

## **Chapter 1**

### **INTRODUCTION**

The MICRO ATX AL12 mainboard is a high-performance personal computer mainboard. This mainboard supports Intel® Pentium® processor/Pentium® processor with MMX™ technology, AMD® K5/K6/K6-2, and Cyrix® 6x86/6x86L/6x86MX/MII processors. This mainboard combines leading edge AGP ATI® 3D 128VR technology in graphics and Creative® ES1373 PCI Enhanced technology in audio. The mainboard also supports three 32-bit PCI (Peripheral Component Interconnect) Local Bus standard slots.

The mainboard uses the highly integrated Aladdin® 5 chipset to support the PCI/ISA and Green standards, and to provide the Host/AGP bridge. The Aladdin® 5 chipset integrates all system control functions such as ACPI (Advanced Configuration and Power Interface). The ACPI provides more Energy Saving Features for the OSPM(OS Direct Power Management) function. The Aladdin® 5 chipset also improves the IDE transfer rate by supporting Ultra DMA/33 IDE that transfer data at the rate of 33MB/s.

The mainboard also supports the Hardware Monitor Controller as an optional function. This function includes: CPU/chassis/power fan control, CPU temperature detect and protect, and system voltage detect.

## **1.1 Mainboard Features**

### **CPU**

- Socket 7 supports Intel® Pentium® processor/Pentium® processor with MMX™ technology.
- Cyrix® 6x86/6x86L/6x86MX/MII are supported.
- AMD® K6/K6-2/K6-3 processors are supported.

### **Chipset**

- Aladdin® 5 M1541/M1543C chipset.

### **FSB (Front Side Bus)**

- 100/95/83.3/75/66/60MHz clocks are supported.

### **Cache Memory**

- Supports 512K or 1MB Pipelined Burst cache memory.

### **Switching Regulator**

- Provides CPU with voltage ranging from 1.3V to 3.5V
- Supports VI/O 3.45 for AMD K6 300 processor

### **Main Memory**

- Supports four memory banks using two 168-pin unbuffered DIMM.
- Supports a maximum memory size of 256MB.
- Supports 3.3v Extended Data Output (EDO) and SDRAM DIMM.

### **Slots**

- Three 32-bit Master PCI Bus slots and one 16-bit ISA bus slots. (wherein one PCI/ISA is shared)
- Supports 3.3v/5v PCI bus Interface.

### **On-Board IDE**

- An IDE controller on the Aladdin® M1543C PCI Chipset provides IDE HDD/CD-ROM with PIO, DMA and Ultra DMA/33 operation modes.
- Connect up to four IDE devices.

**Video**

- ATI® 3D 128 VR
  - Running on AGP BUS.
  - Onboard 8MB SDRAM.
  - 3D Acceleration.

**Audio**

- Creative® ES1373
  - Running on PCI BUS.
  - 64 Voice and AC3 Capable
  - Support Direct Sound and Direct Sound 3D
  - AC97' Compliant

**On-Board Peripherals**

- On-Board Peripherals include:
  - 1 floppy port supports 2 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes.
  - 1 serial ports (COMA)
  - 1 parallel port supports SPP/EPP/ECP mode
  - 2 USB ports
  - 1 IrDA connector for SIR/FIR.
  - 1 VGA port

**BIOS**

- The mainboard BIOS provides “Plug & Play” BIOS which detects the peripheral devices and expansion cards of the board automatically.
- The mainboard provides a Desktop Management Interface(DMI) function which records your mainboard specifications.

**Dimension**

- Micro-ATX form factor : 24.4cm(L) x 24.5cm(W) x 4 layers PCB

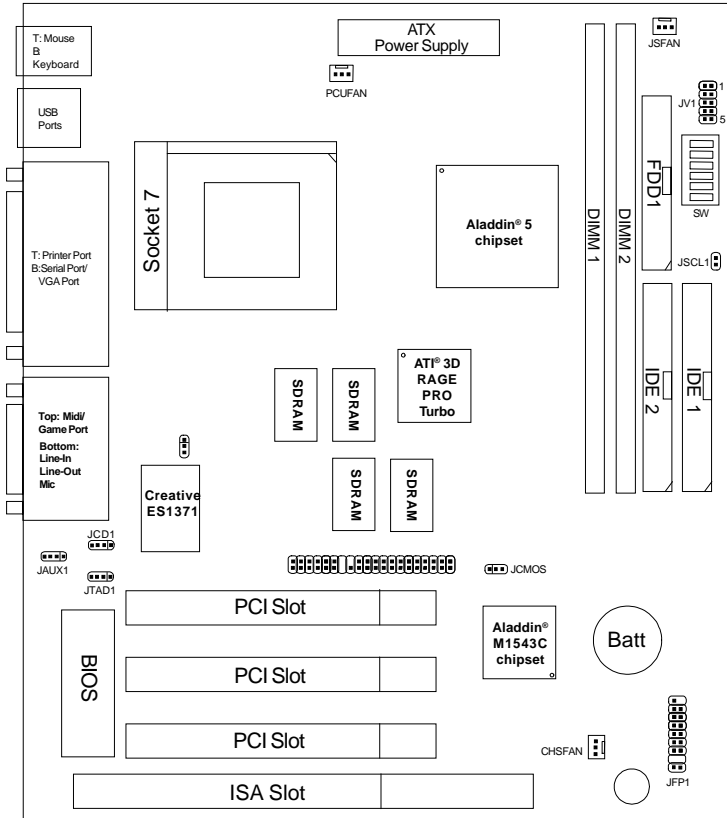
**Mounting**

- 7 mounting holes.

**Remote Control**

- Meet ACPI specifications.
- Power ON/OFF switch connector on-board.
- Soft Power-Off.
- Support modem ring wake-up .
- Support alarm wake-up.
- Support LAN wake-up.

# 1.2 Mainboard Layout



MS-5185 MICRO ATX AL12 Mainboard

## Chapter 2

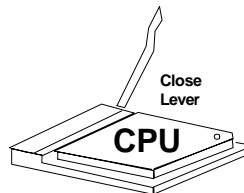
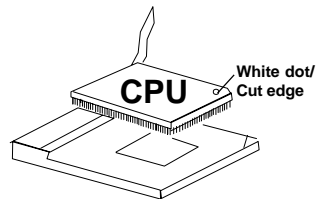
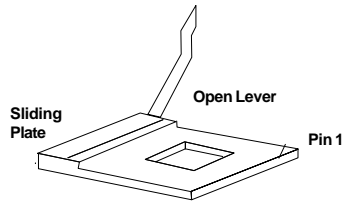
### HARDWARE INSTALLATION

#### 2.1 Central Processing Unit: CPU

The MICRO ATX AL12 mainboard operates with Intel® Pentium® processor/Pentium® processor with MMX™ technology, AMD® K5/K6/K6-2, and Cyrix® 6x86/6x86L/6x86MX/MII processors. It could operate with 2.0V to 3.5V processors. The mainboard provides a 321-pin ZIF Socket 7 for easy CPU installation, a DIP switch (SW1) to set the proper speed for the CPU and (JV1) for setting the CPU voltage. It is recommended that the processor should have a cooling fan attached to prevent from overheating.

##### 2.1-1 CPU Installation Procedure

1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.
2. Locate Pin 1 in the socket and look for the white dot or cut edge in the CPU. Match Pin 1 with the white dot/cut edge. Then, insert the CPU. It should insert easily.
3. Press the lever down to complete the installation.



