

AR-B1790
INDUSTRIAL GRADE
CPU BOARD
User' s Guide

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0. PREFACE

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0.2 WELCOME TO THE AR-B1790 CPU BOARD

This guide introduces the Acrosser AR-B1790 CPU Board.

Use information provided in this manual describes this card's functions and features. It also helps you start, set up and operate your AR-B1790. General system information can also be found in this publication.

0.3 BEFORE YOU USE THIS GUIDE

Please refer to the Chapter 3, "Setting System," in this guide, if you have not already installed this AR-B1790. Check the packing list before you install and make sure the accessories are completely included.

AR-B1790 CD provides the newest information regarding the CPU card. Please refer to the files of the enclosed utility CD. It contains the modification and hardware & software information, and adding the description or modification of product function after manual printed.

0.4 RETURNING YOUR BOARD FOR SERVICE

If your board requires any services, contact the distributor or sales representative from whom you purchased the product for service information. If you need to ship your board to us for service, be sure it is packed in a protective carton. We recommend that you keep the original shipping container for this purpose.

You can help assure efficient servicing for your product by following these guidelines:

1. Include your name, address, daytime telephone, facsimile number and E-mail.
2. A description of the system configuration and/or software at the time of malfunction.
3. A brief description of the problem occurred.

0.5 TECHNICAL SUPPORT AND USER COMMENTS

Users comments are always welcome as they assist us in improving the quality of our products and the readability of our publications. They create a very important part of the input used for product enhancement and revision.

We may use and distribute any of the information you provide in any way appropriate without incurring any obligation. You may, of course, continue to use the information you provide.

If you have any suggestions for improving particular sections or if you find any errors on it, please send your comments to Acrosser Technology Co., Ltd. or your local sales representative and indicate the manual title and book number.

Internet electronic mail to: Sales@acrosser.com

acrosser@tp.globalnet.com.tw

0.6 STATIC ELECTRICITY PRECAUTIONS

Before removing the board from its anti-static bag, read this section about static electricity precautions.

Static electricity is a constant danger to computer systems. The charge that can build up in your body may be more than sufficient to damage integrated circuits on any PC board. It is, therefore, important to observe basic precautions whenever you use or handle computer components. Although areas with humid climates are much less prone to static build-up, it is always best to safeguard against accidents that may result in expensive repairs.

The following measures should be sufficient to protect your equipment from static discharge:

- Touch a grounded metal object to discharge the static electricity in your body (or ideally, wear a grounded wrist strap).
- When unpacking and handling the board or other system components, place all materials on an anti-static surface.
- Be careful not to touch the components on the board, especially the “golden finger” connectors on the bottom of the board.

1. INTRODUCTION

Welcome to the AR-B1790 Embedded ATX Single Board Computer. The AR-B1790 board is Embedded ATX form factor board, which comes equipped with high performance Intel® Pentium 4 Processor with the Intel® advanced chipset the Intel® 845GV GMCH and ICH4 (Intel® 82801DB). This product is designed for the system manufacturers, integrators, or VARs that want to provide all the performance, reliability, and quality at a reasonable price.

In addition, the AR-B1790 provides on chip VGA. The VGA, which provides up to 1600x1200 resolution. The VGA memory is share main memory.

AR-B1790 have two network controller on board, uses Intel® 82551QM and Intel® 82562ET LAN controller, a fully integrated 10/100BASE-TX solution with high performance networking functions and Alert-on-LAN features.

1.1 SPECIFICATIONS

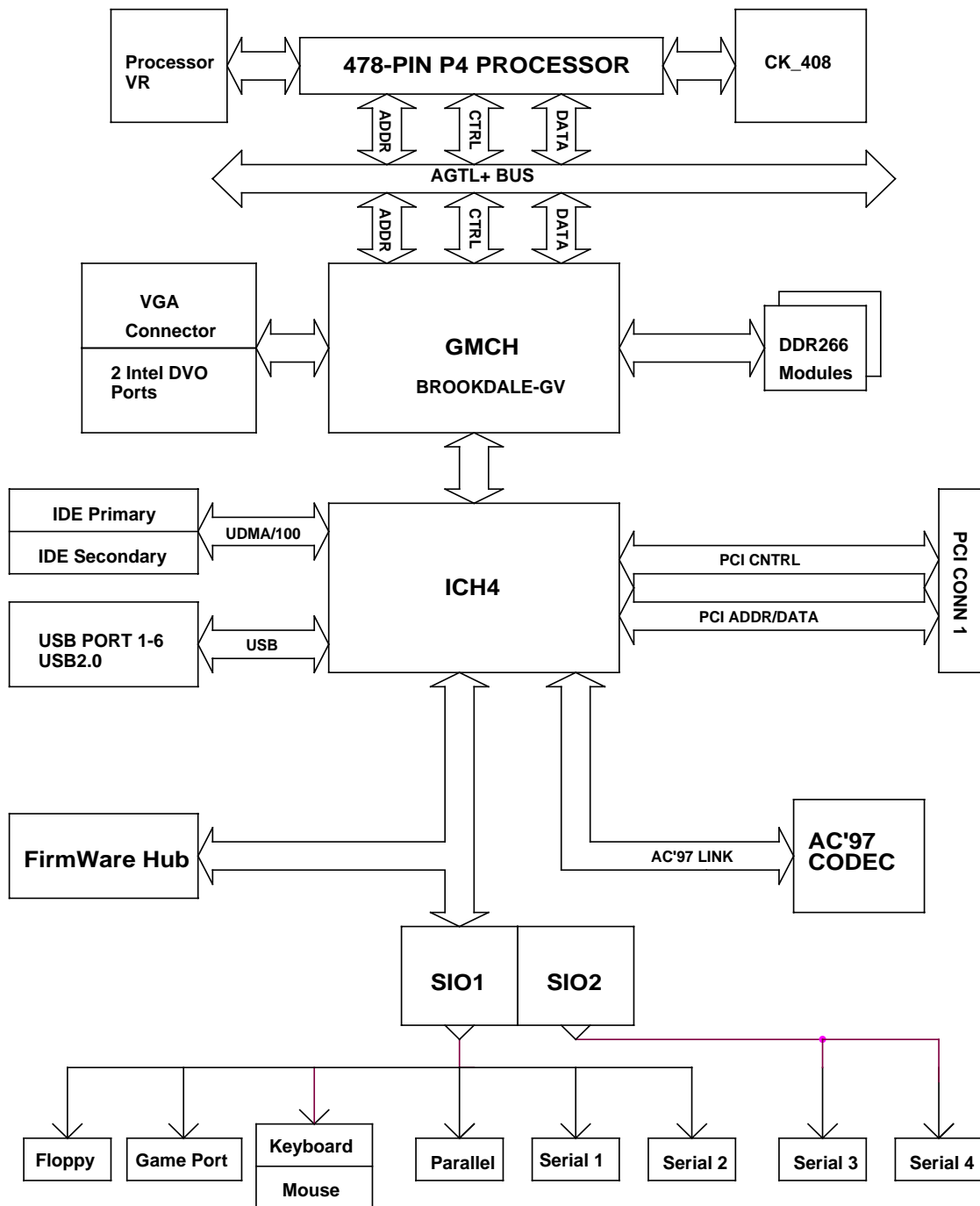
- **CPU:**
 - Support Intel Pentium 4 Northwood (Socket 478) processor
 - Support 533MHz and 400MHz FSB
 - Support Intel Pentium 4 CPUs up to 2.8GHz
- **DMA channels:** 7
- **Interrupt levels:** 15
- **Chipset:**
 - Intel® 845GV【 Integrated 2D / 3D graphics accelerator and support PC2100(DDR266)technology】
 - Intel ICH4 chipset (82801DB) I/O Controller
- **RAM memory:**
 - Support two 184-pin DDR DIMM sockets
 - Support PC200 / 266 DDR SDRAM
 - Support up to 2GB DRAM (Max)
- **Display Interface:** CRT - D-SUB 15-pin female connectr
Dual LVDS(2 channels) - for 36/48 bit or 18/24 bit(single channel) LVDS LCD Panel
2x13x2.00mm pin-header connector
- **On-board IDE Interface:** Two IDE Controller on Intel ICH4 PCI chipset provides IDE HDD/CD-ROM (Ultra DMA33/ATA66/ATA100) operation modes
- **Floppy disk drive interface:** 2.88 MB, 1.44MB, 1.2MB, 720KB, or 360KB floppy disk drive.
- **C. F.:** Supports one socket for Compact Flash Type II interface
- **Series ports:**
 - On-board D-SUB 9-pin male external port for COM1 with RS-232C/Touch Screen (rear I/O panel) uses 2.0mm 3-pin JST connector
 - On-board 2x5x2.54mm pin-header for COM2 connectors with RS-232C/IrDA (IrDA uses 1x5x2.54mm pin-header connector)
 - On-board Two 2x5x2.54mm pin-header connectors for COM3 & COM4 with RS-232C/RS-485
- **Parallel Port:** On-board one D-SUB 25-pin female external port for LPT1 , supports SPP/EPP/ECP modes (rear I/O panel)
- **IrDA port:** Supports IrDA (HPSIR) and ASK (Amplitude Shift Keyed) IR port multiplexed on COM2
- **USB port:**
 - On-board two external port for 4 USB 2.0/1.1 ports (rear I/O panel)
 - On-board one 2x5x2.54mm pin-header connectors for 2 additional USB 2.0/1.1 ports
- **Audio: onboard AC'97 Codec,** On-board 2-Channel AC97 provided by 82801DB Audio Jacks: Line-in, Line-out, Mic-in (rear I/O panel)
- **Watchdog timer:** Software programmable 1~63sec.
- **VGA Controller:** Built in Intel 845GV Chipset
- **Ethernet:**
 - Integrated Intel Kinnereth 10/100Mbps provided by 82801DB South Bridge, with RJ-45 (90 degree) connector built-in LED (rear I/O panel)
 - On-board intel 82551 with RJ-45 (90 degree) connector built-in LED (rear I/O panel)
- **K/B & Mouse:** On-board PS/2 Keyboard and Mouse 6-pin Mini-DIN external connector
- **Power Connector:** ATX & The Pentium 4 ATX power include another 2x2 pin+12V input connector
- **Power Req. :** +5V@ 2A and +12V@ 5A maximum, on-board ATX12 power input connector
- **Operating Temperature:** 0° ~ 60 (CPU needs Cooler)

