

AR-B1552
INDUSTRIAL GRADE
CPU BOARD
User' s Guide

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0.PREFACE

0.1 COPYRIGHT NOTICE AND DISCLAIMER

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0.2 WELCOME TO THE AR-B1552 CPU BOARD

This guide introduces the Acrosser AR-B1552 CPU board.

The information provided in this manual describes this card's functions and features. It also helps you start, set up and operate your AR-B1552. General system information can also be found in this publication.

0.3 BEFORE YOU USE THIS GUIDE

Please refer to the Chapter 3, "Setting Up The System" in this guide, if you have not already installed AR-B1552. Check the packing list before you install and make sure the accessories are completely included.

The CD-ROM provides the newest information regarding the CPU card. **Please refer to the files of the enclosed utility diskette.** It contains the modification, hardware & software information, and it has updated to product functions that may not be mentioned here.

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 packaging for this purpose.

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

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

0.5 TECHNICAL SUPPORT AND USER COMMENTS

User's 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: webmaster@acrosser.com

Check our FAQ sheet for quick fixes to known technical problems.

0.6 ORGANIZATION

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

- Chapter 1, "Overview", provides an overview of the system features and packing list.
- Chapter 2, "System Controller" describes the major structure.
- Chapter 3, "Setting Up the System", describes how to adjust the jumper, and the connector's settings.
- Chapter 4, "Installation", describes setup procedures including information on the utility **CD-ROM**.
- Chapter 5, "BIOS Console", provides the BIOS options settings.

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. OVERVIEW

This is an AR-B1552 Pentium CPU Board with Ethernet, DOM.

This chapter provides an overview of your system features and capabilities. The following topics are covered:

- Specification
- Packing List
- Features

1.1 SPECIFICATION

- CPU: Cyrix GX1 233~300MHz.
- Chipset: Cyrix CS5530A
- Features
- RAM Memory: Supports 1 X SODIMM sockets, 128MB maximum.
- SSD: Compact Flash Interface X 1.
- Watchdog: Software programmable 1~63sec.
- VGA Display: GX1 UMA.
 - CRT – with HDB 15-pin connector.
 - LCD 2mm Pin Header
 - TV-OUT for NTSC and PAL modes
- Ethernet: RT8139C chipset, supports 10/100M base T with RJ-45 connector built-in Led.
- Audio: CS5530A on-chip AC97 compatible audio.
- Super I/O: Winbond 83977TF
 - 1 EIDE (Ultra DMA33)– with one 2.00 mm 44-pin connectors
 - 1 FDC – with 2.54 mm 34-pin connector.
 - 1 Parallel – with 2.54 mm 26-pin connector. Supports SPP/EPP/ECP mode.
 - 1 RS-232C –
 - 1 RS-232C/RS485/IrDA/Touch Screen –
 - RS-232C is selected by jumper and use the same connector.
 - IrDA use 2.54mm 5-pin header.
 - Touch Screen uses 2.0mm 3-pin JST connector.
- USN: A specific Universal Serial Number is attached for hardware identification (accomplished by Dallas DS2401 Silicon Serial Number).
- Keyboard/Mouse: PS/2 compatible 6-pin mini-DIN connector located at bracket.
- USB: Built-in 2 ports USB interface with 2.54mm 10-pin headers.
- RTC: Chipset included, supports ACPI function with 10 years data retention.
- Speaker: Supports on-board buzzer.
- Expansion Bus: PC/104
- LED Indicators: Power LED. LAN LED at LAN port.
- Power Req.: +5V-3.0A maximum and 12V –0.5A maximum.
- Power Connector: One 8-pin 2.5mm JST, one 4-pin 5.08mm wafer connector.
- CE Design-In: Add EMI components to COM ports, Parallel port, CRT, USB, Keyboard, and PS/2 mouse.
- PC Board: 8 layers, EMI considered. Especially in switching power layout.
- Dimensions: 145mm x 102 mm (5.7" x 4").
- 1 Software utility CD

1.2 PACKING LIST

Some accessories are included with the system. Before you begin installing your AR-B1552 board, take a moment to make sure that the following items have been included inside the AR-B1552 package.

- The quick setup manual
- 1 AR-B1552 all-in-one single CPU board
- 1 Hard disk drive interface cable
- 1 floppy interface cable
- 1 Audio adapter cable
- 1 LPT cable
- 1 COM cable
- 1 Keyboard & Mouse cable
- 1 TV-OUT interface cable for NTSC and PAL modes
- Acrosser's AR-B9425 audio card

1.3 FEATURES

The system provides a number of special features that enhance its reliability, ensure its long-term availability, and improve its expansion capabilities, as well as its hardware structure.

- CPU NS GEODE GX1/GXLV
- Cyrix CS5530A Chipset
- Chrontel CH7006 TV-OUT
- Supports 1 x SODIMM, 128 MB Maximum
- Supports DOM Flash Disk
- 1 x 10/100M-Base2 Ethernet
- AWARD flash BIOS
- Power Req.: 5V, 2.5A
- Dimensions: 145 mm x 102 mm

2. SYSTEM CONTROLLER

This chapter describes the main structure of the AR-B1552 CPU board. The following topics are covered:

- Microprocessors
- DMA Controller
- Keyboard Controller
- Interrupt Controller
- Serial Port
- Parallel Port

2.1 MICROPROCESSOR

The AR-B1552 uses the NS GEODE GX1/GXLV CPU (or other GXM CPUs), it is an advanced 32-bit x86 compatible processor offering high performance, fully accelerated 2D graphics, a 64-synchronous DRAM controller and a PCI bus controller, all on a single chip. This latest generation of the MediaGX processor enables a new class of premium performance notebook/desktop, and IPC computer designs.

The MediaGX MMX enhanced processor companion chips provide advanced video and audio functions and permit direct interface to memory. This high-performance 64-bit processor is x86 instruction set compatible and supports MMX technology.

This processor is the latest member of the NS MediaGX family, offering high performance, fully accelerated 2D graphics, synchronous memory interface and a PCI bus controller, all on a single chip. As described in separate manuals, the CS5520 and the CS5530 I/O Companion chips fully enable the features of the MediaGX processor with MMX support. These features include full VGA and VESA video, 16-bit stereo sound, IDE interface, ISA interface, SMM power management, and AT compatibility logic. In addition, the newer CS5530 provides an Ultra DMA/33 interface, MPEG2 assist, and is AC97 Version 2.0 audio compliant.