**2.1-2 CPU Core Speed Derivation Procedure**

1. The DIP Switch SW1 (4, 5, & 6) is used to adjust the CPU clock frequency.

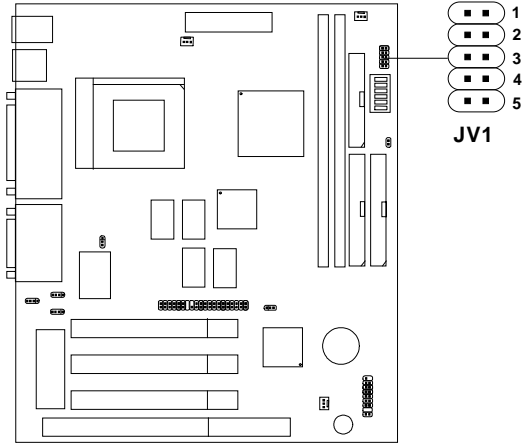
SW1			CPU
4	5	6	Clock
OFF	OFF	OFF	100MHz
ON	OFF	OFF	95MHz
OFF	ON	OFF	83MHz
OFF	OFF	ON	75MHz
OFF	ON	ON	66MHz
ON	ON	ON	60MHz
ON	OFF	ON	68MHz

2. The DIP Switch SW1 (1, 2, and 3) is used to set the Core/Bus (Fraction) ratio of the CPU. The actual core speed of the CPU is the Host Clock Frequency multiplied by the Core/Bus ratio. For example:

**If**    CPU Clock            =    66MHz  
       Core/Bus ratio        =    3/2  
**then** CPU core speed    =    Host Clock x Core/Bus ratio  
   =    66MHz x 3/2  
   =    100MHz

SW1			CPU
1	2	3	Core/Bus Ratio
OFF	OFF	ON	5.5x
OFF	ON	ON	5x
ON	ON	ON	4.5x
ON	OFF	ON	4x
OFF	OFF	OFF	3.5x
OFF	ON	OFF	3x
ON	ON	OFF	2.5x
ON	OFF	OFF	2x

**2.1-3 CPU Voltage Setting: JV1**



<b>V I/O</b>	<b>Vcore</b>	<b>JV1</b>	<b>V I/O</b>	<b>Vcore</b>	<b>JV1</b>
3.4	3.4		3.4	2.8	
3.4	3.3		3.4	2.3	
3.4	3.2		3.4	2.2	
3.4	2.9				



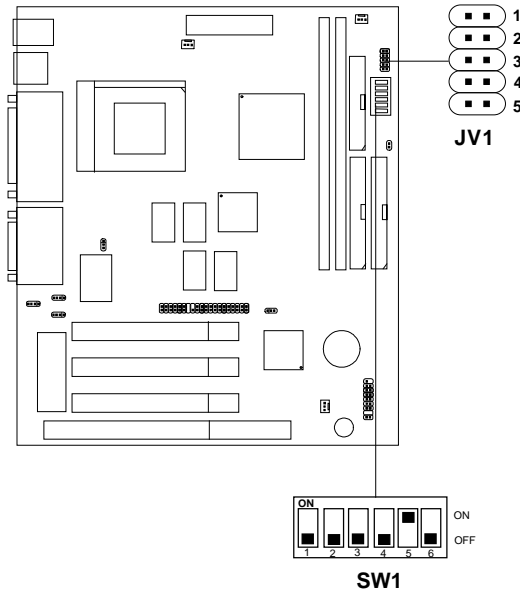
**Other CPU Voltage Setting**

1	2	3	4	5	V/I/O	VCore
OFF	OFF	OFF	OFF	ON	3.45	1.3
ON	OFF	OFF	OFF	ON	3.45	1.35
OFF	ON	OFF	OFF	ON	3.45	1.4
ON	ON	OFF	OFF	ON	3.45	1.45
OFF	OFF	ON	OFF	ON	3.45	1.5
ON	OFF	ON	OFF	ON	3.45	1.55
OFF	ON	ON	OFF	ON	3.45	1.6
ON	ON	ON	OFF	ON	3.45	1.65
OFF	OFF	OFF	ON	ON	3.45	1.7
ON	OFF	OFF	ON	ON	3.45	1.75
OFF	ON	OFF	ON	ON	3.45	1.8
ON	ON	OFF	ON	ON	3.45	1.85
OFF	OFF	ON	ON	ON	3.45	1.9
ON	OFF	ON	ON	ON	3.45	1.95
ON	ON	ON	ON	ON	3.45	2.0
ON	OFF	OFF	OFF	OFF	3.45	2.1
OFF	ON	OFF	OFF	OFF	3.45	2.2
ON	ON	OFF	OFF	OFF	3.45	2.3
OFF	OFF	ON	OFF	OFF	3.45	2.4
ON	OFF	ON	OFF	OFF	3.45	2.5
OFF	ON	ON	OFF	OFF	3.45	2.6
ON	ON	ON	OFF	OFF	3.45	2.7
OFF	OFF	OFF	ON	OFF	3.45	2.8
ON	OFF	OFF	ON	OFF	3.45	2.9
OFF	ON	OFF	ON	OFF	3.45	3.0
ON	ON	OFF	ON	OFF	3.45	3.1
OFF	OFF	ON	ON	OFF	3.45	3.2
ON	OFF	ON	ON	OFF	3.45	3.3
OFF	ON	ON	ON	OFF	3.45	3.4
ON	ON	ON	ON	OFF	3.45	3.5

**2.1-3 CPU Speed and Voltage Setting: SW1 and JV1**





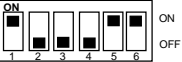
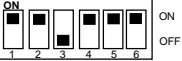

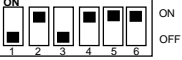

To set the proper speed and voltage of the CPU, you must know the specifications of your CPU (*always ask the vendor for CPU specifications*).

Then refer to **Table 2.1 (Intel® Processor)**, **Table 2.2 (Cyrrix® Processor)**, and **Table 2.3 (AMD® Processor)** for proper setting.

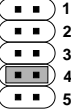


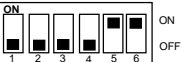


**Table 2.1 Intel® Processor**

**a. Intel® Pentium® Processor**

CPU Type	CPU Voltage			CPU Speed	
	V/I/O	Vcore	JV1	SW1	
90 MHz	3.38				
100 MHz	3.52 				
120 MHz					
133 MHz					
150 MHz					
166 MHz					
180 MHz					
200 MHz					

**b. Intel® Pentium® Processor with MMX™ Technology**

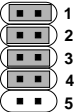



166 MHz	3.3	2.8			
200 MHz					
233 MHz					

**Note:** In case, you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.

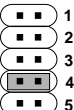
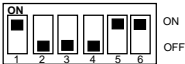

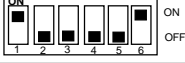
**Table 2.2 Cyrix® Processor**

Cyrix® 6x86 processor uses PR to rate the speed of their processors based on Intel® Pentium® processor core speed. For example, PR150 (120MHz) has 150MHz core speed of Intel® Pentium® processor, but it has 120MHz core speed in Cyrix® processor. Cyrix® 6x86 processor should always use a more powerful fan (ask vendor for proper cooling fan).

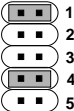





**a. Cyrix® 6x86 processor**

CPU Type	CPU Voltage			CPU Speed	
	VI/O	Vcore	JV1	SW1	
PR166 133MHz (66x2)	3.5				
PR150 120MHz (60x2)					
PR200 166MHz(66x2.5)					

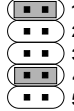

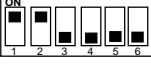
**b. Cyrix® 6x86L processor**

CPU Type	CPU Voltage			CPU Speed	
	VI/O	Vcore	JV1	SW1	
PR166 133MHz (66x2)	3.4	2.8			
PR150 120MHz (60x2)					
PR200 166MHz(66x2.5)					

**c. Cyrix® 6x86MX Processor**

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV1	SW1
<b>PR200</b> (75 x 2)	<b>3.4</b>	<b>2.9</b>	 1 2 3 4 5	 ON OFF
<b>PR233</b> (66 x 3)				 ON OFF
(75 x 2.5)				 ON OFF
(83 x 2)				 ON OFF
<b>PR266</b> (83 x 2.5)				 ON OFF

**d. Cyrix® MII processor**

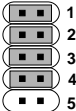



CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV1	SW1
<b>PR300</b> (66x3.5)	<b>3.4</b>	<b>2.9</b>	 1 2 3 4 5	 ON OFF
<b>PR333</b> (100x2.5)				 ON OFF

**Note:** In case, you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.







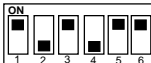







**Table 2.3 AMD® Processor**

AMD® K5/K6 processor uses PR to rate the speed of their processors based on Intel® Pentium® processor core speed . For example, PR133(100MHz) has 133MHz core speed of Intel® Pentium® processor but has 100MHz core speed in AMD® processor.