1.2 PACKING LIST

In addition to this *User's Manual*, the AR-B1790 package includes the following items:

- The quick setup manual
- AR-B1790 Embedded ATX Single Board
- Software utility CD x 1
- FDD Cable x 1 (Optional)
- 5.25" IDE HDD ATA 100 Cable x 1 (Optional)
- 2.5" IDE HDD Cable x 1 (Optional)
- Serial port Cable x 3 (Optional)

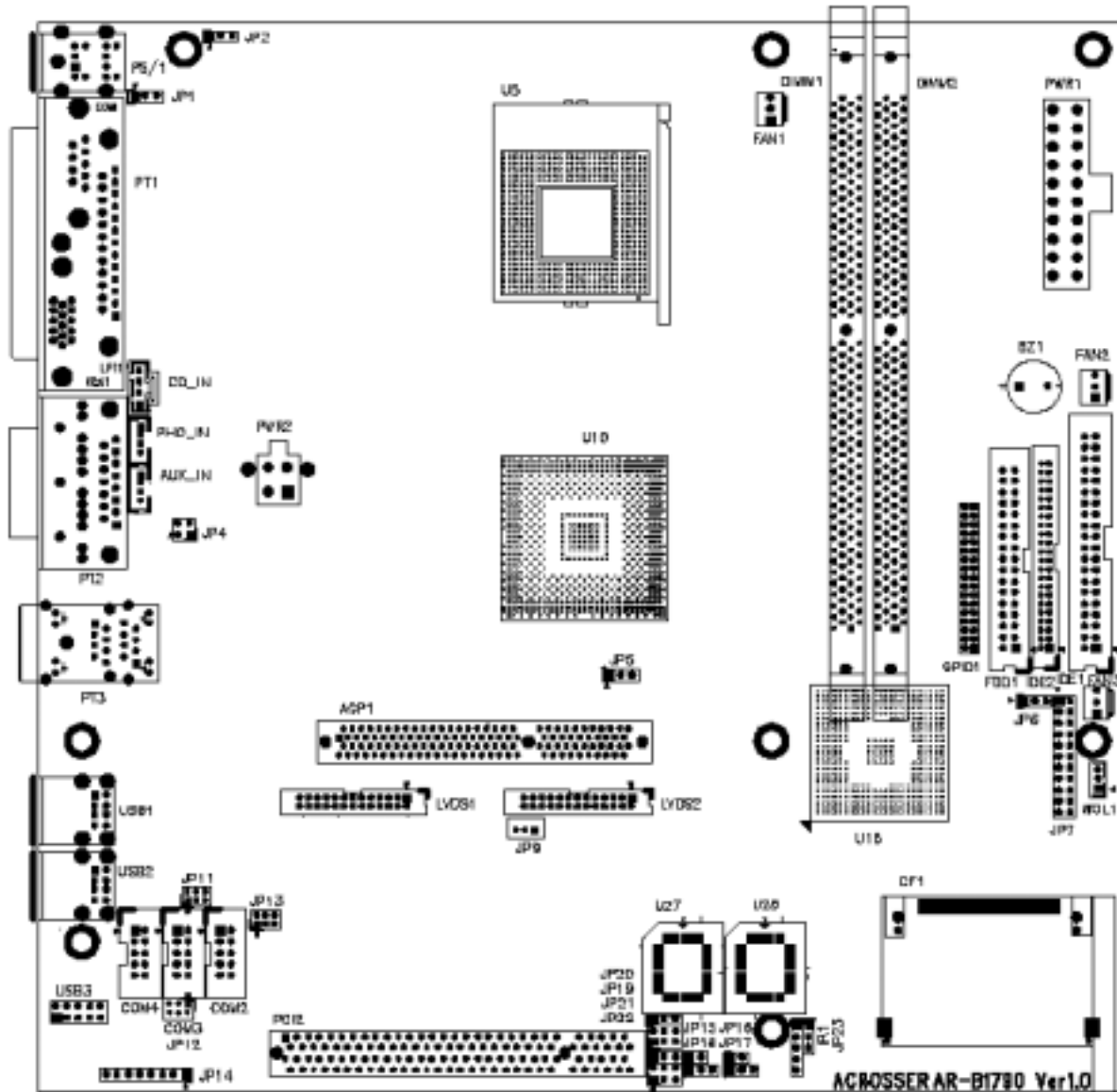
BLOCK DIAGRAM

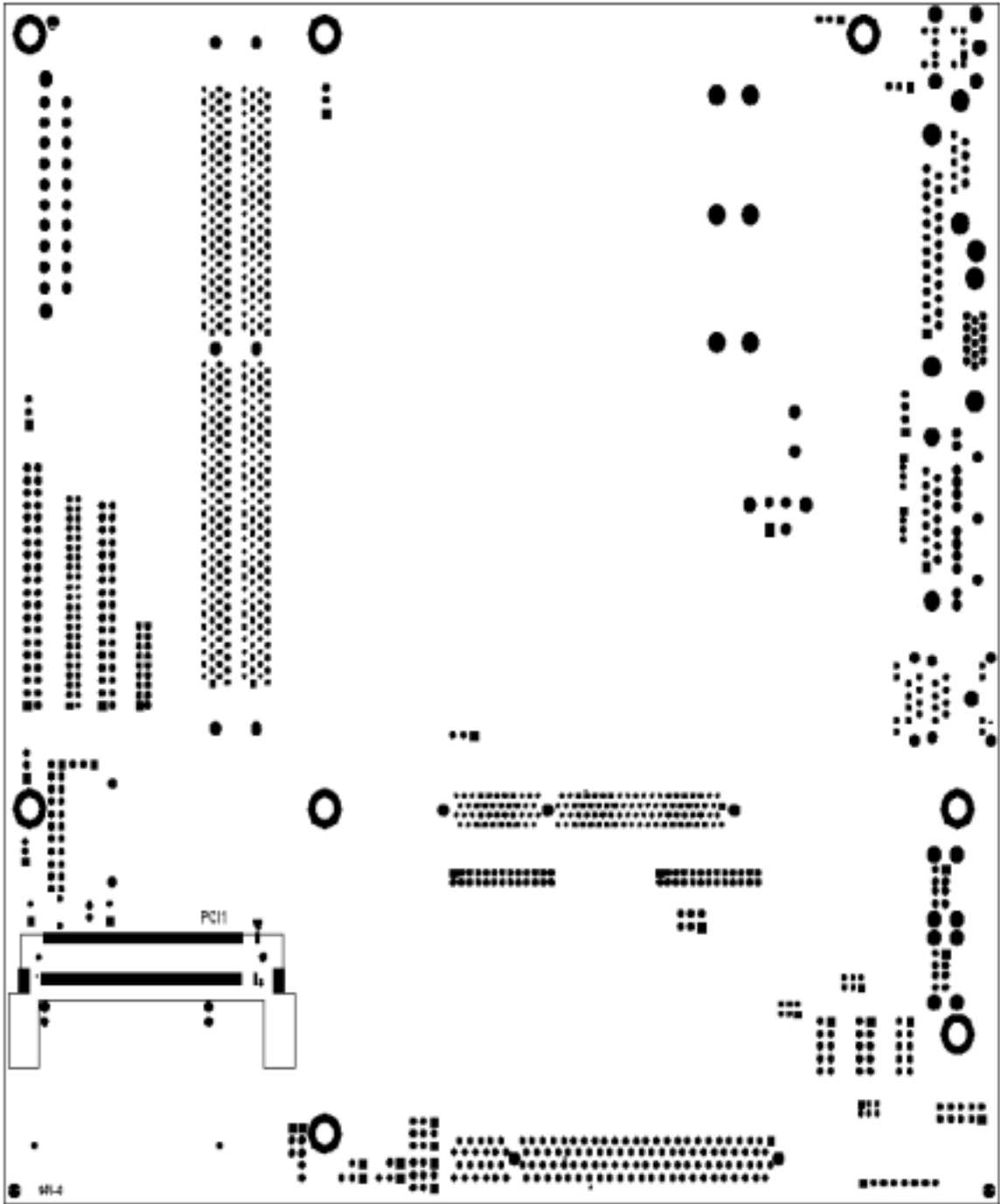


2. INSTALLATION

This chapter describes how to install the AR-B1790. At first, the layout of AR-B1790 is shown, and the unpacking information that you should be careful is described. The jumpers and switches setting for the AR-B1790's configuration are as below.

