

**AR-B1690**  
**Socket370 LPX POS Board with**  
**VGA(CRT/LCD), LAN, Audio, DiskOnChip /**  
**Compact Flash and Mini PCI**  
**User' s Guide**

**Edition: 1.11**  
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## 0. PREFACE

### 0.1 COPYRIGHT NOTICE AND DISCLAIMER

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### 0.2 WELCOME TO THE AR-B1690 CPU BOARD

This guide introduces the Acrosser AR-B1690 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-B1690. General system information can also be found in this publication.

### 0.3 BEFORE YOU USE THIS GUIDE

Please refer to the Chapter 2, "System Setting," in this guide, if you have not already installed this AR-B1690. Check the packing list before you install and make sure the accessories are completely included.

AR-B1690 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](mailto:Sales@acrosser.com)

[acrosser@tp.globalnet.com.tw](mailto:acrosser@tp.globalnet.com.tw)

## 0.6 ORGANIZATION

This information for users covers the following topics (see the Table of Contents for a detailed listing):

Chapter 1, "Introduction", provides specifications and packing list.

Chapter 2, "Setting Up System", describes how to adjust the jumpers and the connector settings.

Chapter 3, "CRT/LCD Flat Panel Display", describes the configuration and installation procedure for using LCD and CRT displays.

Chapter 4, "Watchdog Timer", describes watchdog timer setting and trigger.

Chapter 5, "BIOS Console", provides the BIOS settings options.

Appendix A, Memory & I/O Map

Appendix B, Interrupt Request (IRQ)

## 0.7 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:

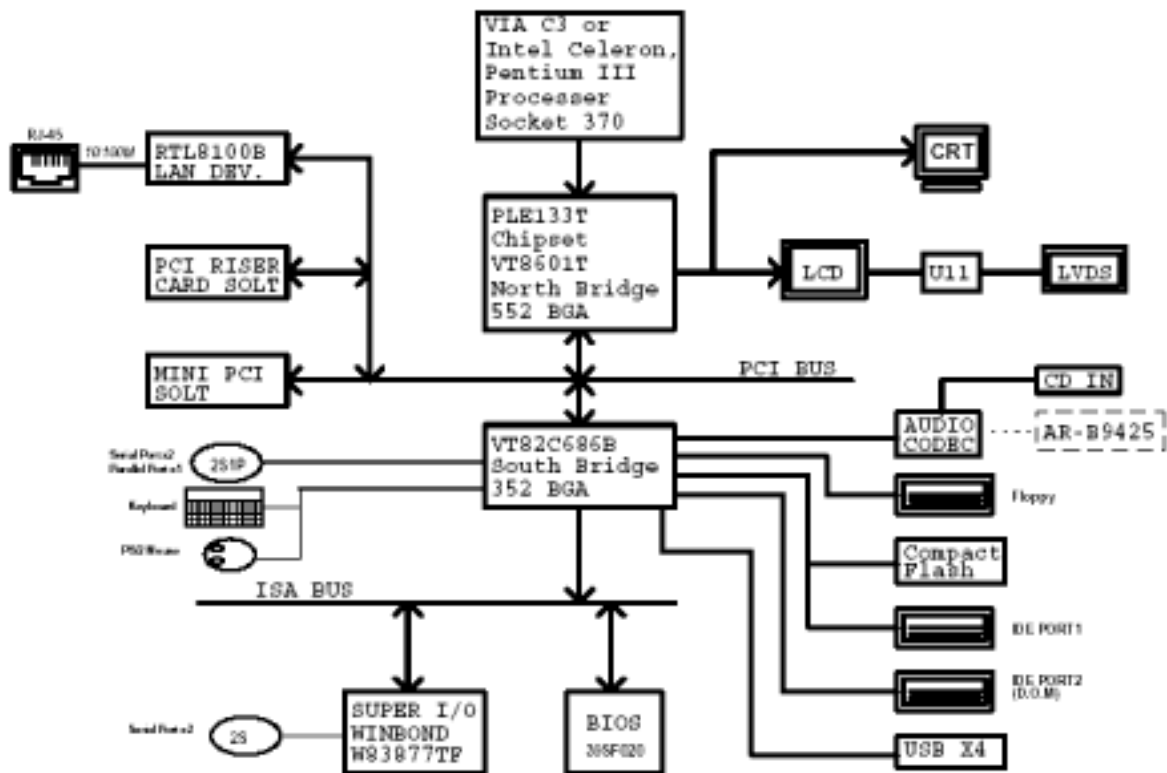
- Touch a grounded metal object to discharge the static electricity in your body (or ideally, wear a grounded wrist strap).
- When unpacking and handling the board or other system components, place all materials on an anti-static surface.
- Be careful not to touch the components on the board, especially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

# 1. INTRODUCTION

Welcome to the AR-B1690 POS Single Board Computer. The AR-B1690 board is POS form factor board, which comes equipped with economical performance with the Celeron series processors, or the impressive performance of the Pentium III series Processors, or Low power VIA C3 series Processors with the VIA ® advanced chipset Apollo PLE133T (VT8601T and VT82C686B). 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-B1690 provides on chip VGA. The VGA, which provides up to True Color (32 bit) 1024x768, or High Color (16 bit) 1280x1024 resolution. The VGA memory is share main memory (2M, 4M, or 8M). AR-B1690 also has 18-bit TFT LCD and LVDS function in the system.

The AR-B1690 is loaded with special on-board features that rival full-size systems. It has one network controller on board, uses RealTek RTL8100B LAN controller, a fully integrated 10/100BASE-TX solution with high performance networking functions. DOC and CompactFlash™. There is a Mini PCI socket for optional international version modem, plus optional support for AC97 3D stereo surround sound with CD-input, AR-B9425 (line-in, line-out and speaker-out, microphone). The AR-B1690 also includes two 168-pin DIMM sockets for up to 1G MB total on-board memory. The ar-b1690 has four on-board serial ports; COM3 and COM4 have +5/+12 V power or GND, two USB connectors for 4 USB ports, watchdog timer and tough industrial grade construction. All these features make the AR-B1690 a very "system integrator friendly" solution, perfect for handling POS applications in the harshest unmanned environments.