**a. AMD® K5 Processor**

CPU Type	CPU Voltage		CPU Speed	
	VI/O	Vcore	JV1	SW1
PR133	3.52	3.52	 1 2 3 4 5	 ON OFF ON OFF
PR150				 ON OFF ON OFF
PR166				 ON OFF ON OFF

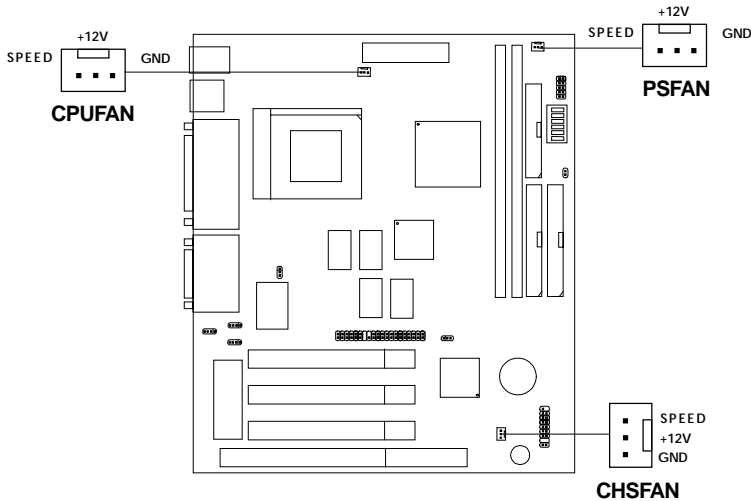
**b. AMD® K6 Processor**

CPU Type	CPU Voltage			CPU Speed
	VI/O	Vcore	JV1	SW1
166MHz	3.4	2.9		
200MHz				
233MHz	3.4	3.2		
266MHz	3.4	2.2		
300MHz				
K6-2 300MHz				
K6-2 333MHz				
K6-2 350MHz				
K6-2 366MHz				
K6-2 380MHz				
K6-2 400MHz				

**Note:** In case, you encounter a CPU with different voltage, just go to **Section 2.1-3** and look for the proper voltage settings.

### 2.1-6 Fan Power Connectors: CPUFAN, PSFAN & CHSFAN

These connectors support system cooling fan with +12V. It supports three pin head connector. When connecting the wire to the connector, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If your mainboard has System Hardware Monitor chipset on-board, you can use a specially designed fan w/ speed sensor to take advantage of System Hardware Monitor's CPU fan control.



**JFAN1: CPU FAN**

**JSFAN1: System (chassis) FAN**

**JPFAN1: Power FAN**

For fans with fan speed sensor, every rotation of the fan will send out 2 pulses. System Hardware Monitor will count and report the fan rotation speed.

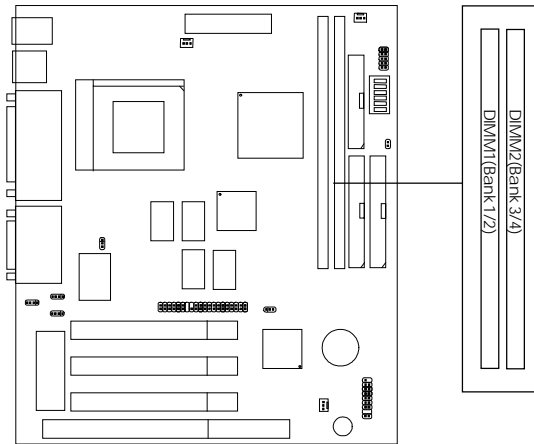
**Note:** Always consult vendor for proper CPU cooling fan.



## 2.2 Memory Installation

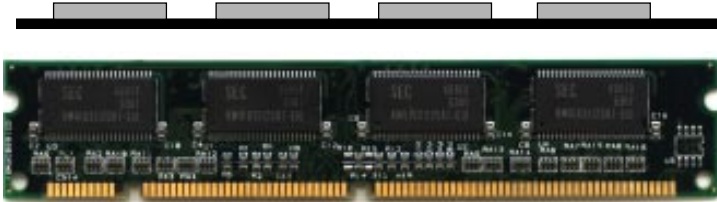
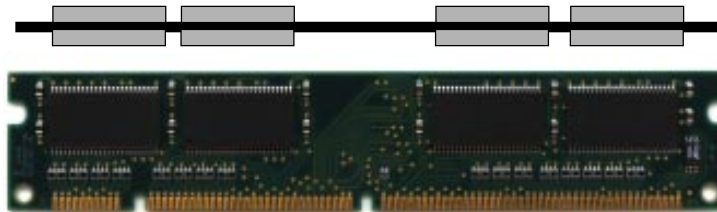
### 2.2-1 Memory Bank Configuration

The mainboard provides two 168-pin DIMM (Double In-Line Memory) sockets. It supports four memory banks for a maximum of 512MB memory. You can use DIMM from 8MB, 16MB, 32MB, 64MB, 128MB to 256MB.

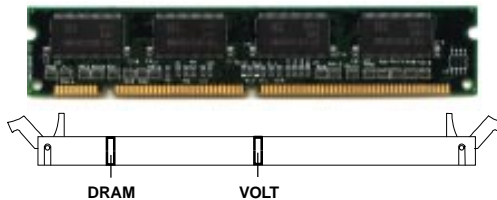


**WARNING!**

**If you use 100 MHz CPU Bus Frequency, only PC100 DIMM Specs. is supported.**

**2.2-2 Memory Installation Procedure:****A. How to install DIMM Module****Single Sided DIMM****Double Sided DIMM**

1. The DIMM slot has two keys marked “VOLT and DRAM” , so the DIMM memory module can only fit in one direction.
2. Insert the DIMM memory module vertically into the DIMM slot. Then, push it in.



3. The plastic clip at the side of the DIMM slot will automatically close.
-

**2.2-3 Memory Population Rules**

1. This mainboard supports Table Free memory, so memory can be installed in DIMM1 or DIMM2 in any order.
2. Use only 3.3v unbuffered DIMM.
3. The DRAM addressing and the size supported by the mainboard is shown next page.
4. Using 100MHz CPU Bus frequency, only PC100 DIMM is supported.

**Table 2.2-1 EDO DRAM Memory Addressing**

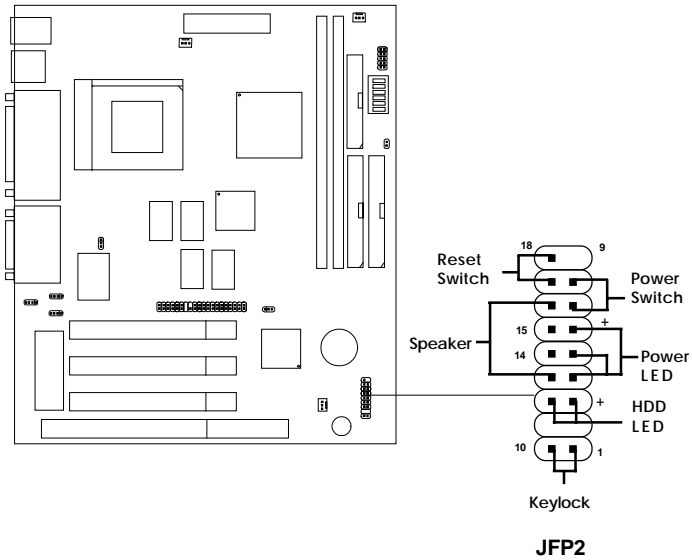
DRAM Tech.	DRAM Density & Width	DRAM Addressing	Address Size		MB/DIMM	
			Row	Column	Single no. Side(S) pcs.	Double no. Side(D) pcs.
16M	1Mx16	SYMM	10	10	8MBx4	16MBx8
	1Mx16	ASYM	12	8	8MBx4	16MBx8
	2Mx8	ASYM	11	10	16MBx8	32MBx16
	2Mx8	ASYM	12	9	16MBx8	32MBx16
	4Mx4	SYMM	11	11	32MBx16	64MBx32
	4Mx4	ASYM	12	10	32MBx16	64MBx32
64M	2Mx32	ASYM	11	10	16MBx2	32MBx4
	2Mx32	ASYM	12	9	16MBx2	32MBx4
	2Mx32	ASYM	13	8	16MBx2	32MBx4
	4Mx16	SYMM	11	11	32MBx4	64MBx8
	4Mx16	ASYM	12	10	32MBx4	64MBx8
	8Mx8	ASYM	12	11	64MBx8	128MBx16