2.1 AR-B1790'S LAYOUT

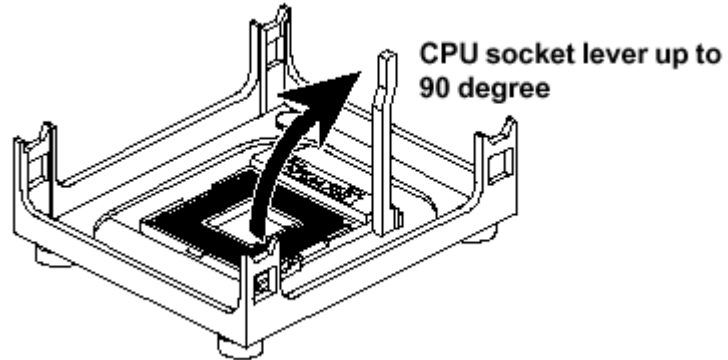




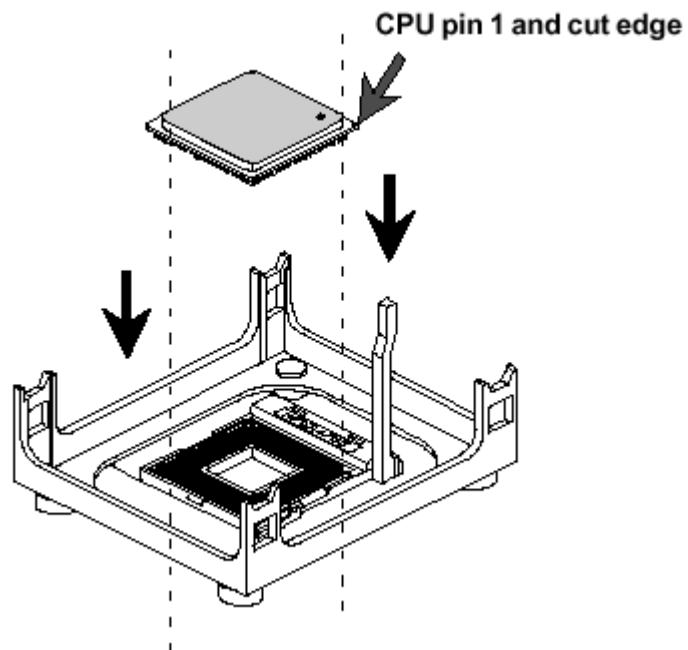
2.2 CPU INSTALLATION

This main board supports Intel Pentium 4/Celeron, Socket 478 series CPU. Please follow the step as below:

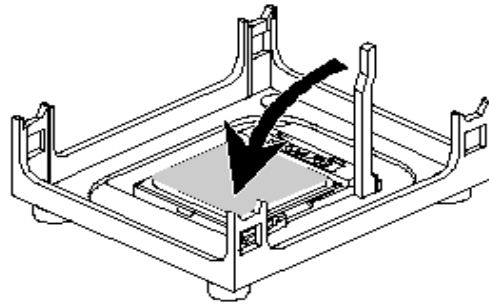
- Be careful of CPU orientation when you plug it into CPU socket.
- Pull up the CPU socket lever and up to 90°



- Locate Pin 1 in the socket and look for a black dot or cut edge on the CPU upper interface. Match Pin 1 and cut edge, then insert into the CPU socket.



- Press down the CPU socket lever and finish CPU installation.

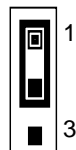


Note: If you do not match the CPU socket Pin 1 and CPU cut edge well, it may damage the CPU.

The Intel Pentium 4/Celeron processor requires a set of heatsink/fan to ensure proper cooling of processor. If heatsink/fan have not been already bundled with your CPU, you must purchase the heatsink/fan separately and have it installed. Plug the cable through the heatsink/fan in the CPU fan power connector located nearby. Note that there are several types of CPU fan connector. Normally, if your main board supports the hardware monitoring function, a 3-pin fan power connector should allow your system to detect the CPU fan's speed.

2.3 CLEAR CMOS (JP6)

If want to clear the CMOS Setup (for example when you forgot the password, please clear the setup and then set the password again.), you should close the pin 2-3 about 3 seconds, then open again, set back to normal operation mode, close the pin 1-2.

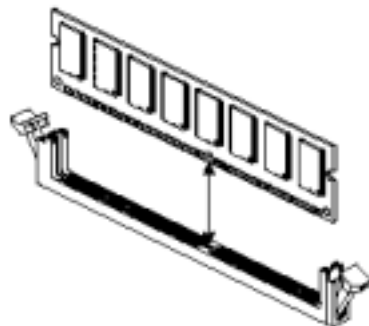


JP6	FUNCTION
1-2 ON	Normal Operation (Factory Preset)
2-3 ON	Clear CMOS

2.4 INSTALL DDR SDRAM SYSTEM MEMORY

To install memory, insert DDR SDRAM memory module(s) in DIMM slot(s), Note that DDR SDRAM module are directional and will not go in the DIMM slot unless properly oriented. After the module is fully inserted into the DIMM slot, lift the chips of both sides of the DIMM slot to lock the module in place.

DDR SDRAM



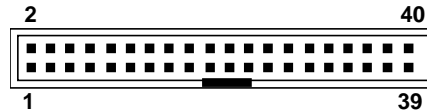
3. CONNECTION

This chapter describes how to connect peripherals, switches and indicators to the AR-B1790 board.

3.1 IDE DISK DRIVE CONNECTOR (IDE1, IDE2)

- **IDE1: Primary IDE Connector**

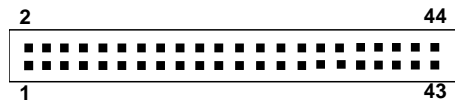
A 40-pin header type connector (IDE1) is provided to interface with up to two embedded hard disk drives (IDE AT bus). This interface, through a 40-pin cable, allows the user to connect up to two drives in a “daisy chain” fashion. To enable or disable the hard disk controller, please use the BIOS Setup program, which is explained further in chapter 5. The following table illustrates the pin assignments of the hard disk drive’s 40-pin connector.



Pin	Signal	Pin	Signal
1	-RESET	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N.C
21	PDDREQ	22	GROUND
23	-PDIOW	24	GROUND
25	-PDIOR	26	GROUND
27	PIORDY	28	GROUND
29	-PDDACK	30	GROUND
31	IRQ14	32	N.C
33	PDA1	34	PD66/100
35	PDA0	36	PDA2
37	-PDCS1	38	-PDCS3
39	HLEDP	40	GROUND

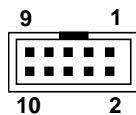
● **IDE 2: Second IDE Connector**

AR-B1790 also provides IDE interface 44-pin connector to connect with the hard disk device.



Pin	Signal	Pin	Signal
1	-RESET	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N.C
21	SDDREQ	22	GROUND
23	-SOIOW	24	GROUND
25	-SOIOR	26	GROUND
27	SIORDY	28	GROUND
29	-SDDACK	30	GROUND
31	IRQ15	32	GROUND
33	SDA1	34	SD66/100
35	SDA0	36	SDA2
37	-SDCS1	38	-SDCS3
39	HLEDS	40	GROUND
41	VCC	42	VCC
43	GROUND	44	N.C

3.2 SERIAL PORTS (COM2, COM3, COM4)



PIN	Signal	PIN	Signal
1	/DCD	2	/DSR
3	RXD	4	/RTS
5	TXD	6	/CTS
7	/DTR	8	/RI
9	GND	10	COM VOLTAGE

3.3 COM3 RS-232/RS-485 SELECT (JP19, JP20)

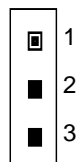
JUMPER	FUNCTION
	<p align="center">RS-232</p> <p align="center"><i>FACTORY PRESET</i></p>
	<p align="center">RS-485</p>

- **RS-485 Terminator Select (JP15)**



* When there is only one the setting should be left off (please take off the jumper), if multiple blocks are used on a single line this should be set to "ON"(place a jumper) in order to properly terminate the connection for better transmission

- **RS-485 Header (JP18)**



PIN	Signal
1	N485+
2	N485-
3	GND

3.4 COM4 RS-232/RS-485 SELECT (JP21, JP22)

JUMPER	FUNCTION
	RS-485
	RS-232 <i>FACTORY PRESET</i>

- RS-485 Terminator Select (JP16)

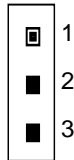


JP16 (ON)

FACTORY PRESET

* When there is only one line the setting should be left off (please take off the jumper), if multiple blocks are used on a single line this should be set to "ON"(place a jumper) in order to properly terminate the connection for better transmission

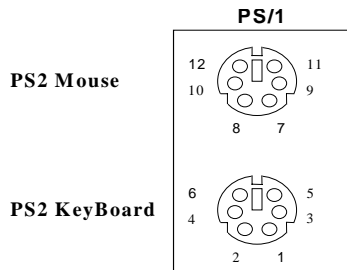
- RS-485 Header (JP17)



PIN	Signal
1	N485+
2	N485-
3	GND

3.5 PS2 KEYBOARD & MOUSE (PS/1)

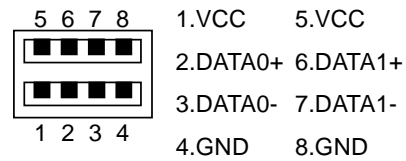
The AR-B1790 provides 6-PIN JST Header and 6-PIN MINI-DIN keyboard/mouse connector.



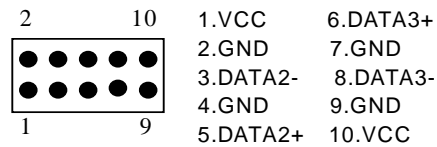
PIN	Signal
1	KBDATA
2	NC
3	GND
4	VCC
5	KBCLK
6	NC
7	MSDATA
8	NC
9	GND
10	VCC
11	MSCLK
12	NC

3.6 USB CONNECTOR (USB1, USB2, USB3)

USB1&USB2



USB 3



3.7 FAN POWER CONNECTOR

The AR-B1790 provides CPU cooling Fan connector. CPU connectors can supply 12V/500mA to the cooling fan.

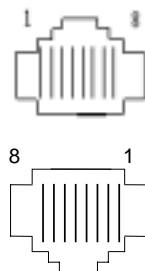


FAN1 FOR CPU FAN
FAN2 FOR SYSTEM FAN
FAN3 FOR CASE FAN

PIN	Signal
1	GND
2	+12V
3	SENSE

3.8 DUAL ETHERNET PORT (PT3)

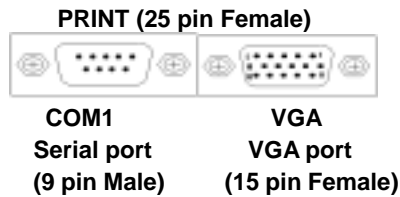
The Ethernet RJ-45 connectors are the standard network headers. The following table is the pin assignment.



Pin	Signal	Pin	Signal
1	TX+	5	Not Used
2	TX-	6	RX-
3	RX+	7	Not Used
4	Not Used	8	Not Used

3.9 PARALLEL & COM1 & VGA PORT (PT1)

AR-B1790 built-in a 9-pin standard COM port, a 15-pin VGA port and 1 LPT port. Device like printer can be connected to LPT port. Mouse and modem etc can be connected to COM port. CRT monitor can be connected to VGA port.



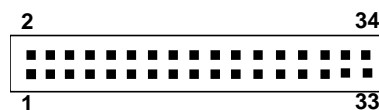
PRINT			
Pin	Signal	Pin	Signal
1	-STB	2	-AFD
3	PD0	4	-ERROR
5	PD1	6	-INIT
7	PD2	8	-SLIN
9	PD3	10	GND
11	PD4	12	GND
13	PD5	14	GND
15	PD6	16	GND
17	PD7	18	GND
19	-ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	N.C

COM1			
Pin	Signal	Pin	Signal
1	/DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	/RTS1	8	CTS1
9	/RI1		

VGA1					
Pin	Signal	Pin	Signal	Pin	Signal
1	RED	6	GND	11	N.C
2	GREEN	7	GND	12	SDA
3	BLUE	8	GND	13	HSYNC
4	N.C	9	VCC	14	VSYNC
5	GND	10	GND	15	SCL

3.10 FLOPPY DRIVE CONNECTOR (FDD1)

The AR-B1790 provides a 34-pin header type connector for supporting up to two floppy disk drives. To enable or disable the floppy disk controller, please use the BIOS Setup program.



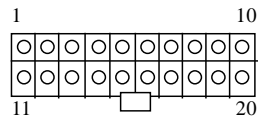
PIN	Signal	PIN	Signal
1-33(odd)	GROUND	18	DIRECTION
2	DRVEN 0	20	-STEP OUTPUT PULSE
4	NOT USED	22	-WRITE DATA
6	DRVEN 1	24	-WRITE GATE
8	-INDEX	26	-TRACK 0
10	-MOTOR ENABLE 0	28	-WRITE PROTECT
12	-DRIVE SELECT 1	30	-READ DATA
14	-DRIVE SELECT 0	32	-SIDE 1 SELECT
16	-MOTOR ENABLE 1	34	DISK CHANGE

3.11 GPIO PORT (GPIO1)



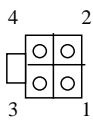
PIN	DEFINE	PIN	DEFINE
1	GPI0	2	GPO16
3	GPI1	4	GPO17
5	GPI7	6	GPO18
7	GPI12	8	GPO19
9	GPI13	10	GPO20
11	GPI33	12	GPO21
13	GPI34	14	GPO22
15	GPI35	16	GPO23
17	GPI36	18	GPO24
19	GPI37	20	GPO25
21	GPI38	22	GPO27
23	GPI39	24	GPO40
25	GPI_1	26	GPO41
27	GPI_2	28	GPO42
29	GPI_3	30	GPO43
31	GPI_4	32	GPO_1
33	VCC5V	34	GND

3.12 ATX POWER CONNECTOR (PWR1)



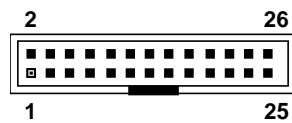
Pin	Signal	Pin	Signal
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PSON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW-OK	18	-5V
9	5VSB	19	5V
10	12V	20	5V

3.13 POWER CONNECTOR (PWR2)



Pin	Signal	Pin	Signal
1	GND	3	+12V
2	GND	4	+12V

3.14 DUAL LVDS CONNECTOR (LVDS1, LVDS2)



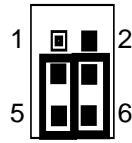
LVDS1

PIN	Signal	PIN	Signal
1	TXOUT0-	14	GND
2	GND	15	TXCLK1+
3	TXOUT0+	16	VTX12
4	GND	17	TXOUT3-
5	TXOUT1-	18	VTX12
6	LVDSVCC	19	TXOUT3+
7	TXOUT1+	20	GND
8	LVDSVCC	21	VTKBP
9	TXOUT2-	22	N.C
10	N.C	23	LVDSVCC
11	TXOUT2+	24	N.C
12	GND	25	LVDSVCC
13	TXCLK1-	26	N.C

LVDS2

PIN	Signal	PIN	Signal
1	TXOUT4-	14	GND
2	GND	15	TXCLK2+
3	TXOUT4+	16	VTX12
4	GND	17	TXOUT7-
5	TXOUT5-	18	VTX12
6	LVDSVCC	19	TXOUT7+
7	TXOUT5+	20	GND
8	LVDSVCC	21	VTKBP
9	TXOUT6-	22	N.C
10	N.C	23	LVDSVCC
11	TXOUT6+	24	N.C
12	GND	25	LVDSVCC
13	TXCLK2-	26	N.C

3.15 LVDS PANEL VOLTAGE SELECT (JP8)



JP8	VOLTAGE
1-3 2-4 ON	+5V
3-5 4-6 ON	+3.3V (Factory Preset)

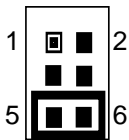
3.16 CONTROL LVDS PANEL BACK-LIGHT (JP9)



3 2 1

PIN	Signal
1	+12V
2	GND
3	EBLT

3.17 COM VOLTAGE SELECT (JP11, JP12, JP13)



PIN	Signal	PIN	Signal
1	COM VOLTAGE	2	+12V
3	COM VOLTAGE	4	+5V
5	COM VOLTAGE	6	GND (Factory Preset)

* JP11 SELECT COM1 PIN 10 VOLTAGE *

* JP12 SELECT COM2 PIN 10 VOLTAGE *

* JP13 SELECT COM3 PIN 10 VOLTAGE *

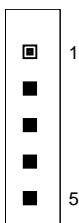
3.18 MINI PCI SLOT (PCI1)

On board one mini PCI slot (PCI1)

3.19 PCI SLOT (PCI2)

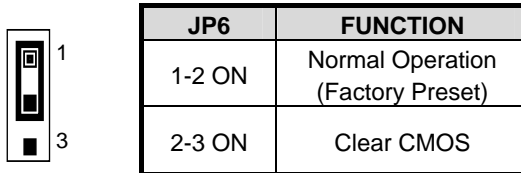
On board one PCI slot (PCI2)

3.20 IRDA HEADER (IR1)

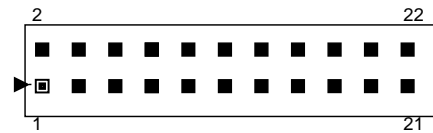


PIN	Signal
1	VCC
2	NC
3	IRRX
4	GND
5	IRTX

3.21 CLEAR CMOS (JP6)



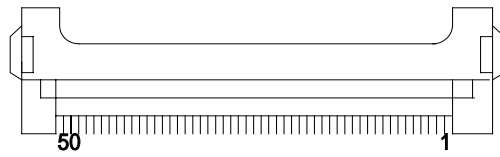
3.22 FRONT PANEL (JP7)



PIN	Signal	PIN	Signal
1	5VSUS	2	VCC
3	POWER BUTTON	4	POWER LED
5	N.C	6	N.C
7	GREEN BUTTON	8	5VSB
9	GND	10	SUSPEND LED
11	N.C	12	N.C
13	VCC	14	5V
15	PRIMARY HDD ACT LED	16	EXTERNAL SPEAKER
17	VCC	18	N.C
19	SECONDARY	20	RESET
21	N.C	22	GND

PIN	FUNCTION
1-3	POWER BUTTON
7-9	GREEN BUTTON
13-15	PRIMARY HDD ACT LED
17-19	SECONDARY HDD ACT LED
2-4	POWER LED
8-10	SUSPEND LED
14-16	SPEAKER
20-22	RESET

3.23 COMPACT FLASH (CF1)



CF1				
-CFCD1	26	1	---	GND
SD11	27	2	---	SD3
SD12	28	3	---	SD4
SD13	29	4	---	SD5
SD14	30	5	---	SD6
SD15	31	6	---	SD7
-CFCS1	32	7	---	-CFCS0
-VS1	33	8	---	GND
-IOR	34	9	---	GND
-IOW	35	10	---	GND
-CFWE	36	11	---	GND
IRQ15	37	12	---	GND
VCC	38	13	---	VCC
GND	39	14	---	GND
Not Used	40	15	---	GND
-CFRST	41	16	---	GND
-IORDY	42	17	---	GND
Not Used	43	18	---	SA2
-CFREG	44	19	---	SA1
-DASP	45	20	---	SA0
-PDIAG	46	21	---	SD0
SD8	47	22	---	SD1
SD9	48	23	---	SD2
SD10	49	24	---	-IO16
GND	50	25	---	-CFCD2

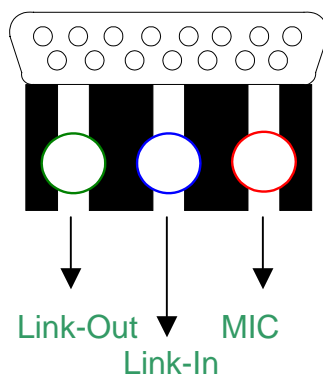
Compact Flash (CF1) and IDE 2 share the same channel. Since a Compact Flash card is installed in the socket, the IDE 2 device will become unusable.

CF card & IDE2 device cannot use at the same time.

3.24 GAME/MINI PORT AND AUDIO CONNECT

The connector supports joystick, MINI Keyboard and other relate audio device.

After install onboard audio driver, you may connect speaker to Link-Out jack, microphone to MIC in jack, other device like CD-ROM, and Walkman etc can also connect Link-In jack.



3.25 CD-IN CONNECTOR (CD-IN)

The connector is for CD-ROM audio connector



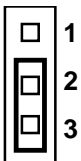
PIN	Signal
1	CD_L
2	GND
3	GND
4	CD_R

3.26 CPU SPEED SELECT (JP5)



JP5	SPEED
1-2	CPU SELECT (Factory Preset)
2-3	100MHz
EMPTY	133MHz

3.27 CF VOLTAGE SELECT (JP23)



JP23	VOLTAGE
1-2	+3.3V
2-3	+5V Factory Preset

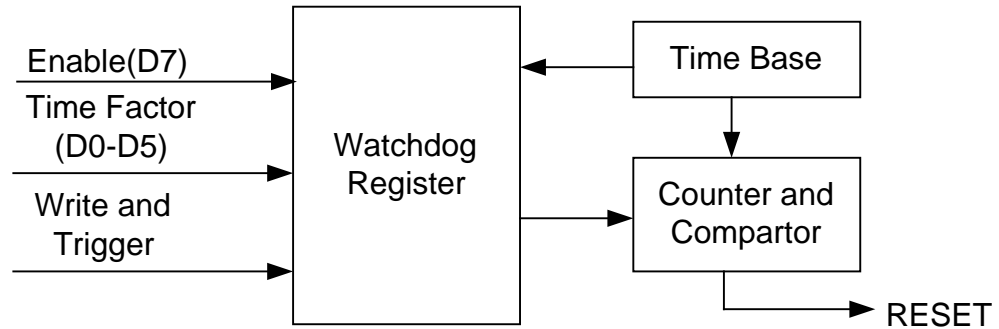
3.28 KB/MS VOLTAGE SELECT (JP2)



JP2	VOLTAGE
1-2	+5V
2-3	+5V SB Factory Preset

4. WATCHDOG TIMER

This section describes the use of Watchdog Timer, including disable, enable, and trigger. AR-B1790 is equipped with a programmable time-out period watchdog timer that occupies I/O port **443H**. Users can use simple program to enable the watchdog timer. Once you enable the watchdog timer, the program should trigger it every time before it times out. Watchdog Timer will generate a response (system or IRQ9) due to system fails to trigger or disable watchdog timer before preset timer, times out.



Watchdog Block Diagram

4.1 WATCHDOG TIMER SETTING

The watchdog timer is a circuit that maybe be used from your program software to detect crash or hang up. The Watchdog timer is automatically disabled after reset. Once you enabled the watchdog timer, your program should trigger the watchdog timer every time before it times out. After you trigger the watchdog timer, the timer will be set to zero and start to count again. If your program fails to trigger the watchdog timer before times out, it will generate a reset pulse to reset the system or trigger the IRQ 9 signal in order to tell your system that the watchdog time is out.

Users could test watchdog function under 'Debug' program as follows:

```
C:>debug

o 2e 87 ;Extended Functions Enable Register

o 2e 87 ;Extended Functions Enable Register

o 2e 07 ;EFIR=EFER (Extended Functions Index Register)
        point to Logical Device Number Reg.

o 2f 08 ;EFDR=EFIR+1,select logical device 8

o 2e f6 ;select CRF6

o 2f 08 ;update CRF6 with value 08H ,(8sec reset)

o 2e 30 ;select CR30

o 2f 01 ;update CR30 with value 01H

q
```

5. BIOS CONSOLE

This chapter describes the AR-B1790 BIOS menu displays and explains how to perform common tasks needed to get up and running, and presents detailed explanations of the elements found in each of the BIOS menus. The following topics are covered:

- BIOS Setup Overview
- Standard CMOS Setup
- Advanced CMOS Setup
- Advanced Chipset Setup
- Power Management
- PCI/Plug and Play
- Peripheral Setup
- Auto-Detect Hard Disks
- Password Setting
- Load Default Setting
- BIOS Exit

5.1 BIOS SETUP OVERVIEW

The BIOS is a program used to initialize and set up the I/O system of the computer, which includes the ISA bus and connected devices such as the video display, diskette drive, and the keyboard.

The BIOS provides a menu-based interface to the console subsystem. The console subsystem contains special software, called firmware that interacts directly with the hardware components and facilitates interaction between the system hardware and the operating system.

The BIOS default values ensure that the system will function at its normal capability. In the worst situation the user may have corrupted the original settings set by the manufacturer.

After the computer is turned on, the BIOS will perform diagnostics on the system and display the size of the memory that is being tested. Press the [Del] key to enter the BIOS Setup program, and then the main menu will show on the screen.

The BIOS Setup main menu includes some options. Use the [Up/Down] arrow key to highlight the option that you wish to modify, and then press the [Enter] key to select the option and configure the functions.

```
AMIBIOS HIFLEX SETUP UTILITY - VERSION 1.54
(C)2001 American Megatrends, Inc. All Rights Reserved

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

Standard CMOS setup for changing time, date, hard disk type, etc.
ESC:Exit ↑↓:Sel F2/F3:Color F10:Save & Exit
```

Setup Main Menu

CAUTION:

1. AR-B1790 BIOS the factory-default setting is used to the <Auto Configuration with Optimal Settings> Acrosser recommends using the BIOS default setting, unless you are very familiar with the setting function, or you can contact the technical support engineer.
2. If the BIOS settings are lost, the CMOS will detect the <Auto Configuration with Fail Safe Settings> to boot the operation system, this option will reduce the performance of the system. Acrosser recommends choosing the <Auto Configuration with Optimal Setting> in the main menu. This option gives best-case values that should optimize system performance.
3. The BIOS settings are described in detail in this section.

5.2 STANDARD CMOS SETUP

The <Standard CMOS Setup> option allows you to record some basic system hardware configuration and set the system clock and error handling. If the CPU board is already installed in a working system, you will not need to select this option anymore.

AMIBIOS SETUP - STANDARD CMOS SETUP									
(C)2001 American Megatrends, Inc. All Rights Reserved									
Date (mm/dd/yyyy): Tue Jun 24,2003					Base Memory: 0 KB				
Time (hh/mm/ss) : 20:06:53					Extd Memory: 0 MB				
Floppy Drive A:		1.44 MB 3½							
Floppy Drive B:		Not Installed							
	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO 32Bit Mode
Pri Master:	Auto								Off
Pri Slave :	Auto								Off
Sec Master:	Not Installed								
Sec Slave :	Not Installed								
Boot Sector Virus Protection					Disabled				
							ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color		

Standard CMOS Setup

Date & Time Setup

Highlight the <Date> field and then press the [Page Up] / [Page Down] or [+]/[-] keys to set the current date. Follow the month, day and year format.

Highlight the <Time> field and then press the [Page Up] / [Page Down] or [+]/[-] keys to set the current date. Follow the hour, minute and second format.

The user can bypass the date and time prompts by creating an AUTOEXEC.BAT file. For information on how to create this file, please refer to the MS-DOS manual.

Floppy Setup

The <Standard CMOS Setup> option records the types of floppy disk drives installed in the system.

To enter the configuration value for a particular drive, highlight its corresponding field and then select the drive type using the left-or right-arrow key.

Primary/Secondary Master/Slave

Press PgUp/<+> or PgDn/<-> to select Manual, None or Auto type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category.

If your hard disk drive type is not matched or listed, you can use Manual to define your own drive type manually. If you select Manual, related information is asked to be entered to the following items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

Access Mode The settings are CHS, LBA, Large, Auto.

Capacity The formatted size of the storage device.

Cylinder Number of cylinders.

Head Number of heads.

Precomp Write precompensation.

Landing Zone Cylinder location of the landing zone.

Sector Number of sectors.

Boot Sector Virus Protection

This option protects the boot sector and partition table of your hard disk against accidental modifications. Any attempt to write to them will cause the system to halt and display a warning message. If this occurs, you can either allow the operation to continue or use a bootable virus-free floppy disk to reboot and investigate your system. The default setting is <Disabled>. This setting is recommended because it conflicts with new operating systems. Installation of new operating systems requires that you disable this to prevent write errors.

5.3 ADVANCED CMOS SETUP

The <Advanced CMOS Setup> option consists of configuration entries that allow you to improve your system performance, or let you set up some system features according to your preference. Some entries here are required by the CPU board's design to remain in their default settings.

AMIBIOS SETUP - ADVANCED CMOS SETUP		
(C)2001 American Megatrends, Inc. All Rights Reserved		
Quick Boot	Disabled	Available Options:
1st Boot Device	Disabled	▶ Disabled
2nd Boot Device	Disabled	Enabled
3rd Boot Device	Disabled	
Try Other Boot Devices	Yes	
S.M.A.R.T. for Hard Disks	Disabled	
BootUp Num-Lock	Off	
Floppy Drive Swap	Disabled	
Floppy Drive Seek	Disabled	
PS/2 Mouse Support	Disabled	
Primary Display	Absent	
Password Check	Setup	
Boot To OS/2	No	
L1 Cache	Disabled	
L2 Cache	Disabled	
		ESC:Exit ↑↓:Sel
		PgUp/PgDn:Modify
		F1:Help F2/F3:Color

Advanced CMOS Setup

Quick Boot

This category speeds up Power On Self Test (POST) after you power on the computer. If it is set to *Enabled*, BIOS will shorten or skip some check items during POST.

1st/2nd/3rd Boot Device

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. The settings are:

<i>Floppy</i>	The system will boot from floppy drive.
<i>LS120</i>	The system will boot from LS-120 drive.
<i>HDD-0</i>	The system will boot from the first HDD.
<i>CDROM</i>	The system will boot from the CD-ROM.
<i>HDD-1</i>	The system will boot from the second HDD.
<i>HDD-2</i>	The system will boot from the third HDD.
<i>HDD-3</i>	The system will boot from the fourth HDD.
<i>ZIP</i>	The system will boot from ATAPI ZIP drive.
<i>LAN</i>	The system will boot from the Network drive.
<i>Disabled</i>	Disable this sequence

Boot Other Device

Setting the option to *Enabled* allows the system to try to boot from other device if the system fails to boot from the 1st/2nd/3rd boot device.

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

S.M.A.R.T is abbreviation of Self-Monitoring Analysis and Reporting Technology. It is reliable and precautionous technology. When Hard Disk disorder, it prevents Hard Disk from the loss of data.

Boot Up Num-Lock

This item is used to activate the Num-Lock function upon system boot. If the setting is on, after a boot, the Num-Lock light is lit, and user can use the number key.

Floppy Drive Swap

The option reverses the drive letter assignments of your floppy disk drives in the Swap A, B setting, otherwise leave on the setting of *Disabled* (No Swap). This works separately from the BIOS Features floppy disk swap feature. It is functionally the same as physically interchanging the connectors of the floppy disk drives. When *<Enabled>*, the BIOS swapped floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A under DOS.

Floppy Drive Seek

If the *<Floppy Drive Seek>* item is setting *Enabled*, the BIOS will seek the floppy *<A>* drive one time upon boot up.

PS/2 Mouse Support

The setting of *Enabled* allows the system to detect a PS/2 mouse on boot up. If detected, IRQ12 will be used for the PS/2 mouse. IRQ 12 will be reserved for expansion cards if a PS/2 mouse is not detected. *Disabled* will reserve IRQ12 for expansion cards and therefore the PS/2 mouse will not function.

Primary Display

The option is used to set the type of video display card installed in the system.

Password Check

This option enables password checking every time the computer is powered on or every time the BIOS Setup is executed. If *Always* is chosen, a user password prompt appears every time the computer is turned on. If *Setup* is chosen, the password prompt appears if the BIOS executed.

Boot to OS/2

When using the OS/2 operating system, you need to Yes this option otherwise leave this on the setup default of *No*.

L1 Cache

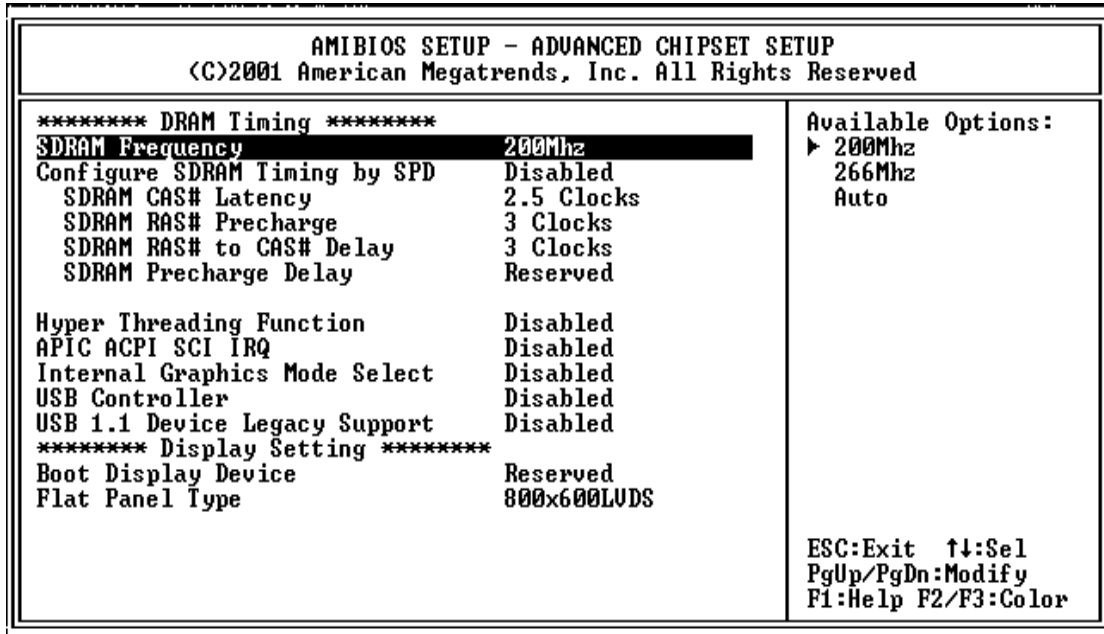
This option specifies the caching algorithm used for L1 internal cache memory.

L2 Cache

This option specifies the caching algorithm used for L2 secondary (external) cache memory.

5.4 ADVANCED CHIPSET SETUP

This option controls the configuration of the board's chipset. Control keys for this screen are the same as for the previous screen.



Advanced Chipset Setup

DRAM Frequency

PC-200 means the memory bus is running at 200MHz. PC-266 means the memory bus is running at 266MHz.

The Choice: 200Mhz, 266Mhz

Configure SDRAM Timing by SPD

SPD is the abbreviation Serial Presence Detect. SPD takes accord the chip types, capacity, timing, voltage data. The system can auto adjust memory according to the data to reach the best situation.

The Choice: Enabled, Disabled

CAS# Latency

This controls the timing delay (in clock cycles) before SDRAM starts a read command after receiving it. Settings: 1.5, 2, 2.5, 3 (clocks). 1.5 (clocks) increases the system performance the most while 3 (clocks) provides the most stable performance.

RAS# to CAS# Delay

This field allows you to set the number of cycles for a timing delay

Precharge Delay

The field specifies the idle cycles before precharge an idle bank. Settings: 7, 6, 5 (clocks).

Hyper Threading Function

Enabling the functionality of Hyper-Threading Technology for your computer system requires ALL of the following platforms. Components:

CPU - an Intel® Pentium® 4 Processor with HT Technology

Chipset - an Intel® chipset that supports HT Technology

BIOS - a BIOS that supports HT Technology and has it enabled

OS - an operating system that includes optimizations for HT Technology

For more information on Hyper-Threading Technology, go to: www.intel.com/info/hyperthreading.

Internal Graphics Mode Select

- Shares 512K/1MB/8MB of the system memory in DOS mode
- Uses Dynamic Video Memory Technology (DVMT) in Windows mode

USB Controller

This option can enable USB Port 0&1 or Disabled USB function.

USB1.1 Device Legacy Support

These options are used to *Enabled* the USB function and it's only useful in the DOS mode. The USB function sets *Enabled* will occupy IRQ10.

Boot Display Device

Use the field to select the type of device you want to use as the display(s) of the system. Setting options: *CRT*, *LFP*, *CRT+LFP*. The option *EFP* refers to the LCD display.

Flat Panel Type

- 800 X 600 LVDS
- 1024 X 768 LVDS
- 1280 X 1024 LVDS
- 1400 X 1050 LVDS
- 1600 X 1200 LVDS

5.5 POWER MANAGEMENT

This section is used to configure power management features. This <Power management Setup> option allows you to reduce power consumption. This feature turns off the video display and shuts down the hard disk after a period of inactivity.

AMIBIOS SETUP - POWER MANAGEMENT SETUP		
(C)2001 American Megatrends, Inc. All Rights Reserved		
Restore on AC/Power Loss	Power Off	Available Options: ▶ Power Off Power On Last State
Keyboard PowerOn Function	Disabled	
Specific Key for PowerOn	N/A	
Mouse PowerOn Function	Disabled	
ACPI Standby State	S1/POS	
USB Device Wakeup From S3/S4	Disabled	
Re-Call UGA BIOS at S3 Resuming	Disabled	
System Thermal	Disabled	
Thermal Active Temperature	40°C/104°F	
Power Button Function	On/Off	
Resume On Ring	Disabled	
Resume On LAN	Disabled	
Resume On PME#	Disabled	
		ESC:Exit ↑↓:Sel PgUp/PgDn:Modify F1:Help F2/F3:Color

Power Management

Keyboard PowerOn Function

This parameter allows you to use specific keys on the keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Any Key] [Specific Key]

Specific Key For PowerOn

[Enter]

Mouse PowerOn Function

When set to [Enabled], this parameter allows you to use the PS/2 mouse to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Left-button] [Right-button]

ACPI Standby State

This option will not be shown or not be available if you are using a CPU with the locked ratio.

Auto: BIOS will automatically select ACPI Suspend type

S1/POS : Set ACPI Suspend type to S1.

S3/SIR : Set ACPI Suspend type to S3

USB KB Wake-Up From S3

Set this field to Enabled to use the Wake-On-USB Keyboard function. This function allows you to use a USB keyboard to wake up a system from the S3 (STR -Suspend To RAM) state.

Power Button Function

This feature sets the function of the power button. Settings are: *Power Off* The power button functions as normal power off button. *Suspend* When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

Resume On Ring

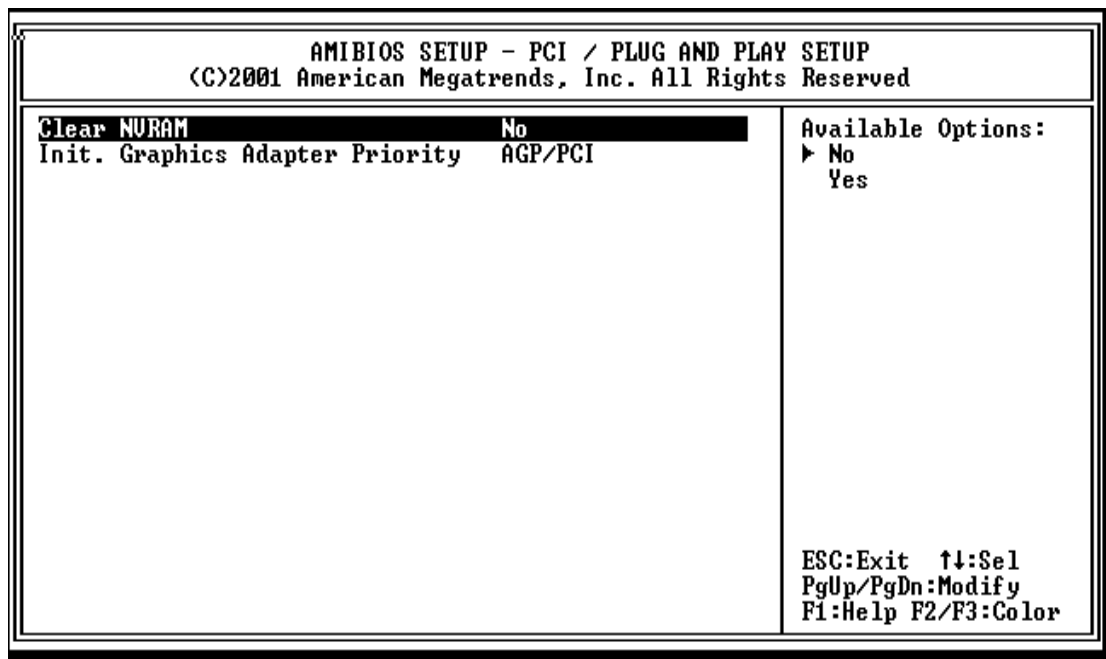
Set this field to Enabled to use the modem ring-on function. This will allow your system to power-on to respond to calls coming from an external or internal modem.

Resume On LAN

If you are using a LAN card that supports the remote wake up function, set this field to Enabled. The will allow the network to remotely wake up a Soft Power Down (Soft-Off) PC. However, if your system is in the Suspend mode, you can wake up the system only through an IRQ or DMA interrupt.

5.6 PCI/PLUG AND PLAY

This section is used to configure PCI / Plug and Play features. The <PCI & PNP Setup> option configures the PCI bus slots. All PCI bus slots on the system use INTA#, thus all installed PCI cards must be set to this value.



PCI / Plug And Play

Init. Graphics Adapter Priority

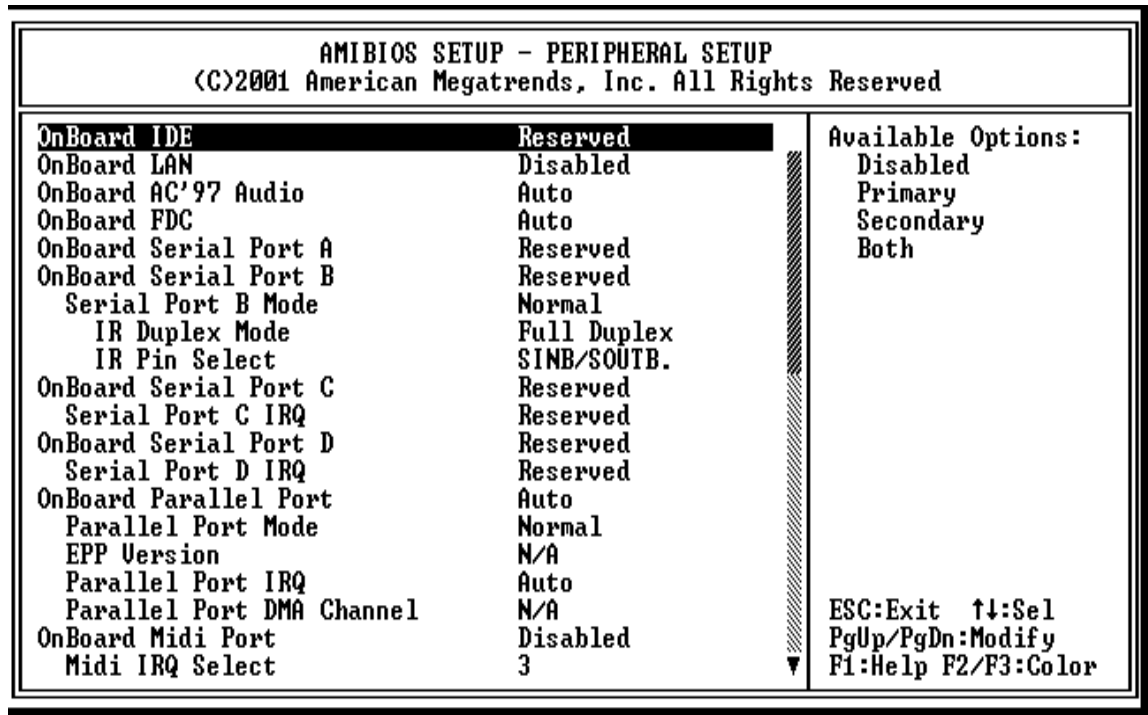
Internal VGA
PCI / Int-VGA

Clear NVRAM

This sets the operating mode of the boot block area of the BIOS FLASH ROM to allow programming in the Yes setting.

5.7 PERIPHERAL SETUP

This section is used to configure peripheral features.



Peripheral Setup

OnBoard IDE

This option is to set up the operating mode of IDE controller. If the main board offers the enhanced I/O port, the choice should be <Enabled>.

OnBoard AC'97 Audio

This option allows you to select AC97 audio chip support Audio.

Auto : BIOS will automatically select onboard AC97 audio.

Disable : Disable this function

OnBoard FDC

This option enables the floppy drive controller on the AR-B1790.

Serial Port A/B/C/D

These items specify the base I/O port addresses of the onboard Serial Port A (COM A)/Serial Port B (COM B). Selecting *Auto* allows AWARD to automatically determine the correct base I/O port address. Settings: *Auto*, *3F8/IRQ4*, *2F8/IRQ3*, *3E8/COM4*, *2E8/COM3* and *Disabled*.

Serial Port B Mode

This item sets the operation mode for Serial Port B. Settings: *Normal*, *1.6 uS*, *3/16 Baud* and *ASKIR*.

Normal: RS-232C Serial Port

IrDA: IrDA-compliant Serial Infrared Port

ASKIR: Amplitude Shift Keyed Infrared Port

IR Duplex Mode

This setting controls the operating mode of IR transmission/reception. Setting options: *Full, Half*. Under Full Duplex mode, synchronous, bi-directional transmission/reception is allowed. Under Half Duplex mode, only asynchronous, i-directional transmission/reception is allowed.

IR Pin Select

Please consult your IR peripheral documentation to select the correct setting of the TxD and RxD signals. Setting options: *RxD2, TxD2, IR-Rx2Tx2*.

OnBoard Parallel Port

This option enables the parallel port on the AR-B1790.

Parallel Port Mode

This option specifies the parallel port mode. ECP and EPP are both bi-directional data transfer schemes that adhere to the IEEE 284 specifications.

Parallel Port DMA Channel

This option is only available if the setting for the parallel Port Mode option is ECP.

Onboard Midi Port

This item is used to specify the base I/O port address for the onboard Midi port. Settings: *Disabled, 330, 300, 290*.

Midi IRQ Select

This item is used to select the IRQ line for onboard Midi port.

5.8 AUTO-DETECT HARD DISKS

This option detects the parameters of an IDE hard disk drive, and automatically enters them into the Standard CMOS Setup screen.

5.9 PASSWORD SETTING

This BIOS Setup has an optional password feature. The system can be configured so that all users must enter a password every time the system boots or when BIOS Setup is executed. User can set either a Supervisor password or a User password.

Select the appropriate password icon (Supervisor or User) from the Security section of the BIOS Setup main menu. Enter the password and press [Enter]. The screen does not display the characters entered. After the new password is entered, retype the new password as prompted and press [Enter].

If the password confirmation is incorrect, an error message appears. If the new password is entered without error, press [Esc] to return to the BIOS Main Menu. The password is stored in CMOS RAM after BIOS completes. The next time the system boots, you are prompted for the password function is present and is enabled.

Enter new supervisor password:

5.10 LOAD DEFAULT SETTING

This section permits users to select a group of settings for all BIOS Setup options. You not only can use these items to quickly set system configuration parameters, but also can choose a group of settings that have a better chance of working when the system is having configuration related problems.

5.10.1 Auto Configuration with Optimal Setting

The user can load the optimal default settings for the BIOS. The Optimal default settings are best-case values that should optimize system performance. If CMOS RAM is corrupted, the optimal settings are loaded automatically.

Load high performance setting (Y/N) ?

5.10.2 Auto Configuration with Fail Safe Setting

The user can load the Fail-Safe BIOS Setup option settings by selecting the Fail-Safe item from the Default section of the BIOS Setup main menu.

The Fail-Safe settings provide far from optimal system performance, but are the most stable settings. Use this option as a diagnostic aid if the system is behaving erratically.

Load fail safe settings (Y/N) ?

5.11 BIOS EXIT

This section is used to exit the BIOS main menu. After making your changes, you can either save them or exit the BIOS menu and without saving the new values.

5.12 BIOS UPDATE

The BIOS program instructions are contained within computer chips called FLASH ROMs that are located on your system board. The chips can be electronically reprogrammed, allowing you to upgrade your BIOS firmware without removing and installing chips.

The AR-B1790 provides the FLASH BIOS update function for you to easily to update to a newer BIOS version. Please follow these operating steps to update to new BIOS:

- Step 1: Turn on your system and don't detect the CONFIG.SYS and AUTOEXEC.BAT files.
- Step 2: Insert the FLASH BIOS diskette into the floppy disk drive.
- Step 3: In the MS-DOS mode, you can type the AMIFLASH program.
- ```
A:\>AMIFLASH
```
- Step 4: Press [ALT+F], The <File> box will show the following message, this message will be highlighted.
- BIOS Filename Loading ... . After typing in the File name you must press<ENTER> or press <ESC> to exit.
- Step 5: And then please enter the file name to the <Enter File Name> box. And the <Message> box will show the following notice.
- Are you sure to write the BIOS into flash ROM?
- Step 6: Press the <Enter> key to update the new BIOS. Then the <Message> box will show the <Programming now ...>.
- Step 7: When the BIOS update is successful, the message will show <Flash ROM Update Completed - Pass>.

## APPENDIX A. ADDRESS MAPPING

### IO Address Map

| I/O MAP | ASSIGNMENT                              |
|---------|-----------------------------------------|
| 000-01F | DMA controller (Master)                 |
| 020-021 | Interrupt controller (Master)           |
| 022-023 | Chipset controller registers I/O ports. |
| 040-05F | Timer control registers.                |
| 060-06F | Keyboard interface controller           |
| 070-07F | RTC ports & CMOS I/O ports              |
| 080-09F | DMA register                            |
| 0A0-0BF | Interrupt controller (Slave)            |
| 0C0-0DF | DMA controller (Slave)                  |
| 0F0-0FF | Math coprocessor                        |
| 1F0-1F7 | Primary IDE Channel                     |
| 170-177 | Secondary IDE Channel                   |
| 2E8-2EF | Serial port-4                           |
| 2F8-2FF | Serial port-2                           |
| 378-37F | Parallel port                           |
| 3B0-3DF | Graphics Controller                     |
| 3E8-3EF | Serial port-3                           |
| 3F0-3F7 | Floppy disk controller                  |
| 3F8-3FF | Serial port-1                           |

### Memory Map:

| MEMORY MAP       | ASSIGNMENT                                                    |
|------------------|---------------------------------------------------------------|
| 0000000-009FFFF  | System memory used by DOS and application                     |
| 00A0000-00BFFFF  | Display buffer memory for VGA/ EGA / CGA / MONOCHROME adapter |
| 00C0000-00DFFFF  | Reserved for I/O device BIOS ROM or RAM buffer.               |
| 00E0000-00EFFFF  | Reserved for PCI device ROM                                   |
| 00F0000-00FFFFFF | System BIOS ROM                                               |
| 0100000-FFFFFFF  | System extension memory                                       |

## APPENDIX B. INTERRUPT REQUEST (IRQ)

| SETTING | HARDWARE USING THE SETTING                         |
|---------|----------------------------------------------------|
| 00      | System timer                                       |
| 01      | Standard 101/102-Key or Microsoft Natural Keyboard |
| 02      | Programmable interrupt controller                  |
| 03      | Serial Port (COM2)                                 |
| 04      | Serial Port (COM1)                                 |
| 05      | IRQ Holder for PCI Steering                        |
| 06      | Floppy Disk Controller                             |
| 07      | Parallel Port (LPT1)                               |
| 08      | RTC clock                                          |
| 09      | ACPI                                               |
| 10      | Serial Port (COM4)                                 |
| 11      | Serial Port (COM3)                                 |
| 12      | PS/2 Compatible Mouse Port                         |
| 13      | Numeric data processor                             |
| 14      | Primary IDE controller                             |
| 15      | Secondary IDE controller                           |

Note: When CF and IDE2 (44pin) simultaneously connect to the Device, the Bios Auto-Detecting time will become longer (approximately 40 seconds). But when it enters into Operating System, two Devices will operate normally.