AR-B1690 System Block Diagram

## 1.1 SPECIFICATIONS

- **CPU:** Intel Pentium III / Celeron, VIA C3 Socket 370 CPU
- **DMA channels:** 7
- **Interrupt levels:** 15
- **Chipset:** VIA® Apollo PLE133T ( VT8601T Integrated 2D / 3D graphics accelerator and VT82C686B)
- **RAM memory:** Supports SDRAM PC133, on-board Two 168-pin DIMMs up to 1.0GB SDRAM memory module.
- **VGA Controller:** Embedded VGA controller, Screen Resolution: up to True Color(32 bit)1024x768, or High Color(16 bit) 1280x1024.
- **Display Interface:** CRT – D-SUB 15-pin female connector  
LVDS – for 18 bit TFT LCD Panel, 2x13x2.00mm pin-header connector  
LCD – for 18 bit TFT LCD Panel, 2x22x2.00mm pin-header connector
- **Ultra ATA/33/66/100 IDE Interface:** Two PCI Enhance IDE channel. The south bridge VT82C686B supports Ultra ATA/33/66/100 IDE interface. To support Ultra ATA66/100 Hard disk, a specified cable must be available.
- **Floppy disk drive interface:** 2.88 MB, 1.44MB, 1.2MB, 720KB, or 360KB floppy disk drive.
- **SSD:** Support one socket for DiskOnChip.
- **C. F.:** Supports Compact Flash Type I interface
- **Series ports:** On-board D-SUB 9-pin male external port for COM1 with RS-232C/Touch Screen  
Touch Screen uses 2.0mm 3-pin JST connector  
On-board D-SUB 9-pin male external port for COM2 with RS-232C/Touch Screen  
Touch Screen uses 2.0mm 3-pin JST connector  
On-board one 2x5x2.54mm pin-header connector for COM3 with RS-232C/RS-485  
On-board one 2x5x2.54mm pin-header connector for COM4 with RS-232C  
COM3 and COM4 Serial ports provides +5V & +12V power supply
- **Parallel Port:** On-board one D-SUB 25-pin female external port for Parallel port LPT1, supports SPP/EPP/ECP modes.
- **Expansion Slot:** On-board one PCI slot, supports PCI Riser card for two PCI expansion slots.
- **Mini PCI:** On board one Mini PCI socket.
- **IrDA port:** Supports IrDA (HPSIR) and ASK (Amplitude Shift Keyed) IR port multiplexed on COM2.
- **USB port:** one external port for 2 USB ports & one 2x5x2.54mm pin-header connector for 2 USB ports
- **Audio: onboard AC'97 Codec,** Supports two channel Left/Right Line IN/OUT, and Left/Right speaker out, MIC IN, CD IN.
- **Watchdog timer:** Software programmable 1~63sec.
- **Ethernet:** 1 RTL8100B chipset, supports **10/100M baseT** with 1 RJ-45 connector built-in LED.
- **K/B & Mouse:** On-board PS/2 Keyboard and Mouse 6-pin Mini-DIN external connector  
On-board 1x6x2.00mm JST connector for Keyboard and PS/2 Mouse
- **GP I/O:** On-board 2x4x2.00mm pin-header connector for 4-bit input and 4-bit output, TTL level.
- **Power Connector:** ATX & AT (P8/P9) power input connector
- **Power Req.:** +5V 6A and +12V 1A maximum
- **PC Board:** 6 layers, EMI considered
- **Dimensions:** 220 mm x 235 mm ( 8.66 " x 9.25 ")
- **Operating Temperature:** 0° ~ 60

## 1.2 PACKING LIST

These accessories are included with the system. Before you begin installing your AR-B1690 board, please make sure that the following items have been included inside the AR-B1690 package.

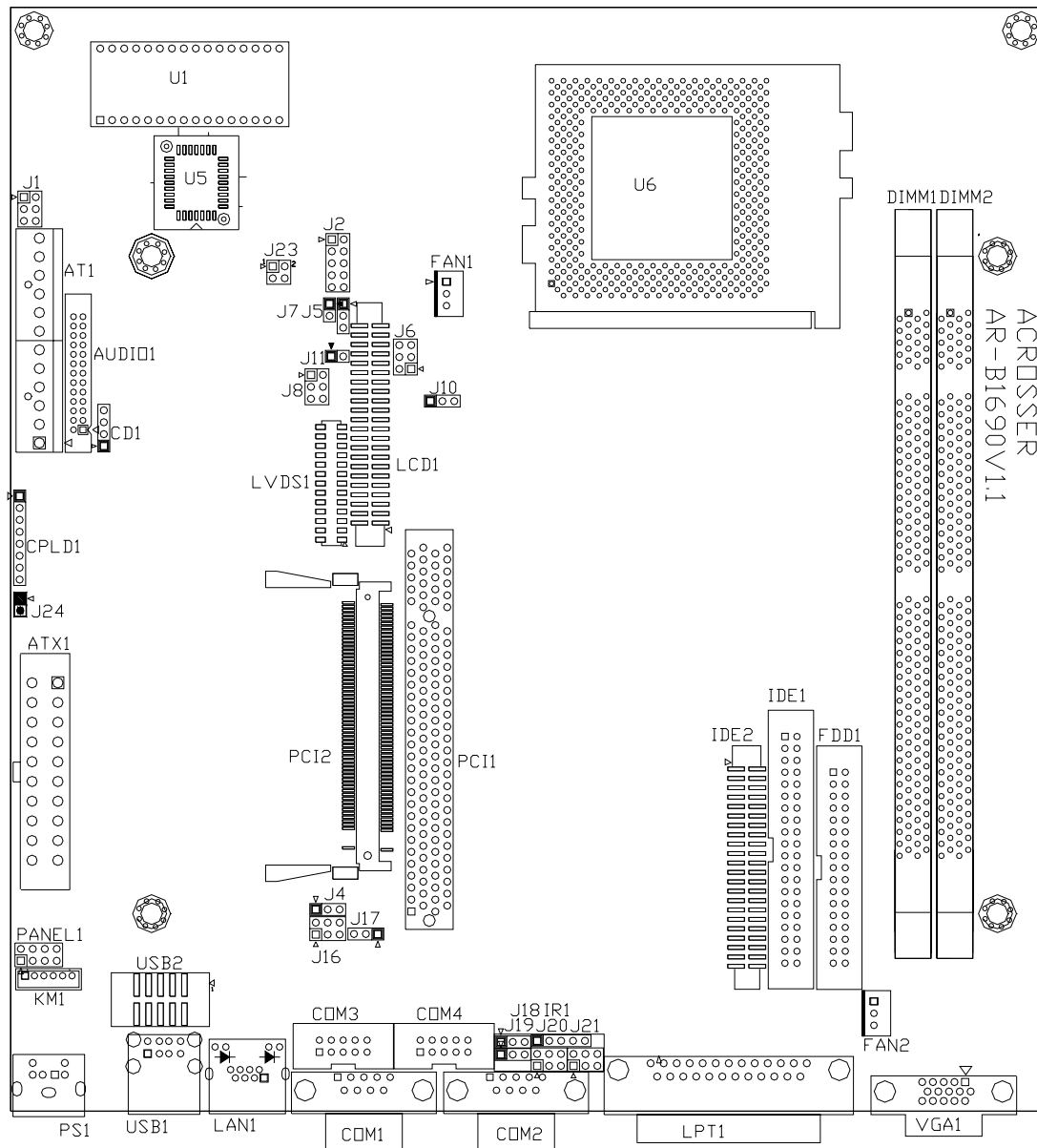
- The quick setup manual
- 1 AR-B1690 CPU board
- 1 Hard disk drive adapter cable for 3.5" hard disk
- 1 Hard disk drive adapter cable for 2.5" hard disk
- 1 Floppy disk drive adapter cable
- 1 Software utility CD
- 2 RS-232 and 1 PS/2 Mouse & Keyboard interface cable mounted on bracket

## 2. SETTING UP SYSTEM

This chapter describes how to install the AR-B1690. At first, the layout of AR-B1690 is shown, and the unpacking information that you should be careful is described.

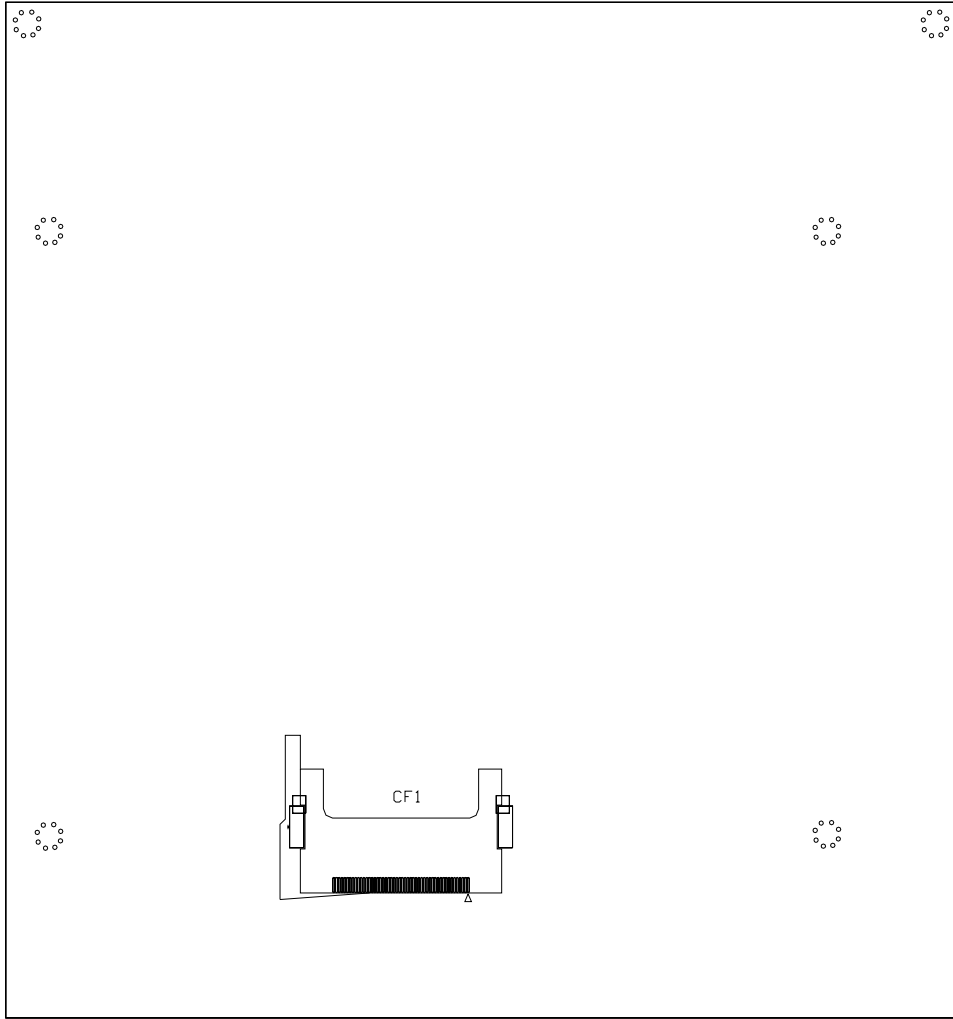
- Overview
- System Settings

### 2.1 AR-B1690 OVERVIEW



TOP PLACEMENT





**BOTTOM PLACEMENT**

## 2.2 SYSTEM SETTINGS

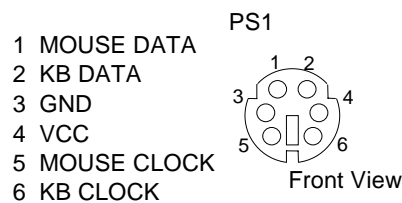
Jumper pins allow you to set specific system parameters. Set them by changing the pin location of the jumper blocks. (A jumper block is a small plastic-encased conductor that slips over the pins.) To change a jumper setting, remove the jumper from its current location with your fingers or small needle-nosed pliers. Place the jumper over the two pins designated for the desired setting. Press the jumper evenly onto the pins. Be careful not to bend the pins.

We will show the locations of the AR-B1690 jumper pins, and the factory-default settings.

**CAUTION:** Do not touch any electronic components unless you are safely grounded. Wear a grounded wrist strap or touch an exposed metal part of the system unit chassis. The static discharges from your fingers can permanently damage electronic components.

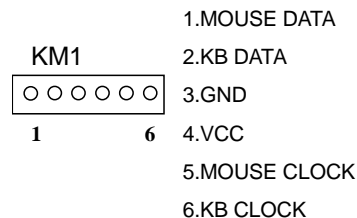
### 2.2.1 Keyboard & Mouse Connector (PS1)

The PS1 is a 6-pin Mini DIN keyboard & Mouse connector. This keyboard & Mouse connector is PS/2 type connector. This connector is also for a standard IBM-compatible keyboard when used with the included PS/2 keyboard & Mouse adapter cable.



### 2.2.2 External Keyboard & Mouse Connector (KM1)

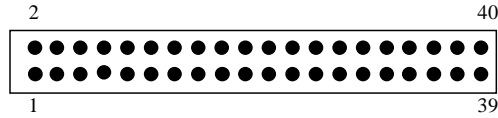
KM1 provides connection of PS2 mouse and Keyboard. Those pins for keyboard & mouse are parallel with KM1, which provides another selection of connecting with keyboard & mouse.



### 2.2.3 Hard Disk (IDE) Connector (IDE1, IDE2)

#### (1) 40 Pin Hard Disk Connector (IDE1)

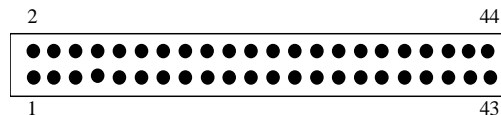
A 40-pin header type connector (IDE1) is provided to interface with up to two embedded hard disk drives (IDE PCI bus). This interface, through a 40-pin cable, allows the user to connect up to two drives in a "daisy chain" fashion. To enable or disable the hard disk controller, please use the BIOS Setup program. 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	NOT USED
21	DRQ A	22	GROUND
23	-IOW A	24	GROUND
25	-IOR A	26	GROUND
27	-CHRDY A	28	NOT USED
29	DACK A	30	GROUND
31	-IRQ A	32	NOT USED
33	SA 1	34	NOT USED
35	SA 0	36	SA 2
37	CS 0	38	CS 1
39	HD LED A	40	GROUND

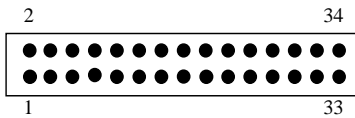
#### (2) 44 Pin Hard Disk Connector (IDE2)

The on-board 44-pin mini-pitched IDE interface is used to let user support either a 2.5" HDD.



## 2.2.4 FDD Port Connector (FDD1)

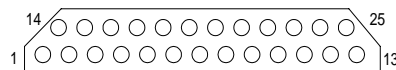
The AR-B1690 provides a 34-pin header type connector for supporting up to two floppy disk drives. To enable or disable the floppy disk controller, please use the BIOS Setup program.



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 ENABLE
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

## 2.2.5 Parallel Port Connector (LPT1)

The connector for the parallel port is a 25-pin D-type female connector.

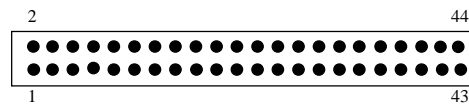


**D-type Connector**

DB-25	Signal	DB-25	Signal
1	-Strobe	14	-Auto Form Feed
2	Data 0	15	-Error
3	Data 1	16	-Initialize
4	Data 2	17	-Printer Select In
5	Data 3	18	Ground
6	Data 4	19	Ground
7	Data 5	20	Ground
8	Data 6	21	Ground
9	Data 7	22	Ground
10	-Acknowledge	23	Ground
11	Busy	24	Ground
12	Paper	25	Ground
13	Printer Select	--	No Used



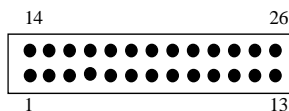
## 2.2.8 LCD Connector (LCD1)



LCD Pin Assignment

Pin	Signal	Pin	Signal
1	GND	2	CLK
3	GND	4	HSYNCR
5	VSYNCR	6	GND
7	Not Used	8	Not Used
9	FPD0(R5)	10	FPD1(R4)
11	FPD2(R3)	12	FPD3(R2)
13	GND	14	FPD4(G5)
15	FPD5(G4)	16	Not Used
17	Not Used	18	FPD6(G3)
19	FPD7(G2)	20	GND
21	FPD8(B5)	22	FPD9(B4)
23	FPD10(B3)	24	FPD11(B2)
25	Not Used	26	Not Used
27	GND	28	FPD12(R1)
29	FPD13(R0)	30	FPD14(G1)
31	FPD15(G0)	32	FPD16(B1)
33	FPD17(B0)	34	GND
35	VCC	36	VCC
37	+12V	38	+12V
39	GND	40	GND
41	DISPENR	42	GKLENR
43	GND	44	VDDEN

## 2.2.9 LVDS Header (LVDS1)



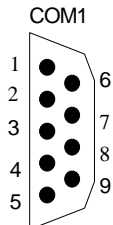
PIN (LVDS1)	FUNCTION	PIN (LVDS1)	FUNCTION
1	TXOUT0-	14	GND
2	TXOUT0+	15	GND
3	TXOUT1-	16	VTX5
4	TXOUT1+	17	VTX5
5	TXOUT2-	18	NC
6	TXOUT2+	19	GND
7	TXCLK-	20	GND
8	TXCLK+	21	VTX12
9	TXOUT3-	22	VTX12
10	TXOUT3+	23	GND
11	VTKBP	24	NC
12	VTX5	25	NC
13	VTX5	26	NC

## 2.2.10 Serial Port (COM1, COM2, COM3 and COM4)

- AR-B1690 is equipped with four serial ports. COM1. COM2 is a standard RS-232 interface.
- COM3.COM4 use an adapter cable to interface with external equipment.
- COM3 can be configured as a RS-485 or RS-232 port.
- When we are configuring J16 or J4, COM3 can also be configured as an RS-232 or RS-485.

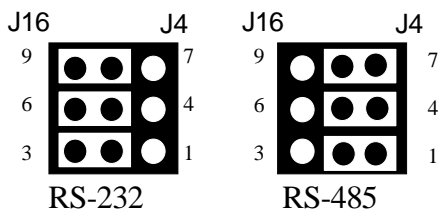
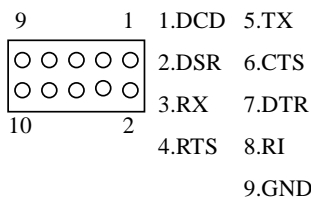
### A. COM1. COM2

Only RS232



### B. COM3

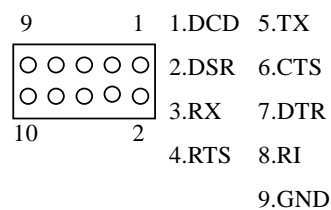
- USED RS232 & RS485



Factory Preset

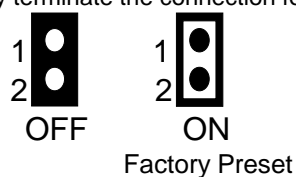
### C. COM 4

- Only RS232

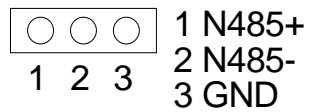


## 2.2.11 RS-485 Terminator Select (J7)

When there is only one line, the setting should be left off. If multiple blocks are used on a single line, it should be set to "ON" in order to properly terminate the connection for better transmission of data.

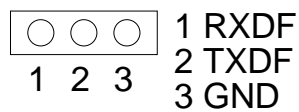


### 2.2.12 RS-485 Header (J5)



### 2.2.13 Touch Screen Connector (J18, J19)

J18 (or J19) is a serial port, which is parallel with COM1 (or COM2). It provides another choice when user needs a serial port but need to connect from board directly without connecting through a D-type connector. The typical application is a touch screen panel.



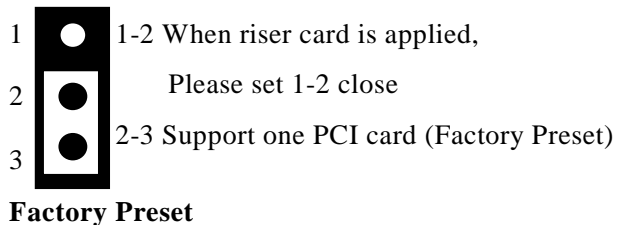
### 2.2.14 PCI Slot (PC1)

On-board one PCI slot (PC1), supports PCI Riser card for two PCI expansion slots.

### 2.2.15 Mini PCI Slot (PCI 2)

On-board one Mini PCI slot (PCI2)

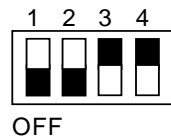
### 2.2.16 PCI Select (J17)





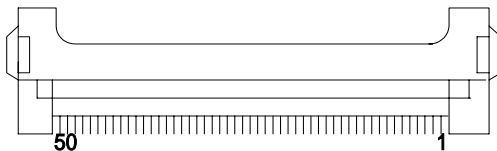
## 2.2.17 CPU Setting System Bus Clock (SW1)

The table below shows the correct setting to match the CPU frequency.



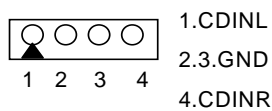
1	2	3	4	CPU	PCI
OFF	OFF	OFF	OFF	133	33.3
ON	OFF	OFF	OFF	124	31
OFF	ON	OFF	OFF	150	37.5
ON	ON	OFF	OFF	140	35
OFF	OFF	ON	OFF	105	35
ON	OFF	ON	OFF	110	36.6
OFF	ON	ON	OFF	115	38.3
ON	ON	ON	OFF	120	40
OFF	OFF	OFF	ON	100	33.3
ON	OFF	OFF	ON	133	44.3
OFF	ON	OFF	ON	112	37.3
ON	ON	OFF	ON	103	34.3
OFF	OFF	ON	ON	66	33 (Factory Preset)
ON	OFF	ON	ON	83	41.6
OFF	ON	ON	ON	75	37.5
ON	ON	ON	ON	124	41.3

## 2.2.18 Compact Flash Connector (CF1)



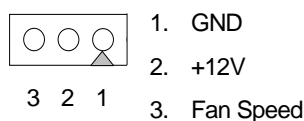
**Caution:** Please avoid using Compact Flash Card and Secondary Devices (IDE2), Such as CD/DVD-ROM, HDD or CD/DVD-writer, at the same time because CF Card and Secondary connector (IDE2) use the same as I/O address on the motherboard, it will cause hardware conflict or it will cause hardware crash.

## 2.2.19 CD IN Connector (CD1)

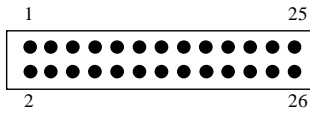


## 2.2.20 CPU Fan Power Connector (FAN1, FAN2)

FAN1 and FAN2 are 3-pin header for the CPU fan. The fan must be a 12V fan.



### 2.2.21 26-Pin Audio Connector (AUDIO1)

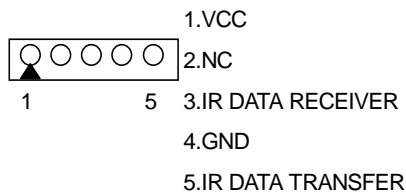


PIN	Signal	PIN	Signal
1	AUXAL	2	LINEL
3	AUXAR	4	LINER
5	VCC	6	Not Used
7	AUDIOL	8	MICPH
9	AUDIOR	10	PCSPKO
11	GND	12	GND
13	Not Used	14	Not Used
15	GND	16	GND
17	Not Used	18	Not Used
19	Not Used	20	Not Used
21	Not Used	22	Not Used
23	Not Used	24	Not Used
25	GND	26	GND

Note: the connector does not contain the GAME (MIDI) port signal. When AR-B1690 audio card is used with this CPU board, the GAME port function is not supported.

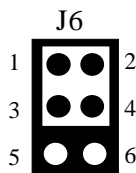
### 2.2.22 Infrared Connector (IR1)

The Infra-red Header pin assignment is as follows:



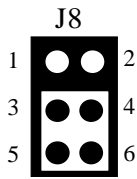
### 2.2.23 Voltage Select (J6 & J8)

■ LCD



JUMPER	VOLTAGE	NOTE
1-3 ON 2-4 ON	VCC3	Factory Preset
3-5 ON 4-6 ON	VCC	

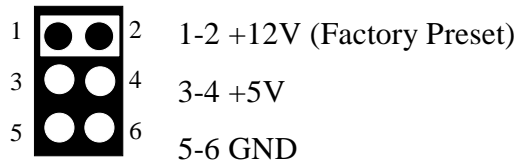
## ■ LVDS



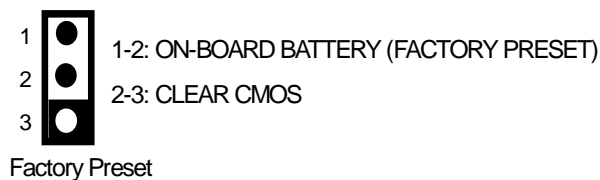
JUMPER	VOLTAGE	NOTE
1-3 ON 2-4 ON	VCC	
3-5 ON 4-6 ON	VCC3	Factory Preset

- The AR-B1690 supports 5V and 3.3V LCD or LVDS displays.
- LCD: Use J6 to change between 5V and 3.3V (**default**) panel video signal level.
- LVDS: Use J8 to change between 5V and 3.3V (**default**) panel video signal level.

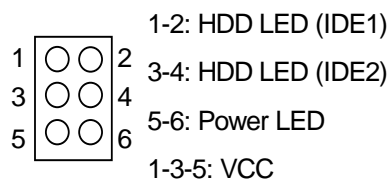
### 2.2.24 COM3-COM4 Voltage Select (J20, J21)



### 2.2.25 Battery Jumper (J10)



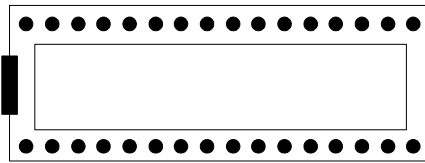
### 2.2.26 LED (J1)



HDD LED (IDE1): External LED connector for primary IDE channel.  
HDD LED (LED2): External LED connector for secondary IDE channel.  
Power LED: External LED connector for Watchdog status indication.

## 2.2.27 D.O.C Socket (U1)

DOC: 32 pin Disk-on-chip Socket



## 2.2.28 DOC Address Select (J11)

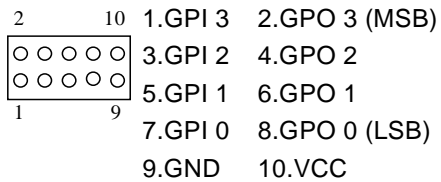
The J11 jumper is used to choose DOC address.



JUMPER	ADDRESS	NOTE
ON	D000:0000	Factory Preset
OFF	D200:0000	

## 2.2.29 GPIO Connector (J2)

Users could test GPIO function under 'Debug' program as follow:



- Users could test GPIO function under 'Debug' program as follow:

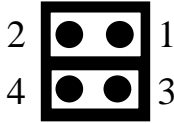
```

C:>debug
● O 215 01H
  Generally, the J2's Pin8 will be High Level, others output pin are Low Level.
● I 215
  FC
  Generally, suppose that J2's Pin1 and Pin3 are High Level then will show "FC"

```

### 2.2.30 GPIO address (J23)

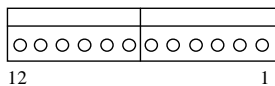
The J23 jumper is used to choose GPIO address.



JUMPER		ADDRESS
1-2	3-4	
ON	ON	215 (Factory Preset)
ON	OFF	216
OFF	ON	77
OFF	OFF	78

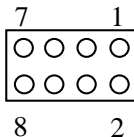
### 2.2.31 AT Power Connector (AT1)

The power connection is a 12-pin connector (PS/2 or AT power standard) requiring  $\pm 5$  V and  $\pm 12$  V power. Keep the ground wires (black color) toward the middle when connecting the power wire from the power supply.



- |               |         |
|---------------|---------|
| 1. POWER GOOD | 7. GND  |
| 2. VCC        | 8. GND  |
| 3. +12V       | 9. -5V  |
| 4. -12V       | 10. VCC |
| 5. GND        | 11. VCC |
| 6. GND        | 12. VCC |

### 2.2.32 External LED and Switch Connector (Panel1)



#### POWER LED

External LED connector is for power status indication.

- 1.PW-LED
- 3.GND

#### HARD DISK LED

External LED connector is for Hard Disk (IDE1 & IDE2) channel.

- 5.VCC
- 7. HD-LED

#### POWER BUTTON

When you choose **ATX Power**, the **POWER BUTTON** is used to connect to an external power button switch in order to push the button to turn on the system. Actually, you can also turn off the system and push the button for more than 4 seconds to turn off the system.

- 2.PW-BN
- 4.GND

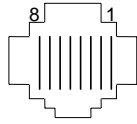
#### RESET BUTTON

The **RESET BUTTON** is used to connect to an external reset switch. Shorting these two pins will reset the system.

- 6.RST-SW
- 8.GND

### 2.2.33 Ethernet RJ-45 Connector (LAN1)

The system supports onboard network connectivity. To utilize this function, install the network driver from the utility diskette, and connect the cable to the following RJ-45 header.



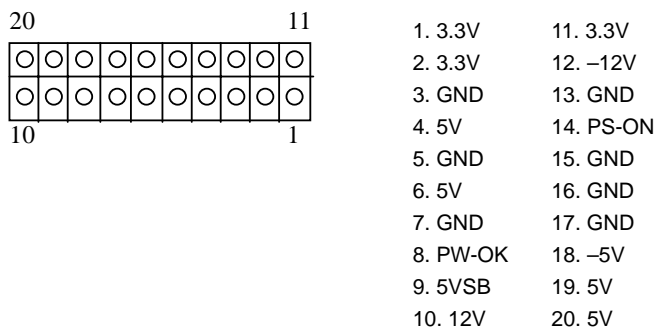
PIN (CN8)	FUNCTION
1	TPTX+
2	TPTX -
3	TPRX+
4	Not Used
5	Not Used
6	TPRX-
7	Not Used
8	Not Used

### 2.2.34 DRAM Configuration (DIMM1, DIMM2)

It can assemble 16/32/64/128/256/512MB 168 pin DIMM Module Memory. When you set up 168-pin DIMM Module Memory, AR-B1690 will auto-detect DRAM, and adopt correct save in order to make memory work till the best situation.

**Caution:** Set up 168-pin DIMM Module Memory, please insert into slot vertical, if the direction is wrong and it leads to failure, please confirm the direction is right.

### 2.2.35 ATX Power Connector (ATX1)



### 2.2.36 SYSTEM POWER SELECT (J24)

Assume user uses AT insert Jumper at J24 Pin for ATX power Jumper is not required.



JUMPER	POWER	NOTE
ON	AT	
OFF	ATX	Factory Preset

### 3. CRT/LCD FLAT PANEL DISPLAY

This chapter describes the configuration and installation procedures for LCD & CRT displays. The following topics are covered:

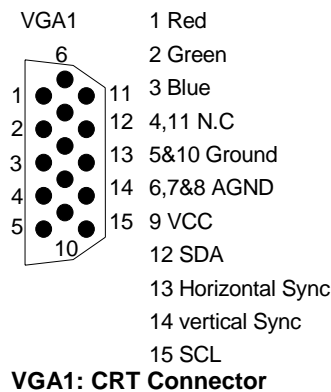
- CRT Connector
- LCD Flat Panel Displays

DON'T SUPPORT EXTERNAL VGA CARD

#### 3.1 CRT CONNECTOR (VGA1)

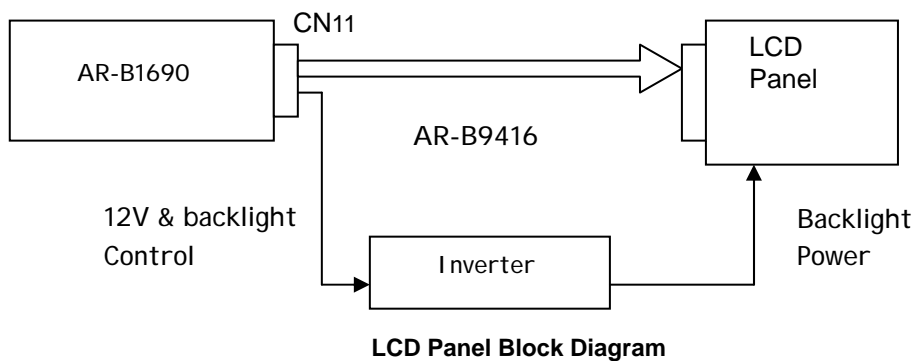
The AR-B1690 supports CRT color monitors. It uses an onboard VGA chipset and you can use the VGA RAM 2.4 or 8 MB. For different VGA display modes, your monitor must possess certain characteristics (the right drivers) to display the mode you want.

To connect to a CRT monitor, an adapter cable has to be connected to the VGA connector. VGA is used to connect with a VGA monitor when you are using the on-board VGA controller as a display adapter. Pin assignments for the VGA connector are as follows:



#### 3.2 LCD FLAT PANEL DISPLAYS

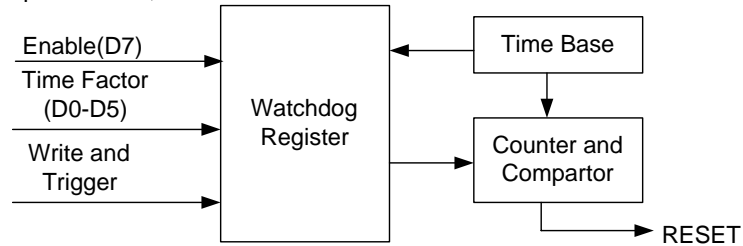
Figure 4-2 shows the connection between AR-B1690 and LCD panel.



The VGA BIOS of AR-B1690 support 800X600 resolution TFT display. Connecting AR-B1690 to other LCD needs different LCD BIOS. Please visit our web site ([www.acrosser.com](http://www.acrosser.com)) or contact with our technical support department ([csd@acrosser.com.tw](mailto:csd@acrosser.com.tw)) for supports of LCD connecting.

## 4. WATCHDOG TIMER

This section describes the use of Watchdog Timer, including disable, enable, and trigger. AR-B1690 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 IRQ) 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.

Please refer to the following table in order to properly program Watchdog function

	D7	D6	D5	D4	D3	D2	D1	D0
1	Enable	Reset	Time period					
0	Disable	IRQ 9						

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

```

C:>debug
● O 443 C8H
Generally, watchdog function would reset system after 8 seconds
● O 443 0
Disable watchdog function
  
```

```

C:>debug
● O 443 88H
Generally, watchdog function would generate IRQ 9 after 8 seconds
● O 443 0H
Disable watchdog function
  
```

### 4.2 WATCHDOG TIMER TRIGGER

After you enable the watchdog timer, your program must write the same factor as triggering to the watchdog timer at least once during every time-out period. You can change the time-out period by writing another timer factor to the watchdog register at any time, and you must trigger the watchdog during every new time-out period in next trigger.



## 5. BIOS CONSOLE

This chapter describes the AR-B1690 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.



Setup Main Menu

#### CAUTION:

1. AR-B1690 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): Mon 10/18,2002				Base Memory: 8 KB			
Time (hh/mm/ss) : 19:02:29				Extd Memory: 8 MB			
Floppy Drive A:		1.44 MB 3½					
Floppy Drive B:		Not Installed					
	Type	Size	Cyln	Head	UPcom	Sec Mode	LBA Blk P10 32Bit Mode Mode Mode
Pri Master:	Auto						On
Pri Slave :	Auto						On
Sec Master:	Auto						On
Sec Slave :	Auto						On
Boot Sector Virus Protection				Disabled			
Month: Jan - Dec				ESC:Exit ↑:Sel			
Day: 01 - 31				PgUp/PgDn:Modify			
Year: 1900 - 2099				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.

### Hard Disk Setup

The BIOS supports various types for user settings, The BIOS supports <Pri Master>, <Pri Slave>, <Sec Master> and <Sec Slave> so the user can install up to two hard disks. For the master and slave jumpers, please refer to the hard disk's installation descriptions and the hard disk jumper settings in section three of this manual.

You can select <AUTO> under the <TYPE> and <MODE> fields. This will enable auto detection of your IDE drives during boot-up. This will allow you to change your hard drives (with the power off) and then power on without having to reconfigure your hard drive type. If you use older hard disk drives, which do not support this feature, then you must configure the hard disk drive in the standard method as described above by the <USER> option.

### 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.

### 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	Enabled	Available Options: Disabled ▶ Enabled	
1st Boot Device	Floppy		
2nd Boot Device	IDE-0		
3rd Boot Device	CD/DVD		
Try Other Boot Devices	Yes		
S.M.A.R.T. for Hard Disks	Disabled		
BootUp Num-Lock	On		
Floppy Drive Swap	Disabled		
Floppy Drive Seek	Disabled		
PS/2 Mouse Support	Enabled		
Primary Display	VGA/EGA		
Password Check	Setup		
Boot To OS/2	No		
L1 Cache	Enabled		
L2 Cache	Enabled		
System BIOS Cacheable	Enabled		
C000,32k Shadow	Cached		
C000,16k Shadow	Disabled		
CC00,16k Shadow	Disabled		
D000,16k Shadow	Disabled		
D400,16k Shadow	Disabled		
D800,16k Shadow	Disabled		
DC00,16k Shadow	Disabled		

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 Boot Device

#### 2nd Boot Device

#### 3rd Boot Device

These options determine where the system looks first for an operating system.

#### 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 controls to *Enabled* or *Disabled* the CPU's Level 1 built-in catch.

## L2 Cache

This option controls to *Enabled* or *Disabled* the CPU's Level 2 built-in catch.

## System BIOS Cacheable

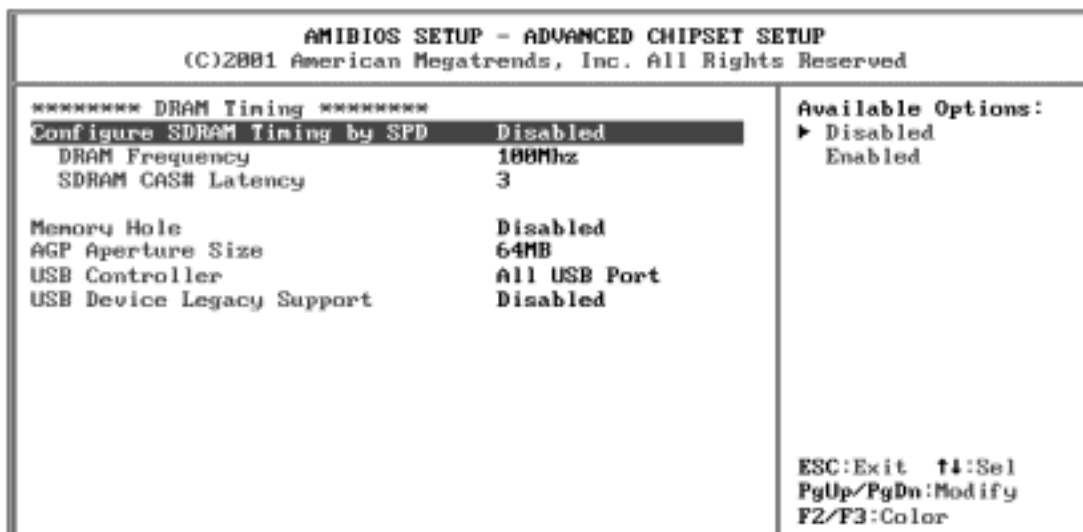
*Enabled* this option to enhance system performance by shadowing and caching system BIOS shadow functions will be ignored.

## Shadow Memory

Each of segments provides three options *Disabled*, *Enabled*, and *Cached* for faster adapter's ROM executions. However this shadow function is Chipset oriented and dependent on system hardware feature. In general, C000 64K will be allocated for VGA BIOS and set to *Cached* to get higher display performance by shadowing and caching feature. If user chooses *Enabled* setting, only BIOS shadow function is active.

## 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

### 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*

### DRAM Frequency

PC-100 means the memory bus is running at 100MHz. PC-133 means the memory bus is running at 133MHz.

**The Choice:** *66Mhz, 100Mhz, 133Mhz*

### SDRAM CAS Latency Time

When synchronous DRAM is installed, the number of clock cycles of CAS latency depends on the DRAM timing.

**The Choice:** *2, 3*

### Memory Hole

You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

### AGP Aperture Size

The item is to set up AGP display to use how much memory to save Texture Data.

### USB Controller

This option can enable ALL USB Port, USB Port 0&1, USB Port 2&3, or Disabled USB function.

### USB 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.

## 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		
ACPI Aware O/S	Yes	Available Options: No ▶ Yes
System Thermal	Disabled	
Thermal Active Temperature	65°C/149°F	
Thermal Slow Clock Ratio	50%-56.25%	
		ESC:Exit F4:Sel PgUp/PgDn:Modify F2/F3:Color

Power Management

### ACPI Aware O/S

The option YES is for ATX power, the option NO is for AT Power.

### System Thermal

If the choice <monitor>is chose, the system will alarm when the system temperature is beyond the critical temperature.

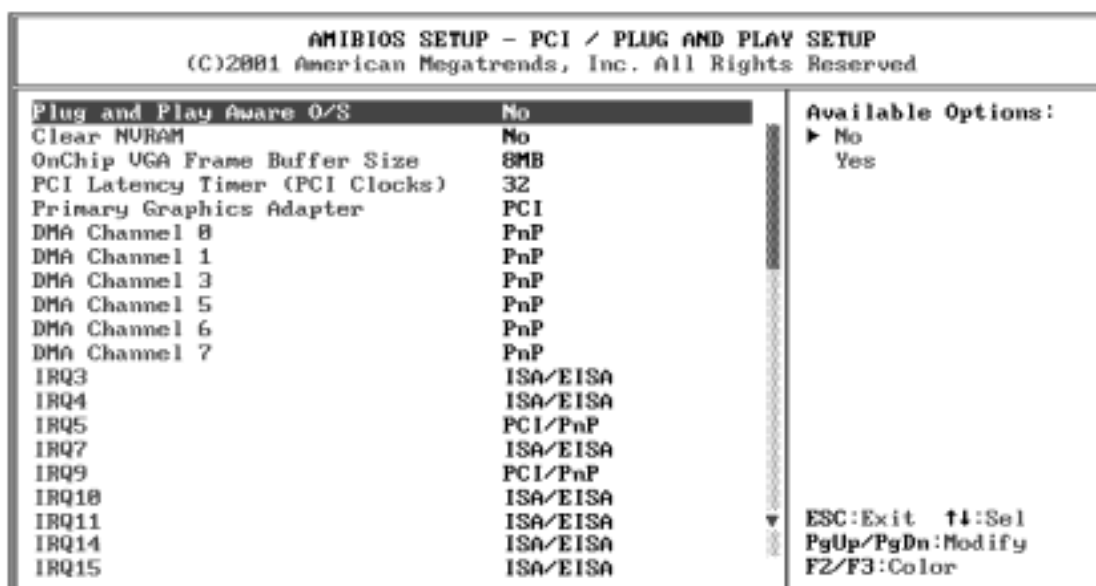
### Thermal Active Temperature

### Thermal Slow Clock Ratio

This item is to set up the Operating Frequency of system clock in power saving mode, to set a suitable clock frequency ratio, which between standard CPU clock and CPU clock in power saving mode when the temperature is beyond the critical temperature.

## 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

### Plug and Play Aware O/S

Set this option to Yes if the operating system installed in the computer is Plug and Play-aware. The BIOS only detects and enables PnP ISA adapter cards that are required for system boot. The Windows 95 operating system detects and enables all other PnP-aware adapter cards. Windows 95 is PnP-aware. Set this option <No> if the operating system (such as DOS, OS/2, Windows 3.x) does not use PnP. You must set this option correctly or PnP-aware adapter cards installed in your computer will not be configured properly.

### Clear NVRAM

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

### PCI Latency Timer (PCI Clocks)

This option sets latency of all PCI devices on the PCI bus. The settings are in units equal to PCI clocks.

### Primary Graphic Adapter

This option is set to use PCI bus or AGP. The AGP mode will get system a faster processing speed.

### DMA & IRQ

These options specify the bus that the named IRQs/DMA lines are used on. These options allow you to specify IRQs/DMA for use by legacy ISA adapter cards. These options determine if the BIOS should remove an IRQ/DMA from the pool of availability of IRQs/DMA passed to the BIOS configurable devices. If more IRQs/DMA must be removed from the pool, the end user can use these PCI/PnP Setup options to remove the IRQ/DMA by assigning the option to the ISA/EISA setting. The onboard I/O is configurable with BIOS.

## 5.7 PERIPHERAL SETUP

This section is used to configure peripheral features.

AMIBIOS SETUP - PERIPHERAL SETUP		
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OnBoard FDC	Enabled	Available Options: Disabled ▶ Enabled
OnBoard Serial Port1	3F8/COM1	
OnBoard Serial Port2	2F8/COM2	
Serial Port2 Mode	Normal	
IR Pins	N/A	
Duplex Mode	N/A	
Receiver Polarity	N/A	
Transmitter Polarity	N/A	
OnBoard Parallel Port	378	
Parallel Port Mode	ECP	
EPP Version	N/A	
Parallel Port DMA Channel	3	
Parallel Port IRQ	7	
OnBoard Serial Port3	3E8/COM3	
Serial Port3 IRQ	11	
OnBoard Serial Port4	2E8/COM4	
Serial Port4 IRQ	10	
OnBoard IDE	Both	
OnBoard AC'97 Audio	Enabled	ESC:Exit F4:Sel PgUp/PgDn:Modify F2/F3:Color

Peripheral Setup

### OnBoard FDC

This option enables the floppy drive controller on the AR-B1690.

### OnBoard Serial Port

This option enables the serial port on the AR-B1690.

### IR Port support

This item is to activate the function of Infra-red.

### OnBoard Parallel Port

This option enables the parallel port on the AR-B1690.

### 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 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 item allows you to decide to *Enabled*, *Disabled* the AC'97 Audio.



## 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-B1690 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 FLASH826 program.  
  
A:\>FLASH826
- 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. I/O & MEMORY MAP

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-FFFFFF	System extension memory

I/O 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
1F0-1F8	Hard Disk controller
250-258	Super I/O
2B0-2DF	Graphics adapter controller
2E8-2EF	Serial port-4
2F8-2FF	Serial port-2
360-36F	Net work ports
378-37F	Parallel port-1
3B0-3BF	Monochrome & Printer adapter
3C0-3CF	EGA adapter
3D0-3DF	CGA adapter
3E8-3EF	Serial port-3
3F0-3F7	Floppy disk controller
3F8-3FF	Serial port-1

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## 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:**

If the content in Setting is inconsistent with CD-ROM, please refer to the setting as priority.