniport Drivers**.



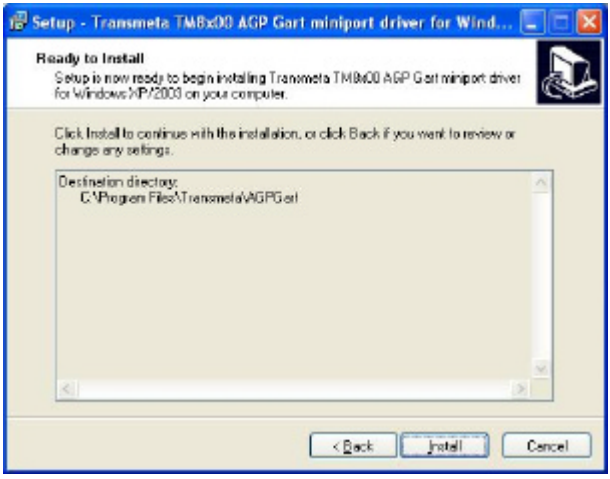
3.Click **Next** to continue.



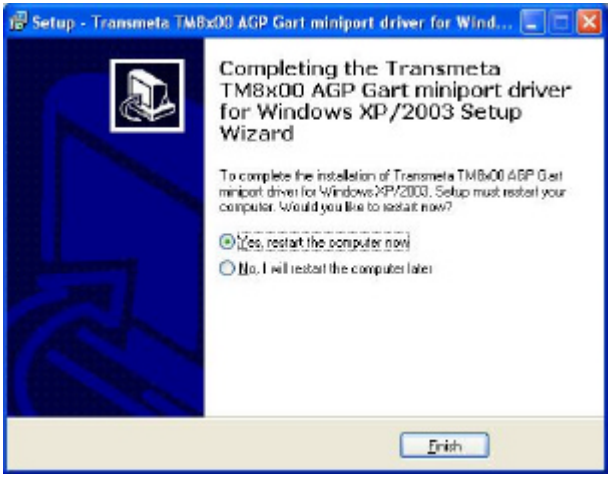
4.Click **Next** to continue.



5.Click **Next** to continue.



6. The Setup process is now complete. Click **OK** to restart the computer.



Analog Device AC'97 Audio Driver Installation

Follow the steps below to install the Analog Device AC'97 Codec Audio Driver.

1. Insert the CD that comes with the motherboard and on the initial screen, click **ATI/ALi Chipsets➔TM8000+Ali1563M Chipset Drivers➔Analog Device AC'97 Codec Audio Driver.**

2. Click **Next** to continue.

3. Click **Continue Anyway** to continue.

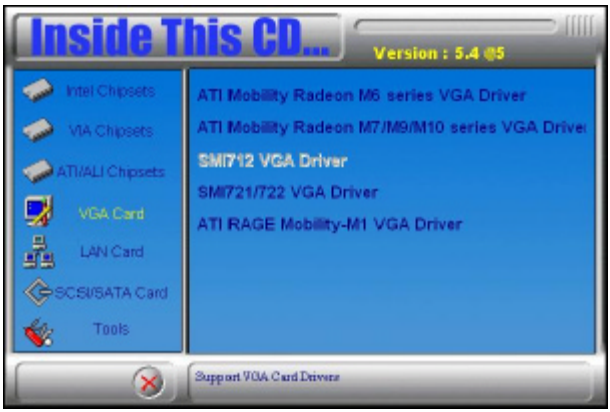


4. Click **Finish** to restart the computer.

ATI Mobility Radeon M7/M9 VGA Driver Installation

Follow the steps below to install the ATI Mobility Radeon M7/M9 VGA Drivers.

1. Insert the CD that comes with the motherboard and the screen below would appear. Click **VGA Card** and then **ATI Mobility Radeon M7/M9/M10 series VGA Drivers**.



2. In the welcome screen, click **Next** to continue the installation.

3. In the license agreement window, click **Yes** to continue.

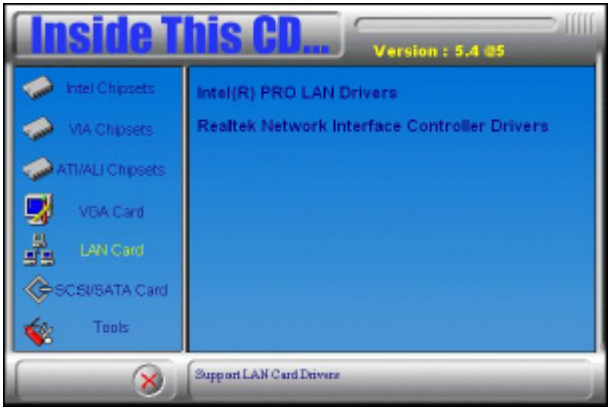
4. In the next screen, click **Express** to start to install the drivers into the system.

5. The Setup process is now complete. Click **Finish** to restart the computer.

Realtek LAN Drivers Installation

Follow the steps below to start installing the Realtek LAN drivers.

1. Insert the CD that comes with the motherboard and the screen below would appear. Click **LAN Card** and then **Realtek Network Interface Controller Drivers**.



2. The Setup process is already complete. Please restart the computer.

This page is intentionally left blank.

Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278 - 27F	Parallel Port #2(LPT2)
2F8h - 2FFh	Serial Port #2(COM2)
2B0 - 2DF	Graphics adapter Controller
378h - 3FFh	Parallel Port #1(LPT1)
360 - 36F	Network Ports
3B0 - 3BF	Monochrome & Printer adapter
3C0 - 3CF	EGA adapter
3D0 - 3DF	CGA adapter
3F0h - 3F7h	Floppy Disk Controller
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

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

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Floppy Disk Controller
IRQ7	Parallel Port #1
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE