

AR-B1520
INDUSTRIAL GRADE
CPU BOARD
User' s Guide

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Table of Contents

0. PREFACE	3
0.1 COPYRIGHT NOTICE AND DISCLAIMER.....	3
0.2 WELCOME TO THE AR-B1520 CPU BOARD.....	3
0.3 BEFORE YOU USE THIS GUIDE	3
0.4 RETURNING YOUR BOARD FOR SERVICE	3
0.5 TECHNICAL SUPPORT AND USER COMMENTS	3
0.6 STATIC ELECTRICITY PRECAUTIONS	4
1. INTRODUCTION	5
1.1 SPECIFICATIONS	5
1.2 PACKING LIST	5
2. INSTALLATION	6
2.1 AR-B1520'S LAYOUT	6
3. CONNECTION	8
3.1 POWER ON CONNECTOR (PWR)	8
3.2 KEYBOARD & MOUSE CONNECTOR (PS/2)	8
3.3 CPU FAN POWER CONNECTOR (FAN)	8
3.4 HARD DISK (IDE) CONNECTOR (IDE).....	9
3.5 INFRARED CONNECTOR (IR)	9
3.6 I/O CONNECTOR FOR SERIAL PORT, VGA CRT AND PARALLEL PORT (CN1)	10
3.7 ETHERNET RJ-45 CONNECTOR (LAN).....	10
3.8 USB CONNECTOR (USB)	11
3.9 GPIO CONNECTOR (GPIO).....	11
3.10 RESET CONNECTOR (RST).....	11
3.11 CLEAR CMOS (CMOS).....	11
3.12 INTERNAL BUZZER (LS1)	12
3.13 COM2 RS-232/RS-485 SELECT (P2,P3)	12
3.14 RS-485 TERMINATOR SELECT (JP2).....	12
3.15 RS-485 HEADER (JP3).....	12
3.16 SDRAM SOCKET 144 PIN (SODIMM)	12
3.17 COMPACT FLASH CONNECTOR (CF)	12
3.18 PC104 PLUS CONNECTOR (PCI)	12
3.19 COMPACT FLASH CONNECTOR SELECT (JP4)	12
3.20 LCD CONNECTOR (LCD).....	13
3.21 LCD PANEL VOLTAGE SELECT (JP1).....	13
3.22 LED MODEL CONNECTOR (LED1).....	13
4. WATCHDOG TIMER	15
4.1 WATCHDOG TIMER SETTING.....	15
5. BIOS CONSOLE	16
5.1 BIOS SETUP OVERVIEW.....	16
5.2 ADVANCED SETUP	17
5.3 PERIPHERALS SETUP	19
5.4 PNP/PCI SETUP	20
5.5 BOOT SETUP	21
5.6 EXIT SETUP	22
5.7 BIOS UPDATE	23
APPENDIX A. ADDRESS MAPPING	24
APPENDIX B. INTERRUPT REQUEST (IRQ)	25

0. PREFACE

0.1 COPYRIGHT NOTICE AND DISCLAIMER

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0.2 WELCOME TO THE AR-B1520 CPU BOARD

This guide introduces the Acrosser AR-B1520 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-B1520. General system information can also be found in this publication.

0.3 BEFORE YOU USE THIS GUIDE

Please refer to the Chapter 1, "Introduction" in this guide, if you have not already installed this AR-B1520. Check the packing list before you install and make sure the accessories are completely included.

AR-B1520 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 <mailto: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-B1520 PC104 Plus Single Embedded Board Computer. AR-B1520 supports SIS550 (a high performance/low cost SoC(System on Chip) solution by integrating an x86 compatible processor, high performance North Bridge, advanced hardware GUI engine and Super South Bridge).

In addition, the AR-B1520 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.

AR-B1520 have one network controller on board, uses Intel 82551 LAN controller, a fully integrated 10/100BASE-TX solution with high performance networking functions and Alert-on-LAN features.

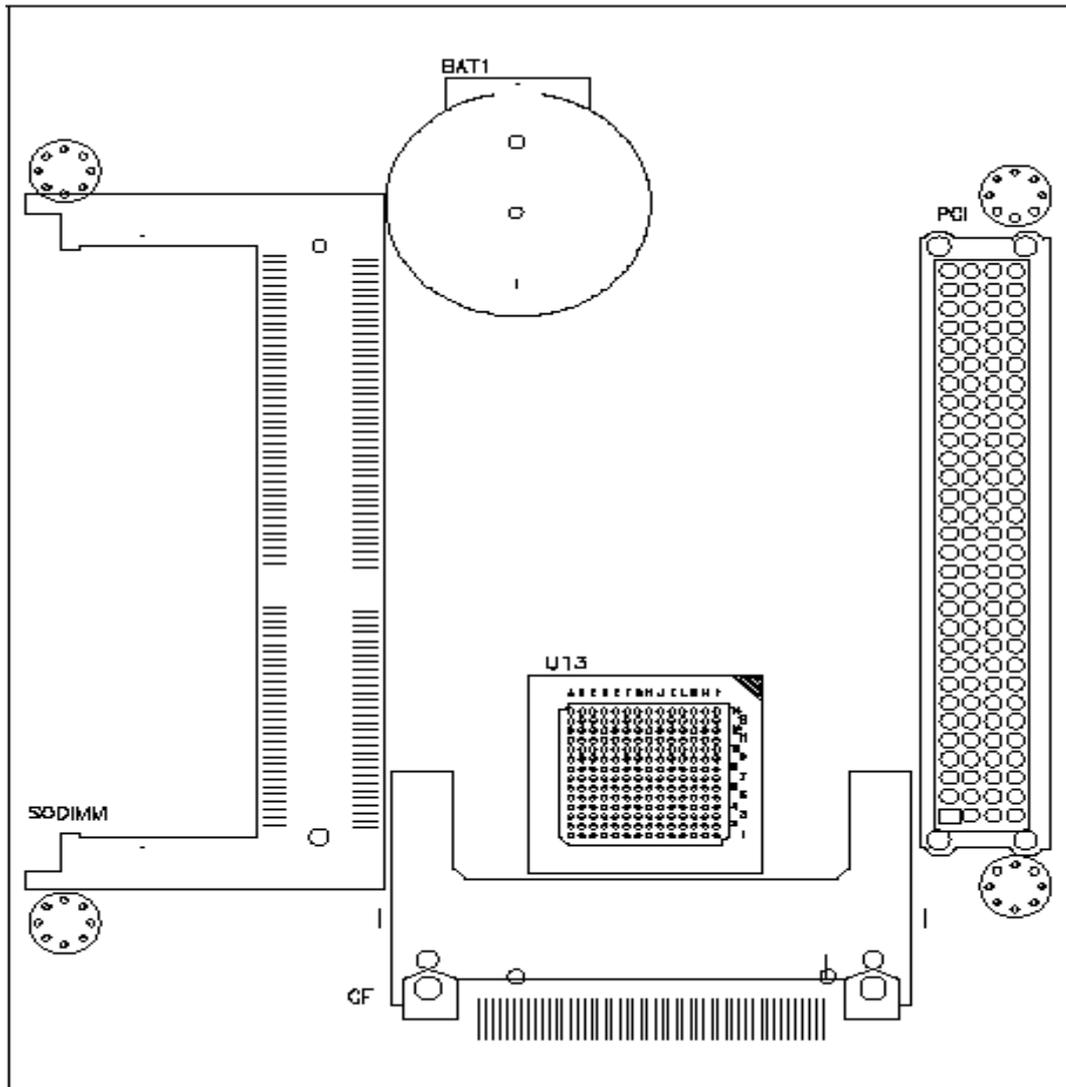
1.1 SPECIFICATIONS

- **CPU:** SIS 550 200MHz EBGA
- **RAM memory:** Provide one 144 pin SO-DIMM socket. The memory capability is up to 512MB.
- **VGA Controller:** Embedded VGA controller, Screen Resolution: up to True Color (32 bit)1024x768.
- **Display Interface:** CRT – D-SUB 15-pin female connector
LCD – for 18 bit TFT LCD Panel, HRS DF-51 pin connector
- **Ultra ATA/33/66 IDE Interface:** One PCI Enhance IDE channel. To support Ultra ATA33/66 Hard disk, a specified cable must be available.
- **Series ports:** Four high-speed 16C550 compatible UARTs ports
COM1,COM3 ,COM4: Only RS-232.
COM2: Supports RS-232/RS-485
- **Parallel Port:** one IEEE1284 compatible Bi-directional ports
- **IrDA port:** Supports IrDA (HPSIR) and ASK (Amplitude Shift Keyed) IR port multiplexed on COM2.
- **USB port:** Support two USB 1.1 compatible ports.
- **Watchdog timer:** Software programmable 1~63sec.
- **Intel 82551 Fast Ethernet Multifunction PCI Controller:** IEEE 802.3u Auto-Negotiation support for 10BASE-T/100BASE-TX standard. Fast back-to-back transmission supports with minimum inter-frame spacing. Connected to your LAN through RJ45 connector.
- **Expansion Bus:** PC/104 Plus
- **Keyboard & Mouse:** PS/2 compatible 6-pin JST connector.
- **Power Consumption:** +5V@3.8A (Max),+12V@0.5A(Max)
- **Operating Temperature:** 0°~ 60 (CPU needs Cooler)

1.2 PACKING LIST

In addition to this *User's Manual*, the AR-B1520 package includes the following items:

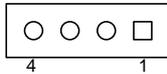
- The quick setup manual
- 1 AR-B1520 CPU board
- 1 Hard disk drive adapter cable
- 1 Parallel port & 4 Serial port & 1 CRT port adapter cable
- 1 Ethernet interface cable
- 1 PS/2 Mouse & Keyboard interface cable
- 1 power control interface cable



3. CONNECTION

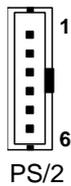
This chapter describes how to connect peripherals, switches and indicators to the AR-B1520 board.

3.1 POWER ON CONNECTOR (PWR)



PIN	Signal
1	VCC (+5V)
2	GND
3	GND
4	+12V

3.2 KEYBOARD & MOUSE CONNECTOR (PS/2)



PIN	SIGNAL
1	MSDATA
2	KBDATA
3	GND
4	VCC
5	MSCLOCK
6	KBCLOCK

3.3 CPU FAN POWER CONNECTOR (FAN)

This is a usual FAN, can't scout function

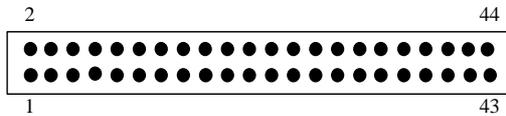


1. +5V
2. +12V
3. GND

3.4 HARD DISK (IDE) CONNECTOR (IDE)

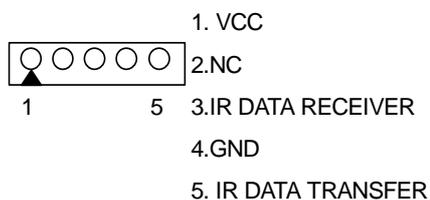
- 44 Pin Hard Disk Connector (IDE)

Please set as "Auto" if slave IDE device that carries FAT16 partition, is used to boot up system

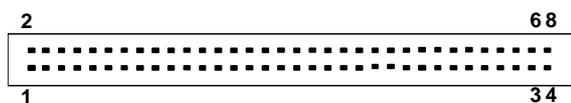


PIN	SIGNAL	PIN	SIGNAL
1	-RESET	2	GND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA15
19	GND	20	N.C.
21	HDDREQ	22	GND
23	-HDDIOW	24	GND
25	-HDDIOR	26	GND
27	HDDRDY	28	GND
29	-HDDACK	30	GND
31	HDDIRQ	32	N.C.
33	SA1	34	ATA 66/100
35	SA0	36	SA2
37	CS0	38	CS1
39	HDLED	40	GND
41	+5V	42	+5V
43	GND	44	N.C.

3.5 INFRARED CONNECTOR (IR)

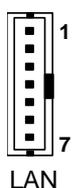


3.6 I/O CONNECTOR FOR SERIAL PORT, VGA CRT AND PARALLEL PORT (CN1)



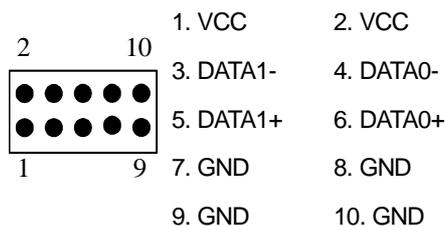
PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
1	DCDA	2	DSRA	3	RXDA
4	RTSA	5	TXDA	6	CTSA
7	DTRA	8	RIA	9	GND
10	GND	11	DCDB	12	DSRB
13	RXDB	14	RTSB	15	TXDB
16	CTSB	17	DTRB	18	RIB
19	GND	20	GND	21	-STB
22	-AFD	23	PD0	24	-ERROR
25	PD1	26	-INIT	27	PD2
28	-SLIN	29	PD3	30	PD4
31	PD5	32	PD6	33	PD7
34	-ACK	35	BUSY	36	PE
37	GND	38	SLCT	39	GND
40	GND	41	VGA RED	42	GND
43	VGA GREEN	44	GND	45	VGA BLUE
46	GND	47	HSYNCR	48	SDA
49	VSYNCR	50	SCL	51	DCDC
52	DSRC	53	RXDC	54	RTSC
55	TXDC	56	CTSC	57	DTRC
58	RIC	59	GND	60	GND
61	DCDD	62	DSRD	63	RXDD
64	RTSD	65	TXDD	66	CTSD
67	DTRD	68	RID		

3.7 ETHERNET RJ-45 CONNECTOR (LAN)

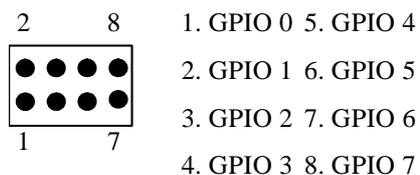


PIN	SIGNAL	PIN	SIGNAL
1	RTX+	5	GND
2	RTX-	6	GND
3	NRX+	7	GND
4	NRX-		

3.8 USB CONNECTOR (USB)



3.9 GPIO CONNECTOR (GPIO)



GPIO ADDRESS BIT ACCESS DESCRIPTION

IO_BASE=5064h
GPIO[7:0] Input/Output Mode Select,
0: Output Mode
1: Input Mode.

IO_BASE=5066h
GPIO[7:0] Pin Level,
0: Pin input level low/Pin output level low
1: Pin input level high/Pin output level high

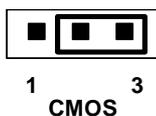
Ex. C:\>DEBUG
-O 5064 00 ; Set GPIO[7:0] to Output
-O 5066 FF ; Set GPIO[7:0] to High

3.10 RESET CONNECTOR (RST)



PIN	SIGNAL
1	RST
2	GND

3.11 CLEAR CMOS (CMOS)



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

3.12 INTERNAL BUZZER (LS1)



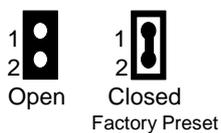
PIN	SIGNAL
1	VCC
2	SPKR

3.13 COM2 RS-232/RS-485 SELECT (P2,P3)

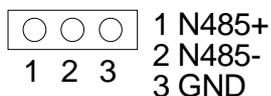
JUMPER	FUNCTION
	RS-485
	RS-232 FACTORY PRESET

3.14 RS-485 TERMINATOR SELECT (JP2)

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



3.15 RS-485 HEADER (JP3)



3.16 SDRAM SOCKET 144 PIN (SODIMM)

3.17 COMPACT FLASH CONNECTOR (CF)

3.18 PC104 PLUS CONNECTOR (PCI)

The PCI connector is optional. It doesn't mount in AR-B1520A

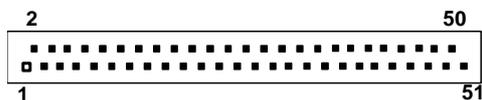
3.19 COMPACT FLASH CONNECTOR SELECT (JP4)



1 2
JP4 (ON)

PIN	FUNCTION
1-2 ON	MASTER
1-2 OFF	SLAVE (Factory Preset)

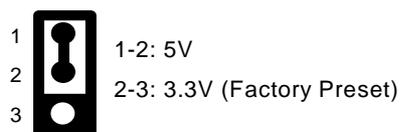
3.20 LCD CONNECTOR (LCD)



PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
1	VVBD2 (B2)	2	LLD6 (R2)	3	VVBD3 (B3)
4	LLD7 (R3)	5	VVBD4 (B4)	6	UUD0 (R4)
7	VVBD5 (B5)	8	UUD1 (R5)	9	VVBD6 (B6)
10	UUD2 (R6)	11	VVBD7 (B7)	12	UUD3 (R7)
13	VVBD8 (G0)	14	VVBD0 (B0)	15	VVBD9 (G1)
16	VVBD1 (B1)	17	LCDVDD	18	LCDVDD
19	VVBD10 (G2)	20	UUD4	21	VVBD11 (G3)
22	UUD5	23	LLD0 (G4)	24	UUD6
25	LLD1 (G5)	26	UUD7	27	LLD2 (G6)
28	MOD	29	LLD3 (G7)	30	HSYNC
31	LLD4	32	VSYNC	33	LLD5 (R1)
34	SHFCLK	35	N.C	36	DISPOFF
37	N.C	38	N.C	39	DEN
40	GND	41	+5V	42	TVSYNC
43	+5V	44	GND	45	ENBLT
46	XCLK	47	VDDEN	48	GND
49	+12V	50	THSYNC	51	+12V

Note: HSYNC, VSYNC, SHFCLK, VDDEN (Pin 30, 32, 34, 47) only for DSTN.

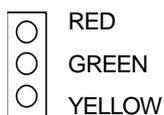
3.21 LCD PANEL VOLTAGE SELECT (JP1)



Factory Preset

1-2: 5V
2-3: 3.3V (Factory Preset)

3.22 LED MODEL CONNECTOR (LED1)



COLOR	FUNCTION
RED	POWER LED
GREEN	LAN LED
YELLOW	HDD LED

Note:

1. If the content in setting is inconsistent with the CD-ROM, please refer to the setting as the priority.
2. User may choose the collocation of ACC1520.

4. WATCHDOG TIMER

This section describes the use of Watchdog Timer. AR-B1520 is equipped with a programmable time-out period watchdog timer that enable user to reset the system after a time out occur. Users can use simple program to enable the watchdog timer, and program the timer in range of seconds or minutes, with maximum 255 seconds/minutes. Once you enable the watchdog timer, the program will start the count down and when counting down to zero the system will generate a reset signal to reset the system.

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 .

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

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, Watchdog)
o 2e f4	;select CRF4 (to set Watchdog Timer Value)
o 2f 02	;set the Watchdog timer to 2 seconds. (00 to disable, max FF)
o 2e 30	;select device 30
o 2f 01	;enable
q	;Quit debug

5. BIOS CONSOLE

This chapter describes the AR-B1520 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:

- Main
- Advanced
- Peripherals
- PnP/Pci
- Boot
- Exit

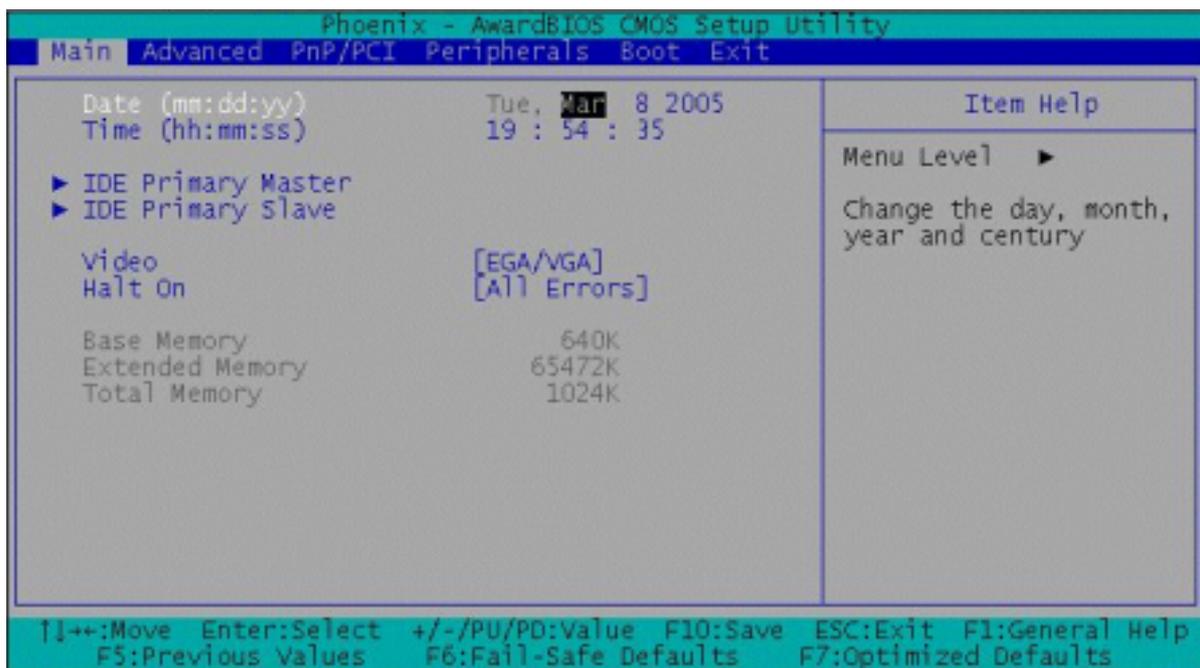
5.1 BIOS SETUP OVERVIEW

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

The <Main> 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.

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.

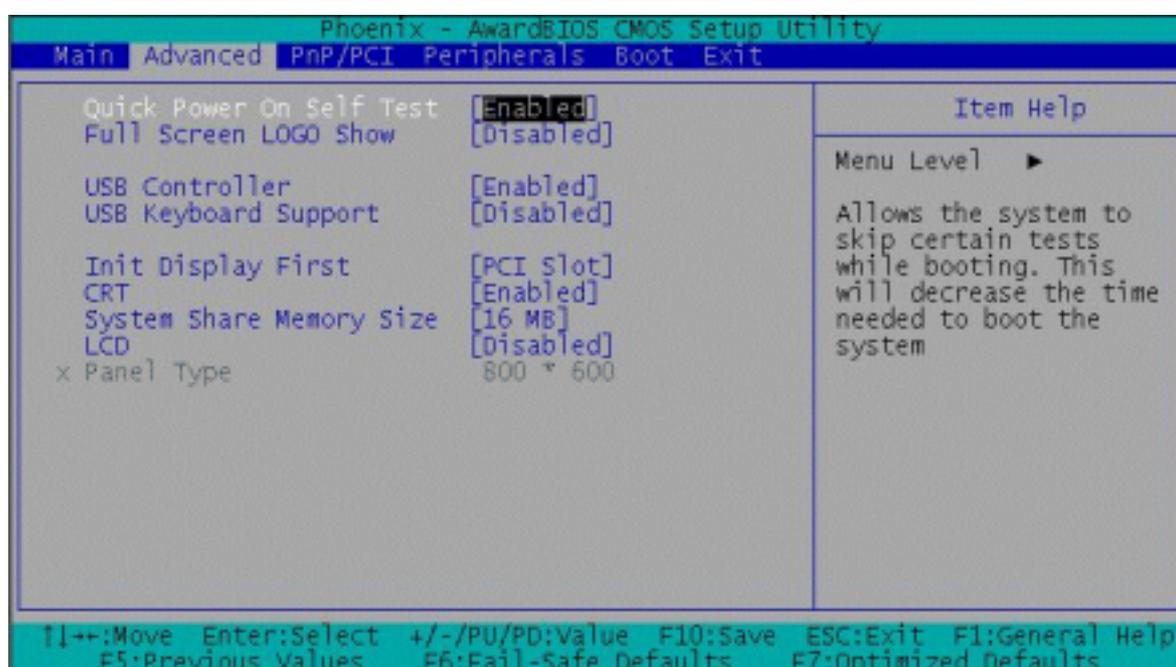
The user can bypass the date and time prompts by creating an AUTOEXEC.BAT file. For information on how to create this file, please refer to the MS-DOS manual.

Hard Disk Setup

The BIOS supports various types for user settings, The BIOS supports <Pri Master> and <Pri 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.

5.2 ADVANCED SETUP

The <Advanced > 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.



Advanced Setu

Quick Power on Self Test

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.

USB Controller

This option can enable USB Ports or Disabled USB function.

USB Keyboard Support

This option can enable or Disabled USB keyboard function.

CRT

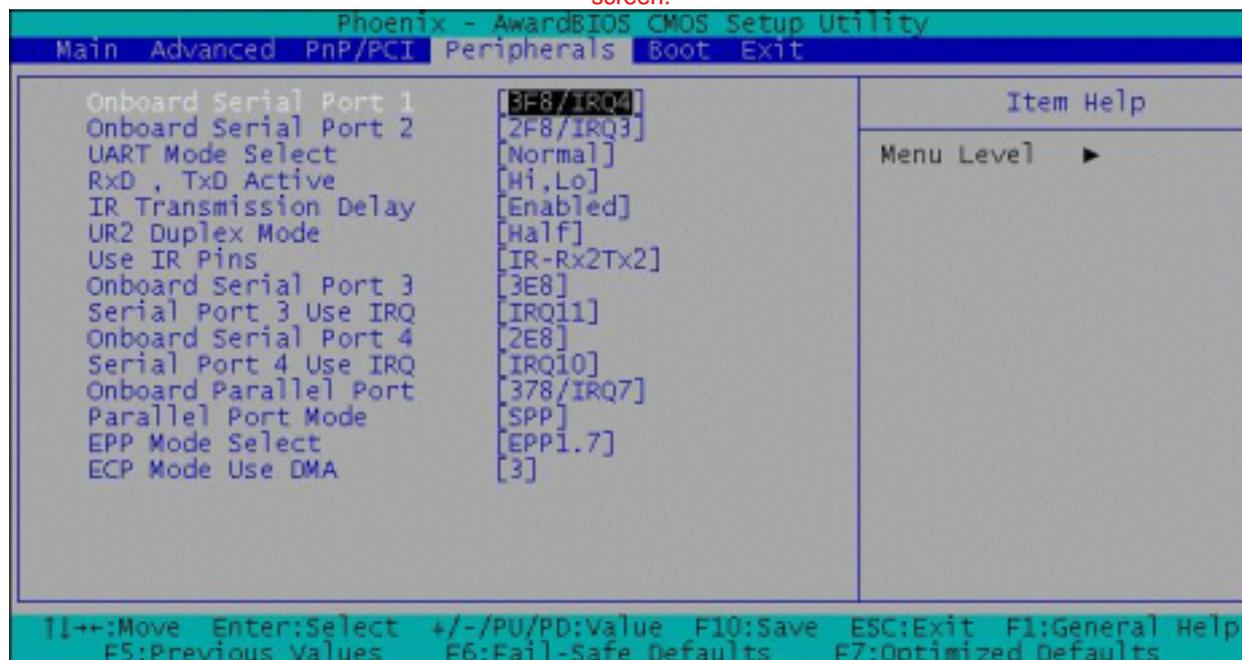
This option can enable VGA for CRT or Disabled CRT function.

LCD

This option can enable VGA for LCD or Disabled LCD function.

5.3 PERIPHERALS SETUP

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



Peripherals Setup

OnBoard Serial Port 1

OnBoard Serial Port 2

OnBoard Serial Port 3

OnBoard Serial Port 4

These options enable the serial port 1,2,3,and 4 on the AR-B1520 .

UART Mode Select

The item allows you to determine which InfraRed (IR) function of the onboard I/O chip, this function uses.

OnBoard Parallel Port

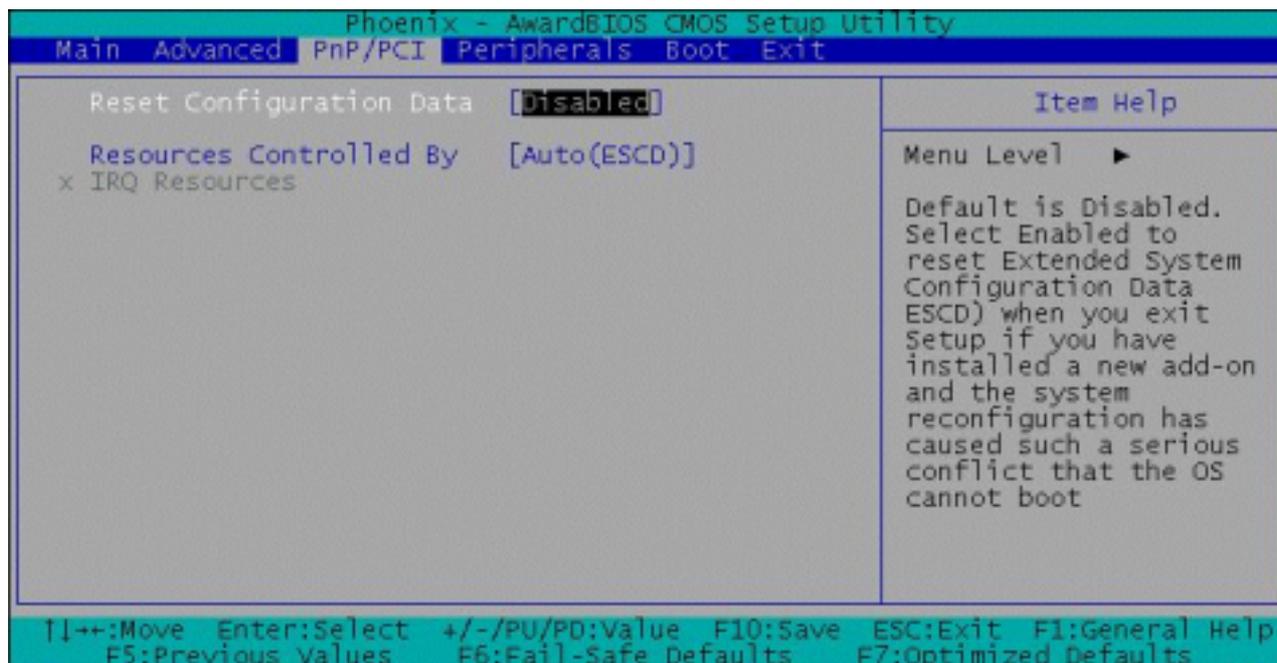
This option enables the parallel port on the AR-B1520.

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.

5.4 PNP/PCI SETUP

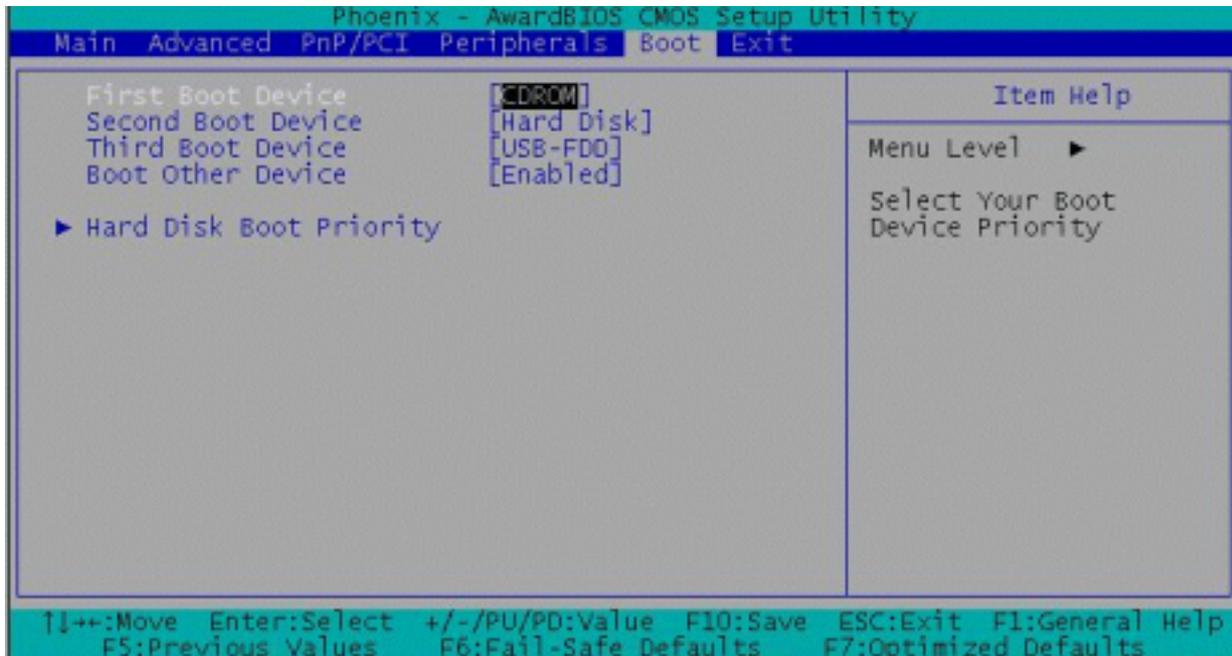
The menu allows you to select enable or disable reset extend system configuration data(ESCO).



PnP/PCI Setup

5.5 BOOT SETUP

The Boot menu allows you to select among the four possible types of boot devices listed using the up and down arrow keys. Promotion or demotion of device alters the priority which the system uses to search for a boot device on system power up.



Boot Setup

First Boot Device

Second Boot Device

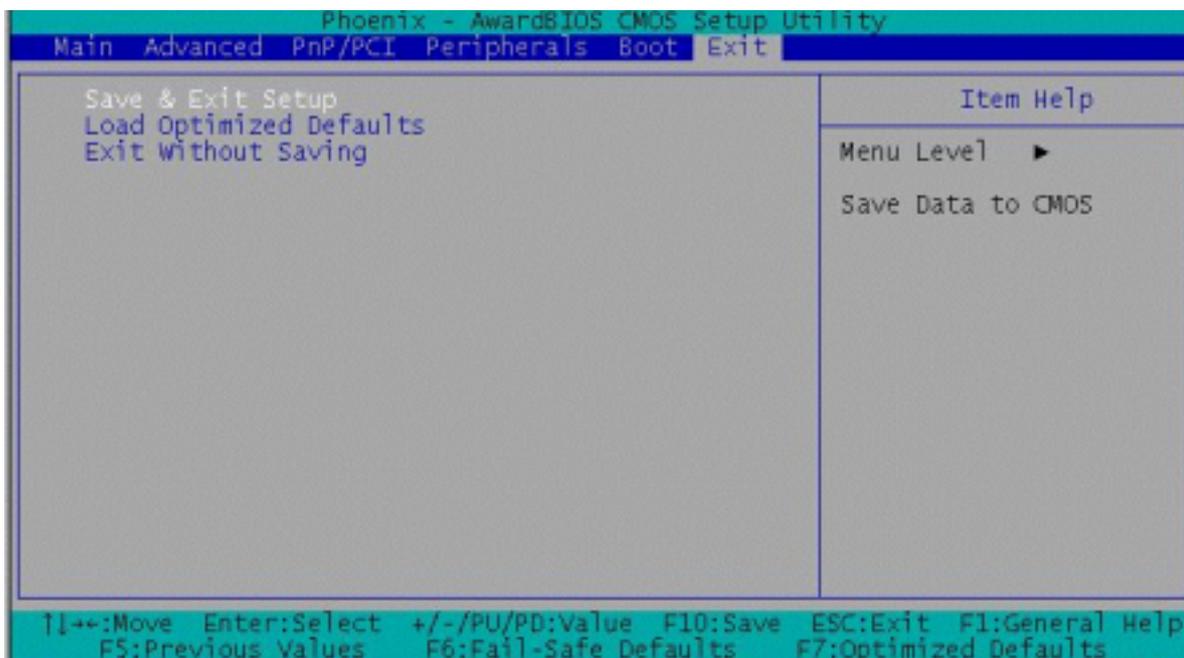
Third Boot Device

Boot Other Device

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

5.6 EXIT SETUP

When you have made all of your selections from the various menus in the step program, save your changes and exit Step. Select Exit from the menu bar by to display the following menu.



Exit Setup

NOTE : Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit this menu.

Save & Exit Step

Once you are finished making your selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The COMS RAM is sustained by an onboard backup battery and stays on even when the PC is turned off. When you select this option, a confirmation window appears. Select [Yes] to save changes and exit.

NOTE : If you attempt to exit the Setup program without saving your changes, the program prompts you with a message asking if you want to save your changes before exiting. Pressing <Enter> saves the changes while exiting.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menus. When you select this option or if you press < F5> , a confirmation window appears. Select [Yes] to load default values. Select **Save & Exit Step** or make other changes before saving the values to the non-volatile RAM.

Exit Without Saving

This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select [Yes] to discard any changes and exit.

5.7 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-B1520 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 FLASH.exe program.

A:\>AWDFLASH

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
0000 – 000F	Direct memory access controller
0020 – 0021	Programmable interrupt controller
0040 – 0043	System timer
0060 – 0060	Standard 101/102-key or Microsoft Natural Keyboard
0061 – 0061	System speaker
0070 – 0071	System COMS/real time clock
01F0 – 01F7	SiS 5513 Dual PCI IDE Controller
01F0 – 01F7	Primary IDE controller (dual fifo)
02F8 – 02FF	Communication Port (COM2)
0378 – 037F	Print Port (LPT1)
03F0 – 03F1	Motherboard resources
03F2 – 03F5	Standard Floppy Disk Controller
03F6 – 03F6	SiS 5513 Dual PCI IDE Controller
03F8 – 03FF	Communication Port (COM1)

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	Communication Port (COM2)
04	Communication Port (COM1)
06	Standard Floppy Disk Controller
07	Printer Port (LPT1)
08	System CMOS/real time clock
10	SiS 7001 PCI to USB Open Host Controller
10	IRQ Holder for PCI Steering
11	IRQ Holder for PCI Steering
12	PS/2 Compatible Mouse Port
13	Numeric data processor
14	SiS 5513 Dual PCI IDE Controller

Note:

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