**Table 2.2-2 SDRAM Memory Addressing**

DRAM Tech.	DRAM Density & Width	DRAM Addressing	Address Size		MB/DIMM	
			Row	Column	Single no. Side(S) pcs.	Double no. Side(D) pcs.
16M	1Mx16	ASYM	11	8	8MBx4	16MBx8
	2Mx8	ASYM	11	9	16MBx8	32MBx16
	4Mx4	ASYM	11	10	32MB	64MB
64M	2Mx32	ASYM	11	9	32MBx2	64MBx4
	2Mx32	ASYM	12	8	16MBx2	32MBx4
	4Mx16	ASYM	11	10	32MB	64MB
	4Mx16	ASYM	13	8	32MB	64MB
	8Mx8	ASYM	13	9	64MB	128MB
	16Mx4	ASYM	13	10	128MB	256MB
64M	2Mx32	ASYM	11	8		
	4Mx16	ASYM	12	8		
	8Mx8	ASYM	12	9		
	16Mx4	ASYM	12	10		

**2.3 Case Connector: JFP2**

The Power Switch, Reset Switch, Key Lock, Power LED, Speaker and HDD LED are all connected to the JFP1 connector block.



**2.3-1 Power Switch**

Connect to a 2-pin push button switch. This switch has the same function with JRMS1.

**2.3-2 Reset Switch**

Reset switch is used to reboot the system rather than turning the power ON/OFF. Avoid rebooting while the HDD LED is lit. You can connect the Reset switch from the system case to this pin.

**2.3-3 Keylock**

Keylock allows you to disable the keyboard for security purposes. You can connect the keylock to this pin.

**2.3-4 Power LED**

The Power LED is always lit while the system power is on. You can connect the Power LED from the system case to this pin.

**2.3-5 Speaker**

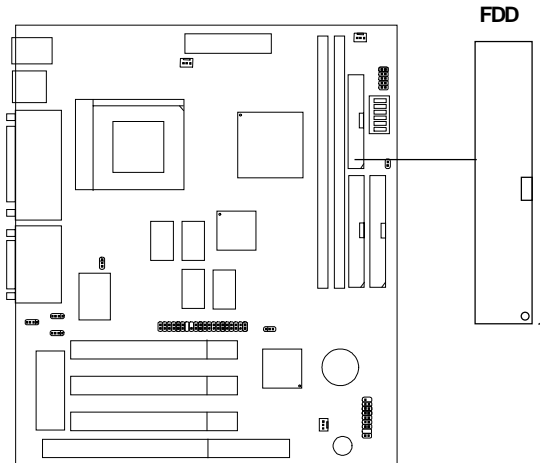
Speaker from the system case is connected to this pin.

**2.3-6 HDD LED**

HDD LED shows the activity of a hard disk drive. Avoid turning the power off while the HDD led is lit. You can connect the HDD LED from the system case to this pin.

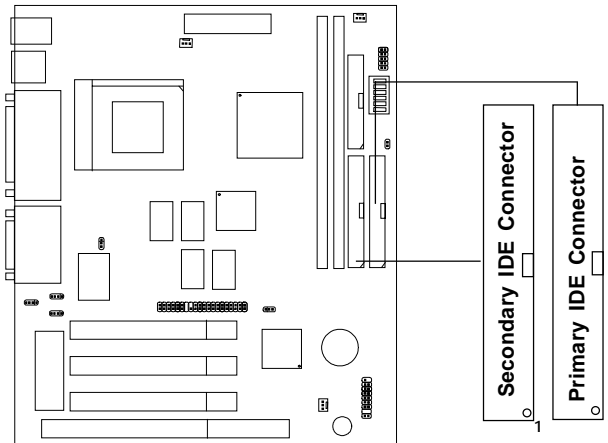
## 2.4 Floppy Disk Connector: FDD

The mainboard also provides a standard floppy disk connector, FDD1 supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. You can attach a floppy disk cable directly to this connector.



## 2.5 Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE Controller that provides two HDD connectors IDE1 (Primary) and IDE2 (Secondary). You can connect up to four hard disk drives, CD-ROM, 120MB Floppy and other devices to IDE1 and IDE2.



### IDE1(Primary IDE Connector)

The first hard disk should always be connected to IDE1. IDE1 can connect a Master and a Slave drive.

### IDE2(Secondary IDE Connector)

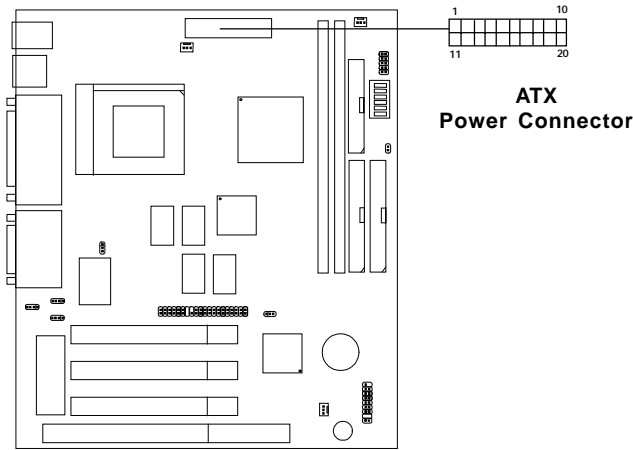
IDE2 can connect a Master and a Slave drive.

---



## 2.6 ATX 20-pin Power Connector: JWR1

This type of connector already supports the remote ON/OFF function. However, you need to connect the **Remote Power On/OFF switch (JRMS1)**.



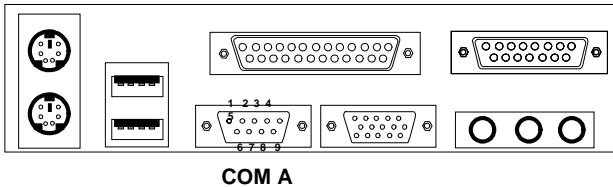
### PIN DEFINITION

PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

**Warning:** Since the mainboard has the instant power on function, make sure that all components are installed properly before inserting the power connector to ensure that no damage will be done.

## 2.7 Serial Port Connector: COM A

The mainboard has a 9-pin male DIN connector for serial port COM A. This port is a 16550A high speed communication port that send/receive 16 bytes FIFOs. You can attach a mouse or a modem cable directly into this connector.



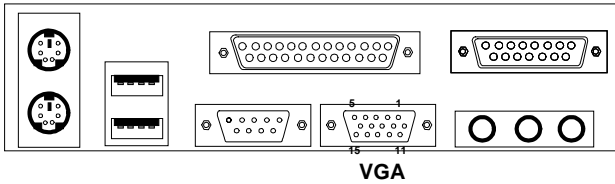
**Serial Ports (9-pin Male)**

### PIN DEFINITION

PIN	SIGNAL
1	<b>DCD</b> (Data Carry Detect)
2	<b>SIN</b> (Serial In or Receive Data)
3	<b>SOUT</b> (Serial Out or Transmit Data)
4	<b>DTR</b> (Data Terminal Ready)
5	<b>GND</b>
6	<b>DSR</b> (Data Set Ready)
7	<b>RTS</b> (Request To Send)
8	<b>CTS</b> (Clear To Send)
9	<b>RI</b> (Ring Indicate)

**2.8 VGA DB 15 Pin Connector**

The mainboard provides a DB 15-pin connector to connect to a VGA monitor.



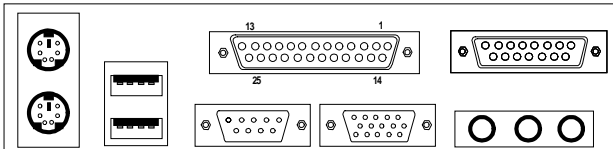
<b>Analog Video Display Connector(DB15-S)</b>	
<b>Pin</b>	<b>Signal Description</b>
1	Red
2	Green
3	Blue
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Not used
10	Ground
11	Not used
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

**2.9 Parallel Port Connector: LPT**

The mainboard provides a 25 pin female centronic connector for LPT. A parallel port is a standard printer port that also supports Enhanced Parallel Port(EPP) and Extended Capabilities Parallel Port(ECP). See connector and pin definition below:

**Parallel Port (25-pin Female)**

**L P T**

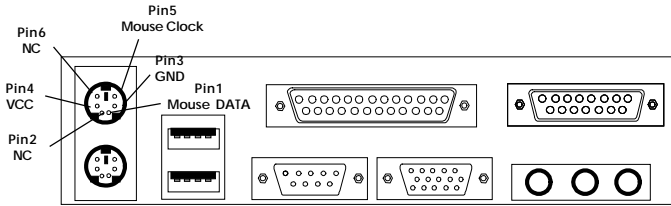


**PIN DEFINITION**

<b>PIN</b>	<b>SIGNAL</b>	<b>PIN</b>	<b>SIGNAL</b>
1	STROBE	14	AUTO FEED#
2	DATA0	15	ERR#
3	DATA1	16	INIT#
4	DATA2	17	SLIN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACK#	23	GND
11	BUSY	24	GND
12	PE	25	GND
13	SELECT		

**2.10 Mouse Connector: JKBSM1**

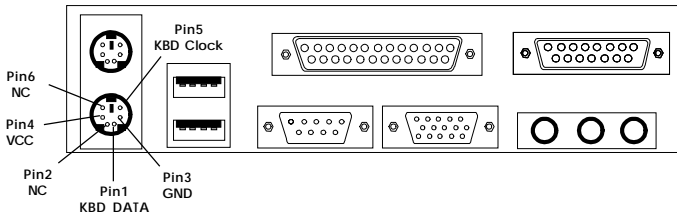
The mainboard provides a standard PS/2<sup>®</sup> mouse mini DIN connector for attaching a PS/2<sup>®</sup> mouse. You can plug a PS/2<sup>®</sup> mouse directly into this connector. The connector location and pin definition are shown below:



**PS/2 Mouse (6-pin Female)**

**2.11 Keyboard Connector: JKBMS1**

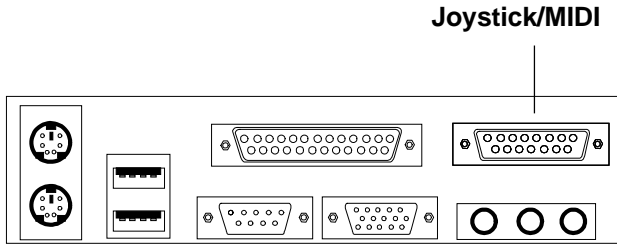
The mainboard provides a standard PS/2<sup>®</sup> keyboard mini DIN connector for attaching a keyboard. You can plug a keyboard cable directly into this connector.



**PS/2 Keyboard (6-pin Female)**

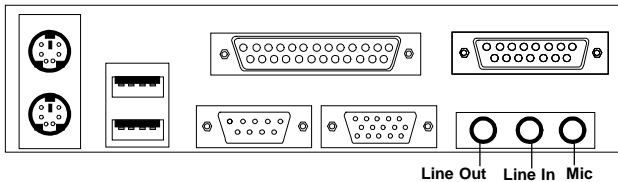
## 2.12 Joystick/Midi Connector

You can connect joystick or game pads to this connector.



## 2.13 Audio Port Connectors

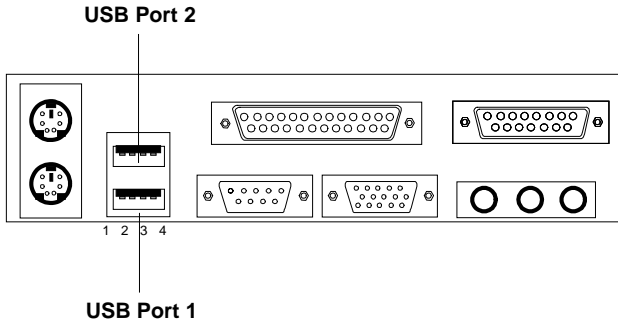
**Line Out** is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape layer, or other audio devices. **Mic** is a connector for the microphones.



### 1/8" Stereo Audio Connectors

## 2.14 USB Connectors

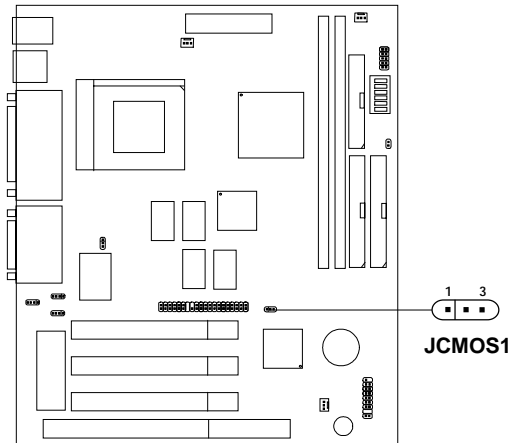
The mainboard provides a **Universal Serial Bus root** for attaching USB devices like: keyboard, mouse and other USB devices. You can plug the USB device directly to this connector.






PIN	SIGNAL
1	VCC
2	-Data0
3	+Data0
4	GND

## 2.15 Clear CMOS Jumper: JCMOS1

A battery must be used to retain the mainboard configuration in CMOS RAM. If you use the on-board battery, you must short 1-2 pins of JCMOS1 to keep the CMOS data.



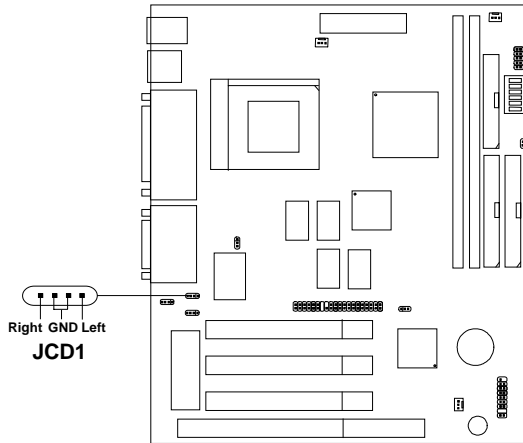
JCMOS1	Function
Short 1-2 	Normal Operation
Short 2-3 	Clear CMOS & Password
Open 	Flash Recovery

**Note:** You can clear CMOS by shorting 2-3 pin, while the system is off. Then, return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard. Always unplug the power cord from the socket wall.



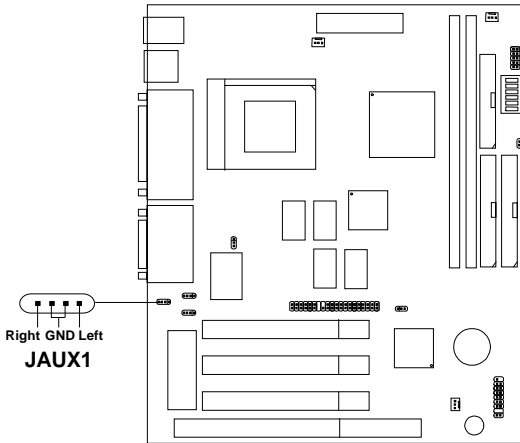
## 2.16 CD Line-In: JCD1

The mainboard provides CD Line-in connector to let you connect to the cable provided by the CD-ROM.



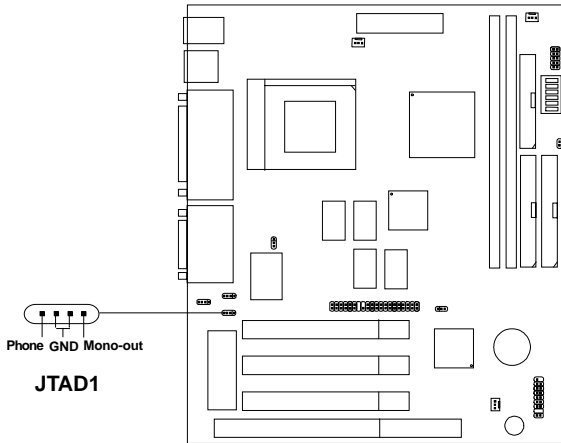
## **2.17 Audio Auxiliary Connector: JAUX1**

Connect the audio cable provided by the CD, TV Tuner, or etc. into this connector.



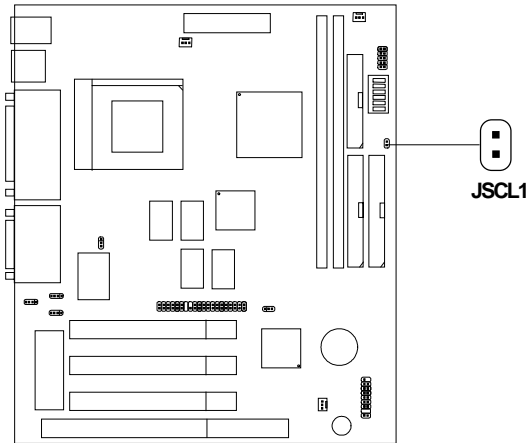
## **2.18 Internal Voice Modem Connector: JTAD1**

This connector is for Internal Modem Card with internal voice connector.



## 2.19 SCSI Active LED: JSCL1

The JSCL1 can be connected with LED connector from any SCSI card. This will enable the Hard disk Front panel to show any activity on the SCSI card.



## **Chapter 3**

### **AMI® BIOS USER'S GUIDE**

The system configuration information and chipset register information is stored in the CMOS RAM. This information is retained by a battery when the power is off. Enter the BIOS setup (if needed) to modify this information.

The following pages will describe how to enter BIOS setup, and all about options.

## 3.1 Enter BIOS Setup

Enter the AMI® setup Program's Main Menu as follows:

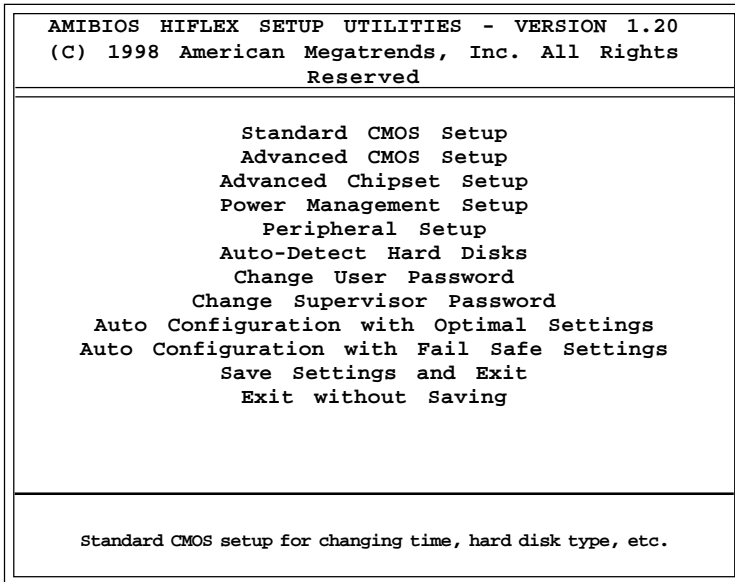
1. Turn on or reboot the system. The following screen appears with a series of diagnostic check.

```
AMIBIOS (C) 1998 American Megatrends Inc.  
AR5189MS VXXX XXXXXX  
Main Processor: XXXXX  
Processor Clock: XXXMHz  
  
Hit <DEL> if you want to run setup
```

```
(C) American Megatrends Inc.  
61-XXXX-001169-00111111-071592-i82440FX-H
```

2. When the "Hit <DEL>" message appears, press <DEL> key to enter the BIOS setup screen.
3. After pressing <DEL> key, the BIOS setup screen will appear.

**Note:** *If you don't want to modify CMOS original setting, then don't press any key during the system boot.*



4. Use the <Up> and <Down> key to move the highlight scroll up or down.
5. Use the <ENTER> key to select the option.
6. To exit, press <ESC>. To save and exit, press <F10>.
7. Section 3.2 to 3.7 will explain the option in more details.

## 3.2 Standard CMOS Setup

1. Press <ENTER> on "Standard CMOS Setup" of the main menu screen .

AMIBIOS SETUP - STANDARD CMOS SETUP												
(C)1998 American Megatrends, Inc. All Rights Reserved												
Date (mm/dd/yyyy):	Fri Feb 27, 1998											
Time (hh/mm/ss):	17:09:25											
Floppy Drive A:	1.44 MB 3 1/2											
Floppy Drive B:	Not Installed											
	Type	Size	Cyln	Head	WPcom	Sec	LBA Mode	Blk Mode	PIO Mode	32Bit 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	: 1901-2099						F2/F3:	Color				

2. Use <Up> and <Down> to choose the item and <PgUp> and <PgDn> keys to modify the highlighted item.
3. After you have finished with the Standard CMOS Setup, press <ESC> to go back to the main menu.



### 3.3 Advanced CMOS Setup

1. Press <ENTER> on “Advanced CMOS Setup” of the main menu

AMIBIOS SETUP - ADVANCED CMOS SETUP		
(C) 1998 American Megatrends, Inc. All Rights Reserved		
1st Boot Device	FLOPPY	Available Options:
2nd Boot Device	IDE-0	Disabled
3rd Boot Device	CD-ROM	IDE0
4th Boot Device	Disabled	IDE1
Password Check	Setup	IDE2
System BIOS Cacheable	Enabled	IDE3
Video BIOS Shadow	Enabled	Floppy
		ARMD-FDD
		ARMD-HDD
		CDROM
		SCSI
		Network
		ESC:Exit :Sel
		PgUp/PgDn:Modify
		F2/F3:Color

2. Use <Up> and <Down> to choose the item and <PgUp> and <PgDn> keys to modify the highlighted item.
3. After you have finished with the Advanced CMOS Setup, press <ESC> to go back to the main menu.

## Description of the item on screen follows:

### 1st Boot Device/2nd Boot Device/3rd Boot Device/4th Boot Device

This option sets the sequence of boot drives.

The settings are:

IDE0	The system will boot from the first HDD.
IDE1	The system will boot from the Second HDD.
IDE2	The system will boot from the Third HDD.
IDE3	The system will boot from the Fourth HDD.
Floppy	The system will boot from Floppy drive.
ARMD-FDD	The system will boot from IOMEGA drive.
ARMD-HDD	The system will boot from LS-120 drive.
SCSI	The system will boot from the SCSI.
Network	The system will boot from the Network drive.
CD-ROM	The system will boot from the CD-ROM.
Disable	Disable this sequence.

### Password Check

This option specifies the type of AMI® BIOS password protection that is implemented. The Optimal and Fail-Safe default settings are Setup.

### System BIOS Cacheable

AMI® BIOS always copies the system BIOS from ROM to RAM for faster execution. Set this option to Enabled to permit the contents of the F0000h RAM memory segment to be written to and read from cache memory. The settings are Enabled or Disabled. The Optimal default setting is Enabled.

### Video BIOS Shadow

Determines whether video BIOS will be copied to RAM for faster execution. Video shadow will increase the video performance.

<b>Enabled</b> (default)	Video shadow is enabled
<b>Disabled</b>	Video shadow is disabled

## 3.4 Advanced Chipset Setup

1. Press <ENTER> on “Advanced Chipset Setup” of the main menu screen.

AMIBIOS SETUP - ADVANCED CHIPSET SETUP		
(C) 1998 American Megatrends, Inc. All Rights Reserved		
USB Keyboard Legacy Support	Disabled	Available Options:
Graphics Aperture Size	64	Disabled
Primary Frame Buffer	Enabled	Enabled
Onboard Sound Chip	Enabled	
		ESC:Exit :Sel
		PgUp/PgDn:Modify
		F2/F3:Color

2. Use <Up> and <Down> to choose the item and <PgUp> and <PgDn> keys to modify the highlighted item.
3. After you have finished with the Advanced Chipset Setup, press <ESC> to go back to the main menu.

## Description of the item on screen are as follows:

### USB Keyboard Legacy Support

Set this option to Enable or Disable USB keyboard/mouse.  
The Optional and Fail-Safe default settings are Disabled.

### Graphics Aperture Size

This option determines the effective size of the graphics aperture used in the particular configuration. The AGP aperture is memory-mapped, while graphics data structure can reside in a graphics aperture. The aperture range should be programmed as non cacheable in the processor cache, access with the aperture range are forwarded to the main memory, then translated to the original issued address via a translation table that is maintained on the main memory. The option allows the selection of an aperture size of 4MB, 8MB, 16MB, 32MB, 64MB, 128MB, and 256MB.

### Primary Frame Buffer

The processor provides a write-combining with buffering strategy for write operation. This is useful for frame buffering. Writing to USWC memory can be buffered and combined in the processor's write-combining buffer (WCB). The WCBs are viewed as a special purpose outgoing write buffers, rather than a cache. The WCBs are written into memory to allocate a different address, or after executing a serializing, locked, or I/O instructions.

During Enabled, this will enable the processor memory location C000 and DFFF segment as USWC memory type.

### Onboard Sound Chip

Choosing Enabled will allow the system to use onboard sound.  
Choose Disabled, when using add-on sound card.



## **Description of the item on screen are as follows:**

### **Power Management/APM**

Set this option to Enabled to enable the power management features and APM(Advanced Power Management). The settings are Enabled, Inst-On(instant-on) or Disabled. The Optimal and Fail-Safe default settings are Disabled.

### **Green Monitor Power State**

This option specifies the power state that the green PC-compliant video monitor enters when AMI® BIOS places it in a power savings state after the specified period of display inactivity has expired. The settings are Off, Standby, Suspend or Disabled. The Optimal and Fail-Safe default settings are Standby.

### **Video Power Down Mode**

This option specifies the power conserving state that the VESA VGA video subsystem enters after the specified period of display inactivity has expired. The settings are Disabled, Standby or Suspend. The Optimal and Fail-Safe default settings are Standby.

### **Hard Disk Power Down Mode**

This option will specifies the power conserving state that the hard disk drive enters after the specified period of hard drive inactivity has expired. The settings are Disabled, Standby or Suspend. The Optimal and Fail-Safe default settings are Disabled.

### **Power Button Function**

During Suspend, if you push the switch once, the system goes into suspend mode and if you push it for more than 4 seconds, the system will be turned off. During On/Off, the system will turn off once you push the switch.

## 3.6 Peripheral Setup

1. Press <ENTER> on "Peripheral Setup" of the main menu screen.

AMIBIOS SETUP - PERIPHERAL SETUP		
(C) 1998 American Megatrends, Inc. All Rights Reserved		
OnBoard FDC	Enabled	Available Options:
OnBoard Serial Port1	3F8H/COM1	Enabled
OnBoard Parallel Port	378H	Disabled
Parallel Port Mode	Normal	
EPP Version	N/A	
Parallel Port IRQ	7	
Parallel Port DMA Channel	N/A	
OnBoard IDE	Both	
CDROM Dual Mode	Normal	
		ESC:Exit :Sel
		PgUp/PgDn:Modify
		F2/F3:Color

2. Use <up> and <down> to choose the item and <PgUp> and <PgDn> keys to modify the highlighted item.
3. After you have finished with the Peripheral Setup, press <ESC> to go back to the main menu.

**Description of the item on screen follows:**

**Onboard FDC**

Choose Auto, for the BIOS to automatically detect the device.

If the ISA add-on card has	Onboard FDC to be set at
FDC exist	Disabled
none FDC exist	Enabled

Choose Enabled, Enabling onboard FDC.

Choose Disabled, Disabling onboard FDC.

The Optimal and Fail-Safe default settings are Auto.

**Onboard Serial Port 1**

Choose Auto, for the BIOS to automatically detect the device.

If the ISA add-on card has				Onboard Serial port to be set at			
COM1 (I/O:3F8H)	COM2 (I/O:3F8H)	COM3 (I/O:3E8H)	COM4 (I/O:2E8H)	PORT1	IRQ ASSIGNED	PORT2	IRQ ASSIGNED
✓	✓	✓	✓	DISABLED	X	DISABLED	X
✓	✓	X	X	COM3	4	COM4	3
X	X	✓	✓	COM1	4	COM2	3
✓	X	X	✓	COM2	3	COM3	4
X	✓	✓	X	COM1	4	COM4	3
✓	✓	✓	X	COM4	3	DISABLED	X
✓	✓	X	✓	COM3	4	DISABLED	X
✓	X	✓	✓	COM2	3	DISABLED	X
X	✓	✓	✓	COM1	4	DISABLED	X
X	X	X	X	COM1	4	COM2	3
✓	X	X	X	COM2	3	COM3	4
X	✓	X	X	COM1	4	COM3	4
X	X	✓	X	COM1	4	COM2	3
X	X	X	✓	COM1	4	COM2	3

**Note:** *If the onboard serial port interrupt and ISA add-on card interrupt are in conflict, the serial port will not work properly. Please disable one of the devices.*



## Onboard Parallel Port

Choose Auto, for the BIOS to automatically assign the onboard parallel port to the available parallel port or disabled.

If the ISA add-on card has			Onboard parallel port to be set as	
LPT1 I/O:378H	LPT2 I/O:278H	LPT3 I/O:3BCH	PORT ASSIGNED	IRQ ASSIGNED
✓	✓	✓	Disabled	X
✓	✓	X	LPT3	5
✓	X	✓	LPT2	5
X	✓	✓	LPT1	7
✓	X	X	LPT2	5
X	✓	X	LPT1	7
X	X	✓	LPT1	7
X	X	X	LPT1	7

**Note:** *If the onboard parallel port interrupt and ISA add-on card interrupt are in conflict, the parallel port will not work properly. Please disable one of the devices.*

## EPP Version

This option is for setting which EPP version will be used. The settings are 1.7 and 1.9.

## Parallel Port Mode

This option allows user to choose the operating mode of the onboard parallel port. The settings are Normal, SPP/EPP or ECP mode.

### **Parallel Port IRQ**

If the onboard parallel mode is not on auto mode, the user can select the interrupt line for onboard parallel port. We suggest that the user select the interrupt for the onboard parallel port as shown below:

<b>Onboard parallel port set at</b>	<b>Parallel Port IRQ</b>
LPT1(378H)	7
LPT2(278H)	5
LPT3(3BCH)	5

### **Parallel Port DMA Channel**

This option allows user to choose DMA channel 1 to 3 for the onboard parallel port on ECP mode.

### **Onboard IDE**

Set this option to enable or disable the on board IDE controller.

### **CDROM DMA Mode**

Set this option to Normal or Turbo.

## Chapter 4

### ALI® IDE DRIVER

#### 1. Overview

The on-chip IDE controller supports two separate IDE controllers for up to 4 IDE devices providing an interface for IDE hard disks and CD-ROMS. The Ultra DMA specification (which supports the 33M bytes per second transfer rate) has been implemented in this IDE controller. The ATA bus pins & the smart deep Buffer (16 x 32-bit Read Ahead and Posted Write) are all dedicated for separate channel to improve the reliability and the performance of IDE Master. Dedicated Pins and Buffers are also the best implementation for today's concurrent OS and application to reduce overhead and achieve the best performance. The IDE controller also supports Tri-state IDE signals for Swap Bay support.



## Chapter 5

### ATI® RAGE PRO TURBO VGA DRIVER

#### 1. Overview

The ATI® RAGE PRO TURBO is a highly integrated graphics controller. Incorporated within this single chip are the 2D, 3D, and video accelerators, palette DAC, and dual-clock synthesizer. This multi-function integrated controller delivers TV-quality scaled video optimized for MPEG playback, industry-leading mach64 2D performance.

##### 1.1 ATI® RAGE PRO TURBO Features

- Support 8M SDRAM for 100MHz.
- Support AGP 2X BUS Up to 133MHz.
- Stunningly fast 2D and 3D performance, achieved through 128-bit engine and advanced 3D architecture
- An enhanced 3D feature with the addition of a 32-bit Z-buffer and an OpenGL stencil buffer, together with improvements in edge anti-aliasing, texture compositing, subpixel/subtexel accuracy, and Z-based fog.
- Enhanced multimedia functionality through a video port that supports AMC.

##### 1.2 System Requirements

This section describes system requirements for the VGA Driver installation and Usage.

<b>Monitor</b>	VGA Support, minimum 640x480 resolution
<b>Operating system</b>	DOS 5.0 or higher, Windows®95/98, Windows®NT 3.51 or 4.0, or OS/2®
<b>CD-ROM</b>	Double Speed or Higher

---

## 2. ATI®Rage PRO TURBO VGA Driver Setup & Usage Procedures

Insert the CD-title into your CD-ROM drive. This CD will auto-run. This will display installation for VGA driver and sound driver. Also included are MSI Utility, Adobe Acrobat, Remote Control Utility, and PC-Cillin 98. Just click the button for automatic installation for ATI Rage Pro Turbo VGA driver.

### 2.1 Windows®95/98

If you start Windows®95/98, this will automatically detect this hardware onboard “PCI Multimedia Audio Device” and “Gameport Joystick”. You need to click “Next”, then “Finish”. Do not click on the “Cancel”. The driver need these ID.



**2.1-1 ALi AGP Driver Installation Procedure:**

**Step 1:** Insert the provided CD\_ROM disk into the CD-ROM drive.

**Step 2:** Look for the CD\_ROM drive, double click on the CD\_ROM icon. This will show the setup screen.

**Step 3:** Click on “ALi AGP Driver” icon.

**Step 4:** This will show an ALi AGP Driver installation menu.

**Step 5:** Click on “Next”.

**Step 7:** This will copy the VGA drivers into the hard drive.

**Step 8:** A message will appear stating you must restart the Windows®95/98 system, select **OK** to restart.

**Step 9:** After restarting, Windows®95/98 will show a new display setting.

**2.1-2 Microsoft DirectX6 Installation Procedure:**

**Step 1:** Click on “Microsoft “DirectX6” icon.

**Step 2:** This will show a Microsoft DirectX6 installation menu

**Step 3:** Click on “Yes” to continue.

**Step 4:** This will copy the Microsoft DirectX6 into the hard drive.

**Step 5:** A message will appear stating you must restart the Windows®95/98 system, select **OK** to restart.

**Step 6:** After restarting, Windows®95/98 will show a new display setting.

**2.1-3 ATI Rage Pro Turbo VGA Installation Procedure:**

**Step 1:** Click on “ATI Rage Pro VGA Drivers” icon.

**Step 2:** This will show an ATI Rage Pro Turbo VGA Drivers installation menu

**Step 3:** Click on “Next” to continue.

**Step 4:** A Licence Agreement will be shown in the screen.

**Step 5:** Click on “Yes” to continue.

**Step 6:** A message will appear stating you must restart the Windows®95/95 system, select **Finish** to restart.

**Step 7:** After restarting, Windows®95/98 will show a new display setting.

**2.1-4 Changing resolution, color depth, and refresh rate:**

- Step 1:** Click **Start** menu and select **Control Panel** from **Settings** group.
- Step 2:** Select **Display** icon.
- Step 3:** Select **Settings**.
- Step 4:** Select Color Palette to change between 16 color, 256 color, Hi color, or True color.
- Step 5:** Select desktop resolution from 640x480, 800x600, 1024x768, and 1280x1024.
- Step 6:** Select Refresh rate list box to change the screen refresh rate.
- Step 7:** Click OK or Apply.



## 2.2 Windows® NT 4.0

**You need to install Windows®NT “Service Pack”, before you install Windows®NT driver.**

### 2.2-1 Display Driver Installation Procedure:

- Step 1:** Click **Start** menu and select **Control Panel** from **Settings** group.
- Step 2:** Select **Display** icon.
- Step 3:** Select **Settings** on the Display Properties.
- Step 4:** Select **Display Type**.
- Step 5:** Select **Change** from the **Adapter Type** Area.
- Step 6:** Select **Have Disk** of Change Display.
- Step 7:** Insert the **CD-Title Disk** into CD-ROM Drive.
- Step 8:** When the Install from Disk dialog box appears, look for your CD-ROM drive: **:\VGAATI\NT40\ati.inf**.
- Step 9:** When the **Change Display** dialog box appears, click **OK**.
- Step 10:** When the Third-party Drivers dialog box appears, click **Yes**  
A message will appear stating that the drivers were successfully installed. Click OK. You must now restart Windows®NT 4.0.

**2.2-2 Changing resolution, color depth, and refresh rate:**

- Step 1:** Click **Start** menu and select **Control Panel** from **Settings** group.
- Step 2:** Select **Display** icon.
- Step 3:** Select **Settings**.
- Step 4:** Select Color Palette to change between 16 color, 256 color, 32768 colors, 65536 colors, and 16777216 colors.
- Step 5:** To select desktop resolution size, go to the Desktop area and use the slide bar to change resolution from 640x480, 800x600, 1024x768, to 1280x1024.
- Step 6:** Select Test to test the resolution. If the display test screen was good, then select Yes when the Testing Mode dialog box appears. If the display test screen was bad, then select No. Windows®NT will give you an error message.
- Step 7:** Click OK. If the display test screen was good and you select Yes, Windows®NT 4.0 will change the mode without restarting the system.

**2.3 AutoCAD, OS/2 and other application. Please refer to “On-Line Manual” in the CD-ROM. You need to install the “Acrobat Reader 3.01” program first.**

## Chapter 6

### CREATIVE® 1373 AUDIO DRIVER

#### 1. Overview

The Creative® 1373 digital controller provides the next generation of audio performance to the PC market.

##### 1.1 Features

- SoundScape WaveTable Synthesizer.
- Full DOS Game Compatibility.
- PCI Bus Master for fast DMA.
- Fully Compliant with PC97 Power Management Specification.

##### 1.2 System Requirements

This section describes system requirements for the Audio Driver installation and Usage.

<b>Operating system</b>	DOS 5.0 or higher, Windows®95/98, Windows®NT 3.51 or 4.0, or OS/2®
<b>CD-ROM</b>	Double Speed or Higher
<b>Chipset</b>	Creative® 1373



**2.1-1 Audio Driver Installation Procedure:**

**Step 1:** Insert the provided CD\_ROM disk into the CD-ROM drive.

**Step 2:** Look for the CD\_ROM drive, double click on the CD\_ROM icon. This will show the setup screen.

**Step 3:** Click on “CREATIVE AudioPCI” sound drivers icon.

**Step 4:** This will copy the audio drivers into the hard drive.

**Step 5:** A message will appear stating you must restart the Windows® 95/98 system, select **yes** to restart.

**Note:** You must install Audio Driver before installing USB support.

**2.2 Windows® NT 4.0****2.2-1 Audio Driver Installation Procedure:**

**Step 1:** Click **Start** menu and select **Control Panel** from **Settings** group.

**Step 2:** Select **Multimedia** icon.

**Step 3:** Click on the **Devices** tab.

**Step 4:** Click **Add**.

**Step 5:** Double click on **Unlisted or Updated Driver** in the list.

**Step 6:** Insert the **CD-ROM Disk** into the CD-ROM Drive.

**Step 7:** When the Install from Disk dialog box appears, look for your CD-ROM drive: **:\Sound\Creative\AudioPCI\Drivers\NT40\English\I386\CD**

**Step 8:** Click **OK**.

**Step 9:** Click **OK**.

**Step 10:** A message will appear stating that the drivers were successfully installed. Click **OK**. You must now restart Windows® NT 4.0.

**2.3 Detailed User’s Manual**

The detailed user’s manual can be found on following path of the CD-ROM provided:

**PATH: Sound\Creative\AudioPCI\Docs\Manual.doc**

---