In addition to the advanced CPU features, the MediaGX processor integrates a host of functions, which are typically implemented with external components. A full-function graphics accelerator provides pixel processing and rendering functions.

The NS MediaGX MMX-Enhanced Processor represents a new generation of x86-compatible 64-bit microprocessors with sixth-generation features. The decoupled load/store unit (within the memory management unit) allows multiple instructions in a single clock cycle. Other features include single-cycle execution, single-cycle instruction decode, 16KB write-back cache, and clock rates up to 300MHz. These features are possible by the use of advanced-process technologies and superpipelining.

2.2 DMA CONTROLLER

The equivalent of two 8237A DMA controllers are implemented on the AR-B1552 board. Each controller is a four-channel DMA device that will generate the memory addresses and control signals necessary to transfer information directly between a peripheral device and memory. This allows high-speed information transfer with less CPU intervention. The two DMA controllers are internally cascaded to provide four DMA channels for transfers to 8-bit peripherals (DMA1) and three channels for transfers to 16-bit peripherals (DMA2). DMA2 channel 0 provides the cascade interconnection between the two DMA devices, thereby maintaining IBM PC/AT compatibility.

The Following is the system information for the DMA channels:

Slave with four 8-bit CHNLS	Master with three 16-bit CHNLS
DMA Controller 1	DMA Controller 2
Channel 0: Spare	Channel 4(0): Cascade for controller 1
Channel 1: IBM SDLC	Channel 5(1): Spare
Channel 2: Diskette adapter	Channel 6(2): Spare
Channel 3: Spare	Channel 7(3): Spare

DMA Channel Controller

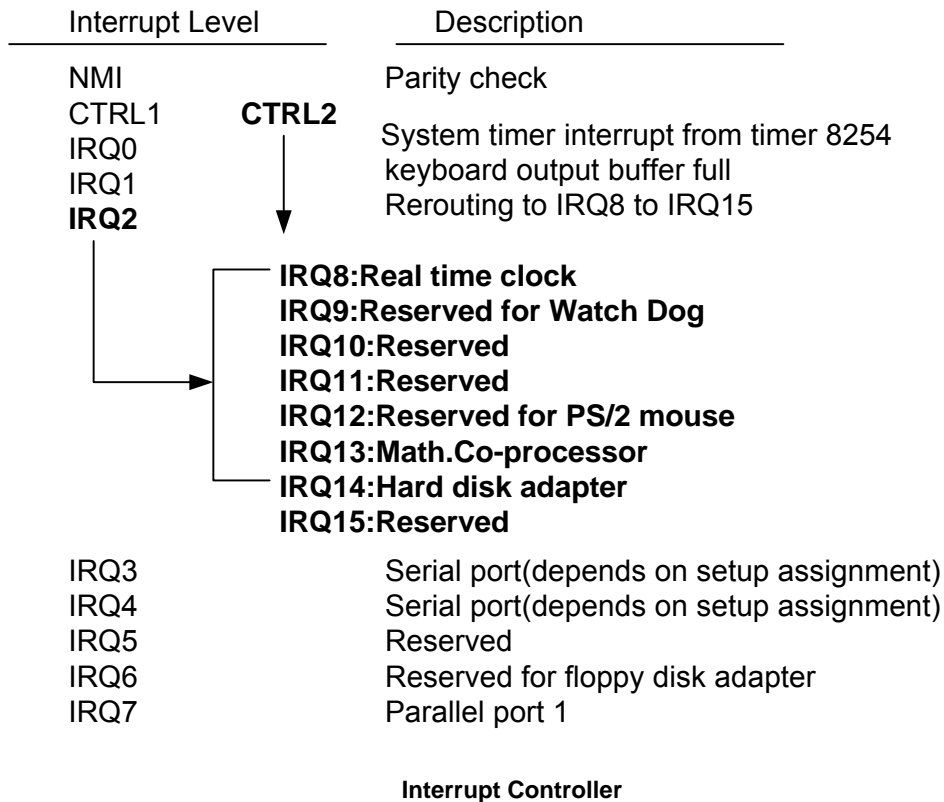
2.3 KEYBOARD CONTROLLER

The 8042 processor is programmed to support the keyboard serial interface. The keyboard controller receives serial data from the keyboard, checks its parity, translates scan codes, and presents it to the system as a byte data in its output buffer. The controller can interrupt the system when data is placed in its output buffer, or wait for the system to poll its status register to determine when data is available. Data can be written to the keyboard by writing data to the output buffer of the keyboard controller. Each byte of data is sent to the keyboard controller in a series with an odd parity bit automatically inserted. The keyboard controller is required to acknowledge all data transmissions. Therefore, another byte of data will not be sent to keyboard controller until acknowledgment is received for the previous byte sent. The "output buffer full" interruption may be used for both send and receive routines.

2.4 INTERRUPT CONTROLLER

The equivalent of two 8259 Programmable Interrupt Controllers (PIC) are included on the AR-B1552 board. They accept requests from peripherals, resolve priorities on pending interrupts in service, issue interrupt requests to the CPU, and provide vectors which are used as acceptance indices by the CPU to determine which interrupt service routine to execute. These two controllers are cascaded with the second controller representing IRQ8 to IRQ15, which is rerouted through IRQ2 on the first controller.

The following is the system information of interrupts levels:



2.4.1 I/O Port Address Map

Hex Range	Device
000-01F	DMA controller 1
020-021	Interrupt controller 1
022-023	Cyrix CS5530
040-04F	Timer 1
050-05F	Timer 2
060-06F	8042 keyboard/controller
070-071	Real-time clock (RTC), non-maskable interrupt (NMI)
080-09F	DMA page registers
0A0-0A1	Interrupt controller 2
0C0-0DF	DMA controller 2
0F0	Clear Math Co-processor
0F1	Reset Math Co-processor
0F8-0FF	Math Co-processor
170-178	Reserved for Fixed disk 1
1F0-1F8	Fixed disk 0
201	Reserved for Game port
208-20A	EMS register 0
218-21A	EMS register 1
278-27F	Parallel printer port (depends on setup assignment)
2E8-2EF	Serial port (depends on setup assignment)
2F8-2FF	Serial port (depends on setup assignment)
300-31F	Prototype card/streaming type adapter
320-33F	Reserved
378-37F	Parallel printer port (depends on setup assignment)
380-38F	SDLC, bisynchronous
3A0-3AF	Bisynchronous
3B0-3BF	Monochrome display and printer port 3 (LPT 3)
3C0-3CF	EGA/VGA adapter
3D0-3DF	Color/graphics monitor adapter
3E8-3EF	Serial port 3 (depends on setup assignment)
3F0-3F7	Reserved for diskette controller
3F8-3FF	Serial port (depends on setup assignment)

I/O Port Address Map

2.4.2 Real-Time Clock and Non-Volatile RAM

The AR-B1552 contains a real-time clock compartment that maintains the date and time in addition to storing configuration information about the computer system. It contains 14 bytes of clock and control registers and 114 bytes of general purpose RAM. Because of the use of CMOS technology, it consumes very little power and can be maintained for long periods of time using an internal Lithium battery. The contents of each byte in the CMOS RAM are listed as follows:

Address	Description
00	Seconds
01	Second alarm
02	Minutes
03	Minute alarm
04	Hours
05	Hour alarm
06	Day of week
07	Date of month
08	Month
09	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown status byte
10	Diskette drive type byte, drive A and B
11	Fixed disk type byte, drive C
12	Fixed disk type byte, drive D
13	Reserved
14	Equipment byte
15	Low base memory byte
16	High base memory byte
17	Low expansion memory byte
18	High expansion memory byte
19-2D	Reserved
2E-2F	2-byte CMOS checksum
30	Low actual expansion memory byte
31	High actual expansion memory byte
32	Date century byte
33	Information flags (set during power on)
34-7F	Reserved for system BIOS

Real-Time Clock & Non-Volatile RAM

2.4.3 Timer

The AR-B1552 provides three programmable timers, each with a timing frequency of 1.19 MHz.

Timer 0 The output of this timer is tied to interrupt request 0. (IRQ 0)

Timer 1 This timer is used to trigger memory refresh cycles.

Timer 2 This timer provides the speaker tone.
Application programs can load different counts into this timer to generate various sound frequencies.

2.5 SERIAL PORT

The ACEs (Asynchronous Communication Elements ACE1 to ACE4) are used to convert parallel data to a serial format on the transmit side and convert serial data to parallel on the receiver side. The serial format, in order of transmission and reception, is a start bit, followed by five to eight data bits, a parity bit (if programmed) and one, 1.5 (in a five-bit format only) or two stop bits(in a 6,7, or 8-bit format). The ACEs are capable of handling divisors of 1 to 65535, and produce a 16x clock for driving the internal transmitter logic.

Provisions are also included to use this 16x clock to drive the receiver logic. Also included in the ACE a completed MODEM control capability, and a processor interrupt system that may be software tailored to the computing time required to handle the communications link.

The following table is a summary of each ACE accessible register

DLAB	Port Address	Register
0	base + 0	Receiver buffer (read)
		Transmitter holding register (write)
0	base + 1	Interrupt enable
X	base + 2	Interrupt identification (read only)
X	base + 3	Line control
X	base + 4	MODEM control
X	base + 5	Line status
X	base + 6	MODEM status
X	base + 7	Scratched register
1	base + 0	Divisor latch (least significant byte)
1	base + 1	Divisor latch (most significant byte)

ACE Accessible Registers

(1) Receiver Buffer Register (RBR)

Bit 0-7: Received data byte (Read Only)

(2) Transmitter Holding Register (THR)

Bit 0-7: Transmitter holding data byte (Write Only)

(3) Interrupt Enable Register (IER)

Bit 0: Enable Received Data Available Interrupt (ERBFI)

Bit 1: Enable Transmitter Holding Empty Interrupt (ETBEI)

Bit 2: Enable Receiver Line Status Interrupt (ELSI)

Bit 3: Enable MODEM Status Interrupt (EDSSI)

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

(4) Interrupt Identification Register (IIR)

Bit 0: "0" if Interrupt Pending

Bit 1: Interrupt ID Bit 0

Bit 2: Interrupt ID Bit 1

Bit 3: Must be 0

Bit 4: Must be 0

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

(5) Line Control Register (LCR)

Bit 0: Word Length Select Bit 0 (WLS0)

Bit 1: Word Length Select Bit 1 (WLS1)

WLS1	WLS0	Word Length
0	0	5 Bits
0	1	6 Bits
1	0	7 Bits
1	1	8 Bits

Bit 2: Number of Stop Bit (STB)

Bit 3: Parity Enable (PEN)

Bit 4: Even Parity Select (EPS)

Bit 5: Stick Parity

Bit 6: Set Break

Bit 7: Divisor Latch Access Bit (DLAB)

(6) MODEM Control Register (MCR)

Bit 0: Data Terminal Ready (DTR)

Bit 1: Request to Send (RTS)

Bit 2: Out 1 (OUT 1)

Bit 3: Out 2 (OUT 2)

Bit 4: Loop

Bit 5: Must be 0

Bit 6: Must be 0

Bit 7: Must be 0

(7) Line Status Register (LSR)

Bit 0: Data Ready (DR)

Bit 1: Overrun Error (OR)

Bit 2: Parity Error (PE)

Bit 3: Framing Error (FE)

Bit 4: Break Interrupt (BI)

Bit 5: Transmitter Holding Register Empty (THRE)

Bit 6: Transmitter Shift Register Empty (TSRE)

Bit 7: Must be 0

(8) MODEM Status Register (MSR)

Bit 0: Delta Clear to Send (DCTS)

Bit 1: Delta Data Set Ready (DDSR)

Bit 2: Training Edge Ring Indicator (TERI)

Bit 3: Delta Receive Line Signal Detect (DSLSD)

Bit 4: Clear to Send (CTS)

Bit 5: Data Set Ready (DSR)

Bit 6: Ring Indicator (RI)

Bit 7: Received Line Signal Detect (RSLD)

(9) Divisor Latch (LS, MS)

	LS	MS
Bit 0:	Bit 0	Bit 8
Bit 1:	Bit 1	Bit 9
Bit 2:	Bit 2	Bit 10
Bit 3:	Bit 3	Bit 11
Bit 4:	Bit 4	Bit 12
Bit 5:	Bit 5	Bit 13
Bit 6:	Bit 6	Bit 14
Bit 7:	Bit 7	Bit 15

Desired Baud Rate	Divisor Used to Generate 16x Clock
300	384
600	192
1200	96
1800	64
2400	48
3600	32
4800	24
9600	12
14400	8
19200	6
28800	4
38400	3
57600	2
115200	1

Serial Port Divisor Latch

2.6 PARALLEL PORT

(1) Register Address

Port Address	Read/Write	Register
base + 0	Write	Output data
base + 0	Read	Input data
base + 1	Read	Printer status buffer
base + 2	Write	Printer control latch

Registers' Address

(2) Printer Interface Logic

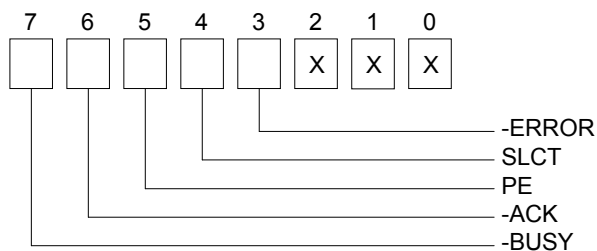
The parallel port of the W83977F-A is for attaching various devices that accept eight bits of parallel data at standard TTL level.

(3) Data Swapper

The system microprocessor can read the contents of the printer's Data Latch through the Data Swapper by reading the Data Swapper address.

(4) Printer Status Buffer

The system microprocessor can read the printer status by reading the address of the Printer Status Buffer. The bit definitions are described as follows:



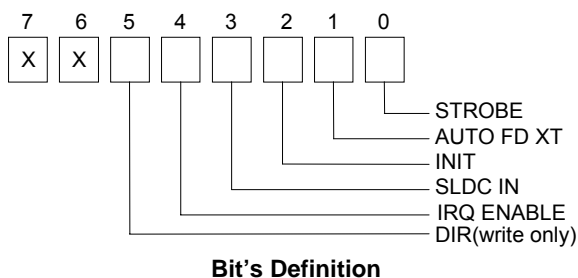
Printer Status Buffer

NOTE: X presents not used.

- Bit 7: This signal may become active during data entry, when the printer is off-line during printing, or when the print head is changing position or in an error state. When Bit 7 is active, the printer is busy and cannot accept data.
- Bit 6: This bit represents the current state of the printer's ACK signal. A0 means the printer has received the character and is ready to accept another. Normally, this signal will be active for approximately 5 microseconds before receiving a BUSY message stops.
- Bit 5: A1 means the printer has detected the end of the paper.
- Bit 4: A1 means the printer is selected.
- Bit 3: A0 means the printer has encountered an error condition.

(5) Printer Control Latch & Printer Control Swapper

The system microprocessor can read the contents of the printer control latch by reading the address of printer control swapper. Bit definitions are as follows:



NOTE: X presents not used.

- Direction control bit. When logic 1, the output buffers in the parallel port are disabled allowing data driven from external sources to be read; when logic 0, they work as a printer port. This bit is write only.
- Bit 5: A1 in this position allows an interrupt to occur when ACK changes from low state to high state.
- Bit 4: A1 in this bit position selects the printer.
- Bit 3: A1 in this bit position selects the printer.
- Bit 2: A0 starts the printer (50 microseconds pulse, minimum).
- Bit 1: A1 causes the printer to line-feed after a line is printed.
- Bit 0: A0.5 microsecond minimum highly active pulse clocks data into the printer. Valid data must be present for a minimum of 0.5 microseconds before and after the strobe pulse.

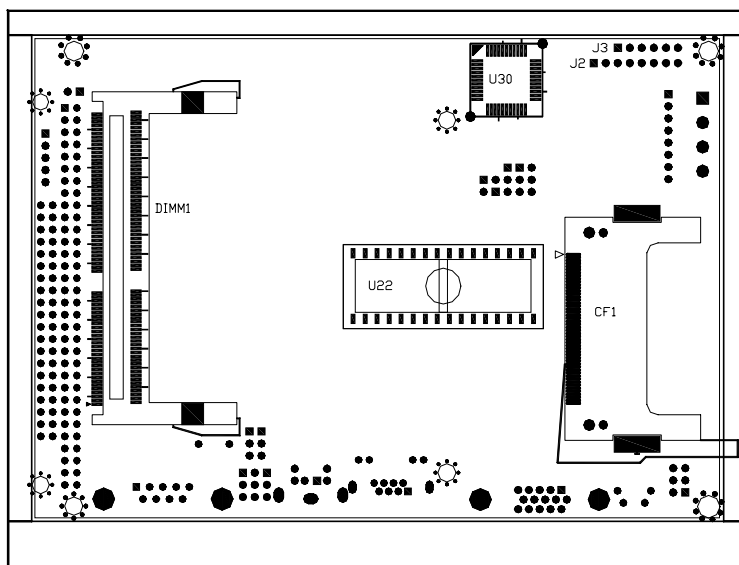
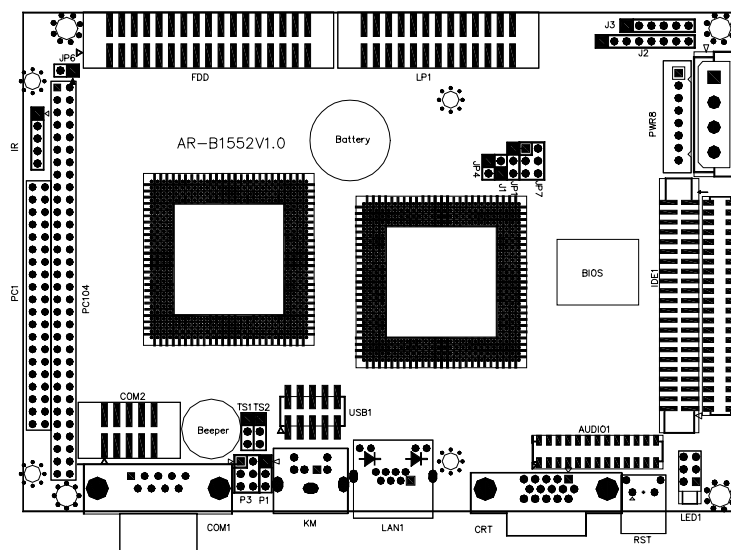
3. SETTING UP THE SYSTEM

This section describes pin assignments for the system's external connectors and the jumper settings.

- Overview
- System Setting

3.1 OVERVIEW

AR-B1552 Pentium Grade Firewall CPU Board with Ethernet, DOM. This section provides the hardware's jumper settings, the connectors' locations, and the pin assignments.



External System Location

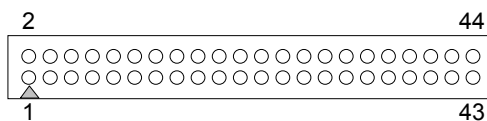
3.2 SYSTEM SETTING

3.2.1 SDRAM SOCKET 144 PIN

3.2.2 Hard Disk Connector

A 44-pin header type connector (CN4) is provided to interface with up to two embedded hard disk drives (IDE AT bus). This interface through a 44-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 44-pin connector.

- IDE1

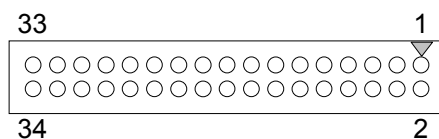


- CF1

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	IDEDREQ	22	GROUND
23	-IOW A	24	GROUND
25	-IOR A	26	GROUND
27	IDEIORDYA	28	GROUND
29	-DACKA	30	GROUND
31	AINT	32	GROUND
33	SA 1	34	Not Used
35	SA 0	36	SA 2
37	CS 0	38	CS 1
39	HD LED A	40	GROUND
41	VCC	42	VCC
43	GROUND	44	Not Used

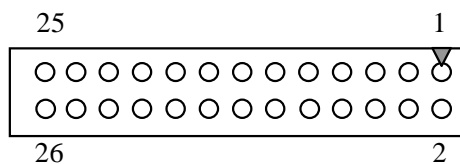
Hard Disk (IDE) Connector

3.2.3 FDD Port Connector



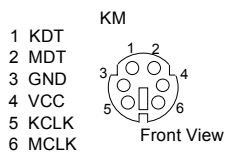
Pin	Signal	Pin	Signal
1-33(odd)	GROUND	18	-DIRECTION
2	-REDUCED WRITE CURRENT	20	-STEP OUTPUT PULSE
4	NOT USED	22	-WRITE DATA
6	NOT USED	24	-WRITE ENABLE
8	-INDEX	26	-TRACK 0
10	-MOTOR ENABLE A	28	-WRITE PROTECT
12	-DRIVE SELECT B	30	-READ DATA
14	-DRIVE SELECT A	32	-SIDE 1 SELECT
16	-MOTOR ENABLE B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

3.2.4 Parallel Port Connector (LPT)



CN8	DB-25	Signal	CN8	DB-25	Signal
1	1	-Strobe	2	14	-Auto Form Feed
3	2	Data 0	4	15	-Error
5	3	Data 1	6	16	-Initialize
7	4	Data 2	8	17	-Printer Select In
9	5	Data 3	10	18	Ground
11	6	Data 4	12	19	Ground
13	7	Data 5	14	20	Ground
15	8	Data 6	16	21	Ground
17	9	Data 7	18	22	Ground
19	10	Acknowledge	20	23	Ground
21	11	Busy	22	24	Ground
23	12	Paper	24	25	Ground
25	13	Printer Select	26	--	No Used

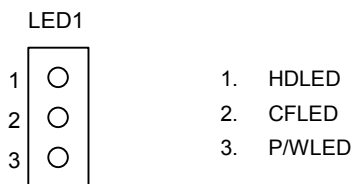
3.2.5 Keyboard & Mouse Connector (KM)



3.2.6 USB Connector (USB1)

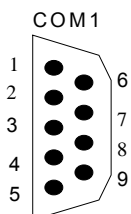


3.2.7 LED Header (LED1)

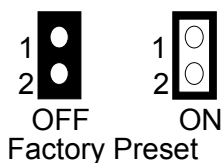
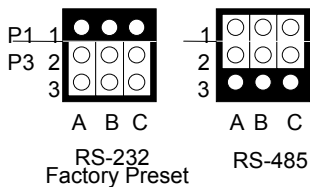


3.2.8 COM1

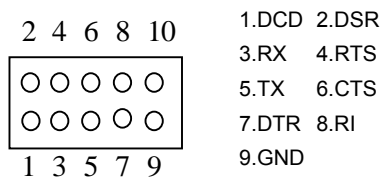
--- Used RS232 & RS485



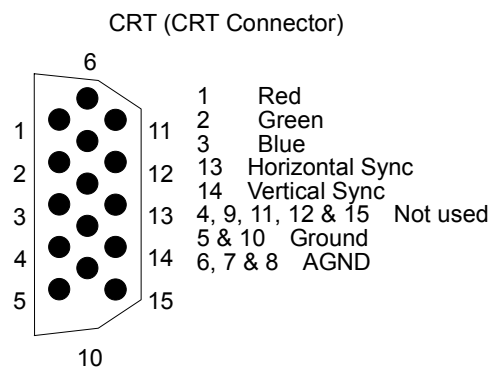
--- RS485 Terminator Select (JP6)



3.2.9 COM2



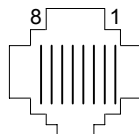
3.2.10 CRT Connector (CRT)



3.2.11 NETWORK Setting

The RJ-45 header is the standard network header. The following table is the pin assignment.

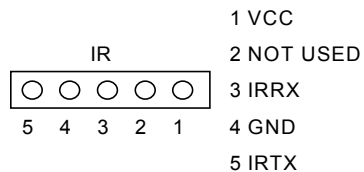
--- RJ-45 Connector (LAN1)



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

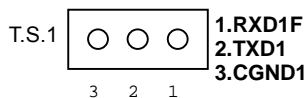
3.2.12 IrDA Header (IR)

The Infra-red Header pins assignments are as follows:

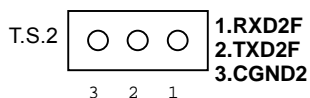


3.2.13 Touch Screen

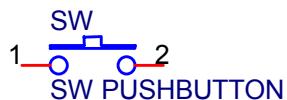
--- TS1



--- TS2

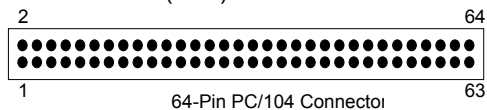


3.2.14 Reset Button (RST)



3.2.15 PC104 CONNECTOR

(1) 64 Pin PC/104 Connector Bus A & B (PC2)



(2) 40 Pin PC/104 Connector Bus A & B (PC1)

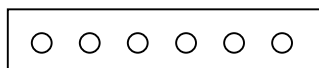


3.2.16 AUDIO HEADER



PIN	FUNCTION	PIN	FUNCTION
1	CDINL	14	NC
2	LININL	15	GNDAUD
3	CDINR	16	GND
4	LININR	17	NC
5	VCC	18	NC
6	NC	19	NC
7	LINOUTL	20	NC
8	MICIN	21	NC
9	LINOUTR	22	NC
10	PCBEEP	23	NC
11	GNDAUD	24	NC
12	GND	25	GNDAUD
13	NC	26	GND

3.2.17 TV-OUT CONNECTOR (J3)

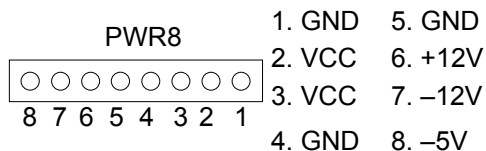
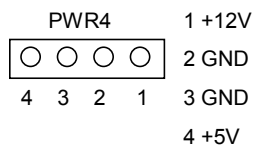


1 2 3 4 5 6

Composite Video and S-video

PIN	ASSIGNMENT
1	LUMINANCE
2	CHROMINANCE
3	COMPOSITE
4	GND
5	GND
6	GND

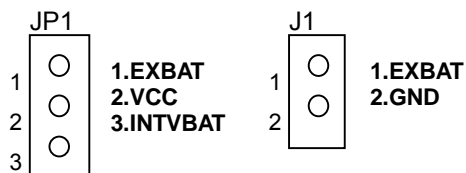
3.2.18 POWER CONNECTOR (PWR4 & PWR8)



3.2.19 BATTERY SELECT (J1 & JP1)

Internal BAT: JP1 2-3 ON (FACTORY PRESET)

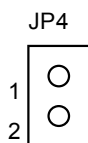
External BAT: JP1 1-2 ON



3.2.20 DOC SOCKET (U22)

DOC:32 Pin Disk-on chip socket

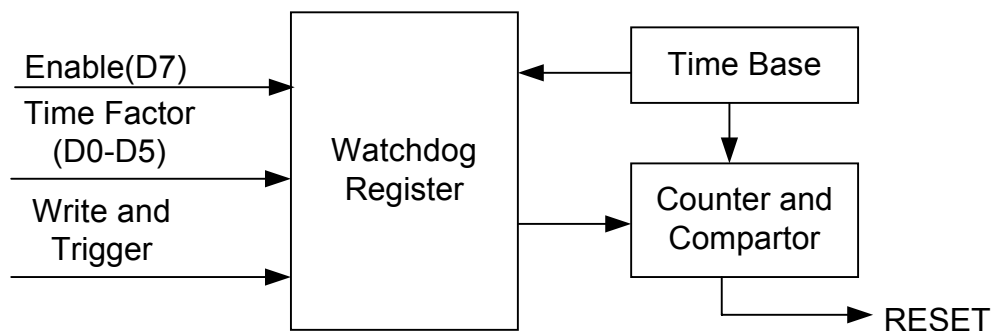
3.2.21 DOC ADDRESS SELECT (JP4)



JUMPER	ADDRESS
OFF (FACTORY PRESET)	C8000
ON	C0000

3.3 WATCHDOG TIMER

This section describes how to use the Watchdog Timer disabled, enabled, and trigger. The AR-B1552 is equipped with a programmable time-out period watchdog timer that occupies I/O post 214H. User can use the program to enable the watchdog timer. Once you enable the watchdog timer, the program should trigger it every time before it times out. And because of the system hang up, your program fails to trigger and disable the timer before it times out. It will generate a reset signal to reset the system. The time-out period can be programmed to be 0 to 63 seconds.



Watchdog Block Diagram

3.3.1 Watchdog Timer Setting

The watchdog timer is a circuit that maybe be used from your program software to detect crashes or hang-ups. 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, it will be set to zero and start to count again. If your program fails to trigger the watchdog timer before time 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 follow:

```

C:>debug
-o 214 C8H
  Generally, watchdog function would
  reset system after 8 seconds
-o 214 0H
  Disable watchdog function
  
```

```

C:>debug
-o 214 88H
  Generally, watchdog function would
  generate IRQ 9 after 8 seconds
-o 214 0H
  Disable watchdog function
  
```


3.3.2 Watchdog Timer Trigger

After you enable the watchdog timer, your program must write the same factor as enabling to the watchdog register at least once every time-out period to its previous setting. 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 before the new time-out period in next trigger.

4. INSTALLATION

This chapter describes the installation procedure. The following topics are covered:

- Overview
- Utility CD-ROM

4.1 OVERVIEW

This chapter provides information for you to set up a working system based on the AR-B1552 CPU board. Please carefully read the details of the CPU board's hardware descriptions before installation. Pay special attention to the jumper settings, switch settings and cable connections.

Follow steps listed below for proper installation:

- Step 1:** Read the CPU board's hardware description in this manual.
- Step 2 :** Set jumpers.
- Step 3 :** Make sure that the power supply connected to your AR-B1552 CPU board is turned off.
- Step 4 :** Connect all necessary cables. Make sure that the HDC; serial and parallel cables are connected to pin 1 of the related connector (not upside down).
- Step 5:** Connect the hard disk flat cables from the CPU board to the drives. Connect a power source to drive.
- Step 6:** Plug the keyboard into the keyboard connector.
- Step 7:** Turn on the power.
- Step 8:** Configure your system with the BIOS Setup program (section 5) then re-boot your system.
- Step 9:** If the CPU board does not work, turn off the power and read the hardware description carefully again.
- Step 10:** If the CPU board still does not perform properly, return the board to your dealer for immediate service.

4.2 UTILITY CD-ROM

The AR-B1552 provides one utility CD-ROM.

4.2.1 Driver Installation

The AR-B1552 provides LAN function drivers for the WIN95, WIN98, WIN2000, WINCE, LINUX, and NT. The driver can auto-setup in the specified mode. The user must first decompress the compressed file.

The 1st step: Decompress the zip files included in the diskettes to your hard disk.

The 2nd step: Execute the corresponding files to setup the system.

The files list and descriptions are as follow:

Files	Descriptions
README.TXT	
GEODEW~1 <DIR>	GEODE win9x: Includes auto-execution program that will setup/install Geode Media drivers in Windows 9X environment.
WINCED~1 <DIR>	WinCE driver: Includes the GxM drivers needed in Win CE environment.
NT4~1 0DR <DIR>	NT4.0 driver: Includes the GxM drivers needed in NT4.0 environment.
LINUXD~1 <DIR>	Linux driver: Includes the GxM drivers needed in Linux environment.
WIN200~1 <DIR>	Win2000 driver: Includes the GxM drivers needed in Win2000 Environment.
8139SW.EXE	An auto extract file that includes: 1. Device drivers of RTL8139A for various operating systems 2. LAN Configuration EEPROM programmer 3. Diagnostic and modification program for RTL8139

5. BIOS CONSOLE

This chapter describes the AR-B1552 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
- BIOS Features Setup
- Chipset Features Set
- PNP/PCI Configuration
- Load Default Setting
- Integrated Peripherals
- Password Setting
- IDE HDD Auto Detection
- BIOS Exit

5.1 BIOS SETUP OVERVIEW

Once you enter Award BIOS CMOS Setup Utility by holding the “Delete” button during boot-up, the Main Menu will appear on the screen. The Main Menu allows you to select from various setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.

ROM PCI/ISA BIOS (2A434AVF)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.

STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
PNP/PCI CONFIGURATION	IDE HDD AUTO DETECTION
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
Esc: Quit	↑↓→←: Select Item
F10: Save & Exit Setup	(Shift) F2: Change Color
Time, Date, Hard Disk Type...	

BIOS Setup Main Menu

- CAUTION:**
1. AR-B1552 BIOS the factory-default setting is used to the <LOAD BIOS DEFAULTS> 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 <LOAD SETUP DEFAULTS> to boot the operation system, this option will reduce the performance of the system. Acrosser recommends choosing the <LOAD BIOS DEFAULTS> 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.

```

ROM PCI/ISA BIOS (2A434AVF)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.
Date (mm:dd:yyyy): Tue, Mar 16, 2000
Time (hh:mm:ss): 16:39:30
<type>
Drive C : 0 ( 0Mb) 0 0 0 0 0 AUTO
Drive D : 0 ( 0Mb) 0 0 0 0 0 AUTO

Drive A: None
Drive B: None
Video: EGA/VGA
Halt On: All, But Keyboard

Base Memory: 640K
Extended Memory: 29184K
Other Memory: 384K

Total Memory: 30208K

Esc: Quit      ↑↓→←: Select Item    PU/PD/+/-: Modify
F1: Help      (Shift) F2: Change 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 by choosing the HDD type, which should be noted directly on the HDD.

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.

Video

This option selects the type of adapter used for the primary system monitor that must match your video display card and monitor. Although secondary monitors are supported, you do not have to select the type in Setup.

You have two ways to boot up the system:

1. When VGA as primary and monochrome as secondary, the selection of the video type is "VGA Mode".
2. When monochrome as primary and VGA as secondary, the selection of the video type is "Monochrome Mode".

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, or PGA monitor adapters
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

Halt On

This option determines whether the computer will stop if an error is detected during power up.

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

5.3 BIOS FEATURES SETUP

The <BIOS FEATURES 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 for optimal performance.

It is suggested that you leave the settings on the factory default unless you are well versed in BIOS features.

ROM PCI/ISA BIOS (2A434AVF)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC.

CPU Internal Cache : Enabled	Video BIOS Shadow : Enabled
Quick Power On Self Test : Enabled	
Boot Sequence : C, CDROM,A	
Boot Up NumLock Status : On	Cyrix 6x86/MII CPUID : Enabled
Boot Up System Speed : High	
Gate A20 Option : Fast	
Memory Parity Check : Disabled	
Typematic Rate Setting : Enabled	
Typematic Rate (Chars/Sec) : 30	
Typematic Delay (Msec) : 250	
Security Option : Setup	Esc: Quit ↑↓→←: Select Item
PCI/VGA Palette Snoop : Disabled	F1: Help PU/PD/+/-: Modify
	F5: Old Values (Shift) F2: Change Color
	F6: Load BIOS Defaults
	F7: Load Setup Defaults

BIOS Features Setup

CPU Internal Cache/External Cache

The two functions speed up memory access. However, it depends on CPU/chipset design. If your CPU is without Internal cache then this item <CPU Internal Cache> will not be show. The AR-B 9625's GXM Cyrix CPU has an internal cache and will automatically be set to <enabled>.

Quick Power On Self Test

This option speeds up Power On Self Test (POST) after you power on the computer. If it is set to Enable, BIOS will shorten or skip some items' checks during POST.

Boot Sequence

The option determines which drive computer searches first for the disk operating system.

Boot Up NumLock Status

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

Boot Up System Speed

This item is used to choose the boot-up speed of system. The choices provided are <LOW> and <HIGH>.

Gate A20 Option

This item is chosen as <Normal>, the A20 signal is controlled by keyboard controller or chipset hardware. The selection is "Fast" means the A20 signal is controlled by Port 92 or a chipset specific method.

Memory Parity Check

An approach that generates and checks parity on each memory transfer and provides an interrupt if an error is found. This item is to <Disabled> or <Enabled> this function.

Typematic Rate Setting

To enable typematic rate and typematic delay programming. If you disable the typematic rate and typematic delay programming, the system BIOS will use the default value of the keyboard controls these 2 items and the default.

Typematic Rate (Chars/Sec)

Typematic Rate sets the rate at which characters on the screen repeat when a key is pressed and held down. The settings are 6, 8, 10, 12, 15, 20, 24, or 30 characters per second.

Typematic Delay (Msec)

The number selected indicates the time period between two identical characters appearing on screen.

Security Option

The option allows the user to limit access to the System and Setup, or just to Setup.

System	The system will not boot and accesses to Setup will be denied if the correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

Note: To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

PCI/VGA Palette Snoop

This option must be set to Enabled if any ISA adapter card installed in the computer requires VGA palette snooping.

Video BIOS Shadow

ROM Shadow copies Video BIOS code from slower ROM to faster RAM. Video BIOS can then execute from RAM. This makes your system faster.

Cyrix 6x86/MII CPUID

The option is to determine whether or not to use the function of controlling or accessing the Cyrix 6x86/MII CPUID.

5.4 CHIPSET FEATURES SETUP

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

ROM PCI/ISA BIOS (2A434AVF)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

SDRAM CAS latency Time : 3 T SDRAM Clock Ratio Div By : 4 16-bit I/O Recovery (CLK) : 5 8-bit I/O Recovery (CLK) : 5	Esc: Quit ↑↓→←: Select Item F1: Help PU/PD/+/-: Modify F5: Old Values (Shift) F2: Color F6: Load BIOS Defaults F7: Load Setup Defaults
---	--

Chipset Features Setup**SDRAM CAS latency Time**

This item is to setup the SDRAM CAS# signal latency time, the smaller value you set it, the higher efficiency you will get.

SDRAM Clock Ratio Div By

This item is to determine the SDRAM Clock Ratio.

16-Bit I/O Cycle Recovery Time**8-Bit I/O Cycle Recovery Time**

These options specify the length of the delay (in BUSCLK) inserted between consecutive 8-bit/16-bit I/O operations.

5.5 PNP/PCI CONFIGURATION

ROM PCI/ISA BIOS (2A434AVF)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

PNP OS Installed : NO Resources Controlled By : Auto Reset Configuration Rate : Disabled	PCI IRQ Activated By : Level
Esc: Quit ↑↓→←: Select Item F1: Help PU/PD/+/-: Modify F5: Old Values (Shift) F2: Color F6: Load BIOS Defaults F7: Load Setup Defaults	

PNP/PCI CONFIGURATION

PNP OS Installed

This item is to choose whether or not installing the PNP (Plug & Play) operation system.

Resources Controlled By

The available choices are <Auto>&<Manual>. To choose <Auto>the resources will be under the control of system automatically. If <Manual> is chosen, the following items will be listed.

<IRQ (3,4,5,7,9,10,11,12,14,15)> Setting these items one by one will clear up the conflict between NON-PNP ISA extension cards and PNP system.

<DMA(0,1,3,5,6,7)> These items are used for the PNP ISA(PCI) cards or NON-PNP old ISA cards which use DMA channel to enable them work normally.

Reset Configuration Data

This item is used to <enable> the function of Reset Configuration Data or not.

PCI IRQ Activated By

This item is to determine the active mode.

5.6 LOAD DEFAULT SETTING

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

5.6.1 Load BIOS Defaults

User can load the optimal default settings for the BIOS. The <LOAD BIOS DEFAULTS> uses best-case values that should optimize system performance. If CMOS RAM is corrupted, the optimal settings are loaded automatically.

Load high performance settings (Y/N)?

5.6.2 Load Setup Defaults

User can load the <LOAD SETUP DEFAULTS> 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)?

5.7 INTEGRATED PERIPHERALS

This section is designed to configure the peripheral features.

ROM PCI/ISA BIOS (2A434AVF)			
INTEGRATED PERIPHERALS			
AWARD SOFTWARE, INC.			
IDE HDD Block Mode	: Enabled		
Primary IDE Channel	: Enabled		
Master Drive PIO Mode	: Auto		
Slave Drive PIO Mode	: Auto		
IDE Primary Master UDMA	: Disabled		
IDE Primary Slave UDMA	: Disabled		
KBC input clock	: 8 MHz		
Onboard Serial Port 1	: 3F8/IRQ4	Multiple Monitor Support	: No Onboard
Onboard Serial Port 2	: 2F8/IRQ3	Video Memory Size	: 2.5M
Onboard IR Controller	: Disabled		
Onboard Parallel Port	378/IRQ7	Esc: Quit	↑↓→←: Select Item
Parallel Port Mode	SPP	F1: Help	PU/PD/+/-: Modify
		F5: Old Values	(Shift) F2: Color
		F6: Load BIOS Defaults	
		F7: Load Setup Defaults	

Integrated Peripherals

IDE HDD Block Mode

This option allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive (HDD).

Enabled	IDE controller uses block mode.
Disabled	IDE controller uses standard mode.

IDE PIO

IDE hard drive controllers can support up to two separate hard drives. These drives have a master/slave relationship, which is determined by the cabling configuration used to attach them to the controller. Your system supports one IDE controller – a primary and a secondary – so you have the ability to install up to four separate hard disks.

PIO means Programmed Input/Output. Rather than have the BIOS issue a series of commands to affect a transfer to or from the disk drive, PIO allows the BIOS to tell the controller what it wants and then let the controller and the CPU perform the complete task by them. This is simpler and more efficient (and faster). Your system supports five modes, numbered from 0 to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

KBC input clock

This item it to chose the input clock of Keyboard Controller

OnBoard Serial Port 1 & 2

This options are used to select the port address of the on-board serial port A. The options are 3F8H, 2F8H, 3E8H, 2E8H, Auto and Disable. Port 1 is COM A, Port 2 is Com D and so on. Port four can be set to be IrDA (Choose Auto) if the IrDA device has been connected.

OnBoard Parallel Port

This option is used to select the port address of the on-board parallel port. The options are 378H, 278H, 3BCH, and Disabled.

Parallel Port Mode

This option specifies the parallel port Mode. The settings are Printer or Extended (Bi-direction).

Multiple Monitor Support

This is to determine the highest priority that the monitor supports. <PCI First> is the default setting. The other two choices are <No Onboard> and <M/B First>.

5.8 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.

5.8.1 Setting Password

Select the appropriate password icon 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 is completed. The next time the system boots, the prompt for the password function is present and is enabled.

Enter new supervisor password:

5.8.2 Password Checking

The password check option is enabled in Advanced Setup by choosing either **Always** (the password prompt appears every time the system is powered on) or **Setup** (the password prompt appears only when BIOS is run). The password is stored in CMOS RAM. User can enter a password by typing with the keyboard. Enter a 1-6 character password. The password does not appear on the screen when typed. Make sure you write it down.

5.9 IDE HDD AUTO DETECTION

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

5.10 BIOS EXIT

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

5.10.1 Save & Exit Setup

This item set in the <Standard CMOS Setup>, <BIOS Features Setup>, <Chipset Features Setup>, <Power Management Setup>, <Integrated Peripherals> and the new password (if it has been changed) will be stored in the CMOS. The CMOS checksum is calculated and written into the CMOS.

As you select this function, the following message will appear at the center of the screen to assist you in saving data to CMOS and Exit the Setup.

Save current settings and exit (Y/N) ?

5.10.2 Exit Without Saving

When you select this option, the following message will appear at the center of the screen to help to Abandon all Data and Exit Setup.

Quit without saving (Y/N) ?

Windows Installation Notice:

1. While AR-B1552/9459 does not have floppy disk function, the proper way to setup the Windows system is to copy all the drivers needed to your hard disk or CD-ROM and to execute them from the related devices.
2. Please refer to BIOS setup section in this manual for booting from CD-ROM
4. If you find any difficulty in the operating systems installation, please contact our technical support for further assistance.

Note: If the content in Setting is inconsistent with CD-ROM. Please refer to the Setting as priority.